

DIGITAL	FCO	CATEGORY [0]	PAGE 1 OF 19
---------	-----	-----------------	-----------------

FIELD CHANGE ORDER	NUMBER: RA82X-0001
--------------------	--------------------

## APPLICABILITY:

Proactive replacement of all RA82 HDAs before Revision E5 with serial number below CX026J0600, or KB0xxxxxxxN. This revision supersedes previous revision, dated 30-Oct-1990.

## PROBLEM &amp; SYMPTOM:

HDA head crashes resulting in customer data loss.

## SOLUTION:

Replace all RA82 HDA's with new RA82 HDA in EQ Kit.

## QUICK CHECK:

RA82 HDA Revision E5, with serial number above CX026J0600, or KB0xxxxxxxN, and all Fx revisions.

## PRE/CO-REQUISITE FCO:

N/A

## MTTI HRS

2.4

## TOOL/TEST EQUIPMENT:

Velostat kit P/N 29-11762-00

## FCO PARTS INFORMATION

FCO KIT NO.	DESCRIPTION OF CONTENTS	EQ KIT VARIATION APPLICABILITY
EQ-01592-01 EQ-01592-02 FA-04922-01	See Page 2 for description of contents. FCO Document	N/A

## FCO CHARGING INFORMATION

## WARRANTY/CONTRACT

## NONWARRANTY/NONCONTRACT

## ON-SITE

## OFF-SITE

## ON-SITE

## OFF-SITE

## MATERIAL ONLY

TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	ORDER-ADMIN, HANDLING PKG, SHIPPING & EQ KIT
DEC	DEC	DEC	DEC	CUS	CUS	CUS	CUS	CUS

## APPROVALS

CSSE  
Karl Isbrecht

CSHQ LOGISTICS  
Dennis LeBlanc

CS PRODUCT SAFETY  
Robert Brister

CSSE MANAGER

This document is published

FCO RELEASE DATE

Art Bley	on multiple media including hardcopy, Customer Services	March, 1991
MICROMEDIA Diane MacDonald	Microfiche Libraries, Customer Services CD-ROM and MDS Microfiche	FCO REVISION B
POPULATION 28,059	Libraries.	PARTS AVAILABILITY November, 1990

```

- - - - -
|d|i|g|i|t|a|l|
- - - - -

```

FCO RA82X-0001

PAGE 2 OF 19

FCO PARTS INFORMATION: (Continued from Page 1)

EQ-01592-01 contains the following:

- 1 - 70-21170-01 RA82 HDA Assembly
- 1 - 12-12635-08 Woven Belt (60Hz)
- 1 - 70-27510-01 RA8X Cable/Spring Assembly
- 1 - FA-04922-01 FCO Document

EQ-01592-02 contains the following:

- 1 - 70-21170-01 RA82 HDA Assembly
- 1 - 12-12635-09 Woven Belt (50Hz)
- 1 - 70-27510-01 RA8X Cable/Spring Assembly
- 1 - FA-04922-01 FCO Document

REFERENCE: SA482 STORAGE ARRAY USERS GUIDE      EK-SA482-UG-001  
SA482 STORAGE ARRAY SERVICE MANUAL      EK-SA482-SV-001

-----  
LIFE SUMMARY: The LIFE program (Life Interval Functional Evaluator) is an information service for high availability service delivery within storage subsystems. LIFE provides the essential information needed to implement a proactive replacement service strategy.

The LIFE tools within the STARS database are accessible either directly from STARS or through the CSCs. The information is then used by the local service engineer as part of a planned replacement strategy for Digital disks at each site. The LIFE program is currently restricted to RA82 HDA's only. This information can be accessed by two methods:

CSC LIFE Information Service

1. The local CSE acquires the HDA serial number and revision from the bar code label.
2. He then calls the CSC and requests LIFE information service. He will be required to give a valid Digital badge number and

EMAIL address for output.

3. The CSC engineer accesses the STARS database and manually enters the device name, device type, HDA serial number, and HDA revision into the LIFE table tool.
4. The output file is sent to the designated EMAIL address for use by the local CSE. The output information is Digital Confidential.

#### Direct STARS Access

1. The CSE acquires the HDA serial number and revision from the HDA.
2. The CSE then accesses the STARS database and selects the LIFE option. He will then be prompted for inputs and receive immediate output information.

PROPRIETARY INFORMATION: The output information supplied by LIFE is Digital Confidential and must be managed at the local level appropriately. It is the responsibility of the local service delivery unit to assure that this information is not used by anyone outside of the corporation. This includes consultation with the customer for whom the LIFE information is being obtained.

d	i	g	i	t	a	l	

FCO RA82X-0001

PAGE 3 OF 19

READ BEFORE PROCEEDING WITH FCO IMPLEMENTATION  
 =====

#### THERMAL STABILIZATION REQUIREMENTS

A period of time should be allowed for temperature stabilization to occur when transporting HDA's from a colder to a warmer environment and vice-versa. The possibility for condensation to form once the HDA has been cooled and then heated quickly is quite high. This can cause head disk interference to occur.

Arrangements should be made to insure that the HDA has time to thermally stabilize. During the winter months, when a large portion of this FCO activity will take place, the difference in temperature between an HDA that has just come in from being transported in the cold, and a computer room environment, can be quite large. If no time is allotted for this this temperature difference to equalize, humidity in the air inside the HDA can actually condense into water inside the HDA and the probability of a head crash is high. The time required for stabilization varies directly with the difference in temperature.

In storage or shipping, (with the HDA packaged for shipping), the HDA should not be subjected to temperatures outside the range specified by DEC STD 102, -40C (-40F), to 66C (151F). The maximum temperature gradient must not exceed 22 deg C per hour, or 40 deg F per hour. If the ambient temperature in which the HDA was stored was between 10C and 38C (50F and 100F), the HDA may be installed immediately. If the ambient temperature was between 0C and 10C (30F and 49F), the HDA should be allowed to warm to room temperature 22C (approximately 70F), in the closed shipping container for three hours minimum and then installed. For temperatures below 0C (30F), allow 1 1/2 hours more for every 12C (10F), in addition to the three hour minimum.

A very cold HDA that was stored in a van overnight at -23C (-10F), for example, could take as much as 9 hours to thermally stabilize to the point where actual operation would not be risky. A maximum period of 13.5 hours could be required to allow thermal stabilization to take place from the lowest acceptable temperature to a standard computer room temperature.

With this in mind, it would be appropriate to have HDA's delivered to the site scheduled for PMC, the day or evening before the actual PMC is to take place. On a day to day operational basis, this may be best handled by having a PMC specialist responsible for delivering the next day's (or that evening's), HDA's in time to assure thermal stabilization and then doing the PMC at the appropriate time afterwards.

Most of this risk can be easily managed by not subjecting the HDA to extreme temperatures, i.e., put the HDA in a warm vehicle, and deliver it to the site.

```
|_|_|_|_|_|_|_|_|_|
|d|i|g|i|t|a|l|
|_|_|_|_|_|_|_|_|_|
```

FCO RA82X-0001

PAGE 4 OF 19

---

RA82 HDA REPLACEMENT  
-----

1. Request the RA82 drive from the customer per PMC schedule.
2. The RA82 drive must be dismounted and deselected.
3. Depress the "A" and the "B" port switches on the Operator Control Panel to the "OUT" position (See Figure 1).
4. Spin down the drive by depressing the RUN/STOP switch on the Operator Control Panel to the "OUT" position (See Figure 1).

NOTE

It is recommended that AC POWER is not removed from the drive being serviced until after the drive is out on its slides. Maintaining power to the drive allows the heads to remain stable and decrease the chance of media/head damage when sliding out the drive.

- 5. Loosen the two hex latch releases located at the top of the SA482 front door and lift up and out on the panel (See Figure 1).
6. Ensure the leveler feet are downward, making solid contact with the floor. Loosen lock nut and turn the leveler hex nut downward (See Figure 2).
7. Pull out the cabinet stabilizer bar (See Figure 3).

C A U T I O N

NEVER SLIDE A DRIVE OUT OF THE CABINET WITHOUT EXTENDING THE CABINET STABILIZER BAR.

- 8. Remove the back door of the cabinet by pressing down on each of the two latch release buttons, and then lifting and removing the door from the bottom two support brackets. Verify all cabling in rear is uniform and not tangled or crimped by sliding drive in and out.
9. Remove the 1/4-inch screws holding the front of the disk drive to the electrostatic discharge brackets.
10. Slowly pull the drive out on it's slides until it locks into place.
11. Push up on the slide lock arm "A" to further extend the drive all the way out (See Figure 4).

FCO RA82X-0001

PAGE 5 OF 19

\_|\_|\_|\_|\_|\_|\_|\_|\_|
|d|i|g|i|t|a|l|
|\_|\_|\_|\_|\_|\_|\_|\_|\_|

- 12. TURN OFF THE AC CIRCUIT BREAKER AT THE REAR OF THE DRIVE AND DISCONNECT THE MAIN AC POWER CORD FROM THE POWER SUPPLY ON THE REAR OF THE DRIVE.

13. Unlock the upper chassis assembly by turning the two cam latches under the front bezel 180 degrees counterclockwise with a 5/16" allen hex wrench (See Figure 5).
14. Raise the drive logic chassis assembly until the damper (gas spring) lock slides in place and supports the upper chassis assembly and the cover is supported by the damper (See Figure 6).

```
*****
*                                     *
*                               CAUTION *
*                                     *
* CHECK FOR DEFECTIVE GAS SPRINGS.  A DEFECTIVE GAS SPRING WILL *
* NOT SUPPORT THE DRIVE LOGIC CHASSIS WHEN RAISED. REPLACE ANY *
* DEFECTIVE GAS SPRINGS. (12-24693-02) *
*****
```

```
*****
*                                     *
*                               CAUTION *
*                                     *
* FOR DRIVE PROTECTION, A GROUNDING (ELECTROSTATIC *
* DISCHARGE) WRIST STRAP MUST BE USED WHEN HANDLING *
* DRIVE MODULES AND COMPONENTS. *
*                                     *
* SPREAD OUT ESD MAT ON A FLAT SECURE WORKING SURFACE *
* TO LAY THE READ/WRITE MODULE AND NEW HDA ON. *
*****
```

15. Attach the alligator clip (ESD wrist strap grounding cord) securely to a clean, unpainted grounded metal surface such as the drive chassis.
16. Unplug connector P502 from the Read/Write module (See Figure 7).
17. Unplug connectors P602 and P603 from the HDA preamplifier module (See Figure 7).
18. Place the cable spring assembly into the RELEASED position. (See Figure 8).
19. Remove Read/Write Module by unplugging connectors P501 and P503 from the Read/Write module (See Figure 7).
20. Remove the four 1/4 inch screws holding the Read/Write module to the HDA (See Figure 7). Remove the ground strap connected to the HDA chassis at this time also.
21. Lift and remove the Read/Write module (See Figure 7).
22. Using a 7/16" nut driver, remove the four HDA retaining nuts and washers (See Figure 7).



23. Place the positioner lock into the LOCK position (See Figure 9).
24. Remove the HDA from the drive by lifting it from diagonally opposite corners. CAUTION, the HDA weighs approximately 35 lbs.
25. Place the HDA on a level surface in the vertical position only. Plastic Feet are provided on the front cover of the HDA for this purpose.
26. DO NOT place the HDA in a horizontal position (on pulley) or the speed and temperature transducers mounted on the bottom of the HDA could be damaged.
27. Before NEW HDA is installed, a new Woven drive Belt (12-12635-08 60Hz or 12-12635-09 50Hz) and a RA8X Cable Spring Assembly (70-27510-01) included in EQ kit, need to be installed.
28. Install both new Drive Belt and Cable Spring in place of existing old Belt and old Cable Spring (See Figure 10).
29. Prior to unpackaging and replacing an HDA, the replacement HDA must be thermally stabilized before its protective barrier bag is opened and HDA is installed.
30. Prior to installing a replacement HDA, the HDA must thermally stabilized as stated above.

Under NO circumstances should the HDA be left overnight in an uncontrolled temperature environment where cold temperatures could have occurred (i.e. in a car) and then opened/installed without the proper thermal stabilization period. After the thermal stabilization criteria has been met, open the HDA box and carefully cut the heat-sealed end of the barrier bag. Unpackage New HDA and carefully remove HDA Spindle Pulley lock. Use HDA Spindle Pulley lock, to lock the spindle pulley of the old HDA in place before packing old HDA for shipping.

Visually inspect New HDA for any damage before it is installed.

#### HDA INSTALLATION PROCEDURE:

31. Check that the cable spring assembly is in the RELEASED position (See Figure 8).
32. Position motor/brake assembly towards front of drive (swing slightly out on pivot rod) to take tension off drive belt.
33. Center the drive belt on the belt ramp bracket on the lower chassis (See Figure 10).

\_	\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l	
\_	\_	\_	\_	\_	\_	\_	\_

\*\*\*\*\*  
\* CAUTION \*  
\* \*  
\* Damage to the HDA or drive belt may result if the drive belt \*  
\* is not aligned correctly. \*  
\* \*  
\*\*\*\*\*

34. Lift the HDA by diagonally grasping opposite corners and carefully lower it over the four mounting bolts.

Again, The HDA weighs approximately 35 pounds.

35. Replace the four nuts and washers that hold the HDA to its mounting bolts and firmly tighten the four nuts to the mounting bolts with a 7/16 inch driver. Torque nuts 5-6 lbs per inch (2.7 kilograms per centimeter).
36. Install the original Read/Write module and cable on top of the new HDA.
37. Reconnect the Ground Strap to the HDA.
38. Connect P502 from the Read/Write module.
39. Connect P602 and P603 to the Read preamplifier module on the front of the HDA.
40. Connect P601 to the HDA read preamplifier.
41. Dress the Read/Write cable between ribs on HDA clamshell to assure that cable does not get pinched when cover is closed.
42. Place the cable spring assembly in the ENGAGED position.

Ensure the cable spring assembly is seated in the cable spring lock bracket. An ERROR code 50 may occur if cable spring is not seated properly.

Check tension cable. It should be aligned in a free moving pulley (part of pulley bracket assembly behind motor.) Use 3-IN-ONE oil (or general purpose lubricant) on pulley to free up washers and pulley bearings if pulley doesn't move freely. Use caution when applying oil. Cover the pulley assembly with a rag before applying lubricant to prevent oil from



splattering on drive belt.

- 43. Reconnect the AC power cord at the rear of drive, to the AC receptacle
- 44. Turn the AC Circuit Breaker, at the rear of the drive, to the "ON" position

```

|_|_|_|_|_|_|_|_|_|
|d|i|g|i|t|a|l|
|_|_|_|_|_|_|_|_|_|

```

FCO RA82X-0001

PAGE 8 OF 19

- 45. Turn the HDA positioner lock counterclockwise to the UNLOCK position. The lever must be lifted to clear the surface of the Read/Write module.
- 46. Spin up the drive by pressing the RUN/STOP switch.  
(If an Error occurs, recheck the cable spring interlock switch.)
- 47. Gently close the logic chassis, DO NOT SLAM - HDA DAMAGE MAY OCCUR.
- 48. Push in on slide arm "B" and slowly slide the drive back into the cabinet (See Figure 4).
- 49. Re-install the screws holding the front of the drive to the electrostatic discharge bracket

```

*****
*                               C A U T I O N                               *
*                               *                                           *
* THE SCREWS HOLDING THE FRONT OF THE DRIVE TO THE *
* ELECTROSTATIC DISCHARGE BRACKET MUST BE INSTALLED *
*                               *                                           *
*****

```

- 50. Re-install back door.
- 51. After the drive has spun up and a ready light is "ON", press the "A" and/or "B" port switches on the Operator Control Panel to the "IN" position
- 52. Run 15 minutes or one (1) pass of RA82 drive diagnostics.

VAX

32 BIT

UDA50, KDA50 or EURLG

HSC50/ILEXER

KDM70/ILEXER

MDM/UTILITY SECTION/TEST 1

Formatting the RA82 HDA may be required if any hard errors (Positioner or Uncorrectable ECC errors) are evident due to shipping or mishandling. Formatting the RA82 HDA is not recommended for soft errors.

53. Return the RA82 drive to the customer.
54. Enter the FCO activity in the Site Management Guide/Drive status sheet, and complete the LARS form for FCO reporting, making sure to indicate PROACTIVE replacement. (See LARS example on following page.)

```

|_|_|_|_|_|_|_|_|
|d|i|g|i|t|a|l|
|_|_|_|_|_|_|_|_|

```

FCO RA82X-0001

PAGE 9 OF 19

## LARS

CATEGORY F	USA	GIA	EUROPE
Activity -			
(a)Contract and Warranty	W	U	Y
(b)IN-DEC Contract	K		
Hardware Segment Code	111		
Non Contract/Non Warranty	F	F	F
(c)RTD/Off-site Agreement	F		
Product Line	01		
DEC Option	RA82X	RA82X	RA82X
Type of Call	M	M	M
Action Taken	D	D	I
Fail Area-Module-FCO-Comments	RA82X-0001	RA82X-0001	RA82X-0001
Material Used	EQ-01592-01	EQ-01592-01	EQ-01592-01
	EQ-01592-02	EQ-01592-02	EQ-01592-02
(a) Warranty Optimum, Warranty Standard and Warranty Basic (on-site) Agreements.			
(b) Applies to INDEC AREA ONLY - Warranty Optimum, Warranty Standard and Warranty Basic (on-site) Agreements.			
(c) RTD=Return to Digital or Off-site Agreements; If Field Engineer On-site, use Activity Code "F".			

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 10 OF 19

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 11 OF 19

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 12 OF 19

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 13 OF 19

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 14 OF 19

\_	\_	\_	\_	\_	\_	\_
d	i	g	i	t	a	l
\_	\_	\_	\_	\_	\_	\_

FCO RA82X-0001

PAGE 15 OF 19

|\_|\_|\_|\_|\_|\_|\_|

FCO RA82X-0001

|d|i|g|i|t|a|l|  
|\_|\_|\_|\_|\_|\_|\_|\_|

PAGE 16 OF 19

\_|\_|\_|\_|\_|\_|\_|\_|  
|d|i|g|i|t|a|l|  
|\_|\_|\_|\_|\_|\_|\_|\_|

FCO RA82X-O001

PAGE 17 OF 19

\_|\_|\_|\_|\_|\_|\_|\_|  
|d|i|g|i|t|a|l|  
|\_|\_|\_|\_|\_|\_|\_|\_|

FCO RA82X-O001

PAGE 18 OF 19

\_|\_|\_|\_|\_|\_|\_|\_|  
|d|i|g|i|t|a|l|  
|\_|\_|\_|\_|\_|\_|\_|\_|

FCO RA82X-O001

PAGE 19 OF 19

\^ RA82X  
\ \ISBRECHT  
\ \RA82X  
\ \FCO\_DOCS  
\ \MAR  
\ \1991  
\ \RA82  
\ \FA-04922-01  
\ \EQ-01592-01  
\ \EQ-01592-02