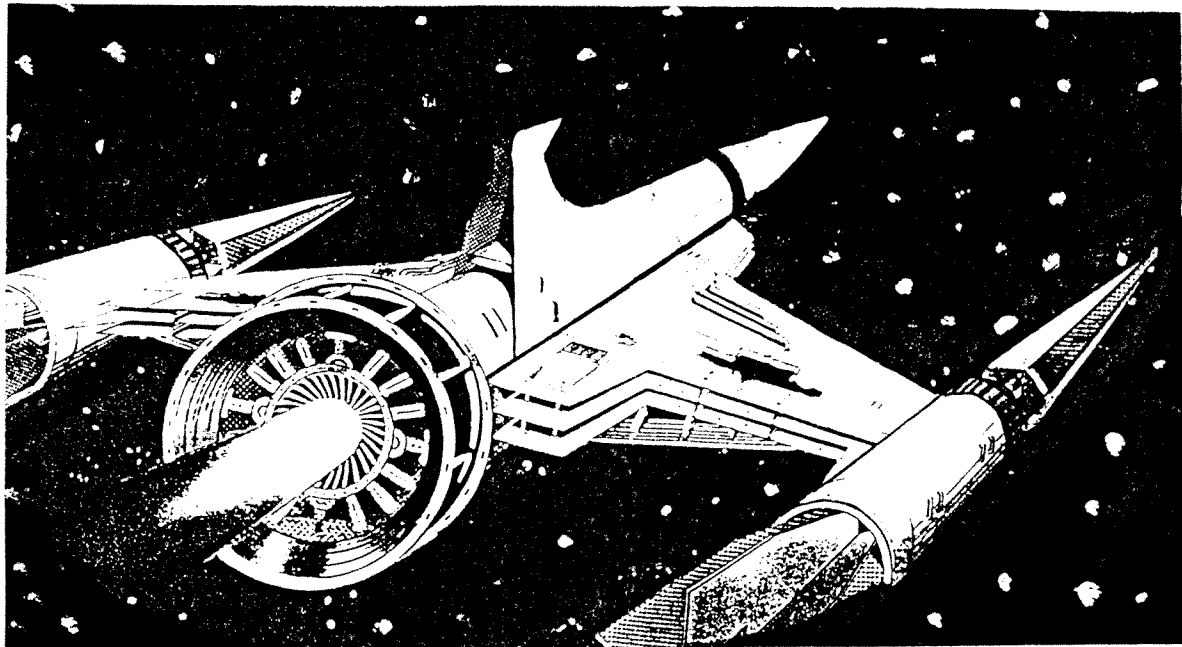


SHY

FOX



service manual

Nichibutsu USA



XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Thanks for purchasing
NICHIBUTSU Conversion Kit

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

Please read this service manual
before you attempt to convert your game.

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

USER INFORMATION
F.C.C. REGULATION COMPLIANCE

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications.

It has been tested and found to comply with the limits for a CLASS "A" computing device pursuant to subpart J of part 15 of F.C.C. rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

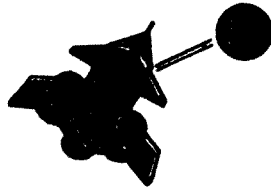
F.C.C. requires that the STICKER that comes with the KIT must be on the back of your machine or elsewhere visible when inspected.

KIT CONTENTS :

1.	SKY FOX Printed Circuit Board	1 pc
2.	Marquee	1
3.	Plexiglass	1
4.	Control Panel Overlay	1
5.	JAMMA Harness	1
6.	HOW TO PLAY Sticker	1
7.	Service Manual	1
8.	8-way Joystick	1
9.	Button / Switch Assembly	4

SKY FOX

INSTRUCTIONS



- Collect **P** for more power count
- Firing of power beams decrease your power count and when it reaches "0", the power beam is disabled.
- As you accumulate more power counts, your ship will have more fire power and maneuverability. 8 levels in all.

POWER SUPPLY

This P.C.Board requires power supply of
* + 5 V 5 A (+ .2%) for game logics
* +12 V 1 A (+ 10%) for audio IC only

It is very important that exactly + 5 V to be attained and checked at the edge connector pin # 4 (positive) and pin # 1 (negative) with a voltmeter .

Note :

In case of any malfunction , such as reset problems or sound problems appears , first check + 5 V at the edge connector with logic board PLUGGED IN .

SERVICE INFORMATION

NICHIBUTSU will repair and exchange parts or replace P.C.Board in the event of manufacturing defect for sixty day warranty period after original purchase with Nichibutsu.

Mail-in service can be obtained during the warranty period by sending the product postage prepaid, to the nearest distributor or NICHIBUTSU USA CORP. (California).

A purchase receipt or other proof of date of original purchase will be required before warranty performance is rendered.

All NON-WARRANTY repairs or returns will be subject to a service charge minimum \$40.00

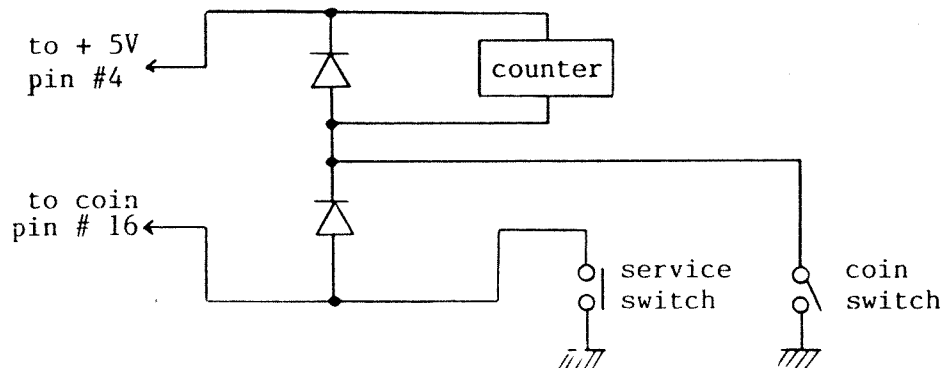
NICHIBUTSU USA reserves the right to refuse to repair any PCBoard not sold by NICHIBUTSU USA or without NICHIBUTSU USA LICENSE SEAL Number .

It is important that the enclosed registration card be filled out entirely and sent in for your protection in case of product failure . SEND IN THE CARD TODAY !

COIN COUNTER SERVICE SWITCH

SKY FOX logic board is designed for use only with + 5 V that means 5 V or 6 V type counter could be used and connected as figure below , absolutely NO 12 V or 24 V type counter should be used .

A service Switch can be obtained by using two silicon diodes such as 1N4001 , 10D1 , etc..

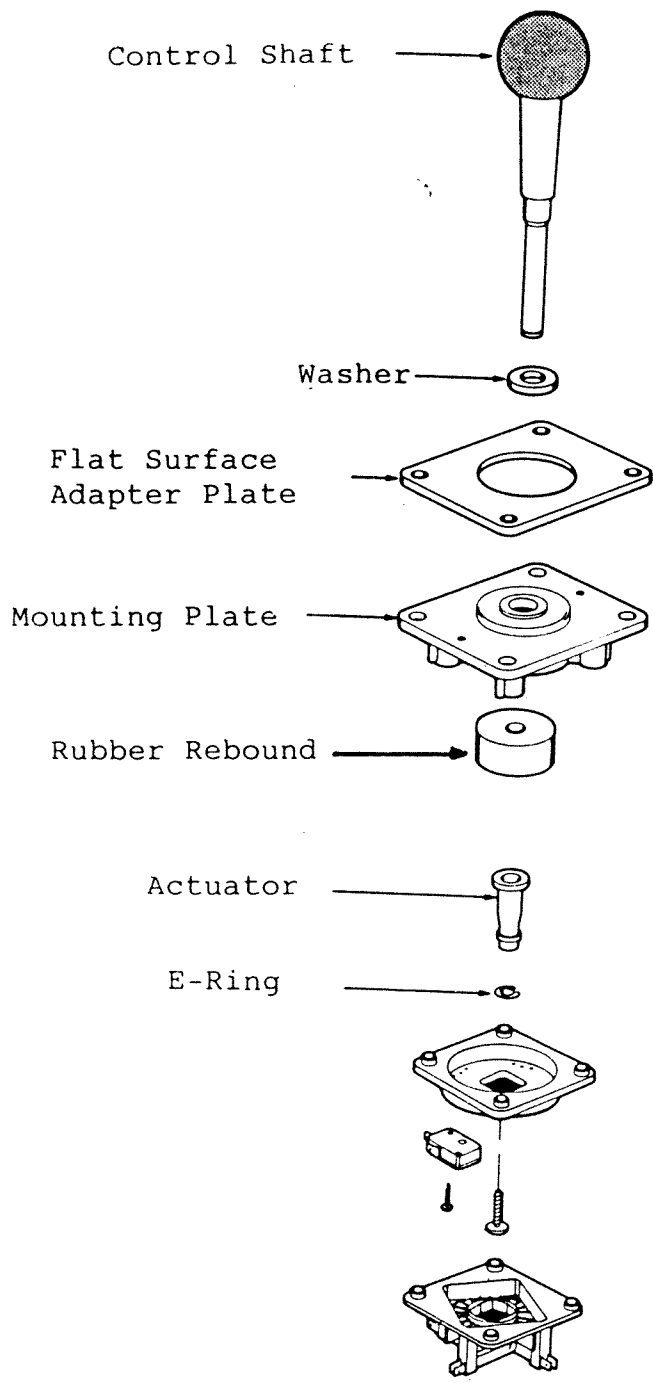


CONTROL PANEL

1. Remove control panel buttons and joysticks . Clean and sand old vinyl or remove old vinyl and clean with thinner.
2. Drill the holes as needed and file the new holes smooth .
3. Peel off the backing paper from our new overlay and expose the adhesive. Heating of the overlay adhesive and/or your control panel recommended in this procedure. Carefully place the overlay on top of your control panel . Try not to leave any bubbles under the overlay.
4. Use a razor knife to cut holes for buttons & joysticks . To avoid cutting a wrong hole , mark it before cutting .
5. STICKERS of MISSILE and BEAM :
 - a. could be stuck on control panel , then put a plexi glass on top .
 - b. could be stuck under the monitor glass at bottom to be corresponding to the buttons .
6. Stick the PLAY INSTRUCTION CARD under your monitor glass .
7. It is recommended to place a clear plexiglass upon the control panel , it will secure all stickers and also make your upright look like NEW .
To avoid chipping while drilling the holes , place the plexiglass on a soft wood surface and use a plexiglass drill bit and hole cutter .

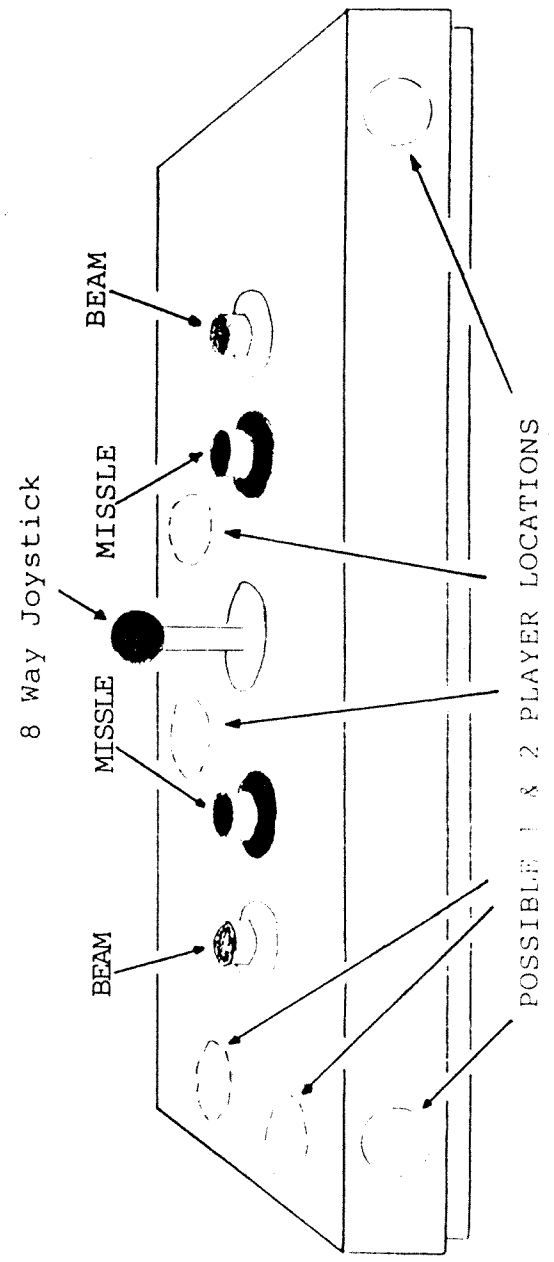
MARQUEE HEADER

The Plexiglass could be cut easily by a plastic cutter , you can find in any hardware store.
Use the old marquee as a template and score the new marquee deeply , then break off the excess with pliers .



Joystick

- To remove control shaft :
1. First remove E-Ring .
 2. Then pull control shaft out of Mounting Plate .



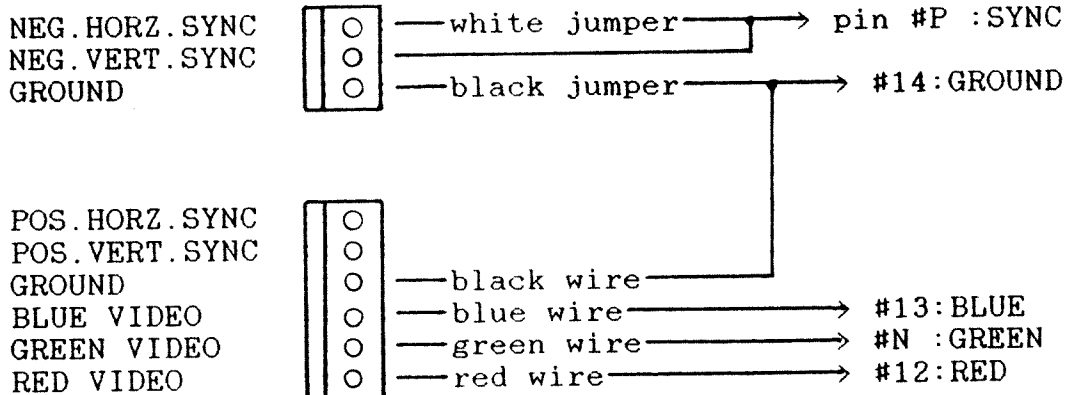
MONITOR

The P.C.Board in this kit can be used with :
 - Any VERTICALLY mounted Raster Scan Monitor .
 - Negative Composite SYNC (synchronization) .

Wires of the new harness to the monitor are color coded to indicate as:
 RED , BLUE , GREEN video signals to the monitor .
 BLACK is used for GROUND (0 V)
 WHITE is for NEGATIVE SYNC .

Attach the wires from the P.C.Board to the monitor's main circuit board as shown below .

*for WELLS-GARDNER MONITOR
 &
 *for ELECTROHOME MONITOR



DIP SWITCH ADJUSTMENTS

SWITCH 1

		1	2	3	4	5	6	7	8
Number of player	1	ON	ON	ON					
	2	OFF	ON	ON					
	3	ON	OFF	ON					
	4	OFF	OFF	ON					
	5	ON	ON	OFF					
FREE PLAY		OFF	OFF	OFF					
Bonus at	20,000 pts				ON	ON			
	30,000 pts				OFF	ON			
	40,000 pts				ON	OFF			
	50,000 pts				OFF	OFF			
Difficulty	Normal						OFF		
	Hard						ON		
Screen Flip Flop								OFF	
Type	TABLE								OFF
	UPRIGHT								ON

* : Recommended Setting

SWITCH 2

				1	2	3	4
COIN	:	1	Coin 1 Credit	ON	ON	ON	OFF
	:	1	" 2 "	ON	OFF	ON	OFF
1	:	1	" 3 "	ON	ON	OFF	OFF
	:	1	" 4 "	ON	OFF	OFF	OFF
	:	2	Coin 1 Credit	OFF	ON	ON	OFF
	:	3	" 1 "	OFF	OFF	ON	OFF
	:	4	" 1 "	OFF	ON	OFF	OFF
	:	5	" 1 "	OFF	OFF	OFF	OFF

*

WIRING CONNECTOR

SOLDER SIDE			PARTS SIDE		
#	Function	Color	#	Function	Color
A	GND	black	1	GND	black
B	GND	black	2	GND	black
C	+ 5 V	Red	3	+ 5 V	Red
D	+ 5 V	Red	4	+ 5 V	Red
E			5		
F	+ 12 V	Yellow	6	+ 12 V	Yellow
H	XXXXXXXXXXXXXXXXXXXXXXX		7	XXXXXXXXXXXXXXXXXXXXXXX	
J			8		
K			9		
L	SPEAKER -	Black	10	SPEAKER +	Gray
M			11		
N	GREEN	green	12	RED	Red
P	SYNC	White	13	BLUE	Blue
R			14	GND	Black
S			15		
T			16	COIN SW	Tan
U	2P START	Gray	17	1P START	Brown
V	2P UP	Green	18	1P UP	Green
W	2P DOWN	Blue	19	1P DOWN	Blue
X	2P LEFT	Violet	20	1P LEFT	Violet
Y	2P RIGHT	Yellow	21	1P RIGHT	Yellow
Z	2P MISSILE	Red	22	1P MISSILE	Red
a	2P BEAM	Orange	23	1P BEAM	Orange
b			24		
c			25		
d			26		
e	GND	Black	27	GND	Black
f	GND	Black	28	GND	Black

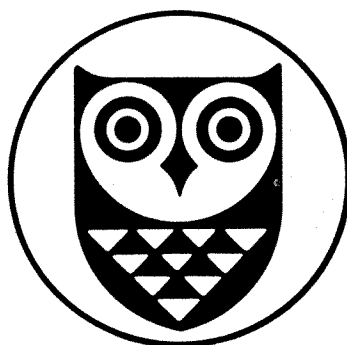
* The Harness provided in this kit is a JAMMA HARNESS , so there are some wires which will not be used by this PCBoard.

* It is important that (GND) and (+5V) must be connected to POWER SUPPLY by at least 3 wires or more , to insure the current is sufficient .

TROUBLE SHOOTING

1. NO SOUND & NO PICTURE
 - * Check +5 Volts at pin #4 (plus) and pin #1 (minus) with a voltmeter.
 - * Check voltage supply for monitor AC 100 or 120 Volts.
 - * Put Credit and push 1P START, start the game and check if you get sound or not.
2. WITH GAME MUSIC but NO PICTURE
 - * The problem could be your MONITOR.
 - * Check 5 wires : RED,BLUE,GREEN,SYNC and monitor GND.
 - * Check AC voltage supply for monitor.
 - * Replace monitor if necessary.
3. WITH PICTURE but NO SOUND
 - * Check two wires leading to SPEAKER (pin #10 and #L).
 - * Make sure both SP(+) and SP(-) are isolated from GND.
 - * Check +12 Volts at pin #6 .
4. GARBAGE SCREEN DISPLAYED
 - * Adjust POWER SUPPLY to have just +5 Volts at pin #4 .
 - * Check if any E-PROM chips are loose from the socket.
5. PICTURE SCROLL
 - * Recheck connections of SYNC and GND between MONITOR and edge CONNECTOR.
 - * Change SYNC polarity on your monitor
POSITIVE to NEGATIVE by using inverter 74LS-04 .
6. PICTURE UP-SIDE-DOWN
 - * Turn your Picture tube 180 degree
or
 - * Switch 4 leads go to yolk coil together
(see your monitor instruction)
or
 - * In case of UPRIGHT machine :
 - Put switch #7 of bank SW 1 ON and
 - Tie PLAYER 1 CNTRL (up,down,left,right) with
PLAYER 2 CNTRL (up,down,left,right) together

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
IN EFFORT TO IMPROVE THE QUALITY OF PRODUCT
SOME PARTS IN THIS MANUAL MAY VARY WITHOUT NOTICE
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX



Nichibutsu

Nichibutsu USA Corp.
15737 Garfield Ave.
Unit #18
Paramount, CA.90723

Phone (213)408-0518
Fax (213)408-0208
Telex 350246NCBT