

MAINTENANCE MANUAL

**MODEL/EX-200A
EX-200N
EY-220A
EY-220C**

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Note : Turn off POWER SWITCH and pull out POWER CABLE from plug socket ; then start cleaning.

Carry out cleaning in a dust-free clean place particularly from iron dusts.

Outside Cleaning

" WEIGHING PAN & PAN SUPPORT "

Detach WEIGHING PAN and PAN SUPPORT and wipe off dusts with detergent-soaked soft cloth.

" PROTECTIVE COVER "

Detach PROTECTIVE COVER and clean it with water-soaked soft cloth. Use neutral detergent, if necessary to remove sticky stains, to protect vinyl-made cover.

" CASE "

Clean CASE with water-soaked soft cloth. Do not drip water inside CASE.

Use soft cloth to clean (1) ACRYLIC PLATE a it is easy to get flaws.

Inside Cleaning

" LEVEL VIAL & DISPLAY TUBE "

Soak soft cloth with water a little and clean both parts (do NOT use detergent of any kind).
Do NOT touch other inside parts.

TROUBLESHOOTING LIST

		Malfunctions		No.
		<p>Note : Carry out Inspections C-1 through C-6 before referring to this table.</p> <p style="text-align: center;">How To See Table</p> <p>Find the malfunction or failure similar to the actual trouble from Malfunctions No. 1 to No. 14 : then see the causes and comments item by item according to the malfunction number. Follow Comment and repair according to Repair No. Example : Malfunction " No display appears after turning on power " ↓ It corresponds to Malfunction No. 2 ↓ 1. Cause - " Fuse is blown out " Replace the blown-out fuse or follow the Troubleshooting List ↓ 2. Cause - " Defect of POWER BOARD " Follow Repair No. B-2-5.</p>		
		Causes	Comments	
1	" g " display remains for long after taking off external tare.	Ambient environment (air flow, vibration)	Change place of installation or use air shield.	
2	Fuse is often blown out.	Dusts on magnet		B-2-1
3	Pan fails to function even if power is turned on.	PAN or PAN SUPPORT contacts UPPER CASE or COVER (when power is input)	Clean PAN and PAN SUPPORT so as not make them contact COVER.	
4	Error in measured weight.	Defect of (48) DISPLAY BOARD.		B-2-2
1	" Error r " display often appears.	Defect of (77) MAIN BOARD.		B-2-3
2	" -P " display remains unchanged.	Defect of (41) POWER BOARD.		B-2-4
1	" +E " display remains unchanged.	Fuse is blown out/power cord plug is not properly set into plug socket.	Replace FUSE applicable to rated voltage.	
4	Random weights are displayed.	Wrong position of (29) STOP NUT.		B-2-5
5	It fails to measure a maximum of 200.000g.	Defect of DEAD LOAD ADJUSTMENT		B-2-6
1	Difference between time to stabilize measurement and time to return to 0 is big.	PAN or PAN SUPPORT is not of standard size.	Replace both with standard PAN and PAN SUPPORT.	
2	Dark display	PAN or PAN SUPPORT is not correctly set on.	Correct set positions (do not make them contact UPPER CASE).	B-2-7
3	" g " display remains for long after depressing TARE key.	Defect of (34) SENSOR BOARD.		B-2-8
4	" g " display remains for long after displaying 8.8.8.8.8.8.8.8kg "	Rare short of (37) FORCE COIL.		B-2-9
5	No display appears after turning on power.	Adjustment is not correct.		
1	Measured values are inconstant.	It fails to display 0.000g when none is placed on PAN.	Continue warm-up for 30 min or more	B-2-10
		Defect of (24) FLEXIBLE BEARING ASSY.		
		Defect of (TF1) TRANSFORMER.	Check voltages and replace (TF1)	

REPAIR PROCEDURE

B-2-1 Removal of Dusts from MAGNET

Wipe off dusts in the following procedure :

- (1) DISASSEMBLY Refer to D-1-1 through D-1-2
- (2) REMOVE DUST Refer to D-1-4
- (3) ASSEMBLY Refer to D-2-1 through D-2-6
- (4) ADJUSTMENT Refer to E-1-1 through E-4-7
- (5) CHECK Refer to C-1-1 through C-6-4

B-2-2 Defect of DISPLAY BOARD

- (1) Display is Dark or do not illuminate :

Check to see if the effective AC voltage $3.9V \pm 10\%$ is applied between Pins 6 and 7 of J3 DISPLAY BOARD. If not, either (K4)

CABLE

or (TF1) TRANSFORMER is defective.

If the effective voltage is applied, (FG1) DISPLAY TUBE is defective. Replace the tube.

- (2) Display is Abnormal :

Example

0 8 2 . 3 1 5 g

(normal 82.315g)

As shown above, certain segments are omitted.
Replace U1 and U3 or (FG1) if it does not work.

Example

0 1 . 4 7 5 g

(normal 111.475)

Digits on certain positions are omitted.
Replace U2 and U4 or (FG1) if it does not work.

B-2-3 Defect of MAIN BOARD

Malfunction No. 1 Measured values are inconstant.

Repair the main board according to the ANALOG SECTION.

Malfunction No. 2 No display appears after turning on the power.

Repair the main board according to the LOGIC SECTION.

Malfunction No. 3

g display remains for long after $\overline{EEEEEEH}$

If the normal display appears after removing the output connector (Pin 50) of PAN or it fails to display normal values after resetting the output connector when OPTION-01 (PARALLEL BCD OUTPUT) is connected, it is defect of OPTION-01.

The BUSY input remains on the low level.

In case OPTION-01 is not connected, repair the main board according to the ANALOG SECTION.

Malfunction No. 4

g display remains for long after depressing

TARE key

Repair the main board according to the ANALOG SECTION.

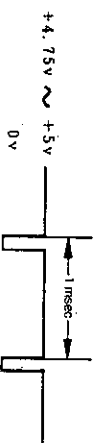
Malfunction No. 8 Random weights appears

Repair the main board according to the LOGIC SECTION.

Malfunction No. 9, 10

\overline{E} \overline{P} display remains unchanged

Repair the main board according to the LOGIC SECTION if the waveform shown below is output to Pin 15 of U17 (LS161A) or refer to the ANALOG SECTION if it is not.



Malfunction No. 11

Error display often appears.

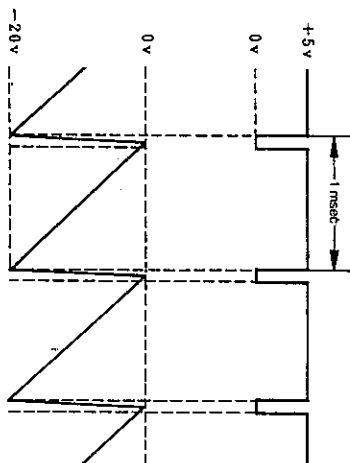
Replace U12 (RAM TMM2016P)

Replace U9 (7404).

Malfunction No. 13 WEIGHING PAN does not function even if power is turned on

Repair the main board according to the ANALOG SECTION.

"Analog Section"

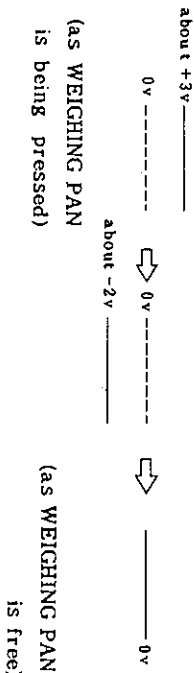


(1) Waveform at Pin 15 of U17

* No checks of the ANALOG SECTION need be made if the waveform at Pin 15 of U17 is normal.

(2) Waveform at Pin 2 of U2

(3) Waveform at Pin 7 of U20



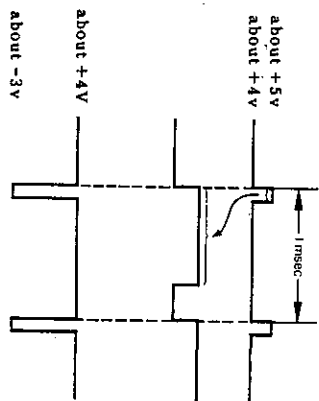
(as WEIGHING PAN is being pressed)

(as WEIGHING PAN is free)

If the waveform is irregular, replace U20 or SENSOR BOARD.

(4) Waveform at Base of Q4 (Transistor)

* Waveform is extended as shown here when a load is applied to WEIGHING PAN.



* Replace Q4 if the collector waveform is irregular while the base waveform is correct.

(5) Check to see if the voltage between TPs (TEST PINS) is held at above +6V. If not, Replace U4, Q6, U18, and U3

"Logic Section"

(1) Check the output pins of U15, 16 and 17

Check to see if the frequencies are half-divided into 4MHz to 2MHz, 1MHz starting from Pin 14 of U15 and ending with Pin 11 of U17. Replace IC if the frequency at its output pin is not half-divided after the frequencies are half-divided immediately before the above output pin.

(2) Check to see if the 4MHz waveform is output to the output pins of U10, Pin 10, 11 and 9.

Make sure of X1 (crystal) and replace U10 if 4MHz is not output to any of its pins 10, 11 or 9.

(3) Check to see if Pin 26 (RESET) of U6 (CPU) is not held at the high level (+5V). If not, Replace C23, Q8, Q7

- (4) Check to see if 2MHz is output to Pin 8 of U5.
 * If entire random values were displayed or the display is irregularly bright, the IC (U7 or U8) of ADDRESS DECODE or IC (U11, 12, 13, 14, 19) of DATA BUS is defective.

B-2-4 Defect of POWER BOARD

Check the output voltages of (TF1) TRANSFORMER. If any output voltage is wrong, replace TF1.

Check to see if the voltage between Pin 1 (GROUND) and TP2 (TEST Pin+5V) of POWER BOARD is held between +4.75V to +5.25V. If not Replace U1, C1, D1

Check to see if the voltage between Pin 1 (GROUND) of J2 and TP1 (TEST PIN -27V)

is held between -28.2V to -26.4V. If not, Replace U2, C2, D2

B-2-5 Wrong Position of (29) STOP NUT

Follow D-1-1 and detach MECHANICAL ASSY including MAGNET ASSY from LOWER CASE.

Dismantle (22) UPPER SHIELD and (40) LOWER SHIELD.

Adjust the height of (29) STOP NUT according to D-2-5.

Attach MECHANICAL ASSY including MAGNET ASSY on LOWER CASE as per D-2-6.

ADJUSTMENT Refer to E-1-1 through E-4-7
 CHECK Refer to C-1-1 through C-6-4

B-2-6 Defect of DEADLOAD ADJUSTMENT

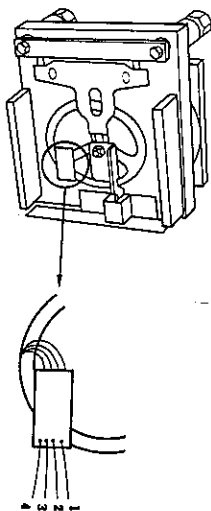
COUNT CHECK Refer to E-4-8.
 DEAD LOAD ADJUSTMENT Refer to E-4-9
 ADJUSTMENT Refer to E-1-1 through E-4-7
 CHECK Refer to C-1-1 through C-6-4

B-2-7 Defect of (34) SENSOR BOARD

Check to see if the levels of Pin 5 and 6 of U20 of the main board vary when pressing the weighing pan.
 Replace (34) if it is found defective.

B-2-8 Disconnection/Rare Shorting of FORCE COIL

Follow D-1-1 and detach MECHANICAL ASSY including MAGNET ASSY from the lower case.



Take the resistances between 1 & 2 and 3 & 4
 1 ~ 2 110~140 Ω
 3 ~ 4 25~40 Ω

If defective, replace (37) FORCE COIL RIBBON in the following steps :

- (1) DISASSEMBLY Refer to D-1-2 through D-1-4
- (2) EXCHANGE Refer to D-1-5
- (3) ASSEMBLY Refer to D-2-1 through D-2-5
- (4) ADJUSTMENT Refer to E-1-1 through E-4-7
- (5) CHECK Refer to C-1-1 through C-6-4

B-2-9 Defect of ADJUSTMENT

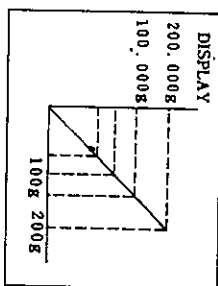
CHECK Refer to C-1-1 through C-6-4
 ADJUSTMENT Refer to E-1-1 through E-4-7
 CHECK Refer to C-1-1 through C-6-4

B-2-10 Defect of (24) FLEXIBLE BEARING ASSEMBLY

Note : Replace FLEXIBLE BEARING ASSY if it is evenly slightly bent, twisted or otherwise deformed together with the upper side (24) and the lower side (24) of (23) MAGNET ASSY in the following procedure :
 DISASSEMBLY & EXCHANGE Refer to D-1-1 through D-2-6
 ASSEMBLY Refer to D-2-1 through D-2-6
 ADJUSTMENT Refer to E-1-1 through E-4-7
 CHECK Refer to C-1-1 through C-6-4

LINEARITY CHECK

C-5-1 Meaning of LINEARITY CHECK



The linearity means to display the measured weight exactly in proportion to the weight to be taken.

C-5-2 Applicable Weights

- 50g weight x 1
- 100g weight x 1
- 200g weight x 1

C-5-3 Tolerance

$\pm 0.001g$

C-5-4 Inspection Procedure

- Depress the TARE key to reset the display to 0.
- Place the 200g weight on the weighing pan.
- Adjust the display to read 200.000g by SPAN VOLUME if it reads otherwise

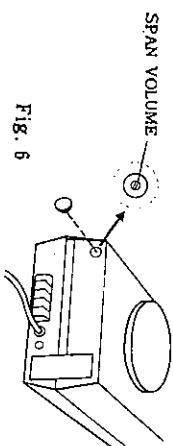


Fig. 6

(turn SPAN VOLUME for a couple of times to precisely indicate 200.000g as the initial 0.000g reading is changed by turning the volume).

- Take out the 200g weight and depress the TARE key.
- Place the 50g weight and record the reading.

Place the 100g weight and record the reading.

Place the 200g weight again and record the reading.

Check to see if the measured weights are all read within the tolerance.

- * Repeat this inspection C-5-4 for at least three times to get best inspection results.

SPAN CHECK

C-6-1 Meaning of SPAN CHECK

This check is to see if the measured weight is equal to the actual weight of an object.

C-6-2 Applicable Weight

One 200g weight

C-6-3 Tolerance

$\pm 0.001g$

C-6-4 Inspection Procedure

- Depress the TARE key.
- Place the 200g weight on the weighing pan.
- Check if the measured weight is held within the tolerance or not (the reading from 199.999g to 200.001g is acceptable as the tolerance is set to $\pm 0.001g$).
- Repeat the same test at least for three times.

DISASSEMBLY

D-1-1

Detachment of MECHANICAL ASSEMBLY including MAGNET ASSEMBLY from (65) LOWER CASE.

Note : Do NOT start the work before turning off POWER SWITCH.

Do NOT pull the cables when removing (K7) and (K8) from the main board (as it causes to loose contact).

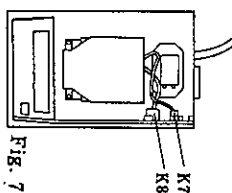


Fig. 7

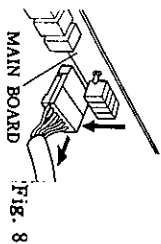


Fig. 8

* Press hard the connector and pull it toward you (Fig. 8).

Detach both WEIGHING PAN and PAN SUPPORT, lay down both on the sides and loosen four screws shown by arrows

* Just loosen the screws so much as can be turned by fingers but do not take them out with a driver.

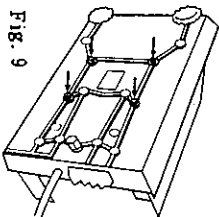


Fig. 9

Use a desk, hold the rear end of scale by one hand, as shown in Fig. 10 ; and remove all four loosened screws.

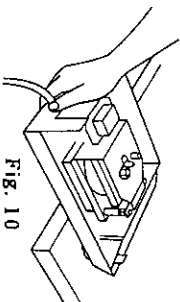


Fig. 10

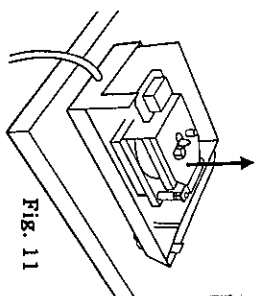


Fig. 11

Hold (32) MAGNET ASSEMBLY and lift it slowly from the bottom without touching other parts around. Then Place it on a clean dust-free place.

D-1-2

Detachment of (14) PEG and Replacement of (24) FLEXIBLE BEARING ASSEMBLY

Note : Do NOT apply extra force to (24) FLEXIBLE BEARING ASSY as it is fragile.

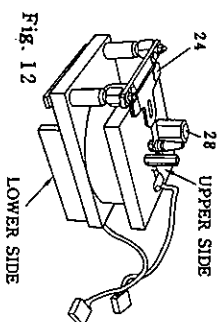


Fig. 12

UPPER SIDE
LOWER SIDE

See Fig. 12

Detach (22) UPPER SHIELD and

(40) LOWER SHIELD.

Remove (28) LEVEL VIAL

with a spanner.

Loosen (30) shown in Fig. 13 with (805) (10mm special spanner)

and loosen (29) STOP BOLT as much as (802) (8mm spanner) can be set into (35).

Secure (35) with (802) (8mm spanner) as shown in Fig. 14. so as not to turn it then loosen (14) PEG with (803) (10mm spanner) as much as it does not come off.

Lay down (14) MECHANICAL ASSY as shown in Fig. 15 slowly and dismantle it. Place each part removed in the order of assembly.

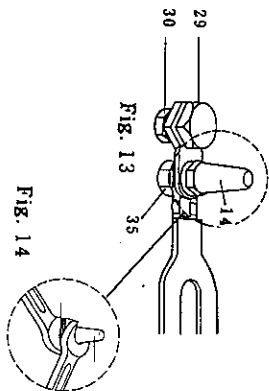


Fig. 13

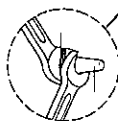


Fig. 14

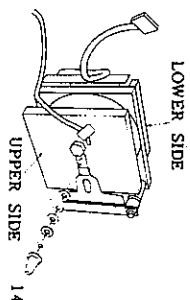


Fig. 15

D-1-3 Replacement of (24) FLEXIBLE BEARING ASSEMBLY

* D-1-3 is required only if (24) FLEXIBLE BEARING ASSY is defective or damaged and it needs be replaced.

Note : Do NOT turn (25) CORNERLOAD NUT while the replacement is proceeding.
Replace another flexible bearing assembly on the lower side following the upper side replacement.

Remove two (23) NUTS by (806) (7mm spanner) as shown in Fig. 16 and detach (24) FLEXIBLE BEARING ASSY.

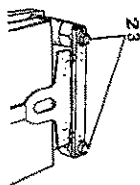


Fig. 16

Visually check a new flexible bearing assembly to see if the bearings are aligned straight as shown in Fig. 17. Do not use if they are even slightly twisted.

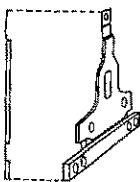


Fig. 17

Turn each of two (25) CORNERLOAD NUTS as shown in Fig. 18 to set the height between arrows to 30.7mm to 31.0mm.

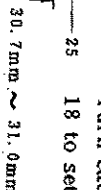


Fig. 18

Attach (20) ALUMINUM WASHER and (15) SPRING WASHER to the correct side of (24). Carefully set (15) : after (24) is attached set both (23) NUTS lightly.

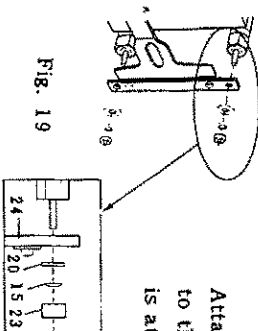


Fig. 19

D-1-4 Dust Cleaning of MAGNET

Note : Use steel tools with care as the magnet force of MAGNET is quite strong.

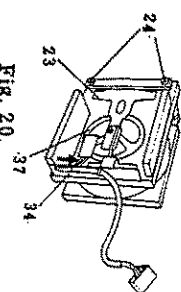


Fig. 20

Place MAGNET ASSY as shown in Fig. 20.
Remove four thin cords on PC board of (37), shown by arrow, by a soldering iron.
Alternately loosen (23) NUTs by (806) (7mm spanner) and remove both.

Hold the part shown by arrow in Fig. 21 and slowly remove it without damaging (24) FLEXIBLE BEARING ASSY.

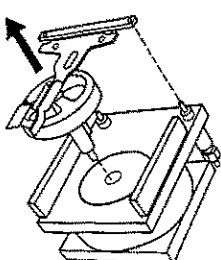


Fig. 21

Keep the removed part in a box as shown in Fig. 22.

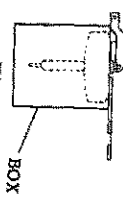


Fig. 22

Note : (24) FLEXIBLE BEARING ASSY remains on the upper side.
Clean the magnet thoroughly as dusts remained on it cause troubles later.

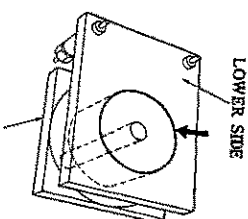


Fig. 23

Lay down the magnet as shown in Fig. 23 (with lower side up)
Insert an adhesive paper type (not cloth tape) into the gap shown by arrow and clean off dusts and iron powders from the magnet.
Then illuminate the magnet to see if any dusts remain on it.



D-1-5

Detachment of (24) FLEXIBLE BEARING ASSEMBLY on the lower side of MAGNET ASSEMBLY

* D-1-5 is required only if (24) is found defective or damaged.

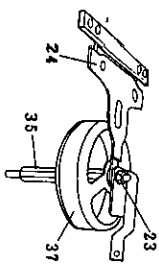


Fig. 24

Secure (35) WEIGHING AXLE with (802) (8mm spanner) ; loosen (23) NUT by (801) (7mm box driver) and dismantle (24). Place the decomposed parts in the order of dismantling.

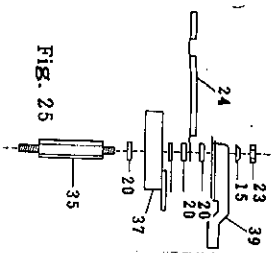
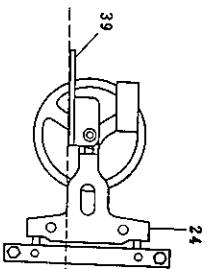


Fig. 25

Replace (24) with new spare according to Fig. 25 with particular care to be paid to the direction of (15) SPRING WASHER.
Lightly clamp (23) NUT after setting (39) POSITIONING HOLE UNIT perpendicular to (24).

ASSEMBLY



D-2-1

Attachment of (24) FLEXIBLE BEARING ASSY, (37) FORCE COIL BOBBIN & (35) WEIGHING AXLE

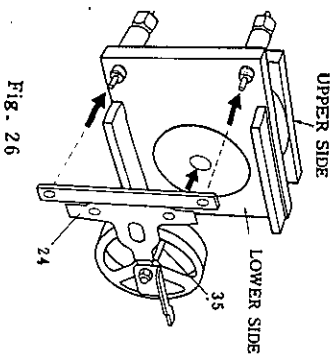


Fig. 26

Insert both (35) and (24) towards the arrow as shown in Fig. 26
Gently set (35) into (24) on the upper side of MAGNET ASSY as shown in Fig. 27.

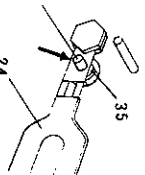


Fig. 27

D-2-2

Setting of (24) FLEXIBLE BEARING ASSY on lower side of MAGNET ASSY

* D-2-2 is required only if D-1-5 has been carried out.

Detach (31) STANDOFF by (802) (8mm spanner) as shown in Fig. 27

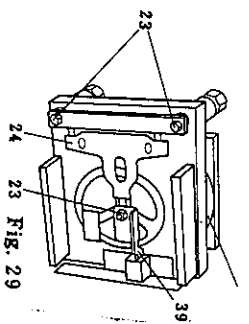


Fig. 29

Place MAGNET ASSY as shown in Fig. 29.
Lightly set (23) NUT shown by the arrow in Fig. 29. Do not forget (15) SPRING WASHER.

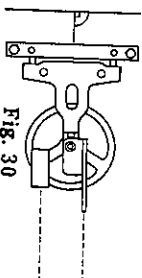


Fig. 30

Secure (35) with (802) (8mm spanner) in a way as shown in Fig. 27 and clamp (23) NUT by (801) (7mm box driver) to secure it.

D-2-3 attachment of (37) FORCE COIL BOBBIN

BOBBIN

Set in (15) SPRING WASHER and lightly clamp (23) NUT shown in Fig. 32
Attach (31) STANDOFF and place MAGNET ASSY as shown in Fig. 31.

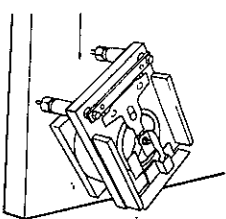


Fig. 31

Slowly clamp (23) NUTs shown in Fig. 32 alternately so as to set (37) FORCE COIL BOBBIN at the center of gap, as shown in Fig. 33.

Lift up (39) about 3mm by fingers and check to see if it touches (37). If it does, loosen (23) and check it again.

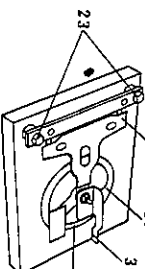


Fig. 32

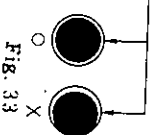
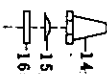


Fig. 33

D-2-4 Attachment of (14) PEG & (19) STOP PLATE

Note 1: Use (15) SPRING WASHER as shown in Fig. 34.

- 2: (16) BRASS WASHER is generally used in the factory adjustment. Assemble the unit intact regardless of whether the brass washer is attached or not.
- 3: Note the thickness of (17), (18) and (20) ALUMINIUM WASHERS differs from each other.



Attach (14) through (20) as shown in Fig. 35.

Set (14) PEG lightly.

Adjust (19) and (29) STOP BOLTS so as to set (19) STOP PLATE as shown in Fig. 36.

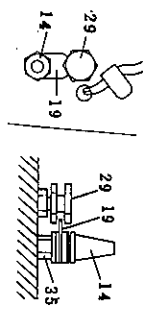


Fig. 36

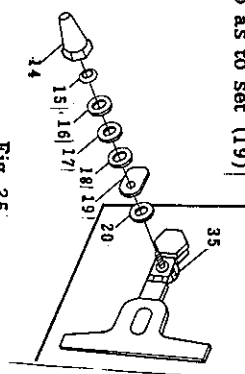


Fig. 35

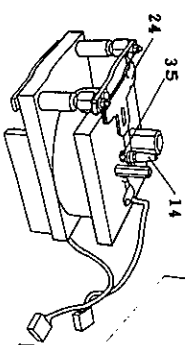


Fig. 37

Place MAGNET ASSY as shown in Fig. 37.
Secure (35) WEIGHING AXLE with (802) (8mm spanner) and clamp (14) PEG by (803) (10mm spanner).
Lift up (14) with fingers and see if it smoothly functions or follow D-2-3 if not.

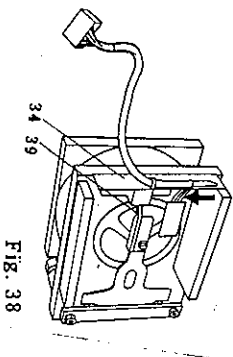


Fig. 38

Attach (34) SENSOR BOARD in a way so as to set (39) POSITIONING HOLE UNIT at the center as shown in Fig. 39.
Solder the cord shown by arrow in Fig. 38.

D-2-5 Adjustment of (29) STOP BOLT Height

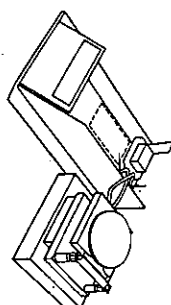


Fig. 40

Place MECHANICAL ASSEMBLY including MAGNET ASSEMBLY on a flat desk as shown in Fig. 40.

Connect K7 and K8 to the main board J4, J5 as shown in Fig. 40

Attach both WEIGHING PAN and PAN SUPPORT.

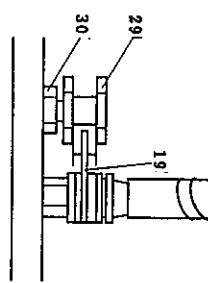


Fig. 41

Turn on the power and turn (29) so as to move (19) STOP PLATE to the center of (29) STOP BOLT as shown

Fig. 41. Then adjust the height and clamp (30) NUT. Disconnect (K7) and (K8) from the main board, J4, J5. Place MECHANICAL ASSEMBLY including MAGNET ASSEMBLY on a clean dust-free desk.

D-2-6 Attachment of MECHANICAL ASSEMBLY including MAGNET ASSEMBLY to LOWER CASE

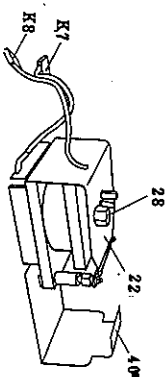


Fig. 42

Set (28) LEVEL VIAL with a spanner.
Set (22) UPPER SHIELD and (40) LOWER SHIELD as shown in Fig. 42 and secure them with screws.

Hold the assembly by one hand as shown in Fig. 43 without tilting it; then secure it at four points with (59) (SCREW 4 x 15), (27) (SPRING WASHER 4mm) and (67) (WASHER 4mm).

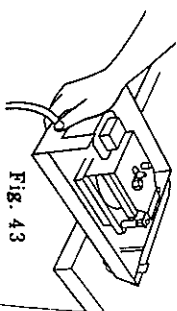


Fig. 43

Connect (K7) and (K8) with the main board J4, J5 as shown in Fig. 44.

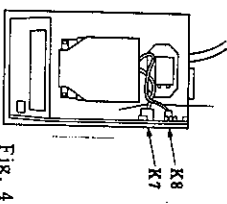


Fig. 44

PRECAUTION

E-1-1 Environment

The ambient temperature 20 °C ~ 25 °C
The room is free of vibration and ventilation.
The balance is not directly exposed to the sunlight.
The room is clean and dust-free particularly from iron dusts.

E-1-2 Working

Make sure by (28) LEVEL VIAL if the balance is set flat or not.
Warm up the balance for 30 min or more.
Do not touch any parts or units, particularly the volumes, unless so specified.
Use the high-precision standard weights.
Handle the weights with particular care.
Use the BREEZE-BREAK to protect the balance from wind.
Check all parts thoroughly after each adjustment.

CORNERLOAD ADJUSTMENT

E-2-1 Description of CORNERLOAD ADJUSTMENT

Follow C-4 (CORNERLOAD CHECK) and adjust CORNERLOAD.

E-2-2 Applicable Weight

One 50g weight (overlay the fractional weights, if used).

E-2-3 Adjustment Procedure

Depress the TARE key.
Set the 50g weight on Point A as shown in Fig. 4. at the page of Depress the TARE key.
Set the 50g weight on Point B and record the reading and the code.
Repeat the same weighing on Points C, D & E and record the readings and the codes.

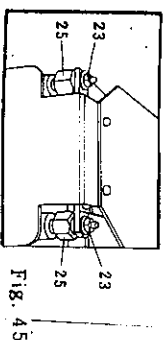


Fig. 45

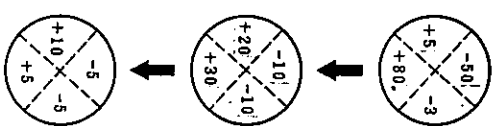
Collate the measured weights with E-2-6 (CORNERLOAD ADJUSTMENT LIST) and turn (25) CORNERLOAD NUTS on both sides, as shown in Fig. 45, to adjust the cornerload.

To turn (25), loosen (23) so much as (25) can be lightly turned; then clamp (23) tightly.
Do not loosen both the left and right (23) NUTs at a time and proceed with the adjustment of either cornerload nut after the adjustment of other one is complete.
Refer to the corner load adjustment list, E-2-6 and repeat E-2-4 to complete the adjustment.

Follow the adjustments E-3 and E-4 following E-2-3 CORNERLOAD ADJUSTMENT without fail; then follow the checks C-4, C-5 and C-6.

E-2-4 Typical CORNERLOAD ADJUSTMENT

(UNIT : mg)



When collated with E-2-6, the "8" pattern is displayed. Then turn both of (25) at left and right sides clockwise (more information is given in E-2-3).

It is the "4" pattern of E-2-6, turn the left (25) only clockwise.

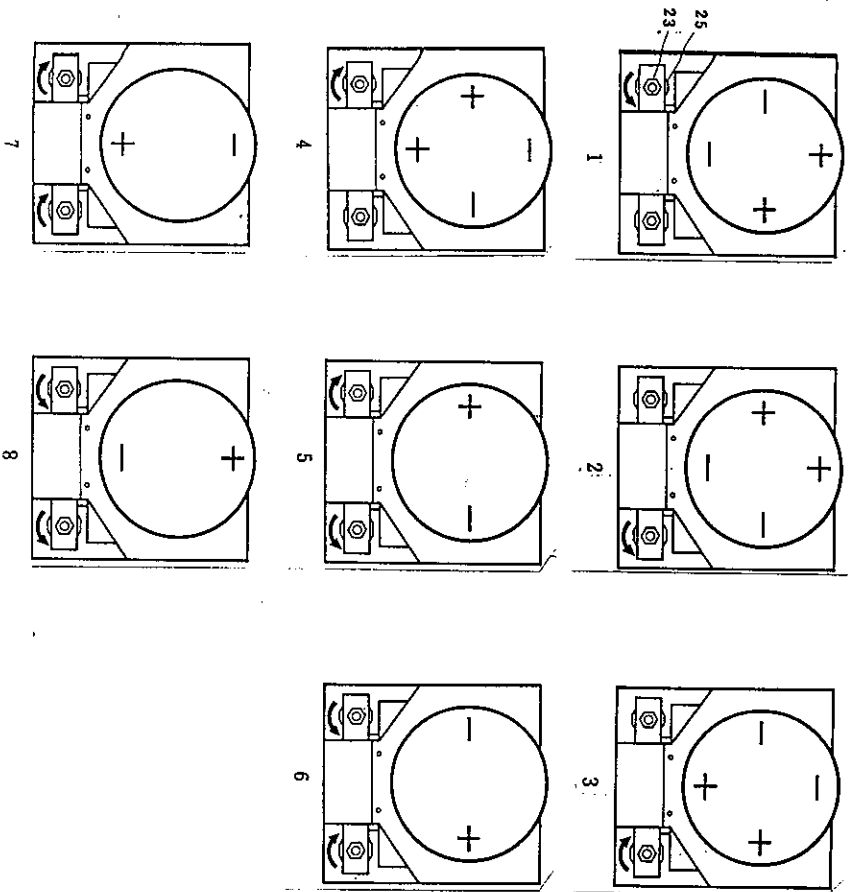
It is again the "4" pattern of E-2-6, turn the left (25) only clockwise.

D-2-5 If cornerload adjustment failed

In case it fails to lower the displayed value by the repeated cornerload adjustment or the adjustments resulted as follows, it might be caused by wrong assembly if the unit was once dismantled. Correctly assemble the unit once again. Or it may be caused by certain defect of (24) FLEXIBLE BEARING ASSY, replace the assembly according to B-2-10.



E-2-6 CORNERLOAD ADJUSTMENT LIST



LINEARITY ADJUSTMENT

E-3-1 Meaning of LINEARITY

This adjustment is to follow C-5 (LINEARITY CHECK) and adjust the linearity, which deviates from the tolerance ($\pm 0.001g$).

E-3-2 Applicable weights

- One 50g weight
- One 100g weight
- One 200g weight

E-3-3 Tolerance

$\pm 0.001g$

E-3-4 Adjustment Procedure

The linearity adjustment shall be carried out in the following procedure according to E-3-5 (TYPICAL LINEARITY ADJUSTMENT).

Step 1

See E-1 (PRECAUTION)

Place the 200g weight on the center of weighing pan.

If " + E " is displayed, turn SPAN VOLUME shown in Fig. 46 by the attached driver counterclockwise until a digit is shown.

If a digit is displayed instead of " + E ", no adjustments are required (here the display needs not exactly be 200.000g).

Take off the weight from the weighing pan.

Step 2

Depress the TARE key.

Place the 100g weight on the weighing pan and record the reading (this display is called A).

Depress the Tare key.

Take off the weight.

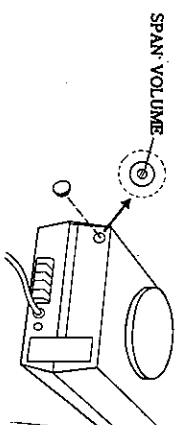


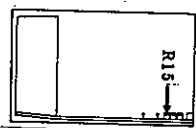
FIG. 46

Step 3

Place the 200g weight on the weighing pan and record the reading (this display is called B).

Step 4

Compare both values A and B.



If B > A (B is larger than A), turn R15 (LINEARITY VOLUME) of the main board as shown in Fig. 47 counter-clockwise.

If B < A (B is smaller than A), turn R15 clockwise.

Repeat the above steps 2 to 4 until both A and B are found equal (with the tolerance of $\pm 0.001g$) (at least for a few times, although it depends on the operator).

* Follow E-4 (SPAN ADJUSTMENT) after completing E-3-4 *

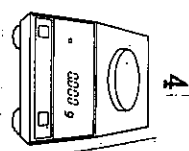
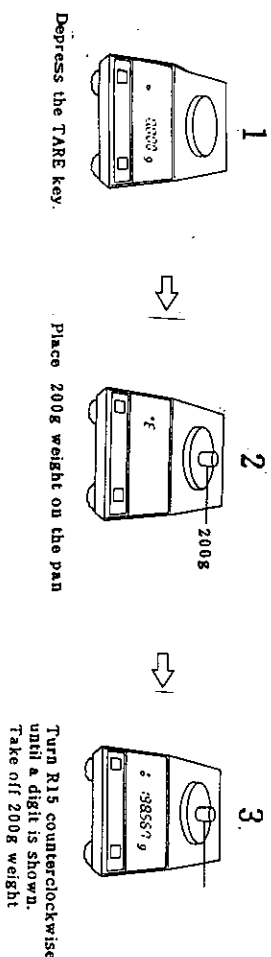
* Follow E-3-6 if proper LINEARITY adjustment by R15 failed *

E-3-5 TYPICAL LINEARITY ADJUSTMENT

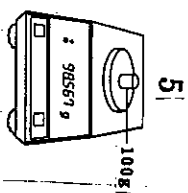
A- Displayed value with 100g weight

B- Displayed value with 200g weight after the TARE key is depressed while the 100g weight remained on the weighing pan, then the 100g weight was taken out.

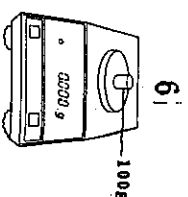
Example : B > A



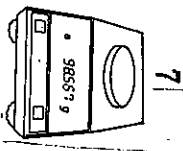
Depress the tare key



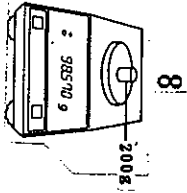
Place 100g weight on the pan. This display is called A.



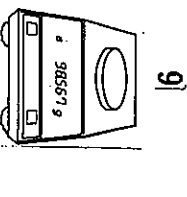
Depress the TARE key.



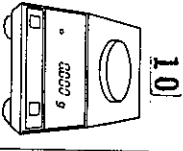
Take off 100g weight



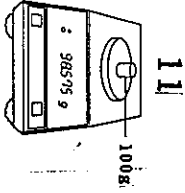
Place 200g weight on the pan. This display is called B. Turn R15 counterclockwise as B > A.



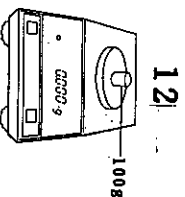
Take off 200g weight



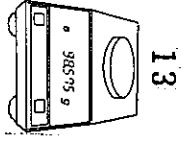
Depress the tare key



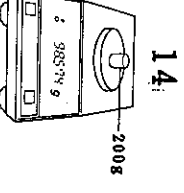
Place 100g weight on the pan. This display is called A.



Depress the TARE key.



Take off 100g weight



Place 200g weight on the pan. This display is called B. Adjustment is complete as A coincides with B (with the tolerance of $\pm 0.001g$).

E-3-6 In case adjustment by LINEARITY adjustment volume R15 failed.

Change the resistance of R16 of the main board.

Turn off the power and detach the main board.

If R15 is fully turned counterclockwise as B) A, change 100K Ω to 200K Ω .

If R15 is fully turned clockwise as B (A, change 100K Ω to 47K Ω). Following the change of resistance, set back the main board into the scale and repeat E-3-4.

SPAN ADJUSTMENT

E-4-1 DESCRIPTION OF SPAN ADJUSTMENT

Follow C-6 (SPAN CHECK). If the tolerance ($\pm 0.001g$) is not observed, place a weight in the known weight on center of the weighing pan and adjust the reading to the known weight.

E-4-2 Tolerance $\pm 0.001g$

E-4-3 Applicable weights

- One 50g weight
- One 100g weight
- One 200g weight

E-4-4 Adjustment Procedure

See E-4-5 (Typical Span Adjustment)

Depress the TARE key.

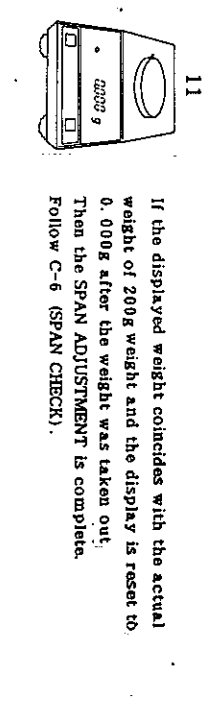
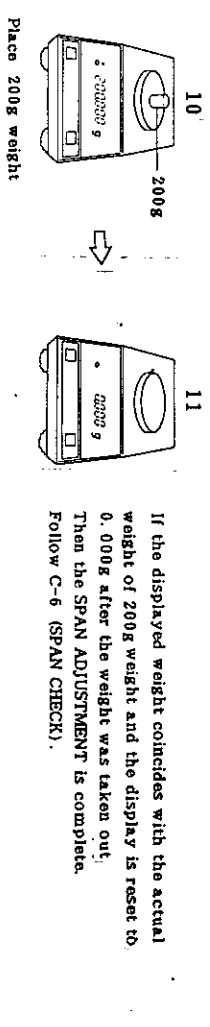
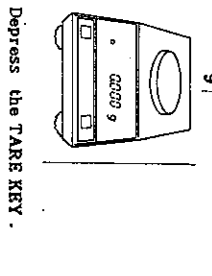
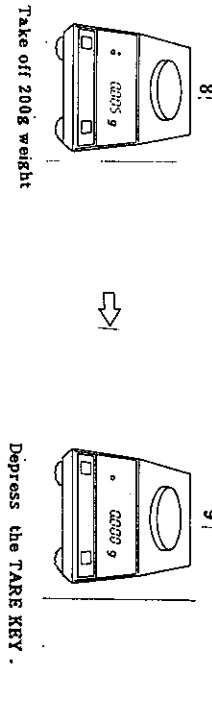
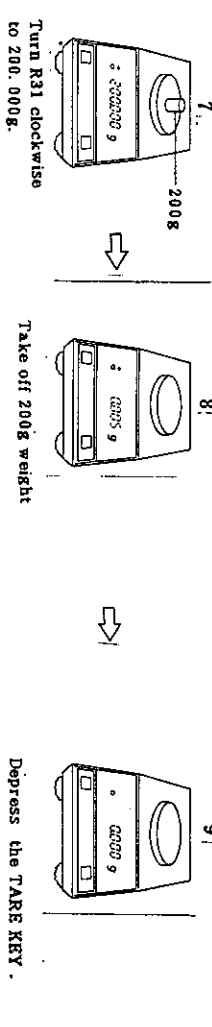
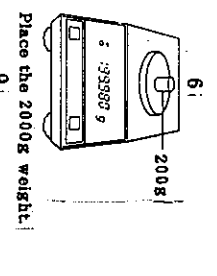
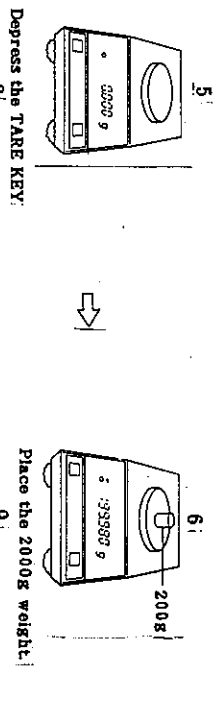
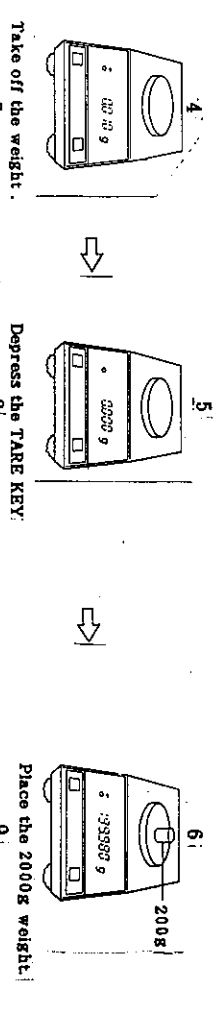
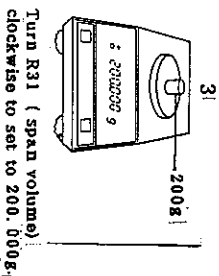
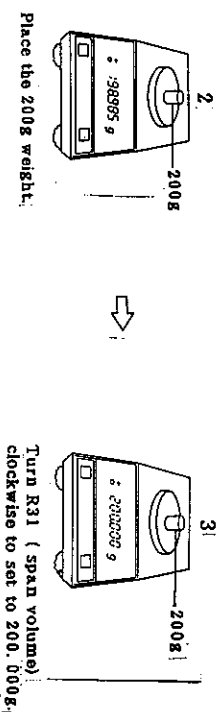
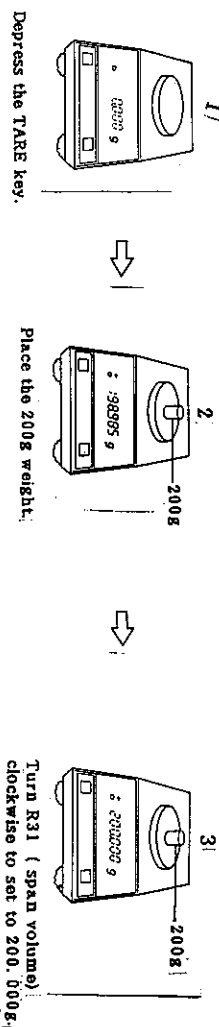
Place the 200g weight on the center of weighing pan.

Turn R31 (SPAN VOLUME), which is located at shown in FIG. 46, with the attached driver clockwise to set the equal value to the 200.000g display if the former reading is smaller. If the displayed value is equal to +E or larger than +200.000g, turn R31 (SPAN VOLUME) counterclockwise to set to 200.000g. Take off the weight.

As the span volume is turned and the weight is taken off, the value displayed as 0.000g shifts either to the plus or minus side, depending on the turning of span volume. Take off the weight without fail after the span volume has been turned; then depress the TARE key and make sure 0.000g is displayed. Repeat the same procedure E-4-4 until 200.000g is displayed (with the tolerance of $\pm 0.001g$).

* Follow E-4-6 if unable to adjust the span by fully turning R31 (SPAN VOLUME) clockwise and counterclockwise *

E-4-5 TYPICAL SPAN ADJUSTMENT



E-4-6 CHANGE OF DIP SWITCH SETTING

Note : Carry out E-4-8 (COUNT CHECK) first and change the setting if no defect nor trouble is found by the check.

Adjust the span by joint use of POSITION No. 3, POSITION No. 4 of DIP SWITCH as shown in Fig. 49 and R31 (SPAN VOLUME).

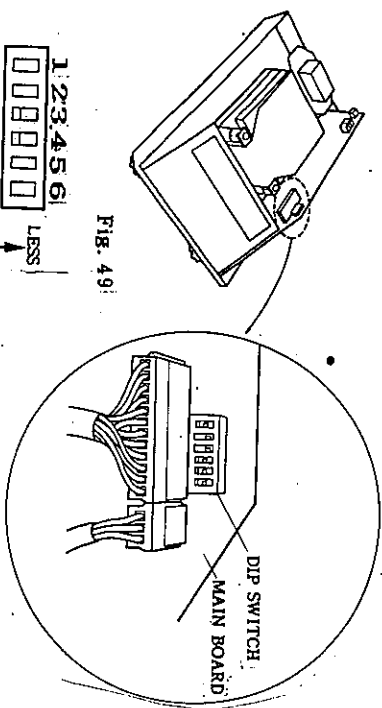
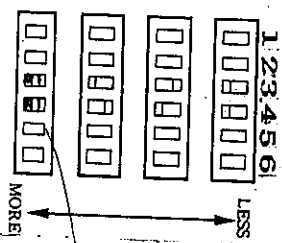


Fig. 49



The following relation is made between the settings of POSITION Nos. 3/4 of DIP SWITCH and the change in display :

1 2 3 4 5 6
0 0 0 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
MORE

Fig. 50

Fully turn R31 (SPAN VOLUME) counterclockwise then turn it back by 10 times.

Record the present setting of DIP SWITCH.

If unable to adjust the span properly by the counterclockwise turn of R31 (SPAN VOLUME), change the present setting of DIP SWITCH (Fig. 50) to a lower level. If the adjustment by full clockwise turn failed, change the setting to a higher level.

Note : If the DIP SWITCH setting is changed,

A few seconds after depressing the TARE key, the display will read

Repeat E-4-4.

* Follow E-4-7 if unable to adjust the span by E-4-6 *

E-4-7 Jumper Wire Change

Turn off the power.

Reset the DIP SWITCH setting to the initial setting as recorded in E-4-4.

Change the jumper wires, JP A and JP B of the main board (Fig. 51) as follows using a nipper and a solder iron :

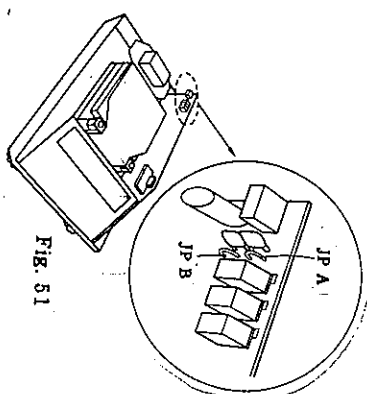


Fig. 51

Cut JP A and connect JP B if JP A is connected and JP B is cut out.

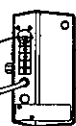
Connect JP A and cut JP B if JP A is cut out and JP B is connected.

Turn on the power.

Repeat E-4-4 and E-4-6.

* Follow E-4-8 and E-4-9 if unable to adjust the span by E-4-7 *

E-4-8 COUNT CHECK



Leave the weighing pan without load.

Push up the mode switch as shown in Fig. 52 to turn it on.



Fig. 52 MODE SWITCH

Turn on the power while depressing the TARE key, certain digit are displayed as shown in Fig. 53.

Then check if the digits are within $\begin{array}{|c|} \hline 0 \\ \hline \end{array}$ 350 to $\begin{array}{|c|} \hline 0 \\ \hline \end{array}$ 650

* Example *
 $\begin{array}{|c|} \hline 0 \\ \hline \end{array}$ 560

Fig. 53

If the digits deviate from the above range, either (24) FLEXIBLE BEARING ASSY is defective or the assembly has been made wrongly if the unit was once dismantled. Replace (24) as per B-2-10 and re-assemble the scale in the correct manner.

E-4-9 DEADLOAD ADJUSTMENT

* (807) Variable Resistor Specification

Variable resistance 100 ~ 1M Ω

Variable resistance width 10 Ω

Applicable resistance 1/4W, $\pm 100\text{PPM}/^{\circ}\text{C}$

Note : Carry out the adjustment without removing the main board from the lower case.

Set the resistance of (807) variable resistor to 500 or more if it is connected between two TPs (TEST PIN), as shown in Fig. 54. Keep the above limit even if the resistance is varied.

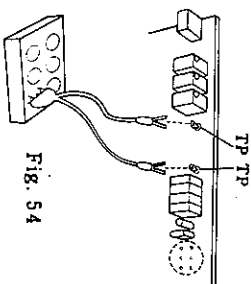


Fig. 54

See E-4-10, Typical Deadload Adjustment.

Step 1

Turn off the power.

Detach the upper case.

Disconnect all resistors between R57 and R60 of the main board.

Connect (807) variable resistor between two TPs (TEST PIN) at shown in Fig. 54.

STEP 2

Repeat E-4-8 (COUNT CHECK).

The displayed value is called A.

Place the 200g weight on the weighing pan; the displayed value is called B.

Vary the resistance of variable resistor to find the resistance where B is 3100 (constant) larger than A and it is closest to value A+3100.

Turn off the power and set a suitable resistance for R57; Use the resistor having $\pm 25\text{PPM}/^{\circ}\text{C}$ if between 500 Ω and 1k Ω or having $\pm 50\text{PPM}/^{\circ}\text{C}$ if more than 1k Ω .

Take off the weight.

Repeat Step 2 until the value B becomes equal to value A+3100 (tolerance ± 5), provided that the resistor is consecutively connected from R58 to R59 and so on.

Note: If the resistance of (807) variable resistor is wrongly set

under 500 and either +E or -P is displayed in the ad-

justment, Q4 of the main board is destroyed and it must

Follow the following procedure after completing the dead

load adjustment without fail;

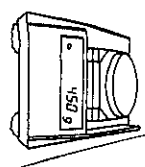
LINEARITY ADJUSTMENT Refer to E-3-1~E-3-6

SPAN ADJUSTMENT Refer to E-4-1~E-4-7

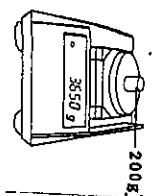
LINEARITY CHECK Refer to C-5-1~C-5-4

SPAN CHECK Refer to C-6-1~C-6-4

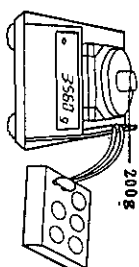
E-4-10 Typical Dead Load Adjustment



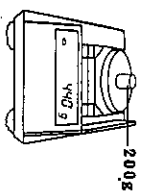
Push up the mode switch.
Depress the TARE key and turn on the power at the same time.
450 is displayed. Take it as A.



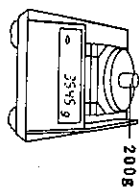
Place the 200g weight on the weighing pan.



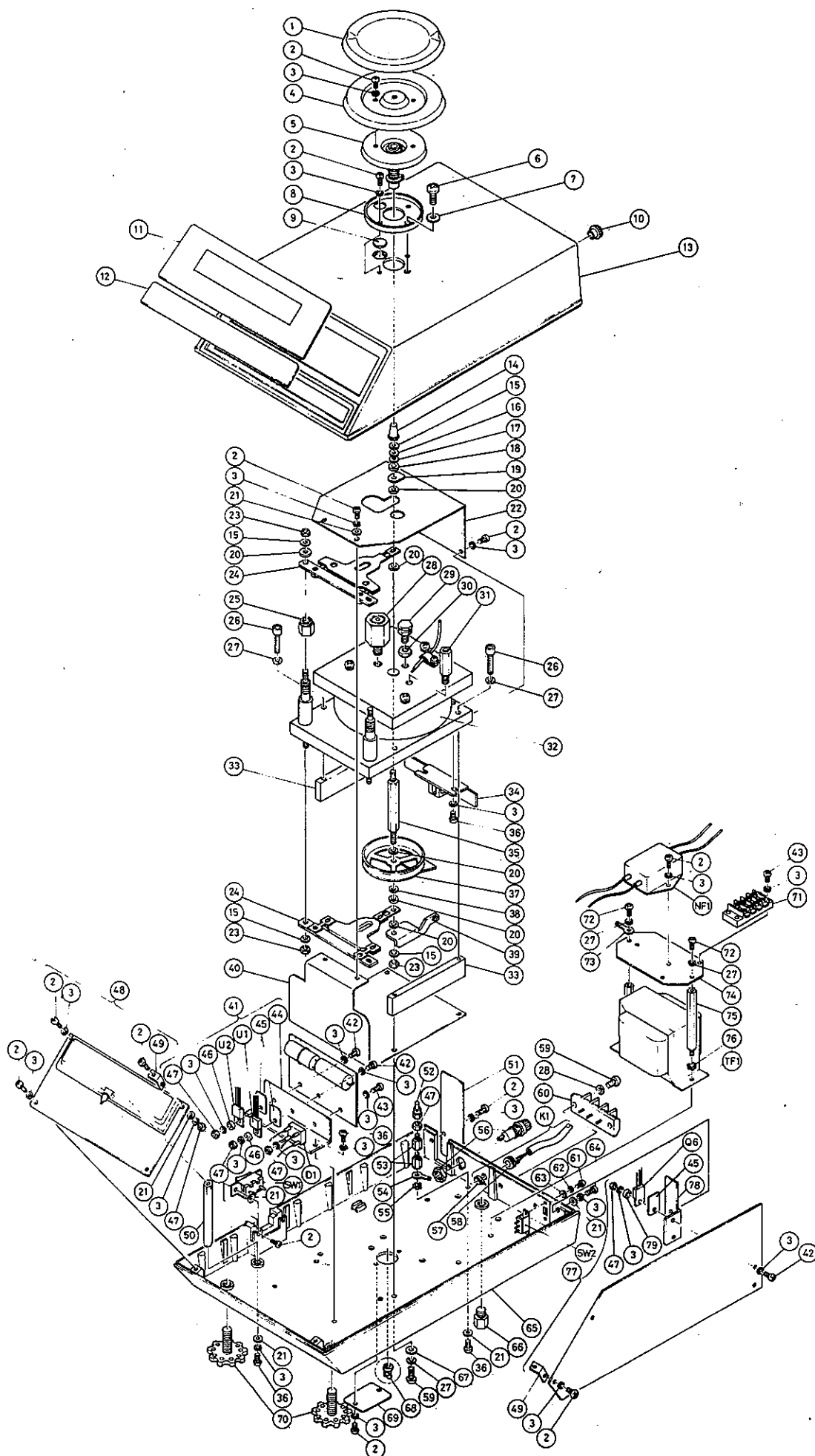
When the resistance of variable resistor is being varied, the displayed value is larger than $450 \text{ "A"} + 3100 = 3550 \text{ "B"}$ and the closest is 3560.

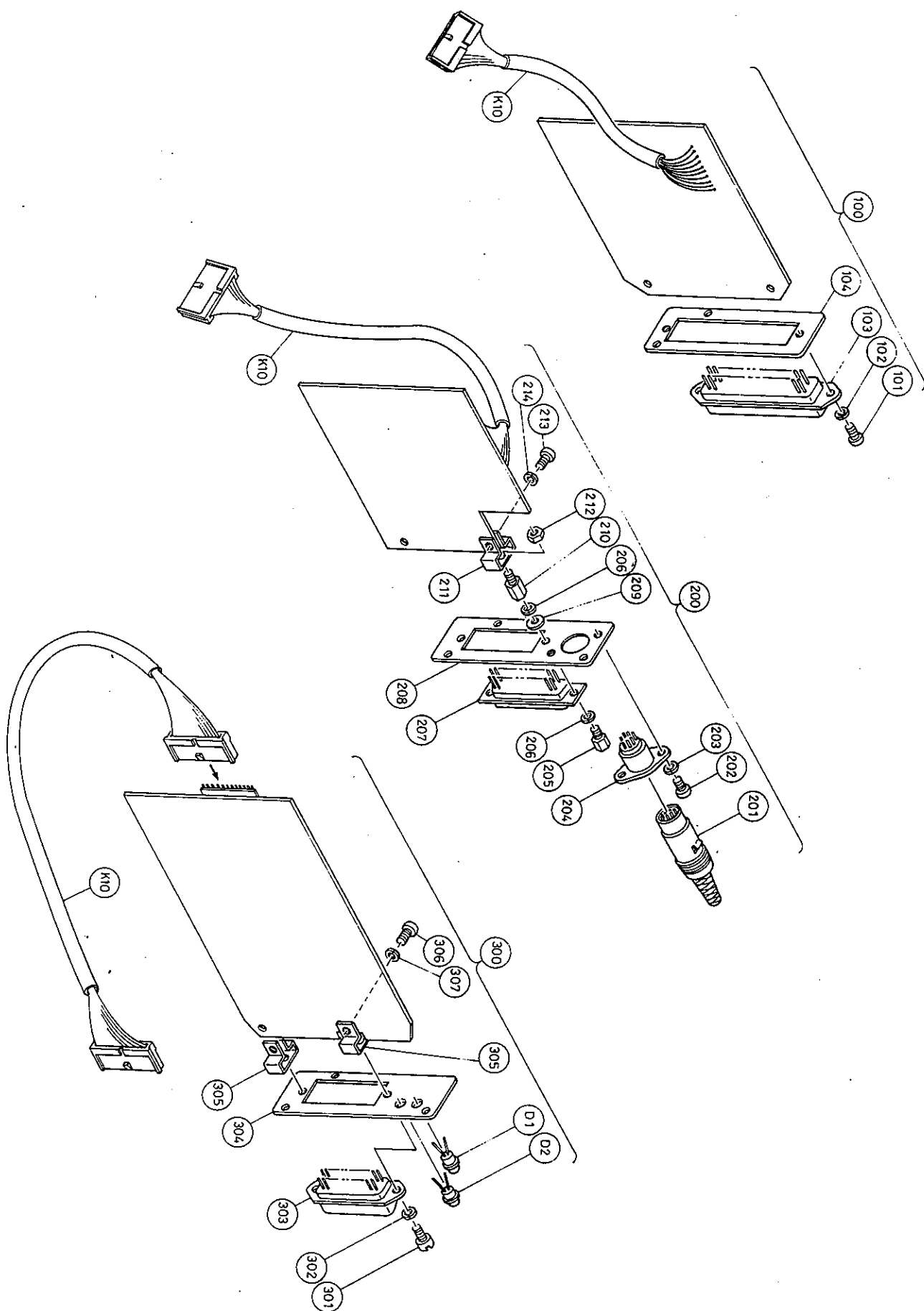


Solder a 1K resistor to R57 of the main board.
Take off the weight.
As the value A changed,

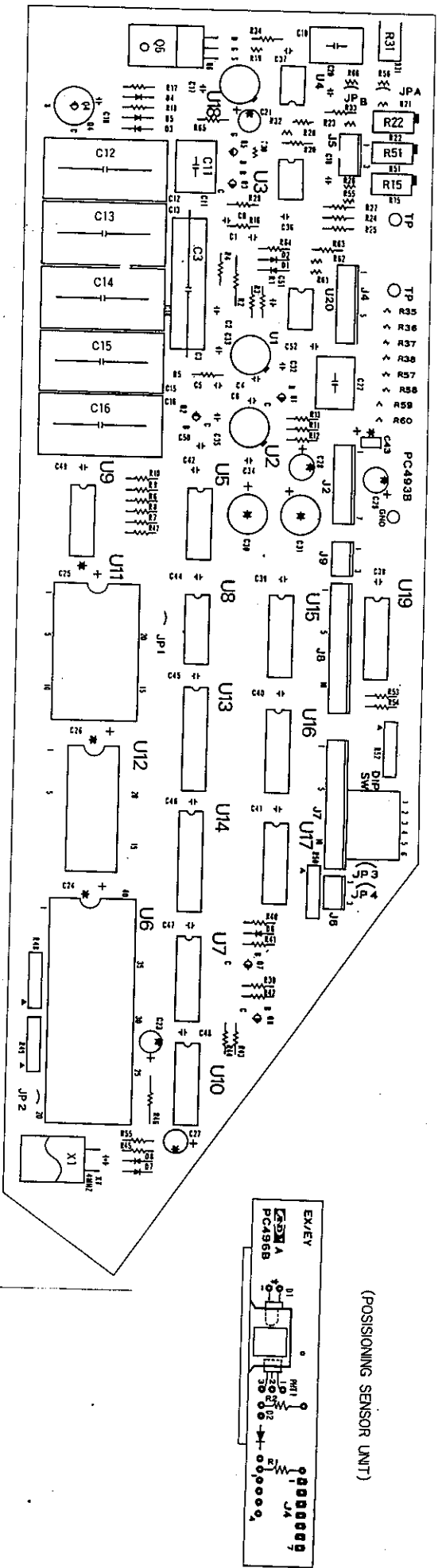


The displayed value 440 is now considered A.
 $440 \text{ "A"} + 3100 = 3540 \text{ "B"}$
This is acceptable as the displayed value 3545 is closest to 3540 (with the tolerance of +5).

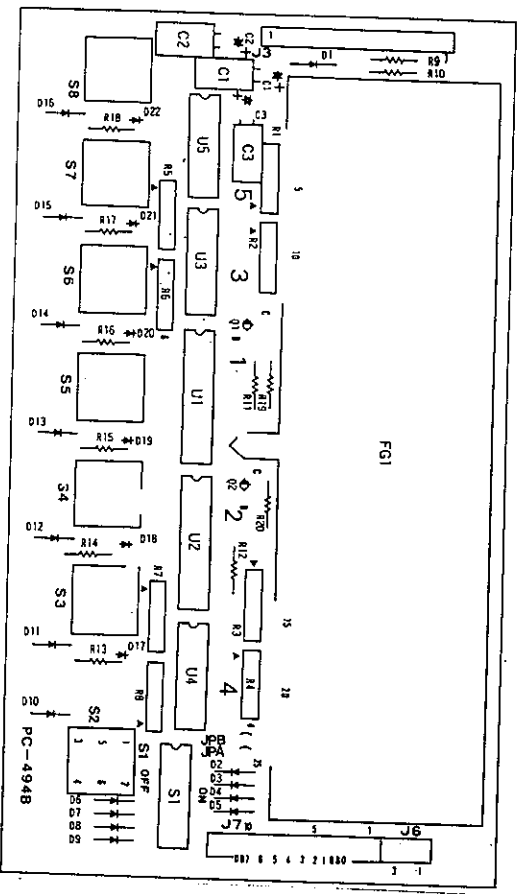




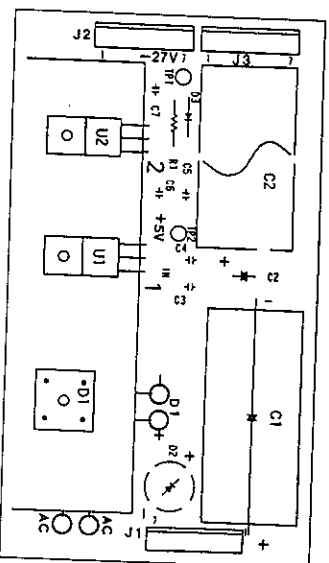
MAIN BOARD

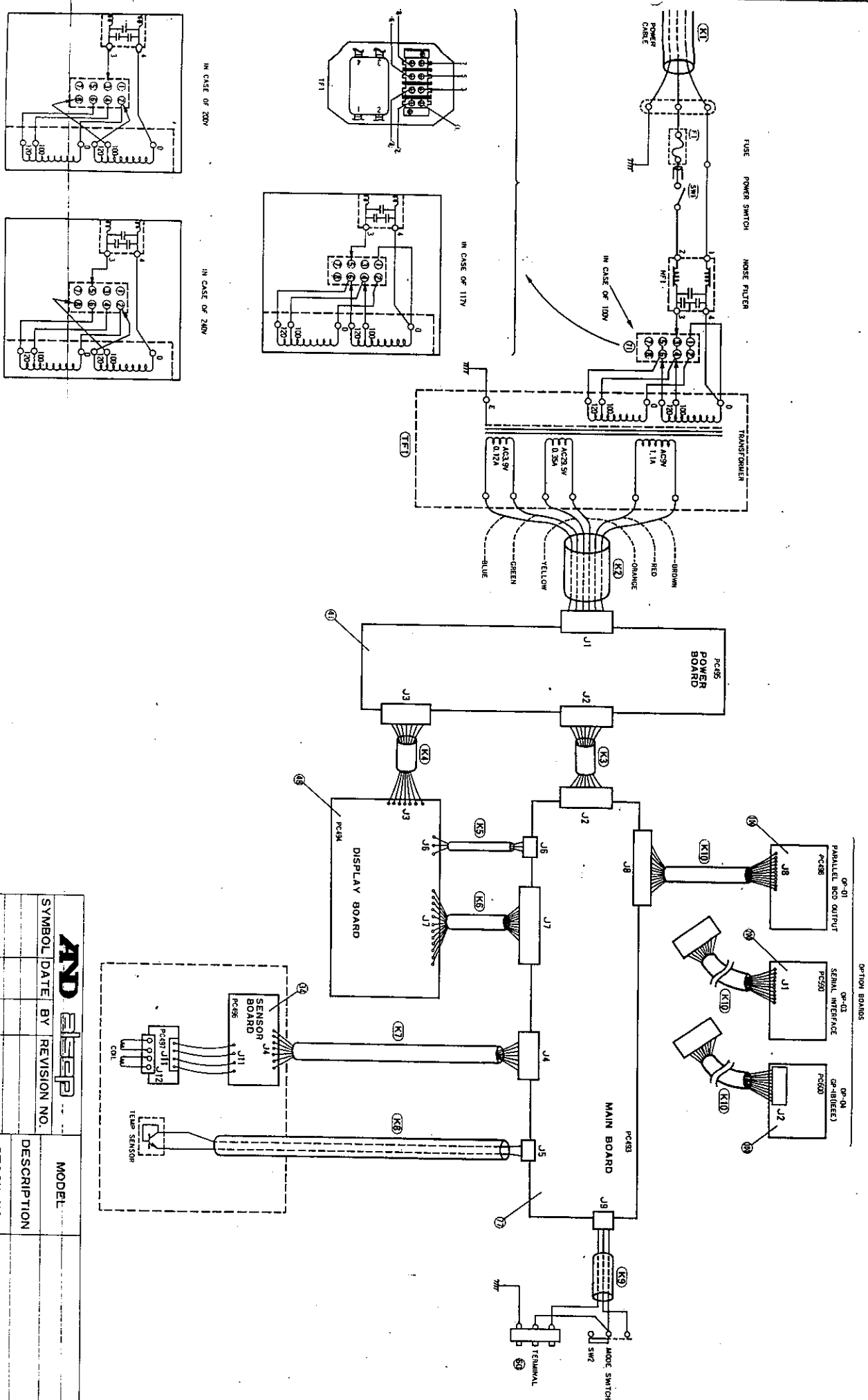


DISPLAY BOARD



POWER BOARD





AND

SYMBOL DATE BY REVISION NO.

MODEL

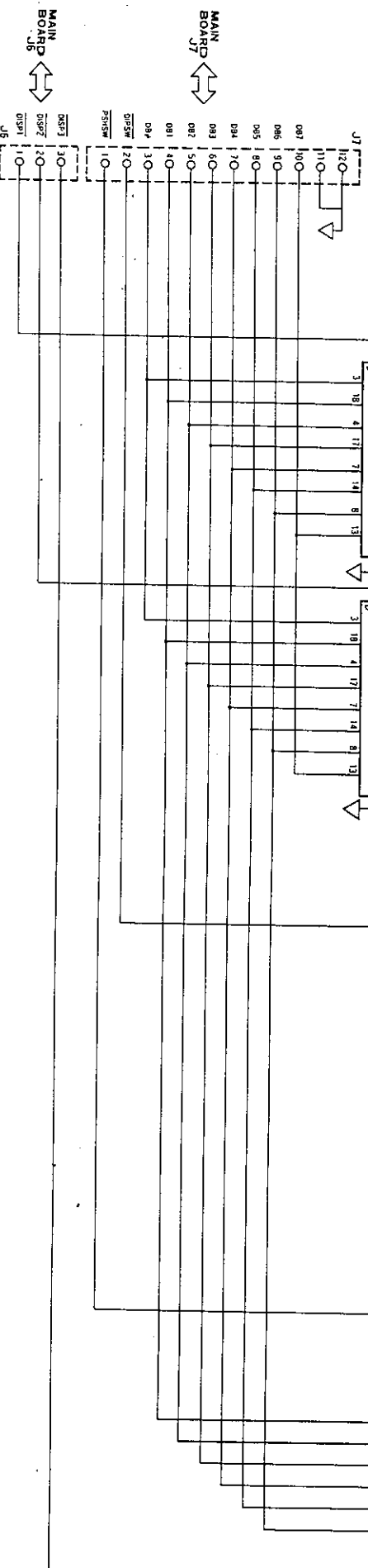
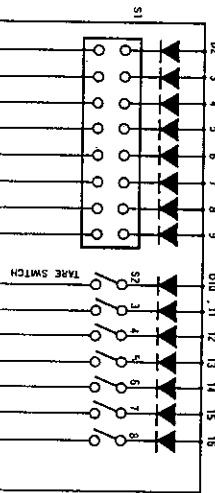
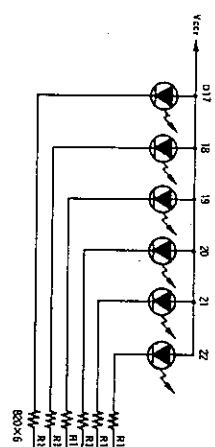
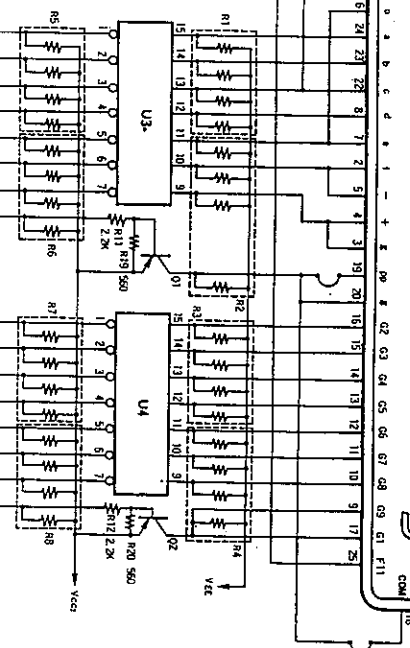
DESCRIPTION

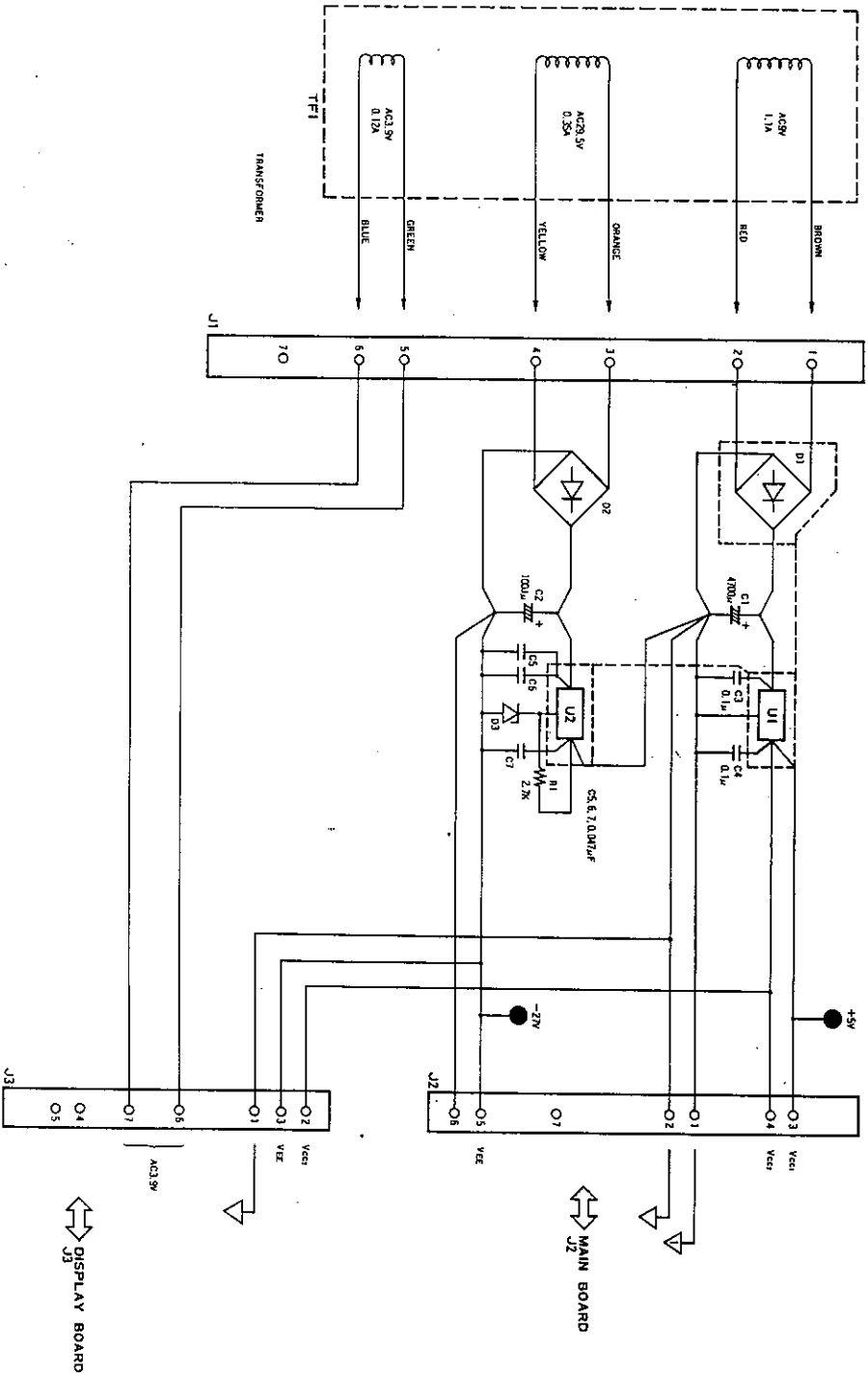
STOCK NO.

DRAWING NO.

PA:EX200A-1

ECJ-00440

ECJ-00443



AND **elsep**

MODEL

SYMBOL DATE BY REVISION NO.

DESCRIPTION

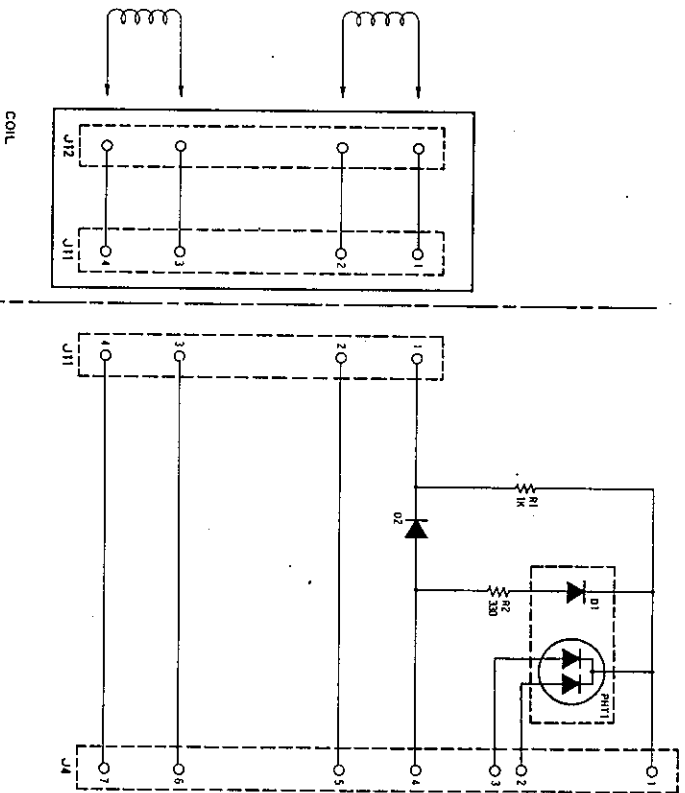
POWER BOARD

STOCK NO.

PZ.495

DRAWING NO.

EC3-00444



AND *elsep*

MODEL

SYMBOL DATE BY REVISION NO.

DESCRIPTION

STOCK NO.

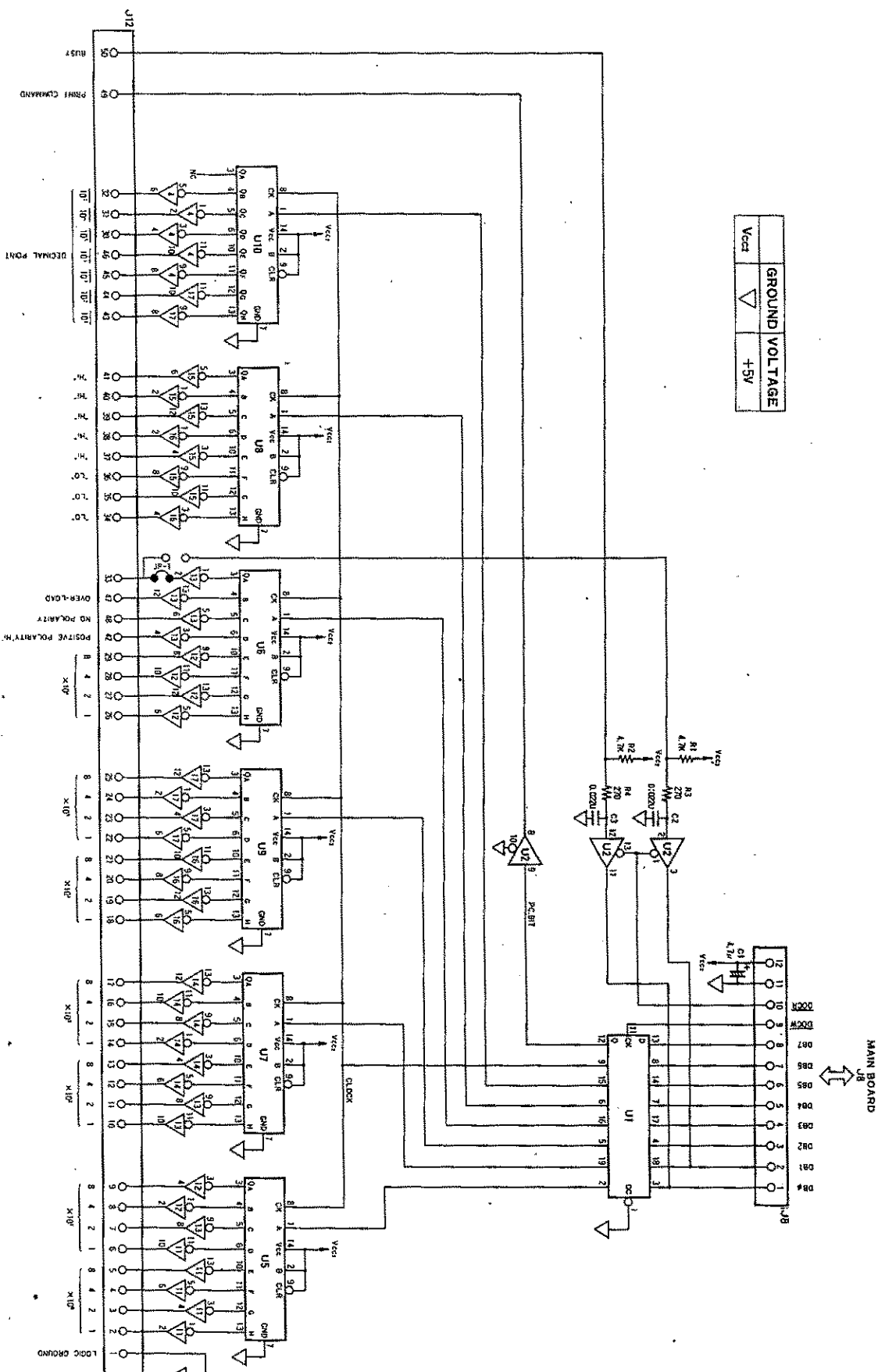
DRAWING NO.

SENSOR BOARD

PZ:495

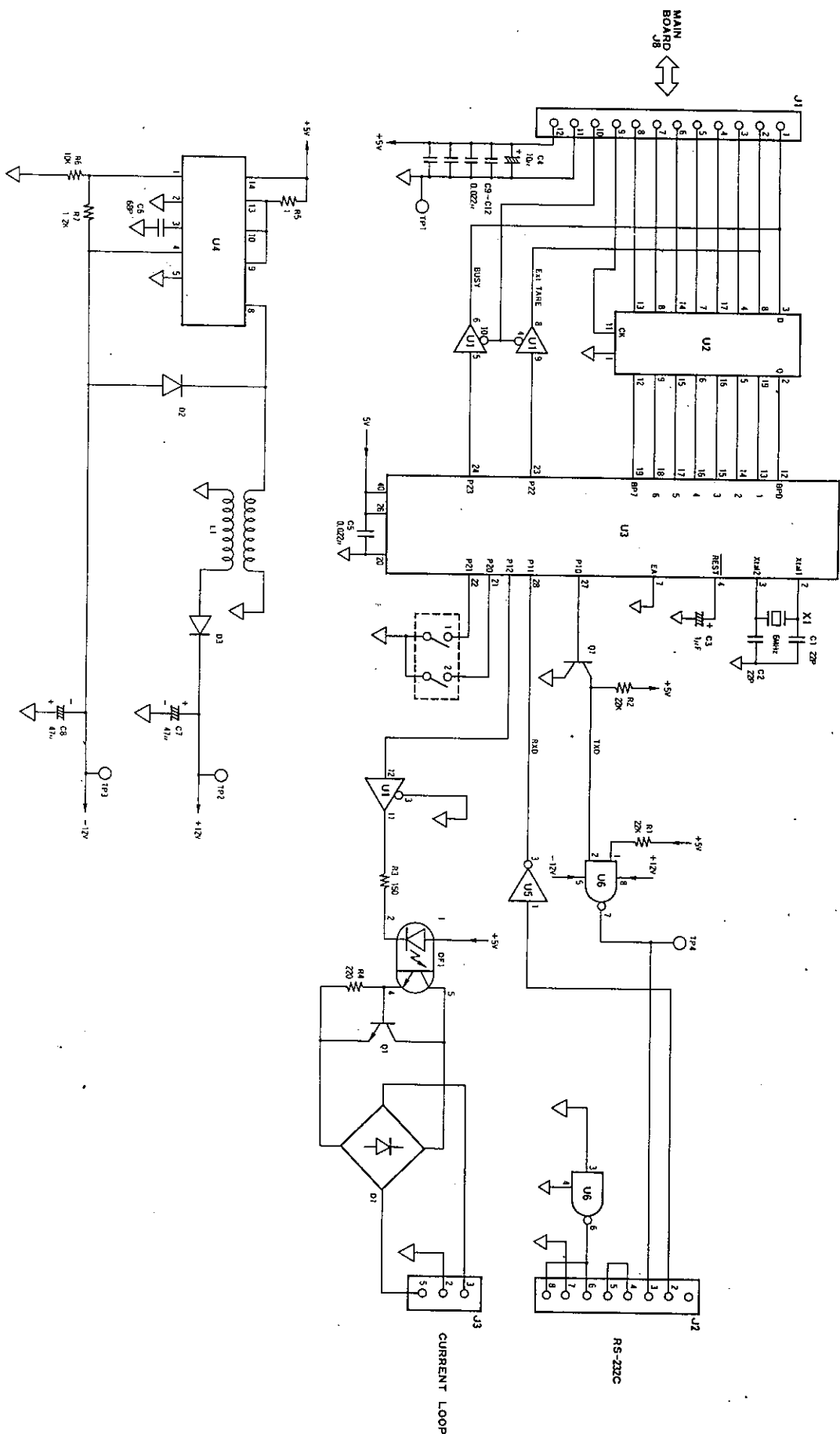
ECI-00445

GROUND	VOLTAGE
Vcc	+5V



- NO POLARITY... "0" WHEN ZERO -P OR BEING TARED
- PRINT COMMAND... POSITIVE PULSE WITH 1msec WIDTH
- BUSY... FAN IN 1 LATCHES OUTPUT DATA WHEN INPUT IS "0"

AND		BY REVISION NO.	
SYMBOL	DATE	MODEL	AK EXY-01
DESCRIPTION		PARALLEL BCD OUTPUT	
STOCK NO.		PZ-498	
DRAWING NO.		EC-00446	



AND elsep

SYMBOL DATE BY REVISION NO.

MODEL

AK:EXY-03

DESCRIPTION

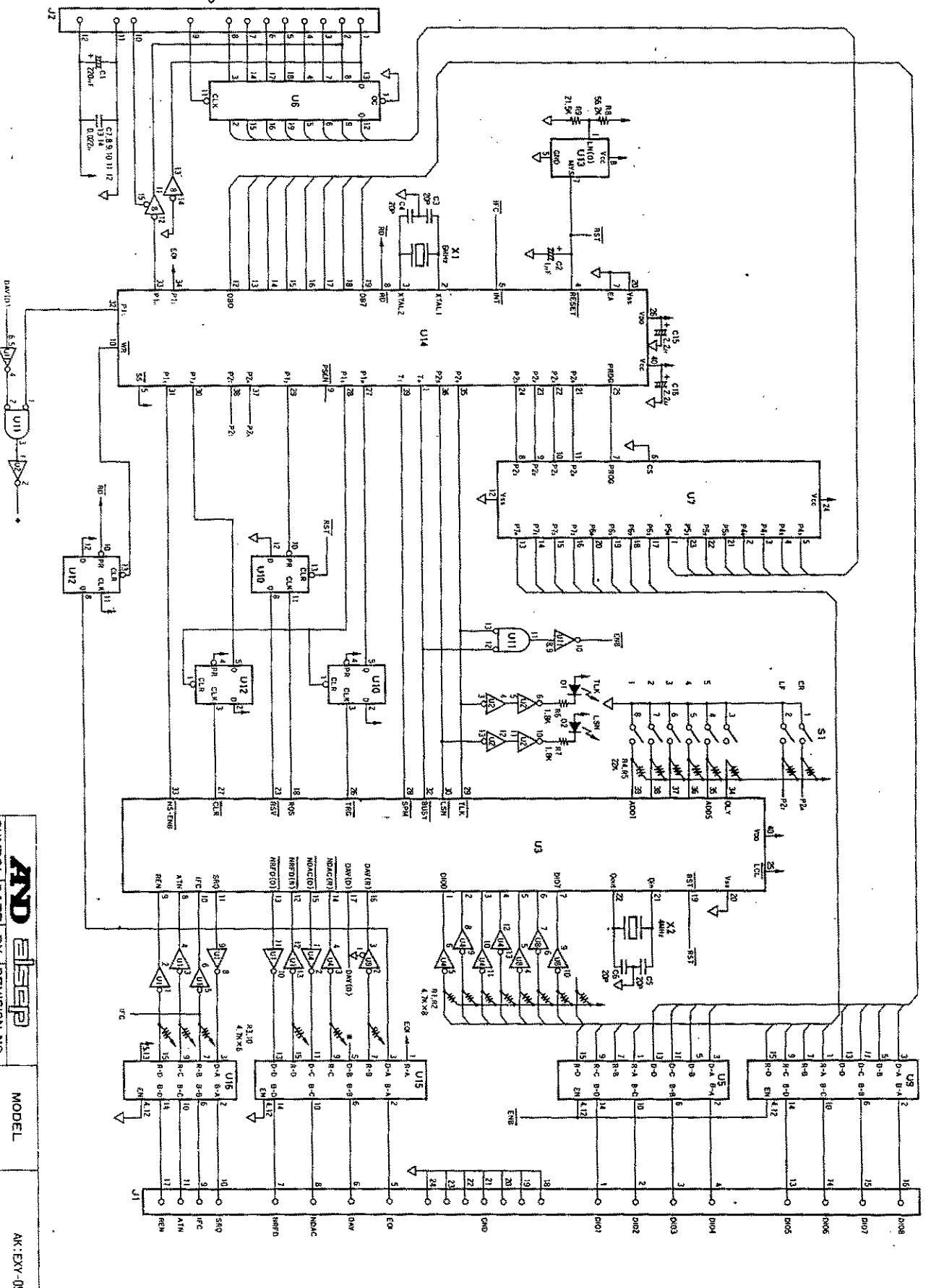
SERIAL INTERFACE

STOCK NO.

PZ:590

DRAWING NO.

EC:00532



AND

MODEL

AK:EXY-09

SYMBOL DATE BY REVISION NO.

DESCRIPTION

GP-18(IEE)

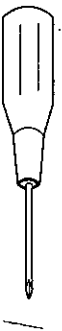
STOCK NO.

PZ:600

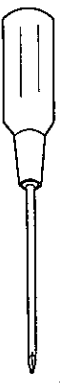
DRAWING NO.

EC-100662

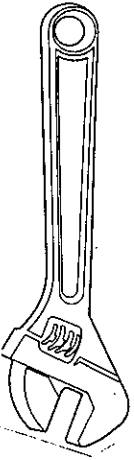
GENERAL TOOLS



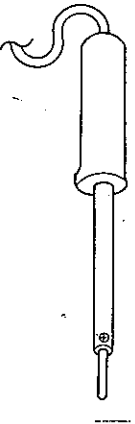
SCREW DRIVER (2.6mm)



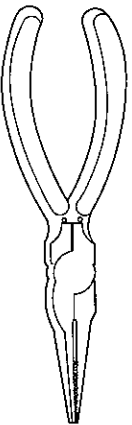
SCREW DRIVER (3mm)



ADJUSTABLE END WRENCH



SOLDERING IRON



NEEDLE-NOSED PLIERS

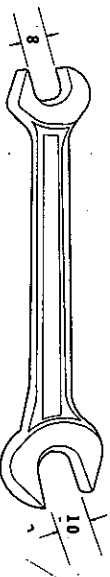
SPECIAL TOOLS



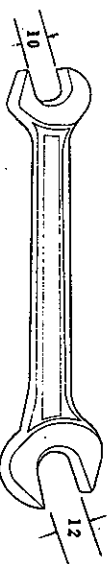
800 NUT DRIVER



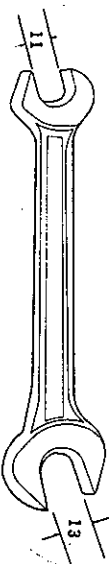
801 NUT DRIVER



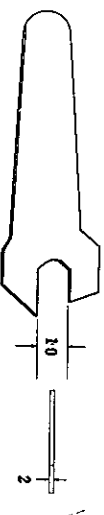
802 OPEN-END WRENCH



803 OPEN-END WRENCH



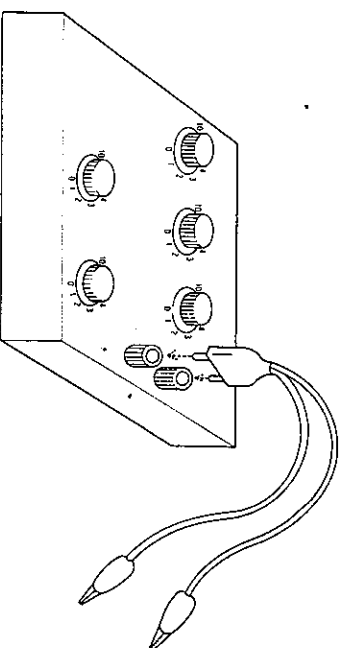
804 OPEN-END WRENCH



805 OPEN-END WRENCH



806 OPEN-end wrench



807 VARIABLE RESISTOR

MAIN BOARD

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
77	PZ: 493A	PZ: 493A	MAIN BOARD FULLY ASSEMBLED			
	"	PC: 493B	PRINTED CIRCUIT BOARD			
C1	"	CM: 5002 333K1	CAPACITOR 0.033 μ F, 50V			
C2, 6	"	CM: 5002 103K1	CAPACITOR 0.01 μ F, 50V			
C3	"	CM: 2003 105K	CAPACITOR 1 μ F, 200V			
C4	"	CC: 33P	CAPACITOR 33PF, 50V			
C5	"	CC: 0.01U	CAPACITOR 0.01 μ F, 25V			
C9	"	CC: 3P	CAPACITOR 3PF, 50V			
C10, 18	"	CC: 0.001U	CAPACITOR 0.001 μ F, 50V			
C11, 19, 22	"	CM: 5002 224K1	CAPACITOR 0.22 μ F, 50V			
C12~16	"	CM: E1106KN	CAPACITOR 10 μ F, 100V			
C17	"	CC: 0.047U	CAPACITOR 0.047 μ F, 50V			
C20	"	CC: 470P	CAPACITOR 470PF, 50V			
C21	"	CT: 1VR33	CAPACITOR 0.33 μ F, 35V			
C23	"	CK: SM50VB10	CAPACITOR 10 μ F, 50V			
C24~C27	"	CT: 1A4R7	CAPACITOR 4.7 μ F, 10V			
C28, 29	"	CK: SM10VB100	CAPACITOR 100 μ F, 10V			
C30, 31	"	CK: SM35VB100	CAPACITOR 100 μ F, 35V			

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
C32~42, 51 52, 44~49	PZ: 493A	CC: 0.22U	CAPACITOR 0.022 μ F, 50V			
C43	"	CT: 1V010	CAPACITOR 1 μ F, 35V			
C50	"	CC: 10P	CAPACITOR 10PF, 50V			
DIP SW	"	SD: KTD06	DIP SWITCH(6POS)			
D1, 2	"	DI: 1SS53	DIODE			
D3	"	DI: 1S2095A	DIODE			
D4, 5, 7, 8	"	DI: 1S1588	DIODE			
D6	"	DZ: RD3.6EB	ZENER DIODE 3.6V			
JS1	"	JS: 10324-01-445	SOCKET (24PIN)			
JS2	"	JS: 10340-01-445	SOCKET (40PIN)			
J2, 4	"	JT: 171825-7	CONNECTOR			
J5, 6, 9	"	JT: 171825-3	CONNECTOR			
J7, 8	"	JT: 1-171825-12	CONNECTOR			
Q1, 7	"	QT: C1815Y	TRANSISTOR			
Q2, 3	"	QT: A1015Y	TRANSISTOR			
Q4	"	QT: A594	TRANSISTOR			
Q5	"	QT: 2N5486	J. FET (NCH)			
Q6	"	QT: VN66AF	VMOS FET			

PARTS LIST

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DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
R1, 4	PZ: 493A	RC: 82K	RESISTOR 82K			
R2, 46	"	RC: 1/2 1M	REISITOR 1M			
R3	"	RC: 330K	RESISTOR 330K			
R5, 6	"	RC: 6.8K	RESISTOR 6.8K			
R7, 39, 53 54, 55	"	RC: 4.7K	RESISTOR 4.7K			
R8	"	RC: 2.2K	RESISTOR 2.2K			
R9, 17, 33, 45	"	RC: 1K	RESISTOR 1K			
R10, 11	"	RC: 12K	RESISTOR 12K			
R12	"	RC: 68K	RESISTOR 68K			
R13, 44	"	RC: 15K	RESISTOR 15K			
R15	"	RV: 32299X-1-204	CERMET TRIMER 200K, ±100PPM/°C			
R16, 29	"	RC: 100K	RESISTOR 100K			
R18, 64	"	RC: 470R	RESISTOR 470Ω			
R19, 21, 26	"	RF: 6.8KSF	RESISTOR 6.8K 1/8W, ±50PPM/°C			
R20	"	RM: 470RF	RESISTOR 470Ω 1/4W, ±100PPM/°C			
R22	"	RV: 9×5K	CERMIT TRIMMER 5K, ±100PPM/°C			
R23	"	RF: 2.2KSF	RESISTOR 2.2K 1/8W, ±50PPM/°C			
R24, 25	"	RM: 68KF	RESISTOR 68K 1/4W, ±100PPM/°C			

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
R27	PZ: 493A	RM: 33KF	RESISTOR 33K 1/4W, ±100PPM/°C			
R28	"	RF: 1KSF	RESISTOR 1K 1/8W, ±50PPM/°C			
R30	"	RF: 3.9KSF	RESISTOR 3.9K 1/8W, ±50PPM/°C			
R31	"	RV: 9×5000R	CERMET TRIMMER 500Ω, ±100PPM/°C			
R32	"	RF: 1/4 68KSF	RESISTOR 68K 1/4W, ±50PPM/°C			
R34, 41, 63, 65	"	RC: 100R	RESISTOR 100Ω			
R35~38	"	RL: 5000B	RESISTOR 500Ω 3/10W, ±5PPM/°C			
R40	"	RC: 68R	RESISTOR 68Ω			
R42	"	RC: 22K	RESISTOR 22K			
R43	"	RC: 560R	RESISTOR 560Ω			
R47	"	RC: 1.5K	RESISTOR 1.5K			
R48, 49	"	RN: IHR-4-223MA	GROUP RESISTOR 22K, 4W			
R50, 52	"	RN: IHR-4-472MA	GROUP RESISTOR 4.7K, 4W			
R51	"	RV: 3299X-1-104	CERMET TRIMMER 100K, ±100PPM/°C			
R61, 62	"	RF: 180KSF	RESISTOR 180K 1/8W, ±50PPM/°C			
TP, GND	"	TM: CP-10	TEST TERMINAL			
U1	"	UA: LM308H	OP AMP LM308			
U2	"	UA: LM311	VOLTAGE COM- PARATOR LM311			

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
U3, 20	PZ: 493A	UA: TL082CP	DUAL OP AMP TL082			
U4	"	UA: OP07DP	OP AMP OP07DP			
U5	"	UT: LS74	LS TTL LS74			
U6	"	UN: Z80	CPU Z80			
U7	"	UT: LS138	LS TTL LS138			
U8	"	UT: LS32	LS TTL LS32			
U9	"	UT: 04	TTL 7404			
U10	"	UC: 4049	CMOS 4049			
U11	"	UN: 2716	ROM 2716			
U12	"	UN: TMM2016P	RAM TMM2016P			
U13	"	UT: LS374	LS TTL			
U14	"	UC: 40H374	HIGH SPEED CMOS 40H374			
U15, 16, 17	"	UT: LS161	LS TTL LS161			
U18	"	UA: LM399H	VOLTAGE REFER- ENCE LM399H			
U19	"	UT: LS367	LS TTL LS367			
X1	"	XT: HC18/U4MHZ	CRYSTAL 4MHZ; HC18/U			
2	"	:	SCREW 3x6			
3	"	:	SPRING WASHER 3			

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PARTS LIST

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PARTS LIST

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PARTS LIST

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SERIAL INTERFACE OP-03

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
(200)	PZ: 590	PZ: 590	OPTION-03			
	"	PC: 590	FULLY ASSEMBLED			
	"		PRINTED CIRCUIT BOARD			
C1, 2	"	CC: 22P	CAPACITOR			
	"		22PF, 50V			
C3	"	CT: 1V010	CAPACITOR			
	"		1μF, 35V			
C4	"	CT: 1C100	CAPACITOR			
	"					
C5, 9, 10, 11	"	CC: 0.022U	CAPACITOR			
12	"		0.022μF, 50V			
C6	"	CC: 68P	CAPACITOR			
	"		68PF, 50V			
C7, 8	"	CK: SM50VB47	CAPACITOR			
	"		47μF, 50V			
D1	"	DI: W02	DIODE			
	"					
D2, 3	"	DI: 1S1588	DIODE			
	"					
DF1	"	DF: PS2001	PHOTO COUPLER			
	"					
JS1	"	JS: 10340-01-445	IC SOCKET			
	"					
(K10)	"	KO: 102-10S40	CABLE WITH CONNECTOR			
	"					
L1	"	LR: H5AT7-14-3.5	CORE			
	"					
Q1, 2	"	QT: C1815Y	TRANSISTOR			
	"		C1815Y			
R1, 2	"	RC: 22K	RESISTOR 22K			
	"					
R3	"	RC: 150R	RESISTOR 150Ω			
	"					
R4	"	RC: 220R	RESISTOR 220Ω			
	"					

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
R5	PZ: 590	RC: 1R	RESISTOR 1Ω			
R6	"	RC: 10K	RESISTOR 10K			
R7	"	RC: 1.2K	RESISTOR 1.2K			
SW1	"	SD: KTD04	DIP SWITCH			
TP1, 2, 3, 4	"	TM: CP-10	TEST PIN			
U1	"	UT: LS125	TTL			
U2	"	UT: LS374	TTL			
U3	"	UN: D8748	CPU			
U4	"	UR: TL497ACN	TTL			
U5	"	UT: 75189	TTL			
U6	"	UT: 75150P	TTL			
X1	"	XT: HC18/U6MHZ	CRYSTAL 6MHZ			
(201)	"	JA: TCP0576	CONNECTOR			
(202)	"					
(203)	"					
(204)	"	JA: TCS0270	CONNECTOR			
(205)	"	JA: HD-LNA	SCREW LOCK			
(206)	"					

PARTS LIST

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GP-IB OP-09

DRWG. NO.	P.C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
(300)	PZ: 600	PZ: 600	OPTION-09 FULLY ASSEMBLED			
	"	PC: 600	PRINTED CIRCUIT BOARD			
C1	"	CK: SM10VB220	CAPACITOR 220 μ F, 10V			
C2	"	CT: 1V010	CAPACITOR 1 μ F, 35V			
C3~6	"	CC: 22P	CAPACITOR 22PF, 50V			
C7~14	"	CC: 0.022U	CAPACITOR 0.022 μ F, 50V			
C15, 16	"	CT: 1D2R2	CAPACITOR 2.2 μ F, 10V			
D1, 2	"	DL: TLR102KW	DIODE			
J1	"	JT: 57-20240-D35	CONNECTOR			
J2	"	JT: 1-171826-2	CONNECTOR			
JS	"	JS: 10340-01-445	IC SOCKET			
(K10)	"	KO: 102-12W30	CABLE WITH CONNECTOR			
R1~3, 10	"	RN: IHR-4-472MA	GROUP RESISTOR 4.7K, 4W			
R4, 5	"	RN: IHR-4-223MA	GROUP RESISTOR 22K, 4W			
R6, 7	"	RC: 1.8K	RESISTOR 1.8K			
R8	"	RM: 56.2KF	RESISTOR 56.2K 1/4W, ± 100 PPM/ $^{\circ}$ C			
R9	"	RM: 21.5KF	RESISTOR 21.5K 1/4W, ± 100 PPM/ $^{\circ}$ C			
S1	"	SD: KTD08	DIP SWITCH			

DRWG. NO.	P. C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
U1, 2, 4	PZ: 600	UC: 40H4004	CMOS			
U3	"	UC: 8530B	CMOS			
U6	"	UT: LS374	TTL			
U7	"	UC: 82C43P	CMOS			
U8	"	UT: LS368	TTL			
U5, 9, 15, 16	"	UN: MC3446A	TTL			
U11	"	UC: 4001	CMOS			
U10, 12	"	UC: 40H74	CMOS			
U13	"	UA: MB3761	COMPARATOR			
U14	"	UN: 8749N	CPU			
X1	"	XT: HC18/U 10MHZ	CRYSTAL 10MHZ			
X2	"	XT: HC18/U 4MHZ	CRYSTAL 4MHZ			
(300)	"					
(301)	"					
(302)	"					
(303)	"					
(304)	"					
(305)	"					

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DRWG. NO.	P. C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
1		04: A41829A	WEIGHING PAN			
2		:	SCREW 3x6			
3		:	SPRING WASHER 3			
4, 5		PB: EX200A-1	PAN SUPPORT			
6		:	SCREW 5x12			
7		:	WASHER 5			
8		04: A41832B	DUST-PROOF RING			
9		07: A41821B	LEVEL VIAL			
10		:	PLASTIC COVER			
11		01: A41935B	ACRYLIC PLATE			
12		01: A42338A	KEY SHEET			
13		07: A10012	UPPER CASE			
14		05: A41747A	PEG			
15		10: S-NO-1-SUS	SPRING WASHER 4.2x8x0.3			
16		05: A43300	BRASS WASHER			
17		804: A43299	ALMINUM WASHER T=1			
18		804: A43298	ALMINUM WASHER T=2			
19		804: A41746B	STOP PLATE			

DRWG. NO.	P. C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
20		804: A41840	ALMINUM WASHER T=1			
21		:	WASHER 3			
22		04: A41751B	UPPER SHIELD			
23		:	NUT 4			
24		PB: EX200A-2	FLEXIBLE			
25		05: A41742	BEARING ASS'Y CORNERLOAD NUT			
26		:	SCREW BOLT			
27		:	SPRING WASHER			
28		:	LEVEL VIAL			
29		05: A41749A	STOP BOLT			
30		:	NUT 6			
31		05: A41743A	STAND OFF			
32		:	MAGNET ASS'Y			
33		05: A41750A	SPACER			
34		PZ: 496	SENSOR BOARD			
35		05: A41748A	WEIGHING AXLE			
36		:	SCREW 3x8			
37		09: A31592C	FORCE COIL BOBBIN			

DRWG. NO.	P. C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
38		07: A41841	BAKELITE WASHER			
39		04: A41745A	POSITIONING			
40		04: A41752C	HOLE UNIT LOWER SHIELD			
41		PZ: 495	POWER BOARD			
42		:	FULLY ASSEMBLED SCREW 3x12			
43		:	SCREW 3x18			
44		04: A41836B	HEAT SINK			
45		QA: AC256-1674	INSULATING			
46		QA: AC316A	PLATE GROMMET			
47		:	SCREW 3			
48		PZ: 494A	DISPLAY BOARD			
49		04: A41839	FULLY ASSEMBLED BOARD FITTINGS			
50		05: A41825A	BOARD LOCKING			
51		02: A41838E	POLE COVER PLATE			
52		TM: STK-A-2	CONNECTION			
53		05: A40254A	TERMINAL STANDOFF 8			
54		:	TERMINAL WASHER			
55		FH: SN1009	3 LOCK WASHER			

DRWG. NO.	P. C. BOARD	PARTS NUMBER	DESCRIPTION	UNIT PRICE US. \$	QTY	AMOUNT US. \$
56		:	FUSE CASE			
57		:	BINDING BELT			
58		10: NG-D	RUBBER BAND			
59		:	SCREW 4x15			
60		TM: F2035AM4-3P	TERMINALS			
61		:	SCREW 2x6			
62		:	SPRING WASHER 2			
63		:	WASHER 2			
64		:	SCREW 3x10			
65		03: A10011	LOWER CASE			
66		05: A41897	REAR FOOT			
67		:	WASHER 4			
68		805: A42284	UNDER-HOOK (OPTION-05)			
69		04: A41899A	METAL COVER			
70		07: A41834C	FRONT ADJUSTABLE FOOT			
71		TM: ML-24-4P	TERMINALS			
72		:	SCREW 4x8			
73		:	TERMINAL WASHER			

