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PERIPHERAL EQUIPMENT DIVISION

PRODUCT IMPROVEMENT BULLETIN

TITLE: POSITIONER RETICLE CHECKLIST			PIB NO.
			DK3030
PRODUCT LINE: TAPE [ ] DISK [X] FORMATTER [ ]	EQUIPMENT CHANGED: Mylar Reticle Assy 102876	MODEL SERIES AFFECTED: D3000	EFFECTIVE DATE: 3/14/75

CLASS OF BULLETIN:	ORDER PART KIT NO.	EFFECTIVITY
[ ] IMPROVEMENT [ ] RETROFIT ON FAILURE [ ] RETROFIT RECOMMENDED [XX] SERVICE INFORMATION ONLY	N/A	All D3000 Disk Drives Prior to 3414XXXXX

I SCOPE

This checklist is designed as a service aid for D3000 Disk Drives. It outlines the interrelated symptoms and causes of the X+90 drift phenomenon as well as corrective action guidelines.

Although it will aid in determining whether a D3000 positioner has an optic problem, it by no means reflects all the failure modes. If a positioner optic's problem is suspected the following documents should be referenced in conjunction with this checklist.

PIB's	Titles
DK3015	Positioner Transducer Lamp Removal and Replacement Procedure
DK3016	Positioner Scale Removal and Replacement Procedure
DK3017	Positioner Reticle Removal and Replacement Procedure
DK3022	Positioner Lamp Life Improvement

II SYMPTOMS OF X+90/X+0 DRIFT

A. Loss of Quadrature clocks (X+90) when loading heads, reveals itself in so much as the positioner does not stop at Track 0, resulting in an emergency unload.

B. While performing one-track repetitive seeks, the X+0 waveform (TP20 SERVO PCBA) reveals excessive overshoots, but seek times are within specifications.

III CAUSES OF X+90/X+0 DRIFT

A. Flexure of Mylar Reticle
This problem is caused by the difference in the coeffecient of expansion of the mylar reticle and the photocell assembly resulting from variations in ambient temperature.
SYMPTOM--a sudden, gross change in X+90 and X+0 amplitudes as caused by the mylar reticle suddenly deforming, "popping" out of flatness (oil-can effect). This condition normally occurs during temperature changes within the disk drive.

****NOTE****

If the amplitude of the waveform decreases, this is an indication that the mylar has deflected inward forming

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a concave surface. An outward deflection will cause an increase in the X+90 and X+0 analog wave form amplitudes.

B. Positioner Scale Movement

The positioner scale is mounted to the positioner carriage assembly with three hex head screws. The scale to reticle spacing (.005" ± .001") and is adjusted by loosening the scale mounting screws and moving the scale into position using a piece of paper or mylar .005" thick, then retightening these three screws. Should these screws become loose, the scale will shift in position, changing the scale to reticle spacing, causing X+90 and X+0 signal amplitudes to change. The normal failure mode is an increase in scale to reticle spacing resulting in a decrease in X+90 and X+0 signal amplitudes.

SYMPTOMS OF POSITIONER SCALE MOVEMENT:

(a) One or more of the scale mounting screws are loose.
(b) The X+90 analog signal amplitude is less than 6V peak-to-peak..
(c) The X+90 and X+0 signal amplitudes vary significantly (more than 10%) as the positioner is moved, manually, through its full stroke.

X+90/X+0DRIFT CHECKLIST

A. Setup

(1) Establish service status.
  a. Power Off.
  b. Remove Dust Cover.
  c. Extend Circuit Boards to the service position.
(2) Observation of X+90 and X+0 analog waveforms.
  a. Disconnect Connectors J205 and J206 from Servo PCBA.
  b. Connect Oscilloscope to observe X+90 waveform at TP2 of Servo PCBA.
  c. A.C. Power On and observe illumination of SAFE indicator.
  d. Load Disk Cartridge in drive, then depress RUN/STOP switch. Observe that the disk drive comes up to speed.
  e. Approximately 33 seconds after depressing RUN/STOP switch, manually load heads onto the disk at about Track 000.
  f. Move positioner carriage, by hand, between Track 000 and Track 202 and observe the X+90 analog waveform.
  g. The X+90 analog waveform should have a peak-to-peak amplitude of approximately 6V (negative peak may be clipped).
  h. The X+90 analog positive peak should be approximately +3V above ground.
  i. Move probe to TP20 (X+0).
  j. Move positioner carriage through its full stroke (Track 000 to Track 202) and observe analog waveform.
  k. The peak-to-peak amplitude should be 12V peak-to-peak centered at ground.
  l. Neither end of the X+0 waveform should be clipped.
  m. Should any of the above mentioned items not be within specifications, drift is apparent, and the following pages should be utilized for corrective action.

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B. Scale to Reticle Spacing Checklist.
Removal of the READ/WRITE PCBA and the scale protection shield is required to make these checks. USE CARE WHEN REMOVING SCALE SHIELD SO AS NOT TO SCRATCH THE SCALE.

(1) Are the three scale bracket mounting screws tight?
(2) Check for proper scale to reticle spacing using a piece of paper or mylar .005" thick.

CAUTION: STEEL FEELER GAUGES MUST NOT BE USED UNDER ANY CIRCUMSTANCES!

(3) Readjust the reticle to scale spacing as required, the proper spacing is .005 ± .001 inches. Ensure that the scale mounting bracket screws are tight.
(4) Recheck X+0 and X+90 adjustments.

C. Reticle Assembly Checks
If the X+0 and X+90 signals are still improper, checking of the reticle is required.

(1) Using a piece of masking tape or scribe, mark the position of the reticle in the holder.
(2) Loosen the two reticle assembly mounting screws and remove the reticle assembly from the position transducer body.
(3) Observe the flatness of the mylar reticle.
(4) If the mylar reticle surface is distorted (concave or convex surface), remove the mylar reticle using the procedures outlined in PIB DK3017. Replace with glass reticle (103679-01) and make necessary servo adjustments per Section 6 of the D3000 manual.
(5) If the mylar reticle surface appears flat, remount the reticle assembly into position transducer assembly body. Use alignment as marked in Step "C (1)" as the initial setting. Readjust if necessary using D3000 manual, Section 6, Reticle Adjustment Procedures.

****NOTE****

If and when all reticle checks have been made, and amplitudes of X+0 and X+90 are still improper, Ref. PIB DK3022. POSITIONER LAMP IMPROVEMENT.