

ABSTRACT

Still Mostly A work in progress

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This document is meant to catalogue the problems/ solutions I have encountered with Compaq portable III gas plasma displays. This document also catalogues a general idea of how these screens work to better understand how to repair them.

SOURCES

Generally in all of the documents in school that I have written this goes at the very bottom, but these sources include videos that are very useful to watch, so I'm putting them at the top. Also I can't take all of the credit, I wouldn't have known where to look if it weren't for these videos.

Really useful video that explains what chips you need to replace for your screen:

https://youtu.be/6W3H5wOy5sY?si=f2_sc2NSUQTlg_oZ

First video I found that does the repair, but doesn't go into much detail, still helpful:

<https://youtu.be/c71P5KAsxpM?si=uVOyKfqRs78nUrE2>

To navigate this document click on the icon on the left with the 3 dots and 3 lines.(Desktop)

On mobile the tabs are navigable at the bottom of the screen.

When you hover over it it'll say: "show tabs" click on it.

Separating this into tabs will allow for better organization/navigation, and stop endless scrolling.

Part 1, screens covered under this guide

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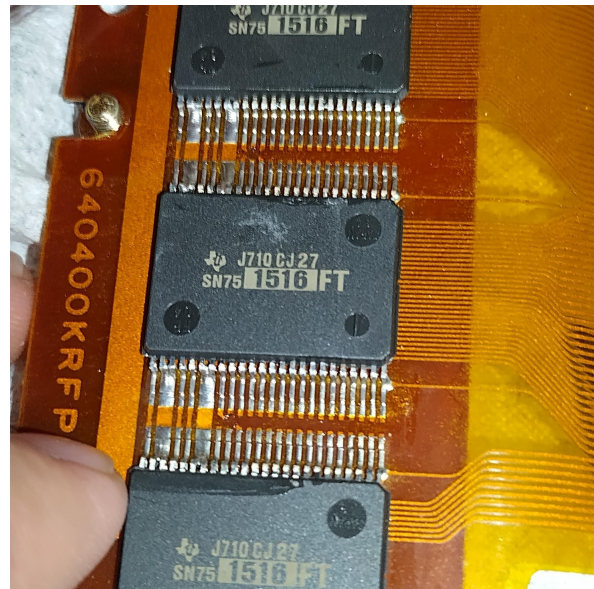
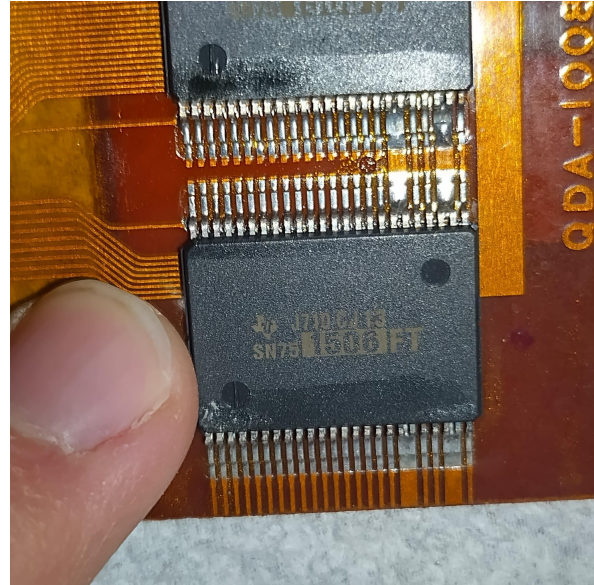
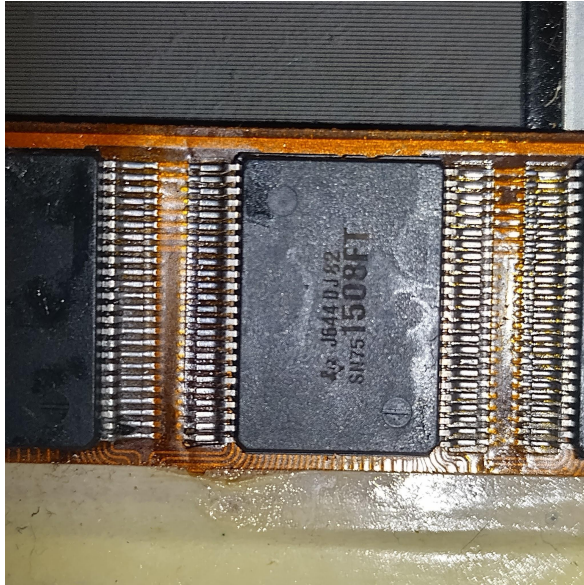
The screens covered in this guide use the ICs below, and this guide is mainly focused on replacing them. The ICs are as follows:

SN75 1508FT (BOTTOM OF SCREEN)

SN75 1518FT (TOP OF SCREEN)

SN75 1506FT (Looking from the back- LEFT SIDE OF SCREEN)

SN75 1516FT (Looking from the back- RIGHT SIDE OF SCREEN)



Here are links to datasheets for the ICs covered in this guide that control the plasma screen:

SN751516:

<https://www.alldatasheet.com/datasheet-pdf/view/463144/TI1/SN751516FT.html>

SN751518:

<https://www.alldatasheet.com/datasheet-pdf/view/192866/STMICROELECTRONICS/SN751518FT.html>

SN751506:

<https://www.alldatasheet.com/datasheet-pdf/view/463143/TI1/SN751506FT.html>

SN751508:

<https://www.alldatasheet.com/datasheet-pdf/view/192865/STMICROELECTRONICS/SN751508FT.html>

Any screen that uses these ICs can be fixed by following this guide. Known screens are ones made by Matsushita (Panasonic), and Oki electronics, which at the time I only know that the Compaq Portable III uses these screens, and the Toshiba T3100 also does but with a larger model.

Here's the Toshiba screens covered:

(picture)

Part 2, determining faults

Part 2, Determining Faults

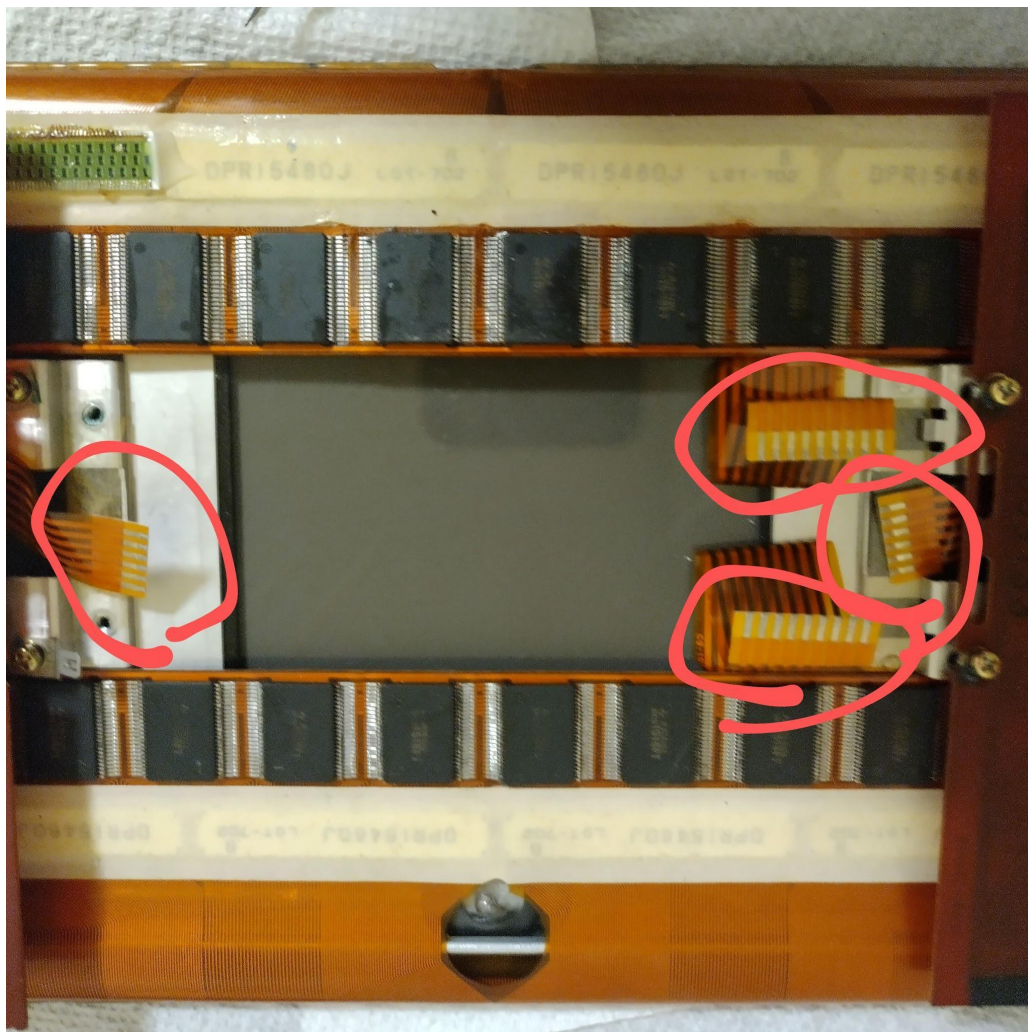
These plasma screens are designed in a good and bad way, for one the line driver ICs are soldered directly to plastic flex cables, and for two, there's no way to cool heated components, so the ICs slowly cook themselves. I could name more things, but I'm not here to insult the manufacturers of these plasma screens

On the other hand, the display is designed in such a way that you can disconnect every single Line driver IC so that you can diagnose the problem area. Unplugging any one of the cables below allows you to turn off every other vertical or horizontal line.

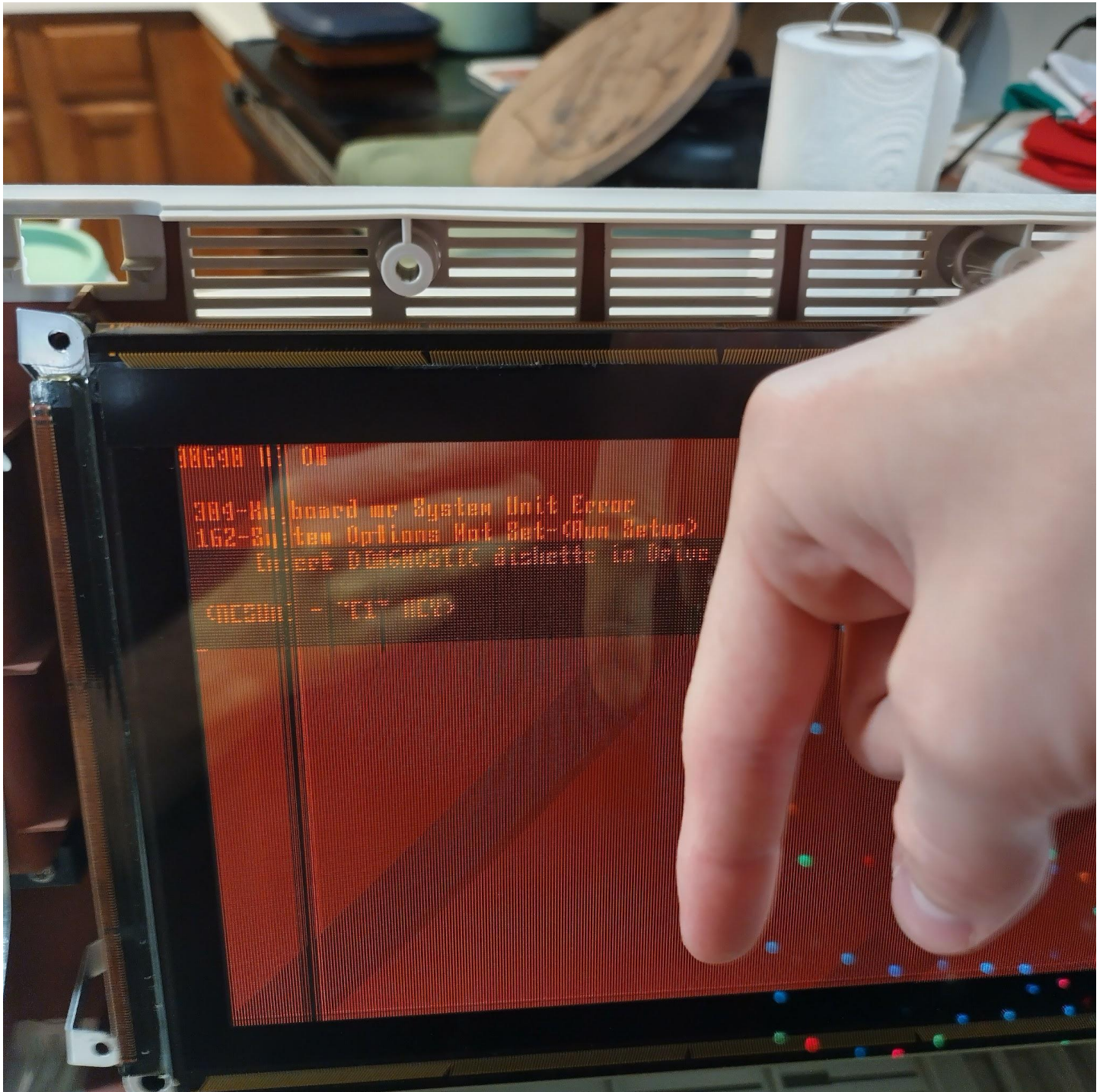
The top row of chips controls the odd number vertical lines (1,3,5,7,9,etc...)

The bottom row of chips controls the even number of vertical lines (2, 4, 6, 8, 10, etc...)

While it is useful to know which chips control which lines, it's almost impossible to count from left to right to determine if your dead lines are on even columns or odd columns. That is why it is better to unplug one of these cables one at a time:

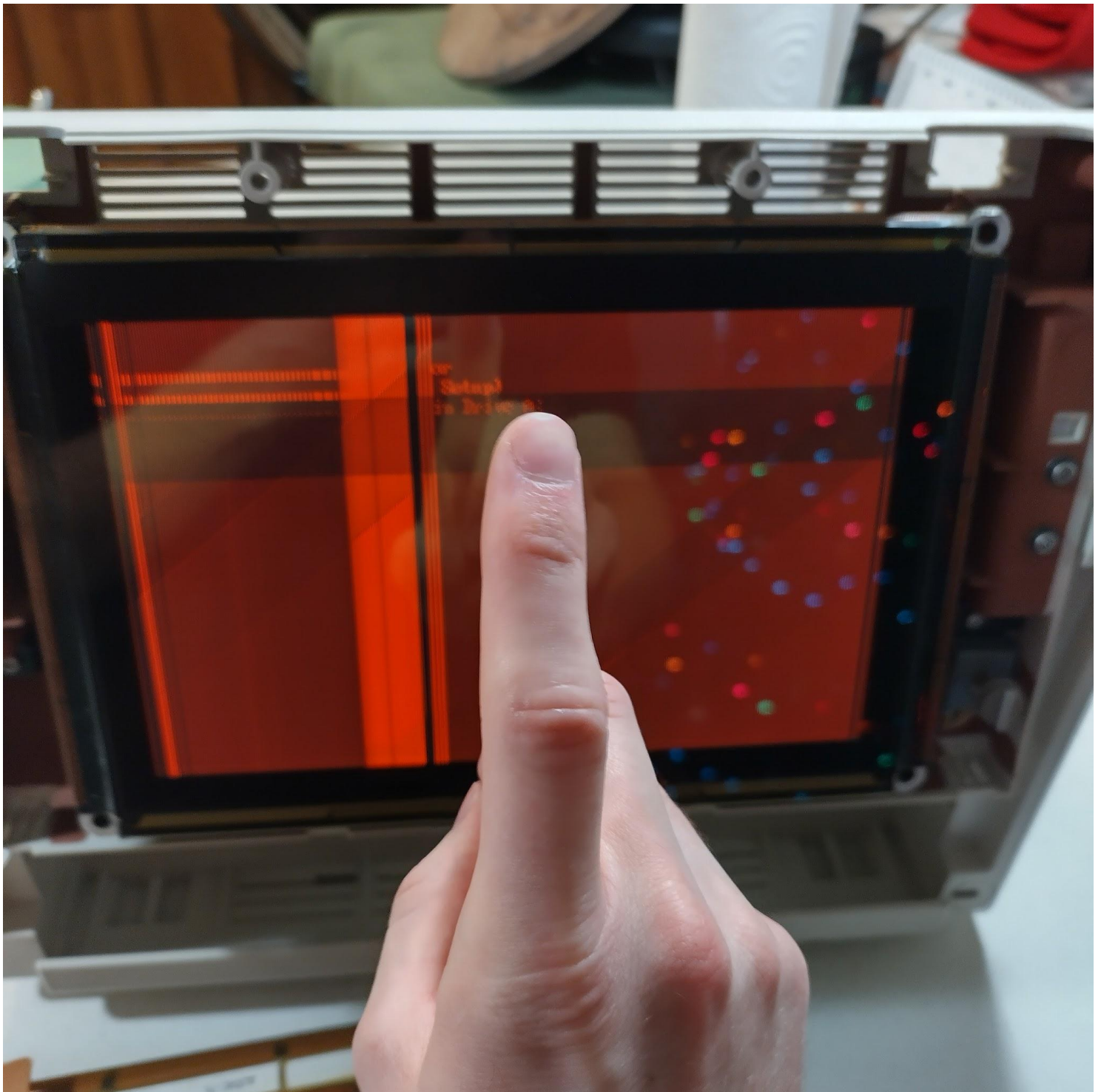


First start with unplugging the top ribbon connector, turn it on, and you'll notice that every odd line is off, if anything that isn't an odd line is off you'll notice. For example in the image below, I only unplugged the top row of chips, yet there's still dead lines, for the next few pictures I'll be demonstrating the same screen:



The bottom row is the only one on

This means that there are some faulty ICs on the bottom and on one of the horizontal sides. Turning off the screen, and plugging back in the top ribbon connector, you can move on to unplug the bottom ribbon connector, and turn the screen on again to take note of any faults:



The top row is the only one on

What chips do I replace?

Good question! You're going to want to use this rule when replacing chips: never only replace one! The reason why I say this is because data flows through each of the ICs, and data flows in series rather than in parallel. This means that a chip that's traced from bad lines on the screen sometimes isn't the bad chip, but can sometimes be due to one next to it sending noisy data. Here's an example and proof of this behavior:

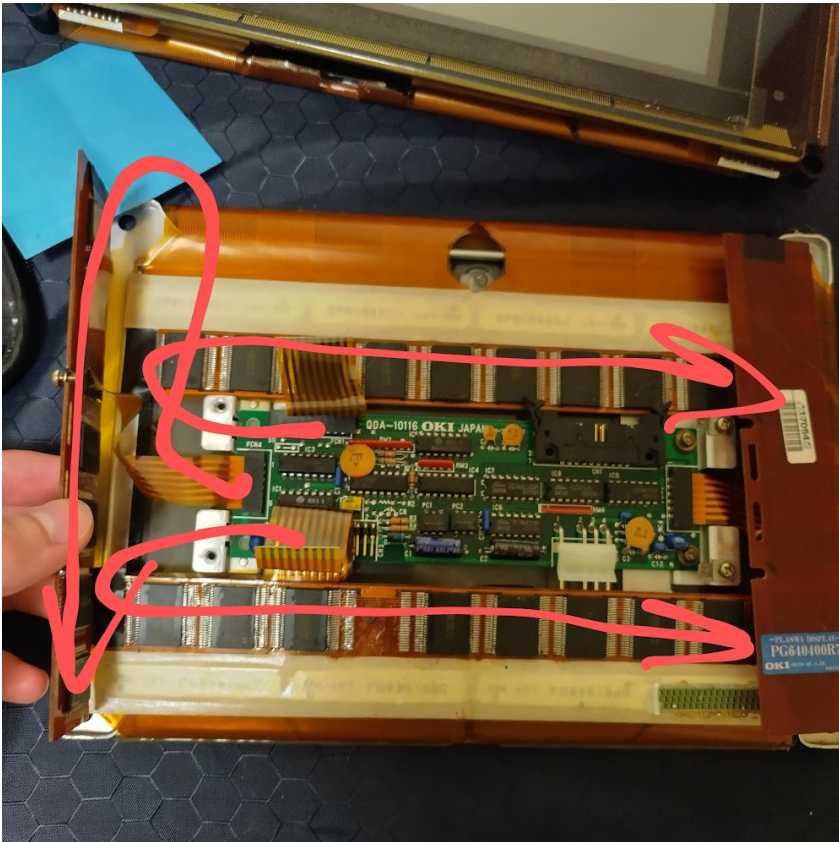
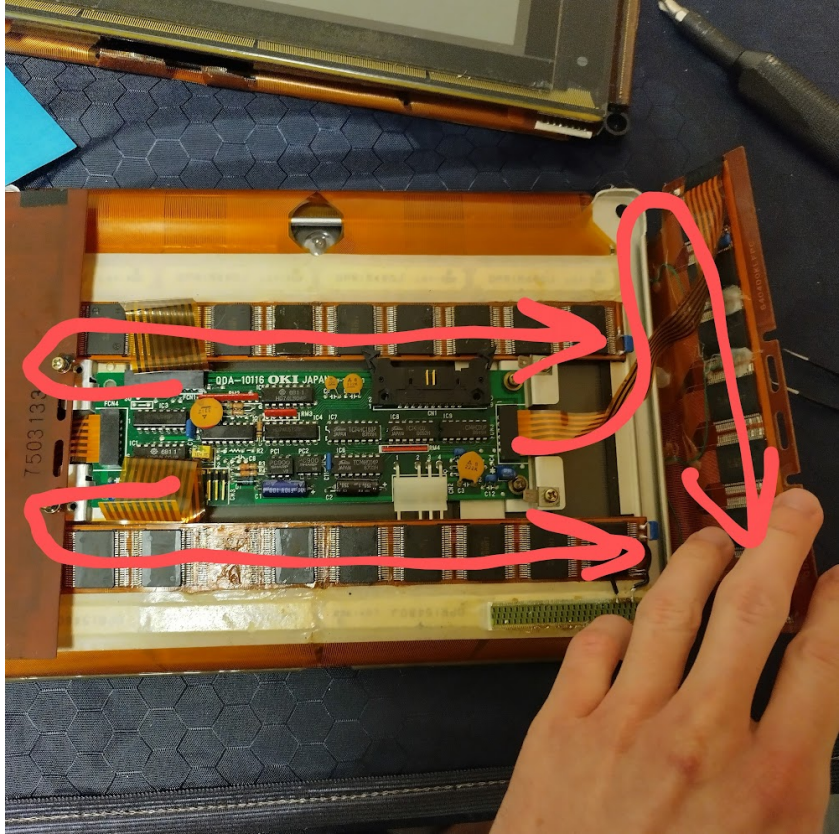


The massive chunk of dead lines in the middle of the screen causes every other line to the left to not display text correctly. Shorted chips can also send garbage data to the

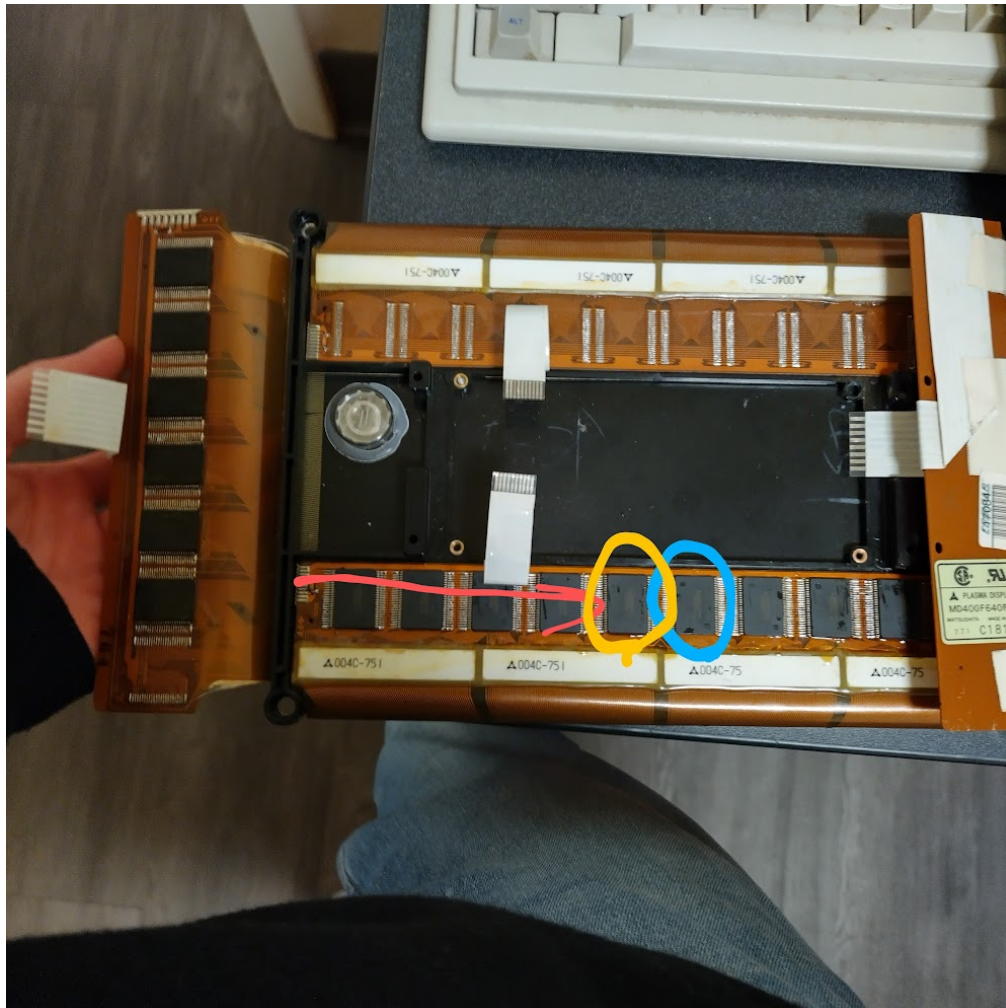
rest of the screen and cause garbage text to show up:



This is the same screen, just before I reflowed solder joints to see if that's all it needed. Best practice is you're going to need to replace The "dead" IC plus the one that receives data before it. You can find which two ICs these are by following which end the ribbon cable plugs in to, **RED ARROWS** indicate the direction of data flow:



Keeping the flow of data in mind, here's a hypothetical situation where a chip goes bad:



The chip circled in **BLUE** was traced to be bad, there was random bright and dead lines where this chip connects to. To fix this, you should not only replace this chip but the one in **YELLOW** as well. This is because both could be dead, and you want to minimize heat exposure to the flex cable. **DON'T DO WHAT I DID WHEN FIRST STARTING OUT, YOU'LL LIFT A PAD AND ADD EXTRA WORK.** I was working with ICs that were in unknown condition, so I had to solder/desolder ICs multiple times. Lifting pads is very recoverable, but it is very hard to do bodge wire work on flex cables. It's always better to replace more than one so that you don't have to constantly keep replacing them due to thinking one is bad.

Part 3, Sourcing chips

Part 3, Sourcing replacement chips, and requesting quotes

**I TAKE NO RESPONSIBILITY IF YOU GET SCAMMED BY SELLERS,
BUY AT YOUR OWN RISK!!!!!!!!!!**

**YOU WILL MOST LIKELY NOT BE SCAMMED, BUT BE WARY OF OVERSEAS
SELLERS, I'VE HEARD STORIES OF NOT DELIVERING, OR DELIVERING FAKE
COMPONENTS. WITH ALL UNKNOWN THINGS, EXERCISE CAUTION!!!!**

The main problem I had going into this was that I didn't have any way to replace my faulty chips. The only way I could think of finding replacements was to get a donor screen which is what I ended up doing. Through much research however, I found out that you can go to a website and request quotes for parts, and here is where I was able to source just the chips without a donor screen: <https://www.digchip.com/>

The screenshot shows the DigChip.com website. At the top, there's a header with the logo "DigChip.com" and the tagline "Electronics components database". To the right of the logo is a search bar labeled "Search Circuit" with a placeholder "Type part number". Next to it is a dropdown menu labeled "Section" with "Distributor / Supplier" selected. A "Search" button is to the right of the dropdown, and a "Log In" link is further right.

On the left side, there's a blue sidebar menu with the following links: "Search datasheet", "Buy / Find supplier", "Parametric search", "New parts / circuits", "Cross reference", "Application notes", "Others", "Change language", and "Contact".

The main content area has a light blue background. It contains a paragraph of text about DigChip.com being a leading provider of electronic components documentation, followed by two links: "Click here to learn more on members benefits." and "Click here to learn more on distributors benefits." Below this text are three search sections:

- Find Datasheet**: A section with a label "Enter part number" and a "Search" button.
- Find component to buy**: A section with a label "Enter part number" and a "Search" button.
- Find components to buy, multiple parts**: A section with a text box for entering multiple parts. Above the text box is a table showing the syntax for entering multiple parts:

Syntax	Example
Part number 1 ; Quantity 1	LM317 ; 300
Part number 2 ; Quantity 2	MAX232 ; 500
Part number 3 ; Quantity 3	78L05 ; 50
....	

Below the table is a label "Enter part number" and a large text input field.

If you type in the part numbers for the ICs you need you can request quotes and several companies will reach out to you like they did me. Here's where I typed in the number of one of the horizontal chips:

Find supplier - Request For Quote

Search distributor result found for: **SN75 1506FT**

Select the checkbox items you want to buy or to ask for price then click on this button =>

Part number	Distributor	Stock	DC	Manufacturer	Description
☒ SN751506FT	Shenzhen Allinwesemi Electroni	50000	-	-	-
	Ic Agent Electronics Co.,ltd	22500	-	-	-
	Ic Agent	22500	2016	TI	SSOP
	Depu Electronics Co., Ltd	5000	2020	TI	SOP
	New Strength Electronic Co.,li	1800	09	TI	SOP
	Dgt Technology (hk) Co., Limit	18500	2021	Texas Instruments	DC PLASMA DRIVER, 32-SEGMENT
	Lkrelec	500	21	Texas Instruments	-
	Smart Pioneer Electronics Co.	30000	2022	Texas Instruments	DC PLASMA DRIVER, 32-SEGMENT
	Shenzhen Shengyu Electronics T	4165	-	Texas Instruments	IC DRIVER DC PLASMA 32-SEGMENT
	Excellence Ic	450050	2223	TI	TI

As you can see, several suppliers show up, however you'll also have several that aren't listed here contact you(This is from personal experience).

RFQ list

Choose a Date

▼

▼

Go

Export

Part number	Manufacturer	Quantity	Comments	RFQ Date
SN751506FT	Texas Inst.	28		2024-12-23
SN751516FT	Texas Inst.	28		2024-12-23
SN751508FT	Texas Inst.	40	Looking for 40 of these as well	2024-12-23
SN751518FT	Texas Inst.	40	I'm looking for these to replace bad ones on several Compaq Portable III plasma screens	2024-12-23

Above is all of the test quotes I sent out, and I got multiple sellers to contact me. check part(?) for a list of sellers that contacted me.

Search any one of these chips that you need:

SN75 1508FT (BOTTOM OF SCREEN)

SN75 1518FT (TOP OF SCREEN)

SN75 1506FT (Looking from the back- LEFT SIDE OF SCREEN)

SN75 1516FT (Looking from the back- RIGHT SIDE OF SCREEN)

And request quotes for each type you need. Personally I ordered 15 of the top and bottom vertical sync ICs, as I only needed those ones. I actually ordered from two different companies, and they both delivered. I only ordered the top and bottom chips because I had only had two horizontal chips go bad, and I had enough chips from the donor screens to fix them. Here's the bottom ICs I ordered(they were thankfully not knockoffs, and I fixed an entire bottom row of one of my screens with them):



Editing this now, be wary of cheap ICs they will most likely not function. The ones above were \$5 a pop, but if you see cheaper ones don't bother, I already tried, and half of them

were dead on arrival. Cheaper ones will most likely be scams.

desoldering, and soldering ICs

To desolder dead ICs, I used a heat gun with the temp set to **300 degrees** you can go all the way down to 250, but there's no point. I found it better to desolder them faster than to slowly heat them up longer. **Make sure you use flux.** It is also better to use more heat to get the solder more runny. Making sure the solder is completely melted will help to keep the ribbon cable traces in tact.

Desoldering the ICs for the first time will be hard, as they are glued down. I recommend using sharp tweezers to hold against the edge of the IC, and applying a small amount of force upward biasing the force on one side of the IC. Don't lift up under the pins, rather lift up on the side of the IC without the pins. Gently wedge the tips of your sharp tweezers under the plastic. carefully heat one side of the IC, moving the heat back and forth slowly across the pins, after a few seconds of heat exposure, you should feel the glue give way, and the IC should come up on one side, it'll feel like you're pulling a zipper.(To be sure the glue melts, It'll take about 20 seconds to melt the glue). Once one side of the IC is desoldered, grasp it with your tweezers, and SLOWLY pull up the other side while applying heat. I also recommend using Tin foil to cover up the other ICs.

DO ALL OF THIS SLOWLY!!!!!!

For soldering on new ICs, **DO NOT USE A HEAT GUN.** In the previous step we used a heat gun to desolder the ICs, but for this step we will only use a soldering iron. Don't worry if you're not skilled in soldering small things, as this will be fairly easy if you use plenty of flux. If you use flux on the pins, the solder won't bridge, if you don't use flux however, it will bridge the pins.

Ribbon Cable repairs

Screen artifacts and anomalies

control board faults

Conclusions

