1 VM96 (RC216) information

A VM96 is (from the advertising brochure from Sensormatic):

"SensorVision
Video Surveillance Systems

ViewManager 96

Video Matrix Switcher

RC216H"

"ViewManager 96 is the most innovative and powerful video system controller ever offered. The unique TouchTracker controller is designed for one handed, laptop or tabletop operation of the system. The TouchTracker provides one button activation of system activities, vector proportional pan and tilt control and user assignable zoom and focus control keys. Operators can select cameras, views, patterns, sequences, salvos and zones by name through a unique on-screen user menu and TouchTracker buttons."

"Features

- Versatile system size — minimum 16 video inputs and 4 video outputs, maximum 96 video inputs and 8 video outputs
- Futuristic TouchTracker hand held controller
- Programmable quick views, patterns, sequences, zones and salvos
- Plain language usage on screens to simplify operation
- Multilevel user restrictions
- Full matrix switching capability
- Embedded PC platform for future plug and play option
- A new generation of versatile programmable video security"

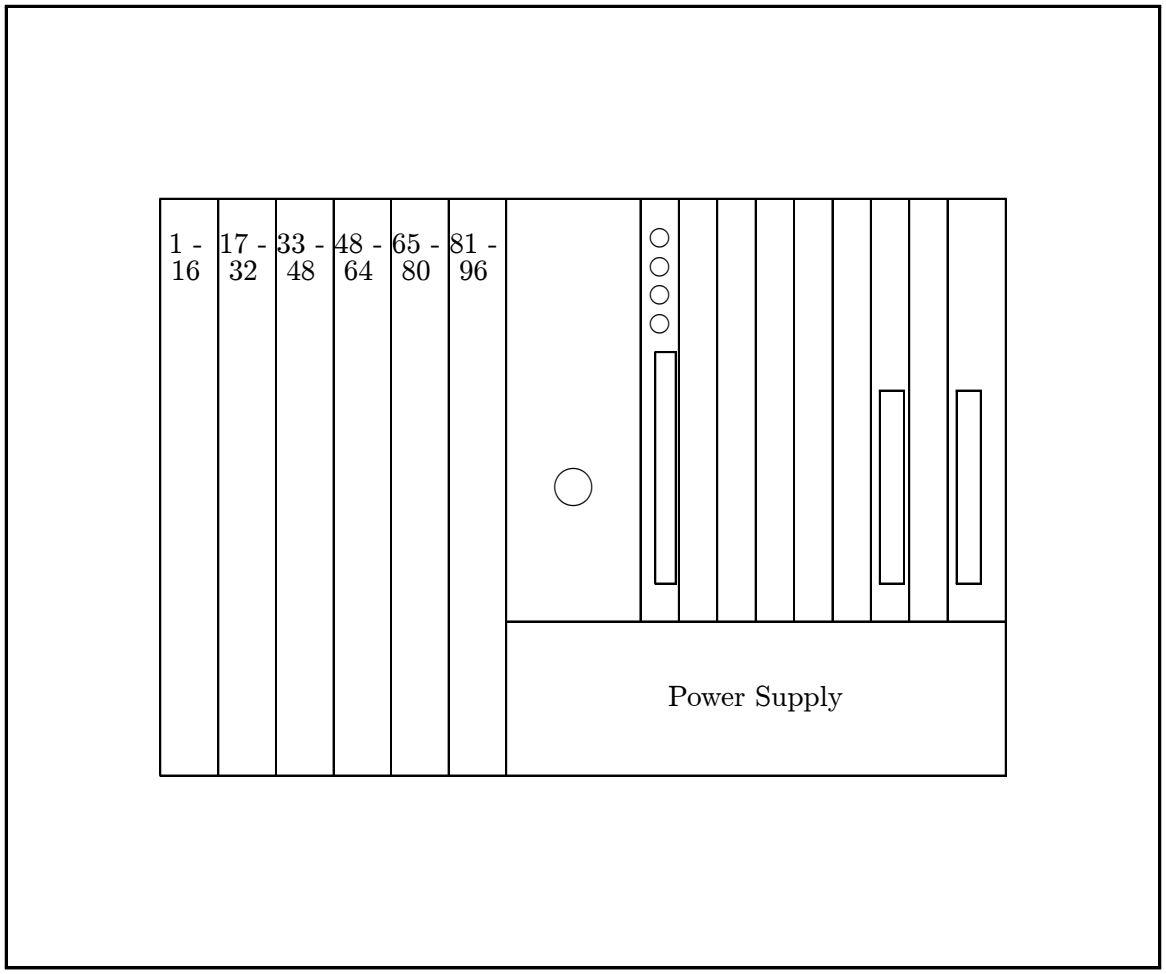
1.1 VM96 chassis connections

The right rear of a VM96 (RC216 Figure 1, page 3) is marked as follows:

[1] $Header: d:/sears/RCS/pictsc1.tex,v 1.4 2001-05-22 08:28:18-07 Hamilton Exp Hamilton $
[2] $Header: d:/TXB-S422/RCS/vm96.inc,v 1.11 2002-02-28 12:57:48-08 Hamilton Exp Hamilton $

Sensornet	
1 2	Net 1
3 4	Net 2
5 6	Net 3
7 8	Net 4
1 2 3 4	RX HI + RX LO - TX + TX LO -
5 6 7 8	RX HI + RX LO - TX HI + TX LO -
—422—	

Table 1. Rear IO connections with an RC216H/VM96



$RCSfile: vm96.inc,v $

Figure 1. VM96 (RC216) Rear view

1.2 SensorNet protocol

The "DeltaDome II, Installation and Service Guide" (8000-2708-01, Rev A, page 8) indicates that this protocol:

1. Utilizes one pair of unshielded twisted pair, 22 AWG, non-polarized cable.
2. Supports a maximum of 32 devices on a line.

In the manual for the "ADTT16 Enhanced Touch Tracker, 8000-2672-02, Rev. A" (ADTT16E), it mentions (on page 12) that SensorNet:

1. Has a bit rate of 230.4 Kbps,
2. Uses SDLC as a Link Layer Protocol,
3. Utilizes a "Proprietary" Application Protocol,
4. With Network Nodes for Enhanced Touch Tracker and SensorNet Domes.

From an investigation at Sears Clovis on 15MAY01, it appears that the Sensornet Net X outputs consist of:

1. A type of Manchester data encoding.
2. The baud rate of the signal is about 500 KHz.
3. The bit rate of the signal is about 238 KHz.
4. Commands repeat about every 25 ms.
5. Command blocks consist of three command blocks.
6. Some commands consist of two sub-command blocks and some consist of one larger sub-command block.
7. If two sub-command blocks are sent then they are sent about every 520 μs apart.
8. Each short sub-command block is about 316 μs long.
9. An expanded sub-command block shows the presence of Manchester formatted data.
10. Assuming that each data bit is about 316 μs long and that each bit of data is about 4.2 μs long, indicates that a "typical" command might consist of about 64 or so bits (or better yet about 8 bytes). This takes into account probable leading data bits for synchronization, start and parity bits on the data bytes.
11. The start of each sub-command has a variable width starting bit. After that the data is reasonably consistent.
12. Odd and even numbered Sensornet "Net" outputs appear to be complemented and have the same information.

1.3 RC216 messages

So far the following on-screen messages from a RC216 have been detected:

1. `Camera 44 is OFFLINE`, this message is displayed whenever the RC216 does not get a response (answer to a POLL command) from a previously working camera/dome.
2. `Camera 44 is ONLINE`, this message is displayed whenever the RC216 gets a message from a POLL command when the unit was previously marked as being "offline". It lasts for about 5 seconds.
3. `Pattern 20` is displayed when a dome is running a pattern.

1.4 Operating notes

1. To enter a pattern:
   A. Enter the menu system of the controller by hitting the "`Menu`" key on the TouchTracker.
   B. Select a pattern number to use. It is unclear if a currently defined pattern may be changed.

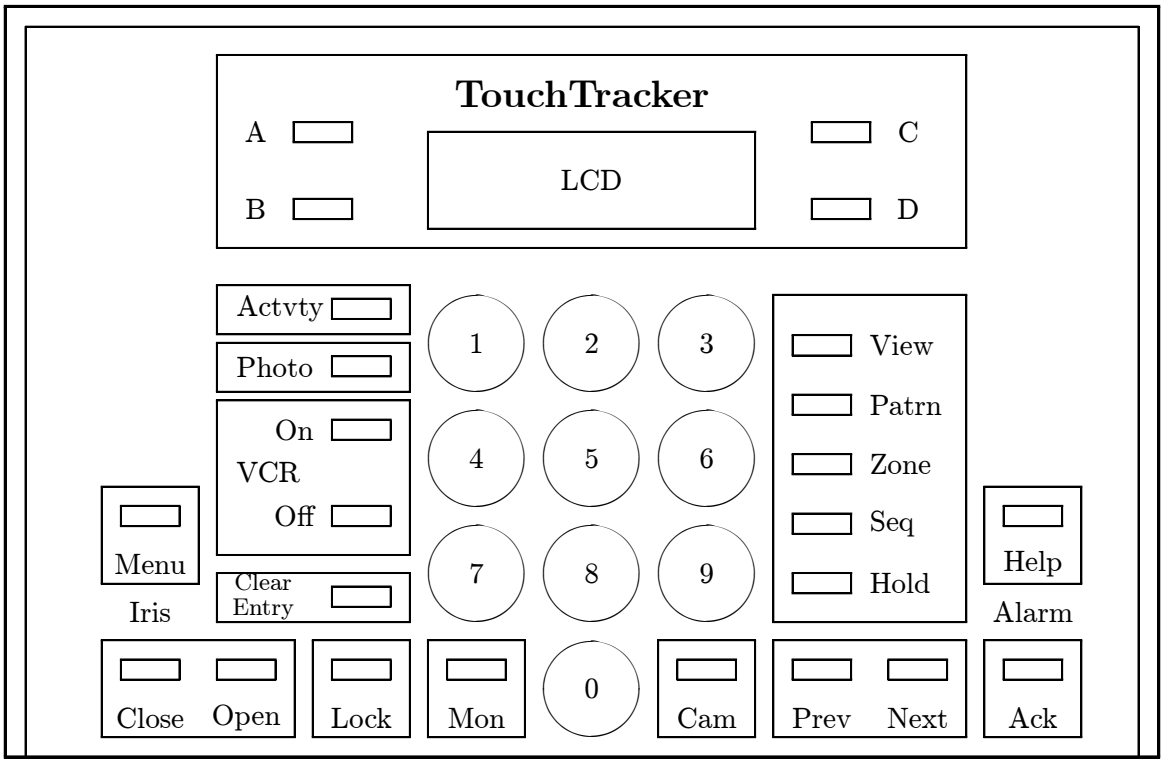
      Note that while actually defining a pattern the Spectra will put up a message saying "`PROGRAMMING PAT`" on the screen. This message does conflict with the controller's messages and may not be turned off.
   C. When done with the pattern, hit the "`Ack`" button on the TouchTracker.
   D. The controller will then ask if you want to run the new pattern. Hit the "`Ack`" button on the TouchTracker to run the new pattern. Note Sensormatic domes do not save the pattern until the user indicates that the pattern is OK. At this point the Spectra has already save the most recent pattern.

      There is a difference between the way that a Spectra and a DeltaDome/SpeedDome saves patterns. The Spectra saves commands for a given amount of time, while the Sensormatic domes save 99 commands **no matter how long it takes to run them**.
   E. To complete the test/new pattern run, hit the "`Clr`" key on the TouchTracker.
   F. To actually save the new pattern hit the "`Ack`" key on the TouchTracker to save the pattern and complete the pattern saving process. (Remember that the Spectra always has the new pattern saved. However the controller does not know that it is a Spectra so it "talks" to the Spectra as though it is a DeltaDome/SpeedDome.)
2. To run a pattern continuously:
   A. Hit the "`C`" button on the TouchTracker.
   B. Enter in the pattern number. Note that patterns are system wide, i.e. the controller will "know" that pattern #22 is for dome #3 etc.
   C. Hit the "`Patrn`" key on the TouchTracker.

D. And whichever dome the pattern applies to, will start running its pattern continuously. Remember that this is the only way that a Spectra runs patterns. It may be that a Sensormatic dome will only run a pattern once or that the controller stops the pattern after a given amount of time. (Which is happening in unknown.)

3. To have a dome "flip", hit the "D" key on the TouchTracker.

4. To change the state of AUX 4 (windshield/wiper on/off), hit the "B" key on the TouchTracker. The TXB-S422 translates AUX 4 to Auxilary #1. This is done so that with an Esprit, auxilary #1 is used to control the windshield wiper. Thus the windshield wiper may be turned on and off through use of the "B" key.



$RCSfile: tt.inc,v $

Figure 2. VM96 type TouchTracker layout

[3] $Header: d:/TXB-S422/RCS/tt.inc,v 1.5 2002-02-14 16:08:02-08 Hamilton Exp Hamilton $

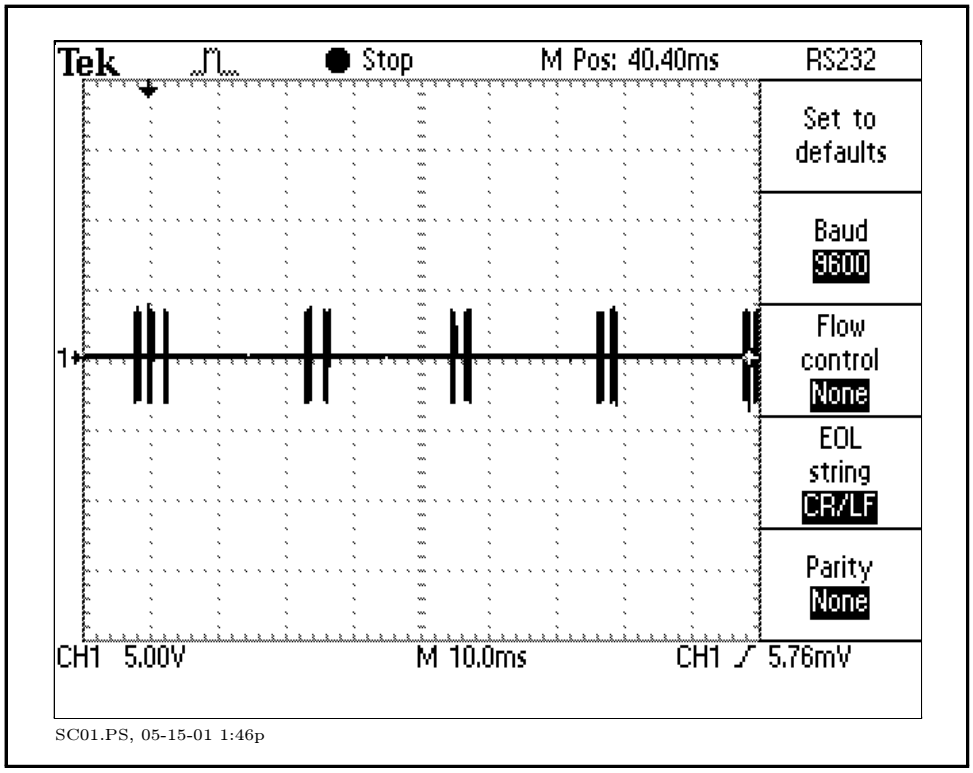


Figure 3. Clovis Sears store, typical data.

Trace	Use
1	SensorNet, Net 3.

[4] `$Header: d:/TXB-S422/RCS/pictsc1.inc,v 1.2 2001-10-17 11:56:06-07 Hamilton Exp Hamilton $`

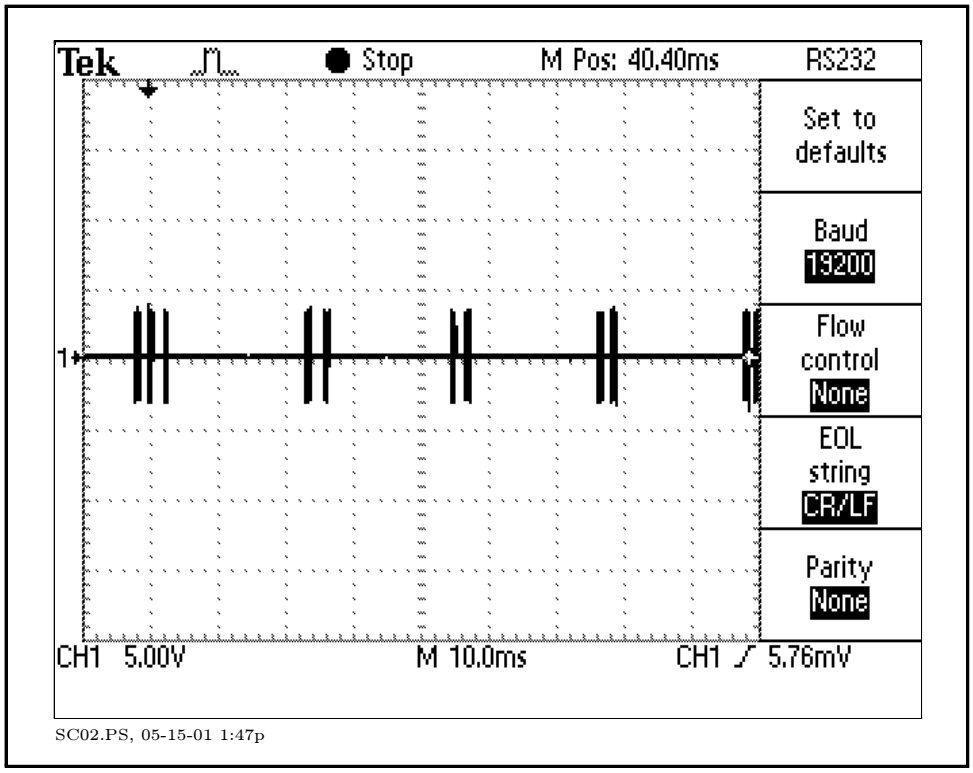


Figure 4. Clovis Sears store, typical data, same as SC01.PS.

Trace	Use
1	SensorNet, Net 3.

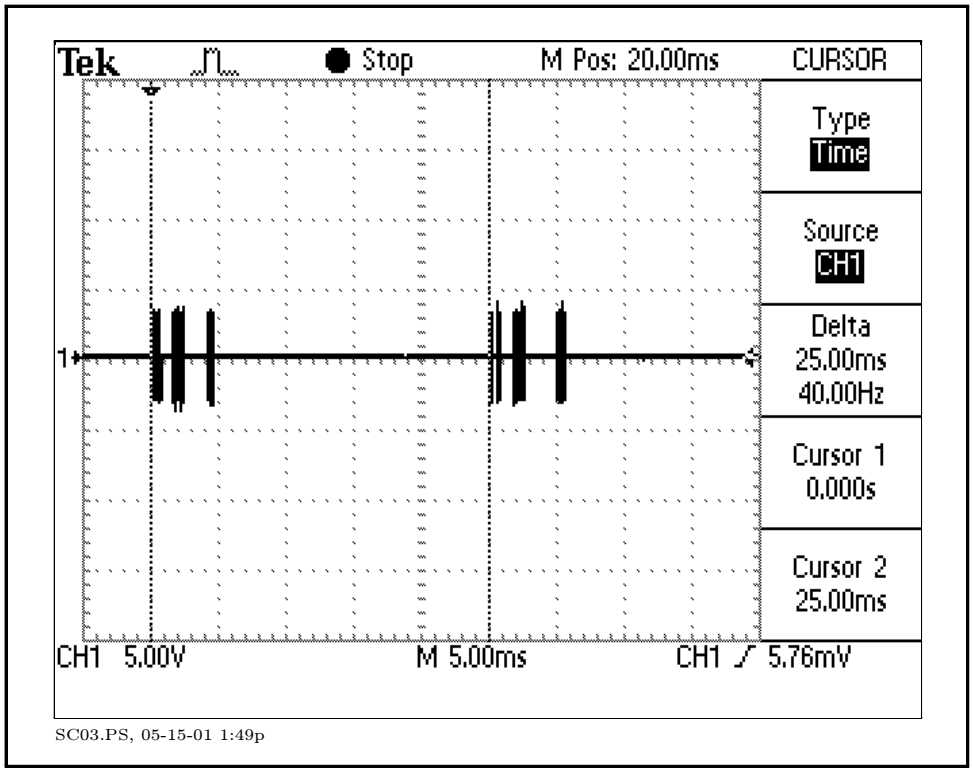


Figure 5. Clovis Sears store, timing between two major command groups.

Trace	Use
1	SensorNet, Net 3.

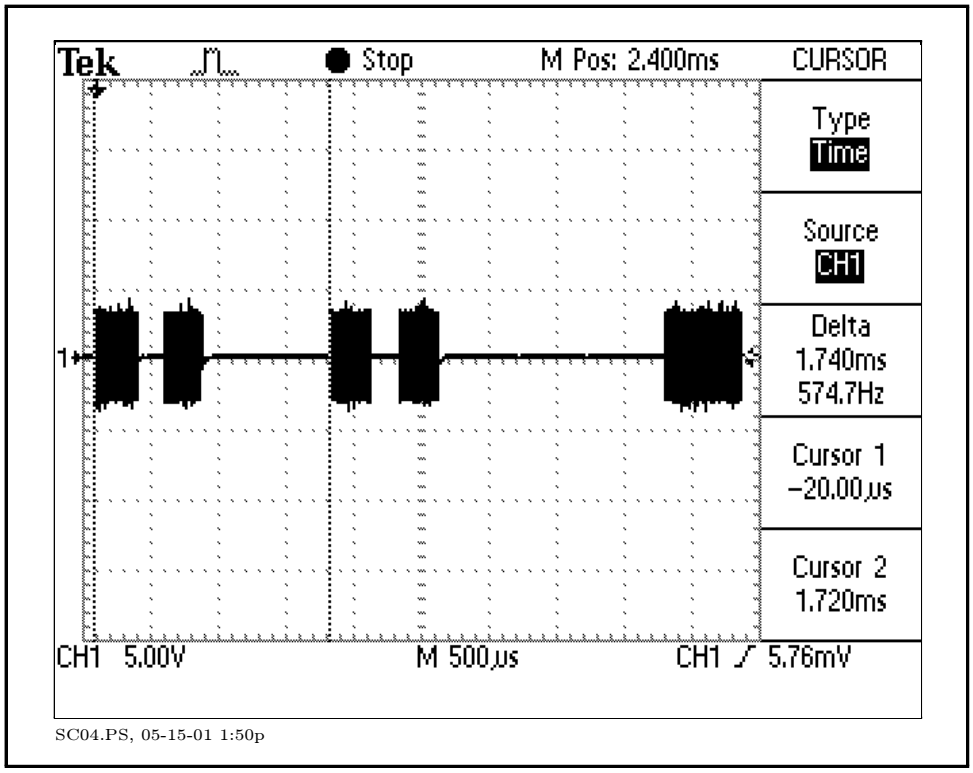


Figure 6. Clovis Sears store, timing between two minor groups.

Trace	Use
1	SensorNet, Net 3.

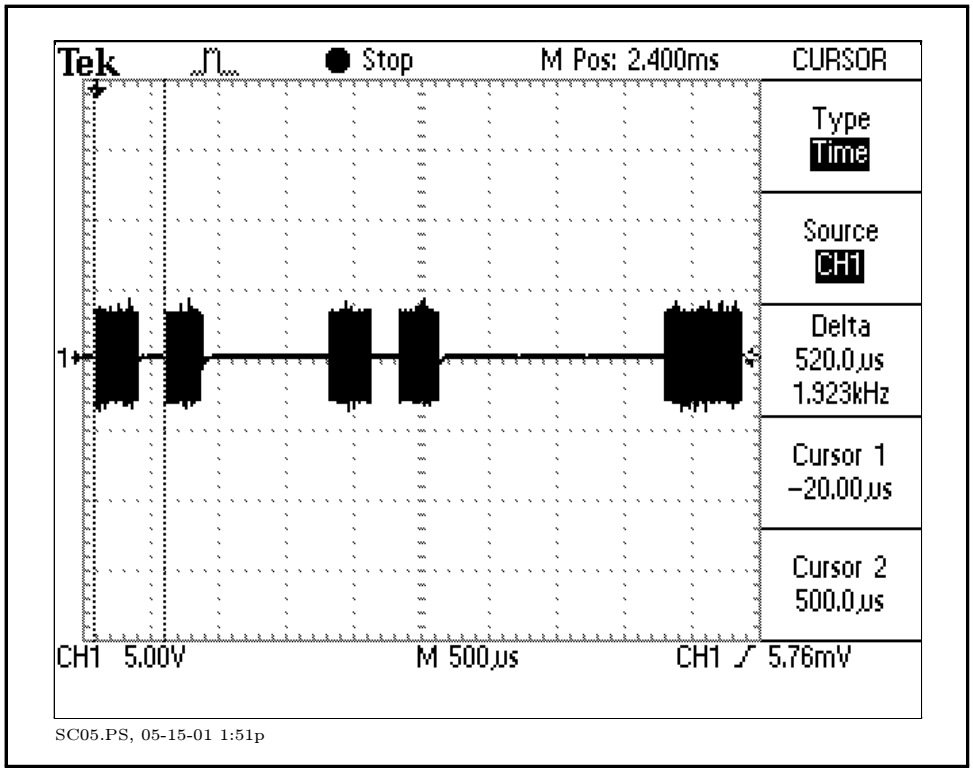


Figure 7. Clovis Sears store, timing between two sub-command blocks.

Trace	Use
1	SensorNet, Net 3.

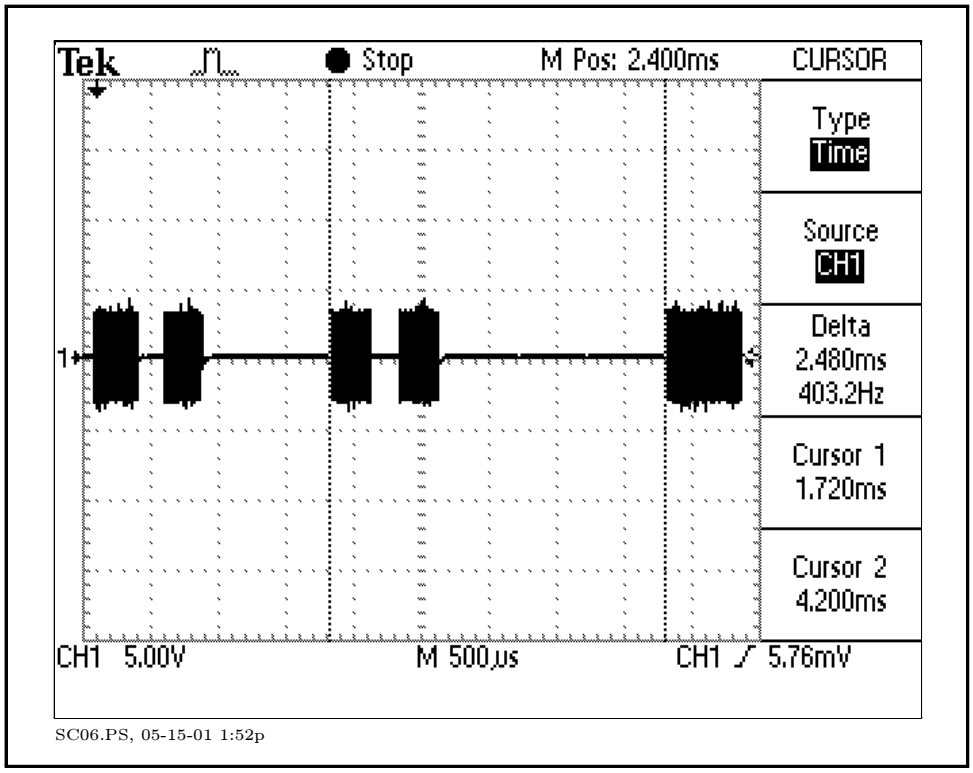


Figure 8. Clovis Sears store, timing between second minor group and third minor group.

Trace	Use
1	SensorNet, Net 3.

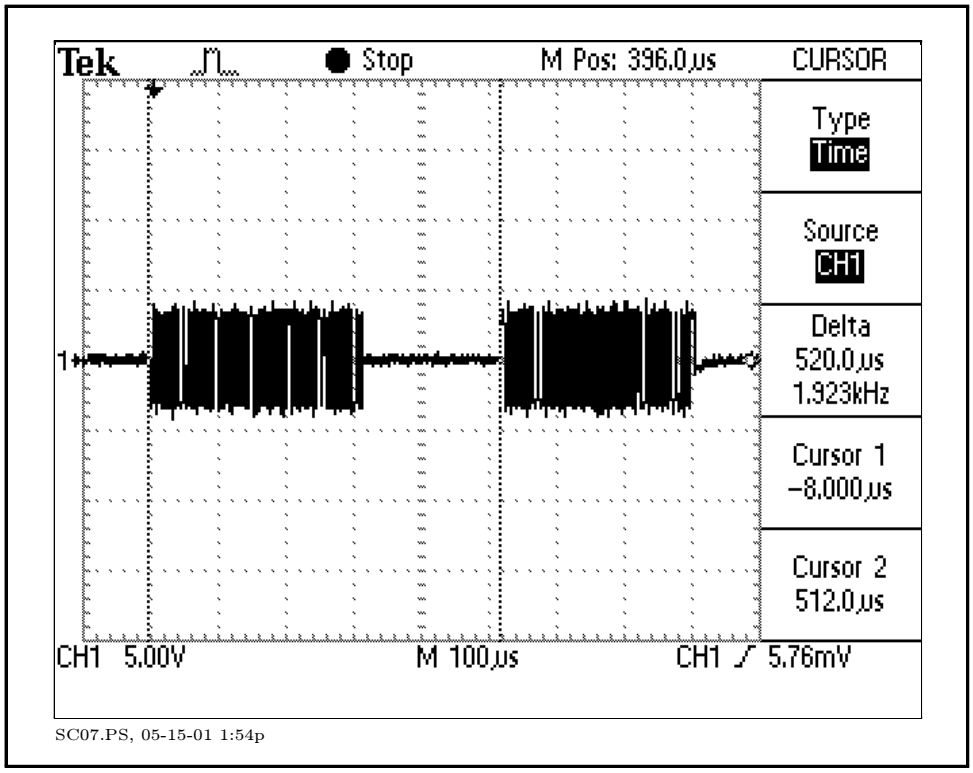


Figure 9. Clovis Sears store, detailed timing between first two sub-command blocks.

Trace	Use
1	SensorNet, Net 3.

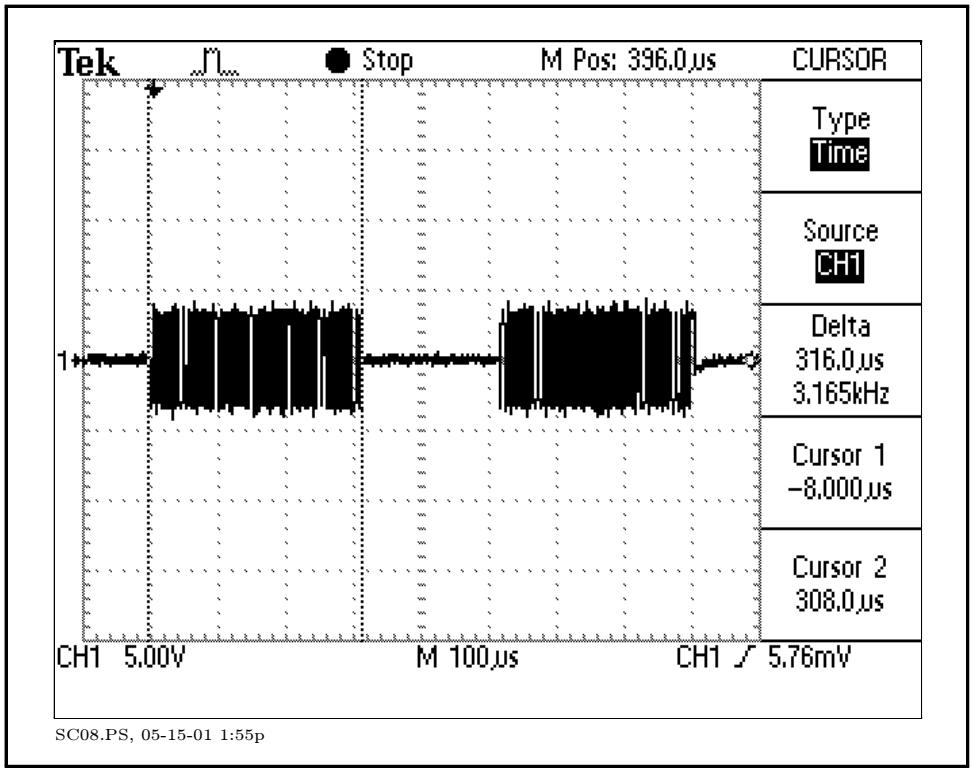


Figure 10. Clovis Sears store, duration of the first part of first sub-command.

Trace	Use
1	SensorNet, Net 3.

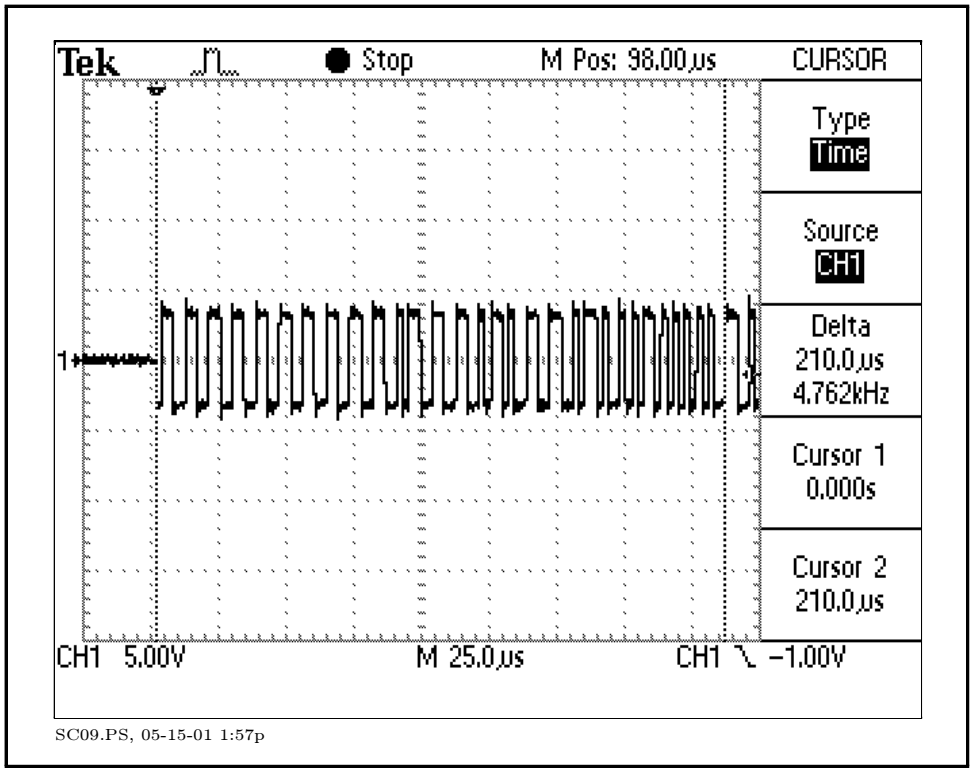


Figure 11: Clovis Sears store, expanded command information from first part of first sub-command.

Trace	Use
1	SensorNet, Net 3.

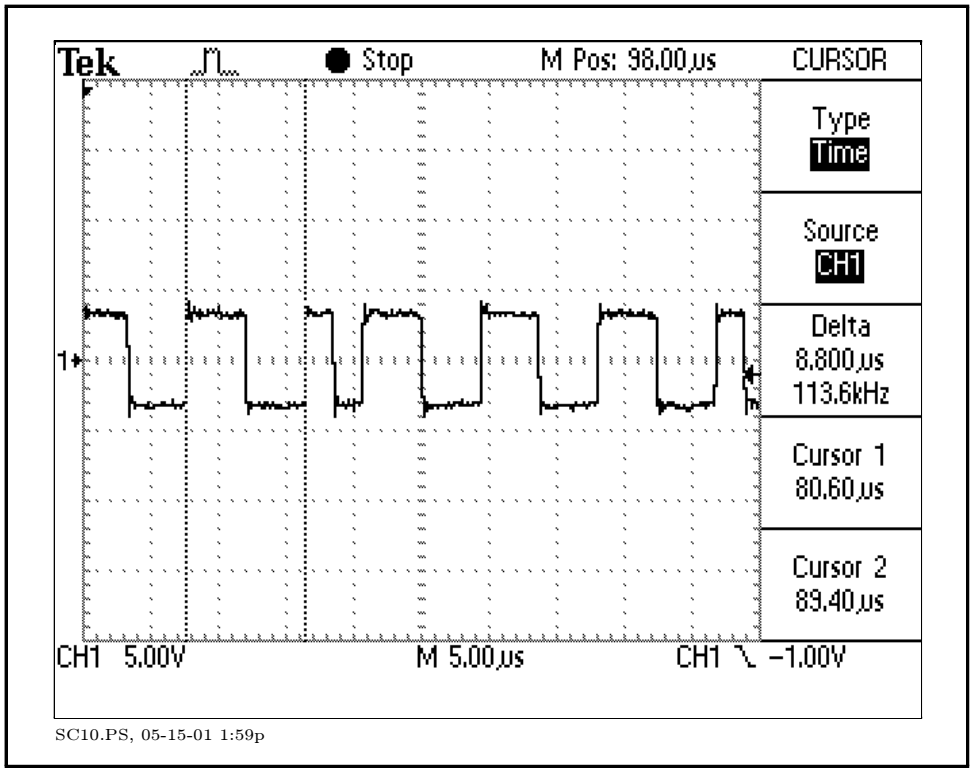


Figure 12. Clovis Sears store, timing details of a “full long” pulse.

Trace	Use
1	SensorNet, Net 3.

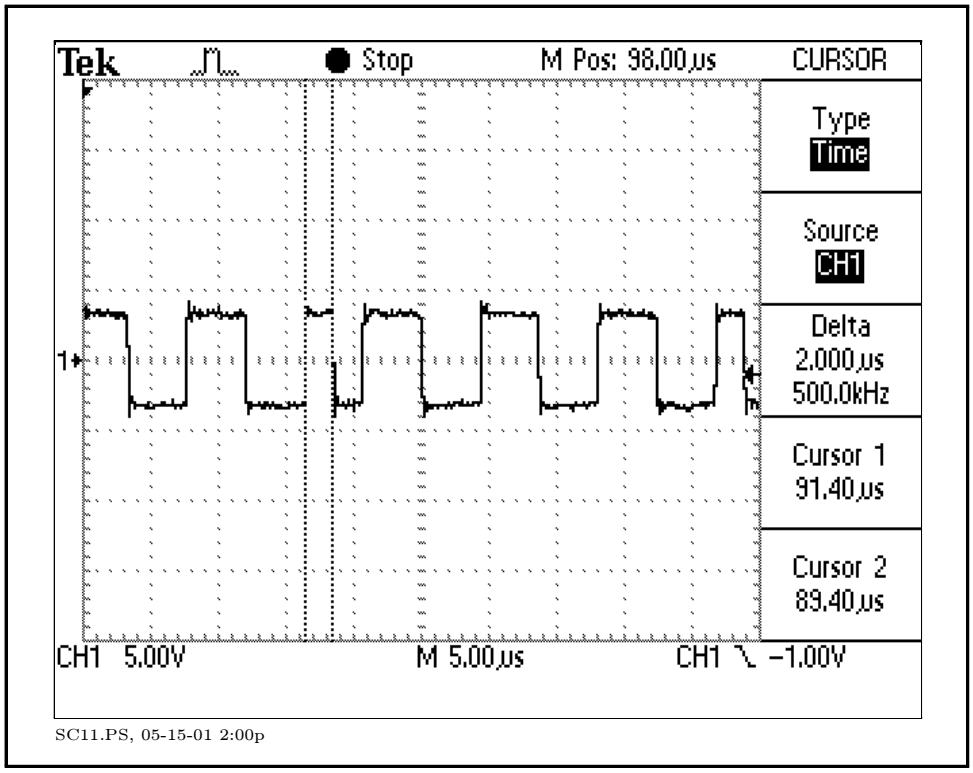


Figure 13. Clovis Sears store, timing details of a "short high" pulse.

Trace	Use
1	SensorNet, Net 3.

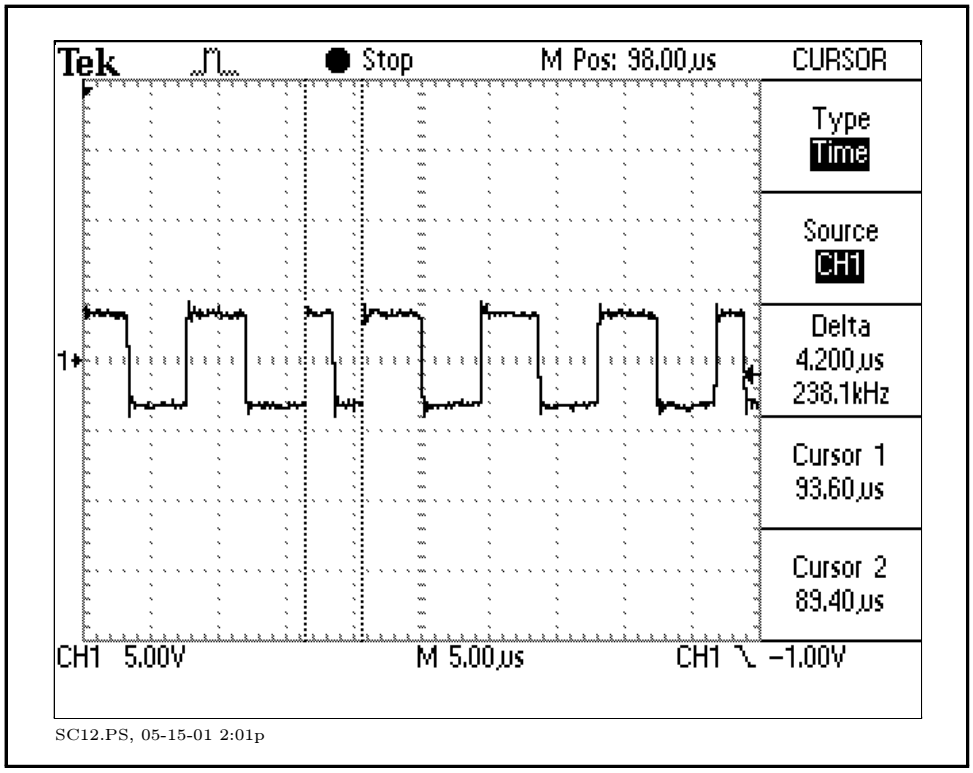


Figure 14. Clovis Sears store, timing details of a "full short" pulse.

Trace	Use
1	SensorNet, Net 3.

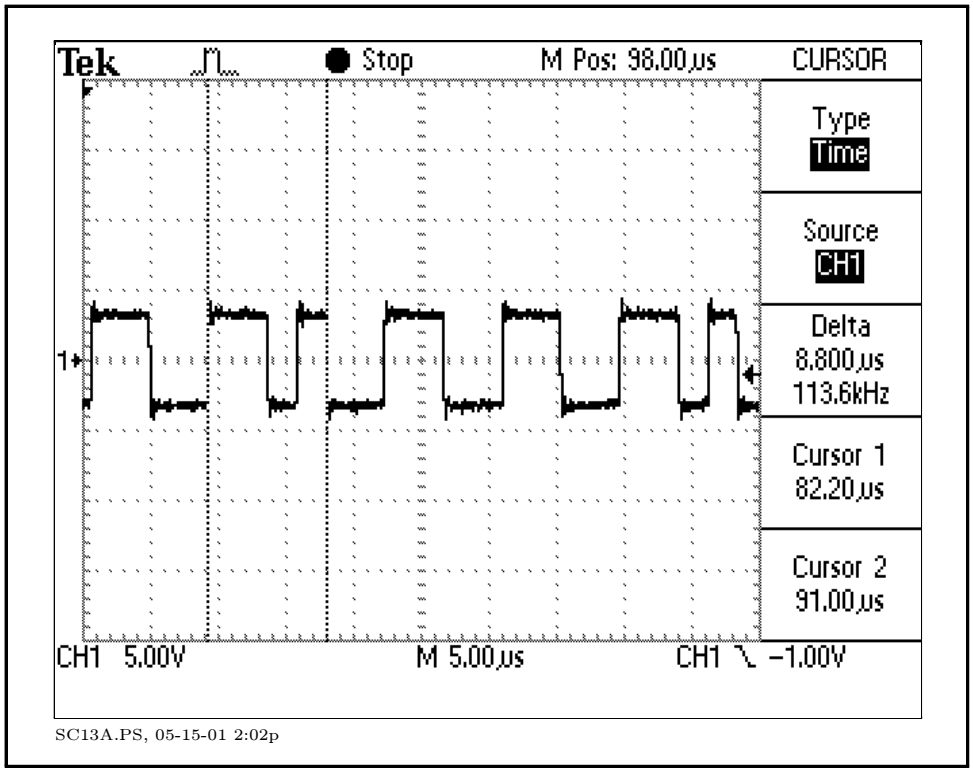


Figure 15. Clovis Sears store, timing details of a "long high and full short" pulse set.

Trace	Use
1	SensorNet, Net 3.

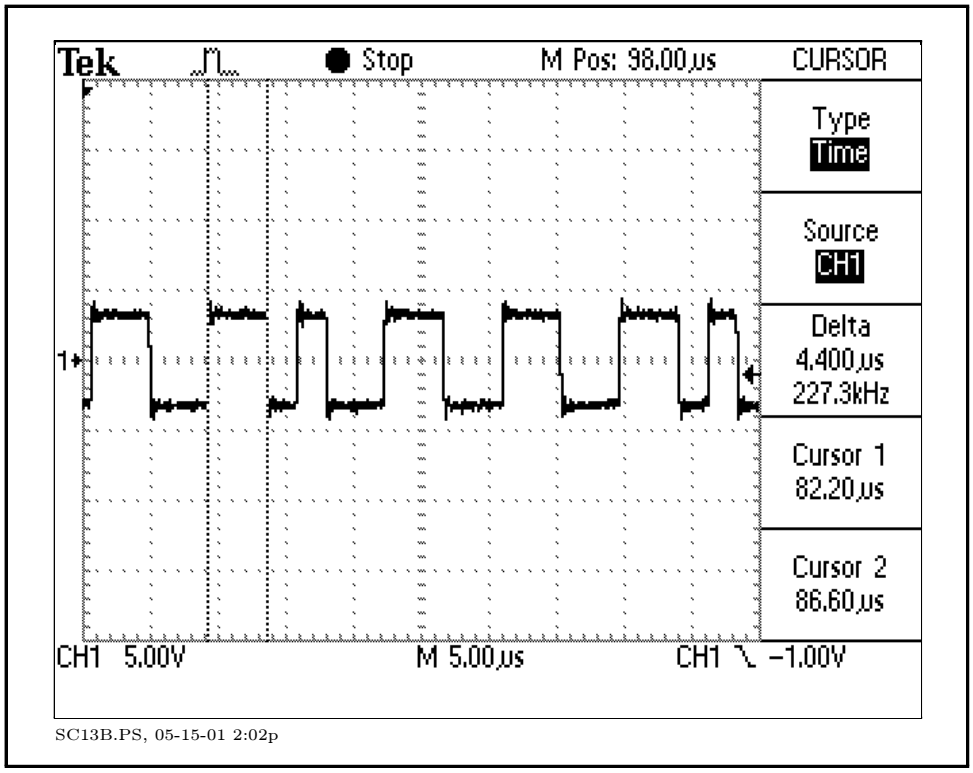


Figure 16. Clovis Sears store, timing details of a "long high" pulse.

Trace	Use
1	SensorNet, Net 3.

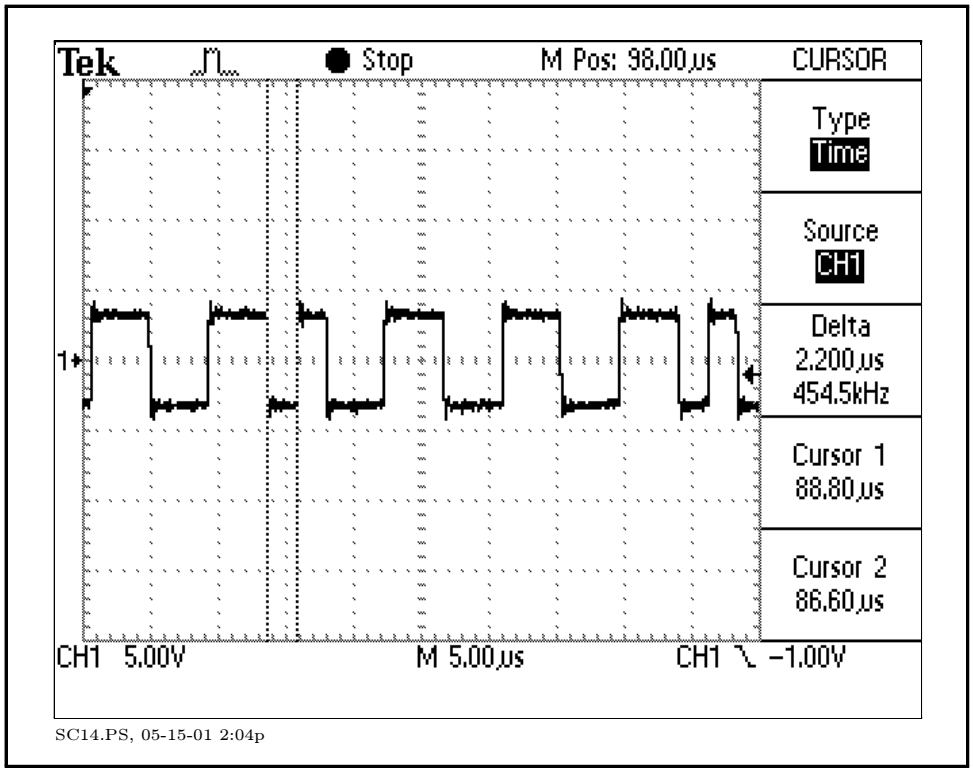


Figure 17. Clovis Sears store, timing details of a "short low" pulse.

Trace	Use
1	SensorNet, Net 3.

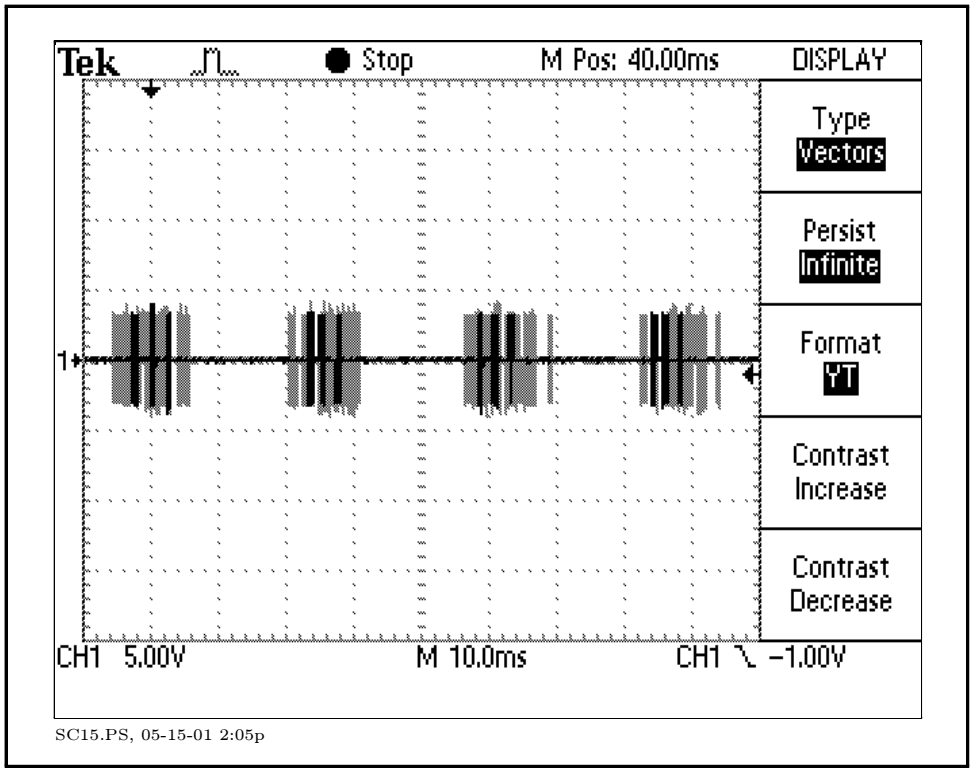


Figure 18. Clovis Sears store, $3 \sim 4$ accumilated seconds of typical command data.

Trace	Use
1	SensorNet, Net 3.

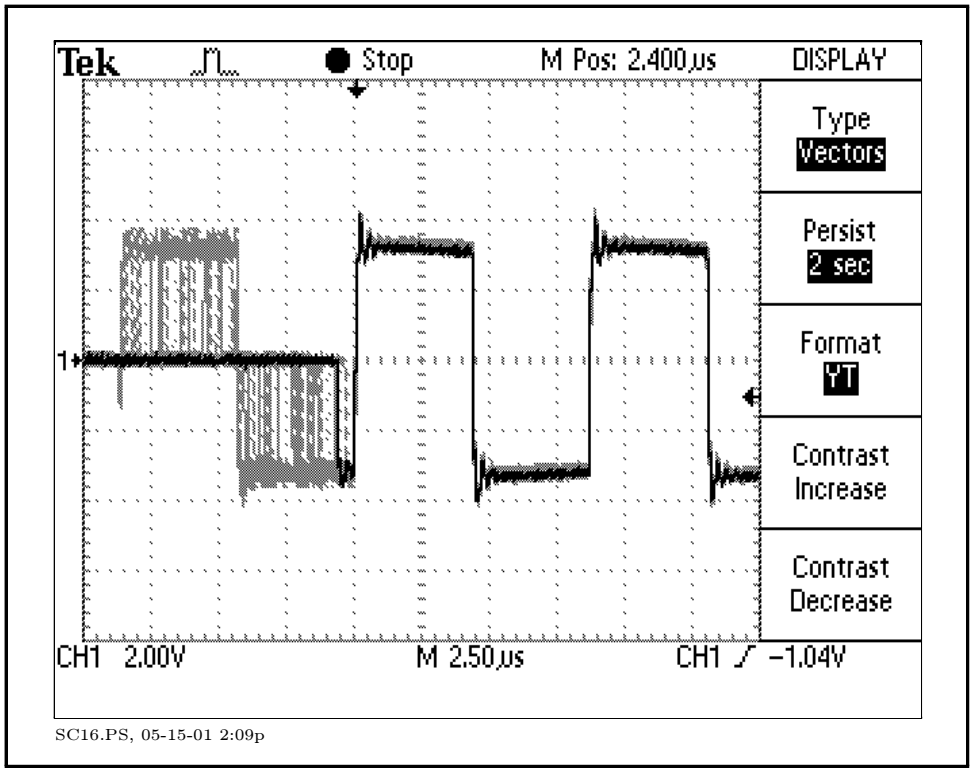


Figure 19. Clovis Sears store, expanded start of 2 accumilated seconds of command data.

Trace	Use
1	SensorNet, Net 3.

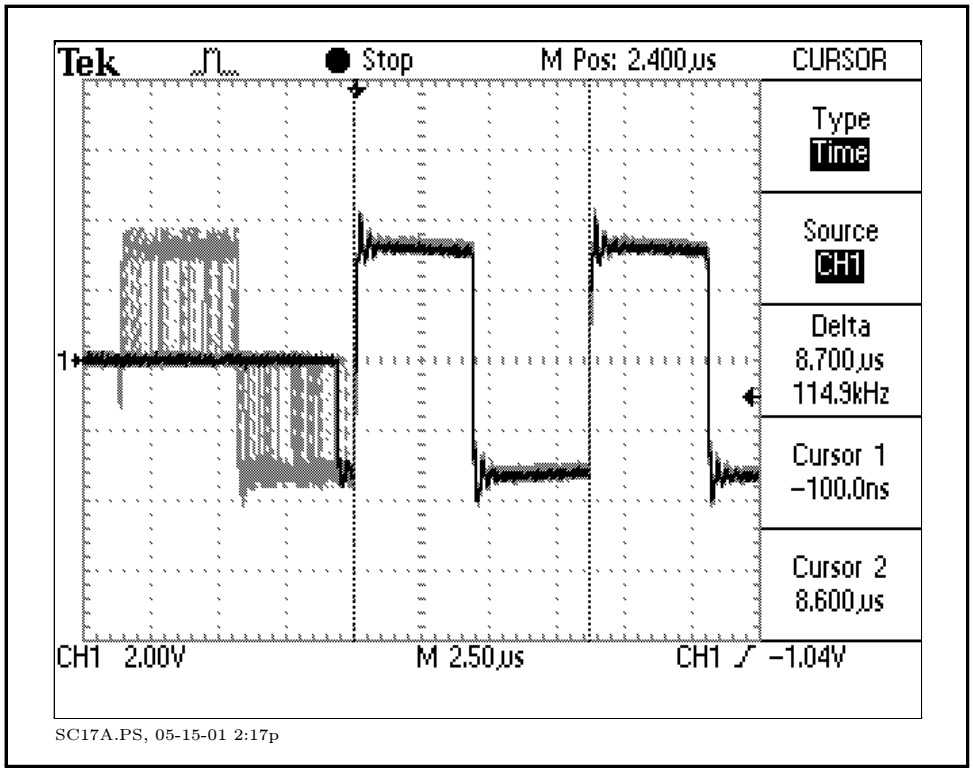


Figure 20: Clovis Sears store, expanded start of 2 accumilated seconds of command data with timing information.

Trace	Use
1	SensorNet, Net 3.

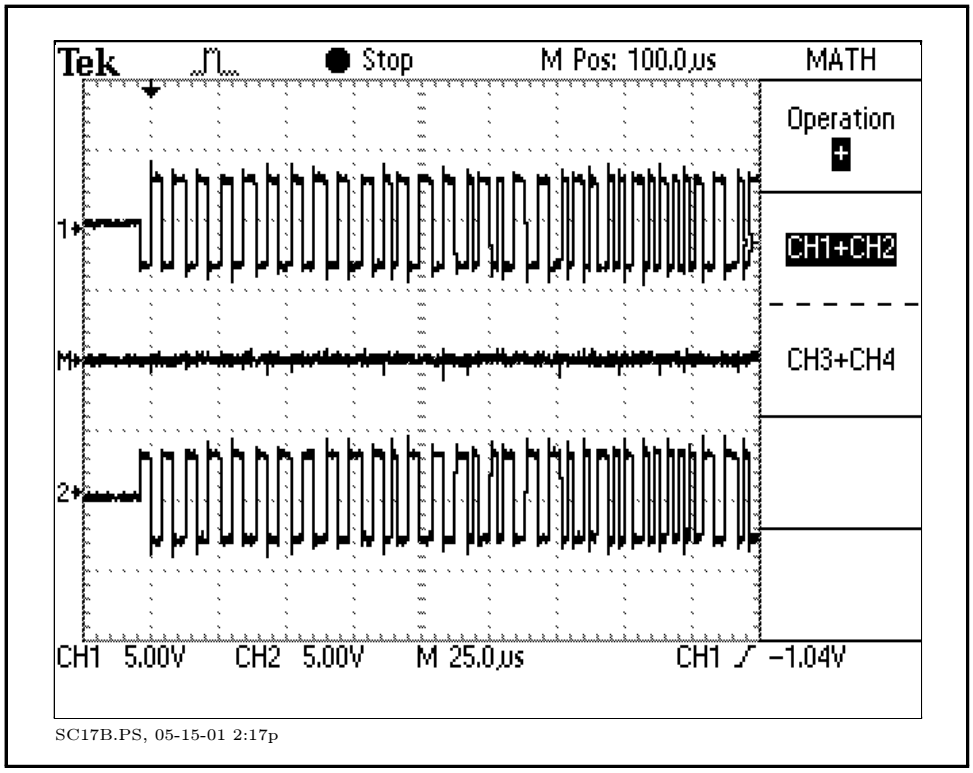


Figure 21. Clovis Sears store, note that Net 3 and Net 4 are inverted but identical.

Trace	Use
1	SensorNet, Net 3.
2	SensorNet, Net 4.
M	SensorNet, Net 3 + Net 4.

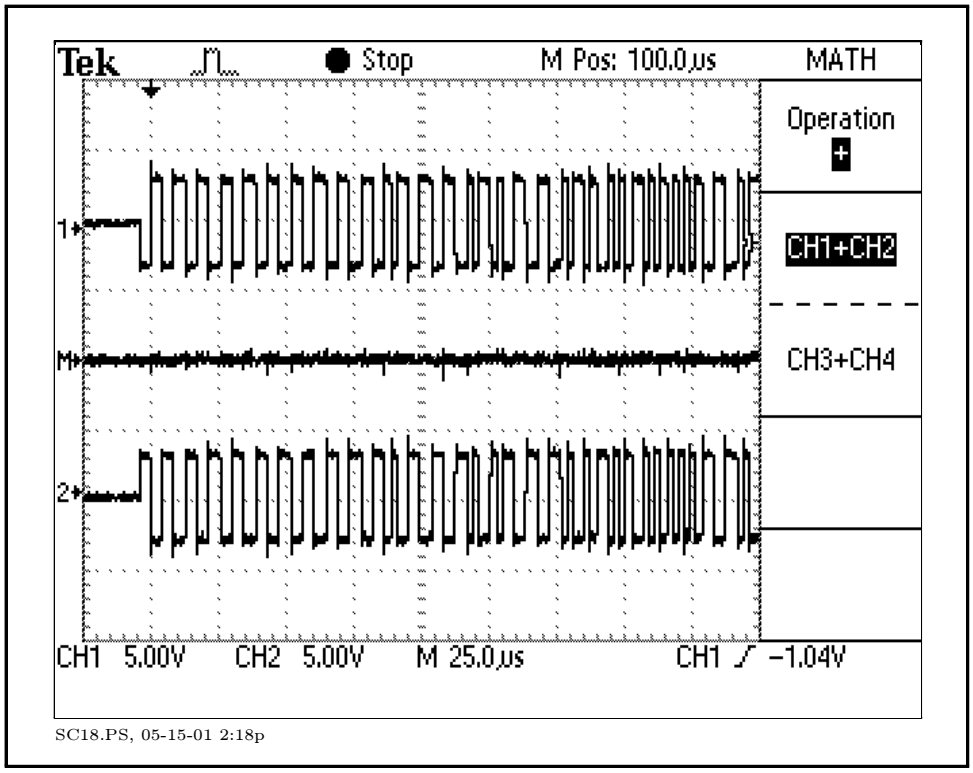


Figure 22. Clovis Sears store, same as SC17B.

Trace	Use
1	SensorNet, Net 3.
2	SensorNet, Net 4.
M	SensorNet, Net 3 + Net 4.