

SERVICE LETTER

DATE: September 15, 1976

NUMBER: DK3037

TITLE: IMPROVE READ/WRITE MARGIN PERFORMANCE

PURPOSE

To improve Read/Write margin performance on all 1500 rpm, 2200 bpi disk drives.

TEST

Refer to Read/Write margin testing procedure.

ACTION REQUIRED

Remove C8 and C9 from Read/Write PCBA. (Ref. Figure I)
(103751-02, 04, 06 or 08 only).

ADJUSTMENTS

None

SCHEMATIC CHANGES

I03750, sheet 2, Table II

Assy. 103751 Dash No.	FROM:		TO:	
	Value	Part No.	Value	Part No.
-01, -05	68 PF	130-6805	68 PF	130-6805
-02, -06	68 PF	130-6805	OMIT	-
-03, -07	68 PF	130-6805	68 PF	130-6805
-04, -08	68 PF	130-6805	OMIT	-

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Reidentify PCBA

FROM:	TO:
103751-02A	103751-02A + ECN 8625
103751-04A	103751-04A + ECN 8625
103751-06A	103751-06A + ECN 8625
103751-08A	103751-08A + ECN 8625
103751-02B	103751-02B + ECN 8625
103751-04B	103751-04B + ECN 8625
103751-02C	103751-02D
103751-04C	103751-04D
103751-06B	103751-06C
103751-08B	103751-08C

TIME REQUIRED

20 minutes

READ/WRITE MARGIN TESTING PROCEDURE

1.0 PURPOSE

The following tests are designed to determine the data reliability margins of a D3000 disk drive using the dual one-shot data decoder Read/Write PCBA, 103751.

2.0 EQUIPMENT REQUIRED

- 2.1 Oscilloscope having at least a 100 MHz bandwidth and a dual channel vertical pre-amp.
- 2.2 Two (2) 10X, low capacity (12.5 pf) scope probes with ground leads.
- 2.3 Disk exerciser, PERTEC Model DO-1 or equivalent.

3.0 PROCEDURE

- 3.1 Connect disk exerciser to the D3000 disk drive under test.
- 3.2 Apply power to the disk drive, depress the RUN/STOP switch, and allow the disk drive to come ready.

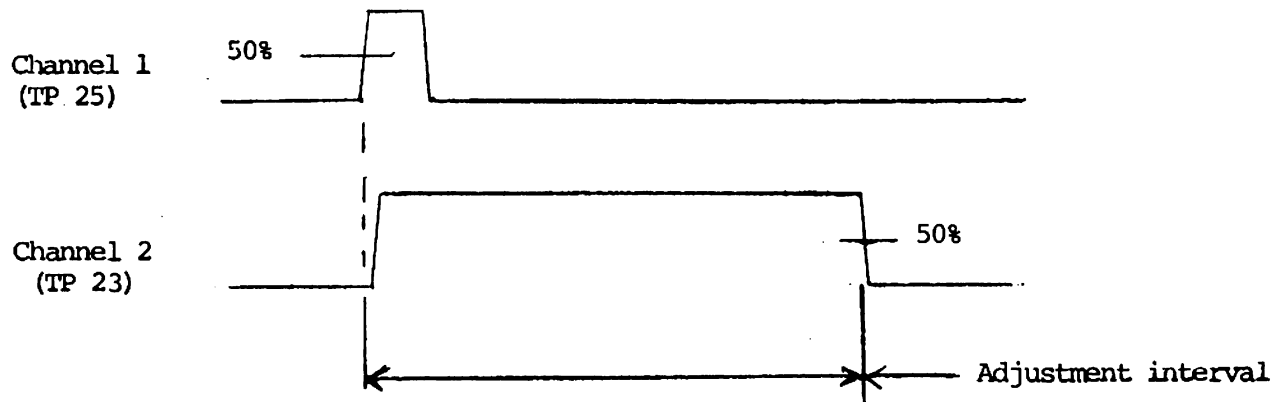
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- 3.3 Calibrate the oscilloscope horizontal sweep rate on the 100 ns/div. scale, using the 10 MHz oscillator output of the D3000 Logic PCBA; TP13 on most boards. Each period of the oscillator (10 MHz) waveform should equal exactly one verticle graticule division.
- 3.4 Connect oscilloscope Channel 1 probe to TP25 and Channel 2 probe to TP23 on the Read/Write PCBA. Connect both scope ground leads to TP17.
- 3.5 Adjust both scope verticle channels to 0.1V/div., use normal sync, alternate mode, and internal trigger on Channel 1 positive (leading) edge.
- 3.6 Position the Read/Write heads over cylinder address 405_{10} (625_8).
- 3.7 Write an alternate zero data pattern on the disk surface to be tested.
- 3.8 Set the disk exerciser to the Read mode with the Stop on Error switch set.
- 3.9 Ensure that the data decoder one-shots have been adjusted to their specifications. If not, adjust to specification noted below: (Ref. Para. 3.13 and 3.18).



The adjustment intervals are as follows:

Long one-shot adjustment intervals (R115)	485 ± 5 ns
Short one-shot adjustment interval (R113)	440 ± 5 ns

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- 3.10 Observe the readback performance of the disk drive for all surfaces. An acceptable criteria would be no errors for two full minutes of operation for each surface.
- *3.11 Continue reading and adjust R115 (long one-shot) counter-clockwise (CCW) until a data error occurs. Reset the exerciser and readjust R115 until the occurrence of errors is approximately one every 10 seconds.
- 3.12 Set the disk exerciser to write an all zeros data pattern. Then reset to the read mode.
- 3.13 Note the adjustment interval. The acceptable limit for this interval is: ≤ 435 ns.
- 3.14 Readjust R115 until the long one-shot adjustment interval is as specified in para. 3.9.
- 3.15 Perform steps 3.7 and 3.8.
- *3.16 Adjust R113 (short one-shot) clockwise (CW) until the data error rate is as specified in 3.11.
- 3.17 Set the disk exerciser to write an all ones pattern, then reset to the read mode.
- 3.18 Note the adjustment interval. The acceptable limits for this interval are ≥ 490 ns.
- 3.19 Readjust R113 until the short one-shot adjustment interval is as specified in para. 3.9.

*In some cases, connection of the scope probes to the Read/Write PCBA reduces the Read/Write margins. The oscilloscope probes may, therefore, be removed during margin testing and reconnected only to measure the adjustment interval.

	R113 Short "Ones"	R115 Long "Zeros"
1500 RPM	440 NS CW ≥ 490	485 NS CCW ≤ 435
2400 RPM	270 NS CW ≥ 310	300 NS CCW ≤ 270

NOTE: If margins cannot be met, replace that particular head and retest.

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