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CONVERSION KIT CONTENTS:

- MAIN PRINTED CIRCUIT BOARD
- P.C.B. CAGE (FCC REQUIRED)
- CONNECTING WIRING HARNESS
- 6 SETS — BUTTON ASSEMBLIES
- TWO 8-WAY JOYSTICKS
- MARQUEE (HEADER)
(1/8" acrylic sheet)
- ONE SET SIDE PANEL GRAPHICS (left & right)
- CONTROL PANEL OVERLAY
- CONTROL PANEL DECALS
instruction decals/button decals (2 sets)
- MANUAL
- REGISTRATION CARD

REPLACEMENT ACCESSORIES ARE AVAILABLE THROUGH YOUR DISTRIBUTOR.

THIS KIT USABLE FOR COCKTAIL AND UPRIGHT VIDEO GAMES WITH A
RASTAR SCAN MONITOR WHICH IS OR CAN BE MOUNTED HORIZONTALLY.

LIFE FORCE INTRODUCTION

KONAMI CONVERSION KITS are the most complete conversion kits available today. Every detail has been carefully considered, designed and packaged to provide you the means of easily producing a professional conversion.

These kits have all the accessories to easily convert your UPRIGHT or COCKTAIL video game.

We strongly urge you to FULLY STUDY this instruction manual BEFORE you begin your conversion. It contains step-by-step instructions, schematic diagrams and suggestions on how to install your Konami Conversion Kit and maximize your profits.

LIFE FORCE can be installed in any horizontally mounted raster scan monitor game.

Everything you will need to construct your new game is provided in this kit. All accessory parts—wiring harness, joystick, etc. are custom made for LIFE FORCE by top engineers experienced in the coin-op industry. Two 8-way joysticks (as provided) MUST be used.

The Player Instruction and Button Control decals are made of a non-destructible acrylic material specifically to keep the player from peeling them off. Should you convert a cocktail table game, LIFE FORCE is supplied with 2 sets of button decals.

★ ★ ★ IMPORTANT NOTICE ★ ★ ★

The Japanese Amusement Machine Manufacturers Association (JAMMA) has introduced a new standard in video game P.C.B.'s. It was decided that all new products from any JAMMA member will use the same pin print-out on the edge connector. The edge connector will have 56 pin outs, 28 per side.

Konami Inc. will offer a 56 to 36 pin adaptor P.C.B. available through your distributor. This new adaptor P.C.B. will enable the new 56 pin out to adapt to Konami's old standard 36 pin out.

★ ★ ★ STEREO SOUND ★ ★ ★

LIFE FORCE offers stereo sound in this kit.
Please see page 7 for proper installation.

PUTTING YOUR BEST GAME FORWARD

PREPARATION:

For best results, all old graphics should be removed completely from the cabinet. "Stick-on" graphics can be removed by using a hairdryer or hot air device. The heat from the dryer will loosen the adhesive, allowing you to easily peel them off — any adhesive residue can be cleaned off with acetone and a soft dry cloth. (DO NOT USE ACETONE ON SURFACES PAINTED WITH FLAT PAINT.)

TOOLS YOU NEED:

1. Foaming Aerosol (such as "Windex").
2. Soft Squeegee.
3. X-Acto Knife.

SIDE PANEL DECALS

1. Spray area of cabinet where Side Panel decals are to be applied with foaming aerosol or a mild soap solution.
2. Remove protective backing from decals.
3. Position decals into place.
4. With a soft squeegee, beginning from the center of the decal, slowly and evenly press out excess foam until you achieve a smooth finish.
5. Allow to set approximately 2 to 3 hours before handling. Maximum adherence is achieved in 48 to 72 hours.

6. Trim side decal to fit your cabinet.

CONTROL PANEL OVERLAY:

1. Refer to Recommended Control Panel Layout on page 1.
2. Drill any new holes needed.
3. Plug any holes that will not be used. (A permanent epoxy filler works well for this step.)
4. Pre-position the overlay prior to removing the backing.
5. Slowly apply the overlay — inch by inch on the control panel, removing the backing as you apply it.
6. Once it's in place, by using an X-Acto knife, cut around the button and joystick placements.

INSTRUCTION/BUTTON DECALS:

Apply the Player Instruction, Button and 1 Player/2 Player decals in their respective positions. Apply pressure liberally. Allow to set as long as possible before putting game on location.

NOTE: Maximum adherence is achieved in 48 to 72 hours.

FCC WARNING LABEL:

FCC Warning Label must be applied to the outside of the cabinet near the line cord entry.

MARQUEE

(WEAR PROTECTIVE GLASSES WHILE TRIMMING MARQUEE)

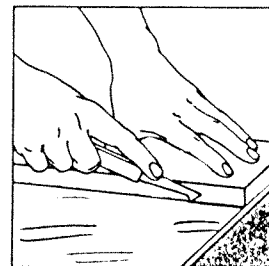
1/8" Acrylic Marquee should be cut to fit your game. DO NOT remove protective mask until this is done.

One way of cutting your Marquee is as follows: (Be sure to protect painted side of Marquee from any surface which may scratch or mar finish).

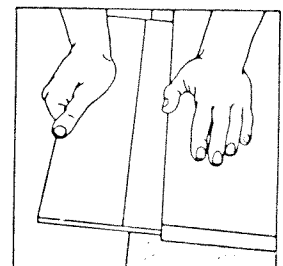
CUTTING WITH A KNIFE OR SCRIBER

Acrylic sheet up to 3/16" thick may be cut by a method similar to that used for cutting window glass. Use a scribe of some kind — a scribing knife such as the one pictured, a metal scribe, an awl, or even a sturdy craft knife — to score the sheet. Draw the scribe several times (7 or 8 times for a 3/16" thick piece) along a straight edge held firmly in place. It is best not to remove the protective masking. Make the cuts carefully using firm, even pressure. For best results make each stroke cleanly off the edge of the sheet.

Then clamp the acrylic sheet or hold it rigidly under a straight edge with the scribe mark hanging just over the edge of a table. Protect your hands with a cloth, and apply a sharp downward pressure to the other side of the sheet. It will break along the scratch. Scrape the edges to smooth any sharp corners. This method is not recommended for long breaks or thick material.



Always draw the scribing knife along a straight edge.



Break sheet over edge of table after scribing.

P.C.B. CAGE INSTALLATION

Konami, Inc. now supplies a new style P.C.B. cage which is superior to old style cages because of ease of installation. The cage is made of a 32 point stem-stock which is fire retardant.

TO INSTALL THE CAGE:

1. Open cage bottom and secure to desired P.C.B. position.
2. Install printed circuit board inside cage using wood screws, screwed through the cage bottom into cabinet side.
3. Close the cage over printed circuit board and secure with latch on cage.

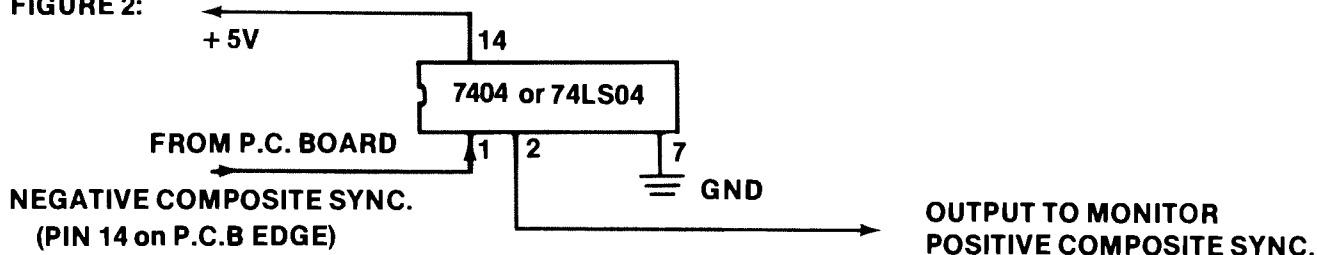
LIFE FORCE: MONITOR SPECIFICATIONS

LIFE FORCE requires a horizontally mounted monitor. It also generates composite negative sync. If your monitor is composite positive sync, you will have to change to composite negative sync.

- (1) To alternate composite positive sync to composite negative sync, use 7404 IC or 74LS04 IC. The signal on the output pin from the P.C.B. is a combination of H-sync and V-sync.

NOTE: Please refer to Figure 2.

FIGURE 2:

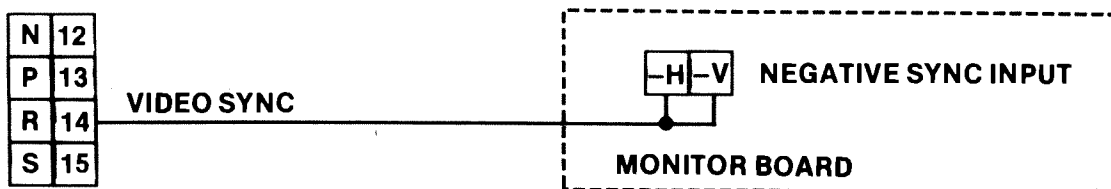


(+ 5V and GND should be taken out of the P.C. Board.)

- (2) Separate Sync modification for LIFE FORCE if your monitor has "Separate Sync" input. (For example "Electrohome brand" and Wells-Gardner brand.")

Step 1

WIRING HARNESS

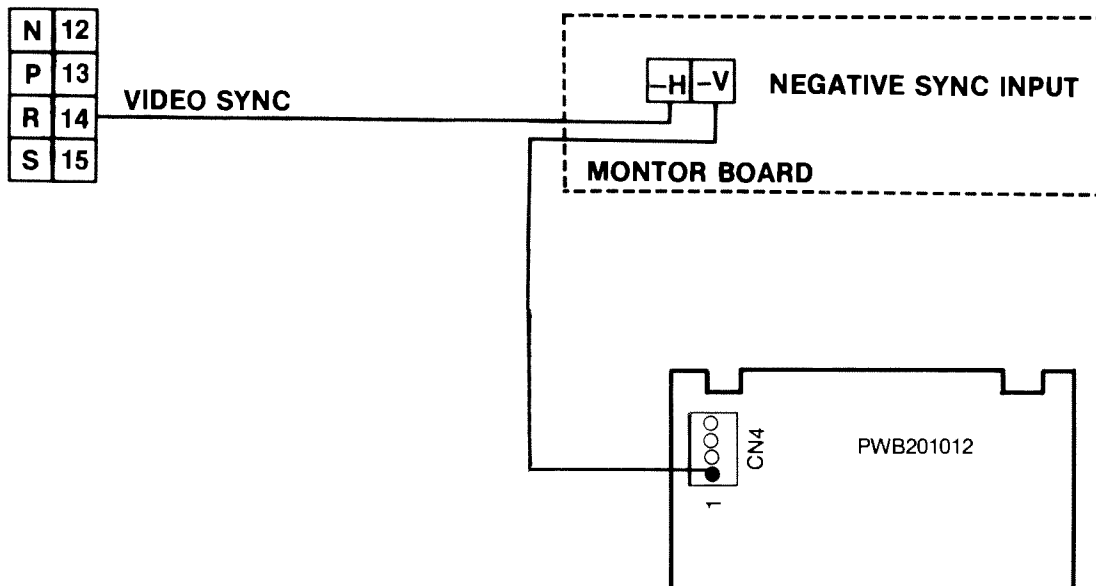


If the picture is still not stable...

Step 2

Prepare Hook-up wire to separate -H and -V sync. signals.

WIRING HARNESS



LIFE FORCE: MONITOR INFO.

SERVICE INSTRUCTIONS

NOTE: All monitors are equipped with automatic degaussing coils (L701) which demagnetize the picture tube every time the monitor is turned on after being off for a minimum of 5 minutes. Should any part of the chassis become magnetized it will be necessary to degauss the affected area with a manual degaussing coil. Move the coil slowly around the CRT face and all surrounding metal parts. Then slowly withdraw for a distance of 6 feet before turning off.

1.0 BLACK LEVEL CONTROL ADJUSTMENT

This control has been set at the factory and should not need further attention, however, when the game is connected a slight adjustment of VR201 may be necessary to obtain the proper black level (the black portion of the picture just extinguished).

2.0 VERTICAL SIZE (HEIGHT)

Location of this control is shown in Fig. 1. This control must be adjusted slowly, if necessary, until the picture or test pattern attains the correct vertical proportions.

3.0 CIRCUIT PROTECTION

A 4.0A pigtail fuse, mounted on the Main Board has been provided to protect the Power Output Circuit.

4.0 FOCUS

Adjust the focus control, located on the HV unit (T352), for maximum over-all definition and fine picture detail.

5.0 HORIZONTAL HOLD CONTROL ADJUSTMENT, VR351 (See Fig. 1)

A warm-up period of at least five minutes should be allowed before alignment is carried out. With the monitor being driven from the game signal, short TP601 to TP31. Adjust VR351 until the picture stops sliding horizontally. Remove the short.

6.0 HORIZONTAL VIDEO POSITION

If the video is off center on the raster some compensation can be made by adjusting this control.

7.0 VERTICAL RASTER POSITION ADJUSTMENT

If the video is off center vertically, (short dimension of picture tube) some compensation can be made by moving the vertical raster position adjustment jumper to either positions "U" or "D".

8.0 HORIZONTAL RASTER POSITION ADJUSTMENT

If the video is off center horizontally (long dimension of the picture tube) some compensation can be made by moving the horizontal raster position adjustment jumper to either positions "R" or "L".

9.0 HORIZONTAL WIDTH ADJUSTMENT

The horizontal width coil is a hexagonal tuning tool adjustment. This control must be adjusted slowly, if necessary, until the picture or test pattern attains the correct horizontal proportions.

* KONAMI GAMES ARE ALL NEGATIVE COMPOSIT SYNC.
USE THE THREE PIN CONNECTOR ON THE MONITOR.

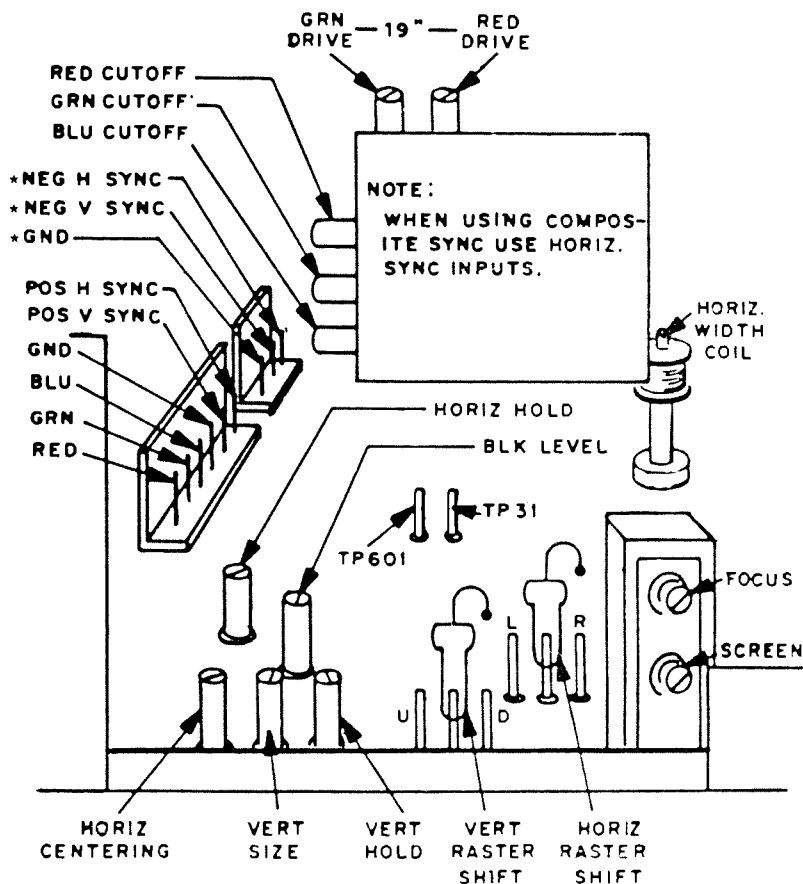


FIGURE 1

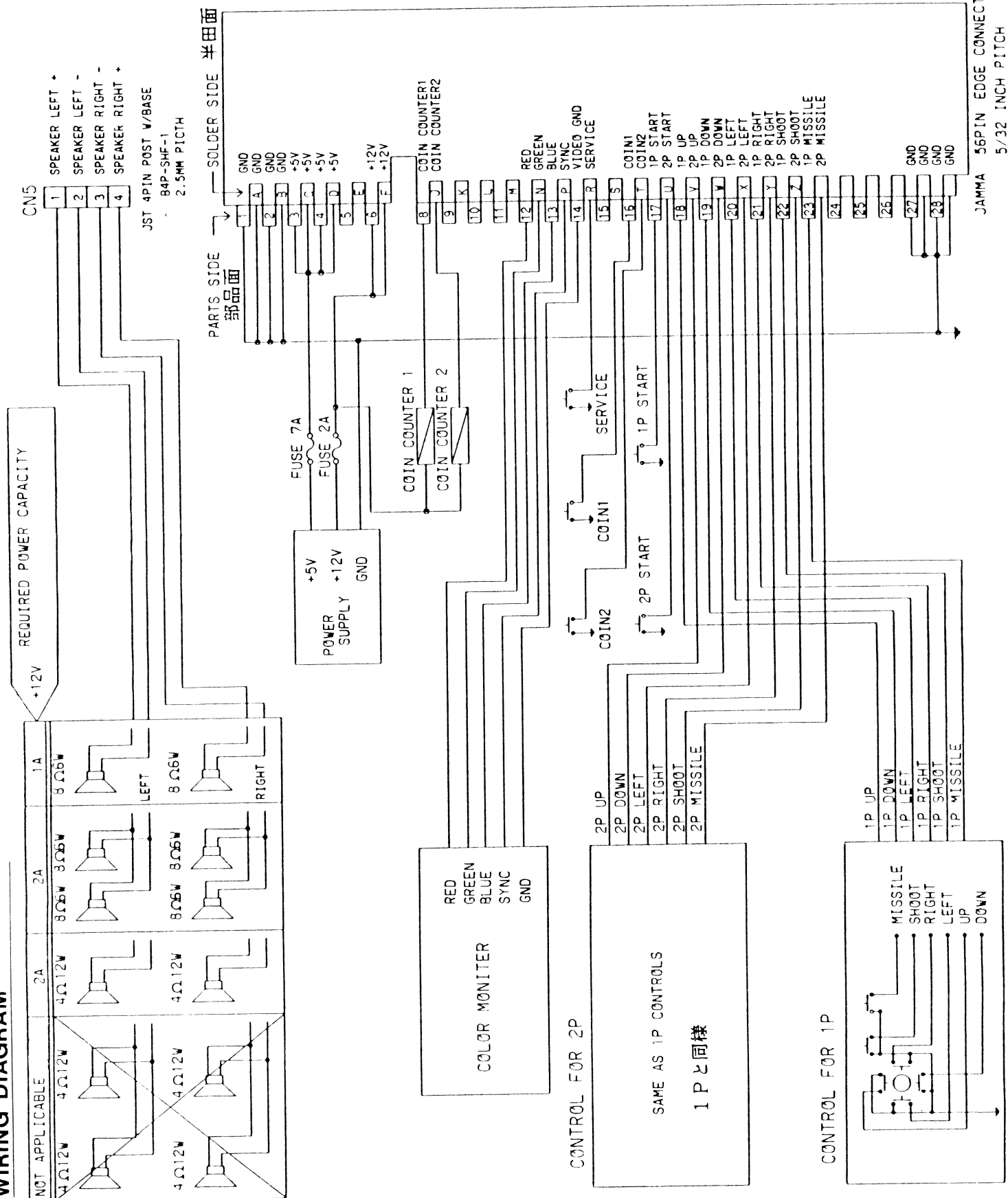
LIFE FORCE: WIRING HARNESS

				Solder Side ←		→ Parts Side	
WIRE COLOR KEY:							
BLACK	GND	A	1	GND	BLACK		
BLACK	GND	B	2	GND	BLACK		
RED	+ 5V DC	C	3	+ 5V DC	RED		
RED	+ 5V DC	D	4	+ 5V DC	RED		
	(EMPTY)	E	5	(EMPTY)			
ORANGE	+ 12V DC	F	6	+ 12V DC	ORANGE		
	*KEY	H	7	*KEY			
WHITE/RED	COIN COUNTER 2	J	8	COIN COUNTER 1	WHITE/BLACK		
	(EMPTY)	K	9	(EMPTY)			
WHITE/GREEN	(Mono Speaker Output)	L	10	(Mono Speaker Output)	WHITE/BLUE		
	(EMPTY)	M	11	(EMPTY)			
GREEN/WHITE	VIDEO GREEN	N	12	VIDEO RED	RED/WHITE		
WHITE	VIDEO SYNC	P	13	VIDEO BLUE	BLUE/WHITE		
YELLOW/BLACK	SERVICE SW	R	14	VIDEO GROUND	BLACK		
	NOT USED	S	15	NOT USED			
YELLOW/RED	COIN 2	T	16	COIN 1	YELLOW/BLUE		
WHITE/VIOLET	2P START	U	17	1P START	ORANGE/BLACK		
WHITE/BROWN	2P UP	V	18	1P UP	WHITE/GRAY		
ORANGE/WHITE	2P DOWN	W	19	1P DOWN	YELLOW/GRAY		
ORANGE/RED	2P LEFT	X	20	1P LEFT	YELLOW/GREEN		
ORANGE/GRAY	2P RIGHT	Y	21	1P RIGHT	ORANGE/BLUE		
GRAY/RED	2P SHOOT	Z	22	1P SHOOT	GRAY/BLACK		
GRAY/GREEN	2P MISSILE	a	23	1P MISSILE	GRAY/BLUE		
	NOT USED	b	24	NOT USED			
	NOT USED	c	25	NOT USED			
	NOT USED	d	26	NOT USED			
BLACK	GND	e	27	GND	BLACK		
BLACK	GND	f	28	GND	BLACK		

(BASE COLOR/LINE COLOR)

*Cocktail Table or Dual Control
Upright Only

WIRING DIAGRAM



LIFE FORCE: TECHNICAL INFORMATION

IS THE HORIZONTAL SCAN ON YOUR MONITOR TOO SMALL?

Most of the Wells-Gardner monitors in the field are set for an active video signal of 50 micro seconds. Konami's LIFE FORCE active video signal is 40 micro seconds. Therefore if the horizontal scan is too small, an adjustment of the monitor is recommended. This may be solved simply and inexpensively. (Refer to your Wells-Gardner schematic.)

1. Change capacitor C365 on the monitor to .15 mf 200V polypropolene.
2. Add an 820 P.F. 1500V polypropolene capacitor across the horizontal output transformer Q352 from the collector to the emitter.
3. Cut the horizontal centering wire #30. (Usually yellow in color.)

STEREO/MONO SOUND INSTALLATION

Konami introduces stereo sound.

Please read instructions carefully. If your video cabinet doesn't utilize two speakers, follow instructions for mono output.

TECHNICAL INFORMATION

Adjusting Sound Volume

In stereo specifications, adjust volume of each speaker separately (L and R).

In monaural specifications, use R-volume switch to adjust volume. L-volume switch is irrelevant to volume. By R VOLUME.

HOW TO CHANGE TO MONAURAL/STEREO

*Note: Mono & Stereo sound *cannot* operate simultaneously.

For Mono Sound

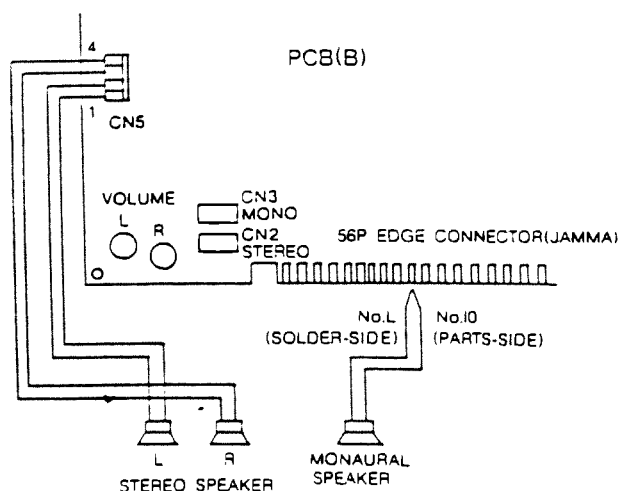
Use pin #10 and of the 56 pin edge connector to the speaker contacts.

Also connect Jumper connector into CN3.

For Stereo Sound

Use connector CN5 as your speaker output ports connect pins 1 & 2 to the left speaker pins 3 & 4 to the right speakers.

Also connect Jumper connector to CN2.



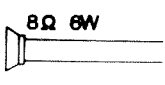
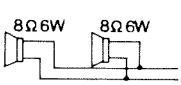
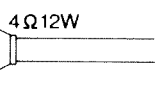
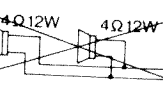
LIFE FORCE: TECHNICAL INFORMATION

(1) Required Power Capacity

+ 5V DC 7A or more.

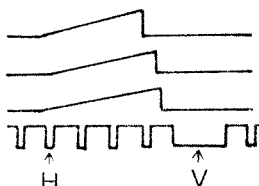
+ 12V DC See Figure 1 below.

Figure 1:

SPEAKER				
Required Power Capacity	12V 1A	12V 2A	12V 2A	Not Applicable

(2) Signal output

R(red) analog, positive
G(green) analog, positive
B(blue) analog, positive
Sync. H-V composite negative



PLAY INSTRUCTION

For one or two players.

Player can enter at any time.

3 ships per credit. Each coin slot can accept up to 9 credits per play.

To continue, insert coins BEFORE you lose your last ship.

(Note: The number of player's ships and the maximum credits per play can be changed by Dip Switch Settings.)

Move your space ship by 8-way joystick.

Destroy enemies by "Shoot" button.

Pick up the parts to increase your power.

- SPEED UP Five speed levels.
- MISSILE Press "Missile" button to launch.
- LASER Your forward rockets turn to deadly lasers.
- RIPPLE LASER Use "Shoot" button to fire.
- FORCE FIELD Protect your ship with barriers.
- MULTIPLE Increase your fire power by up to 4 times as much.

You can obtain multiple special powers but you cannot have LASER as well as RIPPLE LASER.

SELF TEST

A. How to start

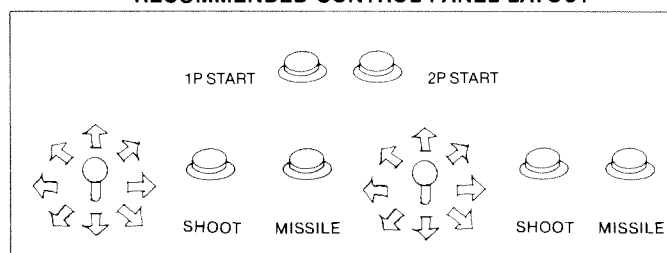
1. Turn on the SW3 of the DIP SW3.

B. Test Items

1. Conditioning of Picture Contortion
2. Color Conditioning
3. Control Check
4. Coin Counter Check
5. DIP SW SET
6. Sound Check

*To change items, push 1P start button.

RECOMMENDED CONTROL PANEL LAYOUT



DIP SWITCH SETTINGS

DIP SW No. 1 Settings

Coin 1 Switch Set

SW	4	3	2	1	COIN	PLAY
•	OFF	OFF	OFF	OFF	1	1
			OFF	ON	1	2
			ON	OFF	1	3
			ON	ON	1	4
	OFF	ON	OFF	OFF	1	5
			OFF	ON	1	6
			ON	OFF	1	7
			ON	ON	2	1
	ON	OFF	OFF	OFF	2	3
			OFF	ON	2	5
			ON	OFF	3	1
			ON	ON	3	2
	ON	ON	OFF	OFF	3	4
			OFF	ON	4	1
			ON	OFF	4	3
			ON	ON	FREE PLAY	

Coin 2 Switch Set

SW	8	7	6	5	COIN	PLAY
•	OFF	OFF	OFF	OFF	1	1
			OFF	ON	1	2
			ON	OFF	1	3
			ON	ON	1	4
	OFF	ON	OFF	OFF	1	5
			OFF	ON	1	6
			ON	OFF	1	7
			ON	ON	2	1
	ON	OFF	OFF	OFF	2	3
			OFF	ON	2	5
			ON	OFF	3	1
			ON	ON	3	2
	ON	ON	OFF	OFF	3	4
			OFF	ON	4	1
			ON	OFF	4	3
			ON	ON	INVALIDITY	

DIP SWITCH NO. 2 SETTINGS

THE NUMBER OF PLAYER'S LIFE

SW	1	2	NUMBER
•	OFF	OFF	2
	ON	OFF	3
	OFF	ON	5
	ON	ON	7

SOUND IN ATTRACT MODE

SW	8	SOUND
•	OFF	OFF
	ON	ON

NUMBER OF COIN SLOTS

SW	3	NUMBER
	OFF	SINGLE
	ON	TWO (SEPARATE)

MAXIMUM CREDITS FOR CONTINUATION

SW	4	5	MAXIMUM NUMBER
•	OFF	OFF	1
	ON	OFF	3
	OFF	ON	5
	ON	ON	9

DIFFICULTY OF THE GAME

SW	6	7	DIFFICULTY
•	OFF	OFF	EASY
	ON	OFF	NORMAL
	OFF	ON	DIFFICULT
	ON	ON	VERY DIFFICULT

• Shows normal setting

DIP SWITCH NO. 3 SETTINGS

Video Screen Flip

SW	1	
•	OFF	NORMAL
	ON	UPSIDE DOWN

MANUAL TEST

SW	3	MODE
•	OFF	GAME PLAY
	ON	TEST MODE

CHANGE OF TABLE OR UP-RIGHT

SW	4	TYPE
•	OFF	TABLE
	ON	UP-RIGHT

*SW 2 NOT USED

USER INFORMATION
WARNING
F.C.C. REGULATION COMPLIANCE

THIS KIT IS INTENDED FOR USE ONLY ON COIN-OPERATED VIDEO GAMES MANUFACTURED AFTER OCTOBER 1, 1983 WHICH HAVE BEEN VERIFIED FOR COMPLIANCE WITH REQUIREMENTS IN PART 15 OF F.C.C. RULES FOR A CLASS A COMPUTING DEVICE.

IMPROPER CONNECTION OF THIS KIT OR CONNECTION TO ANY OTHER GAME NOT SO MANUFACTURED OR VERIFIED FOR COMPLIANCE MAY CAUSE UNACCEPTABLE INTERFERENCE TO RADIO AND T.V. RECEPTION, REQUIRING THE OPERATOR TO TAKE WHATEVER STEPS ARE NECESSARY TO CORRECT THE INTERFERENCE.

THE P.C. BOARD CAGE SUPPLIED WITH THIS CONVERSION KIT MUST BE UTILIZED AND TERMINATED TO GROUND AT THE TIME OF INSTALLATION.



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