IVEX Parameter Tables, Rev 1.01

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Introduction

The IVEX file specifies the correlator-initialization configuration by referencing a keyword specified by the operator at correlator-initialize time.

The IVEX Block Structure

The IVEX block structure is indicated diagrammatically as follows, where each indentation implies another level of referencing:

$IVEX_REV	specifies revision level of IVEX file
$CORR_INIT	defines highest-level key for corr configuration
$PBS_INIT	specifies keys for PBS initialization
$DRIVE_INIT	specifies contents of tables to be downloaded to PCM
$TRM_CONFIG	specifies TRM configuration
$SU/CORR_CONNECT	specifies connection between SU and correlator

IVEX Rules

Each IVEX $block is allowed to specify only parameters which are defined for that type of $block. The IVEX Parameter Tables define in detail these parameters for each type of $block.

Each table lists the allowed parameter names and the associated fields. Field numbers in parenthesis are optional. Parameter type '&link' is a VEX linkword as defined in the VEX documentation. If 'units' are specified, the field must have a units label of the proper type.

$IVEX_REV Block

The $IVEX_REV block specifies the revision level of the parameters structure of the IVEX file.

Parameter	Field	Description	Type	Allowed values	Units	Comments
rev	1	IVEX revision number	real	1.0		Will be updated as necessary

$CORR_INIT Block

Each 'def' in the $CORR_INIT block may specify a different initial correlator configuration; the operator selects one intial configuration from among the available 'defs' in the $CORR_INIT block.

Parameter	Field	Description	Type	Allowed values	Units	Comments
system_tempo	1	System speed scaling factor	real	0.75-1.00		Factor of 1.0 corresponds to 32 MHz SYSCLK speed; specified value must be consistent with installed crystal freqs.
bocf_period	1	Fundamental length of correlator-frame period	int			In units of SYSCLK cycles; must be multiple of 32; must divide evenly into 32,000,000.
CUCC_serial_ports	1	Correlate crate#	int	0-1		
	2	Terminal server environment variable name	char	TSERV0| TSERV1		

	3	Port# for CUCC serial port A	int	1-16		Baud rate assumed to be 9600
	4	Port# for CUCC serial port B	int	1-16		Baud rate assumed to be 9600
start_stop counter	1	Terminal server environment variable name	char	TSERV0| TSERV1		HP53131A counter parameters
	2	Term server port#	int			
analog_switch	1	Terminal server environment variable name	char	TSERV0| TSERV1		
	2	Term server port#	int			
timing_monitor	1	Name of measurement	char			For global timing measurements; name is for reporting purposes (i.e. 'TSPM')
	2	Analog switch position	int			
	3	Minimum acceptable value	real			
	4	Maximum acceptable value	real			
	5	Failure action				NYI
ref $PBS_INIT	1	Specifies configuration of one PBS	keyword			Highest-level PBS initialization key; must be one 'ref $PBS_INIT for each PBS.

$PBS_INIT Block

Each 'def' in the $PBS_INIT block specifies the initialization parameters for a single PBS; there must be one 'def' for each PBS attached to the correlator.

Parameter	Field	Description	Type	Allowed values	Units	Comments
SU_ID	1	SU logical ID number	int	0-15		Specifies the 'ID' that will be attached to the specified PBS
	2	SU-defined 'host' name	char			Identifies physical unit
SUCC_serial_ports	1	Terminal server environment variable name	char	TSERV0| TSERV1		
	2	Port# for SUCC console port	int	1-16		Baud rate assumed to be 9600
	3	Port# for SUCC DPU port	int	1-16		Baud rate assumed to be 9600
tape_servo_interval	1	Interval for SU tape-servo monitoring	real	>0	time	Typically 3 seconds
timing_monitor	1	Name of measurement	char			For PBS timing measurements; name is for reporting purposes (i.e. 'PBU0')
	2	Analog switch position	int			
	3	Minimum acceptable value	real			
	4	Maximum acceptable value	real			
	5	Failure action				NYI
ref $SU_INIT	1	Specifies configuration of SU	keyword			
ref $DRIVE_INIT	1	Specifies configuration of drive	keyword			
ref $SU/CORR_CONNECT	1	Specifies connection between SU and correlator	keyword			

$DRIVE_INIT Block

Each 'def' in the $DRIVE_INIT block specifies the initialization parameters for a single tape-playback drive.

Parameter	Field	Description	Type	Allowed values	Units	Comments
drive_type	1	Drive type	char	Mark4|VLBA		
mcb_address	1	Start of address space	hex			4 digits
	2	ID (switch within drive)	hex			2 digits
capstan_relative_diameter	1	Capstan size relative to norm	real	0.9-1.1		Larger value indicates larger-diameter capstan
vacuum_setting	1	Vacuum	real		(in-H_2O)	Relevant only for VLBA/Mark 4 drives; implied units.
	2	Hex setting necessary to achieve above vacuum	hex			Format is '0xqrst', where 'qrst' is a 4-digit hex number
	3	Vacuum	real		(in-H_2O)	Another vacuum/setting value pair
	4	Hex setting necessary to achieve above vacuum	hex			
tape_acceleration	1	Tape acceleration	real		accel	Normal units are ips/sec
headstack/DIM_connect	1	Headstack number	int	1-2		Specifies connection between an odd/even set of headstack tracks to a DIM
	2	Odd or even tracks	char	odd|even		Set of 16 tracks; Tracks are numbered in VLBA convention
	3	DIM port to which they are connected	int	0-3		DIM HSC port number
	4	Nominal bit rate of equalizers installed on DIM	int	2|4|8|16	-	
monitor_module_track	1	Headstack number	int	1-4		
	2	Fwd direction tape monitor trk	int			
	3	Rev direction tape monitor trk	int			
	4	Equalizer selection	int	0|1|2		
headstack_parms	1	Headstack number	int		1-2	
	2	'Forward' headstack position bias	real		length	Usually in microns
	3	'Reverse' headstack position bias	real		length	Usually in microns
	4	Inchworm forward-fast speed	real		vel	Usually in microns/sec (unsigned)
	5	Inchworm forward-slow speed	real		vel	Usually in microns/sec (unsigned)
	6	Inchworm reverse-fast speed	real		vel	Usually in microns/sec (unsigned)
	7	Inchworm forward-slow speed	real		vel	Usually in microns/sec (unsigned)
	8	LVDT positive scale	real		(um/volt)	Unsigned; implied units
	9	LVDT negative scale	real		(um/volt)	Unsigned; implied units
peaking_period	1	Head-peaking period	real		time	Default is 12 secs

$TRM_CONFIG Block

Each 'def' in $TRM_CONFIG block specifies the rules by which TRM channels of an SU are to be allocated when configuring for a task and the parity threshold for valid data.

Parameter	Field	Description	Type	Allowed values	Units	Comments

TRM_order_within_channel	1	Multiplex ratio (tracks/channel)	int	1|2|4		**M:** Only fanout recording supported (i.e. multiple tracks per channel)
	2	Bits/sample	int	1|2		**B**
	3..n	Bit streams designators	char	signx|magx (where x= 0|1|2|3)		n=2+**M*B**; order of fields 3..n specifies order in which bit=streams are to be assigned to TRM 'tracks'
parity_error_limit	1	Parity threshold for valid data	real	on|off		Bytes per byte
invalid_frame_control	1	Invalid on frame CRC error	log	on|off		
	2	Invalid on parerr limit exceeded	log	on|off		
	3	Invalid on 'no sync'	log	on|off		
	4	Invalid on 'unexpected sync'	log	on|off		

Notes:

1. Obviously, TRM 'tracks' can be assigned only to the headstack to which they are connected.
2. The bit stream designators specify the order of bits in the multiplexed fields and must be consistent with the specified values of **M** and **B**.
3. There should be one 'TRM_order_within_channel=" statement for each possible combination of **M** and **B**. The SU configuration software will chose the correct one depending on the values of **M** and **B** for the task to be executed.
4. For data identified at 1 bit/sample, the CRM output the magnitude bit always fixed =1.

$CRM_CONFIG Block

The $CRM_CONFIG block specifies the required barrel-unroll output assignments for the proper reconstruction of each CRM output channel.

Parameter	Field	Description	Type	Allowed values	Units	Comments
unroll_out_assignment	1	Multiplex ratio (tracks/channel)	int	1|2|4		**M**: Only fanout recording supported (i.e. multiple tracks per channel)
	2	CRM output channel	int	0-63		
	3	Barrel-unroll output for 'sign0'	int	0-63		
	4	Barrel-unroll output for 'mag0'	int	0-63		
	5	Barrel-unroll output for 'sign1'	int	0-63		Relevant only for **M**=2 or 4
	6	Barrel-unroll output for 'mag1'	int	0-63		Relevant only for **M**=2 or 4
	7	Barrel-unroll output for 'sign2'	int	0-63		Relevant only for **M**=4
	8	Barrel-unroll output for 'mag2'	int	0-63		Relevant only for **M**=4
	9	Barrel-unroll output for 'sign3'	int	0-63		Relevant only for **M**=4
	10	Barrel-unroll output for 'mag3'	int	0-63		Relevant only for **M**=4

Note:

1. Theses assignments are fixed in SU Xilinx chips and cannot be changed.
2. There must be one 'unroll_out_assignment=' statement for each CRM output for each possible value of **M**.
3. Obviously, barrel-unroll output numbers must not be duplicated for a given value of **M**.

$SU/CORR_CONNECT Block

Each 'def' in the $SU/CORR_CONNECT block specifies the connections from one SU to the correlator proper. The connections are defined in physical 'channel-groups' each channel-group consisting of four SU output channels carried on a single coax cable.

Each SU has 4 output channel-groups, each consisting of 4 contiguous physical SU output channels as follows:

SU chan-group	SU physical output chans
0	0-3
1	4-7
2	8-11
3	12-15

Similarly, each Input Board (one per correlator 'segment') can accept 2 input channel-groups, numbered 0 and 1. One SU channel-group connects to one Input Board channel-group via one coax cable.

Parameter	Field	Description	Type	Allowed values	Units	Comments
SU_connect	1	SU channel-group output	int	0-3		
	2	Correlator segment number	int	0-3		Correlator crate contains two 'segments' of four correlator boards each, each served by one Input Board.
	3	Input board chan-group	int	0-15		

Note:
1. Within a single 'def', there must be one 'SU_connect=' statement for each SU output channel-group.
2. These connections remain fixed unless physical cabling changes are made.
3. Software should check that each input-board-channel-group input has no more than one SU-channel-group output assigned to it.

Update History

1 Nov 1999: Initial release

28 February 2000: Add 'peaking_period=' to $DRIVE_INIT section.