

INSTRUCTION MANUAL



Nichibutsu

XXXXXXXXXXXXXXXXXXXXXX

Thanks for purchasing
NICHIBUTSU Conversion Kit

XXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

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

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

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 :

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* TERRA FORCE *

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 !

REQUIREMENTS

This P.C. Board requires :

1. Horizontal Mounted Raster Scan Monitor
2. Power Supply of

* + 5 V 7 A (\pm 2%) for game logics
* +12 V 1 A (\pm 10%) for audio IC only

It is very important that exactly + 5 V to be attained and checkd 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 .

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MONITOR

The P.C. Board in this kit can be used with :

- Any HORIZONTAL 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)

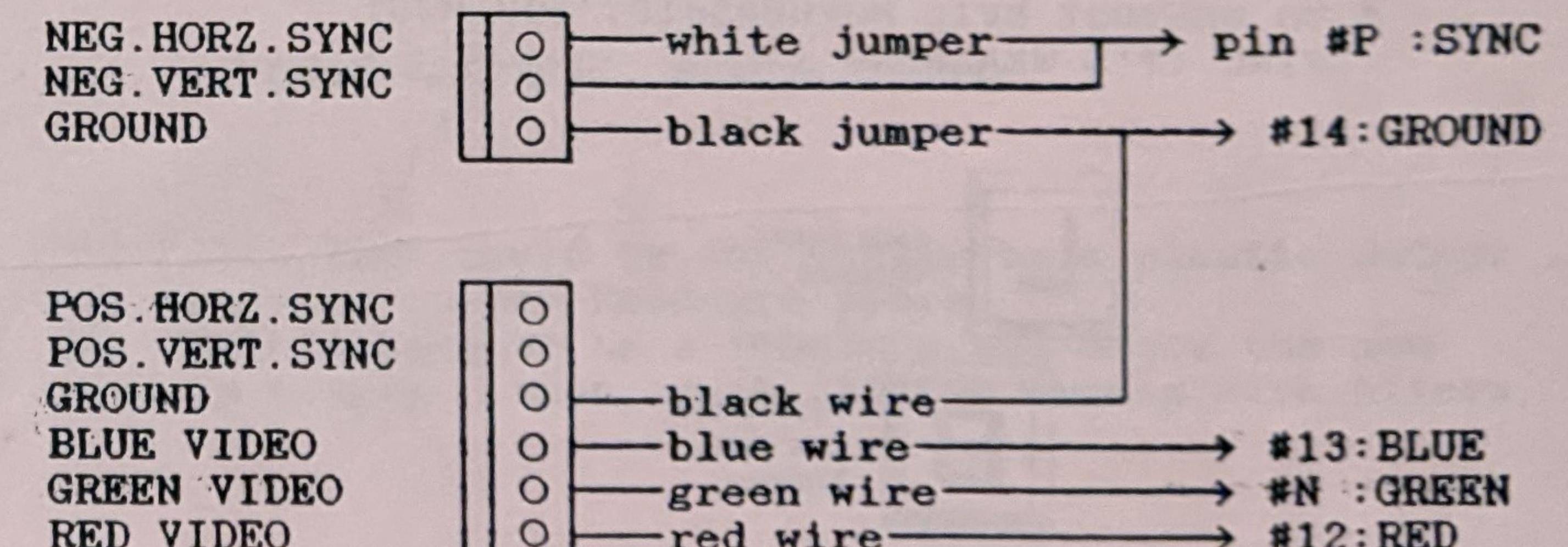
WHITE is for NEGATIVE SYNC .

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

*for WELLS-GARDNER MONITOR

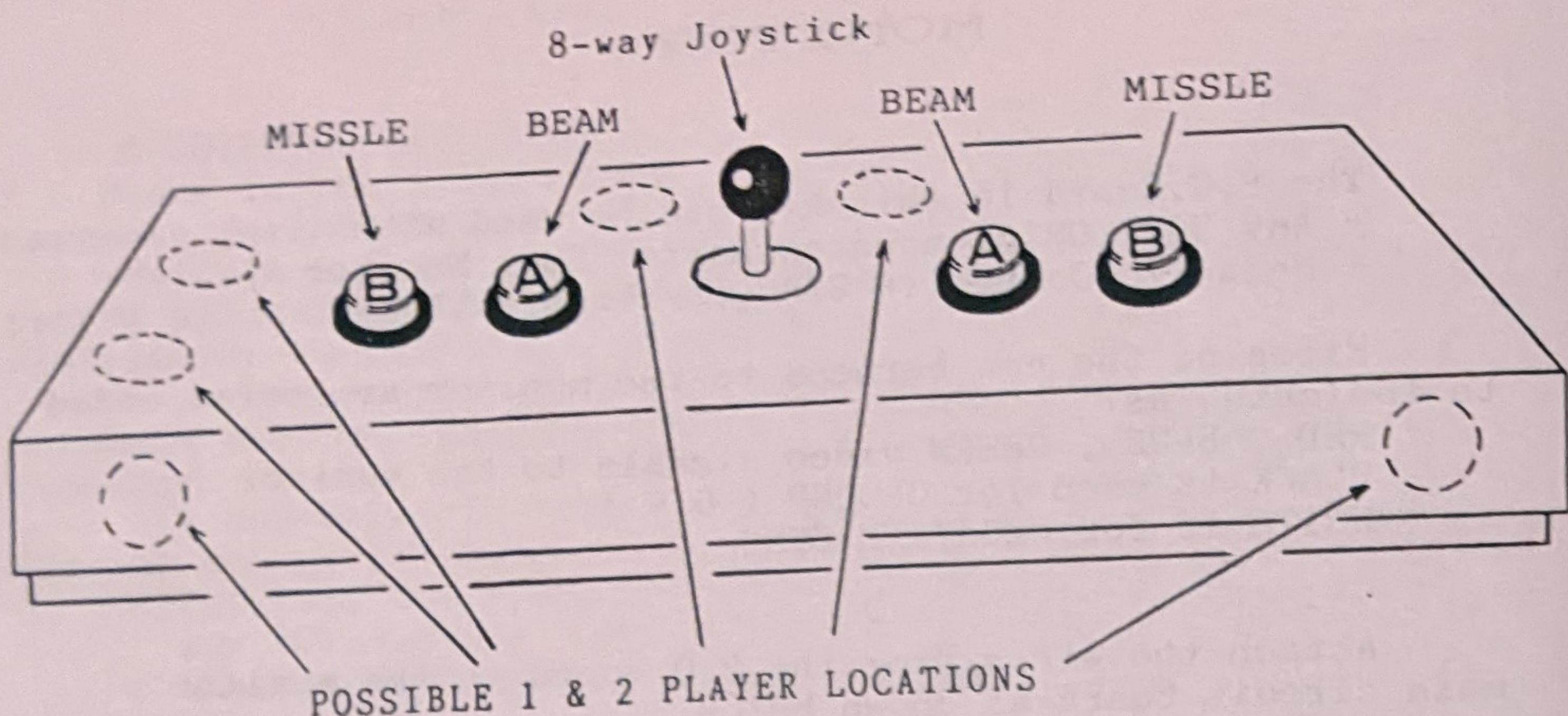
&

*for ELECTROHOME MONITOR



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* TERRA FORCE *

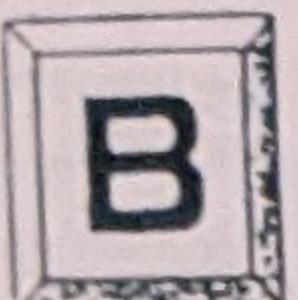


HOW TO PLAY

- * SHOOT RED DOMES AT THEIR TIPS
- * SHOOT ROBOTS IN THEIR EYES
- * DESTROY WINGER SQUADRON FOR LETTERS
- * PICK UP ALLY SHIP FOR EXTRA FIREPOWER
- * TO DESTROY EVIL MOTHERSHIP, YOU MUST FIND IT'S WEAKNESS



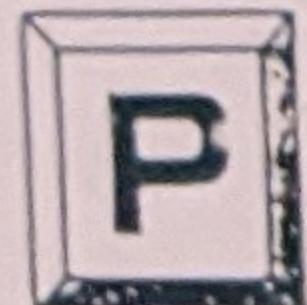
Laser Beam
Increased



Hyper Missile
Gets More
Explosive



Speed-up



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* TERRA FORCE *

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 SHOOT and WEAPON :
 - a. could be placed on control panel , then put a plexi glass on top .
 - b. could be placed 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 .

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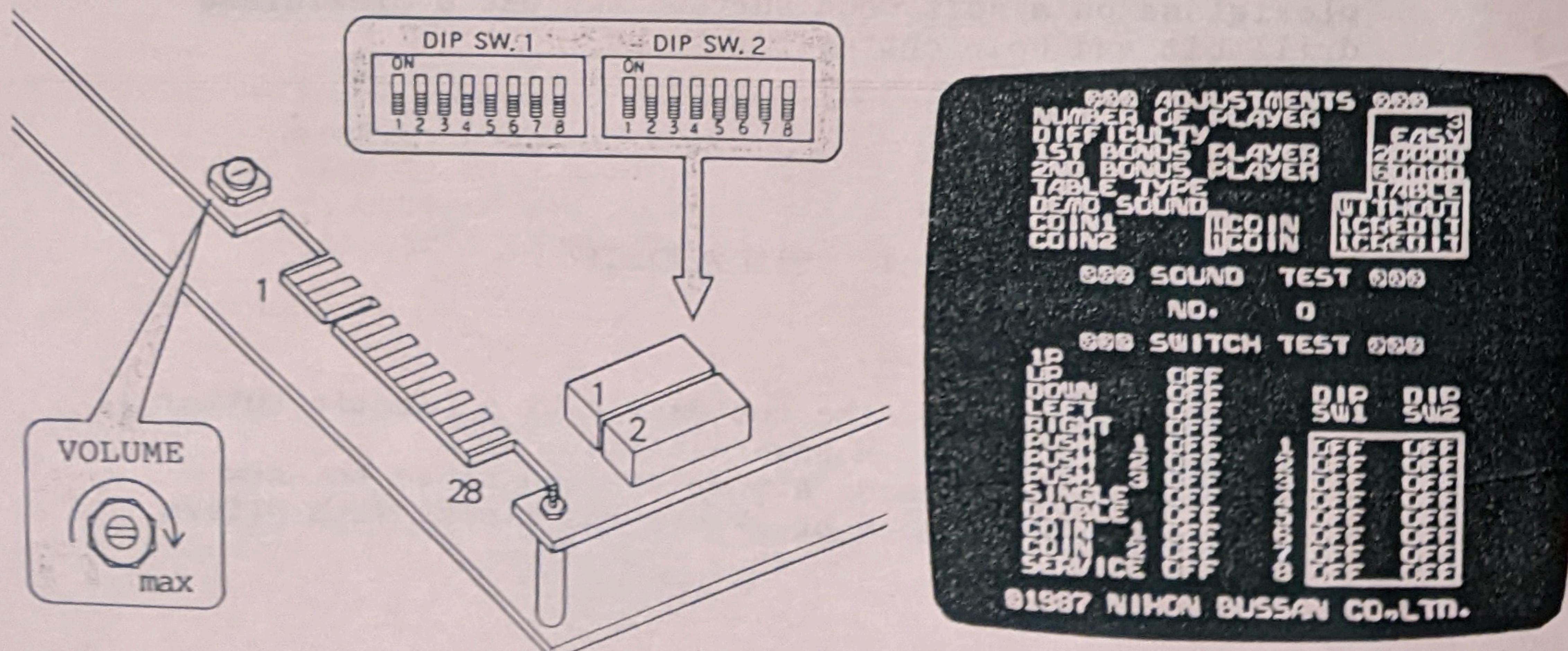
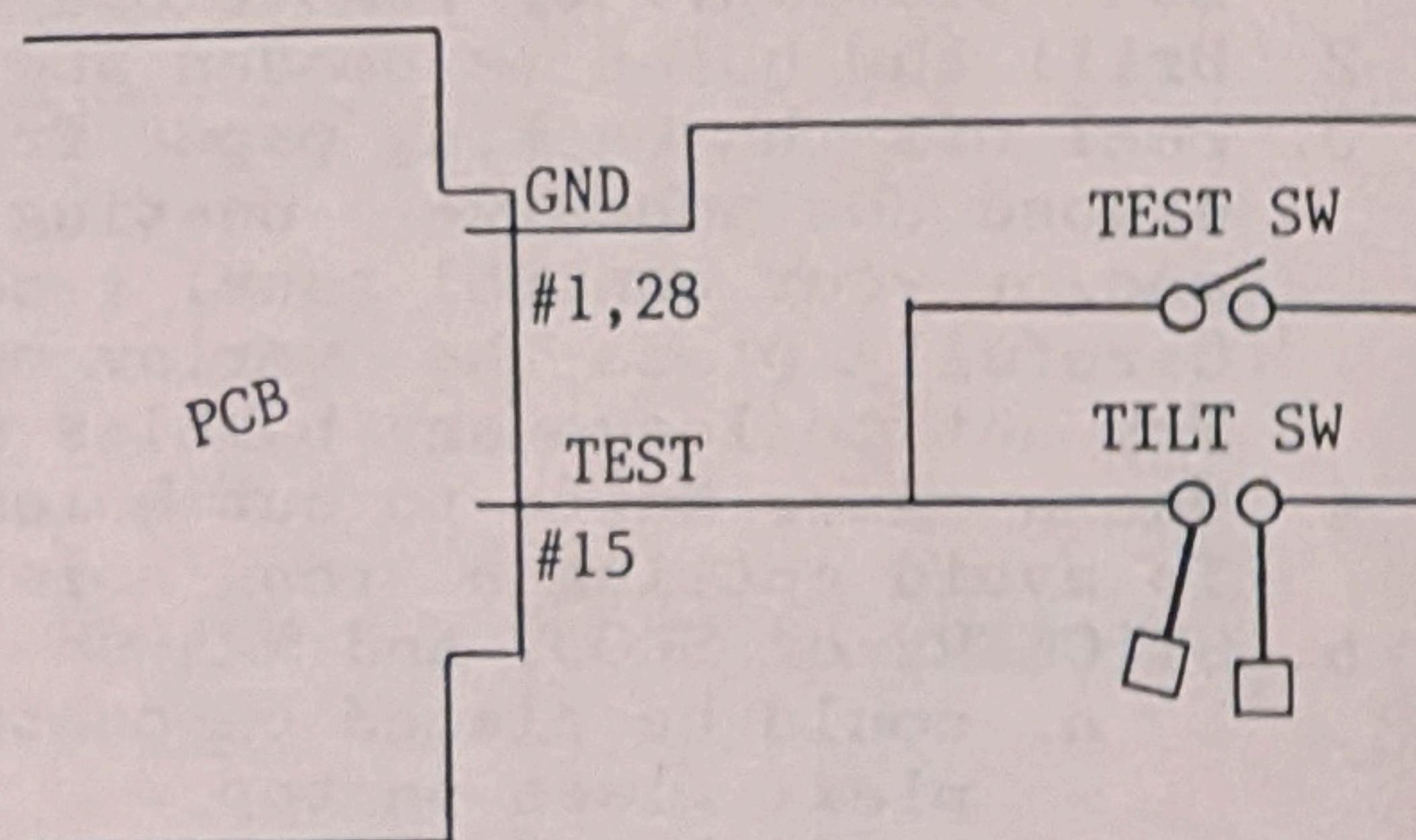
TEST SWITCH

TILT SWITCH

It is an option to use the TEST switch as a TILT switch , see right figure .

Below is the TEST MODE screen .

SOUND TEST :
Move the joystick UP or
DOWN , Adjust the volume
if necessary



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* TERRA FORCE *

DIP SWITCH ADJUSTMENTS

SWITCH 1

		1	2	3	4	5	6	7	8
Number of player	3	OFF	OFF						
	4	ON	OFF						
	5	OFF	ON						
	6	ON	ON						
Bonus	First Bonus	20K		OFF					
	First Bonus	50K		ON					
	+ Every	60K		OFF					
	+ Every	90K		ON					
Demo Sound	WITH				OFF				
	WITHOUT				ON				
Type	TABLE					OFF			
	UPRIGHT					ON			
Difficulty	EASIEST				OFF	OFF			
	EASY				ON	OFF			
	HARD				OFF	ON			
	HARDEST				ON	ON			

SWITCH 2

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	XXXXXXXXXXXXXX		7	XXXXXXXXXXXXXX	
J	COUNTER 2	Red	8	COUNTER 1	Violet
K			9		
L	SPEAKER -	Black	10	SPEAKER +	Gray
M			11		
N	GREEN	green	12	RED	Red
P	SYNC	White	13	BLUE	Blue
R	SERVICE	Pink	14	GND	Black
S			15	TEST	Blue
T	COIN 2	Orange	16	COIN 1	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 BEAM	Red	22	1P BEAM	Red
a	2P MISSLE	Orange	23	2P MISSLE	Orange
b			24		
c			25		
d			26		
e	GND	Black	27	GND	Black
f	GND	Black	28	GND	Black

* It is important that (GND) and (+5V) must be connected to POWER SUPPLY by 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 Credits 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
 - * Switch #6 of BANK SW 2 will invert the screen .

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



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