DIGITAL	FCO	CATEGORY [I]	PAGE 1 OF 4

FIELD CHANGE ORDER   NUMBER: RA70X-I002

APPLICABILITY:
This FCO should be implemented on all RA70X disk drives manufactured before October, 1991. See Page 2 for more detail.

PROBLEM & SYMPTOM: Due to stress relief of the positioner block, the heads in the RA70 will become offset over time, causing E9 and E25 errors. These errors will lead to customer data loss.

SOLUTION: Replace UV ROM.

QUICK CHECK: Use the command "SHOW DISK" to see the μcode revision. If it is below V83, it should be replaced.
You may also use LIFE to get a listing of the drive and code revision.

PRE/CO-REQUISITE FCO: See Page 2.

MTTI HRS
.5 Hrs.

TOOL/TEST EQUIPMENT:
Velostat Kit (P/N 29-11762-00)

FCO PARTS INFORMATION

FCO KIT NO.	DESCRIPTION OF CONTENTS	EQ KIT VARIATION APPLICABILITY
EQ-01619-02	1 23-637E6-00 UV ROM	The -02 kit replaces the
FA-04952-02	1 FCO Document	-01 kit

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 Gary Kline	CSL LOGISTICS Robert Clark	CS PRODUCT SAFETY Robert Brister
CSSE MANAGER Art Bley	This document is published on multiple media including hardcopy, Customer Services	FCO RELEASE DATE

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The drive's microcode is resident in a 28 pin, DIP-socketed
"UV-ROM" in socket E4 on the read-write module (54-17775).
Note: This is the ONLY "IC" which has a plug-in socket on either
module making up the ECM Assy.

The code revisions have these part numbers:

```
        ECM   at    J6    P/N   =   23-541E6-00   V79
        ECM   >>    J6    P/N   =   23-587E6-00   V81
        ECM   >>    K8    P/N   =   23-627E6-00   V82
        ECM   >>    L1    P/N   =   23-637E6-00   V83
```

[Note, V80 was never released to the field]

The new code (V83), is compatible will all revisions of the ECM
module set.

                        FCO PROCEDURE

1.   Refer to RA70 Disk Drive Technical Manual EK-ORA70-TD-001
     and SA70 Enclosure Service Manual (in SA705 / "Bonsai" Cab)
     EK-SA70E-SV-002 for steps required and necessary procedures to
     access the ECM assembly.

2.   After separating the HDA from the Electronic Control Module
     (ECM), perform the following steps:

     A.   Place the ECM module set on the Velostat mat.

          NOTES:

          - The ECM module is made up of two separate modules.

          - The module WITHOUT the large hole is the read-write module.

          - The module WITH the large hole is the servo module.

- Both modules are interconnected via J5 and J6
            [J5 is 2 3/4 inches long and J6 is 2 3/8 inches long]

      B. Make absolutely sure that your ESD wrist straps are in place!
          (Continued on Page 3)


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      C. Position the ECM upright, so that the servo module (with
          big hole), is on your left and the hole closest to you.
          (J5 connector will be facing up.)

      D. Stabilize the ECM in this position with fingers of either
          hand, leaving your thumbs free.

                              CAUTION

           During the following separation procedure, be careful
          of any pins protruding from either circuit board, so as
                  not to puncture your thumbs and fingers.

      E. Center your thumbs over J5 while supporting both
          modules with fingers and palm; then, very gently exert
          pressure outward (left thumb pushing against Servo Module and
          right thumb pushing on R/W Module, until the male pins
          of the R/W module have cleared connector J5.

      F. Turn the ECM over so that now the large hole appears
          on the right side.

      G. Repeat the same procedure to separate J6 connector.
          J6 is positioned closer to the edge of the circuit
          board and so, restricting the "grab" surface for your thumbs.
          Take a small flat-bladed screwdriver and wedge it into the
          gap between left module and the connector shroud for the male
          pins of the right module. After the modules have come apart
          about 1/8 inch, use your thumbs to separate them completely.

      H. With both modules now apart, position them flat on the
          Velostat mat, with circuit board components facing up.

      I. The Servo module (large hole), will now be on the right
          and the R/W module on the left side, in front of you.

      J. Facing the left module (= R/W Assy), identify IC socket

location E4 in the left corner closest to you. This is the
only socketed IC on the R/W module.

K. With a small, flat bladed screwdriver, gently (partially)
lift this ROM on the side closest to S1 and E1.
S1 and E1 can be used as leverage points for the screwdriver.
Repeat the same "crow bar" procedure to lift up slightly on the
opposite end of E4 (next to Y1 Crystal), but DO NOT use
Y1 as a leverage support. Alternately raise the ends of E4
until this ROM has cleared the socket.

                              CAUTION

         Do not grab the IC between your thumb and index finger
        to pull it out of its socket. The ROM would very likely
            flip over and puncture your fingers with its pins.

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L. Check and straighten (if needed) the pins of the
FCO ROM part. Line up the ROM over the E4 socket
so that the IC-reference notch matches, and gently push
E4 into its socket, making sure that none of the
IC pins get damaged or bent.

M. Realign both modules with J5/J6 connectors and push
these connectors together, one connector at a time.

N. Now resume the assembly procedure in accordance with the
technical reference material listed under step 1.
(Attach the ECM to the HDA Assy. and re-install
the drive into its corresponding cabinet.)

O. Power on the drive and wait for the LEDs to go off. This
indicates the drive has passed its power up diagnostics.

P. Spin up the drive and wait for the ready light to come on.
This indicates the drive has passed spinup diagnostics.

Q. Run HSC/HOST diagnostics for 15 minutes. Make sure these
diagnostics run only within the diagnostics area of the drive.

R. Update LARS as per following example.

                              LARS

```
     CATEGORY I                      USA           GIA         EUROPE


     Activity -
     (a)Contract and Warranty        W             U           Y
     (b)IN-DEC Contract              K
        Hardware Segment Code        111           031
        Non Contract/Non Warranty    F             F           F
     (c)RTD/Off-site Agreement       F
        Product Line                 031           031


     DEC Option                      RA70          RA70        RA70
     Type of Call                    M             M           M
     Action Taken                    D             D           I
     Fail Area-Module-FCO-Comments   RA70X-I002    RA70X-I002  RA70X-I002
     Material Used                   EQ-01619-02   EQ-01619-02 EQ-01619-02
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(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".

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\\FCO_DOCS
\\RA70X
\^ RA70
\\RA7X Disk Drives
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