

For LPS 1440S  
LPS 2160S

## EMPIRE/EMPIRE PLUS SYSTEM CYLINDER FORMAT

### CYLINDER -1 HEADS 0-3:

<u>Sector</u>	<u>Description</u>
0	Customer Configuration results
1	1-Corner Test results (audit only)
2	Functional Test results
4	I/O Test Results
5	Digital Scan Verification Test results (NOT USED)
6	1-Corner Defect List
10	Digital Scan defect list
20	Function Test Defect List
22	Customer Config Defect list
24	I/O defect list
30-35	Selfscan Command Script
36-47	Selfscan Results
48-59	Selfscan Defect List
60-1xx	Unused

## CYLINDER -2 HEADS 0-3:

### Sector    Description

#### 0    **Mode Pages:**

Savable mode page information is stored in this sector.

Page Format:	Page Byte	Description
	0	Page Number
	1	Length of page data.
	2-n	Page Data. (length is defined in byte 1).

1    Reserved

#### 2-3    **Configuration Pages:**

Savable configuration page information is stored in these sectors.

Page Format: Same as Mode pages

4-5    Reserved

#### 6-29    **Format Header Three Count Bytes (C0-C2)**

Format Header Bytes for Sector Sizes 512, 520, 524 and 256 bytes. 1024 uses two 512 byte sectors. The count field information for each sector size is saved in six sectors. Each zone has 58 groups (one for each wedge) of three bytes (counts C0, C1 and C2). The count fields are used when formatting and determining the size of data sections between the wedges. The counts must be written before any format command can execute with the exception of the format track command with Host supplied ID'S.

- 6 - 11 Start of Format Header Bytes for 512 bytes per sector.
- 12 - 17 Start of Format Header Bytes for 520 bytes per sector.
- 18 - 23 Start of Format Header Bytes for 524 bytes per sector.
- 24 - 29 Start of Format Header Bytes for 256 bytes per sector.

#### **Format Header Four Count Bytes (C0-C3)**

Format Header Bytes for Sector Sizes 512, 520, and 524 bytes. 1024 uses two 512 byte sectors. The count field information for each sector size is saved in eight sectors. Each zone has 58 groups (one for each wedge) of four bytes (counts C0, C1, C2 and C3). The count fields are used when formatting and determining the size of data sections between the wedges. The counts must be written before any format command can execute with the exception of the format track command with Host supplied ID'S.

- 6 - 13 Start of Format Header Bytes for 512 bytes per sector.
- 14 - 21 Start of Format Header Bytes for 520 bytes per sector.
- 22 - 29 Start of Format Header Bytes for 524 bytes per sector.

#### 30-37    **Working List (W-List):**

This list contains the currently formatted defects in sorted order. This list must be initialized to empty on a virgin drive. All defect lists contain a one byte checksum at the last byte of the eight sectors. The sum of all bytes including the checksum byte is ASCII 'E' or 45 hex.

#### 38-45    **Primary List (P-List):**

This list is converted from the BFW P-List, defined below, based on sector size. Whenever the BFW P-list is initialized, or the sector size changes, this list is initialized.

- 46-53 **Grown List (G-list):**  
This list is written to by any reassign block command, auto reassign operation, and is initialized by the same commands that initialize the BFW P-list.
- 54-61 **Alternate W-List (For SUN use only):**  
This list is used by the drive to save the old W-list when creating a new W-list after a reassign block command or an auto reassign operation. If a power failure should occur during the command then the old list will be restored.
- 62-69 **Bytes From Wedge Primary List (BFW P-List):**  
This list is the manufacturer's defect list and can only be initialized by the factory format command or the regular format command with CDB 1 option = 1D hex in super mode. This list cannot be erased by the customer.
- 70-77 **Alternate G-List (For SUN use only):**  
This list is used by the drive to save the old G-list when creating a new G-list after a reassign block command or an auto reassign operation. If a power failure should occur during the command then the old list will be restored.
- 78-1xx Unused

**CYLINDER -3 HEADS 0-3:**

<b><u>Sector</u></b>	<b><u>Description</u></b>
00-09	<b>PRML Untrained R/W FIR coefficients (251 bytes/set)</b>
00 - 01	R/W Chan registers 2 values head 0
02 - 03	R/W Chan registers 2 values head 1
04 - 05	R/W Chan registers 2 values head 2
06 - 07	R/W Chan registers 2 values head 3
08 - 09	R/W Chan registers 2 values head 4
10 - 11	R/W Chan registers 2 values head 5
12 - 13	R/W Chan registers 2 values head 6
14 - 15	R/W Chan registers 2 values head 7
16 - 17	R/W Chan registers 2 values head 8
18 - 19	R/W Chan registers 2 values head 9
20 - 21	R/W Chan registers 2 values head 10
22 - 23	R/W Chan registers 2 values head 11
24 - 25	R/W Chan registers 2 values head 12
26 - 27	R/W Chan registers 2 values head 13
28 - 29	R/W Chan registers 2 values head 14
30 - 31	R/W Chan registers 2 values head 15
32 - 33	R/W Synt registers 1 values
34 - 35	R/W Init registers 0 values
36	AGC error recovery bytes
37	Register 01h - Non-zero positive reference level (DKVAL) and (DKVTB)
38	Register 02h - Positive Threshold value (THP)
39	Register 03h - FCA Step size values (FCAR)
40	Register 04h - Gain step size values (PACQTRK)
41	Register 05h - Quantizer Offset (QOFFSET)
42	Register 06h - Timing step size (alpha) in ACQ values (n1 - n2)
43	Register 07h - Timing step size (alpha) in TRK values (n3 - n4)
44	Register 08h - Timing step size (beta ) in ACQ values (m1- m2)
45	Register 09h - Timing step size (beta ) in ACQ values (m3- m4)
46	Register 0Ah - Servo threshold value
47	Register 20h - Number of bits from sync field to the THOLD (TRKON)
48	Register 21h - Number of bytes in data field using step size (FCACOUNT)
49	Register 24h - Scrambler and FCA update rate (NDIVIDE)
50	Register 25h - Gain offset value (GOFFSET)
51	Register 26h - Threshold for sync detection (THPSYNC)
52	Register 27h - Sync window (SYNCWIN)
53	Register 0Dh - Servo FIR coefficients A
54	Register 0Eh - Servo FIR coefficients B
55	Register 0Fh - Servo FIR coefficients C
56	Register 10h - Servo FIR coefficients D
57	Register 11h - Servo FIR coefficients E
58	Write current (single bit) /zone & head vendor dependent
59 - 70	PRML R/W FIR coefficients head 0
71 - 82	PRML R/W FIR coefficients head 1
83 - 94	PRML R/W FIR coefficients head 2
95 - 106	PRML R/W FIR coefficients head 3
107 - 118	PRML R/W FIR coefficients head 4
119 - 130	PRML R/W FIR coefficients head 5
131 - 142	PRML R/W FIR coefficients head 6
143 - 154	PRML R/W FIR coefficients head 7
155 - 166	PRML R/W FIR coefficients head 8

} 4 extra new heads  
for yuban

167 - 178	PRML R/W FIR coefficients head 9
179 - 190	PRML R/W FIR coefficients head 10
191 - 202	PRML R/W FIR coefficients head 11
203 - 214	PRML R/W FIR coefficients head 12
215 - 226	PRML R/W FIR coefficients head 13
227 - 238	PRML R/W FIR coefficients head 14
239 - 250	PRML R/W FIR coefficients head 15

**NOTE: This table repeats 16 times for a total of 4016 bytes in length.**

**CYLINDER -3 HEADS 0-3:**

<b>Sector</b>	<b>Description</b>
10-19	<b>PRML Trained R/W FIR coefficients (251 bytes/set)</b>
00 - 01	R/W Chan registers 2 values head 0
02 - 03	R/W Chan registers 2 values head 1
04 - 05	R/W Chan registers 2 values head 2
06 - 07	R/W Chan registers 2 values head 3
08 - 09	R/W Chan registers 2 values head 4
10 - 11	R/W Chan registers 2 values head 5
12 - 13	R/W Chan registers 2 values head 6
14 - 15	R/W Chan registers 2 values head 7
16 - 17	R/W Chan registers 2 values head 8
18 - 19	R/W Chan registers 2 values head 9
20 - 21	R/W Chan registers 2 values head 10
22 - 23	R/W Chan registers 2 values head 11
24 - 25	R/W Chan registers 2 values head 12
26 - 27	R/W Chan registers 2 values head 13
28 - 29	R/W Chan registers 2 values head 14
30 - 31	R/W Chan registers 2 values head 15
32 - 33	R/W Synt registers 1 values
34 - 35	R/W Init registers 0 values
36	AGC error recovery bytes
37	Register 01h - Non-zero positive reference level (DKVAL) and (DKVTB)
38	Register 02h - Positive Threshold value (THP)
39	Register 03h - FCA Step size values (FCAR)
40	Register 04h - Gain step size values (PACQTRK)
41	Register 05h - Quantizer Offset (QOFFSET)
42	Register 06h - Timing step size (alpha) in ACQ values (n1 - n2)
43	Register 07h - Timing step size (alpha) in TRK values (n3 - n4)
44	Register 08h - Timing step size (beta ) in ACQ values (m1- m2)
45	Register 09h - Timing step size (beta ) in ACQ values (m3- m4)
46	Register 0Ah - Servo threshold value
47	Register 20h - Number of bits from sync field to the THOLD (TRKON)
48	Register 21h - Number of bytes in data field using step size (FCACOUNT)
49	Register 24h - Scrambler and FCA update rate (NDIVIDE)
50	Register 25h - Gain offset value (GOFFSET)
51	Register 26h - Threshold for sync detection (THPSYNC)
52	Register 27h - Sync window (SYNCWIN)
53	Register 0Dh - Servo FIR coefficients A
54	Register 0Eh - Servo FIR coefficients B
55	Register 0Fh - Servo FIR coefficients C
56	Register 10h - Servo FIR coefficients D
57	Register 11h - Servo FIR coefficients E
58	Write current (single bit) /zone & head vendor dependent
59 - 70	PRML R/W FIR coefficients head 0
71 - 82	PRML R/W FIR coefficients head 1
83 - 94	PRML R/W FIR coefficients head 2
95 - 106	PRML R/W FIR coefficients head 3
107 - 118	PRML R/W FIR coefficients head 4
119 - 130	PRML R/W FIR coefficients head 5
131 - 142	PRML R/W FIR coefficients head 6
143 - 154	PRML R/W FIR coefficients head 7
155 - 166	PRML R/W FIR coefficients head 8

167 - 178	PRML R/W FIR coefficients head 9
179 - 190	PRML R/W FIR coefficients head 10
191 - 202	PRML R/W FIR coefficients head 11
203 - 214	PRML R/W FIR coefficients head 12
215 - 226	PRML R/W FIR coefficients head 13
227 - 238	PRML R/W FIR coefficients head 14
239 - 250	PRML R/W FIR coefficients head 15

**NOTE: This table repeats 16 times for a total of 4016 bytes in length.**

**CYLINDER -3 HEADS 0-3:**

20-1xx Unused



**CYLINDER -4 To -10 HEADS 0-7:**

<b><u>Sector</u></b>	<b><u>Description</u></b>
00-1xx	Unused.