

Chapter 6 - Fault Diagnosis

Fault Diagnosis

The *Stereoscan 430* has been designed to achieve a high standard of reliability. However as with any complex system faults do occur from time to time. When they do the key requirement is to identify the fault and rectify it with the minimum possible inconvenience to the user. This chapter is provided to assist in diagnosing faults and identifying the correct course of action.

In the event of some difficulty being experienced with the instrument, it is strongly recommended that the *HELP* messages available are read. With the aid of these it should be possible to either identify and rectify the problem, or to be able to provide enough information to the local service centre for them to be able to remedy any fault speedily and efficiently.

Please note that in the event of having to contact your local service centre, the following information will be required:-

- Instrument serial number
- Order number
- Software version number
- Description of error messages

Any given fault in the system is either a PC fault or a fault within the *Stereoscan* system. Because the error messages and symptoms of these fault types differ, they will be treated separately. But first it is necessary to review the diagnostic information available from the system.

6.1. Diagnostic Aids

There are various aids available to help in the diagnosis of any problem, these are:-

- The Front Panel illuminated switches
- The Status LEDs at the rear of the instrument
- The various Error Messages generated by the instrument
- The effect of various controls on image quality

They should all be noted when troubleshooting, and the results passed back to your Service Centre, if you do not manage to clear the fault using this information.

6.2. PC Related Faults

PC related problems are usually diagnosed by the BIOS (Basic I/O System) when the machine boots up. There are two ways in which such problems are reported to the user, by "BEEP" codes or by BIOS error messages.

6.2.1. Beep Codes

If an error occurs during the **Power On Self Test (POST)** routines, this is usually communicated to the user through a series of audible beeps. In the event of any of the BEEP codes sounding, it is highly likely that the PC card will have to be replaced, although some may help identify a more simple problem.

The following is a list of BEEP codes with possible causes:-

BEEPS	ERROR MESSAGE	POSSIBLE CAUSE
1	Refresh Failure	
2	Parity Error	
3	Base 64KB Memory Failure	Memory fault - check SIMMS are seated correctly
4	Timer not Operational	
5	Processor Error	
6	8042 - Gate Failure	Keyboard Fault ?
7	Processor Exception Interrupt Error	
8	Display Memory Read/Write Error	VGA Card Fault ?
9	ROM Checksum Error	
10	CMOS Shutdown Register Read/Write Error	

All these faults will prevent the system from booting up, with the exception of **No.8**. This error will allow boot-up to be completed and cause an error message to be printed on the screen.

6.2.2. BIOS Error Codes

In the event of a non-fatal error occurring, the BIOS diagnostic system provides a series of error messages. These error messages are displayed in the following format:-

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to RESUME
```

The non-fatal error messages are displayed first, and then

Press the <F1> key to continue with the boot procedure

is displayed. The <F1> prompt message is not displayed if

"Wait for <F1> if any Error"

in ADVANCED CMOS SET-UP has been **DISABLED**. For most non-fatal error messages there is only one message. If a second message appears it will be :-

RUN SETUP UTILITY

If this message occurs, press <F1> to run AMI BIOS SETUP

Overleaf is a listing of all the AMI Non-Fatal Error Messages.

6.2.3. AMI BIOS Non-Fatal error Messages

ERROR MESSAGE	EXPLANATION
8042 Gate A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042
Address Line Short!	An Error has occurred in the address decoding circuitry
C: Drive Error	The BIOS is not receiving any response from hard disk drive C:. Run the Hard Disk Utility to correct this problem. Also, check the C: hard disk type in the Standard CMOS Setup to make sure
C: Drive Failure	The BIOS cannot get a response from the hard disk C:. Replace the Hard Disk
Cache Memory Bad. Do not Enable Cache	Cache Memory is defective. Run a Diagnostic Utility such as AMI Diagnostic.
CH-2 Timer Error	An AT system has two timers. There is an error with timer #2
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	After CMOS RAM values are saved, a checksum value is generated for error checking. The message appears if the previous value is different from the current value. Run Setup.
CMOS System Options not set	The values stored in CMOS RAM are either corrupt or non-existent. Run Setup.

CMOS Display type Mismatch	The video type in CMOS RAM does not match the type detected by the BIOS. Run Setup.
CMOS Memory size Mismatch	The amount of memory found by the BIOS is different from the amount in CMOS RAM. Run Setup.
CMOS Time & Date Not Set	Run the Standard CMOS Setup to set the date and time in CMOS RAM
D: Drive Error	The BIOS is not receiving any response from the hard disk drive D:. Run the Hard Disk Utility. Also check the D: hard disk type in Standard CMOS Setup to make sure that the hard disk type is correct.
D: Drive Failure	The BIOS cannot get a response from hard disk drive D:. Replace the hard disk.
Diskette Boot Failure	The boot diskette in floppy drive A: is corrupt. It cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch not properly set	Some systems require that a video switch be set to either colour or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	An error has occurred in the DMA Controller.
DMA #1 Error	An error has occurred in the first DMA Channel.
DMA #2 Error	An error has occurred in the second DMA Channel.
Invalid Boot Diskette	The BIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard is locked - Unlock it	The keyboard lock on the system is engaged. The system must be unlocked to continue the boot process.
Keyboard Error	There is a timing problem with the keyboard. Make sure an AMI Keyboard BIOS is installed. Set "Keyboard" in the Standard CMOS to "Not Installed", which skips the keyboard POST routines.
Keyboard Interface Error	There is an error with the keyboard connector.
No ROM BASIC	Cannot find a proper bootable sector on either diskette drive A: or hard disk Drive C:. The BIOS cannot find ROM Basic.

OFF Board Parity	<p>There is a parity error with memory installed in an I/O (BUS) slot. The message format is</p> <p>OFF BOARD PARITY ERROR ADDR = XXXX</p> <p>where XXXX is the address (in Hexadecimal) where the error has occurred. Off Board means that it is part of the memory installed via an adaptor card in an I/O (bus) slot. Run memory diagnostic software, such as AMI Diag, to find and correct memory problems.</p>
ON Board Parity	<p>There is a parity error with memory installed in an I/O (bus) slot. The message format is</p> <p>ON BOARD PARITY ERROR ADDR = XXXX</p> <p>where XXXX is the address (in Hexadecimal) where the error occurred. On board means that it is part of the memory attached directly to the BIOS. run memory diagnostic software, such as AMI Diag, to find and correct memory problems.</p>
Parity Error ???	<p>There is a parity error with the system memory, but the address of the error cannot be determined. Run memory diagnostic software, such as AMI Diag, to find and correct memory problems.</p>

6.3. Stereoscan 430 Faults

6.3.1. The Image Processor

The Image Processor, together with the PC, forms the heart of the entire system.

- It controls all the other modules, supplying both data and timing signals
- It accepts all the various input signals i.e. SE, BSD, 4QBSD, CL etc, and processes them for display on the monitor
- It provides the display video
- It provides all the graphics in the form of annotation and PC Windows_{TM}

Therefore, if there is a problem with an entire sub-system, for example, no Electron Optical control at all and vacuum system problems, or no EHT operation, the possibility is that the Image Processor is at fault.

If there is no video signal of any kind on the monitor, or if the video or display are corrupted in any way, the Image Processor is suspect.

The Image Processor has its own power supply, and this is monitored by LEDs 4, 6 and 8 at the rear of the instrument. Therefore it is important to check their status and inform the Service Centre when reporting any problem.

6.3.2. The Vacuum System

Most major vacuum problems are communicated to the operator by error messages internally generated by the instrument. In the event of a vacuum problem that does not generate an Error message, here are some hints and tips that may help locate the source of the problem, and either resolve it, or give your Service Centre adequate information with which to rectify it.

Check the vacuum seals that have been broken since the vacuum fault appeared, these are usually the stage door or the gun "O" rings, to ensure that they are clean and free of any particles of dirt or hair and that they are not in any way damaged.

If an "O" ring is found to be dirty, carefully remove and clean it. When replacing an "O" ring it is essential to ensure that the inner face where the "O" ring sits is perfectly clean and free of dirt and hairs and that the seam of the "O" ring itself does not lie across the sealed surface.



The use of grease is not recommended, as this can cause contamination of the column leading to degraded performance. It has been found that the action of cleaning an "O" ring with fingers applies enough grease to provide adequate lubrication.

Ensure that any samples that have been put in the chamber are not porous and that the fixative used, is not outgassing. If in doubt about the samples, remove them in order to check that the system vacuum returns to a normal level without them after about 4 hours pumping.

Check that the cooling fans for the plinth are operating correctly. If the turbo pump is too hot it will not be able to pump efficiently.

Confirm that the temperature and humidity in the room are not unusually high, this would again adversely affect pumping efficiency.

Check the condition of the silica crystals in the dessicator to ensure that they are still blue, pink crystals allow too much moist air into the chamber which would increase the pump down time and also degrade the system vacuum.

Is there a vacuum reading available?

Does the turbo pump sound as if it is operating at full speed, or does a high pitched whine suggest that it cannot reach full speed?

6.3.3. *Electron Optics*

Most Electron Optical (EO) problems will be evident by looking at the image on the monitor, and are likely to be caused by one of three possibilities:-

- A power supply failure
- An internal communications problem
- An EO failure

A Power Supply Failure

This can be identified by the condition of the Status LED's at the rear of the instrument. They should be inspected, and a note taken of which LEDs are illuminated in both the STANDBY and OPERATE modes, and this information passed to your Service Centre.

An Internal Communications Problem

Will probably cause a series of EO faults, that is a number of functions will not work. For example, there may be no STIGMATOR correction **AND** no C3 LENS control, or some other combination, **BUT**, all the STATUS LED's will be illuminated. This, again, should be reported to your Service Centre.

An EO Failure

It is probable (though not definite) that only one EO function will not work, such as, one lens or that there is no Beam Shift available, or similar. This points to the likelihood that the EO system has failed, and this should be reported to your Service Centre.

6.3.4. *The EHT System*

An EHT set fault is likely to be shown by an Error Message generated by the instrument, however, in the absence of any Error Message, it could well be possible to identify a problem by the following symptoms:-

1. No electron beam possible, even though the filament is known to be OK.
2. No PM (Photo-Multiplier) noise (or snow), even with maximum signal brightness.
3. Reduced PM noise, even with maximum signal brightness.

4. Unstable beam, or filament current, especially noticeable in the emission image.
5. EHT tripping out.
6. Image drifting out of focus.
7. Unacceptable change in the instrument calibration.



1, 2 and 3 could also be caused by:-

- a) *a vacuum interlock problem*
- b) *the wrong (or NO) detector being selected*
- c) *the aperture changer being out of position (especially no.1)*

4 and 5 can also be caused by:-

- a) *a cracked filament base*
- b) *an incorrectly fitted or positioned filament in the firing unit*
- c) *dirty filament contacts either in the gun or in the EHT set.*
- d) *a dirty firing unit, especially the grid aperture*
- e) *an old filament*
- f) *a dirty anode*
- g) *an inadequate vacuum, especially when using high KV.*

6 and 7 can also be caused by:-

- a) *a faulty Electron Optical system*

Short Filament Life

If short filament life is experienced the following factors should be checked as they will almost certainly shorten a filament's operational life.

Ensure that the vacuum is good before firing up a filament. Although a filament can be fired up as soon as "Vac Ready" is achieved, the longer that it is possible to wait for the vacuum to improve, before using the filament, the better for filament life (and also signal quality!).

Filament positioning in the firing unit will also affect filament life for both better or worse, and the following tips may be useful for optimising the instrument performance and filament life:-

Tungsten Emitter

Fitting a New Tungsten Filament

When fitting a new filament to a firing unit, insert the filament as described in Section 2.2.4 *Changing the Filament*, ensuring the filament is visible in the centre of the firing unit aperture. Once the filament is central, using the firing unit tool supplied, screw the adjusting ring in until the filament is level with the front face of the firing unit aperture. Then bring the filament back as far as is required for your operating requirements according to the following guide:-

High Resolution/ Optimum Signal	$\frac{3}{4}$	turn back from front face of aperture
Medium Resolution/ General applications	1	turn back from front face of aperture
Low Resolution/ Maximum Filament Life	$1\frac{1}{4}$	turns back from front face of aperture

Additionally, for maximum beam stability, essential for long EDX/WDX analysis, as well as setting the filament back $1\frac{1}{4}$ turns, it is recommended that the Beam Current be reduced from 400uA to about 100-200uA. This will increase, still further, the life span of the filament.

Running Up a New Tungsten Filament

When running up a new Filament it is good practice to select the New Filament checkbox on the Gun Set Up panel (**Beam-> Gun Setup**). This will select a run up routine tailored to the new filament. The field will automatically be deselected when the run up completes.

It is advisable to run a new Tungsten filament up carefully for the first time, if possible starting at a relatively low KV (5-10 KV) and letting the filament get warmed up, before gradually increasing to any working KV significantly above 5-10 KV.



That it may be noticed the filament position may drift having been heated, and might need to be re-centred after being heated up for the first time.

6.4. LEO Error Messages

There are many reasons why error messages may appear. With each message on-line help is available. In addition an alphabetical list of all error messages is included below.

6.4.1. Error Messages

ACQUIRE COMMAND ERROR

This error is given when a signal acquisition command fails.

Code numbers greater than 40 indicate the failure of an internal consistency check. Contact Leica

Code numbers less than 40 indicate that there is a failure in the communication to the DSP subsystem.

Please report the problem.

The code number given identifies the failing command as follows:-

1	SET_ZONE_K1_CMD
2	SET_ZONE_K2_CMD
3	SET_ZONE_ALPHA_CMD
4	SET_ZONE_BETA_CMD
5	SET_ZONE_SUB_CMD
6	SET_ZONE_PORT_CMD
7	SET_ZONE_OFFSET_CMD
8	SET_ZONE_GAIN_CMD
9	SET_ZONE_INVERT_CMD
A	CREATE_IDENTITY_LUT
B	CREATE_GAMMA_LUT
C	CREATE_INVERT_LUT
D	CREATE_USER_LUT
E	COMBINE_USER_LUTS
F	ENABLE_WINDOW_PLANE
10	SET_DETECTOR_MIXING
11	SET_FAVE_NOISE_REDN
12	SET_LINT_NOISE_REDN
13	SET_FINT_NOISE_REDN
14	SET_WINDOW_SEL
15	SET_FREEZE_CMD
16	COPY_USER_LUT
17	SEE_LUT
18	DEFINE_WINDOW

BRIGHTNESS RLM FAILED TO INITIALISE

This is an internal software error which should not occur.

If the fault should occur please contact Leica.

BRIGHTNESS RLM FAILED TO LOAD

This is an internal software error which should not occur.

If the fault should occur please contact Leica.

CANNOT PRINT COLOUR TIFF

This error is given when an attempt is made to print a TIFF file which contains a real colour image.

The printer can only print Grey or binary files.

CLIPBOARD BITMAP CREATE ERROR

This failure is given when cutting an image to clipboard.

This is typically caused by inadequate PC memory (or disk swap file). Close any other applications.

CLIPBOARD - BITMAP DATA ERROR

This error indicates that the data in the bitmap is corrupt.

CLIPBOARD CONVERSION MEMORY ERROR

This failure is given when cutting an image to clipboard.

This is typically caused by inadequate PC memory (or disk swap file). Close any other applications or free up space on hard disk. (N.B. swap file must be contiguous space).

CLIPBOARD FETCH FAILED

This failure is given when pasting an image from clipboard.

The call to the clipboard returned a failure.

CLIPBOARD - GET CONTEXT FAILED

This error indicates that a display context could not be obtained.

Inadequate resources. Close other applications.

CLIPBOARD - UNKNOWN BITMAP TYPE

The clipboard contains a bitmap of a type which cannot be handled by the LEO software.

CONFIG FILE READ ERROR - USING DEFAULT

This error occurs when an attempt is made to access a parameter or state which is currently disabled by the operational rules.

This error is given when a file error is detected on reading the configuration file CONFIG.LEO or when a format error is detected.

This file contains the configuration data (options etc) for the Right Hand Side of the SEM (electronics).

When this error occurs a default minimum configuration is assumed.

CONFIG FILE WRITE ERROR

This error is given when a file error is detected on writing the configuration file CONFIG.LEO.

This file contains the configuration data (options etc) for the Right Hand Side of the SEM (electronics).

The most likely cause of error is inadequate disk space.

COULD NOT READ DATA FROM NVRAM, READ FROM DATA.VAC

Configuration and calibration information relating to the column is saved in Non Volatile RAM.

This data could not be read correctly. The standby copy of this data held in file DATA.VAC has been used.

If the format of NVRAM data has been altered (check release notes) then on first startup of the system this error will be given.

If this is not the first use after an upgrade please report the problem.

DEFAULT.VAC FILE USED

Configuration and calibration information relating to the column is saved in Non Volatile RAM.

Due to a problem reading the NVRAM an attempt has been made to use the standby DATA.VAC file and either the data is corrupt, an incompatible version or the file could not be found. The file DEFAULT.VAC has been used which contains a default set of data. Any calibration data has therefore been lost.

Please report the problem.

EHT COMMS FAILED TO OPEN/CLOSE

This error is given when there is a failure in the communications to the EHT set. A Status code is given which will enable details of the fault to be determined.

Please report the problem.

EHT - FILAMENT BLOWN

This message indicates that the filament has blown and should be replaced.

An incorrectly seated firing unit or dirty contacts may also give this error.



EHT - INHIBITED BY VAC SYSTEM

The EHT supplies are inhibited by the Vacuum system state.

This is typically a warning.

EHT SET COMMS TIMEOUT

The EHT set has failed to respond within a reasonable period.

Please report the problem.

EHT SET INTERNAL FAULT

The EHT set has reported an internal error.

Please report the problem.

EHT - SET TRIPPED

This error indicates a trip of the EHT set.

This is typically caused by:-

1. Dirty firing unit
2. Incorrectly fitted filament (i.e. too close to aperture)
3. Broken or cracked filament base
4. Inadequate vacuum especially when high KV is used

EHT - SPURIOUS RESET

EHT set has been reset for an unknown reason (i.e. not by system software).

FAILED TO ACTIVATE:-

ACQ. PROCESS
DSP PROCESS
EHT PROCESS
EO PROCESS
STAGE PROCESS
VAC PROCESS

These are internal software errors which should not occur. If the fault should occur please contact Leica.

FAILED TO LOAD:-

ACQUIRE RLM
DSP RLM
EHT RLM
EO RLM
IMEX RLM
OVERLAY MANAGER
STAGE RLM
VAC RLM

These are internal software errors which should not occur. If the fault should occur please contact Leica.

FAILED TO WRITE DATA.VAC

DATA.VAC is the standby file containing the configuration and calibration for the column.

An attempt has been made to update this file and has failed. This is typically due to lack of disk space.

Please check free space on disk and discard or archive files as necessary.

FAILED TO WRITE NVRAM

Configuration and calibration information relating to the column is saved in Non Volatile RAM.

An attempt has been made to update this information which has failed. The information will have been saved in the standby file DATA.VAC.

Please report the problem.

FAILED TO WRITE NVRAM AND DATA.VAC

Configuration and calibration information relating to the column is saved in Non Volatile RAM.

An attempt has been made to update this information which has failed.

DATA.VAC is the standby file containing the configuration and calibration for the column.

An attempt has been made to update this file and has failed. This is typically due to lack of disk space.

HRRU COMMAND ERROR

This error is given when a command to the HRRU fails.

Code numbers greater than 40 indicate the failure of an internal consistency check. Contact Leica.

Code numbers less than 40 indicate that there is a failure in the communication to the DSP subsystem.

Please report the problem.

The code number given identifies the failing command as follows:-

- | | |
|---|-------------------------|
| 1 | HRRU_FITTED |
| 2 | TAKE_LEFT_STORED_PHOTO |
| 3 | TAKE_RIGHT_STORED_PHOTO |

4	TAKE_LIVE_PHOTO
5	GAMMA_OVERLAY_HRRU_LUT
6	GAMMA_HRRU_LUT
7	SET_FILM_SPEED
8	SET_LIVE_REPEAT
9	SET_CAMERA_TYPE
A	SET_HRRU_FOCUS
B	SET_HRRU_BRIGHTNESS
C	SET_HRRU_CONTRAST
D	SAVE_HRRU_CONFIG

IMEX FAILED TO INITIALISE

This is an internal software error which should not occur.

If the fault should occur please. Contact Leica.

INCORRECT IDENT CODE

This error occurs when the user interface attempts to access a system parameter in the Master DLL using an incorrect identification code. Contact Leica.

INVALID DEFAULT.VAC FILE

Configuration and calibration information relating to the column is saved in Non Volatile RAM. The file containing the initial default data is corrupt, an incompatible version or not found.

Please report the problem.

INVALID PARAMETER RECEIVED BY EHT SET

This error is given when the EHT set receives a command with invalid parameter(s).

This may be symptomatic of a communications error.

Please report the problem.

INVALID STAGE COMMAND

This error is given when a command is issued to move the stage to an invalid position (i.e. beyond the limits). This may be due to defining an invalid stage scan pattern which would result in limit violation.

INVALID STATE VALUE

This error occurs when the user interface attempts to set a system parameter in the Master DLL to an incorrect state. Contact Leica.

NO BITMAP IN CLIPBOARD

This failure is given when pasting an image from clipboard.

The clipboard does not contain a bitmap.

NVRAM DATA INCONSISTENT WITH CONFIG FILE

Configuration and calibration information relating to the column is saved in Non Volatile RAM.

The config file contains the configuration data (options etc) for the Right Hand Side of the SEM (electronics).

This message indicates that an inconsistency has been found. A default configuration is assumed.

This message should only occur where hardware changes have taken place (e.g. new board installed).

If necessary please report the problem.

BOTH COPIES OF DATA HAVE THEREFORE BEEN LOST.

Please report the problem.

OPEN CLIPBOARD ERROR

This failure is given when cutting/pasting an image to/from clipboard.

PARAMETER OR STATE CURRENTLY DISABLED

This error occurs when an attempt is made to access a parameter or state which is currently disabled by the operational rules.

PARAMETER RANGE ERROR FROM EHT SET

This error is given when the EHT set receives a command with parameter value(s) out of valid range.

This may be symptomatic of a communications error.

Please report the problem.

READ TIFF DIRECTORY ERROR

This error is given when reading a TIFF file.

The error occurred when reading the TIFF file internal image directory.

The file is corrupted.

This is typically due to a partially written file, truncated due to inadequate disk space.

READ TIFF HEADER ERROR

This error is given when reading a TIFF file.

The error occurred when reading the TIFF header.

This error may be given if an attempt is made to read a TIFF file (e.g. to determine its header information) while the file is being printed.

Alternatively the file may have been corrupted.

This is typically due to a partially written file, truncated due to inadequate disk space.

READ TIFF IMAGE ERROR

This error is given when reading a TIFF file.

The error occurred when reading a TIFF image structure.

The file is corrupted.

This is typically due to a partially written file, truncated due to inadequate disk space.

STAGE COMMAND ERROR

This error is given when a stage command fails.

Code numbers greater than 40 indicate the failure of an internal consistency check/queueing. Contact Leica.

Code numbers less than 40 indicate that there is a failure in the communication to the stage/vac subsystem.

Please report the problem.

The code number given identifies the failing command as follows:-

1	SET_UP_STAGE_REQ
2	MANUAL_INIT_REQ
3	AUTO_INIT_REQ
4	LOWER_USER_LIMITS_REQ
5	UPPER_USER_LIMITS_REQ
6	TIGA_TIMER_TICK_REQ
7	SPEED_MOVE_REQ
8	STAGE_POSITION_REQ
9	BACKLASH_REQ
A	MOVE_MODE_REQ
B	ABORT_REQ
C	STAGE_PARAMS_V_START
D	STAGE_PARAMS_V_INC
E	STAGE_PARAMS_T_STEP
F	STAGE_PARAMS_BACKLASH_SPD
10	STAGE_PARAMS_BACKLASH_DST
11	STAGE_PARAMS_MAXIMUM_SPD
12	GET_ERROR_STATUS
13	CHECK_STAGE_PSU

STAGE X -15V FAILED

Please report the problem.

STAGE X +15V FAILED

Please report the problem.

STAGE Y -15V FAILED

Please report the problem.

STAGE Y +15V FAILED

Please report the problem.

STAGE Z -15V FAILED

Please report the problem.

STAGE Z +15V FAILED

Please report the problem.

TIFF ANNOTATION MEMORY LOCK ERROR

This error is given when attempting to lock in memory the image annotation associated with a worksheet.

This is typically caused by inadequate PC memory (or disk swap file). Close any other applications or free up space on hard disk. (N.B. swap file must be contiguous space).

TIFF FILE ERROR

This error is given when reading a TIFF file.

Either the file could not be found or error in reading first block.

TIFF IMAGE SELECT ERROR

This error is given when an inconsistent image selection is defined (e.g. no image selected).

UNKNOWN COMMAND RECEIVED BY EHT SET

This error is given when the EHT set receives a command it does not understand. This may be symptomatic of a communications error.

Please report the problem.

VACUUM BOARD -12V FAILED

Please report the problem.

VACUUM BOARD +12V FAILED

Please report the problem.

VACUUM BOARD -5V FAILED

Please report the problem.

VACUUM BOARD +5V FAILED

Please report the problem.

VACUUM COMMAND ERROR

This error is given when a vacuum command fails.

Code numbers greater than 40 indicate the failure of an internal consistency check. Contact Leica.

Code numbers less than 40 indicate that there is a failure in the communication to the stage/vac subsystem. Please report the problem.

The code number given identifies the failing command as follows:-

1	CONFIGURE_FRONT_PANEL_REQ
2	SYSTEM_PUMPING_REQ
3	CONFIG_VIEWING_WINDOW_REQ
4	CONFIG_COLUMN_PUMPING_REQ
5	COLUMN_PUMPING_REQ
6	COLUMN_ISOLN_REPLY_REQ
7	EDX_CONFIGURE_REQ
8	WDX_CONFIGURE_REQ
9	FILAMENT_THRESH_REQ
A	EDX_THRESH_REQ
B	SET_4QBSD_QUADRANT_REQ
C	SET_4QBSD_VISIBILITY_REQ
D	SET_4QBSD_GAIN_REQ
E	SET_SCM_RANGE_REQ
F	SCM_READINGS_REQUIRED_REQ
10	VACUUM_TIMER_ROUTINE_REQ
11	WRITE_VACUUM_DATA_REQ
12	READ_VACUUM_DATA_REQ
13	OPER_WDX_GATE_VALVE_REQ
14	AIRLOCK_CONFIGURE_REQ
15	SET_TILT0
16	SET_TOUCH_ALARM_OFF
17	GET_VACUUM_ERRORS
18	GET_COMMS_PSU
19	SPECIMEN CURRENT MONITOR MEASUREMENT ERROR

The following errors refer to failures in the communications with the Vacuum subsystem:-

21	Comms timeout
22	Comms overrun
23	Unknown command
24	Invalid parameter
25	Out of range parameter
26	Command failed
27	Bad reply
28	Put Queue error
29	Get Queue error
2A	Wrong parameter
2B	Space error
2C	Reply parameter error

VACUUM SYSTEM LEAK

This error is given when the turbo pump takes an excessive time to reach its maximum speed, which is indicative of a vacuum system leak or poor sample preparation.

VAC SYSTEM PENNING GAUGE FAILURE

Please report the problem.

WRITE TIFF DIRECTORY ERROR

This error is given when writing a TIFF file.

An error occurred while writing the directory portion of the TIFF file.

This is typically due to inadequate disk capacity. Delete excess files.

WRITE TIFF HEADER ERROR

This error is given when writing a TIFF file.

Either the file cannot be created or an error occurred when writing the TIFF header.

This is typically due to inadequate disk capacity. Delete excess files.

WRITE TIFF IMAGE ERROR

This error is given when writing a TIFF file.

An error occurred while writing the image portion of the TIFF file.

This is typically due to inadequate disk capacity. Delete excess files.

6.4.2. Other Errors

In addition to the errors listed above there are two types of error which may (but should not) occur. The usual explanation of such an error is a failure in the LEO software.

WINDOWS_{TM} APPLICATION ERROR

When a Windows_{TM} application error occurs the user is presented with two options 'IGNORE' or 'CLOSE'. It is strongly recommended that the application should be closed. Further to this it is also recommended that the system should be powered off and on again to ensure that it is returned to a consistent state.

Actor Error

When an Actor error occurs the options available are 'Debug' or 'OK'. The only valid selection in this case is OK, but before selecting it please note down the information contained in the error window. Again a power off reboot should be performed (even if the LEO application appears to continue correctly).

When either of the above errors are encountered please inform Leica Cambridge of the circumstances leading to the error together with any information from the error window.

