

# TXB Testing

31 October 2006

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<sup>1</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/TestCabl.tex,v 1.6 2006-10-31 07:43:48-08  
Hamilton Exp Hamilton \$

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# 1 Power up sequence

Power up sequences consist of sending query commands to the Pelco PTZ unit until an answer is received. The query command is unique in that it is the only command that Pelco PTZ units do not look at the address in. Thus this is a way to find the address of the Pelco PTZ unit with software.

Older designs for TXBs sent the query command at one baud rate and waited for a response. (In the current set of comm line dumps in this document, single speed queries are being sent.) Newer designs send the request at baud rates of 2400, 4800, 9600 and 19200. The newer designs wait after each query request for a full reply, when a reply is received, the baud rate in use at the time is saved and used for all further communications. Thus providing an “auto baud” capability for the TXB  $\longleftrightarrow$  Pelco PTZ connection.

Following the receipt of a query response, the TXB will send its type, software revision ID and the configuration of any DIP switches/jumpers to the Pelco PTZ for display. This is done so that an installer has some idea of what is plugged into the Pelco PTZ. It also tells the installer that almost all of the TXB is operating correctly. The only part of the TXB that is not tested by this “name display” is the input circuitry from the competitor’s head end.

The TXB will clear the screen when it gets a first command from the head end. This is the point where these recordings stop.

## 1.1 In a Spectra

This is a recording of the power up sequence between a TXB-Hernis and a Spectra III, software rev 1.27.

```

1  $Header: d:/GeneralInformation/TXBTesting/RCS/S-TXB-H1.out,v 1.1 2006-01-19 06:37:57-08
Hamilton Exp Hamilton $
2  $Header: d:/TXB-Hernis/txb-h/Captures/RCS/s-txb-h1.out,v 1.2 2006-01-12 10:57:49-08 Hamilton
Exp $
3  FTS capture file: E:\Capture\newtest2.cfa (1/12/2006 10:15:07 AM)
4  Event 1 (1/12/2006 10:13:35.754380 AM) through
5  Event 3,543 (1/12/2006 10:14:14.971394 AM)
6
7      1,      1: DCE      0.000000      0.000000 ff 01 00 45 00 00 46
8      1,      1: DTE      0.008191      0.001041 ff 01 44 44 35 33 43 42 57 00 00 00 00 00 00 00
13
9
10     2,      8: DCE      0.031323      0.005449 ff 01 00 45 00 00 46
11     2,     19: DTE      0.039076      0.001041 ff 01 44 44 35 33 43 42 57 00 00 00 00 00 00 00
13
12
13     3,     15: DCE      0.062665      0.005903 ff 01 00 15 14 54 7e
14     3,     37: DTE      0.070386      0.001042 ff 01 00 7e
15     4,     22: DCE      0.093615      0.020111 ff 01 00 15 15 58 83
16     4,     41: DTE      0.101169      0.001042 ff 01 00 83
17     5,     29: DCE      0.124807      0.020521 ff 01 00 15 16 42 6e
18     5,     45: DTE      0.132990      0.001042 ff 01 00 6e

```

|    |     |          |           |                                |
|----|-----|----------|-----------|--------------------------------|
| 19 | 6,  | 36: DCE  | 0.155964  | 0.019848 ff 01 00 15 17 2d 5a  |
| 20 | 6,  | 49: DTE  | 0.164201  | 0.001039 ff 01 00 5a           |
| 21 | 7,  | 43: DCE  | 0.187104  | 0.019867 ff 01 00 15 18 48 76  |
| 22 | 7,  | 53: DTE  | 0.194663  | 0.001004 ff 01 00 76           |
| 23 | 8,  | 50: DCE  | 0.218310  | 0.020527 ff 01 00 15 19 45 74  |
| 24 | 8,  | 57: DTE  | 0.226903  | 0.001041 ff 01 00 74           |
| 25 | 9,  | 57: DCE  | 0.249500  | 0.019478 ff 01 00 15 1a 52 82  |
| 26 | 9,  | 61: DTE  | 0.257275  | 0.001041 ff 01 00 82           |
| 27 | 10, | 64: DCE  | 0.280907  | 0.020515 ff 01 00 15 1b 4e 7f  |
| 28 | 10, | 65: DTE  | 0.288471  | 0.001042 ff 01 00 7f           |
| 29 | 11, | 71: DCE  | 0.312111  | 0.020516 ff 01 00 15 1c 49 7b  |
| 30 | 11, | 69: DTE  | 0.320502  | 0.001038 ff 01 00 7b           |
| 31 | 12, | 78: DCE  | 0.343249  | 0.019628 ff 01 00 15 1d 53 86  |
| 32 | 12, | 73: DTE  | 0.351313  | 0.001042 ff 01 00 86           |
| 33 | 13, | 85: DCE  | 0.374392  | 0.019955 ff 01 00 15 1e 20 54  |
| 34 | 13, | 77: DTE  | 0.382697  | 0.001043 ff 01 00 54           |
| 35 | 14, | 92: DCE  | 0.405529  | 0.019714 ff 01 00 15 1f 41 76  |
| 36 | 14, | 81: DTE  | 0.413686  | 0.001043 ff 01 00 76           |
| 37 | 15, | 99: DCE  | 0.436695  | 0.019890 ff 01 00 15 20 4c 82  |
| 38 | 15, | 85: DTE  | 0.445098  | 0.001041 ff 01 00 82           |
| 39 | 16, | 106: DCE | 0.467834  | 0.019617 ff 01 00 15 21 50 87  |
| 40 | 16, | 89: DTE  | 0.476200  | 0.001041 ff 01 00 87           |
| 41 | 17, | 113: DCE | 0.498974  | 0.019739 ff 01 00 15 22 48 80  |
| 42 | 17, | 93: DTE  | 0.506558  | 0.001046 ff 01 00 80           |
| 43 | 18, | 120: DCE | 0.530190  | 0.020514 ff 01 00 15 23 41 7a  |
| 44 | 18, | 97: DTE  | 0.537658  | 0.001016 ff 01 00 7a           |
| 45 | 19, | 127: DCE | 0.561342  | 0.020566 ff 01 00 15 24 20 5a  |
| 46 | 19, | 101: DTE | 0.569168  | 0.001008 ff 01 00 5a           |
| 47 | 20, | 134: DCE | 0.592487  | 0.020201 ff 01 00 15 25 30 6b  |
| 48 | 20, | 105: DTE | 0.600157  | 0.001033 ff 01 00 6b           |
| 49 | 21, | 141: DCE | 0.623811  | 0.020536 ff 01 00 15 26 20 5c  |
| 50 | 21, | 109: DTE | 0.631251  | 0.001043 ff 01 00 5c           |
| 51 | 22, | 148: DCE | 0.654949  | 0.020573 ff 01 00 15 27 20 5d  |
| 52 | 22, | 113: DTE | 0.662775  | 0.001041 ff 01 00 5d           |
| 53 |     |          |           |                                |
| 54 | 23, | 155: DCE | 13.812216 | 13.146391 ff 01 00 17 00 00 18 |
| 55 | 23, | 117: DTE | 13.820289 | 0.001043 ff 01 00 18           |
| 56 |     |          |           |                                |
| 57 | 24, | 162: DCE | 13.843161 | 0.019754 ff 01 00 04 30 00 35  |
| 58 | 24, | 169: DCE | 13.859196 | 0.009787 ff 01 00 75 00 00 76  |
| 59 |     |          |           |                                |
| 60 | 24, | 121: DTE | 14.144459 | 0.001042 ff 01 00 35           |
| 61 | 24, | 125: DTE | 14.148617 | 0.001043 ff 01 01 75           |
| 62 |     |          |           |                                |

## 1.2 In an ExSite

This is a recording of the power up sequence between a TXB-Hernis an ExSite, with wiper running software rev 1.03.

```

1  $Header: d:/GeneralInformation/TXBTesting/RCS/ExSite4.out,v 1.1 2006-01-19 06:37:44-08 Hamilton
Exp Hamilton $
2  $ Header: d:/TXB-Hernis/txb-h/Captures/RCS/exsite4.out,v 1.1 2006-01-12 09:52:28-08 Hamilton
Exp $
3  FTS capture file: E:\Capture\newtest2.cfa (1/12/2006 9:29:01 AM)
4  Event 1 (1/12/2006 9:12:57.500578 AM) through
5  Event 5,060 (1/12/2006 9:14:04.137341 AM)
6
7      1,      1: DCE      0.000000      0.000000 ff 01 00 45 00 00 46
8      1,      1: DTE      0.007510      0.001042 ff 01 49 50 53 58 4d 33 31 43 42 57 32 33 20 20 20
dd
9
10     2,      8: DCE      0.031643      0.006457 ff 01 00 45 00 00 46
11     2,     19: DTE      0.039332      0.001035 ff 01 49 50 53 58 4d 33 31 43 42 57 32 33 20 20 20
dd
12
13     3,     15: DCE      0.063661      0.006711 ff 01 00 15 14 54 7e
14     3,     37: DTE      0.071677      0.001049 ff 01 00 7e
15     4,     22: DCE      0.094605      0.019810 ff 01 00 15 15 58 83
16     4,     41: DTE      0.102874      0.001041 ff 01 00 83
17     5,     29: DCE      0.125751      0.019759 ff 01 00 15 16 42 6e
18     5,     45: DTE      0.133558      0.001042 ff 01 00 6e
19     6,     36: DCE      0.156902      0.020225 ff 01 00 15 17 2d 5a
20     6,     49: DTE      0.164859      0.001056 ff 01 00 5a
21     7,     43: DCE      0.188050      0.020072 ff 01 00 15 18 48 76
22     7,     53: DTE      0.196059      0.001049 ff 01 00 76
23     8,     50: DCE      0.219182      0.020006 ff 01 00 15 19 45 74
24     8,     57: DTE      0.227054      0.001034 ff 01 00 74
25     9,     57: DCE      0.250334      0.020162 ff 01 00 15 1a 52 82
26     9,     61: DTE      0.258252      0.001038 ff 01 00 82
27    10,     64: DCE      0.281479      0.020110 ff 01 00 15 1b 4e 7f
28    10,     65: DTE      0.289345      0.001004 ff 01 00 7f
29    11,     71: DCE      0.312632      0.020169 ff 01 00 15 1c 49 7b
30    11,     69: DTE      0.320647      0.001098 ff 01 00 7b
31    12,     78: DCE      0.343778      0.019999 ff 01 00 15 1d 53 86
32    12,     73: DTE      0.351858      0.001044 ff 01 00 86
33    13,     85: DCE      0.374918      0.020017 ff 01 00 15 1e 20 54
34    13,     77: DTE      0.382952      0.001118 ff 01 00 54
35    14,     92: DCE      0.406063      0.020065 ff 01 00 15 1f 41 76
36    14,     81: DTE      0.413934      0.001043 ff 01 00 76
37    15,     99: DCE      0.437165      0.020096 ff 01 00 15 20 4c 82
38    15,     85: DTE      0.445148      0.001117 ff 01 00 82
39    16,    106: DCE      0.468355      0.020157 ff 01 00 15 21 50 87
40    16,     89: DTE      0.476287      0.001042 ff 01 00 87
41    17,    113: DCE      0.499500      0.020044 ff 01 00 15 22 48 80
42    17,     93: DTE      0.507386      0.001041 ff 01 00 80
43    18,    120: DCE      0.530644      0.020088 ff 01 00 15 23 41 7a

```

|    |     |          |           |                               |
|----|-----|----------|-----------|-------------------------------|
| 44 | 18, | 97: DTE  | 0.538844  | 0.001042 ff 01 00 7a          |
| 45 | 19, | 127: DCE | 0.561785  | 0.019822 ff 01 00 15 24 20 5a |
| 46 | 19, | 101: DTE | 0.569585  | 0.001040 ff 01 00 5a          |
| 47 | 20, | 134: DCE | 0.592945  | 0.020201 ff 01 00 15 25 30 6b |
| 48 | 20, | 105: DTE | 0.600927  | 0.001042 ff 01 00 6b          |
| 49 | 21, | 141: DCE | 0.624092  | 0.020038 ff 01 00 15 26 20 5c |
| 50 | 21, | 109: DTE | 0.632028  | 0.001042 ff 01 00 5c          |
| 51 | 22, | 148: DCE | 0.655222  | 0.020077 ff 01 00 15 27 20 5d |
| 52 | 22, | 113: DTE | 0.663329  | 0.001041 ff 01 00 5d          |
| 53 |     |          |           |                               |
| 54 | 23, | 155: DCE | 10.147763 | 9.481314 ff 01 00 17 00 00 18 |
| 55 | 23, | 117: DTE | 10.155591 | 0.001043 ff 01 00 18          |
| 56 |     |          |           |                               |
| 57 | 24, | 162: DCE | 10.179058 | 0.020349 ff 01 00 02 1c 00 1f |
| 58 | 24, | 169: DCE | 10.194970 | 0.009709 ff 01 00 75 00 00 76 |
| 59 |     |          |           |                               |
| 60 | 24, | 121: DTE | 10.455006 | 0.001049 ff 01 00 1f          |
| 61 | 24, | 125: DTE | 10.459132 | 0.001004 ff 01 01 75          |
| 62 |     |          |           |                               |

## APPENDIX A

### A Test Configurations

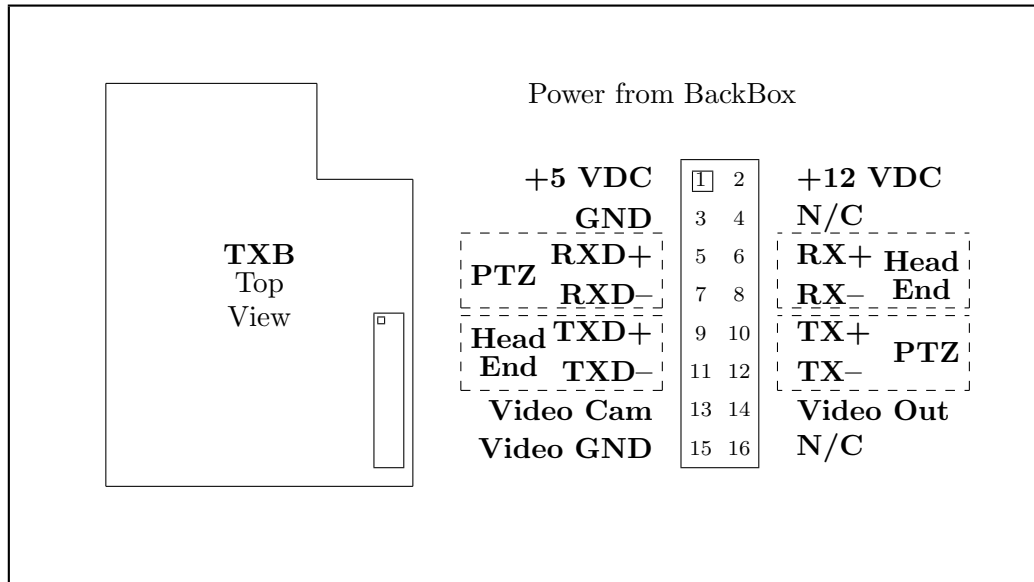
#### A.1 Cable Wiring

| Cable    | 16-pin | Cable    | Use                                                |
|----------|--------|----------|----------------------------------------------------|
|          | 1      |          | +5 VDC, Esprit                                     |
|          | 2      |          | +12 VDC, Spectra                                   |
|          | 3      |          | Ground                                             |
|          | 4      |          | No Connection                                      |
| <b>A</b> | 5      |          | RXD + to dome                                      |
|          | 6      | <b>B</b> | RX + to head end                                   |
| <b>A</b> | 7      |          | RXD – to dome                                      |
|          | 8      | <b>B</b> | RX – to head end                                   |
| <b>A</b> | 9      |          | TXD + to dome                                      |
|          | 10     | <b>B</b> | TX + to head end                                   |
| <b>A</b> | 11     |          | TXD – to dome                                      |
|          | 12     | <b>B</b> | TX – to head end                                   |
|          | 13     |          | Video in, from dome                                |
|          | 14     |          | Video out, to head end, Coaxitron in from head end |
|          | 15     |          | Video ground                                       |
|          | 16     |          | No Connection                                      |

Table A-1. TXB socket wiring on the Spectra

---

<sup>2</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/16Pins.inc,v 1.2 2006-04-04 14:06:57-07 Hamilton  
Exp Hamilton \$



\$RCSfile: 16Pins.inc,v \$

Figure A-1. TXB pin outs

| TXB-S422     |       | Pin | Spectra II |           |
|--------------|-------|-----|------------|-----------|
| Direction    | Name  | #   | Name       | Connector |
| —            | +5V   | 1   | Open       | —         |
| —            | +12V  | 2   | +12V       | —         |
| —            | Gnd   | 3   | Gnd        | —         |
| —            | Open  | 4   | Open       | —         |
| To Camera    | RXD+  | 5   | RXD+       | J6-6      |
| From Control | RX+   | 6   | RX+        | P4-4      |
| To Camera    | RXD-  | 7   | RXD-       | J6-7      |
| From Control | RX-   | 8   | RX-        | P4-3      |
| From Control | TDX+  | 9   | TXD+       | J6-4      |
| To Camera    | TX+   | 10  | TX+        | P4-1      |
| From Control | TXD-  | 11  | TXD-       | J6-5      |
| To Camera    | TX-   | 12  | TX-        | P4-2      |
| —            | Video | 13  | Video Cam  | J7-10     |
| —            | Video | 14  | Video Out  | J1        |
| —            | Gnd   | 15  | Gnd        | —         |
| —            | Open  | 16  | Open       | —         |

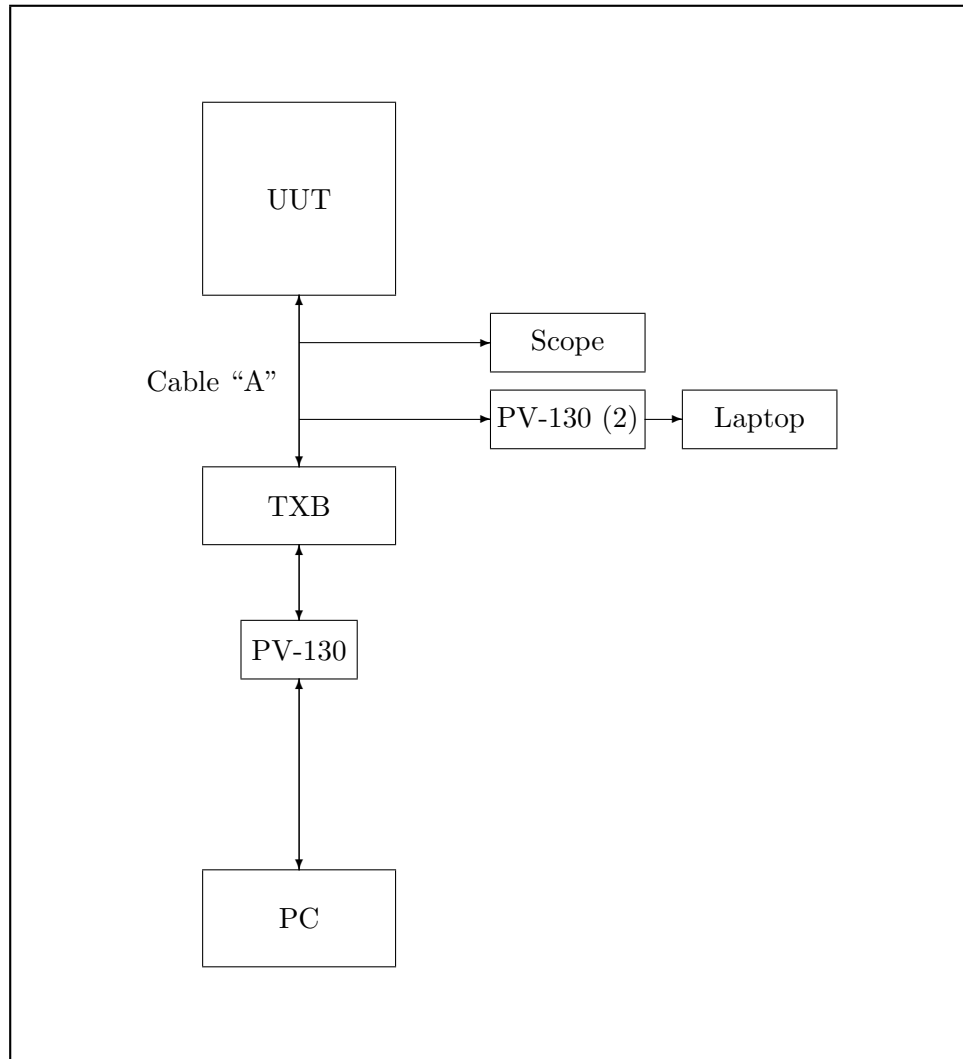
Table A-2: TXB RS-422 signal names *vs.* Spectra signal names, from SH11-0006-00B0 and SH05-0007-00F



| Cable    | Color | 16-pin | Use   | DB-9 |
|----------|-------|--------|-------|------|
| <b>A</b> | Blue  | 12     | TXB – | 6    |
|          | Green | 10     | TXB + | 1    |
|          | Black | 8      | RXD – | 9    |
|          | Red   | 6      | RXD + | 5    |
| <b>B</b> | Blue  | 11     | TXB – | 6    |
|          | Green | 9      | TXB + | 1    |
|          | Black | 7      | RXD – | 9    |
|          | Red   | 5      | RXD + | 5    |

Table A-3. Cable A &amp; B wiring

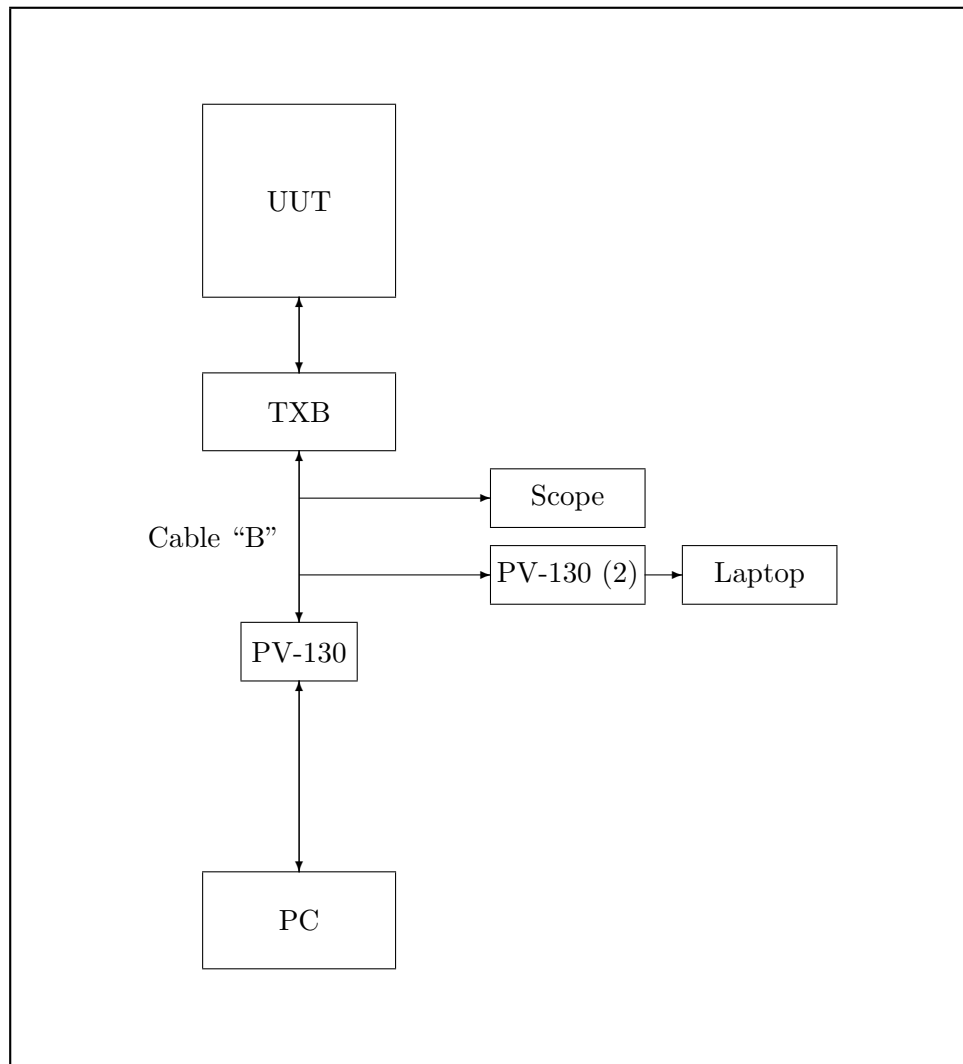
## A.2 Configuration A for monitoring D Protocol between a TXB and a Spectra



\$RCSfile: ConfigA.inc,v \$

Figure A-2. TXB test configuration "A", D Protocol between a TXB and a UUT

<sup>3</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/ConfigA.inc,v 1.3 2006-04-05 08:57:54-07  
Hamilton Exp Hamilton \$

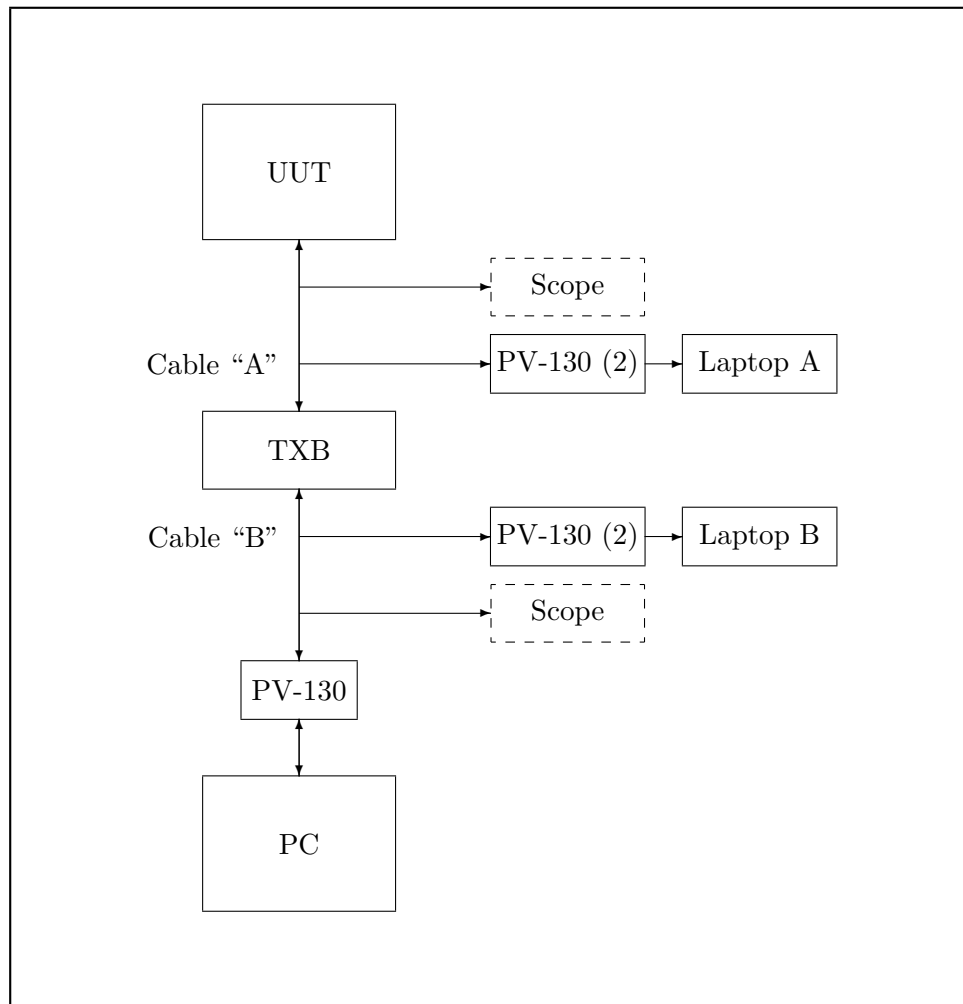
**A.3 Configuration B for monitoring a Foreign protocol between a TXB and its source**

\$RCSfile: ConfigB.inc,v \$

Figure A-3. TXB test configuration "B", Foreign Protocol between a head end and a TXB

<sup>4</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/ConfigB.inc,v 1.3 2006-04-05 08:57:54-07  
Hamilton Exp Hamilton \$

#### A.4 Configuration with two PCs for monitoring both protocols simultaneously



\$RCSfile: Config2.inc,v \$

Figure A-4. TXB test configuration for all protocol communications into and out of a TXB

<sup>5</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/Config2.inc,v 1.1 2006-10-31 07:40:14-08  
Hamilton Exp Hamilton \$

## APPENDIX B

### B Running FTS Software

#### B.1 How to save data with FTS

Utilizing the new asynchronous data capture program from FrontLine Test Systems' named "Serialtest Async" requires that it be set up as follows to capture data from a Panasonic WV-CU161 keyboard in RS-485 four wire mode:

1. Configuration: Monitor Both 19200,N,8,1 19200,N,8,1 DTE=COM4, DCE=COM5.  
Configuration parameters must match the equipment being tested/monitored.
2. Capture file:E:\Capture\test, or where ever you want to put it.
3. Bit Order: LSB first (normal)
4. Hardware Settings: Use FTS Cables
5. System Settings: Wrap Buffer is selected
6. System Settings: Capture Buffer Size (in K): 2052
7. System Settings: File Size (in K): 4102
8. Program Start Up Options: Prompt for a filename, then immediately start capturing.
9. Advanced System Options: <all at defaults>

After getting every thing turned on, click on the correct Icon, fool around a bit and then select "Live: Start Capture to Disk...".

To output the captured data:

1. Export Events...
2. Apply Template: Sample Events
3. Displayed Fields: Side Timestamp Hexadecimal
4. Text Output
5. Separate Records With CR/LF
6. Output Header
7. Output Field Name Record

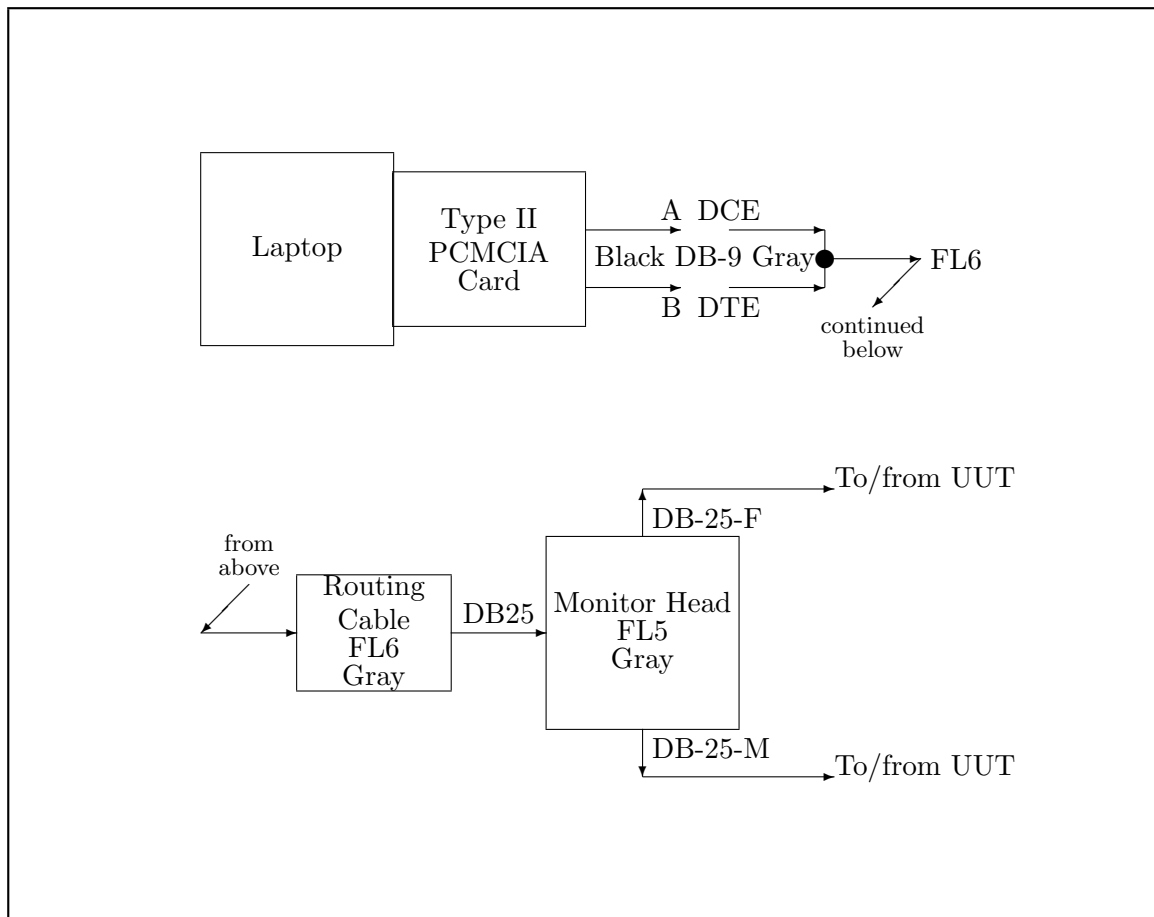
---

<sup>6</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/FtsSave.inc,v 1.2 2006-01-19 07:43:16-08  
Hamilton Exp Hamilton \$

8. Align Field Names With Data
9. Timestamp Format: Native
10. Character Set: ASCII
11. Signals Characters: 1/0
12. Errors Characters: X/<sp>
13. Field Delimiter: Space
14. Filter Out: Neither Side
15. Export: Entire Buffer
16. As: Serialtest Async Events.txt or other name of your choice

---

<sup>7</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/InterCnt.inc,v 1.1 2006-01-19 07:05:39-08  
Hamilton Exp Hamilton \$



\$RCSfile: InterCnt.inc,v \$

Figure B-1. Connections for use with FrontLine Systems' version of Breakout

### B.1.1 Input Data Format

The capture data must be saved with the following fields in the following order:

1. Sample data line: "DCE\_1/12/2006\_9:12:57.506823\_AM\_46"
2. **Data Source:**
  - 2.1. For cable **A**: "DCE\_" (from TXB) or "DTE\_" (from Pelco PTZ)
  - 2.2. For cable **B**: "DCE\_" (from PC) or "DTE\_" (from TXB)
3. **Date/Time:** "1/12/2006\_9:12:57.506823\_AM\_"
4. Note that the day, month, and hour fields may be expressed as one or two digits. It is the responsibility of other analysis software to be able to work with variable sized fields.
5. **Data:** "46"

The typical first few lines of the capture file **must** be as follows:

```

1  FTS capture file: E:\Capture\newtest2.cfa (1/12/2006 9:29:01 AM)
2  Event 1 (1/12/2006 9:12:57.500578 AM) through
3  Event 5,060 (1/12/2006 9:14:04.137341 AM)
4
5  Sd   Timestamp                               Hx
6  DCE 1/12/2006 9:12:57.500578 AM ff
7  DCE 1/12/2006 9:12:57.501616 AM 01
8  DCE 1/12/2006 9:12:57.502658 AM 00
9  DCE 1/12/2006 9:12:57.503698 AM 45
10 DCE 1/12/2006 9:12:57.504742 AM 00
11 DCE 1/12/2006 9:12:57.505781 AM 00
12 DCE 1/12/2006 9:12:57.506823 AM 46
13 DTE 1/12/2006 9:12:57.508088 AM ff
14 DTE 1/12/2006 9:12:57.509123 AM 01
15 DTE 1/12/2006 9:12:57.510164 AM 49
16 DTE 1/12/2006 9:12:57.511206 AM 50
17 DTE 1/12/2006 9:12:57.512249 AM 53
18 DTE 1/12/2006 9:12:57.513282 AM 58
19 DTE 1/12/2006 9:12:57.514331 AM 4d
20 DTE 1/12/2006 9:12:57.515373 AM 33
21 DTE 1/12/2006 9:12:57.516397 AM 31
22 DTE 1/12/2006 9:12:57.517400 AM 43
23 DTE 1/12/2006 9:12:57.518409 AM 42
24 DTE 1/12/2006 9:12:57.519527 AM 57
25 DTE 1/12/2006 9:12:57.520568 AM 32
26 DTE 1/12/2006 9:12:57.521548 AM 33
27 DTE 1/12/2006 9:12:57.522647 AM 20
28 DTE 1/12/2006 9:12:57.523686 AM 20
29 DTE 1/12/2006 9:12:57.524729 AM 20
30 DTE 1/12/2006 9:12:57.525764 AM dd
31 DCE 1/12/2006 9:12:57.532221 AM ff

```



32 DCE 1/12/2006 9:12:57.533262 AM 01  
33 DCE 1/12/2006 9:12:57.534304 AM 00  
34 DCE 1/12/2006 9:12:57.535346 AM 45  
35 DCE 1/12/2006 9:12:57.536395 AM 00  
36 DCE 1/12/2006 9:12:57.537435 AM 00  
37 DCE 1/12/2006 9:12:57.538470 AM 46  
38 DTE 1/12/2006 9:12:57.539910 AM ff  
39 DTE 1/12/2006 9:12:57.540952 AM 01  
40 DTE 1/12/2006 9:12:57.541988 AM 49  
41 DTE 1/12/2006 9:12:57.542954 AM 50  
42 DTE 1/12/2006 9:12:57.543995 AM 53  
43 DTE 1/12/2006 9:12:57.545106 AM 58  
44 DTE 1/12/2006 9:12:57.546148 AM 4d  
45 DTE 1/12/2006 9:12:57.547188 AM 33  
46 DTE 1/12/2006 9:12:57.548231 AM 31  
47 DTE 1/12/2006 9:12:57.549266 AM 43  
48 DTE 1/12/2006 9:12:57.550308 AM 42  
49 DTE 1/12/2006 9:12:57.551349 AM 57  
50 DTE 1/12/2006 9:12:57.552392 AM 32

## B.2 Saving Oscilloscope Pictures

With a Tektronix TDS220 (and other similar Tektronix Oscilloscopes) configure the printer port as follows:

1. Hard Copy Setup:
  - 1.1. LAYOUT Portrait
  - 1.2. FORMAT EPSIMAGE
  - 1.3. PORT RS232
2. RS-232 setup:
  - 2.1. BAUD 19,200
  - 2.2. FLOW CONTROL None
  - 2.3. EOL STRING CR/LF
  - 2.4. PARITY None
3. Computer setup.
  - 3.1. Boot the computer into “real DOS” not “DOS in a window” if using Kermit to collect data.
  - 3.2. On the computer set it up to receive serial data.
  - 3.3. Use a “null modem” or “Laplink” type cable to connect the two together.
  - 3.4. Using this configuration, it will take 1 to 2 minuets to transfer the data from the oscilloscope to the picture.

---

<sup>8</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/ScopeSav.inc,v 1.1 2006-01-19 07:05:49-08  
Hamilton Exp Hamilton \$

## APPENDIX C

### C MAKESECS.L

Serial data captured with the SerialTest Async program has to be “processed” before it is in a format that allows easy understanding of what is there. The flex program MAKESECS is used to do the first step of getting rid of some unused data and converting the time into a total seconds field<sup>10</sup>.

#### C.1 Raw Data Capture File

The SerialTest Async program converts its captured data into an ASCII file. The order and some of the format of the output file is selected via parameters in the “Export Events” menu choice. For normal collection of data the following fields were chosen as shown below:

DTE 9/27/2005 8:34:55.468656 AM 57

1. DTE<sub>L</sub>: This is the source of the data. It is either DTE (Data Terminal Equipment) or DCE (Data Communication Equipment). Both of these are old terms and have little to do with collecting data when the data has to be converted from RS-422 levels to RS-232 as the two values may be easily interchanged. It is important to remember that once an assignment is made to not change it for the duration of testing.
2. 9/27/2005<sub>L</sub>: This is the date that the capture was performed on. The date and time are selected as one item, thus it is necessary to get the date if the time field is wanted. This format is variable and has been observed to have the following formats with M = Month, D = Day and Y = Year:
  - 2.1. M/D/YYYY
  - 2.2. M/DD/YYYY
  - 2.3. MM/D/YYYY
  - 2.4. MM/DD/YYYY
3. 8:34:55.468656<sub>L</sub>: This is the time of data capture. It has the following formats with H = Hours, M = Minutes, S = full Seconds and s = parts of a second:
  - 3.1. H:MM:SS.ssssss
  - 3.2. HH:MM:SS.ssssss

---

<sup>9</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/MakeSecs.inc,v 1.3 2005-09-29 11:27:20-07  
Hamilton Exp Hamilton \$

<sup>10</sup>All the samples/examples used in this document came from testing the TXB-NTCIP when it was installed in a Spectra III SE running rev 1.27 of the software.

4. **AM<sub>L</sub>**: This indicates which half of the day the data was captured during. It has the following formats:

- 4.1. A

- 4.2. AM

- 4.3. P

- 4.4. PM

57: This is the hexadecimal value that was captured. Hex bytes are represented by lower case letters.

## C.1.1 Sample Raw Data File

```
1 FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
2 Event 1 (9/27/2005 8:33:26.076887 AM) through
3 Event 1,103 (9/27/2005 8:39:31.531404 AM)
4
5 Sd Timestamp Hx
6 DTE 9/27/2005 8:33:26.076887 AM
7 DTE 9/27/2005 8:33:26.076901 AM 00
8 DCE 9/27/2005 8:34:55.452286 AM ff
9 DCE 9/27/2005 8:34:55.453361 AM 01
10 DCE 9/27/2005 8:34:55.454402 AM 00
11 DCE 9/27/2005 8:34:55.455445 AM 45
12 DCE 9/27/2005 8:34:55.456458 AM 00
13 DCE 9/27/2005 8:34:55.457462 AM 00
14 DCE 9/27/2005 8:34:55.458562 AM 46
15 DTE 9/27/2005 8:34:55.460336 AM ff
16 DTE 9/27/2005 8:34:55.461383 AM 01
17 DTE 9/27/2005 8:34:55.462426 AM 44
18 DTE 9/27/2005 8:34:55.463466 AM 44
19 DTE 9/27/2005 8:34:55.464481 AM 35
20 DTE 9/27/2005 8:34:55.465484 AM 33
21 DTE 9/27/2005 8:34:55.466579 AM 43
22 DTE 9/27/2005 8:34:55.467620 AM 42
23 DTE 9/27/2005 8:34:55.468656 AM 57
24 DTE 9/27/2005 8:34:55.469698 AM 00
25 DTE 9/27/2005 8:34:55.470738 AM 00
26 DTE 9/27/2005 8:34:55.471781 AM 00
27 DTE 9/27/2005 8:34:55.472815 AM 00
28 DTE 9/27/2005 8:34:55.473856 AM 00
29 DTE 9/27/2005 8:34:55.474899 AM 00
30 DTE 9/27/2005 8:34:55.475940 AM 00
31 DTE 9/27/2005 8:34:55.476975 AM 00
32 DTE 9/27/2005 8:34:55.478018 AM 13
33 DCE 9/27/2005 8:34:55.545387 AM ff
34 DCE 9/27/2005 8:34:55.546455 AM 01
35 DCE 9/27/2005 8:34:55.547495 AM 00
36 DCE 9/27/2005 8:34:55.548537 AM 6b
37 DCE 9/27/2005 8:34:55.549579 AM 00
38 DCE 9/27/2005 8:34:55.550620 AM 00
39 DCE 9/27/2005 8:34:55.551669 AM 6c
40 DTE 9/27/2005 8:34:55.553205 AM ff
41 DTE 9/27/2005 8:34:55.554247 AM 01
42 DTE 9/27/2005 8:34:55.555290 AM 00
43 DTE 9/27/2005 8:34:55.556331 AM 6d
44 DTE 9/27/2005 8:34:55.557365 AM 01
45 DTE 9/27/2005 8:34:55.558407 AM 17
46 DTE 9/27/2005 8:34:55.559450 AM 86
47 DCE 9/27/2005 8:34:56.513995 AM ff
48 DCE 9/27/2005 8:34:56.515053 AM 01
49 DCE 9/27/2005 8:34:56.516113 AM 00
50 DCE 9/27/2005 8:34:56.517175 AM 00
51 DCE 9/27/2005 8:34:56.518236 AM 00
52 DCE 9/27/2005 8:34:56.519303 AM 00
53 DCE 9/27/2005 8:34:56.520345 AM 01
54 DTE 9/27/2005 8:34:56.522072 AM ff
55 DTE 9/27/2005 8:34:56.523107 AM 01
56 DTE 9/27/2005 8:34:56.524074 AM 00
57 DTE 9/27/2005 8:34:56.525190 AM 01
```

## C.2 Output from MAKESECS

MAKESECS processes the raw capture file and does the following to it.

1. It inserts a control field for RCS/VisualSourceSafe to use. This is the first line of the output.
2. Then the next three lines are saved. This is the original header that SerialTest Async placed in the file as a very brief overview of what the file is about.
3. The SerialTest Async column header is deleted.
4. Then the captured data is reformatted as follows:

```
      2,11::DTE89.3917690.00103657
```

- 4.1. 2,: Indicates that this is the second message group from its source. Source will be either DTE or DCE.
- 4.2. 11:: Indicates that this is the 11<sup>th</sup> overall byte from its source. This field is copied directly from the capture file.
- 4.3. DTE: Indicates that this message/byte comes from the DTE data source. All DTE flags are offset by one byte to make them slightly different from the DCE flags
- 4.4. 89.391769: Total seconds of the day relative to the start of this data capture. This is converted from hours, minutes, seconds and AM/PM information. However end of day rollover, end of month rollover and end of year rollover are not properly processed. I.e. don't expect good results if the capture is through midnight local time.
- 4.5. 0.001036: Time from the preceding byte from this source. In this case 0.001036 is about the "right" time for bytes coming in at a 9,600 baud rate. There is a time quantization, or granularity, problem with the clock and getting the "exact" right time. Inter byte times for various baud rates (all of these end up with repeating 3's or 6's):
  - 4.5.1. 1200 = .0083333 sec
  - 4.5.2. 2400 = .0041666 sec
  - 4.5.3. 4800 = .0020833 sec
  - 4.5.4. 9600 = .0010416 sec
  - 4.5.5. 19200 = .00042083 sec
- 4.6. 57: The data byte in hexadecimal. This field is copied directly from the capture file.
5. After processing all of the input data some overall statistics are output. These self explanatory statistics message are:
  - 5.1. There were a total of 52 bytes transferred
  - 5.2. There were a total of 21 DCE bytes transferred

- 5.3. The first DCE byte came in at 89.375399 seconds from the start of data collection
  - 5.4. The last DCE byte was at 90.443458 seconds from the start of data collection
  - 5.5. There were a total of 31 DTE bytes transferred
  - 5.6. The first DTE byte came in at 0.000000 seconds from the start of data collection
  - 5.7. The last DTE byte was at 90.448303 seconds from the start of data collection
6. From time to time various changes in the exact format will be made at the whim of the person using the program.

### C.2.1 Raw output of the MAKESECS program

```

1 $Header: d:/GeneralInformation/TXBTesting/RCS/Start1.dat,v 1.1 2006-01-11 09:28:42-08 Hamilton Exp
Hamilton $
2 FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
3 Event 1 (9/27/2005 8:33:26.076887 AM) through
4 Event 1,103 (9/27/2005 8:39:31.531404 AM)
5
6
7 1,      1: DTE      0.000000    0.000000
8 1,      2: DTE      0.000014    0.000014 00
9
10 2,      1: DCE      89.375399    89.375385 ff
11 2,      2: DCE      89.376474    0.001075 01
12 2,      3: DCE      89.377515    0.001041 00
13 2,      4: DCE      89.378558    0.001043 45
14 2,      5: DCE      89.379571    0.001013 00
15 2,      6: DCE      89.380575    0.001004 00
16 2,      7: DCE      89.381675    0.001100 46
17
18 2,      3: DTE      89.383449    0.001100 ff
19 2,      4: DTE      89.384496    0.001047 01
20 2,      5: DTE      89.385539    0.001043 44
21 2,      6: DTE      89.386579    0.001040 44
22 2,      7: DTE      89.387594    0.001015 35
23 2,      8: DTE      89.388597    0.001003 33
24 2,      9: DTE      89.389692    0.001095 43
25 2,     10: DTE      89.390733    0.001041 42
26 2,     11: DTE      89.391769    0.001036 57
27 2,     12: DTE      89.392811    0.001042 00
28 2,     13: DTE      89.393851    0.001040 00
29 2,     14: DTE      89.394894    0.001043 00
30 2,     15: DTE      89.395928    0.001034 00
31 2,     16: DTE      89.396969    0.001041 00
32 2,     17: DTE      89.398012    0.001043 00
33 2,     18: DTE      89.399053    0.001041 00
34 2,     19: DTE      89.400088    0.001035 00
35 2,     20: DTE      89.401131    0.001043 13
36
37 3,      8: DCE      89.468500    0.067369 ff

```

```

38      3,      9: DCE      89.469568      0.001068 01
39      3,     10: DCE      89.470608      0.001040 00
40      3,     11: DCE      89.471650      0.001042 6b
41      3,     12: DCE      89.472692      0.001042 00
42      3,     13: DCE      89.473733      0.001041 00
43      3,     14: DCE      89.474782      0.001049 6c
44
45      3,     21: DTE      89.476318      0.001049 ff
46      3,     22: DTE      89.477360      0.001042 01
47      3,     23: DTE      89.478403      0.001043 00
48      3,     24: DTE      89.479444      0.001041 6d
49      3,     25: DTE      89.480478      0.001034 01
50      3,     26: DTE      89.481520      0.001042 17
51      3,     27: DTE      89.482563      0.001043 86
52
53      4,     15: DCE      90.437108      0.954545 ff
54      4,     16: DCE      90.438166      0.001058 01
55      4,     17: DCE      90.439226      0.001060 00
56      4,     18: DCE      90.440288      0.001062 00
57      4,     19: DCE      90.441349      0.001061 00
58      4,     20: DCE      90.442416      0.001067 00
59      4,     21: DCE      90.443458      0.001042 01
60
61      4,     28: DTE      90.445185      0.001042 ff
62      4,     29: DTE      90.446220      0.001035 01
63      4,     30: DTE      90.447187      0.000967 00
64      4,     31: DTE      90.448303      0.001116 01
65
66  There were a total of      52 bytes transferred
67
68  There were a total of      21 DCE bytes transferred
69  The first DCE byte came in at 89.375399 seconds from the start of data collection
70  The last DCE byte was at 90.443458 seconds from the start of data collection
71
72  There were a total of      31 DTE bytes transferred
73  The first DTE byte came in at 0.000000 seconds from the start of data collection
74  The last DTE byte was at 90.448303 seconds from the start of data collection
75

```



### C.3 Final Processing of the MAKESECS Processed Capture File

The output of MAKESECS is then taken, and using an editor, has each message formatted to fit on one line and then that line usually has a textual description of what it is appended.

```

1  $Header: d:/GeneralInformation/TXBTesting/RCS/Start2.dat,v 1.1 2006-01-11 09:28:44-08 Hamilton Exp
Hamilton $
2  FTS capture file: E:\Capture\newtest2.cfa (9/27/2005 8:40:01 AM)
3  Event 1 (9/27/2005 8:33:26.076887 AM) through
4  Event 1,103 (9/27/2005 8:39:31.531404 AM)
5
6
7      1,      1: DTE      0.000000      0.000000                      Noise
8      1,      2: DTE      0.000014      0.000014 00                      Noise
9      2,      1: DCE      89.375399      89.375385 ff 01 00 45 00 00 46 Query
10     2,      3: DTE      89.383449      0.001100 ff 01 44 44 35 33 43 42 57 00 00 00 00 00 00 00 13 Query
Reply
11     3,      8: DCE      89.468500      0.067369 ff 01 00 6b 00 00 6c Query Device Type
12     3,     21: DTE      89.476318      0.001049 ff 01 00 6d 01 17 86 Device Type Response
13     4,     15: DCE      90.437108      0.954545 ff 01 00 00 00 00 01 Stop
14     4,     28: DTE      90.445185      0.001042 ff 01 00 01                      Response
15
16 There were a total of      52 bytes transferred
17
18 There were a total of      21 DCE bytes transferred
19 The first DCE byte came in at 89.375399 seconds from the start of data collection
20 The last DCE byte was at 90.443458 seconds from the start of data collection
21
22 There were a total of      31 DTE bytes transferred
23 The first DTE byte came in at 0.000000 seconds from the start of data collection
24 The last DTE byte was at 90.448303 seconds from the start of data collection
25

```



## APPENDIX D

## D D Protocol Commands

|                                    |                  |                    |                                |
|------------------------------------|------------------|--------------------|--------------------------------|
| <b>0x01</b>                        | 1 <sub>10</sub>  | —                  | Standard Extended Response     |
| <b>0x03</b>                        | 3 <sub>10</sub>  | EC_SET_PRESET      | Set Preset                     |
| <b>0x05</b>                        | 5 <sub>10</sub>  | EC_CLEAR_PRESET    | Clear Preset                   |
| <b>0x07</b>                        | 7 <sub>10</sub>  | EC_MOVE_PRESET     | Go To Preset                   |
| <b>0x09</b>                        | 9 <sub>10</sub>  | EC_SET_AUX         | Set Auxiliary                  |
| <b>0x0B</b>                        | 11 <sub>10</sub> | EC_CLEAR_AUX       | Clear Auxiliary                |
| <b>0x0D</b>                        | 13 <sub>10</sub> | EC_DUMMY_1         | Dummy                          |
| <b>0x0F</b>                        | 15 <sub>10</sub> | EC_RESET           | Remote Reset                   |
| <b>0x11</b>                        | 17 <sub>10</sub> | EC_ZONE_START      | Set Zone Start                 |
| <b>0x13</b>                        | 19 <sub>10</sub> | EC_ZONE_END        | Set Zone End                   |
| <b>0x15</b>                        | 21 <sub>10</sub> | EC_WRITE_CHAR      | Write Character to Screen      |
| <b>0x17</b>                        | 23 <sub>10</sub> | EC_CLEAR_SCREEN    | Clear Screen                   |
| <b>0x19</b>                        | 25 <sub>10</sub> | EC_ALARM_ACK       | Alarm Acknowledge              |
| <b>0x1B</b>                        | 27 <sub>10</sub> | EC_ZONE_ON         | Zone Scan On                   |
| <b>0x1D</b>                        | 29 <sub>10</sub> | EC_ZONE_OFF        | Zone Scan Off                  |
| <b>0x1F</b>                        | 31 <sub>10</sub> | EC_START_RECORD    | Set Pattern Start              |
| <b>0x21</b>                        | 33 <sub>10</sub> | EC_END_RECORD      | Set Pattern Stop               |
| <b>0x23</b>                        | 35 <sub>10</sub> | EC_START_PLAY      | Run Pattern                    |
| <b>0x25</b>                        | 37 <sub>10</sub> | EC_ZOOM_SPEED      | Set Zoom Speed                 |
| <b>0x27</b>                        | 39 <sub>10</sub> | EC_FOCUS_SPEED     | Set Focus Speed                |
| <b>0x29</b>                        | 41 <sub>10</sub> | EC_CAMERA_RESET    | Reset Camera defaults          |
| <b>0x2B</b>                        | 43 <sub>10</sub> | EC_AUTO_FOCUS      | Auto-focus auto/on/off         |
| <b>0x2D</b>                        | 45 <sub>10</sub> | EC_AUTO_IRIS       | Auto Iris auto/on/off          |
| <b>0x2F</b>                        | 47 <sub>10</sub> | EC_AGC             | AGC auto/on/off                |
| <b>0x31</b>                        | 49 <sub>10</sub> | EC_BLC             | Backlight compensation on/off  |
| <b>0x33</b>                        | 51 <sub>10</sub> | EC_AWB             | Auto white balance on/off      |
| <b>0x35</b>                        | 53 <sub>10</sub> | EC_DEVICE_PHASE    | Enable device phase delay mode |
| <b>0x37</b>                        | 55 <sub>10</sub> | EC_SHUTTER_SPEED   | Set shutter speed              |
| <b>0x39</b>                        | 57 <sub>10</sub> | EC_ADJUST_PHASE    | Adjust line lock phase delay   |
| <b>0x3B</b>                        | 59 <sub>10</sub> | EC_ADJUST_RB_WB    | Adjust white balance (R-B)     |
| <b>0x3D</b>                        | 61 <sub>10</sub> | EC_ADJUST_MG_WB    | Adjust white balance (M-G)     |
| <b>0x3F</b>                        | 63 <sub>10</sub> | EC_ADJUST_GAIN     | Adjust gain                    |
| <b>0x41</b>                        | 65 <sub>10</sub> | EC_ADJUST_AI_LEVEL | Adjust auto-iris level         |
| <i>Continued on the next page.</i> |                  |                    |                                |

<sup>11</sup>\$Header: d:/GeneralInformation/TXBTesting/RCS/dcmnds.inc,v 1.4 2006-10-24 13:22:47-07 Hamilton  
Exp Hamilton \$

|                                          |                   |                         |                                  |
|------------------------------------------|-------------------|-------------------------|----------------------------------|
| <i>Continued from the previous page.</i> |                   |                         |                                  |
| <b>0x43</b>                              | 67 <sub>10</sub>  | EC_ADJUST_AI_PEAK       | Adjust auto-iris peak value      |
| <b>0x45</b>                              | 69 <sub>10</sub>  | EC_QUERY                | Query                            |
| <b>0x47</b>                              | 71 <sub>10</sub>  | EC_PRESET_SCAN          | Preset Scan                      |
| <b>0x49</b>                              | 73 <sub>10</sub>  | EC_SET_ZERO             | Set Zero Position                |
| <b>0x4B</b>                              | 75 <sub>10</sub>  | EC_SET_PAN              | Set Pan Position                 |
| <b>0x4D</b>                              | 77 <sub>10</sub>  | EC_SET_TILT             | Set Tilt Position                |
| <b>0x4F</b>                              | 79 <sub>10</sub>  | EC_SET_ZOOM             | Set Zoom Position                |
| <b>0x51</b>                              | 81 <sub>10</sub>  | EC_QUERY_PAN            | Query Pan Position               |
| <b>0x53</b>                              | 83 <sub>10</sub>  | EC_QUERY_TILT           | Query Tilt Position              |
| <b>0x55</b>                              | 85 <sub>10</sub>  | EC_QUERY_ZOOM           | Query Zoom Position              |
| <b>0x57</b>                              | 87 <sub>10</sub>  | EC_DOWNLOAD             | Download                         |
| <b>0x59</b>                              | 89 <sub>10</sub>  | EC_PAN_RESP             | Query Pan Response               |
| <b>0x5B</b>                              | 91 <sub>10</sub>  | EC_TILT_RESP            | Query Tilt Response              |
| <b>0x5D</b>                              | 93 <sub>10</sub>  | EC_ZOOM_RESP            | Query Zoom Response              |
| <b>0x5F</b>                              | 95 <sub>10</sub>  | EC_SET_MAG              | Set Magnification                |
| <b>0x61</b>                              | 97 <sub>10</sub>  | EC_QUERY_MAG            | Query Magnification              |
| <b>0x63</b>                              | 99 <sub>10</sub>  | EC_MAG_RESP             | Query Magnification Response     |
| <b>0x65</b>                              | 101 <sub>10</sub> | EC_ECHO_MODE            | Activate Echo Mode               |
| <b>0x67</b>                              | 103 <sub>10</sub> | EC_SET_BAUD             | Set Remote Baud Rate             |
| <b>0x69</b>                              | 105 <sub>10</sub> | EC_START_DOWNLOAD       | Start Download                   |
| <b>0x6B</b>                              | 107 <sub>10</sub> | EC_QUERY_DEV_TYPE       | Query Device Type                |
| <b>0x6D</b>                              | 109 <sub>10</sub> | EC_QUERY_DEV_TYPE_RESP  | Query Device Type Response       |
| <b>0x6F</b>                              | 111 <sub>10</sub> | EC_QUERY_DIAG_INFO      | Query Diagnostic Info            |
| <b>0x71</b>                              | 113 <sub>10</sub> | EC_QUERY_DIAG_INFO_RESP | Query Diagnostic Info Response   |
| <b>0x73</b>                              | 115 <sub>10</sub> | EC_VERSION_INFO         | Version Information Macro Opcode |
| <b>0x75</b>                              | 117 <sub>10</sub> | EC_EVEREST              | Everest Macro Opcode             |
| <b>0xFD</b>                              | 253 <sub>10</sub> | —                       | Return Status                    |
| <b>0xFF</b>                              | 255 <sub>10</sub> | —                       | Invalid op code                  |

```

// D command bits for Dcmd1 and Dcmd2
#define CLOSE    0x04    // Dcmd1
#define OPEN     0x02    // Dcmd1
#define NEAR     0x01    // Dcmd1

#define FAR      0x80    // Dcmd2
#define WIDE     0x40    // Dcmd2
#define TELE     0x20    // Dcmd2

#define DOWN     0x10    // Dcmd2 plus Ddata2
#define UP       0x08    // Dcmd2 plus Ddata2
#define LEFT     0x04    // Dcmd2 plus Ddata1
#define RIGHT    0x02    // Dcmd2 plus Ddata1

// Standard command length
#define EC_COMMAND_LENGTH      7 // Length of D protocol commands

// Reply lengths
#define EC_GENERAL_REPLY_LENGTH 4 // Length of most replies
#define EC_EXTENDED_REPLY_LENGTH 7 // Length of all non-EC_QUERY queries
#define EC_QUERY_REPLY_LENGTH 18 // Length of an EC_QUERY reply

```

## APPENDIX E

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