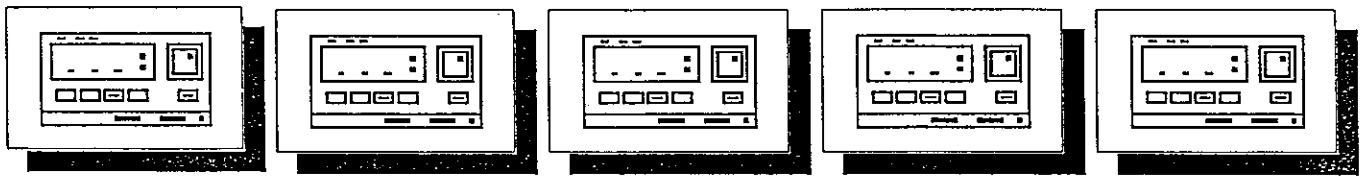
AD-4323

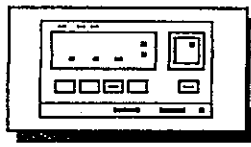
Weighing Indicator



MAINTENANCE MANUAL

maintenance-AD-4323-v.1.c 89.09.30 OYM

A&D Company, Limited



AD-4323
Maintenance
Manual

CONTENTS

WARRANTY

Warranty rights vary from country to country but it is the general intention of A&D Co., Ltd., to offer customers a one year warranty on this product from the day it is purchased. In some countries consumer protection legislation states that your dealer is responsible for offering a warranty and under these circumstances please refer to your local dealer.

In the U.S.A. the product (if defective) should be returned, freight prepaid by the customer, to A&D Engineering Inc. in California and in Europe the product can be returned freight prepaid to A&D Instruments GmbH in Frankfurt, West Germany. Elsewhere the product can be returned to A&D Co., Ltd. in Japan. In any event please contact your nearest A&D office, before shipping, to confirm that the product is covered by this warranty. Simple repairs can be carried out by your local dealer under warranty and this may be the fastest method of solving your problem.

This warranty only applies to product failures due to defective materials and/or workmanship. This warranty will be rendered invalid if, upon inspection, it is found that the product was: Abused; used for a purpose for which it was not designed; mishandled; placed in a hostile environment; repaired by unauthorized personnel; improperly installed or not adjusted in accordance with instructions given in this manual. If repair under warranty is confirmed by A&D, then the product will be repaired (or replaced, at the discretion of A&D) and then returned to the customer at no extra cost.

COMPLIANCE WITH FCC RULES

Please note that this equipment generates, uses and can radiate radio frequency energy. This equipment has been tested and has been found to comply with the limits of a Class A computing device pursuant to Subpart J of Part 15 of FCC rules. These rules are designed to provide reasonable protection against interference when equipment is operated in a commercial environment. If this unit is operated in a residential area it might cause some interference and under these circumstances the user would be required to take, at his own expense, whatever measures are necessary to eliminate the interference.

(FCC = Federal Communications Commission in the U.S.A.)

SPECIFICATIONS

■ ANALOG INPUT and A/D CONVERSION

Input Sensitivity	up to 0.6μV/D (D="min. division" or "graduation")
ZERO Adjustment Range	0.35mV~24mV
Max. Load Cell Input Volt.	36mV
Load Cell Excitation	12V DC ± 5% 280mA
ZERO Temperature Comp.	±(0.2μV + 0.0008% of Dead Load)/°C TYP
Span Temperature Comp.	± 0.0008% / °C TYP
Non-Linearity	0.01% F.S.
Input Noise	± 0.3μV_{p-p}
Input Impedance	10 MΩ
A/D Conversion Method	3 phase, true integrating dual-slope type
A/D Resolution	96,000 Counts Max.
A/D Conversion Rate	approx. 70 times/second (14 m sec/conversion)

■ DIGITAL SECTION

Weighing Display	High intensity 7-segment, cobalt-blue fluorescent
Display Height	13mm ($1/2$")
Minimum Division	times 1, x2, x5, x10, x20, x50
Maximum Display	"+500450
Under ZERO Indication	"–" minus sign
"ZERO" ▼ Annunciator	Center of ZERO (0±0.17D)
"MD" ▼ Annunciator	Motion Detection
"GROSS" ▼ Annunciator	GROSS Mode
"NET" ▼ Annunciator	NET Mode
"TARE ENTERED" ▼ Annun.	Tare has been entered
"lb" ● Annunciator	Pounds Displayed (lb or kg version)
"kg" ● Annunciator	Kilograms Displayed
"t" ● Annunciator	Tonne Displayed (kg or t version)
STANDBY / OPERATE KEY	Activates display and functions.
ZERO Key	ZERO's the Display when stable.
TARE Key	Tare when stable - in NET mode, display ZERO.
GROSS / NET Key	Changes from "GROSS" to "NET" and vice versa.
PRINT Key	Send print command to printer via current loop OP–01 or OP-04.

❑ GENERAL

Power Requirements	100,115,220,240V AC +10%,-15% 50/60Hz
NET Weight	Approx. 3kg (6.6lb)
Operating Temperature	-5°C to 40°C (23°F to 104°F)
Maximum Humidity	85% (non-condensing)
Physical Dimensions	192(W)x187(D)x96(H)mm 7.56"x7.36"x3.78"
Memory Battery Back-up	6 years or more without AC power (lithium).

❑ STANDARD ACCESSORIES

	quantity
Load Cell Connector	1
Serial Outlet Connector	1
Setpoint Connector	1
Control I/O Connector	1
Fuse: 100 or 120 V AC = 0.5A; 220 or 240 V AC = 0.3A	1
Power Cable	1
Capacity Sticker	1
Rubber Feet	4

❑ OPTIONS

Option OP-01	Parallel BCD (Binary-Coded-Decimal) output (DATA OUT). Output data: weight, NET/GROSS, MD Decimal point, lb, kg, (t), print trigger, overload.
Option OP-04	Serial Interface. Two types of serial interface are available with this option: 1) EIA-RS-232C, with or without handshake. 2) 20mA current loop (passive). Baud Rate & Format are identical to RS-232C.
Option OP-05	Setpoint Unit. Independent unit in separate metal casing. The unit can be directly interfaced via an attached cable and connector. Final Weight (Target), Free Fall, Preliminary Weight (cut-off point), and High/Low Limit.
Option OP-07	Analog output (current).

❑ WEIGHT CONVERSION TABLE

One kg	=	2.204 62 lb(avoir) approximately.
One lb	=	0.453 59kg.
One t	=	tonne 1,000kg (Metric Ton) or 2,204.62 lb approximately.
	=	ton, long: (20 cwt) 2,240 lb or 1,016.05kg approximately.
	=	ton, short: 2,000 lb or 907.18kg approximately.
	=	tun 216 imp. gal. (ale), 252 imp. gal. (wine). "weight"=volume x density. One imp. gal. of distilled water at 62°F=10 lb=4.536kg but also equals about 4.546 liters/dm^3/kg at 4°C. One liter of water at 4°C equals 1kg. One US gal. is about 5/6 of an imp. gal. or about 3.785 liters.

■ F-FUNCTIONS and SETTINGS

F 01	Decimal Point Adjustment	Displays to 1,2,3 or 4 decimal places.
F 02	Weighing Unit Selection	"kg"↔ "t" (Not USA version)
F 03	Display Update Rate	17 times/sec, 4 times/sec.
F 04	Digital Filter	Week ↔ Strong.
F 05	Set ZERO Range	2% or 10% of Maximum Capacity.
F 06	Motion Detection Condition	0.5 sec, 1 count → 1 sec, 9 counts
F 07	Auto. ZERO Track. Comp.	1 sec, .5 division → 2 sec, 4.5 division
F 08	Holding Mode	Normal Hold, Peak Hold
F 09	Comparison Result Output	Normal Output, Locked w/ Display

❑ *For Batch Weighing*

F 10	Pulse Width of FINISH signal	0.1 sec → 2.0 sec
F 11	ZERO Band	Selectable (enter weight)
F 12	Optional Preliminary Weight	Selectable (enter weight)
F 13	Timer - Comparator Inhibiter	0.1 to 2.0 seconds or Disable.
F 14	Automatic Free Fall Comp.	Set Weight or Disable.
F 15*	Measurement Mode	Normal, Loss-in Batching. *When F-70="0"
F 15*	Comparison Mode	Modes 1→5. *When F-70="1".
F 16	TARE & ZERO keys Availability	Stable or Always Working (Not USA version).
F 17	TARE key Availability	Avail., N. A. at Minus Gross (Not USA version)
F 18	Timer - Finish Signal	Set between 0.1 sec. and 9.9 sec.
F 19	N. A.	N. A.

❑ *Front Panel Keys*

F 20	Panel Key Disable Selection	Enable/Disable Selection (Not USA version)

❑ *For Standard Current Loop*

F 21	Baud Rate	600, 2400 Baud.
F 22	Output Data	Display, GROSS, NET, Tare or Gross+Net+Tare
F 23	Output Mode	Stream, Auto Print, PRINT key.
F 24	Output Availability	Always Available, or Stable Only
F 25→30	N. A.	

❑ *For BCD Option* ***OP-01***

F 31	Output Data	Display, GROSS, NET, or Tare Data.
F 32	Output Mode	Stream, Auto Print, PRINT Key.
F 33	Output Logic	Positive Logic, Negative Logic.
F 34→40	N. A.	

❑ *For Serial Interface Option* ***OP-04***

F 41	Baud Rate	600, 1200, 2400, 4800, 9600.
F 42	Output Data	Display, GROSS, NET, Tare or Gross+Net+Tare Data (also update rates).
F 43	Output Mode	Stream, Auto Print, Print Key, Command.
F 44	Output Availability	Always Available, Only when Stable
F 45→50	N. A.	

❑ *For Analog Option* ***OP-07***

F 51	Analog Output Data	Display, Gross, or Net Data.
F 52	Output current at display ZERO	0.0mA through 99.9mA.
F 53	Output current at Full Scale	0.0mA through 99.9mA.
F 54→60	N. A.	

❑ *For Check Weighing*

F 61	High High Limit Weight	Input the Weight.
F 62	High Limit Weight	Input the Weight.
F 63	Low Limit Weight	Input the Weight.
F 64	Low Low Limit Weight	Input the Weight.
F 65→69	N. A.	

❑ *Weighing Mode*

F 70	Weighing Mode	Batch Weighing, Check Weighing

GENERAL

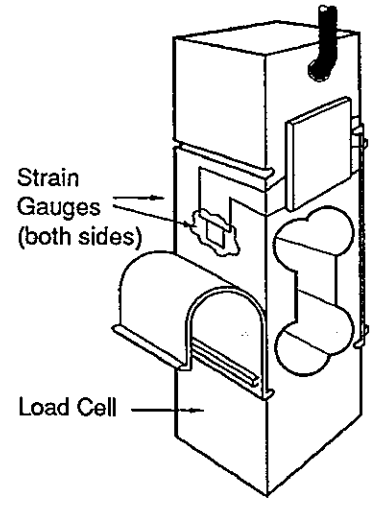
The AD-4323 is a high speed weighing indicator which amplifies the analog output from a Load Cell(s) and converts this to digital data, displaying it as a weight value. It has high speed sampling at 70 times per second, with equally high accuracy of 1/10,000.

Standard and optional features include I/O's for Batch Weighing, and interfaces for External controllers and instruments. **FDC**™ (Full Digital Calibration) calibrated ZERO and SPAN values are stored in non-volatile memory, and setting data is written in memory with a battery back-up.

Watchdog circuitry protects unexpected movement of the indicator. **WATCHDOG**™ circuitry virtually eliminates malfunctions commonly associated with computerized equipment, protecting against unexpected software crashes of the indicator. And, the unit is screened against **RFI** (Radio Frequency Interference).

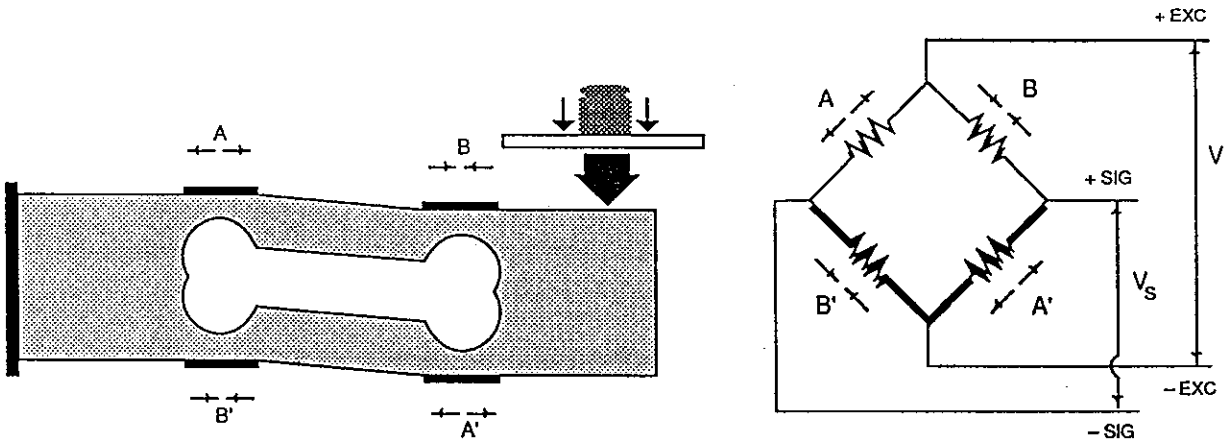
METHOD

A Load Cell works by detecting stress in a spring element using strain gauges that have been bonded to the upper and lower surfaces, forming a Wheastone Bridge circuit.



When the Wheastone Bridge circuit is supplied excitation voltage by the indicator, the resulting voltage output becomes the indicator's measurement input.

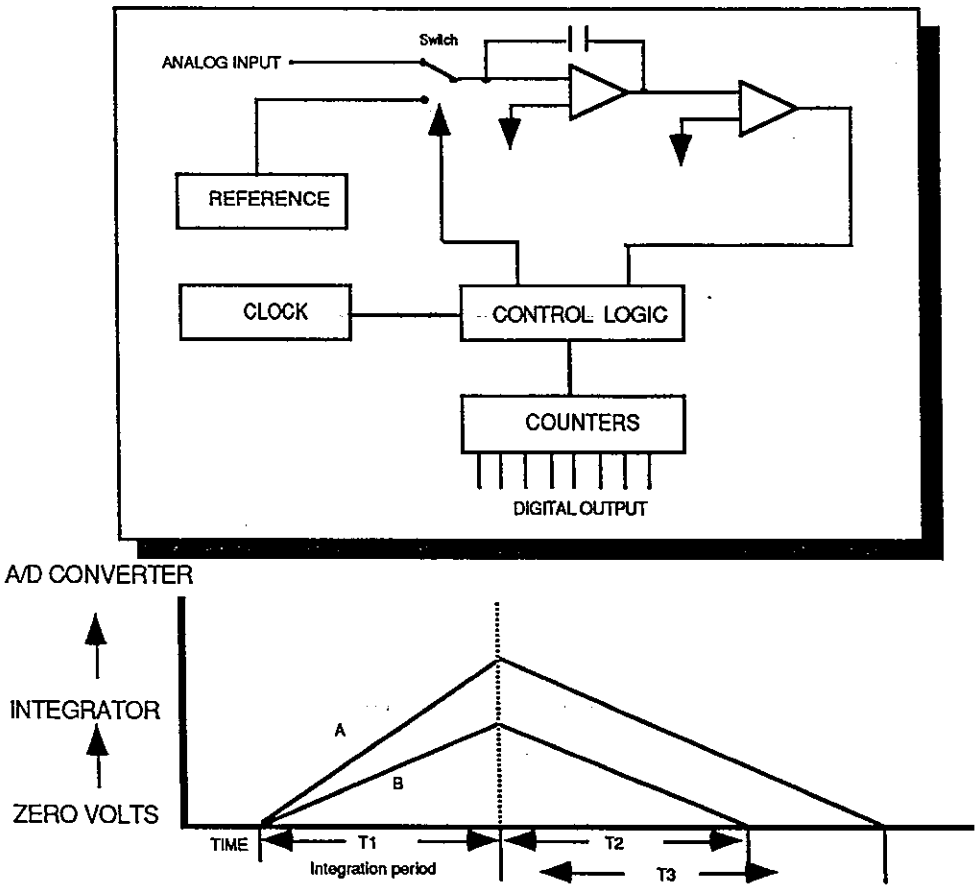
When weight is applied, the force causes the Load Cell to bend, causing an elongation/contraction relationship (Hooke's Law). The strain gauges measure the stress and the resulting output is directly proportional to the applied force.



The output is then amplified, converted to a digital signal by an A/D converter and then used to calculate and display the weight.

A/D CONVERTER

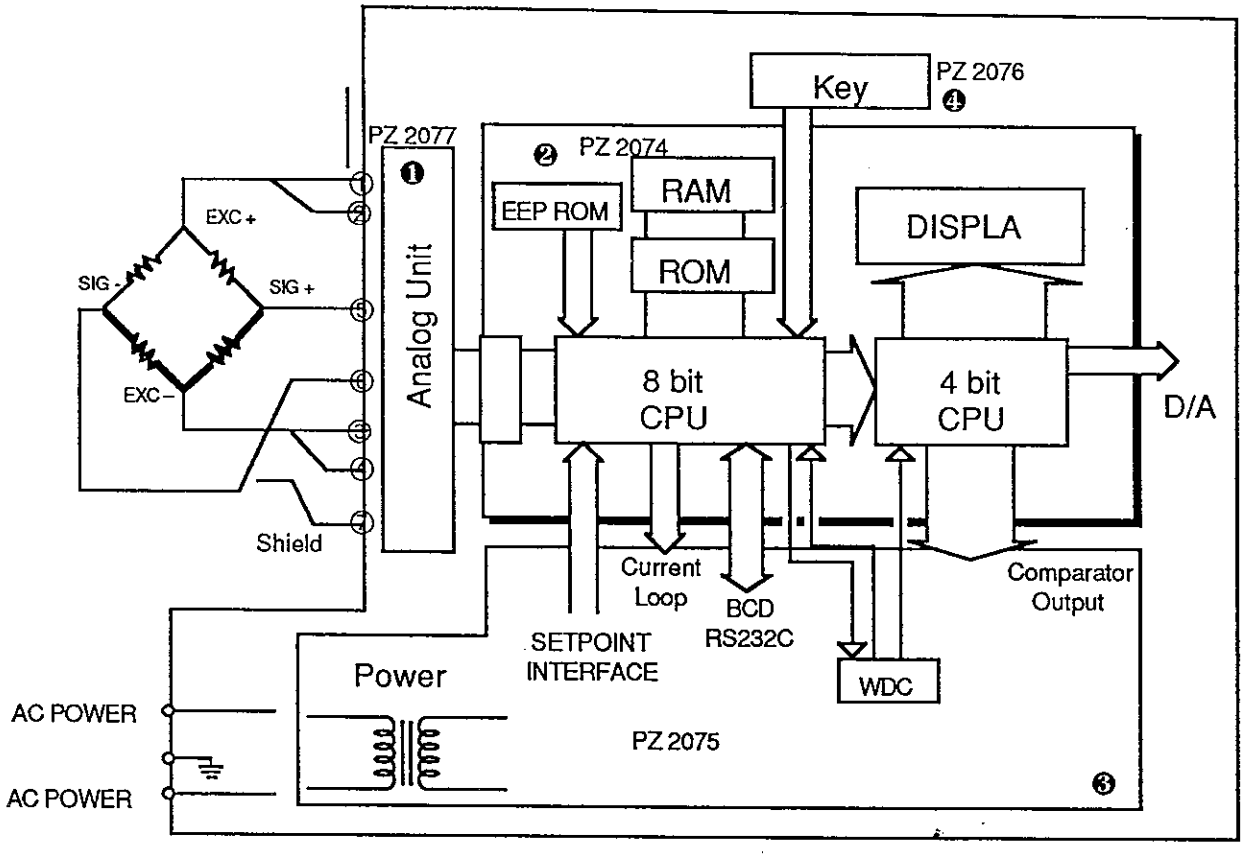
Weighing indicators are designed to amplify the analog output from a load celll, convert the analog signal to digital data and then display this data as a weight reading. This weighing indicator employs a highly accureate dual slope A to D conversion method.



Integrator output slope is constant with respet to time. Dual-slope converter measures time taken for output to reach zero volts. Small input B-Short T2, Large input A-Long T3 time.

$BV_{in} = T2/T1x(V_{ref})$

BLOCK DIAGRAM



❶ Analog Section — The analog unit is encased in an aluminum casing to protect the unit from electronic noise. The analog unit takes the analog output from the load cells, amplifies it and converts it into a digital signal.

❷ Logic Section — The digital signal from the analog unit is processed by a 8 bit CPU, passed through a digital filter, and processed to the proper span vector.

The 20mA Current Loop output, the RS-232C output, and the BCD output data will be transferred by the 8 bit CPU as serial data. The key switch settings, slide switch and the digital switches will all be read by the the 8 bit CPU.

The display data, comparator output and the output data, are transferred to the 4 bit CPU.

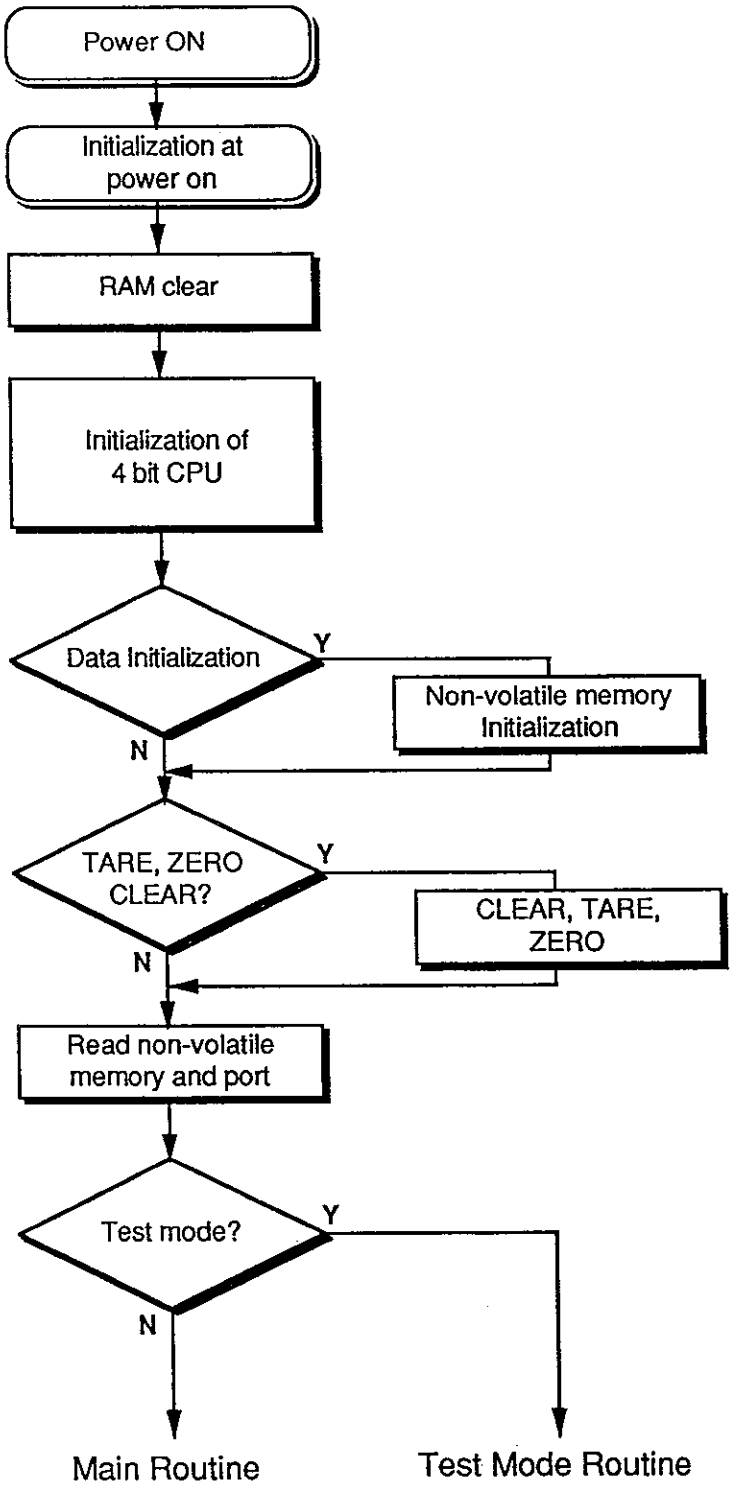
The calibrated ZERO and SPAN values, plus function settings, are stored in nonvolatile memory.

❸ Power and Interface Section — The power unit supplies 5V DC for the main logic excitation voltage for the load cell(s), and AC voltage for the fluorescent display.

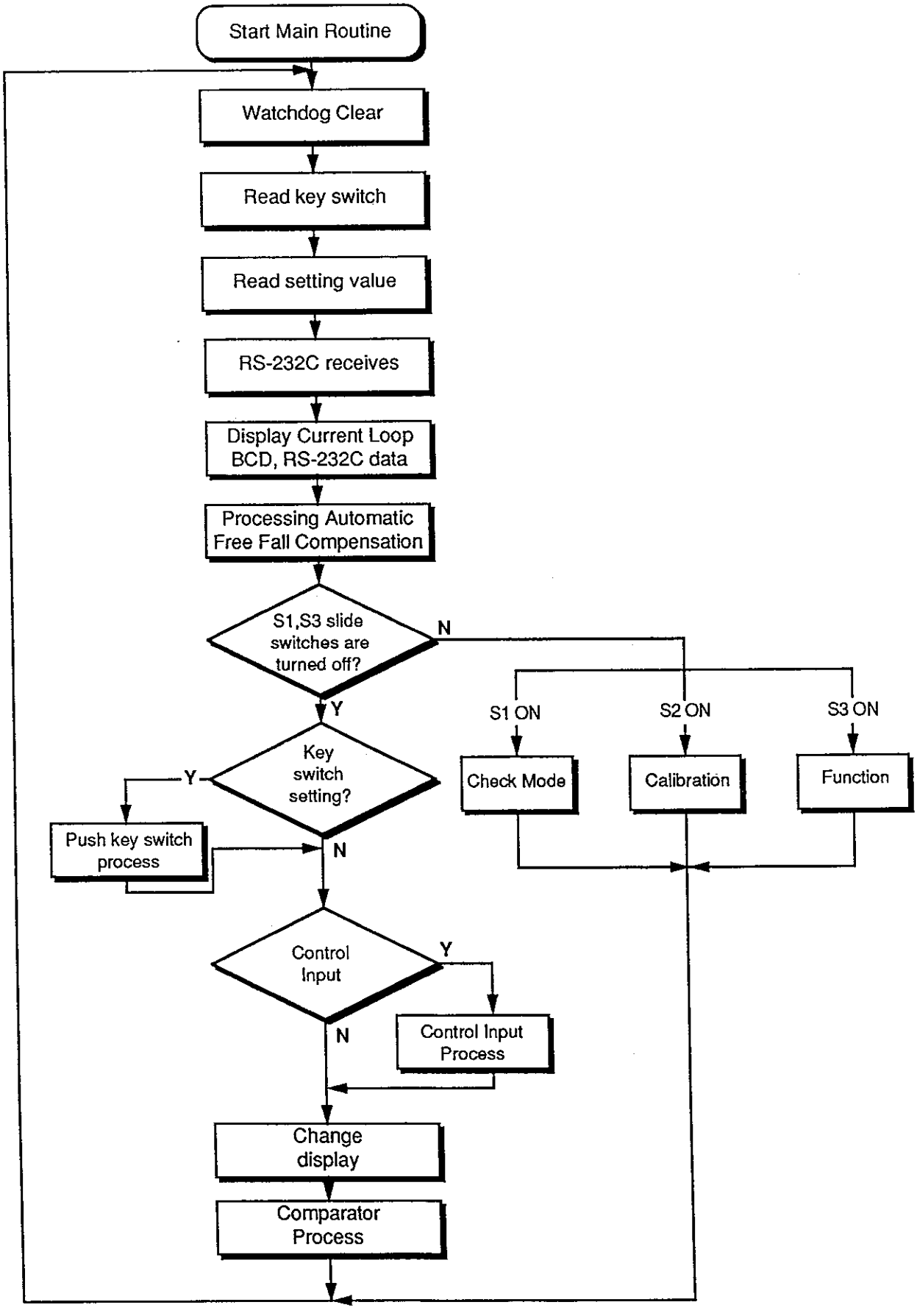
The interface unit contains the conversion circuits for the Current Loop, Set Point and Control I/O.

❹ Key Units — Six key switches and diodes.

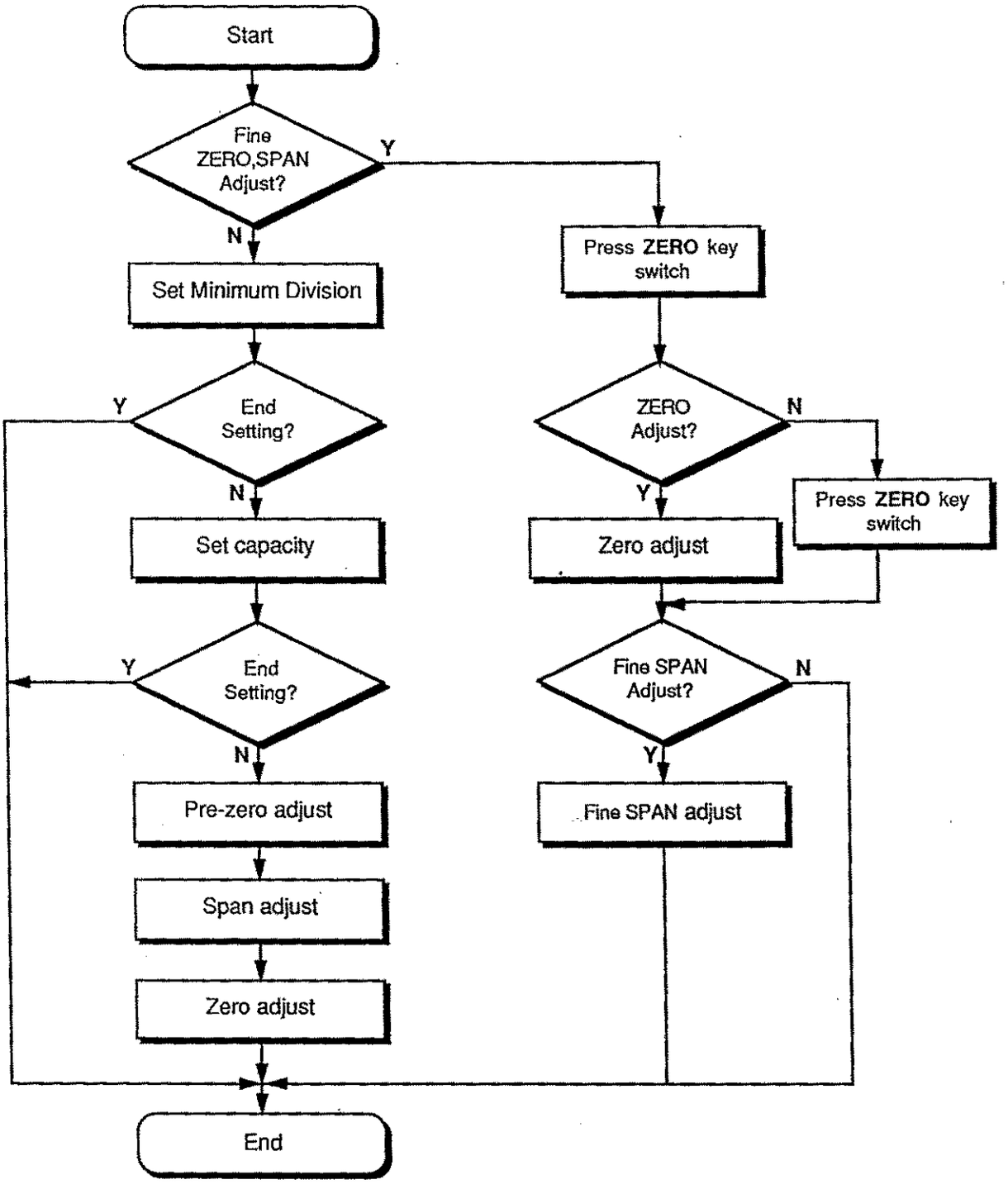
SOFTWARE FLOWCHART



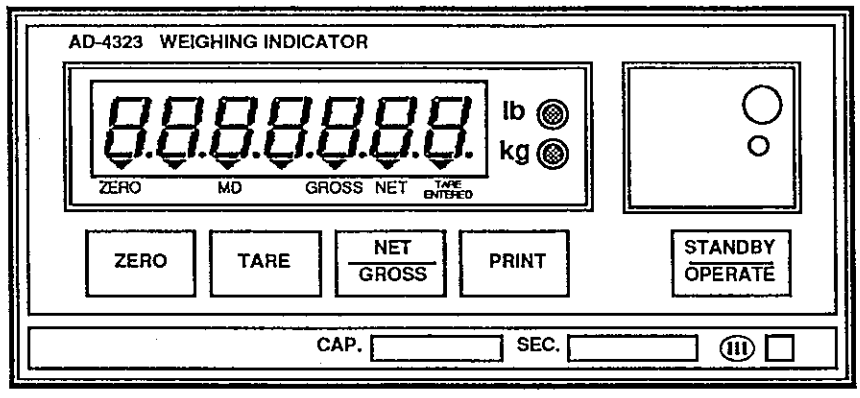
MAIN ROUTINE FLOWCHART



CALIBRATION FLOWCHART



FRONT PANEL DESCRIPTION



The STANDBY/OPERATE Key

This key switches the unit between STANDBY and OPERATE mode. While in STANDBY mode - the display will go OFF and all data output will stop. The power cord must be removed to disconnect power to the AD-4323.

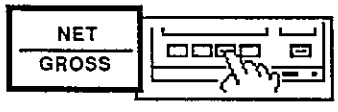
The ZERO Key

The **ZERO** key returns the display to the center of ZERO when the weighing device is empty (user selected within ±2% or 10% of the maximum capacity), and motion is not detected (MD annunciator is not on). It should not be confused with the **TARE** key which re–ZERO's the display and switches to NET mode.

The TARE Key

The **TARE** key switches to NET mode, ZERO's the display, stores the TARE weight in memory (if motion is not detected) and the TARE ENTERED Annunciator will light.

Maximum TARE value is Max. Capacity, regardless of the decimal point position (if any). Max. Capacity is also the maximum display value which can be stored as TARE when in GROSS mode.



The NET/GROSS Key

The **NET/GROSS** key switches between the two modes. The annunciators and display will alternate between NET and GROSS.

The PRINT Key

The **PRINT** key transmits to printer via Option OP–01 (BCD output) or Option OP–04 (RS–232C interface) and Standard Current Loop.

▼ ZERO — The **ZERO** Annunciator triangle will appear when the display is showing the center of ZERO.

▼ MD — The **MD** (Motion Detection) Annunciator triangle will appear when the display is unstable due to weighing device motion.

▼ GROSS — The **GROSS** Annunciator triangle will appear when the display is in the GROSS mode, the display showing the GROSS weight.

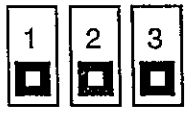
▼ NET — The **NET** Annunciator triangle will appear when the display is in the NET mode, the display showing the NET weight.

▼ TARE ENTERED — The **TARE ENTERED** Annunciator triangle will appear when a TARE weight has been entered.

lb ◎ *USA version only* — The **lb** Annunciator light will appear when the AD-4323 is in the pound weighing mode - the displayed weight is in pounds. *note:* lb/kg version only (USA).

kg ◎ — The **kg** Annunciator light will appear when the AD-4323 is in the kilogram weighing mode - the displayed weight is in kilograms.

t ◎ *International version only* — The **t** Annunciator light will appear when the AD-4323 is in the tonne weighing mode - the displayed weight is in tonne. *note:* International version only.



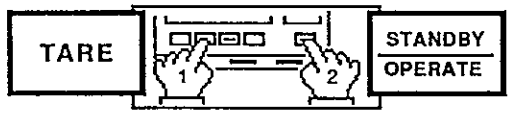
There are three dip-switches behind the front panel (removed by the Front Panel Cover Screw).

1) Dip-switch no. 1 moves the AD–4323 into **View Mode** (see p. 76).
2) Dip-switch no. 2 moves the AD–4323 into **Calibration Mode.**
3) Dip-switch no. 3 moves the AD–4323 into **F-Function Mode.**

CAP. ■ — In the space provided, the owner should mark the AD-4323's set weighing (max.) capacity, and minimum division.

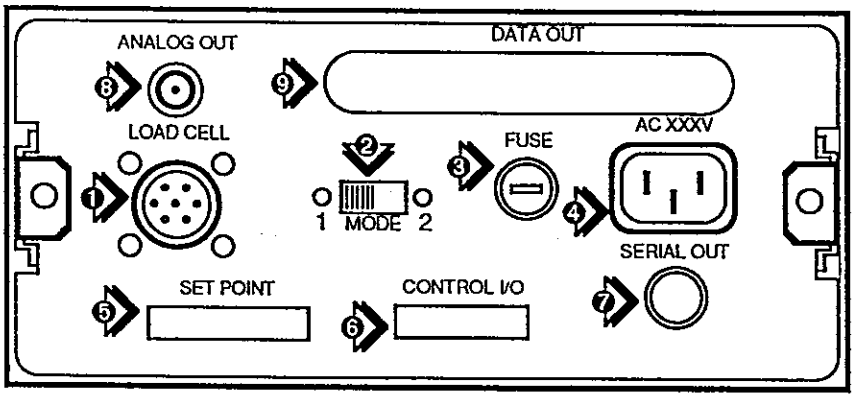
SEC. ■ — In the space provided, the owner should mark the AD-4323's section weight specification.

To Clear ZERO and TARE Memories



To clear the ZERO and TARE memories: Start with the display OFF. Press and hold the **TARE** key.While holding the **TARE** key, press the **STANDBY/OPERATE** key.

REAR PANEL DESCRIPTION



❶ Load Cell connector.

❷ **lb ↔ kg** switch (USA version) or **front panel keys enable ↔ front panel key disable** switch (International version).

Mode		USA	International
1	1 MODE 2	**lb** weighing	**Disable** Front Panel Keys
2	1 MODE 2	**kg** weighing	**Enable** Front Panel Keys

❸ **Fuse Holder**
(screw counter-clockwise for re

Line Voltage	Fuse
AC 100V ~120V	0.5A
AC 220V ~240V	0.3A

❹ Three prong **Power Connector** with ground.

❺ **Setpoint Connector.** To connect with Option OP-05 or similar setpoint device.

❻ **Control I/O Connector.** To connect with weighing equipment accepting control signals.

❼ **Current Loop Serial Outlet Connector** for Printer, external display.

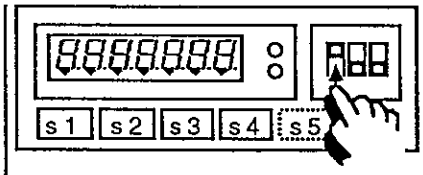
❽ Optional OP-07 **Analog Output Connector.** 4→20mA.

❾ Optional OP-01 Parallel Binary-Coded-Decimal **BCD Output Connector.** Open-collector output.

❾ Optional OP-04 **Serial Interface Connector.** Two types of serial interface are available with this option: 1) EIA-RS-232C. 2) 20mA current loop (passive).

SELF-CHECK MODE

Step 1.



•Slide the left dip-switch (check) ON⇑.

The display will come ON with all characters lit.

The display will blank during a **RAM** check, followed by;

XXXXX

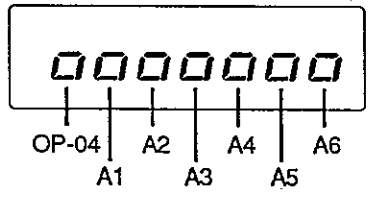
❶ The **Setpoint FINAL Value** in memory will be displayed ("XXXXX" here denotes the value), followed by;

❸ The **Setpoint FREE FALL Value** in memory will be displayed, followed by;

❹ The **Setpoint PRELIM Value** in memory will be displayed, followed by;

❺ The **Setpoint OVER Value** in memory will be displayed, followed by;

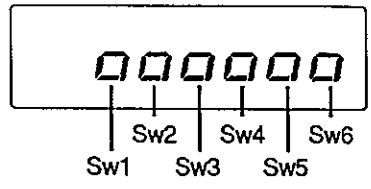
❻ The **Setpoint UNDER Value** in memory will be displayed, followed by;



Either "0" if no connection,

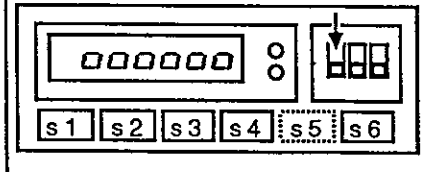
or "1" if a connection (CONTROL I/O, or OP-04) will be displayed, followed by;

Step 2.



A "1" will appear when the front panel switches are pressed - indicating a good switch. •Press each key in turn, if the display does not change, then the key switch is bad.

Step 3.



•Slide the left dip-switch (check) OFF⇓.

CXXXXXX

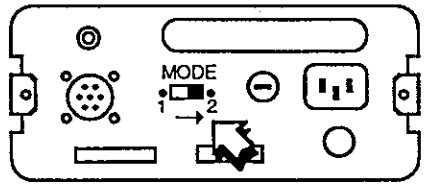
The internal A/D SPAN value will be shown, followed by;

End

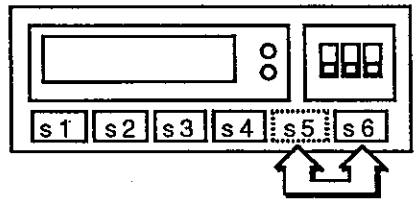
"End" will be displayed for a couple of seconds, and then the display will return to normal.

CHECK MODE

Entering the Check Mode



Step 1. With the AC power OFF, set the MODE switch on the rear panel to **MODE 2.**



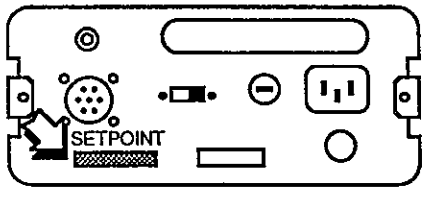
Step 2. Set all three front dip-switches to OFF.

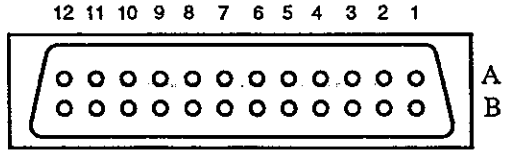
Step 3. Press and hold key switch **5** & **6**.and supply AC power.

Step 4. For a couple of seconds the display will flash the internal count number of the analogue unit. Simultaneously, the two LED's will flash as the I/O B1→B8 sequentially sends data.

Step 4. You may go to any of the following sections to check a particular function. The checks do not have to be done in any particular order. See the LEAVING THE CHECK MODE section when you have finished checking the desired function.

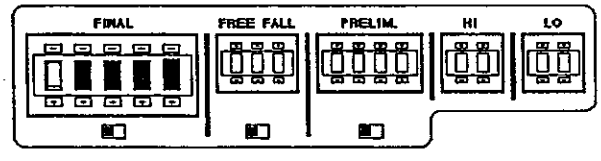
Setpoint Input Pins A-5→A-8 (Final 10^0→10^3)





Step 5. Slide dip-switch 1 ON, switches 2 & 3 OFF.

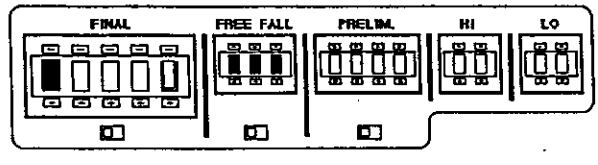
Step 6. Pins **A-5→A-8.** The display should correspond to the first four **FINAL** digits settings on the setpoint unit (10^0→10^3).



Setpoint Input Pins A-9→A-12 (Final 10^4, Free Fall 10^0→10^2)

Step 5. Slide dip-switches 1 & 3 OFF and 2 ON.

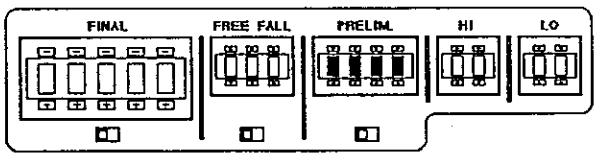
Step 6. Pins **A-9→A-12.** The display should correspond to the fifth **FINAL** digit(10^4) and the three **FREE FALL** digits (10^0→10^2).



Setpoint Input Pins B-1→B-4 (Prelim. $10^0 \rightarrow 10^3$)

Step 5. Slide dip-switches 1 & 2 ON and 3 OFF.

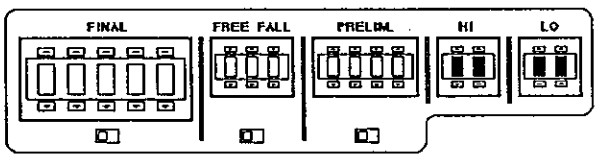
Step 6. Pins **B-1→B-4.** The display should correspond to the four **PRELIM** digits ($10^0 \rightarrow 10^3$).



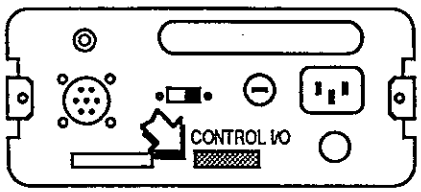
Setpoint Input Pins B-5→B-8 (Hi 10^0,10^1 Lo 10^0,10^1)

Step 5. Slide dip-switches 1 & 2 OFF and 3 ON.

Step 6. Pins **B-1→B-4.** The display should correspond to the two **HI** digits ($10^0 \rightarrow 10^1$) and the two **LO** digits ($10^0 \rightarrow 10^1$).



Control I/O Interface Check



Display/Pin Representation

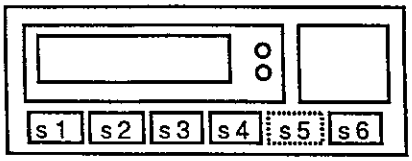
Step 5. Slide dip-switches 1 & 3 ON and 2 OFF.

Step 6. Individually short the **CONTROL I/0** pins, if the pin is good, the corresponding display digit will go from "0" to "1". For example if you short pin A1, the last display digit should got to "1"

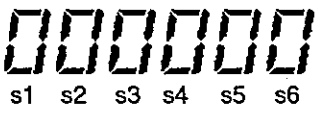
NOTE: Throughout this check, the display will correspond to the **CONTROL I/0** pins as shown above.

If option OP-04 is installed, the first display digit will show "1" instead of "0".

Front Panel Key Switch Check

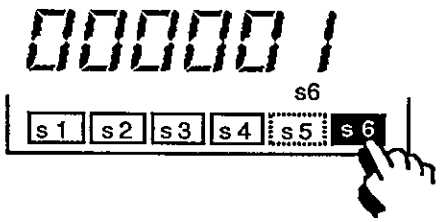


Display/Key Switch Representation



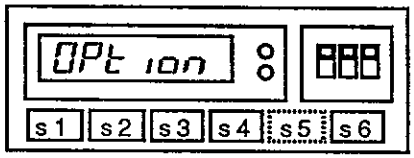
Step 5. Slide dip-switches 1 OFF and 2 & 3 ON.

Step 6. Press each key switch on the front panel to check, if the switch is good, the corresponding display digit will go from "0" to "1". For example, if you press key switch 6, the last display digit should got to "1"



Options Check

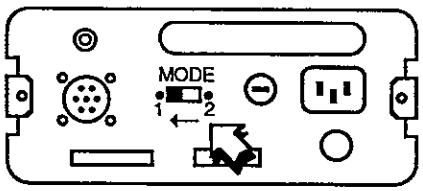
Step 6. If you slide all of the dip-switches ON, "OPtion" will be displayed. Unfortunately, this check requires special equipment – send to your A&D dealer if required.



Non-Volatile Memory Check

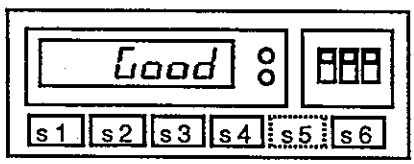
Step 1. Slide all the dip-switches ON.

Step 2. Set the MODE switch on the rear panel to **MODE 1**.



Step 5. The display will flash "FFFF","AAAA", "5555", "0000"

Step 5. If everything is correct "Good" will be displayed.

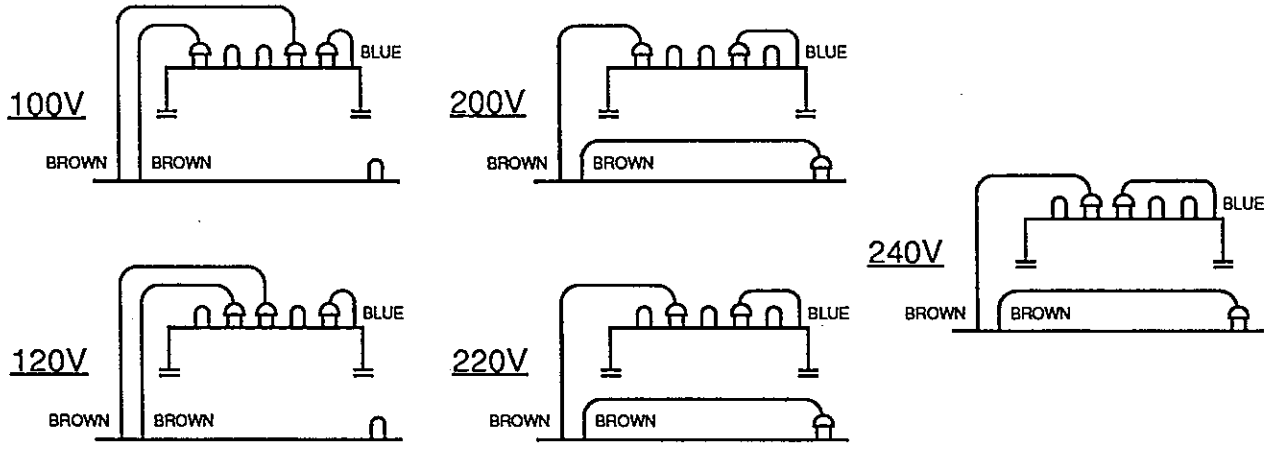


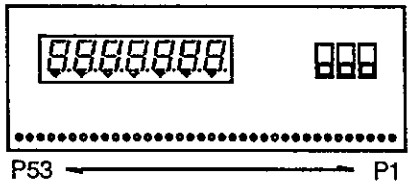
Power Board Check

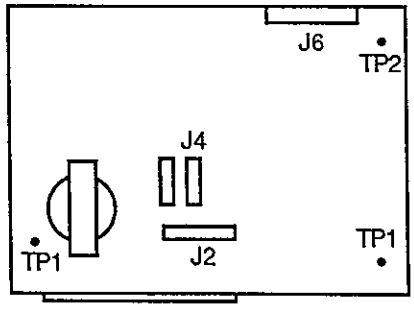
Disassemble the main board from the case, then the front panel board from the main board.

The front panel board from the main board must remain connected. Make sure that the main board is resting on non conductive material.

The transformer should be connected with the commercial voltage. The AD-4323 can be connected to AC 100V, 120V, 200V, 220V or 240V via the two brown and one blue cables from the transformer. The connections are shown at left.







Connect to Power, and check the voltages:

TP1	to	**P51**	DC 5V ±5%
TP1	to	**P50**	DC -24V→ -29V
TP1	to	**J2(10)**	DC 12V ±5%
TP2	to	**U6(24)**	DC 5V ±5%
J6(A8)	to	**DF5(1)**	DC 6V→7.5V
P46	to	**P47**	AC 3.0V →3.6V
J4(7)	to	**J4(8)**	AC 16.2V →21.6V

Number in parenthesis are the connector pin numbers. The voltages are obtained using commercial voltage. If the supplied voltages are quite different form the figures, check the transformer connection.

When the voltages are low, check the chip temperature, to see if they are abnormal.

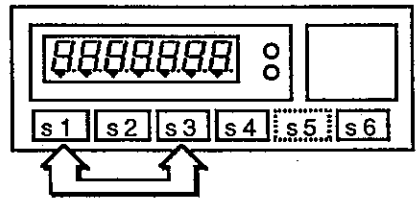
DO NOT SHORT PINS WHEN CHECKING THE VOLTAGE.

INITIALIZATION

This is a procedure to Initialize the AD-4323 in two parts. Steps 1-4 stores all initialization data *except for* Calibration data. Step 5 accepts the CAL data (Zero CAL, MD, Max. Cap., & Span CAL). Please read the entire procedure before starting.

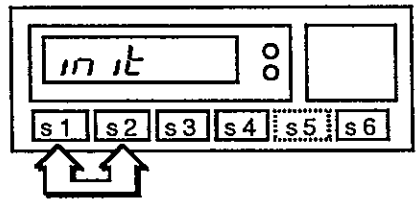
Step 1. With the power disconnected – Press and hold key switches 1 and 3.

Step 2. Plug in the power. "8.8.8.8.8.8.8" will be displayed.



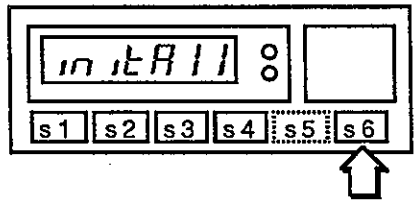
Step 3. While holding key switch 1, press key switch 2.

Step 4. Release both. "init" will be displayed. Initialization information - excluding CAL - is now accepted.



Step 5. Quickly (you only have a couple of seconds) press and release key switch 6 while "init" is still being displayed. If you miss it - start over.

NOTE "initALL" will be displayed. Release both. All initialization information including CAL is now accepted.



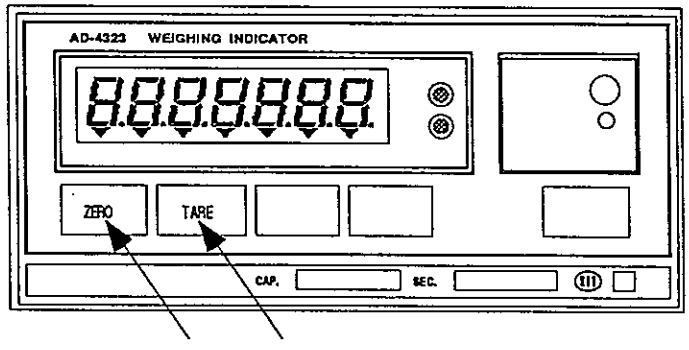
SETTING TO MEET INDIVIDUAL REGULATION

This is a procedure to set for meeting the approval of specified countries listed below.

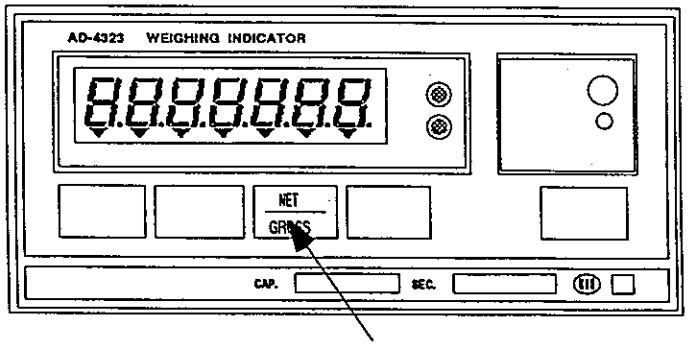
Display	Country
JAPAn	JAPAN
OUEr SEA	International
AUStr Id	Australia
HO I Idnd	Holland
nZ Land	New Zealand
SoutHAF	South Africa
USA	U.S.A.

oPlease perform following preparation prior to the setting.

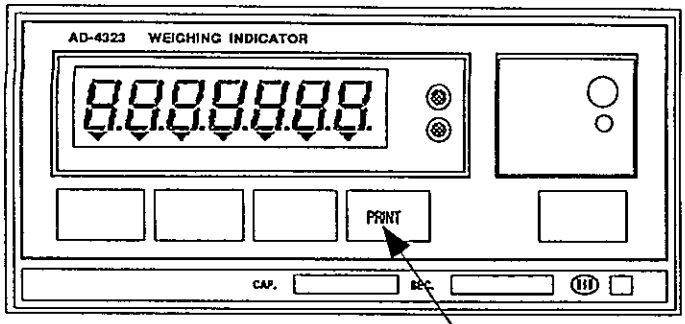
1. AC power OFF.
2. Set the mode switch at the rear panel to **MODE 2.**



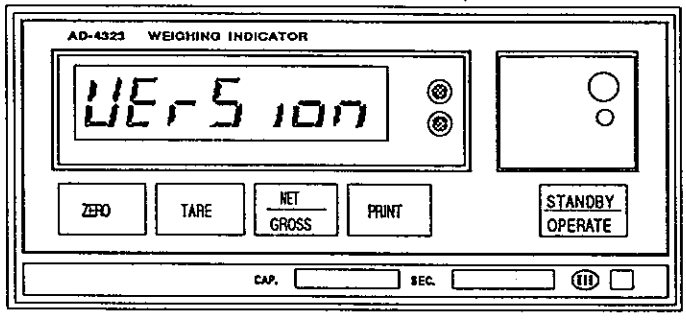
1)While pressomg Zero and Tare key, connect the power line.
All segment will be turned on.
Remove fingers from two keys at the same time.



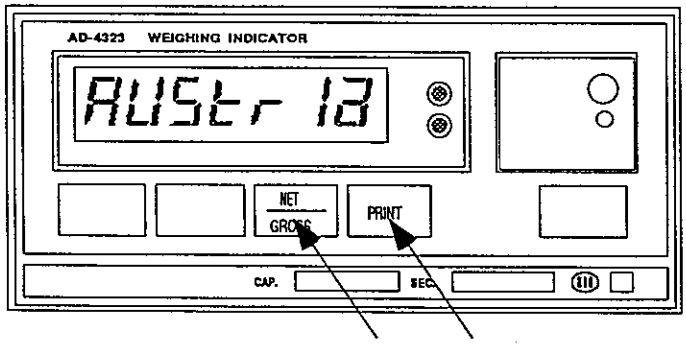
2)Press NET/GROSS key twice immediately.



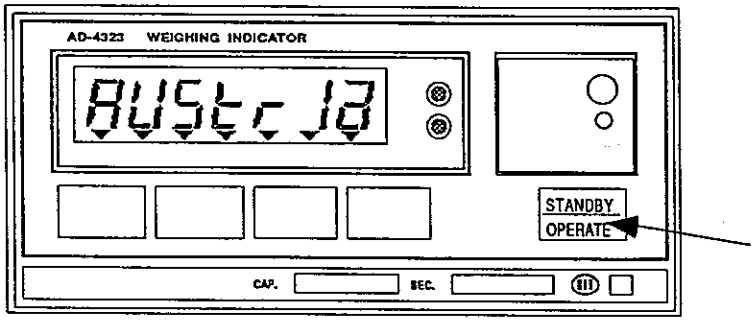
3)Then press PRINT key for 3 times immediately.



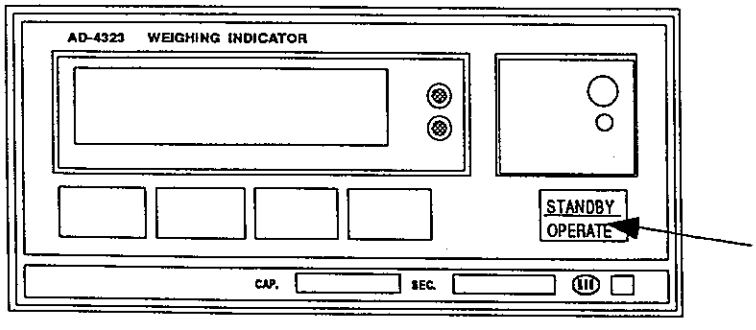
4)Display shows "version" for 2 seconds.



5)Select the desired country which you need by using NET GROSS and PRINT key.
If display shows "V Err" please press STANDBY OPERATE key first, then reselect the country by pressing NET GROSS and PRINT keys

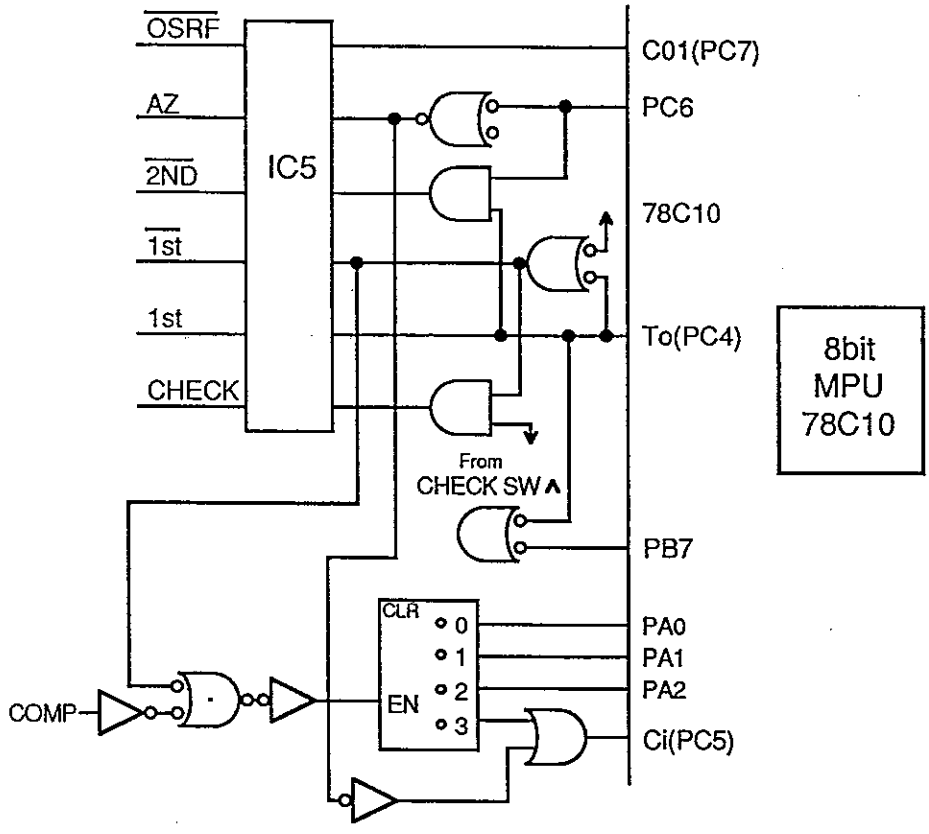


6)After select the desired country, press STANDBY OPERATE key. Then all t will be displayed.

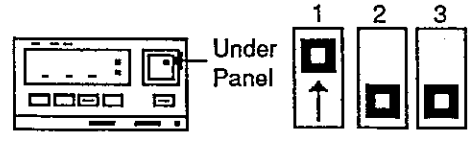


7)To escape from this mode, press STANDBY OPERATE key again. This selection of country will be written into non-volatile memory and return to normal mode.

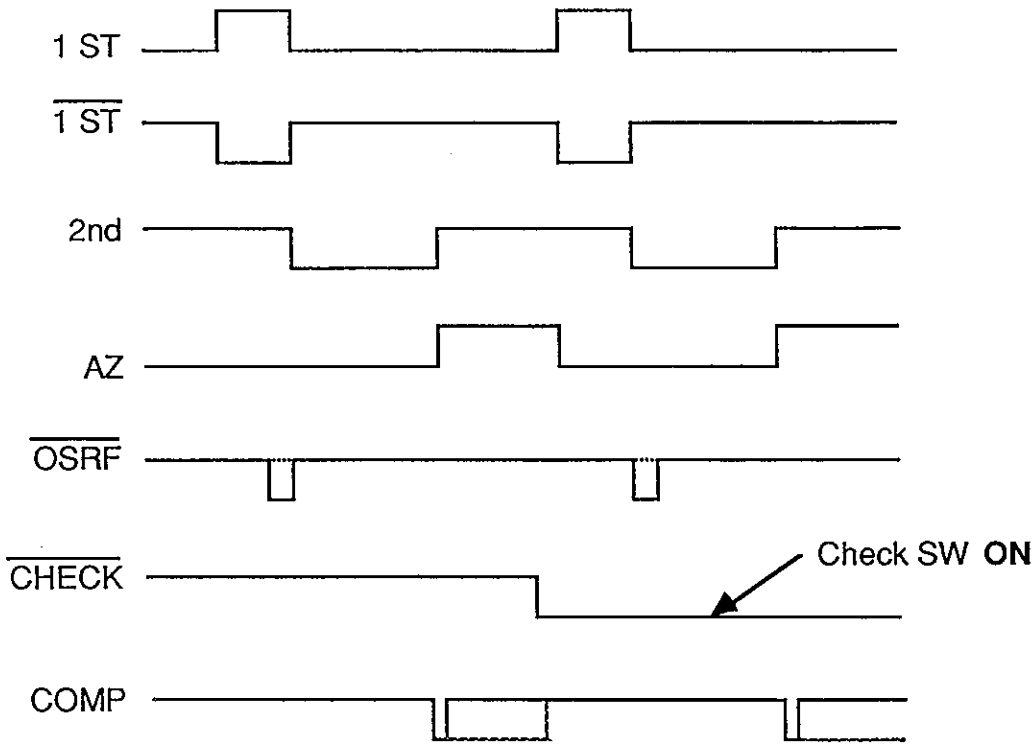
A/D Control Circuit



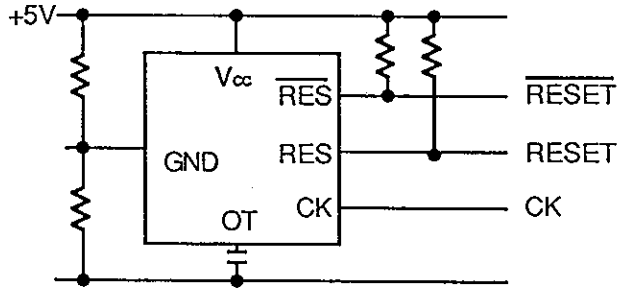
- A 8 bit CPU controls the A/D converter (please see to the following wave form diagram).
- The **IC 5** is an open connector (7406), the input side TTL's output level is 0-12V.
- The **COMP** input level is 0-5V.
- When the front Dip-switch no. 1 is turned ON, the the waveform $\overline{\text{CHECK}}$ will turn from **HI** to **LO**.



Waveform Checks



Watchdog Circuit



The Watchdog circuit chip monitors the power supply voltage. When the power is turned ON, it generates the power-on reset until the supply voltage becomes adequate.

It also resets if the clock inputs are longer than expected, i.e. contains a Watchdog timer.

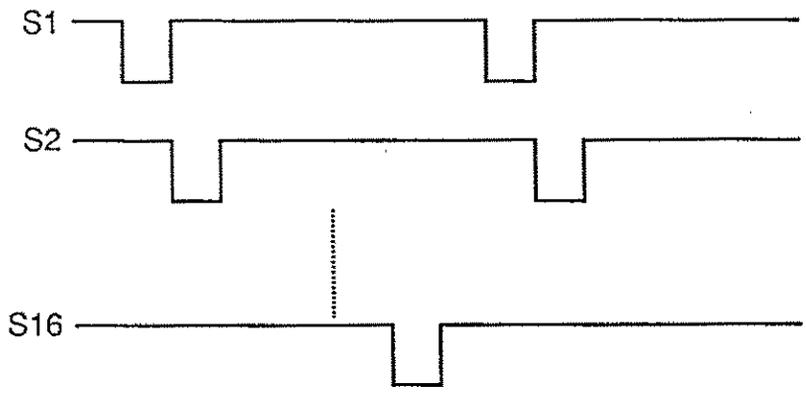
I/O Circuits

As the outputs are open-collectors, it is necessary to provide an external power supply and registers to check them.

Setpoint Circuit

IC6 Circuit

The IC6 circuit generates the pulses to select a bit of the digital switches. As the outputs are open-collectors, it is necessary to provide an external power supply and registers to check them.



PARTS LIST

AD4323A
DISPLAY BOARD

CIRCUIT SYMBOL OR DRWG. NO.	PARTS NAME	DESCRIPTION	Q'TY
	7PZ:2074	DISPLAY BOARD FULLY ASSEMBLED	1
	PC:2074	PRINTED CIRCUIT BOARD	1
	CC:0.022U	CAPACITOR 0.022μF 50V	10
C 1,3	CT:1A4R7	CAPACITOR 4.7μF 10V	2
C 2	CT:1D2R2	CAPACITOR 2.2μF 20V	2
D 1,2	DL:TLUG144	LED	2
D 3	DZ:05Z9.1	ZENER DIODE	1
	ED:FIP7B13	DISPLAY TUBE	1
	JI:1-163740-9	CONNECTOR	3
(U11)	JS:10328-01-445	SOCKET 28PIN	1
J 1	JT:172429-8	CONNECTOR	1
Q 1	QT:C1815Y	TRASISTOR	1
R 11	RC:NAT1M	RESISTOR 1MΩ 1/4W	1
R 7	RC:NAT68K	RESISTOR 68KΩ 1/4W	1
R 1,2	RC:10K	RESISTOR 10KΩ 1/4W	2
R 3,4	RC:560R	RESISTOR 560Ω 1/4W	2
R 8,9	RN:IHR-6-104JA	RESISTOR NETWORK	2
R 5,6,10	RN:IHR-8-223MA	RESISTOR NETWORK	3
S 1～3	SS:2NB2X2AG	SWITCH	3
TP 1	TM:CP-10	TEST PIN	1
U 3	UC:D78C10G-1B	CMOS	1
U 11	UC:HCU04	CMOS	1
U 8	UC:HC00	CMOS TC74HC00P	1
U 12	UC:HC04	CMOS TC74HC04P	1
U 9	UC:HC08	CMOS TC74HC08P	1
U 10	UC:HC32	CMOS TC74HC32P	1
U 13	UC:HC4520	CMOS TC74HC4520P	1
U 5	UC:HC540	CMOS TC74HC540P	1
	UC:HC573	CMOS TC74HC573P	1
U 1	UC:RP93C46	EEPROM	1
U 7	UC:5518CFL	CMOS TC5518CFL-15	1
	UC:7516HG595-12	CPU	1
X 1	XT:C4SB-12M-L02	CERAMIC 12MHz	1

AD4323A
MAIN BOARD

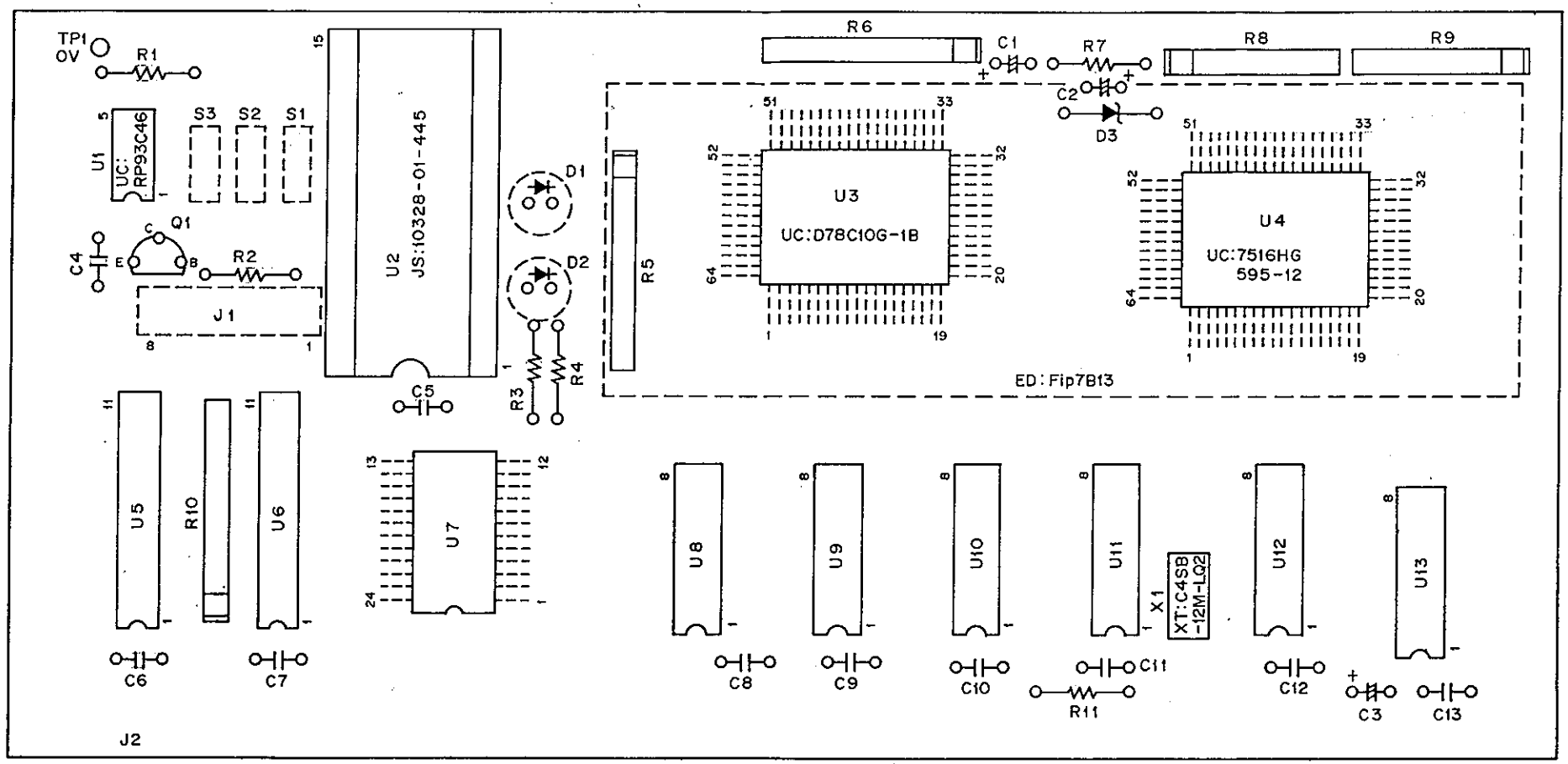
CIRCUIT SYMBOL OR DRWG. NO.	PARTS NAME	DESCRIPTION	Q'TY
	7PZ:2075	MAIN BOARD FULLY ASSEMBLED	
C 1,2	CC:0.01U500V	CAPACITOR 0.01μF 500V	2
C 19,20	CC:0.022U	CAPACITOR 0.022μF 50V	2
C 5,6,10,11	CC:0.1U25V	CAPACITOR 0.1μF 25V	6
C 16	CC:100P	CAPACITOR 100pF 50V	1
C 12	CK:SM16VB470	CAPACITOR 470μF 16V	1
C 8,18	CK:SM25VB22	CAPACITOR 22μF 25V	2
C 4,9	CK:SM25VB2200	CAPACITOR 2200μF 25V	2
C 14	CK:SM50VB10	CAPACITOR 10μF 50V	1
C 13	CK:SM50VB100	CAPACITOR 100μF 50V	1
C 7	CK:9117	CAPACITOR 4700μF 35V	1
C 17	CM:E1474KN	CAPACITOR 0.47μF 100V	1
C 3	CM:6003104K	CAPACITOR 0.1μF 600V	1
DF 3,4	DF:PS-2403-2	PHOTO COUPLER	2
DF 1,2,5~7	DF:PS-2403-4	PHOTO COUPLER	5
D 1~3	DI:W02	DIODE BRIDGE	3
D 4~6	DI:1B4B42	DIODE BRIDGE	3
D 7,24	DI:1SS97	DIODE	2
D 8~22	DI:1S1588	DIODE	15
D 23	DZ:05Z5.6	ZENER DIODE 5.6V	1
	EB:CR2032-WT12	LITHIUM BATTERY	1
	FH:FH-B02	FUSE HOLDER	1
	FS:F7142-0.5A	FUSE 0.5A	1
J 5	JA:4470-01-1111	CONNECTOR	1
	JI:360A2	CONNECTOR	3
J 6	JI:365P016-AG	CONNECTOR	1
J 7	JI:365P024-AG	CONNECTOR	1
	JS:NC-174	SOCKET	1
J 2	JT:1-171825-2	CONNECTOR	1
J 3	JT:1-172429-2	CONNECTOR	1
J 4	JT:172429-8	CONNECTOR	1
	JT:61134-1	CONNECTOR	1
	KO:280A-08BR	CONNECTOR CABL	2
L 1,2	LL:SF-T8-40S	COIL	2
	QA:AC256-1674	INSULATING PLATE	3

AD4323A
MAIN BOARD

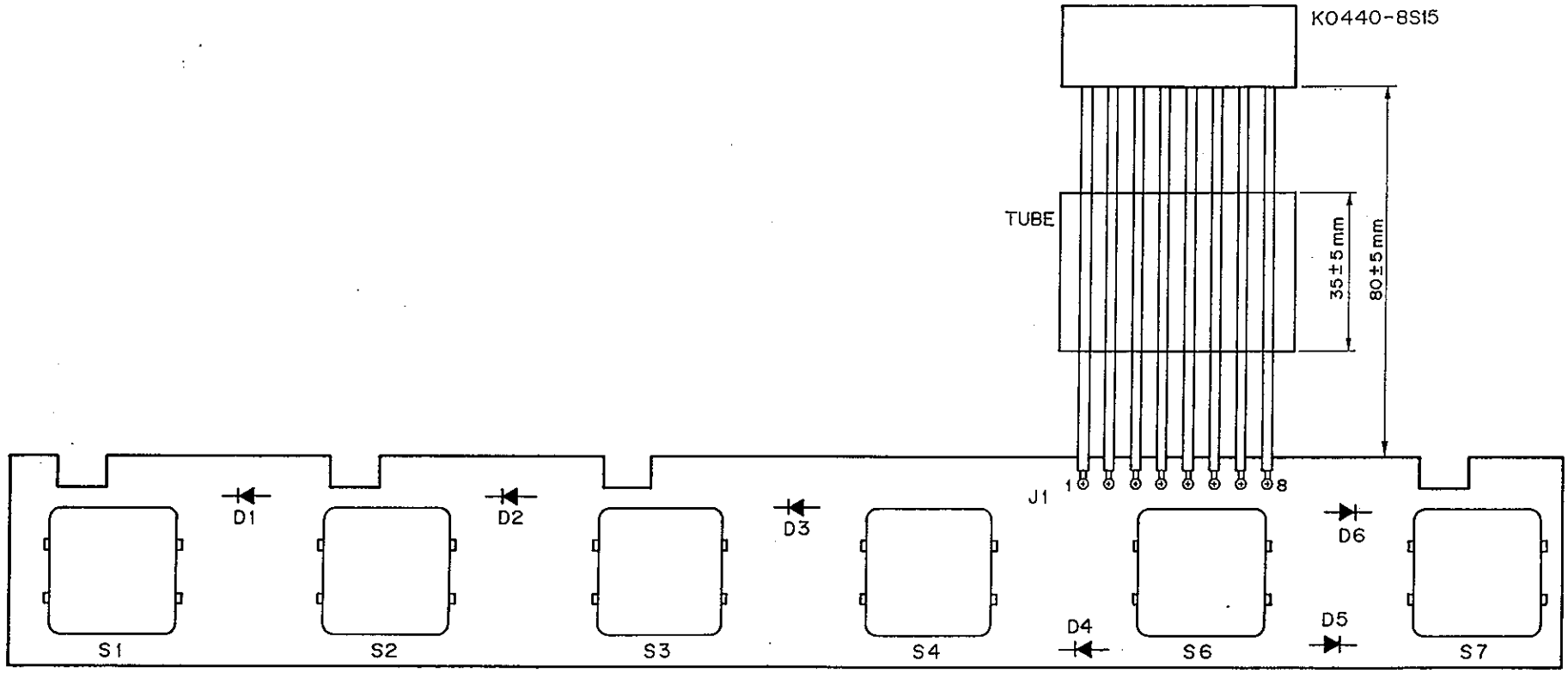
CIRCUIT SYMBOL OR DRWG. NO.	PARTS NAME	DESCRIPTION	Q'TY
	7PZ:2075	MAIN BOARD FULLY ASSEMBLED	
	QA:AC316A	PLATE GROMMET	3
Q 1~3	QT:C1815Y	TRANSISTOR	3
R 12~18,28~33	RC:1K	RESISTOR 1KΩ 1/4W	13
R 5,35	RC:10K	RESISTOR 10KΩ 1/4W	2
R 19~27	RC:2.7K	RESISTOR 2.7KΩ 1/4W	9
R 7	RC:22K	RESISTOR 22KΩ 1/4W	2
R 2	RC:27R	RESISTOR 27Ω 1/4W	1
	RC:330R	RESISTOR 330Ω 1/4W	1
R 3,4,6,8	RC:4.7K	RESISTOR 4.7KΩ 1/4W	4
R 1	RC:470R	RESISTOR 470Ω 1/4W	1
R 11	RC:680R	RESISTOR 680Ω 1/4W	1
R 9,10	RC:82R	RESISTOR 82Ω 1/4W	2
R 36,37	RN:1HR-4-182KA	RESISTOR NETWORK	2
R 34,38,39	RN:1HR-4-472MA	RESISTOR NETWORK	3
	SS:SW-16	SWITCH	1
	TF:328	TRANSFORMER	1
TP 1,2	TM:CP-10	TEST PIN	2
U 1	UA:MB3773PS-G		1
U 2,3	UA:TD62003AP	TRANSISTOR NETWORK	2
U 7,9	UR:TA78005AP	REGULATOR	2
U 8	UR:78M12H	VOLTAGE REGULATOR	1
U 5	UT:06	TTL SN7406N	1
U 6	UT:159	TTL SN74159N	1
	01:A34778A	REAR PANEL	1
	02:A48921	BLAN PANEL	1
	04:A49263	BLAN PANEL	1
	05:A40055	SPACER 19mm	1
	05:A42206	ANTI-TAMPER FIXING SCREW 3mm	1
	05:A49401		1
	07:A48927		2

AD4323
KEY BOARD

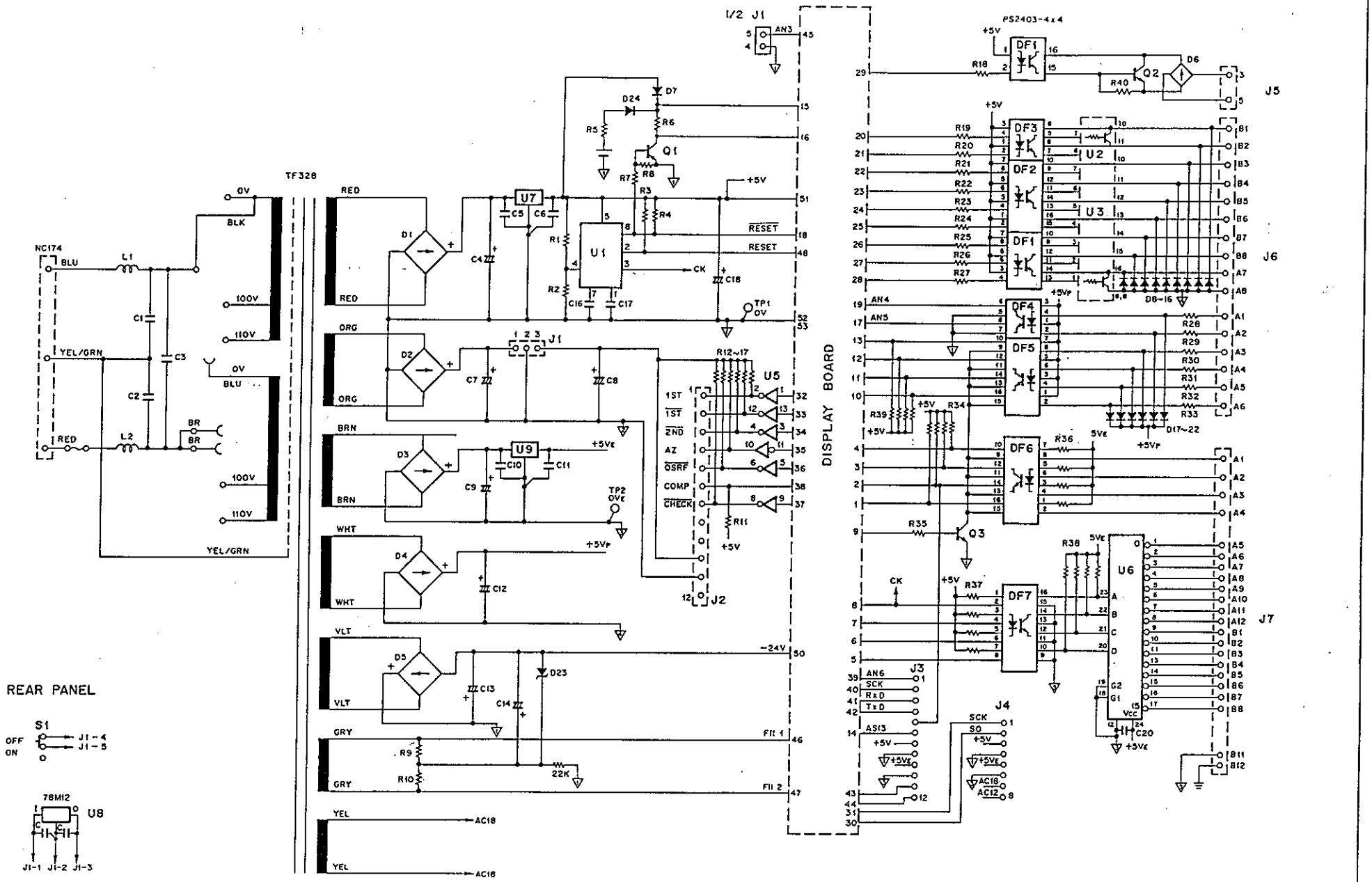
CIRCUIT SYMBOL OR DRWG. NO.	PARTS NAME	DESCRIPTION	Q'TY
	7PZ:2076	KEY BOARD FULLY ASSEMBLED	
D 1~6	DI:1S1588	DIODE	6
	KO:440-8S15	CONNECTOR CABLE	1
S 1~6	SK:KHC10902	SWITCH	6



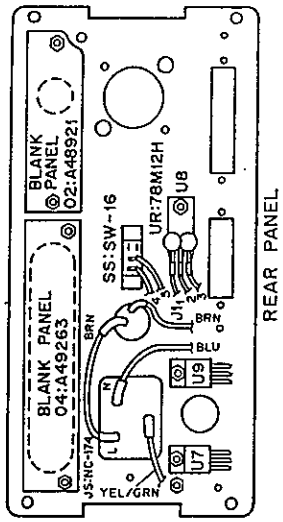
MODEL	AD-4323
DESCRIPTION	DISPLAY BOARD
STOCK NO.	PZ:2074
DRWG. NO.	KZ3-0066O

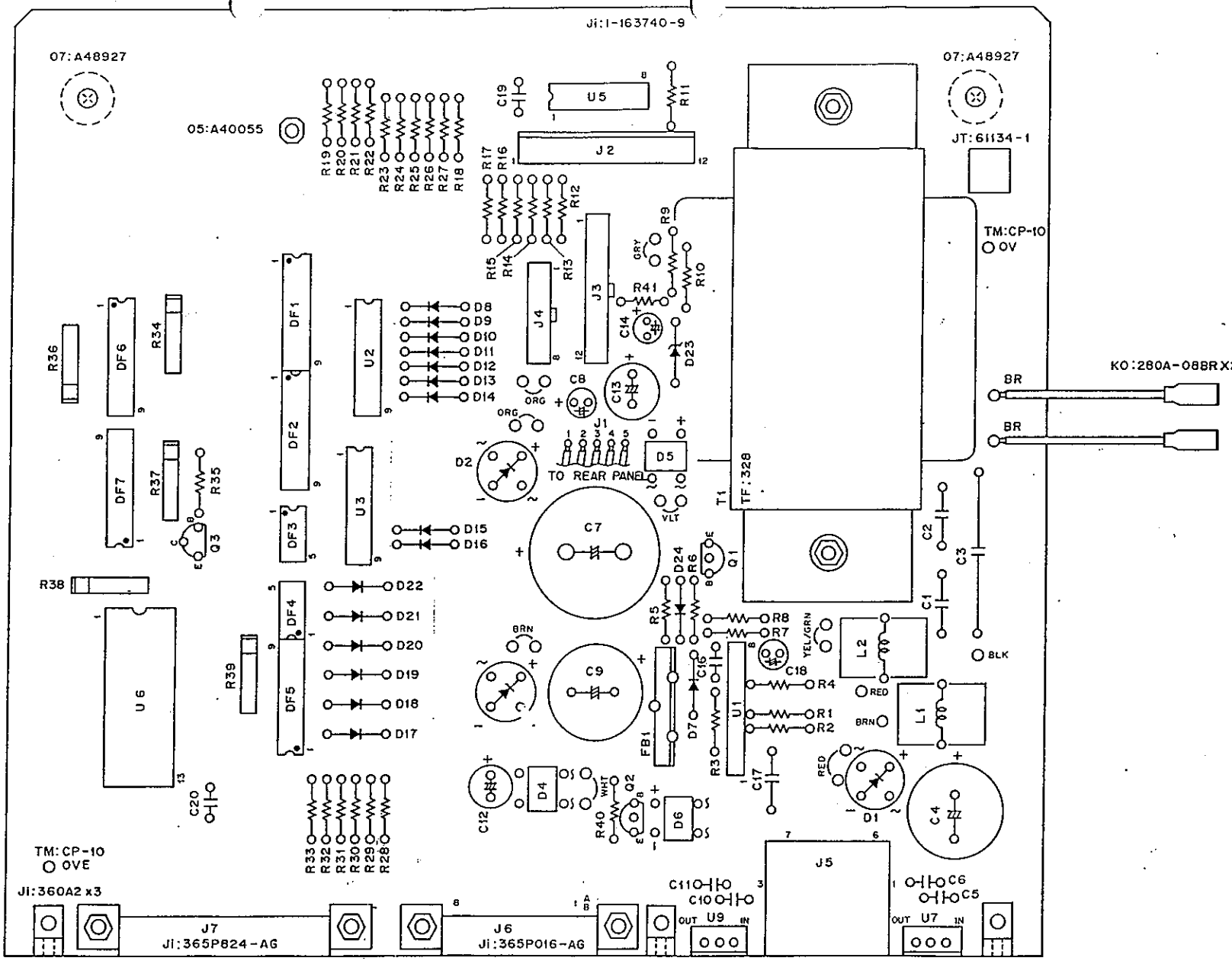


MODEL	AD-4323
DESCRIPTION	KEY BOARD
STOCK NO.	PZ:2076
DRWG. NO.	KZ3-00661

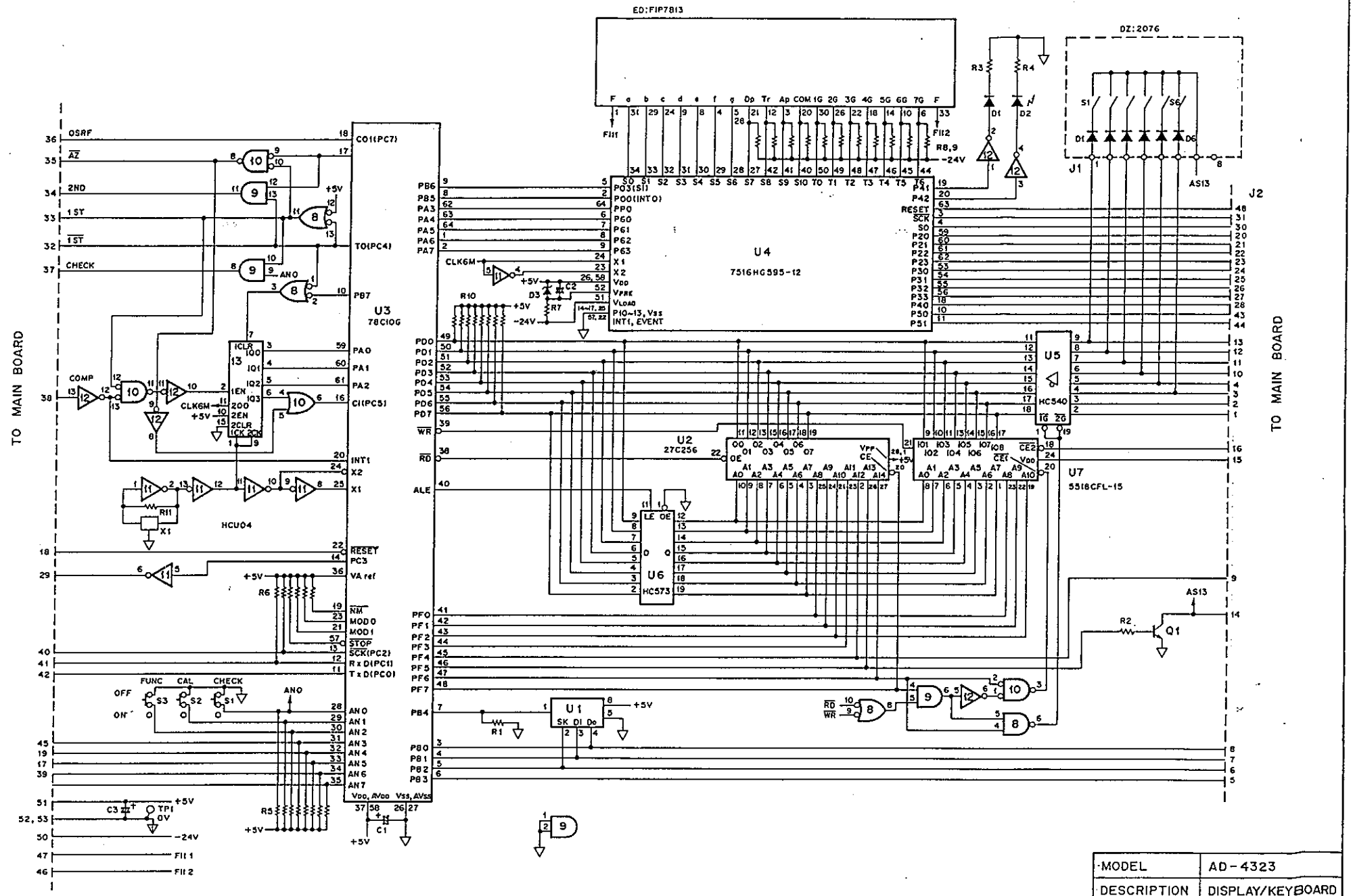


MODEL	AD-4323
DESCRIPTION	MAIN BOARD
STOCK NO.	PZ:2075
DRWG. NO.	EC3-01188



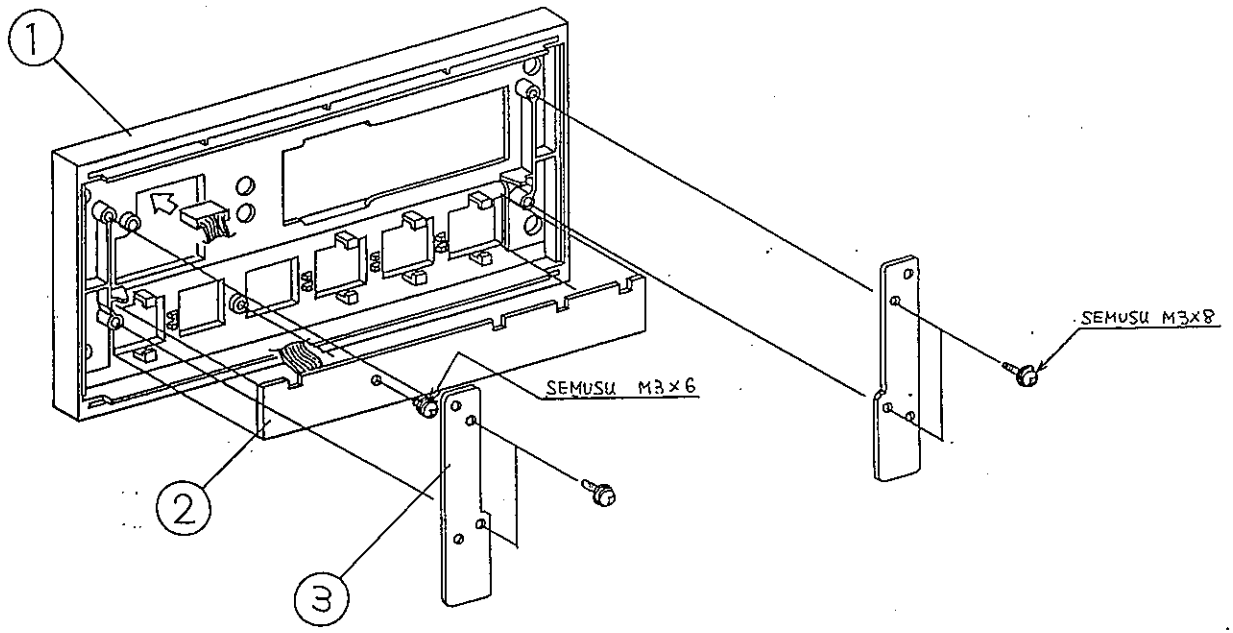


MODEL	AD-4323
DESCRIPTION	MAIN BOARD
STOCK NO.	PZ:2075
DRWG. NO.	KZ2-00347



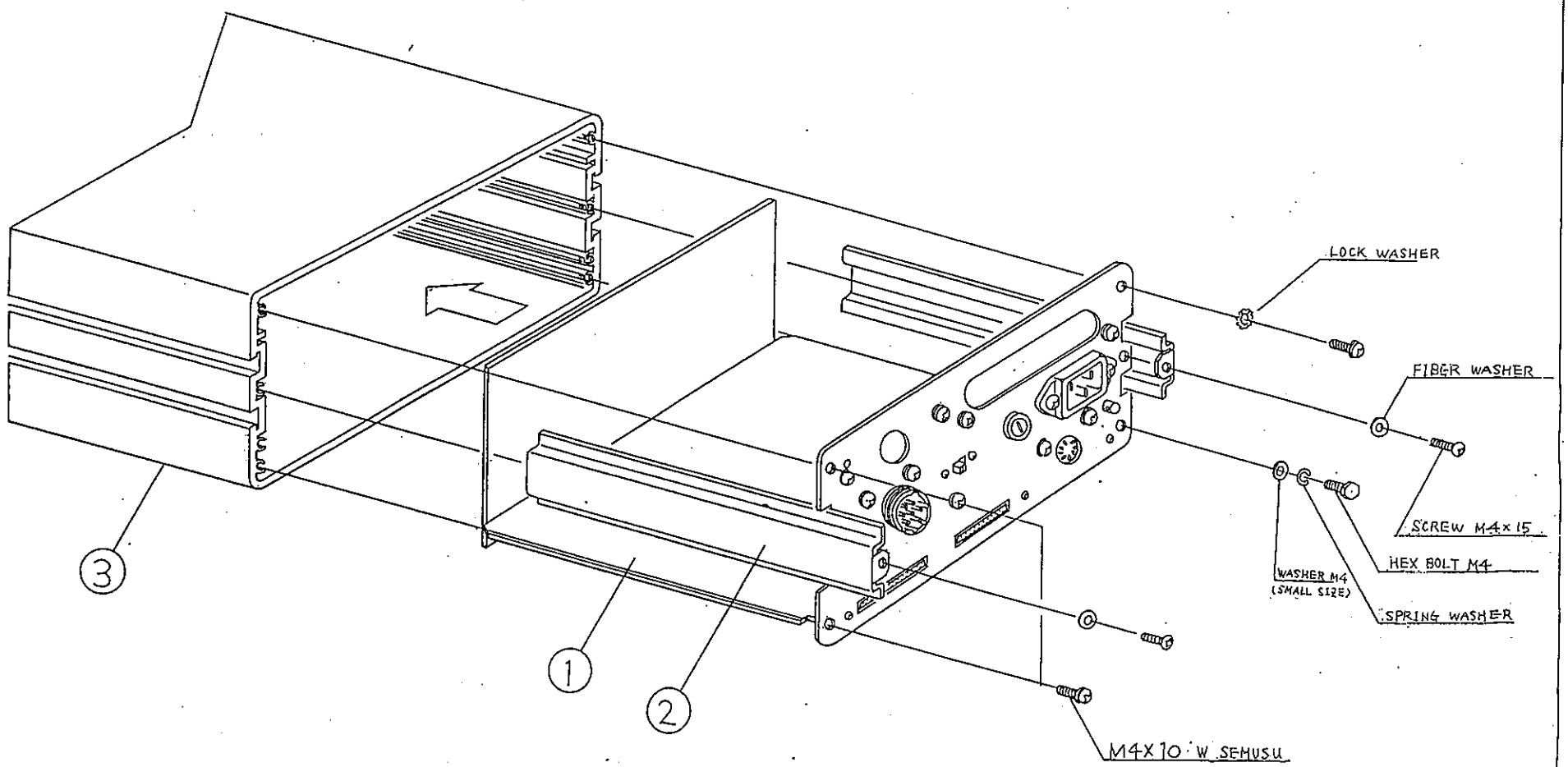
MODEL	AD-4323
DESCRIPTION	DISPLAY/KEYBOARD
STOCK NO.	PZ:2074/76
DRWG. NO.	EC3-01189

.G.NO.	PARTS NAME	DESCRIPTION	Q'TY
1	07:A10089-2	FRONT FRAME	1
2	PZ:2076	KEY BOARD	1
3	04:A48928	PLATE	2

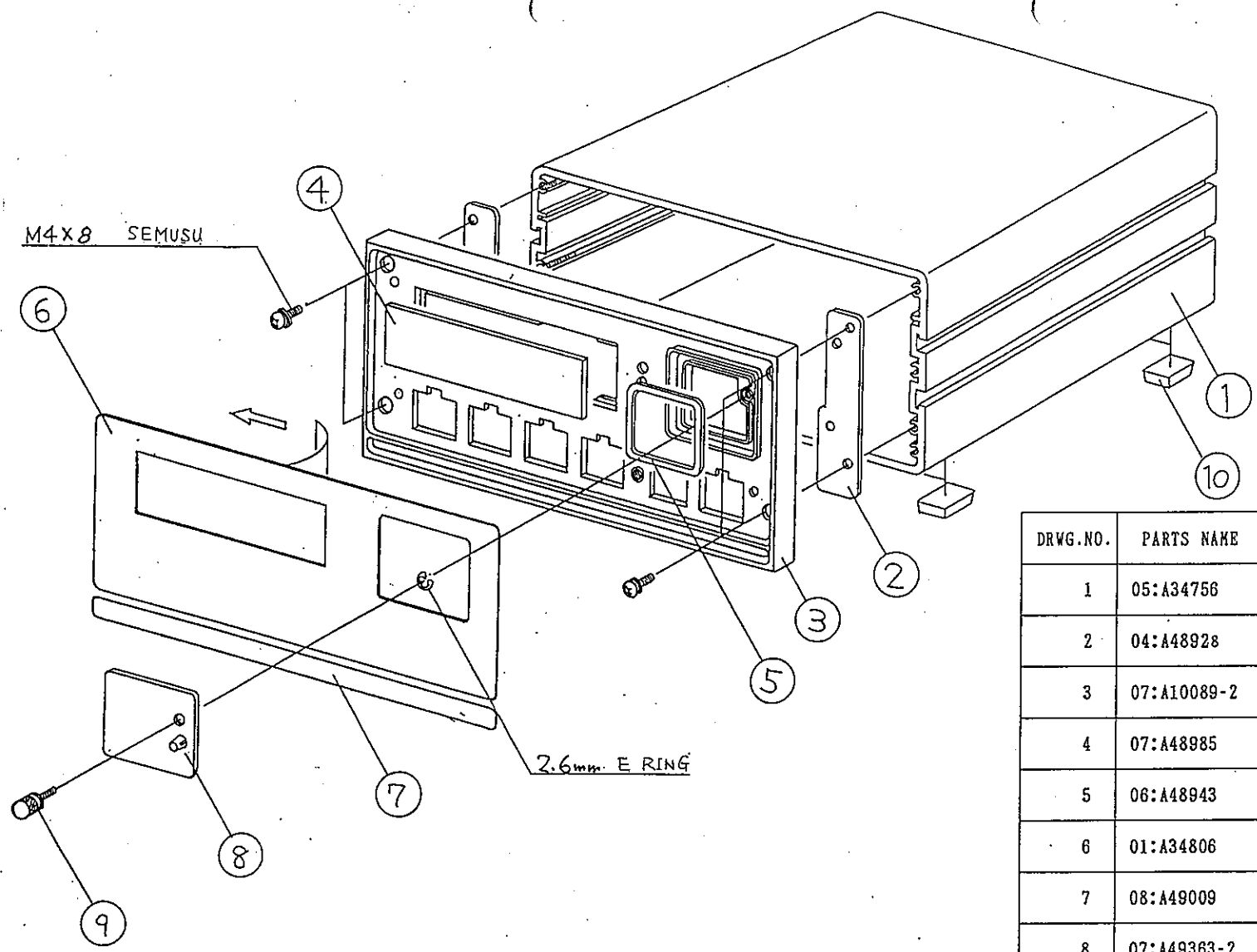


				Model	AD4323
Symbol	Date	By	Revision No.	Description	EXPLODED VIEW
				Stock No.	
				Drwg.No.	

G.NO.	PARTS NAME	DESCRIPTION	Q'TY
1		UNIT	1
2	04:A48924	SLIDE LOCK	2
3	05:A34756	CASE	1



				Model	AD4323
Symbol	Date	By	Revision No.	Description	EXPLODED VIEW
				Stock No.	
				Drwg.No.	

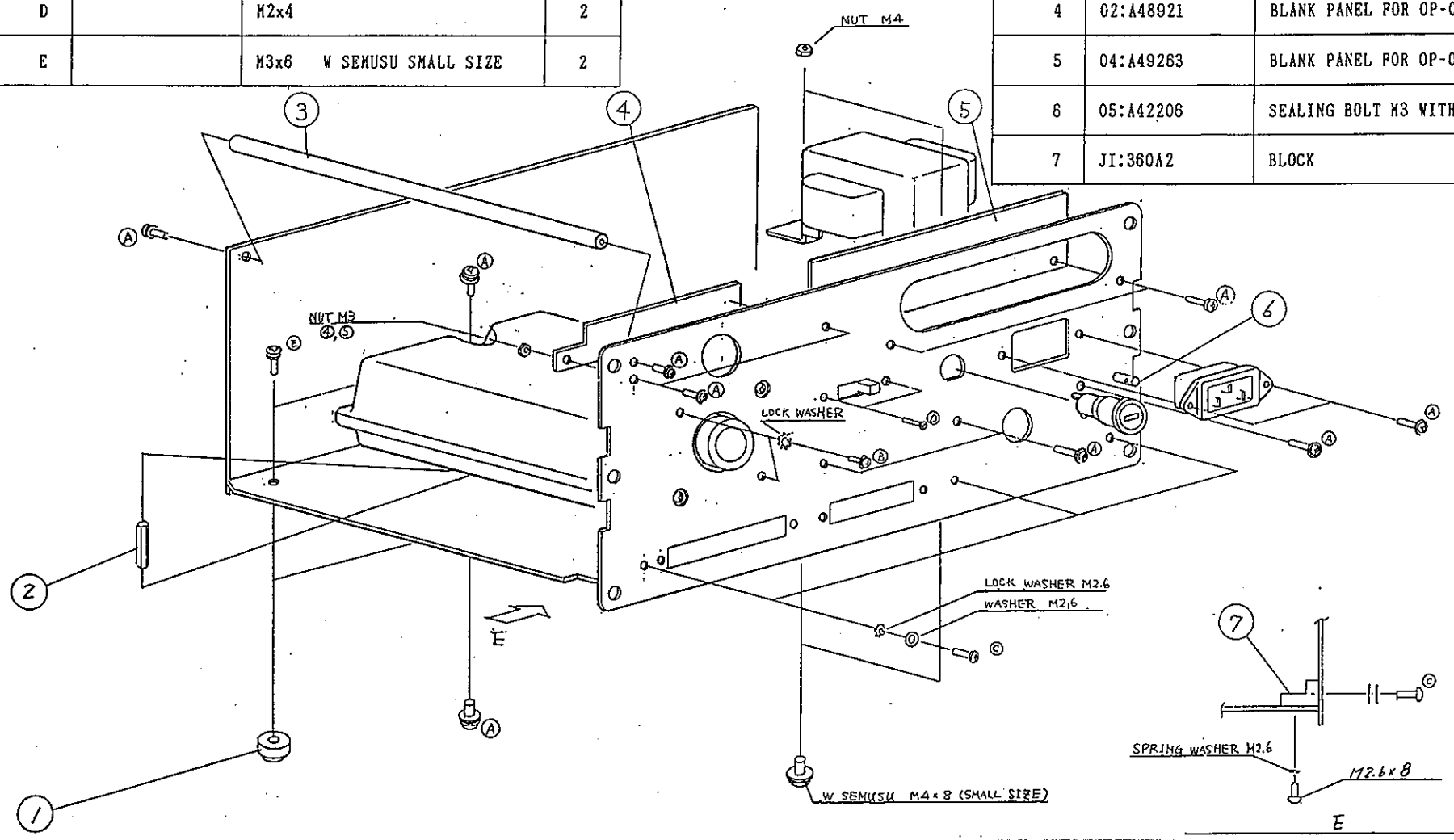


DRWG.NO.	PARTS NAME	DESCRIPTION	Q'TY
1	05:A34756	CASE	1
2	04:A48928	PLATE	2
3	07:A10089-2	FRONT FLAME	1
4	07:A48985	FILTER	1
5	06:A48943	SEAL	1
6	01:A34806	KEY SHEET	1
7	08:A49009	CAPACITY. LABEL	1
8	07:A49363-2	BLANK PANEL	1
9	07:A45440	SEALING SCREW WITH HOLE	1
10	10:SJ-5023	RUBBER FOOT	4

Symbol	Date	By	Revision No.	Model	AD4323
				Description	EXPLODED VIEW
				Stock No.	
				Drwg.No.	

DRWG.NO.	PARTS NAME	DESCRIPTION	Q'TY
A		M3x8 W SEMUSU SMALL SIZE	13
B		M3x8 W SEMUSU	2
C		M2.6x4	3
D		M2x4	2
E		M3x6 W SEMUSU SMALL SIZE	2

DRWG.NO.	PARTS NAME	DESCRIPTION	Q'TY
1	07:A48927	PLASTIC SPACER	2
2	05:A40055	SPACER	1
3	05:A49401	SUPPORT	1
4	02:A48921	BLANK PANEL FOR OP-07	1
5	04:A49263	BLANK PANEL FOR OP-01	1
6	05:A42206	SEALING BOLT M3 WITH HOLE	1
7	JI:360A2	BLOCK	3



Symbol	Date	By	Revision No.	Model	AD4323
				Description	EXPLODED VIEW
				Stock No.	
				Drwg.No.	