

PERIPHERAL EQUIPMENT DIVISION

TITLE			TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE		PIB NO. DK3050C
PRODUCT LINE	TAPE DISK FORMATTER X	EQUIPMENT CHANGED PCBA 103977	MODEL SERIES AFFECTED D3000		EFFECTIVE DATE
CLASS OF BULLETIN:		ORDER PART KIT NO.	EFFECTIVITY		
IMPROVEMENT		N/A	All 200 tpi D3000 Disk Units, fitted with Temperature and Write Compensation PCBA 103977 D342X and D344X from Serial Number 451600651 onwards.		
RETROFIT ON FAILURE			This PIB replaces DK3050.		
RETROFIT RECOMMENDED					
X SERVICE INFORMATION ONLY					

PURPOSE: To provide the necessary test configurations, test procedures and adjustment procedures for the temperature compensation portion of the Temperature and Write Compensation PCBA.

SYMPTOM: Verification and/or adjustment will be required for the following conditions:

- (1) Disk pack/or drive incompatibility.
- (2) Replacement of the Temperature and Write Compensation PCBA.
- (3) Component replacement on the Temperature and Write Compensation PCBA.

PARTS REQUIRED: None

SPECIAL TOOLS REQUIRED:

- (1) Temperature probe/thermometer having a range from 20°C to 35°C (68°F to 95°F) and an error limit not greater than $\pm .5^{\circ}\text{C}$ ($\pm 1^{\circ}\text{F}$).
- (2) Digital Voltmeter.
- (3) Disk exerciser model TE-D01 Pertec P/N 895300-01 (optional).
- (4) $F^{\circ} = 1.8C^{\circ} + 32$

TEST CONFIGURATION:

- (1) The test disk cartridge must be stored for a minimum of 90 minutes at the same ambient temperature as the disk drive prior to insertion in the disk drive.
- (2) Insert the test disk cartridge.
- (3) Run the disk drive in the READY mode for a minimum of 20 minutes to allow to stabilize.
- (4) Connect a disk exerciser capable of selecting the upper and lower platters and also capable of positioning the heads to any desired cylinder address.

NOTE

All references to test points are on the Temperature and Write Compensation PCBA as shown in Figure 1 on Page 6.

Should Additional Information Be Required — Contact

PERTEC

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PERTEC 20-K012C(1)

Distribution Code - 6318

TITLE TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE

PIB NO.
DK3050C

TEST
PROCEDURE:

- (1) Establish the test configuration described in previous paragraph.
- (2) Using a Digital Voltmeter, connect the positive test lead to TP4 on the Temperature and Write Compensation PCBA, and the common test lead to TP5 (ground on the same PCBA).
- (3) Place a temperature probe adjacent to the thermistor (within 1cm) and measure **AIR TEMPERATURE**.
- (4) Measure the **MOUNTING BLOCK TEMPERATURE**.
- (5) Average the two readings and use the average temperature in the succeeding steps.

EXAMPLE:

Ambient temperature	=	28°C
Block temperature	=	30°C
(28 + 30) + 2	=	29°C

By referring to the TEMPERATURE TO VOLTAGE CONVERSION CHART for 29°C, the following voltages should be present at TP4 (Table 1).

Cylinder 64	=	-0.346VDC
Cylinder 128	=	-0.174VDC
Cylinder 256	=	+0.163VDC

- (6) Position the heads to cylinder addresses (in Table 1) that are within the temperature range indicated by the average temperature probe reading (per Step 5).
- (7) Observe the voltage readings at TP4 for each cylinder address in Step 6.

NOTE

If any of the voltages noted in Step 7 are outside the + 100MV tolerances (see Table 1), perform the adjustment procedure in the next paragraph.

- (8) Proceed with the scaling resistor verification on Page 4.

ADJUSTMENT
PROCEDURE:

- (1) Note the average temperature adjacent to the thermistor established in Steps 3, 4, and 5 above.
- (2) Move the DVM positive probe to TP3 on the Temperature and Write Compensation PCBA. Maintain the DVM ground lead on TP5.
- (3) Adjust R15 on the PCBA to attain a voltage that corresponds to the temperature noted in Step 1. (see Table 2)

TITLE

TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE

PIB NO.
DK3050C

TEMPERATURE TO VOLTAGE CONVERSION CHART

TABLE 1

TEMPERATURE		CYLINDER ADDRESS	TCTP4 VOLTAGE
°C	°F	(Decimal)	
20	68	64	+0.432 ± 0.100V
		128	+0.217 "
		256	-0.204 "
21	69.8	64	+0.346 "
		128	+0.174 "
		256	-0.163 "
22	71.6	64	+0.260 "
		128	+0.131 "
		256	-0.122 "
23	73.4	64	+0.174 "
		128	+0.088 "
		256	-0.081 "
24	75.2	64	+0.088 "
		128	+0.045 "
		256	-0.040 "
25	77.0	64	.000 "
		128	.000 "
		256	.000 "
26	78.8	64	-0.088 "
		128	-0.045 "
		256	+0.040 "
27	80.6	64	-0.174 "
		128	-0.088 "
		256	+0.081 "
28	82.4	64	-0.260 "
		128	-0.131 "
		256	+0.122 "
29	84.2	64	-0.346 "
		128	-0.174 "
		256	+0.163 "
30	86.0	64	-0.432 "
		128	-0.217 "
		256	+0.204 "
31	87.8	64	-0.518 "
		128	-0.260 "
		256	+0.245 "
32	89.6	64	-0.604 "
		128	-0.305 "
		256	+0.286 "
33	91.4	64	-0.690 "
		128	-0.348 "
		256	+0.327 "
34	93.2	64	-0.778 "
		128	-0.391 "
		256	+0.368 "
35	95.0	64	-0.864 "
		128	-0.434 "
		256	+0.409 ± 0.100V

TITLE	TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE	PIB NO. DK3050C
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TABLE 2

<u>°C</u>	<u>°F</u>	<u>TCTP3 VOLTAGE</u>
22.0	71.6	+2.898 to +2.954V
23.0	73.4	+2.970 to +3.030V
24.0	75.2	+3.044 to +3.106V
25.0	77.0	+3.118 to +3.182V
26.0	78.8	+3.198 to +3.262V
27.0	80.6	+3.277 to +3.343V
28.0	82.4	+3.361 to +3.429V
29.0	84.2	+3.440 to +3.510V
30.0	86.0	+3.514 to +3.586V
31.0	87.8	+3.604 to +3.676V
32.0	89.6	+3.684 to +3.756V
33.0	91.4	+3.764 to +3.836V
34.0	93.2	+3.844 to +3.916V
35.0	95.0	+3.924 to +3.996V

SCALING RESISTOR

VERIFICATION:

- (1) Move the DVM positive probe to TP2 on the Temperature and Write Compensation PCBA.
- (2) Adjust R16 on the Temperature and Write Compensation PCBA to +1.0V.
- (3) Move the DVM positive probe to TP4 on the Temperature and Write Compensation PCBA.
- (4) Using the disk exerciser, refer to Table 3 and check that the voltage at TP4 is within the range specified for each of the cylinder addresses listed.

TABLE 3

<u>CYLINDER ADDRESS</u>	<u>TCTP4 VOLTAGE</u>
32 (40 _g)	+1.49 to +1.82V
96 (140 _g)	+0.98 to +1.20V
160 (240 _g)	+0.50 to +0.61V
224 (340 _g)	-0.07 to +0.05V
288 (440 _g)	-0.51 to -0.41V
352 (540 _g)	-1.12 to -0.92V
400 (620 _g)	-1.72 to -1.40V

NOTE

If voltages on TP4 are not within limits for each cylinder address in Step 4, there may be a component failure in the scaling resistor and/or the cylinder address circuitry.

- (5) Proceed with the environment temperature adjustment.

TITLE TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE

PIB NO.
DK3050C

ENVIRONMENT TEMPERATURE ADJUSTMENT:

NOTE

Location of the heads is not relevant to this adjustment.

- (1) Note the temperature reading on the probe adjacent to the thermistor.
- (2) Move the DVM positive probe to TP2 on the Temperature and Write Compensation PCBA.
- (3) Adjust R16 to the voltage (Table 4) corresponding to the temperature reading observed in Step 1.

TABLE 4

<u>AIR TEMPERATURE</u>		<u>TCTP2 VOLTAGE</u>
<u>°C</u>	<u>°F</u>	
20	68.0	+0.40V
21	69.8	+0.32V
22	71.6	+0.24V
23	73.4	+0.16V
24	75.2	+0.08V
25	77.0	+0.00V
26	78.8	-0.08V
27	80.6	-0.16V
28	82.4	-0.24V
29	84.2	-0.32V
30	86.0	-0.40V
31	87.8	-0.48V
32	89.6	-0.56V
33	91.4	-0.64V
34	93.2	-0.72V
35	95.0	-0.80V

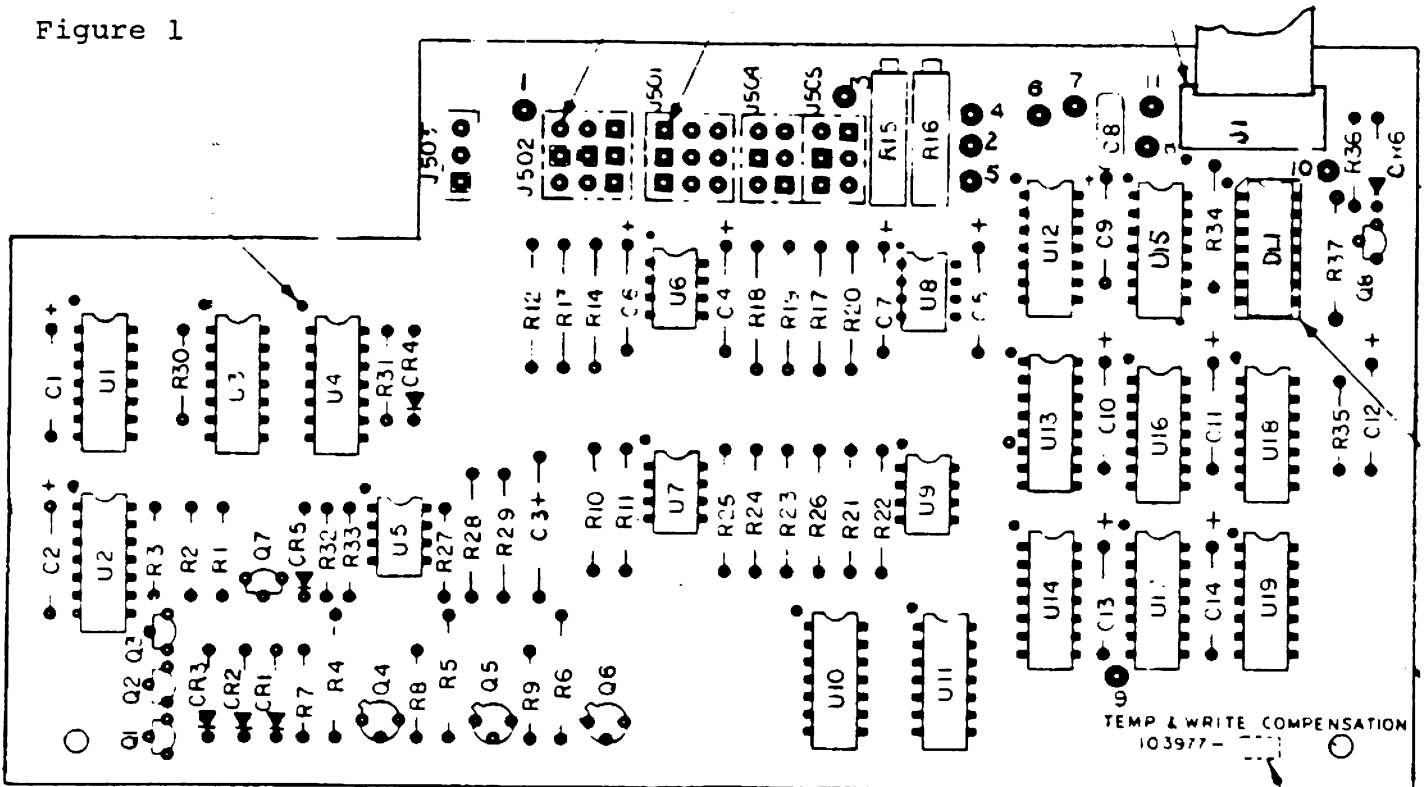
NOTE

Mechanical CE alignment (Paragraph 6.13, D3000 manual) must be performed if any temperature compensation adjustments are made.

TITLE TEMPERATURE COMPENSATION ADJUSTMENT PROCEDURE

PIB NO.
DK3050 C

Figure 1



REFERENCE DRAWINGS:

Schematic number 103976 (sheet 1)

Assembly number 103977