HEAVY BARREL

T.M.

WARNING

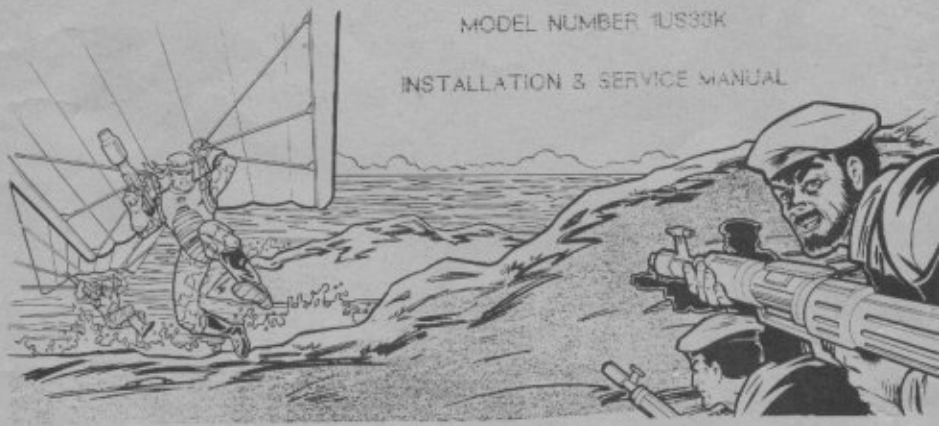
This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

2 PLAYER CONVERSION KIT

MODEL NUMBER 1US33K

INSTALLATION & SERVICE MANUAL



MANUAL PART NUMBER: 780-0086-00

DATA EAST USA, INC.

470 NEEDLES DRIVE
SAN JOSE, CA 95112
TELEPHONE: (408) 286-7074

FCC WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, ie; in strict accordance with this instructions manual, may cause harmful interference to radio communications. This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment.

Operation of this equipment in a residential environment is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

FBI WARNING

Federal law provides severe civil and criminal penalties for the unauthorized reproduction, distribution, or exhibition of copyrighted audio-visual works and video games. The Federal Bureau of Investigation investigates allegations of criminal copyright infringemant.

COPYRIGHT NOTICE

Heavy Barrel™ is Copyright 1988 Data East Corporation, sold exclusively in the United States of America and Canada by Data East USA, Inc. All rights reserved.

ENVIRONMENTAL DATA

This product is intended for use indoor use only, power requirements are 105-125 volts AC, 50-60 hz, and requires a 3 wire grounded outlet.

SERVICE PROCEDURES

To obtain replacement parts and technical service, contact the authorized Data East Distributor in your area. If you require referral or further technical assistance, you may contact Data East's Customer Service department during the hours of 8:00 am to 5:00 pm Pacific Time at (408) 286-7074.

AAMA WARNING

DATA EAST USA, INC., in cooperation with the American Amusement Machine Association, has installed an "AAMA PROTECT" certification label on each HEAVY BARREL PCB manufactured for legal sale in the United States of America.

If you are offered a HEAVY BARREL PCB that does not have the "AAMA PROTECT" certification label, you should suspect that the board is not legal, and should contact DATA EAST USA, INC., at (408) 286-7074, or Bob Fay of the AAMA at (703) 548-8044.

HEAVY BARREL

CONVERSION KIT

MODEL NUMBER: 1US33K

INSTALLATION & SERVICE MANUAL

TABLE OF CONTENTS

1. GENERAL INFORMATION

A. Specific Requirements.....1

B. List of Materials.....1

C. Installation Instructions.....2

2. GAME INFORMATION

A. Game Options.....6

B. PCB Edge Connector Pin-Out.....7

C. Rotary Control Connector Pin-Out.....8

© 1988 DATA EAST USA, INC.

470 NEEDLES DRIVE
SAN JOSE, CA. 95112
(408) 286-7074

FIRST PRINTING
FEBRUARY 1988

PN: 780-0086-00

1. GENERAL INFORMATION

A. Specific Requirements.

The Heavy Barrel game is a one or two player video game conversion kit. It is intended to be installed into an existing video game cabinet and comes with all the necessary components to make the converted game look and play like a new dedicated game!

THE GAME TO BE CONVERTED MUST MEET THE FOLLOWING REQUIREMENTS

MONITOR	Vertical, RGB, negative Composite Sync input.
POWER SUPPLY	+ 5vdc @ 7 amp, +12 vdc @ 1 amp, -5vdc @ .5amp (MIN)

B. List of Materials.

QTY	DESCRIPTION	PART NUMBER
1	PCB, HEAVY BARREL	510-0126-00
1	MAIN HARNESS, JAMMA, KIT	036-0158-00
2	JOYSTICK, 8 WAY, ROTARY	450-0012-00
2	PUSHBUTTON ASSY, YELLOW	350-0016-04
4	PUSHBUTTON ASSY, RED	350-0016-02
4	PUSHBUTTON, SHORT, GREY	350-0001-08
4	PUSHBUTTON HOLDER W/SWITCH	185-0001-00
4	PAL NUT, NYLON	240-0001-00
1	CNTRL PNL OVERLAY, HEAVY BARREL	800-0031-00
1	UNDERLAY CARD, HEAVY BARREL	810-0029-00
2	SIDE DECAL, GENERIC	820-0040-00
1	MARQUEE PLEX, HEAVY BARREL	830-0037-00
1	LABEL SET, PUSHBUTTON ID	406-0085-00
1	FCC WARNING LABEL	406-0003-00
1	MANUAL, INSTALLATION & SERVICE	780-0086-00

C. Installation Instructions.

When selecting a game to convert, make sure that the Power Supply, the Monitor, and the Coin Acceptors are functional. There is nothing more frustrating than installing a conversion kit and having it not operate due to a faulty Monitor or Power Supply. I know...we will all suspect that the new Logic PCB is defective, right?

It is mandatory that the cabinet be wired to conform with all National and Local Electric Code requirements before the conversion is attempted, The primary section must have adequate noise filtering on the AC line to prevent unwanted conducted radio frequency interference. 'Adequate' is defined as a filter with both common mode and differential mode filtering and a minimum current capacity of 1 ½ amperes.

According to the FCC and other regulatory agencies, every video game must have 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 sticker is included in this kit.

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

TAKING IT APART...

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.

Find the wiring diagram of 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 them as to their function. This kit contains a new Main Harness, but you will need to splice it into the existing power supply and video wires.

Remove the existing game harness parts that will not be used in this conversion. NOTE: You are modifying only the secondary (DC from power supply) and I/O (video, speaker, and controls) section of the wiring. DO NOT MODIFY OR REMOVE THE PRIMARY AC WIRING. The primary AC wiring has been designed and built to comply with UL and FCC regulations and must not be altered.

Remove the game PCBs. Remove all exterior decals and repaint the cabinet if necessary. Repair any cabinet damage at this point. Remove the monitor plex (or glass). If your plex has silkscreened artwork on it, you will need to strip it off, or replace the plex with a piece cut to the same size. Using the Monitor Plex as a template, cut the supplied Underlay Card to the same size as the plex. **NOTE: Be certain that the opening in the Underlay Card lines up with the Monitor CRT.**

Remove the Marquee Plex from the game and use it as a template to cut the new Marquee Plex down to the correct size. Remove the control panel from the game and remove all controls and graphics from it. NOTE: Save a Player Start button, as one is not supplied in this kit.

PUTTING IT TOGETHER...

Control Panel: This is never any fun, so lets do it first and get it out of the way. Select a button and joystick layout that fits your control panel size. Refer to figure 1 for the suggested panel layout.

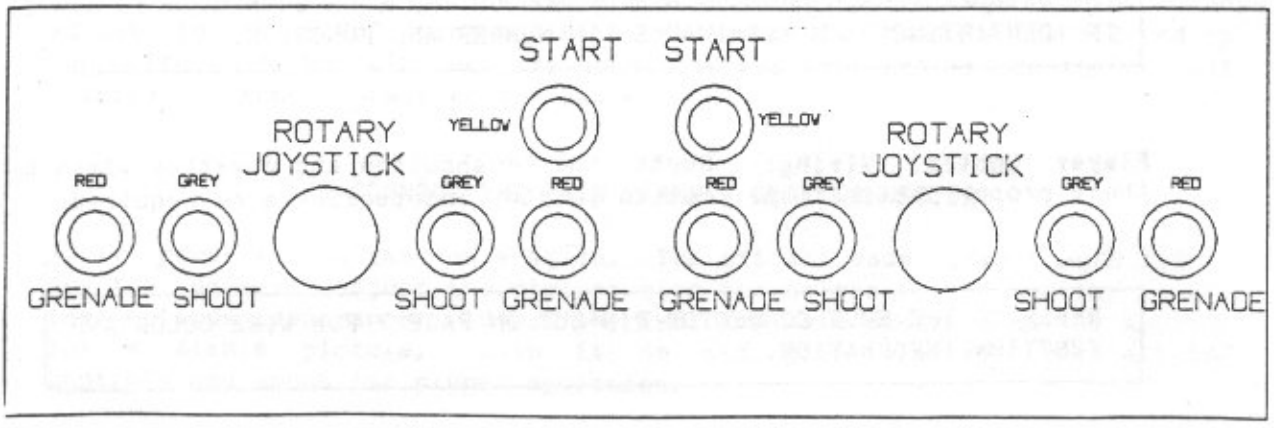


Figure 1

Install the Control Panel Overlay by peeling off the paper backing and carefully laying the overlay down onto the panel. Smooth it out starting in the center and working your way out to the edges, removing all of the trapped air pockets. If possible, cut the edges of the overlay oversize and fold the excess under the panel. Cut out the button and joystick holes. Install the Control Function Labels found on the sheet of labels supplied in your kit. NOTE: Install the Control Function Labels in the formation shown in figure 1.

Cover the Control Panel Overlay and Control Function Labels with a clear plex to protect the overlay and labels. Install the buttons and joystick at this time. NOTE: This conversion kit does not supply the Player Start button. You must use a button removed from the control panel in an earlier step. Mount the completed control panel to the cabinet.

Game PCB: Mount the game PCB set to a convenient wall of the cabinet using the mounting feet and hardware supplied with the pcb.

Power Supply Wiring: Plug the Main Harness edge connector onto the Game PCB's edge connector. Separate the DC Power wires and route them through the cabinet to the Power Supply. Try to keep the length of these wires to a minimum for best results. **NOTE: Use a minimum of 2 wires EACH for the +5 Volts and the Ground lines between the power supply and the PCB.** Terminate them at the Power Supply as required.

NOTE: IMPROPER WIRING WILL DAMAGE THE PCB SET AND VOID YOUR WARRANTY!

THE DATA EAST MAIN HARNESS HAS LABELS ON THE EDGE CONNECTOR TO ASSIST IN IDENTIFYING EACH TERMINAL'S PIN NUMBER AND FUNCTION.

Player Control Wiring: Route the Pushbutton and Joystick wires up to their proper destinations, cut to length, and terminate as required.

REFER TO THE EDGE CONNECTOR PIN-OUT ON PAGE 7 FOR WIRE COLOR AND FUNCTION INFORMATION.

NOTE: No EMI Filter PCB is required for this conversion kit as suitable filtering is provided on the Main PCB Set.

B. Installation Instructions (cont.)

Monitor Wiring: The game PCB set has outputs for Positive Red, Green, Blue, and Negative Composite Sync. If your monitor has separate Horizontal and Vertical sync inputs, hook the Composite sync to the negative Horizontal input. This method will work on most monitors, however some model Electrohome's require that the Composite sync signal be hooked up to both the negative Horizontal and Vertical inputs. Contact your distributor for more information if you are uncertain as to how to hook up the monitor wires.

Coin Door: The Coin Counter(s) may be the 12 volt or 6 volt type as the game PCB utilizes an open collector drive circuit. Hook one coin counter wire to the required voltage (+12v or +5v) and the other wire to the coin counter signal wire from the game PCB.

Graphics: Install the Game Instruction Labels onto the Underlay Card, either in the lower portion, or on one side of the picture tube cutout. Install the Underlay Card under a clear monitor plex (or glass). Mount the new Marquee Plex, and install the Side Decals. **NOTE: Install the FCC Warning label to the upper rear of the cabinet.**

THE BIG TEST!

REMOVE THE MAIN HARNESS EDGE CONNECTOR FROM THE GAME PCB!

Apply power to the game. **Measure the +5 volts** at the edge connector and **adjust to +5.15 VDC** using a Digital Multi-Meter. Measure the +12 and -5 vdc wire to be certain they are connected properly and are on the correct terminals. Remove power to the game.

RE-CONNECT THE MAIN HARNESS EDGE CONNECTOR!

Apply power to the game once again. The attract mode video should appear on the screen. Adjust the picture size and colors on the monitor to get the optimum appearance. Adjust the Sync and Hold controls on the monitor for a stable picture. Coin it up and give it a try! Test all the controls and sound for proper operation.

Congratulations! You have successfully installed your Data East conversion kit! We hope that it gives you many years of successful operation.

2. GAME INFORMATION

A. Game Options.

The game options can be changed via 2 banks of dip-switches on the game PCB set. Be certain to remove power to the game when changing settings.

DIP SWITCH 1

ITEM	ACTION	1	2	3	4	5	6	7	8
COIN	1 COIN = 1 CREDIT:	OFF	OFF						
VS	1 COIN = 2 CREDIT:	ON	OFF						
CREDIT	1 COIN = 3 CREDIT:	OFF	ON						
COIN 1	2 COIN = 1 CREDIT:	ON	ON						
COIN	1 COIN = 1 CREDIT:			OFF	OFF				
VS	1 COIN = 2 CREDIT:			ON	OFF				
CREDIT	1 COIN = 3 CREDIT:			OFF	ON				
COIN 2	2 COIN = 1 CREDIT:			ON	ON				
DIAGNOSTICS MODE	NO:					OFF			
	YES:					ON			
DEMO MODE SOUND	YES:						OFF		
	NO:						ON		
SCREEN REVERSE	NORMAL:							OFF	
	FLIP:							ON	
DON'T CHANGE									OFF

DIP SWITCH 2

ITEM	ACTION	1	2	3	4	5	6	7	8
NUMBER OF LIVES	THREE (3):	OFF	OFF						
	FIVE (5):	ON	OFF						
	ONE (1):	OFF	ON						
	INFINITE (∞):	ON	ON						
GAME DIFFICULTY	NORMAL:	NORMAL		OFF	OFF				
	HARD:	EASY		ON	OFF				
	NORMAL:	HARD		OFF	ON				
	FAST:	VERY HARD		ON	ON				
BONUS LIVES AWARDED AT:	30K»80K»160K:					OFF	OFF		
	50K»120K»190K:					ON	OFF		
	100K»200K»300K:					OFF	ON		
	150K»300K»450K:					ON	ON		
CONTINUE MODE (BUY-IN)	NO:							OFF	
	YES:							ON	
DON'T CHANGE	:								OFF

B. PCB Edge Connector Pin-Out.

The game PCB set uses a 56 pin 'JAMMA' standard Edge Connector pin out as shown below in figure 2.

WIRE COLOR	SOLDER SIDE	PIN #	PIN #	PARTS SIDE	WIRE COLOR
BK	GROUND	A1	B1	GROUND	BK
BK	GROUND	A2	B2	GROUND	BK
RD	+5 VOLTS	A3	B3	+5 VOLTS	RD
RD	+5 VOLTS	A4	B4	+5 VOLTS	RD
BL	-5 VOLTS	A5	B5	-5 VOLTS	BL
OR	+12 VOLTS	A6	B6	+12 VOLTS	OR
	BLOCKING KEY	A7	B7	BLOCKING KEY	
VI	COIN COUNTER 2	A8	B8	COIN COUNTER 1	SL
		A9	B9		
WH/BK	SPEAKER (-)	A10	B10	SPEAKER (+)	BK/WH
		A11	B11		
GN	VIDEO-GREEN	A12	B12	VIDEO-RED	RD
WH	VIDEO-SYNC	A13	B13	VIDEO-BLUE	BL
YL	SERVICE SW.	A14	B14	VIDEO GROUND	BK
BK/YL *	TILT SW. (N/A)	A15	B15	TEST SW.	* BK/GN
RD	COIN SWITCH 2	A16	B16	COIN SWITCH 1	GN
RD/WH	2P START	A17	B17	1P START	BN/WH
YL/WH	2P UP	A18	B18	1P UP	YL
GN/WH	2P DOWN	A19	B19	1P DOWN	GN
OR/WH	2P LEFT	A20	B20	1P LEFT	OR
RD/WH	2P RIGHT	A21	B21	1P RIGHT	RD
BL/WH	2P SHOOT	A22	B22	1P SHOOT	BL
VI/WH	2P GRENADE	A23	B23	1P GRENADE	VI
PK/WH	NOT USED	A24	B24	NOT USED	PK
		A25	B25		
		A26	B26		
BK	GROUND	A27	B27	GROUND	BK
BK	GROUND	A28	B28	GROUND	BK

Figure 2

C. Rotary Controller Connector Pin-Out.

The Rotary Controller section of the joystick assemblies must be plugged into the Game PCB. Each controller has a 13 pin cable which plugs into CN 5 and CN 6 as shown in figure 3 below.

CONNECTOR 9	
PIN	FUNCTION
1	AUDIO OUT
2	AUDIO GND
3	DC GROUND
4	+ 5 VOLTS
5	+12 VOLTS
6	- 5 VOLTS

CONNECTOR 7 & 8	
PIN	FUNCTION
1	+ 5 VOLTS
2	+ 5 VOLTS
3	GROUND
4	GROUND
5	INPUT XA
6	INPUT XB
7	INPUT YA
8	INPUT YB

CONNECTOR 5 & 6	
PIN	FUNCTION
1	GROUND
2	INPUT 1
3	INPUT 2
4	INPUT 3
5	INPUT 4
6	INPUT 5
7	INPUT 6
8	INPUT 7
9	INPUT 8
10	INPUT 9
11	INPUT 10
12	INPUT 11
13	INPUT 12

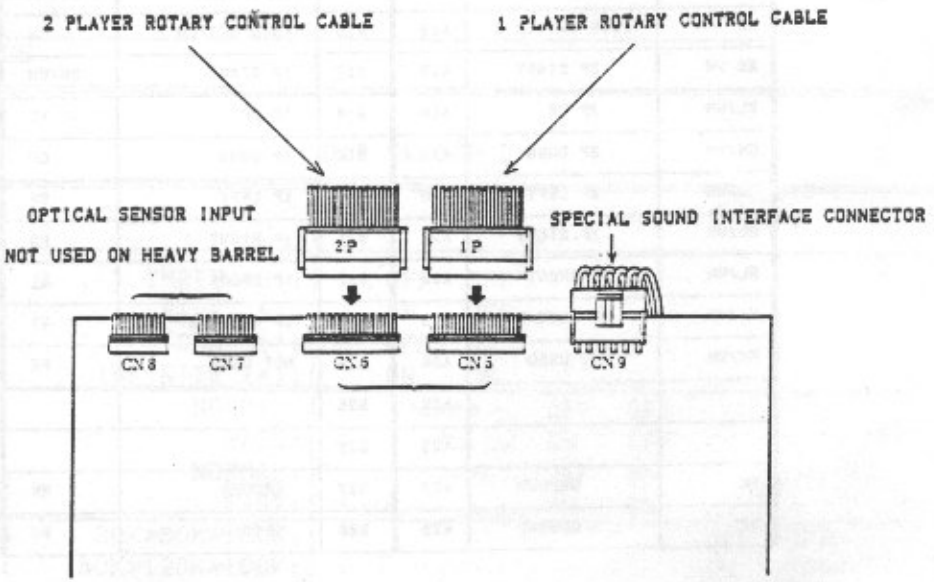


Figure 3

WARRANTY INFORMATION

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

GAME LOGIC PRINTED CIRCUIT BOARD(S)	**90 DAYS**

No other parts of the Seller's products are warranted.

Warranty periods are effective from date of initial shipment from Seller to Buyer. 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 buyer that stated products are defective.
2. Such products are properly packaged and then returned freight pre-paid, to a place specified by Seller.

This warranty does not apply to products damaged during shipment and/or due to improper handling, or due to improper installation or usage, or alteration. In no event shall 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 BUYER, THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.