TXB Testing

14 May 2007

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[1] `$Header: d:/GeneralInformation/TXBTesting/RCS/TXB-Test.tex 1.8 2007-05-14 13:45:21-07 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 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 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

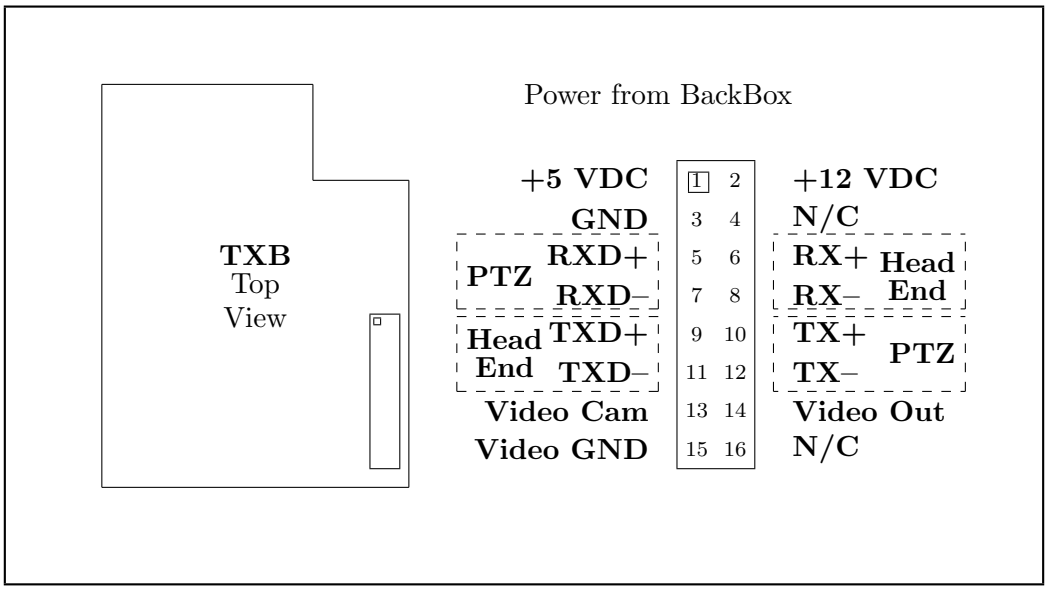
A Test Configurations

A.1 Cable Wiring

Cable	16-pin	Cable	Use
	1		+5 VDC, Esprit
	2		+12 VDC, Spectra
	3		Ground
	4		No Connection
A	5		RXD + to dome
	6	**B**	RX + to head end
A	7		RXD – to dome
	8	**B**	RX – to head end
A	9		TXD + to dome
	10	**B**	TX + to head end
A	11		TXD – to dome
	12	**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

[2] `$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

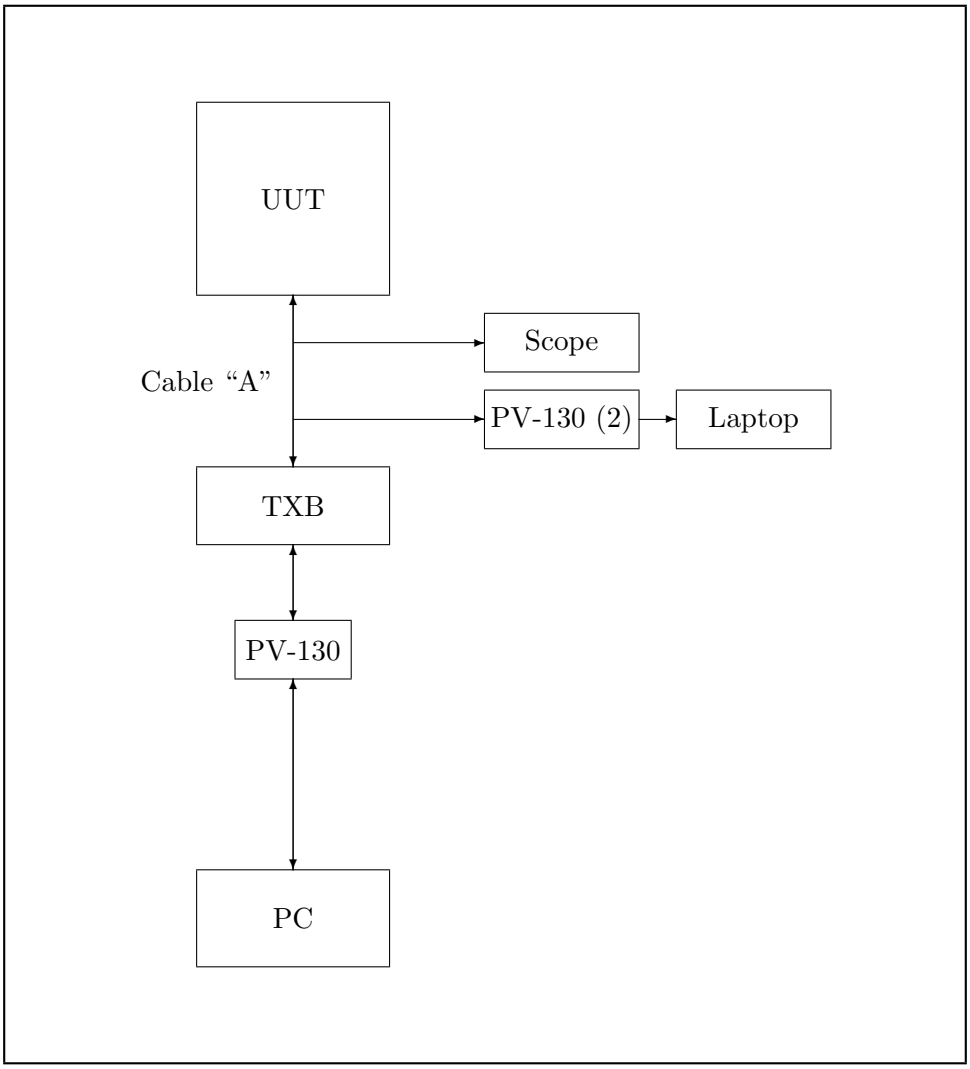
TXB-S422		Pin	Spectra II	
Direction	Name	#	Name	Connector
—	+5V	1	Open	—
—	+12V	2	+12V	—
—	Gnd	3	Gnd	—
—	Open	4	Open	—
To Camera	RXD+	5	RXD+	J6-6
From Control	RX+	6	RX+	P4-4
To Camera	RXD–	7	RXD–	J6-7
From Control	RX–	8	RX–	P4-3
From Control	TDX+	9	TXD+	J6-4
To Camera	TX+	10	TX+	P4-1
From Control	TXD–	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
A	Blue	12	TXB –	6
	Green	10	TXB +	1
	Black	8	RXD –	9
	Red	6	RXD +	5
B	Blue	11	TXB –	6
	Green	9	TXB +	1
	Black	7	RXD –	9
	Red	5	RXD +	5

Table A-3. Cable A & B wiring

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

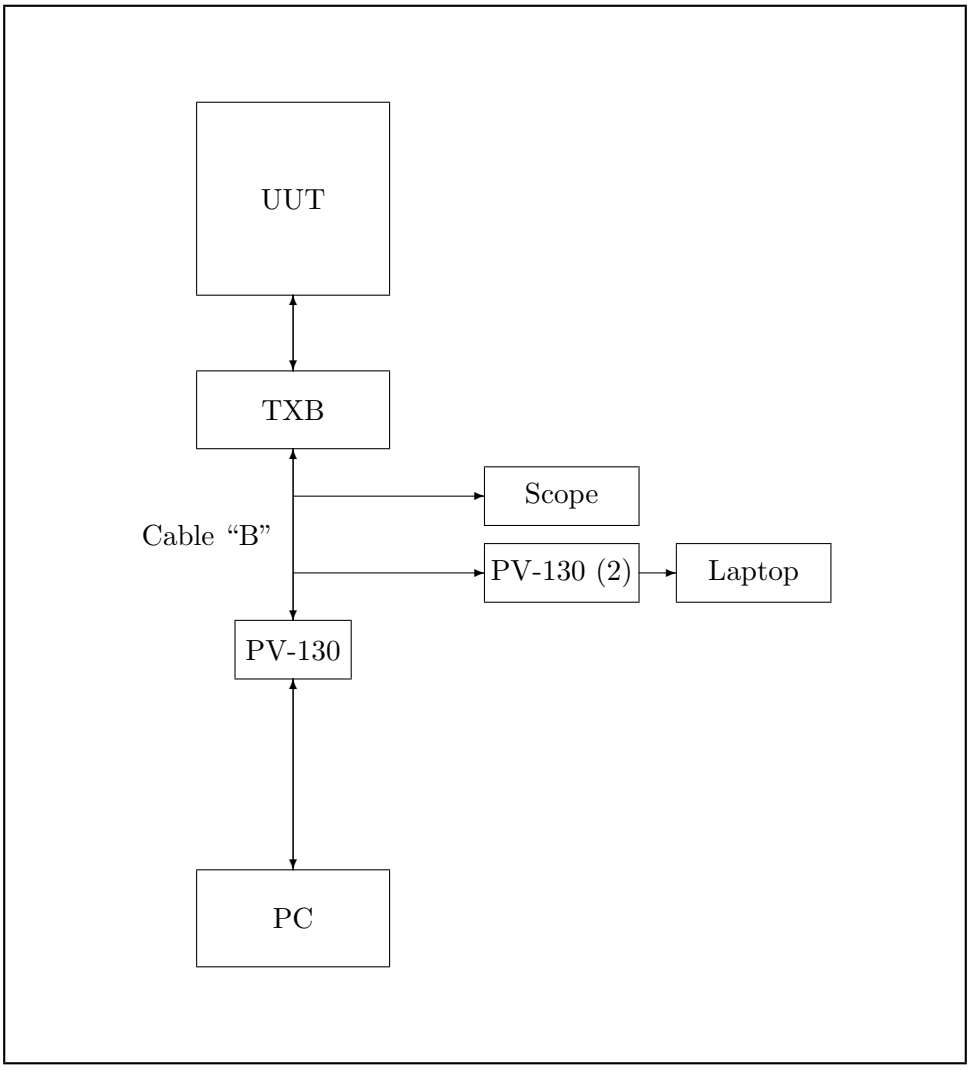


$RCSfile: ConfigA.inc,v $

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

[3] $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

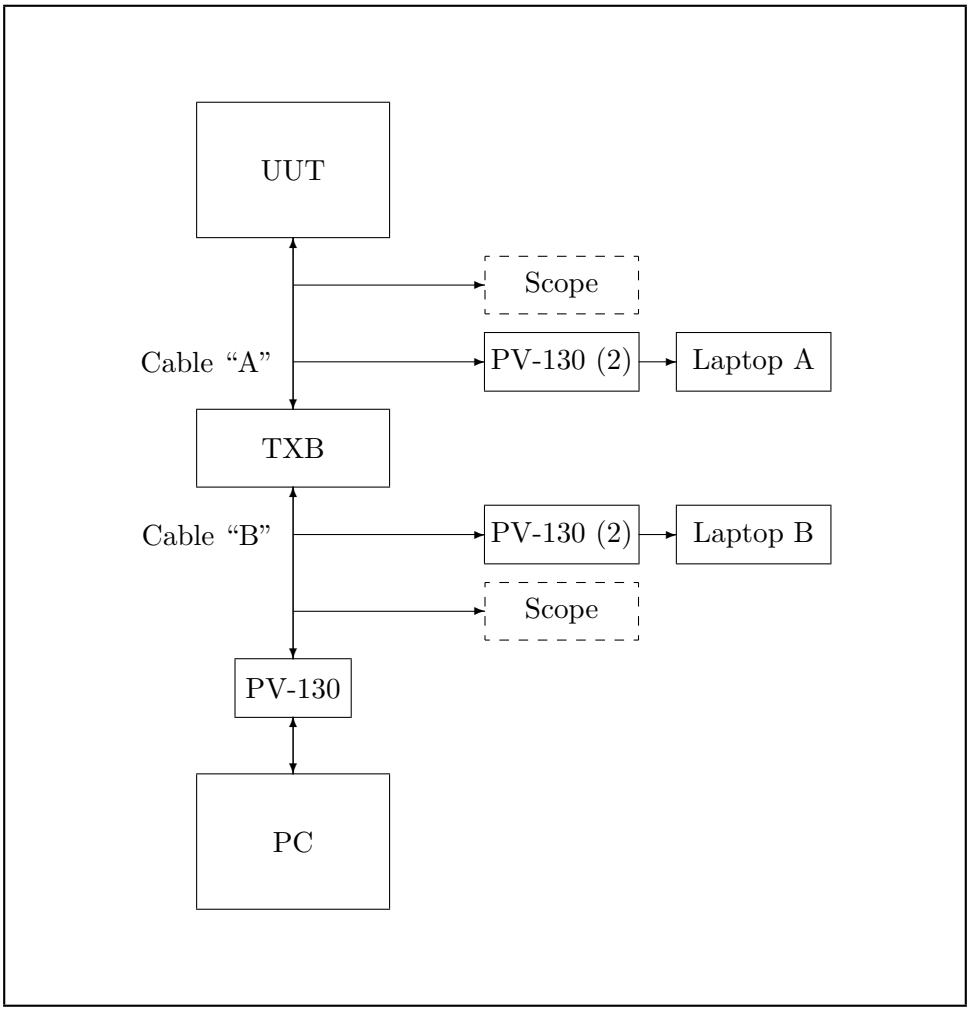


$RCSfile: ConfigB.inc,v $

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

[4] `$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



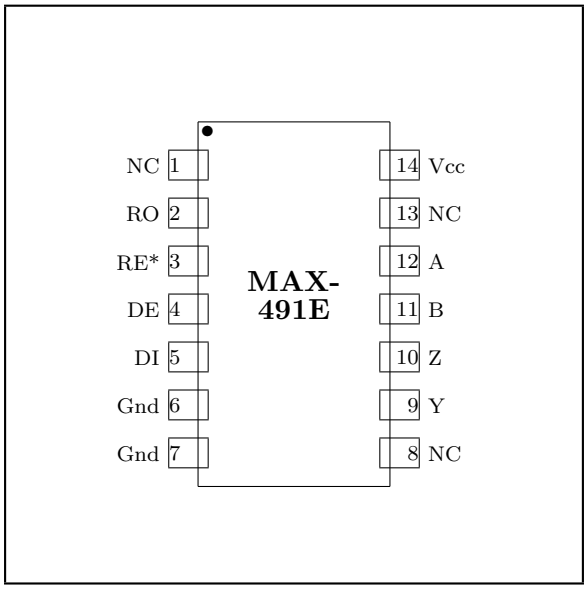
$RCSfile: Config2.inc,v $

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

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

APPENDIX B

B Typical Pin Assignments

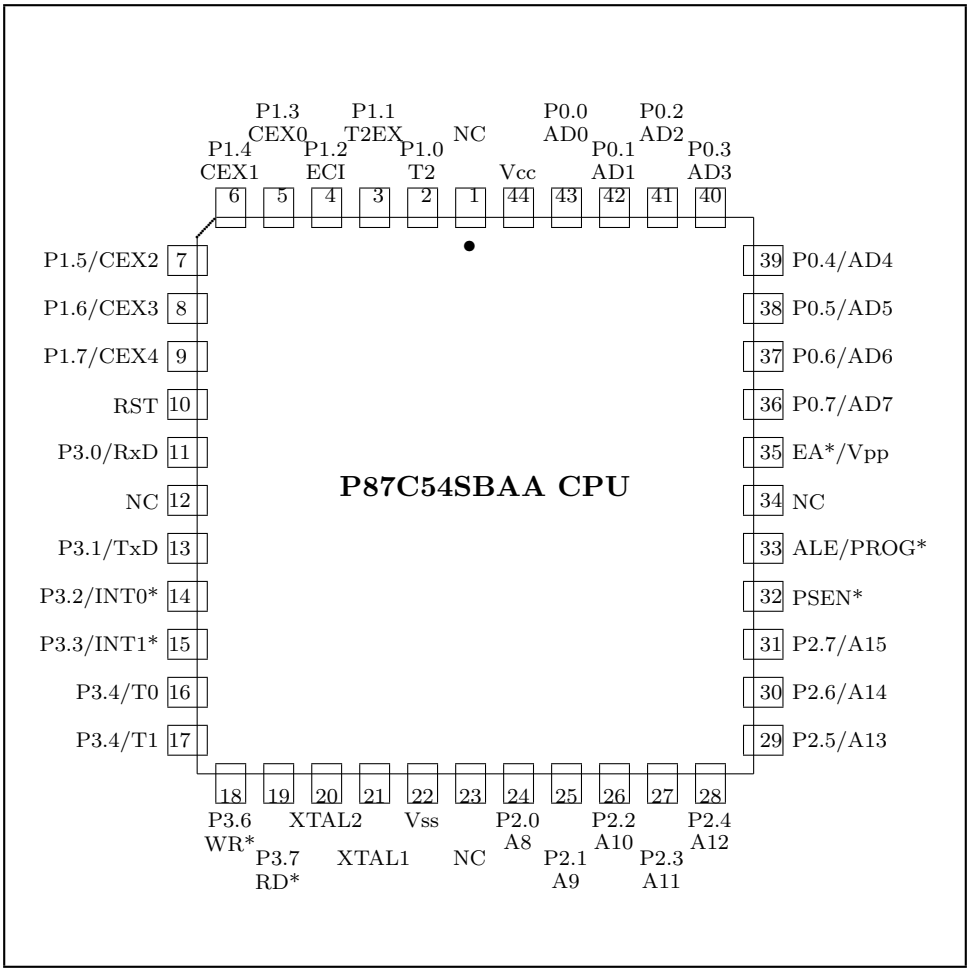


$RCSfile: ChipShap.inc,v $

Figure B-1. MAX491E pin assignments

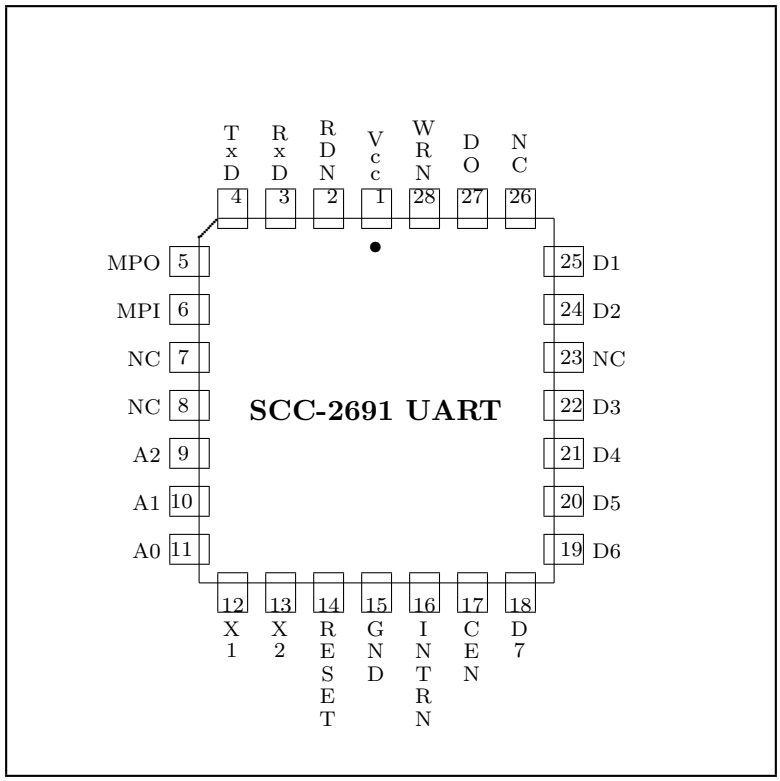
[6] $Header: d:/GeneralInformation/TXBTesting/RCS/ChipShap.inc,v 1.4 2006-09-19 13:12:33-07 Hamilton Exp Hamilton $

Pin	Name	Use
1	NC	No Connection
2	RO	Receiver Output to UART
3	RE*	Receiver Output Enable from CPU
4	DE	Driver Output Enable, X and Y are enabled when DE is high.
5	DI	Driver Input from UART
6	Gnd	Ground
7	Gnd	Ground
8	NC	No Connection
9	Y	Noninverting Driver Output to Head End
10	X	Inverting Driver Output to Head End
11	B	Inverting Receiver Input from Head End
12	A	Noninverting Receiver Input from Head End
13	NC	No Connection
14	Vcc	Power in



$RCSfile: ChipShap.inc,v $

Figure B-2. P87C54SBAA pin assignments



$RCSfile: ChipShap.inc,v $

Figure B-3. SCC2691 pin assignments

APPENDIX C

C Running FTS Software

C.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...`".

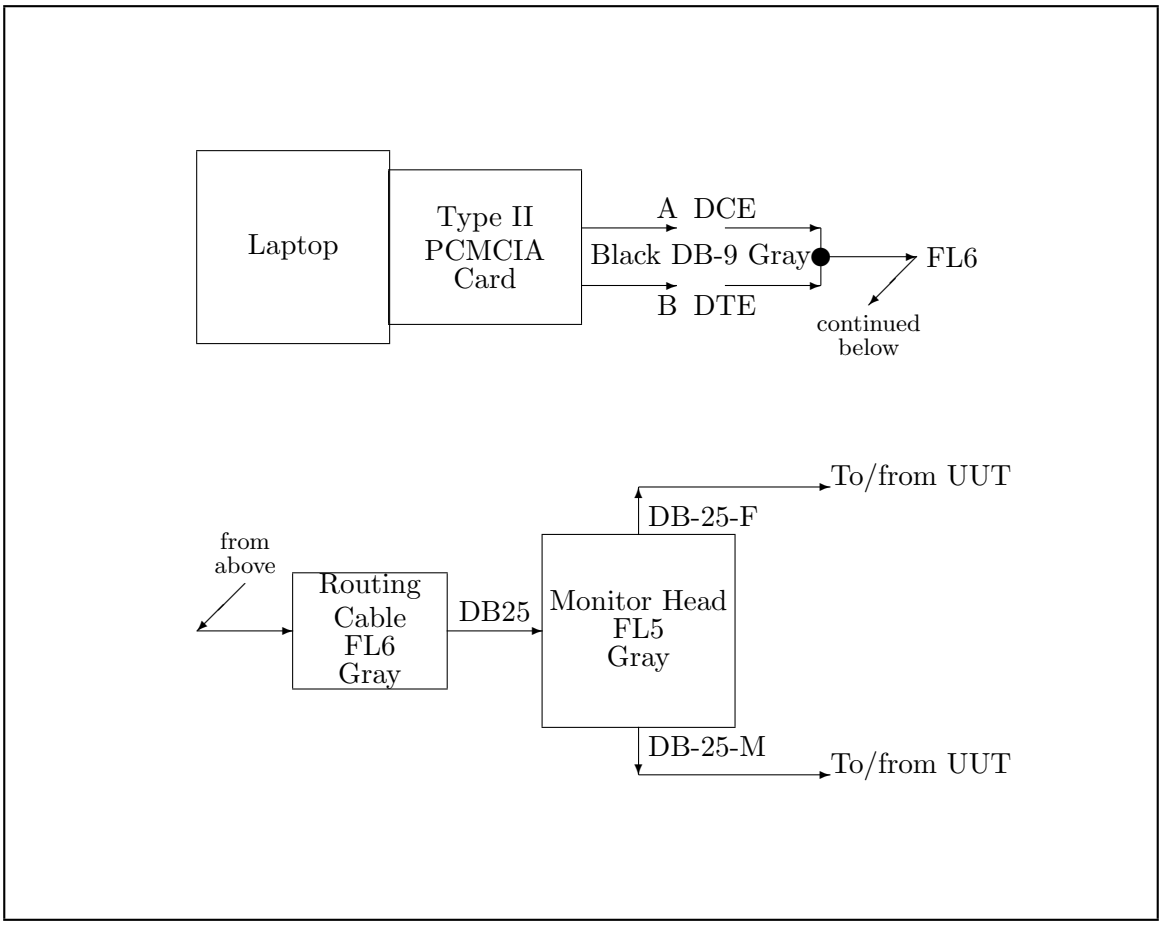
To output the captured data:

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`

[7] `$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

[8] $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 C-1. Connections for use with FrontLine Systems' version of Breakout

C.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
```

C.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.

[9] `$Header: d:/GeneralInformation/TXBTesting/RCS/ScopeSav.inc,v 1.1 2006-01-19 07:05:49-08 Hamilton Exp Hamilton $`

APPENDIX D

D 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[11].

D.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␣`: 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␣`: 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␣`: 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`

[10] `$Header: d:/GeneralInformation/TXBTesting/RCS/MakeSecs.inc,v 1.3 2005-09-29 11:27:20-07 Hamilton Exp Hamilton $`

[11] 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␣`: 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.

D.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
```

D.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:␣␣DTE␣␣␣␣89.391769␣␣␣␣0.001036␣57

   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^{th} 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.

D.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
```

D.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 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 E

E D Protocol Commands

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

Continued on the next page.

[12] $Header: d:/GeneralInformation/TXBTesting/RCS/dcmnds.inc,v 1.4 2006-10-24 13:22:47-07 Hamilton Exp Hamilton $

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

```
// D command bits for Dcmnd1 and Dcmnd2
#define CLOSE   0x04    // Dcmnd1
#define OPEN    0x02    // Dcmnd1
#define NEAR    0x01    // Dcmnd1

#define FAR     0x80    // Dcmnd2
#define WIDE    0x40    // Dcmnd2
#define TELE    0x20    // Dcmnd2

#define DOWN    0x10    // Dcmnd2 plus Ddata2
#define UP      0x08    // Dcmnd2 plus Ddata2
#define LEFT    0x04    // Dcmnd2 plus Ddata1
#define RIGHT   0x02    // Dcmnd2 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 querys
#define EC_QUERY_REPLY_LENGTH     18 // Length of an EC_QUERY reply
```

APPENDIX F

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