

KNUCKLE HEADS

OPERATION MANUAL

DISTRIBUTED BY:

NAMCO LIMITED
2-8-5 TAMAGAWA, OHTA-KU, TOKYO, 146, JAPAN



1. Cautions

- (1) Be sure to turn off the cabinet whenever installing or removing the PC board.
- (2) Be sure to use an edge connector which is applied to the JAMMA standard. Any modifications such as cutting the edges of PC boards will cause a failure and also will be out of our guarantee for repair.
- (3) Never test the PC boards for conductivity with a multimeter or similar device. The PCB contains sensitive chips which could be destroyed even by the internal voltage of such a device.
- (4) Foreign matters or dust on the PC boards will cause a failure. Turn off the power and clean the PC boards with a brush or similar thing.
- (5) When transporting the PC boards, wrap them with sponges or air caps and pack them in a cardboard box so that they can avoid a direct impact from outside during shipment.
- (6) For maintenance, contact your distributor.

2. Specifications

- (1) Control panel: **One-side 4-P specification**
 - 8-direction lever: 4 (1P, 2P, 3P, 4P, 1 each)
 - Button switch: 12 (1P, 2P, 3P, 4P, 3 each)
 - Start switch: 4 (1P, 2P, 3P, 4P, 1 each)
- (2) PC board size: 220 x 230 mm
- (3) Direction of monitor: Horizontal

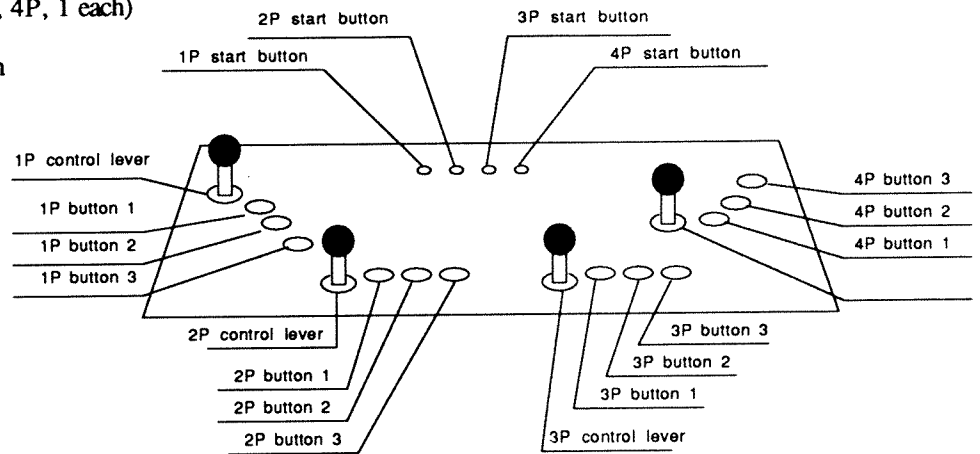


Fig.1

3. Connection

- (1) Connection of control panel
See below to connect the control panel to the cabinet (See Page 3: PC board Connector Table).
- (2) Connection of PC board
Connect the PC board to the cabinet (see Page 3: PC Board Connector Table).
Using the PC board with a stereo cabinet allows you to enjoy a stereophonic effect (See Page 3: Connection to Stereo Cabinet).

4. Explanation of PC Boards

- (1) Option switches
The PC Board enters the test mode by setting option switch No.1 to "ON". Normally, all of the option switches are "OFF".
- (2) Control volumes
The control volumes are already adjusted properly at shipment. Unless otherwise inconvenient, use the control volumes as they are.
 - ① Speaker volumes
To decrease the sound volume of the speaker, turn the speaker volume counter-clockwise.
 - ② Headphone volume
To decrease the sound volume of the speaker, turn the headphone volume counter-clockwise.

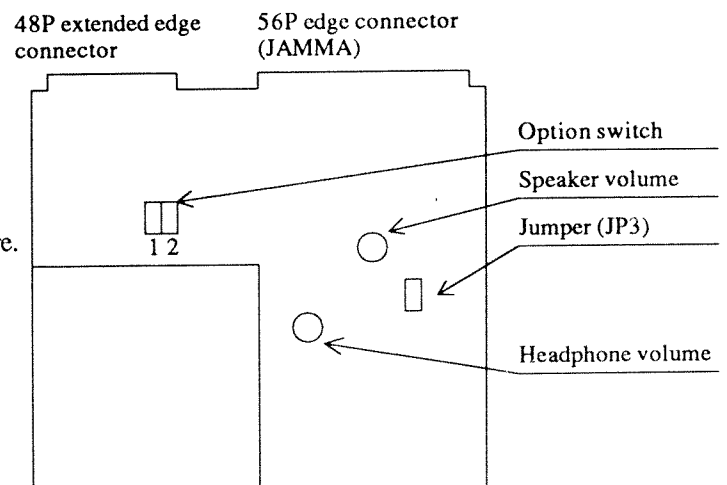


Fig.2

Specified Connector

Use a DDK 225-10024202314 as a 48P extended edge connector.

5. Test Mode

(1) The PC Board enters the test mode by setting the test switch on the PC Board to "ON" on the game screen. And the test menu screen is displayed on the monitor. Use the test switch (For connection, see Page 3: PC Board Connector Table) on the cabinet or the option switch on the PC Board.

When an item is selected by operating the 1P control lever up and down and the 1P button 1 switch is pushed, the selected test screen is displayed.

(2) Game fees can be changed on the coin option screen, and the game difficulty can be changed on the game option screen. Select an item by operating the 1P control lever up and down, and change its contents using the 1P button 1 switch (see the option setting table). After that, push the 1P button 2 switch to return to the test menu screen.

FLIP [OFF]	(a) The screen can be turned upside down by pushing the 1P button 1 switch
SWITCH Test	(b) Switch test screen
SOUND Test	(c) Sound test screen
COIN Options	(d) Coin option screen (Setting of game fees)
GAME Options	(e) Game option screen (Setting of game difficulty)
COMM Test	(f) Not used
OBJECT Test	(g) Object test screen
SCROLL Test	(h) Scroll test screen
A.D.S.	(i) Game data display screen
COLOR Test	(j) Color test screen (for monitor adjustment)
CONVERGENCE Test	(k) Cross hatch pattern (for monitor adjustment)

(Test menu screen)

COIN OPTIONS [Defaults in GREEN]	
Game Cost :	①
1 Coin 1 Credit	
Discount to Continue :	②
No	
Coin1 Mech Value :	③
1 Coin Count as 1 Coin	
Coin2 Mech Value :	④
1 Coin Count as 1 Coin	
Coin3 Mech Value :	⑤
1 Coin Count as 1 Coin	
Coin4 Mech Value :	⑥
1 Coin Count as 1 Coin	
Bonus for Quantity Buy In :	⑦
None	
FREE PLAY :	⑧
No	

(Coin Options screen)

GAME OPTIONS [Defaults in GREEN]	
Difficulty Level :	⑨
Medium	
Music in Attract :	⑩
Yes	
Display FBI Screen :	⑪
No	
Credit Mode :	⑫
Common	
Coin Counter :	⑬
Type A	
Cabinet Type :	⑭
4 Players	

(Game options screen)

(Option setting table)

(< Original setting)

Item	Contents	
① Game fees	Coin count required for one game (one credit)	1 < [1 - 9]
② Discount	50% discount when continuing a play	No <, Yes
③ Coin1 Mech	Count per coin	1 < [1 - 9]
④⑤⑥ Coin2~4 Mech	Count per coin	1 < [1 - 9]
⑦ Bonus coin	One additional coin per the specified number of coins	None < 2 Coins Give 1 Coin ~ 9 Coins Give 3 Coins
⑧ Free Play	No <, Yes	
⑨ Game Difficulty	Medium < [Easy, Medium, Hard, Very Hard]	
⑩ Attract sound	Yes <, No	
⑪ FBI display	No (Not displayed) <, Yes (Displayed)	
⑫ Credit mode	Common (Credit is common to 1P, 2P, 3P and 4P) < Each One (Credit is set for 1P, 2P, 3P and 4P each) 1P & 2P Common, 3P & 4P common (Credit is common to 1P and 2P [for Coin1 Mech], and 3P and 4P [for Coin2 Mech])	
⑬ Coin Counter	Type A (1 coin counter for 4 slots) < Type B (1 coin counter for each 1 slot) Type C (1 coin counter for each 2 slots)	
⑭ Cabinet Type	4 Players (Standard) <, 2 Players	

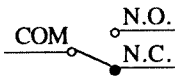
Example	Game fees		①	②	③	⑦	Credit display	(Note) Game fees are set by ①, ②, ④ and ⑦ when Coin2 Mech is used.
	1 game	Continue						
	100 yen	100 yen						
100 yen	50 yen	2 Coins 1Credit	Yes	1Count 2Coins	None	CREDIT 0/2		

6. PC Board Connector Table

JAMMA edge connector (56P 3.96 mm pitch)

Solder side	Terminal No.		Parts side
GND	A	1	GND
GND	B	2	GND
+5V	C	3	+5V
+5V	D	4	+5V
	E	5	
+12V	F	6	+12V
Insertion error preventing key	H	7	Insertion error preventing key
Coin counter 2	J	8	Coin counter 1
	K	9	Coin lockout 1
Speaker (-)	L	10	Speaker (-)
Audio (GND)	M	11	Audio (GND)
Video GREEN	N	12	Video RED
Video SYNC	P	13	Video BLUE
Service switch	R	14	Video GND
	S	15	Test switch
Coin switch 2	T	16	Coin switch 1
2P start switch	U	17	1P start switch
2P lever UP	V	18	1P lever UP
2P lever DOWN	W	19	1P lever DOWN
2P lever LEFT	X	20	1P lever LEFT
2P lever RIGHT	Y	21	1P lever RIGHT
2P button 1	Z	22	1P button 1
2P button 2	a	23	1P button 2
2P button 3	b	24	1P button 3
	c	25	
	d	26	
GND	e	27	GND
GND	f	28	GND

- Do not connect anything to the blank connectors.
- Both lockout solenoid and coin counter operate on +12V.
- Connect the switches to N.O. terminals such as a microswitch, and the GND to the COM terminal.



- The supply voltage is available within $\pm 5\%$. For use in the best condition, get the supply voltage as close to the specified voltage as possible.

(Recommended power capacity)

+5V $\pm 5\%$	2.0A or more
+12V $\pm 5\%$	2.0A or more

Extended edge connector (48P 2.54 mm pitch)

Solder side	Terminal No.		Parts side
Speaker R (-)	A1	B1	Speaker R (-)
Headphone R	A2	B2	Headphone L
4P start switch	A3	B3	Headphone GND
	A4	B4	
Insertion error preventing key	A5	B5	Insertion error preventing key
4P RIGHT	A6	B6	4P LEFT
4P DOWN	A7	B7	4P UP
4P button 1	A8	B8	4P button 2
VCC	A9	B9	GND
VCC	A10	B10	GND
	A11	B11	
	A12	B12	
	A13	B13	4P button 3
	A14	B14	
Coin switch 3	A15	B15	Coin switch 4
Coin counter 3	A16	B16	Coin counter 4
VCC	A17	B17	GND
VCC	A18	B18	GND
3P button 3	A19	B19	3P button 2
3P button 1	A20	B20	3P RIGHT
3P LEFT	A21	B21	3P DOWN
3P UP	A22	B22	3P start switch
	A23	B23	
	A24	B24	

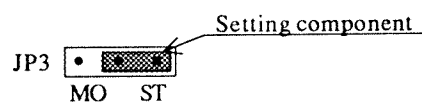
- Do not connect anything to the blank connectors.

[Connection to stereo cabinet]

(1) STEREO/MONO setting

Place the STEREO/MONO setting component (JP3) on the PC board in the STEREO position.

(Caution) If the JP3 is set to "STEREO" on a cabinet with monophonic specifications as shown above, only the left sound comes from the speakers.



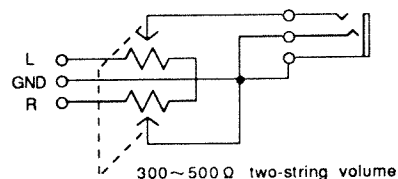
(2) Connection to speakers

The speaker output of 56P edge connector (JAMMA) on the PC board is the left (L) output. Connect the right (R) speaker to the right (R) speaker output of 48P edge connector on the PC board.

* Use a DDK 225-100242-2314 as a 48P extended edge connector.

[Headphone output]

Connect the headphone to the headphone output of the 48P edge connector.



(Recommended headphone circuit)