CLIFF HANGER

CONTENTS:

SAFETY INSTRUCTIONS

READ INSTRUCTIONS!! Please read all the <u>CARE AND MAINTENANCE AND DISC</u> <u>PLAYER INSTALLATION</u> instructions before installing or operating the disc player or game.

PLEASE FOLLOW all warnings on the disc player, and operating instructions in the manual included with the machine.

- Moisture forms in the operating sections of the disc player, and the players performance will be impaired if the appliance is brought from cool surroundings into a warm room or if the room temperature suddenly rises. and the player is put into use.

- To prevent this, allow the game and player to warm up for about an hour before turning on. Also be sure to keep game away from any heat sources (i.e. radiator or heat register).

- Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the game and protect it from overheating these openings must not be blocked or covered.

- There should be a 3-4 inch space between the back of the game and the wall to provide adequate ventilation for the fan.

- Stern recommends that you change the air filter by the front intake vents every two months to keep the disc player area as clean as possible.

- The game should not be placed in an area where the room temperature will exceed 90 degrees F.

- If all these steps are followed, the internal cabinet temperature will remain approximately 2-3 degrees F. above ambient.

PR-8210 VIDEO DISC PLAYER CARE AND MAINTENANCE

CLEANING: Unplug the game from the wall outlet before cleaning. DO NOT use liquid cleaners or aerosol cleaners on the disc player. If necessary, use a damp cloth for cleaning.

. Use a soft, clean cloth to wipe off dust and dirt accumulated on the player. If necessary, moisten a soft cloth with water to remove heavy dirt.

. Never use paint-thinner, benzene, or other solvents. They react with the players surface and cause color changes and melting.

OBJECTIVE LENS CARE:

The objective lens is a key part of the player. Note that the lens surface must be clean in order to maintain the best performance.

NEVER TRY TO TOUCH THE LENS SURFACE!!

If too much dust or dirt accumulates, it may degrade the picture quality. Dust can be removed from the lens with an air blower for a camera lens.

CARE AND STORAGE OF VIDEO DISCS:

. The disc may be dusted with a clean soft cloth and safely cleaned using a mild plastic cleaner.

. Dirt on the disc does not affect information stored on it, but may cut down on the amount of light reflected back from the disc.

. Discs should be stored in their jackets and in a vertical position.

<u>CLIFF HANGER</u>

<u>PR-8210 VIDEO DISC PLAYER INSTALLATION</u>

<u>PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING PLAYER TO</u>

<u>PREVENT DAMAGE, AND MAINTAIN WARRANTY!!</u>

<u>INSTALL DISC PLAYER WHEN MACHINE IS ON LOCATION ONLY!!</u>

Step 1:   Open carton. Lift player out of carton with wrappers and end caps attached. After lifting out, remove and save wrappers and end caps.

The carton, wrappers and end caps <u>MUST</u> be saved to repack the disc player if the machine is to be moved.

Step 2:   <u>Mounting Disc Player</u>:

<u>CAUTION</u>: <u>DO NOT CONNECT ANY WIRES TO PLAYER AT THIS TIME.</u> <u>PUT PLAYER ON ITS TOP ONLY!! DO NOT PLACE ON ITS SIDE!!</u>

The disc player must be mounted to the shock absorbers on the disc player panel located behind the front access panel of the game.

Locate the spacers and mounting screws as they will be needed for this operation.

1). Open front access panel and slide panel out from game.

2)   Remove the four corner screws from the bottom of the disc player. (See illustration below).

FRONT

REMOVE SCREWS

REMOVE SCREWS

└FAN

BOTTOM OF PLAYER

5
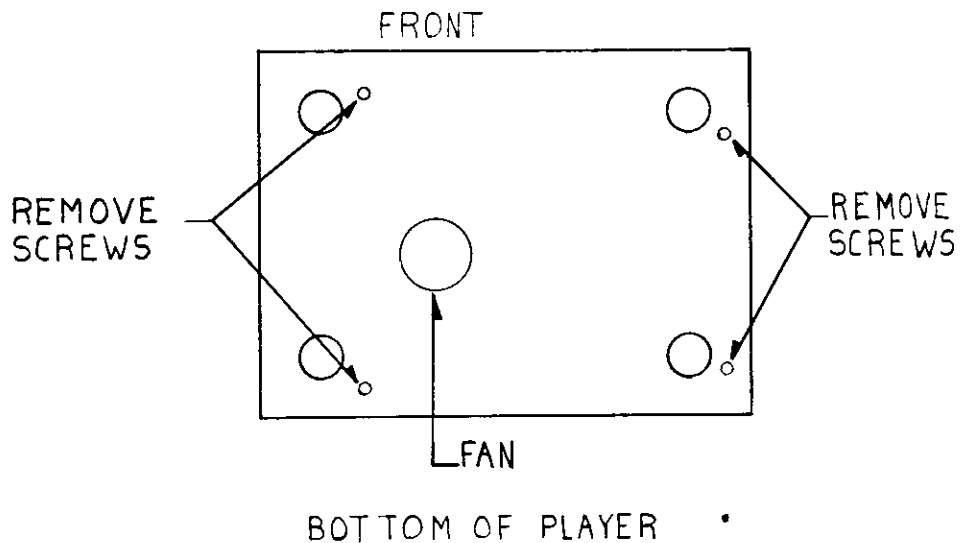
Step 2 (Cont'd):

        3). Use spacers and mounting screws included with game.
            Mount the player to the panel. The spacers go between
            the shock absorbers and the Player so that when
            assembled the <u>PLAYERS FEET DO NOT TOUCH THE MOUNTING</u>
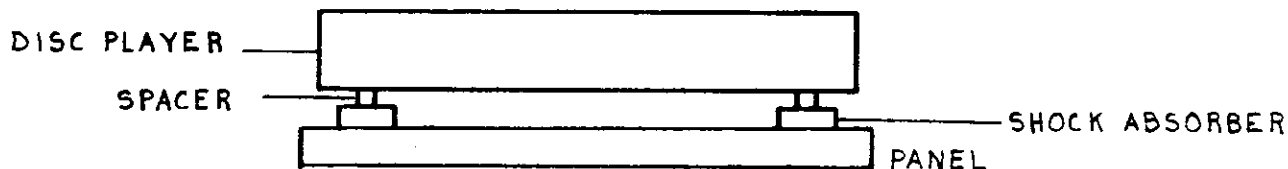   <u>PANEL</u>. (See illustration 2 below).

DISC PLAYER ———

SPACER ———

———SHOCK ABSORBER

PANEL

            The front of the disc player when mounted, faces the
            front of the machine.

        <u>CAUTION:</u> <u>DISC PLAYER MUST BE REMOVED FROM GAME IF IT IS</u>
                  <u>MOVED TO NEW LOCATION.</u>

Step 3.   <u>Disc Player Set-Up: Opening the Hood</u>

        The Disc Player hood can only be opened when the power is
        turned on.

        To open the hood: (See illustration 3 below)

        1). Plug the unit into the Disc Player Service Outlet.

            Note: The Disc Player Service Outlet is <u>NOT</u> the
                    service outlet on the electronics drawer.
                    <u>A Special Switched Outlet</u> is provided for
                    the Disc Player. It is located near the
                    right rear of the cabinet (looking from
                    back of machine) above the Player area.
                    The Disc Player line cord goes up through
                    the front cable feed hole.
        2). Press the Power Switch to turn the unit on.
        3). Press the Reject/Open Switch to unlock the hood, and
            lift the hood gently with your hand.

        <u>LEAVE UNIT ON!!</u>

How to open the hood
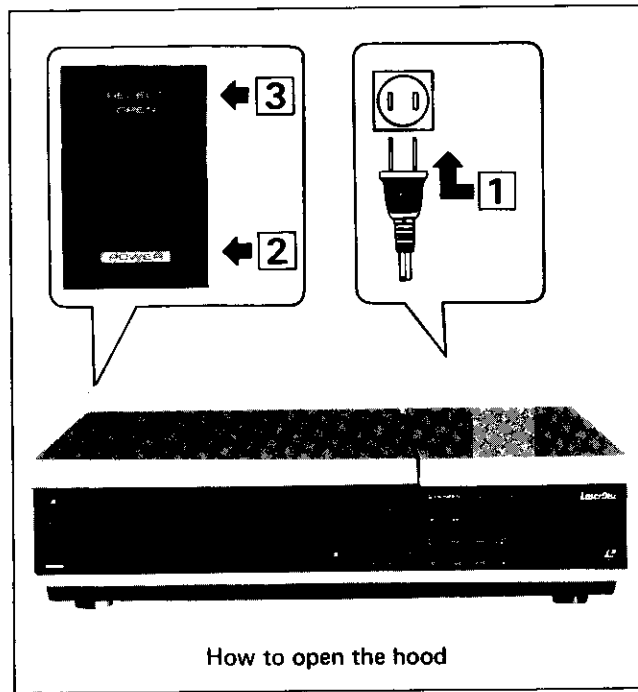
Step 4:   <u>Disc Player Set-Up:</u> <u>Removing Shipping Screw and Lens Cap</u>

To prevent damage to the internal mechanism during shipment, a shipping screw and plate is placed beside the center shaft at the factory. (See illustration 4 below). Use a screwdriver or coin to unscrew and remove the <u>SCREW</u> and <u>SCREW PLATE</u>. Next remove the <u>LENS CAP</u> which is placed over the lens to protect it from dust and dirt. (See illustration 4 below). <u>LEAVE UNIT ON!!</u>

Remove the lens cap.   Remove the shipping screw.

Shipping screw and lens cap removal
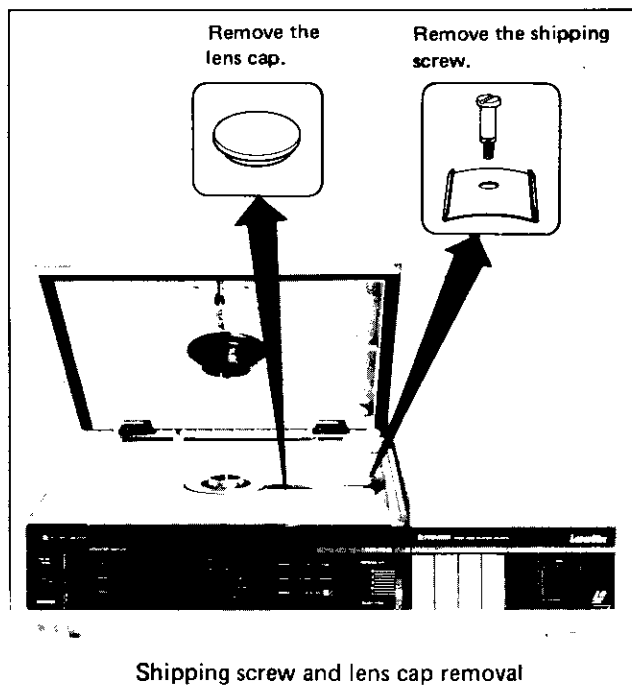
NOTE: Store shipping screw, plate and lens cap, with the carton
               and wrappers. The screw, plate and lens cap MUST be
               replaced if the unit is to be moved to a new location.

               WHEN REPLACING SHIPPING SCREW AND PLATE, THE POWER TO THE
               PLAYER MUST BE ON!!

Step 5:   Disc Player Set-Up: Installing the Disc

               With hood open, insert the disc with the label side of the
               disc facing up. Close the hood so that it clicks shut.
               TURN PLAYER OFF!!

Step 6:   Disc Player Set-Up: Connecting Disc Player

               Connect the video out, audio out and control wires to the
               back of the player at this time.   (See illustration 5
               below).
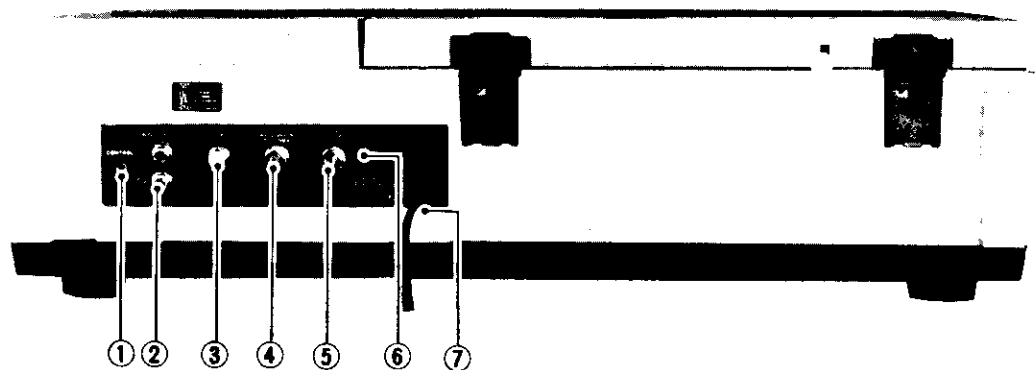
               1)   Control Wire   5)   N/U
               2)   Audio Out   6)   N/U
               3)   Video Out   7)   Line Cord
               4)   N/U

NOTE: The disc player is completely controlled by the logic
               boards. Once player is turned on, no control switches have
               to be pushed to operate the player.

               TURN PLAYER ON.

               PUSH UNIT INTO MACHINE.

Step 7:   <u>Power-Up Entire Game:</u>

When the logic boards have reset, they will begin to
control the disc player. The disc will begin to rotate and
the stand-by light will begin to flash on and off. In 15
to 30 seconds, the disc will reach its rated speed. A
picture will appear on the monitor and the stand-by
indicator will go out. The unit is now functional.

On all games, there are some items that must be checked after shipment. Making these visual inspections may avoid time consuming service work later. Minor troubles caused during shipment are unavoidable. Cable connectors may be loosened, switches may go out of adjustment, and chips in sockets may have come loose.

- Check cable connectors and socketed chips to make sure they are properly seated and tight.

- Check switches for proper adjustments.

- Check transformer for any foreign material shorting across wiring lugs.

- Check that fuses are firmly seated and making good contact.

- Check switches for foreign material that may have come loose in shipment and could cause shorting of contacts.

- Check for any wires that may have become disconnected.

- Check that all cable connectors are completely seated on printed circuit board assemblies.

- Check that cables are clear of all moving parts.

- Check adjustment of the two normally open tilt switches located on the left side of cabinet by control panel.

NOTE: To protect solid state components, before touching any component in the back box, discharge any possible static build-up by touching any ground circuit, e.g. ground braid.

In Cliff Hanger, Cliff is trying to enter Count Dragoe's castle to save the kidnapped Princess from Dragoe's evil clutches.

Control Cliff as he first sees and tries to save the Princess only to be outfoxed by Dragoe's henchmen as they kidnap her and spirit her off to the Count's castle.

Cliff finds the ring the Count gave the princess and his search for her leads him to a town where, in an incredible chase scene, Cliff is persued through the town and the town's sewer system by the Count's helicopter.

Cliff's adventures lead him through numerous other perilous situations that require him to have quick reflexes, great leaping ability and the skills of a Ninja.

When cliff enters the castle, he finally meets the Count face to face, and their bitter struggle in the castle clock tower almost does Cliff in.

In the surprise ending, Cliff rises up to the occasion and saves the princess.

Control Cliff's actions by using the two action buttons or joystick.

Use hand button to control movements of Cliff's arms.

Use foot button to control movements of Cliff's legs.

Use joystick to start movement or change directions of Cliff or car.

Use individual controls or combinations for successful moves.

CONTROL PANEL:

Joystick: 4-way joystick is used to begin movement on the screen
                 or change the direction of movement on the screen of
                 Cliff or Cliff's car. These direction changes are
                 from the players perspective.

                 Example: If the action on the screen changes from
                 left to right, you would have to move the joystick to
                 the right.

Hand Button: Is used to control the movements of Cliff's arms and
                 hands.

                 Example: If Cliff uses his arm or hand to block or
                 grab something, then the Hand Button would be used for
                 the correct move.

Foot Button: Is used to control the movement of Cliff's legs.

                 Example: If Cliff is jumping across something or
                 climbing up something, the Foot Button would be used
                 for the correct move.
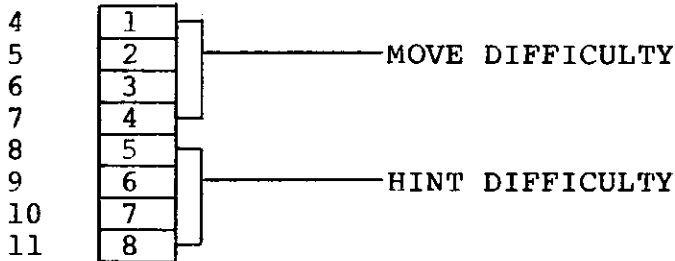
SECTION II: GAME ADJUSTMENTS

All dip switches used for game adjustments are located on the ZPU-2000
board.   The ZPU-2000 board is the bottom board in the card cage.

        ZPU-2000   DIP SWITCH DESIGNATION

<u>H11</u>

4	1
5	2
6	3
7	4
8	5
9	6
10	7
11	8

1,2,3,4 ——MOVE DIFFICULTY

5,6,7,8 ——HINT DIFFICULTY

<u>G11</u>

12	1	SERVICE INDEX
13	2	SWITCH TEST
14	3	FREE PLAY
15	4	PLAYER IMMORTALITY
16	5	SCENE JUMP
17	6	ATTRACT SOUND OFF
18	7	PLAY THRU/RANDOM
19	8	

SERVICE INDEX   ON/OFF
SWITCH TEST   ON/OFF
FREE PLAY   ON/OFF
PLAYER IMMORTALITY   ON/OFF
SCENE JUMP   ON/OFF   LEVEL JUMP
ATTRACT SOUND OFF   ON/OFF
PLAY THRU/RANDOM   ON/OFF   OF GAME GROUPS

<u>F11</u>

20	1
21	2
22	3
23	4
24	5
25	6
26	7
27	8

1,2 ——LEFT COIN CHUTE

5,6 ——RIGHT COIN CHUTE

<u>E11</u>

28	1
29	2
30	3
31	4
32	5
33	6
34	7
35	8

1,2 ——NUMBER OF LIVES PER GAME (3, 4, 5, 6)
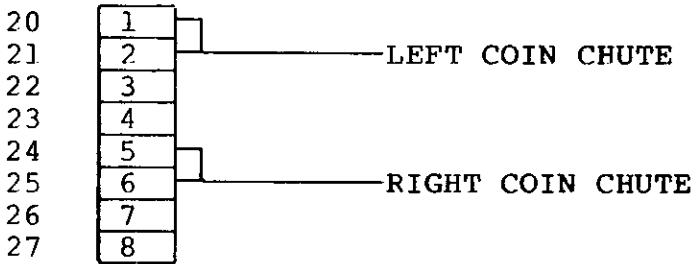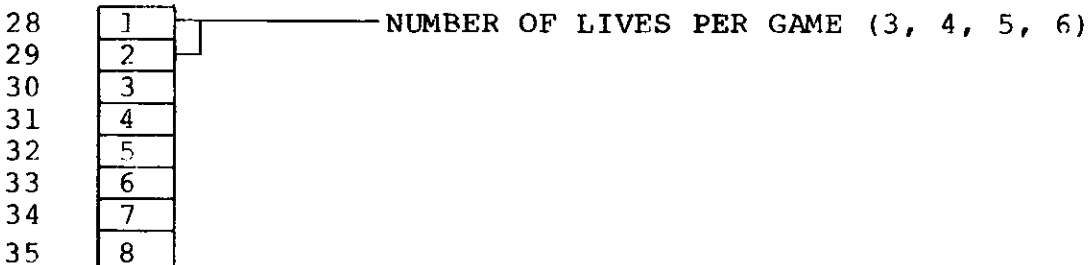
MOVE DIFFICULTY:

SWITCHES	4	3	2	1	
	OFF	OFF	OFF	OFF	EASIEST
	OFF	OFF	OFF	ON	
	OFF	OFF	ON	OFF	
	OFF	OFF	ON	ON	
	OFF	ON	OFF	OFF	
	OFF	ON	OFF	ON	
	OFF	ON	ON	OFF	
	OFF	ON	ON	ON	
	ON	OFF	OFF	OFF	
	ON	OFF	OFF	ON	
	ON	OFF	ON	OFF	
	ON	OFF	ON	ON	
	ON	ON	OFF	OFF	
	ON	ON	OFF	ON	
	ON	ON	ON	OFF	
	ON	ON	ON	ON	HARDEST

This setting determines the difficulty of the moves in the game by opening or closing the "WINDOW" that these moves can be made in.

HINT DIFFICULTY:

SWITCHES	8	7	6	5	
	OFF	OFF	OFF	OFF	MOST HINTS
	OFF	OFF	OFF	ON	
	OFF	OFF	ON	OFF	
	OFF	OFF	ON	ON	
	OFF	ON	OFF	OFF	
	OFF	ON	OFF	ON	
	OFF	ON	ON	OFF	
	OFF	ON	ON	ON	
	ON	OFF	OFF	OFF	
	ON	OFF	OFF	ON	
	ON	OFF	ON	OFF	
	ON	OFF	ON	ON	
	ON	ON	OFF	OFF	
	ON	ON	OFF	ON	
	ON	ON	ON	OFF	
	ON	ON	ON	ON	LEAST HINTS

If used, this setting determines the amount of visual clues the game will give the player.

FREE PLAY   DIP SWITCH 14
    YES   ON
    NO   OFF

PLAYER IMMORTALITY   DIP SWITCH 15
    YES   ON
    NO   OFF

    Used for test purposes. In this mode, your player is never destroyed.

SCENE JUMP   DIP SWITCH 16
    YES   ON
    NO   OFF

    Used for test purposes. In this mode, pushing the Player One button
    jumps to next scene.

ATTRACT MODE SOUND OFF   DIP SWITCH 17
    ON   OFF
    OFF   ON

NUMBER OF LIVES PER GAME:

LIVES	SWITCH 28	SWITCH 29
3	OFF	OFF
4	ON	OFF
5	OFF	ON
6	ON	ON

COIN SWITCH SETTINGS:

COIN	SWITCHES		CREDITS	COIN
Left Chute	20	21		
Right Chute	24	25	CREDITS	COIN
	OFF	OFF	1	2
	ON	OFF	1	2
	OFF	ON	1	3
	ON	ON	1	4

    IF BOTH COIN CHUTES ARE ADJUSTED THE SAME FOR MULTIPLE COINS, CREDITS
WILL INCREASE AS IF DROPPED IN SAME CHUTE.

SECTION III: SERVICE MODES

The System provides three service modes:
(1) Power on self test for each board
(2) Service Index
(3) Switch Test

I. POWER ON SELF TEST:
    ZPU-2000: This board has its own test L.E.D. and goes through its
    own self test on power-up. Each flash checks a particular section of
    the board. The L.E.D. flashes upon <u>completion</u> <u>of</u> <u>a</u> <u>test.</u>

    Listed below is the sequence of flashes of the L.E.D. and what
    section of the board is being checked.

ZPU-2000 - 7 Flashes:

            1st = Z80 Microprocessor
            2nd = Rom 0 Position 1H
            3rd = Rom 1 Position 2H
            4th = Rom 2 Position 3H
            5th = Rom 3 Position 4H
            6th = Scratch Ram   6C
            7th = Bookkeeping   6F

II. <u>SERVICE INDEX:</u>

    Access into the Service Index can be made by turning Switch No. 12 of
    the ZPU Board on.

    <u>SERVICE INDEX</u   <u>DIP 12</u>
        ON   ON
        OFF   OFF

    The Service Index displays six (6) categories on the screen that
    provide access to Bookkeeping Information, Game and Coin Adjustment
    Settings and Various Diagnostic Tests.

    A. The categories in the Service Index are listed below:

            01   Bookkeeping
            02   Game Adjustment
            03   Credit/Coin Adjustment
            04   Monitor Test
            05   Sound Test
            06   Game Play Statistics

B.   Selecting a category:
     To select a category you:

     (1)   Push the Joystick to move the cursor up the index.
     (2)   Push the Joystick to move the cursor down the index.
     (3)   To select a category, push the Player 1 Start.
     (4)   To exit from a category, push the Player 2 Start.

C.   Description of Categories:

01   BOOKKEEPING: The Bookkeeping category contains information on:

     (1)   Total Plays
     (2)   Coins through the Left Coin Chute.
     (3)   Coins through the Right Coin Chute.
     (4)   Total seconds played
     (5)   Longest game in seconds
     (6)   Shortest game in seconds
     (7)   Highest Game Score
     (8)   Highest Score Reached

     To reset the categories back to zero, push Switch Number Two (2)
     on the ZPU-2000 Board (See ZPU Illustration. This resets all
     categories except Number 7, Highest Game Score - this is handled
     separately.

     NOTE: Number 6 - Shortest Game in seconds is reset to 99.

     HIGHEST GAME SCORE:

     The System displays twenty (20) high scores in two different
     categories: All Time and Today.

          Scores in the Today Column are reset every time the machine
          is turned off.

          Scores in the All Time Column are retained in memory and
          are not reset when the machine is turned off.

          Scores in the All Time Column can be cleared One At A Time
          by pushing Switch Number One on the ZPU-2000 Board (See ZPU
          Illustration. Each push of Switch One clears the highest
          score of the group and all other scores move up. To clear
          the entire column push Switch One, ten (10) times.

02   GAME ADJUSTMENTS:

     Displays how a particular adjustment has been set, the dip
     switches controlling that function, and the status of those
     switches.

03   CREDIT/COIN ADJUSTMENTS·

Show what Coin/Credit combination has been set for both the Left
and Right Coin Chutes, and which switches control each chute.

04   MONITOR TEST:

Displays a Red, Blue, Green or Crosshatch pattern on the screen
for monitor adjustments.

To change screens, push the Player One Button.

05   SOUND TEST:

Allows you to test each sound of the game individually. To do
this use the joystick to call up the sound (See Chart) you want
to test. Pushing the Player One Button creates the sound.

To exit the Sound Test, push Player Two Button.

LIST OF GAME SOUNDS:
01   Good Action (Beep)
02   Bad Action (Boop)

06   GAME PLAY STATISTICS:

This category contains informatin on:
(1)   Range of Scores:
            This page shows the range of scores achieved in 10K
            points increments. It displays values from 0 to 140K
            points. It also shows how many times each level was
            reached.

(2)   Range of Times:
            This page shows the range of time played, in minutes.
            Times shown are from 0 to 14 minutes and increase at
            one minute intervals.

(3)   Range of Scenes:
            This page shows the number of times the highest scene
            was reached per game.

Pushing the Player One Button changes the display to the next
page.

Pushing Switch #2 on ZPU Board clears the page being displayed
back to zero.

The Switch Test can be turned on by:
(1) Turning Switch Number 13 of the ZPU Board on and pushing the
     Reset Button (SW3).

0 = Switch Open   1 = Switch Closed

CONTROL PANEL AND COIN SWITCHES:

SWITCH	STROBE	BIT
Player One/Feet	5	2
Player Two/Feet	5	3
Left Hand Button	5	4
Right Coin Switch	5	1
Left Coin Switch	5	0
ZPU Switch 1	0	6
ZPU Switch 2	0	7
Right Hand Button	5	5
N/U	5	6
Tilt Switch (2)	5	7
Joystick Up	6	0
Joystick Right	6	1
Joystick Down	6	2
Joystick Left	6	3

ZPU DIP SWITCHES:

Dip Switch 4	4	0
Dip Switch 5	4	1
Dip Switch 6	4	2
Dip Switch 7	4	3
Dip Switch 8	4	4
Dip Switch 9	4	5
Dip Switch 10	4	6
Dip Switch 11	4	7
Dip Switch 12	3	0
Dip Switch 13	3	1
Dip Switch 14	3	2
Dip Switch 15	3	3
Dip Switch 16	3	4
Dip Switch 17	3	5
Dip Switch 18	3	6
Dip Switch 19	3	7
Dip Switch 20	2	0
Dip Switch 21	2	1
Dip Switch 22	2	2
Dip Switch 23	2	3
Dip Switch 24	2	4
Dip Switch 25	2	5
Dip Switch 26	2	6
Dip Switch 27	2	7
Dip Switch 28	1	0
Dip Switch 29	1	1
Dip Switch 30	1	2
Dip Switch 31	1	3
Dip Switch 32	1	4
Dip Switch 33	1	5
Dip Switch 34	1	6
Dip Switch 35	1	7

CLIFF HANGER HARDWARE SYSTEM

Cliff Hanger uses a Z80 based microprocessor system consisting of seven (7) boards:

(1) ZPU Board
(2) GSI Board
(3) VMB Board
(4) UIB Board

(5) RFB Board
(6) CRF Board
(7) PS1200

(1) **ZPU Board (located in card rack):**
This board contains a Z80 microprocessor running at 4.00 MHZ. ZPU Board also contains program memory, scratch pad memory, battery backed-up CMOS ram, coin counter and lamp drivers which are used to power the infra red LED's that control the disc player in games using the LD-1100 disc player. The ZPU Board also contains the Switch Matrix Controller. This circuit controls up to 80 switches. The switches are arranged in a matrix of 10 rows (strobes) and 8 columns (bits). A diode must be in series with all switches; anode to the column (bit) line, cathode to the row (strobe) line.

(2) **GSI Board (located in card rack):**
Graphics and Sound Interface Board:
- Generates non-disc graphics and sound.
- Reads the frame number from the disc and feeds that information to the ZPU Board.
- Provides an interrupt to the ZPU Board when the disc player is in search mode (INT).
- Provides an interrupt to the ZPU Board each time it reads a frame number on the disc.
- Had dual audio amps for stereo sound.
- Has volume controls.
- Provides switching signal to VMB Board. B-Y and R-Y signal the VMB Board to switch from disc player graphics to GSI generated graphics. They are analog signals, when the signals are negative, disc player video is on the screen, when the signals are positive, GSI graphics are on screen. (With Analog signals ground = positive).

(3) **VMB Board (located on side of cabinet behind monitor):**
Video Multiplexer Board:
The VMB board is a video matrix board which acts as a matrix switch. It controls what video will be on the screen, disc player video or GSI generated video. The switching signal comes from the GSI Board (see explanation of GSI Board).
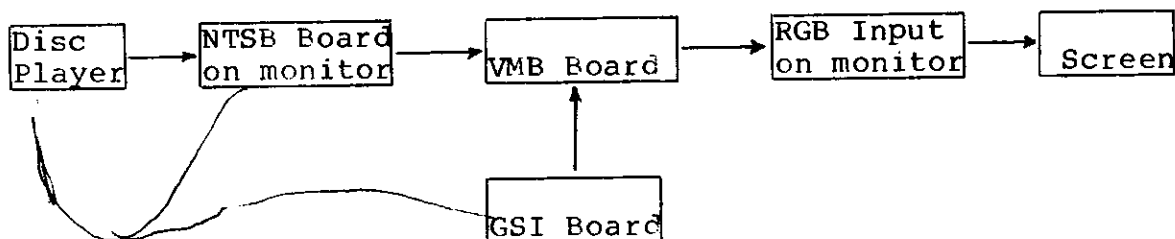
(4) <u>RFB Board:</u>
Rectifier and Filter Board
      Provides +12 VDC unregulated at 2 amps for audio amps on GSI
      Board.

(5) <u>UIB Board (Located on front wall of cabinet below control panel:</u>
Universal Interface Board
      The UIB Board is the diode board fro the switch matrix. All
      switches except ZPU switches go through this board.

(6) <u>CRF Board (Located in cage):</u>
      This is the R.F. Filter Board for the logic system, as well as
      providing static protection for the system.

(7) <u>PS1200:</u>
      Provides voltages for the logic boards. This system is using:
      +5 VDC +/-.20
      +12 VDC
      -5 VDC