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Faulty 9-Track Cipher F880 Tape Drive

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Tuesday, 05 January 2010 17:29

5-JAN-2010

It's time to fix my 9-track tape drive, a Cipher 880.

The Cipher 880 9-track tape drive installed on the DSVAX III would usually work up to the point of an "init", but a fault would always develop.The fault is indicated by error code 17 - "LOAD" and "HI DEN" flashing, which means "The compliance arm exceeded its travel limits during normal operation".

Subsequently, testing the arm movement found no problem (service aid 24 found normal voltages).

Thus I decided to open up the drive and check what gives.
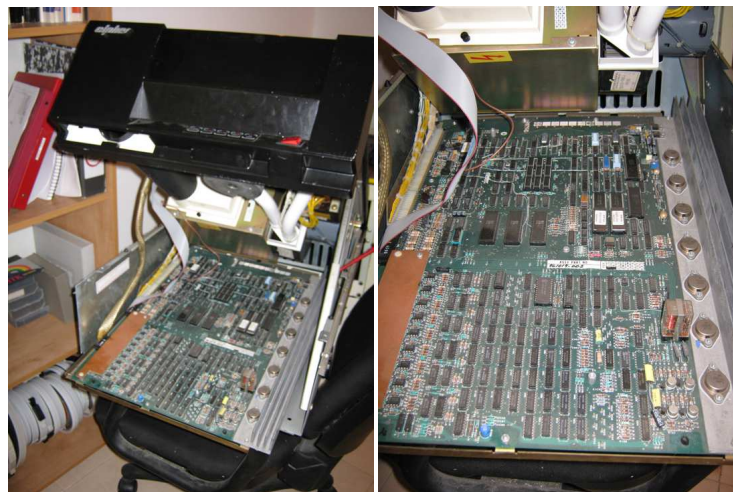
Checking the huge PCB, I found the components on it do not correspond to the schematics found on the "F880's Operation Maintenance" manual from bitsavers.org . It was rather very similar to the M891 manual . At least IC and resistor designations appeared correct.

Running the tape drive open, another problem suddenly appeared - the vacuum motor was constantly "on". Running diagnostic test No. 34 and pressing the LOAD button did not manage to switch it off either. I have tracked the problem to a faulty chip, U17P (A 7438 hex schmitt trigger inverter).
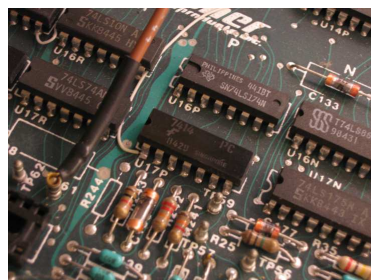
The offending IC should only have pins 5 and 6 used, but its pin 1 is connected via a long jumper wire to one of the Z8036 IC's, meaning the schematics are not complete, perhaps this patch was part of what made this drive a F880 ? I can't tell whether the original PCB was swapped and I am looking at a replacement from a 891, which was done long, long ago.
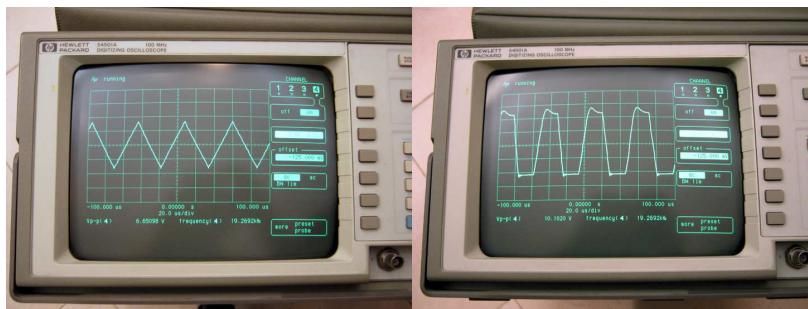
7-JAN-2010

U17P (7414 Hex Schmitt Trigger) Removal and Replacement
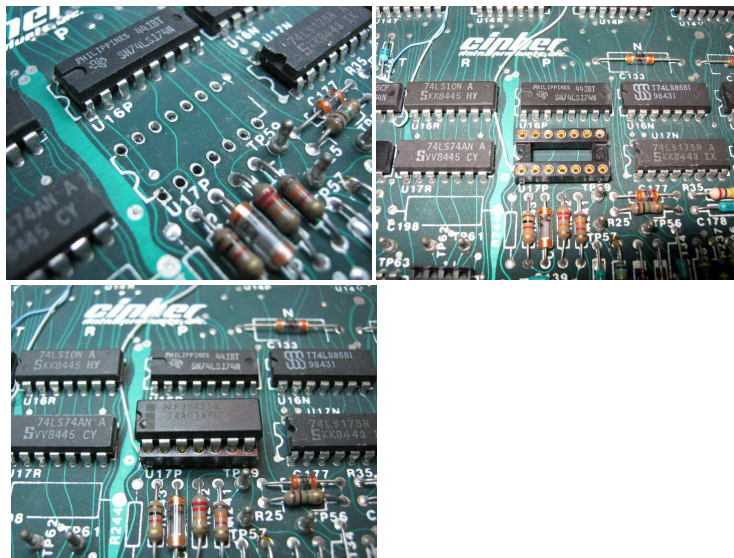
After replacing the offending 7414, the problem was solved - the suction motor is again under control. Now it is time to dig in and solve that "error code 17".

8-JAN-2010

Test Point Waveforms, Compliance Arm Adjustment

TP56 looks OK, TP59 looks a bit odd - perhaps U20N (4136 op amp) is faulty ?

Before attempting a replacement - I tried re-adjusting the compliance arm tension spring, releasing the mounting screw and changing the spring load force (the mounting screw and bracket are the ones marked with blue dye in the photo). But it did not help - code 17 problem persisted, even with spring tension increased or decreased.
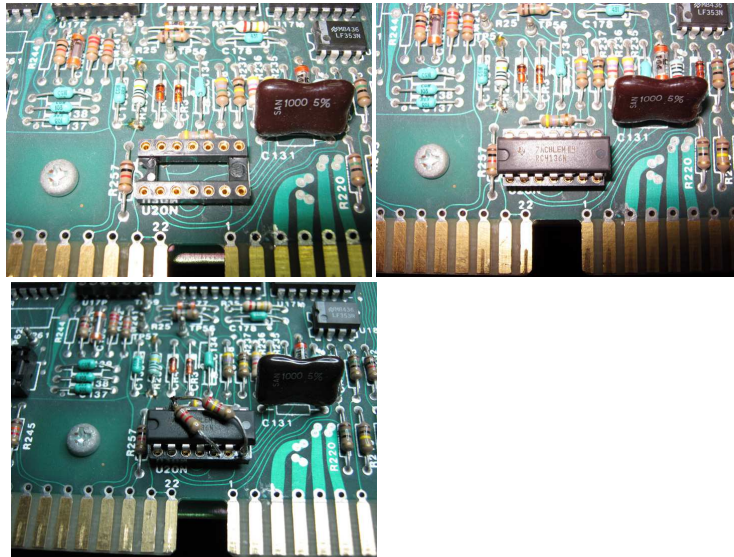

10-JAN-2010

U20N Replacement

It is time to replace U20N. I chopped it away, removed the pins, placed a socket instead, and mounted a new 4136. Finished off with re-doing the two resistor patch.
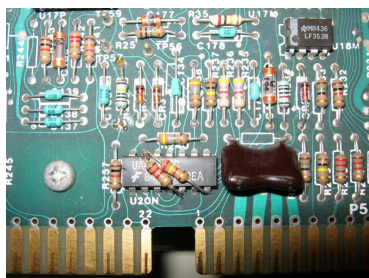
Testing the tape drive reveals that indeed the 4136 was faulty. Now the tape spins again, and the video shows the proof !

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