1.0 SCOPE

This document describes the operating procedure for the final in-process automatic servo writing station on CM6426 . Series Disk Drive.

2.0 TEST EQUIPMENT REQUIRED

2.1 Dual output power supply, +5V 2A minimum & +12V 4A minimum.
2.2 Temperature controlled environment, 75 degree F 5 degree.
2.3 CMI automatic servo writer board, P/N 100073 REV A.
2.4 Automatic servo writing firmware, ID# FAW2.

3.0 OPERATING PROCEDURE

3.1 After drive passes seventy-two hours burn-in cycle, remove burn-in rack from burn-in room and stablize at room temperature for one hour.
3.2 After one hour of stablization, remove X43 burn-in Prom from Z20 on main board and replace with FAW2 Prom.
3.2 Connect automatic servo writer to drive and connect power cable assembly from servo writer to J3 on main board.
3.3 Connect TP1 and TP2 jumpers on auto servo writer board to TP17 and TP6 on main board respectively.
3.4 Place disk drive horizontally on a rack in Soak Room.
3.5 Connect power cable assembly from burn-in rack to J4 on auto writer board. Drive should start up and cycle through initialization.
3.6 If drive fails to start up, check fuse indicators. If indicator is on, remove & replace with a proper rating fuse. Otherwise, remove drive from rack and indicate the symptom on traveller with your initials. Route drive to staging area
3.7 LED 2 should start flashing after initializtion and LED 2 should remain flashing for one and half hours of soak period
3.8 If LED 2 stops flashing initially, remove drive from rack. Check wire connection, FAW2 EPROM, and bent pins in the edge connectors on servo wrtier board, repair as needed.
3.9 Place failed drive on a different rack after visual inspecti and restart the auto servo test. If drive still fails, remc drive from rack and indicate the symptom on traveller with your initials. Route drive to staging area.
3.1.0 When LED 2 stop flashing after one and half hours or sooner, use paragraph 4.0 to determine the status of the drive.

4.0 LED'S STATUS INTERPRETATION

4.1 The following chart should be used to determine the status of the drive upon completion of servo writing.

L1	L2	L3	STATUS
--	--	--	POSITIONING SYSTEM ERROR.
ON	--	--	RECOVERY OFFSET IS NOT ACCEPTABLE
--	ON	--	SPINDLE MOTOR RELATED FAILURE
ON	ON	--	BURST COULD NOT BE WRITTEN OR RECOVERY CIRCUITS BADLY BIASED
--	--	ON	SERVO WRITER BOARD RELATED FAILURE
ON	--	ON	EXCESSIVE BIAS IN RECOVERY CIRCUITS
--	ON	ON	EXCESSIVE TIME WAS REQUIRED TO COMPLETE WRITE AND CHECK SEQUENCES
ON	ON	ON	PASSES SERVO WRITING TO BE PROCESSED

5.0 POST PREPARATION

5.1 After drive passes auto servo writing successfully, remove drive from rack and perform the following operations:

a. Disconnect jumpers from TP17 and TP6 on main board.
b. Disconnect power connector from J3 on main board.
b. Remove FAW2 EPROM from Z20 on main board.
c. Remove auto servo writer board from drive.

5.2 Route to the next station.

Wedge Check

(Channel 1   TP 6   〈Index〉

(Channel 2   TP 14,13   〈MFM Data〉

Display Channel 2

TRIGGER Mode 〈Normal〉 Channel 1

Scope Setting

Channel 1   set to   .5v/Div

Channel 2   SET to   50M/Div

(TIME/DIV
(Delay Time   SET to 20 u.s.

DRIVE SETTING

1) INSTALL E PROM
2) SELECT Drive for DRIVE Ø.
3) PLUg IN Servo BOARD
   Black wire — TP 6
   White wire — TP 17

Left Burst | Right Burst | HEADER | DATA

USER Index

** RUN DRIVE FOR MINIMUM OF 20 MINUTES before Re-servo writing.
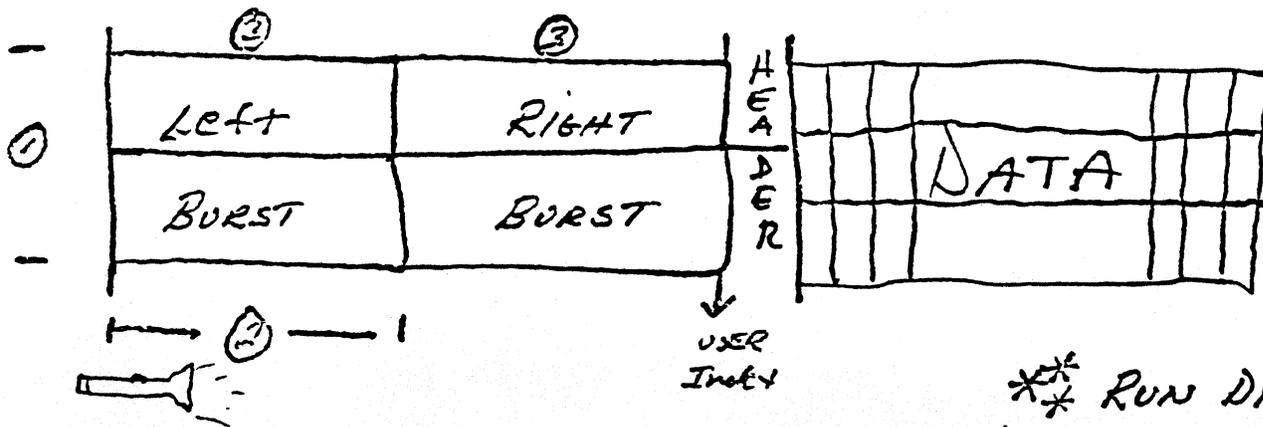
NOTE:

① Amplitude should APPROX 2·3 VOLTS

② Length of Burst should be 64u.s Each Burst

③ Observe that their is A Left AND Right Burst

④ Check Voltage AT TP 10 = 1-3 VOLTS

Set-up for Writing Servo Bursts

1. Power Supply (Power to Servo Board)
2. Servo Writer Board
3. Servo Prom
4. Select drive jumper for Drive Ø
5. Plug power from servo board to disk drive.

Note: Connect the black wire from Servo Board to TP6 of Main PCB.

Connect the white wire from Servo Board to TP17 of Main PCB.

Drive should be exercised for one hour minimum before Servo Writing.

Upon completion all three LED's will be on (refer to Interpretation of LED).

I   Description

A. A "closed loop" techique is utilized in the writing of the bursts wherein a set of bursts is written without offset bias and the encoder offset in the corrected condition is determined. If this offset is excessive (greater than 250 millivolts), the measured offset is used as a bias in the writing of a new set of bursts. If the new offset is excessive, a third set of bursts is written using a value derived from the offset value at zero bias in conjunction with the bias value and the measured offset from the bursts written with the first correction bias used. If the offset is still excessive the process is repeated until either the measured offset is acceptable or 99 rewrites have taken place.

B. During the two hour stabilization period, the drive is constantly being monitored for proper operation in a sequence where: 1. A left burst is written and checked for proper sense over the offset range. 2. A right burst is written and checked for proper sense over the offset range. 3. A burst set is written and checked to be sure the offset value obtained is in a correctable range. 4. All cylinders are written with a right burst (done to insure the validity of the check for missing bursts). 5. The positioner goes to the landing zone, the spindle motor is turned off and the positioner lock solenoid disengaged. The spindle motor is then restarted and a restore sequence executed (done to insure that the solenoid can be retracted reliably and that the spindle motor and driver do not have any points in the rotation from which the motor cannot be restarted. 6. The positioner is reinitialized and sequence 1-5 repeated until the time wait is over.

II Interpretation of LED indicators upon completion of test

    A. No LED's on indicates an error in positioning system.

    B. LED 1 on indicates that bursts resulting in acceptable recovery offset could not be obtained in 99 retrys.

    C. LED 2 on indicates an error in spindle motor startup or loss of index signal from spindle motor.

    D. LED1 and LED2 indicates that a burst either could not be written or the recovery circuits were so badly biased that a proper sense could not be obtained even when only one burst was written.

    E. LED 3 on indicates a problem on the servo writer board where the counter which determines the operation to be performed could not be cleared.

    F. LED1 and LED3 on indicates that the burst recovery circuits have such a large bias that the condition is not considered correctable.

    G. LED2 and LED3 on indicates that an excessive time was required to complete the write and check sequences.

    H. LED1, LED2 and LED3 on indicates that the process has been completed sucessfully and that the unit is in the landing zone awaiting further manufacturing operations.

Note: The above LED patterns are indications only that are obtained by the interaction of the entire hardware system of drive, writer board, system power supplies etc., and system program. As a "for instance" the jumper wire to TP4 on the drive not being connected would prevent bursts from being written and would probably result in a LED1 and LED2 error indication.

WEDGE CHECK ON SCOPE

Scope Setting

    Channel 1 TP6 (Index)
   Channel 2 TP13,14 (MFM Data)

    Trigger Mode (Channel 1) Normal
    Display Channel 2

    Channel 1 set to 5v/Div.
    Channel 2 set to 50mv/Div.

    Time/Div 20 u.s.

Note: 1.   Observe steady Amplitude Burst
        2.   Length of each Burst should approximately be 64 u.s.
        3.   Observe a left and right Burst
        4.   Turn drive from one side to another and observe Burst
             correction

```
I
N
D
E
X
      |--- 64 u.s. ---|

-->  ┌─────────────┬─────────────┬───┬──────────────────┐
     │             │             │ H │                  │
     │             │             │ E │                  │
     │             │             │ A │      DATA         │
     │             │             │ D │                  │
     │             │             │ E │                  │
     │             │             │ R │                  │
-->  └─────────────┴─────────────┴───┴──────────────────┘
         Left          Right
         Burst         Burst
```
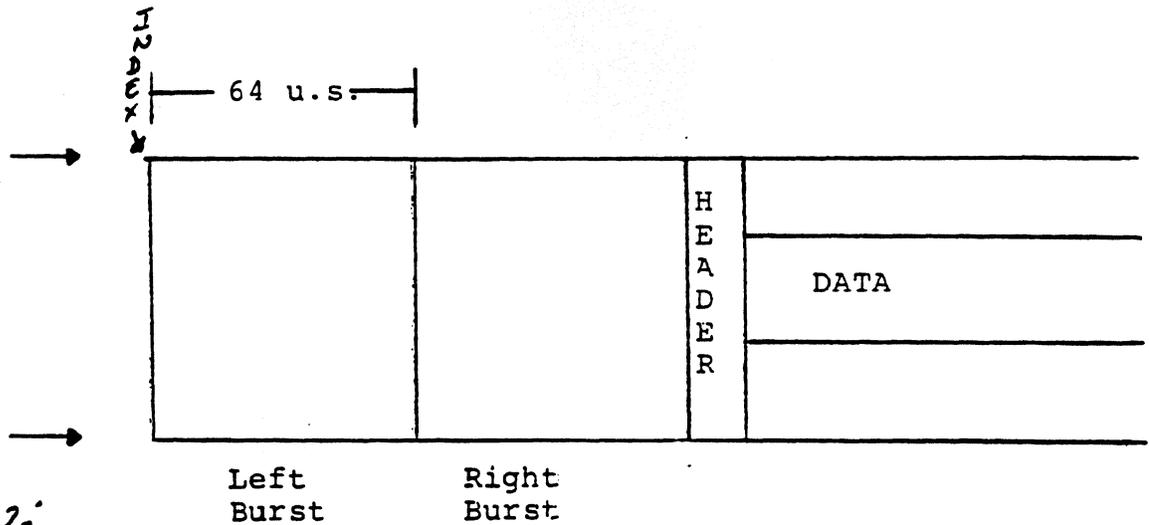
CAUTION:

PROM FAW 3 is to be used when servo
Writing Drives that have A 925 E PROM.

PROM SSW5 is to be used when servo
WRITING DRIVES that have A 972 E PROM.

NOTE:

These boards ARE NOT inter-changeable
between 925 to 972.

When the drive powers up, it has no idea what track its on,
which means it has no idea which head has servo pattern also.

The drive calls head zero, rushes toward zero counting head to
low offset voltages 5 all together, and one head to high offset
voltage. From hear head one is called and it is moved in
counting head to low offset readings which should be 6.
Process is repeated to assure good servo burst and trk aware-
ness.

Note: Media should be degaused to assure a clean burst and
burst must have no flaws.

-12 on zero and one must be very clean and degaused.

Note: Drive will find TRK00 without servo burst

76 ⟷ 79 TYPE
SERVO BURST
CM 6000 SERIES TRK00 EXPLANATION

TRK	BURST	HD	EXPLANATION
5		1	BURST ON BOTTOM/TOP
4		0	BURST ON BOTTOM/TOP
3		1	BURST ON BOTTOM/TOP
2		0	BURST ON BOTTOM/TOP
1		1	BURST ON BOTTOM/TOP
00		0	BURST ON BOTTOM/TOP
1		1	BURST ON LEFT BOTTOM ONLY
2		0	BURST ON LEFT BOTTOM ONLY
3		1	BURST ON LEFT BOTTOM ONLY
4		0	BURST ON LEFT BOTTOM ONLY
5		1	BURST ON LEFT BOTTOM ONLY
6		0	BURST ON LEFT BOTTOM ONLY
7		1	BURST ON LEFT BOTTOM ONLY
8		0	BURST ON LEFT BOTTOM ONLY
9		1	BURST ON LEFT BOTTOM ONLY
10		0	BURST ON LEFT BOTTOM ONLY
11		1	BURST ON LEFT BOTTOM ONLY
12		0	BURST ON RIGHT TOP ONLY

NOTE ✳ DRIVE will find TRK00
with out SERVO BURST