

# CONVERSION KIT

installation & service manual



**DE** DATA EAST USA, INC.  
470 Needles Drive  
San Jose, CA 95112

780-0045-00

F I R E T R A P  
I N S T A L L A T I O N   A N D   S E R V I C E   M A N U A L  
C O N V E R S I O N   K I T   M O D E L   N U M B E R   1 U S 2 4 K

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1st Printing  
November 1986

# 1 . R E A D T H I S F I R S T

## a. Checking your kit.

Your Data East conversion kit contains all of the components required for installation in most color upright video game cabinets. Before beginning, check the contents of your conversion kit for the following materials:

(1)	Firetrap PCB set	510-0089-00
(1)	EMI filter PCB, DE-0239	520-0083-00
(1)	Main harness, conversion kit	036-0122-00
(1)	Marquee plex, Firetrap	830-0026-00
(1)	Monitor underlay card, Firetrap	810-0018-00
(1)	Control panel overlay, generic kit	800-0021-01
(2)	Side decal, generic kit	820-0036-00
(2)	Joystick assy, 4/8 way	450-0009-00
(1)	Pushbutton assy, Red	350-0016-02
(1)	Installation & Service manual	780-0045-00
(1)	FCC Warning Label	406-0003-00
(1)	Kit, accessory, Firetrap conv.	505-0007-00

Verify that your kit is complete before going further. If you are going to be converting a Data East Karate Champ game, refer to the special instructions relating to this kit in the Installation Procedures section of this manual.

**b. General conversion requirements.**

This Data East conversion kit is designed to be installed into an existing video game cabinet. All necessary components and graphics have been supplied to make the results of this conversion look and play like a brand new upright game. There are several requirements to consider when selecting a game to convert. They are as follows:

**MONITOR:** RGB, NEGATIVE COMPOSITE SYNC, VERTICALLY MOUNTED

**POWER SUPPLY:** + 5 VOLTS AT A MINIMUM OF 7 AMPERES.  
(Firetrap pcb set draws 4.8 amps)

+ 12 VOLTS AT A MINIMUM OF 1 AMPERE.  
(Firetrap pcb set draws .50 amps nominal)

When selecting a game to convert, make sure that the coin acceptors are functional, the monitor and power supply work well, and the cabinet is structurally sound. There is nothing more frustrating than installing a new conversion kit and discovering that it will not come up due to a faulty monitor or power supply. I know, the first thing we will suspect is the new Logic PCB, right? Save yourself some time and money by making sure the original game works before you install the conversion kit.

It is mandatory that the cabinet be wired to conform with all National and Local Electrical Code requirements before the conversion is attempted. The system must have adequate noise filtering on the AC line to prevent unwanted conducted radio frequency interference. "Adequate" is defined as a filter having both common mode and differential mode filtering with a current capacity of at least 1 1/2 amperes.

According to the FCC and/or other regulatory agencies, every video game must be clearly labeled with the name and address of the Original Manufacturer, Date of Manufacture (or serial number), Voltage Rating, Current Rating, Suitability for indoor or outdoor use, and Model Number. In addition, the FCC requires that after conversion, the unit must be labeled with a suitable warning stating that radio frequency interference may result from use in a residential area. An acceptable warning sticker is included in your kit.

IT IS THE RESPONSIBILITY OF THE PERSON PERFORMING THE CONVERSION TO COMPLY WITH ALL LABELING REQUIREMENTS.

c. Warranty information.

DATA EAST LIMITED WARRANTY

Data East USA, Inc., ("Seller"), warrants only to the initial purchaser of its products that the items listed below are free from defects in material and workmanship under normal use and service for the warranty period specified:

Printed Circuit Boards (game logic) (90) days

No other parts of Seller's product are warranted.

Warranty periods are effective from initial date of shipment from Seller to its authorized distributors.

Seller's sole liability shall be, at its option, to repair or replace products which are returned to Seller during the warranty periods specified, provided:

1. Seller is notified promptly upon discovery by purchaser that stated products are defective.
2. Such products are properly packaged and then returned freight prepaid, to Seller's plant.

This warranty does not apply to any parts damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall the Seller be liable for any anticipated profits, loss of profits, loss of use, accidental or consequential damages or any other losses incurred by the customer in connection with the purchase of a Data East USA, Inc., product.

WARRANTY DISCLAIMER

EXCEPT AS SPECIFICALLY PROVIDED IN A WRITTEN CONTRACT BETWEEN SELLER AND PURCHASER, THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

## 2 . GENERAL INFORMATION

### a. Operator selectable options.

The Firetrap game contains operator selectable coinage, bonus, levels, etc.. These options can be altered to suit the requirements of a particular application by changing the configuration of the 2 dip-switch packages located on the main logic pcb (see figure 1). The following tables outline the available options.

DIPSWITCH 1		1	2	3	4	5	6	7	8
COIN	1 COIN = 1 CREDIT	OFF	OFF	OFF					
VS	1 COIN = 2 CREDIT	ON	OFF	OFF					
CREDIT	1 COIN = 3 CREDIT	OFF	ON	OFF					
COIN 1	1 COIN = 4 CREDIT	OFF	OFF	ON					
	1 COIN = 5 CREDIT	ON	ON	OFF					
COIN	1 COIN = 1 CREDIT				OFF	OFF			
VS	2 COIN = 1 CREDIT				ON	OFF			
CREDIT	3 COIN = 1 CREDIT				OFF	ON			
COIN 2	4 COIN = 1 CREDIT				ON	ON			
CABINET STYLE	TABLE							OFF	
	UPRIGHT							ON	
ATTRACT MODE SOUND	YES							OFF	
	NO							ON	
FLIP SCREEN	NORMAL								OFF
	REVERSE								ON

DIPSWITCH 2		1	2	3	4	5	6	7	8
LEVEL OF DIFFICULTY	NORMAL	OFF	OFF						
	EASY	ON	OFF						
	HARD	OFF	ON						
	VERY HARD	ON	ON						
NUMBER OF LIVES	THREE			OFF	OFF				
	FOUR			ON	OFF				
	FIVE			OFF	ON				
	INFINITE			ON	ON				
BONUS LIVES AWARDED AT:	50K & EVERY 70K					OFF	OFF		
	60K & EVERY 80K					ON	OFF		
	80K & EVERY 100K					OFF	ON		
K = 1000	50K ONLY					ON	ON		
CONTINUE (BUY-IN) MODE	YES							OFF	
	NO							ON	
TEST MODE	NO								OFF
	YES								ON

b. Sound volume

Firetrap's sound volume level is controlled by the VR1 potentiometer located on the main logic pcb as shown in figure 1. Turn the control clockwise to increase the sound level.

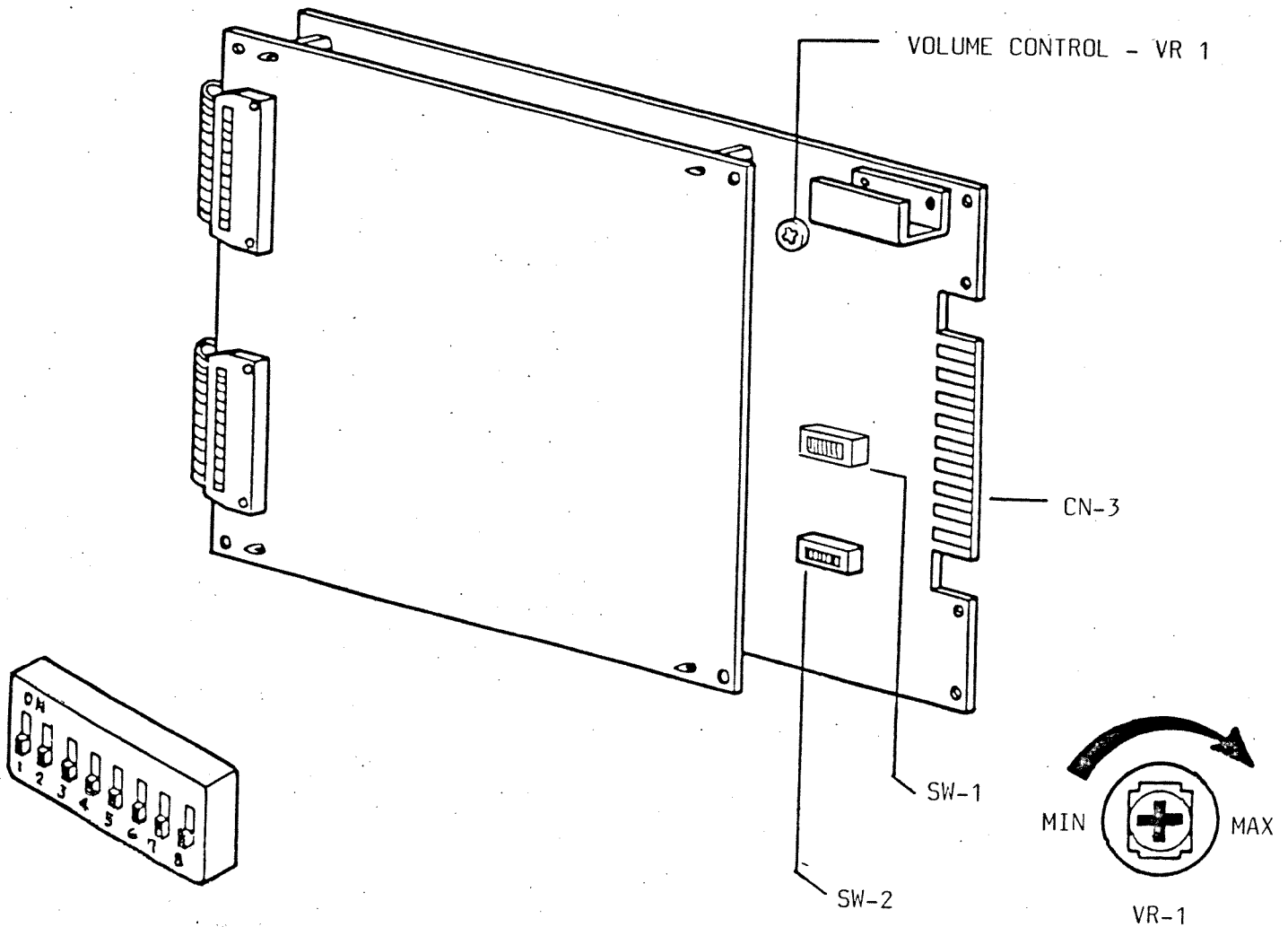


FIGURE 1

### 3 . I N S T A L L A T I O N I N S T R U C T I O N S

#### a. Conversion preparations.

Performing a few simple tasks when preparing a game to be converted can save you much time and effort when you are installing the conversion kit. This section will cover the basic procedures to follow when preparing your game. NOTE: If you are converting a Data East Karate Champ game, skip on to page 12; Karate Champ conversion procedures.

FIND THE WIRING DIAGRAM FOR THE GAME TO BE CONVERTED! You will need to identify the required DC power supply output wires, and the monitor video and sync wires. Note the color coding of these wires or better yet, label each one as to their function. This conversion kit contains a new Main Harness, but you may need to splice into the existing power supply and monitor wires.

Remove the existing game harnesses that will not be utilized in the final conversion. NOTE: This conversion kit only requires modification of the secondary (DC from power supply) and I/O (control panel and coin) sections of the original wiring. DO NOT REMOVE OR MODIFY THE PRIMARY AC WIRING. The primary AC wiring should have been designed and built to UL and FCC regulations and must not be modified.

Remove the existing game logic boards. Remove all decals and/or paint over existing cabinet graphics. Repair any cabinet damage at this time.

Remove the monitor plex (or glass). If your plex has silkscreened artwork on it, you will need to strip it off or replace with a clear plex cut to the same size. Use your original plex as a template when cutting the new Underlay Card down to size.

Remove the marquee plex. Use this plex as a template when cutting the new Marquee plex down to size.

Remove the control panel from the cabinet and strip it down. The game is now ready to be converted!

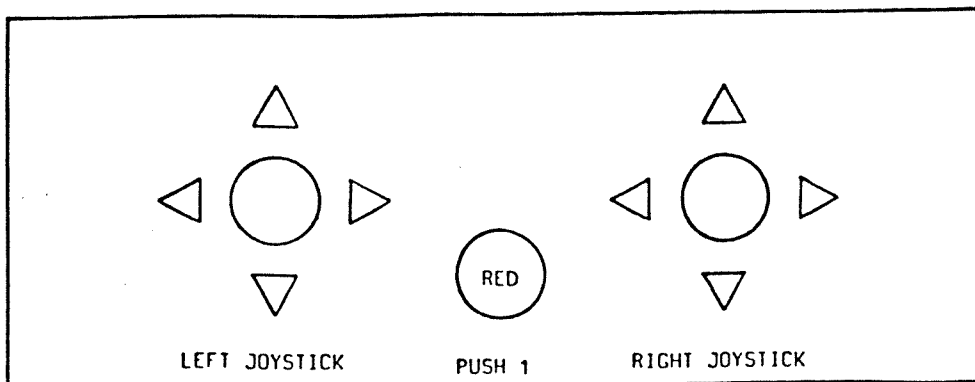


FIGURE 2



**b. Installation procedures.**

**Control Panel:** This is never any fun, so lets do it first and get it out of the way. Examine the suggested control panel layout drawing (fig. 2) and see what holes you will have to add and/or plug.

**NOTE:** The Red pushbutton MUST be installed or the player will not be able to enter initials into the high score table.

Install the control panel overlay by peeling off the paper backing and carefully lowering it down on to the panel. Smooth it out starting from the center and work your way out to the edges, removing all of the trapped air pockets. Using a sharp blade, cut out all of the required holes and mount the controls as shown in the layout drawing (fig. 2). Mount the completed control panel to the cabinet.

**PCB Set:** Mount the Firetrap pcb set into the cabinet. We recommend mounting these to a side wall to allow for adequate convection cooling. This pcb set does not require an EMI cage, but use of the DE-0239-0 EMI Filter pcb is MANDATORY!

**Main Harness:** Plug the Main Harness onto the edge connector of the EMI Filter pcb and route the power supply wires neatly to the power supply. For best results, these wires should be routed in such a way as to keep the overall length to a minimum. Use a minimum of two (2) wires EACH for the +5 volt and Ground wires from the Power Supply to the pcb set. The +12 volt wire is not critical, one (1) wire is adequate. Terminate these wires as required by your particular application.

**WARNING:** IMPROPER WIRING WILL CAUSE SUBSTANTIAL DAMAGE TO THE PCB SET AND VOID YOUR WARRANTY!

Route the remaining wires to their proper destinations, cut to the proper length, and terminate as required. See Specific Wiring Information for hook up details.

**NOTE:** As mentioned in the Conversion Requirements, this pcb set outputs NEGATIVE COMPOSITE SYNC to the monitor. If your monitor does not support Composite Sync, hook the Sync wire to the - Horizontal Sync input. This method will work on most monitors, however, some Electrohome models require that Sync be tied to both the - Horizontal and - Vertical inputs for proper operation. Contact your distributor if you are uncertain as to the proper hook up procedures for your monitor.

**b. Installation procedures** (continued)

The Coin Counter(s) can be 5 volt or 12 volt units as the pcb set utilizes an Open Collector output driver circuit. See Specific Wiring Information for hook up details.

**Graphics:** Install the Underlay Card. This card will rest directly under the clear monitor plex (or glass). Mount the new Marquee Plex in place at this time. Apply the side decals, being careful to remove all air pockets. **MANDATORY:** Install the FCC warning label to the back of the cabinet to complete the installation procedures!

**The Big Test:** Before applying power to the game, go back and verify that the wiring is correct. **DISCONNECT THE PCB EDGE CONNECTOR NOW!** With the pcb edge connector disconnected, apply power and **MEASURE WITH A DIGITAL MULTIMETER** the +5 volt level in respect to ground **AT THE EDGE CONNECTOR**. Refer to the edge connector pinout on page 9. Adjust the power supply to get a 5.1 volt reading at this point. Check the +12 volt level and the -5 volt (if required) level in the same manner. **REMOVE POWER FROM THE GAME AND ALLOW 1 MINUTE FOR THE POWER SUPPLY TO DISCHARGE.**

Reinstall the pcb edge connector and apply power to the game. The game's attract mode video should appear on the screen. Examine the video for correct appearance. Adjust the controls on the monitor to get the optimum picture as required.

Well, coin it up and play it! Check for proper controls, video, and sound.

c. Edge connector pinout.

The Firetrap pcb has a 56 pin JAMMA standard edge connector. Data East USA, Inc., supplies a suitable EMI filter pcb (DE-0239-0) with each conversion kit to make the game comply with FCC regulations and adapt to the Data East USA, Inc., harness pin-out configuration.

The edge connector pin-out diagram below represents the JAMMA standard used on the actual game pcb, the one on page 10 is the Data East USA, Inc., type harness pin-out used on the DE-0239-0 EMI filter pcb.

J A M M A E D G E C O N N E C T O R P I N - O U T

FIRETRAP PCB EDGE CONNECTOR, CN-3

SOLDER SIDE	PIN NUMBER		COMPONENT SIDE
GROUND	A	1	GROUND
GROUND	B	2	GROUND
+ 5 VOLTS	C	3	+ 5 VOLTS
+ 5 VOLTS	D	4	+ 5 VOLTS
- 5 VOLTS N/A	E	5	- 5 VOLTS N/A
+12 VOLTS	F	6	+12 VOLTS
BLOCKING KEY	H	7	BLOCKING KEY
COIN COUNTER 2	J	8	COIN COUNTER 1
	K	9	
SPEAKER (-)	L	10	SPEAKER (+)
	M	11	
VIDEO GREEN	N	12	VIDEO RED
VIDEO SYNC	P	13	VIDEO BLUE
SERVICE SWITCH	R	14	VIDEO GROUND
	S	15	
COIN SWITCH 2	T	16	COIN SWITCH 1
START SWITCH 2	U	17	START SWITCH 1
2P CONTROL L UP	V	18	1P CONTROL L UP
2P CONTROL L DOWN	W	19	1P CONTROL L DOWN
2P CONTROL L LEFT	X	20	1P CONTROL L LEFT
2P CONTROL L RIGHT	Y	21	1P CONTROL L RIGHT
2P CONTROL R UP	Z	22	1P CONTROL R UP
2P CONTROL R DOWN	a	23	1P CONTROL R DOWN
2P CONTROL R LEFT	b	24	1P CONTROL R LEFT
2P CONTROL R RIGHT	c	25	1P CONTROL R RIGHT
2P CONTROL PUSH 1	d	26	1P CONTROL PUSH 1
GROUND	e	27	GROUND
GROUND	f	28	GROUND

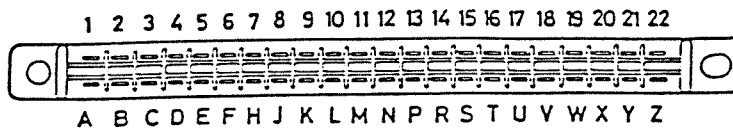
DATA EAST EDGE CONNECTOR PIN - OUT

HARNESS CONNECTOR, EMI FILTER PCB: DE-0239-0

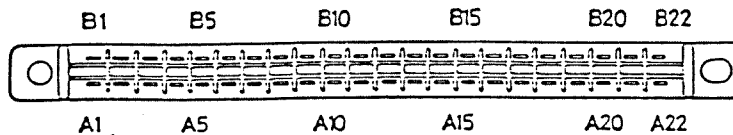
SOLDER SIDE	PIN NUMBERS		COMPONENT SIDE
2P CONTROL L DOWN	A	1	1P CONTROL L DOWN ✓
2P CONTROL L UP	B	2	1P CONTROL L UP ✓
2P CONTROL L LEFT	C	3	1P CONTROL L LEFT ✓
2P CONTROL L RIGHT	D	4	1P CONTROL L RIGHT ✓
2P CONTROL R LEFT	E	5	1P CONTROL R LEFT ✓
2P CONTROL R RIGHT	F	6	1P CONTROL R RIGHT ✓
2P CONTROL PUSH 1	H	7	1P CONTROL PUSH 1 ✓
TEST SWITCH	J	8	SERVICE SWITCH
2P CONTROL R UP	K	9	1P CONTROL R UP ✓
2P CONTROL R DOWN	L	10	1P CONTROL R DOWN ✓
<i>Red wire</i> ✓ 2P START SWITCH	M	11	1P START SWITCH ✓
COIN SWITCH 2	N	12	COIN SWITCH 1
COIN COUNTER 2	P	13	COIN COUNTER 1
VIDEO GREEN	R	14	VIDEO BLUE
VIDEO SYNC	S	15	VIDEO RED
	T	16	
SPEAKER (-)	U	17	SPEAKER (+)
- 5 VOLTS	V	18	+ 12 VOLTS
+ 5 VOLTS	W	19	+ 5 VOLTS
+ 5 VOLTS	X	20	+ 5 VOLTS
GROUND	Y	21	GROUND
GROUND	Z	22	GROUND

GREEN  
 Yellow  
 Orange  
 RED  
 PINK  
 WHITE  
 BLUE  
 BLUE  
 PURPLE  
 BROWN  
 BLACK

EDGE CONNECTOR TERMINAL NUMBERING:

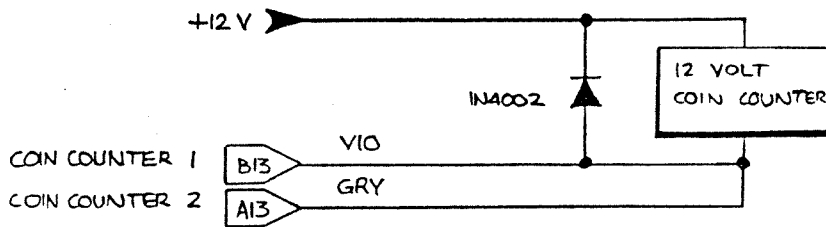
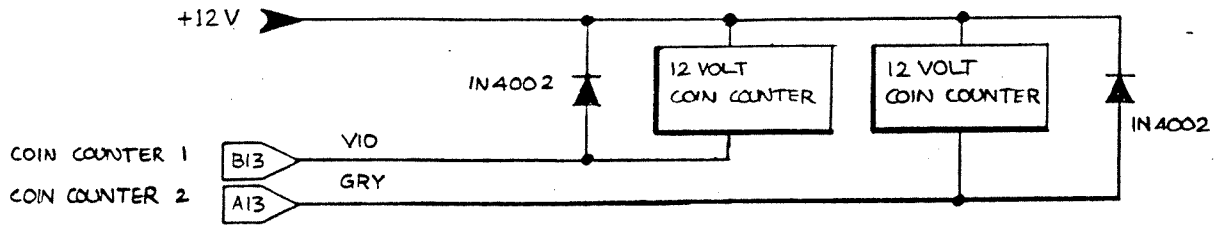


CONNECTOR CR7E-44DA-3.96 E (HIROSE)

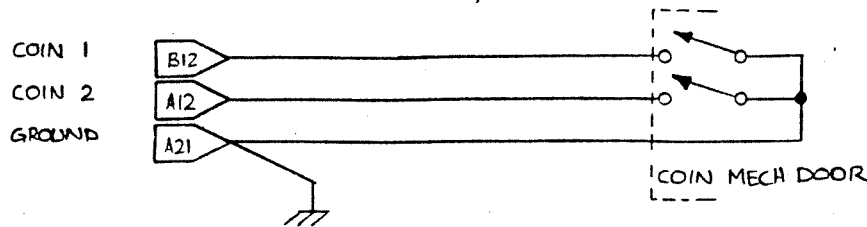
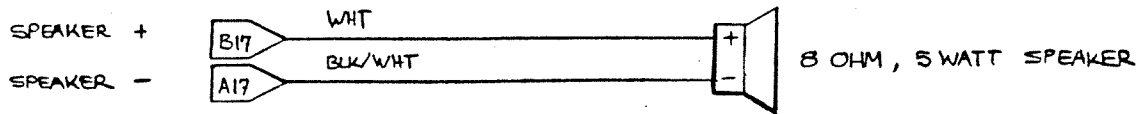


CONNECTOR 1168-044-009 (KEL)

d. Specific wiring information.



NOTE:  
 5 VOLT COIN COUNTER  
 MAY BE SUBSTITUTED.  
 YOU MUST WIRE TO  
 +5 VOLT SUPPLY IF  
 5 VOLT COUNTER IS  
 USED.



 = EMI FILTER PCB EDGE CONNECTER

#### 4. SPECIAL CONVERSION PROCEDURES FOR KARATE CHAMP

This conversion kit includes the materials required to convert a Data East Karate Champ Player vs Player upright into a Firetrap. The small bag of accessories includes the 3 wires that you will need to add to the Karate Champ harness. Follow the installation procedures below to perform the conversion:

Remove the control panel from the cabinet. Peel off the existing overlay. Clean off any residual glue. Acetone works well for this application.

Drill a 1 1/8 inch hole in the center of the control panel for the Red pushbutton. Be certain to check for clearance between the joysticks and the start buttons. Plug the two outside joystick holes (figure 3). To plug the unused holes, we suggest Super-Glueing a flat piece of plastic or metal to the underside of the panel and filling the hole with epoxy so that the surface of the panel is smooth. Install the control panel overlay and the required controls.

Remove the Karate Champ main harness and game logic pcb. Install the Firetrap pcb in its place. NOTE: Use of the metal EMI cage is not required for Firetrap. The use of the DE-0239-0 EMI FILTER PCB IS MANDATORY!

To modify the Karate Champ main harness, remove the Brown wire on pin 8 (component side) of the 44 pin edge connector and solder it to pin 9 (component side) of the edge connector.

Insert the terminated end of the Violet/White wire into pin 13 of the Left Control molex connector (figure 4). Route the other end of the wire back to the edge connector, cut to the proper length, and solder it to pin 10 (component side) of the edge connector.

Add the short Violet/White wire to pin 13 of the control panel harness and connect the Fast-on terminal to the right joystick's "Down" switch terminal. Reconnect the control panel wires as shown in figure 3. Connect the short black wire supplied in the kit to a convenient Black wire in the control panel harness and plug the Fast-on terminal to the Red push-button.

Test the controls. The left joystick controls the left arm of the player image, and the right joystick controls the right arm of the image. To move the image horizontally to the left, move the left joystick to the left. To move the image horizontally to the right, move the right joystick to the right.

Install the graphics to complete the conversion as described in section 3; Installation Procedures.

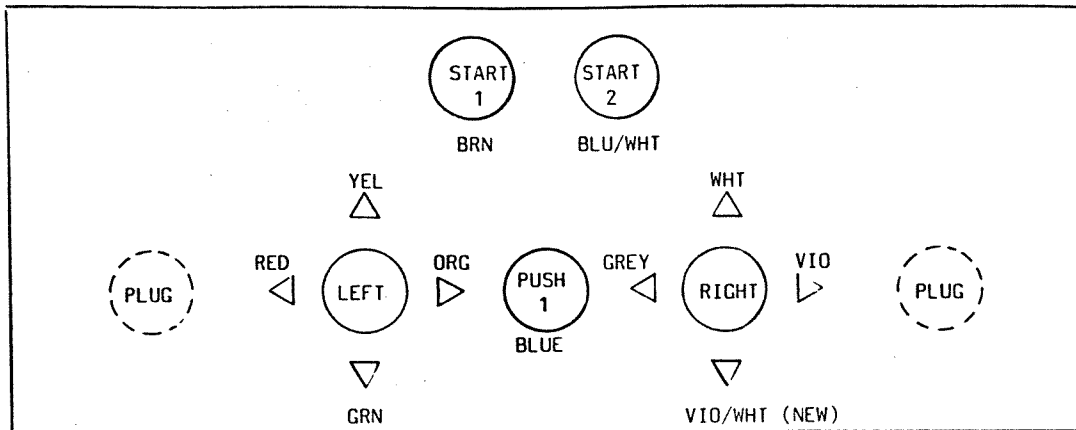


FIGURE 3

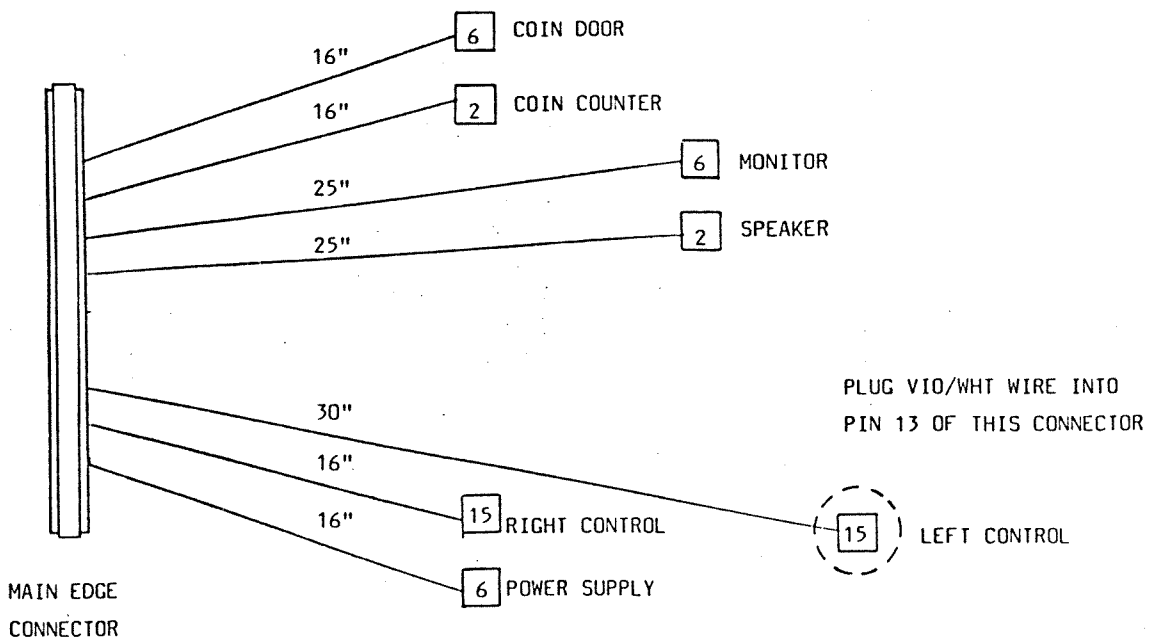
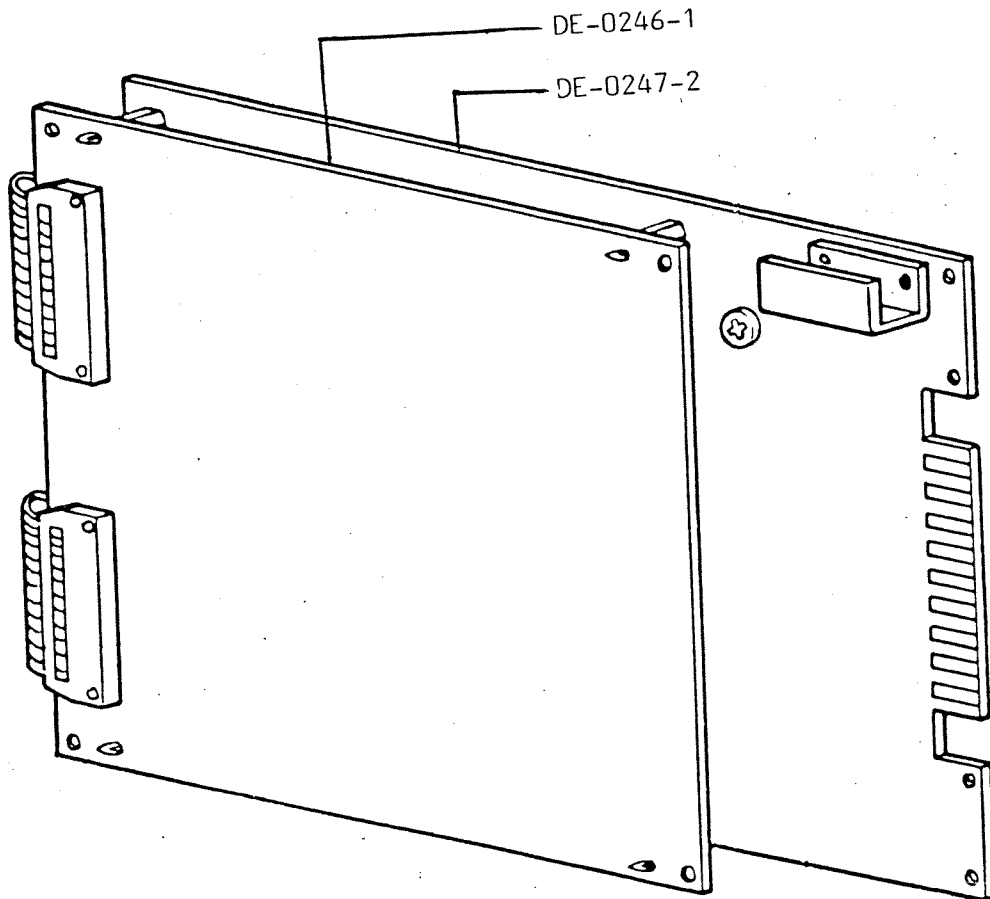


FIGURE 4

5 . PCB SCHEMATICS

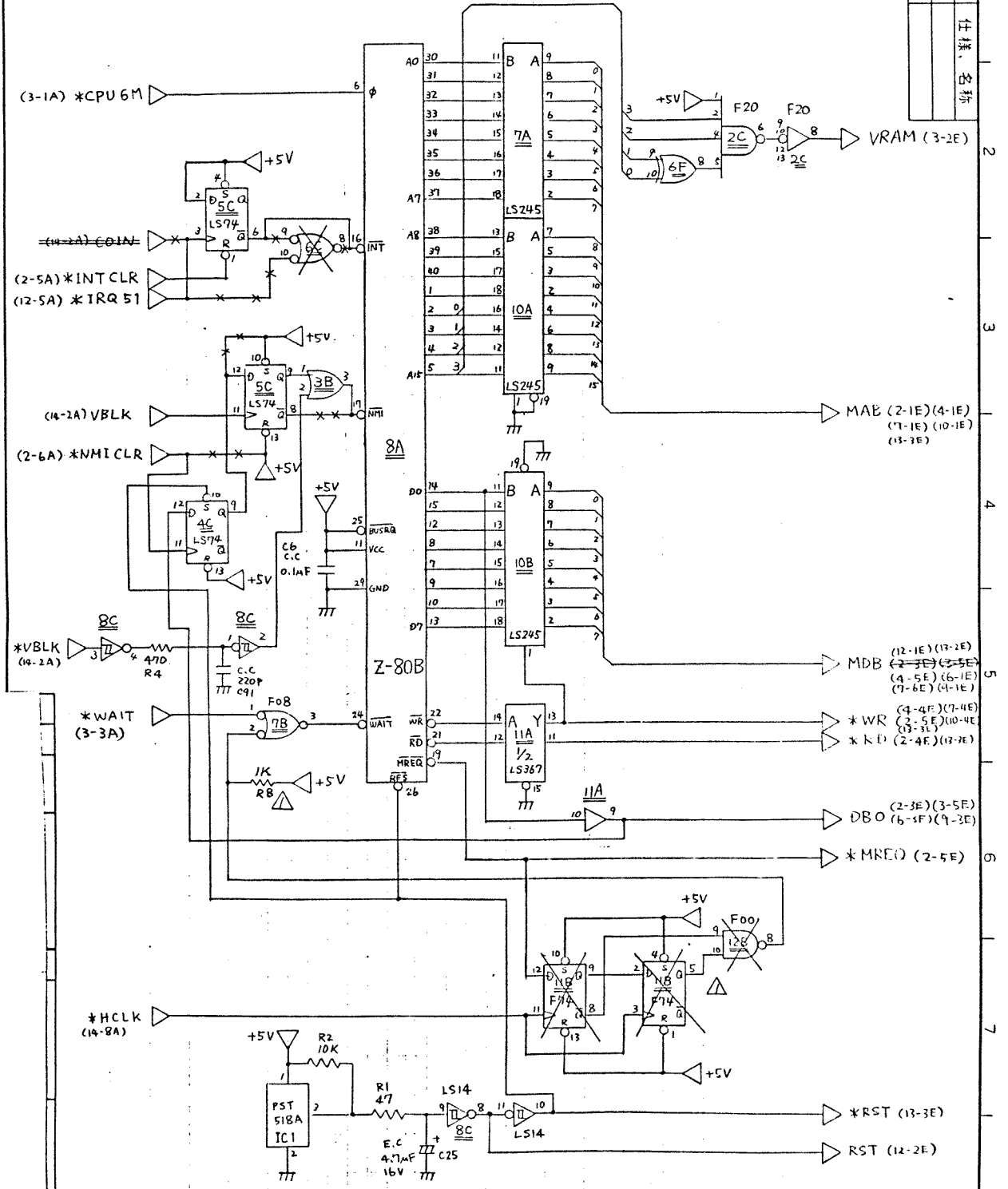


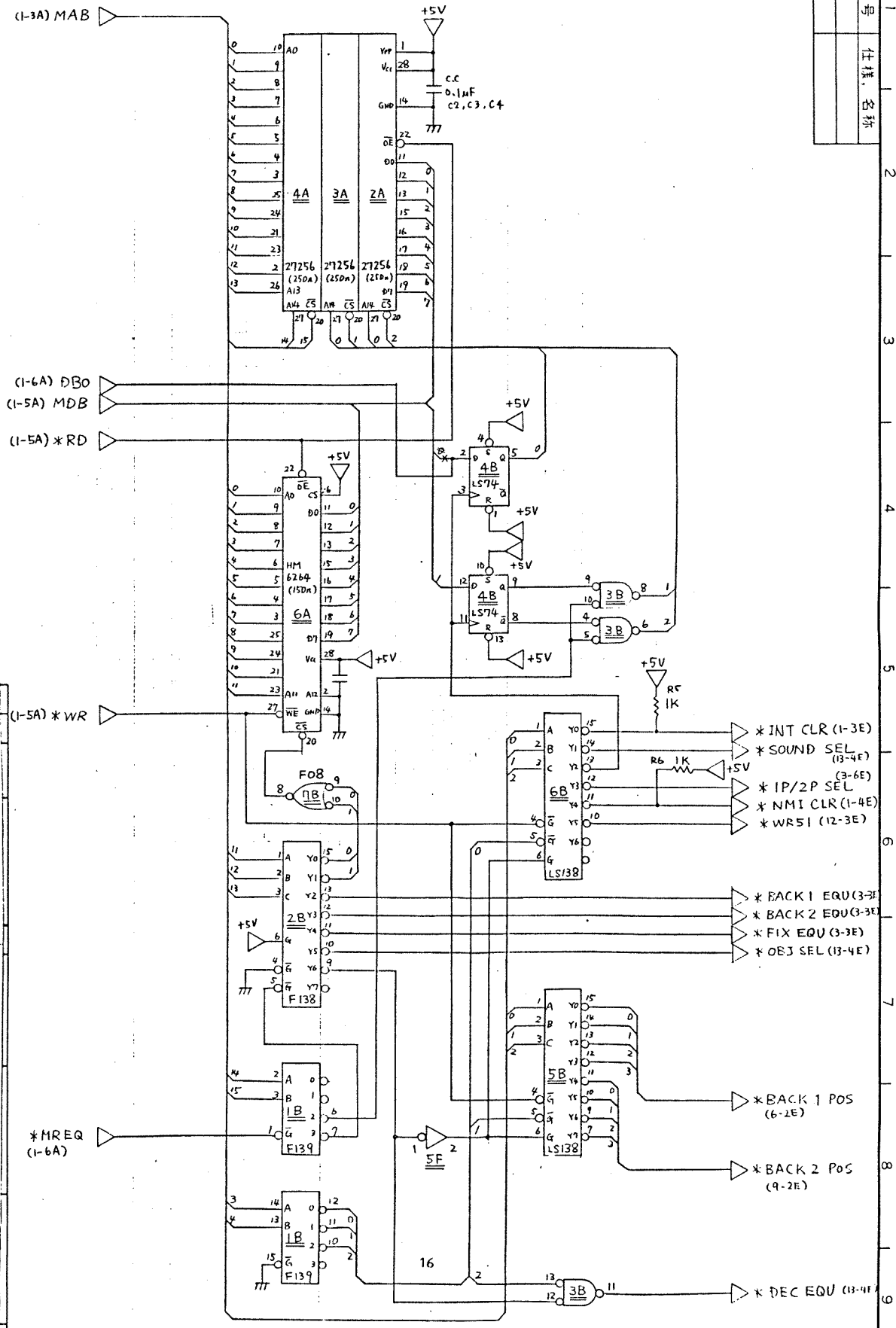


DE-0246-1

記事  
 △ 山田 61.9.22  
 11B, 12B 内蔵機工事  
 7B #2 2 (K.O.R8) 2-7, 10, 17, 7

1	関連番号
2	仕様、名称

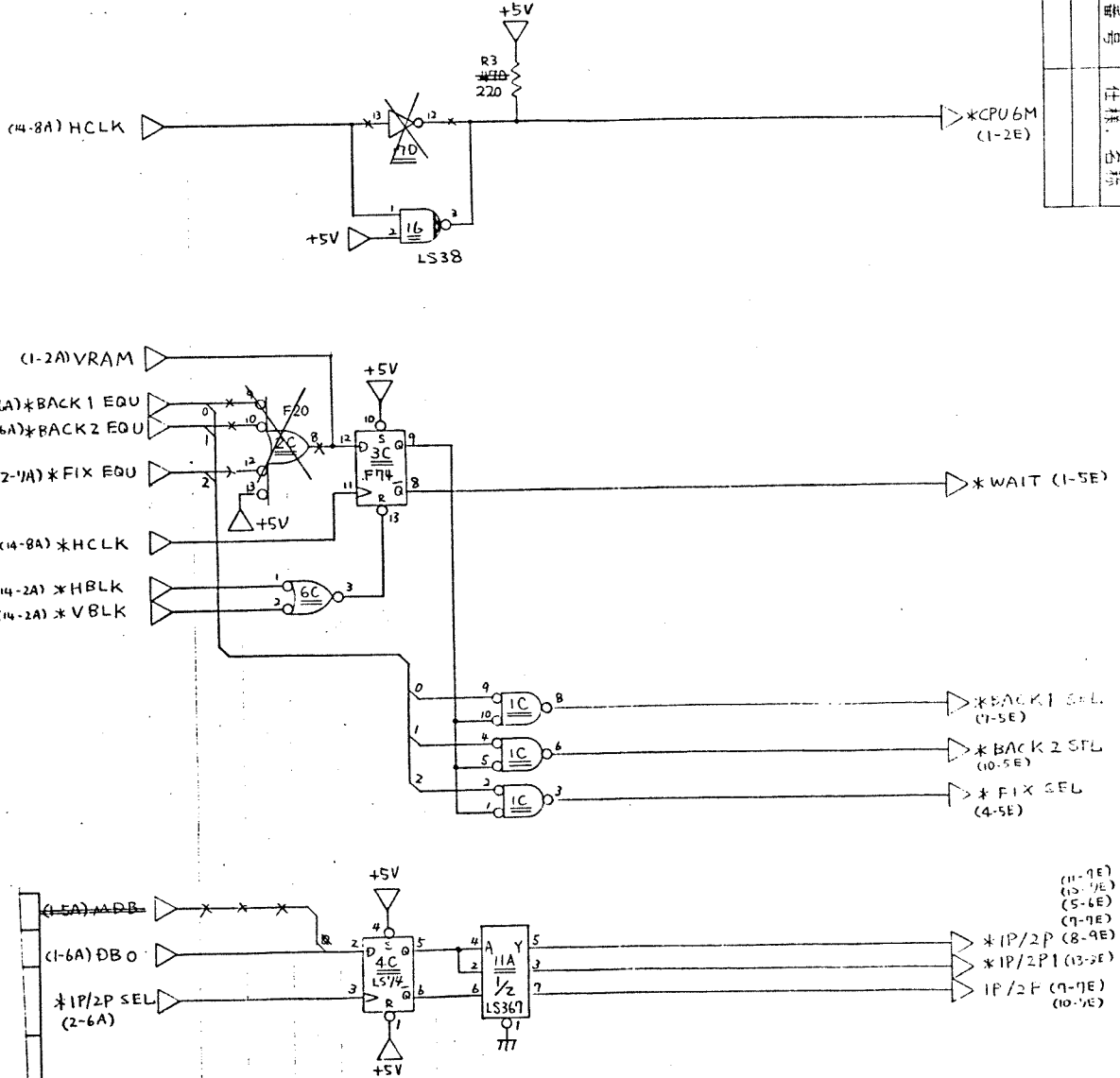




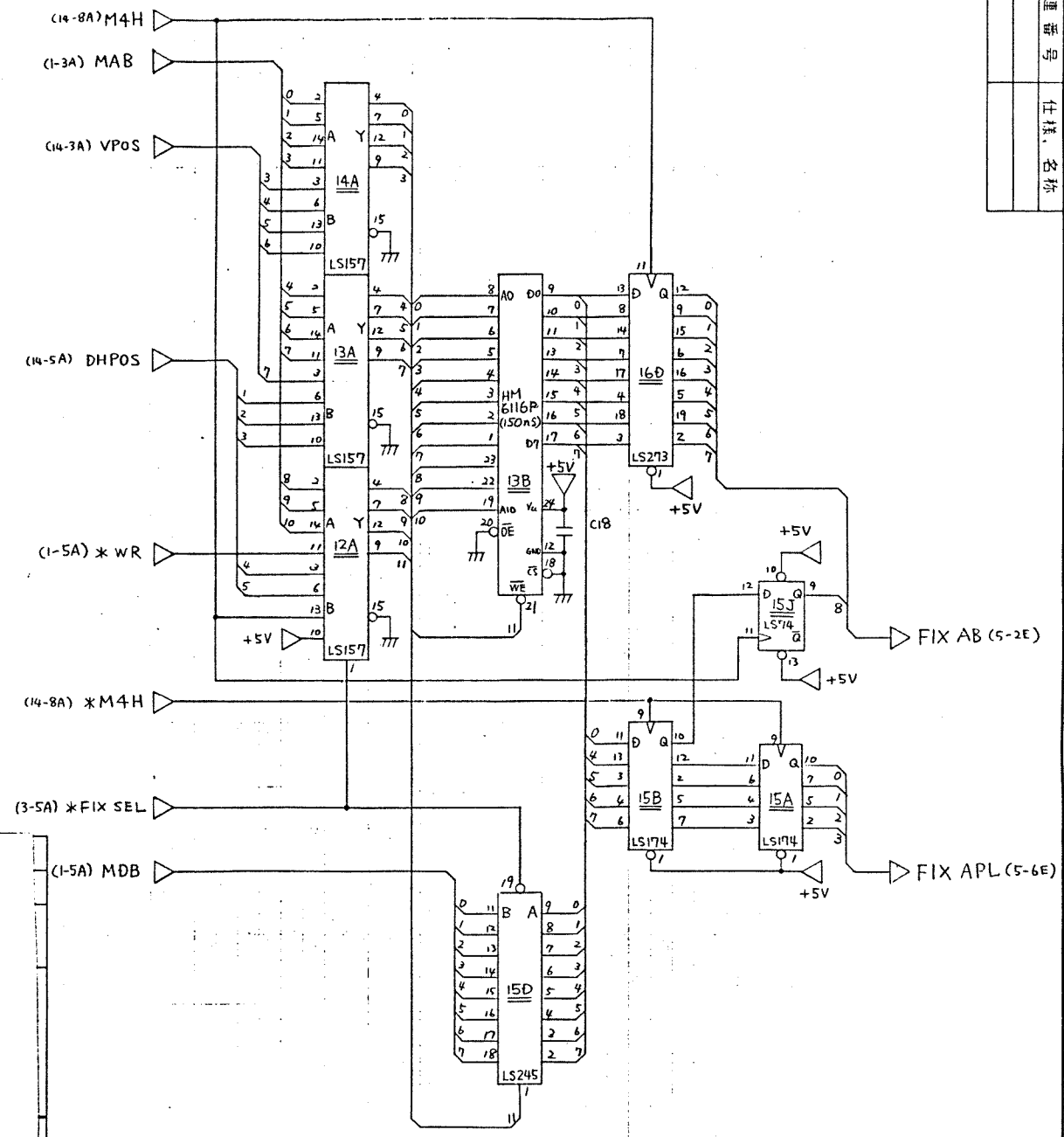
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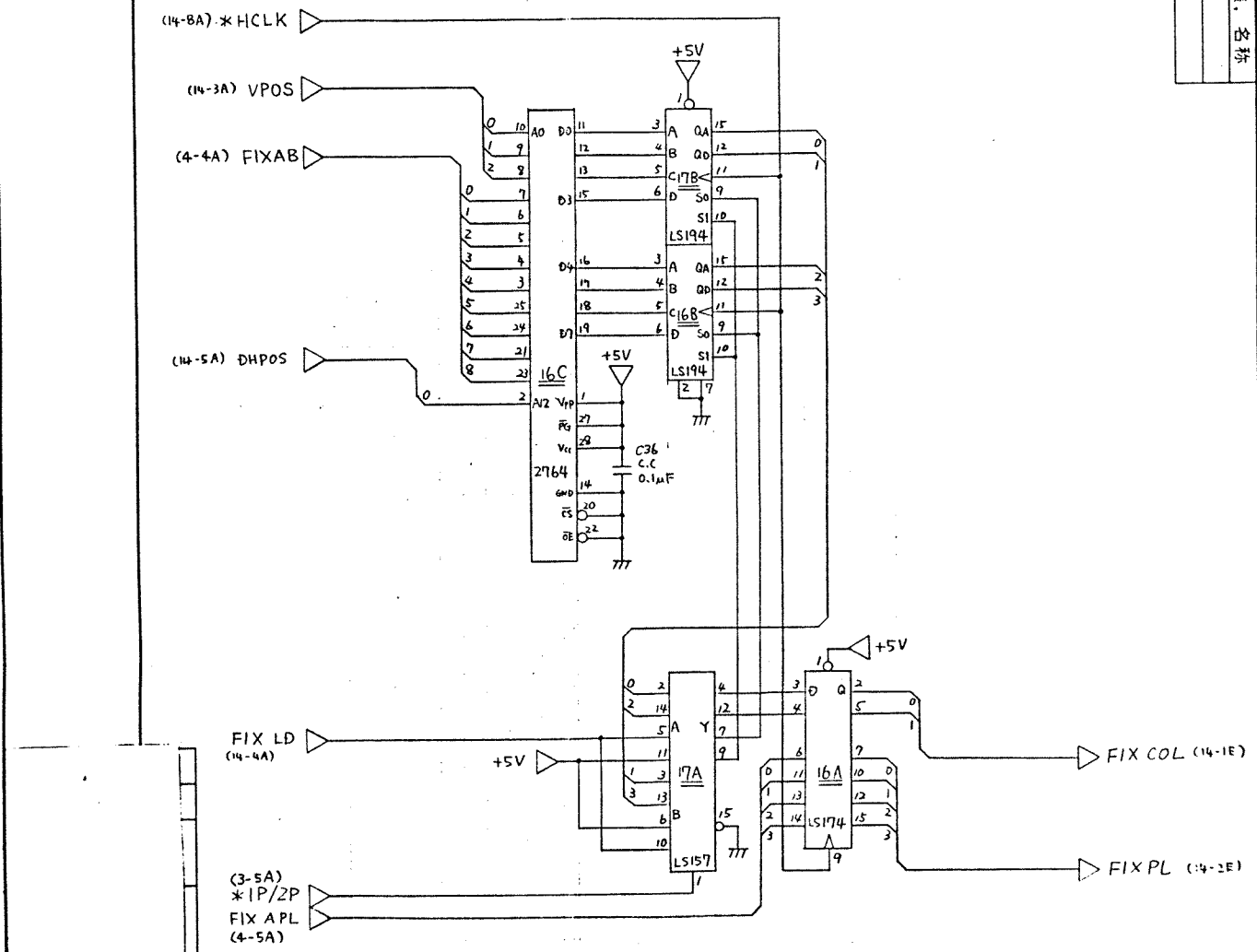


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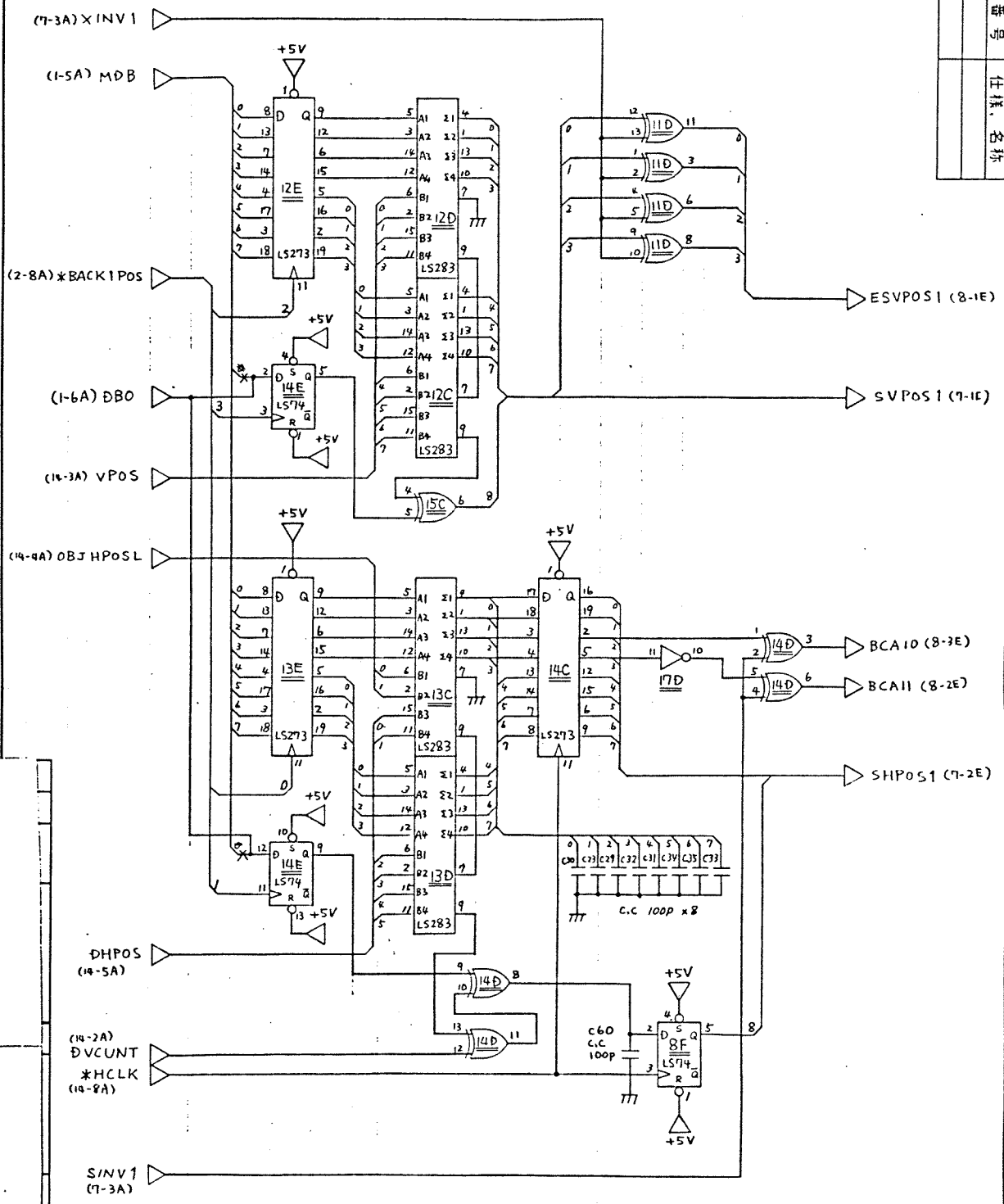
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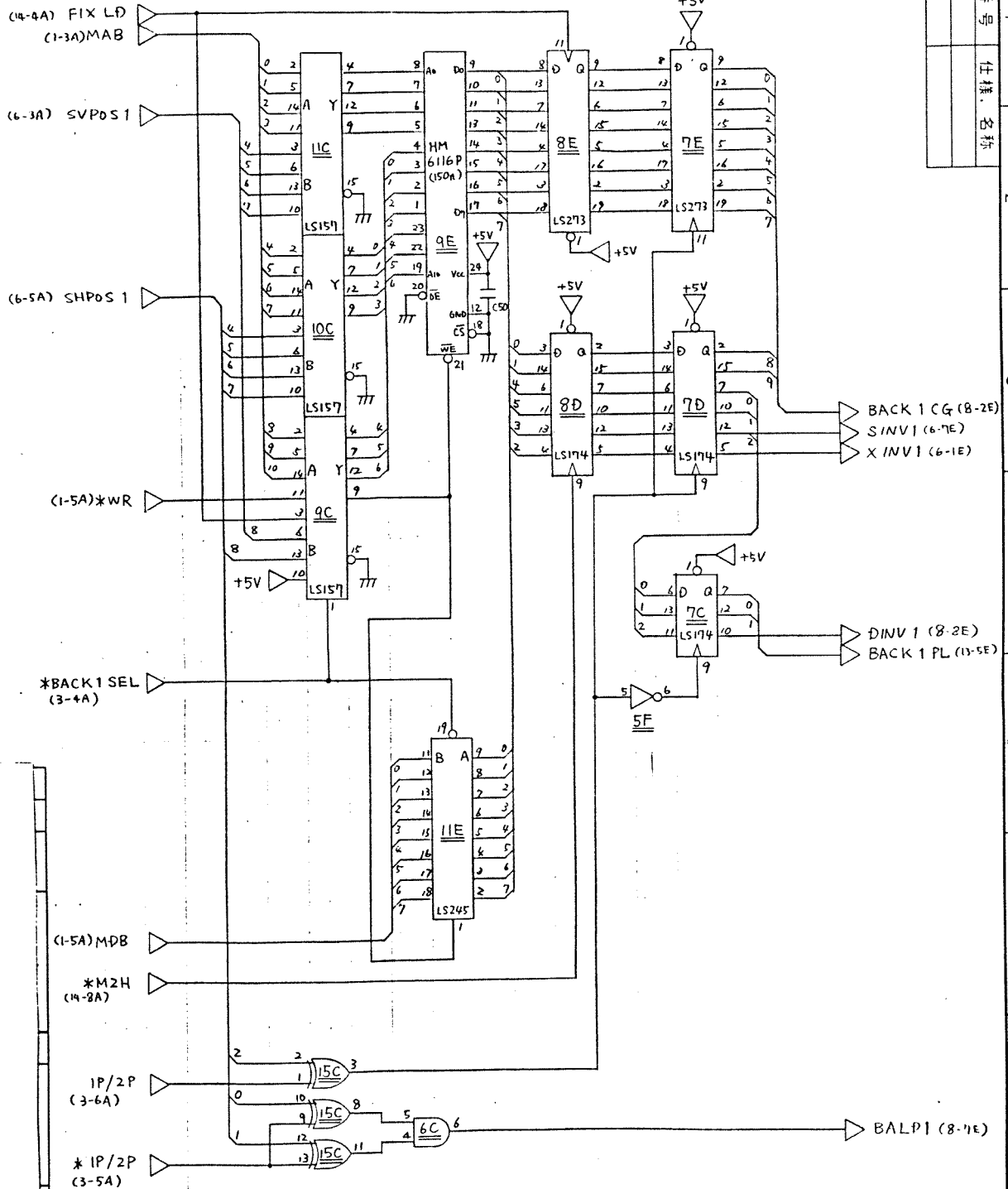
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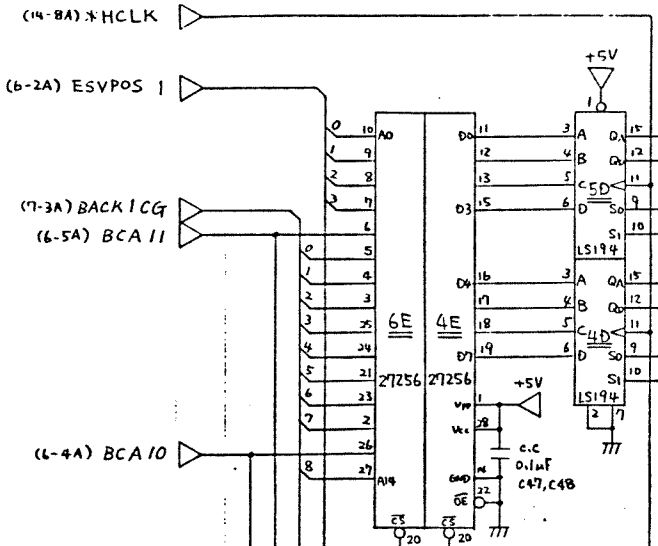
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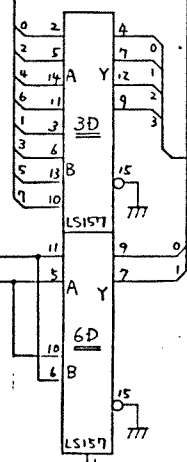
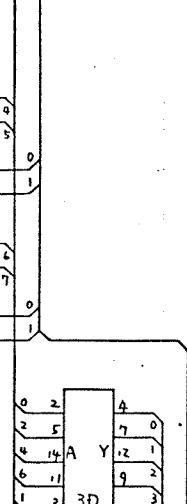


(6-4A) BCA10

BALD1  
(7-7A)

(7-4A)  
DINV 1  
\* 1P/2P  
(3-5A)

22



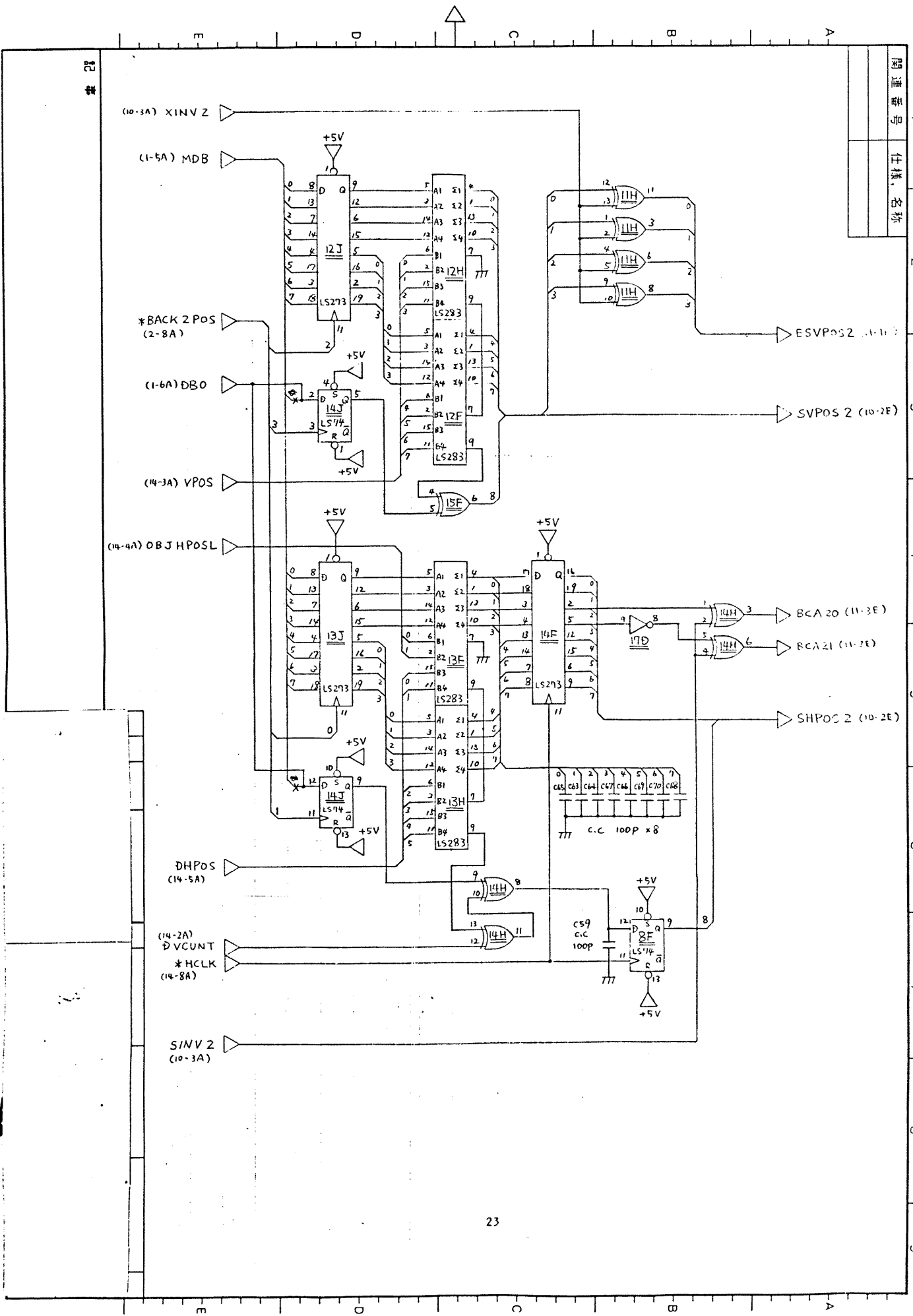
BACK1COL (3-5E)

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E D C B A

m O O B A



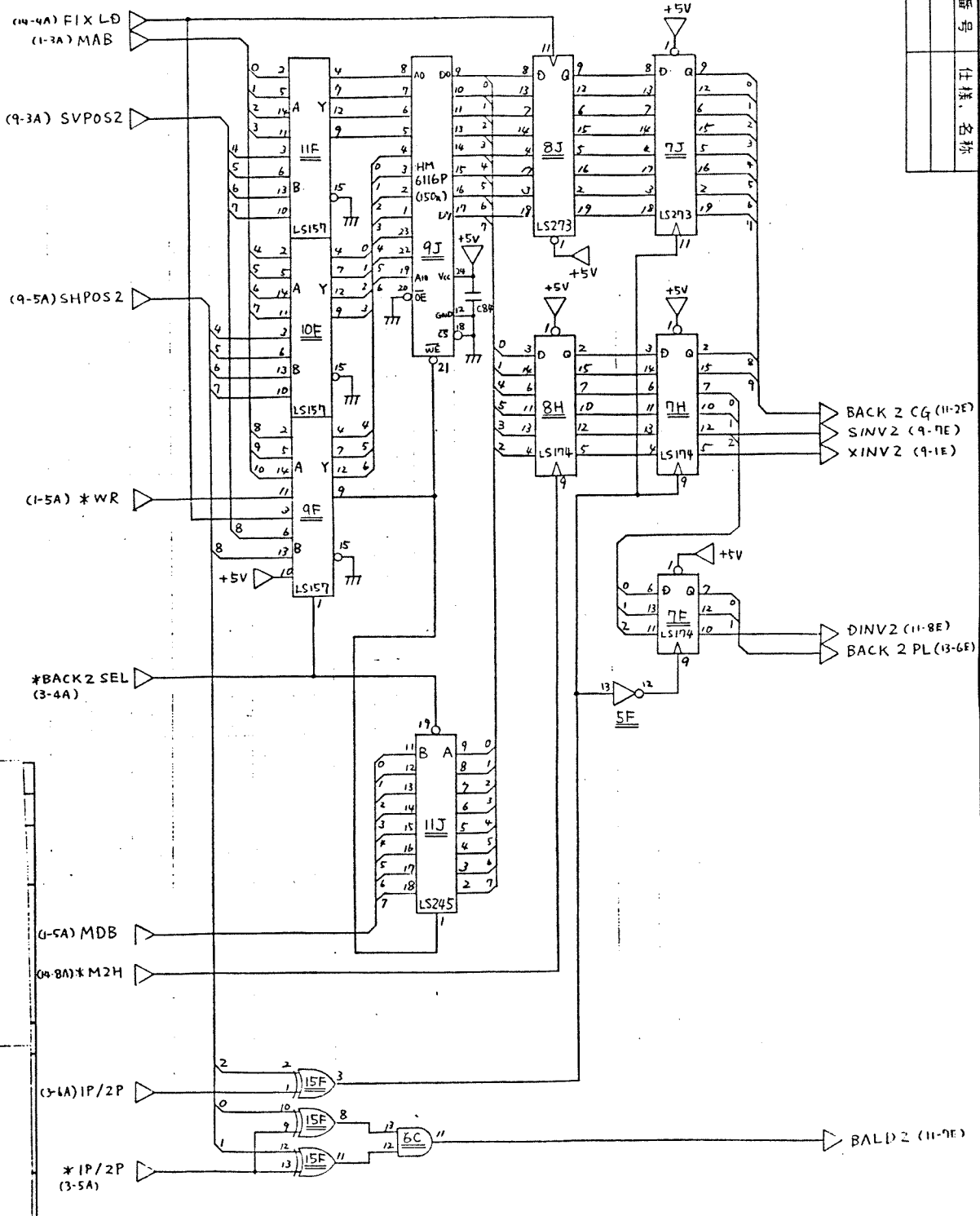


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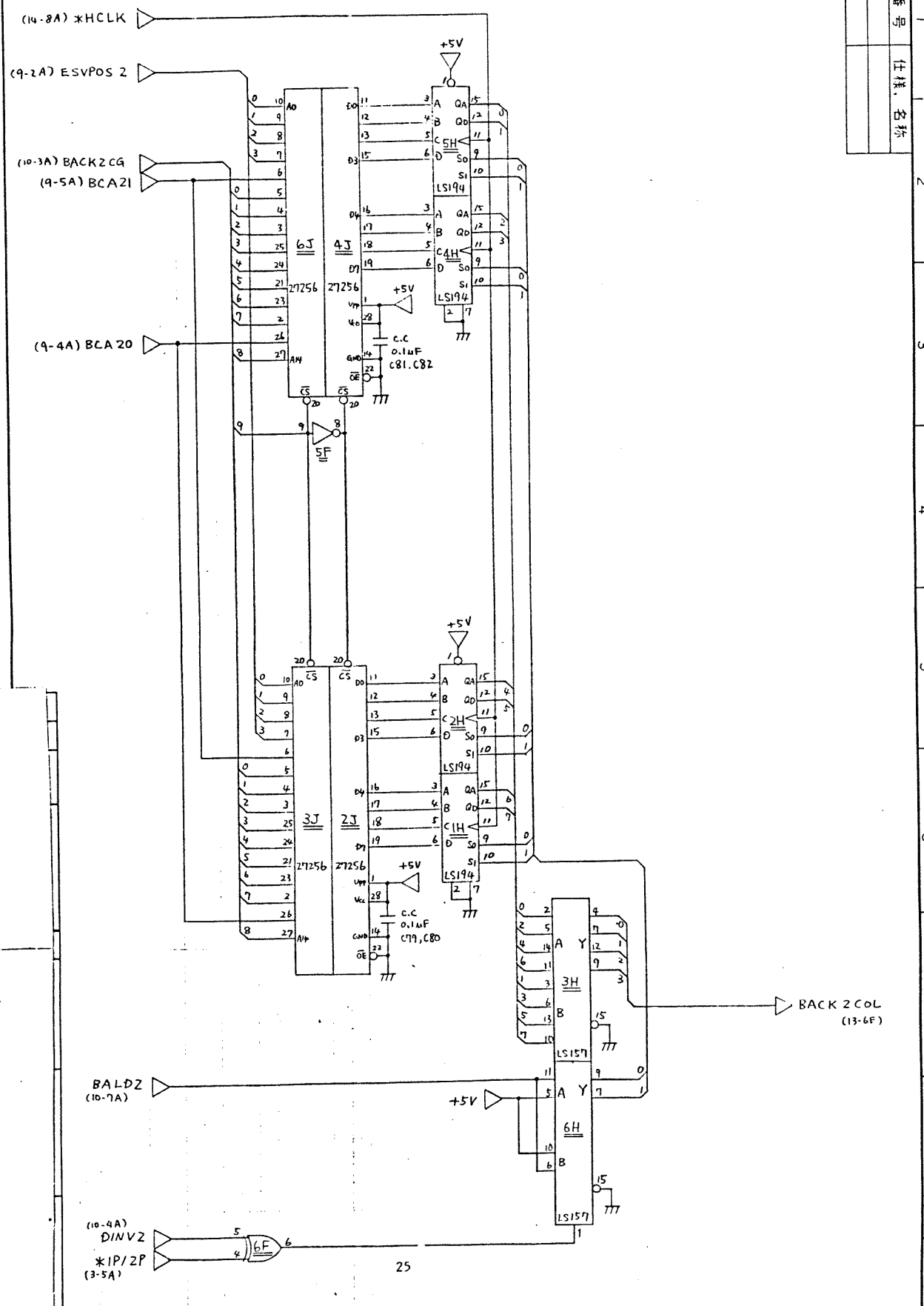
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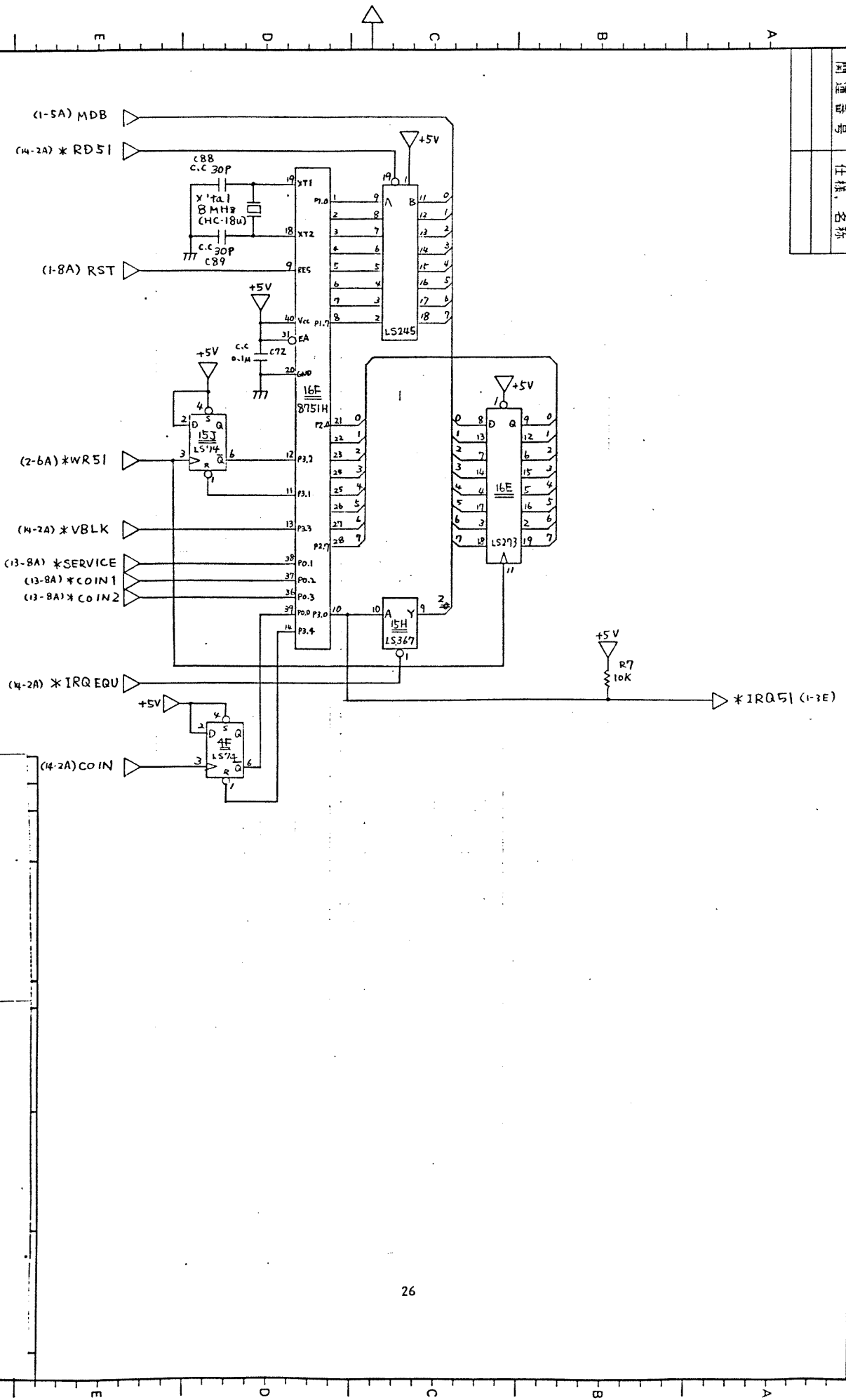
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图 26



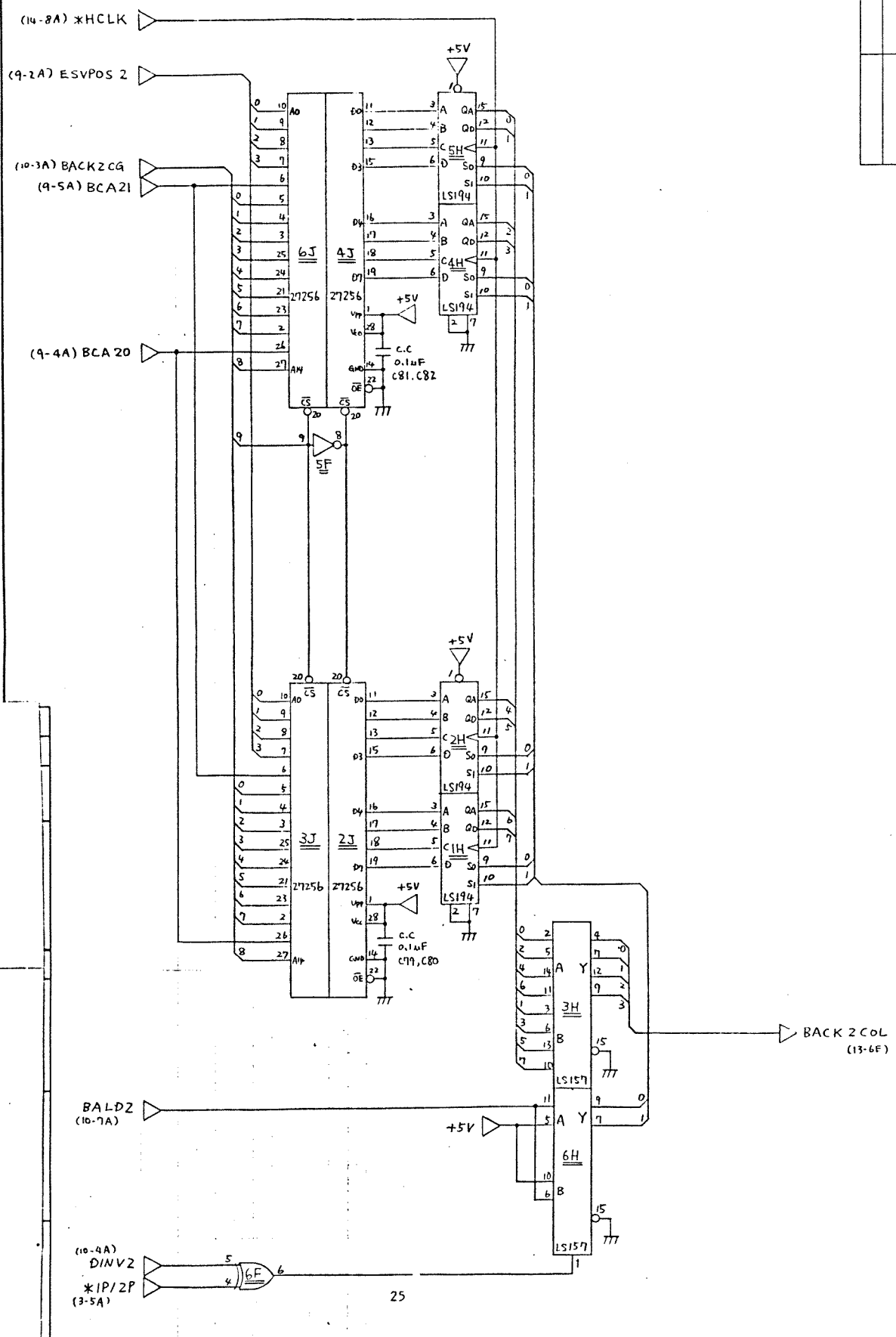
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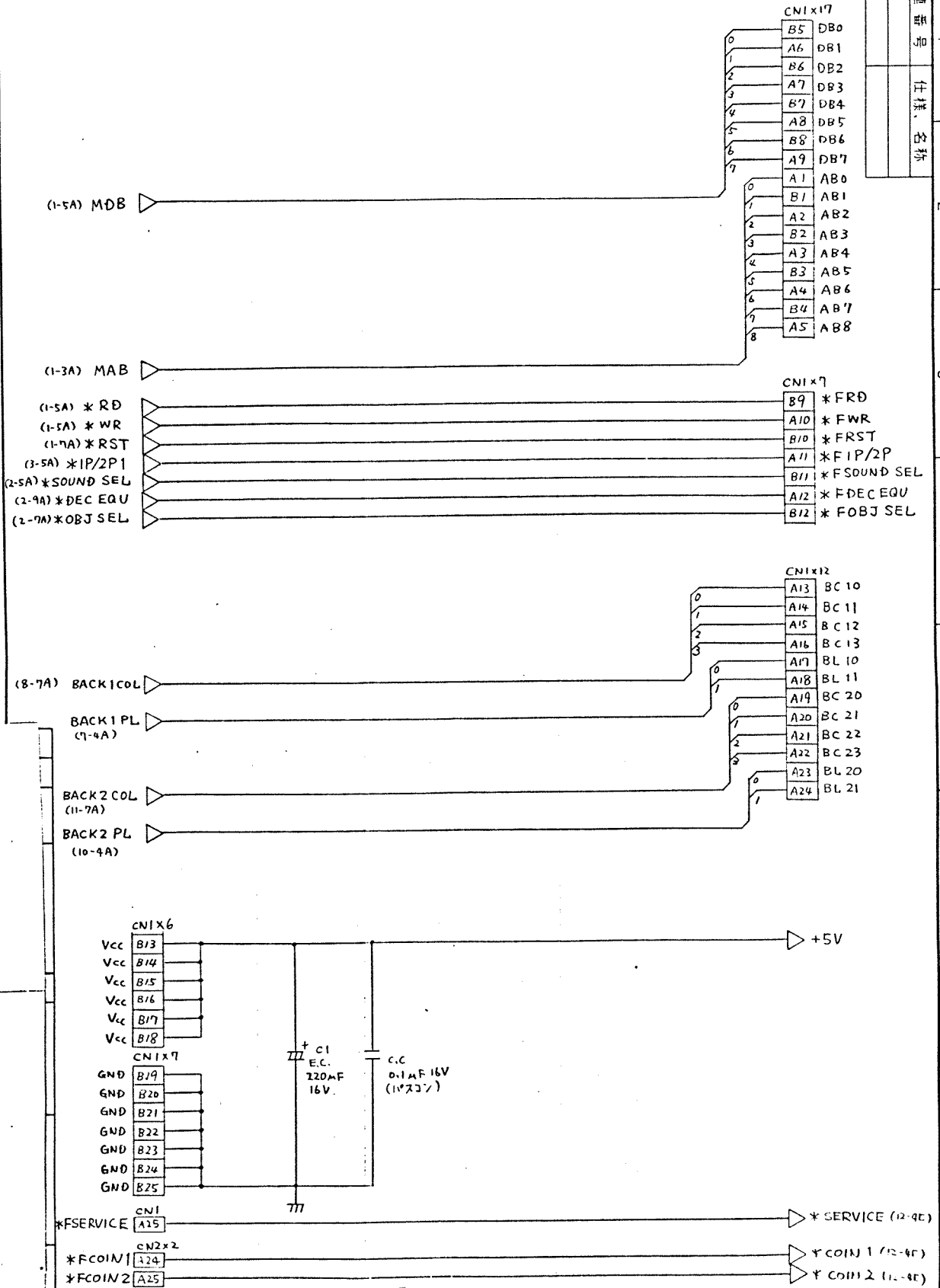


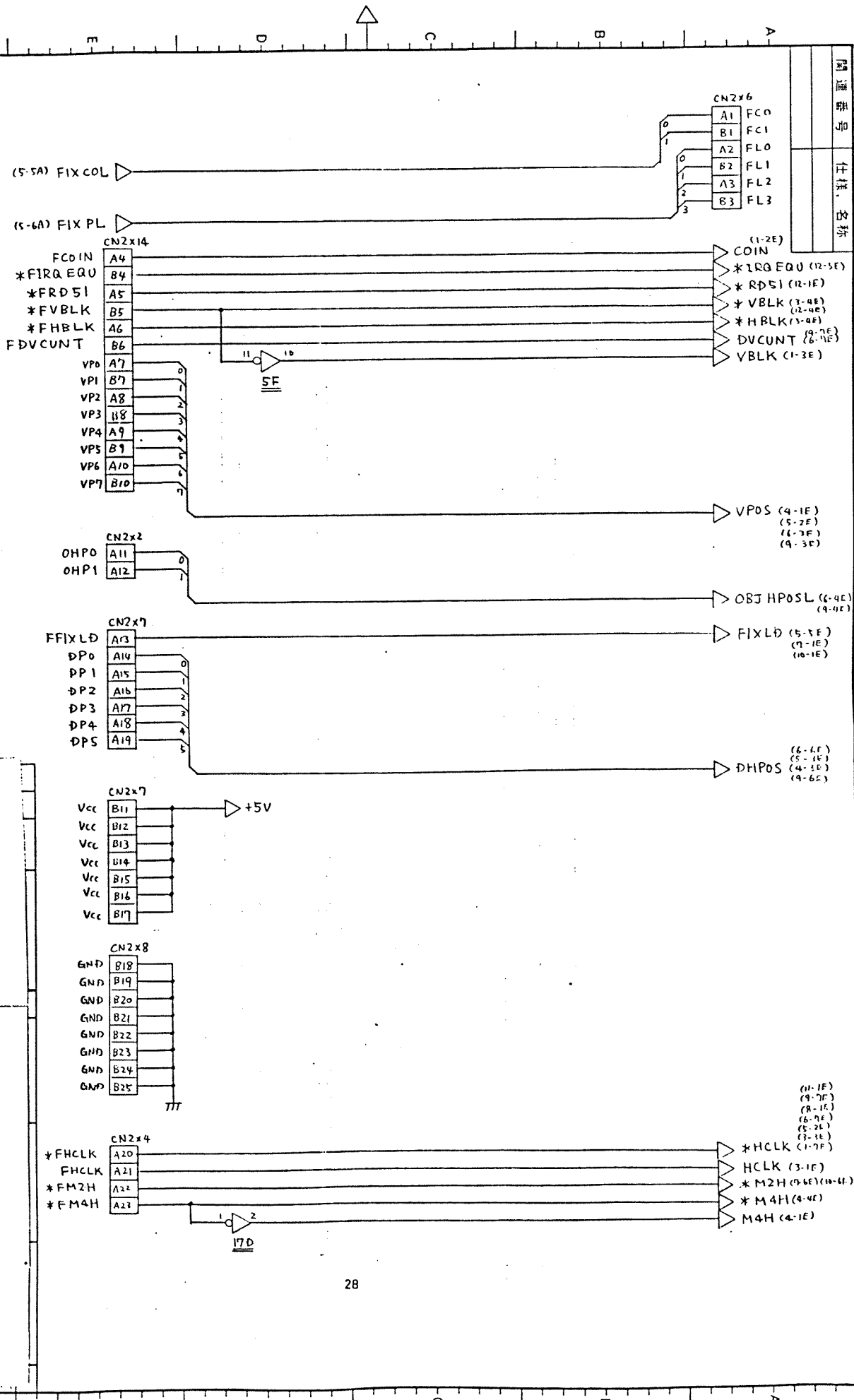
BACK 2 C0L  
(13-6F)

25

記 号

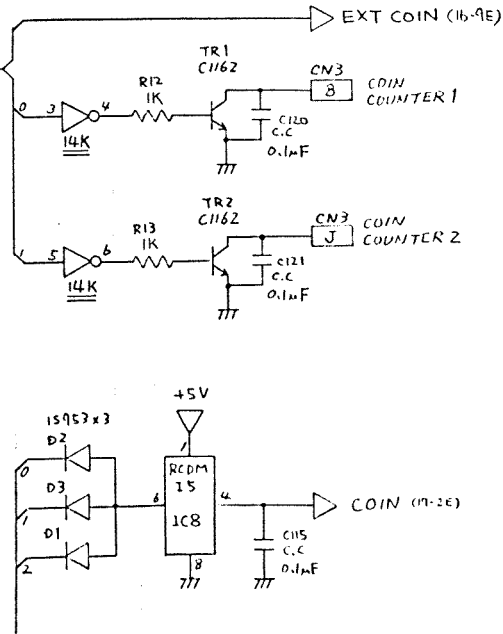
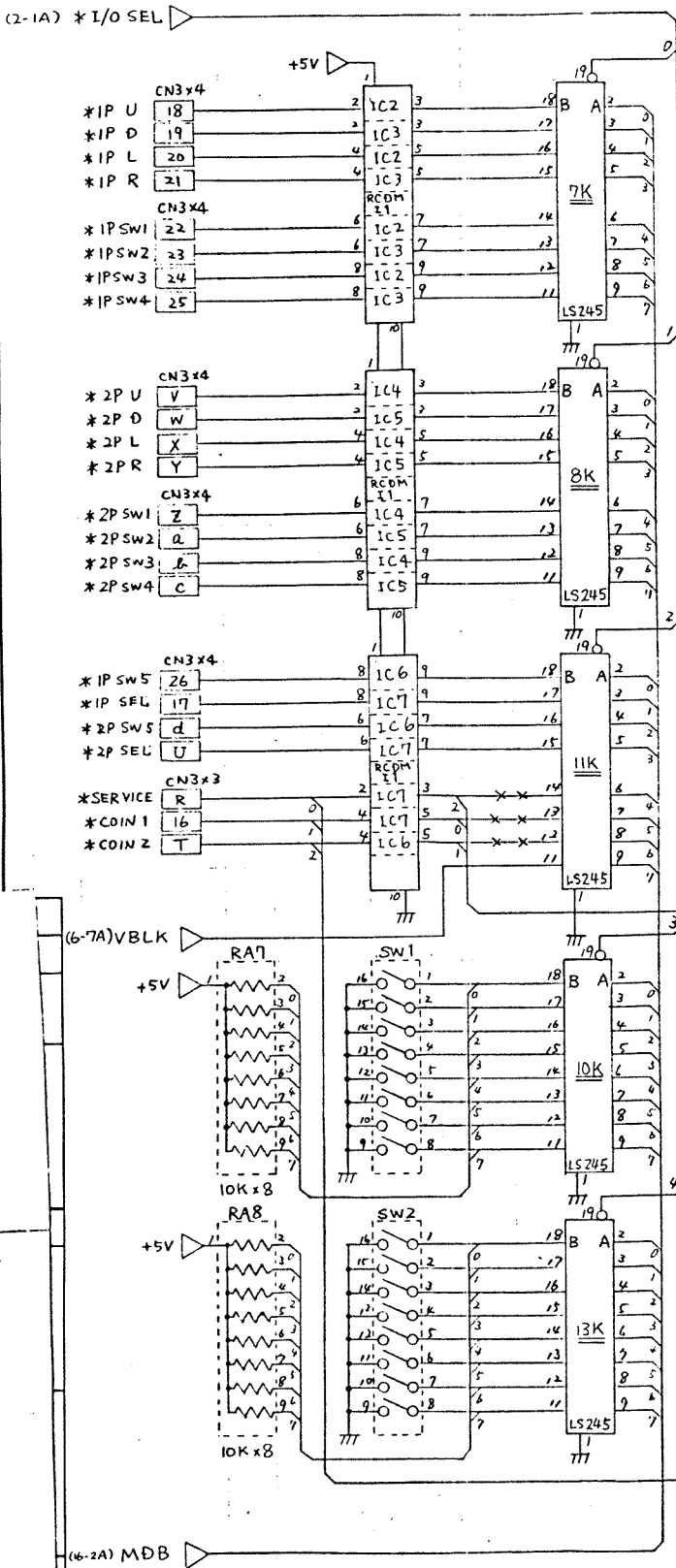
回路番号 仕舞、名称





DE-0247-2

图 29

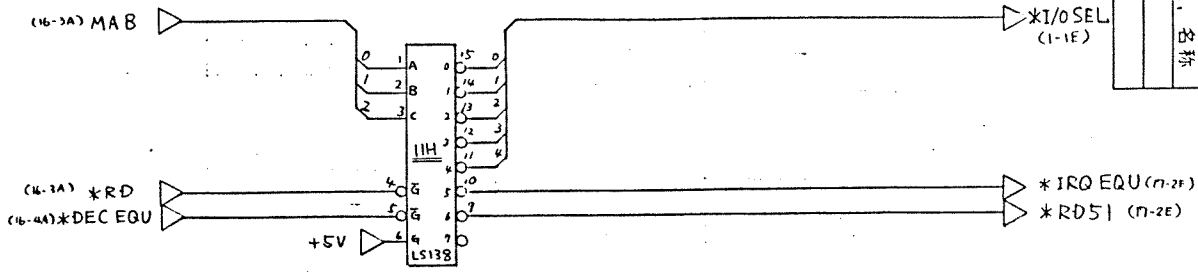


图例号 任样名称

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LS138



回路番号	1
仕様名称	2
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	9

表 27

(9-2A) \*HCLK  
(16-3A) MAB

(9-4A) HPOS

(16-3A) \*WR

(9-5A) VCUNT

(16-4A) \*DBJ SEL

(16-2A) MDB

(10-7A) LVCUNT  
\*VL0AD  
(6-1A)  
\*IP/2P  
(16-2A)  
IP/2P  
(16-4A)

関連番号  
仕様名称

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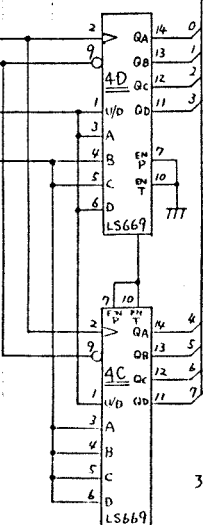
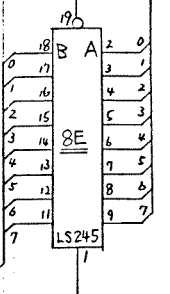
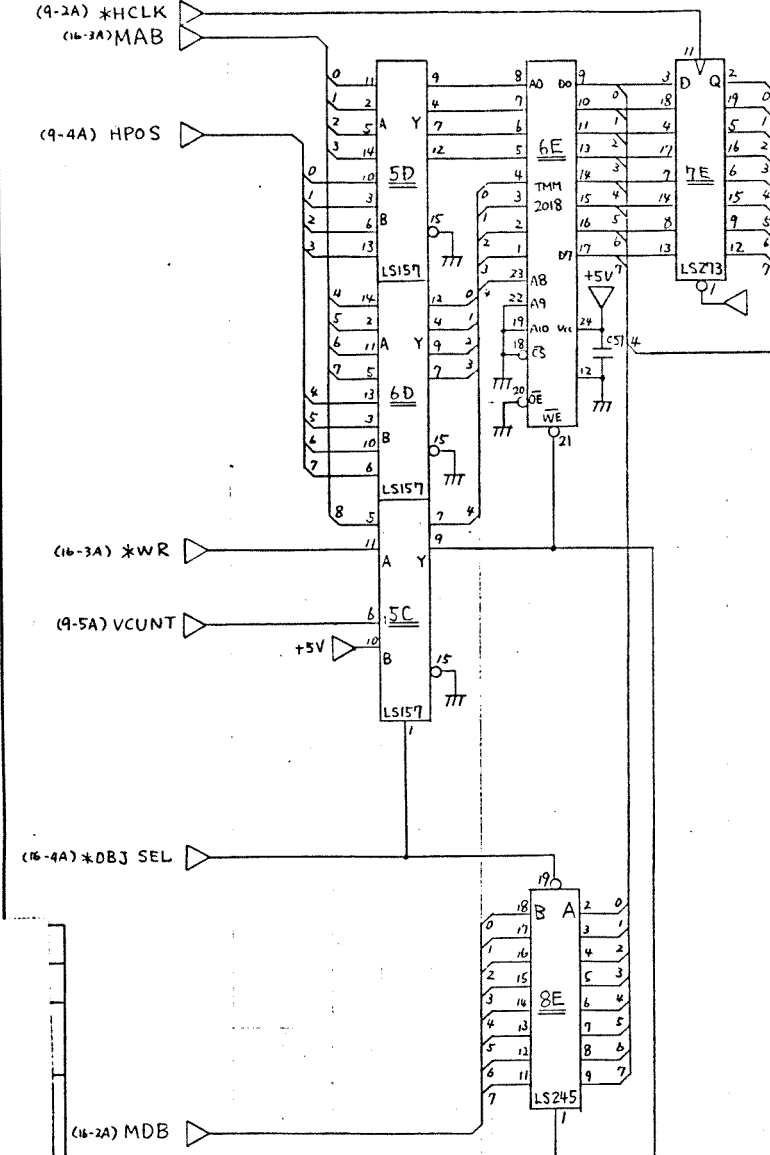
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OBJ DB (4-2E)

MXD (4-4E)

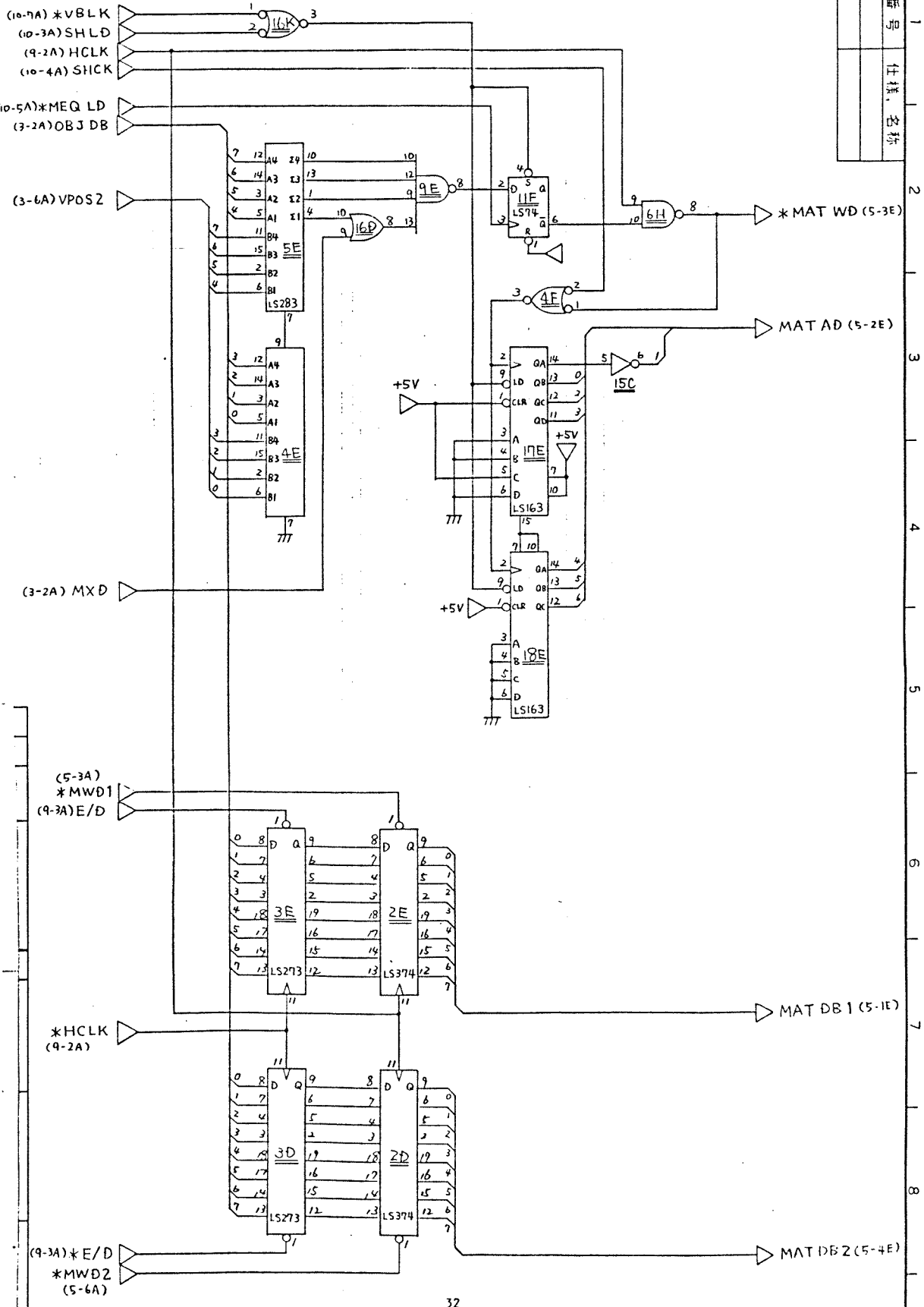
VPOS 2 (4-2E)



31

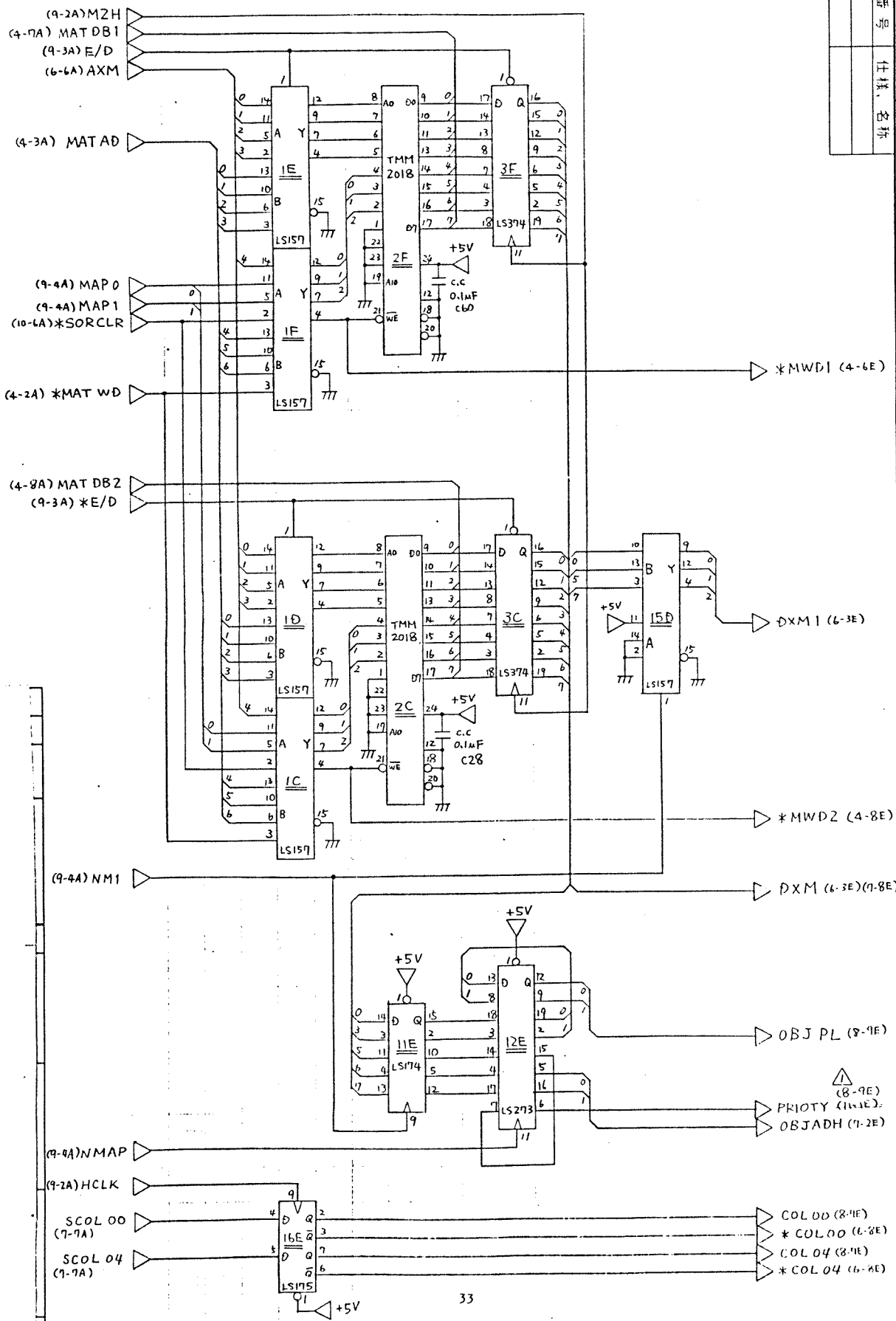
建 2

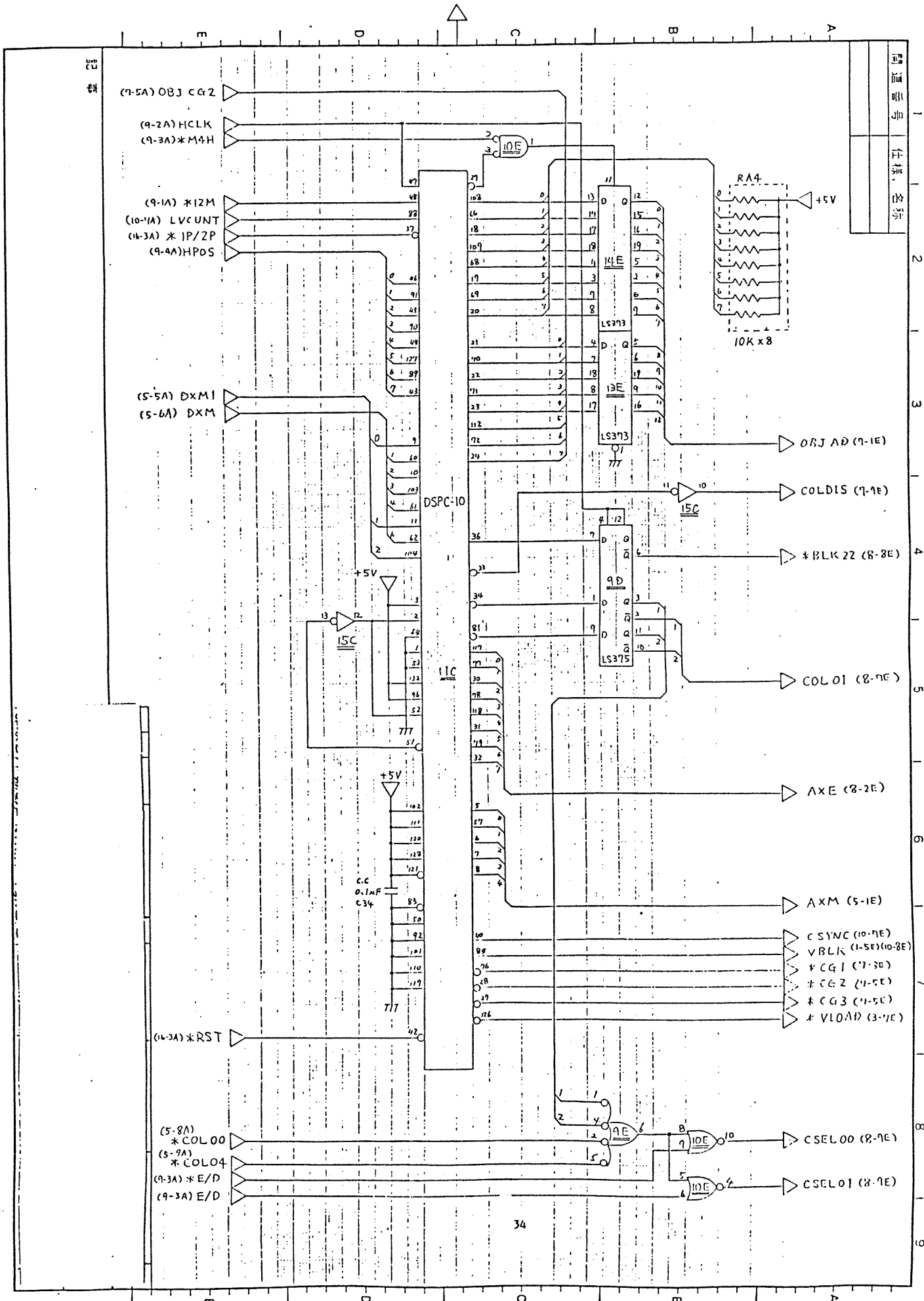
1	問 題 番 号
2	仕 様 名 称



記 事  
 △ 山田 61.9.3 動作改善の為 変更

回路番号	1
仕様、名称	

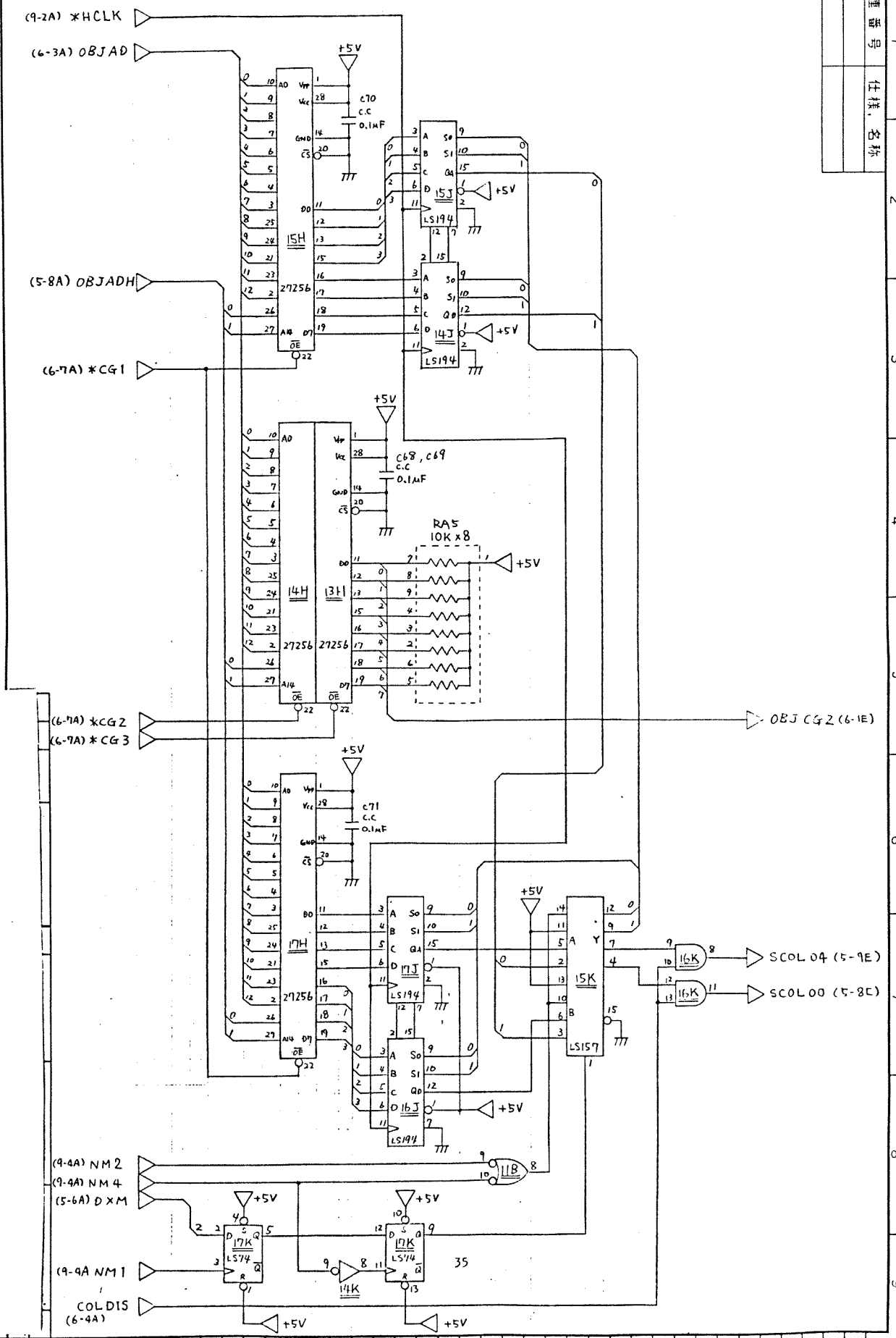




圖號	1
名稱	任務
日期	
設計	
校核	

開運番号	仕様名称

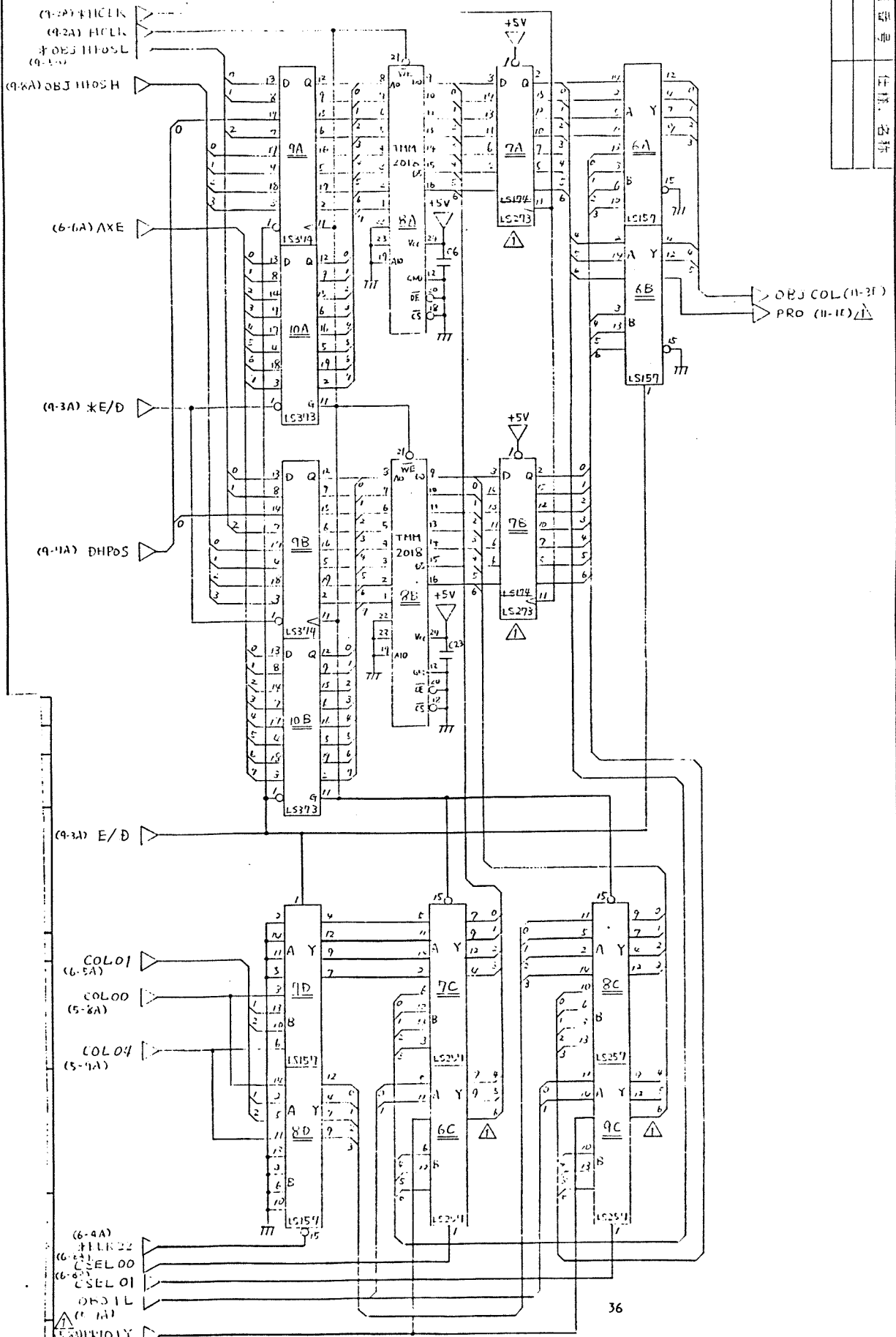
記号



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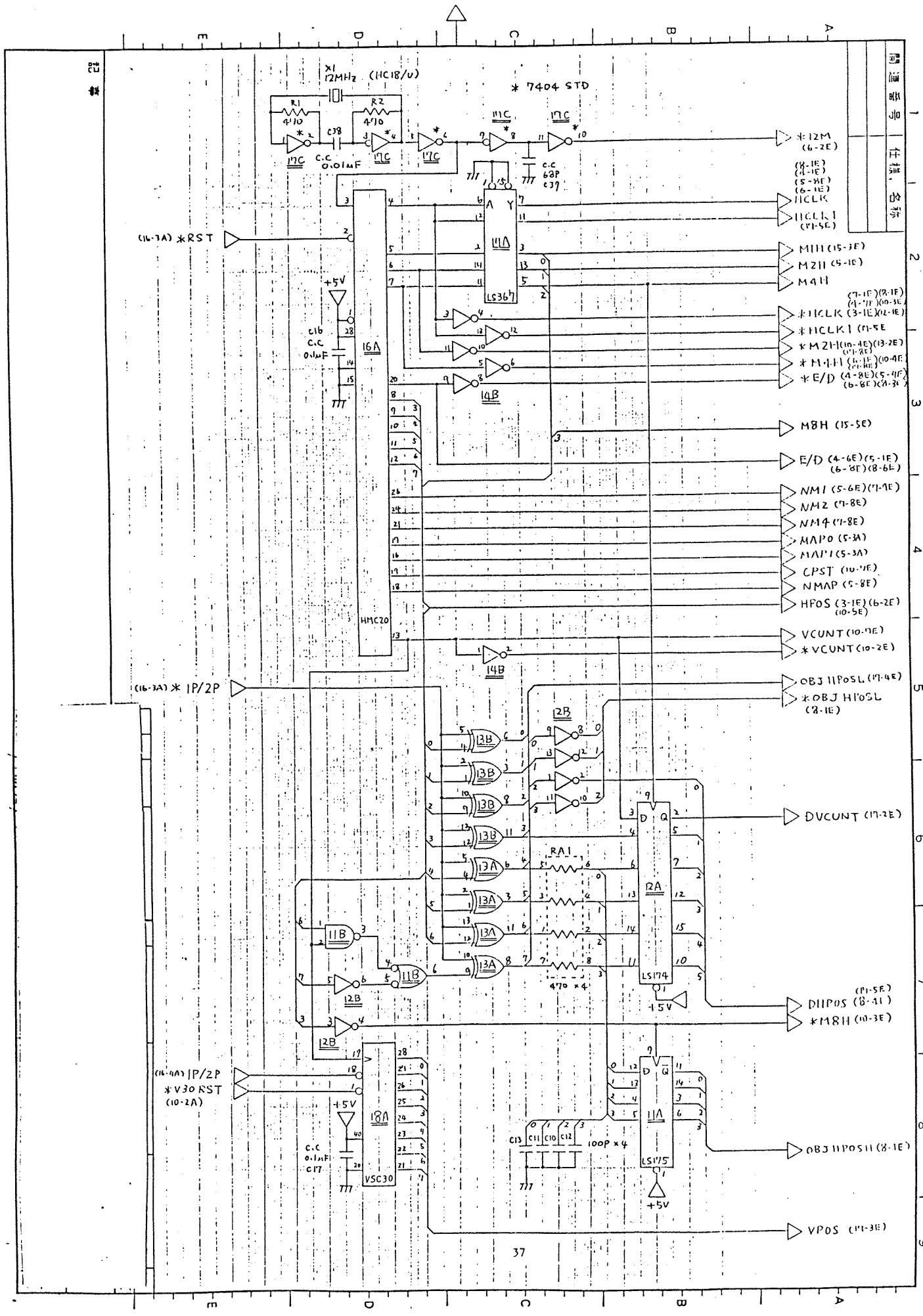
OBJ CG 2 (6-1E)  
SCOL 04 (5-9E)  
SCOL 00 (5-8E)

記号  
5. 1.3 (9A) (9B) (9C) (9D) (9E) (9F) (9G) (9H) (9I) (9J) (9K) (9L) (9M) (9N) (9O) (9P) (9Q) (9R) (9S) (9T) (9U) (9V) (9W) (9X) (9Y) (9Z) (9AA) (9AB) (9AC) (9AD) (9AE) (9AF) (9AG) (9AH) (9AI) (9AJ) (9AK) (9AL) (9AM) (9AN) (9AO) (9AP) (9AQ) (9AR) (9AS) (9AT) (9AU) (9AV) (9AW) (9AX) (9AY) (9AZ) (9BA) (9BB) (9BC) (9BD) (9BE) (9BF) (9BG) (9BH) (9BI) (9BJ) (9BK) (9BL) (9BM) (9BN) (9BO) (9BP) (9BQ) (9BR) (9BS) (9BT) (9BU) (9BV) (9BW) (9BX) (9BY) (9BZ) (9CA) (9CB) (9CC) (9CD) (9CE) (9CF) (9CG) (9CH) (9CI) (9CJ) (9CK) (9CL) (9CM) (9CN) (9CO) (9CP) (9CQ) (9CR) (9CS) (9CT) (9CU) (9CV) (9CW) (9CX) (9CY) (9CZ) (9DA) (9DB) (9DC) (9DD) (9DE) (9DF) (9DG) (9DH) (9DI) (9DJ) (9DK) (9DL) (9DM) (9DN) (9DO) (9DP) (9DQ) (9DR) (9DS) (9DT) (9DU) (9DV) (9DW) (9DX) (9DY) (9DZ) (9EA) (9EB) (9EC) (9ED) (9EE) (9EF) (9EG) (9EH) (9EI) (9EJ) (9EK) (9EL) (9EM) (9EN) (9EO) (9EP) (9EQ) (9ER) (9ES) (9ET) (9EU) (9EV) (9EW) (9EX) (9EY) (9EZ) (9FA) (9FB) (9FC) (9FD) (9FE) (9FF) (9FG) (9FH) (9FI) (9FJ) (9FK) (9FL) (9FM) (9FN) (9FO) (9FP) (9FQ) (9FR) (9FS) (9FT) (9FU) (9FV) (9FW) (9FX) (9FY) (9FZ) (9GA) (9GB) (9GC) (9GD) (9GE) (9GF) (9GG) (9GH) (9GI) (9GJ) (9GK) (9GL) (9GM) (9GN) (9GO) (9GP) (9GQ) (9GR) (9GS) (9GT) (9GU) (9GV) (9GW) (9GX) (9GY) (9GZ) (9HA) (9HB) (9HC) (9HD) (9HE) (9HF) (9HG) (9HH) (9HI) (9HJ) (9HK) (9HL) (9HM) (9HN) (9HO) (9HP) (9HQ) (9HR) (9HS) (9HT) (9HU) (9HV) (9HW) (9HX) (9HY) (9HZ) (9IA) (9IB) (9IC) (9ID) (9IE) (9IF) (9IG) (9IH) (9II) (9IJ) (9IK) (9IL) (9IM) (9IN) (9IO) (9IP) (9IQ) (9IR) (9IS) (9IT) (9IU) (9IV) (9IW) (9IX) (9IY) (9IZ) (9JA) (9JB) (9JC) (9JD) (9JE) (9JF) (9JG) (9JH) (9JI) (9JJ) (9JK) (9JL) (9JM) (9JN) (9JO) (9JP) (9JQ) (9JR) (9JS) (9JT) (9JU) (9JV) (9JW) (9JX) (9JY) (9JZ) (9KA) (9KB) (9KC) (9KD) (9KE) (9KF) (9KG) (9KH) (9KI) (9KJ) (9KK) (9KL) (9KM) (9KN) (9KO) (9KP) (9KQ) (9KR) (9KS) (9KT) (9KU) (9KV) (9KW) (9KX) (9KY) (9KZ) (9LA) (9LB) (9LC) (9LD) (9LE) (9LF) (9LG) (9LH) (9LI) (9LJ) (9LK) (9LL) (9LM) (9LN) (9LO) (9LP) (9LQ) (9LR) (9LS) (9LT) (9LU) (9LV) (9LW) (9LX) (9LY) (9LZ) (9MA) (9MB) (9MC) (9MD) (9ME) (9MF) (9MG) (9MH) (9MI) (9MJ) (9MK) (9ML) (9MN) (9MO) (9MP) (9MQ) (9MR) (9MS) (9MT) (9MU) (9MV) (9MW) (9MX) (9MY) (9MZ) (9NA) (9NB) (9NC) (9ND) (9NE) (9NF) (9NG) (9NH) (9NI) (9NJ) (9NK) (9NL) (9NM) (9NN) (9NO) (9NP) (9NQ) (9NR) (9NS) (9NT) (9NU) (9NV) (9NW) (9NX) (9NY) (9NZ) (9OA) (9OB) (9OC) (9OD) (9OE) (9OF) (9OG) (9OH) (9OI) (9OJ) (9OK) (9OL) (9OM) (9ON) (9OO) (9OP) (9OQ) (9OR) (9OS) (9OT) (9OU) (9OV) (9OW) (9OX) (9OY) (9OZ) (9PA) (9PB) (9PC) (9PD) (9PE) (9PF) (9PG) (9PH) (9PI) (9PJ) (9PK) (9PL) (9PM) (9PN) (9PO) (9PP) (9PQ) (9PR) (9PS) (9PT) (9PU) (9PV) (9PW) (9PX) (9PY) (9PZ) (9QA) (9QB) (9QC) (9QD) (9QE) (9QF) (9QG) (9QH) (9QI) (9QJ) (9QK) (9QL) (9QM) (9QN) (9QO) (9QP) (9QQ) (9QR) (9QS) (9QT) (9QU) (9QV) (9QW) (9QX) (9QY) (9QZ) (9RA) (9RB) (9RC) (9RD) (9RE) (9RF) (9RG) (9RH) (9RI) (9RJ) (9RK) (9RL) (9RM) (9RN) (9RO) (9RP) (9RQ) (9RR) (9RS) (9RT) (9RU) (9RV) (9RW) (9RX) (9RY) (9RZ) (9SA) (9SB) (9SC) (9SD) (9SE) (9SF) (9SG) (9SH) (9SI) (9SJ) (9SK) (9SL) (9SM) (9SN) (9SO) (9SP) (9SQ) (9SR) (9SS) (9ST) (9SU) (9SV) (9SW) (9SX) (9SY) (9SZ) (9TA) (9TB) (9TC) (9TD) (9TE) (9TF) (9TG) (9TH) (9TI) (9TJ) (9TK) (9TL) (9TM) (9TN) (9TO) (9TP) (9TQ) (9TR) (9TS) (9TT) (9TU) (9TV) (9TW) (9TX) (9TY) (9TZ) (9UA) (9UB) (9UC) (9UD) (9UE) (9UF) (9UG) (9UH) (9UI) (9UJ) (9UK) (9UL) (9UM) (9UN) (9UO) (9UP) (9UQ) (9UR) (9US) (9UT) (9UU) (9UV) (9UW) (9UX) (9UY) (9UZ) (9VA) (9VB) (9VC) (9VD) (9VE) (9VF) (9VG) (9VH) (9VI) (9VJ) (9VK) (9VL) (9VM) (9VN) (9VO) (9VP) (9VQ) (9VR) (9VS) (9VT) (9VU) (9VV) (9VW) (9VX) (9VY) (9VZ) (9WA) (9WB) (9WC) (9WD) (9WE) (9WF) (9WG) (9WH) (9WI) (9WJ) (9WK) (9WL) (9WM) (9WN) (9WO) (9WP) (9WQ) (9WR) (9WS) (9WT) (9WU) (9WV) (9WW) (9WX) (9WY) (9WZ) (9XA) (9XB) (9XC) (9XD) (9XE) (9XF) (9XG) (9XH) (9XI) (9XJ) (9XK) (9XL) (9XM) (9XN) (9XO) (9XP) (9XQ) (9XR) (9XS) (9XT) (9XU) (9XV) (9XW) (9XX) (9XY) (9XZ) (9YA) (9YB) (9YC) (9YD) (9YE) (9YF) (9YG) (9YH) (9YI) (9YJ) (9YK) (9YL) (9YM) (9YN) (9YO) (9YP) (9YQ) (9YR) (9YS) (9YT) (9YU) (9YV) (9YW) (9YX) (9YY) (9YZ) (9ZA) (9ZB) (9ZC) (9ZD) (9ZE) (9ZF) (9ZG) (9ZH) (9ZI) (9ZJ) (9ZK) (9ZL) (9ZM) (9ZN) (9ZO) (9ZP) (9ZQ) (9ZR) (9ZS) (9ZT) (9ZU) (9ZV) (9ZW) (9ZX) (9ZY) (9ZZ)



回路番号	仕様名称

OBJ COL (11-31)  
PRO (11-17) 1



12MHz

\* 7404 STD

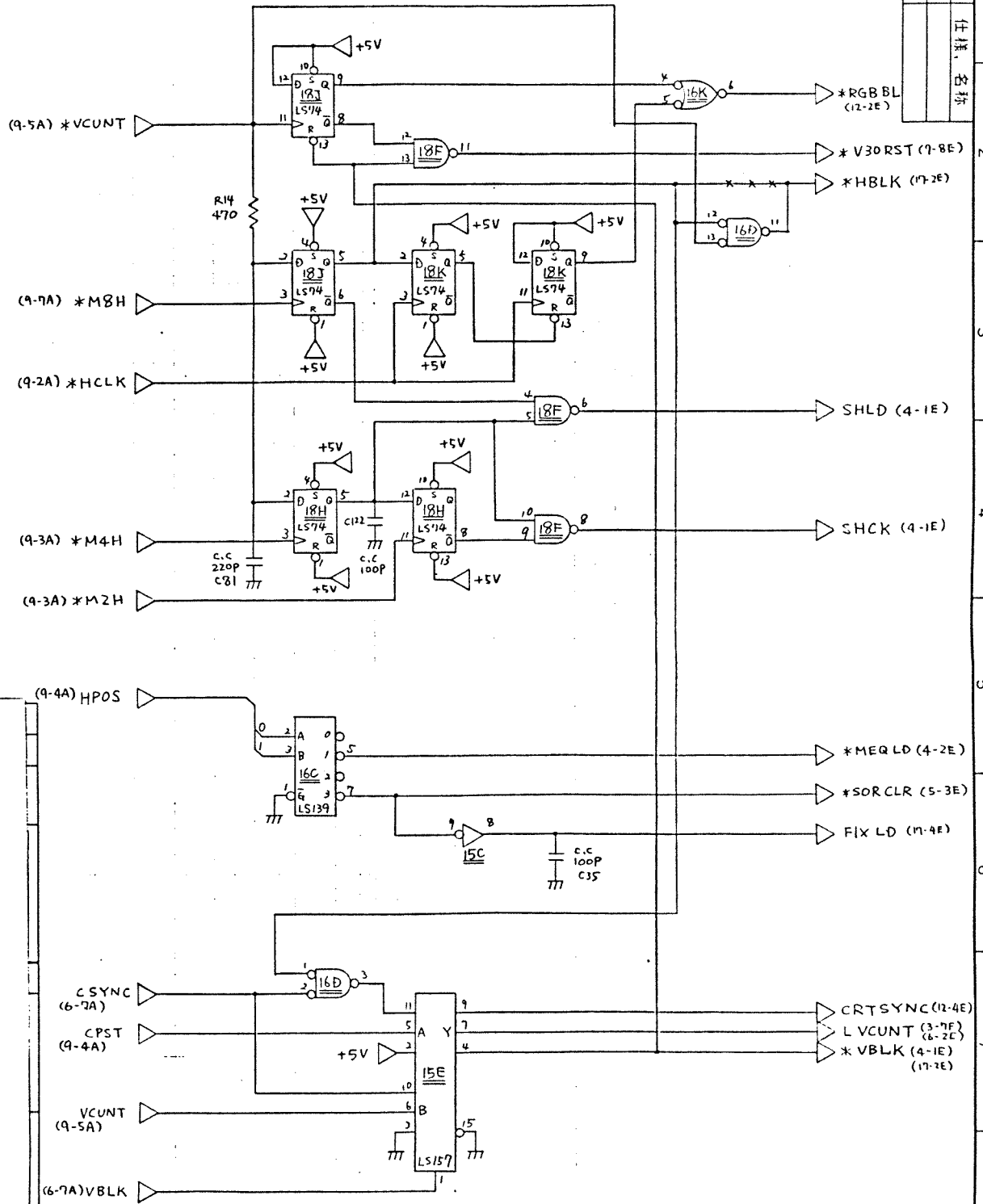
(16-3A) \*RST

(16-3A) \*IP/2P

(16-4A) IP/2P  
\*V30 RST  
(10-2A)



回路番号	
仕様、名称	



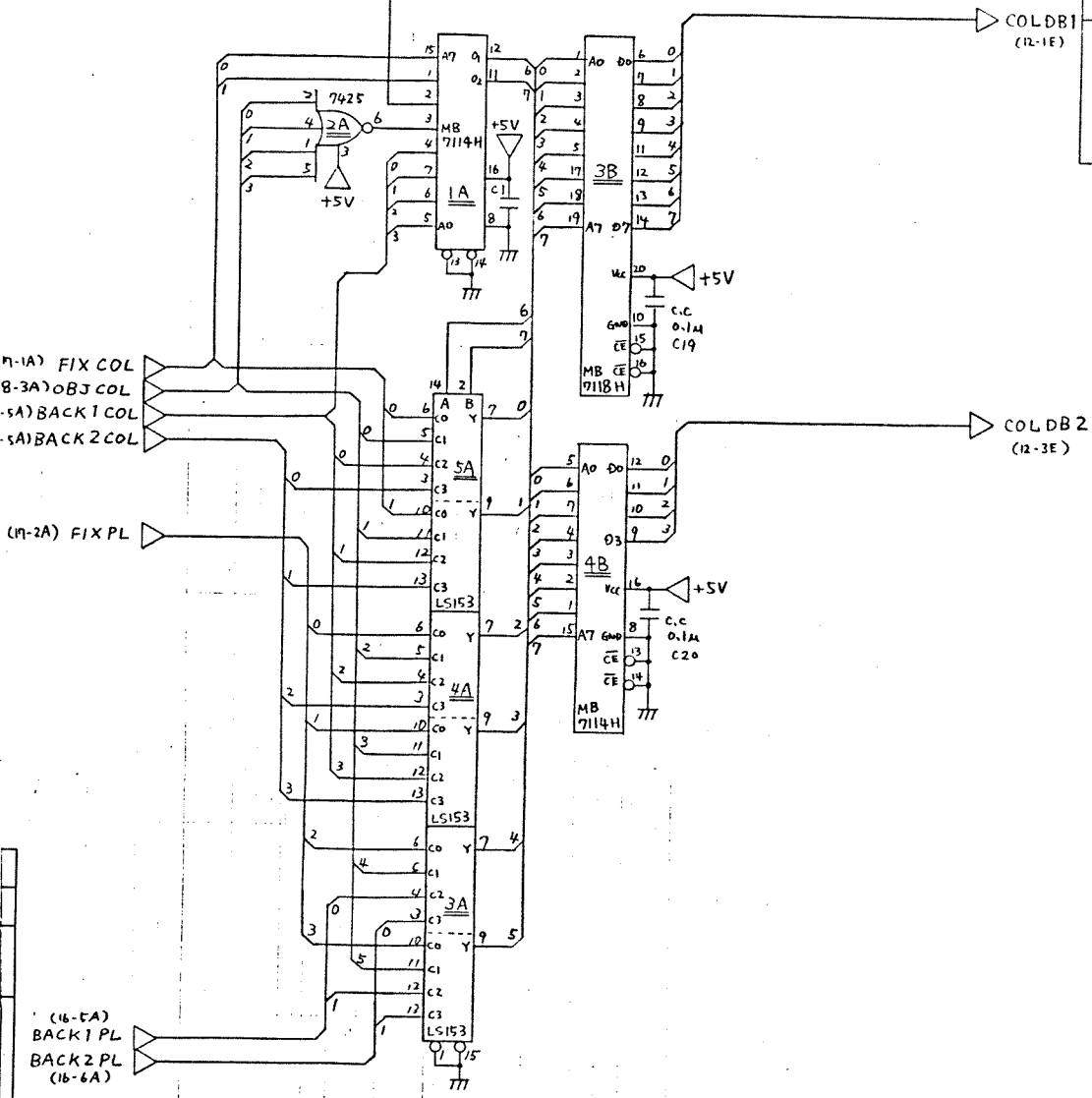
記 事  
 △ 山田 61.9.3 動作改善の為変更

(B-3A) PRO  
 (E-2A) PRIORITY

(M-1A) FIX COL  
 (B-3A) OBJ COL  
 (16-5A) BACK 1 COL  
 (16-5A) BACK 2 COL

(M-2A) FIX PL

(16-5A) BACK 1 PL  
 BACK 2 PL  
 (16-6A)



関連番号	
仕様名称	

图 27

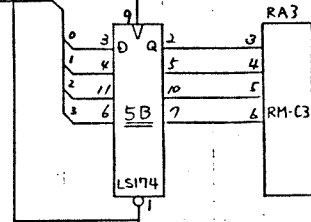
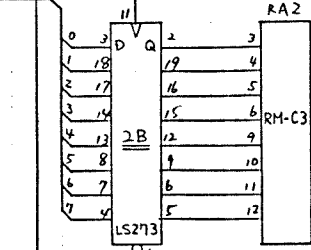
(9-2A) \*HCLK

(11-1A) COLDB1

(10-2A) \*RGB BL

(11-3A) COLDB2

(10-1A) CRT SYNC



R5  
47

CN3  
12 R

CN3  
N G

CN3  
13 B

CN3  
P SYNC

CN3  
14 TV.GND

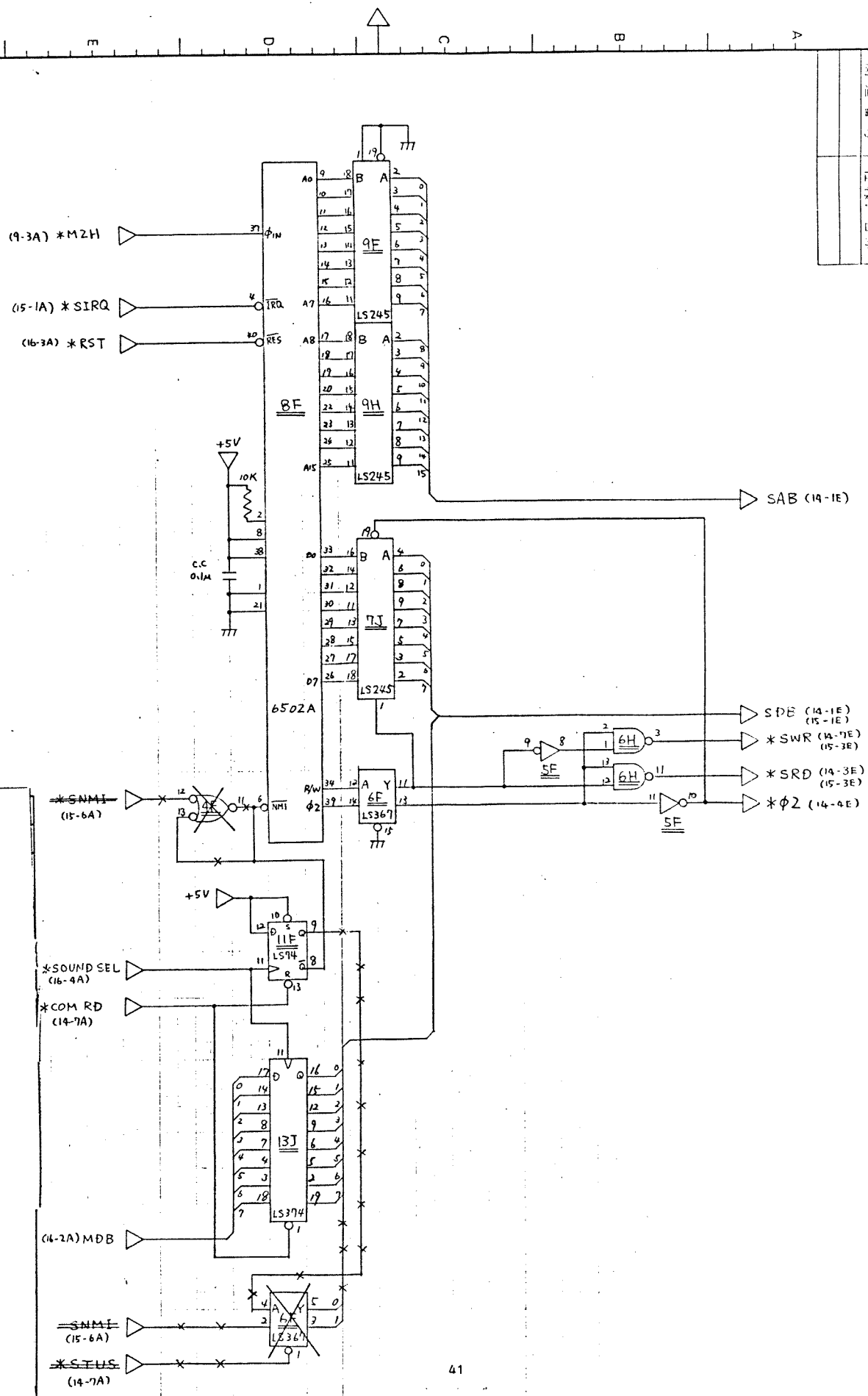
图通号	任务名称
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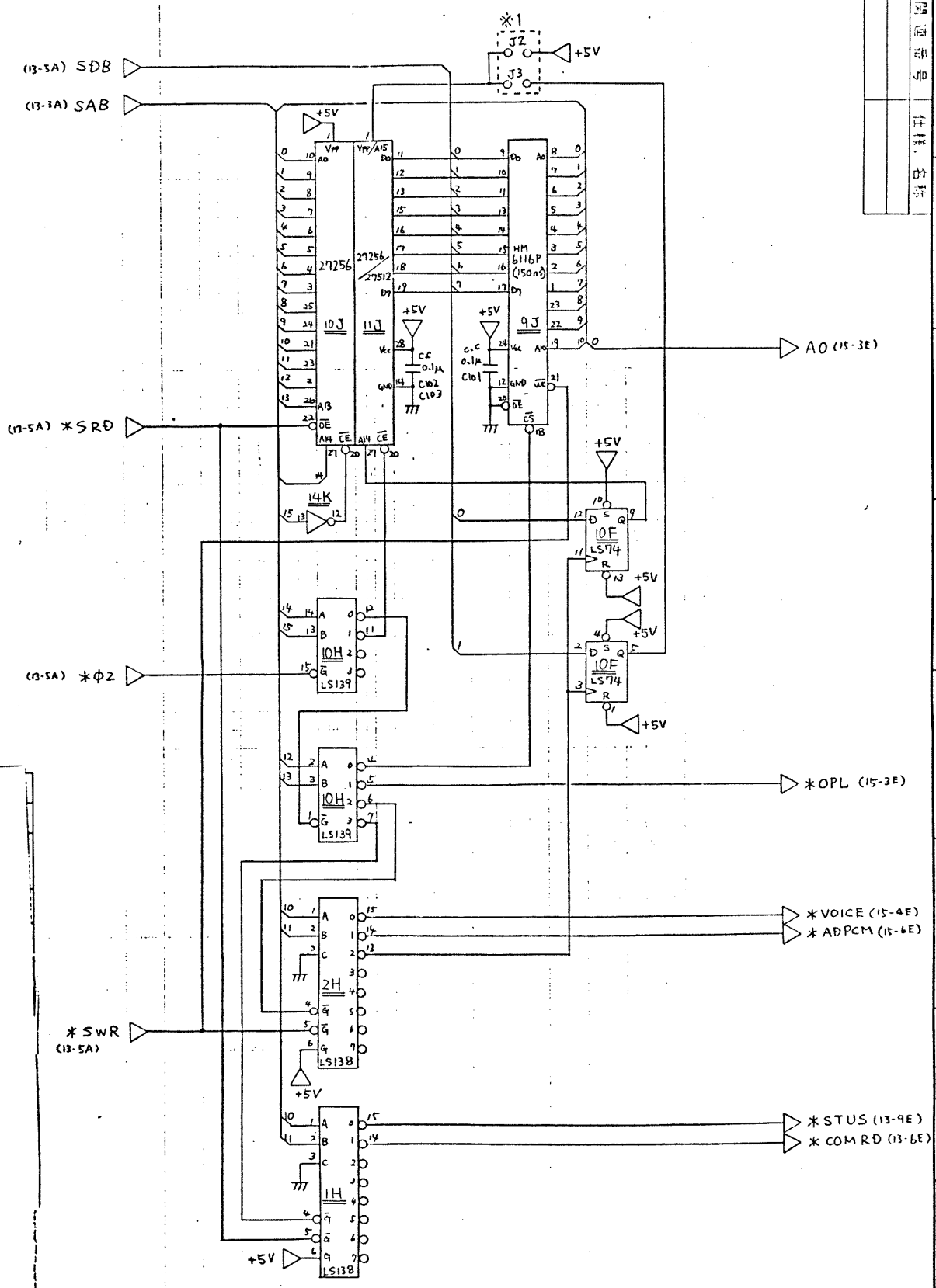
地址

图例

名称



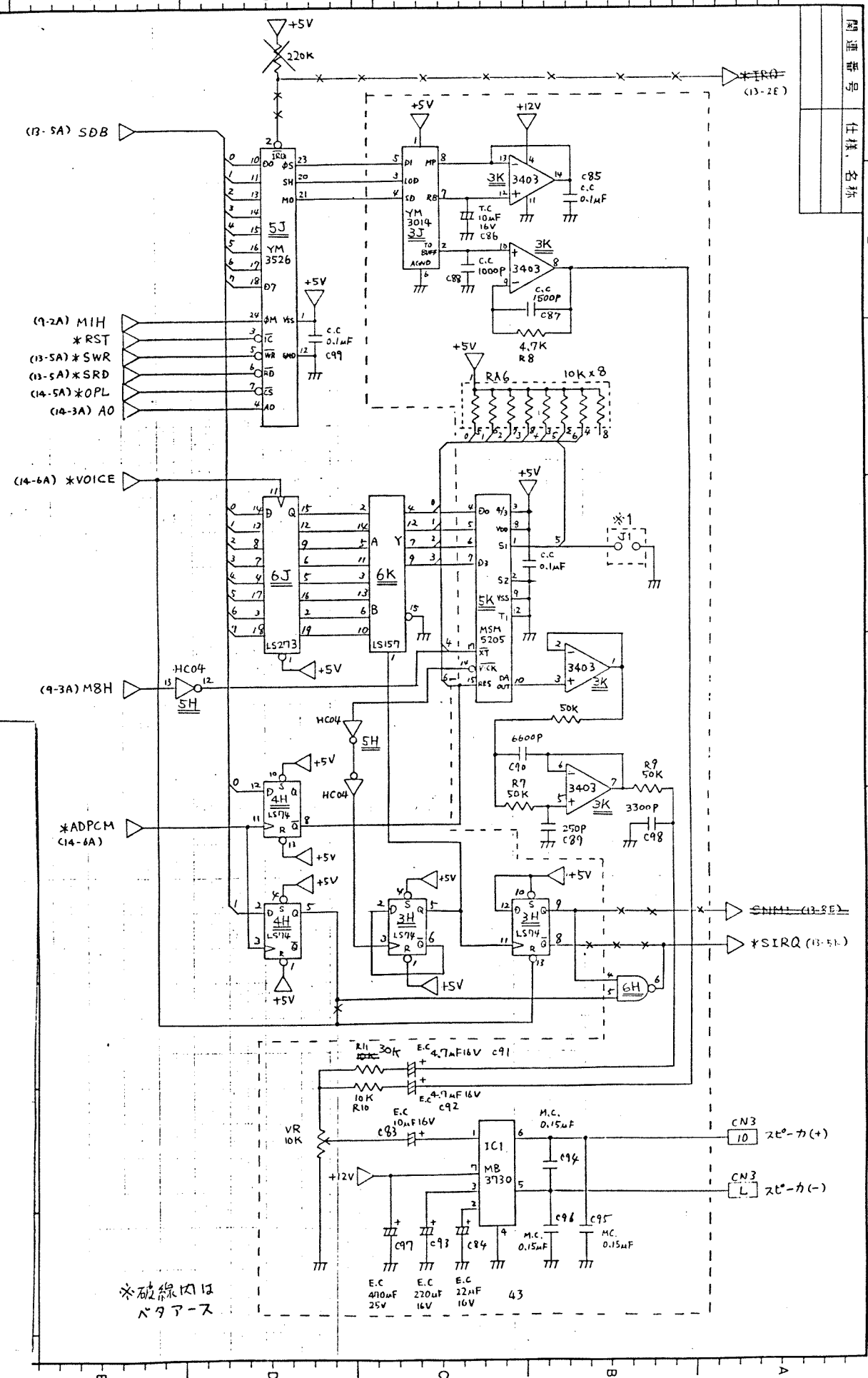
記 号  
 \*1 27256使用の時は、J2にジャンパー-93、27512使用の時は、J3にジャンパー-75。  
 J2、J3を同時にジャンパーしないこと。



記号	説明

関連番号	仕様、名称

※1 ADPCMの7.77kHz用回路の切り替え用。7.77kHz=8kHz、3.0kHz=4kHz

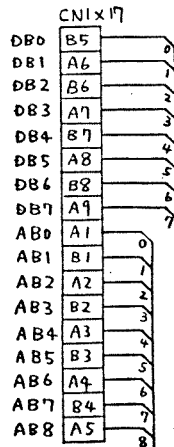


※破線内は  
パーツ

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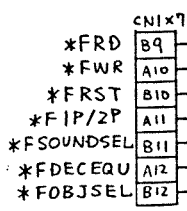
記 号

開 連 番 号	1
任 務 名 称	

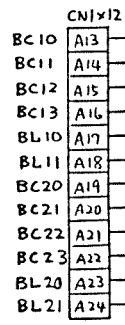


MDB (1-8E)(3-6E)(13-8E)

MAB (2-1E)(3-1E)



\*RD (2-2E)  
 \*WR (3-3E)  
 \*RST (6-7E)(9-2E)  
 \*IP/2P (3-7E)(6-2E)(9-5E)  
 \*SOUND SEL(13-6E)  
 \*DEC EQU (2-2E)  
 \*OBJ SEL (3-5E)  
 IP/2P (3-7E)(9-8E)



BACK 1 COL (11-3E)

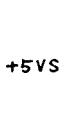
BACK 1 PL (11-6E)

BACK 2 COL (11-3E)

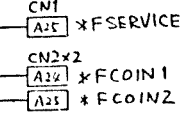
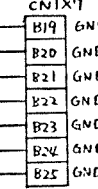
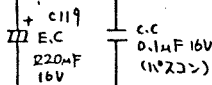
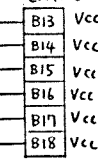
BACK 2 PL (11-6E)



+12V



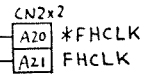
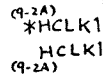
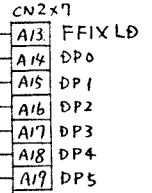
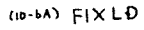
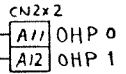
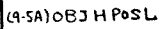
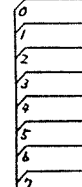
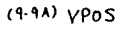
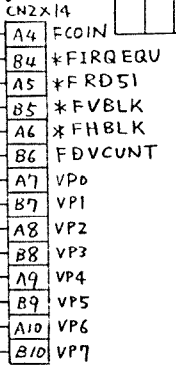
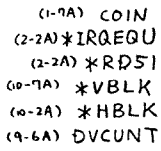
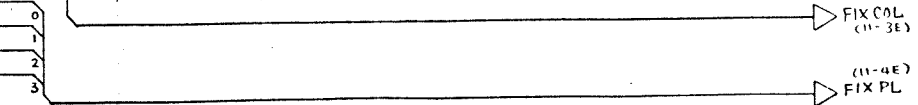
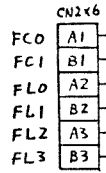
+5V



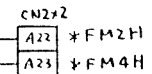
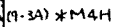
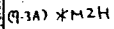
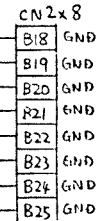
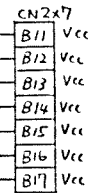
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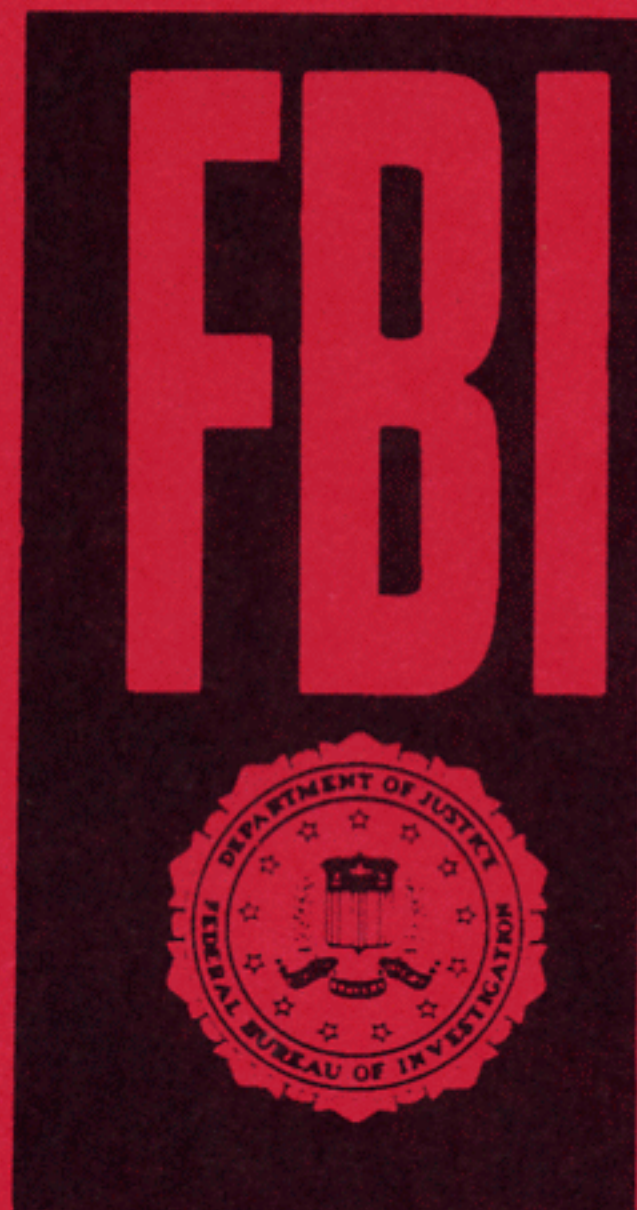
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