171-0005
Procoin 330 Coin sorter
Service Manual

Version 1.0 – Jan 2006

SUZO HAPP®

GAMING, AMUSEMENT AND INDUSTRIAL COMPONENTS

INDEX

1. ELECTRIC CONTROLLING PARTS

The electric controlling parts of PRC300 series coin rail sorters consist of 5 main parts ：

(1) Main Board（YBJ600CPU-S）

(2) Input & Output Board（NYFJ400I/O-S）

(3) Amplifier Board（YFJ500ADC-S）

(4) Power Supply Board（SGS600P）

(5) Keypad & LCD Display（YFJ600KDC-S）

PRC300 series are installed with the same electric controlling parts. But as they have different channels, their length is different. This version of service manual is covering PRC 330：

Front view of the machine PRC330: picture (1)

Hopper

Keypad and display

Foreign coin channel

Channels (8pcs)

Picture 1

Rear view of the machine PRC330: picture (2)

Power supply board

Main Board

AMP board

I/O board
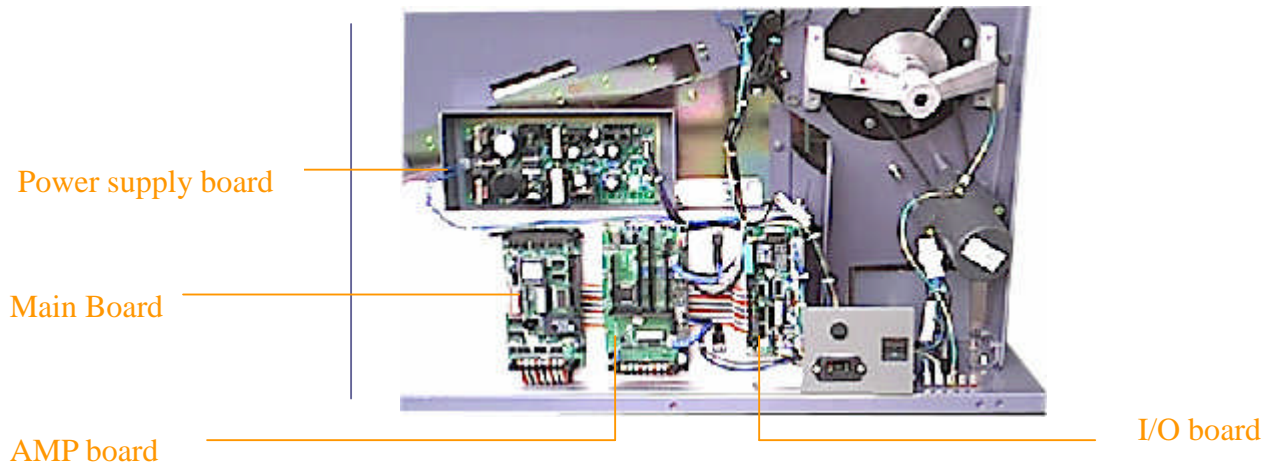
Picture 2

The wiring diagram of YFJ-300 series coin rail sorters is as follows：(NEXT PAGE)
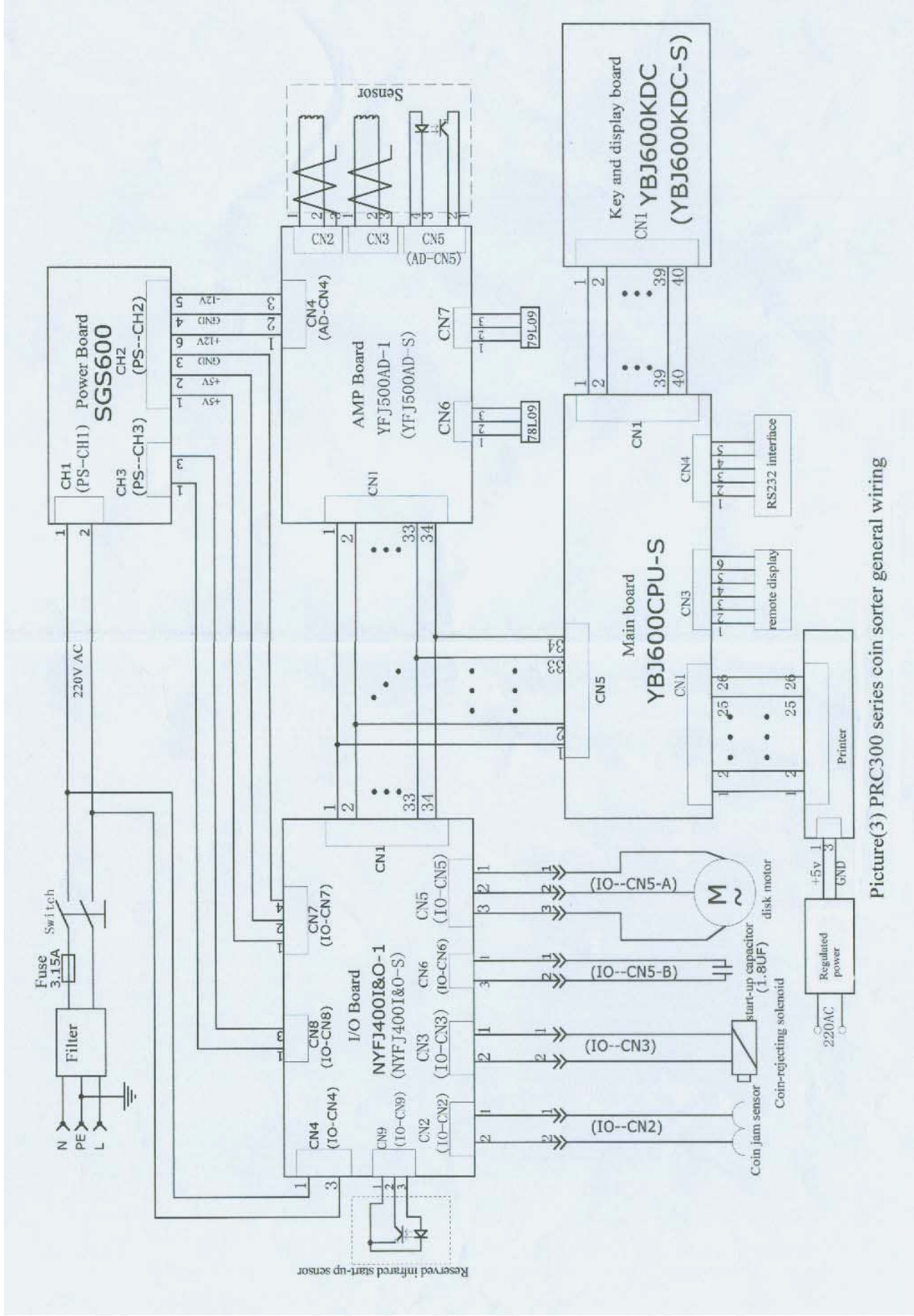
Picture(3) PRC300 series coin sorter general wiring

1). Main Board

The microprocessor of this machine uses W78E58 series. The parallel controlling bus is used as its base. Input and output uses a framework design。

The microprocessor's working frequency is 16MHZ，using X25045 serial EEPROM to store systematical data under power off，SRAM is 62256（32K byte），DS12887is real time clock，GAL16V8（PLD）is interpretation code，74HC245 is bus driver。The whole process is driven by the signals of clock, and all the operation is performed chronologically strictly.

The main board consists of CPU controlling circuit、bus circuit、RS232 communication interface and DIP-8 optional circuit etc. The controlling software is stored in CPU chip and all the working parameters are stored in EEPROM。

Main board: picture (4)

CPU Version

YBJ600CPU-S Board

8-dip encoder switch
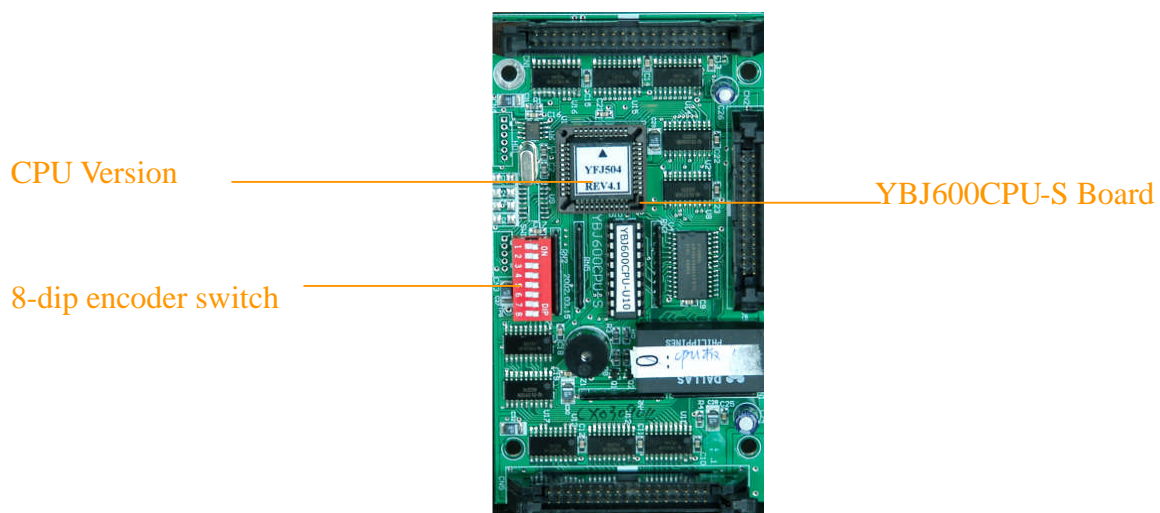
Picture 4

Ports on the main board：

Main board sockets	Remarks
CN1 40-pin port	Display port，providing working voltage and controlling signals
CN2 26-pin port	Printer port，providing working voltage and controlling signals
CN3 5-pin port	Communication interface. Can be connected with RS232
CN4 6-pin port	Remote display port（optional）
CN5 34-pin port	Bus port，connected with ADN board and I&O board

Specific functions of the DIP-8 encoder switches:

NO	ON / OFF	FUNCTIONS
1 2 3		Factory setting
4	ON	To amend values
	OFF	Cannot amend values
5	ON	Factory setting
	OFF	
6	ON	Factory setting
	OFF	
7	ON	Self-study, details refer to chapter3
	OFF	Can't self-study

| 8 | ON | Chinese display |
| | OFF | English display |

2). I&O Board

It consists of bus port circuit, solenoid-driving circuit, motor driving circuit, power-regulating circuit, and solenoid-accelerating power circuit. It functions to detect the signals of switches and drive the motors and solenoids.

I&O Board: picture (5)

Fuse 1 A

NXF I400I/O

Lamp L1 — 5V
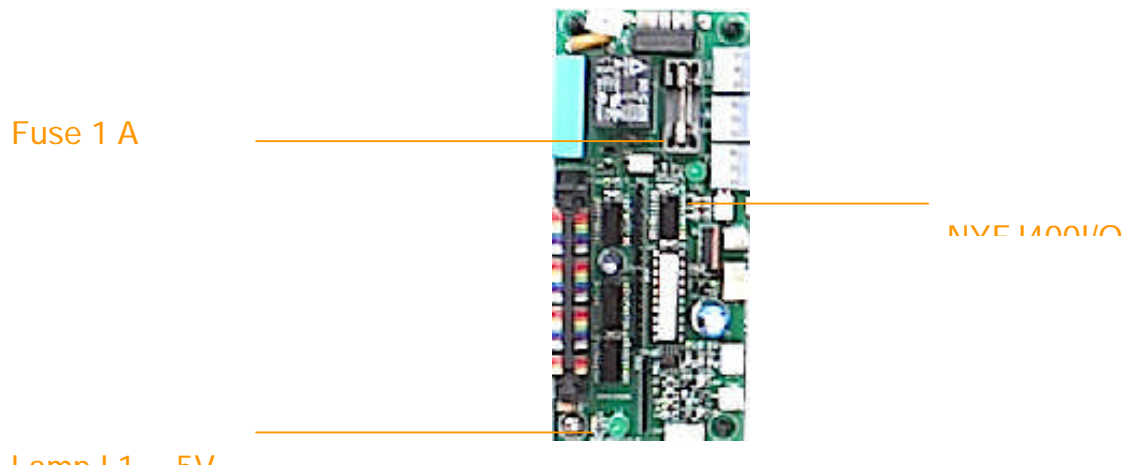
Picture 5

Ports on I&O board：

I&O board	REMARKS
CN1 34-pin port	Bus port, connected with CPU board and ADC board
CN2 2-pin port	Connected with coin jam sensor，judging whether coins in the disk are jammed.(See picture 6)
CN3 2-pin port	Connected with the coin-rejecting solenoid，when foreign coins are detected，CPU sends out signals to reject them.
CN4 3-pin port	Connected with 220V A.C.
CN5 3-pin port	Connected disk motor
CN6 3-pin port	Starting capacitor 1.8UF
CN7 4-pin port	Pins 1、2&4 are connected with PS Board CH2″1、2、3″＋5V
CN8 4-pin port	Pins1&3 are connected with PS Board CH3″1、3″＋24V
CN9 3-pin port	Reserved for infrared start-up sensor

Coin jam view: picture (6)
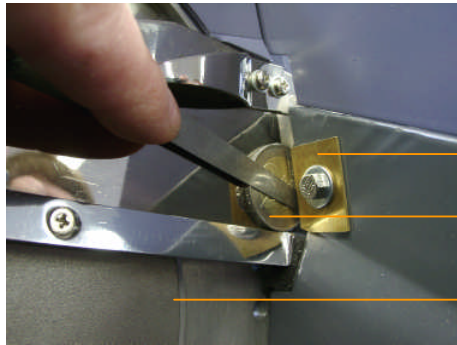
Coin jam sensor（contact plate）

Coin

Disk

Picture 6

3). AMP Board

It consists of AMP board1, AMP board2, AMP board3, AMP board4, compensation circuit,

A/D circuit, and power regulation circuit etc. It utilize TLC0820 high-speed AD chip for fast

collection of the data of the coins passing by the sensor.

AMP Board: picture (7)

AMP board1 Potentiometer W2

AMP board2 Potentiometer W2

AMP board4

AMP board3 Potentiometer W1

Compensation board

YFJ500ADC-S

Datum voltage

Potentiometer W4 、 W5 、 W6
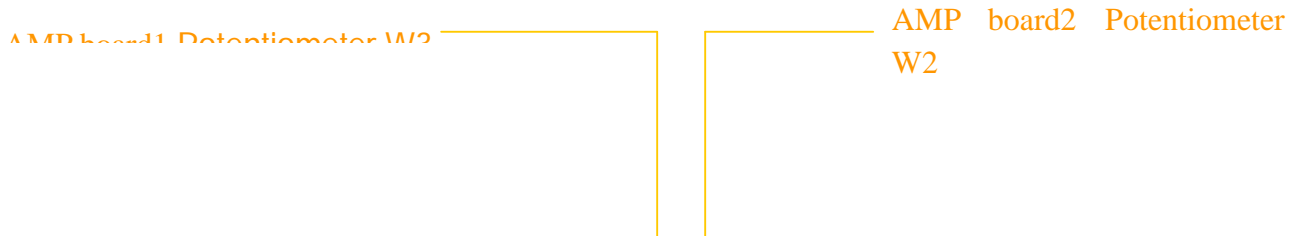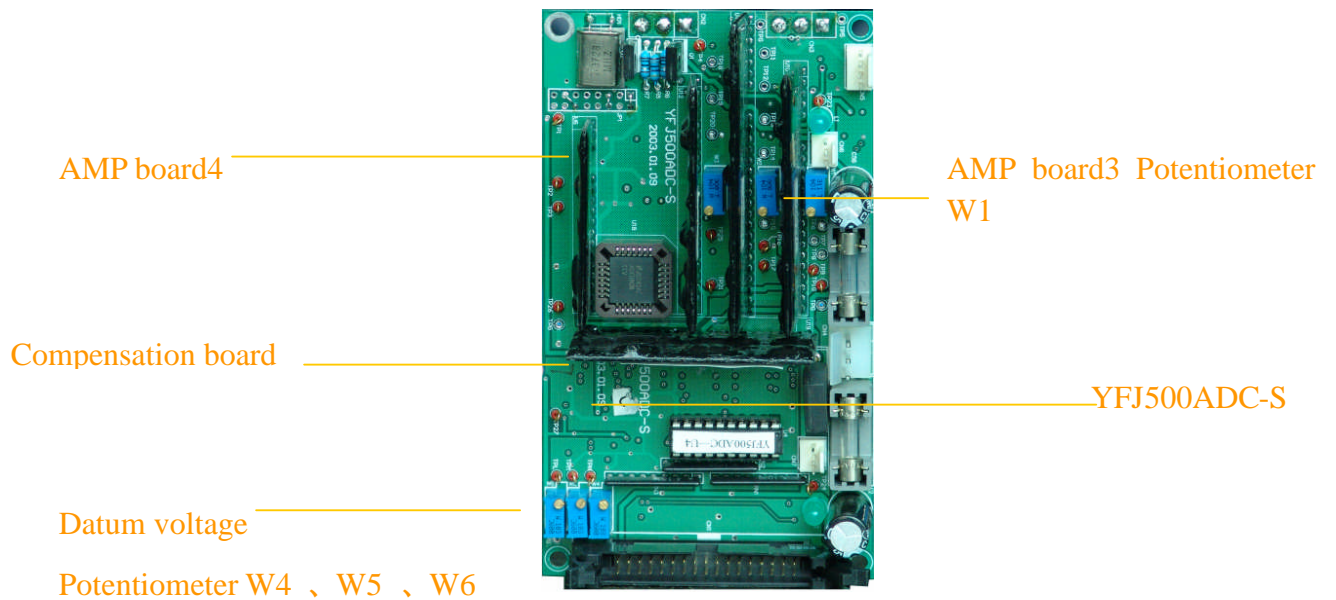
Picture (7)

Ports on ADC AMP board:

AMP board	Remarks
CN1 34-pin port	Bus socket，to CPU board and I&O board，
CN2 3-pin socket	Emitting terminal of the counting and detecting sensor
CN3 3-pin socket	Receiving terminal of the counting and detecting sensor
CN4 3-pin socket	Pin6 ,+12V ; pin4 ,GND; pin5,－12V
CN5 4-pin socket	Infrared sensor（mounted inside the counting and detecting

		sensor)
CN6 3-pin socket		78L09 three-phase power-regulator; pin1 **+** 16V; pin2 ,GND; pin3, **+** 9V
CN7 3-pin socket		79L09 three-phase power-regulator; pin1, GND;pin2, **-** 16V; pin3, **-** 9V

There are 4 potentiometers on the ADC AMP board. Voltage adjustment and testing point is as follows

Adjust	Test point	Requirements
Potentiometer W1	TP10	Observe the wave of the test points with a oscillograph. Make sure that no cut occurs to the sinusoid shape wave.
Potentiometer W2	TP17	
Potentiometer W3	TP21	
	TP26	
Potentiometer W4	TPH	Under self-learn mode, adjust the potentiometers. When testing with the smallest size coins, the collected value should be no less than 20. When testing with largest coins ,the collected value should be around 220.
Potentiometer W5	TPM	
Potentiometer W6	TPL	
	TP27	A/ D reference voltage 4V

4).**Power Supply Board**

The board functions to transform the output A.C. voltage from the power transformer into D.C

voltage through commutation, filtering and regulation.

Voltage on each point is as follows: Picture (8)

Power supply board
Fuse 4A

Output 5V
Output ±12V

Output 24V
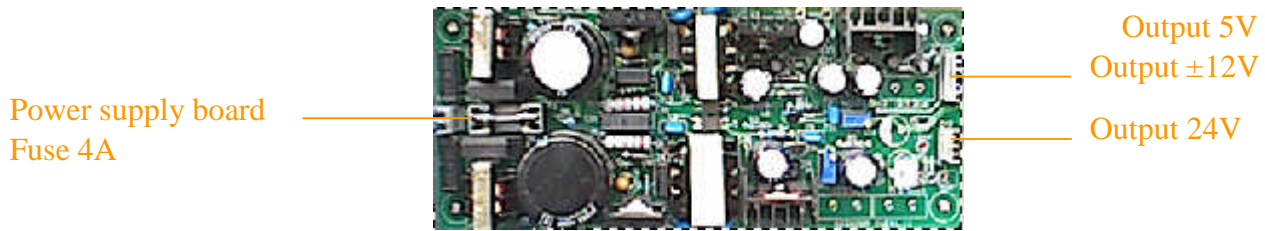
Picture 8

The power unit is compatible to variable input voltage , with its range between A.C. 100V to 240V. And the four output groups voltage are respectively：+5V、+12V、-12V、+24V。

Ports on PS board：

PORT	REMARKS
CN1 2-pin	Connected with 220V A.C.
CN2 6-pin	pins1、2&3 are ＋5V , supplying voltage for integrated circuit blocks；pins4、5&6 are ±12V.
CN3 3-pin	Pins 1&3 are ＋24V

CN2　6 pins：Pins1、2&3 are ＋5V output ,

Pins 4&5 are －12V output , regulated by three terminal circuit 79L09 to－9V , supplying working voltage for the integrated circuit blocks on the AMP Board.

Pins4&6 are ＋12V output , regulated by three terminal circuit 79L09 to +9V , supplying working voltage for the integrated circuit blocks on the AMP Board.

5). Keypad and Display

They mainly consist of bus circuit, contrast adjustment circuit and keypad displaying circuit etc. The display shows the machine's working status, value sum, and statistics etc. And the operator can select corresponding function according to necessity. It uses 240×64 dots LCD display and provides English operation screen, which can realize the friendly dialogues between operators and machines.

Keypad and display: picture (9)

LCD display

```
MIX COUNT           2004.02.03  09: 24
          VALUE:            0.00
          COUNT:            0
NO: 1                      F: 0
```

YFJ500KDC-S

```
1000   100    10     1
[M+]  [MR]  [Print] [REV] [CAS] [Reset]

[◁] [△] [▽] [▷] [SET]         [Stop/Start]
```

Keys (12)
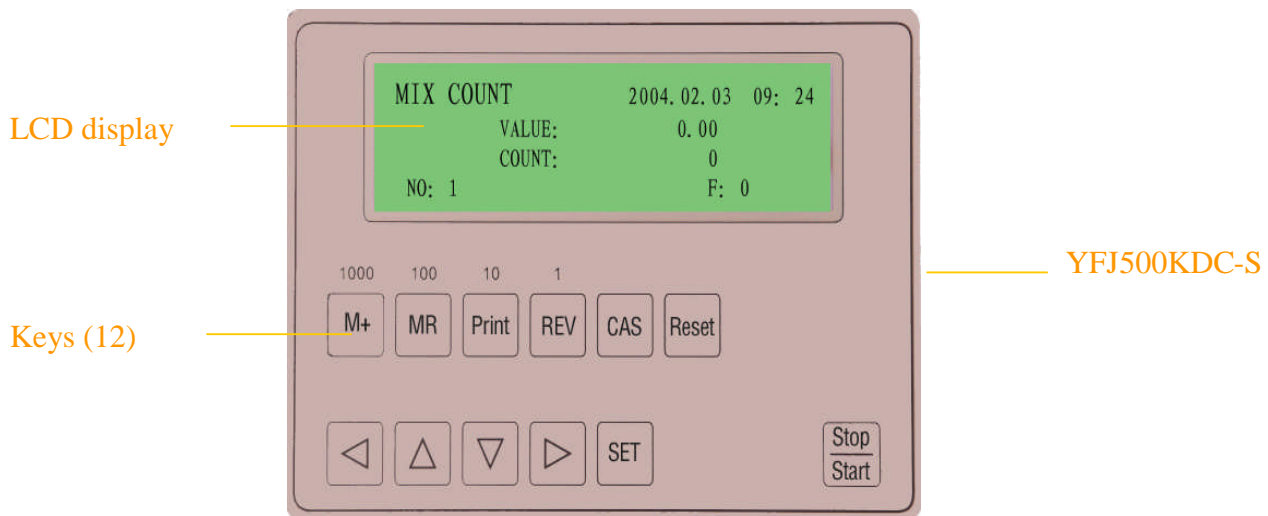
Picture 9

The contrast potentiometer of the KDC board has been fixed, so when the machine is switched on with SET key pressed, the LCD contrast degree cannot be adjusted.

KDC board	Connected with
40 poles cable wire	CPU board 40 poles cable wire

6). Counting and detecting sensor COINSURE (Picture 10)

All the coins passing by the sensor have difference in materials and parameters from each other, which are analyzed and compared by CPU to realize the function of counting and detecting.

Counting and detecting sensor (black)

Hopper
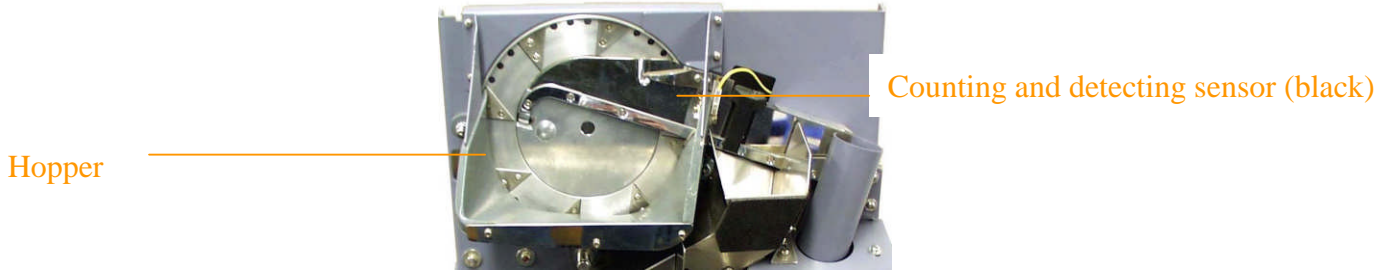
Picture 10

During counting the machine can count coin quantity , sum value and foreign coin sum , and store and print all the data of counted coins.

2.TESTING FUNCTION

1).Test 1

This is mainly to test the condition of two sensors、coin-rejecting solenoid and the disk motor .

Operate as follows：

Switch on the machine with RESET key pressed and enter test1, the machine displays:

TEST 1

S2：1　S3：1　S4：1　S5：1

S6：1　S7：1

Picture 11

S4 :

```
                    ┌──────────────────┐
                    │ 1= coins detected │
  ──▶ Activating sensor   0= without coins │
                    └──────────────────┘
```

S5 :

```
                      ┌──────────────────┐
                      │ 0=coin jam        │
  ──▶ Jam detecting sensor  1=no coin jam   │
                      └──────────────────┘
```

Coin under the counting and detecting sensor ,   Coin jam：0   See Picture (6)

S4：0

Press ◀ key ,the display shows in its right lower part"REJECT",with the sound"TA,TA",which

indicates the solenoid works normally , and press start/stop to stop ；

Press start/stop , the display shows in its right lower part"MOTOR", and press start/stop to

stop ；

Press REV key, the display shows in its right lower part "MOTOR R", and press start/stop to

stop ；

2.) Test 2

Under Test1 status, press CAS to enter TEST 2

TEST2

Picture（12）

This test is mainly to adjust the working voltage of sensor (8pcs) to the best point. Adjust

potentiometer W1, W2, W3, respectively until OK is shown. Decrease by turning clockwise,

and increase by turning anti-clockwise.

3). Display Accumulated Number

When the machine is first switched on, it first carries out a self-check. Then it will display the machine type, software version and accumulated number.

4). Restoration of the Working Parameters

Place switch 4 on the DIP-8 encoder switches to ON, press MR key and switch on the machine, it will display "FORMAT?". Press SET , 15 seconds later it returns to mix count. And the initializing is over. Parameters stored in CPU will be used as working parameters. Then put switch4 to OFF, and turn off the machine.

5). Value Setting

Place switch 4 on the DIP-8 encoder switches to ON, then switch on the machine and enter the normal working condition. Press SET to enter the main menu. Select "2. VALUE". Press SET to enter "value setting". Press ▲ ▼ to modify the channel number that is flashing. When the value flashes, press M+, MR, PRINT, REV to modify the different digits of the values. Press RESET to clear the value, and/or press SET to save. Press START/STOP to return to normal working condition.

3. SELF-STUDY OF THE COINS' PARAMETERS

The parameters, such as diameter, thickness and material (alloy) of each coin denomination must be stored into the machine. This step is completed by the Self-Study mode as follows:
Switch on the machine and the display shows "MIX COUNT", then press SET to enter "MAIN MENU". Then by pressing the arrow keys, select "6.LEARN" and press SET to confirm – as shown in picture (18). The display will show the denomination's parameters such as low frequency, middle frequency and high frequency and the 4th parameter's maximum and minimum values as well as the difference range. Alternatively directly switch on the machine with START/STOP pressed to enter the SELF-STUDY mode directly.

```
SELF-LEARN      2003.11.20        12:30

        Channel : 1    Value : 0.01
```

Max. .of parameter1

Min. of parameter 1

Parameter 4   Parameter3   Parameter 2

Difference range

Picture (12)
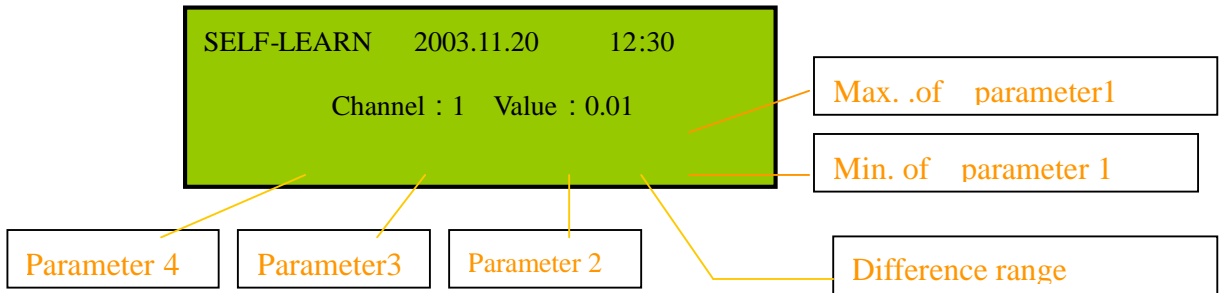
a). Press ▲ ▼ to select the channel. Put between 100-200 coins of each denomination at a time into the hopper and press START/STOP to feed the coins through the machine to allow the Self-Study process to be done for each denomination.

b). Press 1000/M+ to save the studied data, when the data flashes it means the data is stored into EEPROM. The result of the self-study of each coin's parameters are directly related to the accuracy of the machine's counting and detecting capability.

c). Press ◄ to select cyclically print, clear, restore, adjustment or self-learn, and then press SET to confirm. The selection is shown in the upper left area of the display.

    a.   PRINT: to print the parameters of the denomination studied

    b. CLEAR: to clear the parameters of the denomination studied

    c. RESTORE: to restore the cleared parameters

    d. ADJUST: to adjust the parameters of the denomination studied.

When selecting adjustment, you can modify the "difference range".   This is done as follows: Press the ▲ ▼. keys to pre-select the "difference range" to be adjusted. The pre-selected range will flash. Then press ► to select the number to be modified. After modification, press SET to save, or press RESET to exit without saving.

d). During the process of saving parameters, if the machine finds that two different denominations overlap, it will display the two values. This requires that the parameter study of these two denominations be repeated until the "SAVE" process is OK.

* The coin denomination values per channel are fixed - the following is for the EURO coins on the PRC-420: TABLE (1):

VALUE		0.01	0.02	0.1	0.2	0.05	1.00	0.50	2.00
CHANNEL	FOREIGN COIN BOX	1	2	3	4	5	6	7	8

Table (1)   (Euro)

It could be possible that 2 different issues of a denomination may be required to be counted and/or split. In this case, the parameters of one of these issues can be stored under channel 9

4.   MECHANICAL ADJUSTMENT

4.1 Drive disk *(66)* and hopper *(26)*

Adjustment：when mounting hoppers、ensure the left side gap between the hopper (26) and the disk（66） Note：If the surface of the centering disk is higher than that of the driver disk , this will slow down the sorting speed , and easily causes coin jams.

In the middle should be adjusted to be 5.7mm with a 5.7mm gauge(Fig.1). There is a 1～2mm adjustable gap between the hopper and hopper spacer. When coin jam occurs ,the hopper can be moved outward 1～2mm automatically to remove coin jams by itself.(Fig. 2)

66

26

(Fig .1)

2mm
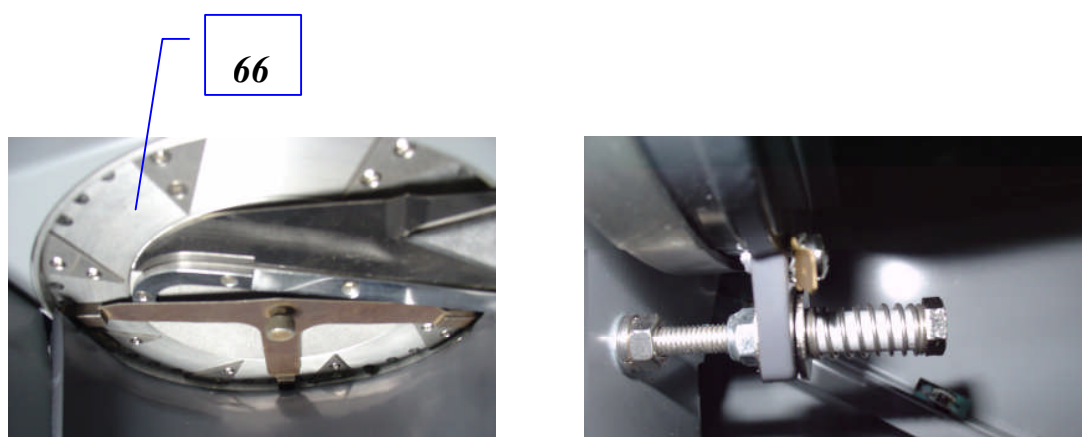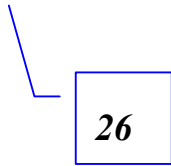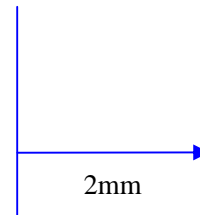
(Fig. 2)

If the gap is not appropriately adjusted; the machine cannot automatically remove the coin jams.

4 . 2   Drive disk (31) and centering disk(32) adjustment

Belt wheel (67) must be threaded tightly by the drive disk (66)   screw S1 , and the surface of

the centering disk (65) must be even to or lower than the surface of the drive disk belt wheel.

S1

67

66

65
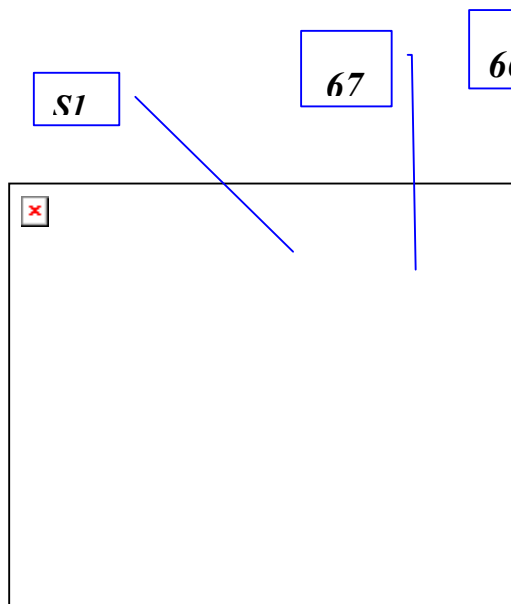
(Fig . 3)
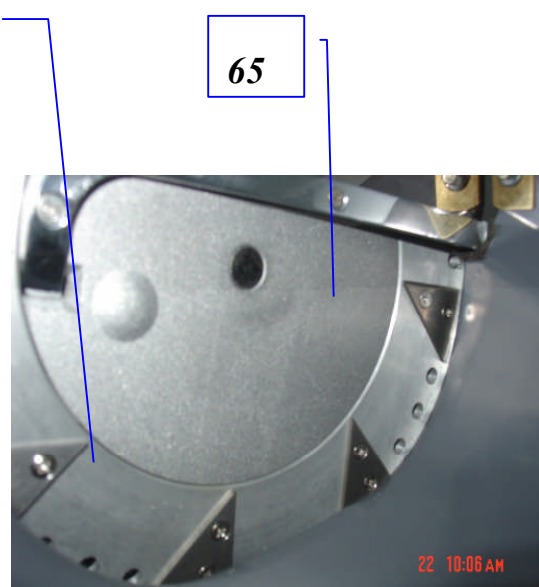
(Fig. 4)

Note：If the surface of the centering disk is higher than that of the driver disk , this will slow down the sorting speed , and easily causes coin jams.

4.3 Adjustments of Rail and Back up Plate for Rail

Adjustment：The rail and back up plate must be level off. Adjust the flatness of the rail by the screw wholes on it。 The back up plate must be flat and straight , and adjust it with the suck-head screw。

phenomena：Rail and back up plate must be flat and straight. If not, when coins roll down , they may jump or roll off the rail, which will cause error counting.

4.4 Limit block adjustment

1 . The distance between the front sharp angle of the triangle limit block *(23)*and the surface of the rail *(24)* should be equivalent to the diameter of the biggest coin plus 2mm(Fig.5) , the distance between the side of the contact plate*(27)* and the sliding plate should be the thickness of the thickest coin plus 0.5mm(Fig.6).
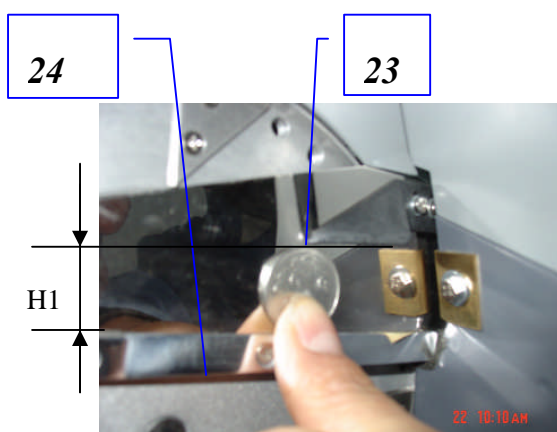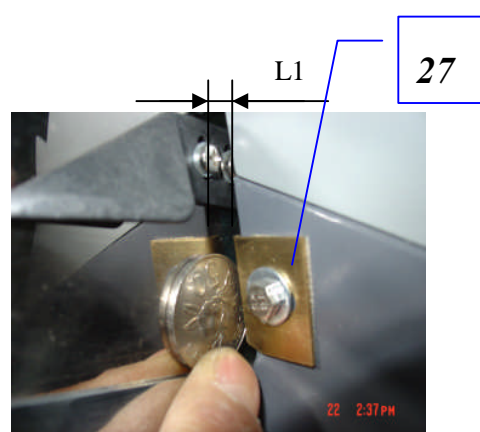
（ Fig. 5 ）　　　　　　　　　　　　（ Fig.6 ）

2．Deflector（40）height H2（between deflector and the rail）, should be equivalent to the diameter of the corresponding coin denomination to deflect the coin into the channel .

If the contact plate is mounted improperly, two overlapping coins may pass on to the rail. If the limit block is amounted improperly, three coins may pass on to the rail simultaneously , which will cause error counting. If the deflector is mounted too high, it will lose its function of guiding coins. If it is mounted too low, coin jams will occur.

4.5 Adjustment of Motor Belt

Adjustment：Belt*(68)* should not be too loose. If the belt is too loose, loosen the four screws *(72)* in the motor to move the motor downward. （Fig.7）

phenomena：If belt *(68)* is too loose , it will slide and slow down the sorting speed。

Note：1、The belt wheel of the motor and the belt wheel on the disk must be in the same plane.

2、After mounting the cover , it should not prevent the movement of the hopper.
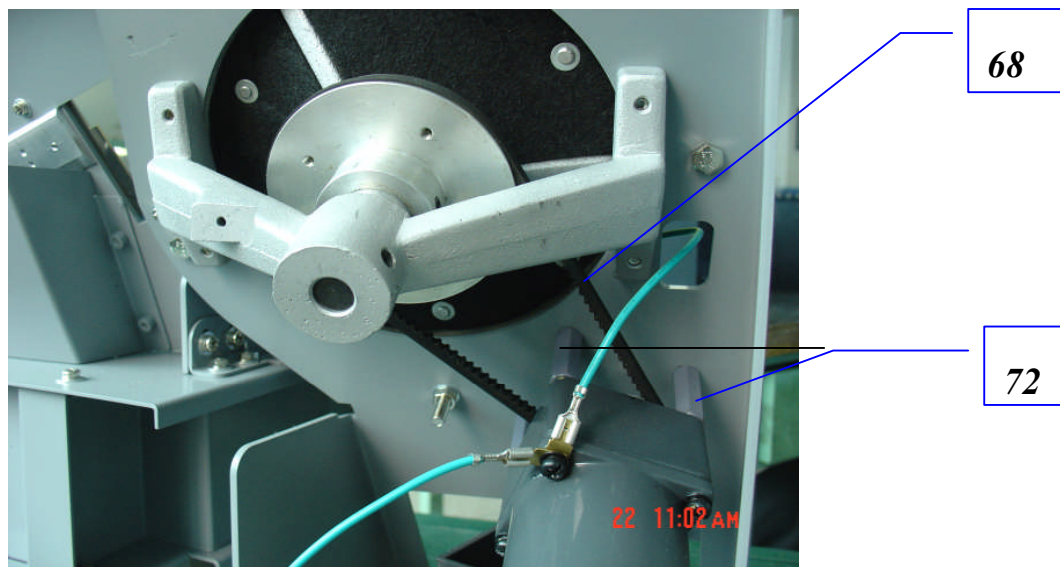
（Fig. 7）

5. ERROR INFORMATION

Errors During Sorting,

Error displayed	Reason	Correction
Coin jam！	Short circuit between jam sensor and rail	Remove the coin and press RESET
Coin under sensor 1！	There is coin under counting and detecting sensor	Remove the coin and press RESET
Box full！	Foreign coins reach 200 pcs	1. Empty the drawer，press START 2.Press ▲ and RESET simultaneously to clear foreign coins number only.
BATCH OK！	Batch number is reached	Press RESET

6. ERRORS AND TROUBLE SHOOTING

1). Hesitant Coin Transportation

   After the machine is used for a period of time or it is heavily used every day, some parts may suffer from normal wear and tear., which will influence the normal counting and detecting accuracy of the machine, so the corresponding parts should be changed. Details refer to Chapter5.

2). Parameters Adjustment

   If the machine works abnormally or wrongly rejects coins, especially after any mechanical adjustment has been carried out, then the coin parameters should be re-Studied/learnt.- refer to "3. Self-learn of the parameters of coins"

3). Display Panel Damaged

If the display panel displays characters lacking strokes or unknown marks, please check whether the 40-pin power line is in good condition or change the display panel.

4) Sensors Damaged

Over time, some of machine's sensors may age. The machine will warn with errors messages. The condition of the sensors can be tested in test1. For the specific test, please refer to "2.test function".

5). Circuit Board Damaged

① Fuse melts due to short circuit.

I/O board fuse: 1pc	F1-------1A disk motor
Power fuse: 1pc	3.15A------220V A.C. INPUT
Power board fuse: 1pc	F1------4A
AND board fuse: 2pc	F1------1A (regulated) 9V
	F2------1A (regulated)-9V

② CN3（24V）on power supply board can not be tested：PS board PKE200 orTOP227 is damaged.

CN2（5V）on power supply board can not be tested：PS board TL431 is damaged。

③ TPH、TPM、TPL voltage on ADC board cannot be tested : L1 lamp AND is off ,78L09

is damaged。

7). Motor Damaged

Motor does not rotate：capacitor malfunctions or fuse melts；Or the failure of its own.

Change corresponding components according to situation or error information. If there is any problem that cannot be handled by yourself, please contact the local distributor.

7. Enclosure: YFJ-3XX Machine's Spare Parts Drawings and List

Rail Coin Sorter Parts List

NO.	DISCRIPTION	QTY	UNIT PRICE（￥）	REMARK
1	Rubber pad	4	4.75	
2	Base plate	1	250.00	
3	Suspect coin box	1	30.00	
4	Suspect coin channel	1	32.00	
5	Left frame	1	110.00	
6	Side plate	1	12.00	
7	Ground connector	2	2.00	
8	Hexagon bolt	2	0.70	
9	Lock nut	5	1.50	
10	Coin scraper	8	5.00	
11	Side plate (left)	1	5.00	
12	Back plate	1	14.00	
13	Guide rail	1	80.00	
14	Back up plate for rail	1	100.00	
15	Coin guide plate	1	1.00	
16	Baffle plate（1）	1	3.00	
17	Suspect coin box	1	18.60	
18	Sunk-head screw M3	1	0.13	
19	Sensor	1	3.00	
20	Plastic plate (big)	1	4.50	

21	Plastic plate (small)	1	6.00	
22	Coin exit channel	1	120.00	
23	Limit block for coin dia.	8	5.00	
24				
25	Feed plate for rail	1	100.00	
26	Back up plate	1	54.00	
27	Round channel（2）	1	5.00	
28	Disk support frame	1	36.70	
29	Belt wheel (big)	1	37.50	
30	Oil bush	2	1.00	
31	Drive disk	1	111.50	
32	Centering disk	1	24.50	
33	Contact plate	1	2.50	
34	Hopper	1	150.00	
35	Compression spring	1	0.60	
36	Aluminum tube	1	2.00	
37	Hexagon head bolt	1	0.70	
38	Hinge	1	20.10	
39	Pad hinge	1	20.00	
40	Upper plate	1	126.00	
41	Drawer	9	25.50	
42	Lower cover 1	1	32.00	
43	Lower cover 2	1	1.06	
44	Belt wheel (small)	1	18.00	
45	Motor feet	4	1.20	
46	Motor	1	570.00	
47	Power board	1	408.00	
48	Socket	1	60.00	
49	Switch	1	11.40	
50	Socket holder	1	12.00	
51	Fuse holder	1	8.40	
52	Aluminum fixed plate	1	6.00	
53	CPU board	1	115.72	
54	Aluminum back plate	1	46.00	
55	Right frame	1	114.00	
56	A/D board	1	397.69	
57	Aluminum slope bar	1	13.50	
58	Belt	1	24.00	
59	Shaft	1	8.70	
60	Hopper cover	1	25.50	
61	Hinge	2	5.60	
62	Hinge	2	5.60	
63	Plastic door	1	1.02	

64	Cover	1	542.00	
65	Display panel	1	100.91	
66	Rear cover	1	11.84	
67	Fixture plate	1	50	
68	PS board holder	1	11.98	
69	I/O board	1	193.71	
70	Fixture strip 1	1	7.31	
71	Fixture strip 2	1	7.31	

11 12 15 59 67 29 28

32 10

31

9

8

35

37

7 34 33 30

36

71 70

45 46

44

58

4   21   16   6   19   20   23   26

14

13

18

38   22   25   24   52

60 61 66

62

65 63 64
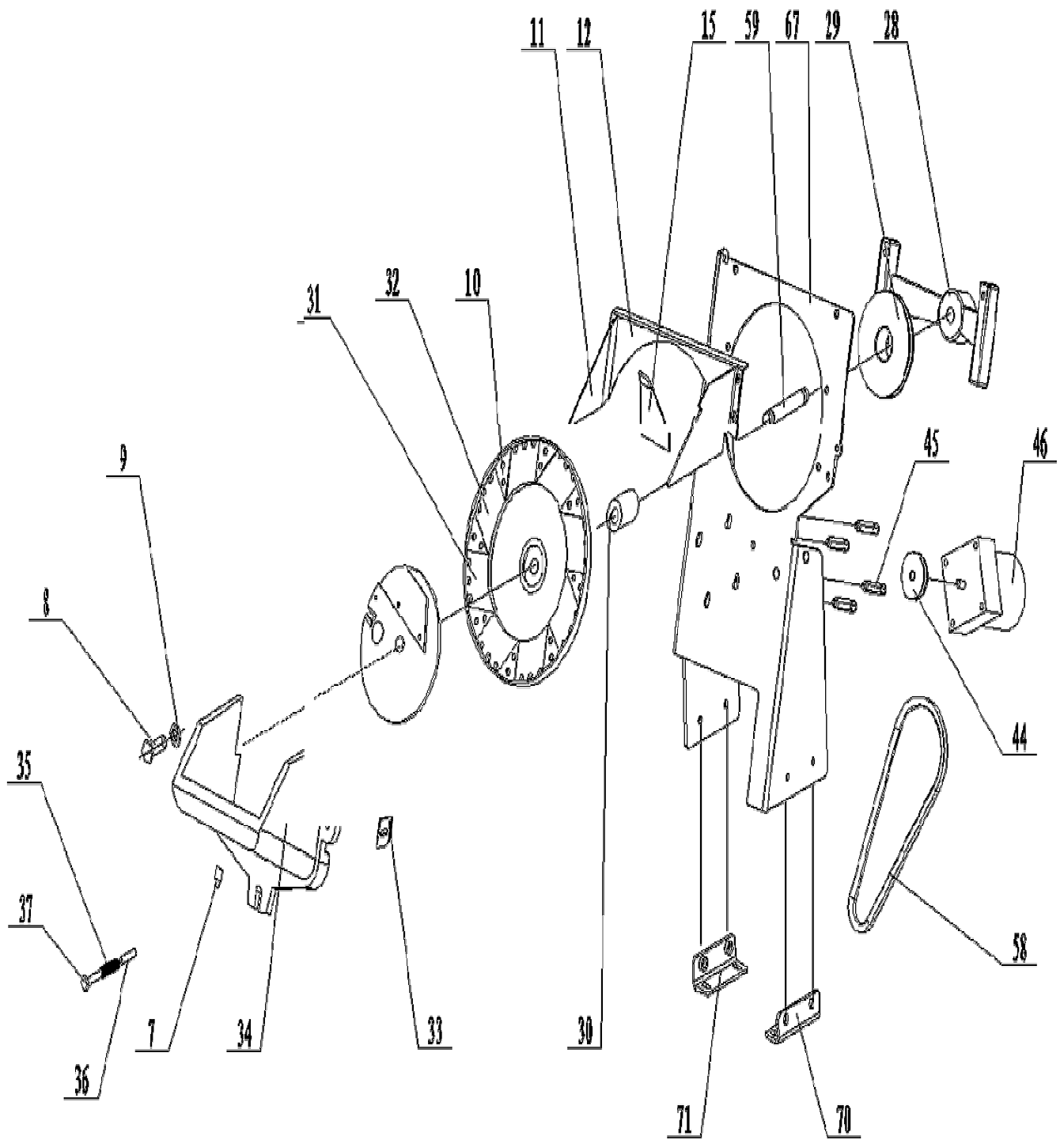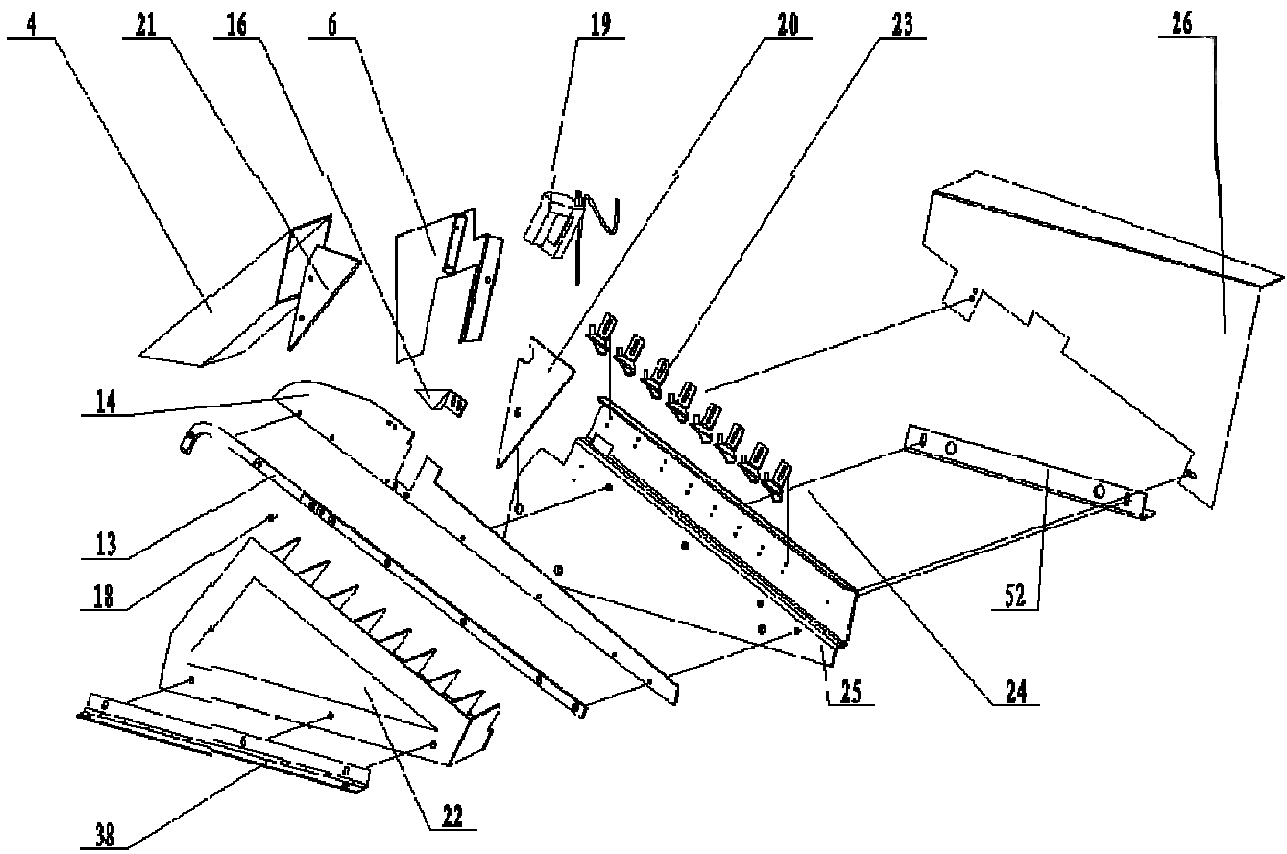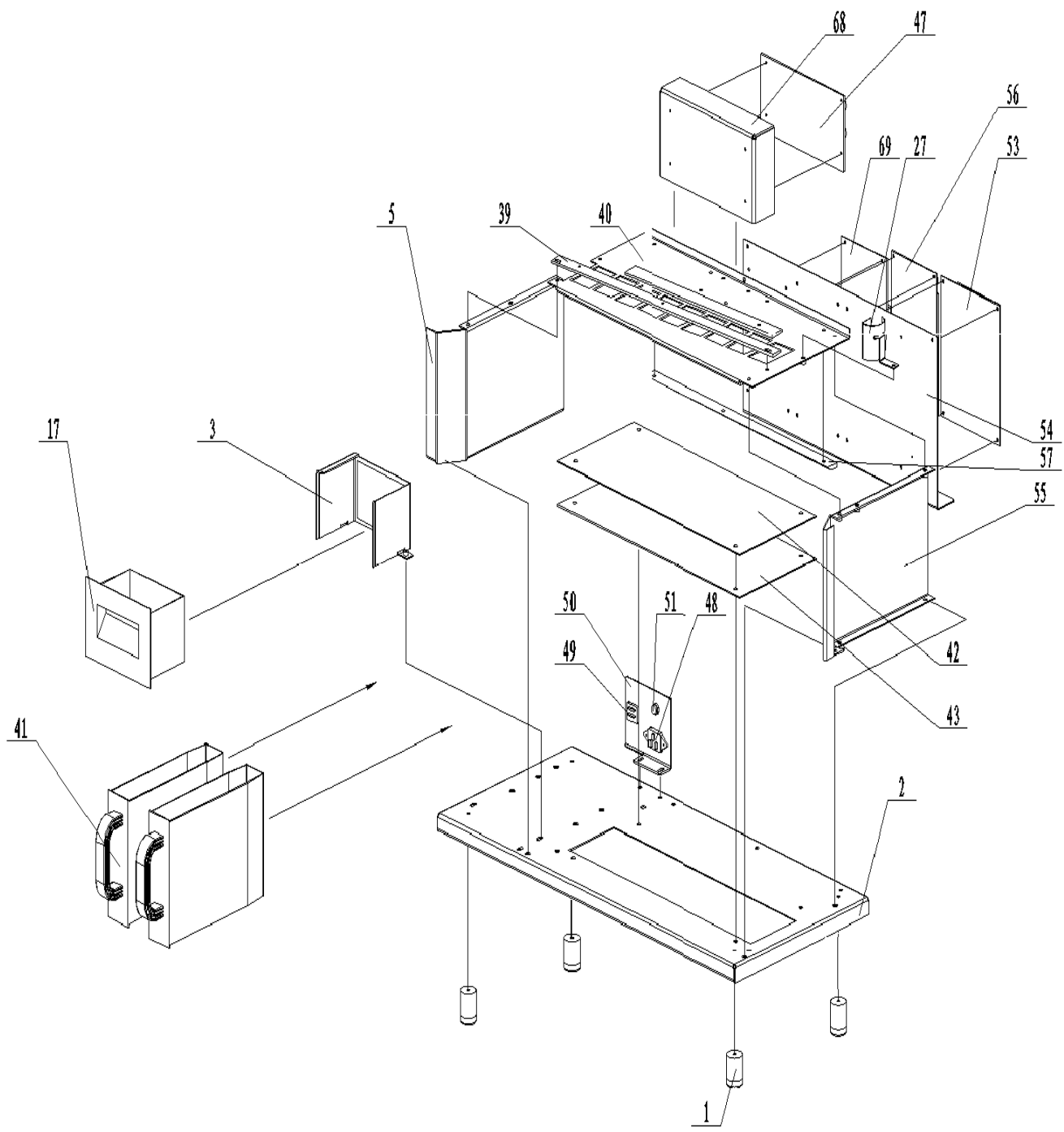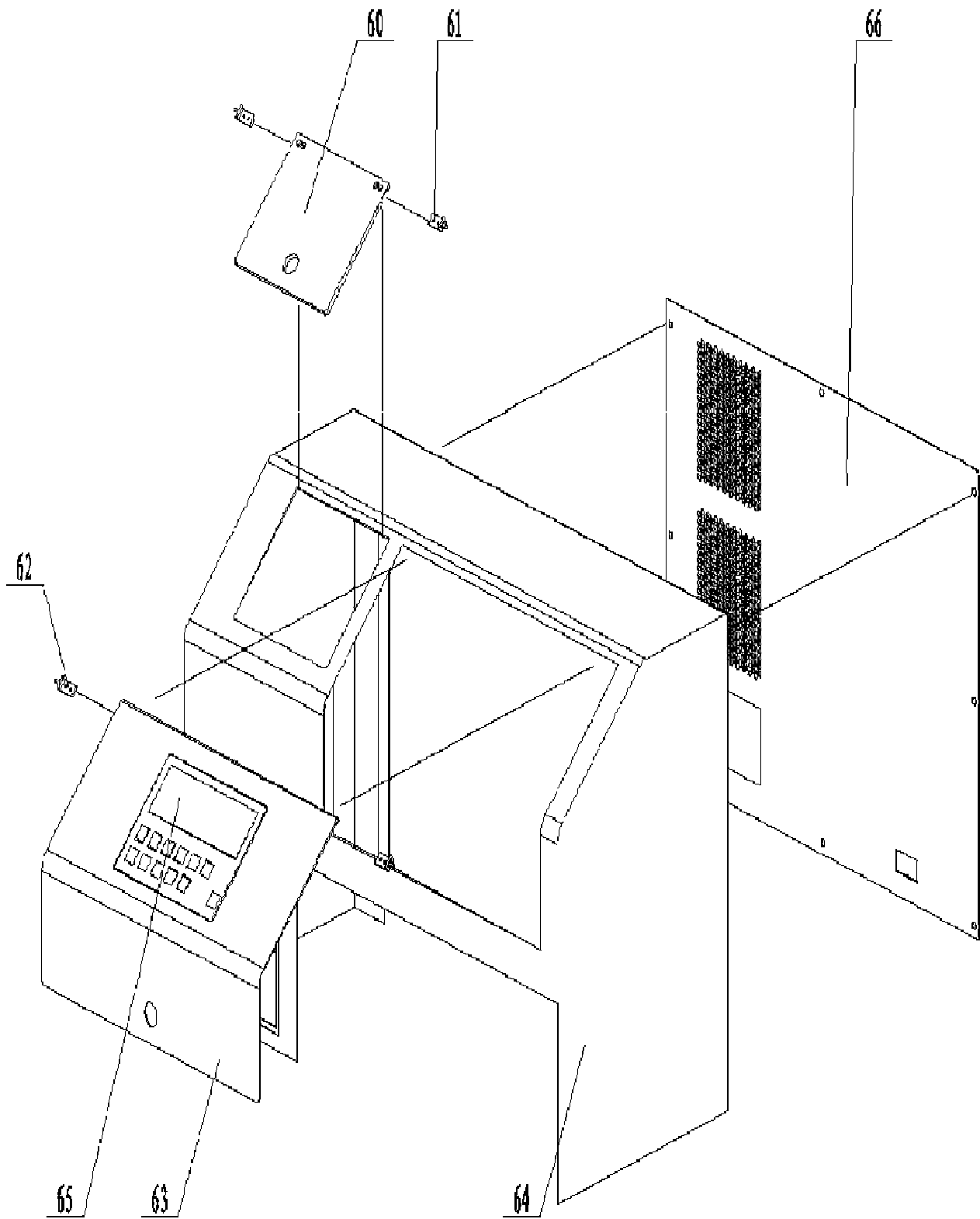
8. Electronic Boards Layout.
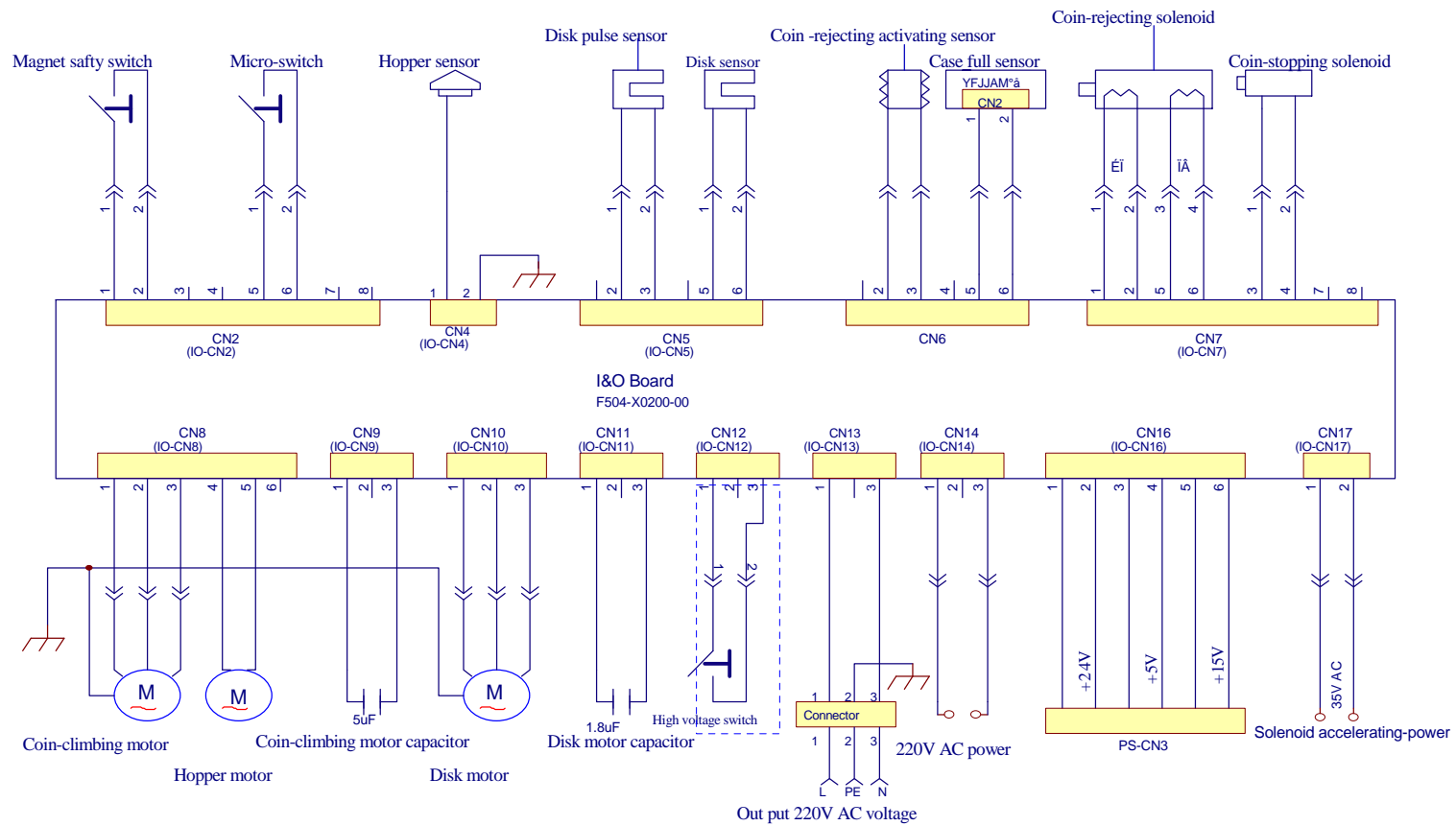
Picture(6) Wiring diagram of I/O BOARD
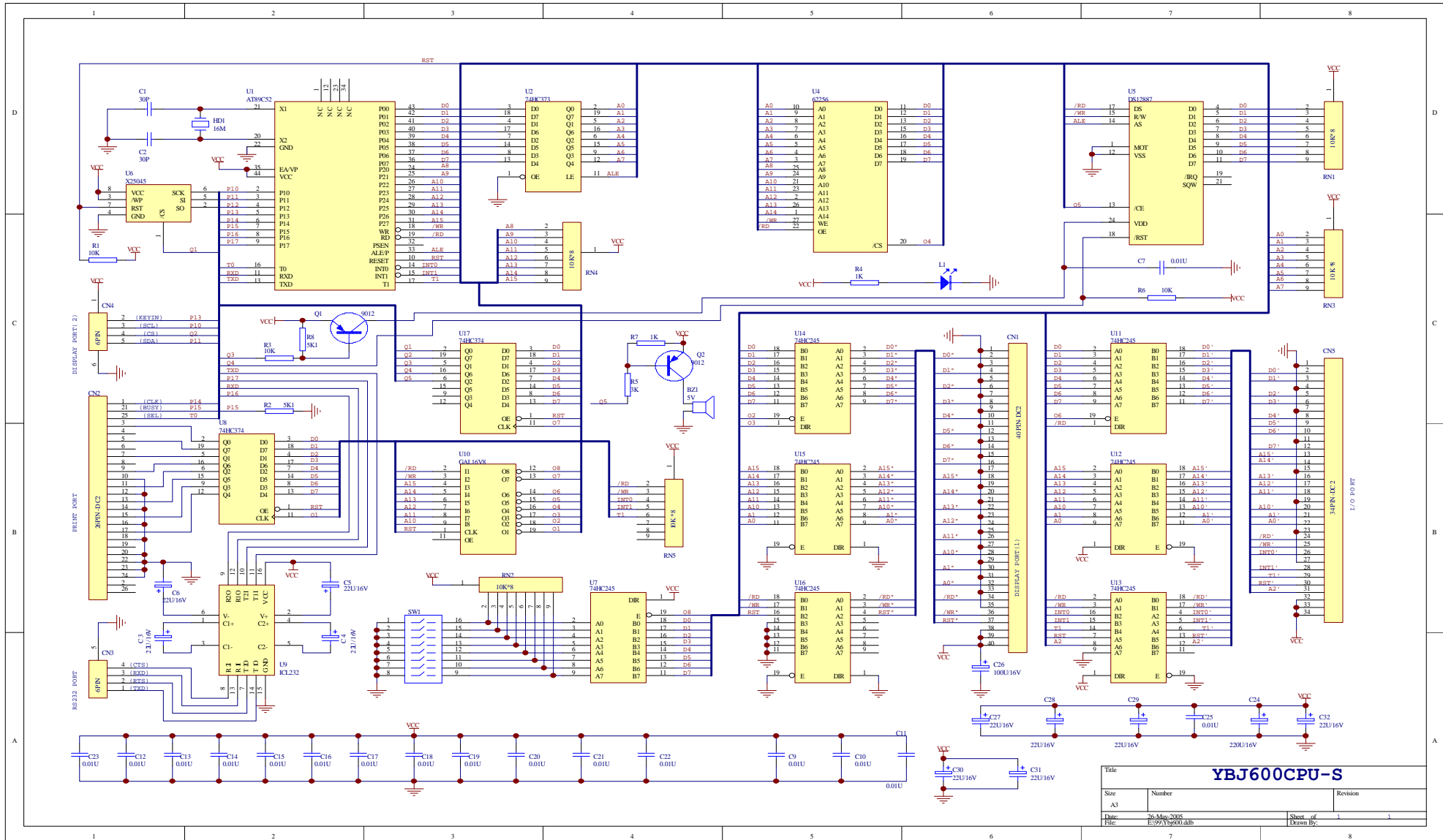
YBJ600CPU-S

Size	Number		Revision
A3			

Date:	26-May-2005	Sheet of	1	1
File:	E:\99\Ybj600.ddb	Drawn By:		

CN1
TO YBJ600CPU ON DC2
40PIN DC2

D0" D1" D2" D3" D4" D5" D6" D7" A15" A14" A13" A12" A11" A10" A1" A0" /RD" /WR" RST"
VCC

U2
74HC245
A7 B7
A6 B6
A5 B5
A4 B4
A3 B3
A2 B2
A1 B1
A0 B0
DIR
E

U1
74HC245
A7 B7
A6 B6
A5 B5
A4 B4
A3 B3
A2 B2
A1 B1
A0 B0
E DIR

RN1
10K*8
VCC
PB0 PB1 PB2 PB3 PB4 PB5 PB6 PB7

CN3
2PIN-2.54
TO LED
VCC
R1
6.8/0.5W

U3
74HC245
A2 B2
A1 B1
A0 B0
A3 B3
A4 B4
A5 B5
A6 B6
A7 B7
DIR E
VCC

U8
74HC374
D0 Q0
D1 Q1
D2 Q2
D3 Q3
D4 Q4
D5 Q5
D6 Q6
D7 Q7
RST OE
CLK

P B0 P B1 P B2 P B3 P B4 P B5

S7 S8 S9 S10 S11 S12
12*12-½¼ü

D2
1N4148

S1 S2 S3 S4 S5 S6
12*12-½¼ü

D1
1N4148

U4
74HC245
A2 B2
A1 B1
A0 B0
A3 B3
A4 B4
A5 B5
A6 B6
A7 B7
DIR E
VCC

U5
GAL16V8
I1 O1
I2 O2
I3 O3
I4 O4
I5 O5
I6 O6
I7 O7
I8 O8
CLK OE

R4 R5
1K 1K

VCC
R2
0

U7
X9313W
/CS VCC
/INC VH
U/D VW
VSS VL

R3
20k

C18 C19
510P 1000P

CN2
20PIN DC2
LCD PORT
/WR /RD O4 A0 O1 D0 D1 D2 D3 D4 D5 D6 D7
VCC
CN2.19=GND

VCC
C3 C4
22U/16V 0.01U

VCC
C9 C14
0.01U 0.01U

VCC
C5 C6 C7 C8
0.01U 0.01U 0.01U 0.01U

C10
10U/16V

U6
ICL7660
CP+ V+
N.C OSC
CP- LV
GND VO

C13 C11
10U/16V 0.1U

Q1
9013
VCC

W1
5K

C15
10U/16V

U9
ICL7660
CP+ V+
N.C OSC
CP- LV
GND VO

C12
10U/16V

C16
10U/16V

C17
0.01U

VCC
C1 C2
22U/16V 0.01U

YBJ600KDC-S
SOUTH

yfjADC-1
yfjADC-S.S01

I/O BUS

INT0

yfjADC-3
yfjADC-S.S03

FQ
CY
HIN
HOUT
MIN
MOUT
LIN
LOUT

I/O BUS

INT0

yfjADC-2
yfjADC-S.S02

I/O BUS

FQ
CY
HIN
HOUT
MIN
MOUT
LIN
LOUT

yfjADC-4
yfjADC-S.S04

INT0

I/O BUS

U1 74HC245

D0'	2	A0	B0	18	D0
D1'	3	A1	B1	17	D1
D2'	4	A2	B2	16	D2
D3'	5	A3	B3	15	D3
D4'	6	A4	B4	14	D4
D5'	7	A5	B5	13	D5
D6'	8	A6	B6	12	D6
D7'	9	A7	B7	11	D7

DIR 1 /RD
E 19 O1

U2 74HC245

A15'	2	A0	B0	18	A15
A14'	3	A1	B1	17	A14
A13'	4	A2	B2	16	A13
A12'	5	A3	B3	15	A12
A11'	6	A4	B4	14	A11
A10'	7	A5	B5	13	A10
A1'	8	A6	B6	12	A1
A0'	9	A7	B7	11	A0

DIR 1 E 19
VCC

U3 74HC245

/RD'	2	A0	B0	18	/RD
/WR'	3	A1	B1	17	/WR
INT0'	16	B2	A2	4	INT0
	15	B3	A3	5	INT1
	14	B4	A4	6	T1
RST'	7	A5	B5	13	RST
A2'	8	A6	B6	12	A2
	9	A7	B7	11	

DIR 1 E 19
VCC

CN1

TO YBJ60 CPU CN5 34PIN

1	
2	D0'
3	D1'
4	
5	D2'
6	D3'
7	
8	D4'
9	D5'
10	
11	D6'
12	D7'
13	A15'
14	A14'
15	
16	A13'
17	A12'
18	A11'
19	
20	A10'
21	A1'
22	A0'
23	
24	/RD'
25	/WR'
26	INT0'
27	
28	
29	
30	RST'
31	A2'
32	
33	
34	

VCC

U4 GAL16V8

A15	2	I1	O1	19	O1
A14	3	I2	O2	18	O2
A13	4	I3	O3	17	O3
A12	5	I4	O4	16	O4
A10	6	I5	O5	15	O5
	7	I6	O6	14	O6
/RD	8	I7	O7	13	O7
/WR	9	I8	O8	12	O8

RST 1 CLK
11 OE

VCC

| | C1 22U/16V | C2 0.01U | C3 0.01U | C4 0.01U | C5 0.01U | C6 0.01U |

RN1 10K*8

D0	2
D1	3
D2	4
D3	5
D4	6
D5	7
D6	8
D7	9

VCC 1

RN2 10K*8

A15	2
A14	3
A13	4
A12	5
A11	6
A10	7
A1	8
A0	9

VCC 1

RN3 10K*8

/RD	2
/WR	3
INT0	4
INT1	5
T1	6
RST	7
A2	8
	9

VCC 1

I/O BUS

YFJ500ADC-S

SOUTH

YFJ500ADC-S

LOW=(120T)
HIGHT= (140T)

CN3
3PIN

ANALOG INPUTS

R9 10k
R12 100K
R10 10k
R11 100K

U9A TLE2082
-9
+9

U9B TLE2082

TP5

TJ7 TJ8
C21' N.C   C21 75P
TJ9 TJ10
C22' N.C   C22 75P
TJ11 TJ12
C23' N.C   C23 22P
TJ13 TJ14
C24' N.C   C24 22P

U10 YFJ500HAMP-S
+9 -9
21 23
FIN1 VDD VSS W3 16
FIN2 W2 15
TP1   W1 14
TP4   13
FIN3 WX 12
TP3   11
FIN4 FIN5 9
GND   FIN6 10
22   TP5 17
      TP2 18
CY FQ OUT
19 20

HOUT
HIN (SEE PAGE 2)

TP6
TP9
100K W1
TP8

TJ15 C26 30P C26' N.C
TP10 TP7 TJ17 TJ18
TJ16
C25 30P C25' N.C

(SEE PAGE 2)
CY
FQ

I/O BUS

VCC
D3 1N4148

C64 0.01u

U13 TLC0820A
AIN D0 1
RE+ D1
VCC D2
MOD D3
RE- D4
GND D5
/OF D6
NC   D7
/IT /CS
     /WR
     /RD
D0 D1 D2 D3 D4 D5 D6 D7 O3 /WR /RD

TJ19 TJ20
C27' 220P C27 150P
TJ21 TJ22
C28' 220P C28 150P

U11 YFJ500MAMP-S
FIN1 VDD 26 +9
FIN2 GND 27
TP1   VSS 28 -9
FIN3 OUT 25
TP11 CY 24
TJ23 TJ24 FQ 23
C29' 75P C29 100P TP7 22
TP2   W3 21
FIN4 W2 20
TJ25 TJ26 W1 19
C30' 75P C30 100P TP6 18
WX1   WX2 17
R13 5K6 TP5 16
TP3   FIN7 14
TJ27 TJ28 FIN8 15
C31' 200P C31 150P TP4 13
FIN5
TJ29 TJ30 FIN6 12
C32' 200P C32 150P

MOUT
TP17
MIN (SEE PAGE 2)
50K W2
TP16
TP15
TJ31 C34 100P C34' 75P
TJ32
TP12
TP13
TP14
TJ33 C33 100P C33' 75P
TJ34

TJ45 TJ35 TJ36
C35" 3300P C35' 1800P C35 470P
TJ46 TJ37 TJ38
C36" 3300P C36' 1800P C36 470P

U12 YFJ500LAMP-S
FIN1 OUT 19
FIN2 CY 18
TP1   FQ 17
FIN4 TP5 16
WX1   W3 15
TP2   W2 14
WX2   W1 13
TP5   TP4 12
FIN3
VDD GND VSS
20 21 22
+9 -9

TP18
R14 15K
TP19

C66 0.01u
TP21
LOUT
LIN (SEE PAGE 2)
100K W3
TP25
TP20
TJ41 TJ42 TJ48

C65 0.01u

TJ47 TJ39 TJ40
C37" 1800P C37 300P C37' 1500P
C38' 1500P C38 300P C38" 1800P

VCC
D4 1N4148
U14 TLC0820A
AIN D0
RE+ D1
VCC D2
MOD D3
RE- D4
GND D5
/OF D6
NC   D7
/IT /CS
     /WR
     /RD

VCC
C40 22U/16V C42 0.01U C43 0.01U C44 0.01U
C50 22U/16V C48 0.01U C49 0.01U -9

TP-H
+9
C39 22U/16V

+9
R15 2K
U16B LM358
W4 10K
R16 3K3
U8 TL431
C41 0.01U C72 0.01U

TP-M
+9
R31 2K
U25B LM358
W5 10K
R32 3K3
U23 TL431
C79 0.01U C80 0.01U

U25A LM358
R33 2K
TP-L
W6 10K
R34 3K3
U24 TL431
C81 0.01U C82 0.01U
+9

VCC
D5 1N4148
U15 TLC0820A
AIN D0
RE+ D1
VCC D2
MOD D3
RE- D4
GND D5
/OF D6
NC   D7
/IT /CS
     /WR
     /RD

+9
C45 22U/16V C46 0.01U C47 0.01U C51 0.01U C52 0.01U
C53 0.01U C54 0.01U -9
VCC

YFJ500ADC-S
SOUTH

2

CN4
3PIN
TO TRANSFORMER

F1
1A

F2
1A

BG1
KBJ210

C56
1000U/25V

C57
1000U/25V

C58
0.01U

C59
0.01U

CN6
2.54-3P
(7809)

TP23

C60
0.01U

C61
0.01U

C62
22U/16V

C63
22U/16V

CN7
2.54-3P
(7909)

TP24

+9

R17
1K5

L1

R18
1K5

L2

-9

CN5
4PIN
START SENSOR

R20
20K

R19
1K

R24
680

+9

C67
1000P

R22
10K

R21
1K

R23
20K

+9

R25
100K

U17A
LM393

INT0
(SEE PAGE 1)

U17B
LM393

YFJ500ADC-S

SOUTH

3

I/O BUS

VCC

R1 1K
VD1 1N4007
R2 1K
R3 1K
R4 100K
VCC

CN2 2PIN
1
2

VD2 1N4007
VD3 1N4007

C7 0.1U

U5A LM393
3
2
8
4

R6 3K3
R5 2K2
VCC

VCC
R18 20k
R19 10k
R17 4k7
U5B LM393
5
6
7
T1
R20 100k

CN9 3PIN
1
2
3

R16 330
R21 20k
VCC

VCC
CN7 4PIN
1
2
3
4

+24
VD4 FR203
CN3 2PIN
1
2
REJECT

INT1

VCC
R7 1K
U7 TLP521-1
+24
R8 22K
Q1 IRF540

R9 10K
GND1

VD5 FR203

U6 74HC374
D0
D1
D4
D5
D6
D7
D2
D3
OE
CLK
Q0
Q1
Q4
Q5
Q6
Q7
Q2
Q3

D0
D6
D7
RST
O2

CN6 3PIN
1
2
3
MOTOR C1 (1UF)

VCC
U8 S202C1
Q2 9012

R11 RMZ470V
R12 47/2W
C8 0.1U/250V

CN5 3PIN
1
2
3
MOTOR

I/O BUS

VCC
R10 1K
U9 TLP521-1
Q3 2N5551
R13 4K7
GND1

VD6 1N4007
+24
REL1
943-1C-24D

F1 1A

CN4 3PIN
1
2
3
220V AC

VCC
R14 1K
C9 100U/16V
C10 0.01U
L1

CN8 4PIN
1
2
3
4
C11 100U/35V
C12 0.01U
+24
R15 6K8
L2
GND1

VCC
C13 0.01U

YFJ400I&O
½Ó¿Ú°å
£¨±íÃù°å£©

Y400I&O-S-1-Y
SOUTH

5

C32 0.033U/250AC
Z2 P6KE200
R10 36K/2W
D8 UF4004
D7 UF4004
+12
U8 7912
Vin -5V
GND
-12
C26 1000U/25V
C24 0.01U/63V
C14 1000U/25V
C16 0.01U/63V
C19 0.01U/63V
C18 1000U/16V
T2 EI-25
D5 BYV26C
D6 1N4148
D4 MUR1620
I2 3.3UH
C22 1000U/16V
U7 LM2940
Vin +5V
GND
I5 3.3UH
C37 0.01U/63V
+5
CH2 2.54-6P
I3 33MH*2
B2 KBL06
AC +
AC -
R9 330K/0.5W
C3 100UF/400V
C35 0.01U/250VAC
U2 TOP223Y
S D
C
C12 0.1U/100V
C33 1000P/630V
C17 1000U/25V
C23 0.01U/63V
C31 100U/16V
C30 100U/16V
-12 +12
C1 0.1U/250VAC
U4 PC817
R11 510R
R13 5K6
R8 220R
C25 0.1U/100V
VR2 10K
C13 47UF/16V
R2 6.2R
C20 2200PF/1KV
C21 2200PF/1KV
U6 TL431
CH1 3.96-2P
220V
F1 250V/4A
R6 560K/0.5W
C11 0.1U/250VAC
C29 0.1U/250VAC
Z1 P6KE200
R12 36K/2W
T1 EI-28
D3 MUR3020
C10 1000U/35V
I1 3.3UH
C9 1000U/35V
+24
U9 7818
Vin +18V
GND
U10 7812
Vin +12V
GND
C27 0.01U/63V
C36 1000P/630V
D1 BYV26C
D2 1N4148
C5 0.1U/100V
GND1
I4 33MH*2
B1 KBL06
AC +
AC -
R7 330K/0.5W
C2 150UF/400V
C34 0.01U/250VAC
U1 TOP227Y
S D
C
U3 PC817
R4 1K
R5 33K
R3 1K
C8 0.1U/100V
C15 1000U/16V
C28 0.01U/63V
CH3 2.54-5PIN
GND1 +24
C4 47UF/16V
R1 6.2R
C6 2200PF/1KV
C7 2200PF/1KV
U5 TL431
VR1 10K
GND1
CH4 2.54-2PIN
GND1
SGS600P-Y
SOUTH
(SGS600P)
6