

**DYMEK**

C O R P O R A T I O N



## ANALOG ALIGNMENT DISK

A Dymek Alignment Disk is a specially pre-recorded disk that is used to align and adjust various elements of a flexible disk drive.

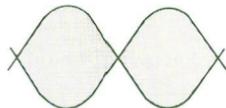
Dymek manufactures many different types of alignment disks. Each one has different features for different uses. The particular disk you need will depend on the type of disk drive with which it is to be used. (See the back page for a listing of commonly used types.)

### WHAT IS ON THIS DISK

The following is a discussion of typical alignment disk contents. Some disks may not have all of these elements. The track locations and other information are located on the disk label.

#### CAT'S EYE TRACK (CE)

A Cat's-eye Track is used to align the track position of the head. This track is really two eccentrically recorded tracks separated by an unrecorded band. The average center of the unrecorded band is the true track center. This condition occurs when the two Cat's-eye lobes are of equal amplitude as viewed on an oscilloscope.



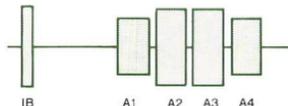
#### INDEX BURST (INX)

An Index Burst is a short recorded zone of all 'zeroes' data and is used to adjust the position of the Index sensor on the disk drive. For most drives, the time between the leading edge of the index sensor pulse and the first pulse of the index burst is 200 microseconds. For the exact value on your drive, consult the drive manufacturer's literature.



#### AZIMUTH GROUP (AZ)

An Azimuth Group is a set of four bursts of signals recorded at different angles. As the drive reads the signals, the amplitude of each burst will vary depending upon the angle of the head. By observing the relative amplitudes of the four bursts, the angle of the read head can be determined.





## TRACK 00 SENSOR ALIGNMENT (TKO)

A signal recorded on track 0 is used to adjust the Track 0 sensor in the drive.

After the drive's radial position has been adjusted (using the Cat's-eye track) the sensor indicating track 0 can be adjusted.

This signal can also be used to adjust head settling time in drives that load and unload the heads.

### 1F and 2F

A 1F track is a track recorded with the system's low frequency rate while a 2F track is recorded at the system's high frequency rate. These are used to determine the head's playback resolution, which is the ratio of 2F read signal amplitude to 1F read signal amplitude.



## EQUIPMENT REQUIRED

In addition to the alignment disk and the disk drive, the following equipment is usually required in the drive manufacturer's literature:

- An oscilloscope with an external trigger input and differential signal input capabilities.
- A Disk Drive Exerciser that will allow the drive to read signals and move the head to specific tracks.
- A power supply to operate the drive, if this is not an integral part of the Disk Drive Exerciser.
- The appropriate cables for connecting the equipment together.

Consult the manufacturer's literature to determine the details of how to operate the equipment and how to make adjustments to the drive itself.

## HOW TO USE THE DISK

### BASIC REQUIREMENTS

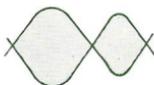
- This alignment disk is specified for use only over a temperature range of 65° to 75°F and a relative humidity range of 45% to 55%. The disk must acclimate one hour for each 5°F or 5% relative humidity change.
- Care must be taken not to write pre-recorded areas of the disk as the alignment information will be lost. In addition, the standard handling precaution for any recorded floppy disk must be observed.

- Measurements and adjustments will require observing the read signal from the head by use of an oscilloscope. This is normally done by connecting the oscilloscope to the drives pre-amplifier output and triggering the oscilloscope on the leading edge of the drive's index output. Consult the drive manufacturer's literature for more detailed information.
- When making track alignment adjustments to a double-sided drive, the side 0 adjustment must be compromised so that side 0 and side 1 fall within drive manufacturer's specifications.

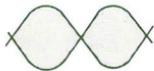
## ADJUSTING RADIAL POSITION

Use the Drive Exerciser to position the head on the required Cat's-eye track. When the track position of the head is correct, the read signal will have two lobes of equal amplitude. If the lobes are unequal, the head is off-track in the direction indicated in the figure below. Following the drive manufacturer's instructions, adjust the position of the head until it is within the drive manufacturer's specifications, usually with lobes within 80% of each other.

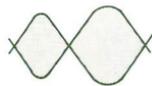
$$\text{Lobe ratio} = \frac{\text{min. lobe}}{\text{max. lobe}}$$



OFF TRACK  
TOWARD SPINDLE



ON TRACK



OFF TRACK  
AWAY FROM SPINDLE

$$\text{OFF TRACK DIMENSION} = N \left( \frac{1 - R}{1 + R} \right)$$

$$\begin{aligned} N &= 0.008 \text{ for } 48 \text{ TPI} \\ N &= 0.0045 \text{ for } 96 \text{ TPI} \\ N &= 0.0034 \text{ for } 135 \text{ TPI} \\ R &= \text{Lobe ratio} \end{aligned}$$

## ADJUSTING THE TRACK 00 SENSOR

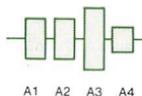
Use the Drive Exerciser to position the head on track 0. Observe the read 1F signal on track 0. Follow the drive manufacturer's instructions to verify proper operation of the track 0 sensor and to adjust it if necessary.

## ADJUSTING THE INDEX SENSOR

Use the Drive Exerciser to position the head on the required index track. Observe the read signal. Follow the drive manufacturer's instructions to verify proper operation of the index sensor and to adjust it if necessary. Typically, the index burst should appear  $200 \pm 50$  microseconds after the leading edge of the index sensor output.

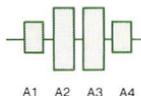
## CHECKING AZIMUTH

Use the Drive Exerciser to position the head on the required azimuth track. Observe the amplitude of each of the four azimuth bursts. When the head is at the zero angle, the amplitude of the first and fourth signal bursts will be equal as shown below. When the amplitude of the first two bursts are equal, the head is rotated clockwise (+) at an angle given on the label. If the last two bursts are equal, the angle is counterclockwise (-) at an angle given on the label.



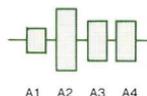
A1 A2 A3 A4

Clockwise,  
plus (+) direction



A1 A2 A3 A4

Zero angle  
(correct)



A1 A2 A3 A4

Counterclockwise,  
minus (-) direction

The actual angle of the head may be obtained using the following formula:

$$\text{If } A_2 < A_3 \quad \text{Label value} \times \frac{A_3 - A_2}{A_3 - A_1}$$

$$\text{If } A_3 < A_2 \quad \text{Label value} \times \frac{A_2 - A_3}{A_2 - A_4}$$

## CHECKING RESOLUTION

To determine the head's playback resolution use the Drive Exerciser to position the head on the required 2F track. Observe the read signal and determine the average signal level. Position the head on the required 1F track and also determine the average signal level.

$$\text{Resolution (\%)} = 100 \times \frac{\text{2F Signal Amplitude}}{\text{1F Signal Amplitude}}$$

This value typically should be greater than 50%. Some manufacturers' literature may not specify resolution. In any case, when resolution is less than 30%, head replacement may be required. If in doubt, use a Dymek Recording Interchange Diagnostic (RID) disk for IBM-compatible systems, or Apple II family systems to see if the disk drive will pass tests specially designed to determine acceptable operating conditions.

## DYMEK ANALOG ALIGNMENT DISK

Model No.	Size	Sides	TPI	Comments
301-12	3.5"	1	135	300 RPM
302-11	3.5"	2	135	600 RPM
302-12	3.5"	2	135	300 RPM
302-15	3.5"	2	135	600 RPM Sony Replacement
501-1	5.25"	1	48	
501-2	5.25"	1	48	
501-6B	5.25"	1	48	SA 127 Shugart Replacement
502-1	5.25"	2	48	
502-1D	5.25"	2	96	
502-6A	5.25"	2	48	SA 129 Shugart Replacement
502-6B	5.25"	2	48	SA 128 Shugart Replacement
502-8D	5.25"	2	96	SA 148 Shugart Replacement
502-9D	5.25"	2	96	SA 149 Shugart Replacement
502-11	5.25"	2	48	
502-11D	5.25"	2	96	
502-14	5.25"	2	48	
502-15	5.25"	2	48	
502-30H	5.25"	2	96	1.6 Mbyte
502-91D	5.25"	2	96	SA I26 Shugart Replacement
506-10	5.25"	1	96/100	206-10 Dysan Replacement
506-11	5.25"	1	96	206-11 Dysan Replacement
506-30	5.25"	2	96/100	206-30 Dysan Replacement
506-31	5.25"	2	96	206-31 Dysan Replacement
506-44	5.25"	2	96	1.6 Mbyte
512-1D	5.25"	2	96	Azimuth offset 33 min.
512-11D	5.25"	2	96	Azimuth offset 33 min.
524-2A	5.25"	2	48	224-2A Dysan Replacement
592-11	5.25"	2	48	
801-2	8"	1	48	SA 120 Shugart Replacement
802-1	8"	2	48	
802-2	8"	2	48	SA 122 Shugart Replacement
802-9	8"	2	48	
802-11	8"	2	48	

This is a list of some of the commonly-used Dymek Alignment disks. For additional information regarding Dymek Alignment disks, please contact the Dymek Sales Department at (408) 436-8700.

**DYMEK**  
CORPORATION

1984 DYMEK CORPORATION, SAN JOSE, CA.

# DYMEK

## ALIGNMENT DISKETTE

DK 524-2A

NO. P090

MADE IN USA

	<u>TRACK</u>	<u>SENS</u>	<u>OFFSET</u>
CE	<u>16</u>		
IDX	<u>01/34</u>		
AZM	<u>34</u>	<u>12'15'18'</u>	<u>--</u>
1F	<u>32</u>		
2F	<u>00/33/39</u>		

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