WEIGHING INDICATOR

AD-4321A/B

MAINTENANCE MANUAL

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1-1 General

AD-4321 is a weighing indicator which amplifies an analog load cell output signal, converts this signal into digital data and then calculates a digital weight value to be displayed.
AD-4321A runs on AC electricity and AD-4321B on 12 V DC.
Available as options are BCD parallel output (OP-01) and RS-232C plus 20 mA current loop serial interfaces (OP-04).
Use this manual in conjunction with the Instruction Manual sent with the Weighing Indicator.

Components

· A/D converter : The A/D converter is actuated by a control signal from the CPU. It amplifies the load cell output, performs analog/digital conversion and then sends the digital data to the CPU. It can drive up to eight 350 Ω load cells.

· Watch dog circuit : This circuit monitors clock pulses which the CPU outputs at constant intervals. If the clock pulses are not output due to a CPU's software crash, etc., it will return the CPU to its normal operation by transmitting a reset signal to the CPU.

· Resetting circuit : This circuit constantly outputs a reset signal to the CPU until a specified voltage is obtained when the power is turned on (thus preventing a program run error). When the voltage supplied to the CPU falls below the specified value due, for instance, to a brief power failure, a reset signal will be sent before the CPU program crashes.

· Power circuit : This circuit supplies the voltage required by each component. This circuit varies between AD-4321A and AD-4321B.

· Low battery detecting circuit (AD-4321B only)
This circuit outputs a low battery signal to the CPU when the supply voltage falls below +10.5 V.

· Display : This indicator uses a 7-digit fluorescent display tube.

· Display driver : This driver converts a signal at TTL level into the voltage required to drive the fluorescent display tube.

· Setting dip switches : These are dip switches for setting zero track, motion detection, minimum division, decimal point and maximum capacity.

· Front key switches : These are ZERO , GROSS/NET , TARE , STANDBY/OPERATE and PRINT switches. The PRINT switch is directly connected to the option board, and the other switches to the CPU.

· External control : An external control signal is isolated by a photocoupler and connected to the CPU in case of AD-4321A. In case of AD-4321B, however, it is not isolated; the print signal is directly connected to the option board.

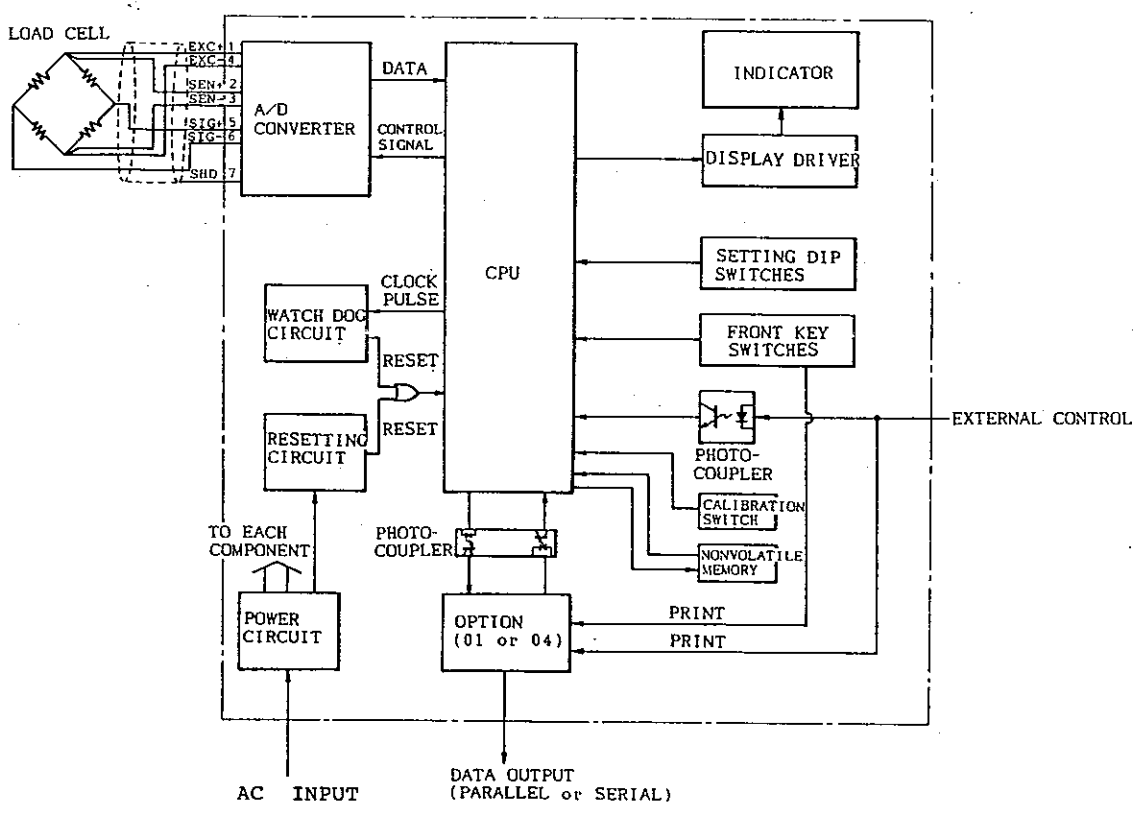
· CALIBRATION switch : This switch, which initiates calibration mode, is connected to the CPU.

· Nonvolatile memory : This memory stores calibrated zero and span values. Written data will not be erased, even if the power is turned off.

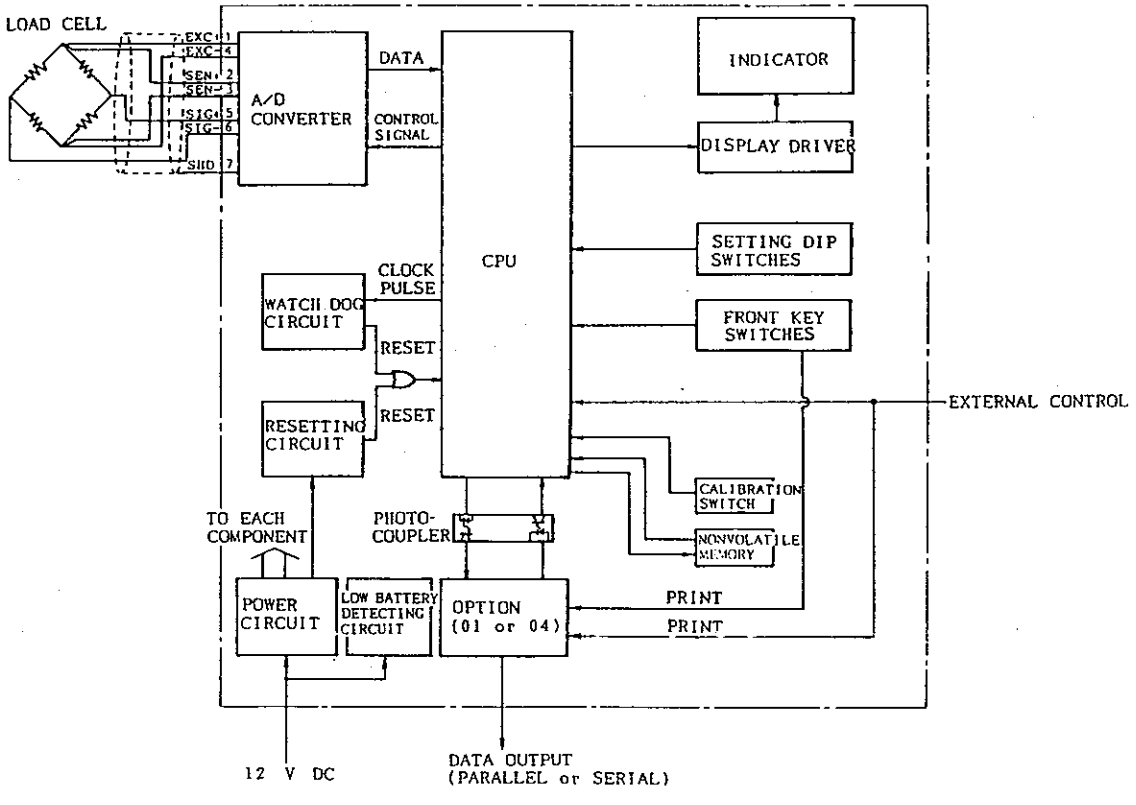
· Options : Available as options are BCD parallel output (OP-01) and serial output (OP-04). These are isolated from the CPU in AD-4321A, but not isolated in AD-4321B.

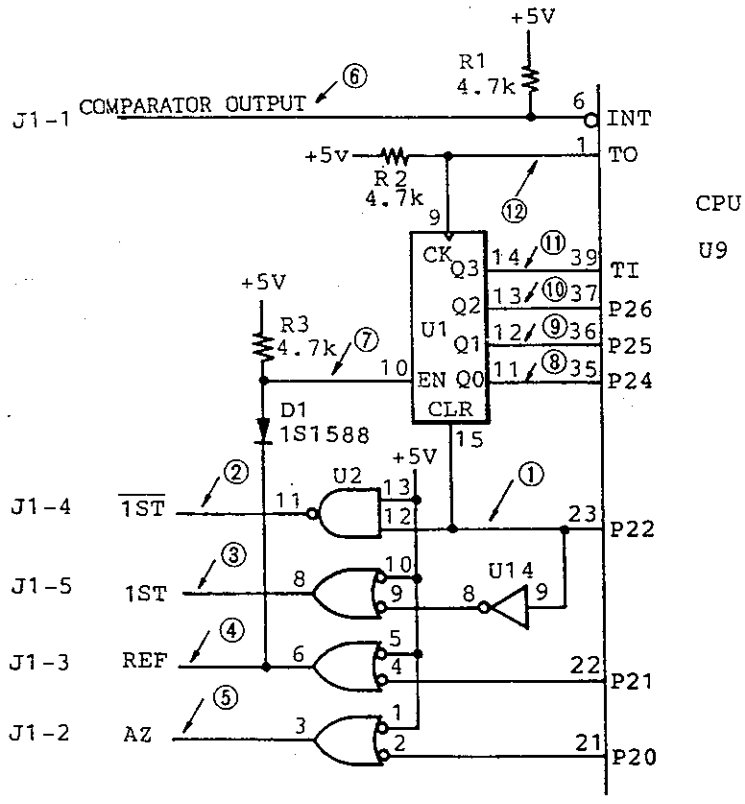
1-2 Block Diagram

AD4321A



AD4321



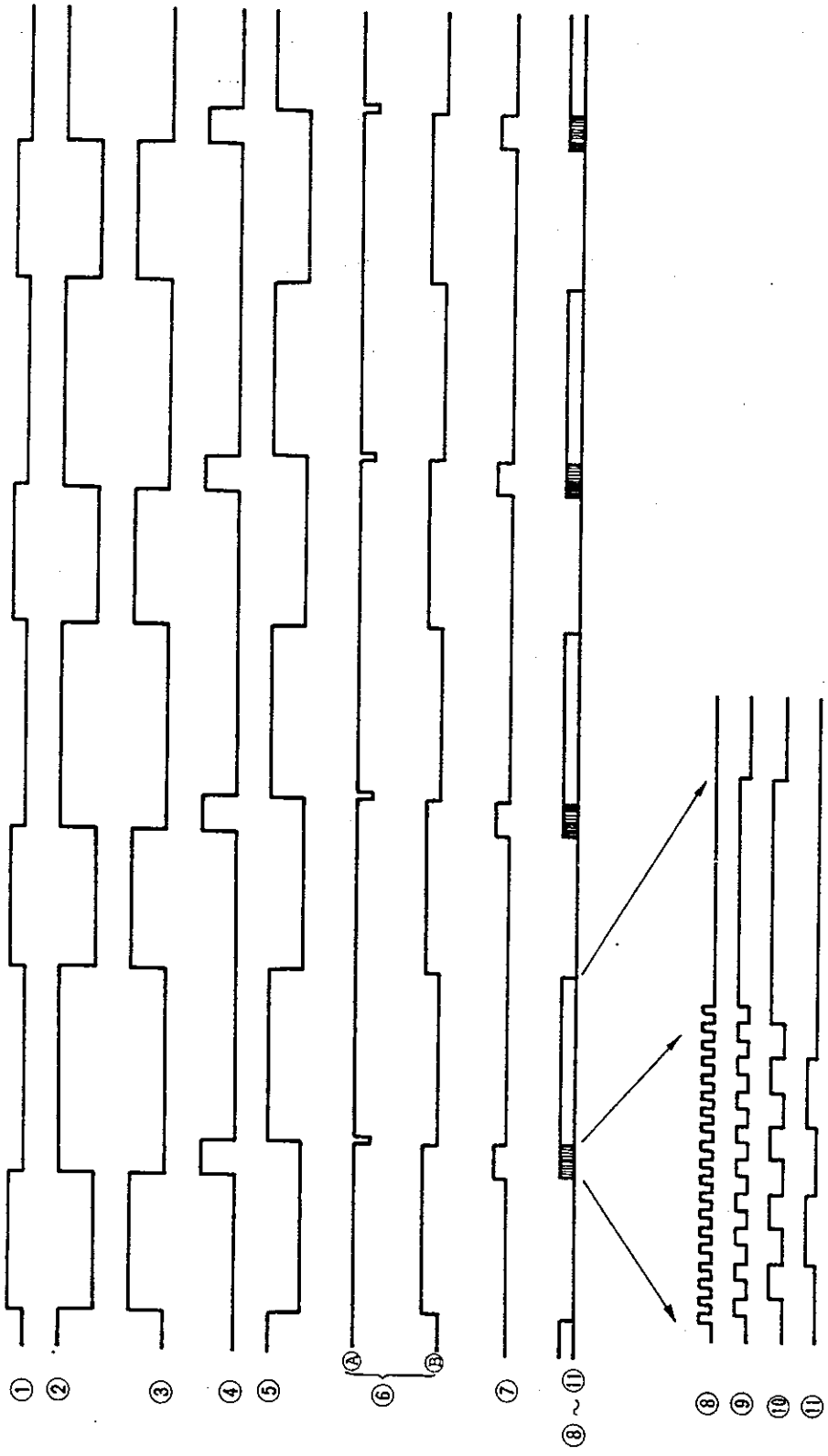


U2 converts a TTL-level signal into a signal of 0~+12V (+10 V for AD-4321B). D1 and R3 convert signals of 0~+12 V into TTL-level signals. Signals ② through ⑤ are those of 0~+12 V(+10 V), and the others are those on the TTL level. The wave form of signal ⑥ can be either wave form Ⓐ or Ⓑ as shown in the following timing chart. Both forms are normal. U1 is a 4-bit binary counter.
Outputs ⑧ through ⑪ change only while signal ⑦ is on H level. If signal ⑦ is on L level, data will be held, and if signal ① is changed to H, data will be cleared.

Since U2 has an open collector output, wave forms cannot be correctly observed unless PZ:710(A/D unit) is connected.

A wave form of 2 MHz is always output to ⑫.

A/D Control Circuit Timing Chart (when PZ:710 is connected)

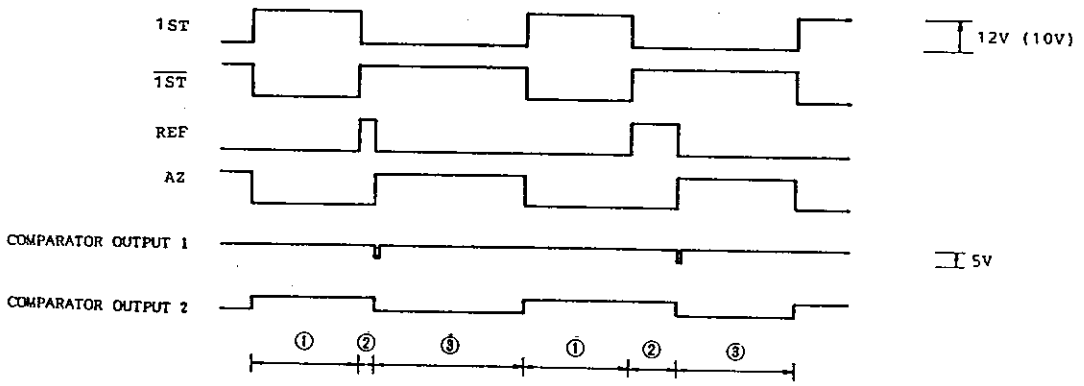


1-4 Operation Check of PZ:710A(A/D Converter)

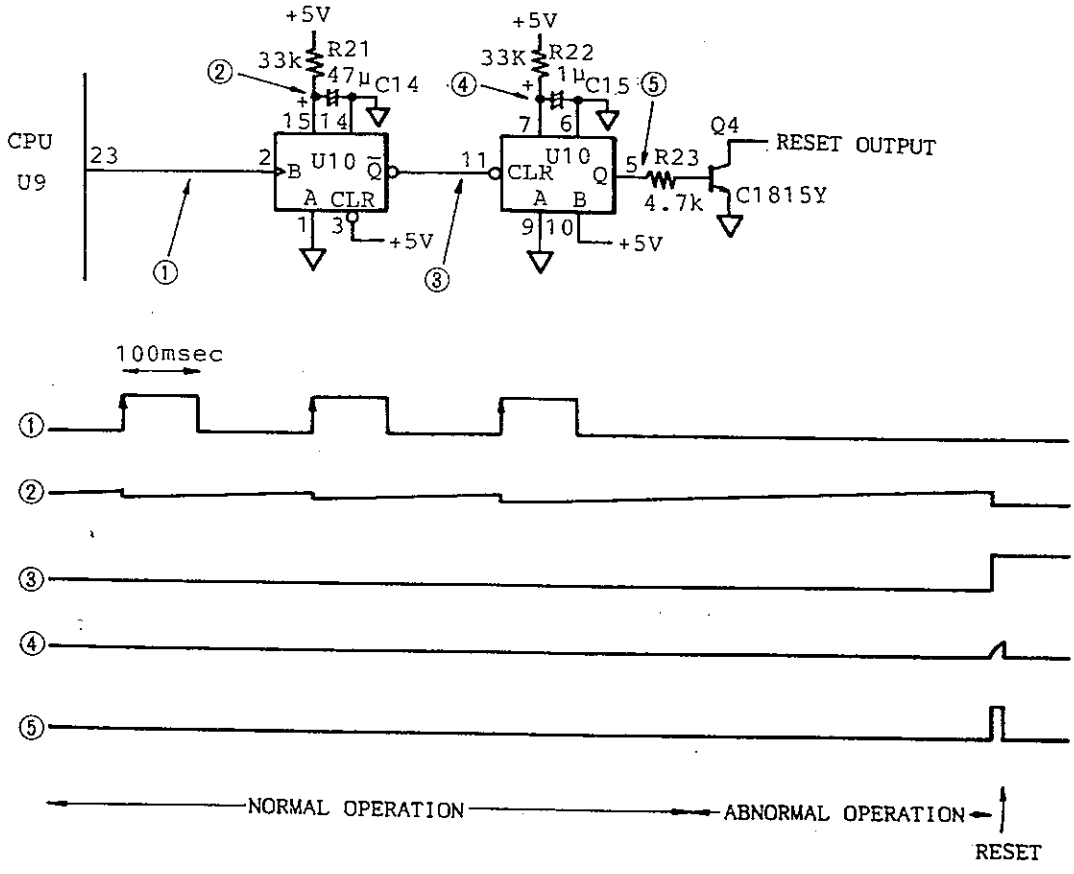
Connect a load cell to the PZ:710A, and then, connect the A/D board connector (J1) to the main board(PZ:708A or PZ:709A). If each signal on the EI connector side takes the wave form shown in the timing chart, this indicates that this unit is operating properly. Check that the 2nd integration time fluctuates when the input voltage (load on the load cell) is changed. The fluctuation range will be about 1.5 msec for an input voltage of 2 mV, and about 60 msec for 36 mV.

During both the 1st and 2nd integration times the comparator output will always be on the H level. It will change to the L level when the input voltage is negative. AD-4321 functions properly only when the load cell output is positive.
In an auto zero time, comparator output will be on either the H or L level. Either level is normal.
The control signal from the main board is of open collector output type and pulled up inside the PZ:710A. Therefore, if the PZ:710A is disconnected, the control signal will not be output from the main board.

PZ:710A(A/D Converter) Timing Chart
The value in parentheses is for AD-4321B.

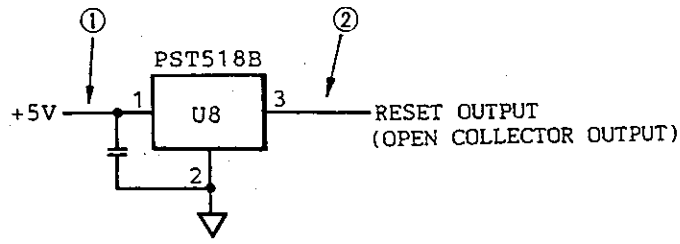


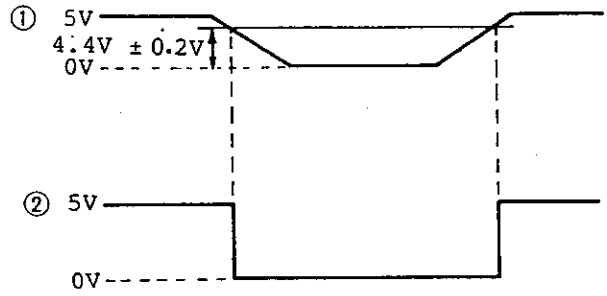
1st integration time, input. Always constant at 100 msec.
2nd integration time, output. A short output period equals a low input voltage and a long output period equals a high input voltage.
One cycle(① + ② + ③) is always 256 msec. Therefore, the longer the 2nd integration time is, the shorter the auto zero time is.
Although 1ST, $\overline{1ST}$, REF and AZ are 12 V(10 V) signals, comparator outputs are 5 V signals. Although the comparator output takes two forms (COMPARATOR OUTPUT 1 and COMPARATOR OUTPUT 2) as shown in the figure above, both forms are normal.



Normally, if the CPU is functioning properly, a 100 msec pulse wave form(①) will be being output once every 256 msec. At the rise edge of this pulse, the single stable multi-vibrator on the 1st step of U10(LS123) will be triggered and output of L appears at $\overline{Q}$ (pin 4). This output pulse width, which is determined by R21 and C14, is about 700 msec. Since the CPU outputs pulses at intervals of 256 msec, they will always be triggered and output to Q will remain at the L level. Since this $\overline{Q}$ signal is connected to the clear input of the 2nd-step single stable multi-vibrator, the 2nd-step output (pin 5) will change to the L level. If the CPU causes a software crash and does not output pulses, the 1st-step output $\overline{Q}$ will turn to the H level, the clear state of the 2nd step will be cancelled, pulses (about 15 msec) which are determined by R22 and C15 will be output to Q (pin 5), the transistor (Q4) will be turned on and the CPU will be reset. Thus it will be normal for pulses of about 15 msec to be output to ⑤ when pin 2 of U10 is short-circuited to GND.

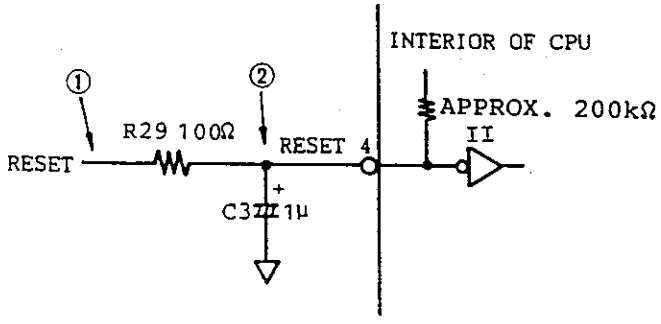
1-6 Resetting Circuit

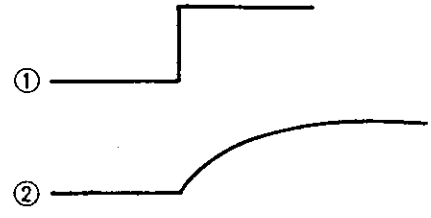




U8 monitors the supply voltage. If it falls to 4.4 V(± 0.2 V) or less, an output transistor will be turned on. The output transistor is of open collector output. Since U8 operates until the supply voltage falls to 0.8 V, it resets the CPU when the supply voltage is between 0.8 V and 4.4 V.

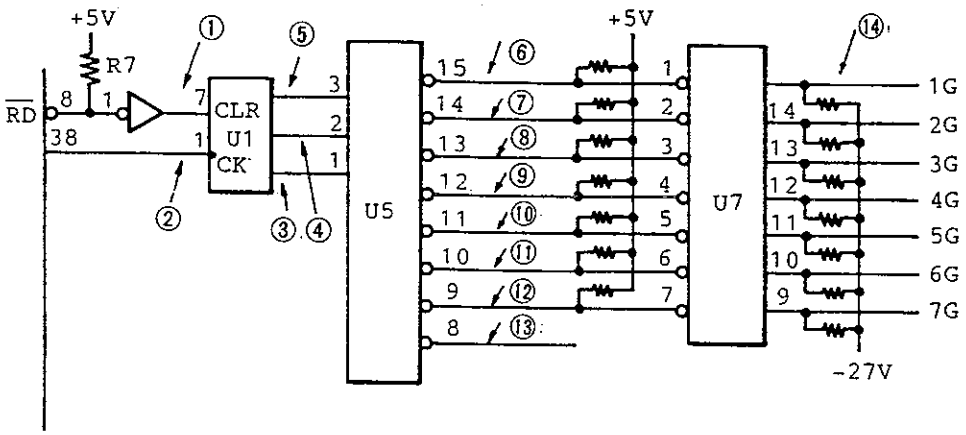
Power-on Delay Circuit





Since a reset pin is pulled up at about 200 k inside the CPU, a resetting time(50 msec) required for the CPU can be obtained by adding 1μF(C3). R29 is provided to control the discharge current of C3.

Digital Signal

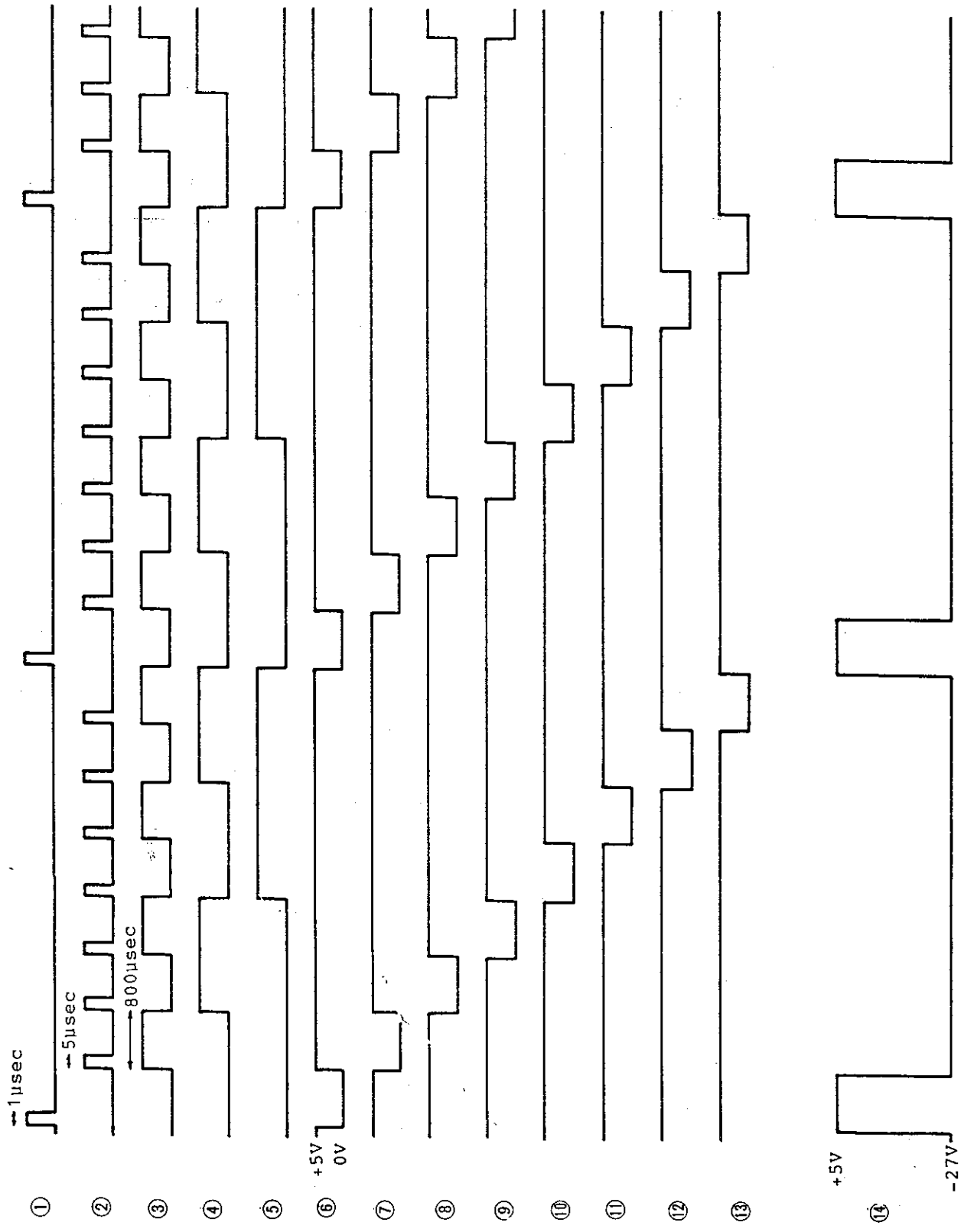


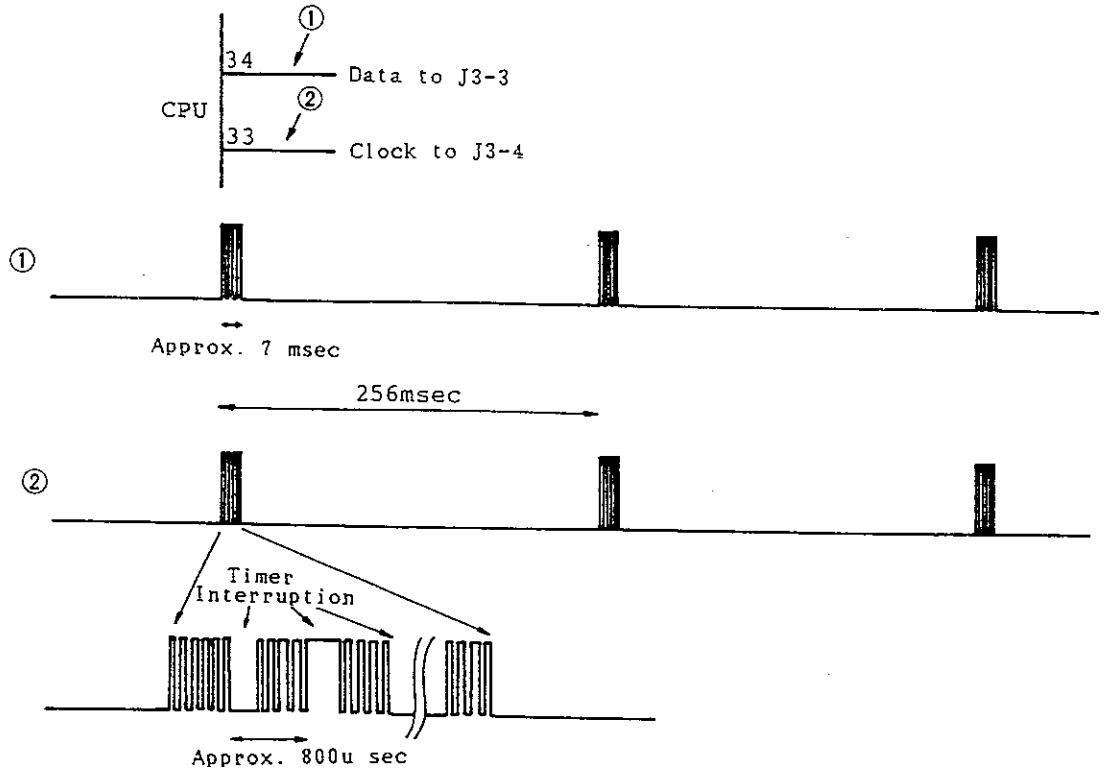
U1 is a 4-bit binary counter. It is used as an octal counter, using only the lower 3 bits of 4 bits. With output of the octal counter entered the line decoder of "U5 3 to 8", one of eight lines is decoded by 3-bit data. With this method employed, the eight lines can be sequentially selected by two signals(pins 8 and 38) from the CPU. U7 converts a TTL-level signal into a signal of +5 V~-27 V(-23 V for AD-4321B) and drives the grid of the fluorescent display tube. The output signal of U5 is used not only as a digital signal for display, but also as a select signal to read switches (key switches, dip switches, etc.).

Segment Signal

The segment signals (a through g and decimal point) are output from pins 12 through 19 and 24 of the CPU, which are synchronized with respective digital signals. Their wave forms depend on the data being displayed. U6 and Q1 and Q2 perform level conversion in the same way U7.

Display Circuit (Digital Signal) Timing Chart

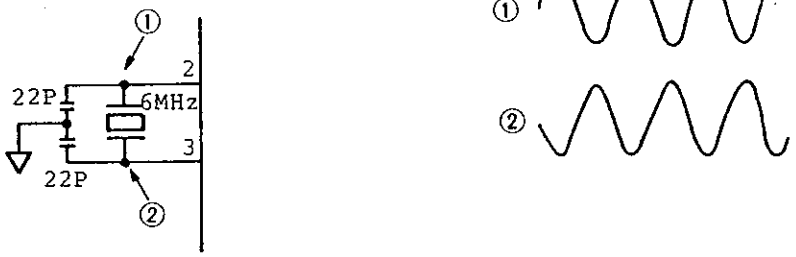




Data is output upon every sample (at intervals of 256 msec). The data is transmitted with serial clock pulses (②). Although the serial clock is of pulses at intervals of about 150〃sec, as a timer interruption is applied every 800〃sec and a display rewriting routine runs, the pulses go off from a serial clock wave form every 800〃sec. The data wave form (①) depends on the data value being output.

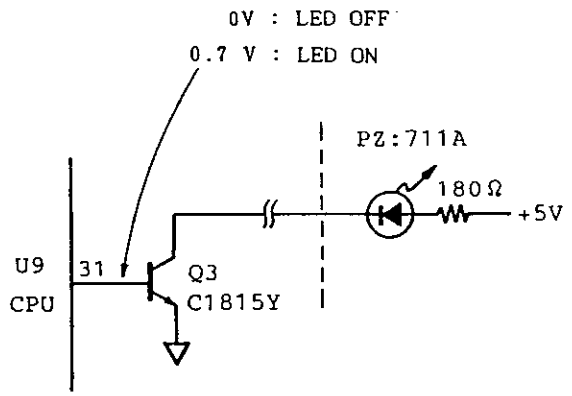
The data to be output will be received by the OP-01 or OP-04 board at the rising edge of the serial clock pulse.

Note) These data and serial clock waveforms are connected to U3(X2444 NOVRAM) as well. U3 is accessed immediately after the power is turned on or after calibration has been completed. Normally, however, it is not accessed because CE (Chip Enable, pin 1) is on the L level.



Both ① and ② are of 6 MHz, and wave forms close to a sine wave are output.

Tare LED Drive Circuit



When the pin 31 is of 0.7 V, the transistor(Q3) is turned on and the LED lights up. When the pin 31 is of 0 V, the transistor is turned off and the LED switches off.

2. ADJUSTMENT PROCEDURES

Of AD-4321A and AD-4321B, only the power unit is different from each other and the other components are common.

2-1 Voltage Check of AD-4321A

(1) Changeover of the supply voltage

AD-4321A can use the following 4 levels of power supply input voltage; 100 V, 120 V, 220 V and 240 V. The allowable fluctuation range of each input voltage is -15% to +10%.

To change the input voltage, replace fastened terminals.

- For an input voltage of 100 V
  Blue : 1 , Brown : 2 and 5
- For an input voltage of 120 V
  Blue : 1 , Brown : 3 and 6
- For an input voltage of 220 V
  Blue : 3 , Brown : 4 and 5
- For an input voltage of 240 V
  Blue : 3 , Brown : 4 and 6

(2) Voltage check

With TP1 as GND ;	TP2	12V	(11.4 ~ 12.6)
	TP3	5V	(4.75 ~ 5.25)
	TP4	-27V	(-26.0 ~ -28.5)
With TP6 as GND ;	TP5	7V	(6.5 ~ 7.5)
With TP9 as GND ;	TP7	5V	(4.75 ~ 5.25)
	TP8	13V	(11.0 ~ 14.0)
	TP10	-13V	(-11.0 ~ -14.0)

Make the above-mentioned voltage checks with a specified supply voltage. If a voltage different from the specified one is used (however, within -15% to +10%), TP4 and TP5 will differ from the above-mentioned values. Each voltage will be normal if it stays with the range mentioned in parentheses. As for TP4, TP5, TP8 and TP10, even though they are not within the respective ranges mentioned in parentheses, the operation of AD-4321A will not be affected if each deviation is within ±1 V.

2-2 Voltage Check and Adjustment of AD-4321B

Connect to the 12 V DC power supply (11 V ~ 18 V).

(1) Voltage adjustment

With TP1 as GND, adjust with R27 (1 kΩ VR) so that the voltage of TP2 may be between 10.02 V and 10.04 V.

(2) Voltage check

With TP1 as GND ;

TP2	10V	(10.02 ~ 10.04)
TP3	5V	(4.75 ~ 5.25)
TP4	5V	(4.75 ~ 5.25)
TP5	-23V	(-22.0 ~ -24.0)
TP6	-10V	(- 9.0 ~ -11.0)

Each voltage will be normal, if it stays in the range mentioned in parentheses. As for TP5 and TP6, even if they are not within the respective ranges mentioned in parentheses, the operation of AD-4321B will not be affected as long as each deviation is within ±1 V.

(3) Adjustment of the low battery detection voltage

Turn on (OPERATE mode) the display. Adjust R24 (10 kΩ VR) so that "L0" may be displayed when the supply voltage is gradually decreased to 10.5 V, and that this display will disappear when the supply voltage is gradually increased to 10.8V.
See to it that "L0" appears without fail when set to 10.5 V, and that it disappears without fail when set to 10.8 V.
After this adjustment, check by changing the supply voltage whether the adjustment has been properly carried out.

2-3 Switch Check

Turn on the power and check that each switch is properly functioning. (Refer to the Instruction Manual.)

2-4 Calibration

When the A/D unit is replaced, make a recalibration. (For the calibration method, refer to the Instruction Manual.)

3. INSPECTION PROCEDURES

AD-4321A	AC power type
AD-4321B	DC power type
OP-01	BCD OUT
OP-04	RS-232C

3-1 Appearance

There should not be any scratch or stain. As for a domestic model, seals, etc. below the key seat and filter should be of required specifications. (Check also that the feet are attached.)

3-2 Function

- Check that the POWER lamp(red) lights up, if the power supply is connected.
- With the ON/OFF switch turned on, check that the display appears with a decimal point located at the following position; . .
- The display should be 0 when a dummy cell value is 0.5 mV/V, 200.0 when it is 0.9 mV/V, 400.0 when it is 1.3 mV/V, 600.0 when it is 1.7 mV/V, 800.0 when it is 2.1 mV/V and 1,000.0 when it is 2.5 mV/V.
  A relative error should be within ± 1 count, and an FS absolute error should be within ± 10 counts.
- With about 5 counts displayed, check that the display turns to 0 and the ZERO lamp lights up, if the ZERO switch is pressed.
- With about 5 counts displayed, check that the display turns to 0, the GROSS mark lights off, the NET mark lights up and the TARE ENTERED lamp(green) lights up, if the TARE switch is pressed.
- With the GROSS/NET switch pressed, check that the NET lamp lights off and the GROSS lamp lights up.
- Using an external control jig, check that each of the ZERO, TARE and GROSS/NET modes functions.
- Check that the stablization lamp lights up only when the display is stable.
- Check that settings upon shipment are as follows:

VS/OIML	Only 4 ON	Only 1 and 4 ON	Call sw OFF

3-3 OP-01(BCD OUT) Check

Using AD-8114B(A&D)

Check each digit for 1, 2, 4 and 8. When a gross weight is displayed, check that "↑" appears in front of the most significant digit.

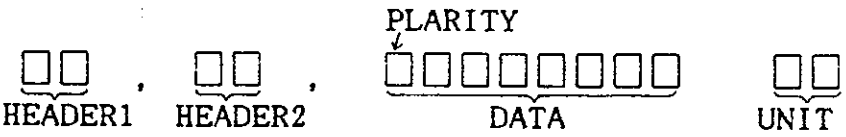
A unit is "kg". The decimal point should be located at the same position as the display.
In the OVERLOAD state, printing should be done in red color. When a negative value is displayed, a "-" sign should be printed.

3-4 OP-04(RS-232C) Check

· Settings upon shipment : 2,400 baud, STREAM mode
Go through the following procedures, using PC-9801(NEC).

MON↓ SSW2↓ 06↓ CTRL/B

TERM "COM:E71NNNLL"↓
Data is displayed as follows on the CRT.



HEADER 1	ST	STABLE
	US	UNSTABLE
	OL	OVER LOAD
HEADER 2	GS	GROSS WEIGHT
	NT	NET WEIGHT
DATA	DATA	ALWAYS 8 DIGITS SO IF NO DECIMAL POINT
	THEN	SPACE AFTER POLARITY

Check each display.

4. PARTS LIST

AD-4321-A

MAIN BOARD-1

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:708A	PZ:708A	PZ:708A	MAIN BOARD FULLY ASSEMBLED	
"	"	PC:708B	PRINTED CIRCUIT BOARD	
C35,36	"	CC:0.01U500V	CAPACITOR 0.01μF 500V	
C1,2,4,5,8,10~13	"	CC:0.022U	" 0.022μF 50V	
C17,18,21,22,27, 28	"	CC:0.1U25V	" 0.1μF 25V	
C6,7	"	CC:22P	" 22pF 50V	
C14	"	CK:SM10VB47	" 47μF 10V	
C25	"	CK:SM16VB470	" 470μF 16V	
C20,26	"	CK:SM25VB2200	" 2200μF 25V	
C30,32	"	CK:SM35VB100	" 100μF 35V	
C15	"	CK:SM50VB1	" 1μF 50V	
C19,23,29,31,33	"	CK:SM50VB10	" 10μF 50V	
C24	"	CK:SM50VB220	" 220μF 50V	
C16	"	CK:9117	" 4700μF 35V	
C34	"	CM:6003104K	" 0.01μF 600V	
C3	"	CT:1V010	" 1μF 35V	
PC1	"	DF:TLP521-3	PHOTO COUPLER	
D20,21,22	"	DI:F14A	DIODE	
D16~19	"	DI:W02	DIODE BRIDGE	
D1~9,11~15	"	DI:1S1588	DIODE	
D24,25	"	DZ:05Z13	ZENER DIODE	
D23	"	DZ:05Z5.6	"	
	"	FH:FH-B02	FUSE HOLDER	
	"	FS:F7142-0.5A	FUSE	
J4	"	JA:4470-01-1111	CONNECTOR	
J6	"	JD:230-10-30	"	
J9	"	JS:NC-174	"	
U9	"	JS:10340-01-445	IC SOCKET	
J3	"	JT:1-171825-2	CONNECTOR	
J10	"	JT:171825-3	"	
J1,2	"	JT:171825-7	"	
1~6	"	JT:61134-1	"	
K01	"	KO:102-3S10	CONNECTOR CABLE	
J8	"	KO:280A-08BL	"	
"	"	KO:280A-08BR	"	
L1,2	"	LL:SF-T8-40S	COIL	
Q1,2,6	"	QT:A1015Y	TRANSISTOR	
Q3,4,5	"	QT:C1815Y	"	
R14,15,16,18	"	RC:100K	RESISTOR 100K 1/4W	
R29	"	RC:100R	" 100ohm 1/4W	
R7,24	"	RC:22K	" 22K 1/4W	
R21,22	"	RC:33K	" 33K 1/4W	
R4,5,6	"	RC:330R	" 330ohm 1/4W	
R1,2,3,23	"	RC:4.7K	" 4.7K 1/4W	
R27,28	"	RC:470R	" 470ohm 1/4W	
R8,9	"	RC:8.2K	" 8.2K 1/4W	
R25,26	"	RC:82R	" 82ohm 1/4W	
R10,11,12,13	"	RN:IHR-4-223MA	RESISTOR NETWORK 22K x 4, 1/8W	
R17,19	"	RN:IHR-4-472MA	RESISTOR NETWORK 4.7K x 4, 1/8W	

AD-4321-A
MAIN BOARD-2

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
R20	PZ:708A	RN:IHR-6-104JA	RESISTOR NETWORK 100K x 6, 1/8W	
T1	"	TF:261C	TRANSFORMER	
TP1~10	"	TM:CP-10	TEST PIN	
U8	"	UA:PST518B	VOLTAGE COMPARATOR	
U1	"	UC:14520B	C/MOS	
U4	"	UC:4069	"	
U6,7	"	UC:5067	"	
U3	"	UN:X2444	NOVRAM	
U12,13	"	UR:TA78005AP	VOLTAGE REGULATOR 5V, 1A	
U11	"	UR:TA78012AP	VOLTAGE REGULATOR 12V, 1A	
U10	"	UT:LS123	TTL	
U5	"	UT:LS138	"	
U2	"	UT:LS26	"	
X1	"	XT:HC18/U6MHZ	CRYSTAL 6MHz	
		05:A44614	LOCKING POLE	
		05:A42206	SEALING BOLT M3 WITH HOLE	
		01:A44619B	REAR PANEL	
		02:A44648A	BLANK PANEL	

AD-4321-B
MAIN BOARD-1

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:709A	PZ:709A	PZ:709A	MAIN BOARD FULLY ASSEMBLED	
"	"	PC:709B	PRINTED CIRCUIT BOARD	
C1,2,4,5,8,10~13, 17,18,19,21,22	"	CC:0.022U	CAPACITOR 0.022μF 50V	
C24,25,27,28,31	"	CC:0.1U25V	" 0.1μF 25V	
C32	"	CC:150P	" 150pF 50V	
C6,7	"	CC:22P	" 22pF 50V	
C14	"	CK:SM10VB47	" 47μF 10V	
C30	"	CK:SM16VB1000	" 1000μF 16V	
C16	"	CK:SM35VB100	" 100μF 35V	
C15	"	CK:SM50VB1	" 1μF 50V	
C23,26,29,33,34	"	CK:SM50VB10	" 10μF 50V	
C20	"	CT:1VR33	" 0.33μF 35V	
C3	"	CT:1V010	" 1μF 35V	
D19	"	DI:F14A	DIODE	
D1~16	"	DI:1S1588	"	
D18	"	DZ:05Z11	ZENER DIODE	
D17	"	DZ:05Z5.6	"	
	"	FH:FH-B02	FUSE HOLDER	
	"	FS:F7142-1A	FUSE	
J4	"	JA:4470-01-1111	CONNECTOR	
J6	"	JD:230-10-30	"	
U9	"	JS:10340-01-445	IC SOCKET	
J3	"	JT:1-171825-2	CONNECTOR	
J10	"	JT:171825-3	"	
J1,2	"	JT:171825-7	"	
Q1,2,10	"	QT:A1015Y	TRANSISTOR	
Q5	"	QT:A473Y	"	
Q9	"	QT:C1173	"	
Q3,4,6,7,8	"	QT:C1815Y	"	
R25	"	RC:10K	RESISTOR 10K 1/4W	
R14,15,16,18	"	RC:100K	" 100K 1/4W	
R36	"	RC:100R	" 100ohm 1/4W	
R21	"	RC:12K	" 12K 1/4W	
R28	"	RC:2.2K	" 2.2k 1/4W	
R33	"	RC:2.7K	" 2.7K 1/4W	
R7,26,34	"	RC:22K	" 22K 1/4W	
R29	"	RC:220R	" 220ohm 1/4W	
R35	"	RC:3.9K	" 3.9K 1/4W	
R4,5	"	RC:33K	" 33K 1/4W	
R30	"	RC:330R	" 330ohm 1/4W	
R1,2,3,6	"	RC:4.7K	" 4.7K 1/4W	
R32	"	RC:47K	" 47K 1/4W	
R31	"	RC:5.6K	" 5.6K 1/4W	
R8,9	"	RC:8.2K	" 8.2K 1/4W	
R22	"	RM:383KF	" 383K 1/4W ±100ppm/°C	
R23	"	RM:42.2KF	" 42.2K 1/4W ±100ppm/°C	
R10~13	"	RN:IHR-4-223MA	RESISTOR NETWORK 22K x 4, 1/8W	
R20	"	RN:IHR-4-472MA	RESISTOR NETWORK 4.7K x 4, 1/8W	
R17,19	"	RN:IHR-6-104JA	RESISTOR NETWORK 100K x 6, 1/8W	

AD-4321-B
MAIN BOARD-2

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
R24	PZ:709A	RV:2K103	POTENTIOMETER	
R27	"	RV:3K102	"	
T1	"	TF:262	TRANSFORMER	
TP1~6	"	TM:CP-10	TEST PIN	
U11	"	UA:MB3761	VOLTAGE COMPARATOR	
U8	"	UA:PST518B	"	
U1	"	UC:14520B	C/MOS	
U4	"	UC:4069	"	
U6,7	"	UC:5067	"	
U3	"	UN:X2444	NOVRAM	
U12,13	"	UR:TA78005AP	VOLTAGE REGULATOR 5V, 1A	
U10	"	UT:LS123	TTL	
U5	"	UT:LS138	"	
U2	"	UT:LS26	"	
X1	"	XT:HC18/U6MHZ	CRYSTAL 6MHz	
	"	05:A44614	LOCKING POLE	
	"	05:A42206	SEALING BOLT M3 WITH HOLE	
	"	01:A44619B	REAR PANEL	
	"	02:A44648A	BLANK PANEL	
	"	01:A44632A	BLANK PANEL FOR DC 12V	

SWITCH BOARD

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:764	PZ:764	PA:764	SWITCH BOARD FULL ASSEMBLED	
"	"	PC:764	PRINTED CIRCUIT BOARD	
SW1~6	"	SK:KHC10902	KEY SWITCH	

DISPLAY BOARD

PZ:711A	PZ:711A	PZ:711A	DISPLAY BOARD FULLY ASSEMBLED	
"	"	PC:711B	PRINTED CIRCUIT BOARD	
D1~17	"	DI:1S1588	DIODE	
D19	"	DL:PG5553KY	LED LAMP	
D18	"	DL:PR5553K	"	
DISPLAY	"	ED:FIP7B13	DISPLAY TUBE	
F pin	"	JI:1-163740-9	F FORM PIN	
R2	"	RC:180R	RESISTOR 180ohm 1/4W	
R1	"	RC:330R	" 330ohm 1/4W	
S1,2	"	SD:KTD08	DIP SWITCH	
S3	"	SS:2NB2X2-N	KEY SWITCH	

OPTION-01

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:712	PZ:712	PZ:712	OPTION-01 BOARD FULLY ASSEMBLED	
"	"	PC:712A	PRINTED CIRCUIT BOARD	
C2,6,8~21	"	CC:0.022U	CAPACITR 0.022μF 50V	
C1,3	"	CK:SM10VB100	" 100μF 10V	
C4	"	CK:SM50VB1	" 1μF 50V	
C5,7	"	CT:1VR33	" 0.33μF 35V	
PHC1	"	DF:TLP521-3	PHOTO COUPLER	
D1	"	DI:1S1588	DIODE	
J1	"	JA:57-40500-D39	CONNECTOR	
J2	"	KO:102-12S20	CONNECTOR CABLE	
Q1,2	"	QT:C1815Y	TRANSISTOR	
R6~9,14,15,17,18	"	RC:10K	RESISTOR 10K 1/4W	
R11,13	"	RC:100R	" 100ohm 1/4W	
R16	"	RC:15K	" 15K 1/4W	
R10	"	RC:22K	" 22K 1/4W	
R12	"	RC:33K	" 33K 1/4W	
R1,2,3	"	RC:330R	" 330ohm 1/4W	
R4,5	"	RC:470R	" 470ohm 1/4W	
R19	"	RN:IHR-4-472MA	RESISTOR NET WORK 4.7K x 4, 1/8W	
SW1	"	SD:KTD08	DIP SWITCH	
U7~10	"	UC:4094	C/MOS	
U13	"	UT:LS00	TTL	
U1~6,15	"	UT:LS04	"	
U14	"	UT:LS123	"	
U11	"	UT:LS14	"	
U12	"	UT:LS74	"	
04	"	04:A44622	BOARD EDGE PLATE	

OPTION-04

CIRCUIT SYMBOL OR DRWG. NO.	LOCATION	PARTS NAME	DESCRIPTION	Q'TY
PZ:713	PZ:713	PZ:713	OPTION-04 BOARD FULLY ASSEMBLED	
"	"	PC:713A	PRINTED CIRCUIT BOARD	
C7~12	"	CC:0.022U	CAPACITOR 0.022μF 50V	
C4,5	"	CC:22P	" 22pF 50V	
C6	"	CC:220P	" 220pF 50V	
C2,3	"	CK:SM10VB100	" 100μF 10V	
C1	"	CT:1V010	" 1μF 1V	
PC1,2	"	DF:TLP521-3	PHOTO COUPLER	
D1	"	DI:W02	DIODE BRIDGE	
J4	"	JA:TCS0270	CONNECTOR	
J1	"	JA:25-30-335S	"	
U5	"	JS:10340-01-445	IC SOCKET	
J3	"	KO:102-12S20	CONNECTOR CABLE	
J2	"	KO:102-7S20	"	
Q1,2,3	"	QT:C1815Y	TRANSISTOR	
R5,6	"	RC:10K	RESISTOR 10K 1/4W	
R14	"	RC:100R	" 100ohm 1/4W	
R12	"	RC:220R	" 220ohm 1/4W	
R1,2,7,8,9,11	"	RC:330R	" 330ohm 1/4W	
R10,13	"	RC:4.7K	" 4.7K 1/4W	
R3,4	"	RC:470R	" 470ohm 1/4W	
SW1	"	SD:KTD06	DIP SWITCH	
U6	"	UA:PST518B	VOLTAGE COMPARATOR	
U1,2	"	UT:LS04	TTL	
U4	"	UT:75188	"	
U3	"	UT:75189A	"	
X1	PZ:713	XT:HC18/U6MHZ	CRYSTAL 6MHz	
04	"	04:A44623	BOARD EDGE PLATE	

5. ASSEMBLY

① Install the keyboard in the front panel and plug the keyboard connector into the main board.

② Clip the front panel onto the main board.

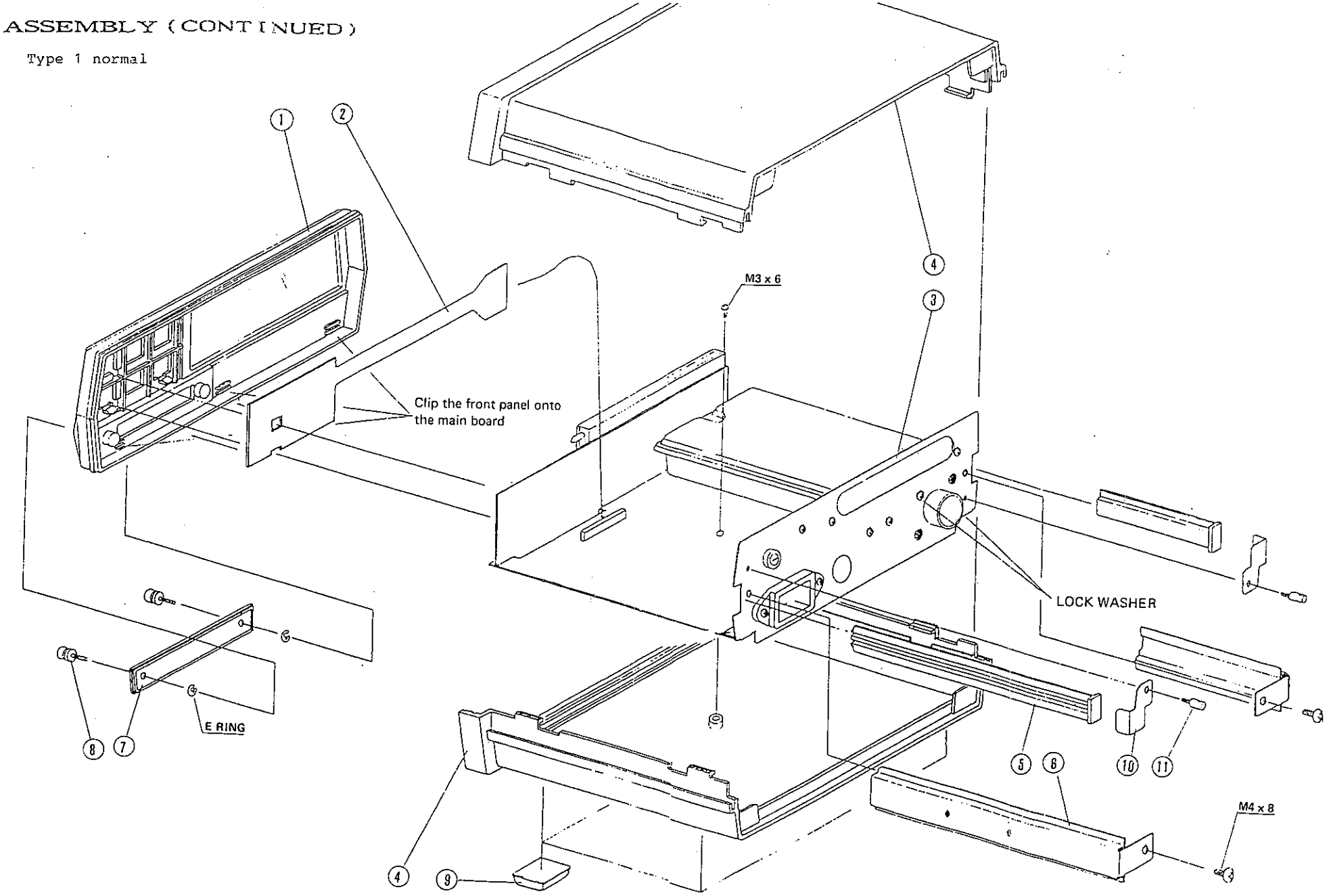
③ Slide the main board, with front panel attached, downwards onto the lower half of the case.

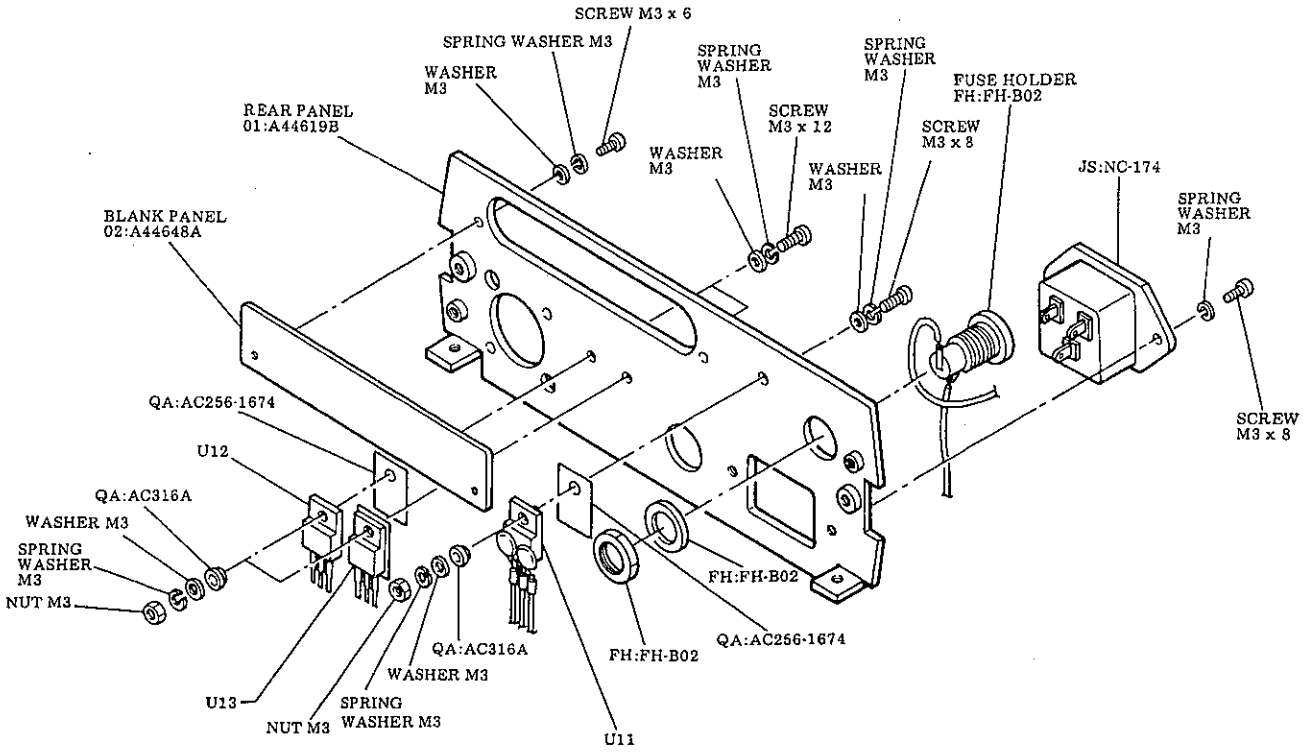
④ Lower the upper case on to the lower case and marry.
Slide the case locking bars ⑤ into the grooves in the case sides and then install the anti-tamper brackets ⑩ and slide locks for panel mounting ⑥.

N°	PARTS NAME	DESCRIPTION
1	09:A33012	Front Panel
2	PZ:764	Key-board
3	PZ:708A-711A	Main board+Display board 〈A type〉
〈3〉	PZ:709A-711A	Main board+Display board 〈B type〉
4	07:A10039	Upper 〈Lower〉 half of case
5	07:A44613	Case locking bar
6	04:A44621	Slide lock
7	07:A44612	Panel cover
8	05:A42208	Anti-tamper screw
9	10:SJ-5023	Foot
10	04:A44891	Anti-tamper bracket
11	05:A42206	Anti-tamper fixing screw

ASSEMBLY (CONTINUED)

Type 1 normal




SCREW M3 x 6
SPRING WASHER M3
WASHER M3
REAR PANEL 01:A44619B
BLANK PANEL 02:A44648A
SPRING WASHER M3
WASHER M3
SCREW M3 x 12
WASHER M3
SPRING WASHER M3
SCREW M3 x 8
FUSE HOLDER FH:FH-B02
JS:NC-174
SPRING WASHER M3
SCREW M3 x 8
QA:AC256-1674
U12
QA:AC316A
WASHER M3
SPRING WASHER M3
NUT M3
U13
NUT M3
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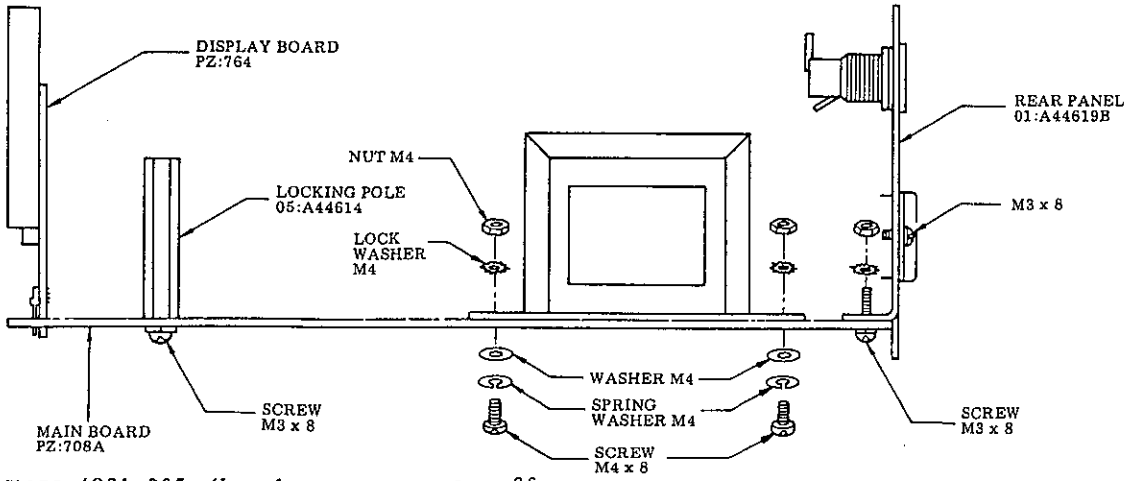
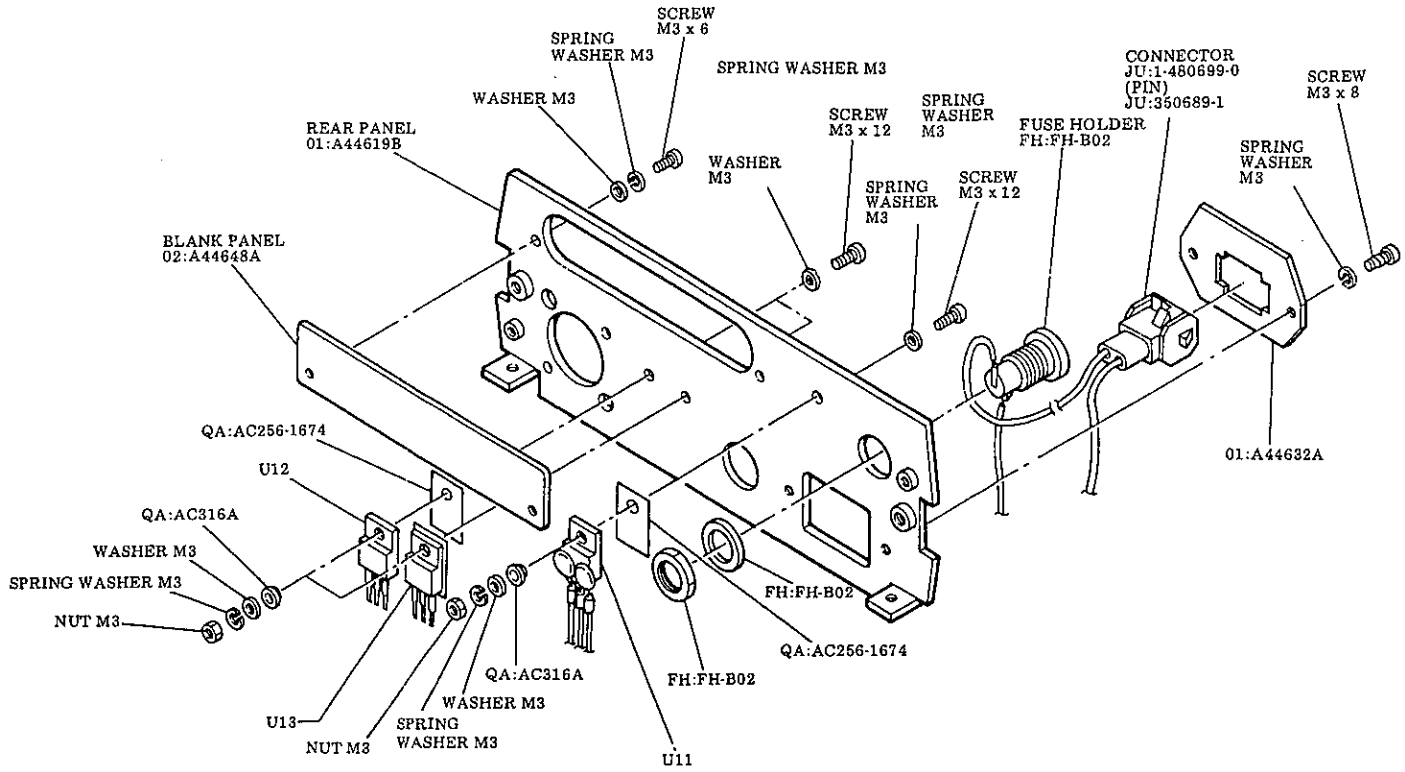
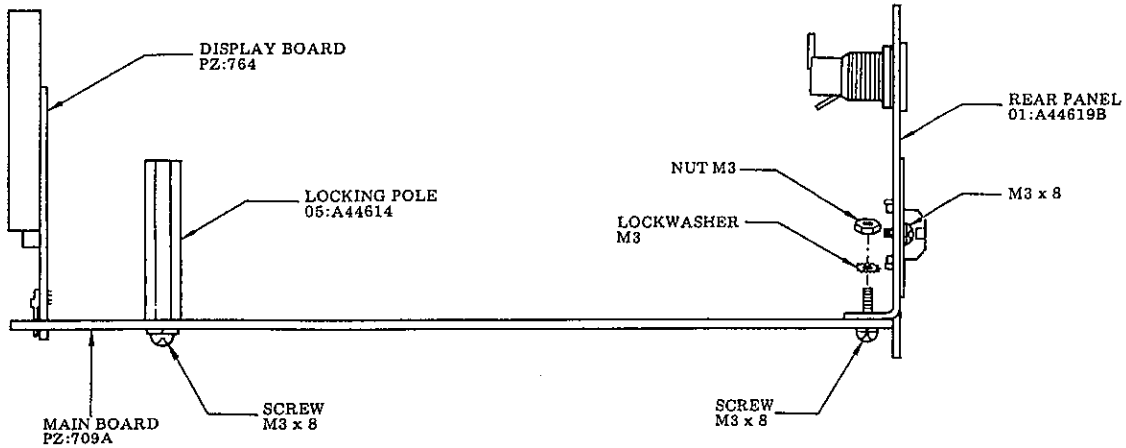
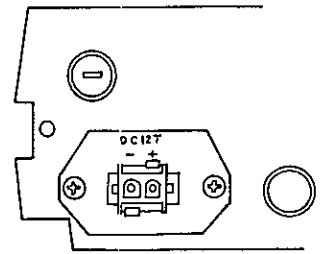
WASHER M3
QA:AC316A
U11
FH:FH-B02
FH:FH-B02
QA:AC256-1674

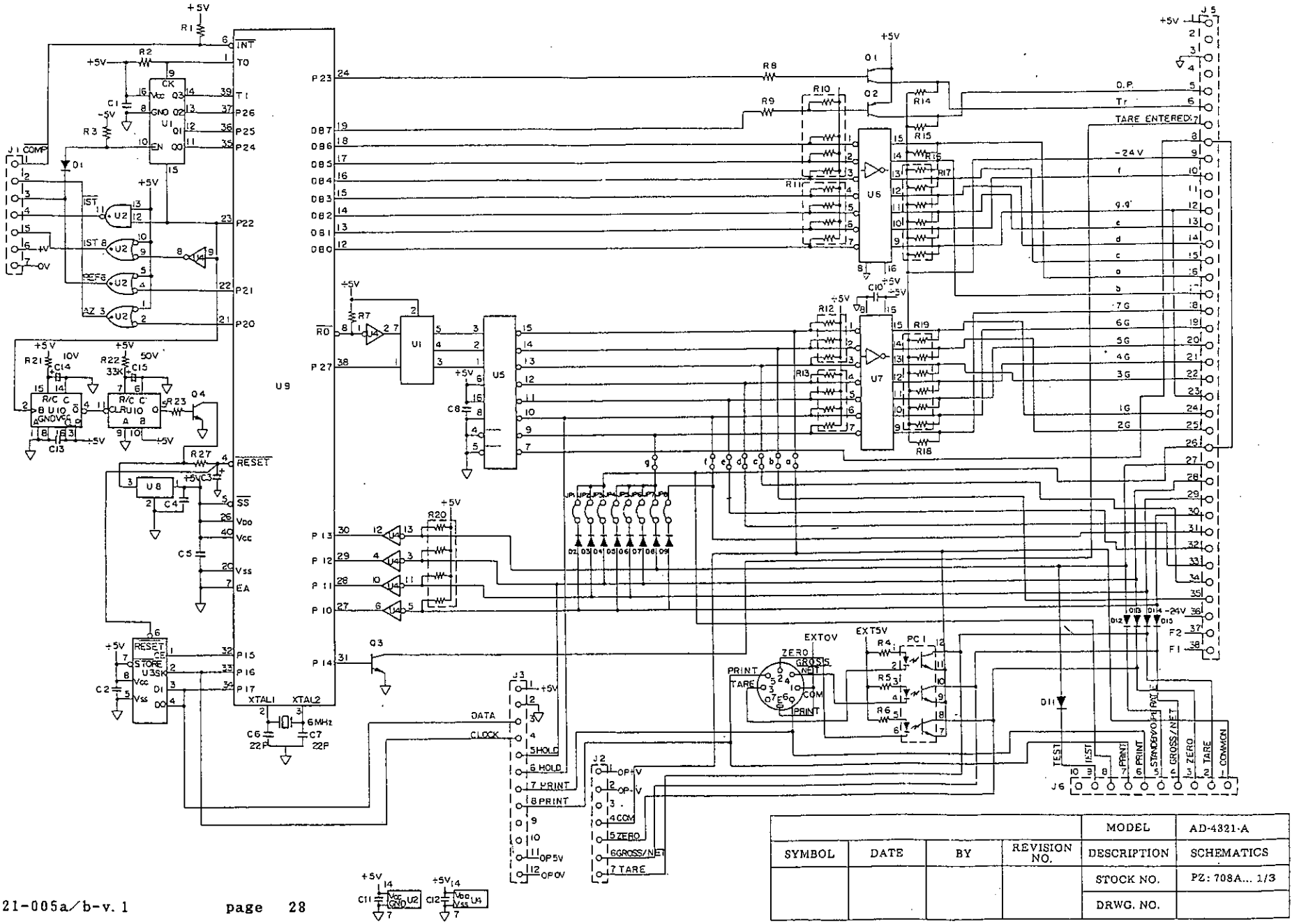

DISPLAY BOARD PZ:764
NUT M4
LOCKING POLE 05:A44614
LOCK WASHER M4
REAR PANEL 01:A44619B
M3 x 8
WASHER M4
SPRING WASHER M4
SCREW M4 x 8
SCREW M3 x 8
SCREW M3 x 8
MAIN BOARD PZ:708A


SCREW
M3 x 6
SPRING
WASHER M3
SPRING WASHER M3
CONNECTOR
JU:1-480699-0
(PIN)
JU:350689-1
SCREW
M3 x 8
WASHER M3
SCREW
M3 x 12
SPRING
WASHER
M3
FUSE HOLDER
FH:FH-B02
REAR PANEL
01:A44619B
WASHER
M3
SPRING
WASHER
M3
SCREW
M3 x 12
SPRING
WASHER
M3
BLANK PANEL
02:A44648A
01:A44632A
QA:AC256-1674
U12
QA:AC316A
WASHER M3
SPRING WASHER M3
NUT M3
FH:FH-B02
QA:AC256-1674
QA:AC316A
FH:FH-B02
WASHER M3
U13
SPRING
WASHER M3
NUT M3
U11


DISPLAY BOARD
PZ:764
REAR PANEL
01:A44619B
NUT M3
LOCKING POLE
05:A44614
M3 x 8
LOCKWASHER
M3
MAIN BOARD
PZ:709A
SCREW
M3 x 8
SCREW
M3 x 8


DC12V

6. SCHEMATICS



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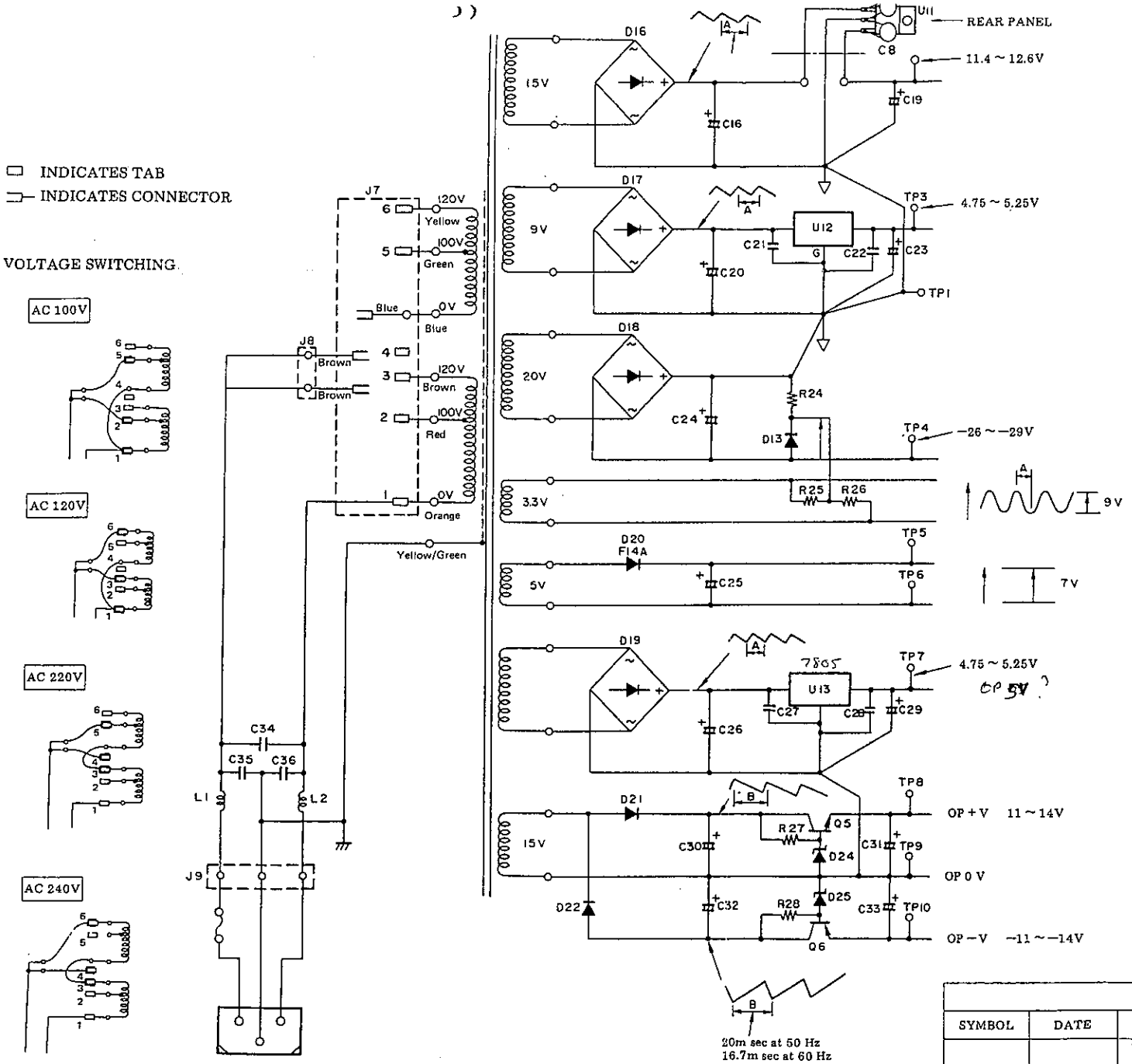
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 708A... 1/3
				DRWG. NO.	



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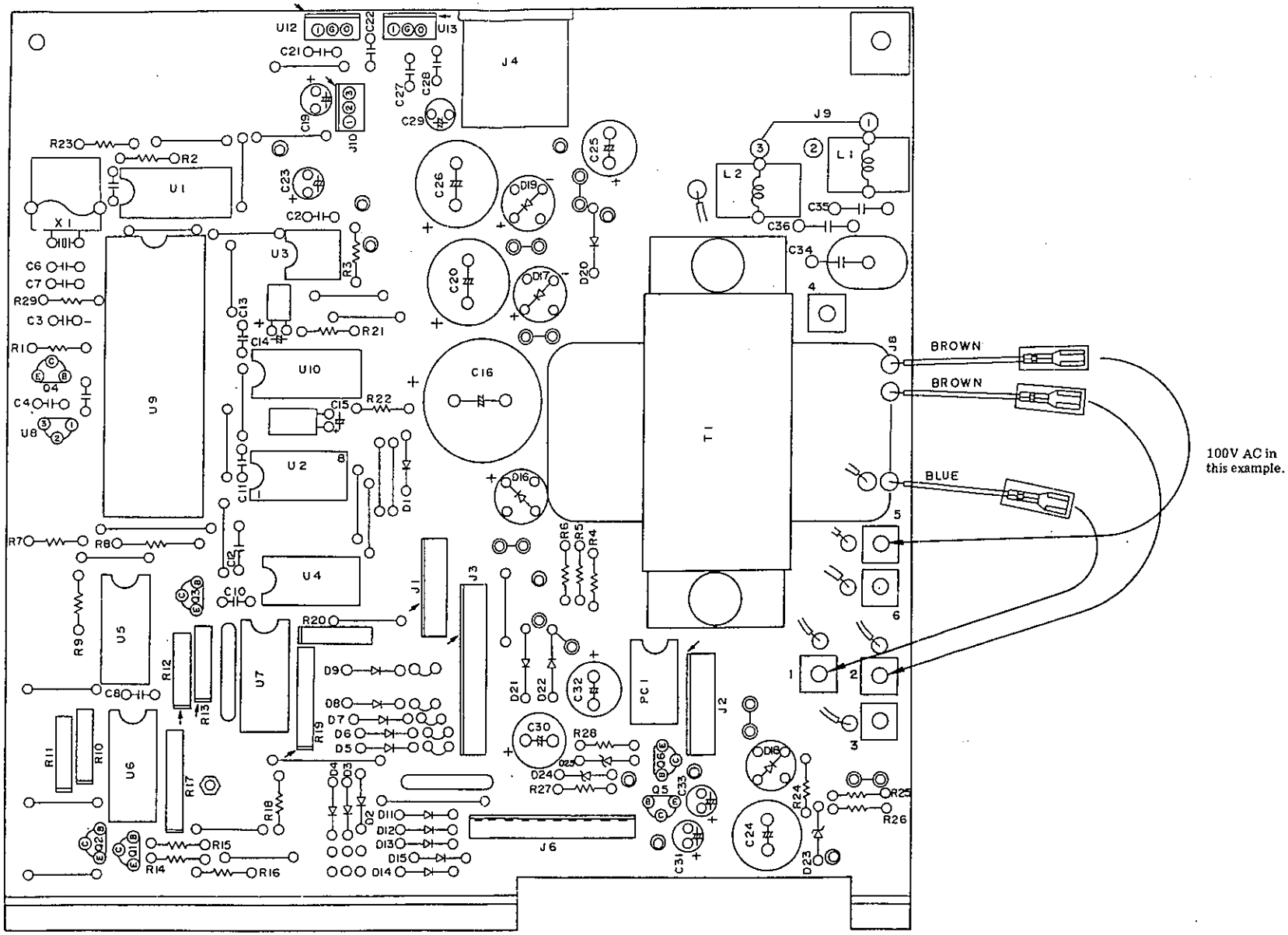
				DRWG. NO.	



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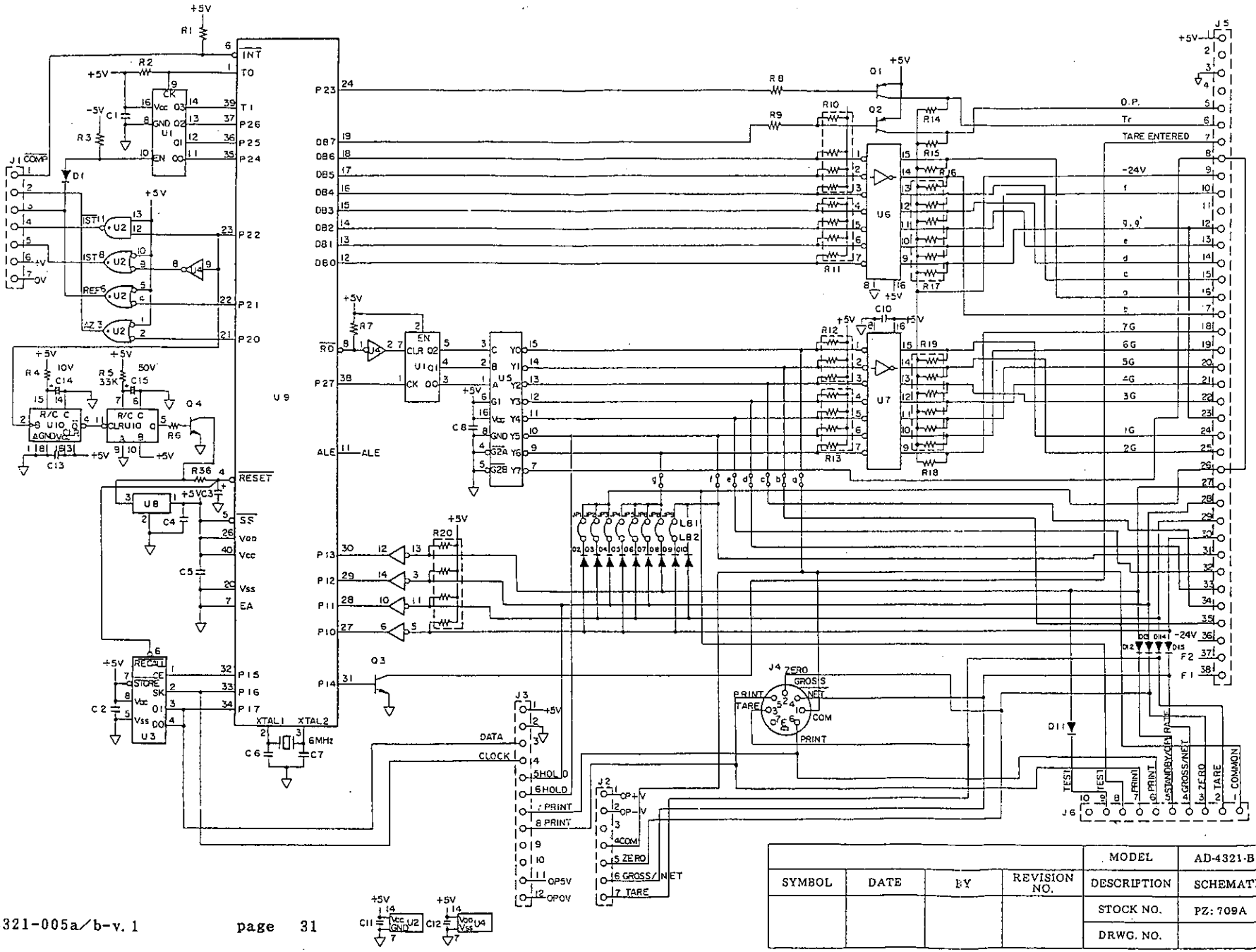
				DRWG. NO.	



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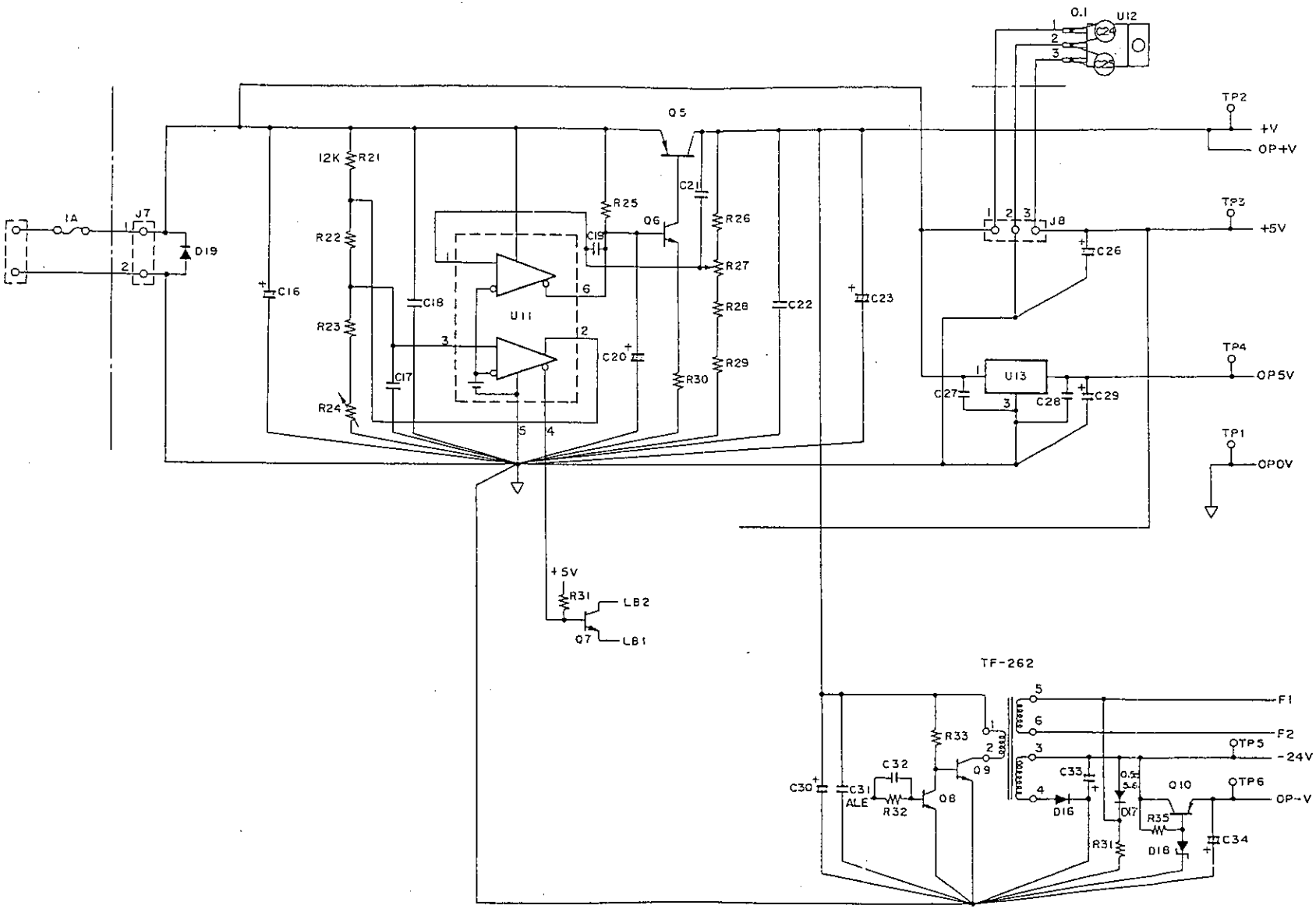
				DRWG. NO.	



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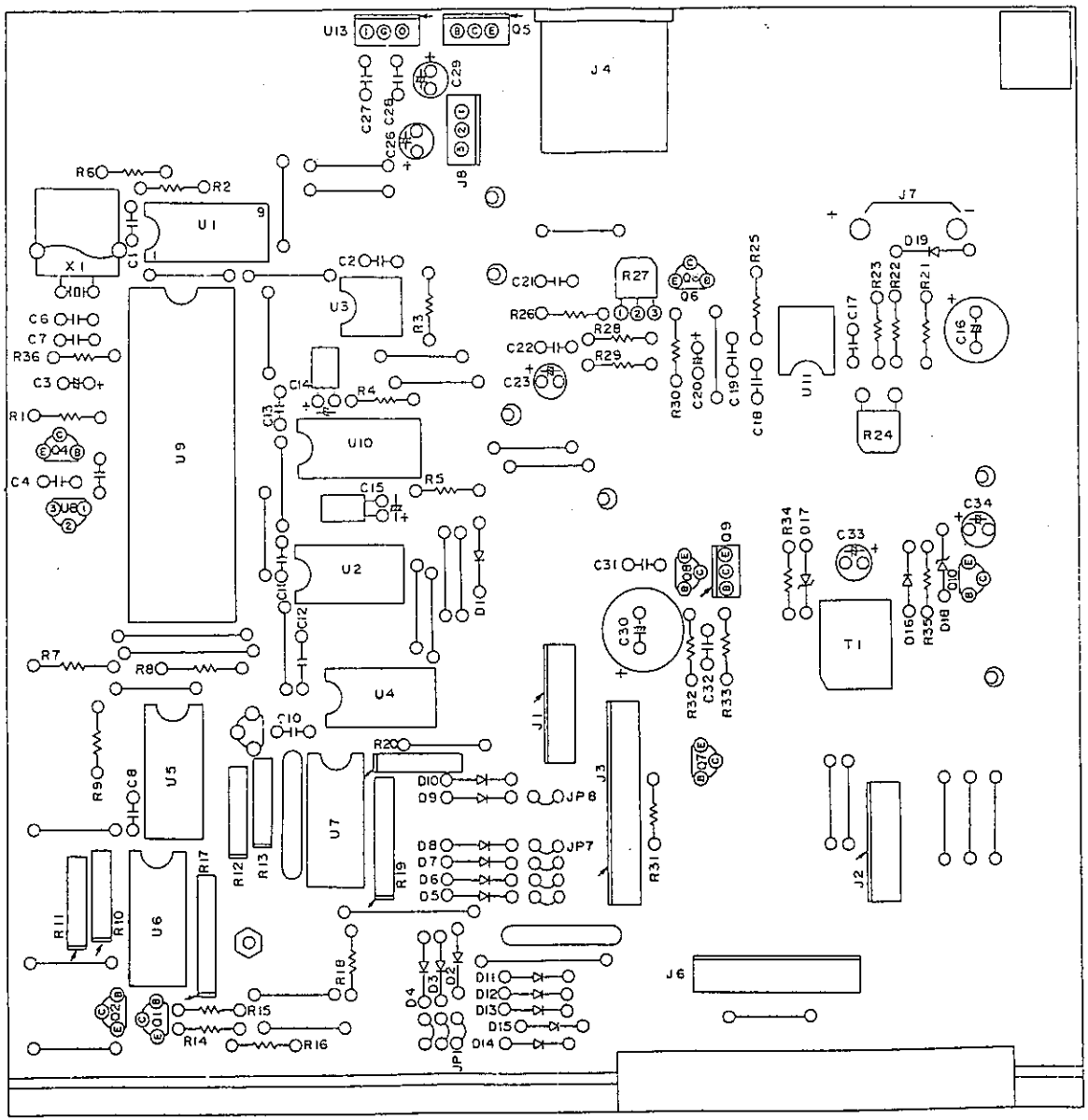
SYMBOL	DATE	BY	REVISION NO:	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 709A
				DRWG. NO.	



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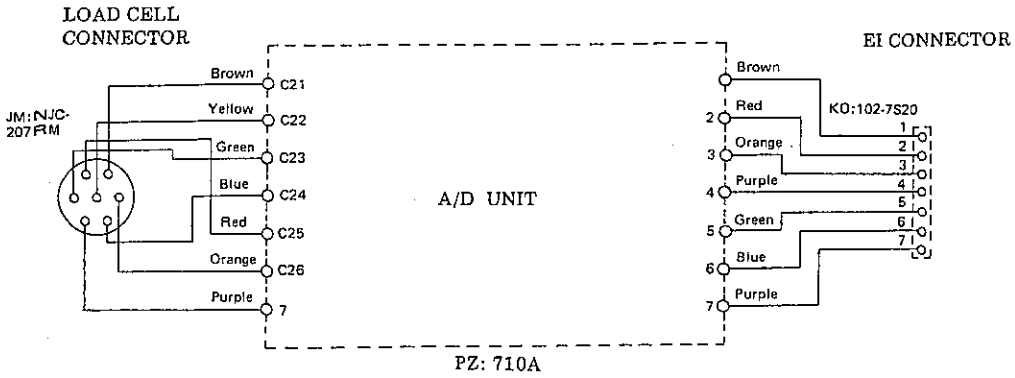
				DRWG. NO.	



( ) INDICATES THE CASE OF AD4321B

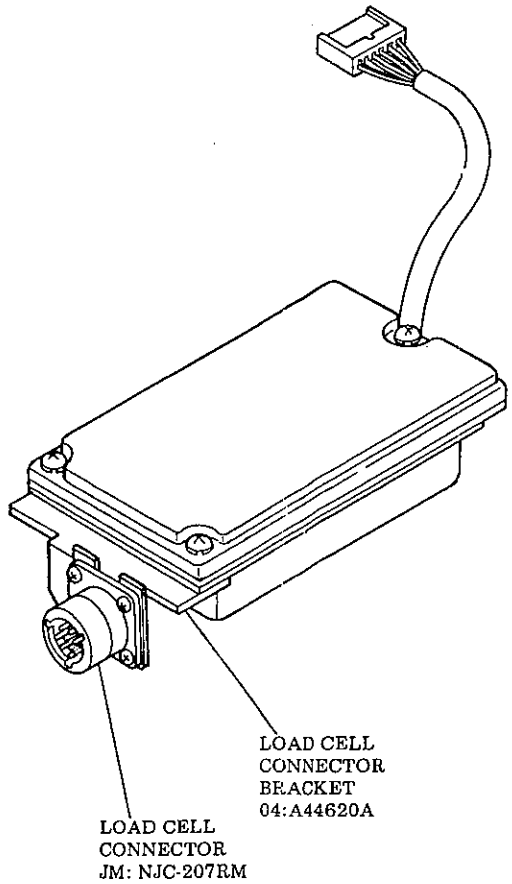
LOAD CELL CONNECTOR

1	EXC+	12V (10V) OUTPUT H	
2	SEN+	SENSE INPUT H	A/D UNIT WILL OPERATE ABNORMALLY
3	SEN-	SENSE INPUT L	WHEN SENSE INPUT IS NOT CONNECTED
4	EXC-	12V (10V) OUTPUT L	
5	SIG+	LOAD CELL OUTPUT H	
6	SIG-	LOAD CELL OUTPUT L	
7	SHD	SHIELD	(INTERNALLY CONNECTED TO PIN 4)

EI CONNECTOR

1	COMPARATOR OUTPUT	
2	AZ	CONTROL SIGNAL
3	REF	
4	1ST	
5	1ST	
6	+12V (+10V)	
7	0V	

AD-4321-SP



				MODEL	AD-4321-A/B
SYMBOL	DATE	EY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 710-SP
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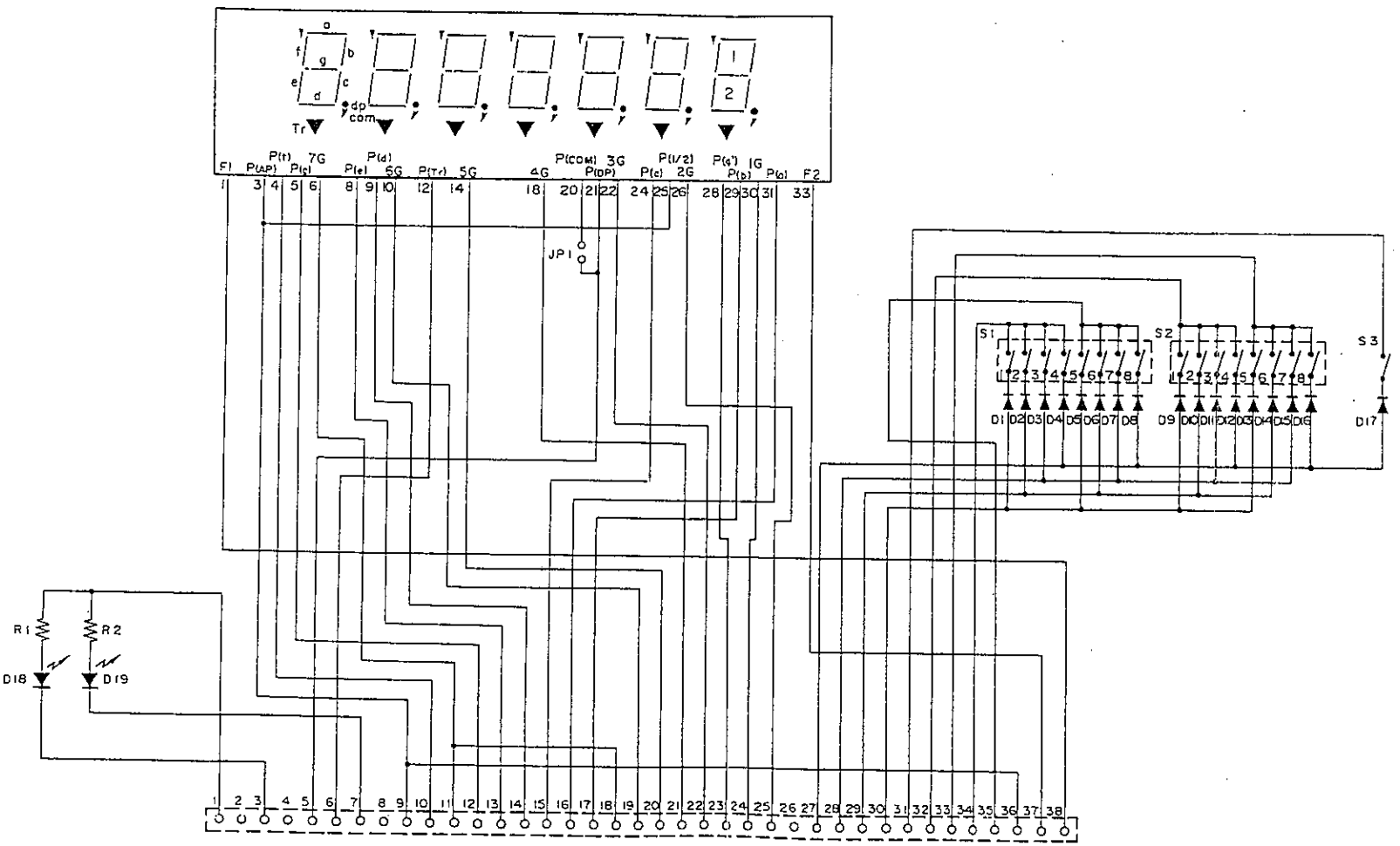

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SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
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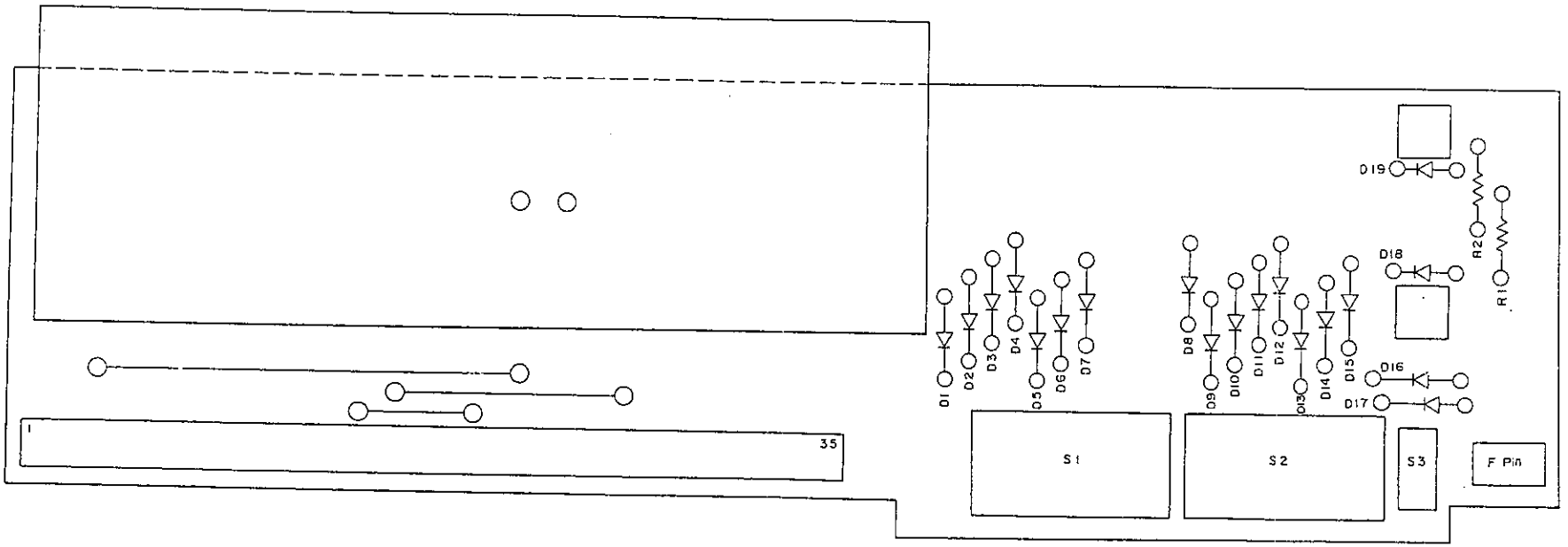

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SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
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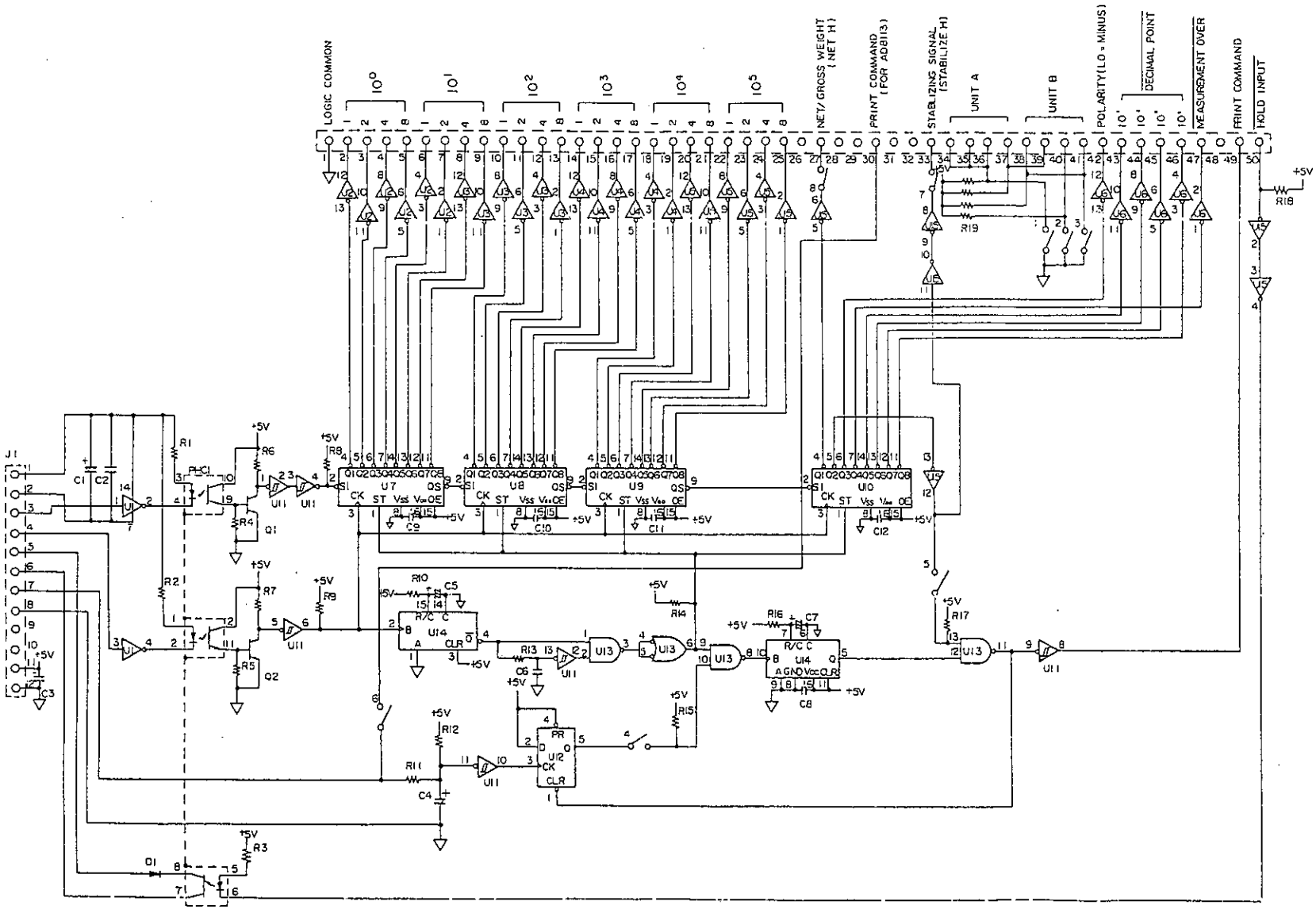

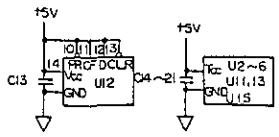

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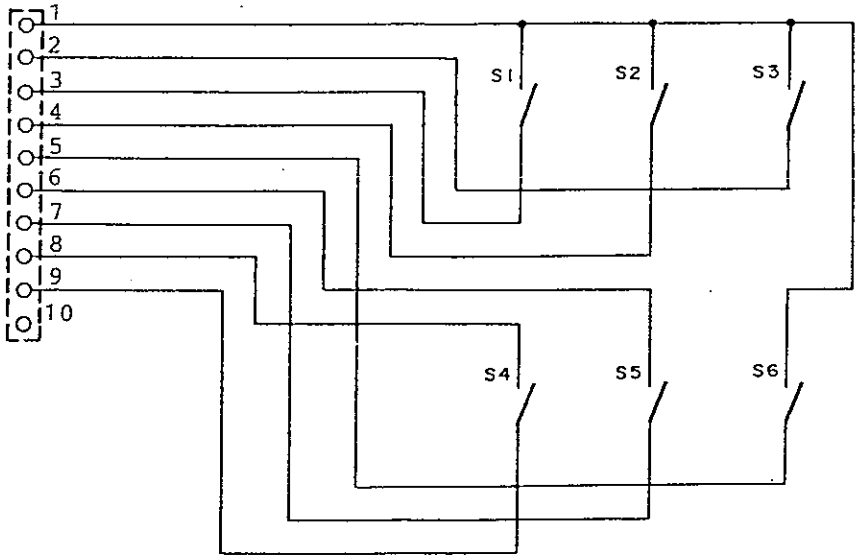
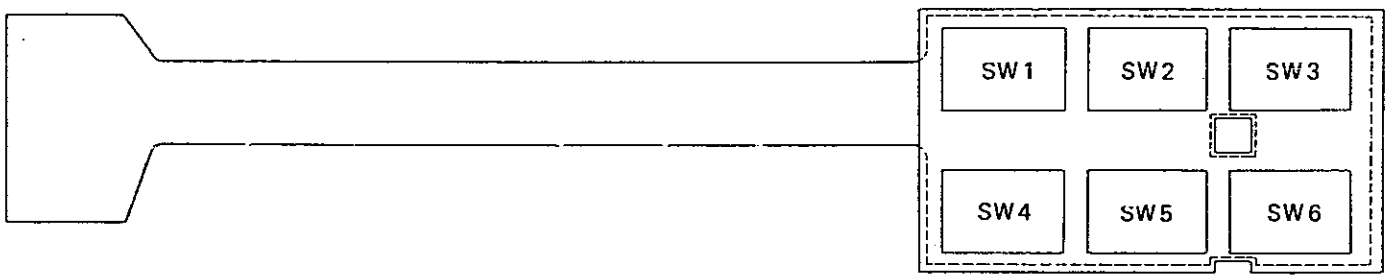
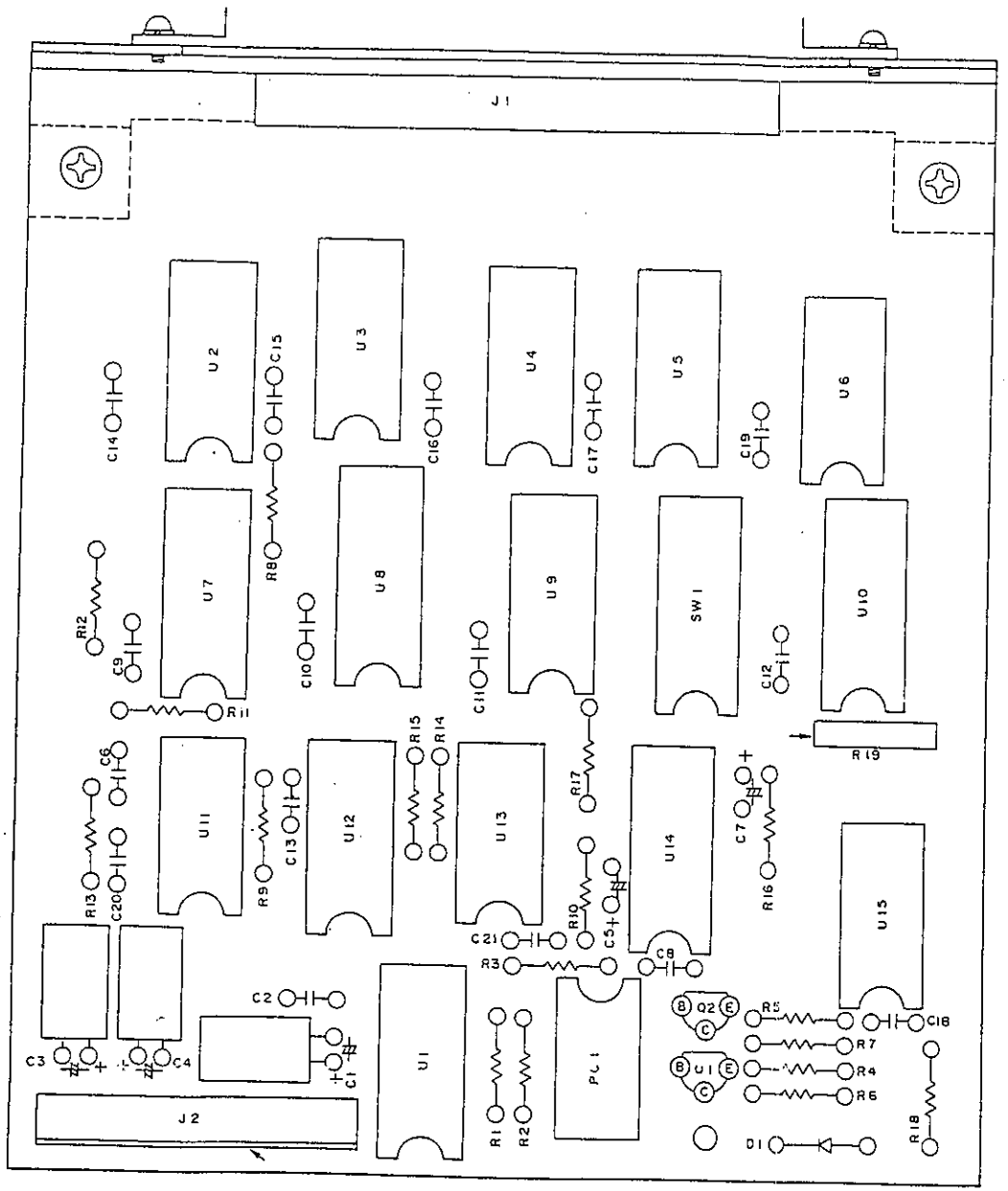
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 712
				DRWG. NO.	

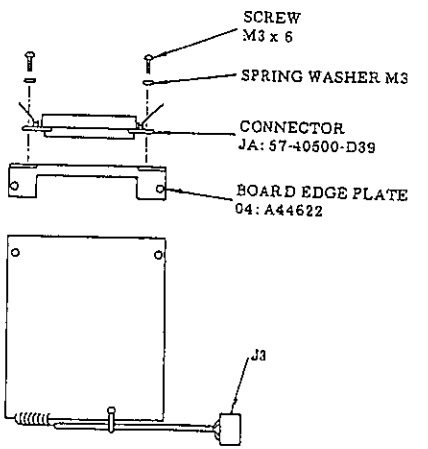




SW1: ZERO
SW2: GROSS/NET
SW3: TARE
SW4: NOT USED
SW5: PRINT
SW6: STANDBY/OPERATE

				MODEL	AD-4321-A/B
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 764
				DRWG. NO.	





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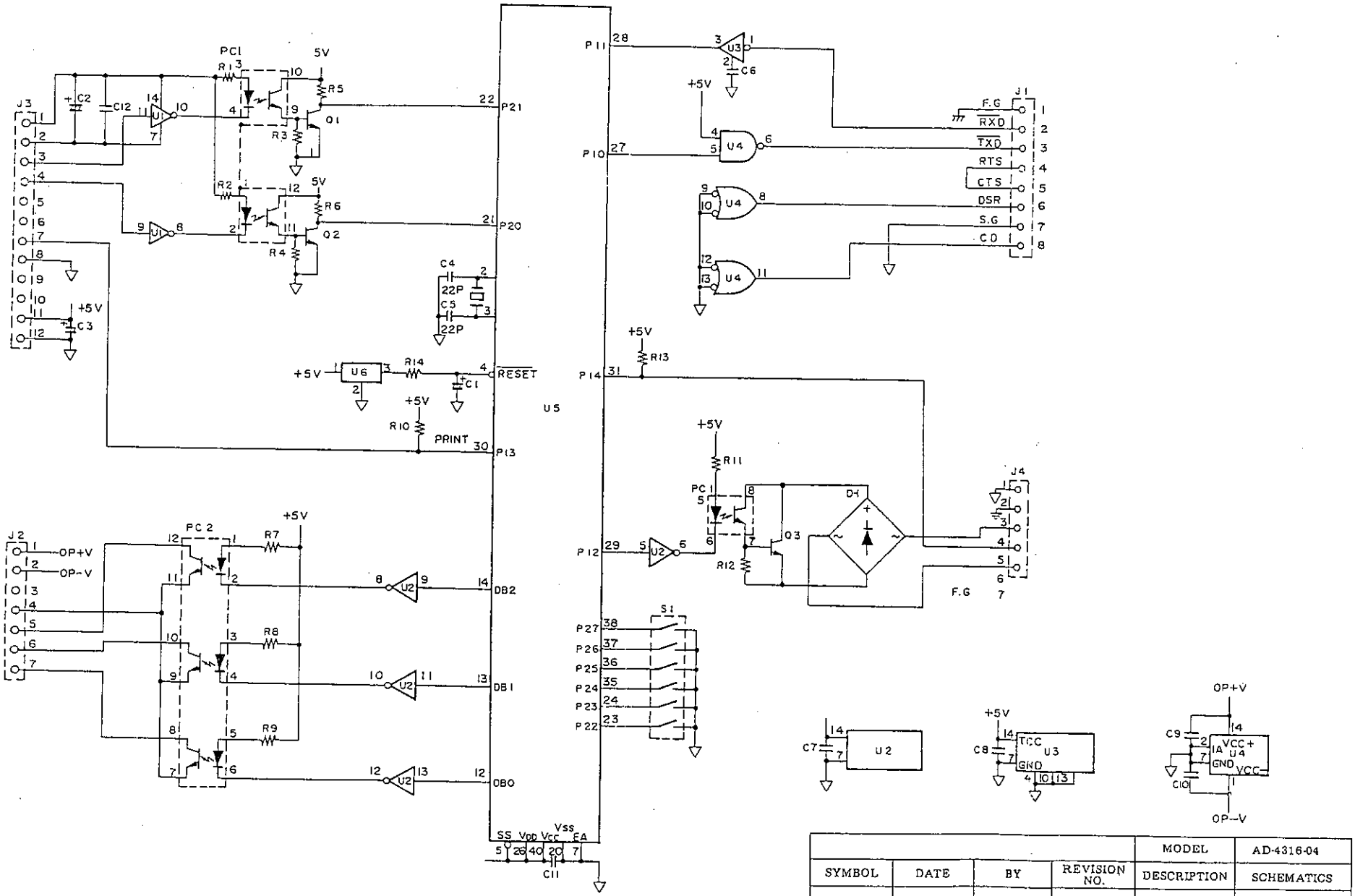
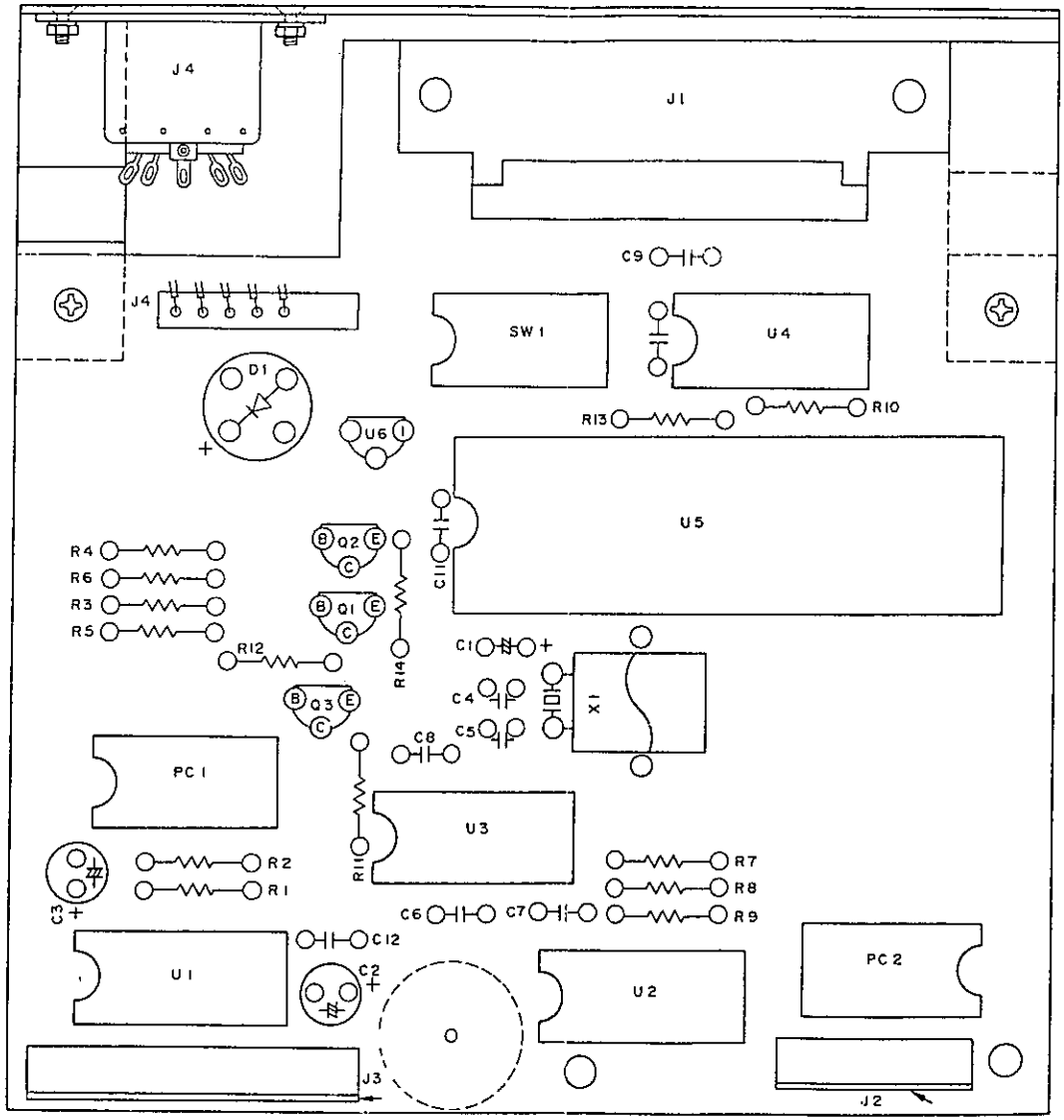
				DRWG. NO.	



				MODEL	AD-4316-04
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 713
				DRWG. NO.	



				MODEL	AD-4316-04
SYMBOL	DATE	BY	REVISION NO.	DESCRIPTION	SCHEMATICS
				STOCK NO.	PZ: 713
				DRWG. NO.	