

## 1. Introduction

The Baton Control Module (BCM or RF-Baton!) paging basestation component has the ability to relay its current status via a list of Error Codes. When an error is detected the Error is logged in the BCM's error log. The error log can be read via the FIPS interface. Some of the errors are also reported as alarms to the Choreographer!. The Choreographer! is notified of unsolicited alarms from the BCM asynchronously as, and when, the error condition occurs. Because the OCM does not support a network interface between itself and the Choreographer!, the BCM is also responsible for relaying specific OCM alarms to the Choreographer!.

### Definitions

**Alarm** - A report of a system performance degradation.

**Error** - A report of a diagnosed problem or an information event. Some errors may trigger alarms, while others will not.

## 2. Version Information

The information in this document shows the current status of the RF-B! errors for all releases of software upto and including:

### 1.6.1

Backwards compatibility is maintained between releases when appropriate. When an alarm is added the release version to first support the alarm is noted in the Description column of the tables. If no version is listed, assume that it has been present since RFB 1.2.2.

## 3. Reading the Error Logs on OCM and BCM

### 3.1. Reading Error Logs Via FIPS

Error Logs can be read on the BCM via the FIPS "a 104" command. Entering "a 104" causes all currently logged errors to be displayed. Software Errors, those errors pertaining to the BCM's software operating system, are saved to a separate log. This log is readable via the "a 110" FIPS command.

### Error Log Description

When the "a 104" FIPS command is issued, all currently logged errors are returned to the terminal. The example below shows a typical error log on the BCM.

```
FIPS: a 104
FIPS: <STATION_ERROR><LOG_ERROR><S STATION RESET><ROOT><354><1996/04/
02.12:00:00><1>
```

Each log entry line contains the following information:

**<Type><Action><Error Code><Caller><Line Num><Timestamp><Occurrences>**

**Type** - helps determine which subsystem within the module is responsible for the error condition. The Type can take on values such as NVM, DSP, STATION\_ERROR, GPS, etc..

**Action** - tells what action the error logging mechanism took when the error occurred. Action can be either RESET\_STATION (fatal error, station was reset) or LOG\_ERROR (non-fatal, error was logged, but station was not reset).

**Error Code** - used to identify individual errors. The tables in this document contain descriptions of each of the possible error codes.

**Caller** - Used for software debugging. The Caller represents the software source code module which logged the error

**Line Num** - Used for software debugging. The Line Num is the physical line number of the calling software source code module from where the error was logged.

**Timestamp** - the GPS time when the latest occurrence of the error was logged. If GPS time is not known at the time the error is logged, the Timestamp will contain the current value of the onboard clock, which starts timing from 1996/04/02.12:00:00 upon reset.

**Occurrences** - the number of times the current combination of Type, Action, Error Code, Caller, and Line Num have occurred since the log was last cleared. Note that different Callers can log the same Error Code, in which case separate log entries will be made.

When the **a 110** FIPS command is issued on the BCM (not supported on the OCM) all currently logged Software Errors are returned to the terminal. The example below shows a typical Software Error log on the BCM.

```
FIPS: a 110
```

```
FIPS: <SWARE><LOG_ERROR><E_SRAM_READ_FAULT><ERROR_LOG_HANDLER><848>
```

Each Software Error log entry line contains the following information:

```
<Type><Action><Error Code><Caller><Line Num>
```

### 3.2. Reading Alarms via the Choreographer!

Alarms are sent via the network as they occur. A “popup” window is displayed for each alarm received by the C!. See Choreographer! User Manual for details.

## 4. Clearing the Error Logs on OCM and BCM

### 4.1. Clearing Error Logs via FIPS

Enter the FIPS **a 111** command to clear the OCM or BCM Error Logs. To clear the Software Error Log on the BCM, enter FIPS **a 113**.

**4.2. Clearing Alarms via the Choreographer!**

Logged alarms can be removed from the Choreographer's alarm log

**5. Using the Error Code Tables**

## RF-B! Error/Alarm Code Definitions

### Table 1: Station Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
✓			<b>E_HIGH_STABILITY_REFERENCE_FAILURE</b>	The Station lost contact with the Ultra High Stability Reference (UHSO).
✓			<b>E_UNABLE_TO_DETERMINE_SYS_CONFIG</b>	Unknown Station Controller Type
✓			<b>E_XILINX_DOWNLOAD_FAILURE</b>	An error occurred while attempting to download a program to the Xilinx FPGA.
✓			<b>E_DUPLICATE_MDP_FRAMES</b>	Duplicate frame detected in paging queue
✓			<b>E_PENDULUM_NOT_LOCKED</b>	The Pendulum has fallen out of phase lock with the 10MHz. This could be due to the absence of a 10MHz Reference, incorrect programming or failure of the RF-O Synthesizer or incorrect programming or failure of the Pendulum.
✓			<b>E_PENDULUM_REFERENCE_FAILURE</b>	The Pendulum Clock is not longer detectable by the Host Microprocessor.
✓			<b>E_OPP_VERSION_NOT_SUPPORTED</b>	Unsupported OPP version.
✓			<b>E_PAGING_PROTOCOL_NOT_SUPPORTED</b>	Unsupported paging protocol.
✓			<b>E_PLACE_BATCH_ON_PAGING_QUEUE</b>	Frame not added to paging queue.
✓			<b>E_SASM_FREERUN_TIMEOUT</b>	GPS lock not required during Simulcast FREERUN. Paging is disabled until GPS lock is required.
✓			<b>E_TX_OK_DOWN</b>	TX_OK signal has been disabled by the transmitter.
✓			<b>E_LATE_LAUNCH_TIME</b>	Single message data purged. The necessary processing time and current time exceeded the launch time.
✓			<b>E_EARLY_LAUNCH_TIME</b>	Single message data purged. The launch time is too far ahead of the current time. Not enough RF-B! memory.
✓			<b>E_FLUSH_PDM_LIST</b>	All message data purged. Data queues are flushed upon the BCM disabling paging.

## RF-B! Error/Alarm Code Definitions

### Table 1: Station Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
✓			<b>E_PULSE_OUTSIDE_WIN_PAGING</b>	1 PPS pulse occurred outside designated window.
✓			<b>E_MISSING_AM_SIDE BAND</b>	One of the two sidebands of AM data was missing from a message batch scheduled to be routed to the transmitter.
✓			<b>E_SUB_CHANNEL_DELETED</b>	AM subchannel message data was invalid.
✓			<b>E_NO_DSP_AVAILABLE</b>	BCM ran out of available subchannels to transmit the data on.
✓			<b>E_UNMATCHED_ACTIVE_SUBCHNL_LAUNCH_TIME</b>	Launch time of pending message batch did not correspond with the end time of current message batch on a unique subchannel.

### Table 2: DSP Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
✓			<b>E_DSP_BOOTSTRAP_TIMEOUT_ERROR</b>	Unsuccessful attempt in downloading bootstrap code to the DSP.
✓			<b>E_DSP_TIMEOUT_ERROR</b>	Unsuccessful attempt to download main application code to the DSP.
✓			<b>E_DSP_STARTUP_FAILURE</b>	An attempt to download code to one of the DSP's failed.
✓			<b>E_DSP_TIMEOUT_ON_OUTPUT</b>	The DSP did not respond to a Host request within a designated time-out period.
✓			<b>E_DSP_OUTPUT_BUFFER_FULL</b>	Only valid during a training request. Training request made, but there were no DSP message buffers available to receive the training request.

## RF-B! Error/Alarm Code Definitions

### Table 3: Operating System Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
	✓		<b>E_TIMEOUT</b>	Task timed out waiting for resource.
	✓		<b>E_UNIMPL</b>	Unemployments System Service.
	✓		<b>E_SSFN</b>	Illegal System Service function number.
	✓		<b>E_NODENO</b>	Illegal Node Number.
	✓		<b>E_OBJDEL</b>	Object has been deleted.
	✓		<b>E_OBJID</b>	Illegal/Invalid Object ID.
	✓		<b>E_OBJTYPE</b>	Incorrect Object Type.
	✓		<b>E_OBJTFULL</b>	Object Table Full.
	✓		<b>E_OBJNF</b>	Object not found.
	✓		<b>E_RSTFS</b>	Informative only. Files maybe corrupted on restart.
	✓		<b>E_NOTCB</b>	Cannot Create - Out of Tabs.
	✓		<b>E_NOSTK</b>	Cannot Create - No Stack Space.
	✓		<b>E_TINYSTK</b>	Cannot Create - Stack Too Small.
	✓		<b>E_PRIOR</b>	Cannot Create - Priority out of range.
	✓		<b>E_ACTIVE</b>	Cannot Start - Already Active.
	✓		<b>E_NACTIVE</b>	Cannot Restart - Never Started.
	✓		<b>E_SUSP</b>	Cannot Suspend - Already Suspended.
	✓		<b>E_NOTSUSP</b>	Cannot Resume - Not Suspended.
	✓		<b>E_SETPRI</b>	Cannot Change Priority - New Priority.

## RF-B! Error/Alarm Code Definitions

### Table 3: Operating System Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
	✓		E_REGNUM	Illegal task register number.
	✓		E_FOPEN	Cannot Delete - Files Open.
	✓		E_DELFS	Cannot Delete - Error from While.
	✓		E_DELLC	Cannot Delete - Error from Preppy.
	✓		E_DELNS	Cannot Delete - Error from PNA.
	✓		E_RNADDR	Cannot Create - Start address not on long word or MMU page.
	✓		E_UNITSIZE	Cannot Create - Unit size not power of 2 or less than 4.
	✓		E_TINYUNIT	Cannot Create - Length too large for given unit size.
	✓		E_TINYRN	Cannot Create - Region length too small for required RNCB.
	✓		E_SEGINUSE	Cannot Delete - One or more segment in use.
	✓		E_ZERO	Cannot Getseg - Requested size is zero.
	✓		E_TOOBIG	Cannot Getseg - Requested size is too big.
	✓		E_NOSEG	Cannot Getseg - Not enough memory.
	✓		E_NOTINRN	Cannot Getseg - Segment does not belong to the region.
	✓		E_SEGADDR	Cannot Getseg - Incorrect segment start address.
	✓		E_SEGFREE	Cannot Retseg - Segment already free.
	✓		E_RNKILLD	Cannot Getseg - Region deleted while waiting.
	✓		E_TATRNDL	Informative - Tasks were waiting at deletion.
	✓		E_PTADDR	Cannot Create - Start address not on long word or MMU boundary.
	✓		E_BUFSIZE	Cannot Create - Buffer size not a power of 2 or less than 4.

## RF-B! Error/Alarm Code Definitions

### Table 3: Operating System Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
	✓		E_TINYPT	Cannot Create - Length too small for necessary PTCB.
	✓		E_BUFINUSE	Cannot Delete - One or more buffers in use.
	✓		E_NOBUF	Cannot Getbuf - No free buffers available.
	✓		E_BUFADDR	Cannot Retbuf - Incorrect buffer start address.
	✓		E_BUFFREE	Cannot Retbuf - Buffer already free.
	✓		E_NOQCB	Cannot Create - No more QCB's.
	✓		E_NOMGB	Cannot Create or Send - No more message buffers.
	✓		E_QFULL	Cannot Send - Message queue full.
	✓		E_QKILLD	Cannot Receive - Queue deleted while waiting.
	✓		E_NOMSG	Cannot Receive - No pending message.
	✓		E_TATQDEL	Informative - At time of deletion tasks were waiting.
	✓		E_MATQDEL	Informative - At time of deletion messages were pending.
	✓		E_NOEVS	No wanted events were pending.
	✓		E_NOTINASR	Cannot Return - Not in ASR.
	✓		E_NOASR	Cannot Send - Task has no valid ASR.
	✓		E_NOSCB	Cannot Create - No more SCB.
	✓		E_NOSEM	Cannot Acquire - Semaphore not available.
	✓		E_SKILLD	Cannot Acquire - Semaphore deleted while waiting.
	✓		E_TATSDEL	Informative - At time of deletion tasks were waiting.
	✓		E_NOTIME	Time of day has not been set.



## RF-B! Error/Alarm Code Definitions

### Table 3: Operating System Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
	✓		E_ILLDATE	Date input out of range.
	✓		E_ILLTIME	Time of day input out of range.
	✓		E_ILLTICKS	Ticks input out of range.
	✓		E_NOTIMERS	No timers left.
	✓		E_BADTMID	Invalid timer id specified.
	✓		E_TMNOTSET	Cannot Cancel - Timer not set.
	✓		E_TOOLATE	Time Request Too Late - Time already past.
	✓		E_PALIGN	PADDR not page-aligned.
	✓		E_LALIGN	LADDR not on section boundary.
	✓		E_UNMAPPED	Logical address is not mapped.
	✓		E_SUPER	Cannot affect supervisor map.
	✓		E_TOOMUCH	Copy Too Long - Past section end.
	✓		E_MAPPED	Section already mapped
	✓		E_NOSECT	No Section available
	✓		E_ZEROMAP	Zero memory to be mapped.
	✓		E_TOOLONG	Length greater than section.
	✓		E_SWITCH	Illegal more switch.
	✓		E_IODN	Illegal device major number.
	✓		E_NODR	No driver provided.
	✓		E_IOOP	Illegal I/O operation number.

## RF-B! Error/Alarm Code Definitions

**Table 4: Software Errors**

Reported Via		C!	Error Code	Description
Error Log	SW Log			
	✓		<b>E_UNABLE_TO_START_TASKS</b>	An attempt to start one of the Station Tasks has failed.
	✓		<b>E_ILLEGAL_IPS_COMMAND</b>	An unrecognized FIPS action command was received.
	✓		<b>E_UNEXPECTED_IPS_COMMAND</b>	An unrecognized UHSO alignment command was received.
	✓		<b>E_NOT_ENOUGH_MEMORY</b>	There was not enough memory to dynamically allocate a buffer.
	✓		<b>E_BAD_IMAGE_CRC</b>	An application remote software download attempt failed.
	✓		<b>E_UNEXPECTED_ELSE</b>	The code took an undesired branch in a conditional statement.
	✓		<b>E_SWITCH_DEFAULT</b>	The value passed to a conditional 'switch' statement did not match any of the tested values.
	✓		<b>E_UNEXPECTED_OPCODE</b>	A command passed to a task was not recognized by that task.
	✓		<b>E_UNEXPECTED_TERMINATION</b>	Expecting UHSO warm-up timer to go off, but instead, wrong timer name is passed.
	✓		<b>E_SRAM_WRITE_FAULT</b>	Attempt to write to Static RAM failed.
	✓		<b>E_SRAM_READ_FAULT</b>	Attempt to read from Static RAM failed.
	✓		<b>E_VARIABLE_OUT_OF_RANGE</b>	Variable passed to a routine was outside its allowed limits.
	✓		<b>E_PORT_ACCESS_FAILURE</b>	The GPS asr has been started without a valid duart port having been assigned and allocated.
	✓		<b>E_ILLEGAL_PORT_NUMBER</b>	An attempt to access an illegal output port has been made.
	✓		<b>E_DETERMINE_OBJECT_ID_NOT_FOUND</b>	An unrecognized system id value was used.

## RF-B! Error/Alarm Code Definitions

### Table 4: Software Errors

Reported Via		C!	Error Code	Description
Error Log	SW Log			
	✓		<b>E_ILLEGAL_PARAMETER_WRITE</b>	FIPS user attempted to write to a value which is application read only.
	✓		<b>E_PARAMETER_WRITE_OUT_OF_RANGE</b>	UHSO alignment parameters are invalid.
	✓		<b>E_PASSED_PARAMETER_OUT_OF_RANGE</b>	A FIPS parameter was out of range.
	✓		<b>E_PARAMETER_MANAGER_BAD_STATUS</b>	Parameter manager status problem.
	✓		<b>E_BAD_XILINX_PARAMETER</b>	Invalid Xilinx type used.
	✓		<b>E_SNMP_SETUP_MIB_FAIL</b>	SNMP MIB initialization failed.
	✓		<b>E_SNMP_DECODE_FAILURE</b>	Failed decode of received SNMP packet.
	✓		<b>E_CANNOT_FLUSH_QUEUE</b>	Failed attempt to flush message queue because maximum number of messages expected was received.

### Table 5: GPS Errors

Reported Via		C!	Error Code	Description
Error Log	SW Log			
✓		✓	<b>E_GPS_SELF_TEST_FAILURE</b>	Self test on GPS Receiver failed.
✓			<b>E_GPS_NOT_TRACKING_SATELLITES</b>	GPS lost satellite tracking after initialization.
✓			<b>E_GPS_NO_RESPONSE</b>	GPS Receiver does not response back to a Host command within designated time period
✓			<b>E_GPS_BAD_COMMAND</b>	Bad command received from GPS receiver. Xray only.
✓			<b>E_CORRUPTED_GPS_COMMAND_TABLE</b>	GPS command table has been corrupted.

## RF-B! Error/Alarm Code Definitions

### Table 5: GPS Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
✓			<b>E_BUFFER_LENGTH_EXCEEDED</b>	GPS message size has exceeded buffer size. Xray only
✓			<b>E_GPS_BAD_PACKET_LENGTH</b>	Requested Trimble GPS packet was incorrect size. Xray only.
✓			<b>E_GPS_UNSTUFF_PACKET_FAIL</b>	Trimble GPS report packet is invalid.

### Table 6: OPP Errors

Reported Via			Error Code	Description
Error Log	SW Log	C!		
	✓		<b>E_OPP_BIND</b>	Error in binding the UDP socket to an address or port number.
	✓		<b>E_OPP_RECVFROM</b>	Error in receiving a UDP packet from the socket.
	✓		<b>E_OPP_IOCTL</b>	The UDP link has an I/O error.
	✓		<b>E_OPP_PSDOWN</b>	The UDP link is inactive and can not be used.
	✓		<b>E_OPP_ASN1_DECODE</b>	Error in decoding a UDP packet.
	✓		<b>E_OPP_ASN1_INIT</b>	Initialization of the ASN.1 decoder fails.
	✓		<b>E_OPP_SOCKET</b>	Error in creating UDP socket.
	✓		<b>E_OPP_SELECT</b>	Error waiting for input on UDP socket.
	✓		<b>E_OPP_INVALID_PARAMETER_ID</b>	Invalid parameter id returned on update.
	✓		<b>E_ADD_MEMBERSHIP_FAILED</b>	Multicast membership add failed.
	✓		<b>E_DROP_MEMBERSHIP_FAILED</b>	Multicast membership drop failed.

## RF-B! Error/Alarm Code Definitions

### Table 7: Alarms

Reported Via			Error Code	Description
Error Log	SW Log	C!		
✓		✓	<b>S_PAGING_IS_DISABLED</b>	Caused by Distribution Link Failure, High Stability Reference failure, GPS receiver out of lock, GPS receiver failure, TX_OK line fail. NOTE: TX_OK line is asserted by the OCM, until one of the following occurs on the OCM: synthesizer out of lock, SASM failure, module reset.
✓			<b>S_GPS_IS_DISABLED</b>	This is issued when GPS access is disabled through FIPS by the user. GPS is disabled through parameter 99 in the parameter database.
	✓		<b>S_GPS_RESOLVED_LOCATION</b>	Issued upon successful initialization of the GPS receiver.
✓			<b>RSR_POWER_UP_RESET</b>	Issued upon Power-on reset..
✓			<b>RSR_EXTERNAL_TOTAL_SYSTEM_RESET</b>	Issued upon hard reset (front panel reset button)
✓			<b>RSR_SOFTWARE_RESET</b>	Issued upon software reset (FIPS: a 117)
✓			<b>RSR_SOFTWARE_WATCHDOG_RESET</b>	Issued upon reset caused by watchdog timer expiration
✓			<b>RSR_DOUBLE_FAULT_MON_RESET</b>	Issued upon internal bus error
✓			<b>RSR_LOSS_OF_CLOCK_RESET</b>	Issued upon failure of CPU clock
✓			<b>RSR_SOFT_RESET_PIN_RESET</b>	Internal only, soft reset.

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## RF-B! Error/Alarm Code Descriptions

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