DIGITAL	FCO	CATEGORY	PAGE 1
		[F]	OF 14

FIELD CHANGE ORDER NUMBER: DS-173Q1-F001

APPLICABILITY:
This FCO should be installed on all MIRA systems shipped before 03-Jul-1989.

PROBLEM & SYMPTOM: Cross talk problem between Dispatcher cable and switched
cable. Revision incompatibility problem between M7764-00 and M7763-00 module.

SOLUTION:

QUICK CHECK:

PRE/COREQUISITE FCO: None

MTTI HRS

3.5 Hrs.

TOOL/TEST EQUIPMENT: None

FCO PARTS INFORMATION

FCO KIT NO.	DESCRIPTION OF CONTENTS	EQ KIT VARIATION APPLICABILITY
EQ-01568-01	2 M7763, 2 M7764, 2 cables 70-27118-03	N/A
FA-04893-01	FCO Document	

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	FSHQ LOGISTICS	FS PRODUCT SAFETY
J.Claude Chalumeau	Rick Orlando	Robert Brister

CSSE MANAGER	FS. MICROFICHE LIBRARIES	FCO RELEASE DATE
Guy Caillaud	VAXDOC EP-CSVDC-LB	9 April 1990
_____	_____	_____
MICROMEDIA		FCO REVISION
Diane MacDonald	STARS	A
_____	VAX Notes	_____
POPULATION		PARTS AVAILABILITY
_____	_____	_____

```
 _ _ _ _ _ _                  |        FCO   DS-173Q1-F001
| | | | | | | |               |
|d|i|g|i|t|a|l|               |        PAGE 2 OF 14
|_|_|_|_|_|_|_|               |
                             |
_____|_____
```

Applicability: (Continued from Page 1)

     All MIRA systems, Revision A1 or A2, with the following part
     numbers are affected:

     o DS-173Q1-A2/A3

   This FCO is also required for Special Customized MIRA PDP systems
   (not always referred to with the part numbers listed above), that
   use the MIRA logic modules M7763 and M7764 at Revision D
   or below.

   This FCO incorporates ECO's M7763-AE006, M7764-AE004, DS173QZ-AE004.

   This FCO also provides the functionality enhancements made in the
   following ECO's:

     o M7763-AE004 Implement DC LOW
     o M7764-AE003 add LM339 to drive DCOK (DC LOW)
     o M7763-AE005 etch re-layout to suppress extra wires

    Implementation: Planned call, as the whole system must be shutdown,
    and the customer application stopped to install this FCO.

 Problem/Symptom: (Continued from Page 1)

    Intermittent data corruptions happen when testing switched KMV1A
    with XXDP Diagnostics in MIRA Systems. The data was corrupted by
    cross-talk between cables generated by the BC05L cable between the
    MIRA watch-dog Module (M7763-00) and the dispatcher module
    (M7764-00).

A re-layout of the two modules M7763-00 and M7764-00 has been
necessary to adapt the impedances between these modules. Both M7764
and M7763 become Revision E with the new etch. A new cable 70-27118
has been designed to replace the BC05L cable.

The new modules M7763 and M7764 at Rev E cannot be used with the
previous revision D or below.

Solution: (Continued from Page 1)

    Replace all modules M7763 and M7764 at Revision D or below by new
    modules at Rev E and replace BC05L dispatcher cables at one time.

Quick Check: (Continued from Page 1)

    If all the cables on the watch-dog module M7763-00 are flat cables
    this FCO is required.

    If you find a round cable (70-27118-03) connected to the M7763, the
    module is at the correct Revision (E), and the FCO is not required.

    NOTE: This can be checked in both systems A or B, as they must
    be identical in terms of revision levels of M7763.

INTERCONNECTION OF MIRA MODULES (SYSTEM A is shown)

      WATCH DOG MODULE TO BE REPLACED   COMPUTER A
          --------------------------   CPU BOX SLOT 3

```
         /   M7763                      /
        /           +-------+          /
       /            |  J2   |         /
      /             +-+---+-+        /
     /                |   +-------------+
    /                 | 70-23890-03     |
   /                  +------------+     |
  /                        /       |     |
 /                        /        |     |
/       +-------+        /         |     |
/       |  J1   |       /          |     |
/       +-+---+-+      /           |     |
-------------|     +---------------+---+----------+
            |     BC05L-03  Replaced by  70-27118-03 cable
            +----------------------+---+--------+    |
                                   |   |        |    |
                                   |   |        |    |
                                   |   |        |    |
DISPATCHER MODULE TO BE REPLACED   |   |        |    |
                                   |   |        |    |
  SWITCHING        ----------------|   |--------|    |-----------
  BOX A            / M7764         |   |        |    |          /
  SLOT 1          /                |   +-----++ +---++          /
                 /                 |   || J6  || J5  |         /
                /                  |   +-+-+-++-----+          /
               /                   |   |                     /
              /                    |   |                    /
             /                     |   |                   /
            /     +-----+  +-----+ ++---++  +-----+        /
           /      | J4  |  | J3  | | J1  |  | J2  |       /
          /       ++---++  ++---++ +-----+  ++---++      /
         /         |   |    |   |   |   |    |   |      /
   _____|   |____|   |_____|   |___/
              |   |    |   |                |   |
              |   |    |   |                |   |
      70-23891-03     70-23892-03         70-23893-03
   TO DISPATCHER M7764    TO THROUGH PASS    TO ALARM PANEL
   IN OTHER SYSTEM        CONNECTOR
   (TWISTED HALF TURN)    (TO FRONT PANEL)


    _ _ _ _ _ _ _           |        FCO  DS-173Q1-F001
   | | | | | | | |          |
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   |_|_|_|_|_|_|_|          |
                            |
_____|_____


   FIELD INSTALLATION AND TEST PROCEDURE FOR FCO DS-173Q1-F001
   ----------------------------------------------------------------


Preliminary Recommendations:
----------------------------
```
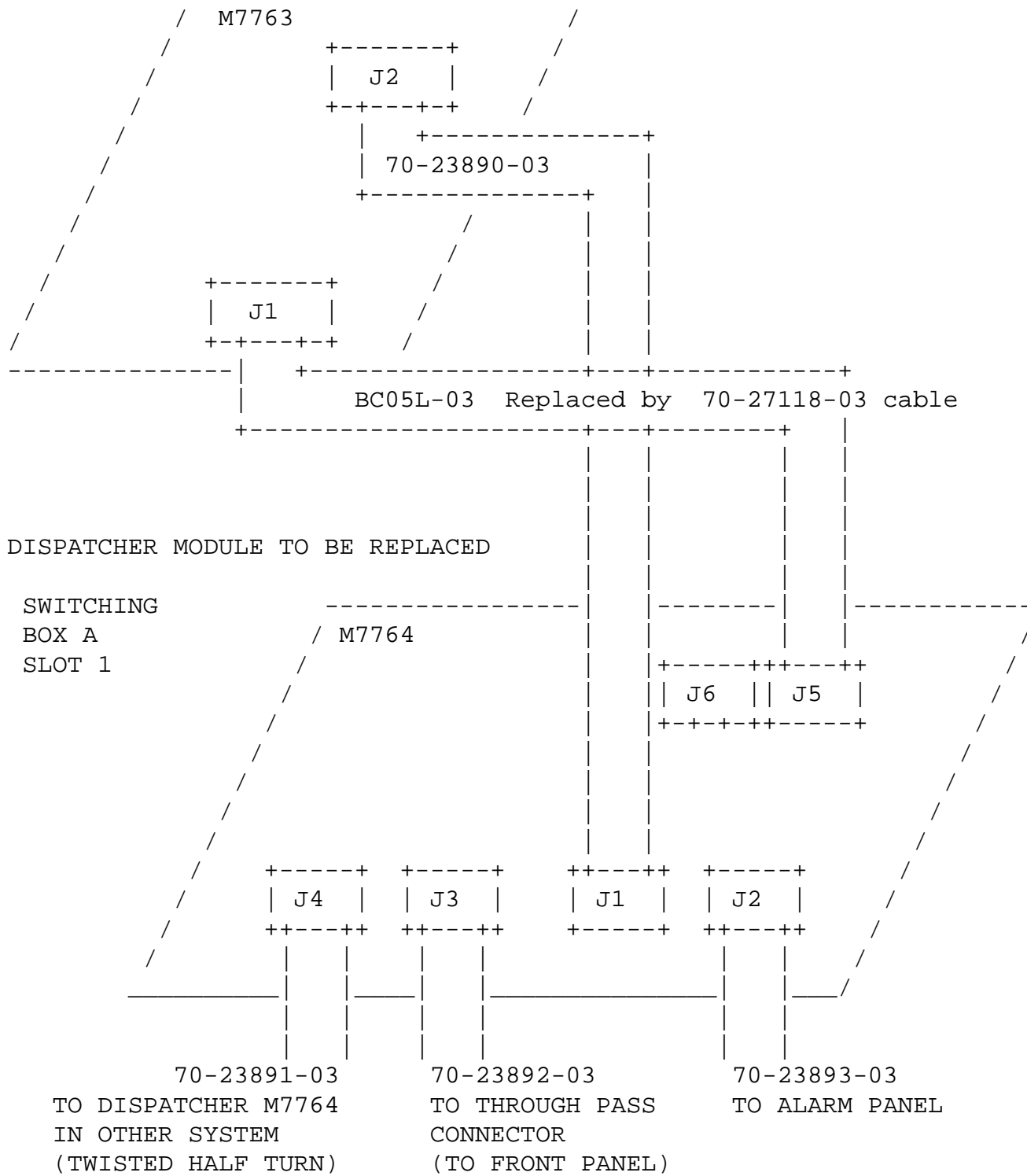
This FCO replaces all watch-dog, dispatchers modules and BC05L
cables attached to these dispatchers. This replacement requires the
complete MIRA to be powered down.

Before making any modifications to the system, insure both MIRA
systems have no hidden fault in their hardware.

The best way to check complete MIRA system integrity is to ask the
System Manager or User to run the MIRA TEST command and if the test
is successful, to make a MIRA SWAP with his application.

If the system has a fault somewhere, do not attempt to implement this
FCO, but fix the system first.

The interconnection of the modules and cables to be replaced is shown
on Page 4.

The test procedures under RSX are separate and given on Page 10.

The watch-dog link cable (70-23891-03) between the A and B systems,
connected on J4 of M7764 modules in switching boxes 0, is a half-turn
between both systems. It is wise to mark the upper side on both ends
of this cable before disconnecting.

There are some "traps" with in MIRA behavior for non-aware persons
during use of diagnostics. See test procedure on Page 9 for details.

==========
WARNING
==========

The customer might have modified the STARTUP.CMD file to include
the startup of MIRA software. Some processes require undetermined
time to start, and could cause TIME-OUT when the software MIRA is
started. To avoid this potential problem of MIRA time-out when you
will reboot the Operating System, you must check the STARTUP.CMD
on both System A and B before you stop the system. If MRASTART.CMD
is included in the system startup command file, modify the STARTUP
file and put the MIRA start command MRASTART.CMD as a comment line.
You must do these checks and modifications on both systems A and B.
This will allow you to start MIRA software manually and check
the system as described on Page 10 after you have installed the FCO.

```
 _ _ _ _ _ _ _               |        FCO   DS-173Q1-F001
| | | | | | | |              |
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|_|_|_|_|_|_|_|              |
                             |
_____|_____

     Field Installation
```

```
              ------------------

                      Pre-Test of System
                      ------------------


 1. Check the STARTUP.CMD files on both systems as described in the
    **WARNING** on Page 5. Modify the files if necessary and ask the
    System Operator to stop the application. Installation of this
    FCO needs to stop both systems A and B.

 2. Run MIRA test on System A and System B. (See test on Page 10).

 3. If MIRA test is successful on both system, issue a SWAP at operator
    console. If MIRA SWAP fails, do not attempt to install this FCO.
    Refer to MIRA Installation and Maintenance Guide EK-MIRAI-MM.

 4. Stop MIRA on both systems using MIRA STOP DCL command.  (standby
    first, then Master)

 5. Shut down the system by executing the Shutdown Command Procedure.

       $ @SYS$SYSTEM:SHUTDOWN on both systems.

                    FCO Hardware Installation
                    -------------------------

 6.  Power-Off Instructions

     After the system has been shut down, switch off both CPU A
     and B with Front Panel CPU switches.  Place the two Circuit Breakers
     for System A at the top of cabinet and System B at the bottom of
     cabinet, in the "OFF" (0) position.  Wait five minutes to allow the
     capacitors to bleed down.

 7.  Use ALL ESD safety precautions to prevent DOA modules in upgrade kit.

 8.  Utilize static strap. Unpack FCO material.

 9.  On System A (Top system):

10.  Open the unswitched I/O panel door.

11.  Remove the M7763-00 module from slot 3.  Note switch settings.

12.  Disconnect cable BC05L-03 from connector J1.

13.  Mark orientation and disconnect cable 70-23890-03 (20 pins)
     from connector J2.
```

14. Take the new module M7763-00 at Rev. E and reconnect the cable
    70-23890-03 (20 pins) into connector J2.

15. Connect the new round cable (3 feet) 70-27118-03 into J1
    of the M7763 module (note mark on connector upper side).

16. Set CSR and Vector address switches as on the old M7763 module.
    (See switch settings on Page 13, if necessary.)

17. Plug the new M7763-00 into slot 3 of CPU box.

18. Route the new round cable 70-27118-03 to the switching box 0.
    (It will go to the dispatcher M7764 in slot 1 of this box.)

19. Remove the dispatcher module M7764-00 from slot 1 of switching
    box 0. Note the switch position E5 on the left of the board.
    (See switch settings on Page 13, if necessary.)

20. Disconnect cables from connectors J5, J6, J2, J1, J3, J4.

21. Reconnect cables on the new M7764-00 rev E module on connectors
    J2, J1, J3, J4. Note cables orientation especially J4 (watch-dog
    link).

22. Replace the BC05L-03 cable from the M7763-00 by the round cable
    (3 feet) 70-27118-03. Connect it to J5 (right hand side)
    of the M7764 module. Note that J5 and J6 locations can vary
    on previous revisions modules (A, B, C or D).

23. Remove the BC05L-03 flat cable from the system, store it for return
    to logistics.

24. Set up the E5 switches as they were on the old M7764 module.

25. Plug the M7764 Module in the backplane.

26. Check if all cables are properly set up. Close the CPU panel.

27. You can now power-up System A. Observe the CPU self test sequence.
    (It is possible to see a double boot during self tests, this is
    not a failure, the second pass must be OK, proceed to next step).

28. Start loading of diagnostics on CPU A.

29. Once the diagnostics are loading, you can start the FCO installation
    on System B.

Upgrade System B
----

30. Repeat the similar procedure for system B to replace the M7763
    and M7764 modules and cables. Using the same recommendations as
    as mentioned in Step's 10 through 26.

31. Do not power-on System B immediately.

Testing MIRA with Diagnostics
----

32. Test System A with XXDP Diagnostics.

    Once the diagnostics are loaded, you can power-up System B
    and start loading diagnostics on System B.

33. Running system exerciser tests in verify mode on both systems
    A and B is normally sufficient. During MIRA tests, check warning
    messages, to insure switching boxes and switching modules are
    correctly seen by the MIRA diagnostics. (See diagnostics for
    details on Page 9)

34. When diagnostics have been run successfully, power-off
    Systems A and B to reset the entire system.

Testing MIRA under RSX
----

35. Power-on both systems and Boot the Operating System on both CPU's.

    WARNINGAfter FCO installation the MIRA Software will fail
    if only one CPU is booted with Operating system.

36. Log in as system operator.

37. Test MIRA as described in MIRA Testing procedure on Page 10.

38. Modify the STARTUP.CMD files if necessary and ask the System
    Operator to restart his application.

Complete Site Administration
----

39. Update the module revisions to E1 and system revision level to
    A3 on the MIRA configuration sheet in the cabinet.

40. Package the material in the same ESD boxes and close boxes.

41. Update the Site Management Guide to reflect this FCO.

42. Report this FCO activity on the LARS sheet in the "Fail Area/
    Module/FCO/Comments" as per example on Page 14.

43. Return the old material ASAP to Logistics Center.

                 MIRA STANDALONE DIAGNOSTICS   XXDP

For the FCO installation test purpose, it is sufficient to run
MIRA Diagnostics VMRAxx.BIN in customer mode or installation mode with
no loopbacks.

See Chapter 3.7.8 of MIRA Installation and Maintenance guide
EK-MIRAI-MM for details of tests.

As non-switched options and switched options cabling is not modified,
there is no need to test the system with external loopbacks.

==========
WARNING
==========

DO NOT RUN TEST IN INSTALLATION MODE ON BOTH SYSTEMS AT THE SAME TIME.

 System Exerciser test

 Do not attempt to use it with loopback at I/O panel level, if
 you are not familiar with MIRA tests with switched options.
 This test needs to close the MIRA switches using MIRA utilities,
 before you start the exerciser.

(Typical check when starting a MIRA system, useless messages have been deleted)

```
    Log in as system manager.

  $ @[1,2]UVSTARTUP (loads Driver and installs MIRA tasks, if not already done)
  $ @MRASTART.CMD
  $ MRA
  MIRA> SHOW
        Local System State   :      MASTER
        Remote System State  :  UNKNOWN
        Swap State           :      ENABLED

        Module   Module State        Switch Map
         0       DISC/NOSWITCH       UNASSIGNED
         1           CONNECTED       SAME
         2           CONNECTED       SAME
         3           CONNECTED       SAME
         4           CONNECTED       SAME
         5       DISC/NOSWITCH       UNASSIGNED
         6       DISC/NOSWITCH       UNASSIGNED
         7       DISC/NOSWITCH       UNASSIGNED
         8       DISC/NOSWITCH       UNASSIGNED
         9       DISC/NOSWITCH       UNASSIGNED
        10       DISC/NOSWITCH       UNASSIGNED
        11       DISC/NOSWITCH       UNASSIGNED

         Total Connected:  4     Total Assigned:  4
  MIRA> TEST
        Local loop test    : OK
        Remote loop test   : OK
        Watchdog link connected
        Switching box 0 connected
        Switching box 1 not connected
        Front panel connected
        Alarm I/O panel connected
        Module       Test                Status
         0       FAIL/NOSWITCH        DISC/NOSWITCH
         1                 OK         CONNECTED
         2                 OK         CONNECTED
         3                 OK         CONNECTED
         4                 OK         CONNECTED
         5       FAIL/NOSWITCH        DISC/NOSWITCH
         6       FAIL/NOSWITCH        DISC/NOSWITCH
         7       FAIL/NOSWITCH        DISC/NOSWITCH
         8       FAIL/NOSWITCH        DISC/NOSWITCH
         9       FAIL/NOSWITCH        DISC/NOSWITCH
        10       FAIL/NOSWITCH        DISC/NOSWITCH
        11       FAIL/NOSWITCH        DISC/NOSWITCH
```

MIRA TESTING PROCEDURE UNDER RSX (continued)

```
MIRA> SHO

     Local System State    :       MASTER
     Remote System State   :  STANDBY
     Swap State            :       ENABLED

     Module    Module State       Switch Map
      0        DISC/NOSWITCH       UNASSIGNED
      1            CONNECTED       SAME
      2            CONNECTED       SAME
      3            CONNECTED       SAME
      4            CONNECTED       SAME
      5        DISC/NOSWITCH       UNASSIGNED
      6        DISC/NOSWITCH       UNASSIGNED
      7        DISC/NOSWITCH       UNASSIGNED
      8        DISC/NOSWITCH       UNASSIGNED
      9        DISC/NOSWITCH       UNASSIGNED
     10        DISC/NOSWITCH       UNASSIGNED
     11        DISC/NOSWITCH       UNASSIGNED
       Total Connected:  4      Total Assigned:  4
MIRA> TEST
     Local loop test   : OK
     Remote loop test  : OK
     Watchdog link connected
     Switching box 0 connected
     Switching box 1 not connected
     Front panel connected
     Alarm I/O panel connected
     Module        Test              Status
      0        FAIL/NOSWITCH        DISC/NOSWITCH
      1                OK           CONNECTED
      2                OK           CONNECTED
      3                OK           CONNECTED
      4                OK           CONNECTED
      5        FAIL/NOSWITCH        DISC/NOSWITCH
      6        FAIL/NOSWITCH        DISC/NOSWITCH
      7        FAIL/NOSWITCH        DISC/NOSWITCH
      8        FAIL/NOSWITCH        DISC/NOSWITCH
      9        FAIL/NOSWITCH        DISC/NOSWITCH
     10        FAIL/NOSWITCH        DISC/NOSWITCH
     11        FAIL/NOSWITCH        DISC/NOSWITCH
```

```
MIRA> SWAP
MIRA> SHO
     Local System State   :      STANDBY
     Remote System State  :   MASTER

     Module    Module State        Switch Map
      0        DISC/NOSWITCH        UNASSIGNED
      1         DISCONNECTED        SAME
      2         DISCONNECTED        SAME
      3         DISCONNECTED        SAME
      4         DISCONNECTED        SAME
      5        DISC/NOSWITCH        UNASSIGNED
      6        DISC/NOSWITCH        UNASSIGNED
      7        DISC/NOSWITCH        UNASSIGNED
      8        DISC/NOSWITCH        UNASSIGNED
      9        DISC/NOSWITCH        UNASSIGNED
     10        DISC/NOSWITCH        UNASSIGNED
     11        DISC/NOSWITCH        UNASSIGNED
        Total Connected:  0        Total Assigned:  4
MIRA> TEST

     Local loop test    : OK
     Remote loop test   : OK
     Watchdog link connected
     Switching box 0 connected
     Switching box 1 not connected
     Front panel connected
     Alarm I/O panel connected
     Module        Test              Status
      0        FAIL/NOSWITCH        DISC/NOSWITCH
      1                 OK          DISCONNECTED
      2                 OK          DISCONNECTED
      3                 OK          DISCONNECTED
      4                 OK          DISCONNECTED
      5        FAIL/NOSWITCH        DISC/NOSWITCH
      6        FAIL/NOSWITCH        DISC/NOSWITCH
      7        FAIL/NOSWITCH        DISC/NOSWITCH
      8        FAIL/NOSWITCH        DISC/NOSWITCH
      9        FAIL/NOSWITCH        DISC/NOSWITCH
     10        FAIL/NOSWITCH        DISC/NOSWITCH
     11        FAIL/NOSWITCH        DISC/NOSWITCH


MIRA> EXIT

     Do not forget to re-activate the MIRA start into the STARTUP.CMD files
     if you have modified these files.


****** END OF TEST SYSTEM IS READY FOR APPLICATION USE ******
```

```
 _ _ _ _ _ _ _                        |           FCO   DS-173Q1-F001
| | | | | | | |                       |
| | | | | | | |                       |
|d|i|g|i|t|a|l|                       |           PAGE 13 OF 14
|_|_|_|_|_|_|_|                       |
                                      |
_____|_____
```

                            MIRA SWITCH SETTINGS

     M7764-00   DISPATCHER MODULE   (SWITCH LOCATION E5)

   Main Cabinet (Switching Box 0)

                   _____
                  | 3 | 2 | 1 | 0 | Bit

                  | ON | OFF | OFF | OFF | Switch Settings Main Cabinet
                  ----
                    E5   E5   E5   E5
                     1   2   3   4   Switch Number

   Expansion Cabinet (Switching Box 1)

                   _____
                  | 3 | 2 | 1 | 0 | Bit

                  | OFF | ON | OFF | OFF | Switch Settings Main Cabinet
                  ----
                    E5   E5   E5   E5
                     1   2   3   4   Switch Number

     M7763-00   WATCHDOG MODULE

   Vector Address location E24   example (400)

MSB   LSB
Bit 15   14   13   12   11   10   9   8   7   6   5   4   3   2   1   0

Switch   E24   E24   E24   E24   E24   E24   E24
                                       1   2   3   4   5   6   7

                                      OFF   ON   OFF   OFF   OFF   OFF   OFF

     CSR Address   location E33   example   (767000)

MSB   LSB
Bit 15   14   13   12   11   10   9   8   7   6   5   4   3   2   1   0

Switch   E33   E33   E33   E33   E33   E33   E33   E33   E33   E33

```
        1      2      3      4      5      6      7      8      9      10

       OFF     ON     ON     ON    OFF    OFF    OFF    OFF    OFF    OFF
```

                                  LARS

CATEGORY F	USA	GIA	EUROPE
Activity -			
(a)Contract and Warranty	W	U	Y
(b)IN-DEC Contract & Warranty	K		
Hardware Segment Code	111		
Non Contract/Non Warranty	F	F	F
(c)RTD/Off-site Agreement	F		
Product Line	16		
DEC Option	DS-173Q1-XX	DS-173Q1-XX	DS-173Q1-XX
Type of Call	M	M	M
Action Taken	D	D	I
Fail Area-Module-FCO-Comments	MIRA-F001	MIRA-F001	MIRA-F001
Material Used	EQ-01568-01	EQ-01568-01	EQ-01568-01

(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".

```
\^ 173Q1
\\173Q1
\\DS-173Q1
\\CHALUMEAU
\\1990
\\APR
\\FCO_DOCS
```