

Part #:	<b>MPM3650 Power Module</b>	  
Description:	This 17V, 6A power module offers an ultra-low profile package and high integration.	 <a href="#">Download Datasheet</a>

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Author

Topic: **Sencore LC102 Display Problems** (Read 16536 times)

volvo\_nut\_v70 and 0 Guests are viewing this topic.

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:

**Sencore LC102 Display Problems**  
« on: September 09, 2015, 04:09:39 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I originally posted this to beginner forum but I notice it should have been under repairs.

My Sencore LC102 is showing a blurred LCD Display and since I have never worked on these Boards I wonder if someone here could help?

I have the manual and block diagram for the unit but no service manual.  
Wondering if the blurred image could be compensated for through potentiometer?

There are about 20 available on main board none on display board and no way to identify what they control.

I have added an image.  
I checked voltages at various TP and the LCD chip all seem fine.

Posting a photo of display.



Sencore.jpg (131.11 kB, 720x538 - viewed 622 times.)

[Report to moderator](#) [Logged](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**OldSchoolTechCorner**

Frequent Contributor



Posts: 327

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #1 on:** September 09, 2015, 09:59:29 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

The LCD is bad, reasons could be due to the layers of glass start to separate and the liquid crystal material starts to bleed, or seals failing around the outside of the glass.

« Last Edit: September 09, 2015, 10:01:58 pm by OldSchoolTechCorner »

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**Johnny10**

Frequent Contributor



Posts: 865

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #2 on:** September 10, 2015, 01:01:31 am »

[Say Thanks](#) [Reply](#) [Quote](#)

Are these specialty items or can they be replaced?

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**klunkerbus**

Supporter



Posts: 162

Country:

Electrical Engineer (retired early)



**Re: Sencore LC102 Display Problems**

« **Reply #3 on:** September 10, 2015, 02:16:46 am »

[Say Thanks](#) [Reply](#) [Quote](#)

Is it unusual though that both displays would be failing so consistently? Since they're subjected to the same environmental conditions since assembly, does that make simultaneous glass failure typical? The display on the left has to be custom due to the unique legends on the display. Since that one is custom, odds are the one on the right is custom as well. The manual lists Sencore part numbers for the displays - it might not hurt to drop Sencore an email asking about the parts.

Some trivia for you... I ran one of the two design labs at Sencore in the late 1970's. The company was struggling to decide whether new products should stick with the traditional LED displays or go to LCD, which was new at the time. Sencore used to rely heavily on company field reps for sales, and all the reps attended annual or semiannual meetings at the company. I'll never forget being asked by the president of the company to prepare prototypes of both LED and LCD displays for the sales team to "vote" on as part of one of those meetings. During my introduction to the sales team, the president

stated I was ramrodding the LCD path - "look, he even brought a prototype of an LCD to convince you". Almost laughably, all or nearly all of the sales staff pleaded for LCD, saying that's what their customers were wanting. I started looking for new job shortly after that sales meeting.

The LC102 was after my time.

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**klunkerbus**

Supporter



Posts: 162

Country:

Electrical Engineer (retired early)



**Re: Sencore LC102 Display Problems**

« **Reply #4 on:** September 10, 2015, 04:08:04 am »

[Say Thanks](#) [Reply](#) [Quote](#)

One thing I'd check is the backplane oscillator that feeds both displays. If that oscillator quits, the display glass is driven effectively with DC, which they don't like.

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**OldSchoolTechCorner**

Frequent Contributor



Posts: 327

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #5 on:** September 10, 2015, 04:20:02 am »

[Say Thanks](#) [Reply](#) [Quote](#)

**Quote from: klunkerbus on September 10, 2015, 04:08:04 am**

One thing I'd check is the backplane oscillator that feeds both displays. If that oscillator quits, the display glass is driven effectively with DC, which they don't like.

Agree more like the backplane oscillator definitely worth checking that the LCD backplane ac oscillator is running , as could be dc bias damage to the crystal lattice. Convert it over to a LED displays, if can't source the originals.

« *Last Edit: September 10, 2015, 04:24:40 am by OldSchoolTechCorner* »

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**Joule Thief**

Regular Contributor



Posts: 249

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #6 on:** September 10, 2015, 04:43:03 am »

[Say Thanks](#) [Reply](#) [Quote](#)

**Quote from: klunkerbus on September 10, 2015, 02:16:46 am**

Some trivia for you... I ran one of the two design labs at Sencore in the late 1970's. The company was struggling to decide whether new products should stick with the traditional LED displays or go to LCD, which was new at the time.

And all that time i was saving my lunch money to buy a new FE160 analog FET multimeter. I still use it as my primary analog meter even today.

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Perturb and observe.

**Johnny10**

Frequent Contributor



Posts: 865

Country:

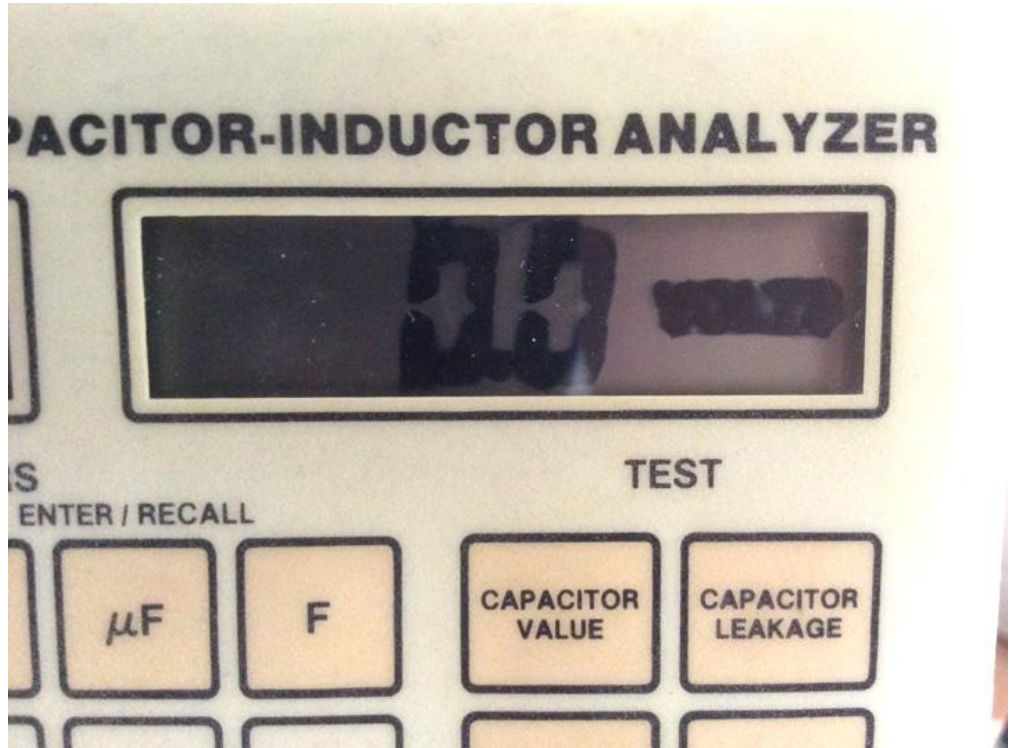


**Re: Sencore LC102 Display Problems**

« **Reply #7 on:** September 10, 2015, 02:50:29 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I have a closer shot of Display.  
Thanks for all the interesting analysis. Checking the oscillator later today.  
Going to be difficult to get back behind the display.



photo(1).JPG (146.59 kB, 720x538 - viewed 398 times.)

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**Johnny10**  
Frequent Contributor



Posts: 865  
Country:



**Re: Sencore LC102 Display Problems**  
« Reply #8 on: September 10, 2015, 10:36:08 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I am getting something in the 58-59 hertz range.  
Does that sound about right?  
I have been looking at other backplane designs in the 40-150 hz.

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**klunkerbus**  
Supporter



Posts: 162  
Country:

Electrical Engineer (retired early)



**Re: Sencore LC102 Display Problems**  
« Reply #9 on: September 11, 2015, 12:10:02 am »

[Say Thanks](#) [Reply](#) [Quote](#)

**Quote from: Johnny10 on September 10, 2015, 10:36:08 pm**

I am getting something in the 58-59 hertz range.  
Does that sound about right?  
I have been looking at other backplane designs in the 40-150 hz.

Hopefully someone else can chime in. The on-line manual I've been looking at doesn't have a good schematic capture - I was hoping the frequency would have been noted on it. When I was inking up schematics at Sencore (yeah, some of us started before the days of desktop computers), I always tried to include obvious info like that. I don't have a lot of experience with the glass-only type of LCDs, and as I mentioned the experience I had was long ago. I don't remember the frequency being critical though.

« Last Edit: September 11, 2015, 01:09:14 pm by klunkerbus »

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**Johnny10**  
Frequent Contributor



**Re: Sencore LC102 Display Problems**  
« Reply #10 on: September 11, 2015, 03:21:04 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I would like to thank you guys for the help!  
Hopefully someone out there can point me to a source for screen replacement. :-(



Posts: 865

Country:



I continue to look through the schematics I have available but they are not very complete as to specifics.

Is there a Service Manual available?

Report to moderator

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

## Quarlo Klobrigney

Frequent Contributor



Posts: 873

Country:

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### Re: Sencore LC102 Display Problems

« Reply #11 on: September 11, 2015, 03:37:26 pm »

Say Thanks

Reply

Quote

Ignore my PM here you go! <http://bama.edebris.com/manuals/sencore/lc102/>

#### Quote from: Johnny10 on September 11, 2015, 03:21:04 pm

I would like to thank you guys for the help!  
Hopefully someone out there can point me to a source for screen replacement. :-)

I continue to look through the schematics I have available but they are not very complete as to specifics.  
Is there a Service Manual available?

Report to moderator

**Voltage does not flow, nor does it go.**

"I do 7 things at a time, I do them very well, and then I move on."

## klunkerbus

Supporter



Posts: 162

Country:

Electrical Engineer (retired early)



### Re: Sencore LC102 Display Problems

« Reply #12 on: September 11, 2015, 04:38:36 pm »

Say Thanks

Reply

Quote

Quarlo - that's the same on-line manual I was looking at. It doesn't include any service info, and the schematic in the scanned capture is all hacked up. The pages would have to be printed and taped together to see if it is all there. As Johnny10 indicated, the LC102 schematic is lacking useful descriptors and labels.

Johnny10 - as mentioned earlier, the display on the left HAS to be a custom for Sencore. Finding a pin compatible replacement is a very long shot. Sencore no longer builds this kind of test equipment, but there's a chance they still support these older products. Try contacting them through the methods listed on their support | service and repair web page. If you contact the parts specialist directly, according to the manual the Sencore display part numbers are 23A86 for the 6-digit one on the left and 23A87:A for the 4-digit one on the right. It sure doesn't hurt to try asking them.

It wouldn't likely be clean when you're done, but worst case it should be possible to read the multiplexed display data coming from the LC102 microprocessor into a new microcontroller that regenerates the display on either a character display (like 2x20 or 4x20) or to a bit mapped display. I've seen other people doing this for older test equipment where the VFD display has faded and a replacement isn't available. In this approach, you'd basically be replacing the LC102 display board.

Report to moderator

## Johnny10

Frequent Contributor



Posts: 865

Country:



### Re: Sencore LC102 Display Problems

« Reply #13 on: September 11, 2015, 05:47:31 pm »

Say Thanks

Reply

Quote

Well you are correct, the schematic in the manual is a bear to work with.

I printed out 6 sheets and pieced and taped them together. However I see there is a Block Diagram and then also a chip diagram.

I will have to print this out and piece it together. I also downloaded PDF's for the individual IC chips. The display board has D Flip Flop, Quad Latch, Dual Timer and LCD Driver IC chips that I was able to get pin-outs for.  
The fun begins!

And I am still wondering if the screen damage is environmental, age or a DC Bias issue.

I am not familiar with these LCD driver boards and support chips but I guess I have a new project. What I have read is that DC damage is irreversible and that is a big disappointment! No matter I am going to have to find replacements.

Report to moderator

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Quarlo Klobrigney**

Frequent Contributor



Posts: 873  
Country:

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**Re: Sencore LC102 Display Problems**

« Reply #14 on: September 11, 2015, 06:23:19 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Fortunately my LC102 is not experiencing the LCD symptoms in your photos. I know the schematics are all over the place. Without opening mine, is the LCD just a flat piece of glass with leads on either side or is it a module? I would think the former. If so, it will be multiplexed and not compatible to a 4x20 type with  $\mu$ controller on board.

I could have a look inside if you need me to.

The MD4332 is the LCD Driver IC. Sure enough it is for the flat glass multiplexed LCD type driver. Have you scoped the D1, CLK, RST & T/C as well as the 5V bus for noise?

Like Elvis, Sencore has left the building. And us as well. I have several pieces of their gear. All orphaned.

« Last Edit: September 11, 2015, 06:40:23 pm by Quarlo Klobrigney »

[Report to moderator](#)

**Voltage does not flow, nor does it go.**

"I do 7 things at a time, I do them very well, and then I move on."

**klunkerbus**

Supporter



Posts: 162  
Country:

Electrical Engineer (retired early)



**Re: Sencore LC102 Display Problems**

« Reply #15 on: September 11, 2015, 08:02:14 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I want to clarify that no, you couldn't simply hook an integrated 4x20 type display onto anything currently in the LC102.

Without printing out the schematic and researching the LCD display board design, my guess is that the data from the LC102 microprocessor to the LC102 display board consists of a data bus and various strobe lines, with each strobe line used to clock the display board latches for each character, and possibly a strobe line used to latch status for all the unique labels on the display. My point with suggesting the 4x20 or another type of integrated display is that there's no technical reason those data lines couldn't be captured by another microcontroller, with that microcontroller running the custom firmware necessary to interpret what the LC102 wants displayed, and then generating the necessary interface for a new display type. Again, people have done this before on other old equipment. With trial and error, it shouldn't be hard to figure out what each of the strobe lines is being used for. It's a personal decision on whether the effort is worth it.

EDIT: Of course, if the LC102 microprocessor is already taking care of the segment-level detail for the display, or the interface to the LC102 display board is serial, converting the data to a new display would be harder, but still possible.

« Last Edit: September 11, 2015, 08:14:08 pm by klunkerbus »

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**Quarlo Klobrigney**

Frequent Contributor



Posts: 873  
Country:

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**Re: Sencore LC102 Display Problems**

« Reply #16 on: September 11, 2015, 08:22:13 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I understand now that a module is not what you said, The data is serial in daisy chained shift-register parallel out and could be easily done with an AVR in the Megaxx9 series which support direct glass LCD output and by remapping with code, and subbing another glass LCD.

There are however glass only LCD's still available on places like eBay. It's just a matter of looking at the LCD and determining a part number/series, if in fact it is defective.

If it is all done, and can't be found, I would replace the LCD with an OLED display and  $\mu$ Controller.

**Quote from: klunkerbus on September 11, 2015, 08:02:14 pm**

I want to clarify that no, you couldn't simply hook an integrated 4x20 type display onto anything currently in the LC102.

EDIT: Of course, if the LC102 microprocessor is already taking care of the segment-level detail for the display, or the interface to the LC102 display board is serial, converting the data to a new display would be harder, but still possible.

« Last Edit: September 11, 2015, 08:30:25 pm by Quarlo Klobrigney »

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**Voltage does not flow, nor does it go.**

"I do 7 things at a time, I do them very well, and then I move on."

**klunkerbus**

Supporter



Posts: 162

**Re: Sencore LC102 Display Problems**

« Reply #17 on: September 11, 2015, 09:08:37 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

The problem in finding replacement glass, assuming Sencore has in fact stopped supporting the old gear, is in the display annunciators that were very likely unique to Sencore. Before I left Sencore, I do

Country: 

Electrical Engineer (retired early)



know we were always defining custom LCDs for any new product - it was just cheaper and easier to come up with a professional-looking front panel that way, as compared to a generic numeric display complemented with some sort of backlit annunciators. I don't remember the tooling cost being that bad for the custom displays, at least not when that would have been spread across a production buy of say 500 displays.

The 6-digit display on the left includes WAIT, OPEN, SHORT, pF, uH, uA, (M-ohm), uF, mH, mA, (K-ohm), RINGS, V, %, (ohm) GOOD, and BAD. I doubt that can be found in any off-the-shelf replacement. The 4-digit display on the right at least only has VOLTS.

« Last Edit: September 11, 2015, 09:18:42 pm by klunkerbus »

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### Johnny10

Frequent Contributor



Posts: 865

Country: 

### Re: Sencore LC102 Display Problems

« Reply #18 on: September 11, 2015, 09:53:41 pm »

Say Thanks

Reply

Quote

I will work on the unit this weekend, maybe!!

Mine is open so I will take some photos.  
This morning I unscrewed the front to expose the Display Board.  
Very few IC chips and about 5 capacitors.  
Will post photos tomorrow.

Report to moderator  Logged


Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

### Quarlo Klobrigney

Frequent Contributor



Posts: 873

Country: 

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### Re: Sencore LC102 Display Problems

« Reply #19 on: September 11, 2015, 09:54:46 pm »

Say Thanks

Reply

Quote

I have lost myself in .... what was I just talking about  
oh yeah, I just looked and the unit that I have for a backup is the LC101.  
Brain fart. No wonder the designators you mentioned didn't sound right.  
Also that you worked for Sencore. Too bad they went a different direction.  
I use a different older LED Sencore as a daily driver. I was going to get to the 101 because the calibration is off so I stored it away and lost myself. What a dope. My apologies for my earning the asshat award.

EDIT: I also know now why I stored it away...I can't find a service manual for it. I am slipping.

« Last Edit: September 11, 2015, 10:02:12 pm by Quarlo Klobrigney »

Report to moderator  Logged

**Voltage does not flow, nor does it go.**


"I do 7 things at a time, I do them very well, and then I move on."

### klunkerbus

Supporter



Posts: 162

Country: 

Electrical Engineer (retired early)



### Re: Sencore LC102 Display Problems

« Reply #20 on: September 12, 2015, 01:30:54 am »

Say Thanks

Reply

Quote

Johnny10, good luck on whatever you hope to accomplish with the LC102 this weekend.

Quarlo, I can't speak for Johnny10, but no apologies needed on my account. I think our dialogue helped explain to Johnny10 what he's working with.


Report to moderator  Logged

### Johnny10

Frequent Contributor



Posts: 865

Country: 

### Re: Sencore LC102 Display Problems

« Reply #21 on: September 19, 2015, 08:00:20 pm »

Say Thanks

Reply

Quote

Waiting for a new LCD Panel to test the display board. Decided to add some pics while waiting they should be here Monday.

Tested voltage and signal at the LCD Driver chip.

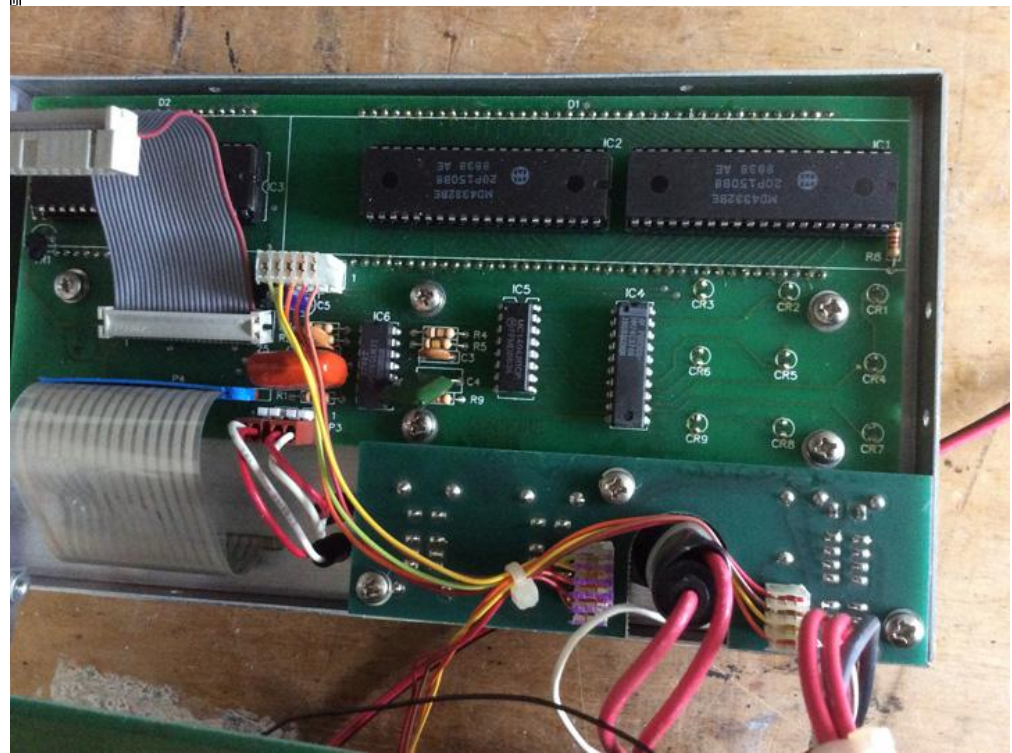
This is Signal going to Data Pin on LCD.

One concern the duty cycle for LCD states should be exactly 50%. However I am getting about 45% on calculation.

Still wondering what happened to display LCD crystals.



Sencore Front Face.JPG (185 kB, 720x538 - viewed 361 times.)

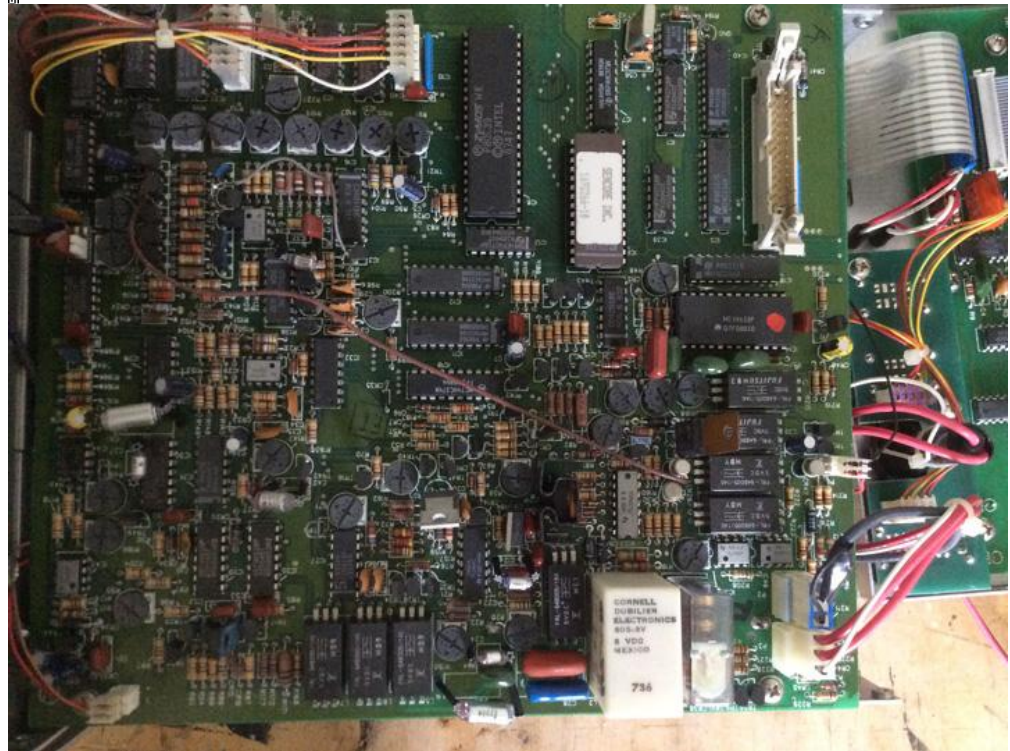


Sencore LC102 Display Board.JPG (197.63 kB, 720x538 - viewed 434 times.)





Sencore LC102 Power Supply Board.JPG (216.15 kB, 720x538 - viewed 534 times.)



Sencore Main Board.JPG (231.4 kB, 720x538 - viewed 455 times.)



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 **Johnny10**  
Frequent Contributor

 **Re: Sencore LC102 Display Problems**  
« Reply #23 on: September 19, 2015, 10:56:52 pm » [Say Thanks](#) [Reply](#) [Quote](#)




Posts: 865  
Country: 

I have been following the datasheet for another driver chip based on an earlier attempt by someone with a broken LCD but the information on his LCD driver was different. Just started reading about this chip and now I need to look at completely different pins. The true/complimentary pin has me a bit confused. I purchased a few 4 digit LCD crystal displays just to experiment with. For custom characters I am thinking a separate chip decoding various characters for uF, pF, MF and the Good/Bad, etc.


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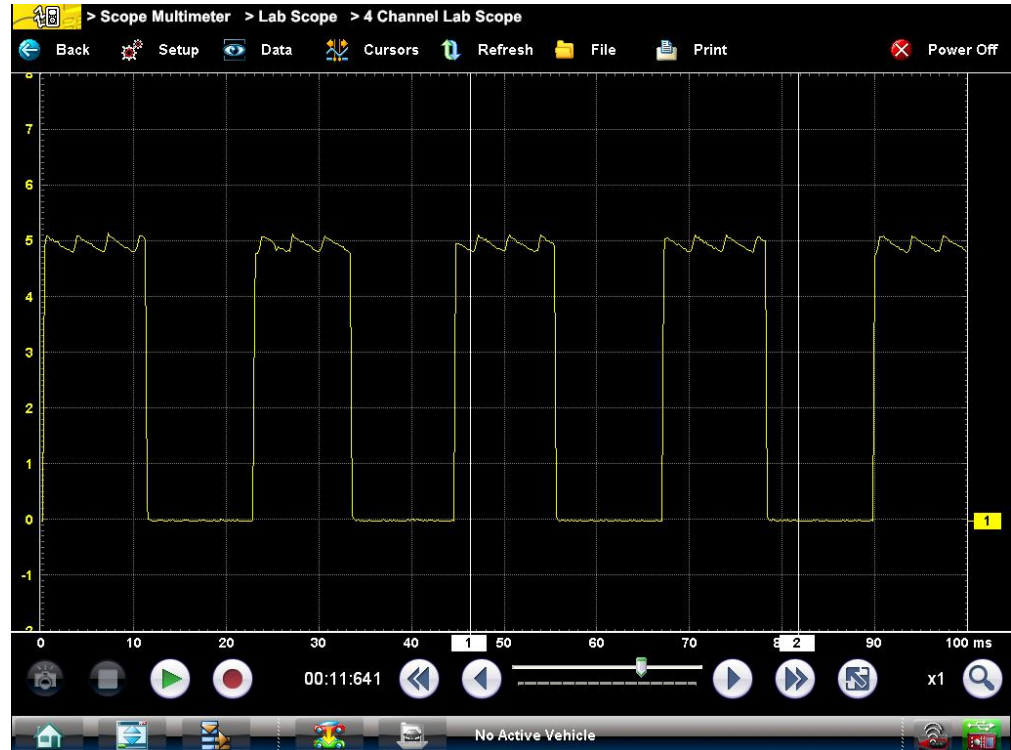
 **Johnny10**  
Frequent Contributor

 **Re: Sencore LC102 Display Problems**  
« Reply #24 on: September 20, 2015, 05:42:17 pm » [Say Thanks](#) [Reply](#) [Quote](#)

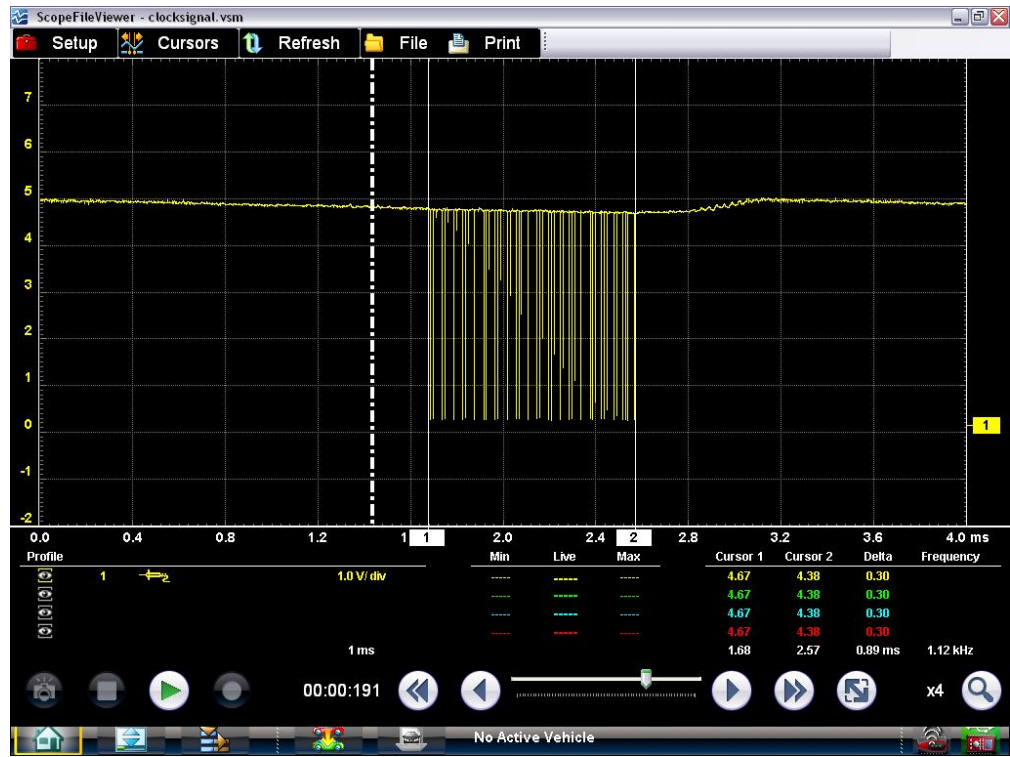


Posts: 865  
Country: 

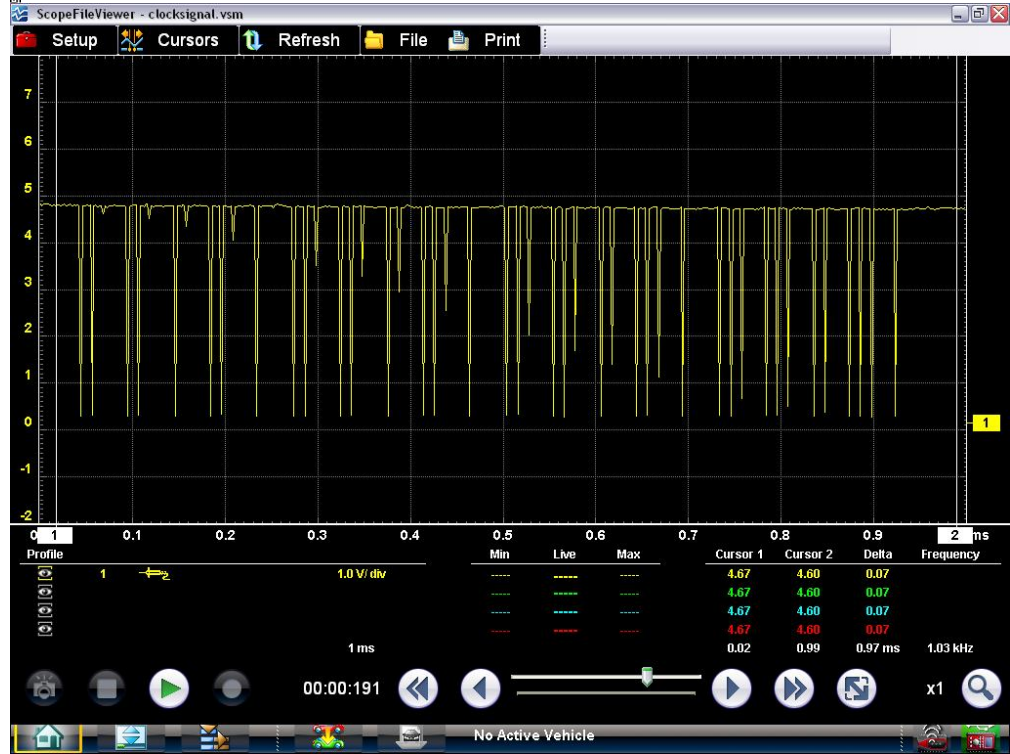
After finding the correct Pin-out for the LCD Driver Chip I am adding screen shots of the T/C Pin and CIK Pin.



T-C Pin.jpg (106.65 kB, 1024x768 - viewed 248 times.)



CLK Pin.jpg (119.46 kB, 1024x768 - viewed 226 times.)



CLK Pin 1MS Division.jpg (129.24 kB, 1024x768 - viewed 265 times.)

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**Johnny10**  
Frequent Contributor

**Re: Sencore LC102 Display Problems**  
« Reply #25 on: September 21, 2015, 09:34:55 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Sencore emailed me back today...

No LCD screens, No detailed schematics, no calibration Procedures  
They do have power Supply for sale.



Posts: 865  
Country:

« Last Edit: January 14, 2016, 06:20:34 am by Johnny10 »

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**  
Frequent Contributor

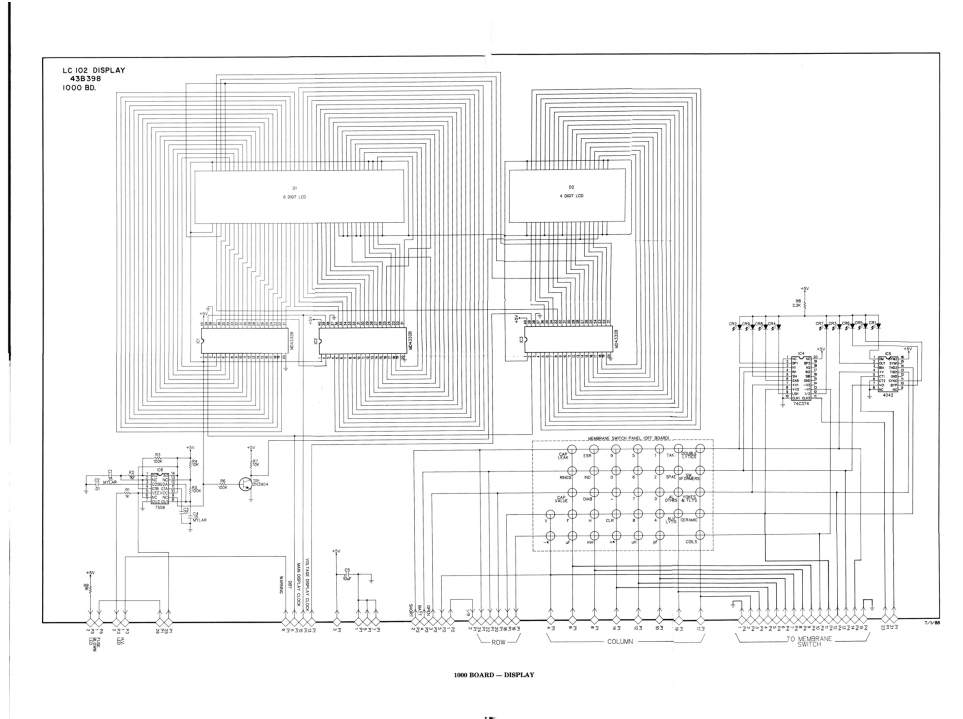
**Re: Sencore LC102 Display Problems**  
« Reply #26 on: September 27, 2015, 06:17:58 pm »

[Say Thanks](#) [Reply](#) [Quote](#)



Posts: 865  
Country:

I have been putting together schematic image from 8 different shots



Sencore Display Board Schematic.jpg (892.12 kB, 2400x1798 - viewed 272 times.)

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

The following users thanked this post: coromonadalix

**Sencoretech**  
Contributor

**Re: Sencore LC102 Display Problems**  
« Reply #27 on: October 20, 2015, 07:26:56 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Posts: 18  
Country:

I replied on your other thread. I've worked on these units for years and I've never seen one quite like this but I'm almost certain it's the LCDs themselves. Sencore ran out of these LCDs quite awhile ago as well. If you can find a replacement front board from a LC102 or possibly a LC77 you should be good to go. If you get a LC77 you'd have to move the screens from it to your old board though.

Sencore ran out of the schematic packet years and years ago and it was never scanned in. If anyone needs help on these units I'm happy to lend my services.

[Report to moderator](#) Logged

**Johnny10**  
Frequent Contributor

**Re: Sencore LC102 Display Problems**  
« Reply #28 on: October 21, 2015, 01:04:53 pm »

[Say Thanks](#) [Reply](#) [Quote](#)



Posts: 865  
Country:

I have been working on other projects but the Sencore is still on my workbench. I believe you are correct something in the LCDs the oscillator seems to be working fine at about 45Hz With what did I say? 47% duty cycle. Yesterday however I shorted something on the unit as I was moving around the disconnected front panel looking to hook a probe to the display driver chip. Yikes! Now no power going anywhere.



I missed a unit on eBay for a ridiculous 99 dollars which would have saved about 400 dollars in time and parts.

Ahh for the love of a hobby!

As you can see I am piecing together schematics for the unit from a scanned group of pages. No calibration instructions yet but I am still looking.

The measurements for a 1000mf Nichicon 400volt electrolytic reads 1304

For ceramic disk a 68pf reads 71-72.

Caps just out of the box.

Thanks for the help I will be working on the LCD as soon as I figure out what I shorted.

[Report to moderator](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**

Frequent Contributor



Posts: 865

Country:



**Re: Sencore LC102 Display Problems**

« Reply #29 on: October 21, 2015, 02:44:00 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Just noticed you gave me cal data.

Thank you very much.

I am wondering if I should change caps on this unit while I have it apart? What would you suggest?

[Report to moderator](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Sencoretech**

Contributor

Posts: 18

Country:



**Re: Sencore LC102 Display Problems**

« Reply #30 on: October 21, 2015, 05:41:45 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

**Quote from: Johnny10 on October 21, 2015, 02:44:00 pm**

Just noticed you gave me cal data.  
Thank you very much.

I am wondering if I should change caps on this unit while I have it apart? What would you suggest?

The only caps I've seen fail on these are the old poly caps on the top board. Even those were few and far between. The only ones I'd worry about are the filter caps on the power supply board(bottom board) and I wouldn't change them unless the supplies start to look dirty.

[Report to moderator](#)

**Sencoretech**

Contributor

Posts: 18

Country:



**Re: Sencore LC102 Display Problems**

« Reply #31 on: October 21, 2015, 05:48:26 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

**Quote from: Johnny10 on October 21, 2015, 01:04:53 pm**

I have been working on other projects but the Sencore is still on my workbench. I believe you are correct something in the LCDs the oscillator seems to be working fine at about 45Hz With what did I say? 47% duty cycle. Yesterday however I shorted something on the unit as I was moving around the disconnected front panel looking to hook a probe to the display driver chip. Yikes! Now no power going anywhere.



I missed a unit on eBay for a ridiculous 99 dollars which would have saved about 400 dollars in time and parts. Ahh for the love of a hobby!

As you can see I am piecing together schematics for the unit from a scanned group of pages. No calibration instructions yet but I am still looking. The measurements for a 1000mf Nichicon 400volt electrolytic reads 1304 For ceramic disk a 68pf reads 71-72. Caps just out of the box. Thanks for the help I will be working on the LCD as soon as I figure out what I shorted.

Bummer, hopefully you can find what is shorting out and hopefully it's not a driver chip those would be hard to find. I'll do some scrounging around here and see if I can find any used LCDs, no promises but we probably have a few meters laying around that had other parts cannibalized

Report to moderator Logged

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:



**Re: Sencore LC102 Display Problems**  
« Reply #32 on: October 21, 2015, 10:53:19 pm »

Say Thanks Reply Quote

Didn't someone just suggest filter caps on the power board?  
With a list of cap #'s

And then it disappeared or was I reading another thread?

Hey! All the information I can use ...

Report to moderator Logged

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**crispy\_tofu**  
Super Contributor

Posts: 1124  
Country:



**Re: Sencore LC102 Display Problems**  
« Reply #33 on: October 22, 2015, 03:11:14 am »

Say Thanks Reply Quote

**Quote from: Johnny10 on October 21, 2015, 10:53:19 pm**

Didn't someone just suggest filter caps on the power board?  
With a list of cap #'s  
And then it disappeared or was I reading another thread?  
Hey! All the information I can use ...

Hmmm... I do remember that too. We're both dreaming?! 😬  
Maybe they were wrong or it was a different thread. 😊

Report to moderator Logged

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:



**Re: Sencore LC102 Display Problems**  
« Reply #34 on: October 22, 2015, 01:26:44 pm »

Say Thanks Reply Quote

I appreciate any scrounging around you can do.  
Will get working on finding my short or actually open!

Report to moderator Logged

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Sencoretech**  
Contributor

Posts: 18  
Country:



**Re: Sencore LC102 Display Problems**  
« Reply #35 on: October 25, 2015, 03:15:02 am »

Say Thanks Reply Quote

**Quote from: Johnny10 on October 22, 2015, 01:26:44 pm**

I appreciate any scrounging around you can do.  
Will get working on finding my short or actually open!

I have display out of an LC77 that I think will work in a LC102. I'm going to double check the schematic on Monday and let you know

Report to moderator Logged

**rf+tech**  
Frequent Contributor



Posts: 318  
Country:

Real radios are olive drab



**Re: Sencore LC102 Display Problems**  
« Reply #36 on: October 25, 2015, 07:11:00 pm »

Say Thanks Reply Quote

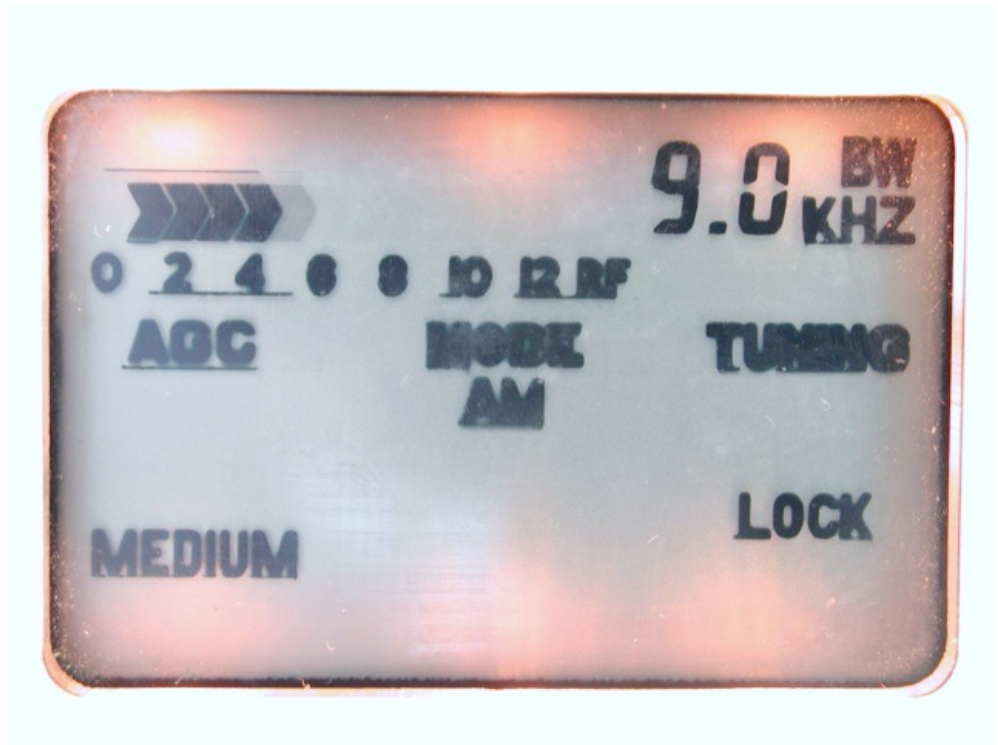
Johnny10,

The problem with your LC102 display looks similar to a problem I encountered about five years ago with a Racal RA6790/GM receiver. To my eye, the displays on my receiver appeared to be over-driven with excessive contrast, as in the first two photos attached.

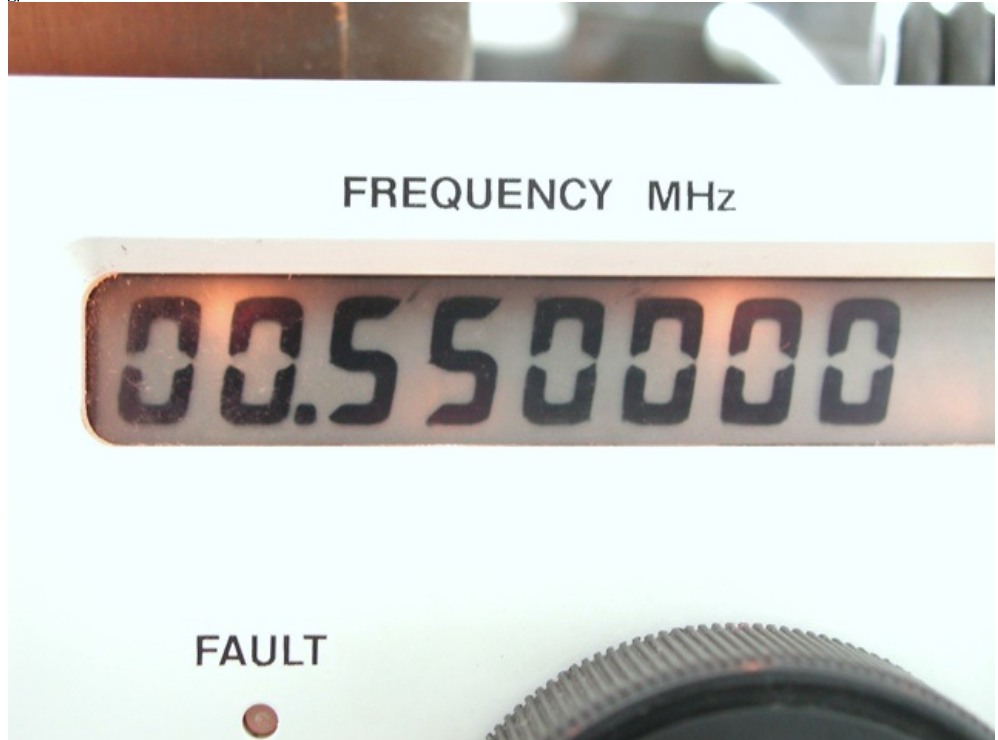
The second two photos show the improvement obtained by raising the LCD backplane frequency from 100 Hz to about 1.5 kHz. This was determined experimentally by altering the time constant of the backplane RC oscillator in steps and judging the improvement.

Why this works is unclear, but my best guess has to do with an excessive number of operational hours. The segments may have been flexed to the point where their "hinge" has weakened and now they flip too easily. Increasing the backplane frequency to a point where the segments are less responsive makes the display look near normal. One thing I did not think to check at the time was the duty cycle of the backplane drive, prior to altering the frequency.

If anyone has some insider info, or a better theory, I would certainly like to know more.

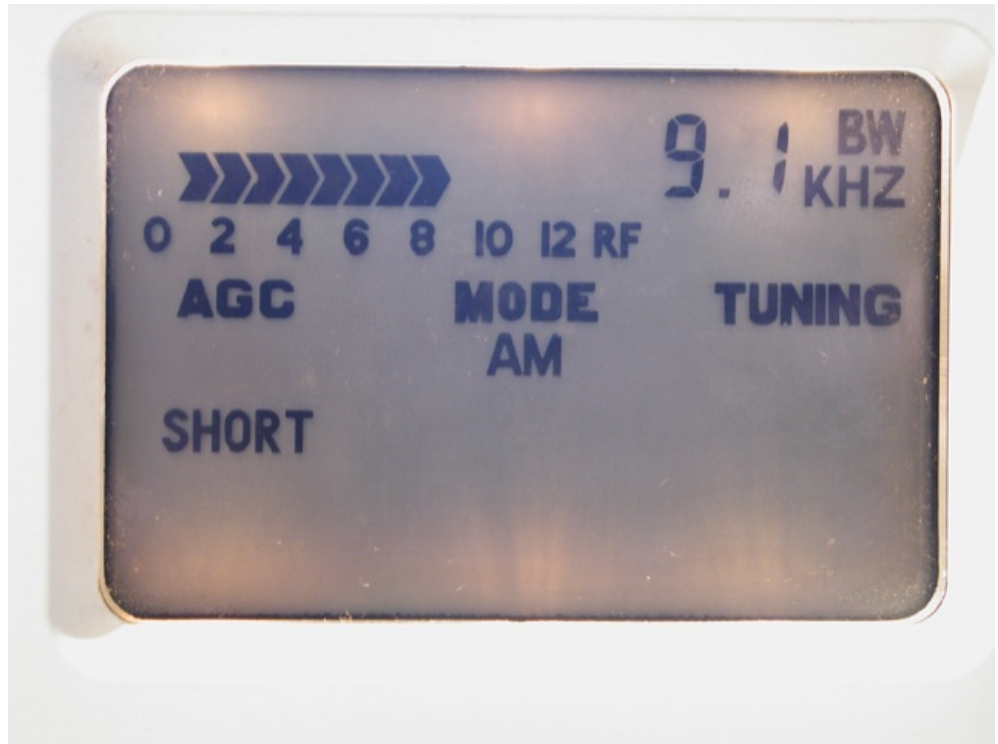


6790-lcd-1.jpg (64.8 kB, 640x480 - viewed 222 times.)



6790-lcd-2.jpg (48.95 kB, 640x480 - viewed 175 times.)





6790-lcd-3.jpg (60.41 kB, 640x480 - viewed 191 times.)



6790-lcd-4.jpg (52.83 kB, 640x480 - viewed 173 times.)

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RT-1133 AN/PRC-70 \* RT-794 AN/PRC-74 \* RT-841 AN/PRC-77 \* RT-524 AN/VRC-12 \* RT-834 AN/GRC-106 \* RT-F100

**Johnny10**  
Frequent Contributor



Posts: 865

**Re: Sencore LC102 Display Problems**  
« Reply #37 on: October 26, 2015, 02:49:40 am »

[Say Thanks](#) [Reply](#) [Quote](#)

Now that is very interesting!  
That does look like my display and that is giving me the idea to check on the schematic the backplane frequency by design and the current frequency.  
They may have changed also.  
I believe it was 45 hz the research I have done says the duty cycle must be 50% to eliminate DC

Country: 





riding on the AC.  
My device is accurate to the specs I calculated from the resistors at the PWM.


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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**crispy\_tofu**  
Super Contributor



Posts: 1124  
Country: 




 **Re: Sencore LC102 Display Problems**  
« **Reply #38 on:** October 26, 2015, 02:54:01 am »


[Say Thanks](#)   [Reply](#)   [Quote](#)


Fantastic!! 

[Report to moderator](#)  [Logged](#)

**Johnny10**  
Frequent Contributor





Posts: 865  
Country: 



 **Re: Sencore LC102 Display Problems**  
« **Reply #39 on:** October 28, 2015, 03:17:19 pm »

[Say Thanks](#)   [Reply](#)   [Quote](#)

Sencoretech, any luck with LC 77 LCD matchup?  
My Power supply is messed up. I get 12V power to the TR15 input transistor than no turn of gate to continue for creation of 5 volt and 18 volt.  
Printing out and pasting together schematic now.

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Sencoretech**  
Contributor

Posts: 18  
Country: 



 **Re: Sencore LC102 Display Problems**  
« **Reply #40 on:** October 29, 2015, 01:15:30 pm »

[Say Thanks](#)   [Reply](#)   [Quote](#)

**Quote from: Johnny10 on October 28, 2015, 03:17:19 pm**

Sencoretech, any luck with LC 77 LCD matchup?  
My Power supply is messed up. I get 12V power to the TR15 input transistor than no turn of gate to continue for creation of 5 volt and 18 volt.  
Printing out and pasting together schematic now.


Yes, the LC77 front should work on the LC102. The LC77 is missing the stop testing LED so you'd have an extra plug that wouldn't connect. One thing to note is about 1/2 way through making LC102s we had to change display driver chips and thus we had to rev the firmware. So if you have a "newer" unit you'd out of luck with a LC77 display.


As far as power to the display you should have 5 volts coming in on plug 1 pin 3 (display board side). Then another 5V on plug 5 pin 2, but that's just for the stop testing light I believe. That should be it for voltages.


« Last Edit: October 29, 2015, 01:21:31 pm by Sencoretech »


[Report to moderator](#)  [Logged](#)

**Johnny10**  
Frequent Contributor





Posts: 865  
Country: 



 **Re: Sencore LC102 Display Problems**  
« **Reply #41 on:** October 29, 2015, 01:35:57 pm »


[Say Thanks](#)   [Reply](#)   [Quote](#)


Looks like I have the MD4332BE Display Driver chips

[Report to moderator](#)  [Logged](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**  
Frequent Contributor






 **Re: Sencore LC102 Display Problems**  
« **Reply #42 on:** October 29, 2015, 01:40:38 pm »

[Say Thanks](#)   [Reply](#)   [Quote](#)


I am not sure about serial numbers.  
Unit has stickers saying Run 12  
220 P102-3

[Report to moderator](#)  [Logged](#)

Posts: 865  
Country: 

 **Sencoretech**

Contributor

Posts: 18  
Country: 

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

 **Re: Sencore LC102 Display Problems**  
« Reply #43 on: October 29, 2015, 03:25:59 pm »

Say Thanks Reply Quote

**Quote from: Johnny10 on October 29, 2015, 01:40:38 pm**

I am not sure about serial numbers.  
Unit has stickers saying Run 12  
220 P102-3

Run 12 is the second production run, so yes you have an older LC102 with the same driver chips. I believe I have a working LC102 that I can try this display board in. I'd rather not sell you this w/o being 100% sure it'd work. Let me give it a try and I'll get back to you.

Report to moderator  Logged

 **Sencoretech**

Contributor

Posts: 18  
Country: 

 **Re: Sencore LC102 Display Problems**  
« Reply #44 on: October 30, 2015, 03:39:10 pm »

Say Thanks Reply Quote

**Quote from: Johnny10 on October 29, 2015, 01:35:57 pm**

Looks like I have the MD4332BE Display Driver chips


Johnny10,  
I couldn't find a working LC102 to test the board in. I do believe it'll work but I can't be 100% sure. The driver chips and LCDs match the LC102 and if need you could transfer them over to your display board. I did test it in a LC77 and the board does function.

Report to moderator  Logged

 **Johnny10**

Frequent Contributor



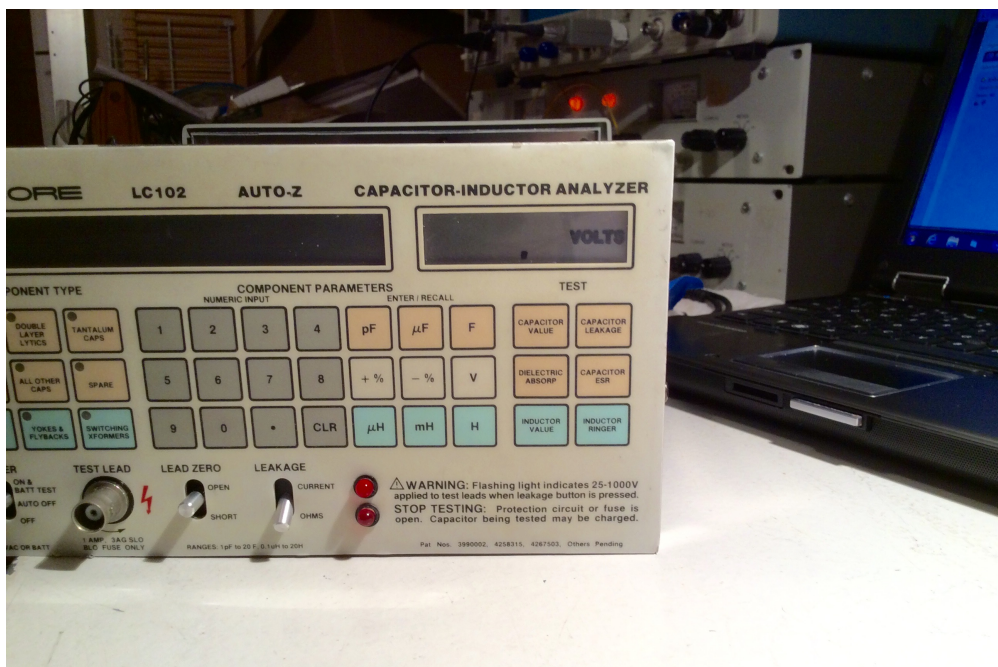
Posts: 865  
Country: 

 **Re: Sencore LC102 Display Problems**  
« Reply #45 on: December 19, 2015, 04:15:46 am »

Say Thanks Reply Quote

Somewhere along the way I shorted out the TR15 Transistor MTP3055 after replacing that I now have a display only showing Volts image. There is data on Pin 1 of the 4332 driver but nothing on Pin 2 from the MCU. If I cool the area around the processor and some latch chips. I get a jumbled display.

Volts.image



FullSizeRender.jpg (760.32 kB, 2592x1720 - viewed 205 times.)

« Last Edit: December 22, 2015, 07:55:28 pm by Johnny10 »

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**  
Frequent Contributor

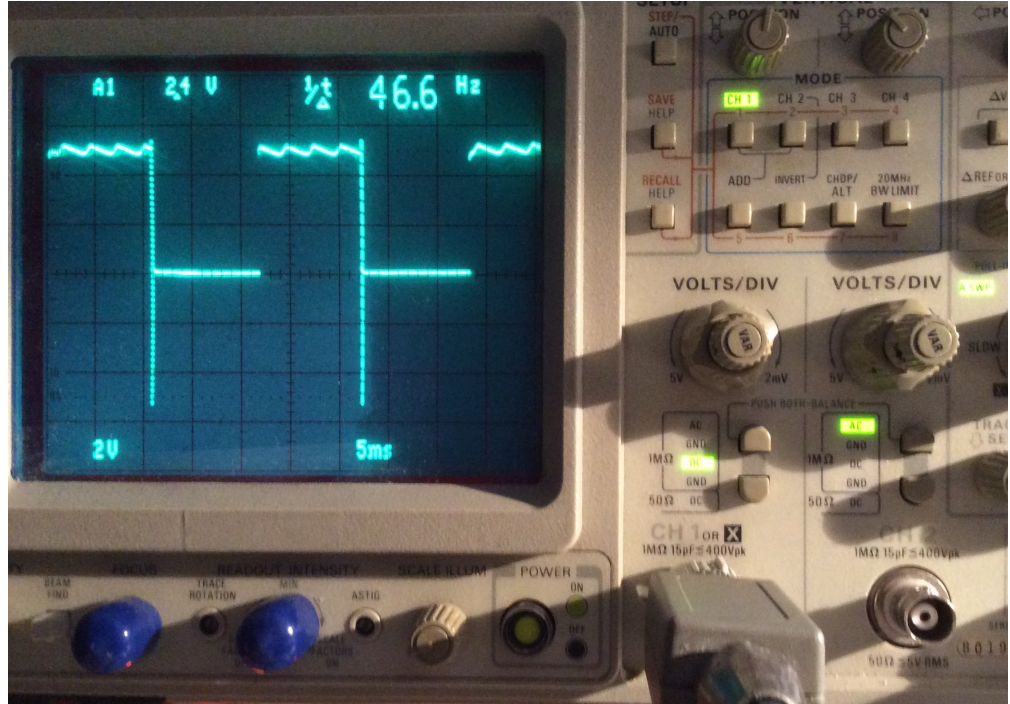


Posts: 865  
Country:

**Re: Sencore LC102 Display Problems**  
« Reply #46 on: December 19, 2015, 09:18:18 pm »

Say Thanks Reply Quote

Pin 1 of 4332 display driver



FullSizeRender.jpg (662.69 kB, 2251x1582 - viewed 132 times.)

« Last Edit: December 22, 2015, 07:42:19 pm by Johnny10 »

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:

**Re: Sencore LC102 Display Problems**  
« Reply #47 on: December 22, 2015, 07:58:05 pm »

Say Thanks Reply Quote

Jumbled Display



Jumbled display.jpg (663.81 kB, 2492x1608 - viewed 203 times.)

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Re: Sencore LC102 Display Problems**

« Reply #48 on: December 30, 2015, 05:17:47 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I ordered a new 80C39 MCU chip just waiting for it to arrive.

Seems there was a voltage and frequency from the 7556 timing chip going to display driver but only a .380 volt signal on the Data pin coming from I think pin 15 on the ribbon.

[Report to moderator](#) Logged

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Re: Sencore LC102 Display Problems**

« Reply #49 on: January 13, 2016, 11:18:20 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

OK, New micro-controller came in and guess what?

No work!

Well I should have known 11 mhz version and this chip has 6mhz clock.

Not from same manufacturer original is intel my replacement chip is Phillips.

Not sure on date code DSD8801V5 YS

I did question the guys at Micro-controller EEV BLOG FORUM they thought would not be a problem.

Will say when I asked a couple of months ago a kind forum member said so many improvements and added instructions it would be a difficult match.

What maybe should have tipped me off is after I ordered chip I did some research and it said "added instructions".

But too late.

Well nonetheless I got the unit working again I now have full display, I can enter data from front panel, all test point voltages are match and I lowered ripple from 100mV to about 9mV... one more problem left.

When I try and zero leads. I always get a short on the open test.

Which also causes Capacitor Value test to display "short"

Anyone know how this unit tests for the short condition?

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:



**Johnny10**  
Frequent Contributor



Posts: 865  
Country:



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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Seekonk**

Super Contributor



Posts: 1878

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #50 on:** January 14, 2016, 08:27:11 am »

[Say Thanks](#) [Reply](#) [Quote](#)

This has been an interesting thread. I assume your display is back to the way it was, still blooming. I will have to try that frequency trick some time. Buying old equipment with LCD displays always scares me.

Not to hijack the thread, but I have a LC101 with the plastic bezel on the front missing. This now seems unavailable. Was there another product they used this same bezel I might find on ebay cheap?

[Report to moderator](#) [Logged](#)

**Johnny10**

Frequent Contributor



Posts: 865

Country:



**Re: Sencore LC102 Display Problems**

« **Reply #51 on:** January 14, 2016, 02:55:56 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I was thinking how to implement the frequency change last night. Rereading the comment on that and searching out the oscillator data. Signal comes from the 7556 chip on the display board. The 7556 IC contains two 555 circuits, one for the backplane oscillator and one for flashing the LED's. The formulas are the same as for the 555 timer IC.  $Astable\ mode\ 1.44 / ((R1 + R2 + R2)(C))$ . Calculates to 45Hz 52.4% duty cycle. I measure 46.4Hz 49% duty cycle.

Display is still blooming but I have found that lowering the current or the voltage also cleans up the blooming. Problem is the circuit shuts down with either lower current or voltage as soon as a test is performed.

I purchased a display board from another member and have yet to install it in my unit until I am sure everything is working properly.

[Report to moderator](#) [Logged](#)

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**rf+tech**

Frequent Contributor



Posts: 318

Country:

Real radios are olive drab



**Re: Sencore LC102 Display Problems**

« **Reply #52 on:** January 14, 2016, 07:01:56 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

Johhny10,

If you have a few minutes to try this - temporarily change the timing capacitor to 1/10 the existing value. This should result in the backplane running about 460 Hz. If this looks promising, then try decreasing C again by a factor of five.

I've yet to come across another LCD with this blooming problem to try this on. I would appreciate knowing how your display responds.

Very interesting how your display responds to lowered current or voltage. Would you mind sharing the details as to how you did this?

Thanks,

RF+ Tech

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RT-1133 AN/PRC-70 \* RT-794 AN/PRC-74 \* RT-841 AN/PRC-77 \* RT-524 AN/VRC-12 \* RT-834 AN/GRC-106 \* RT-F100

**Johnny10**

Frequent Contributor



**Re: Sencore LC102 Display Problems**

« **Reply #53 on:** January 14, 2016, 07:21:12 pm »

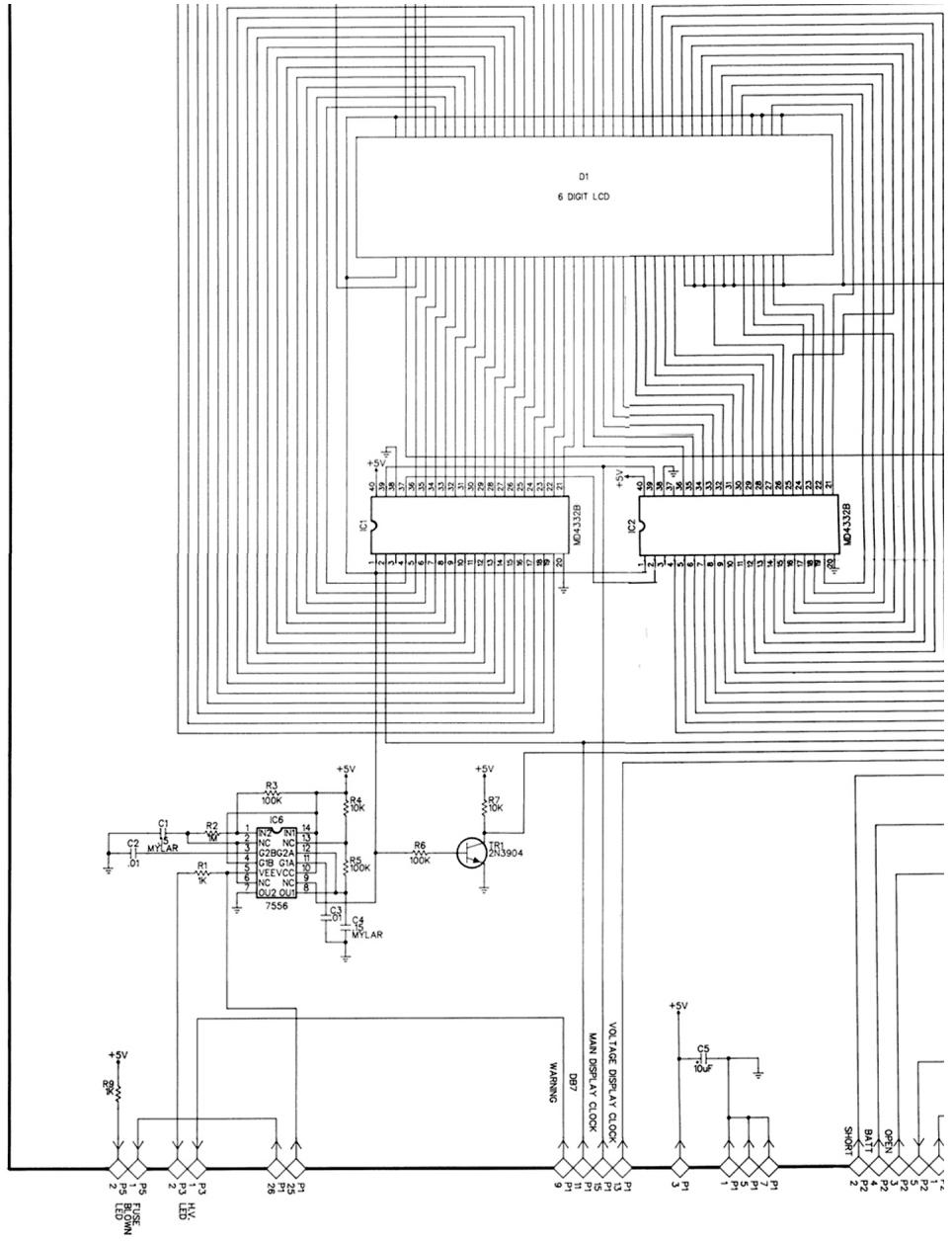
[Say Thanks](#) [Reply](#) [Quote](#)



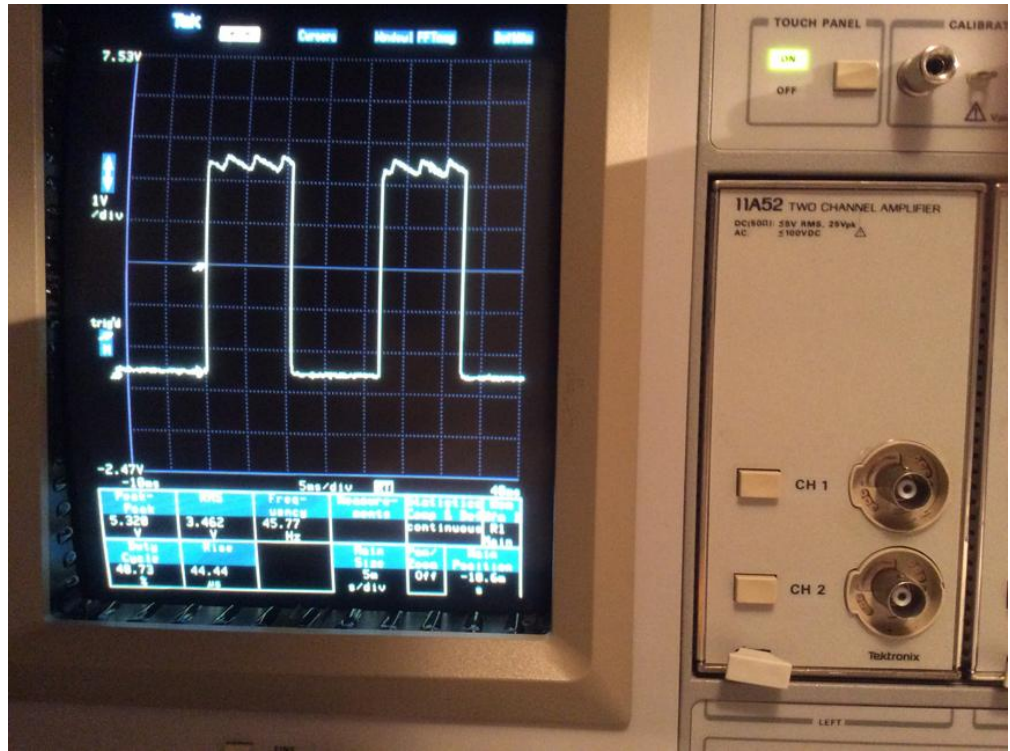
Posts: 865  
Country:

Glad you responded! rf-tech  
I haven't forgotten your message.

I have added an image of the circuit controlling backplane oscillator.  
The right side controls timing with the 10K, 100K resistors and .15uF cap.



Sencore Display Reduced.jpg (610.16 kB, 1500x1967 - viewed 169 times.)



Backplane Oscillator.jpg (325.03 kB, 864x645 - viewed 155 times.)

« Last Edit: January 15, 2016, 12:59:38 am by Johnny10 »

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Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:

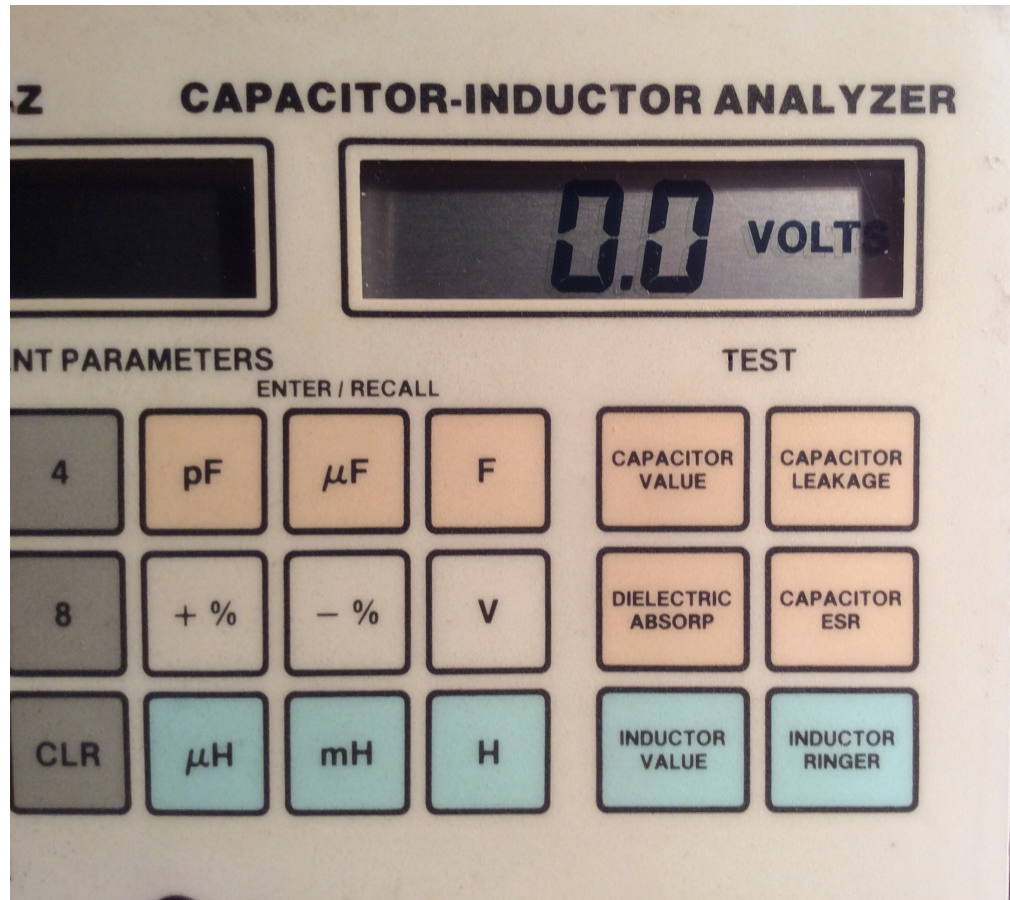
**Re: Sencore LC102 Display Problems**

« Reply #54 on: January 15, 2016, 05:52:05 am »

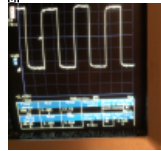
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I changed the cap C4 to .01uF.  
Making for 709 frequency, sort of the middle of your change.  
Good results





2).jpg (674.03 kB, 2156x1936 - viewed 235 times.)



1).jpg (733.4 kB, 1930x1835 - viewed 182 times.)

« Last Edit: January 15, 2016, 05:53:40 am by Johnny10 »

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**Johnny10**  
Frequent Contributor



Posts: 865

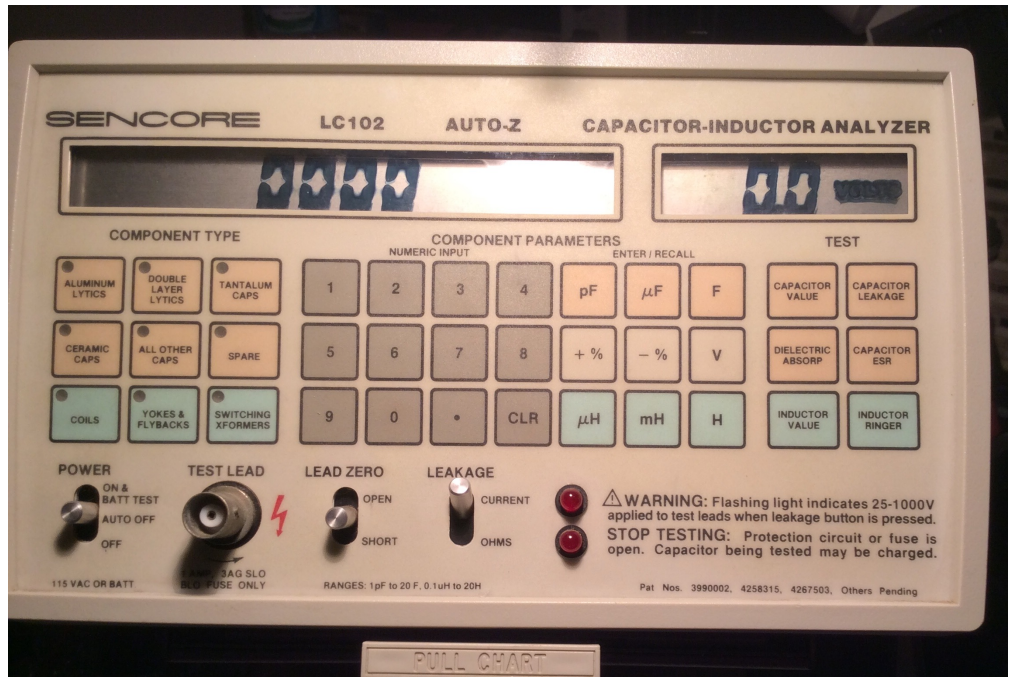
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**Re: Sencore LC102 Display Problems**  
« Reply #55 on: January 15, 2016, 06:01:20 am »

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Remember before image?



Before Photo.jpg (679.55 kB, 2290x1542 - viewed 213 times.)

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**glicos**  
Regular Contributor

Posts: 66

**Re: Sencore LC102 Display Problems**  
« Reply #56 on: January 15, 2016, 06:10:11 am »

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Excellent thread!!!

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**rf+tech**  
Frequent Contributor



Posts: 318  
Country:

Real radios are olive drab

**Re: Sencore LC102 Display Problems**  
« Reply #57 on: January 16, 2016, 03:41:55 am »

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Most Excellent, Johnny10!

This just made my day, made me laugh and smile. Thanks for posting your results!

Anybody have some theories about why raising the backplane frequency works to correct the blooming, or what causes the blooming?

RF+ Tech

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RT-1133 AN/PRC-70 \* RT-794 AN/PRC-74 \* RT-841 AN/PRC-77 \* RT-524 AN/VRC-12 \* RT-834 AN/GRC-106 \* RT-F100

**Johnny10**  
Frequent Contributor



Posts: 865  
Country:

**Re: Sencore LC102 Display Problems**  
« Reply #58 on: January 18, 2016, 09:59:42 pm »

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RF+Tech Thanks for the help

I did put a note in to a fellow that was making his own LCD screens to see if he understood the problem of frequency.

I guess I am going to go back in there and change the capacitor again but I have been debating on an adjustable trimmer cap?  
1nF - 10nF or similar.

Now I have another problem with LC102 and that is I get a short every time I try and zero out the probe.

This didn't happen before the unit shorted out. I cleaned the connectors but it keeps showing a short

while holding the "open" switch.  
Which keeps the capacitor value function from working.

I am also wondering if I should end this thread with a " fixed "notation and start a new thread on the circuits used to zero probes?

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 **glicos**

Regular Contributor



Posts: 66



 **Re: Sencore LC102 Display Problems**

« **Reply #59 on:** January 19, 2016, 01:26:26 am »

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**Quote from: Johnny10 on January 18, 2016, 09:59:42 pm**

I am also wondering if I should end this thread with a " fixed "notation and start a new thread on the circuits used to zero probes?

Better be unless "zeroing probes" problem is caused by your recent modification on the LCD

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 **rf+tech**

Frequent Contributor



Posts: 318

Country: 

Real radios are olive drab



 **Re: Sencore LC102 Display Problems**

« **Reply #60 on:** January 19, 2016, 04:46:32 pm »

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glicos,

Please carefully review this thread and do note that the "probe zeroing" problem was reported by Johnny10 \*after\* replacing the microprocessor and \*before\* changing the backplane timing capacitor.

Additionally, referencing the schematic, one will observe that there is no connection between the backplane oscillator and the probe zeroing circuitry. Uninformed speculation provides no benefit. My apologies if I sound a bit strong.

Johnny10,

Yes I think it may be better to start another thread, with a title that reflects this additional problem.

RF+ Tech

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 **Johnny10**

Frequent Contributor



Posts: 865

Country: 



 **Re: Sencore LC102 Display Problems**

« **Reply #61 on:** January 19, 2016, 07:24:26 pm »

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RF+TECH That was quite a fix !

I changed the cap again to a .0076 that I found a my local surplus shop.  
Not much of a change that I could see visually. It changed the frequency to 912 Hz.  
Also I had a bit of a problem keeping waveform steady on the oscopo. All for another day.

To finalize this repair I will order a variable cap and make just a few more tests.

This has certainly been an adventure I never imagined and neither did most, that this display was salvageable.

Your post was always in the back of my mind as an interesting solution even though I purchased a replacement screen

I felt it was a curiosity that had to be followed.

Thanks again!

I guess this is what makes for the fun!!

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**rf+tech**

Frequent Contributor



Posts: 318

Country:

Real radios are olive drab



**Re: Sencore LC102 Display Problems**

« Reply #62 on: January 20, 2016, 01:12:47 am »

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Johnny10,

I've posted this additional information to this thread for the benefit of others as it adds a degree of insight and credibility.

This quote from the Racal RA6790/GM receiver technical manual, page 4-43:

**Quote**

LCD displays operate from low frequency square wave pulse trains. The contrast of the display being a function of the frequency.

put me onto the path of discovering the fix, back in February 2010. Since this receiver didn't have a "contrast adjustment", like you, I felt it was a challenge to be followed. Not to mention the near unobtainium of replacement displays.

I will also mention that raising the backplane frequency higher still, will result in the segments looking faded. The new optimal frequency is not sharply defined, just whatever looks good to the eye. Installing a trimmer isn't necessary as one will find that the range of what looks good is very broad.

Call it fixed and have a beer on me. 🍺

RF+ Tech

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**Johnny10**

Frequent Contributor



Posts: 865

Country:



**Re: Sencore LC102 Display Problems**

« Reply #63 on: January 20, 2016, 08:01:30 am »

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