TESLA II - TECHNICAL MANUAL

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INTRODUCTION

1) Welcome to Tesla II VR4
2) Cockpits
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Welcome to the Tesla II VR4 system. Virtual World Entertainment is constantly striving to bring you the best in contemporary entertainment. We are quite proud of the Tesla II system, which you have purchased, and we hope that Tesla II will bring hours of gaming pleasure to you, your family, friends and customers.

To insure that you receive maximum performance from your system, we have created The Customer Technical Training course. The course was designed around four specific goals:

♦   To operate Tesla properly;

♦   To understand the components of Tesla;

♦   To detail the proper care which Tesla requires; and

♦   To troubleshoot situations which may occur with your system.

POWER

1) Breaker   20A per 2 cockpits
2) 5VDC   Remote I/O board
3) 12VDC   fans, auxiliary monitors, and plasma display
4) AC   PC, main monitor, secondary monitor, Tesla coils,
5) 12VDC filtered   Quad amp board

External Switch box

This is simply a standard jay box with UL approved light switch. It is very important that the ground is wired to here from the outside, as this is how the entire pod is grounded.

The **isolation transformer** comes in two flavors in the US the pods are equipped with a straight 110V - 110V transformer. Depending on the power supplied to the pods sometimes a 220V - 110V step-down transformer is used.

Power distribution box

Standard north American 3 prong (fused) power distribution box. It has 12 Ports and an on/off switch. The Power distribution box is grounded via the external switch box; a screw in the top corner of the 5Vpower supply connects the leads. (Note: this layout skips the isolation transformer, which has no ground lead)

Internal Switch

Alternate Power switch. If this is in the off position, none of the cockpit components will get power. See power layout diagram.

The **5V Power** supply only provides power to the Remote I/O Board that, in turn, powers the Button Boards LED's in the auxiliary and secondary monitor buttons.

The **sound amplifier power supply** is a 12V, whose only function is to power the cockpits' amplifier board, which in turn sends sound to the speakers.

POWER SUPPLY

The external switch is located underneath the closet on the outside of the pod. This main switch is the on/off switch for the cockpit. It is through the wiring to this switch that the pod is grounded to prevent electrical shock. The main switch is wired directly (or via a harness) to plug into a standard household power receptacle (110V AC US).

The main switch is also wired to the primary transformer that is used to regulate the AC power supply and protect the cockpit components from power spikes. This transformer is located at the back of the closet on the bottom shelf. In countries where the input voltage is not 110V AC, a step-down transformer may be provided.

The power distribution box is also located in the bottom section of the closet. It is fastened on the wall of the closet on the right side. The box functions as a secondary surge protector with 12 standard US outputs for 110V AC. In addition, it also serves as

the internal on/off switch for the cockpit. The power distribution box receives its power from the primary transformer, which always has an output of 110V AC. The components which will receive power from the power distribution box will be the 5V DC power supply, the 12V DC power supply, the game PC, the main monitor, the secondary monitor, the Tesla coil relays and the amplifier 12V DC power supply.

Also on the bottom shelf are two power supplies. The power supply on the bottom right is a 12V-power supply, which supplies power to the auxiliary monitors inside the cockpit, the fans for the closet and the plasma display on the top of the cockpit.

The power supply on the left is a 5V-power supply, which powers only the remote input/output board known as the RIO board. The RIO board is located on the middle shelf inside the closet. This board communicates with the game PC to ensure proper button reactions inside the cockpit. The RIO board will be discussed in more detail later in this chapter.

Voltage Block Diagram
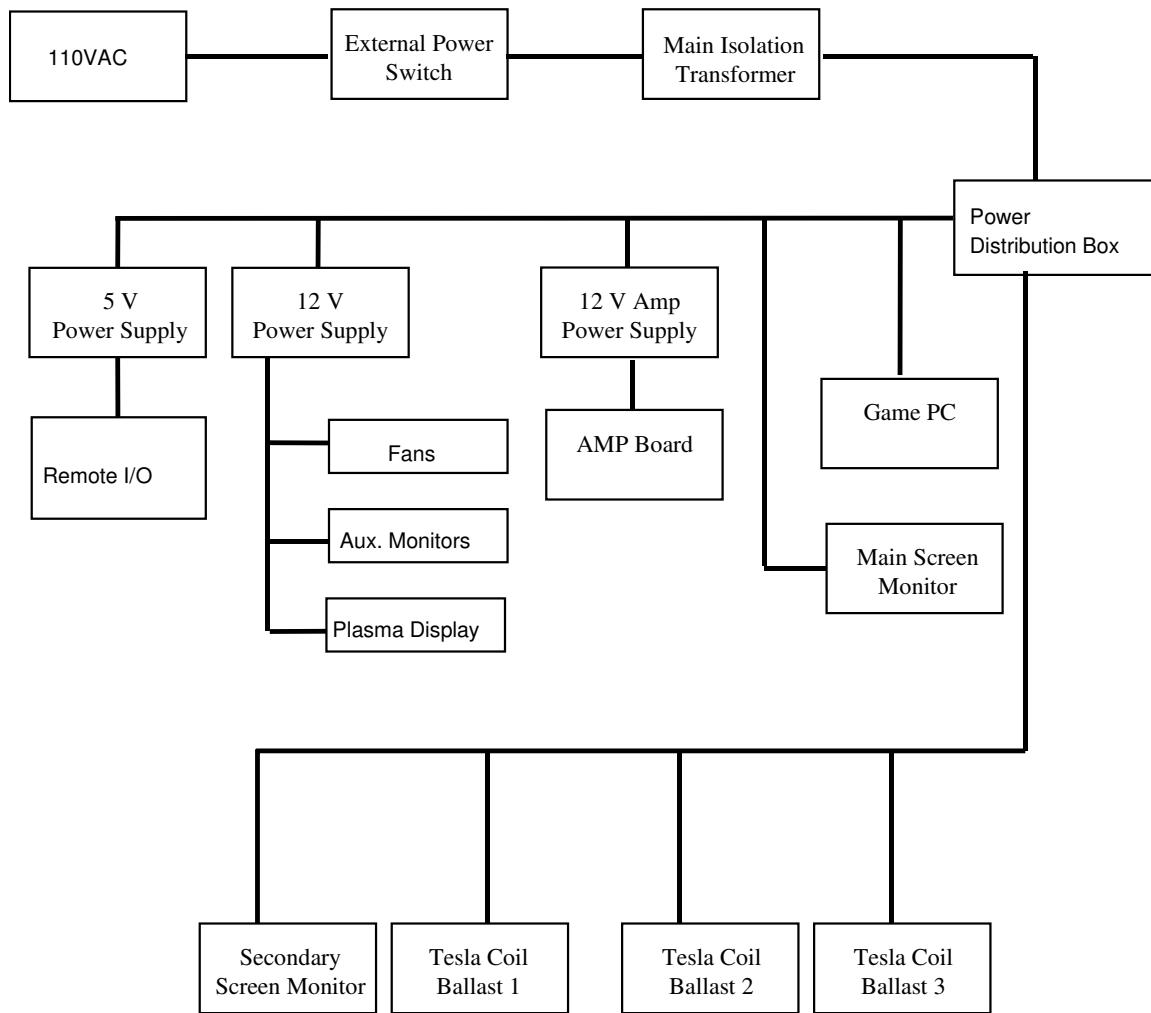
Diagram 1.1

REMOTE I/O

1) All components controlled by Remote I/O (joysticks, throttles, foot pedals, all switches on button boards.
2) Power for remote I/O 5VDC from power supply
3) Remote I/O board communicates with the PC through the serial cable
4) Button boards
5) Addresses
6) Reset button on remote I/O board.
7) RIO diagnostics will be covered in the diagnostics and maintenance section.
8) RIO display board

The Remote I/O (RIO) board handles all of the controls and push buttons in the pod. The Remote I/O handles these devices through the use of Button Boards which are located in the Aux. Monitor cases and at the Joystick and Throttle locations.

The Button boards are connected to the Remote I/O through a 16-pin ribbon cable. The Joystick, Throttle, and Foot Pedals movements are measured by Optical Encoders which are connected to 5 pin connectors also on the Remote I/O Board.

The Remote I/O is powered from the 5V-power supply that is located in the lower section of the front cabinet. The Button Boards get their power through the Remote I/O.

The External Display located in the upper middle panel of the cockpit interior and is connected to the RIO by a 14-pin ribbon cable.

The PC is connected to the board through a DB9 Connector on the board and goes to the COM1 port of the PC.

The two push button switches on the RIO are for resetting and aborting the board.
>   SW1 = Reset
>   SW2 = Abort

There are 6 LED's located next to the reset button that give a continuous status of the board. In normal operation the only LED's that should be lit are the green LED's L1 and L4. When ever you push the reset SW1 you should see the yellow LED L3 light up. Whenever there is a fault the red LED L2 should light up. While the game software is running the TX and RX should be flashing continuously to show that proper communication is taking place between the Rio board and the PC (Depending on the Rev # of the Board, Rev 1 does not have flashing LED's)
>   L1 = Power on
>   L2 = Fault
>   L3 = Reset
>   L4 = Run
>   L5 = TX
>   L6 = RX
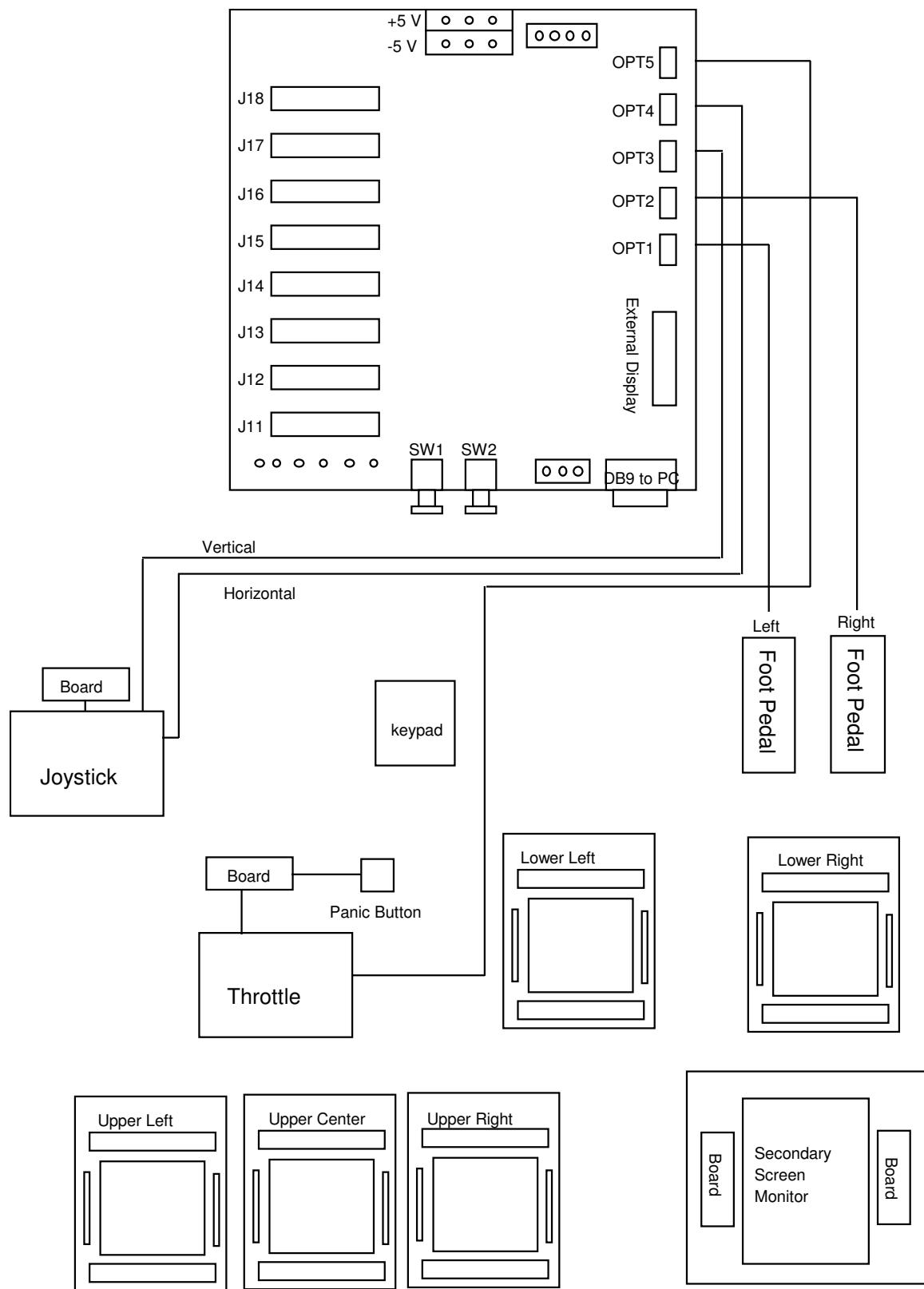
Diagram 1.2

Button Boards

The Button Boards handle the buttons and switches located throughout the pod. These boards are directly connected to the Remote I/O board through the 16-pin ribbon connector.

The 4 pin connectors located at the top of the board are directly connected to the buttons and switches. However the connectors are numbered in the opposite direction of the hex numbers associated with the board. An example being J10 = Hex 00 while J3 = Hex 07.

The address selection is a jumper that is placed over two pins on the selection row to indicate which board is being address per ribbon cable. Therefore if there were only one Button Board on a ribbon cable then the address would be A0. There are only two ribbon cables which have more than one Button Board attached to them and they are for the Secondary Screen and the Overhead Aux. Monitor Button Boards. Additionally, the Overhead Aux. Monitor Ribbon Cable has a fourth header, which is used to attach a terminating resistor to the circuit.

The Secondary Screen Button Boards are addressed as follows:

A0 = Left side button board
A1 = Right side button board

The Overhead Button Boards are addressed as follows:

A0 = Upper Center Button Board.
A1 = Upper Left Button Board.
A2 = Upper Right Button Board.

Joystick Button Board

The Joystick Button Board for the Joystick handles the five buttons and the four hat switches associated with the Joystick. The locations for the joystick connectors to the button board are as follows:

|				
J3	=	White	=	Address 47h
J4	=	Gray	=	Address 46h
J5	=	Green	=	Address 45h
J6	=	Purple	=	Address 44h
J7	=	Blue	=	Address 43h
J8	=	Yellow	=	Address 42h
J9	=	Orange	=	Address 41h
J10	=	Red	=	Address 40h

The 16 pin connectors on the boards go to specific Button Boards. Below is a list of which Button Board is connected to which ribbon cable header on the RIO.

> J11 = Bottom Right Aux. Monitor button board (Aux. 5)
> J12 = Bottom Left Aux. Monitor button board (Aux. 4)
> J13 = Secondary Screen button boards
> J14 = Upper Aux. Monitors button boards (Aux. 1, 2, 3)
> J15 = Internal Keypad
> J16 = Not Used
> J17 = Throttle Button Board
> J18 = Joystick Button Board

The 4 pin connectors on the Remote I/O board go to specific optical encoders. The following is a list of those connections.

> Opt 1 = Left Foot pedal
> Opt 2 = Right Foot pedal
> Opt 3 = Vertical Axis of the Joystick
> Opt 4 = Horizontal Axis of the Joystick
> Opt 5 = Throttle
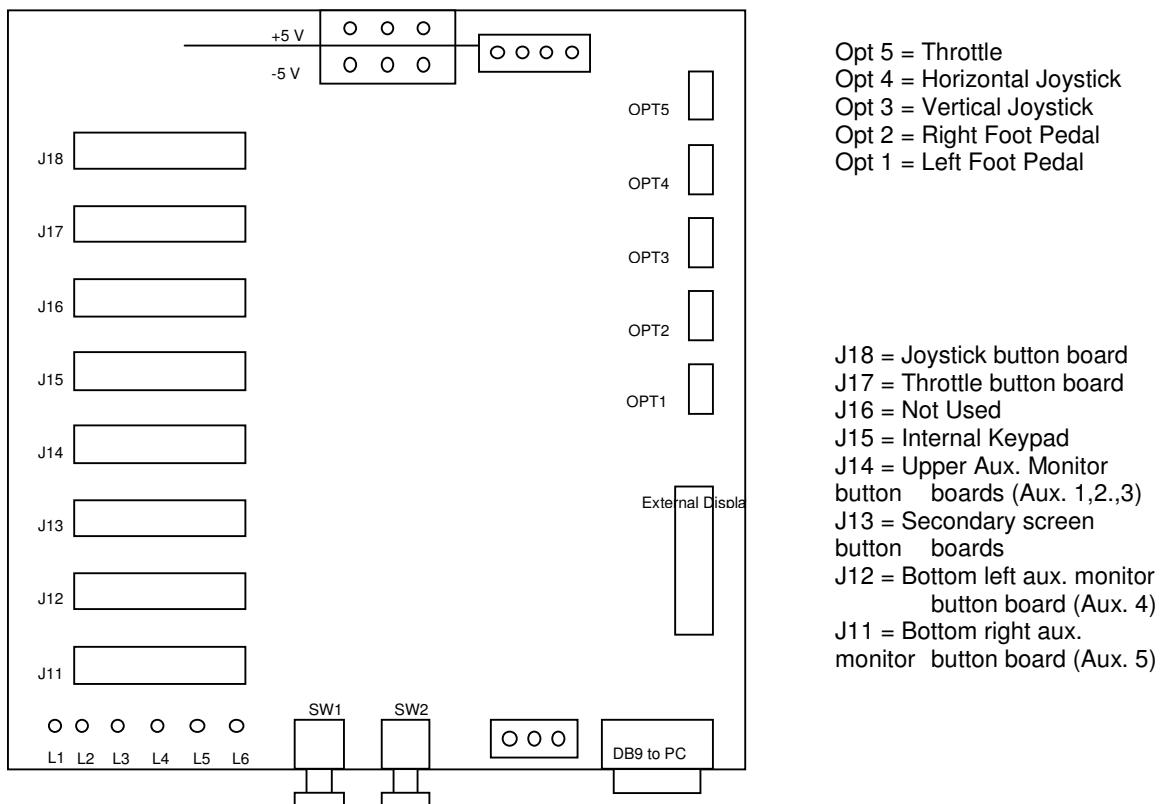
Diagram 1.3

L1 = power on
L2 = Fault
L3 = Reset
L4 = Run
L5 = TX
L6 = RX

Opt 5 = Throttle
Opt 4 = Horizontal Joystick
Opt 3 = Vertical Joystick
Opt 2 = Right Foot Pedal
Opt 1 = Left Foot Pedal

J18 = Joystick button board
J17 = Throttle button board
J16 = Not Used
J15 = Internal Keypad
J14 = Upper Aux. Monitor button   boards (Aux. 1,2.,3)
J13 = Secondary screen button   boards
J12 = Bottom left aux. monitor   button board (Aux. 4)
J11 = Bottom right aux. monitor button board (Aux. 5)

A1

2F   2E   2D   2C

2B   2A   29   28

A0

27   26   25   24

23   22   21   20

A2

37   36   35   34

33   32   31   30

A0

0F   0E   0D   0C

0B   0A   09   08

A0   A1
10   18
11   19
12   1A
13   1B
14   1C
15   1D

A0

07   06   05   04

03   02   01   00

3F

J3

A0

42
44   43
47
41

46   40

45

A0
40=J10

47=J3

Diagram 1.4

AX = Button Board Address
JX = 4 pin connector on Button Board

11

Throttle Button Board

The Throttle Button Board handles more than just the throttle reverse button. It also handles the Panic Button. The connectors should be as follows:

J3	=	Throttle Button	=	Address 3Fh
J4	=	NC	=	Address 3Eh
J5	=	Panic Button	=	Address 3Dh
J6	=	NC	=	Address 3Ch
J7	=	NC	=	Address 3Bh
J8	=	NC	=	Address 3Ah
J9	=	NC	=	Address 39h
J10	=	NC	=	Address 38h

On J3 the Throttle Button is hooked up to the two leads for detecting the Switch (green and white wires). This is due to the Throttle Button not having a Light or LED that needs to be lit.
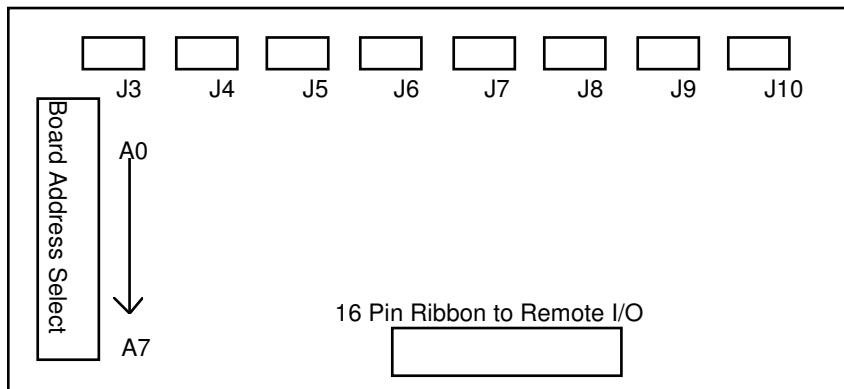

Diagram 1.5

Button Board Connections

Each button in the cockpit has a specific address that identifies it. This button address is dependent on the button board it is attached to. The button boards jumper settings and ribbon cable location on the RIO determines an 0-7 address range for each board. The addresses are in standard hex notation starting at 0 and going to 3F. The buttons addresses are used to determine the function of the button, and can be used to verify working components

SOUND SYSTEM

1) The sound system includes the following: 1 Sound Blaster Live Card, 1 Quad-Amp Board, 4 Tweeter Speakers, 4 Mid-Range Speakers, and 4 Woofer Speakers.
2) The sound card will be covered further in the PC section.
3) The PC generates the sound signal in the sound card.
4) The quad amp board amplifies the signal from the sound card, filters through the three way crossovers and sends it out to the tweeters, woofers, and mid-range speakers.
5) On the amp, top RCA is for the input for rear sound in the cockpit.
6) On the amp, bottom RCS is for the input for the front sound in the cockpit.
7) Front connectors on the front of the quad amp board are for the front speakers.
8) Back connectors on the back of the quad amp board are for the rear speakers.
9) Top connectors on the quad amp board are for the left speakers.
10) Bottom connectors are for the speakers on the right side of the cockpit.
11) Quad amp board runs on its own 12V-power supply that plugs into the power strip.

QUAD AMP BOARD

The amp board takes the output from the sound card and amplifies the signal. It then takes the signal and sends it to one of four three-way crossovers that splits the signal from the quad amplifier board into three separate signals for each type of speaker (Tweeter, Mid-Range and Woofers).

The amplifier that is mounted on the sound amp board has a set of four RCA jacks for the inputs. As the quad amp board is mounted, the bottom set of jack inputs receive signal from the sound card (green port) in the PC. Red goes to red and white goes to white. The same is true for the top set of jack inputs on the amplifier. The top set of jack inputs receive signal from the sound card (black port) in the PC. On the front and back of the amp board is 4 plastic connectors, which provide the final signal for the speakers. As the quad amp board is mounted, the two connectors to the front of the closet are the signal for the front speakers, and the two back connectors are for the back speakers. The connectors on the top are for the speakers on the left, and the connectors on the bottom are for the speakers on the bottom. The amplifier on the board may have two volume adjustment knobs depending on the model of the amp. These adjustments are set to the lowest possible setting. The volume is controlled through the software, and if the hardware volume levels are not set to the minimum value then uneven sound levels can result in the cockpit. There is also a strong possibility of damaging the speakers by overdriving the signal. **(Warning! Excessive levels of sound may damage the hearing of the user.)** Care must be taken not to switch the front and rear outputs of the sound card since the sounds are tuned to the acoustics of the cockpit.

The block diagram of this set-up is shown on the next page.
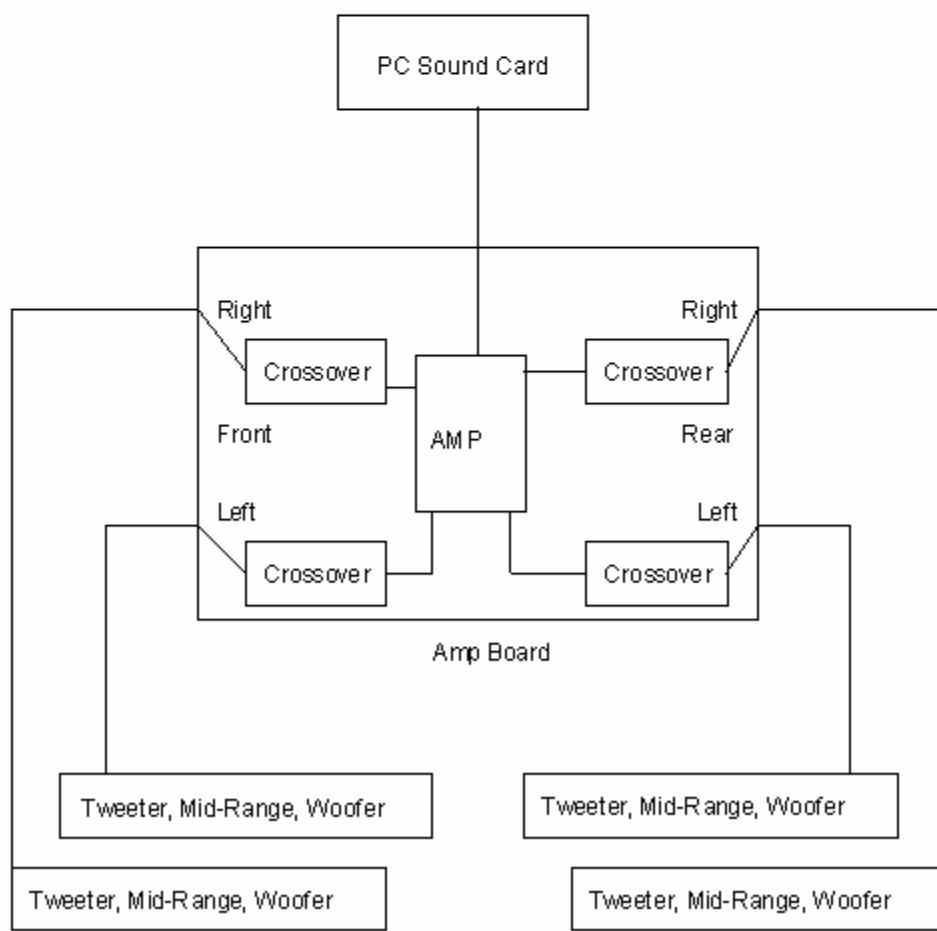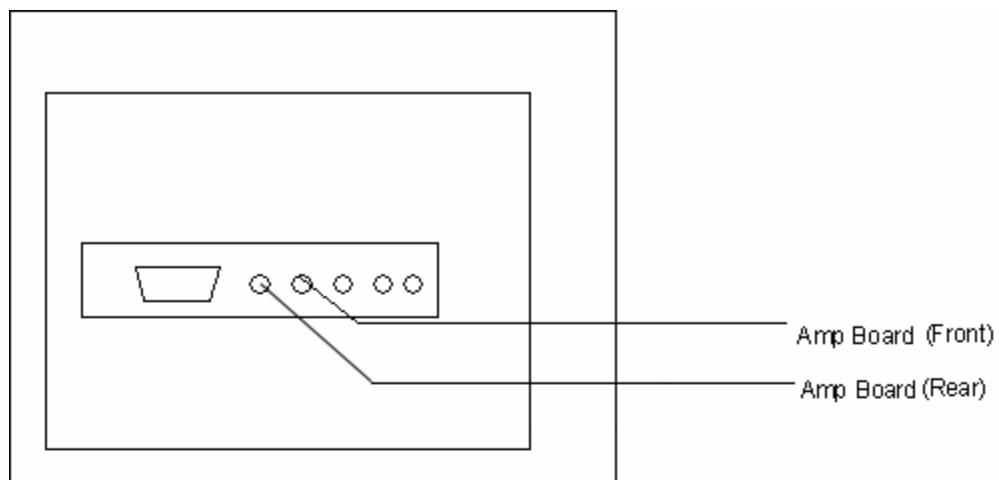
Diagram 1.7

VIDEO SYSTEM

1) AGP and PCI Video cards will be covered in the PC section
2) Monitor adjustment will be covered in the maintenance and diagnostics section
3) Auxiliary is 12V, Primary monitor is 110VAC, and secondary monitor is 110VAC.
4) Auxiliary (Aux.)monitors are 5," Secondary is 13," and primary is 20" VGA
5) Introduce infinity optics system, monitor, beam splitter, and mirror.
6) Cleaning the optics system will be covered in the maintenance and diagnostics section.
7) Keep in mind that all monitors except the primary monitor holds button boards.

CONNECTIONS

The main screen derives its signal from a high density DB15 connector from the back of the PC from the AGP Video Card. The Secondary screen gets its signal from the DB15 connector from the 1st PCI Video Card. The Aux. Monitors all get their signals from a DB25 connector that connects to two (2) DB15 connectors from the 2nd PCI Video Card. All five Aux. Monitors take their signal off the one DB25 connector that connects to the 2nd PCI Video Card and splits to 5 individual cables.

ADJUSTMENTS

The Main screen is a digital monitor. There is a control knob located behind the middle upper panel within the cockpit. Remove the Middle MFD to gain access to the control knob. Pressing on the Control knob will bring up a menu. Rotate the knob to select an option. Press the knob again to enter that selection. Rotate the knob to make changes to that selection. Once you have the setting where you want it, press the knob to exit the selection. You can then exit the menu by either waiting a period of time, or rotate to select exit, and press the knob.

You are able to adjust the Secondary Screen from an adjustment board which is located above the Center Aux. Monitor and below the External Remote I/O Display. The adjustment board allows you to adjust the brightness, contrast, h. hold, h. center, v. center, and v. width. However to adjust the vertical hold, horizontal hold, vertical line, and vertical frequency you must adjust pots that are located inside the monitor itself. The Adjustment board is connected to the monitor using extension cables and the headers. The cable attachments are shown below. The on-board adjustment pots are also displayed in the following figure.

Secondary Screen Adjustment Positions

Monitor Circuit Board

H. Hold

V. Lin

Signal

V. Size

V. Hold

V. Cent.

V. Freq.

Cont.

H. Width

9 Pin Hdr.

Front of Display

▼

Key

⊞   Header

☐   Potentiometer
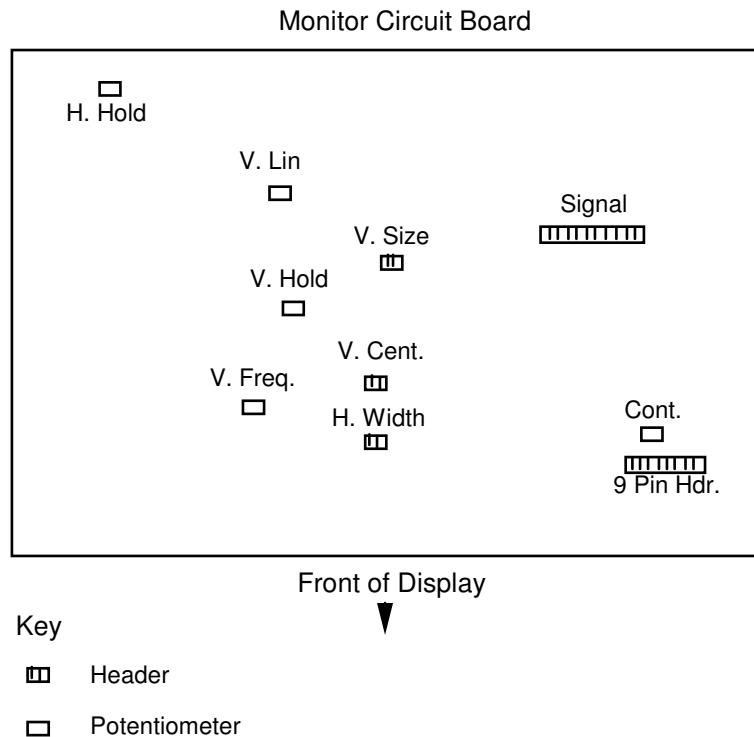
Diagram 1.8

WarningWarning***Warning***Warning***

To adjust some of these pots and when checking Button Boards involves getting your hand inside the cases of the Monitors and can be extremely hazardous. Be Extremely Careful and Take All appropriate actions that will minimize risk when handling these monitors.

WarningWarning***Warning***Warning***

The Aux. Monitors are Black and White VGA monitors. The adjustments for these monitors and located inside the Aux. Monitor cases themselves.

Aux Screen Circuit Board

Key

▨ Header

○ Adjustment Potentiometer

○ Reg. Adjust

Signal

○ Master Brite

▨ Power

○ H. Phase

○ V. Cent.

○ V. Height

○ V. Lin

○ H. Hold

Front of Display
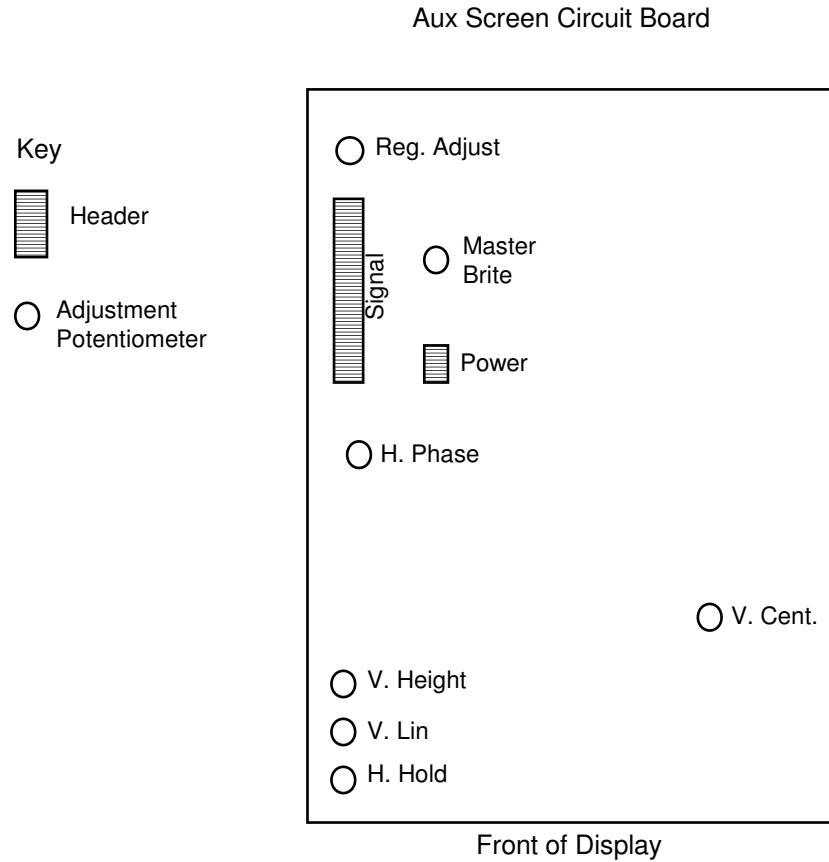
Diagram 1.9

Each Aux. Monitor Case also contains a Button Board that handles the eight buttons located on the front of the case. When the case is right side up the button board is located on the top of the casing. The buttons on the aux. monitor assembly are connected to this button board. The exact location of each button on the button board is given in the button board section of this manual.

WarningWarning***Warning***Warning***

To adjust some of these pots and when checking Button Boards involves getting your hand inside the cases of the Monitors and can be extremely hazardous. Be Extremely Careful and Take All appropriate actions that will minimize risk when handling these monitors.

WarningWarning***Warning***Warning***

**Diagram
1.10**

8 - AGP Video Card
     Main Screen

9 - 1st PCI Video Card
     Secondary Screen

10 - 2nd PCI Video Card
      Aux Monitor Screens

Main Screen
Monitor

Secondary
Screen
Monitor
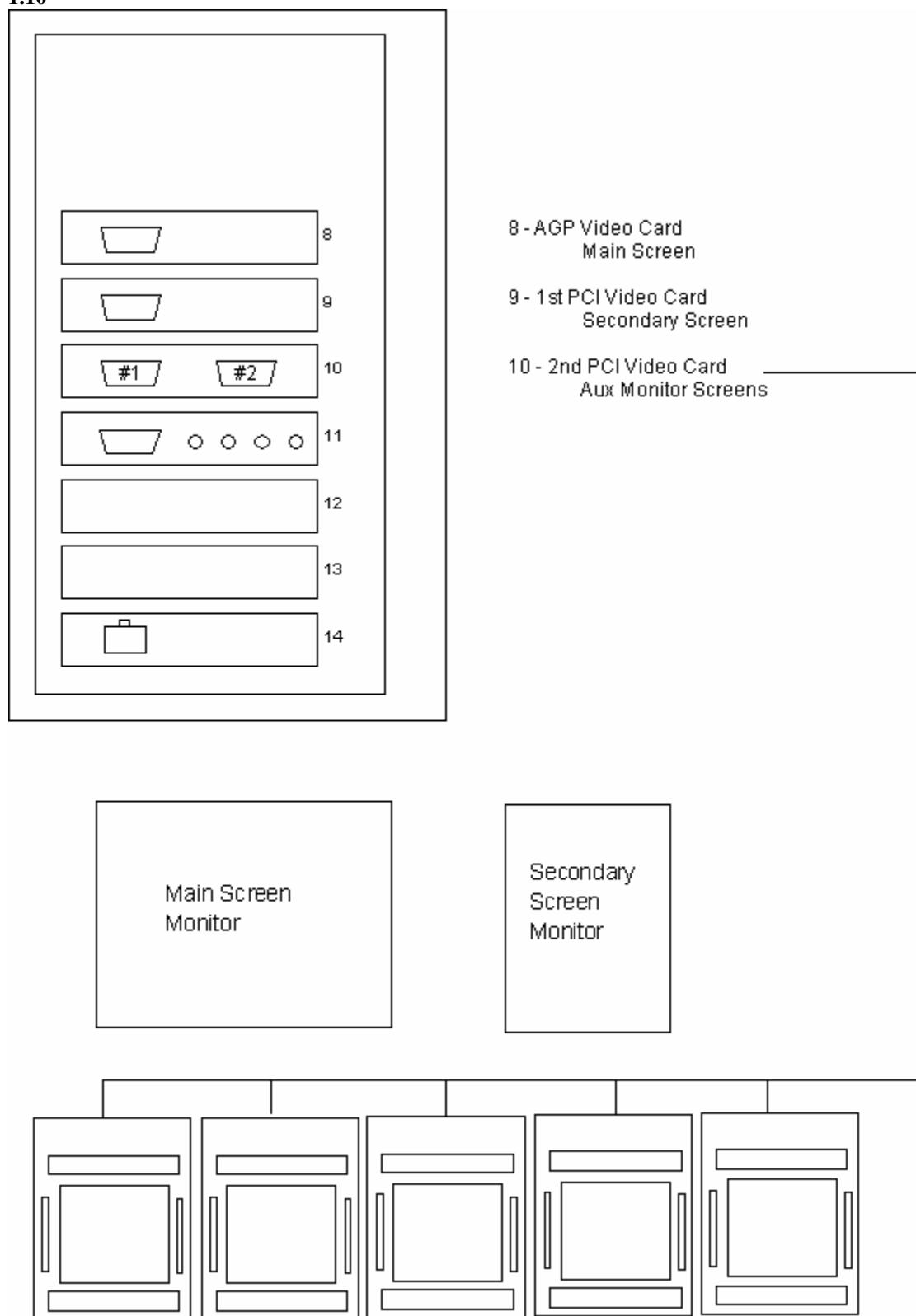
PLASMA DISPLAY

1) Function
2) Testing
3) 12V DC power

Plasma Display

The plasma display is used for identification of the pod for the pilot so that the pilot knows which pod is assigned to him. The plasma display is controlled by the PC through the COM2 serial port. A cable (40-3320-04) to a DB9 connector on the Plasma Display connects this.

Power is supplied to the plasma display by a 4-pin connector from the 12V-power supply.

Testing of the plasma display can be hardware tested by changing a single jumper.

Hardware Test:

Hardware tests can be accomplished by moving the jumper on the back of the plasma display from position 2 to position 6. This will run a diagnostic mode on the display. You should see lines move from left to right, top to bottom, fill screen, clear screen, etc. Remember to move the jumper back to position 2 when you are finished.

TESLA COILS

1) 110V AC powers the lights

The Tesla coils should light up whenever power is on. Ensure all bulbs in both top and bottom Tesla coils are lighting.

Top Coils:
>	8" Circle Bulb 22 Watt (Can be found in most hardware stores under light or bathroom fixtures)

Bottom Coil:
>	Fluorescent Bulb 18 Watt. (Can be found in most hardware stores under light fixtures. Coil tube is permissible)

Caution: For replacement, use fluorescent bulbs ONLY!!! Other incandescent bulbs give off more heat and may cause the interior gels of the Tesla coil to melt or even catch on fire.

```
+-----------+
| 110 VAC   |----------------------+
|           |----------+           |
+-----------+          |           |
                       |           |
              +--------|------+    |
              |    +---+---+   |    |
              |    | Bulb  |   |    |
              |    +-------+   |    |
              |  Lower Tesla   |    |
              +----------------+    |
              +----------------+    |
              |  +----------+  |    |
              |  | Ballast 1|--|----+
              |  +----------+  |    |
              |  +----------+  |    |
              |  | Ballast 2|--|----+
              |  +----------+  |
              |  Upper Tesla   |
              +----------------+
```

Diagram 1.12

20
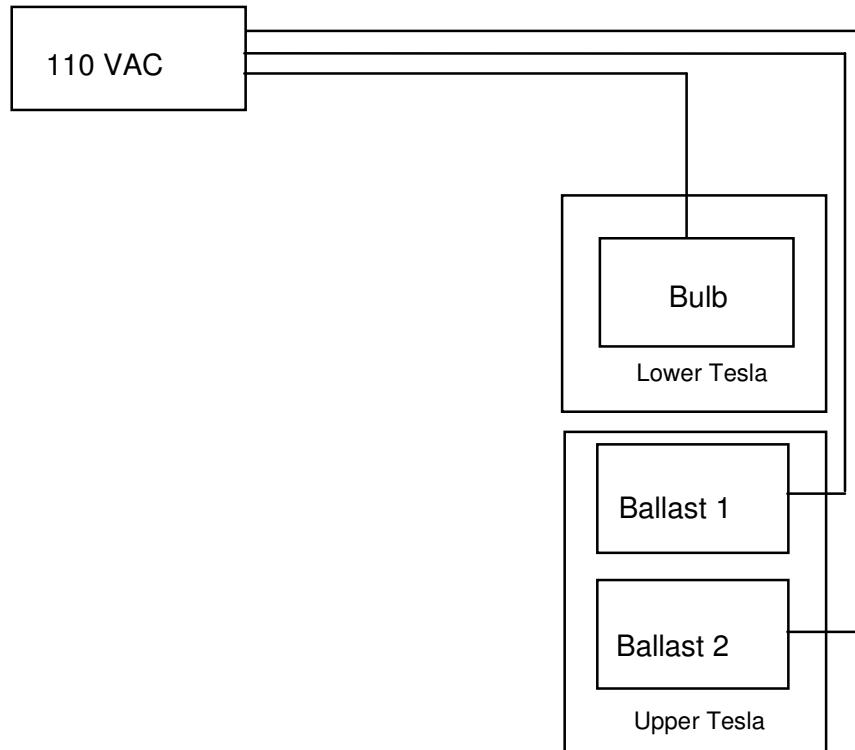
PC

1) Configuration of cockpit PC
2) Memory: 256 Meg
3) Boards:
    ♦ AGP Video Card
    ♦ 2 PCI Video Cards
    ♦ Sound Card
    ♦ Ethernet PCI Card

PC

Description

The PC contains all of the software and interfaces with all the subsystems of the pod.

The layout of the Game PC is shown in the figure below. The Main Screen is driven off of the AGP Card located inside the PC (Position 8). The Secondary Screen is driven off of the 1st PCI Video board (Position 9) and Aux. Monitors are driven off of the 2nd PCI Video Board (Position 10). The 5 Aux. Monitors are connected to a DB25 pin connector that is connected to the 2nd PCI Video Card thru a cable adaptor.

The Sound System is driven off of the Sound Blaster Live sound card located also in the PC (Position 11). The cables to the Quad Amp Board come from the ports of the Sound card (Green = Front, Black = Rear).

The Remote I/O board is connected to the PC through COM1.

The Plasma Display is connected to the PC through COM2.

Power to the PC is connect to the Power Distribution box through a universal power cord commonly used by most computers.

The Ethernet network is connected to each Pod at the Ethernet Card (Position 14)

Rear View of PC

1

2   3

4

5

8

9

#1   #2   10

11

12

13

14

1 - AC Power Plug

2 - Keyboard Connector

3 - Mouse Connector

4 - Com 1 - Remote I/O Baord

5 - Com 2 - Plasma Display

8 - AGP Video Card
        Main Screen

9 - 1st PCI Video Card
            Secondary Screen

10 - 2nd PCI Video Card
            Aux. Monitor Screens

11 - Sound Blaster Live Card

12 - Blank

13 - Blank

14 - Ethernet Card
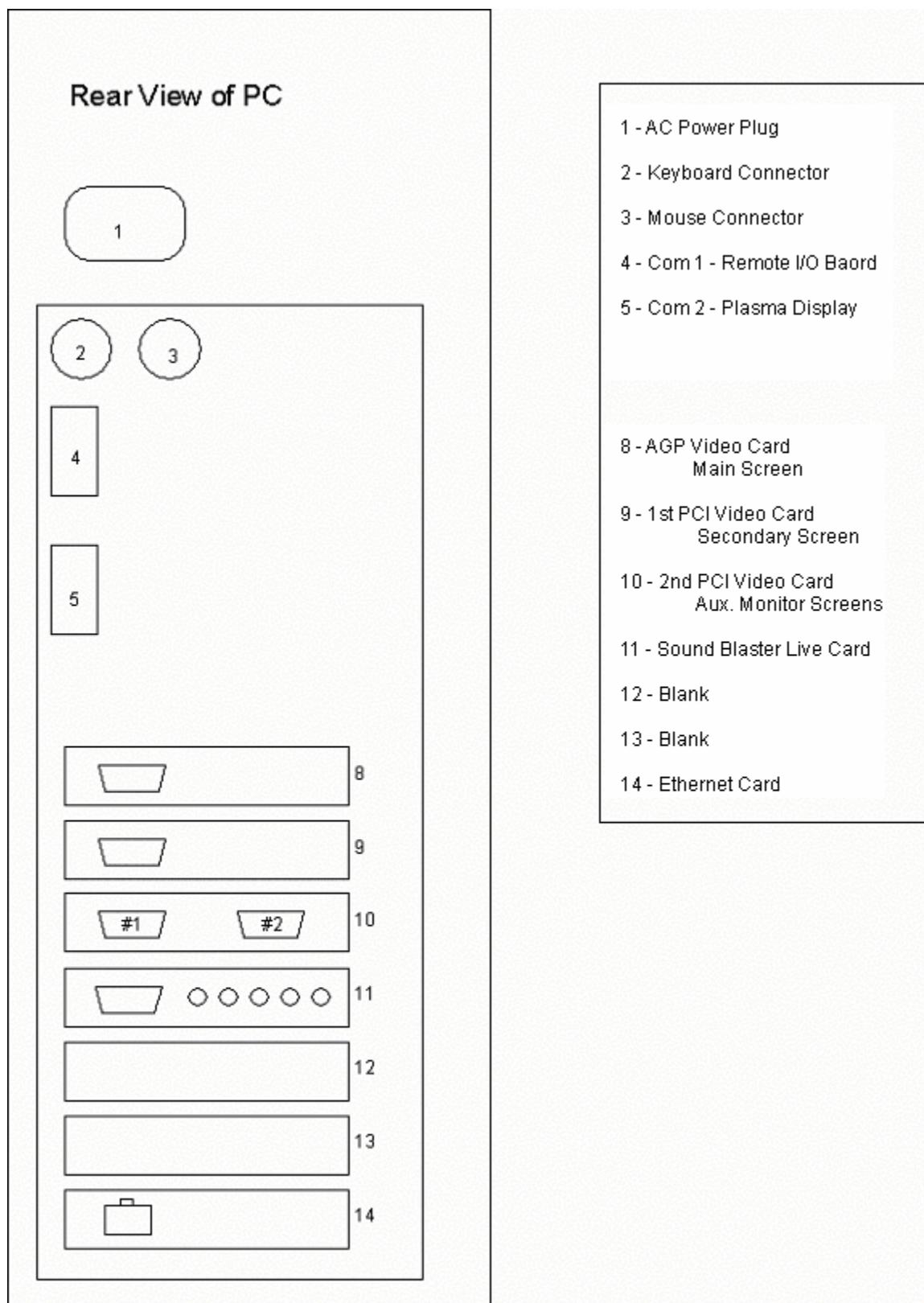
Diagram 2.3

The expansion slots are utilized extensively for Tesla. Two types of expansion slots are used for the added Tesla features. The first type of slot is an AGP slot.   This particular PC has 1 AGP slot. The other type of expansion slot is a PCI slot. Six PCI slots exist in the current PC. The main reason to identify the slots in this PC is to better identify the boards, which are plugged into the expansion slots.

AGP Boards

In the AGP slot is 1 Video Card. This card will not fit in any other slot, so it is hard to get it mixed up with the other video cards. This slot drives the video for the Main Screen monitor.

PCI Expansion Slots

Although six PCI slots exist, Tesla currently utilizes four slots. The 2 PCI Video Cards, Sound Card, and the Ethernet Card are plugged into the PCI slots.

Ethernet Card

The Ethernet card is the interface device used for the Game PC to communicate with the other PC's and the console on the network.

This card is located in slot 14 of the Game PC. The Ethernet addressing is software set so there is no need for jumper changes or hardware reconfiguration.

Other than installing the Ethernet Card into the PC there is nothing more that has to be done when dealing with the hardware issues and installation of the Ethernet Card.

Anything else dealing with Ethernet network issues will most likely be found to be cabling or Software issues.

VIDEO CARDS

1) Location
2) Connectors

AGP Card

The AGP card is in the top most slot of the PC. The video card for this slot will not fit in any other slot, so it will be hard to misplace. When installing this card, be sure it is firmly seated. There may be a locking mechanism toward the back of the slot. It may be a slide lock or a tab. Be sure to unlock/lock this tab when installing or removing the card. This card connects to the Main Screen.

1st PCI Card

The 1st PCI Video card is in the top most PCI slot of the PC. This PCI Video card should only have one (1) 15-pin Connector on it. This video card drives the video for the Secondary Screen. There are no locking mechanisms for PCI cards, so be sure that it is firmly seated and secured properly.

2nd PCI Card

The 2nd PCI Video card is in the next slot below the 1st PCI Video Card. It will have two (2) 15-pin connector's on it. This video card drives the Aux. Monitors.

You will have an adaptor (25 pin connector to two (2) 15 pin connectors) that connects between the video card and the 25 pin Aux. Cable that leads to the 5 MFD's in the Cockpit. The adaptor cable will have a 15-pin connector that is labeled "#1" and a 15-pin connector that is labeled "#2".

The connector labeled "#1" will connect to the top 15 pin header on the video card. The top of the card is the furthest from the motherboard of the PC.

The connector labeled "#2" will connect to the bottom 15 pin header on the video card. The bottom of the card is the closest to the motherboard of the PC.

SOUND CARD

1) Location
2) Jacks

Sound System

The sound system includes the following: 1 Sound Blaster Live Card, Amp Board, 4 Tweeter Speakers, 4 Mid-Range Speakers, and 4 Woofer Speakers.

The Sound Card is located in the bottom or last slot of the PC. The card handles the front and rear sound for the cockpits.

The Amp board takes the output from the sound card and amplifies the signal. It then takes the signal and sends it to one of four three-way crossovers that splits the signal from the Amplifier into three separate signals for the Tweeter, Mid-Range, and Woofers.

The amplifier that is mounted on the sound amp board has a set of four RCA jacks for the inputs. As the quad amp board is mounted, the bottom set of jack inputs receive signal from the Black port of the sound card in the PC. Red goes to red and white goes to white. The same is true for the top set of jack inputs on the amplifier. The top set of jack inputs receive signal from the Green port of the sound card in the PC.

ETHERNET CARD

1) Location
2) Jacks

Ethernet Card

The Ethernet Card is located in the last PCI slot or the slot at the bottom of the PC when standing up.

There are no dip switches or any other jumpers for this card.

Just make sure it is firmly in the PCI slot and secured by the chassis screw.

The will only be one jack for the Ethernet cable (Refer to Ethernet Network).

ETHERNET NETWORK

1) Ethernet
   a) Cabling
   b) Common termination point
   c) Termination
   d) Relevant PC hardware
   e) Block diagram

Cabling

Category V, 10BaseT UTP preferably plenum rated.

Common termination point

  Ethernet: Hub

Termination

  Ethernet: RJ45 eight pin modular plug
         pinouts:
         White/Orange Pin 1   (4 wires
         *Orange/White Pin 2   primarily
         *White/Green Pin 3   used for
          Blue/White Pin 4   Ethernet)
          White/Blue Pin 5
         *Green/White Pin 6
          White/Brown Pin 7
          Brown/White Pin 8

Relevant PC hardware

Network Interface Card (NIC)

Other relevant hardware

Packet switcher for multiple sets

Network Hub Cat 5

Tech PC

Console

Review

Laser Writer
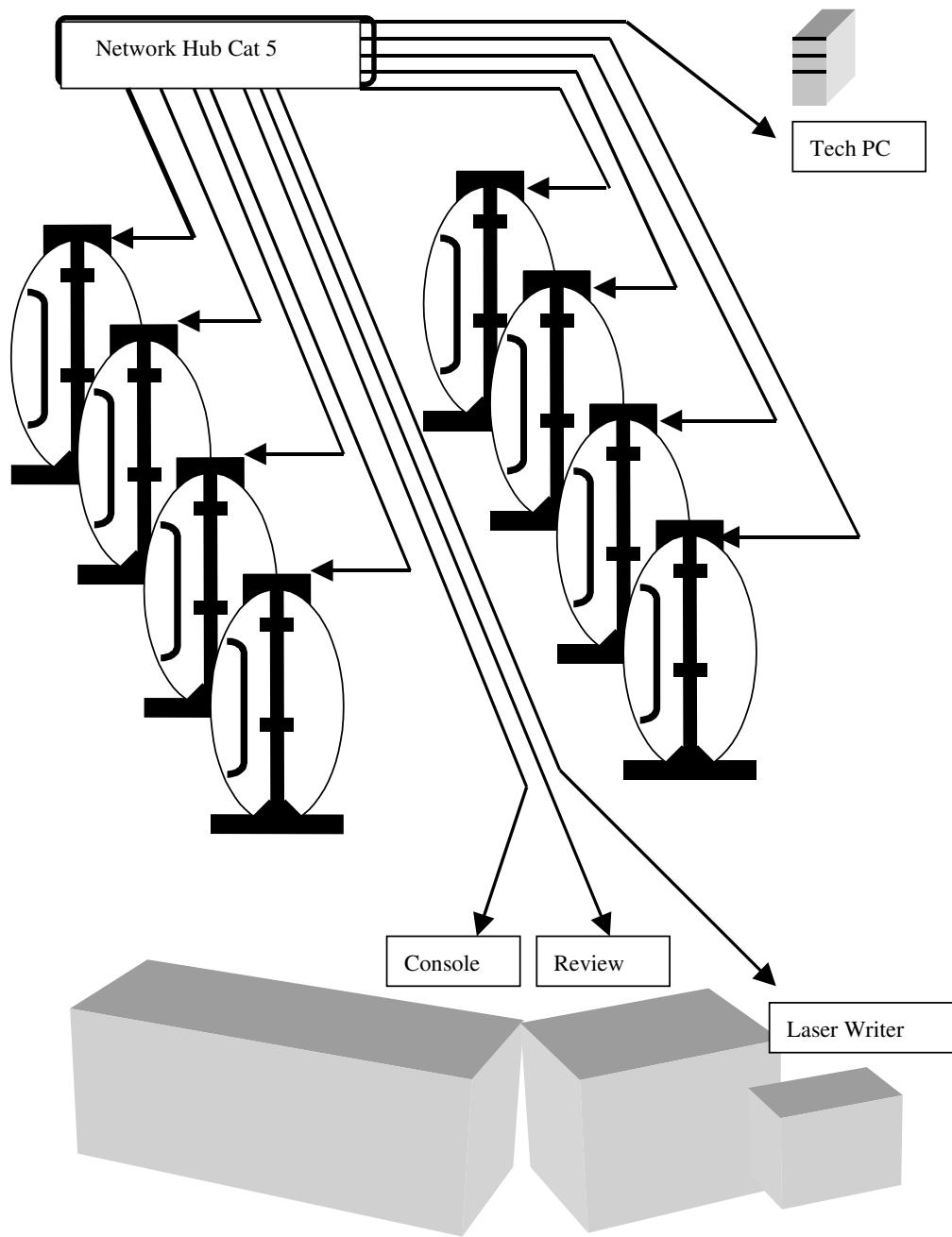
**Diagram 3.1**

MAINTENANCE AND DIAGNOSTICS

1) Introduce maintenance 5.0 checklist
2) Maintenance schedule
   a) Weekly
      1) A9E
      2) Sound
      3) Monitors
      4) Cockpit airflow
   c) Monthly
      1) PC airflow
      2) Check optics clean when necessary
      3) Dust cockpit interiors and blow out closet dust.

   d) Bi- Monthly
      1) File Inventory Sheet with Site Technical Support
      2) Lubricate door rails

Introduce maintenance 5.0 checklist

The Tesla II VR4 system is a complex assortment of computers, networking and electronics. With a system of this type, it is important to test the equipment on a regular basis as part of the routine operations. By testing the equipment regularly, unnecessary crashes can be avoided and necessary repairs can be handled more efficiently. For this purpose, we are able to supply our 5.0 checklist in an Excel format.

Maintenance schedule

Weekly

A9E
The A9E test is the most basic of the diagnostic testing. The purpose of the A9E Test is to verify that all of the components controlled by the RIO board are functioning properly. VWE recommends that the A9E Test be run weekly because of the complexity of the Tesla VR4 system.

Sound
Sound is very important to the entertainment value of the system. It is important to test the sound by playing a game, on a weekly basis.

Weekly

Monitors
The monitors also add substantially to the value of the entertainment of the game. Doing a quick daily inspection of the monitors for scratches, dust, debris, distortion is important.   The adjustments and testing of the monitors will be covered further in the VGL Test Suite section.

Cockpit airflow
Since electronics generally work better at cooler room temperatures, it is recommended that the functionality of the cockpit closet fans are inspected weekly.

Monthly

PC airflow
In order to protect components of the PC, additional fans have been added to the inside of the game PC to improve the airflow. **Warning!** Make sure the PC has appropriate ventilation when placed in any confined space.

Check optics clean when necessary
It is not uncommon for the primary monitor and associated optics (beam splitter, mirror) to become dirty and dusty. This might be noticed during the daily checks. A section for cleaning the monitor, mirror and beam splitter will be covered further in another section.

Dust cockpit interiors and blow out closet dust.
For the sake of keeping the interior of the cockpit clean and keeping the integrity of the electronic components inside the cockpit closet to its highest level, it is necessary to dust the interior, and blow out the closet on a regular basis.

Bi-Monthly

Lubricate door rails
To extend the life of the door slide rails, and to insure ease of operation for the customer, it is necessary to lubricate the door slide rails at least once every two months. This can be done with a silicon spray, and than wiped down so the silicon does not attract dust and buildup.

File Site Inventory
A full site inventory of all VWE related equipment must be filed with Site Technical Support on a bi-montly basis. For your convenience there is an inventory form at the back of this section.

A9E

1) A9E introduction
2) Operation

1. **A9E**
The A9E test is the most basic of the diagnostic testing. The purpose of the A9E Test is to verify that all of the components controlled by the RIO board are functioning properly. VWE recommends that the A9E Test be run weekly because of the complexity of the Tesla II VR4 system.

RUNNING THE A9E TEST

To perform the A9E Test, the cockpit must be on. Once you sit down in the cockpit, you should see an alphanumeric keypad above your head.

Before you start the test, be sure that all cockpit controls, especially the throttle, are in start position. To start the testing, press A9E. The RIO board display, which is located above the overhead auxiliary monitors, should then read F1000000. At this point, hit 0 to reset the optical encoders in the controls of the cockpit. Then hit F to finish the reset function.

Numeric codes are assigned to each cockpit control as follows:

1 - Throttle
2 - Left foot pedal
3 - Right foot pedal
C - Joystick (Vertical)
4 - Joystick (Horizontal)
5 - Push button test
6 - Lamp test (bright)
7 - Lamp test (dim)

THROTTLE

To test the throttle, select 1 on the keypad. The display should now read 01000000. Push the throttle forward as far as it will go. As you are pushing the throttle forward, the RIO display board should be scrolling through numbers. When the throttle is all the way forward, the display will read 0100FC90 (Each cockpit part may vary in elasticity and range, so these numbers could be slightly higher or slightly lower based on the hexadecimal chart in the appendix.).

Return the throttle to its original position, and hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

LEFT FOOT PEDAL

For the left foot pedal, select 2 on the keypad. The display should now read 02000000. Push the left foot pedal down as far as it will go. As you are pushing the left foot pedal down, the RIO display board should be scrolling through numbers. When the left foot pedal is all the way to the floor, the display will read 02000200 (Each cockpit part may vary in elasticity and range, so these numbers could be slightly higher or slightly lower based on the hexadecimal chart in the appendix.).

Return the left foot pedal to its original position, and hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

RIGHT FOOT PEDAL

To test the right foot pedal, select 3 on the keypad. The display should now read 03000000. Push the right foot pedal down as far as it will go. As you are pushing the right foot pedal down, the RIO display board should be scrolling through numbers. When the right foot pedal is all the way to the floor, the display will read 03000200 (Each cockpit part may vary in elasticity and range, so these numbers could be slightly higher or slightly lower based on the hexadecimal chart)

Return the right foot pedal to its original position, and hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

JOYSTICK (VERTICAL)

Select C on the keypad to test the vertical controls on the joystick. The display should now read 0C000000. Push the joystick as far forward as possible. As you are pushing the joystick forward the RIO display board should be scrolling through numbers. When the joystick is all the way forward, the display will read 0C00FFA0 (Each cockpit part may vary in elasticity and range, so these numbers could be slightly higher or slightly lower based on the hexadecimal chart in the appendix.). Then pull the joystick all the way back. When the joystick is as far back as possible, the RIO board display will read 0C000060.

Return the joystick to its original position, and hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

JOYSTICK (HORIZONTAL)

To test the vertical controls on the joystick, select 4 on the keypad. The display should now read 04000000. Push the joystick as far to the right as possible. As

you are pushing the joystick to the right, the RIO display board should be scrolling through numbers. When the joystick is all the way right, the display will read 0400FFA0 (Each cockpit part may vary in elasticity and range, so these numbers could be slightly higher or slightly lower based on the hexadecimal chart in the appendix.). Now push the joystick all the way to the left. The display board will read 04000060.

Return the joystick to its original position, and hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

PUSH BUTTON TEST

To test the buttons surrounding the secondary and auxiliary monitors, select 5 on the keypad. The display should now read 05000000. You must push each button surrounding the secondary and auxiliary monitors one at a time. Do not forget to test the joystick triggers, throttle button, foot pedals and panic button. As the diagram below illustrates, each button has a specific address assigned to it. As you push each button, the RIO board display should flash the number assigned to the button being pushed. For example, when you push button 10, the display should read 05000010. When the button is pushed, it illuminates brightly. When lit and pushed again, the button will go to a dim state.

When you have checked all the buttons, hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

LAMP TEST (BRIGHT)

To test the brightness of the lights, select 6 on the keypad. The display should now read 06000003. Now all of the buttons around the secondary monitor, the auxiliary monitors and the panic button should be lit up brightly. The Tesla coils should also be lit during this test.

When you have checked all the lights hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

LAMP TEST (DIM)

To test the brightness of the lights, select 7 on the keypad. The display should now read 06000001. Now all of the buttons around the secondary monitor, the auxiliary monitors and the panic button should be dimly lit.

When you have checked all the lights hit F on the keypad to signal that you are finished with that test. The RIO display should again read F1000000.

COMPLETING THE A9E TEST

Once you have completed all of the diagnostic tests, press D on the keypad to signal that you are done. If everything is working properly on the RIO board, the

display will read F0000000. If errors occur which do not allow the CPU and RIO board to communicate, the display will read E000….   When this happens, reset the RIO board in the closet. If the error message persists, please refer to the A9E troubleshooting section.

A1

2F   2E   2D   2C

2B   2A   29   28

A0

27   26   25   24

23   22   21   20

A2

37   36   35   34

33   32   31   30

A0

0F   0E   0D   0C

0B   0A   09   08

A0   A1
10   18
11   19
12   1A
13   1B
14   1C
15   1D

A0

07   06   05   04

03   02   01   00

3F

J3

A0

42
47   44   43
41

46   40

45   A0
              40=J10

              47=J3
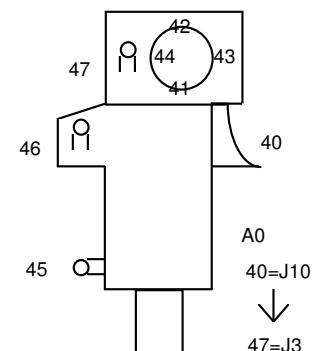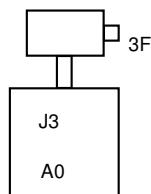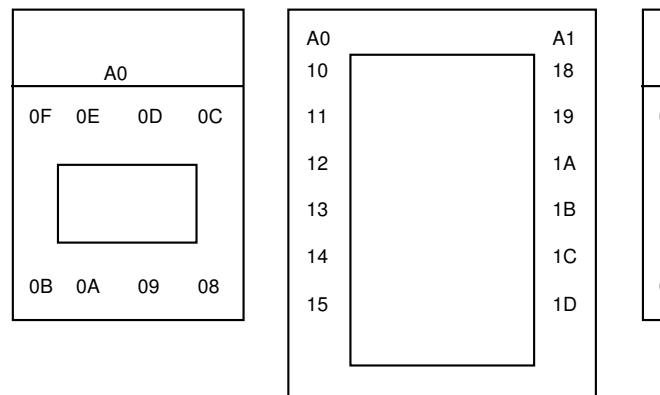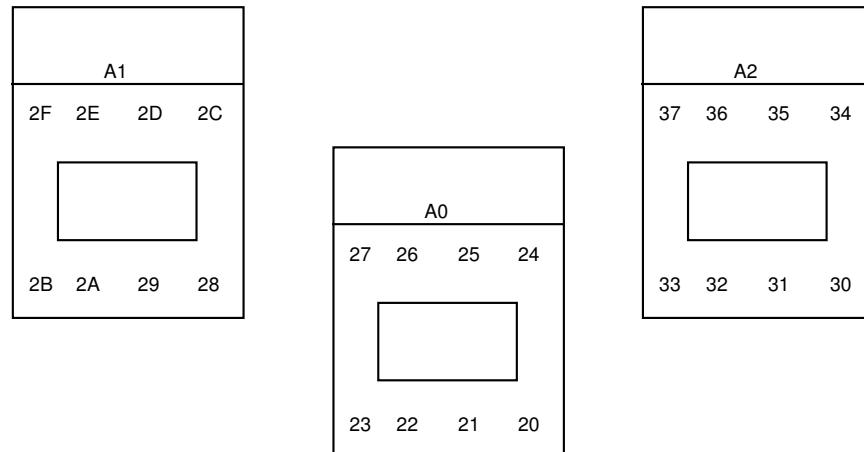
Diagram 6.1

AX=Button Board Address
JX = 4 pin connector on Button Board

CLEANING OPTICS SYSTEM

1) Define optics and how they work
2) Process of cleaning

DRY WIPING THE BEAM SPLITTER

The optics system used in Tesla II VR4 has one other piece of equipment that cannot be tested electronically, and that is the beam splitter.

The beam splitter is the piece of glass that separates the player from the main screen picture. Although it does not happen often, occasionally the glass or the mirror behind it will attract a piece of dust or some other particle, which interferes with the game images. Since monitors are known to attract a lot of dust, it is recommended that the beam splitter is cleaned once a month. Again, not all pods have to be done on the same day as long as they are each cleaned once a month.

To clean the beam splitter, you have to get "behind the scenes." First take off the Plastic cover over the side panel. Next you have to remove the side panel which holds the beam splitter in place. This can be tricky because this is not a full-length panel.

Warning! Use caution when removing the side panel to clean the beam splitter. Be careful not to drop this piece.) It is easier to remove the screws from the bottom first, and then work your way to the top. To prevent injury, be sure to secure the panel as you remove the screws.

Once you have access to the beam splitter, with a lint free cloth dry wipe the beam splitter using gentle, circular motions. The glass is coated with a layer of oil. Cleaning solutions and abrasive motions can scratch the beam splitter.

Warning! Do not use any chemicals or solutions to clean the beam splitter. Distilled water can be used but only if applied to the cloth and not directly to the beam splitter.

Tip: Run a BattleTech game before cleaning. The bright blue sky allows you to view if the beam splitter is clean.

Since the optics panel is open, it is also recommended that you clean the main monitor and the concave mirror. Dampen a cloth with window cleaner and wipe the monitor and mirror.

Warning! Do not pour or spray cleaning solution inside the optics panel because you might get solution on the beam splitter.

Tip: It is a good idea to use two clothes for cleaning the optics system. One with no chemicals for the beam splitter, and one which you use with the cleaning

solution for the monitor and mirror. This way the towels can be used to clean multiple cockpits.

When replacing the wood panel, be careful not to slam the panel against the pod, or you will spread dust all over again. Gently lift the panel into place while supporting it with your knee. When putting the back, replace the screws from the top, center of the panel first and then work your way down. Remember to put the front plastic panel back in place when you are finished.

RMA REQUEST PROCEDURES

VIRTUAL WORLD

Site Technical Support
Phone: 312-470-8530 x871
Fax: 312-470-8545
E-mail: aemerson@virtualworld.com

   In the event that an item, during the normal operation of the center, should fail, it is the responsibility of the Site Technician to correct the problem. The VWE Support teams responsibility is to provide solutions, advice, software and hardware upgrades, parts and expertise for Site Technicians in the capacity to sustain the normal operations of the Virtual World Equipment. VWE Site Technical Support acts as a consultant, trainer, and supplier to the Site Technicians. One of the tools that Support uses to help accomplish this is the **RMA** system.

The **Return Material Authorization** system has been developed to help streamline service and support. Used properly, it will also provide a valuable trail for tracking inventory and logging certain part failures. The following text outlines the sequence of events that should take place upon the failure of a component, which is beyond the capacity of the local Site Technician to solve.

A) *Component Failure in Field*

   A failure requiring an **RMA** is described as any situation in which a component or sub-components becomes defective to a point that is beyond the capacity of the Site Technician to repair due to either lack of replacement parts or expertise.

   A component is defined as a part or sub-part of any cockpit, computer, or Other equipment vital to the normal operation of the Site that is not developed by a third party.

   Third party components are items that have been purchased by VWE through a vender that distributes brand name merchandise. These would include such items as computers, laser disc players, and TV's, etc. Third party components carry their own manufacturers' warranty and need to be repaired locally through their own authorized dealer if possible. It is sometimes possible for VWE to have spare third party components to loan out to centers. Call VWE Tech Support to
check on availability. Additionally, VWE will have invoices for most purchased third party items and can provide copies of these to verify warranted repairs.

B) *Site Technician Sends RMA Request.*

Upon component failure the Site Technician should contact Site Technical Support and request a **RMA** number. The request must contain the date, store number, Technician name, part description, part number if known, urgency of shipping, serial number (if applicable), and detailed description of the part failure. The **RMA** request can be submitted to Site Technical Support in any of the following three ways:

1. Via Internet E-mail — aemerson@virtualworld.com

2. Via Fax — 312-470-8545

3. Via Phone — 312-470-8530 x269

More detailed instructions on the above choices for submission, will be covered following the **RMA** procedure outline.

C) *Support Reviews RMA Request*

A designated support Technician will review the **RMA** request and react in one of two ways.

1) Offers practical solution

If after viewing the **RMA** request, the support Technician is unsure of the most practical solution to subscribe; he/she will consult the other support Technicians. If a solution is found which involves only offering directions/instruction, then Support will call and relay their findings. Otherwise, an **RMA** number will be issued and the item in question will need to be returned. The number will be issued as follows.

2) Issue's RMA number.

When a practical solution cannot be reached among all Technicians involved, the Support Technician will need to issue a **RMA** number.

The **RMA** number given out by the Support Technician consists of eleven digits. As in the example below, the first three digits represent the store number. The next six represent the date of issuance of the **RMA** number. The date format is as follows: (yy/mm/dd.) Finally the last two digits represent each actual item that was issued an **RMA** number that day for that Site. As an example, "0,1" would be given to the first RMA number issued to that store for that day. The digits "12" would represent the twelfth item to be issued an **RMA** number for that

Site that day.

The second RMA number issued on March 12, 1994 for store number 005 would look like the following:

(A)-(B)(C)(D)-(E)
005-940312-02

A. Store (Site) number
B. Year
C. Month
D. Day
E. RMA issuance number per store per day

D) Support opens Contact Report and if necessary issues RMA's

A Contact is opened in the Site Technical Support Database and issues relating to the problem are recorded. If necessary **RMAa** are opened under this contact and can be tracked by either the **RMA** number or the Contact Number.

E) Returns RMA with assigned number, resolution and shipping information

Once the **RMA** number has been determined, the number and resolution will be forwarded to the Site Technician. This notification will take the form of either Internet E-mail or fax. Information to be contained on this returned **RMA** would include whether it was replaced or repaired, who the support Technician was, the date of action, and a description of the action taken or other notes.

F) Site Technician receives RMA, prints it, Attaches to Damaged/Defective Goods and ships it to VWE Technical Support.

1) RMA

When a defective item arrives at VWE Technical Support from one of the centers, it is important to know where the item came from, which Technician shipped it, and what its malfunction is. Just out of the box, all joysticks look alike. For this reason, it is imperative that a copy of the **RMA** form that was sent to you by Site Technical Support is shipped along with the item in question. This will provide all of the information that is required by Site Technical Support for identifying the item.

2) Packing Slips

Likewise to the above, proper packing slips should be included in the

shipping container to insure accurate receipt of all quantities of returned goods. A sample packing slip can be found in the appendix.

3) <u>Shipping</u>

Return shipping instructions will be determined by Site Technical Support and the **RMA** that the Site Technician has received will show routing for return of defective/damaged equipment. It is more crucial for some parts to be turned over quicker than others. For example, a shortage of CPU boards might require fixing the defective board from the Site and sending it back. In this case it should be shipped from the center "Next Day Air."

G) <u>Site Technical Support receives DG with RMA printout</u>

Again, since the item received from a Site has the **RMA** print out attached to it, it can immediately be identified by Site, Date, Item, Failure, and the Site Technician.

If the proper packing list is enclosed, the Support Technician will know how many of which items should be expected within that shipment. The packing slip also helps in case of damage/loss of equipment by delivering carrier.

H) <u>Site Technical Support checks off the entrant in the Site Technical Database</u>

As the defective good arrives from the Site, the proper fields in the Site Technical Database are entered to track when the part arrived.

I) <u>Site Technical Support repairs or selects replacement for DG</u>

When the defective good can be easily fixed, Site Technical Support will repair the defective item and ship it back. Otherwise, a suitable replacement will be selected and shipped in its place.

J) <u>Site Technical Support prints & attaches RMA & Packing Slip to new goods</u>

The proper paperwork must accompany the shipment back to the Site so the Site Technician can match the parts back up with the **RMA** on file. The Support Technicians must print the **RMA** from the STS database for each damaged/defective good returned. Also, enclosed in the shipment will be a packing slip created from the STS database with all parts included in the shipment to the center.

<u>SUMMARY OF RMA PROCEEDURE</u>

1) Component Fails.

2) Site Requests **RMA** via Internet E-Mail, Fax or Phone.

3) Site Technical Support opens Contact and if necessary issues **RMA**.

4) Site Technical Support sends back via Internet E-mail or Fax a **RMA** form with assigned number and shipping instructions.

5) Site Technician attaches printout of **RMA** & Packing Slip to defective good.

6) If deemed necessary, the Site ships defective good.

7) Site Technical Support received defective good & evaluates.

8) Site Technical Support ships back repaired or replaced good.

SUBMISSION OF RMA REQUESTS VIA INTERNET E-MAIL, FAX OR PHONE INSTRUCTIONS

In submitting your **RMA** request, there are three choices available, Internet E-mail, fax or by phone. A sample **RMA** form can be found in the appendix. Following are specific instructions for each choice.

1) Via Internet E-mail:

a) The Site Technician must provide the following information in his/her E-mail request; Date of request, Store number, Technicians name, Part number (if known), Part Description, Serial number (if applicable), urgency of shipment, and detailed Failure Description

b) Address the **RMA** form to aemerson@virtualworld.com. Special requests can be made to certain Site Service Engineers, however, the **RMA** process should go to only the aemerson@virtualworld.com. E-mail address. This is to eliminate confusion and/or possible order duplication

c) Upon receipt of **RMA** request, Site Technical Support will follow the **RMA** procedures as stated previously.

d) Site Technical Support will return via E-mail a copy of the **RMA** request with the assigned **RMA** number, shipping instructions, estimated ship date, whether it is to be repaired or replaced, who the support Technician was, Action Date, and a

description of the action taken or other notes back to the Site Technician

e) The Site Technician should save a copy of the returned E-mail **RMA** request for attaching to returned good and for the Sites tracking of returns.

2) <u>VIA FACSIMILE</u>

a) The Site Technician must provide the following information in his/her phone request; Date of request, Store number, Technicians name, Fax number, Part number (if known), Part Description, Serial number (if applicable), urgency of shipment, and detailed Failure Description. A blank RMA request form can be found in the appendix.

b) Upon receipt of **RMA** request, Site Technical Support will follow the **RMA** procedures as stated previously

c) Site Technical Support will return via fax a copy of the **RMA** request with the assigned **RMA** number, shipping instructions, estimated ship date, whether it is to be repaired or replaced, who the support Technician was, Action Date, and a description of the action taken or other notes back to the Site Technician

d) The Site Technician should save a copy of the returned faxed **RMA** request for attaching to returned good and for the Sites tracking of returns

3) Via Phone:

a) The Site Technician must provide the following information in his/her phone request; Date of request, Store number, Technicians name, Fax number, Part number (if known), Part Description, Serial number (if applicable), urgency of shipment, and detailed Failure Description.

b) Upon receipt of **RMA** request, Site Technical Support will follow the **RMA** procedures as stated previously

c) Site Technical Support will return via fax a copy of the **RMA** request form with the assigned **RMA** number, shipping instructions, estimated ship date, whether it is to be repaired or replaced, who the support Technician was, Action Date, and a description of the action taken or other notes back to the Site Technician

d) The Site Technician should save a copy of the returned faxed **RMA** request for attaching to returned good and for the Sites tracking of returns

CONSOLE INSTALLATION

In the event that the console software becomes corrupted, or you need to replace the hard drive, you will need to follow the procedure given below to restore the Console PC to working order.

Required Materials:
1.   Console Installation CD
2.   Game Software CD

This procedure goes thru the following steps:
1. Bios Setup
2. Hard Drive Setup
        a. Step 1 – FDISK
        b. Step 2 – Console Install
3. Win2K Setup
4. Ghost Image installation
5. Game Software installation

BIOS SETUP

When setting up a PC for the first time or after a major hardware modification, it maybe necessary to configure or check the Bios Settings of the computer.

Upon booting you will see an option to hit the 'DEL' key to enter setup.
Hit the 'Delete' key on the keyboard to get to the Bios Settings screens.

You will now need to compare all of the settings in the Bios to the print out provided with the proper settings for the computers that have been provided to you.

Refer to Appendix "Bios Settings"

Be sure that all of the settings are correct.
Be sure to verify all of the sub menu items as well.

Once all of the settings have been verified, Hit 'F10' on the keyboard.
The bios will respond with a Yes/No question to save changes and exit.
Select "Yes" and hit 'Enter' on the keyboard.

NOTE: Now is a good time to insert the Console Installation CD. This way will not need to reboot the PC again in order to start the boot process from the CD.

HARD DRIVE SETUP

With the Console PC powered on, Insert the CD "Console Installation" into CD Drive of Console PC.

Reboot the PC.

The PC will now boot from the CD instead of the hard drive. If this is not the case, verify your settings in the BIOS or Check that your CD drive is installed properly.

Once the PC has completed the boot process from the CD a DOS menu will come up with the following options:

1. FDISK (optional)
2. Console Install

Step 1-FDISK is an optional step. It is preferable to clean all partitions from the hard drive before installing the ghost image, but not necessary since GHOST will overwrite any partitions that currently exist.

Step 2-Console Install is the option to be used for installing the new OS onto the pc.

STEP 1 - FDISK

Select 1-FDISK from the DOS menu.

Select Y for "large disk support"

Select Y for "NTFS partitions treated as large"

Select 4 for "Display Partition information"
- If there are any partitions you will need to delete them, else just esc out of the program and return to the menu selection.

Select 3 for "Delete partition or Logical DOS Drive"

Before being able to delete any partition, it is necessary to delete any drives (C:, D:, etc) that have been formatted within that partition.

Select 3 for "Delete Logical DOS Drive(s)"
      Enter C: for Drive
      Enter the name of the Volume Label
      Enter Y
      Esc to return

Now that the formatted drive has been removed from the partition, we can delete the partition itself.

Select 3 for "Delete partition or Logical DOS Drive"

Select 2 for "Delete Extended DOS Partition"
      Enter Y
      Esc to return
There is now only 1 partition remaining, and because it is a NTFS partition we will have to take an extra step to remove it.

Select 3 for "Delete partition or Logical DOS Drive"

Select 4 for "Delete Non-DOS Partition"
       Enter 1
       Enter Y
       Esc to return

Go back to the Main Menu. Verify that all the partitions have been removed using the Display Partitions command.

We can now exit the FDISK utility by hitting 'Esc' on the keyboard.

There will be a message about being sure to reboot the PC in order for changes to take effect.

Press 'Esc' again to exit FDISK

You should be returned back to the DOS menu.

Leaving the "Console Installation CD" in the drive, REBOOT the PC using the reset button on the front panel of the PC.

STEP 2 – Console Install

After the PC has reboot and restarted off of the CD, the DOS menu will reappear.

We are now ready to install the OS. We will be using the Ghost utility to do this. This utility will basically copy a hard drive image from the CD to the PC's hard drive. Almost like restoring a backup. The following procedure will take you step by step thru the process.

Select the "2 – Console Install" option from the DOS menu.

A message may appear that will give any additional information that may be needed. Read the Message Prompt then hit any key to continue

When the ghost utility starts up you will get an "About Symantec Ghost" screen, hit 'Enter' on the keyboard at the "OK" prompt to bypass this screen.

From the menu on the screen, using the arrow keys on the keyboard, select "Local"

Now using the arrow keys, Select "Disk"

Again, using the arrow keys, Select "From Image" and then hit 'Enter'.

We now need to select the image that we want to have restored to the hard drive.

When the Open Window is up, we will need to move to the "Look in:" section that selects the drive from which to get the image from. You can either hit the 'TAB' key repeated to get to the necessary area or 'ALT+I' to get to the "Look In:" section…

Using the "Down arrow" key, highlight the "g: [Setup] CD Rom drive" and hit 'Enter'.

In the main area of the window you should now see the ghost image file "BTP4.GHO".

Select the "BTP4.GHO" file and hit 'Enter' or 'Tab' to "Open" and hit 'Enter'.

The next window will show the available hard drives. Since there is only one, then it should already be highlighted.

Select Drive 1 and hit 'Enter' or select "ok" and hit 'Enter'.

The next screen is for the individual partitions within the image that will be copied to the hard drive.

You will see the following information:

Part	type	ID	Description	Label	New Size
1	Primary	##	NTFS	DiskLoad	#####
2	Logical##	FAT32	extd	NO NAME	#####

Change the New Size for the Parts as follows:

Part	Type	ID	Description	Label	New Size
1	Primary	##	NTFS	DiskLoad	**5000**
2	Logical##	FAT32	extd	NO NAME	**5000**

You will see the numbers change when you leave the field to 5004, and 5004.
This is OK…

Select "Ok" and hit the "Enter" key

Next will be a dialog box "Proceed with disk load?"
Select "Yes" and "Enter" or type "Y".

You will now see the progress bar fill from left to right.

When it is complete it will ask to either "Continue" or "Reset Computer"…

Select "Reset Computer"

As the computer resets, Remove the CD.

Step 3 - Win2K Setup

This process is mostly automated with a few exceptions. This will walk you thru those exceptions.

Installing Devices

Windows should start to boot-up and will automatically start trying to detect the various hardware components in the PC. This may take a few minutes. Be patient and let it run thru.

Computer Name and Administrator Password

Windows will ask you to Name the PC.

The name should always be the following convention:

Cockpits = "ALPHA#", # = cockpit number ("ALPHA1")
Console = "ALPHA-CON"
Mission Review = "ALPHA-MR"

Using the above examples enter the proper name in the field.

Do not change the Administrator passwords. Leave those fields alone.

Tab down to "Next>" and hit the Spacebar or just hit Enter.

Networking Settings

Arrow down to select "Custom Settings" and hit Enter.

Arrow down the list and select "Internet Protocol (TCP/IP)". Now use the 'Tab' key to select "Properties" and hit the Spacebar.

You will note that the following fields are already filled in:
      IP Address   200.0.0.21
      Sub Net Mask   255.255.255.0

The only field we are concerned with is the IP Address. An IP Address has been preset for each PC in the set. The Prefix is the same for all IP Addresses. (200.0.0.#)

IP Address = PC Name
200.0.0.1 = ALPHA1
200.0.0.2 = ALPHA2
200.0.0.3 = ALPHA3
200.0.0.4 = ALPHA4
200.0.0.5 = ALPHA5
200.0.0.6 = ALPHA6
200.0.0.7 = ALPHA7
200.0.0.8 = ALPHA8
200.0.0.9 = ALPHA-MR (Mission Review)
200.0.0.10 = ALPHA-CON (Console)

Using the Table above select the proper address and enter into the field provided on the screen. Hit Enter when done. Do not change the sub net mask. If any of the PC's have different sub net mask's, they will act as if they are on a separate network and will not communicate with the other PC's.

AppleTalk Setup

We aren't done yet with this screen. You need to setup for the use of an AppleTalk Printer.

Tab to the 'Install' button and hit 'Spacebar'.
Tab to select 'Protocol', then hit 'ALT+A'
Be sure AppleTalk is highlighted then hit 'Enter'

In the list of protocols should now be have AppleTalk listed.

Tab to "Next>" and hit 'Spacebar' or hit 'Enter'.

Workgroup or Computer Domain

Tab to the field with the entry "WORKGROUP" and change this to "TESLA".
Hit 'Enter'.

At this point the computer should finish the Windows installation and proceed to reboot.

Finishing Windows Installation and Username Selection

A screen should come up labeled "Network Identification Wizard" once Windows starts up.

Hit 'Enter'

The next screen "Users of this Computer" is used to setup the startup account for the computer. There are three choices. We will deal with only one of them. "Consoleuser" and "Gameuser".

Shift+Tab to the User Name field and using the arrow keys change this entry to "Consoleuser". Tab down to the first 'Password' field.

Enter the following for the 'Password' field:
"user" (lower case)

Enter the same thing for the 'Confirm Password' field:
"user" (lower case)

Hit 'Enter' when ready
Hit 'Enter' to "Finish" the installation.

<u>Display Settings</u>

Which settings to use for the Video cards will be dependant on what you are setting up (Console PC, Game PC, or Mission Review PC).

Console PC
Video Card #1:   800x600x16

After the PC has rebooted, a command window will open up showing you the proper settings to choose from. Hit 'Enter' to get the 'Display Control Panel' to open for you.

Using 'Shift+Tab' select the tab at the top labeled "Background".
Using the arrow keys, select the tab at the top labeled "Settings".

You will notice that there is one monitors shown in the window. It should default to the following setting:
Video Card #1:   800x600x16

'Display 1'

Verify Screen Area set to "800x600".
Verify Color set to "High Color (16 bit)"

Use 'Alt+A' to apply current settings.
Hit 'Enter' to close control Panel

Finishing Console Installation

To finish the console installation process, there are a couple more steps.

CD Rom Drive Letter

We need to change the CD-ROM Drive letter from E: to R:

You will need to have administrator access to do this.

From the "Start Menu", select "Log Off consoleuser"
        "Are you sure you want to log off?"
        Hit Enter for "Yes"

At the Login Window:

"User name:"
        Enter "administrator"
"Password:"
        Enter the correct password, or have your supervisor do it for you.

NOTE: This document will not contain the admin password. Please contact your supervisor for the password or contact the VWE Support Staff.

From the "Start Menu", select the following:
        Programs
                Administrative Tools
                        Computer Management

Click on "Disk Management"
        Right Click (with mouse) on the CD-Rom in the right lower window.
        Select "Change Drive Letter and Path…"
        Highlight the drive and Click on "Edit…"
        Change the assigned drive letter from "E:" to "R:"
        Click on "OK"
        Click on "Close"
        Close the "Computer Management Window"

Do not Log Off yet. We will need to setup the Printer Next.

Printer

From the "Start Menu", select the following:
        Settings
                Printers

Double Click on "Add Printer"
>   This will start the "Add Printer Wizard"

Click on "Next>"

Now things get interesting…

Select "Local Printer"
>   Click on "Next>"
>   IF the computer does not detect a printer you will get a message.
>   Click on "Next>"

AppleTalk Printer (Apple or JetDirect)
>   Be sure your Printer is connected to the network and is turned ON.
>
>   We will need to create an AppleTalk port.
>   Click the "dot" in front of "Create a new port".
>   Select "AppleTalk Printing Devices" in the pull down menu.
>   Click on "Next>"
>
>   The computer will start searching for available AppleTalk printers.
>   Select the Printer in the window and then Click on "OK"
>   You may have to specify the type of Printer you're using.
>   Use the two columns "Manufacturers" and "Printers" to select your printer
>   model.
>   Click on "Next>" when ready
>
>   Now give your printer a name.
>   I would recommend just using the default given.
>   Click on "Next>"
>
>   Set to "Do not share this printer"
>   Click on "Next>"
>
>   "Do you want to print a test page?"
>   Set to "Yes"
>   Click on "Next>"
>
>   Click on "Finish"
>
>   It will now ask if you got the test page.
>   If so then Click on "OK"
>   Close the "Printers" Window
>
>   Shut down the computer and Restart

TCP/IP Printer (Non AppleTalk or IP Assigned Printer)
>   Be sure your Printer is connected to the network and is turned ON.
>
>   We will need to create an TCP/IP Printer port.

Click the "dot" in front of "Create a new port".
Select "Standard TCP/IP Port" in the pull down menu.
Click on "Next>"

A new Wizard will start up.
Click on "Next>"

> **Printer settings**
> You should be able to access and/or set the IP Address of the
> printer thru the printers control panel. This may differ from printer
> to printer. If you have to set the IP address, be sure to use
> "200.0.0.#" as the prefix, and don't use a number that may conflict
> with a Game PC. Be safe and use something in the 100's (ex. IP
> address 200.0.0.100).
> Some Printers will allow you to set subnet mask, and require a
> gateway as well.
> > Subnet Mask = 255.255.255.0
> > Gateway = 0.0.0.0 (Currently)

Enter the IP Address of the Printer in the "Printer Name or IP Address"
field.

Don't change the "Port Name", use what has been given when you typed
in the IP Address.

The computer will start searching for the printer.
You may have to specify the type of Printer your using.
Use the two column "Manufacturers" and "Printers" to select your printer
model.
Click on "Next>" when ready

Now give your printer a name.
I would recommend just using the default given.
Click on "Next>"

Set to "Do not share this printer"
Click on "Next>"

"Do you want to print a test page?"
Set to "Yes"
Click on "Next>"

Click on "Finish"

It will now ask if you got the test page.
If so then Click on "OK"
Close the "Printers" Window

Shut down the computer and Restart

Step 4 - Ghost Image

The image that the Game PC will need to be setup from is stored on the Console PC.

Boot the PC till you're at the Windows Desktop.

Insert the "Console Installation" CD into the drive.

A menu will appear with an installation option.

Select the option to install the software.

It will take 3-5 min so don't interrupt it until you get a message indicating that the installation is complete.

Exit the DOS Menu using the correct option.

Remove the CD. Please store this in a safe location.

NOTE: It is a good idea to verify that a ####.GHO file has been transferred to the following location:
          D:\IMAGE\

Step 5 - Game Software

The game software is installed from the "Game Software" CD.

Insert the "Game Software" CD into the CD Drive.

A menu will appear with an installation option.

Select the option to install the software.

It will take 3-5 min so don't interrupt it until you get a message indicating that the installation is complete.

Exit the DOS Menu using the correct option.

Remove the CD. Please store this in a safe location.

Using the Start Menu, Shut down the computer and Restart.

The Computer should automatically start up the print software and the console software needed in order to run your set.

GAME PC INSTALLATION

        In the event that a game pc's software becomes corrupted, or you need to replace the hard drive, you will need to follow the procedures given below to restore the Game PC to working order.

        Required Materials:
1.   "Hard Drive Setup" Floppy
2.   "Network Boot" Floppy
3.   "Ghost Installation" Floppy
4.   Console PC up and running on the Network

This procedure goes thru the following steps:
1. Console PC
2. Hard Drive Setup
     a. FDISK
3. Win2K Setup

Step 1 – Console PC

Boot Console PC and be sure it is up and running on the network before starting the Game PC installation procedure.

Step 2 – Hard Drive Setup

Insert Floppy "Hard Drive Setup" into the Floppy Drive of the Game PC.

Turn on or Reboot the Game PC

Once the PC has completed the boot process from the Floppy a DOS menu will come up with the following options:

1. "F - FDISK Hard Drive"
2. "D - Edit to Dos Prompt"

Step 1-FDISK is a required step for new hard drives. It is preferable to clean all partitions from the hard drive before installation of the ghost image, but not necessary since GHOST will overwrite any partitions that currently exist.

Select "F - FDISK Hard Drive" from menu

        Select Y for "large disk support"

        Select Y for "NTFS partitions treated as large"

        Select 4 for "Display Partition information"
- IF you are installing a **NEW** (just installed, never used before) hard drive, you must first make an active partition and then follow thru the deletion procedure.

Select 1 for "Create DOS partition or Logical DOS Drive"
Select 1 for "Create Primary DOS Partition"
   Enter "N" for "use maximum available size"
   Enter "**5000**" for "Partition size"
   Esc to return
Select 2 for "Set Active Partition"
   Enter "1" for the Partition to make active
   Esc to return

- IF there are any partitions you will need to delete them, else just esc out of the program and return to the menu selection.

Select 3 for "Delete partition or Logical DOS Drive"

Select 3 for "Delete Logical DOS Drive(s)"
  Enter C: for Drive
  Enter the name of the Volume Label
  Enter 'Y'
  'Esc' to return

Select 3 for "Delete partition or Logical DOS Drive"

Select 2 for "Delete Extended DOS Partition"
  Enter 'Y'
  'Esc' to return

Select 3 for "Delete partition or Logical DOS Drive"

Select 4 for "Delete Non-DOS Partition"
  Enter '1'
  Enter 'Y'
  'Esc' to return.

Esc to exit FDISK.

Esc to exit FDISK again.

You should be back to DOS and will have a message stating to remove the Floppy and Reboot the PC.

Remove the "Hard Drive Setup" Floppy from the Drive.

Insert "Network Boot" Floppy into the A: Drive of Game PC

Reboot the Game PC, either using "CTRL + ALT + DEL" or using the reset button on the front of the PC.

The disk will start loading network drivers necessary for communication with the Console PC.

When Asked:
"Type your user ID, or press ENTER if it is GAMEUSER:"

Hit the 'Enter' key.

When Asked:
"Type your domain password:"
Type "user" (lowercase) and hit 'Enter'.

When all the commands have been completed. The disk will request that you insert the "Ghost Installation" disk and type "GHOST" at the prompt.

When the ghost utility starts up you will get an "About Symantec Ghost" screen, hit 'Enter' on the keyboard at the "OK" prompt to bypass this screen.

From the menu on the screen, using the arrow keys on the keyboard, select "Local"

Now using the arrow keys, Select "Partition"

Again, using the arrow keys, Select "From Image" and then hit 'Enter'.

We now need to select the image that we want to have restored to the hard drive.

When the Open Window is up, we will need to move to the "Look in:" section that selects the drive from which to get the image from. You can either hit the 'TAB' key repeated to get to the necessary area or 'ALT+I' to get to the "Look In:" section…

Using the "Down arrow" key, highlight the "e: [] Network drive" and hit 'Enter'.

In the main area of the window you should now see the ghost image file "BTP4.GHO".

Select the "BTP4.GHO" file and hit 'Enter' or 'Tab' to "Open" and hit 'Enter'.

The next window will show the available Partitions within the image that are available.

Part	type	ID	Description	Label	Size
1	Primary	##	NTFS	DiskLoad	#####
2	Logical	##	Fat32 extd	No Name	#####

Select Part 1 and hit 'Enter' or select "ok" and hit 'Enter'.

The next window will show the available Hard Drives that the image can be copied to.

Drive	Size(MB)	Type	Cylinders	Heads	Sectors
1	####	####	####	####	####

Select Drive 1 and hit 'Enter' or select "ok" and hit 'Enter'.

The next screen is to determine where the individual partition within the image will be copied to the hard drive.

You will see the following information:

Part	type	ID	Description	Label	New Size
1	Primary	##	NTFS	DiskLoad	#####

IF you have not used the FDISK utility and deleted the existing partition, You will see the following information:

Part	type	ID	Description	Label	New Size
1	Primary	##	####	######	#####
NEW	Primary	##	NTFS	No Name	#####

IF this is the case then simply arrow up and highlight "Part 1" and hit 'Enter'
Otherwise:

Change the New Size for the Parts as follows:

Part	Type	ID	Description	Label	New Size
1	Primary	##	NTFS	DiskLoad	**5000**

You will see the numbers change when you leave the field to 5004.
This is OK…

Proceed with partition load?
Select "Yes" and 'Enter' or type 'Y'.

You will now see the progress bar fill from left to right.

When it is complete it will ask to either "Continue" or "Reset Computer"…
Select "Reset Computer"

As the computer is rebooting, remove the floppy from the A: Drive.

Step 3 - Win2K Setup

This process is mostly automated with a few exceptions. This will walk you thru those exceptions.

Installing Devices

Windows should start to boot-up and will automatically start trying to detect the various hardware components in the PC. This may take a few minutes. Be patient and let it run thru.

Computer Name and Administrator Password

Windows will ask you to Name the PC.

The name should always be the following convention:

Cockpits = "ALPHA#", # = cockpit number ("ALPHA1")
Console = "ALPHA-CON"
Mission Review = "ALPHA-MR"

Using the above examples enter the proper name in the field.

Do not change the Administrator passwords. Leave those fields alone.

Tab down to "Next>" and hit the Spacebar or just hit Enter.

Networking Settings

Arrow down to select "Custom Settings" and hit Enter.

Arrow down the list and select "Internet Protocol (TCP/IP)". Now use the 'Tab' key to select "Properties" and hit the Spacebar.

You will note that the following fields are already filled in:
IP Address   200.0.0.21
Sub Net Mask   255.255.255.0

The only field we are concerned with is the IP Address. An IP Address has been preset for each PC in the set. The Prefix is the same for all IP Addresses. (200.0.0.#)

IP Address = PC Name
200.0.0.1 = ALPHA1
200.0.0.2 = ALPHA2
200.0.0.3 = ALPHA3
200.0.0.4 = ALPHA4
200.0.0.5 = ALPHA5
200.0.0.6 = ALPHA6
200.0.0.7 = ALPHA7
200.0.0.8 = ALPHA8
200.0.0.9 = ALPHA-MR (Mission Review)
200.0.0.10 = ALPHA-CON (Console)

Using the Table above select the proper address and enter into the field provided on the screen. Hit Enter when done. Do not change the sub net mask. If any of the PC's have different sub net mask's, they will act as if they are on a separate network and will not communicate with the other PC's.

Workgroup or Computer Domain

Tab to the field with the entry "WORKGROUP" and change this to "TESLA".
Hit 'Enter'.

At this point the computer should finish the Windows installation and proceed to reboot.

Finishing Windows Installation and Username Selection

A screen should come up labeled "Network Identification Wizard" once Windows starts up.

Hit 'Enter'

The next screen "Users of this Computer" is used to setup the startup account for the computer. There are three choices. We will deal with only one of them. "Consoleuser" and "Gameuser".

Shift+Tab to the User Name field and using the arrow keys change this entry to "Gameuser". Tab down to the first 'Password' field.

Enter the following for the 'Password' field:
"user" (lower case)

Enter the same thing for the 'Confirm Password' field:
"user" (lower case)

Hit 'Enter' when ready

Hit 'Enter' to "Finish" the installation.

Display Settings

Which settings to use for the Video cards will be dependant on what you are setting up (Console PC, Game PC, or Mission Review PC).

Game PC
Video Card #1:	800x600x16
Video Card #2:	640x480x16
Video Card #3:	1280x480x16

Mission Review PC
Video Card #1:	800x600x16
Video Card #2:	640x480x16
Video Card #3:	640x480x16

After the PC has rebooted, a command window will open up showing you the proper settings to choose from. Hit 'Enter' to get the 'Display Control Panel' to open for you.

Using 'Shift+Tab' select the tab at the top labeled "Background".
Using the arrow keys, select the tab at the top labeled "Settings".

You will notice that there are three monitors shown in the window. They should default to the following settings:

          Video Card #1:   800x600x16
          Video Card #2:   640x480x16
          Video Card #3:   640x480x16

'Display 1'
    Game PC:
        Verify Screen Area set to 800x600.
        Verify Color set to "High Color (16 bit)".
        Use 'Alt+A' to apply current settings.

    Mission Review PC:
        Use 'Alt+A' to apply current settings.
        Use 'Alt+V' to go to "Advance Settings"
        Use 'Shift+Tab' to go to the "General" tab.
        Use the arrow keys to select the "nView" tab.
        Use 'Alt+C' to select "Clone"
        Use 'Alt+A' to apply settings.
        Hit 'Enter' for "OK"

Use 'Alt+D' then arrow down to select 'Display 3'.
    Game PC:
        Use 'Alt+A' to apply current settings.
        Use 'Alt+V' to go to "Advance Settings"
        Use 'Shift+Tab' to go to the "General" tab.
        Use the arrow keys to select the "nView" tab.
        Use 'Alt+H' to select "Horizontal Span"
        Use 'Alt+A' to apply settings.
        Hit 'Enter' for "OK"

    Mission Review PC:
        Don't change Display 2 or 3.

Use 'Alt+A' to Apply current settings.

Verify the settings of each of the monitor settings.

Hit 'Enter' to close control Panel.

Finishing Game PC Installation

To finish the Game PC installation simply shutdown and restart the pc.

When the Game PC reboots, it will automatically check to see if the game software is present. IF it is not, it will connect to the Console PC and start downloading the Game software.

Be sure that you are not running any games during this process. It will cause an excessive amount of traffic on the Network Hub and will not only slow down the installation process, but could interrupt the game in progress.

Once the software has been downloaded, the Game PC will automatically start up the game software and will be available for use.

Mission Review

IF you are setting up the Mission Review, Then read this section.

After completing the Game PC installation and Windows Installation process, let the PC go thru the process of installing the game software.

Once the game software is installed, the pc will automatically start up in game mode.

Hit 'Alt+F4' to exit the Game Software.
You will still see a blank screen.
Hit 'Alt+Tab' to select the "Launcher" software that is still running in the background.
Hit 'Alt+F4' to exit the launcher software.
You should now see the desktop.

Using the keyboard, Hit 'Tab' until a box surrounds the "Start" button.
Hit 'Enter'
Using the Up/Down Arrow keys, select "BTFrstrm"
Hit the Right Arrow key.
Using the Up/Down Arrow keys, select "SetGameType"

A DOS Menu will appear.
Select 'M' to set to Mission Review
Exit the Dos Menu.

The computer will update the proper files so that the next time you reboot, the PC will go into MR mode.

Shutdown and Restart the PC.

NETWORK ADDRESSING & PC SWAPPING

IP Address = PC Name
200.0.0.1 = Alpha1
200.0.0.2 = Alpha2
200.0.0.3 = Alpha3
200.0.0.4 = Alpha4
200.0.0.5 = Alpha5
200.0.0.6 = Alpha6
200.0.0.7 = Alpha7
200.0.0.8 = Alpha8
200.0.0.9 = Alpha-MR (Mission Review)
200.0.0.10 = Alpha-Con (Console)
200.0.0.20 = Alpha-CAM (Camera ship)

Swapping PC between stations or cockpits will require changing two things on each PC. The PC's network name and it's IP address.

In order to change the PC's address and Name's without interfering with each other and the other pc's on the network, you will need to shut down both pc's that are being switched. You will need to use the following procedures to change the name and address of one PC. You will then shut down that pc, and then change the name and address of the other PC. You then will shutdown that pc. Now you can then restart both pc's.

Shut down Both PC's
Start up 1st pc and change it's name and address.
Shut down 1st pc.
Start up 2nd pc and change it's name and address.
Shut down 2nd pc.
Restart both PC's.

Changing PC network name

First log onto the pc as an administrator. You will need to have the person that has the password enter it for you if you don't have access to that information.

User name: administrator
Password: *****

Once you are logged in, do the following:
- 'Tab' until "My Computer" is highlighted, and then hit 'Enter'.
- When the Window "My Computer" pops up, hit 'Backspace'.
- Using the up/down arrow keys, select "My Computer"
- Hit 'Alt+F' and then press 'r' to select properties.
- Using the right/left arrow keys, select "Network Identification".
- 'Tab' until "Properties" is select and hit 'Spacebar'.
- Change the "Computer name" to match the new pc's designation. Example (Alpha1 changes to Alpha2)

- Hit 'Enter' when done.
- A dialog box will appear informing you that you will need to reboot in order for changes to take effect. Hit 'Enter' when ready.
- 'Tab' to "OK" and hit 'Enter'
- A dialog box will appear asking "Do you want to restart your computer now?". Select "No" by hitting the 'n' key.
- Hit 'Alt+F4' to close the window.

Changing IP Address

- 'Tab' until "Start" is highlighted, and then hit 'Enter'.
- Using up/down arrow, select "Settings".
- Right Arrow.
- Using up/down arrow, select "Network and Dial-up Connections", hit 'Enter'.
- Using up/down arrow, select "Local Area Connection", hit 'Enter'.
- 'Tab' until "Properties" is selected and hit 'Spacebar'.
- Using up/down arrow, select "Internet Protocol (TCP/IP)"
- Hit 'Alt+R' to open the "Properties".
- 'Tab' to the IP Address, and change it according to the new PC's location. Example (Alpha1 changing to Alpha2 would be 200.0.0.2)
- Hit 'Enter' to close properties window.
- 'Tab' to "OK" and hit 'Enter' to close window.
- 'Alt+C' to close window.
- 'Alt+F4" to close "Network and Dial-up Connections".

Shutdown and computer, make the changes required for the 2nd PC using the same procedures.

Shutdown 2nd PC and restart both PC's for changes to take effect.