Spectra Command/Response Timings

D Protocol

Part 1

8 July 2008

Eric Hamilton

Contents

[1] `$Header: d:/Binder2/Timings/RCS/Timings.tex,v 1.14 2008-07-08 11:50:51-07 Hamilton Exp Hamilton $`
[2] `tocdepth = 2`

List of Figures

1 Test Background

1. 7DEC06: A short test was run using a Spectra III to determine if the TXB-H caused any slow down in the sending of replies to the head end for various pan and tilt commands.

   1.1 The results of base line timing of just the Spectra III's, reply times to various pan/tilt commands is in Appendix A.2, page 7. This test was run at 9600 baud. (Appendix A.2, page 7)

   1.2 The results of timing tests when the TXB-H was put in the Spectra III are shown in Appendix A.3, page 10. With the data capturing being done between the Spectra and the TXB-H. This test was run at 9600 baud.

2. 8DEC06: Additional testing was done on a Spectra II. The results are in Appendix A.1, page 4. This test was run at 2400 baud. (Appendix A.1, page 4)

3. 11DEC06: Testing was done in D Protocol mode and Hernis Protocol modes.

   3.1 Test with the data capture being done between the GlassKeyboard and the TXB-H. This test was run at 9600 baud. (Appendix A.4, page 13)

   3.2 Test with the data capture being done between the TXB-H and the Spectra with the TXB-H running in Hernis Protocol mode. (Appendix 10, page 18)

   3.3 Test with the data capture being done between the TXB-H and the GlassKeyboard running in Hernis Protocol mode at 9600 baud. (Appendix A.6, page 19) This protocol is different enough from D Protocol, that many variations in timing have occured which was to be expected.

   3.4 Test with the data capture being done between the GlassKeyboard and the Spectra IV. This test was run at 9600 baud. (Appendix A.7, page 22)

2 Test Results

1. To within a reasonable margin of error, the Spectra II and Spectra III had almost identical response times to many pan/tilt commands. The Spectra II's times were about four times longer than the Spectra III's times due to running at 2400 baud *vs.* 9600 baud.

2. When the TXB-H was installed in the Spectra III the response times stayed about the same between the TXB-H and the Spectra. However when the data capture was moved to between the TXB-H and the GlassKeyboard, many replies were "lost". Of the replies that passed through the TXB-H, the timing was about the same as it was with out a TXB-H installed. The results are in Appendix A.4, page 13.

3. From examining the detailed communications log (`S3Time1H.SEC`) what appears to be happening is that many commands do not receive replies at all. It is unclear if the commands get through to the Spectra and the replies are lost or if the TXB-H "looses" them.

A Results from Data Captured Response Times

A.1 Results for run s2time0

A.1.1 Test Details

This is a test using a Spectra II. This test was run at 2400 baud and consisted of pan/tilt D Protocol commands only.

There were this many reply times that were analyzed:

```
1       3686 lines in S2TIME0.TIM
```

A.1.2 Typical response times

The full set of response times are plotted in Figure 2, page 6.

```
    s2time0.typ
 1       1,   0.004140
 2       2,   0.004169
 3       3,   0.004086
 4       4,   0.004141
 5       5,   0.004158
 6       6,   0.004168
 7       7,   0.004141
 8       8,   0.004333
 9       9,   0.004140
10      10,   0.004167
11      11,   0.003974
12      12,   0.004279
13      13,   0.004142
14      14,   0.004167
15      15,   0.004140
16      16,   0.004167
17      17,   0.004167
18      18,   0.004144
19      19,   0.004159
20      20,   0.004139
21      21,   0.004165
22      22,   0.004166
23      23,   0.004169
24      24,   0.004164
25      25,   0.004139
```

A.1.3 The minimum response times

All response times are plotted in Figure 1, page 5 by number of identical responses and their duration.

```
    s2time0.min
 1    3073,   0.003074
 2    1968,   0.003959
 3     920,   0.003968
 4     899,   0.003969
 5     117,   0.003972
 6     700,   0.003972
 7     737,   0.003972
 8    1301,   0.003972
 9    3509,   0.003972
10    3573,   0.003972
11      56,   0.003973
12     269,   0.003973
```

A.1.4 The maximum response times

All response times are plotted in Figure 1, page 5 by number of identical responses and their duration.

```
    s2time0.max
 1     309,   0.004343
 2    1412,   0.004343
 3      91,   0.004344
 4    1644,   0.004344
 5     406,   0.004345
 6     735,   0.004345
 7    1904,   0.004345
 8    2230,   0.004345
 9    1404,   0.004347
10     692,   0.004353
11     399,   0.004360
12    3538,   0.008101
```

A.1.5 The most common response times

All response times are plotted in Figure 1, page 5 by number of identical responses and their duration.

```
    s2time0.mde
 1       47,   0.004138
 2       62,   0.004143
 3       69,   0.004164
 4       74,   0.004169
 5      187,   0.004165
 6      192,   0.004139
 7      209,   0.004142
 8      273,   0.004168
 9      390,   0.004166
10      426,   0.004140
11      507,   0.004141
12      539,   0.004167
```

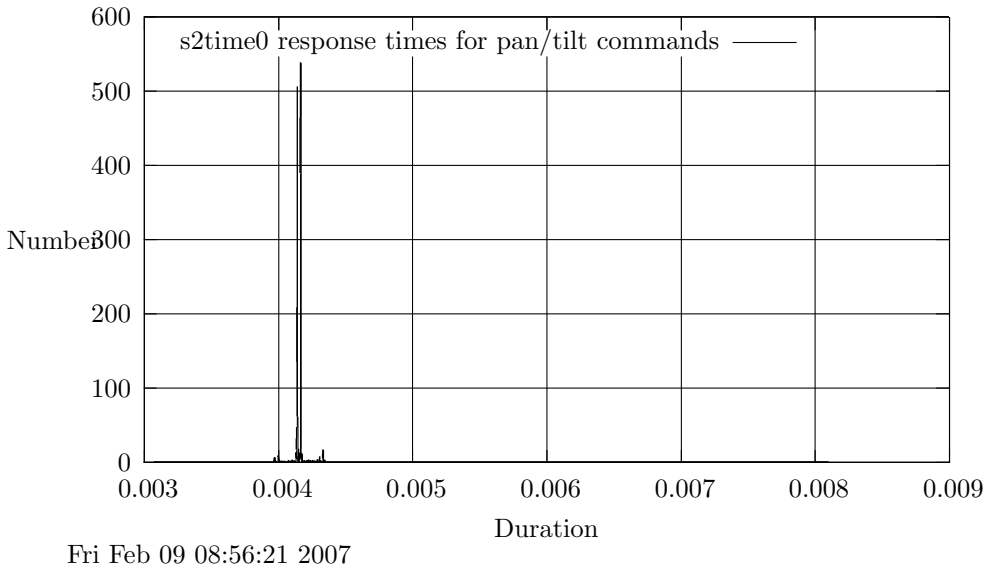

Figure 1: Durations of Responses from Run `s2time0`

A.1.6 Test Run Data

```
1  Event 1 (12/8/2006 9:23:33.606206 AM) through
2  Event 40,546 (12/8/2006 9:31:35.111517 AM)

1  There were a total of    25802 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 481.484414 seconds from the start of data collection
4
5  There were a total of    14744 DTE bytes transferred
6  The first DTE byte came in at 0.031180 seconds from the start of data collection
7  The last DTE byte was at 481.505311 seconds from the start of data collection
```

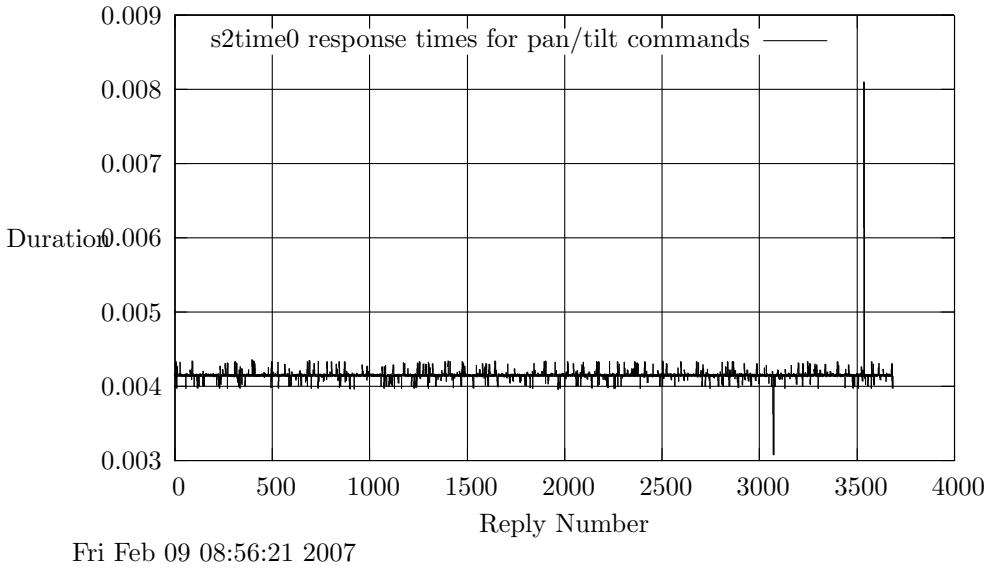

Figure 2: Response Timings for Commands from Run `s2time0`

A.2 Results for run `s3time1`

A.2.1 Test Details

This test monitored the communications between a Spectra III and the GlassKeyboard. All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only.

There were this many reply times that were analyzed:

```
1       3707 lines in S3TIME1.TIM
```

A.2.2 Typical response times

The full set of response times are plotted in Figure 4, page 9.

```
   s3time1.typ
 1       1,   0.001093
 2       2,   0.001037
 3       3,   0.000882
 4       4,   0.001041
 5       5,   0.000910
 6       6,   0.001042
 7       7,   0.001040
 8       8,   0.001043
 9       9,   0.001049
10      10,   0.001046
11      11,   0.001041
12      12,   0.001041
13      13,   0.001045
14      14,   0.001041
15      15,   0.001043
16      16,   0.001049
17      17,   0.001042
18      18,   0.001040
19      19,   0.001042
20      20,   0.001042
21      21,   0.001042
22      22,   0.001050
23      23,   0.001042
24      24,   0.000907
25      25,   0.001040
```

A.2.3 The minimum response times

All response times are plotted in Figure 3, page 8 by number of identical responses and their duration.

```
   s3time1.min
 1     959,   0.000605
 2    1225,   0.000847
 3    2394,   0.000865
 4    2838,   0.000866
 5     275,   0.000868
 6     347,   0.000868
 7     706,   0.000868
 8    2737,   0.000868
 9    2827,   0.000868
10    1061,   0.000869
11    1709,   0.000869
12    2201,   0.000869
```

A.2.4 The maximum response times

All response times are plotted in Figure 3, page 8 by number of identical responses and their duration.

```
   s3time1.max
 1     724,   0.001242
 2    1982,   0.001243
 3    2275,   0.001248
 4    2994,   0.001251
 5    1263,   0.001266
 6    2718,   0.001275
 7    3352,   0.001347
 8    3384,   0.001353
 9    3286,   0.001354
10    1965,   0.024232
11    3286,   0.026093
12    3348,   0.026899
```

A.2.5 The most common response times

All response times are plotted in Figure 3, page 8 by number of identical responses and their duration.

```
   s3time1.mde
 1      90,   0.001046
 2      92,   0.001036
 3     106,   0.001034
 4     129,   0.001050
 5     163,   0.001035
 6     204,   0.001040
 7     224,   0.001047
 8     262,   0.001043
 9     323,   0.001049
10     335,   0.001048
11     400,   0.001041
12     641,   0.001042
```

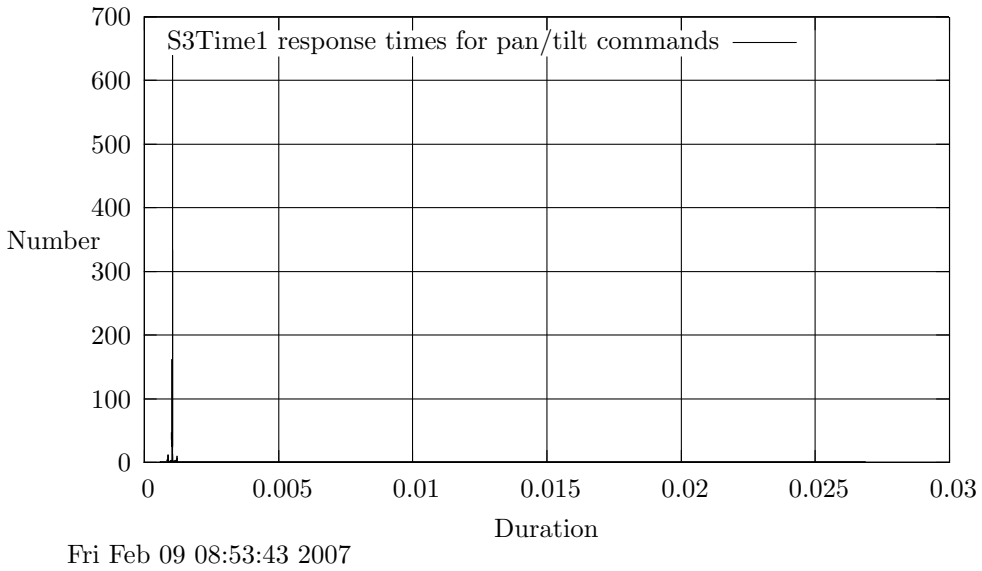

Figure 3: Durations of Responses from Run `s3time1`

A.2.6 Test Run Data

```
1  Event 1 (12/7/2006 1:41:33.556554 PM) through
2  Event 40,777 (12/7/2006 1:48:30.986420 PM)

1  There were a total of    25949 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 417.424818 seconds from the start of data collection
4
5  There were a total of    14828 DTE bytes transferred
6  The first DTE byte came in at 0.007929 seconds from the start of data collection
7  The last DTE byte was at 417.429866 seconds from the start of data collection
```

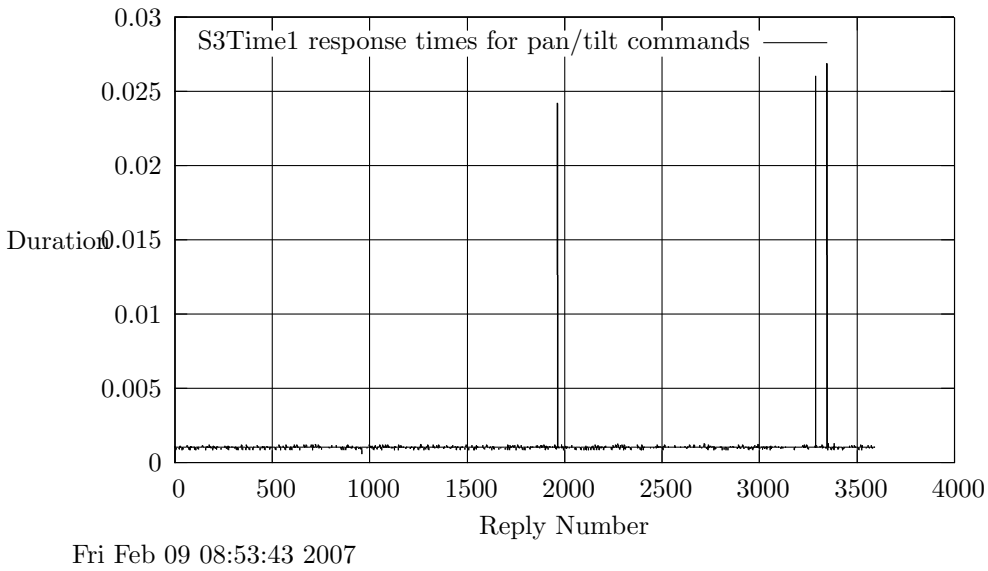

Figure 4: Response Timings for Commands from Run `s3time1`

A.3 Results for run s3time0h

A.3.1 Test Details

This test monitored the communications between the TXB-H and the Spectra III. All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only.

There were this many reply times that were analyzed:

```
1       2327 lines in S3TIME0H.TIM
```

A.3.2 Typical response times

The full set of response times are plotted in Figure 6, page 12.

```
    s3time0h.typ
 1       1,   0.001047
 2       2,   0.001043
 3       2,   0.001041
 4       4,   0.001042
 5       5,   0.001041
 6       6,   0.000881
 7       7,   0.001039
 8       8,   0.001034
 9       9,   0.001042
10      10,   0.001048
11      11,   0.001042
12      12,   0.001049
13      13,   0.001037
14      14,   0.001049
15      15,   0.001039
16      16,   0.001040
17      17,   0.001040
18      18,   0.001049
19      19,   0.001047
20      20,   0.001043
21      21,   0.001047
22      22,   0.001049
23      23,   0.001034
24      24,   0.001041
25      25,   0.001215
```

A.3.3 The minimum response times

All response times are plotted in Figure 5, page 11 by number of identical responses and their duration.

```
    s3time0h.min
 1    1037,   0.000856
 2     324,   0.000866
 3    1718,   0.000867
 4    1015,   0.000868
 5      27,   0.000869
 6     151,   0.000869
 7     792,   0.000869
 8    1010,   0.000869
 9     688,   0.000871
10    1852,   0.000873
11    2101,   0.000873
12     494,   0.000874
```

A.3.4 The maximum response times

All response times are plotted in Figure 5, page 11 by number of identical responses and their duration.

```
    s3time0h.max
 1     455,   0.001216
 2     491,   0.001216
 3     541,   0.001216
 4    1040,   0.001216
 5    1766,   0.001216
 6    1947,   0.001216
 7    2032,   0.001216
 8    2278,   0.001216
 9     344,   0.001226
10    1548,   0.001267
11    1461,   0.001441
12    2252,   0.004542
```

A.3.5 The most common response times

All response times are plotted in Figure 5, page 11 by number of identical responses and their duration.

```
    s3time0h.mde
 1       58,   0.001046
 2       60,   0.001034
 3       60,   0.001036
 4       70,   0.001050
 5      115,   0.001040
 6      120,   0.001035
 7      145,   0.001043
 8      149,   0.001047
 9      213,   0.001048
10      214,   0.001049
11      262,   0.001041
12      381,   0.001042
```

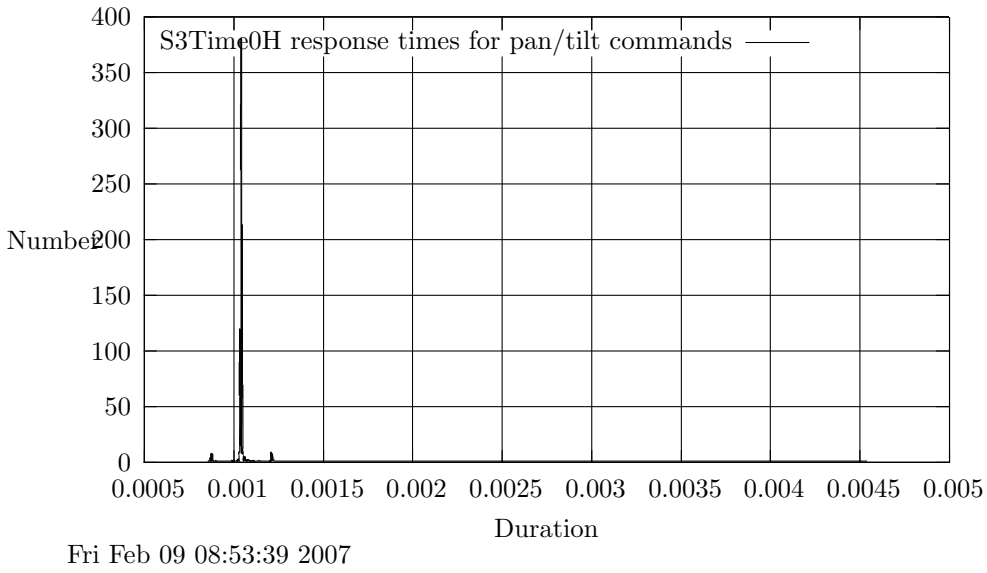

Figure 5: Durations of Responses from Run `s3time0h`

A.3.6 Test Run Data

```
1  Event 1 (12/7/2006 1:56:10.367630 PM) through
2  Event 40,458 (12/7/2006 2:04:33.728581 PM)

1  There were a total of    30996 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 503.360951 seconds from the start of data collection
4
5  There were a total of     9462 DTE bytes transferred
6  The first DTE byte came in at 0.160269 seconds from the start of data collection
7  The last DTE byte was at 503.256865 seconds from the start of data collection
```

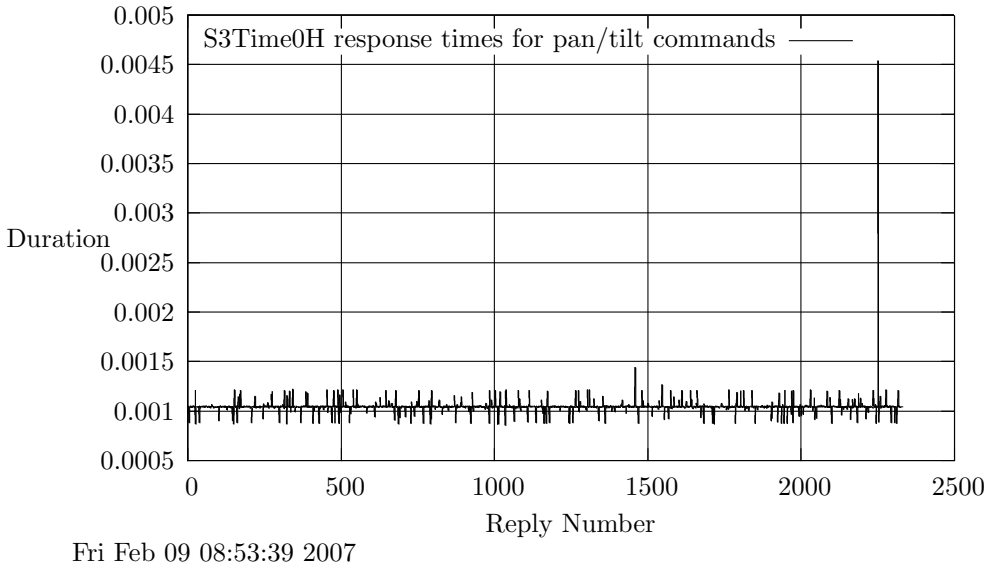

Figure 6: Response Timings for Commands from Run `s3time0h`

A.4 Results for run `s3time1h`

A.4.1 Test Details

This test monitored the communications between the TXB-H and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only.

There were this many reply times that were analyzed:

```
1       2332 lines in S3TIME1H.TIM
```

A.4.2 Typical response times

The full set of response times are plotted in Figure 8, page 15.

```
    s3time1h.typ
 1       1,   0.001039
 2       2,   0.001043
 3       3,   0.001043
 4       4,   0.000990
 5       5,   0.001036
 6       6,   0.001047
 7       7,   0.001041
 8       8,   0.001043
 9       9,   0.001035
10      10,   0.001052
11      11,   0.001046
12      12,   0.001035
13      13,   0.001035
14      14,   0.001039
15      15,   0.001047
16      16,   0.001041
17      17,   0.001047
18      18,   0.001159
19      19,   0.001042
20      20,   0.001048
21      21,   0.001050
22      22,   0.001049
23      23,   0.001042
24      24,   0.001048
25      25,   0.001042
```

A.4.3 The minimum response times

All response times are plotted in Figure 7, page 14 by number of identical responses and their duration.

```
    s3time1h.min
 1     447,   0.000866
 2    1264,   0.000866
 3     829,   0.000869
 4     940,   0.000869
 5     450,   0.000871
 6     969,   0.000872
 7    1330,   0.000873
 8     477,   0.000874
 9     540,   0.000874
10    1285,   0.000874
11    1680,   0.000874
12    1824,   0.000874
```

A.4.4 The maximum response times

All response times are plotted in Figure 7, page 14 by number of identical responses and their duration.

```
    s3time1h.max
 1    2341,   0.001215
 2     805,   0.001216
 3     809,   0.001216
 4    1276,   0.001216
 5    1453,   0.001216
 6      84,   0.001217
 7      85,   0.001217
 8     319,   0.001217
 9    1628,   0.001217
10    1809,   0.001218
11    1495,   0.001219
12     536,   0.001223
```

A.4.5 The most common response times

All response times are plotted in Figure 7, page 14 by number of identical responses and their duration.

```
    s3time1h.mde
 1      42,   0.001046
 2      48,   0.001036
 3      64,   0.001034
 4      78,   0.001050
 5     112,   0.001040
 6     123,   0.001035
 7     164,   0.001043
 8     171,   0.001047
 9     207,   0.001049
10     215,   0.001048
11     273,   0.001041
12     416,   0.001042
```

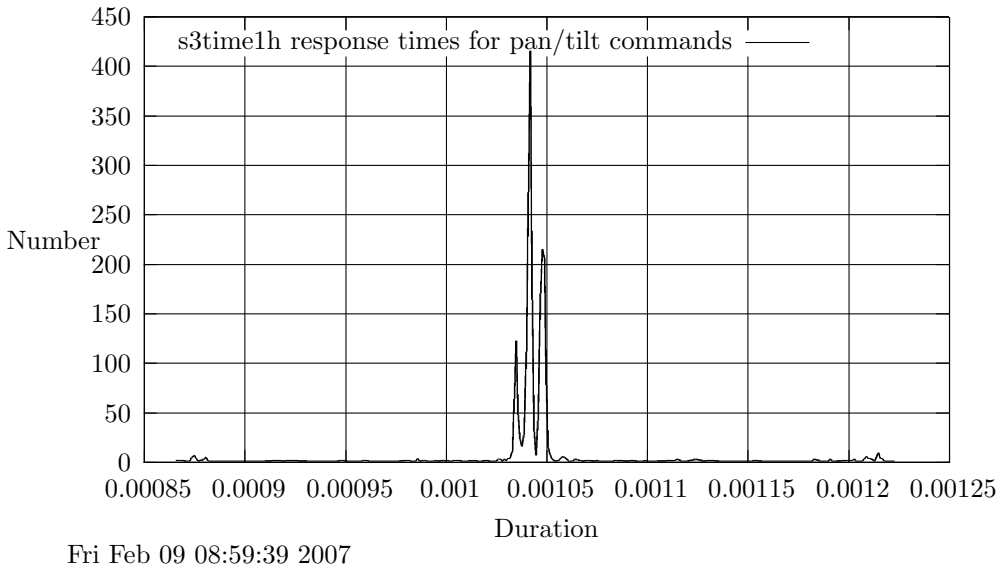

Figure 7: Durations of Responses from Run `s3time1h`

A.4.6 Test Run Data

```
1  Event 1 (12/11/2006 5:43:21.037223 AM) through
2  Event 40,651 (12/11/2006 5:51:43.885360 AM)


1  There were a total of    31143 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 502.839929 seconds from the start of data collection
4
5  There were a total of     9508 DTE bytes transferred
6  The first DTE byte came in at 0.011175 seconds from the start of data collection
7  The last DTE byte was at 502.848137 seconds from the start of data collection
```

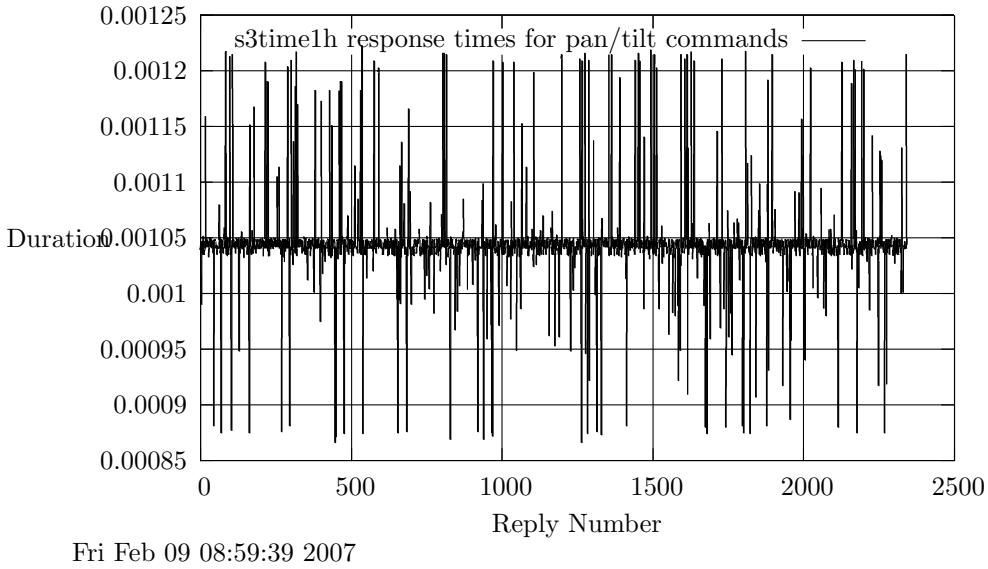

Figure 8: Response Timings for Commands from Run `s3time1h`

A.5 Results for run htime0s

A.5.1 Test Details

This test monitored the communications between the TXB-H and the Spectra. All communications were at 9600 baud. In this test the TXB-H was translating Hernis Protocol into D Protocol, and visa versa. This required that the TXB-H "ask" the Spectra where it was pointing so as to be able to relay that infomation to the GlassKeyboard. The result of this is that many more D Protocol commands had to be sent to the Spectra than would be the case if only pan/tilt commands had to be sent. Also note that more than pan/tilt type commands were sent.

There were this many reply times that were analyzed:

```
1       3246 lines in HTIME0S.TIM
```

A.5.2 Typical response times

The full set of response times are plotted in Figure 10, page 18.

```
   htime0s.typ
 1       1,   0.001042
 2       2,   0.001041
 3       3,   0.001042
 4       4,   0.001042
 5       5,   0.001042
 6       6,   0.001042
 7       7,   0.001042
 8       8,   0.001042
 9       9,   0.001042
10      10,   0.001041
11      11,   0.001035
12      12,   0.001041
13      13,   0.001041
14      14,   0.001040
15      15,   0.001042
16      16,   0.001034
17      17,   0.001051
18      18,   0.001041
19      19,   0.001042
20      20,   0.001044
21      21,   0.001041
22      22,   0.001043
23      23,   0.001042
24      24,   0.001042
25      25,   0.001039
```

A.5.3 The minimum response times

All response times are plotted in Figure 9, page 17 by number of identical responses and their duration.

```
   htime0s.min
 1    3095,   0.000729
 2    2032,   0.000806
 3     422,   0.000864
 4     770,   0.000864
 5    1524,   0.000865
 6    2118,   0.000865
 7     417,   0.000866
 8    1072,   0.000866
 9    1121,   0.000866
10    3004,   0.000866
11    3055,   0.000866
12    2358,   0.000867
```

A.5.4 The maximum response times

All response times are plotted in Figure 9, page 17 by number of identical responses and their duration.

```
   htime0s.max
 1     378,   0.001219
 2     668,   0.001219
 3    2596,   0.001233
 4    2065,   0.001304
 5     916,   0.001348
 6    2143,   0.001914
 7    2373,   0.002316
 8    1204,   0.002942
 9    3104,   0.004957
10     504,   0.006763
11    2139,   0.006796
12    1776,   0.009992
```

A.5.5 The most common response times

All response times are plotted in Figure 9, page 17 by number of identical responses and their duration.

```
   htime0s.mde
 1       18,   0.001209
 2       21,   0.001052
 3       29,   0.001033
 4       32,   0.001036
 5       47,   0.001034
 6       62,   0.001035
 7       69,   0.001044
 8       85,   0.001039
 9      292,   0.001040
10      445,   0.001043
11      673,   0.001041
12     1069,   0.001042
```

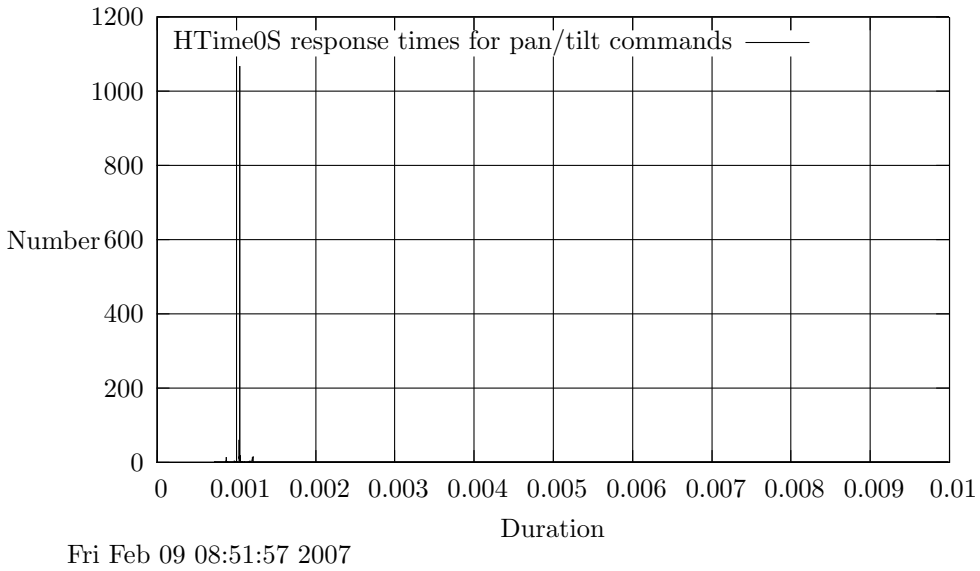

Figure 9: Durations of Responses from Run `htime0s`

A.5.6 Test Run Data

```
1  Event 1 (12/11/2006 6:30:17.274448 AM) through
2  Event 41,486 (12/11/2006 6:31:39.085941 AM)

1  There were a total of    22687 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 81.802029 seconds from the start of data collection
4
5  There were a total of    18799 DTE bytes transferred
6  The first DTE byte came in at 0.008393 seconds from the start of data collection
7  The last DTE byte was at 81.811493 seconds from the start of data collection
```

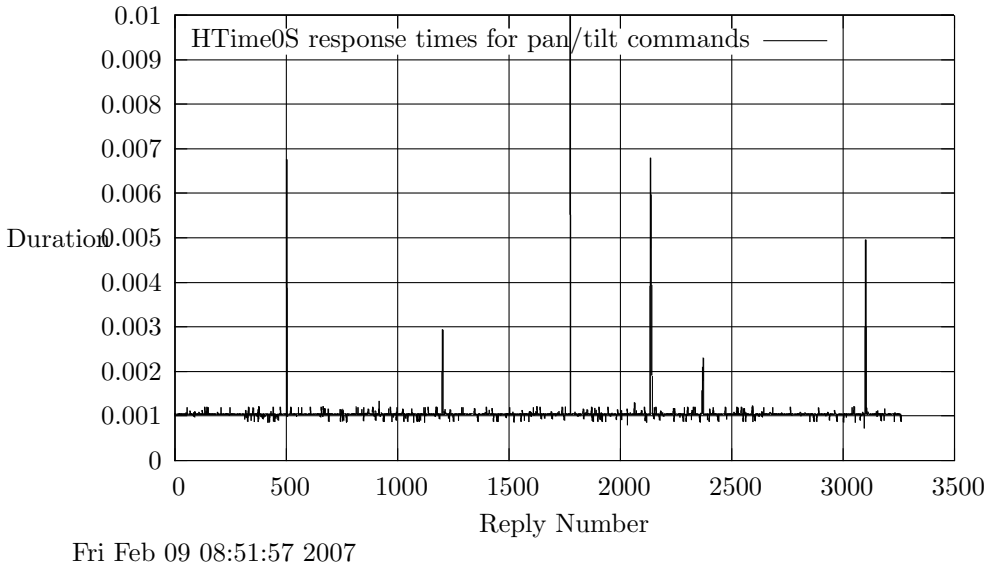

Figure 10: Response Timings for Commands from Run `htime0s`

A.6 Results for run `htime0h`

A.6.1 Test Details

This test monitored the communications between the TXB-H and the GlassKeyboard. The TXB-H/GlassKeyboard were running in Hernis Protocol mode. The test was run at 9600 baud.

There were this many reply times that were analyzed:

```
1       4329 lines in HTIME0H.TIM
```

A.6.2 Typical response times

The full set of response times are plotted in Figure 12, page 21.

```
    htime0h.typ
 1       1,   0.001041
 2       2,   0.038414
 3       4,   0.001039
 4       4,   0.037639
 5       5,   0.001048
 6       5,   0.037638
 7       6,   0.001047
 8       7,   0.001043
 9       7,   0.037761
10      10,   0.001048
11      10,   0.038010
12      11,   0.001048
13      11,   0.038692
14      14,   0.001048
15      14,   0.037612
16      15,   0.001049
17      15,   0.038407
18      17,   0.051200
19      17,   0.037456
20      18,   0.001043
21      18,   0.037736
22      19,   0.001041
23      19,   0.039317
24      22,   0.001048
25      22,   0.037529
```

A.6.3 The minimum response times

All response times are plotted in Figure 11, page 20 by number of identical responses and their duration.

```
    htime0h.min
 1     422,   0.000632
 2     925,   0.000854
 3     740,   0.000866
 4    1030,   0.000868
 5    1155,   0.000868
 6    1268,   0.000868
 7    1355,   0.000868
 8    1836,   0.000868
 9    2228,   0.000868
10    2479,   0.000868
```

A.6.4 The maximum response times

All response times are plotted in Figure 11, page 20 by number of identical responses and their duration.

```
    htime0h.max
 1    2136,   0.056788
 2    2433,   0.057032
 3    2368,   0.060198
 4    1532,   0.066756
 5     345,   0.068146
 6    2514,   0.068847
 7     242,   0.068959
 8     533,   0.079423
 9    2261,   0.089278
10    2127,   0.112267
```

A.6.5 The most common response times

All response times are plotted in Figure 11, page 20 by number of identical responses and their duration.

```
    htime0h.mde
 1      65,   0.001034
 2      81,   0.001046
 3      92,   0.001035
 4     110,   0.001043
 5     132,   0.001040
 6     138,   0.001047
 7     163,   0.001049
 8     194,   0.001048
 9     276,   0.001041
10     348,   0.001042
```

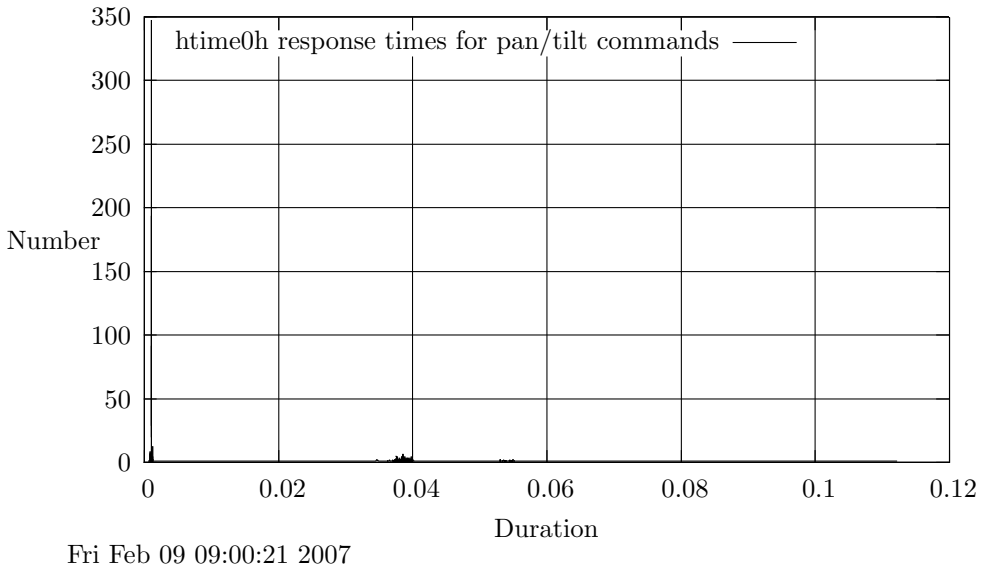

Figure 11: Durations of Responses from Run `htime0h`

A.6.6 Test Run Data

```
1  Event 1 (12/11/2006 6:44:36.536066 AM) through
2  Event 42,562 (12/11/2006 6:48:56.826492 AM)

1  There were a total of     8554 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 259.872283 seconds from the start of data collection
4
5  There were a total of    34008 DTE bytes transferred
6  The first DTE byte came in at 0.065620 seconds from the start of data collection
7  The last DTE byte was at 260.290426 seconds from the start of data collection
```

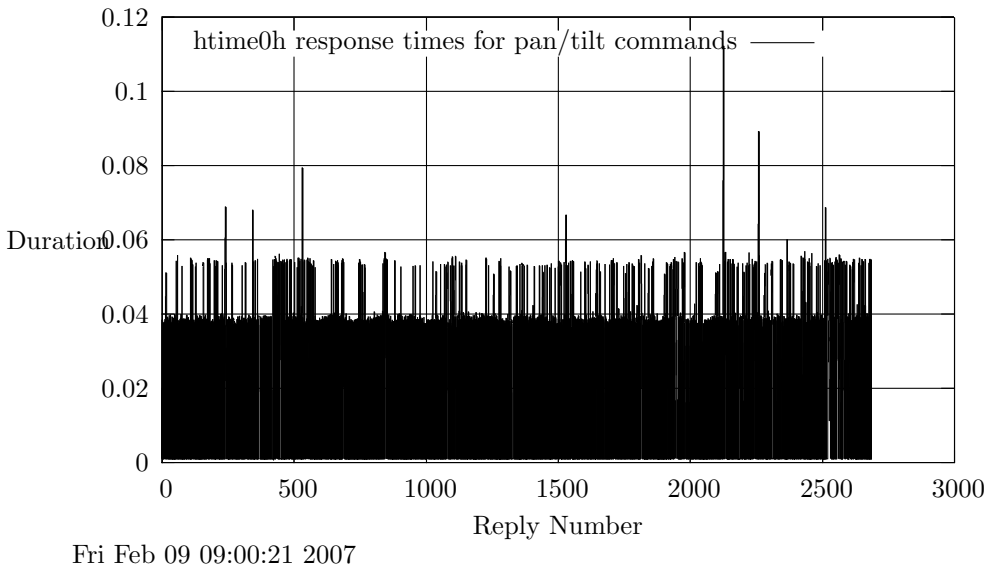

Figure 12: Response Timings for Commands from Run `htime0h`

A.7 Results for run s4time0

A.7.1 Test Details

This test monitored the communications between the GlassKeyboard and a Spectra IV. The TXB and Spectra were both running at 9600 baud.

There were this many reply times that were analyzed:

```
1       3764 lines in S4TIME0.TIM
```

A.7.2 Typical response times

The full set of response times are plotted in Figure 14, page 24.

```
    s4time0.typ
 1       1,   0.001041
 2       2,   0.001042
 3       3,   0.001035
 4       4,   0.001042
 5       5,   0.001062
 6       6,   0.001036
 7       7,   0.001047
 8       8,   0.001049
 9       9,   0.000963
10      10,   0.001042
11      11,   0.001041
12      12,   0.000869
13      13,   0.001043
14      14,   0.001047
15      15,   0.001007
16      16,   0.001047
17      17,   0.001051
18      18,   0.001035
19      19,   0.001042
20      20,   0.001048
21      21,   0.001049
22      22,   0.001042
23      23,   0.001035
24      24,   0.001035
25      25,   0.001047
```

A.7.3 The minimum response times

All response times are plotted in Figure 13, page 23 by number of identical responses and their duration.

```
    s4time0.min
 1    3758,   0.000864
 2     199,   0.000866
 3    1486,   0.000866
 4    2198,   0.000866
 5    2470,   0.000867
 6    2560,   0.000867
 7    1998,   0.000868
 8    2237,   0.000868
 9    2458,   0.000868
10    3194,   0.000868
11      12,   0.000869
12    2913,   0.000869
```

A.7.4 The maximum response times

All response times are plotted in Figure 13, page 23 by number of identical responses and their duration.

```
    s4time0.max
 1    2481,   0.001216
 2    2492,   0.001216
 3    3230,   0.001216
 4    3705,   0.001216
 5    1636,   0.001217
 6    1721,   0.001217
 7    3469,   0.001217
 8    2296,   0.001218
 9    3074,   0.001223
10     147,   0.001263
11    3494,   0.001271
12     924,   0.005533
```

A.7.5 The most common response times

All response times are plotted in Figure 13, page 23 by number of identical responses and their duration.

```
    s4time0.mde
 1      81,   0.001046
 2      85,   0.001036
 3      92,   0.001034
 4     128,   0.001050
 5     175,   0.001040
 6     190,   0.001035
 7     257,   0.001043
 8     285,   0.001047
 9     327,   0.001048
10     333,   0.001049
11     426,   0.001041
12     626,   0.001042
```

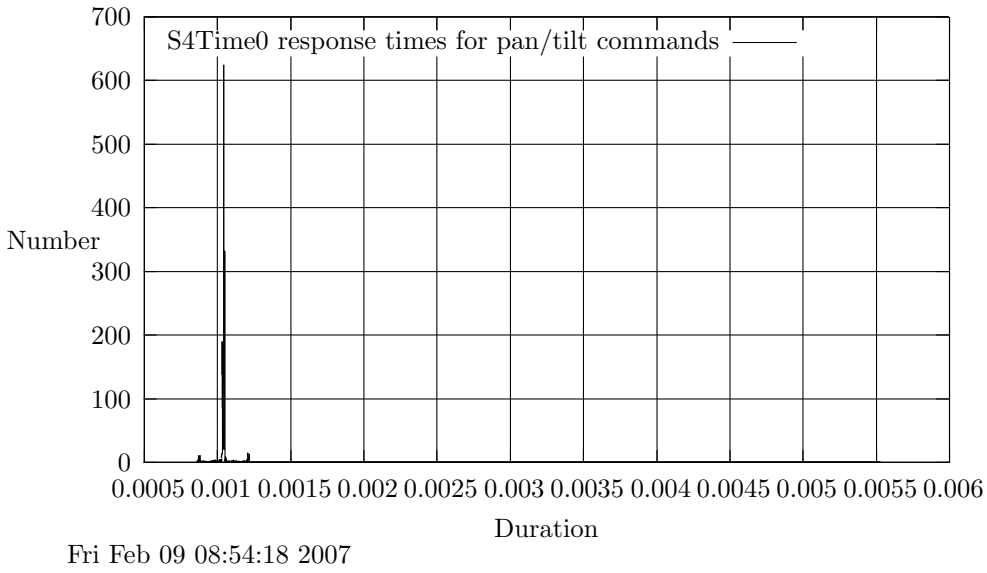

Figure 13: Durations of Responses from Run `s4time0`

A.7.6 Test Run Data

```
1  Event 1 (12/11/2006 12:00:58.635856 PM) through
2  Event 41,404 (12/11/2006 12:07:58.302640 PM)


1  There were a total of    26348 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 419.657323 seconds from the start of data collection
4
5  There were a total of    15056 DTE bytes transferred
6  The first DTE byte came in at 0.010132 seconds from the start of data collection
7  The last DTE byte was at 419.666784 seconds from the start of data collection
```

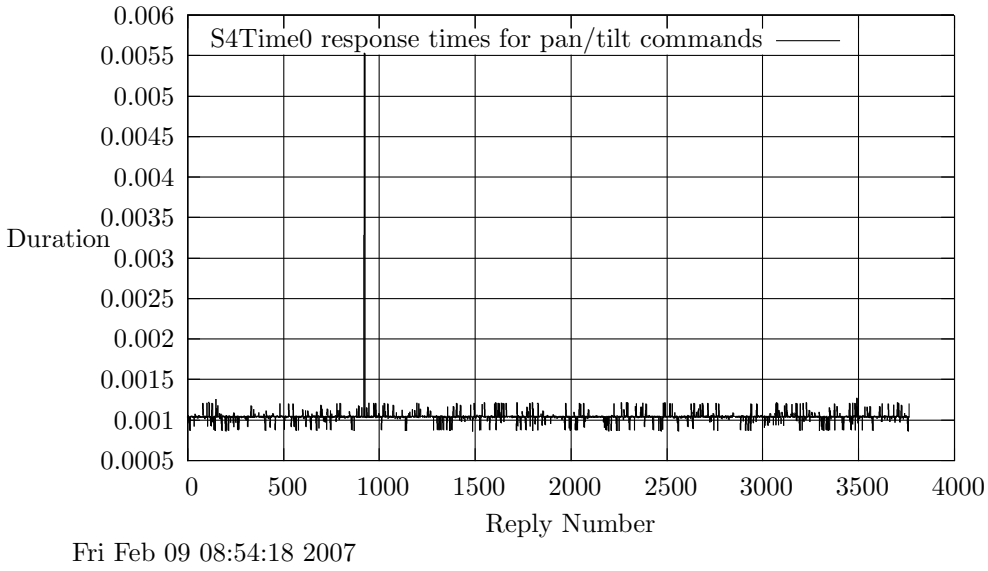

Figure 14: Response Timings for Commands from Run `s4time0`

A.8 Results for run E3012T

A.8.1 Test Details

This test monitored the communications between the ES30TI and the Head End (GlassKeyboard). All communications were at 2400 baud and consisted of D Protocol pan/tilt commands only.

There were this many reply times that were analyzed:

```
1       3654 lines in E3012T.TIM
```

A.8.2 Typical response times

The full set of response times are plotted in Figure 16, page 27.

```
    E3012T.typ
 1       1,   0.004334
 2       2,   0.004142
 3       3,   0.004144
 4       4,   0.004165
 5       5,   0.004024
 6       6,   0.004140
 7       7,   0.004140
 8       8,   0.004140
 9       9,   0.004167
10      10,   0.004141
11      11,   0.004167
12      12,   0.004141
13      13,   0.004313
14      14,   0.004167
15      15,   0.004140
16      16,   0.004167
17      17,   0.004139
18      18,   0.004166
19      19,   0.004169
20      20,   0.004166
21      21,   0.004139
22      22,   0.004142
23      23,   0.004166
24      24,   0.004141
25      25,   0.004139
```

A.8.3 The minimum response times

All response times are plotted in Figure 15, page 26 by number of identical responses and their duration.

```
    E3012T.min
 1    2934,   0.000011
 2    3386,   0.000260
 3    2933,   0.000760
 4    1113,   0.001262
 5    2020,   0.001767
 6    1707,   0.003623
 7    2654,   0.003970
 8    1395,   0.003972
 9    2881,   0.003972
10     546,   0.003973
11    1945,   0.003973
12    1967,   0.003973
```

A.8.4 The maximum response times

All response times are plotted in Figure 15, page 26 by number of identical responses and their duration.

```
    E3012T.max
 1     451,   0.004336
 2     926,   0.004336
 3    1166,   0.004336
 4    2153,   0.004336
 5    3545,   0.004337
 6    2628,   0.004338
 7    1456,   0.004339
 8    2903,   0.004340
 9    1006,   0.004342
10     561,   0.004343
11    2307,   0.004343
12     285,   0.004373
```

A.8.5 The most common response times

All response times are plotted in Figure 15, page 26 by number of identical responses and their duration.

```
    E3012T.mde
 1      38,   0.004164
 2      43,   0.004143
 3      44,   0.004138
 4      80,   0.004169
 5     176,   0.004165
 6     184,   0.004139
 7     184,   0.004142
 8     273,   0.004168
 9     411,   0.004166
10     466,   0.004140
11     502,   0.004141
12     592,   0.004167
```

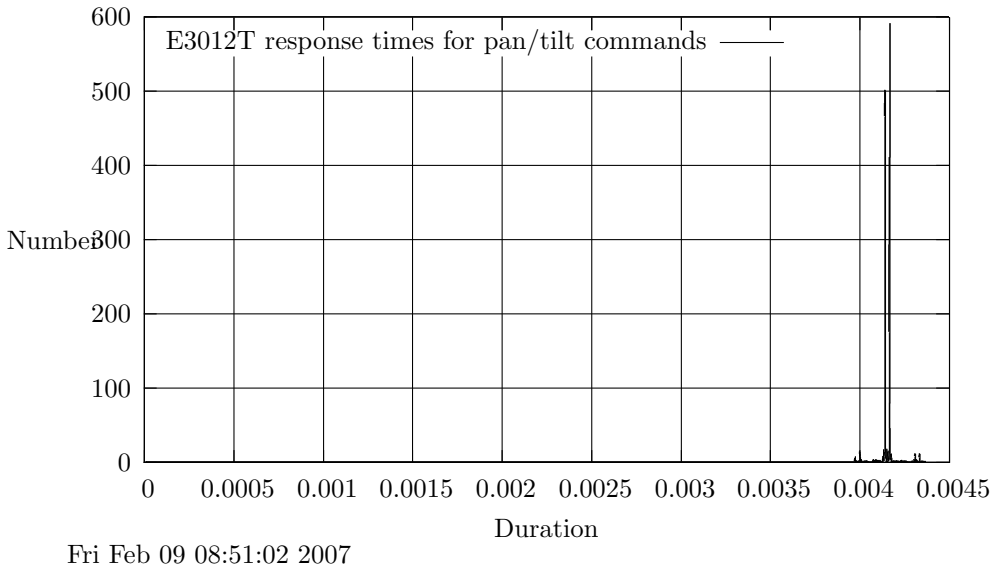

Figure 15: Durations of Responses from Run `E3012T`

A.8.6 Test Run Data

```
1  Event 1 (1/22/2007 10:00:24.286833 AM) through
2  Event 40,194 (1/22/2007 10:08:36.973638 AM)

1  There were a total of    25578 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 492.613912 seconds from the start of data collection
4
5  There were a total of    14616 DTE bytes transferred
6  The first DTE byte came in at 0.030827 seconds from the start of data collection
7  The last DTE byte was at 492.686805 seconds from the start of data collection
```

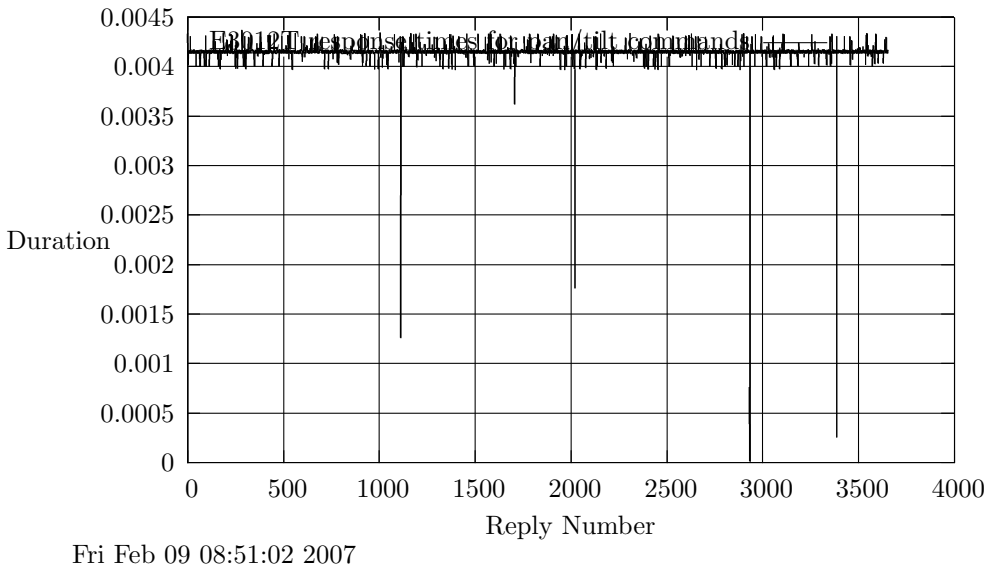

Figure 16: Response Timings for Commands from Run `E3012T`

A.9 Results for run E3012T1

A.9.1 Test Details

This test monitored the communications between the ES30TI and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only.

There were this many reply times that were analyzed:

```
1       3680 lines in E3012T1.TIM
```

A.9.2 Typical response times

The full set of response times are plotted in Figure 18, page 30.

```
    E3012T1.typ
 1       1,   0.001039
 2       2,   0.001047
 3       3,   0.001048
 4       4,   0.001047
 5       5,   0.001048
 6       6,   0.001037
 7       7,   0.001045
 8       8,   0.001048
 9       9,   0.001047
10      10,   0.001047
11      11,   0.001048
12      12,   0.001040
13      13,   0.001042
14      14,   0.001041
15      15,   0.001048
16      16,   0.001049
17      17,   0.001042
18      18,   0.001035
19      19,   0.001034
20      20,   0.001044
21      21,   0.001045
22      22,   0.001007
23      23,   0.001048
24      24,   0.001042
25      25,   0.001047
```

A.9.3 The minimum response times

All response times are plotted in Figure 17, page 29 by number of identical responses and their duration.

```
    E3012T1.min
 1    3149,   0.000010
 2    1528,   0.000384
 3    1767,   0.000858
 4     627,   0.000859
 5    3646,   0.000859
 6    3159,   0.000867
 7     646,   0.000868
 8     709,   0.000868
 9     975,   0.000868
10    1279,   0.000868
11    2526,   0.000868
12    2206,   0.000869
```

A.9.4 The maximum response times

All response times are plotted in Figure 17, page 29 by number of identical responses and their duration.

```
    E3012T1.max
 1    3129,   0.001216
 2    3387,   0.001216
 3    3449,   0.001216
 4     686,   0.001217
 5    1460,   0.001217
 6    1718,   0.001217
 7    2055,   0.001217
 8    1966,   0.001218
 9    1969,   0.001218
10      28,   0.001224
11    3345,   0.001252
12     828,   0.001253
```

A.9.5 The most common response times

All response times are plotted in Figure 17, page 29 by number of identical responses and their duration.

```
    E3012T1.mde
 1      78,   0.001046
 2      90,   0.001036
 3      96,   0.001034
 4     120,   0.001050
 5     148,   0.001035
 6     181,   0.001040
 7     268,   0.001043
 8     280,   0.001047
 9     320,   0.001049
10     370,   0.001048
11     411,   0.001041
12     662,   0.001042
```

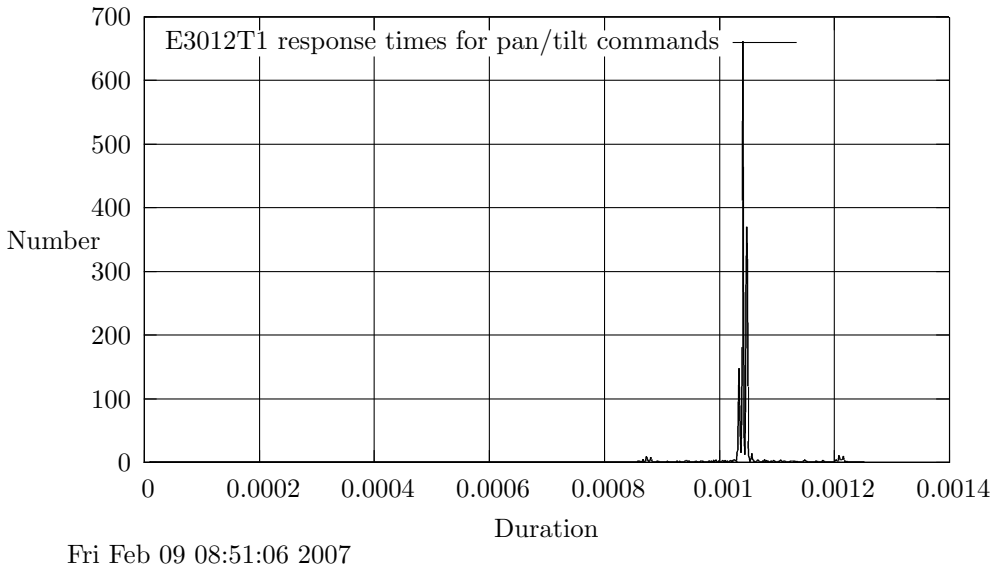

Figure 17: Durations of Responses from Run `E3012T1`

A.9.6 Test Run Data

```
1  Event 1 (1/22/2007 10:43:09.790289 AM) through
2  Event 40,480 (1/22/2007 10:50:01.080437 AM)


1  There were a total of    25760 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 411.280523 seconds from the start of data collection
4
5  There were a total of    14720 DTE bytes transferred
6  The first DTE byte came in at 0.011509 seconds from the start of data collection
7  The last DTE byte was at 411.290148 seconds from the start of data collection
```

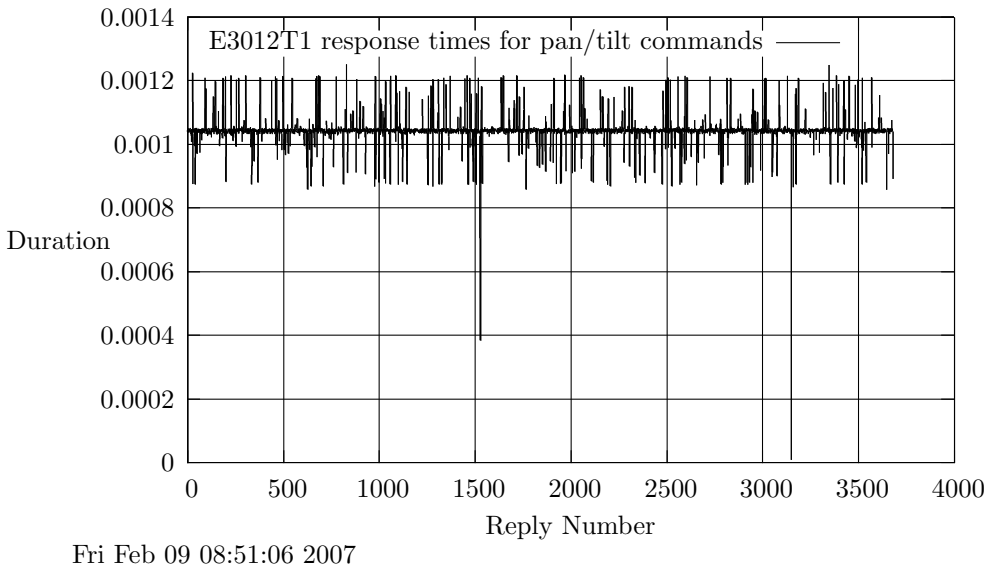

Figure 18: Response Timings for Commands from Run `E3012T1`

A.10 Results for run E3012T2

A.10.1 Test Details

This test monitored the communications between the ES30TI and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only. This testing was done while an MPT-9500 was sending right pan commands constantley. The timing of the command sending was semi-random as the commands were sent by mouse clicking on the GlassKeyboard button.

There were this many reply times that were analyzed:

```
1        349 lines in E3012T2.TIM
```

A.10.2 Typical response times

The full set of response times are plotted in Figure 20, page 33.

```
   E3012T2.typ
 1       1,   0.001047
 2       2,   0.001042
 3       3,   0.001025
 4       4,   0.001197
 5       5,   0.001041
 6       6,   0.001037
 7       7,   0.001043
 8       8,   0.001047
 9       9,   0.001042
10      10,   0.001042
11      11,   0.001043
12      12,   0.001041
13      13,   0.001039
14      14,   0.001049
15      15,   0.001033
16      16,   0.001049
17      17,   0.001048
18      18,   0.000874
19      19,   0.001046
20      20,   0.001033
21      21,   0.001047
22      22,   0.001048
23      23,   0.001039
24      24,   0.001043
25      25,   0.001055
```

A.10.3 The minimum response times

All response times are plotted in Figure 19, page 32 by number of identical responses and their duration.

```
   E3012T2.min
 1     306,   0.000869
 2      54,   0.000873
 3      18,   0.000874
 4      34,   0.000874
 5     183,   0.000876
 6     275,   0.000881
 7      91,   0.000882
 8     184,   0.000882
 9      49,   0.000883
10     288,   0.000952
11     140,   0.000974
12     138,   0.000983
```

A.10.4 The maximum response times

All response times are plotted in Figure 19, page 32 by number of identical responses and their duration.

```
   E3012T2.max
 1      92,   0.001082
 2     273,   0.001154
 3     186,   0.001162
 4     194,   0.001186
 5       4,   0.001197
 6     182,   0.001209
 7     266,   0.001209
 8     171,   0.001210
 9     256,   0.001210
10     289,   0.001210
11     343,   0.001216
12     307,   0.001217
```

A.10.5 The most common response times

All response times are plotted in Figure 19, page 32 by number of identical responses and their duration.

```
   E3012T2.mde
 1       7,   0.001036
 2       7,   0.001040
 3       7,   0.001050
 4       8,   0.001046
 5      10,   0.001034
 6      19,   0.001035
 7      19,   0.001043
 8      31,   0.001048
 9      32,   0.001047
10      37,   0.001049
11      50,   0.001041
12      68,   0.001042
```

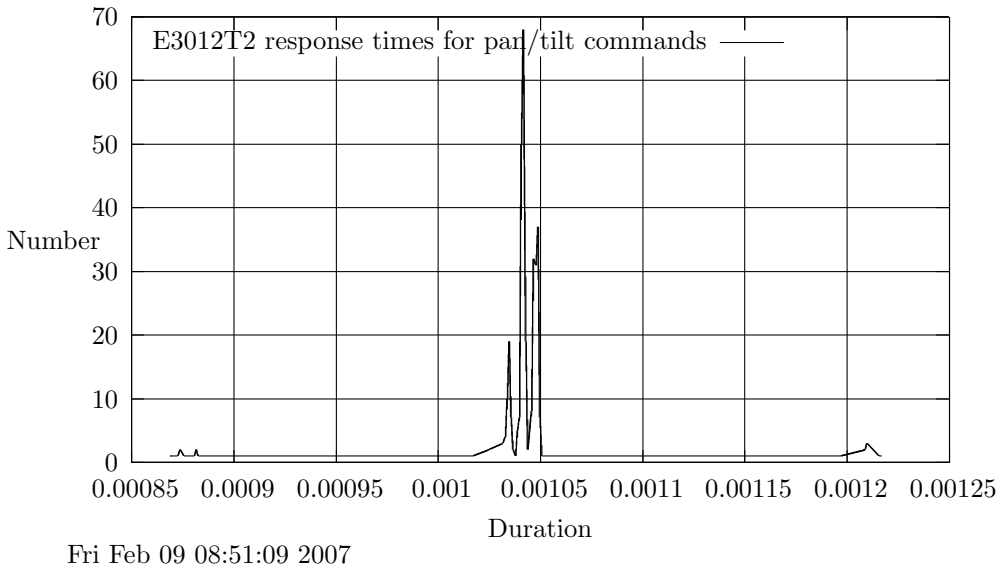

Figure 19: Durations of Responses from Run `E3012T2`

A.10.6 Test Run Data

```
1  Event 1 (1/23/2007 6:47:01.038339 AM) through
2  Event 11,083 (1/23/2007 6:52:30.202383 AM)


1  There were a total of     8743 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 329.153626 seconds from the start of data collection
4
5  There were a total of     2340 DTE bytes transferred
6  The first DTE byte came in at 2.857773 seconds from the start of data collection
7  The last DTE byte was at 329.164044 seconds from the start of data collection
```

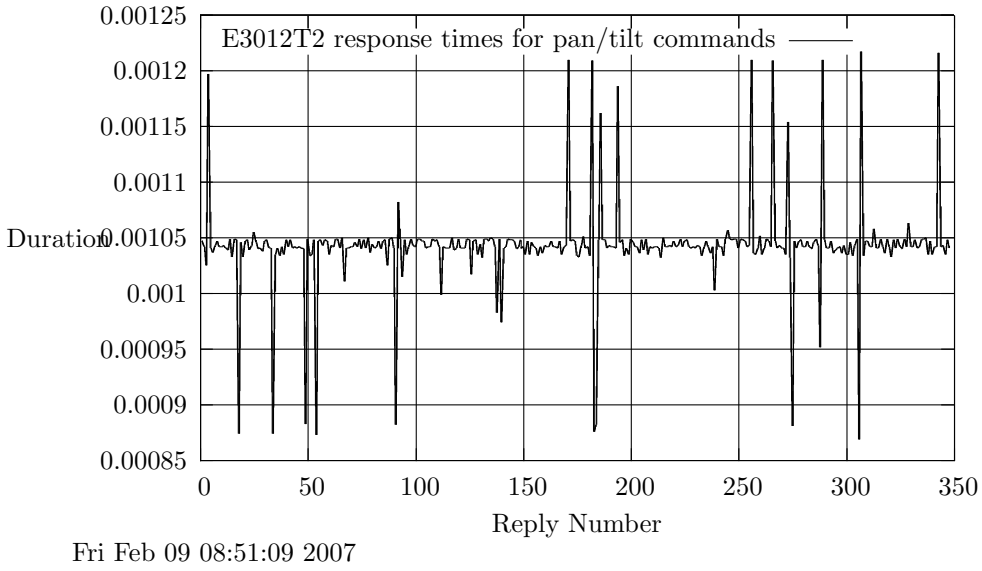

Figure 20: Response Timings for Commands from Run `E3012T2`

A.11 Results for run E3012T3

A.11.1 Test Details

This test monitored the communications between the ES30TI and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan/tilt commands only. This testing was done while an MPT-9500 was sending right pan commands constantley. The timing of sending the query pan command was controlled by the GlassKeyboard to be every 100 ms. In addition to the mostly pan commands from the MPT-9500, focus, iris, zoom and tilt commands were sent. When focus near commands were sent the E3012T sent back four byte replies that were invalid.

The commands to the GlassKeyboard were:

```
:qry_pan_pos()
:delay(100)
```

which ran in repeat mode.

There were this many reply times that were analyzed:

```
1       411 lines in E3012T3.TIM
```

A.11.2 Typical response times

The full set of response times are plotted in Figure 22, page 36.

```
   E3012T3.typ
 1       1,   0.001041
 2       2,   0.001044
 3       3,   0.001048
 4       4,   0.001043
 5       5,   0.001051
 6       6,   0.001046
 7       7,   0.001040
 8       8,   0.001062
 9       9,   0.001042
10      10,   0.001042
11      11,   0.001029
12      12,   0.001042
13      13,   0.000826
14      14,   0.001042
15      15,   0.001047
16      16,   0.001042
17      17,   0.001036
18      18,   0.001042
19      19,   0.001041
20      20,   0.001040
21      21,   0.001042
22      22,   0.001047
23      23,   0.001042
24      24,   0.001210
25      25,   0.001048
```

A.11.3 The minimum response times

All response times are plotted in Figure 21, page 35 by number of identical responses and their duration.

```
   E3012T3.min
 1      13,   0.000826
 2      49,   0.000874
 3     105,   0.000875
 4     217,   0.000875
 5     157,   0.000876
 6     176,   0.000880
 7     215,   0.000884
 8      90,   0.000885
 9     340,   0.000886
10     297,   0.000892
11     134,   0.000898
12     382,   0.000926
```

A.11.4 The maximum response times

All response times are plotted in Figure 21, page 35 by number of identical responses and their duration.

```
   E3012T3.max
 1     391,   0.001166
 2     164,   0.001190
 3     326,   0.001206
 4     313,   0.001208
 5     100,   0.001209
 6     275,   0.001209
 7      24,   0.001210
 8      76,   0.001210
 9     258,   0.001210
10      36,   0.001211
11     182,   0.001215
12     261,   0.001215
```

A.11.5 The most common response times

All response times are plotted in Figure 21, page 35 by number of identical responses and their duration.

```
   E3012T3.mde
 1       10,   0.001044
 2       10,   0.001046
 3       12,   0.001034
 4       12,   0.001050
 5       14,   0.001040
 6       23,   0.001035
 7       24,   0.001043
 8       31,   0.001048
 9       31,   0.001049
10       32,   0.001047
11       43,   0.001041
12       84,   0.001042
```

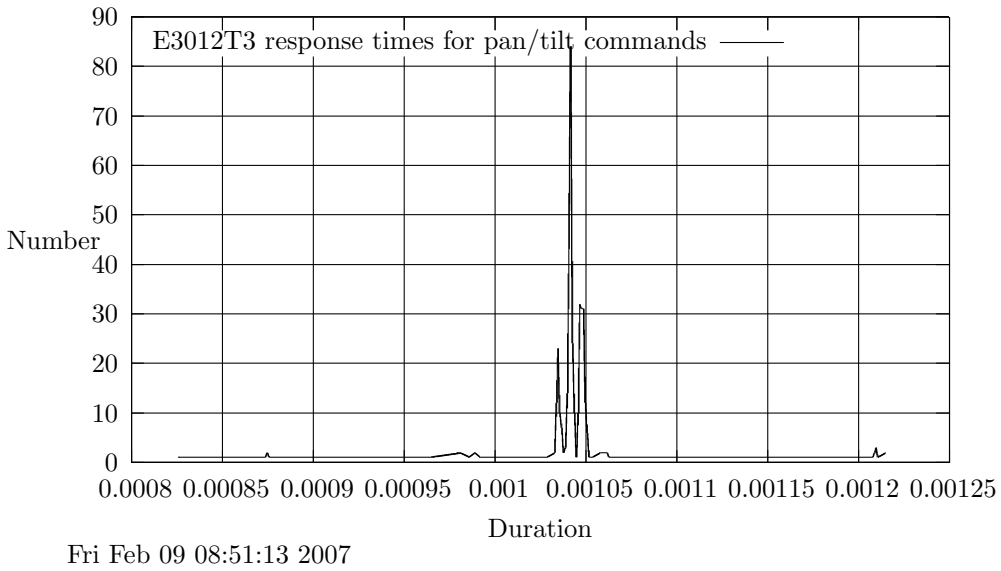

Figure 21: Durations of Responses from Run E3012T3

A.11.6 Test Run Data

```
1  Event 1 (1/23/2007 6:59:48.444181 AM) through
2  Event 11,242 (1/23/2007 7:07:21.056601 AM)


1  There were a total of     8428 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 452.601506 seconds from the start of data collection
4
5  There were a total of     2814 DTE bytes transferred
6  The first DTE byte came in at 0.013242 seconds from the start of data collection
7  The last DTE byte was at 452.612420 seconds from the start of data collection
```

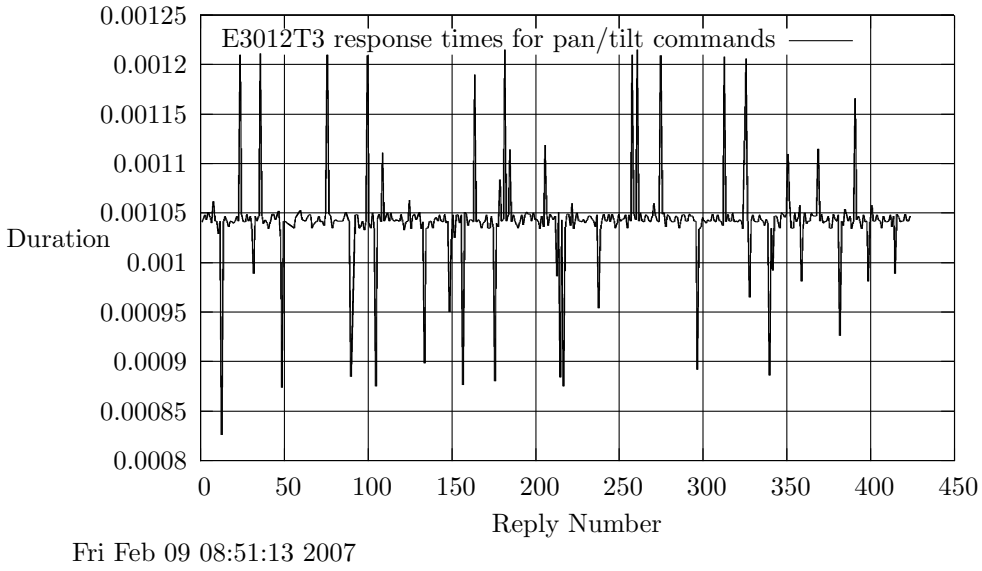

Figure 22: Response Timings for Commands from Run `E3012T3`

A.12 Results for run S3C1

A.12.1 Test Details

This test monitored the communications between an Spectra III and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol query pan commands and the MPT-9500 sending pan right commands only. This testing was done with the GlassKeyboardsending right pan commands constantley. The timing of sending the query pan command was controlled by the GlassKeyboard to be every 100 ms.

The commands to the GlassKeyboard were:

```
:qry_pan_pos()
:delay(100)
```

which ran in repeat mode.

There were this many reply times that were analyzed:

```
1       739 lines in S3C1.TIM
```

A.12.2 Typical response times

The full set of response times are plotted in Figure 24, page 39.

	S3C1.typ	
1	1,	0.001186
2	2,	0.001040
3	3,	0.001048
4	4,	0.001037
5	5,	0.001049
6	6,	0.001041
7	7,	0.001041
8	8,	0.001046
9	9,	0.001041
10	10,	0.001050
11	11,	0.001035
12	12,	0.001036
13	13,	0.001046
14	14,	0.001041
15	15,	0.001057
16	16,	0.001041
17	17,	0.001042
18	18,	0.001043
19	19,	0.001042
20	20,	0.001042
21	21,	0.001048
22	22,	0.001042
23	23,	0.001041
24	24,	0.001043
25	25,	0.001049

A.12.3 The minimum response times

All response times are plotted in Figure 23, page 38 by number of identical responses and their duration.

	S3C1.min	
1	289,	0.000849
2	162,	0.000866
3	698,	0.000867
4	426,	0.000869
5	410,	0.000870
6	429,	0.000873
7	496,	0.000873
8	26,	0.000874
9	513,	0.000874
10	126,	0.000875
11	223,	0.000875
12	238,	0.000875

A.12.4 The maximum response times

All response times are plotted in Figure 23, page 38 by number of identical responses and their duration.

	S3C1.max	
1	358,	0.001171
2	1,	0.001186
3	113,	0.001196
4	617,	0.001208
5	596,	0.001209
6	655,	0.001209
7	675,	0.001209
8	255,	0.001210
9	254,	0.001211
10	244,	0.001216
11	330,	0.001216
12	365,	0.001224

A.12.5 The most common response times

All response times are plotted in Figure 23, page 38 by number of identical responses and their duration.

	S3C1.mde	
1	17,	0.001046
2	20,	0.001034
3	25,	0.001036
4	30,	0.001040
5	34,	0.001050
6	39,	0.001047
7	41,	0.001035
8	42,	0.001043
9	61,	0.001048
10	79,	0.001049
11	90,	0.001041
12	134,	0.001042

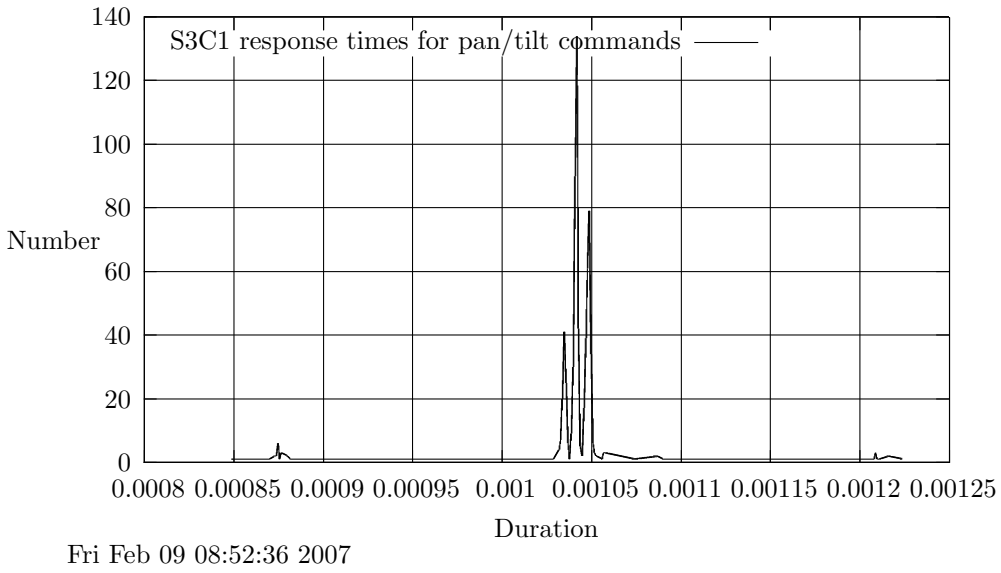

Figure 23: Durations of Responses from Run `S3C1`

A.12.6 Test Run Data

```
1  Event 1 (1/23/2007 9:09:01.399313 AM) through
2  Event 10,304 (1/23/2007 9:11:46.134787 AM)


1  There were a total of     5152 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 164.726525 seconds from the start of data collection
4
5  There were a total of     5152 DTE bytes transferred
6  The first DTE byte came in at 0.008712 seconds from the start of data collection
7  The last DTE byte was at 164.735474 seconds from the start of data collection
```

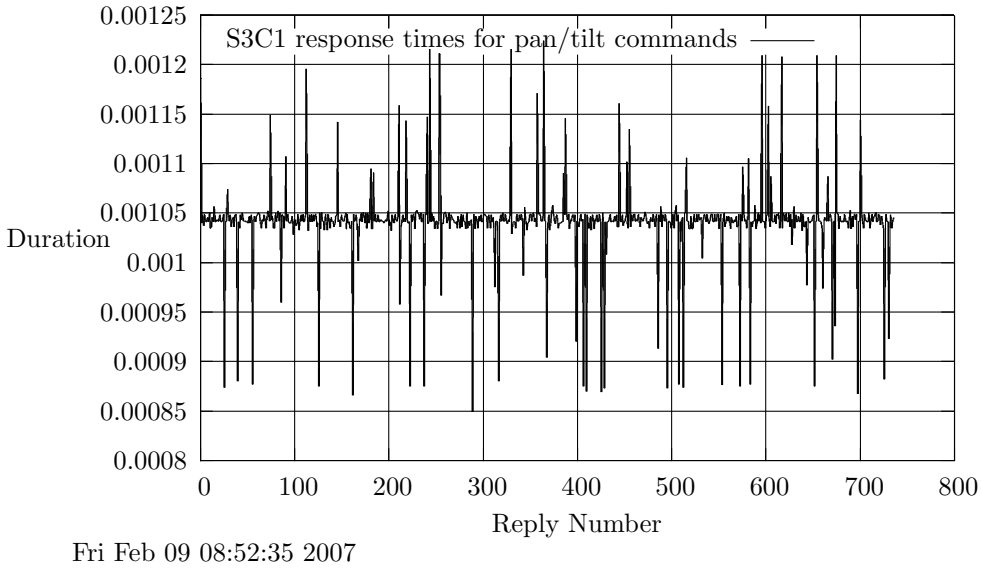

Figure 24: Response Timings for Commands from Run `S3C1`

A.13 Results for run S3Ran1

A.13.1 Test Details

This test monitored the communications between an Spectra III and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan right commands only. This testing was done while the GlassKeyboard running a script sending right pan commands constantley followed by a random delay of 500 ⟶ 1000 ms. Then a query pan command was sent by the GlassKeyboard followed by a random time of 500 ⟶ 1000 ms. And then the process repeated.

The commands to the GlassKeyboard were:

```
:ptz(pr 25)
:rnd_delay(500,1000)
:query_pan_pos()
:rnd_delay(500,1000)
```

which ran in repeat mode.

There were this many reply times that were analyzed:

```
1       3227 lines in S3RAN1.TIM
```

A.13.2 Typical response times

The full set of response times are plotted in Figure 26, page 42.

```
   S3Ran1.typ
 1       1,   0.001046
 2       2,   0.001042
 3       3,   0.001044
 4       4,   0.001047
 5       5,   0.001048
 6       6,   0.001043
 7       7,   0.001041
 8       8,   0.000891
 9       9,   0.001048
10      10,   0.001043
11      11,   0.001042
12      12,   0.001047
13      13,   0.001040
14      14,   0.001042
15      15,   0.001049
16      16,   0.001040
17      17,   0.001043
18      18,   0.001042
19      19,   0.001049
20      20,   0.001063
21      21,   0.001042
22      22,   0.001048
23      23,   0.001042
24      24,   0.001042
25      25,   0.001042
```

A.13.3 The minimum response times

All response times are plotted in Figure 25, page 41 by number of identical responses and their duration.

```
   S3Ran1.min
 1      43,   0.000849
 2    2873,   0.000865
 3    1412,   0.000867
 4    1007,   0.000868
 5    1269,   0.000868
 6    1490,   0.000868
 7    2403,   0.000868
 8    2435,   0.000868
 9     693,   0.000869
10    2723,   0.000869
11    1744,   0.000872
12    2546,   0.000872
```

A.13.4 The maximum response times

All response times are plotted in Figure 25, page 41 by number of identical responses and their duration.

```
   S3Ran1.max
 1    2115,   0.001216
 2     560,   0.001217
 3     892,   0.001217
 4    2789,   0.001217
 5    2992,   0.001217
 6    2976,   0.001218
 7    2501,   0.001223
 8     769,   0.001241
 9    1461,   0.001262
10    2054,   0.001269
11     653,   0.001282
12    2396,   0.001581
```

A.13.5 The most common response times

All response times are plotted in Figure 25, page 41 by number of identical responses and their duration.

```
   S3Ran1.mde
 1      65,   0.001046
 2      71,   0.001036
 3      75,   0.001034
 4     119,   0.001050
 5     132,   0.001035
 6     134,   0.001040
 7     223,   0.001043
 8     235,   0.001047
 9     316,   0.001048
10     326,   0.001049
11     371,   0.001041
12     584,   0.001042
```

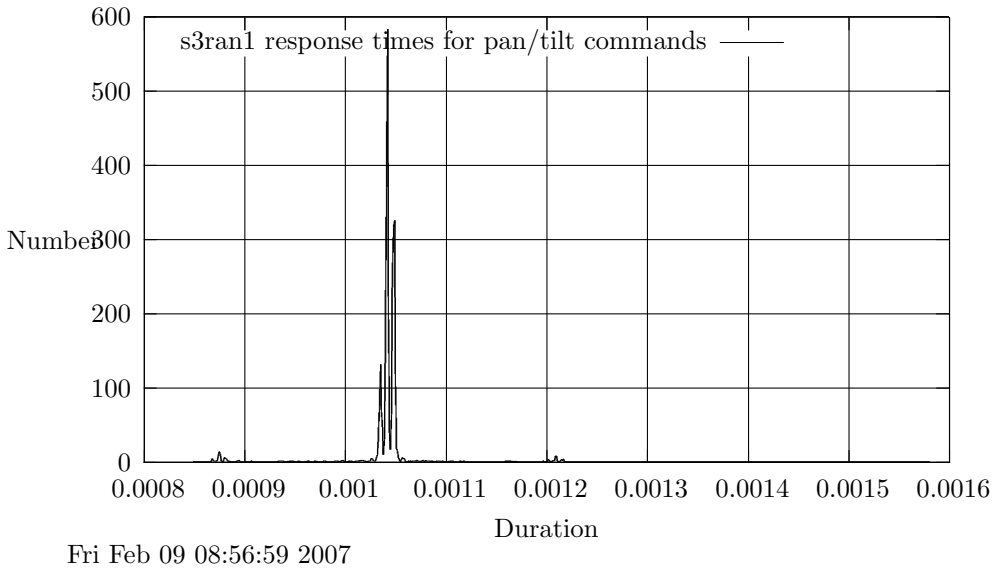

Figure 25: Durations of Responses from Run `S3Ran1`

A.13.6 Test Run Data

```
1  Event 1 (1/23/2007 10:39:57.601596 AM) through
2  Event 40,225 (1/23/2007 11:27:01.316941 AM)

1  There were a total of    22526 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 2823.707153 seconds from the start of data collection
4
5  There were a total of    17699 DTE bytes transferred
6  The first DTE byte came in at 0.007691 seconds from the start of data collection
7  The last DTE byte was at 2823.715345 seconds from the start of data collection
```

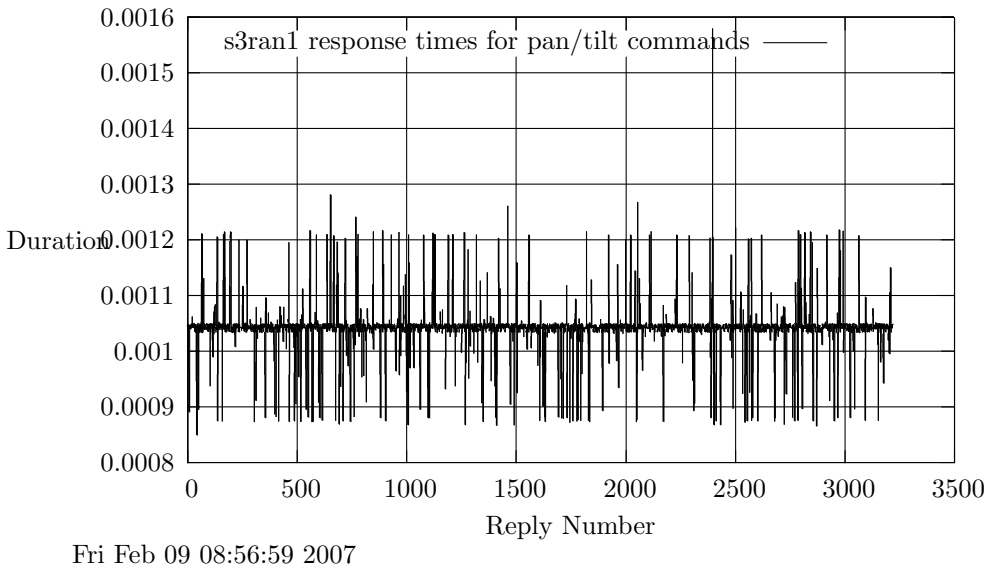

Figure 26: Response Timings for Commands from Run `S3Ran1`

A.14 Results for run S4Ran1

A.14.1 Test Details

This test monitored the communications between an Spectra IV and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan right commands only. This testing was done while the GlassKeyboard sent pan right, a random delay of 500 ⟶ 1000 ms, then a pan query command followed by a a random delay of 500 ⟶ 1000 ms, a stop motion command which was followed by another random delay of 500 ⟶ 1000 ms then the whole process repeated.

The commands to the GlassKeyboard were:

```
:ptz(pr 25)
:rnd_delay(500,1000)
:query_pan_pos()
:rnd_delay(500,1000)
:ptz()
:rnd_delay(500,1000)
```

which ran in repeat mode.

There were this many reply times that were analyzed:

```
1       3429 lines in S4RAN1.TIM
```

A.14.2 Typical response times

The full set of response times are plotted in Figure 28, page 45.

```
    S4Ran1.typ
 1       1,   0.001041
 2       2,   0.001047
 3       3,   0.001035
 4       4,   0.001034
 5       5,   0.001035
 6       6,   0.001041
 7       7,   0.001049
 8       8,   0.001033
 9       9,   0.001048
10      10,   0.001049
11      11,   0.001035
12      12,   0.000882
13      13,   0.000977
14      14,   0.001052
15      15,   0.001047
16      16,   0.001042
17      17,   0.001035
18      18,   0.001018
19      19,   0.001039
20      20,   0.001049
21      21,   0.001035
22      22,   0.000988
23      23,   0.000865
24      24,   0.001047
25      25,   0.001036
```

A.14.3 The minimum response times

All response times are plotted in Figure 27, page 44 by number of identical responses and their duration.

```
    S4Ran1.min
 1    1788,   0.000049
 2      23,   0.000865
 3    1241,   0.000865
 4     341,   0.000867
 5    1176,   0.000868
 6     363,   0.000869
 7     856,   0.000869
 8    1110,   0.000869
 9    1311,   0.000872
10    1566,   0.000872
11    3298,   0.000872
12     421,   0.000873
```

A.14.4 The maximum response times

All response times are plotted in Figure 27, page 44 by number of identical responses and their duration.

```
    S4Ran1.max
 1    1687,   0.001217
 2    1896,   0.001217
 3    2004,   0.001217
 4    3057,   0.001217
 5     424,   0.001218
 6    2901,   0.001223
 7    1546,   0.001225
 8      55,   0.001226
 9     435,   0.001237
10      47,   0.001256
11    1506,   0.001274
12    3043,   0.001277
```

A.14.5 The most common response times

All response times are plotted in Figure 27, page 44 by number of identical responses and their duration.

```
    S4Ran1.mde
 1      66,   0.001046
 2     102,   0.001034
 3     103,   0.001036
 4     122,   0.001050
 5     131,   0.001035
 6     139,   0.001040
 7     220,   0.001047
 8     239,   0.001043
 9     316,   0.001048
10     332,   0.001049
11     385,   0.001041
12     602,   0.001042
```

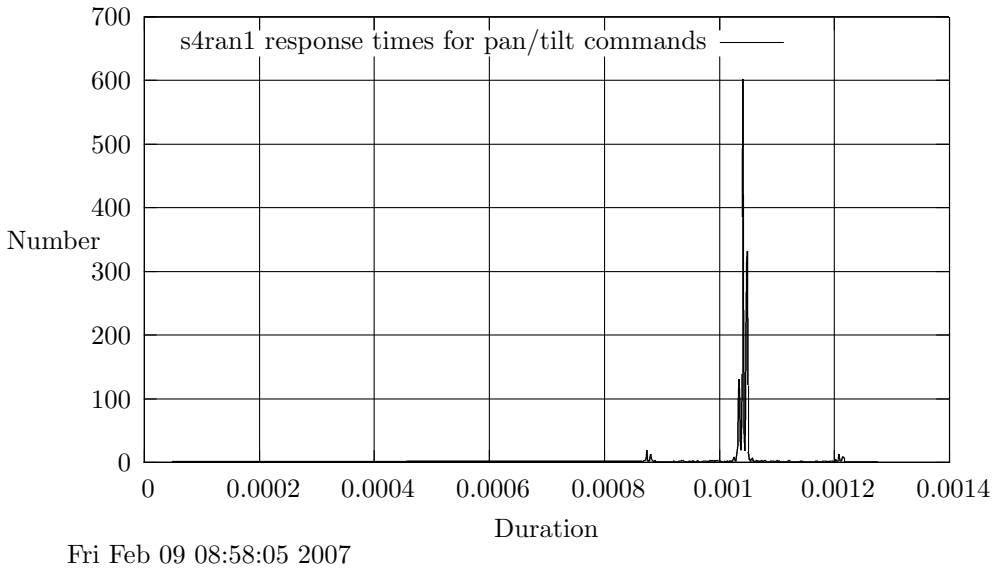

Figure 27: Durations of Responses from Run `S4Ran1`

A.14.6 Test Run Data

```
1  Event 1 (1/23/2007 11:37:34.748453 AM) through
2  Event 41,044 (1/23/2007 12:27:12.565509 PM)

1  There were a total of    23947 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 2977.811010 seconds from the start of data collection
4
5  There were a total of    17097 DTE bytes transferred
6  The first DTE byte came in at 0.009337 seconds from the start of data collection
7  The last DTE byte was at 2977.817056 seconds from the start of data collection
```

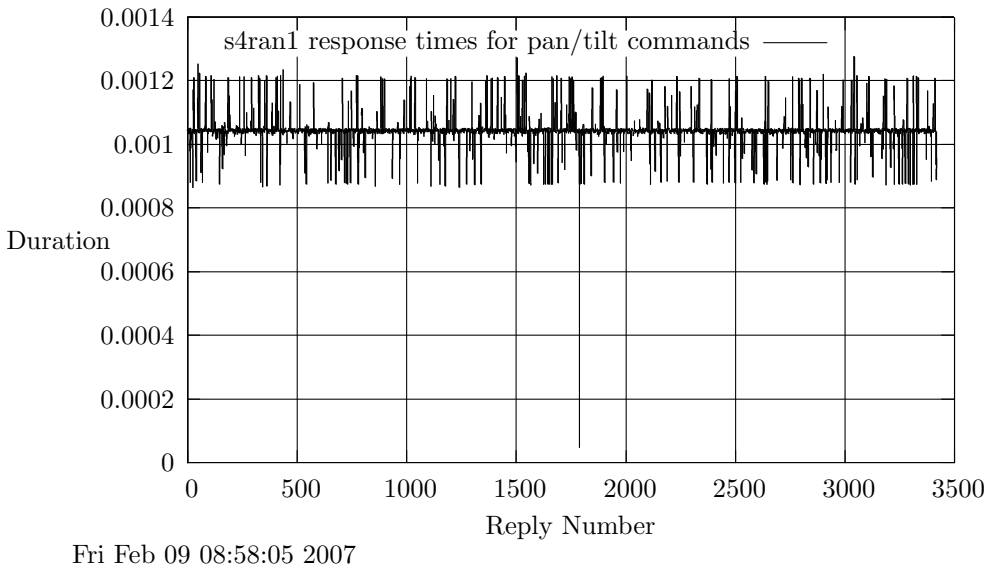

Figure 28: Response Timings for Commands from Run `S4Ran1`

A.15 Results for run E3012TR

A.15.1 Test Details

This test monitored the communications between an Esprit TI and the Head End (GlassKeyboard). All communications were at 9600 baud and consisted of D Protocol pan right commands only. This testing was done while the GlassKeyboard sent pan right, a random delay of 500 ⟶ 1000 ms, then a pan query command followed by a a random delay of 500 ⟶ 1000 ms, a stop motion command which was followed by another random delay of 500 ⟶ 1000 ms then the whole process repeated.

The commands to the GlassKeyboard were:

```
:ptz(pr 25)
:rnd_delay(500,1000)
:query_pan_pos()
:rnd_delay(500,1000)
:ptz()
:rnd_delay(500,1000)
```

which ran in repeat mode.

There were this many reply times that were analyzed:

```
1       3458 lines in E3012TR.TIM
```

A.15.2 Typical response times

The full set of response times are plotted in Figure 30, page 48.

```
    E3012TR.typ
 1       1,   0.001042
 2       2,   0.001042
 3       3,   0.001041
 4       4,   0.001041
 5       5,   0.001041
 6       6,   0.001040
 7       7,   0.001047
 8       8,   0.001216
 9       9,   0.001042
10      10,   0.001048
11      11,   0.001041
12      12,   0.001042
13      13,   0.001048
14      14,   0.001033
15      15,   0.001047
16      16,   0.001040
17      17,   0.001042
18      18,   0.001074
19      19,   0.001049
20      20,   0.001050
21      21,   0.001043
22      22,   0.001041
23      23,   0.001049
24      24,   0.001034
25      25,   0.001049
```

A.15.3 The minimum response times

All response times are plotted in Figure 29, page 47 by number of identical responses and their duration.

```
    E3012TR.min
 1    1583,   0.000010
 2    2131,   0.000010
 3    1787,   0.000011
 4    3409,   0.000858
 5    1948,   0.000861
 6    1710,   0.000866
 7    1121,   0.000867
 8    2148,   0.000867
 9    2581,   0.000867
10     924,   0.000868
11    1876,   0.000868
12    2829,   0.000868
```

A.15.4 The maximum response times

All response times are plotted in Figure 29, page 47 by number of identical responses and their duration.

```
    E3012TR.max
 1    1473,   0.001216
 2    2159,   0.001216
 3    3125,   0.001216
 4    3137,   0.001216
 5    1759,   0.001217
 6    2924,   0.001217
 7    3286,   0.001217
 8    2037,   0.001218
 9    3027,   0.001218
10     935,   0.001220
11    3158,   0.001220
12     619,   0.001225
```

A.15.5 The most common response times

All response times are plotted in Figure 29, page 47 by number of identical responses and their duration.

```
    E3012TR.mde
 1      73,   0.001046
 2     103,   0.001034
 3     112,   0.001036
 4     127,   0.001050
 5     136,   0.001040
 6     168,   0.001035
 7     236,   0.001043
 8     236,   0.001047
 9     300,   0.001048
10     313,   0.001049
11     399,   0.001041
12     607,   0.001042
```

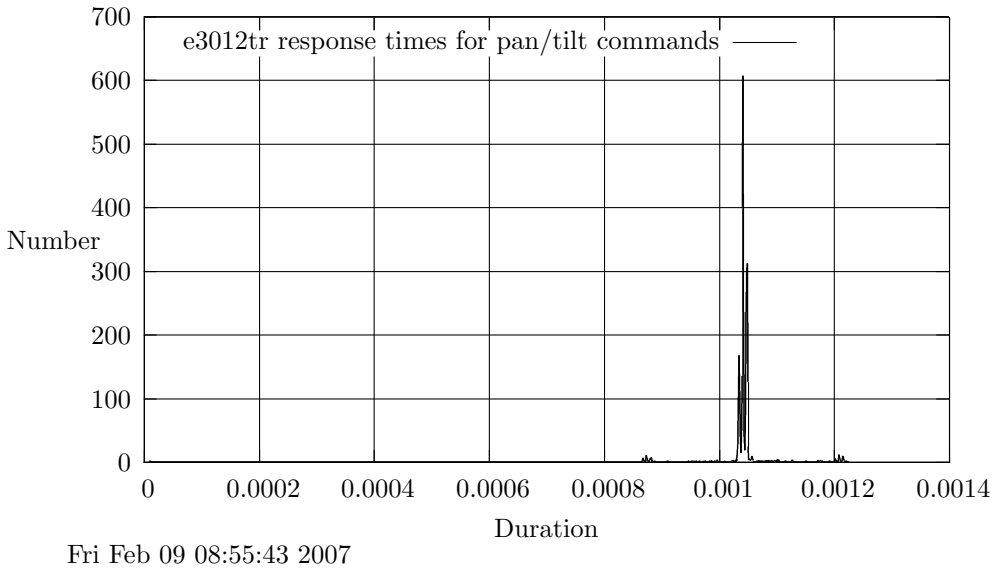

Figure 29: Durations of Responses from Run E3012TR

A.15.6 Test Run Data

```
1  Event 1 (1/23/2007 12:47:28.123314 PM) through
2  Event 41,310 (1/23/2007 1:37:32.890659 PM)

1  There were a total of    24101 DCE bytes transferred
2  The first DCE byte came in at 0.000000 seconds from the start of data collection
3  The last DCE byte was at 3004.750689 seconds from the start of data collection
4
5  There were a total of    17209 DTE bytes transferred
6  The first DTE byte came in at 0.009411 seconds from the start of data collection
7  The last DTE byte was at 3004.767345 seconds from the start of data collection
```

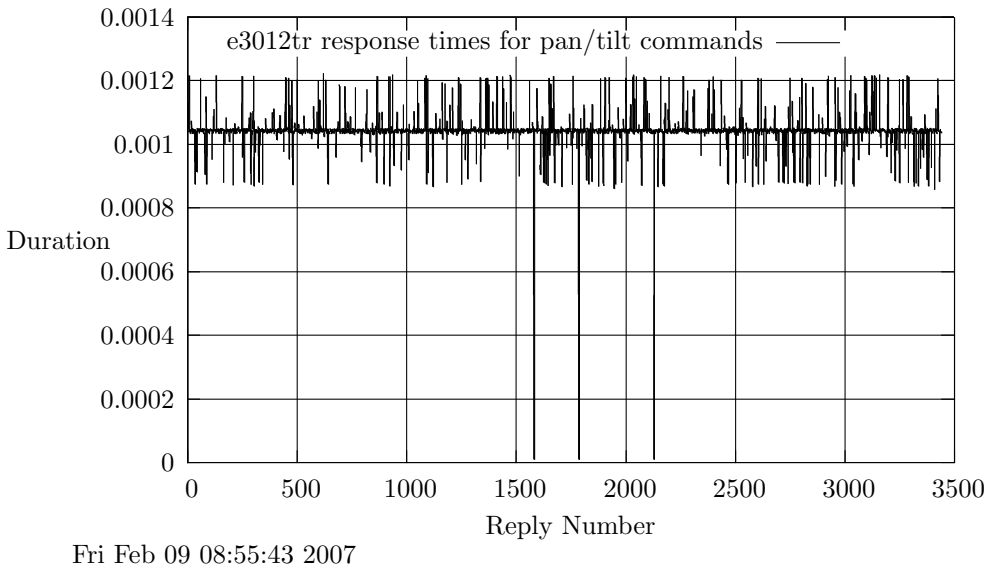

Figure 30: Response Timings for Commands from Run `E3012TR`

Index