

Max Flight Corporation
Trouble Shooting the Electric Virtual Reality Machines

Power Problems

Is the unit plugged into a live circuit?

Power Requirements;

Three phase 208,220,380, 440, 477 VAC for the motor drive and inverters.

Single phase 115/230 VAC for the control console, kiosk and cockpit power.

Ensure power is available by checking the power on lights on the power strips. If not, check to see if plugged in and if so check the circuit breaker in the main power box.

Command console CPU/Monitor power flows from the wall to the power strip, to Battery Backup unit to the CPU and monitor. Make sure green light on UPS is on. If not then there is no external power getting to this unit.

Amp and pre-amp power comes from the console power strip, make sure this is ON ensure power switch is ON in front of each unit.

The three phase power can be checked by measuring phase to phase on the main power contactor located in the power box. Also measure power coming from the wall outlet if not there check the three phase circuit breaker in the main power panel.

Check to see if the BLUE reset on the contactor has tripped, if so reset by pressing in on blue button.

Pull E-Stop out on side of command console. Power must be ON at the Inverters. Check by verifying that the power ON indicators at the top of the inverters is ON --all of them. If power to the inverters does not come on check the control power going to the switch. The power is 115 VAC to one side of the switch, pull the switch out and the same power must be available on the other side of the switch.

No Computer Power

Is the monitor ON?

Is the Battery Backup ON? Green light must be on steady, if not check power to it. Try another extension cord to verify power outlet.

Is the power strip in lower console ON? If not turn it ON.

If the computer does not power up and the above are ON, check the rear of the CPU and see if there is a power switch on the CPU power supply, turn it ON. Check to see if power plug to and at the CPU did not pull out. If everything powers up except the CPU this is an indication of a bad CPU power supply or mother board problem. This power supply is a standard 300 watt that can be purchased at any good computer or electronics supply store. Do not remove the old until you have the new so you can match up cabling and power connectors.

Note! Before touching any board within the computer you MUST ground yourself to the computer case by touching the metal case before any components. This will remove the static electricity from your body to case ground instead of through a electronic chip and destroy it. This procedure will prevent you from damaging expensive circuit boards.

Cockpit Power

Turn cockpit power ON by pressing toggle switch on power strip inside left rear of "A" frame cabinetry. The fans and projector should power up if they do not, check power source to the power strip under the seats and make sure that power switch is turned ON. Check using another extension and going to another power source on the wall. Make

sure power plug that goes to the pitch signal ring is plugged into the power strip. Ensure all plugs are plugged into the power strip. Still no power, check power at the interface connection plug located in center weldment. This feeds power from pitch rings to roll rings. If power is not there it is a sign of bad pitch rings. If there, but not in cockpit then you may have a bad roll ring assembly. By testing the input to a component being there but not at the output of that component it verifies that that component is defective.

Video Problems

For projectors see the respective owners manuals. Presently there are three types of projectors in use.

TELEX
INFOCUS
HITACHI

Each has its own unique requirements. Unit turn on and setup procedures use the respective manual. Signal problems will be discussed here.

Signal flows from the computer, through the pitch signal rings to the roll signal rings to the projector input. There is a connector splice plug inside the center weldment that could cause you problems if it came disconnected. The signal going to the projector is a S-video, VGA or RGB video signal.

Video going to the TV is a composite signal either separated by the computer or done external through a TV elite splitter box.

No Image

If no image at all including test pattern this is usually an indication of a defective bulb providing, you have the projector powered up correctly via the manual. Check to see if fan is running and buttons are highlighted if so power is to the projector. If not, find where you are losing it. **See cockpit power.** If power is there and still no picture, see warranty of your unit for repair.

You have test image but no picture. Check software setting inside the projector. After verifying all settings and you still have no image find out where you are losing the video signal. If signal to the TV is normal but not inside, use the signal to the TV to test the projector. Using a cable use TV signal and plug it into the projector if picture comes back the projector is OK if not then, you have a faulty projector. See warranty for details. If signal to the projector returned using the jumper signal then you have a problem between the projector and the computer. This could mean bad rings, connections and or wiring. Determine which by bypassing them one at a time. The rings used on the electric machine are sealed for life and no maintenance allowed. Call for repair procedures. If a bad wire or cable, repair using best procedures available and authorized.

TV plays normal but projector does not

If the image at the projector is blurred or fuzzy or otherwise distorted it could be caused by the pitch or roll rings and/or associated wiring. If picture has a red or green overtint it is usually caused by a broken wire inside the video cable near one of the connectors. If the picture is half framed especially on a INFOCUS system you need to reset the AUTO IMAGE setting in the projector setup menu. Turn auto image OFF then back ON and a full screen will return.

Audio Problems

Routing is from computer sound card, to the INPUT of pre-amp, OUTPUT from pre-amp to INPUT to main power amp, OUTPUT from main amp to the pitch signal rings, through center weldment connectors to the roll signal rings and finally to the cockpit speakers.

External speakers gets a signal direct from main power amp to each speaker. If there is a problem check the wiring, speaker, or push button selector in front of amp.

Check to see if the power amp is in over current protect, red light on in front. If it is then that is usually an indication of a shorted speaker or wires going to the speakers.

No Sound

Ensure the following;

CPU is ON ---program running

Pre and main amplifiers are ON, source selected and wires connected to respective inputs.

Pre and main amp volume to at least one third volume.

Double click on speaker icon, lower right of screen if there and raise the volume bar, retest. Find any .WAV file in the system by selecting START , Search Files and Folders, type .WAV , Search. On response side double click on any WAV file and it should play and be heard. If not, sound card may not be enabled, conflict in registry or bad sound card. Most of the time, you can reset the sound by hard computer shutdown and restart. If still no sound, use a CD player and plug it into the pre-amp, sound heard problem in computer or selector, still no sound plug it into the main amp, sound is heard, problem in pre-amp, no sound it's the main amp. Plug sound source directly to input of pitch rings, sound heard on speakers it's the main amp. If no sound, plug audio source into roll input side, sound heard its pitch rings or cabling if no sound go to other side of rings directly to speakers input. If sound is heard now the problem is roll rings or cabling.

If Sound but Noisy or Scratchy

Wiring problem, overdriving the pre-amp or amp. Turn settings down on pre-amp if sound clears -OK. If not—decrease sound level from CPU and try again. If good OK if not, Try a test cable directly from main amp to the speaker inputs. If sound OK then the problem is either in the pitch or roll rings or cabling. Back track to determine which one.

If Unit does not Raise

If a new inverter was installed it must be pre programmed prior to operating. Inverters main power not enabled. Check to see that the E-Stop is pulled out and power ON light is on top left of the inverter. If unit works after E-Stop is pulled out you are done. If not, check if lift motor plug or brake cable came out on the power box side. If unit is lowered ensure that the DOWN sensor is being seen by the program. You can use Mitsubishi Client Test program for this check. If it does not see the sensor as closed, check to make sure ride is all the way down. If down and still nothing OHM check switch and/or adjust it if not touching lift tube.

The CANOPY SENSOR being closed will prevent lifting of the ride. Check switch operation by using the Mitsubishi Client Test program and move the switch. It must only show active when the switch is up, canopy open, it must not show if down pressure is applied to the switch. Should it work backwards or not at all repair/replace as required till switch works only when canopy is open.

Canopy Sensor

This is a NORMALLY CLOSED switch, located top center of the inside cockpit seat frame. Use a meter and test switch operation. Then check operation in Mitsubishi Test Client program. Adjustment is correct, when switch activates just as the canopy latch opens onto the safety cable attached to the handle. Adjust as required.

CPU Program

Program lockup will prevent raising. Exit program and perform a computer restart to normal program window.

Unit Raises but not Normal

CPU program error, counterbalancing problem, encoder failure or error or a mechanical interface problem.

CPU—perform a restart

C/W – test manually to see if counterweight moves

Encoders can be tested in Client window

Mechanical interface—ride out of square or plumb. Check these to correct the problem with pitch pivot blocks jamming on the lift keyways.

Lift Encoders, located on the lift drive shaft right side between lift motor and gear box. You can test the operation of the encoder within the Mitsubishi Client Test program. See if the CPU places a value on the right side across from **Lift**, if not then the program is at fault. See if the encoder changes value as it raised, value displayed next to LIFT. If not, bad encoder, cable, interface board, Motion Control card, cabling or CPU power supply that supplies the 5 VDC power to all encoders. If encoder does not update, temp replace with another encoder if now OK install a new one.

NOTE! If the encoder has failed completely or the cabling etc. is bad the lift motor will drive the platform up at an extremely rapid rate until it slams into the top cross bar.

DAMAGE to lift system will occur if you do not stop lift system before top contact by pitch pivot blocks.

Faulty Lift Motor Brake located as part of motor unit it controls when and how the brake is applied by the CPU program via the Inverter. **If the brake is sticking or not releasing at all then the lift drive will function but erratically.**

Check the relay, inverter and power to the brake coil. Check continuity of the brake release coil with power OFF.

Unit Fails to Counterbalance

Can be caused by a faulty pitch encoder, pitch motor brake, brake pad sticking, bad interface board or motion control card, bad ribbon cables or CPU program.

Encoder—test in Mitsubishi Client program

Brake—test by holding brake open manually while balancing

Interface board –by testing voltages to encoders specially pitch

Motion Control Board—replace with known good one only when all else proves OK

Ribbon Cables—try other ones

CPU program—restart the CPU completely

Remove tail cover or have someone monitor the counterweight while you command movement from Mitsubishi program. If counterweight does not move, bad motor, brake, gear box, clutch or inverter. Test for power to motor and the

brake. See if brake is releasing when commanded if not test power. Power to inverter is either three phase or two phases of hot. Phase to phase 208-220 VAC. Brake coil voltage is 115 VAC. If power is not there, bad inverter or no power source.

NOTE! Command movement of motor. If the brake clicks and the motor does not turn could be faulty motor, broken or frozen gear box, frozen drive clutch on top of counterweight. Test for motor drive power at center weldment interface connectors. Brake power can also be tested here. If not there, check on other side of pitch power rings above power box. If power is good to rings but not out you have bad pitch power rings.

Cockpit Leveling setup

For the platform to balance correctly it must be installed correctly and level. To level the platform correctly, lower all the way down, with tail cover installed place a level on the center weldment. Move counterweight all the way back to insure back is down solid on rear stand. Adjust rear stand top board until the bubble in the level indicates level condition. Then adjust the front stand to within a ¼ inch from the bottom of each side of the cockpit. Insure that the cross bar in front is level by placing the level upon it. You may have to raise platform slightly for this step.

Down Sensor

If this sticks or does not reset the encoders to zero it will affect the next cycle balancing procedure. See Balancing procedures.

Fails to Raise Level in Pitch or Roll

Normally caused by the front/rear stand not adjusted correctly. See Cockpit Leveling Setup. Can be weight imbalance not within 100 pounds side to side. If constant could be loose encoder or faulty roll motor brake. If pitch usually caused by an encoder.

Unit Stops Motion

Occupant Safety Switch

Located within the cockpit between both seats. Enables the occupants to signal the operator that they want the ride to stop, lower and they want out. When pressed, it will stop the ride motion, bring the platform to the HOME position, level in pitch and roll facing forward to the stand. Operator lowers the ride, occupants depart, reset the switch and ride is ready for next patrons. Sensor is normally OFF. Can be tested in Mitsubishi Client program.

Canopy Sensor

Canopy sensor activates by either canopy latch releasing, faulty switch, switch wired wrong after repair, switch adjusted incorrectly, wiring or faulty rings. When the switch activates it will stop all motion instantly, freeze the TV image. An alert condition window will open on monitor. Operator must press the E-Stop on side of console and begin the manual leveling and lowering procedure. Allow the patrons to egress. Turn the program OFF and then back ON to test system for repeat failure. Check the operation and adjustment by using the Mitsubishi Client program. Canopy sensor must be functional for the ride to operate to the public.

Up Sensor Faults

Unit raises and balances normally. Continues to the top and the program freezes allowing no further motion. Or, during a normal run the platform stops motion and comes to the home position disabling further motion. An alert window will open "Platform was raised but does not see the up sensors". Operator clicks on lower and platform should lower to down stops. Should program become locked during this phase manual leveling and lowering will have to be performed. Switches can be logically tested in the Mitsubishi Client Test program. Test at the interface board for +5 VDC to the switch if you see this then the CPU power supply is OK. Test the switch using Ohm meter for continuity. If switch/es are OK test the interface card, cabling to/from CPU, cables to the switches. Could be faulty Motion Control Card in CPU.

WARNING! Shock hazard and possible electrocution voltages exist in the CPU, Power Box and all AC voltage connection points. Care must be used. If you are not familiar with high voltages do not tempt fate and allow a qualified person to perform these tests. Special danger exists inside the inverters that contain two storage capacitors each capable of holding 400 VDC.

No Roll or Pitch Movement or erratic Movement while on top

If motion in an axis is slow or erratic it could be due to a faulty brake release solenoid, brake clutch mechanism for that axis. Test the brakes and the respective inverter in the Manual Inverter Test program. Hold the brake open if free movement the problem is in the brake system. Test for power to the brake coil both before and after the rectifier inside the motor enclosure. No power it's a brake relay or faulty inverter. Test for power to the relay Pin 1 and Pin 2 it should be 115 VAC to ground. Command motion test relay input between pins 3 and 4 for 3-5 VDC, if you have it Inverter and CPU OK, still no brake movement bad relay or the second hot leg is missing. Test by switching relays if it works replace relay if it does not test for second hot leg to the brake coil.

Inverters

Power must be OFF to the inverters for a minimum of 10 minutes before starting disconnect of wires. This allows the storage capacitors to discharge to ground. Replacement inverters must be programmed with the initial four parameters before the CPU can talk to it. See the technical manual for correct procedures. Inverters malfunctioning can stop motion at any time and should not be excluded from troubleshooting practice if you have a problem. There are three the same and can be switched for testing purposes just remember, the inverter address must be changed or inverter will not perform in that axis.