MAINTENANCE MANUAL

AD-4316 WEIGHING INDICATOR

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32 DEW ST, THEBARTON, S.A., 5031

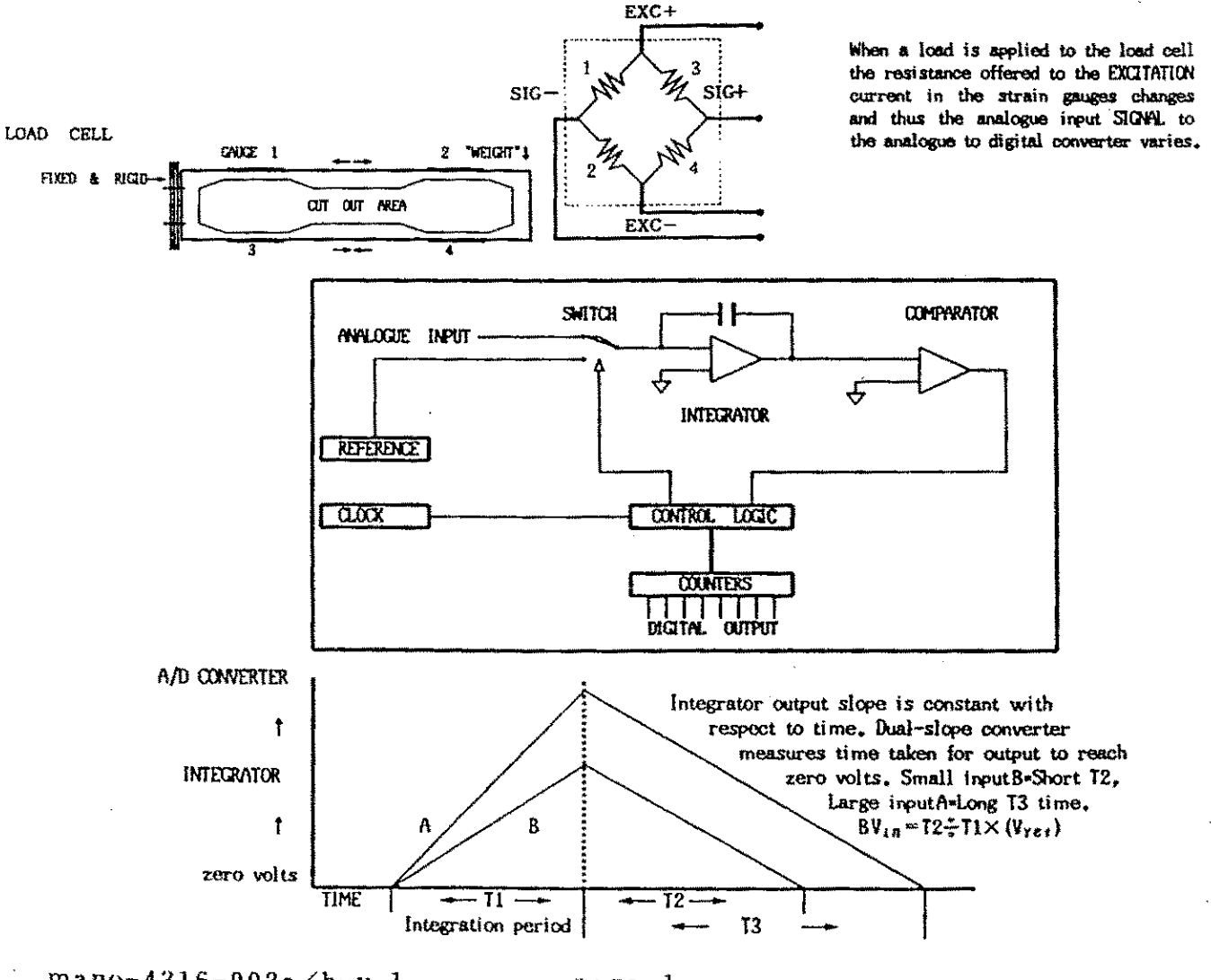
1. INTRODUCTION

This Maintenance Manual concerns the AD-4316 Weighing Indicator and should be used in conjunction with the Instruction Manual sent with the indicator when it is shipped.

If the display is blank check that neither the internal nor any external fuse has blown and change if necessary. Check the power cord for continuity and insulation between Live, Neutral and Earth. Check that the indicator is receiving the correct AC input voltage.

If the display panel is working check that all the display segments are functioning correctly. They should all switch on when the ON/OFF switch is pressed in self check mode.

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



2. TESTING

1. Testing the Main Board & Display Board

a) Check the voltage level of the power supply with CPU (U26) TMP80C39 and ROM (U28) 2732 not plugged into their IC sockets. Look for the following voltages:-

LOGIC POWER SUPPLY:
- 5V : At TD with TC grounded +5V ±5%
- BT5V : At TB with TC grounded +5V ±5%
- -24V : At TA with TC grounded -24V ±5%

ANALOGUE POWER SUPPLY:
- 5V : At TI with TG grounded +5V ±5%
- 12V : At TE with TG grounded +12V ±5%
- -5V : At TF with TG grounded -5V ±5%

LOAD CELL POWER SUPPLY:
- 12V : Between pins 6 & 7 of the connector +12V ±5%

b) Disconnect the power cable and insert the CPU and ROM into their IC sockets (U26 & U28). Switch off all the dip-switch segments for SW1, SW2, SW3 & SW4 and then reconnect the power cable.

c) For OIML equipment the rear mode switch should be on Mode 2 for self checking but for U.S.A. models self checking is automatically initiated when the ON/OFF switch (SW5) is pressed. Start with SW3 & 4 segments all OFF and then switch on the segments one by one and recheck the self-check display. Segment number 1 of SW3 or SW4 ON should give a display of d1 01 or d2 01 respectively. Segment number 2 ON=02, Seg.3 ON=04, Seg.4 ON=08, Seg.5 ON=10, Seg.6 ON=20, Seg.7 ON=40 and Segment number 8 ON=80 (d1 or d2).

PRESS SW5 ONCE
↓
Display blanks, only unit (Kg/t or Kg/Lb) LED remains ON
↓
PRESS SW5 AGAIN
↓
Display reads "888888" for about 2 seconds with all LEDs ON
↓
d1 xx with all LEDs OFF, status of SW3 in hexadecimal notation
↓
d2 xx with all LEDs OFF, status of SW4 in hexadecimal notation
↓
d3 xx with all LEDs OFF, status of the two least significant digits
↓
d4 xx with all LEDs OFF, status of the two middle digits
↓
d5 xx with all LEDs OFF, status of the most significant digit
↓
Cxxxx with unit LED (only) ON, Span calibration value
↓
xxxxx Normal weighing, value of present analogue input

d3, d4 and d5 will show the status of the 5 push button thumbwheels installled on the Option-03 replacement front metal panel cover. Op-03 is plugged in via the J4 printed circuit board connector.

d) Analogue section adjustment
Switch off all the segments for SW1 to SW4, connect a dummy load cell to the load cell input socket and short circuit test pins TI & TJ. Connect the power cable and a digital volt meter (DVM)to TH & TI with TI grounded. Adjust the volume regulator VR1 until the voltage level on the DVM reads "0" +10mV→-50mV.

Switch SW5 (ON/OFF key) OFF and then ON again while simultaneously pressing SW7 (TARE), this will clear any ZERO and TARE data memories in the indicator. Adjust VR2 until the Indicator display panel reads close to zero.

Connect the DVM to the load cell SIGNAL- with the SHIELD grounded. Turn VR4 on the display board fully anticlockwise and the DVM should read approximately 0.9mV. When segments 1 to 8 of SW2 are switched ON in reverse order the DVM display should show these voltages:-

SW2	segment 8 only ON	=	-1.02mV approx.
SW2	segment 7 only ON	=	-1.09mV approx.
SW2	segment 6 only ON	=	-1.29mV approx.
SW2	segment 5 only ON	=	-1.59mV approx.
SW2	segment 4 only ON	=	-2.29mV approx.
SW2	segment 3 only ON	=	-3.63mV approx.
SW2	segment 2 only ON	=	-6.37mV approx.
SW2	segment 1 only ON	=	-11.85mV approx.

Turn the span potentiometer VR3 fully anticlockwise and when "Cxxxx" is displayed during check mode the span calibration value should be displayed. This value should be divided by 2 each time when segments 1 to 8 of SW1 are turned on, starting with segment number 1, then 1+2, then 1+2+3, etc.

e) Disconnect TI/TJ link. Switch on segment number 4 of SW3 with 2 & 3 still off, this will give a minimum division value of x5. Set the dummy load cell to 0.5mV/V and adjust SW2 and VR4 until the display reads zero. Set the dummy load cell to 1.5mV/V and adjust span via SW1 and VR3 until the display reads 50000. Reduce the output from the dummy load cell and check that the TARE function is working properly by pressing SW7. Also check that a weight can be tared via the remote terminals on the rear panel (short TARE to COMMON).

The TARE function should be invalid if a gross weight display is negative, exceeds the maximum capacity set or if the display is in Net mode. The maximum capacity set at present with segments 5→8 of SW3 off is 99990 for OIML units or 500000 (100000/Op-02) for USA units in Lb mode. Set the maximum capacity of the indicator to 50000, switch the display off & then on via SW5. Check that the display blanks if the input signal exceeds this value by 9 minimum divisions and that Tare is invalid above this value. Operate SW7/TARE at 50000, the display should zero and indicate Net Mode, press Net/Gross(SW8) and the display should revert to Gross Mode at 50000. Press SW7 or SW8 (depending on Option & ROM) again, reduce the input signal to 0.5mV and the display should read -50000 in Net mode. Check that the rear panel Net/Gross terminals work.

f) Test that the ZERO button and terminals are only valid when the displayed offset from zero is within ±2% of the maximum capacity programmed and only when the display is stable. If the maximum capacity set is 50000 then the zero function should not work if the display exceeds 1000 (eg 1001 if the minimum division is x1). As SW4 segments 3, 4 & 5 should all be off, the zero track function should be off as well and will therefore not contaminate test results.

g) Test ZERO TRACK by setting segments 3, 4 & 5 of SW4 all on, this will set zero track parameters to ±1.5 min.divisions of zero per 2 seconds (or 2.0d/2 sec for the USA model). With the indicator set to one minimum division check that zero will be tracked within these parameters by increasing the input voltage via the dummy load cell. Zero track should not work if these parameters are exceeded but when it does work the centre of zero LED (D4) should switch on.

h) Segments 6 & 7 of SW4 will set the decimal point position to no decimal point or to 1, 2 or 3 decimal places. See the instruction manual for the settings and check that this function works.

i) If segment number 8 of SW4 is switched on the display update rate should fall from 20 times per second to about 4 times per second.

j) Check that the internal battery will protect (when it is charged) weighing event data stored in memory --- enter a tare value and then disconnect/reconnect the power cable. The maximum voltage at R4 when the power cable is disconnected should be 1mV.

2. Binary Coded Decimal output board Option-01

a) Disconnect the power cable and then install Op-01 via main PCB connector J5. Connect the AD-8114B printer via the AMPHENOL output connector (see the Instruction Manual for 4316) but do not connect pin 48 (the conditional print trigger). Reconnect the power cable.

b) Test that weighing event data is being transmitted and printed correctly.

+↑0	1000.0Kg	would indicate a positive gross weight of 1000.0Kg.
—	1000.0t	would indicate a negative net weight of 1000.0t.
+↑0	. t	would indicate a gross display overload(in red ink)
—	. t	would indicate a net display overload(in red ink).

c) Test again with the conditional print trigger connected so that the printer will only work when data is stable and valid.

3. Setpoint Interface Option-02

a) This interface permits weighing event data to be entered into 4316 via thumbwheels and for 4316 to control weighing events via its COMP. OUT terminals with the high degree of accuracy afforded by the "Time Extrapolated Estimation" method of control. There are some function/ROM software changes (see the 4316 Instruction Manual) associated with this option which should be checked and 4316 should be tested again when this option has been installed.

b) Unplug the power cable before connecting Op-02 via the J3 main PCB connector and replacing the ROM. Refer to the Instruction Manual for some other details concerning Op-02. Connect Option-05 or 06 to provide thumbwheel input data and construct a testing device with LEDs etc to show when the "COMP OUT" (terminals 1→5) output relays have closed. 4316 Minimum Division should be set to x1 with a Maximum Capacity of 10000.

c) Set Op-05 or 06 to:-

Final Weight	=	07777 (TARGET WEIGHT)
Preliminary Weight	=	777 (TARGET less PRELIM)
Lo Limit	=	77
Hi Limit	=	77
Zero Band	=	77
Free Fall	=	77

d) The output terminals are:-

1	=	Lo Limit
2	=	Hi Limit
3	=	Pre-act (shut off, only FREE FALL left)
4	=	Preliminary weight (reduce flow)
5	=	Zero band
6	=	Common
7	=	Loss in weight control (input)
8	=	Completes LED circuit

Time Extrapolated Estimation will be activated when the weighing cycle enters the preliminary weight area. If AD-4316 was being used to control the flow from a hopper it would be at this point that the flow would be reduced in order that the total shut off point (pre-act) could be more accurately estimated. After pre-act, Free Fall would be all that would remain to be added to the weight already registered.
With a target weight of 7777, the preliminary weight will be reached when the display reads 7000 and terminal 4 will complete the circuit so that the flow can be reduced in preparation for pre-act. When the display reaches 7700 the pre-act point will have been reached (total shut off of the flow from the hopper) and terminal 3 should complete (Lo Limit, terminal 1 will break)----77 is the estimated quantity of material in free fall. Test the system by entering weight values from 0000, 1111, 2222 to 9999.
If you are using LEDs to indicate when the relays to the COMP. OUT terminals have closed, they should switch on under these conditions:-

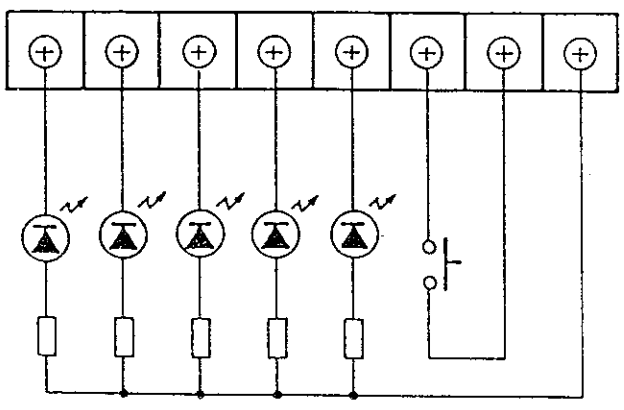
ZERO BAND. Set value of Zero Band (%) x Maximum Capacity

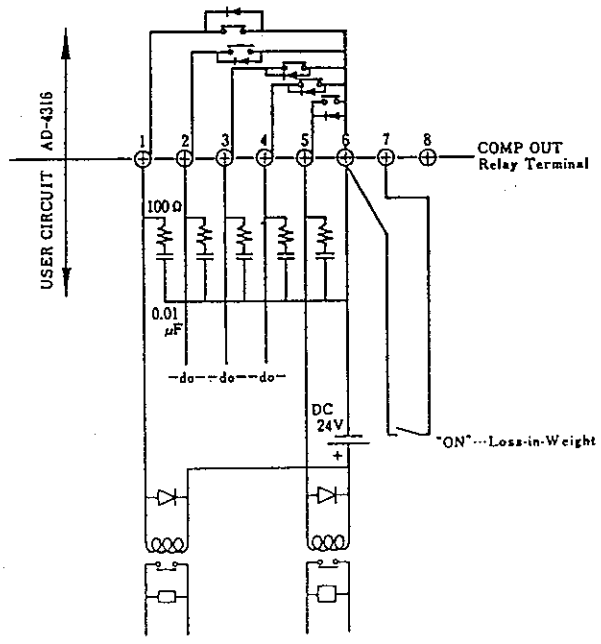
PRELIMINARY WEIGHT. Point at which to reduce flow and start TEE.

PRE-ACT. Total shut off point. Final Weight less Free Fall.

HI LIMIT. Final Weight plus hi limit value.

LO LIMIT. Final Weight less lo limit, LED will switch off after lo limit passed.





e) PUSH BUTTON THUMBWHEELS

The following groups of thumbwheel switches can be directly interfaced.

(a) Final weight	(5 digits)	(b) Free Fall	(2 digits)
(c) Preliminary	(3 digits)	(d) Hi Limit	(2 digits)
(e) Lo Limit	(2 digits)	(f) Zero band	(2 digits) in %

* If Min. Div. is ≥ x5 then (b), (c), (d) & (e) will be multiplied by ten before the Comparator compares the data.

* The least significant digit of a thumbwheel switch group corresponds to the LSD of the weight display, except for Zero band.

f) SETPOINT CONDITION

Relay closes under the following conditions:-

Relay		Condition
Zero band	.....	"Gross Weight"<"Zero band"/100 x Max. Capacity.
Preliminary	.....	"Displayed Weight"≥"Final Weight"-"Preliminary".
Pre-act	.....	"Displayed Weight"≥"Final Weight"-"Free Fall".
Hi limit	.....	"Displayed Weight">"Final Weight"+"Hi limit".
Lo limit	.....	"Displayed Weight"<"Final Weight"-"Lo limit".

*Displayed Weight=the value displayed in either the net or gross mode.

g) SETPOINT INPUT PINS

Pin No.	SIGNAL	Pin No.	SIGNAL
A-1	8×10^1, 8×10^3	B-1	4×10^1, 4×10^3
A-2	2×10^1, 2×10^3	B-2	1×10^1, 1×10^3
A-3	8×10^0, 8×10^2, 8×10^4	B-3	4×10^0, 4×10^2, 4×10^4
A-4	2×10^0, 2×10^2, 2×10^4	B-4	1×10^0, 1×10^2, 1×10^4
A-5	Lo Limit Common	B-5	Hi Limit Common
A-6	Free Fall Common	B-6	Zero Band Common
A-7	Prelim. 10^0, 10^1 Common	B-7	Prelim. 10^2 Common
A-8	Final Weight 10^0, 10^1Comm	B-8	Final Weight 10^2, 10^3Comm
A-9	Final Weight 10^4 Common	B-9	
A-10		B-10	
A-11		A-11	
A-12		A-12	

h) FUNCTION CHANGES

When Option-02 has been installed the following function changes should be considered:-

(a) ZERO and TARE commands will now always be accepted, even if motion has been detected (the load is unstable).

(b) A NET/GROSS command will now change the mode and display to GROSS only, it will not change the mode from GROSS to NET.

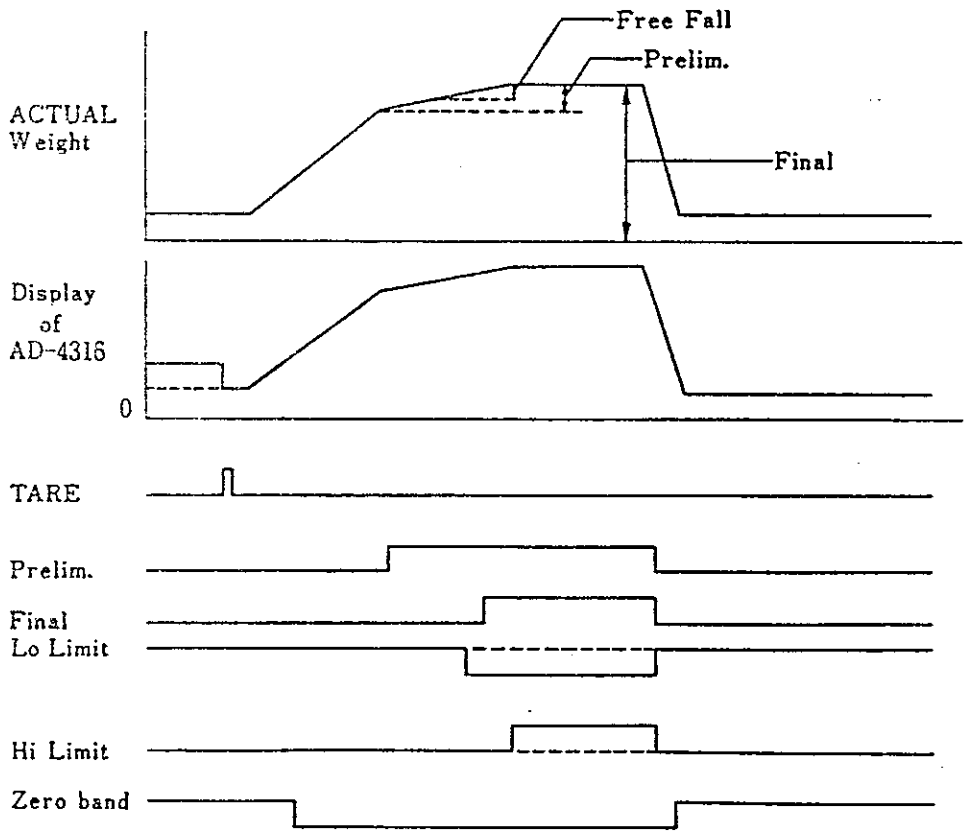
(c) A TARE command will change the mode to NET and zero the display.

(d) For OIML units the Mode 1/2 switch now enables/disables zero tracking only, check mode is permanently on.

(e) For USA units the Lb/Kg calculation is disabled, the LED changes only. One pound (avoir) is approximately 0.4536kg so divide a kilogram display by this conversion factor to find pounds or multiply a pound display by the factor to find kilograms. The exact definition of a pound is 0.45359237kg in the U.K. or 0.453592427 7kg in the U.S.A.

i) TIMING

NORMAL



8) Standard accessory is a single 24 pin connector. FCN 36/J024-A6.

3. THUMBWHEEL TARE (Option-03)

A group of five push button thumbwheels (5 digits) is installed on a replacement front metal panel cover with this option and permits the entry of a tare value. It is plugged in via connector J4 and the U28 ROM must be exchanged.
When Minimum Division is anything but 1, the digital switch value will be evaluated as follows:-

Read as: "If d=*n* then *x* and *y* of LSD will be evaluated as. . . . . "

Min. Div. No.	LSD No.	EVALUATED No.
(a) 2	0 & 1	0
2	2 & 3	2
2	4 & 5	4
2	6 & 7	6
2	8 & 9	8
(b) 5	0, 1 & 2	0
5	3 to 7	5
5	8 & 9	10
(c) 10	LSD	Not Evaluated.
(d) 20	LSD	Not Evaluated.
20	LSD_1	As For (a)
(e) 50	LSD	Not Evaluated.
50	LSD_1	As For (b)

MAIN BOARD 1

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:488	PZ:488	PZ:488	MAIN BOARD FULLY ASSEMBLED	
"	"	PC:488B	PRINTED CIRCUIT BOARD	
C1	"	CK:SM25VB330	CAPACITOR 330μF 25V	
C2	"	CK:SM50VB47	" 47μF 50V	
C3	"	CK:SM25VB1000	" 1000μF 25V	
C4	"	CK:SM50VB330	" 330μF 50V	
C5	"	CK:SM35VB220	" 220μF 35V	
C6	"	CK:SM50VB1000	" 1000μF 50V	
C7,8,9,10,12	"	CK:SM50VB10	" 10μF 50V	
C11	"	CK:SM16VB33	" 33μF 16V	
C13,14,38,39	"	CC:0.01U500V	" 0.01μF 500V	
C15~19,44,49,50, 53,55	"	CC:0.022U	" 0.022μF 50V	
C20,21	"	CM:E1225KN	" 2.2μF 100V	
C22,41	"	CM:E1474KN	" 0.47μF 100V	
C23	"	CC:470P	" 470PF 50V	
C24,25,26,30,33	"	CT:1D2R2	" 2.2μF 20V	
C27,32	"	CC:10P	" 10PF 50V	
C28	"	CS:08S0.1U50V	" 0.1μF 50V	
C29	"	CM:2003105K	" 0.1μF 200V	
C31	"	CC:3P	" 3PF 50V	
C34,37	"	CC:0.001U	" 0.001μF 50V	
C40,45,60	"	CC:0.01U	" 0.01μF 50V	
C42,43	"	CC:22P	" 22PF 50V	
C46	"	CT:1V010	" 1μF 35V	
C47	"	CC:0.047U	" 0.047μF 50V	
C48	"	CT:1VR33	" 0.33μF 35V	
C52	"	CM:6003104K	" 0.01μF 600V	
CN3A	"	JI:365P024-AG	CONNECTOR	
D1~6	"	DI:W02	DIODE BRIDGE	
D7,8,9,12,13,16	"	DI:1S1588	DIODE	
D10,11,14,15, 17~20	"	DI:1SS53	"	
D21	"	DZ:RD5.1FB	ZENER DIODE	
J1	"	JI:1-163740-9	F FORM PIN	
J2	"	JT:1-171825-7	CONNECTOR	
J3,4,5	"	JT:1-171825-2	"	
L1,2	"	LL:SF-T8-40S	COIL	
L3,4,5	"	LL:LF5-222K	"	
L6	"	LR:A5AT7-14-3.5	"	
PHC1,2	"	DF:TLP550	PHOTO COUPLER	
PHC3	"	DF:TLP521-3	" "	
Q1,8	"	QT:C1815Y	TRANSISTOR	
Q3	"	QF:K30ATM-GR	FET	
Q4	"	QF:K30ATM-R	"	
Q5,7	"	QF:K30ATM-Y	"	
Q6	"	QF:ZN4393-S1	"	
Q9	"	QF:A71A-S1	DUAL FETS	
Q10	"	QT:A1015Y	TRANSISTOR	
R1,2	"	RC:100R	RESISTOR 100ohm 1/4W	
R3	"	RC:1.2K	" 1.2K 1/4W	
R4	"	RC:820K	" 820K 1/4W	

MAIN BOARD 2

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
R9,39,60,64	PZ:488	RC:4.7K	RESISTOR 4.7K 1/4W	
R10	"	RC:33K	" 33K 1/4W	
R11	"	RF:15RRF	" 15 ohm 1/8W, ±25PPM/°C	
R12,13	"	RC:15K	RESISTOR 15K 1/4W	
R14,15,21,28,35, 36,43,90	"	RC:10K	" 10K 1/4W	
R16	"	RC:3.3K	" 3.3K 1/4W	
R17,30,42	"	RC:8.2K	" 8.2K 1/4W	
R18	"	RF:9120	ASSEMBLY RESISTOR	
R19	"	RM:3.48KF	RESISTOR 3.48K 1/4W, ±100PPM/°C	
R20	"	RM:121KF	RESISTOR 121K 1/4W, ±100PPM/°C	
R22,34,57,58,59	"	RC:1K	RESISTOR 1K 1/4W	
R23,27	"	RC:470K	" 470K 1/4W	
R24,26,54,55	"	RC:22K	" 22K 1/4W	
R25	"	RC:33K	" 33K 1/4W	
R29	"	RC:680K	" 680K 1/4W	
R31,32	"	RC:47K	" 47K 1/4W	
R33	"	RF:9114	ASSEMBLY RESISTOR	
R37	"	RC:12K	RESISTOR 12K 1/4W	
R38	"	RC:120R	" 120 1/4W	
R40,41	"	RM:47KJ	" 47K 1/4W, ±100PPM/°C	
R44	"	RC:150K	RESISTOR 150K 1/4W	
R45,70,71	"	RC:1.5K	" 1.5K 1/4W	
R46	"	RC:470R	" 470	
R47	"	RM:18KJ	" 18K 1/4W, ±100PPM/°C	
R48	"	RM:5.62KF	RESISTOR 5.62K 1/4W, ±100PPM/°C	
R49	"	RC:100K	RESISTOR 100K 1/4W	
R50	"	RC:3.9K	" 3.9K 1/4W	
R51,52,53	"	RN:IHR-4-223MA	RESISTOR NETWORK 22K x 4, 1/8W	
R46,61,62,65,66	"	RN:IHR-4-472MA	RESISTOR NETWORK 4.7K x 4, 1/8W	
RL1	"	SL:LDI-2M-05D	READ RELAY	
TA~TG	"	TM:CP-10	TEST PIN	
U1,2	"	UR:TA78L005AP	VOLTAGE REGULATOR 5V, 100mA	
U3,5	"	UR:TA78012AP	VOLTAGE REGULATOR 12V, 1A	
U4	"	UR:TA78005AP	VOLTAGE REGULATOR 5V, 1A	
U6	"	UC:4016	CMOS	
U7	"	UC:4011	"	
U8	"	UC:4001	"	
U9	"	UA:TLP072CN	DUAL OP AMPS	
U10,11,12	"	UA:301AC	OP AMP	
U13,14	"	UA:TL082C	DUAL OP AMPS	
U15	"	UC:4069	CMOS	

MAIN BOARD 3

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
U20,21	PZ:488	UA:NE555V	TIMER IC	
U22	"	UA:MB3761	VOLTAGE COMPARATOR	
U23,24	"	UC:5066	CMOS	
U25,38	"	UC:40H174	"	
U27	"	UT:LS04	TTL	
U29	"	UT:LS374	"	
U30	"	UT:LS174	"	
U31	"	UT:LS138	"	
U32	"	UT:LS32	"	
U33	"	UC:14520B	CMOS	
U34,35,36,37	"	UC:MC14503	"	
J6	"	JS:10340-01-445	IC SOCKET	
J7	"	JS:10324-01-445	"	
VR1	"	RV:H201	VOLUME	
X1	"	XT:HC18/U6MHZ	CRYSTAL 6MHz	
BT1	"	EB:N-SB2	NiCd BATTERY	
CN1A	REAR PANEL	JM:NJC-207-RM	CONNECTOR	
CN2A	"	TM:F2066A-4P	"	
KB1	"	KO:102-7S30	CONNECTOR CABLE	
KB2	"	KO:102-7S20	" "	
SW	"	SS:SW-16	SLIDE SWITCH	
U4	"	UR:TA78005P	VOLTAGE REGULATOR 5V, 1A	
U5	"	UR:TA78012P	VOLTAGE REGULATOR 12V, 1A	
17	"	QA:ZB-3M	ACCESSORY SET	
18	"	QA:AC256-1674	MICA SPACER	
27	"	FH:SN1009	FUSE HOLDER	
		FS:F-7142-0.5A	FUSE	
33	"	KB:9101	POWER CORD	
34	"	ET:SR-6N-4	CABLE CLAMP	

DISPLAY BOARD

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:489	PZ:489	PZ:489	DISPLAY BOARD FULLY ASSEMBLED	
"	"	PC:489B	PRINTED CIRCUIT BOARD	
16	"	06:A42209A	DISPLAY PANEL SPACER 30mm x 80mm	
15	"	07:A42210B	10mm SWITCH SPACER	
R1,2	"	RC:82R	RESISTOR 82 1/4W	
R3~8	"	RC:330R	" 330 1/4W	
R9	"	RF:RR101	ASSEMBLY RESISTOR	
R10	"	RF:1/4 82KRF	RESISTOR 82K 1/4W, ±50PPM/°C	
R11	"	RM:1/2 470KJ	RESISTOR 470K 1/2W	
R12	"	RM:270KJ	RESISTOR 270K 1/4W, ±100PPM/°C	
R13	"	RM:120KJ	RESISTOR 120K 1/4W, ±100PPM/°C	
R14	"	RF:1/4 64KRF	RESISTOR 64K 1/4W, ±50PPM/°C	
R15	"	RF:32KRF	RESISTOR 32K 1/8W, ±50PPM/°C	
R16	"	RF:16KRF	RESISTOR 16K 1/8W, ±50PPM/°C	
R17	"	RF:8KRF	RESISTOR 8K 1/8W, ±50PPM/°C	
R18	"	RF:4KRF	RESISTOR 4K 1/8W, ±50PPM/°C	
SW1,2,3,4	"	SD:KTD08	DIP SW	
SW5,8	"	SK:SHM-13-S	KEY SWITCH	
VR3	"	RJ:9W200R	VOLUME 200ohm	
VR4	"	RJ:9W50K	" 50K	
D2~7	"	DL:TLUG144	LED LAMP	
D8,9	"	DI:XE-7021E	DIODE ARAY	
FG1	"	ED:FG612A	DISPLAY TUBE	

OPTION-01

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:490	PZ:490	PZ:490	OPTION-01 BOARD FULLY ASSEMBLED	
"	"	PC:490B	PRINTED CIRCUIT BOARD	
C1	"	CT:1V2R2	CAPACITOR 2.2μF 35V	
C2,3,6,7,8	"	CC:0.022U	" 0.022μF 50V	
C4	"	CC:0.01U/500V	" 0.01μF 500V	
C5	"	CT:1VR33	" 0.33μF 35V	
CN5A	"	JA:57-40500-D39	CONNECTOR	
J5	"	JT:1-171826-2	"	
KB5	"	KO:102-12W10	CONNECTOR CABLE	
R1	"	RC:10K	RESISTOR 10K 1/4W	
R2	"	RC:15K	" 15K 1/4W	
R3,4	"	RC:100R	" 100 1/4W	
U1,2,3,4	"	UT:LS259	TTL	
U5	"	UT:LS123	"	
U6	"	UT:LS00	"	
101	"		SCREW M2.6 x 6	
102	"		SPRING WASHER M2.6	
103	"	04:A41894	BOARD EDGE PLATE	
104	"		SPRING WASHER M3	
105	"		SCREW M3 x 6	

OPTION-02

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:491	PZ:491	PZ:491	OPTION-02 BOARD FULLY ASSEMBLED	
"	"	PC:491A	PRINTED CIRCUIT BOARD	
C1	"	CC:0.022U	CAPACITOR 0.022μF 50A	
C2,3	"	CT:1D2R2	" 2.2μF 20V	
CN4A	"	TM:F2066A-8P	8P TERMINAL	
D1~5	"	DI:1SS53	DIODE	
J3	"	JT:1-171826-2	CONNECTOR	
KB3	"	KO:102-12W10	CONNECTOR CABLE	
R1	"	RC:1K	RESISTOR 1K 1/4W	
R2	"	RC:4.7K	RESISTOR 4.7K 1/4W	
RL-1~5	"	SL:LDI-1M-05D	RELAY	
U1	"	UT:LS174	TTL	
201	"	01:A42199A	TERMINAL FIXING PANEL	
202	"		SPRING WASHER M3	
203			SCREW M3 x 8	
204	"		SCREW M3 x 6	

OPTION-03

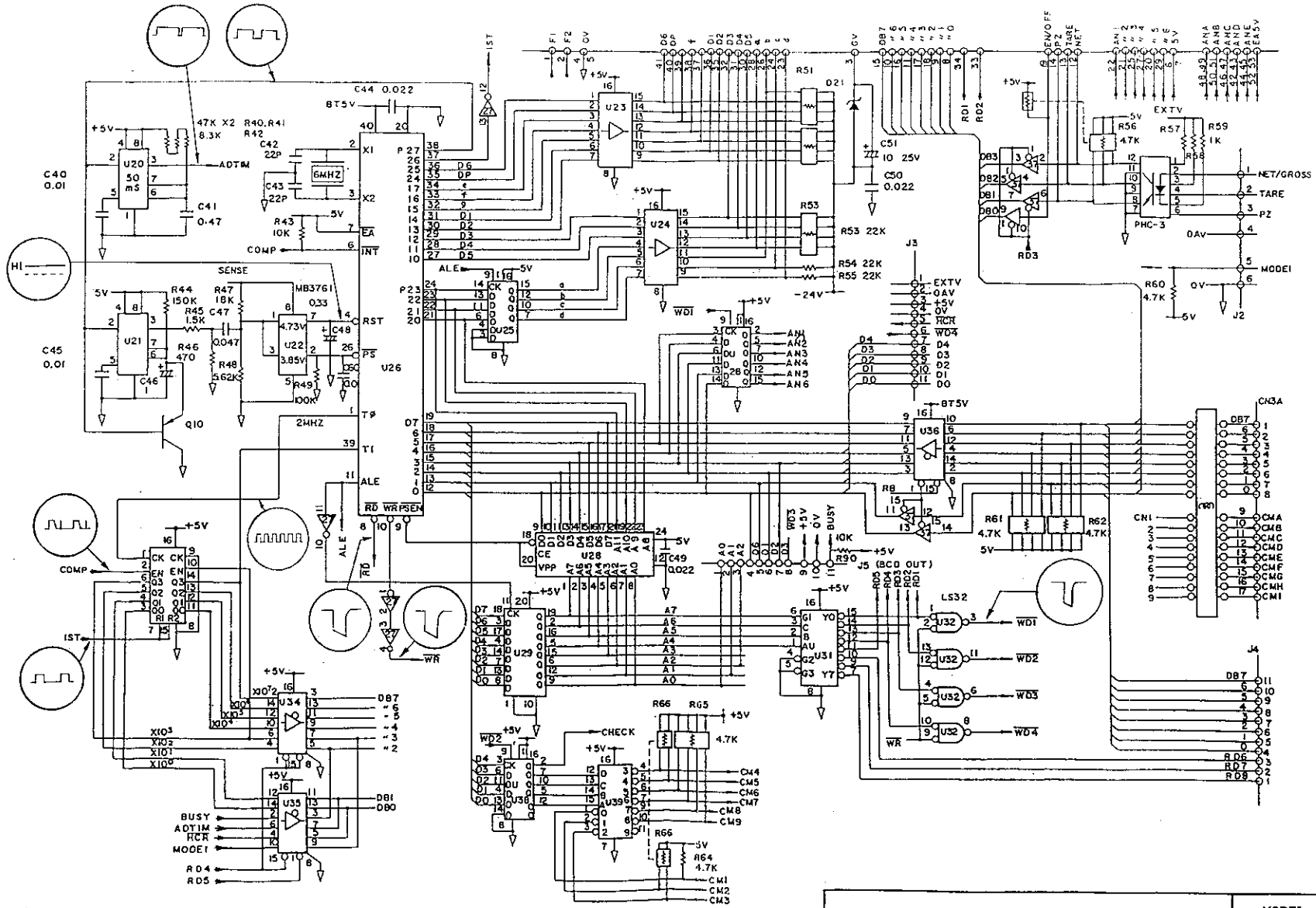
CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
D1~20		DI:1S1588	DIODE	
SW1~5		SD:A7MA207	PUSH BUTTON THUMBWHEELS SW	
301,302		SD:A7MA-2M	SW SIDE BOARD	
KB4		KO:102-12S30	CONNECTOR CABLE	
303		01:A42199A	SW FIXING PANEL	

OPTION-04

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:603	PZ:603	PZ:603	OPTION-04 BOARD FULLY ASSEMBLED	
"	"	PC:603	PRINTED CIRCUIT BOARD	
C1	"	CK:SM50VB10	CAPACITOR 10μF 50V	
C2,3,8	"	CC:0.022U	" 0.022μF 50V	
C4	"	CC:68P	68PF 50V	
C5,6	"	CC:22P	" 22PF 50V	
C7	"	CT:1V010	" 1μF 35V	
C9,10	"	CK:SM50VB47	" 47μF 50V	
CN6A	"	JA:HDB-25S	CONNECTOR	
CN7A	"	JA:TCS0270	"	
D1,2	"	DI:1S1588	DIODE	
D3	"	DI:W02	BRIDGE DIODE	
J5	"	JT:1-171826-2	CONNECTOR	
L1		LR:H5AT7-14-3.5	TRANSFORMER 13TURN-13TURN	
PH1	"	DF:PS2001	PHOTO COUPLER	
Q1,2	"	QT:C1815Y	TRANSISTOR	
R1	"	RC:1R	RESISTOR 1ohm 1/4W	
R2	"	RC:10K	" 10K 1/4W	
R3	"	RC:1.2K	" 1.2K 1/4W	
R4,5	"	RC:22K	" 22K 1/4W	
R6	"	RC:150R	" 150 1/4W	
R7	"	RC:220R	" 220 1/4W	
R8	"	RC:4.7K	" 4.7K 1/4W	
SW1	"	SD:KTD04		
TP1,2,3	"	TM:CP-10	TEST PIN	
U1	"	UT:LS157	TTL	
U2	"	UC:5501-P-1	RAM	
U3	"	UC:14520B	CMOS	
U4	"	UR:TL497ACN	SWITCHING VOLTAGE REGULATOR	
U5	"	UT:75189	TTL	
U6	"	JS:10340-01-445	IC SOCKET	
U7	"	UT:75150P	TTL	
U8	"	UT:LS04	"	
X1	"	XT:HC18/U6MHz	CRYSTAL 6MHz	

COMPONENTS

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
1		05:A42208	SEALING SCREW WITH HOLE	
2		05:A42206	SEALING BOLT M3 WITH HOLE	
3		02:A42201A	BLANK PANEL FOR DIP SW	
4			WASHER M3 SMALL SIZE	
5			SPRING WASHER M3	
6			NUT M3	
7			E RING M3	
8		01:A31848A	KEY SHEET	
9		07:A41864	FILTER	
10			SCREW M4 x 10	
11			SPRING WASHER M4	
12		07:A20239	FRONT FRAME	
13		10:SJ-5023	RUBBER FOOT	
14		05:A32320	CASE	
15		06:A42209A	DISPLAY PANEL SPACER	
16		07:A42210B	SWITCH SPACER 10mm	
17		QA:ZB-3M	ACCESSORY SET	
18		QA:AC256-1674	INSULATING PLATE	
19		FH:SN1009	NUT FOR FUSE HOLDER	
20		"	"	
21		01:A42198C	REAR PANEL	
22			WASHER M4 SMALL SIZE	
23			HEX BOLT M4	
24			SCREW M2 x 6	
25			WASHER M2 SMALL SIZE	
26			LOCK WASHER M4	
27		FH:SN1009	FUSE HOLDER	
28		TM:F2066A-4P	4P TERMINAL	
29			SCREW M3 x 10	
30		04:A41863A	SLIDE LOCK	
31			FIBER WASHER	
32			SCREW M4 x 15	
33		KB:9101	POWER CABLE	
34		ET:SR-6N-4	CABLE CLAMP	
35		02:A42203A	BLANK PANEL FOR OP-02	
36			SCREW M3 x 8	
37		03:A42202A	BLANK PANEL FOR OP-01	
38			NUT M4	
39			SCREW M3 x 6	
40		JH:NJC-207-RM	LOAD CELL CONNECTOR	



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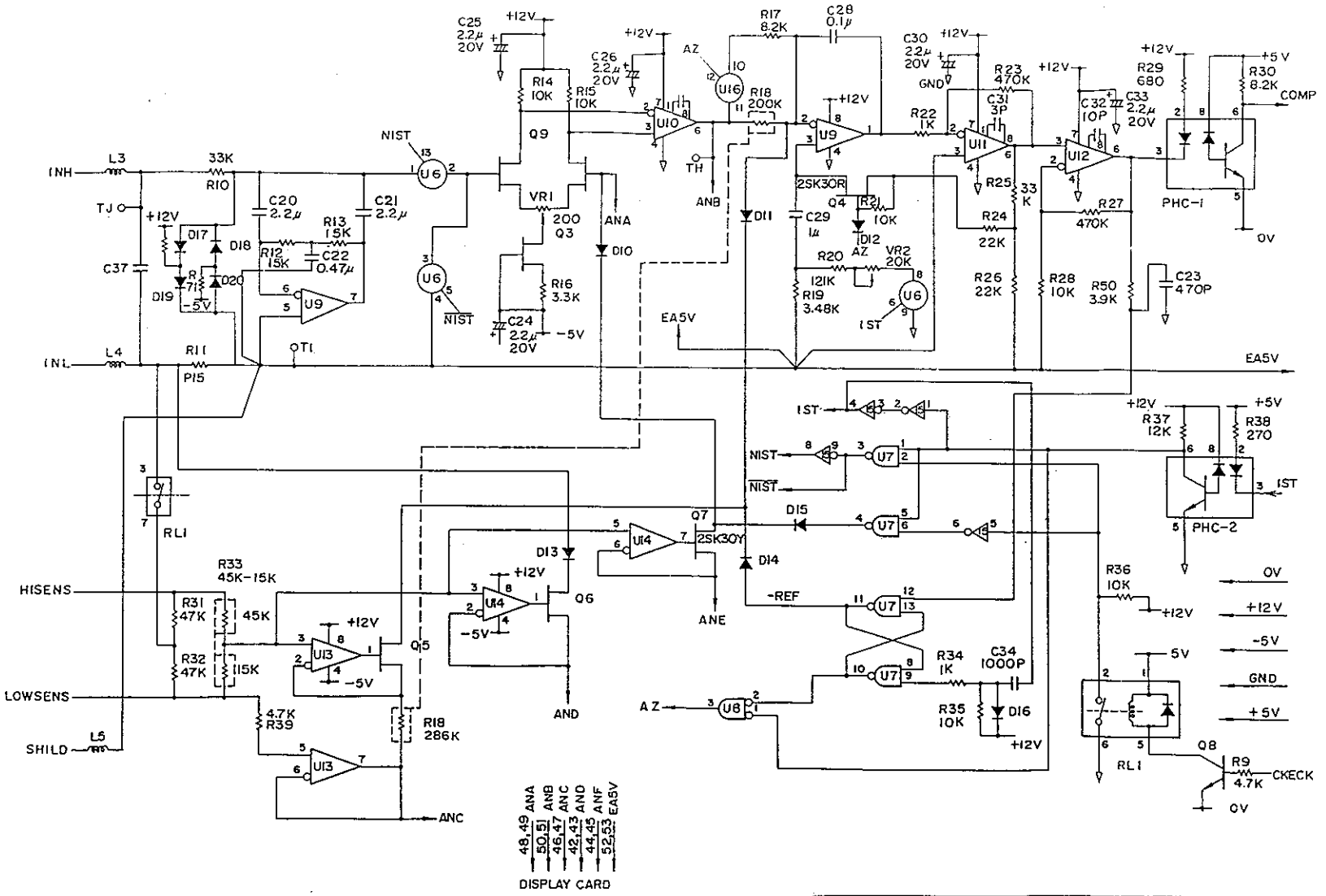
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:488
				DRWG. NO.	



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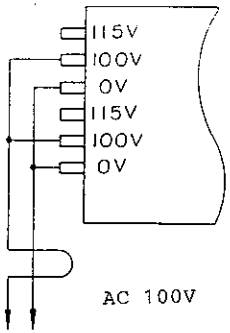
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:488
				DRWG. NO.	

A&D Company, Limited



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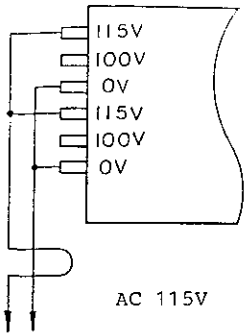
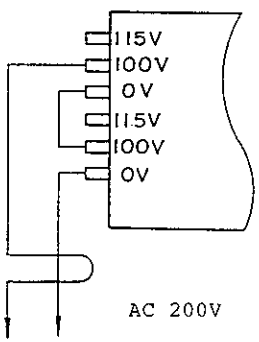
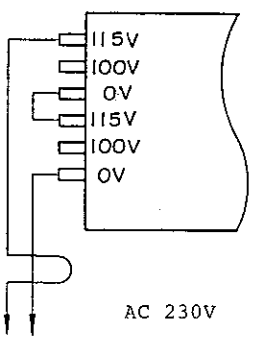


AC 115V



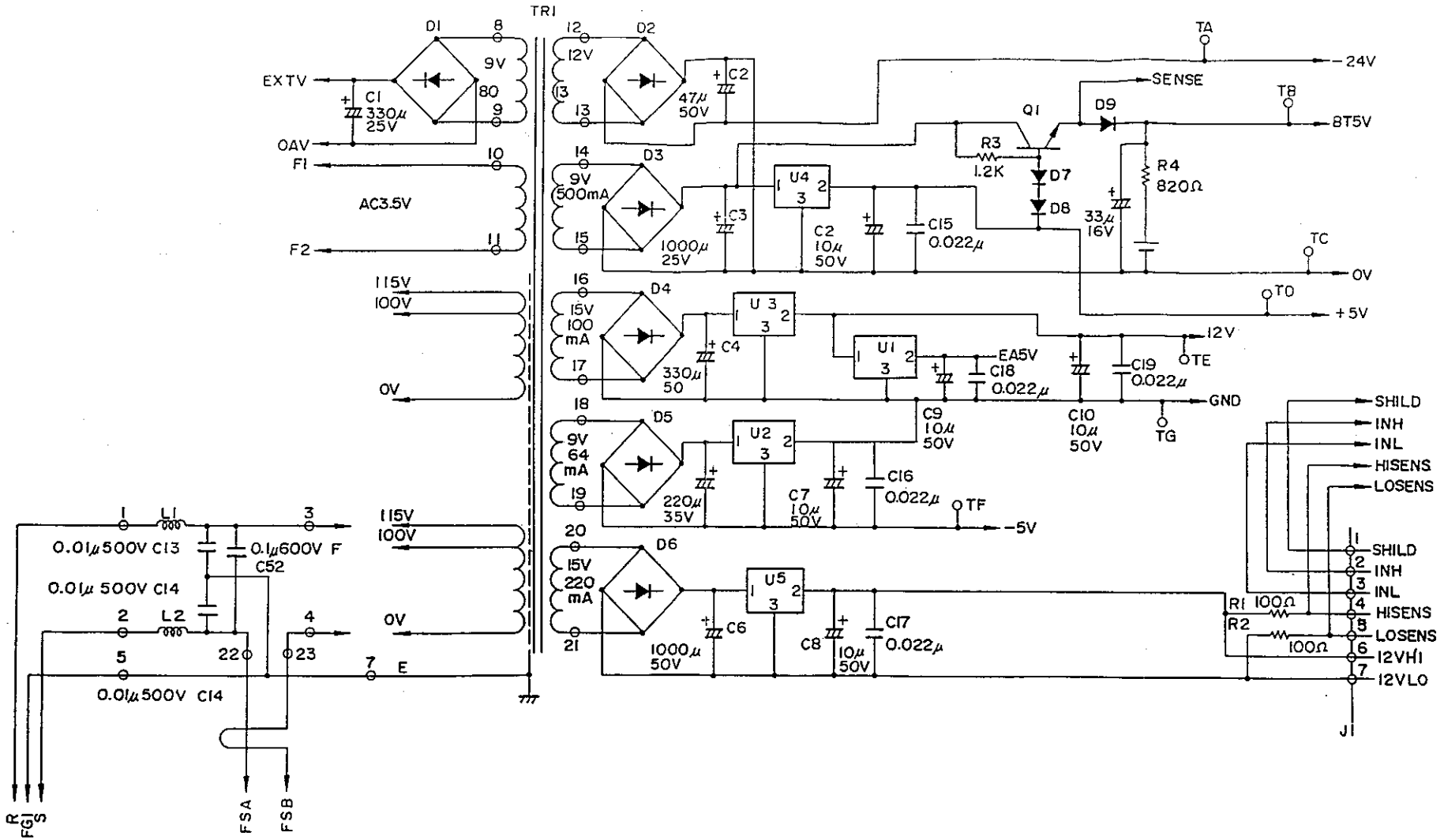
AC 200V



AC 230V

INPUT VOLTAGE SELECTION				MODEL	AD-4316
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



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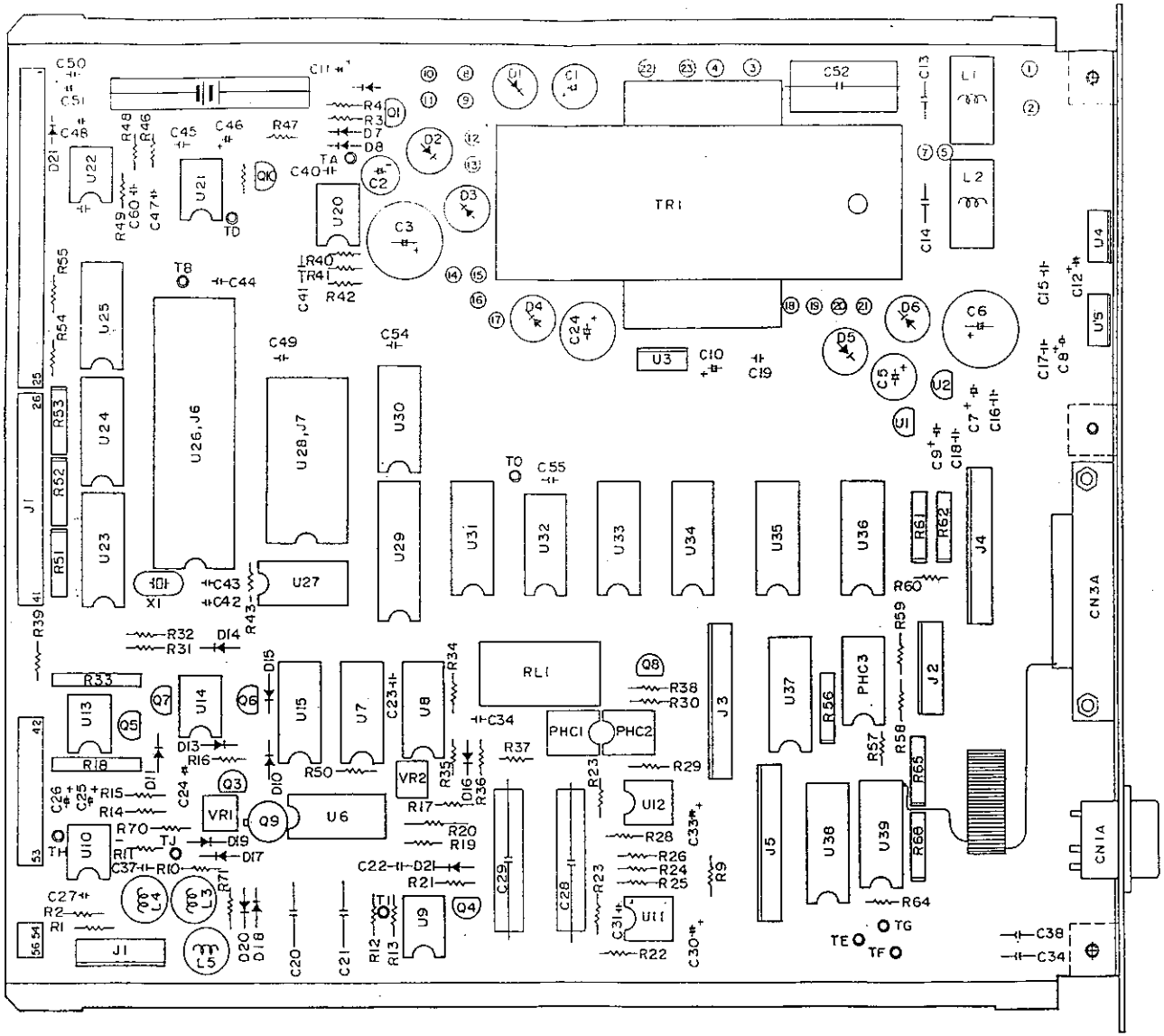
TG,TF REVERSED	9-N-85		A	STOCK NO.	PZ:488
				DRWG. NO.	

A&D Company, Limited



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SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
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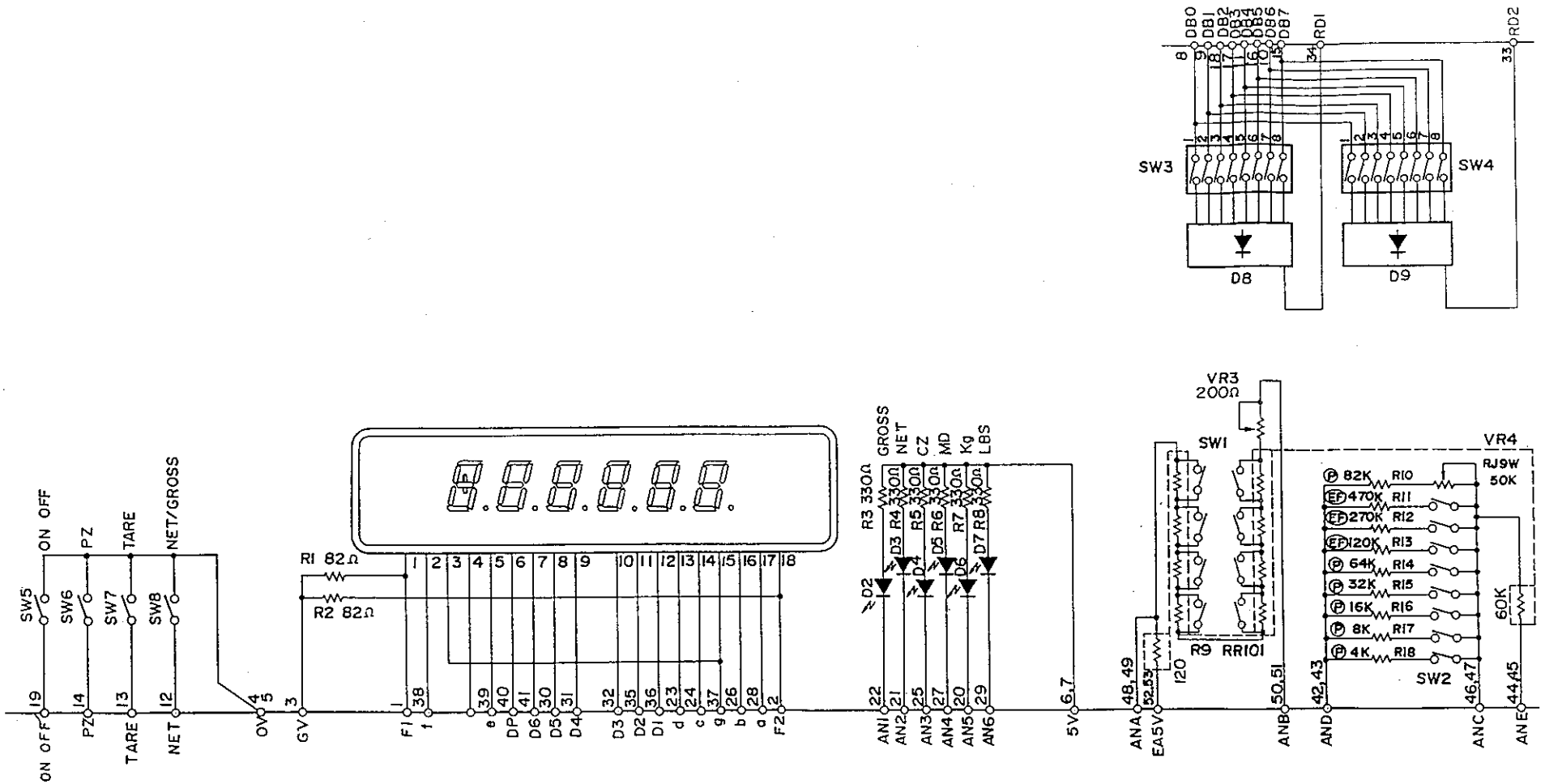
				DRWG. NO.	

A&D Company, Limited



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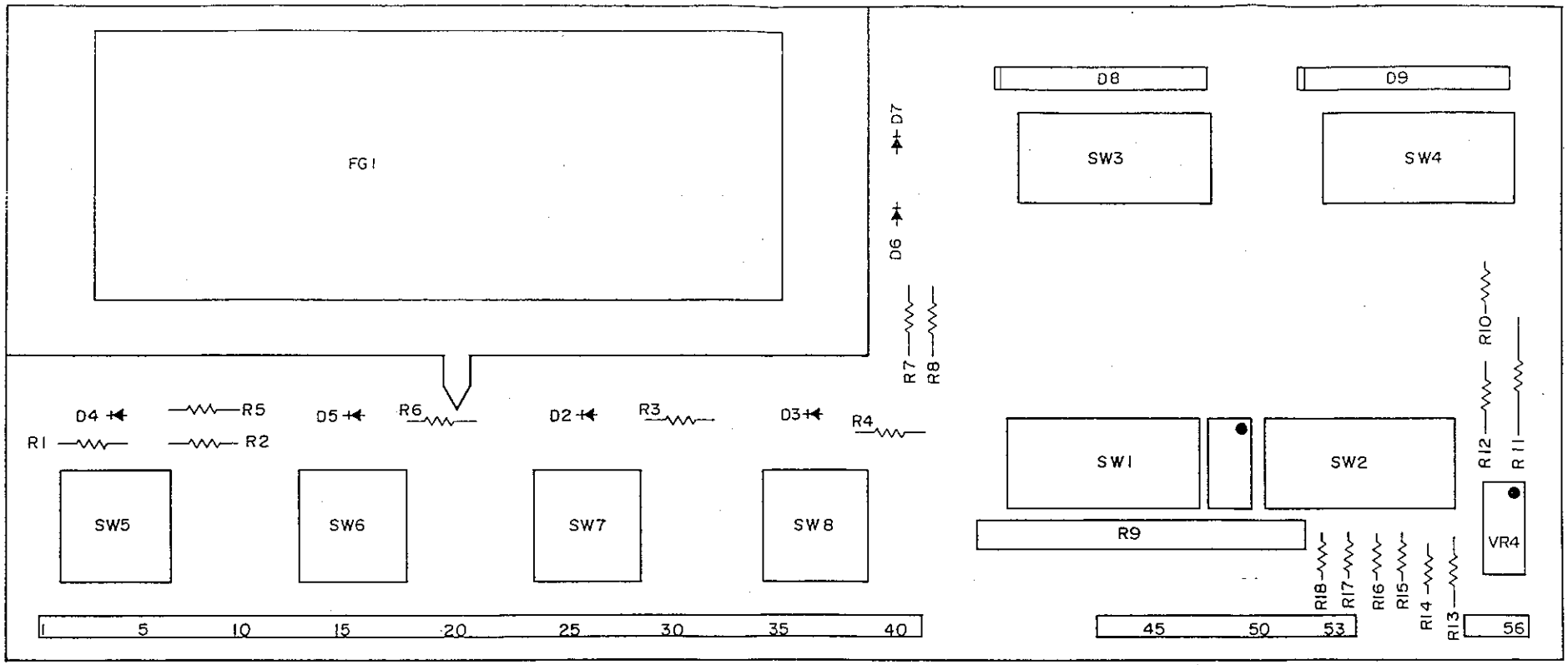
A&D Company, Limited



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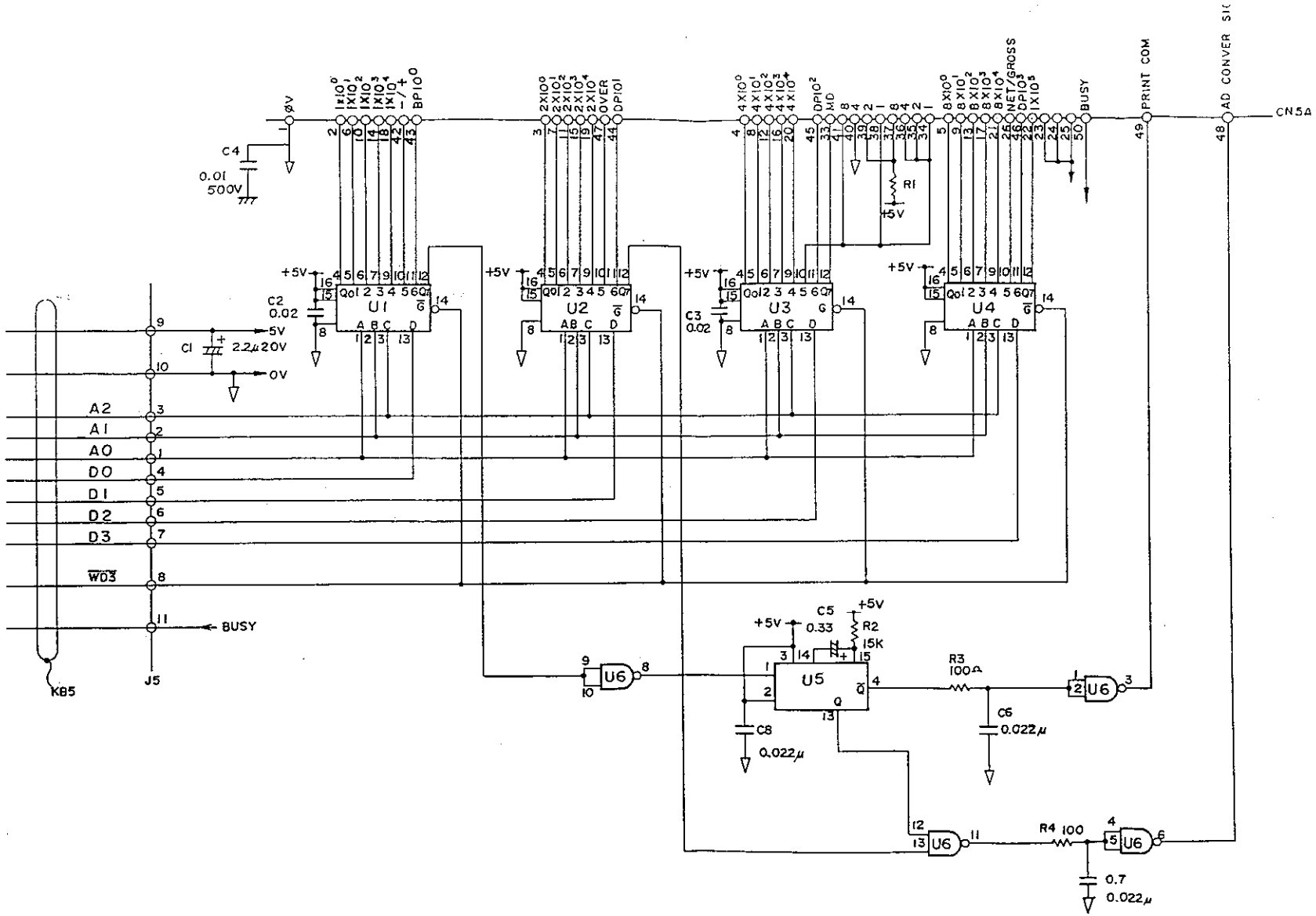
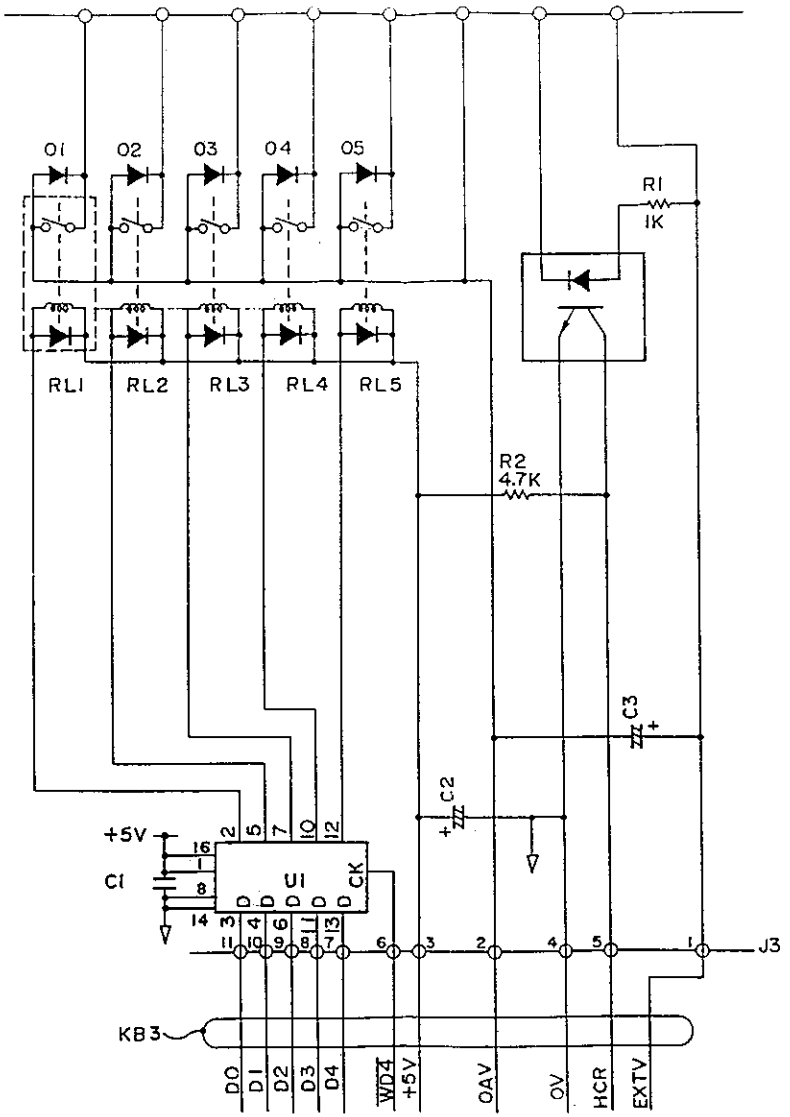
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:489
				DRWG. NO.	

A&D Company, Limited



				MODEL	AD-4316 OP-01
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:490
				DRWG. NO.	

A&D Company, Limited



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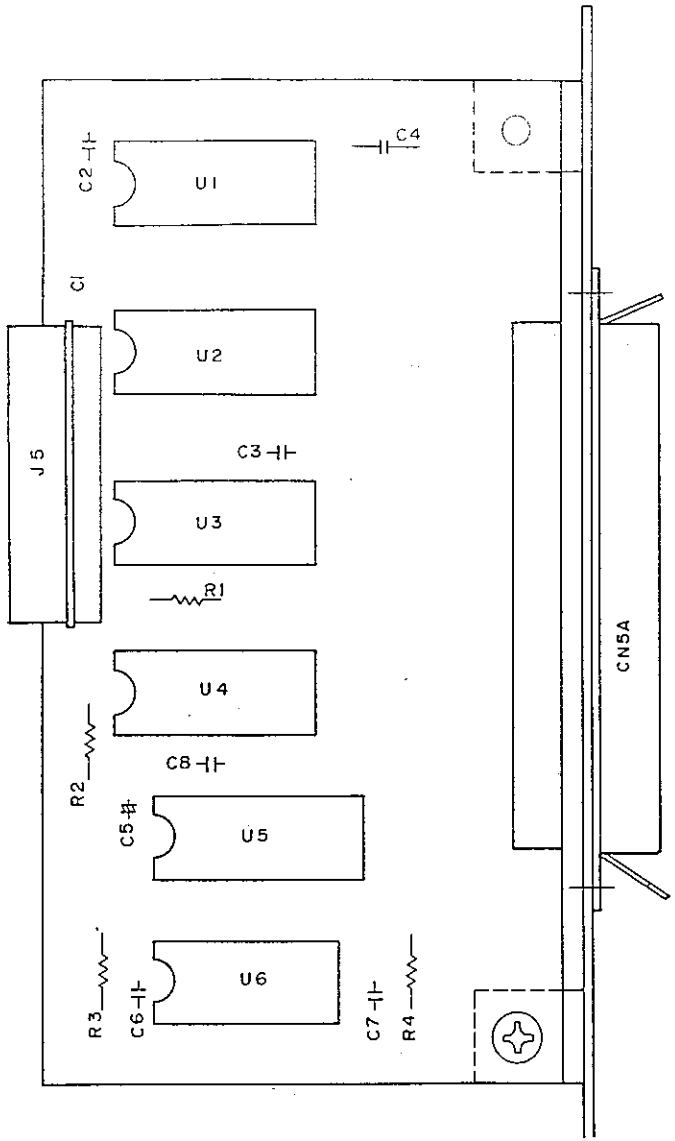
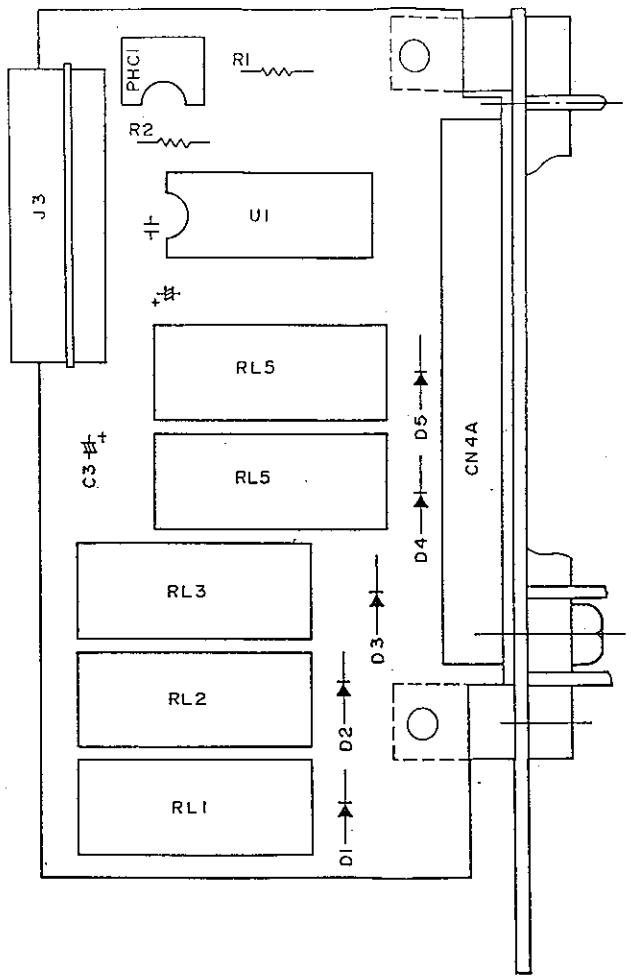
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:491
				DRWG. NO.	

A&D Company, Limited





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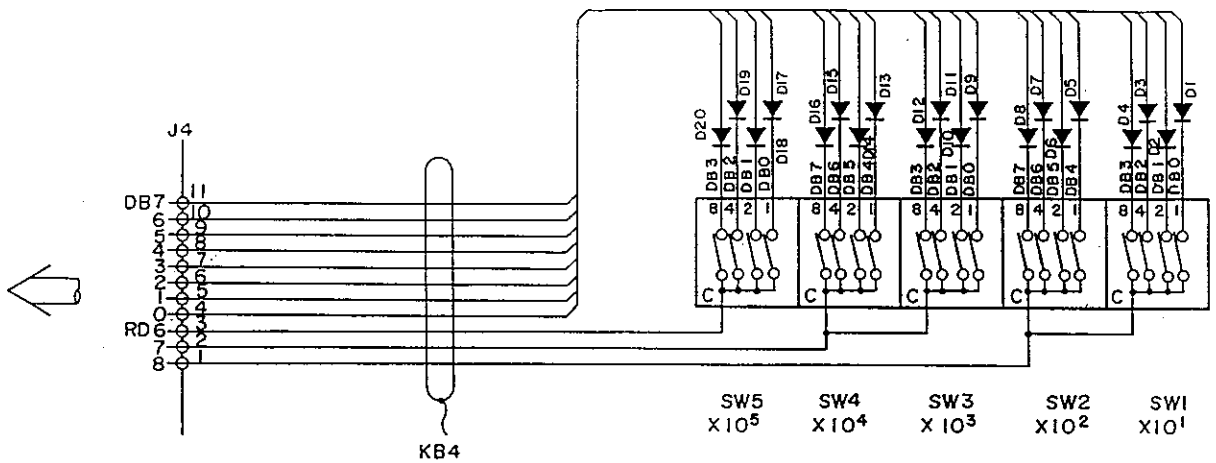
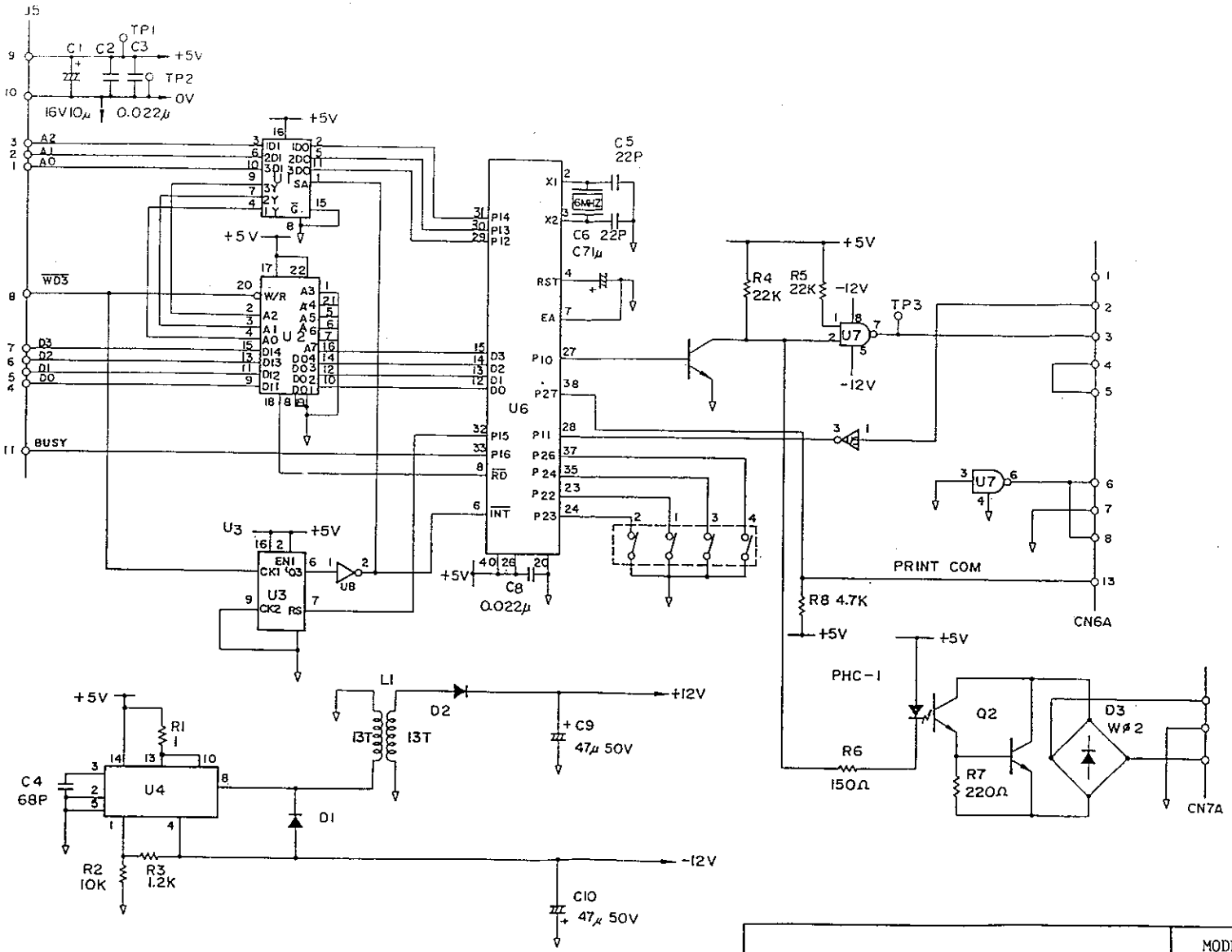
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:491
				DRWG. NO.	

A&D Company, Limited



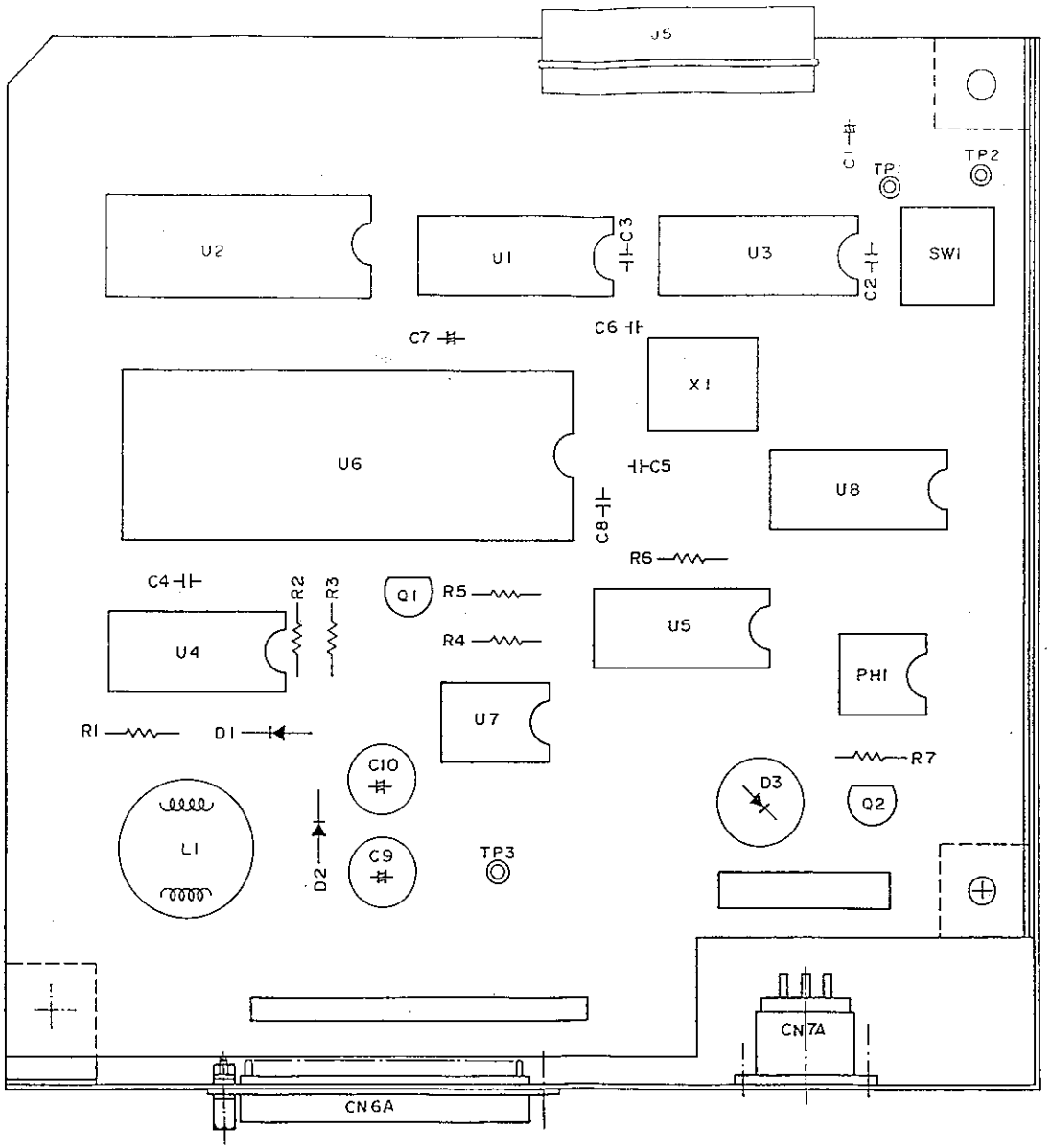
				MODEL	AD-4316 OP-03
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



				MODEL	AD-4316 OP-04
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:603
				DRWG. NO.	

A&D Company, Limited



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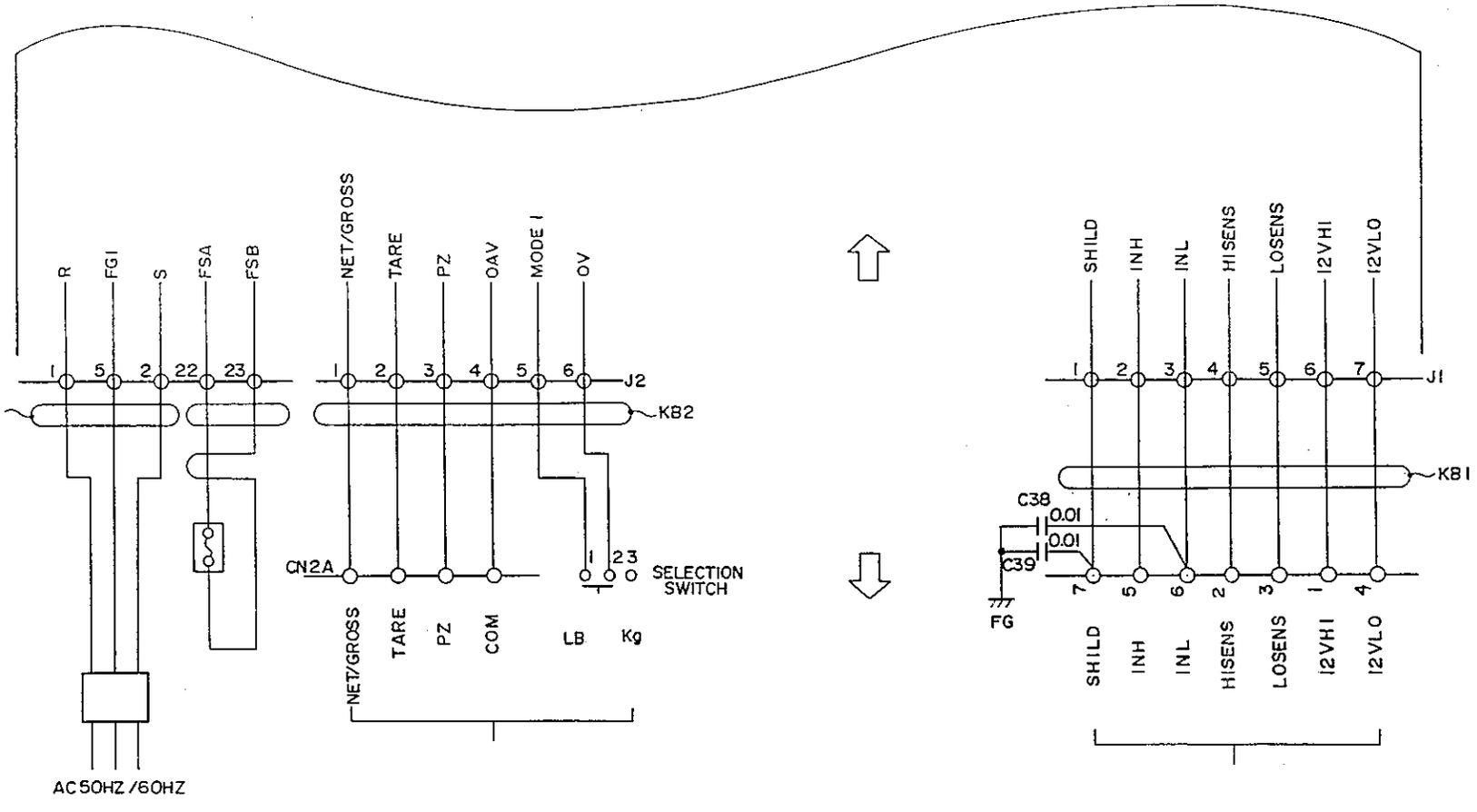
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ:603
				DRWG. NO.	

A&D Company, Limited



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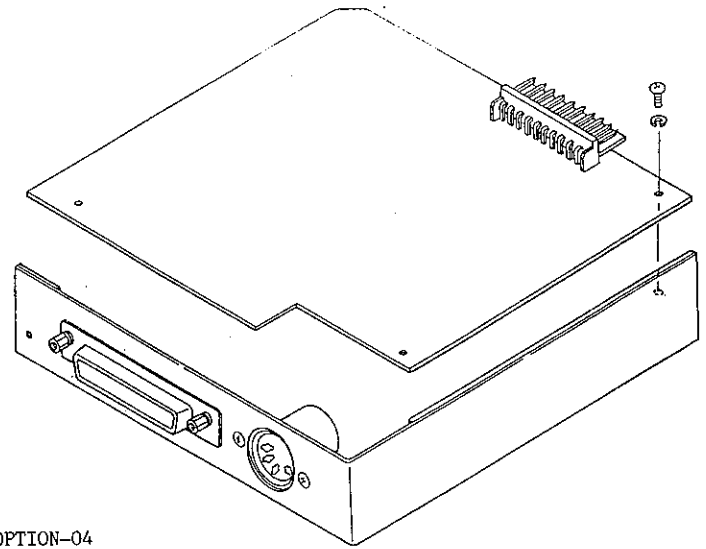
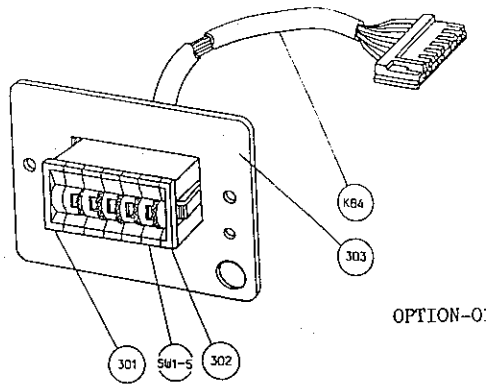
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	
				DRWG. NO.	

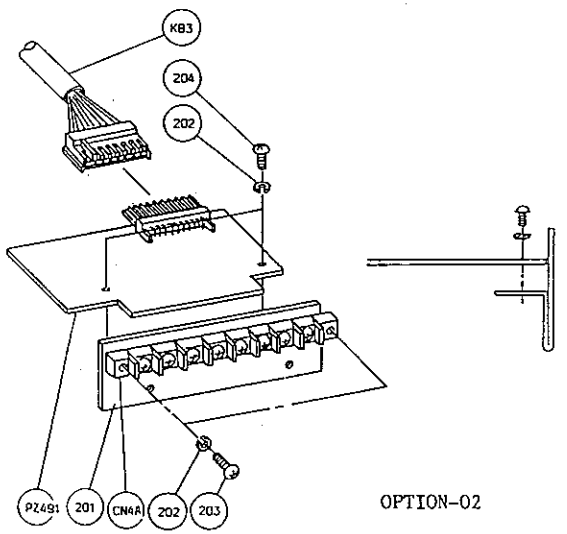
A&D Company, Limited



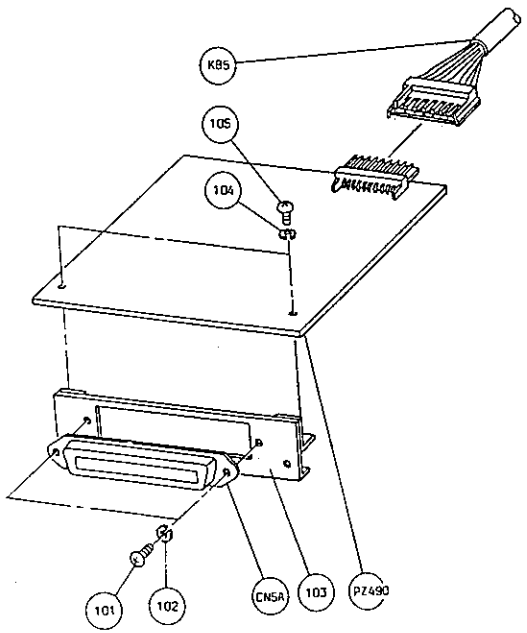
OPTION-04



OPTION-03



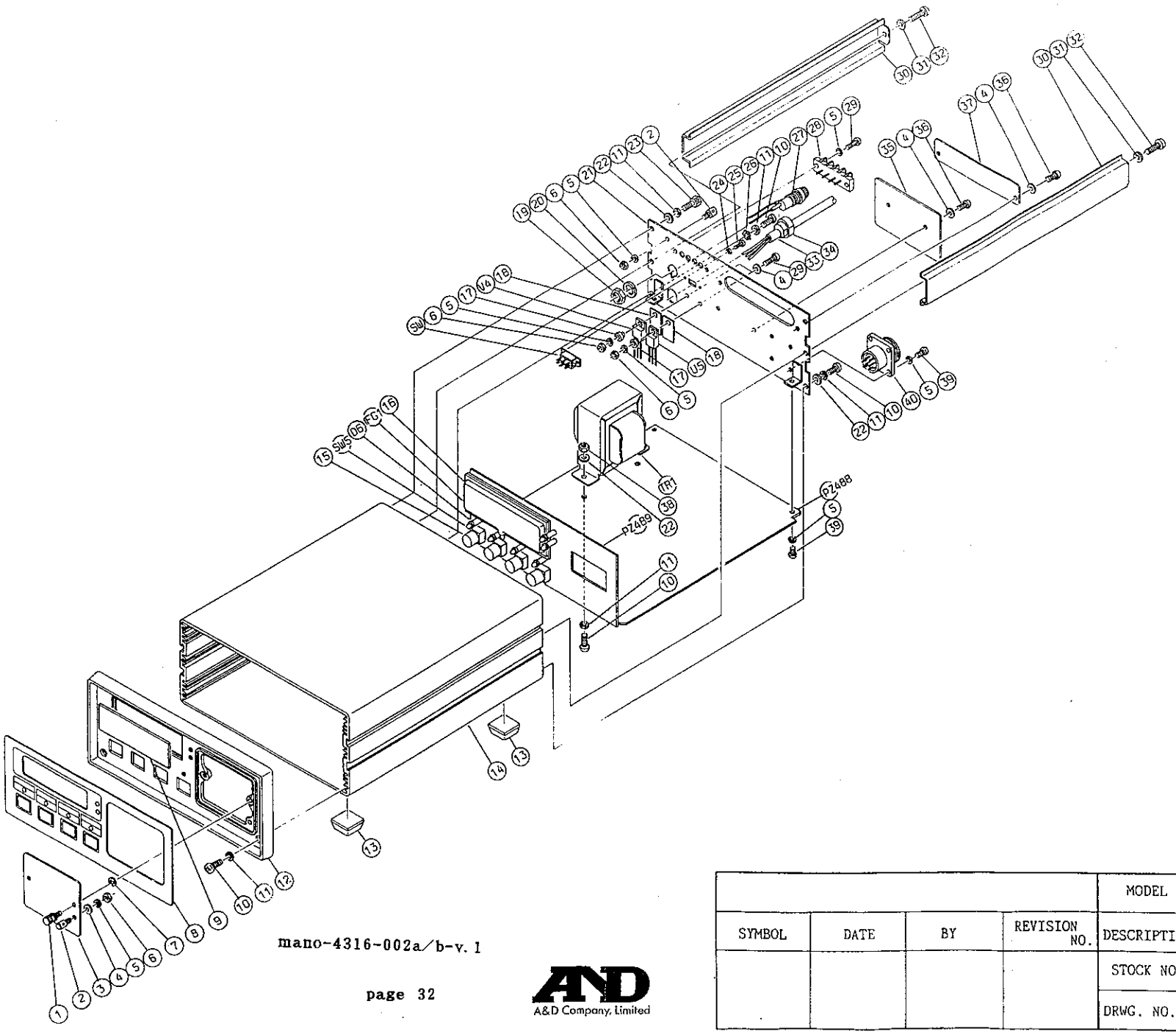
OPTION-02



OPTION-01

				MODEL	AD-4316 OP-01,02,03,04
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPRODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



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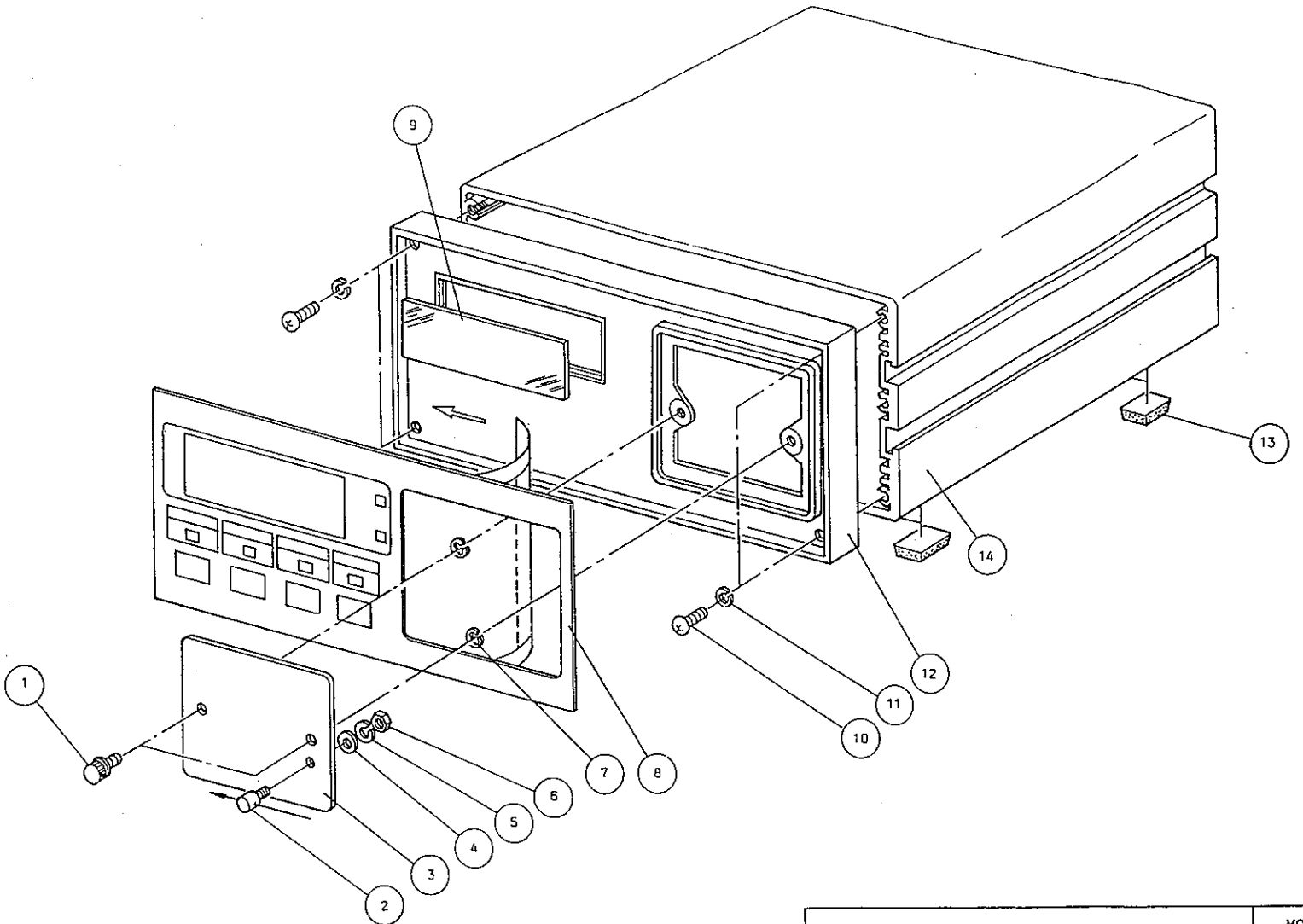
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPLODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



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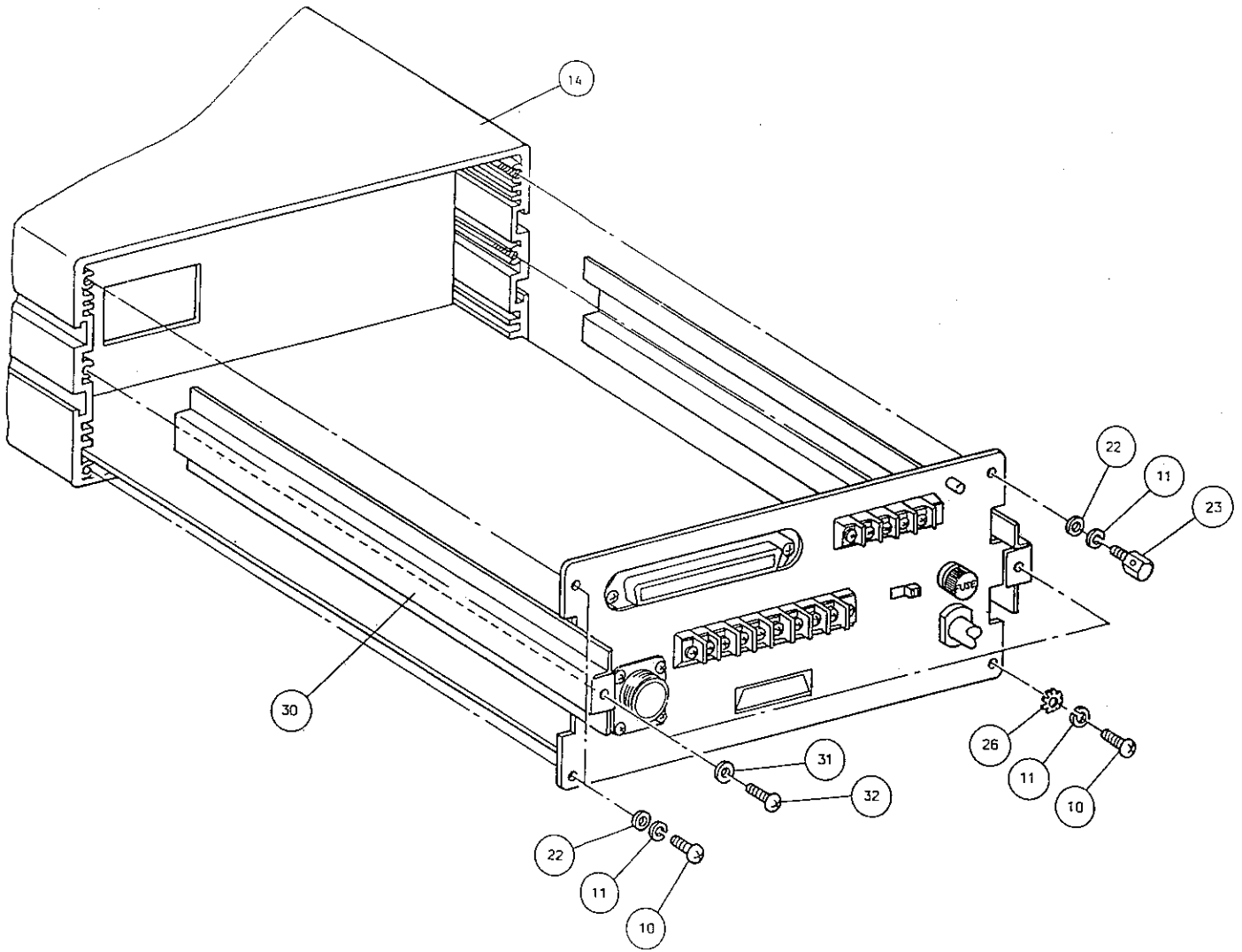
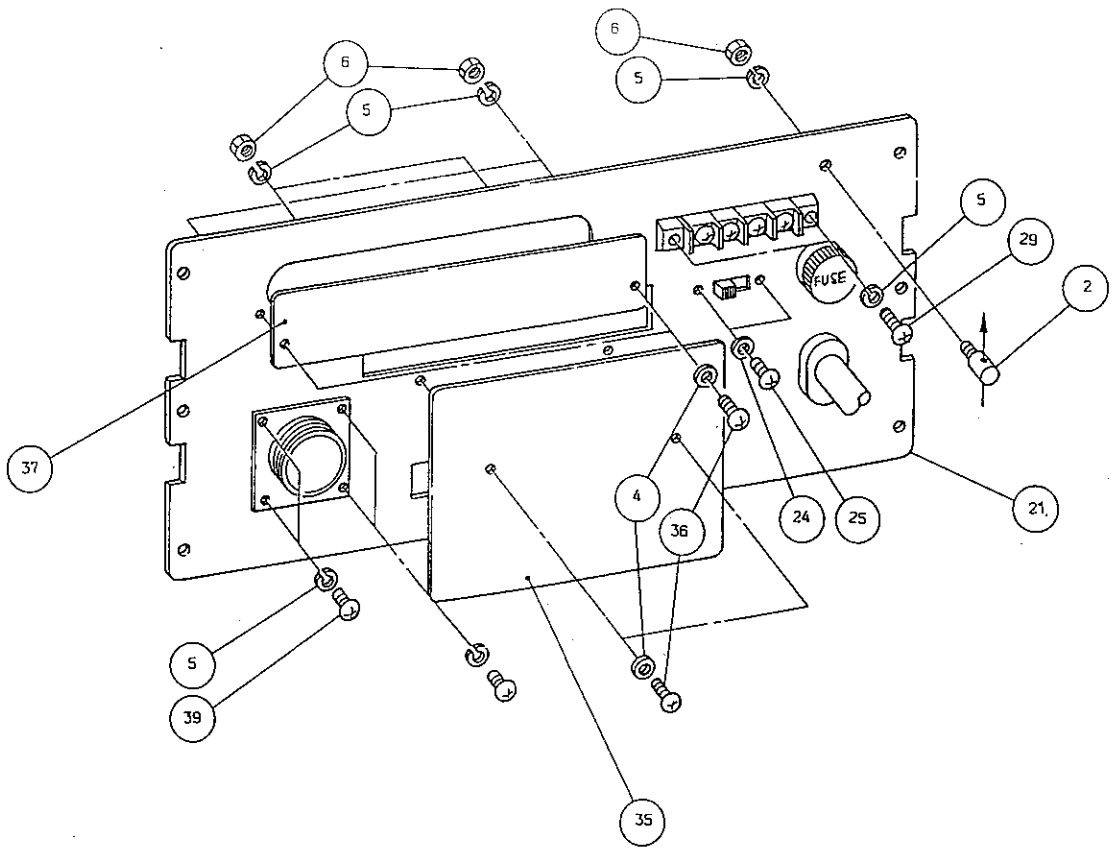
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPLODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



				MODEL	AD-4316
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPLODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



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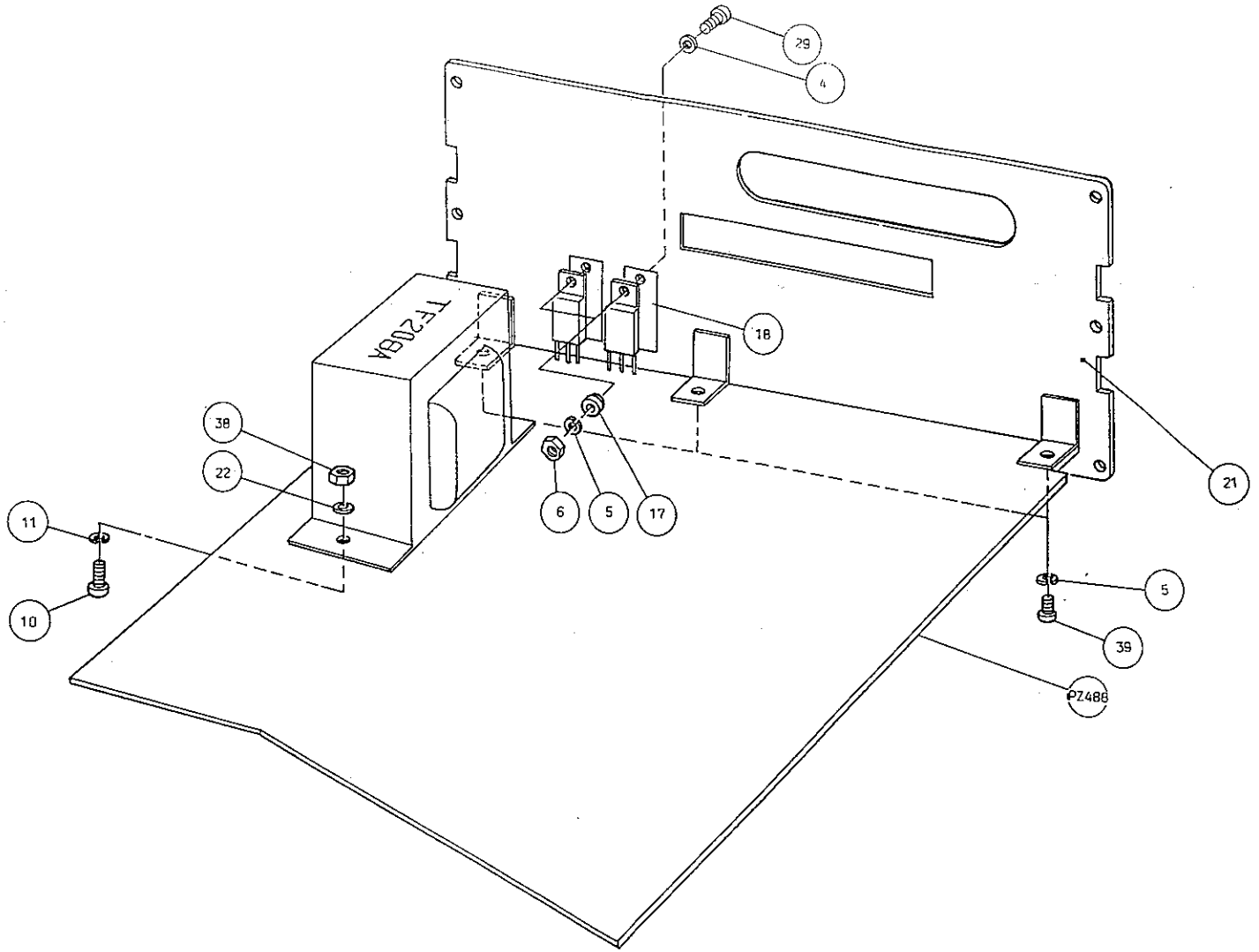
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPLODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited



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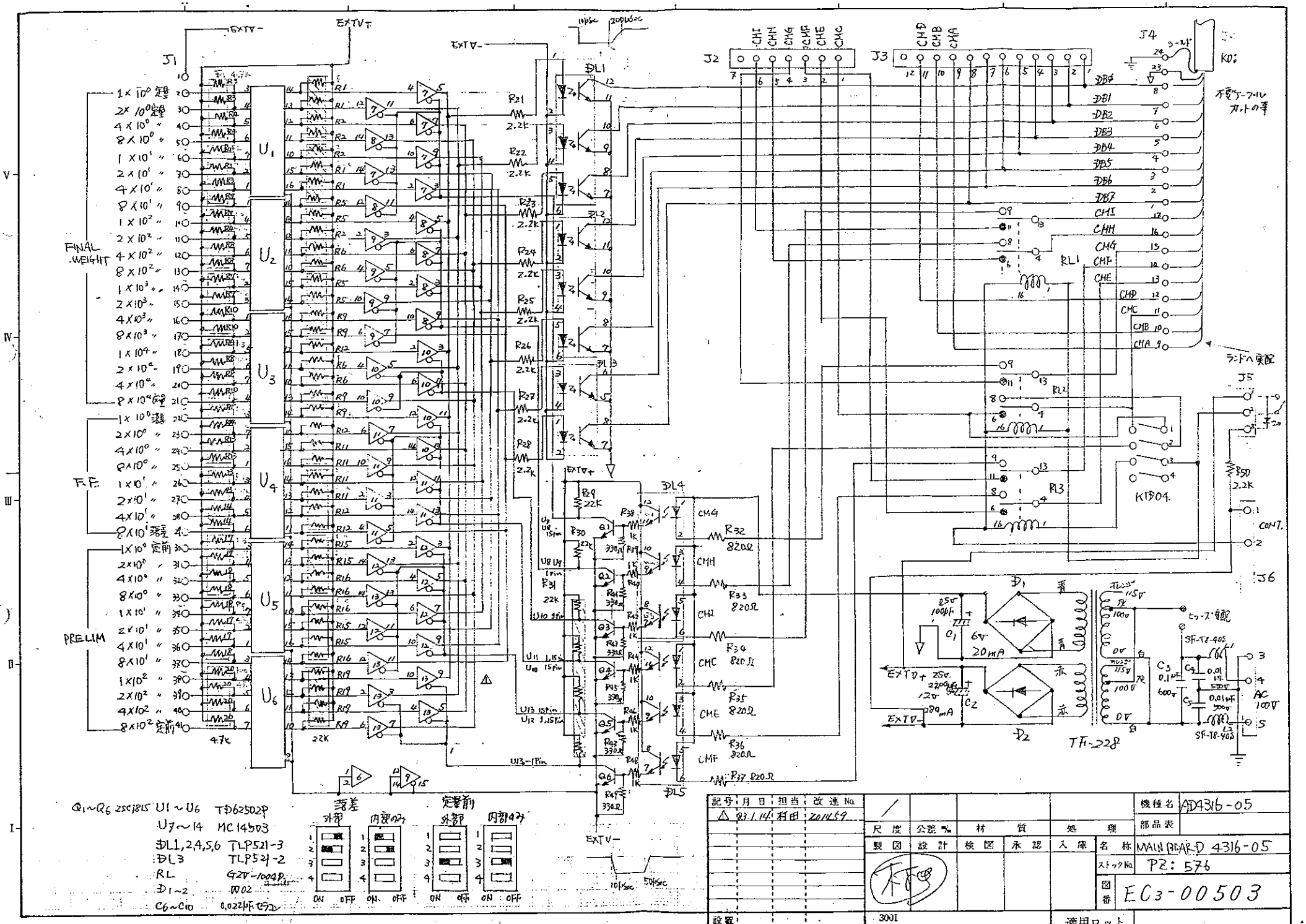
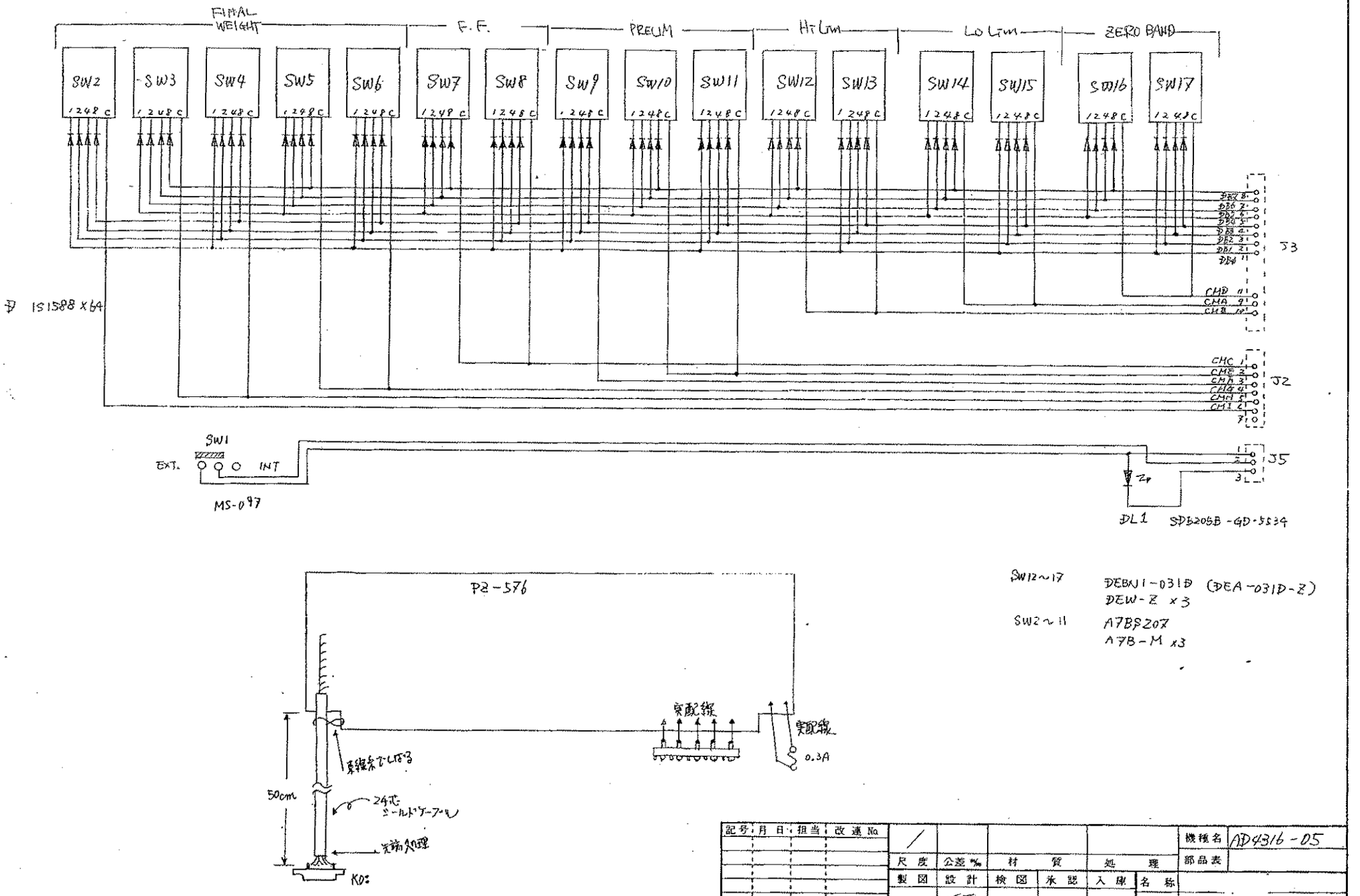
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	EXPLODED VIEW
				STOCK NO.	
				DRWG. NO.	

A&D Company, Limited


J1
J2
J3
J4
J5
J6
FINAL WEIGHT
F.F.
PRELIM
U1
U2
U3
U4
U5
U6
RL1
RL2
RL3
KTP04
TH-228
MAIN BOARD 4316-05
EC3-00503
A&D CO., LTD.
mano-4316-002a/b-v.1 Page 37

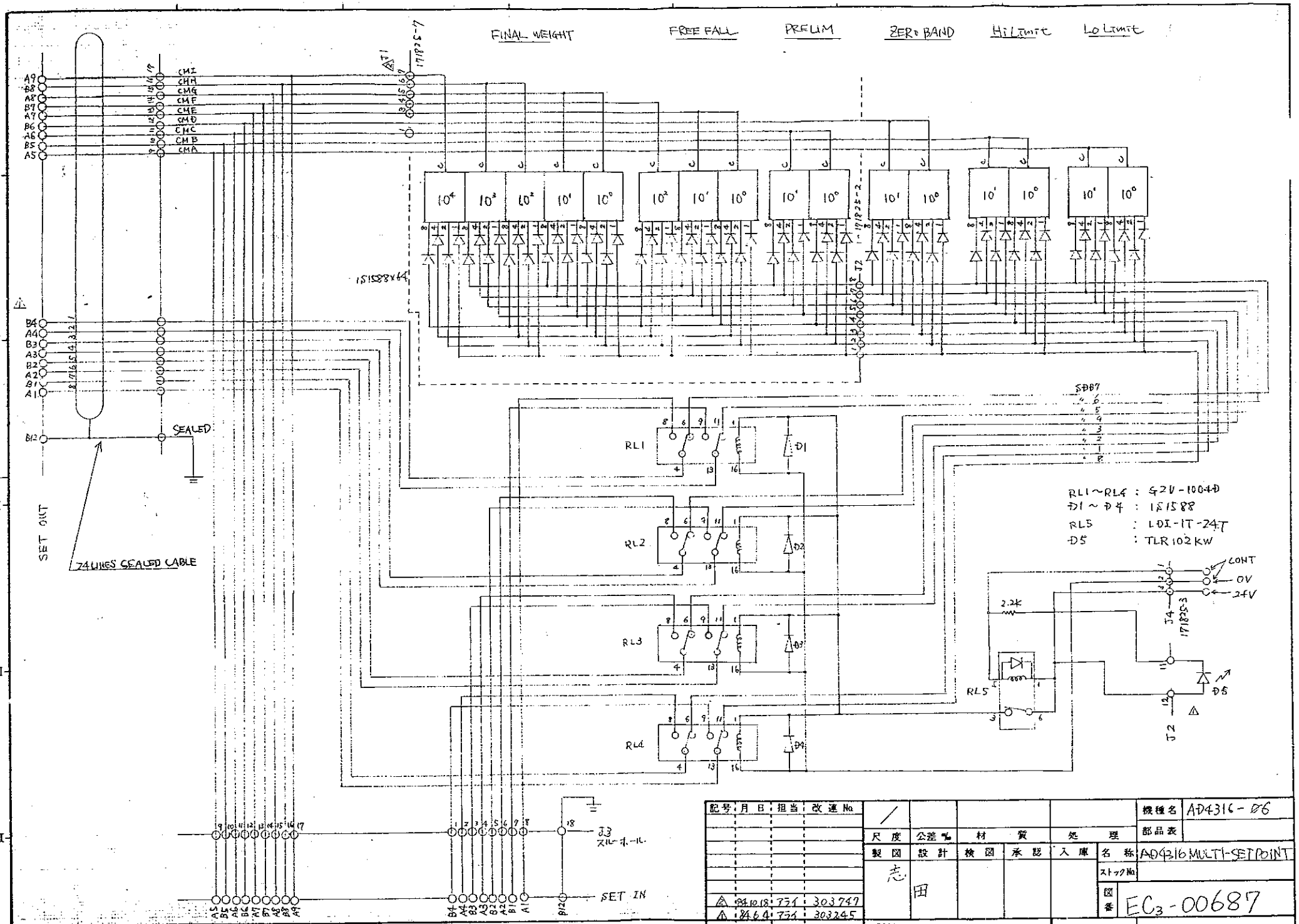


記号	月日	担当	改連No
設置			

尺度	公差%	材質	処理
製図	設計	検図	承認	入庫

3001

機種名 AD4316-05
部品表
名称
ストック№
図番 EC3-00502
適用ロット



記号	月日	担当	改連No.
⚠	94.10.18	751	303747
⚠	94.6.4	751	303245

尺度	公差	材質	処理	機種名	AD4316-06
				部品表	
製図	設計	検図	承認	入庫	名称 AD4316 MULTI-SETPOINT
志田					ストックNo.
					図番 EC3-00687
設置	3001				適用ロット