

## DMPH1A1A.FUN

Test procedure for manual functional test of DS3800DMPH.  
Cards under test should have been tested on the 2270.

## TEST EQUIPMENT

- . Functional verification module 'FVE' (or any L-BUS).
- . HRMA (OR HRMB) PWB.
- . DMPH.
- . Computer terminal (RS232) with cable.
- . Null modem DS3800CHMMA1E1A
- . Power supply DS3820PLSA1A1A (or equiv.)

## INITIAL SETUP (of support cards used)

## BERG JUMPER SETTINGS FOR HRMA :

J2,J5,J8,J9,J12,J13,J14,J15,J16,J17,J18=A  
J1,J3,J4,J6,J7,J10,J11=B

## BERG JUMPER SETTINGS FOR HRMB1N1L :

J2,J5,J6,J7,J13,J14,J15,J16,J17,J18,J21=A  
J1,J3,J4,J8,J9,J10,J11,J12,J19=B  
J20=DONOTCARE

## TEST SETUP DESCRIPTION

- . PLUG HRMA/HRMB IN SLOT 1C. (if using HRMB, Jumper PA10 to DCOM)
- . PLUG TEST PROMS 'P8G304A9936AABY' IN HMPG U22=01AA U23=02AA.
- . SET HMPG BERG JUMPERS : J1=8/16 J2=16K J3=DGN/ J4=L8 J5=GND
- . Set DMPH berg Jumpers : J1=INT J2=COM J3=ARB (toward C11)
- . PLUG HMPG IN SLOT 1F WITH DAUGHTER BOARD MOUNTED.
- . CONNECT RIBBON CABLE BETWEEN DAUGHTER BOARD AND HRMA/HRMB.

## ICMB1C1B.FUN

## PREFACE

-----  
Functional verification tests for the DS3800HCMB.

## EQUIPMENT

-----  
Test Module "FVE".  
FVE switch box with ribbon cable (10 pin).  
Power supply DS3820PLSA1A1A (or equiv).  
Test prom "PSG304A9936AACE".

## SETUP

-----  
Connect FVE switch box JD to module backplane JD.  
Plug test prom into HCMB U32 socket.  
Set HCMB berg jumpers as follows:  
    J2,J3                  "PROM"  
    J4-J6                  "F"  
    J7-J15                Toward daughter board posts  
    J16                   "IN"  
    J17-J24               "F"  
Plug HCMB into module slot 1A.  
Close HCMB PA06 to DCOM.

## TEST PROCEDURE

-----  
Turn power on.  
Reset by momentarily open, then close PA06-DCOM connection.  
Verify the following LED conditions:  
    IM'OK(CR1) and CR2 LED's (all) shift thru (one on at a time).

END OF TEST (REMOVE TEST ROM)

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09JUN88 db changes for FVE

13. Move cable from HRPB-JF to HRPB-JW.  
Place HRPB SW7 & SW8 to on.  
Verify HRPB CR10 & CR11 are on.  
Momentarily short connector JE on HMA42.  
Verify HMA42 RCV-A is on.  
Place HRPB SW7 to off.  
Verify HRPB CR10 is off.

14. Place HRPB SW8 to off.  
Verify HRPB CR11 is off.

END OF TEST

=====

EP88 DB	chsd location of file
UG94 JW	opening of sw's to turn off appropriate led

4. Type '7FF7' [return] and verify the LEDS on HLNE in slot 3D.
  - IMOK LED on (after about 10 seconds)-
  - DIAG LED comes on for about 5 seconds and then goes out.
  - After 'DIAG LED goes out, CONFIG LED comes on, and blinks.
5. Type 'SWC000,' (A55A-)
6. Type '7FF7' [return] and verify that after approximately 5 seconds the IMOK LED's on both HLNE's are on. Other HLNE LED's are off.

NOTE: If during the following tests the CONFIG led on either of the HLNE cards lights then you must wait until they are off before continuing with the test. The delay may be as long as 60seconds. If after 60seconds delay either of the HLNE leds are still on/or blinking then reset the HMPJ by momentary short TP1 to TP2 and repeat steps 1-6.

7. Place HRPB SW1 & SW2 to on.  
Verify HRPB CR4 & CR5 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW1 to off.  
Verify HRPB CR4 is off.
8. Move cable from HRPB-JA to HRPB-JC.  
Place HRPB SW2 & SW3 to on.  
Verify HRPB CR5 & CR6 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW2 to off.  
Verify HRPB CR5 is off.
9. Move cable from HRPB-JB to HRPB-JD.  
Place HRPB SW3 & SW4 to on.  
Verify HRPB CR6 & CR7 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW3 to off.  
Verify HRPB CR6 is off.
10. Move cable from HRPB-JC to HRPB-JE.  
Place HRPB SW4 & SW5 to on.  
Verify HRPB CR7 & CR8 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW4 to off.  
Verify HRPB CR7 is off.
11. Move cable from HRPB-JD to HRPB-JF.  
Place HRPB SW5 & SW6 to on.  
Verify HRPB CR8 & CR9 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW5 to off.  
Verify HRPB CR8 is off.
12. Move cable from HRPB-JE to HRPB-JG.  
Place HRPB SW6 & SW7 to on.  
Verify HRPB CR9 & CR10 are on.  
Momentarily short connector JE on HMAc#2.  
Verify HMAc#2 RCV-A is on.  
Place HRPB SW6 to off.  
Verify HRPB CR9 is off.

0:[manual.fvmodule]hrfbibla.fun

- .1 Setup and test instruction for DS3800HRFB. Prior to performing this test, the PWB should have passed test on the 2270.

#### SPECIAL TEST EQUIPMENT

1. Functional test module: FVE

2. Test support cards and setup.

Slot 2B HMPJ From set="XD86\_MONITOR\_RAM\_LTE"  
J1="D" J2="L" J3-J6="A"

Slot 2D HLNE From "PSP3815PLNF01AA" in socket U10  
J4,J13,J14="TRUE"  
J5-J11,J15-J18="FALSE"

Slot 2F HLNE From "PSP3815PLNF01AA" in socket U10  
J4,J5,J13="TRUE"  
J6-J11,J14-J18="FALSE"

left upper HMAc#1 JA1-JA3 ="T"  
JB1-JB3 ="T"  
J5B,D ="GND"  
J5C,E ="open"

left lower HMAc#2 JA1-JA3 ="T"  
JB1-JB3 ="T"  
J5B,D ="GND"  
J5C,E ="open"

#### POWER SUPPLY REQUIREMENTS

Use power supply type DS3820PSLA1A1A.

#### .4 INITIAL SETUP

1. Plug test support cards in module per section 9.2

2. Cable interconnections.

Cable Type	From	To
Power Cable	FVE-JA	PS-JA
Power Cable	HMAc#1-JG	PS-JF
Power Cable	HMAc#2-JG	PS-JE
Power Cable	HRFB-JJ	PS-JD
20 pin ribbon	HLNE(2D)JA	HMAc#1-JA
20 pin ribbon	HLNE(2F)JA	HMAc#2-JA
TWNAX Cable	HMAc#2-JE	HMAc#1-JE
TWNAX Cable	HMAc#1-JB	HRFB-JA
TWNAX Cable	HMAc#2-JB	HRFB-JB
* RS232 Cable	HMPJ(2B)JB	Computer Display Terminal

\* Use null modem (DS3800HNMA) on HMPJ end of cable with Jumper in SPDE position.

#### .5 TEST DEFINITIONS AND SPECIAL NOTES

In the following paragraph (9.6) the expected response from the computer display terminal is inclosed in parenthesis.

#### TEST PROCEDURE

1. Apply power.

2. After CR2 comes on on the HMPJ, type "BB" (NR86.)

3. Type "SW4000," (A55A-)

20 PIN RIBBON	HLNE(2D)-JA	HMAC #2-JA
COAA	* HRPA-JA	HMAC #2-JE
COAX	* HRPA-JB	HMAC #1-JE

\* HRPA UNDER TEST

3. HRPA UNDER TEST INITIAL SETUP.
  - CONNECT CABLES PER ABOVE
  - PUT SW1 IN THE "ON" POSITION

## 9.5 TEST DEFINITIONS AND SPECIAL NOTES

IN THE FOLLOWING PROCEDURE, "<" INDICATES CARRIAGE RETURN.

## 9.6 TEST PROCEDURE

1. APPLY POWER.
2. AFTER CR2 (YEL) ON HMPJ TURNS ON, TYPE "BB" ON TERMINAL.  
 AFTER MONITOR PROMPT TYPE "SW4000,7FF7<".
3. AFTER ABOUT 5 SECONDS THE FOLLOWING LED STATUS SHOULD EXIST
 

HLNE (2F)	IMOK	DON'T CARE
	DIAG	DON'T CARE
	PEND	DON'T CARE
	CONFIG	DON'T CARE
HLNE (2D)	IMOK	ON
	DIAG	OFF
	PEND	OFF
	CONFIG	BLINKING
HRPA	B/A	OFF
	A/B	BLINKING (MOSTLY ON)
	POWER OK	ON
4. TYPE "SWC000," (NO RETURN) (TERMINAL SHOULD RESPOND WITH "A55A-")
5. TYPE "7FF7<"
6. ABOUT 5 SECONDS AFTER STEP 5, IMOK LED'S ON BOTH HLNE'S SHOULD BE ON, ALL OTHER HLNE LED'S OFF, AND ALL HRPA LED'S ON.
7. PUT SW1 IN THE "OFF" POSITION AND VERIFY THE FOLLOWING LED STATUS.
 

HRPA	A/B	OFF
HRPA	B/A	OFF
HRPA	POWER OK	ON
8. PUT SW1 IN THE "ON" POSITION AND VERIFY THE FOLLOWING LED STATUS.
 

HRPA	A/B	ON
HRPA	B/A	ON
HRPA	POWER OK	ON

END OF TEST

REV	INIT	DESCRIPTION OF CHANGE	DATE COMPLET
0	REV	FIRST MADE FOR DS3800HRPA IF	09DEC85
1	REV	UPDATED TO USE MORE UP-TO-DATE SUPPORT CARDS	07MAY86
2	DB	CORRECT SOME TYPO ERRORS	04DEC86

## 9.0 HRPATFIA.FUN FUNCTIONAL TEST INSTRUCTIONS

### 9.1 SCOPE

THIS DOCUMENT DESCRIBES THE SETUP AND FUNCTIONAL TEST PROCEDURE FOR PWB DS3800HRPA. PRIOR TO PERFORMING THIS TEST, THE PWB SHOULD HAVE PASSED TEST ON THE 2270.

THE FOLLOWING PWB VERSIONS CAN BE TESTED BY THIS PROCEDURE.  
1F1A, 1F1B

### 9.2 SPECIAL TEST EQUIPMENT

#### 1. FUNCTIONAL TEST MODULE: FVE

#### 2. TEST SUPPORT CARDS AND SETUP.

SLOT 2F	HLNE	J4	"T"
		J5-J11	"F"
		J13, J14	"T"
		J15-J18	"F"
		U10	"PSP3815PLNF01AA"

SLOT 2D	HLNE	J4	"T"
		J5	"T"
		J6-J11	"F"
		J13	"T"
		J14-J18	"F"
		U10	"PSP3815PLNA01AA"

SLOT 2B	HMPJ	J1=D J2=L J3=A J4=A J5=A J6=A
		U22 "XD_86_MONITOR_RAM_TEO1"
		U23 "XD_86_MONITOR_RAM_TEO2"

LEFT MODULE SIDE: HMAC #1 - TOP

JA1-JA3	"T"
JB1-JB3	"T"
J5B, D	"GND"
J5C, E	"OPEN"

HMAC #2 - BOTTOM

JA1-JA3	"T"
JB1-JB3	"T"
J5B, D	"GND"
J5C, E	"OPEN"

### 9.3 POWER SUPPLY REQUIREMENTS

THIS TEST IS WRITTEN ASSUMING THE USE OF POWER SUPPLY TYPE DS3820PSLA1A1A.

### 9.4 INITIAL SETUP

#### 1. PLUG TEST SUPPORT CARDS IN MODULE PER SECTION 9.2

#### 2. CABLE INTERCONNECTIONS.

CABLE TYPE	FROM	TO
POWER CABLE	FVE-JA	PS-JA
POWER CABLE	HMAC #1-JG	PS-JF
POWER CABLE	HMAC #2-JG	PS-JE
POWER CABLE	X HRPA-JC	PS-ID

Place HMPK SW1 to the UP position.  
 Type "IBFE2," and verify CRT displays "Cx".  
 Type "<".  
 Type "I9000," and verify CR6 turns on.  
 Type "<".  
 Type "IBFE2," and verify CRT displays "Ex".  
 Type "<".  
 Type "OBFE4,0<" and verify CR6 turns off.  
 Type "OBFE8,0<" and verify CR1 is on.  
 Close PA08 to DCOM and verify CR1 turns off. *PA08 switch up on front panel*  
 Open PA08 connection.  
 Close PA18 to DCOM and verify that with SW1 open(center) CR7 is on,  
 and with SW1 closed CR7 is off.  
 Open PA18 connection and verify that SW1 open does not turn CR7 on.  
 Type "IBFFC," and verify CRT displays "0x" (x=don't care).  
 Close PA22 to DCOM. Type "," and verify CRT displays "4x".  
 Open PA22.  
 Close PA23 to DCOM. Type "," and verify CRT displays "2x".  
 Open PA23.  
 Close PA24 to DCOM. Type "," and verify CRT displays "1x".  
 Open PA24.  
 Close PA25 to DCOM. Type "," and verify CRT displays "8x".  
 Open PA25.  
 Type "<" *n = proper number left of table below*  
 Type "OBFE2,n<" and verify outputs at PA as follows:

type	PA62	PA65	PA63	PA71	PA69	PA80	PA78	PA67
"OBFE2,0<"	0	0	0	0	0	0	0	0
"OBFE2,1<"	0	0	0	0	0	0	0	1
"OBFE2,2<"	0	0	0	0	0	0	1	0
"OBFE2,4<"	0	0	0	0	0	1	0	0
"OBFE2,8<"	0	0	0	0	1	0	0	0
"OBFE2,10<"	0	0	0	1	0	0	0	0
"OBFE2,20<"	0	0	1	0	0	0	0	0
"OBFE2,40<"	0	1	0	0	0	0	0	0
"OBFE2,80<"	1	0	0	0	0	0	0	0

(0=LED on, 1=LED off)

END OF TEST (for cards that have passed 2270).

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The following tests may be omitted if cards have passed 2270.

Type "T" and verify CRT displays "TEST RAM>"

Type "T<" and verify CRT displays "LOW ADDRESS "

Type "0:1000<" and verify CRT displays "HIGH ADDRESS "

Type "3FFF<" and observe the CRT display:

If the tests do not fail then the CRT display will be

BEGIN TEST n

FINISH TEST n

where n is 1 thru 9

If any test fails the CRT will indicate locations failed.

This test requires about 6 minutes to complete.

After the CRT displays "TEST RAM>" then type "R"

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08jun88 DB .changes for FVE



## HMPK1E1B.FUN

## PREFACE

-----  
Functional verification for the DS3800HMPK.

## EQUIPMENT

-----  
Functional module "FVE".  
Extender card DS3800XEX1A1B (or equiv).  
FVE switch box and ribbon cable(34pin).  
Computer terminal (RS232C) with cable.  
Null modem DS3800HNMA1B1A.  
Power supply DS3820PLSA1A1A(or equiv).  
Daughter board DS3800DMPK.  
Monitor test prompts PSG304A9936AABX.

## SETUP

-----  
DMPK jumpers: J1-J14 "/P"  
J15,J16 "P"  
J17 "32K"  
PROMS: U15=PSG304A9936AABX "LO"  
U16=PSG304A9936AABX "HI"  
RAMS: U1,U2= 68A9196P2 (HM6264P-10)  
HMPK jumpers: BJ1 "/1"  
BJ2 "/2"  
BJ3 "4"  
BJ4 "/8"  
BJ5 "/10"  
BJ6 "7GND"

Mount DMPK on HMPK.

Plug HMPK into module slot 1F (using the extender card).

Connect cable from backplane JK to FVE switch box JK-1(HMPK).

## TEST PROCEDURE

4700 E71 Com2

-----  
Apply power. Switch on side of cart  
After about 2 seconds delay CR2 must turn on & stay on.  
Verify waveforms :

0.21us at U2 pin 32

5.78us at PA2

10ms at PA21

1s at PA10

using black plug as common on front panel

+ Verify -11.3 +/-1 VDC at JB2 (with CRT terminal disconnected from JB). 5

+ Verify +11.3 +/-1 VDC at JB4 (with CRT terminal disconnected from JB).

+ Connect CRT terminal to null modem JB.

+ Connect null modem JA to HMPK JB.

+ Place berg-jumper on null modem to "SPEC" position.

Set CRT baud-rate to any of the following speeds:

300 600 1200 2400 4800 9600 19200.

4800 E71 Com2

Type "B" and verify CR2 turns off.

Type "B" again and verify CR1 turns on & CRT displays "HMPK".

Type "OBFE6,0<" and verify CR1 turns off with no-delay. ("<"=return)

Type "OBFE8,0<" and verify CR1 turns on.

Type "OBFE0,0<" and verify CR1 turns off after about 2 seconds delay.

Insure that HMPK SW1 is in the OFF (center) position.

Type "IBFE2," and verify CRT displays "Dx". ("x"=don't care)

Type "<". RETURN

using black board  
connected into HMPK

BEGIN TEST n

FINISH TEST n

where n is 1 thru 9

If any test fails the CRT will indicate failed locations.

This test requires about 8 minutes to complete.

After the CRT displays "TEST RAM>" then type "R".

Remove test prompts.

End of test.

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08JUN88 DB .changes for FVE module.

Verify -11.3 +/-1 VDC at JB2 (with CRT terminal not connected to JB).  
 Verify +11.3 +/-1 VDC at JB4 (with CRT terminal not connected to JB).  
 Connect computer terminal (CRT) to null modem JB.  
 Connect null modem JA to HMPG JB.  
 Place berg-jumper on null modem to "SPEC" position.  
 Set CRT baud-rate to any of the following speeds:  
 300 600 1200 2400 4800 9600 19200.

Type "B" and verify CR2 turns off. *BOTTOM LED ON HMPG Bd.*  
 Type "B" again and verify CR1 turns on & CRT displays "HMPG".  
 Type "OBFE6,0<" and verify CR1 turns off with no-delay. ("<<"=return)  
 Type "OBFE8,0<" and verify CR1 turns on. *TOP LED ON HMPG Bd.*  
 Type "OBFE0,0<" and verify CR1 turns off after about 2 seconds delay.  
 Make the following connections and verify the CRT display :

PA71	PA63	PA65	PA62	"IBFE0,<"
----	----	----	----	-----
F	F	F	F	"FF"
0	F	F	F	"FE"
F	0	F	F	"FD"
F	F	0	F	"FB"
F	F	F	0	"F7"

F = switch open (input floating).  
 0 = switch closed (input tied to dcom).

*OPEN ALL SWITCHES WHEN LOADING*

Type "I9000," and verify CR6 turns on. Type "<". *2nd LED from bottom on HMPG Bd.*  
 Type "OBFE4,0<" and verify CR6 turns off.

Type "I8000,<" and verify CR6 does not turn on.

~~Verify CR6 does not turn on.~~ Verify CRT Displays "AA"

Type "OBFE8,0<" and verify CR1 is on.

Close PA8 to DCOM and verify CR1 turns off.

Open PA8 from DCOM.

Type "IBFFC," and verify CRT displays "0x" (x=don't care).

Close PA22 to DCOM. Type "," and verify CRT displays "4x". Open PA22.

Close PA23 to DCOM. Type "," and verify CRT displays "2x". Open PA23.

Close PA24 to DCOM. Type "," and verify CRT displays "1x". Open PA24.

Close PA25 to DCOM. Type "," and verify CRT displays "8x". Open PA25.

Type "<"

Type "OBFE2,n<" and verify outputs at PA as follows:

	PA69	PA80	PA78	PA67	
OBFE2,0<	0	0	0	0	(0=LED on, 1=LED off)
OBFE2,1<	0	0	0	1	
OBFE2,2<	0	0	1	0	
OBFE2,4<	0	1	0	0	
OBFE2,8<	1	0	0	0	

Type "T" and verify CRT displays "TEST RAM>"

Type "T<" and verify CRT displays "LOW ADDRESS "

Type "0:1000<" and verify CRT displays "HIGH ADDRESS "

Type "3FFF<" and observe the CRT display:

If the tests do not fail then the CRT display will be  
 BEGIN TEST n

FINISH TEST n

where n is 1 thru 9

If any test fails the CRT will indicate locations failed.

This test requires about 13 minutes to complete.

After the CRT displays "TEST RAM>" then

Type "T<" and verify CRT displays "LOW ADDRESS "

Type "0:3000<" and verify CRT displays "HIGH ADDRESS "

Type "3FFF<" and observe the CRT display:

If the tests do not fail then the CRT display will be:

## MPG1D1D.FUN

## PREFACE

Functional verification tests for the DS3800HMPG.

## EQUIPMENT

Functional verification module "FVE" (standard L-BUS).

FVE switch box with ribbon cable (34 pin).

DS3800HXPC (or HXPD) PWB with U27-U30=68A9249P1 (or P2).

DS3800HRMA (or HRMB) PWB.

Daughter board DS3800DMPG.

Monitor test rom set PSG304A9936AABY.

Computer terminal (RS232C) with cable.

Null modem DS3800HNMA1B1A → you do not have to have this bd. Just use null modem.

Power supply DS3820PLSA1A1A (or equiv.) CABLE BETWEEN TERMINAL & JB of HMPG Bd.

## SETUP

Berg jumper settings for HRMA1H1F :

J2,J5,J8,J9,J12,J13,J14,J15,J16,J17,J18=A

J1,J3,J4,J6,J7,J10,J11=B

Berg jumper settings for HRMB1N1L :

J2,J5,J6,J7,J13,J14,J15,J16,J17,J18,J21=A

J1,J3,J4,J8,J9,J10,J11,J12,J19=B

J20=DONOTCARE

Berg jumper settings for HXPC :

J2 → Set jumpers as required for testing HXPC in FVMA UNIT

Berg jumper settings for HXPD1A1A(PR) :

J15=2K J17=RUN DIG(8) thru DIG(D)=F

1,/2,4,/8,16,/32,64,/128 (/ = AWAY FROM U8)

RD,RF=F RE=T 2K/8K=2K PROM=/P RAM=0

Berg jumper settings for DMPG :

J1=COM

Plug HXPC (or HXPD) in slot 1D.

Plug HRMA (or HRMB) in slot 1C.

Plug test proms "PSG304A9936AABY" in HMPG, U22=01AA U23=02AA.

Set HMPG berg jumpers as follows:

JUMPER	SETTING
J1	8/16
J2	16K (8K ON NEW CORRECTED SILK SCREEN?)
J3	DGN BARRED = DGN
J4	L8
J5	GND

Plug HMPG (with DMPG board) in slot 1F.

Connect ribbon cable from DMPG to HRMB.

Connect FVE switch box JK-2 (HMPG) to backplane (JK).

## TEST PROCEDURE

Apply power.

After about 2 seconds delay CR2 must turn on & stay on.

Verify waveforms

5.78us at PA2 ✓

10ms at PA21 ✓

1s at PA32 ✓

- \* RS232 CABLE HMPJ(2B)JB COMPUTER DISPLAY TERMINAL
- \* USE NULL MODEM (DS3800HMA) ON HMPJ END OF CABLE WITH JUMPER IN SPDE POSITION, & JA CONNECTED TO HMPJ.

9.5 TEST DEFINITIONS AND SPECIAL NOTES

IN THE FOLLOWING PARAGRAPH (9.6) THE EXPECTED RESPONSE FROM THE COMPUTER DISPLAY TERMINAL IS ENCLOSED IN PARENTHESIS.

9.6 TEST PROCEDURE

1. APPLY POWER.
2. AFTER CR2 COMES ON ON THE HMPJ, TYPE "BB" (MR00.)
3. TYPE "SW4000," (A55A-)
4. TYPE "7FF7" [RETURN] AND VERIFY THE LEDS ON HLNE IN SLOT 2D.
  - IMOK LED ON (AFTER ABOUT 10 SECONDS).
  - DIAG LED ON FOR ABOUT 5 SECONDS AND THEN GOES OUT.
  - AFTER DIAG LED GOES OUT, CONFIG LED COMES ON AND BLINKS.
5. TYPE "SWC000," (A55A-)
6. TYPE "7FF7" [RETURN] AND VERIFY THAT AFTER APPROXIMATELY 5 SECONDS THE IMOK LED'S ON BOTH HLNE'S ARE ON. OTHER HLNE LED'S ARE OFF.
7. REMOVE POWER. TEST IS COMPLETE.
8. IF CARD(S) UNDER TEST CAME INTO TEST WITHOUT PROM THEN REMOVE TEST PROM FROM CARD(S) UNDER TEST BEFORE SENDING CARD(S) TO NEXT STATION.

END OF TEST

TEST INSTRUCTION REVISION STATUS

REV	INIT	DESCRIPTION OF CHANGE	DATE COMPLETE
0	REV	FIRST MADE FOR DS3800HLNE 1A1A	28-APR-86
1	REV	VARIOUS CHANGES PER DB	08-MAY-86
2	DB	CORRECTION & CHANGES	30-JUL-86
3	DB	ADDED VERSION 1B1B	19-AUG-86

(201,232)HLNE1B1B.FUN

## 9.0 HLNE.FUN FUNCTIONAL TEST INSTRUCTIONS

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### 9.1 SCOPE

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SETUP AND FUNCTIONAL TEST FOR DS3800HLNE.  
PRIOR TO PERFORMING THIS TEST, THE PWB SHOULD HAVE  
PASSED TEST ON THE 2270.

THE FOLLOWING PWB VERSIONS CAN BE TESTED BY THIS PROCEDURE:  
1A1A (J19 & J20 NOT ON 1A1A VERSION)  
1B1B

### 9.2 SPECIAL TEST EQUIPMENT

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1. FUNCTIONAL TEST MODULE: FVE
2. TEST SUPPORT CARDS AND SETUP.  
NOTE: TWO HLNE CARDS ARE REQUIRED. EITHER OR BOTH MAY  
BE THE CARD(S) UNDER TEST. USE SAME PROCEDURE FOR  
TESTING EITHER ONE OR TWO CARDS AT SAME TIME.

(X)

SLOT 2B	HMPJ	PROM SET="SD_86_MONITOR_RAM_TE" J1="D" J2="L" J3-J6="A"
SLOT 2D	HLNE	PROM "PSP3815PLNFO1AA" IN SOCKET U10 J4,J13,J14="TRUE" J5-J11,J15-J18="FALSE" J19="8/16K" J20="INT"
SLOT 2F	HLNE	PROM "PSP3815PLNFO1AA" IN SOCKET U10 J4,J5,J13="TRUE" J6-J11,J14-J18="FALSE" J19="8/16K" J20="INT"
LEFT UPPER	HMAC#1	JA1-JA3 ="T" JB1-JB3 ="T" J5B,D ="GND" J5C,E ="OPEN"
LEFT LOWER	HMAC#2	JA1-JA3 ="T" JB1-JB3 ="T" J5B,D ="GND" J5C,E ="OPEN"

### 9.3 POWER SUPPLY REQUIREMENTS

---

USE POWER SUPPLY TYPE DS3820PSLA1A1A.

### 9.4 INITIAL SETUP

---

1. PLUG TEST SUPPORT CARDS IN MODULE PER SECTION 9.2
2. CABLE INTERCONNECTIONS:

CABLE TYPE	FROM	TO
POWER CABLE	FVE-JA	PS-JA
POWER CABLE	HMAC#1-JG	PS-JF
POWER CABLE	HMAC#2-JG	PS-JE
20 PIN RIBBON	HLNE(2D)JA	HMAC#1-JA
20 PIN RIBBON	HLNE(2F)JA	HMAC#2-JA

POWER CABLE	HMAL#1-JG	PS-JF
POWER CABLE	HMAL#2-JG	PS-JE
20 PIN RIBBON	HLND 2C-JA	HMAL#1-JA
20 PIN RIBBON	HLND 2E-JA	HMAL#2-JA
50 PIN RIBBON	HLND 2C	HLNC 2D
50 PIN RIBBON	HLND 2E	HLNC 2F
TWAX CABLE	HMAL#2-JE	HMAL#1-JB
TWAX CABLE	HMAL#1-JE	HMAL#2-JB
* RS232 CABLE	COMPUTER TERM.	HMPJ SLOT 2B

\* USE NULL MODEM (DS3800HMA) ON HMPJ END OF CABLE.  
 JUMPER IN SPDE POSITION. JA CONNECTOR CONNECTED TO HMPJ.

## 9.5 TEST DEFINITIONS AND SPECIAL NOTES

NONE

## 9.6 TEST PROCEDURE

1. APPLY POWER.
2. AFTER CR2 COMES ON ON THE HMPJ, TYPE "BB" (MR86.)
3. TYPE "SW4000," (A55A-)
4. TYPE "7FF7" THEN [RETURN] AND WATCH FOR THE FOLLOWING TO OCCUR AT THE HLNC IN SLOT 2D.
  - IMOK LED ON (AFTER ABOUT 10 SECONDS).
  - DIAG LED ON FOR ABOUT 5 SECONDS AND THEN GOES OUT.
  - AFTER DIAG LED GOES OUT, CONFIG LED COMES ON AND BLINKS.
  - IMOK LED REMAINS ON
5. TYPE "SWC000," (A55A)
6. TYPE "7FF7" THEN [RETURN] AND THEN VERIFY THAT AFTER APPROXIMATELY 5 SECONDS THE IMOK LED'S ON BOTH HLNC'S ARE ON. (OTHER HLNC LED'S OFF)
7. REMOVE POWER.

END OF TEST

## TEST INSTRUCTION REVISION STATUS

REV	INIT	DESCRIPTION OF CHANGE	DATE COMPLETE
0	REV	FIRST MADE FOR DS3800HLNE 1A1A	28-APR-80
1	REV	VARIOUS CHANGES PER DB	08-MAY-80
2	DB	REMOVED REFERENCES TO HLNE	20-SEP-80

## 9.0 HLND.FUN FUNCTIONAL TEST INSTRUCTIONS

---

### 9.1 SCOPE

---

THIS DOCUMENT DESCRIBES THE SETUP AND FUNCTIONAL TEST PROCEDURE FOR PWB DS3800HLND. PRIOR TO PERFORMING THIS TEST, THE PWB SHOULD HAVE PASSED TEST ON THE 2270.

### 9.2 SPECIAL TEST EQUIPMENT

---

1. FUNCTIONAL TEST MODULE: FVE
2. TEST SUPPORT CARDS AND SETUP. (NOTE: HLND IN 2C OR 2E OR BOTH CAN BE BOARD UNDER TEST. USE SAME PROCEDURE FOR TESTING EITHER ONE BOARD OR TWO BOARDS AT A TIME.)

SLOT 2B	HLND	ROM SET "SD_86_MONITOR_RAM_1E"
SLOT 2D	HLNC	PROM "PSP3815PLNC01AB" IN SOCKET U27 PROM "PSP3815PLNC02AB" IN SOCKET U28 J1-J3, J5-J9 "F" J4 "T" J10-J13 "A"
SLOT 2C	HLND	J1 "T" J2-J8 "F" J9 IN
SLOT 2F	HLNC	PROM "PSP3815PLNC01AB" IN SOCKET U27 PROM "PSP3815PLNC02AB" IN SOCKET U28 J1-J3, J6-J9 "F" J4, J5 "T" J10-J13 "A"
SLOT 2E	HLND	J1, J2 "T" J3-J8 "F" J9 IN
	HMAC#1	JA1-JA3 "T" JB1-JB3 "T" J5B, D "GND" J5C, E OPEN
	HMAC#2	JA1-JA3 "T" JB1-JB3 "T" J5B, D "GND" J5C, E OPEN

### 9.3 POWER SUPPLY REQUIREMENTS

---

THIS TEST IS WRITTEN ASSUMING THE USE OF POWER SUPPLY TYPE DS3820PSLA1A1A.

### 9.4 INITIAL SETUP

---

1. PLUG CARDS IN MODULE PER SECTION 9.2
2. CABLE INTERCONNECTIONS.  
CABLE TYPE FROM TO



POWER CABLE	PVE-JA	PS-JA
POWER CABLE	HMAC#1-JG	PS-JF
POWER CABLE	HMAC#2-JG	PS-JE
20 PIN RIBBON	HLND 2C-JA	HMAC#1-JA
20 PIN RIBBON	HLND 2E-JA	HMAC#2-JA
50 PIN RIBBON	HLND 2C	HLNC 2D
50 PIN RIBBON	HLND 2E	HLNC 2F
TWAX CABLE	HMAC#2-JE	HMAC#1-JB
TWAX CABLE	HMAC#1-JE	HMAC#2-JB
* RS232 CABLE	COMPUTER TERM.	HMPJ SLOT 2B

\* USE NULL MODEM (DS3800HNMA) ON HMPJ END OF CABLE.  
 JUMPER IN SPDE POSITION. JA CONNECTOR CONNECTED TO HMPJ.

## 9.5 TEST DEFINITIONS AND SPECIAL NOTES

-----  
 NONE

## 9.6 TEST PROCEDURE

- 
1. APPLY POWER.
  2. AFTER CR2 COMES ON ON THE HMPJ, TYPE "BB" (MR80.)
  3. TYPE "SN4000," (A55A-)
  4. TYPE "7FF7" THEN [RETURN] AND WATCH FOR THE FOLLOWING TO OCCUR AT THE HLNC IN SLOT 2D.
    - IMOK LED ON (AFTER ABOUT 10 SECONDS).
    - DIAG LED ON FOR ABOUT 5 SECONDS AND THEN GOES OUT.
    - AFTER DIAG LED GOES OUT, CONFIG LED COMES ON AND BLINKS.
    - IMOK LED REMAINS ON
  5. TYPE "SWC000," (A55A)
  6. TYPE "7FF7" THEN [RETURN] AND THEN VERIFY THAT AFTER APPROXIMATELY 5 SECONDS THE IMOK LED'S ON BOTH HLNC'S ARE ON. (OTHER HLNC LED'S OFF)
  7. REMOVE POWER.
  8. IF CARDS CAME INTO TEST WITHOUT TEST ROMS THEN REMOVE TEST PROM FROM HLNC UNDER TEST (SLOT 2C). (OR BOTH HLNC'S IF TWO CARDS TESTED AT ONCE.)

END OF TEST

## TEST INSTRUCTION REVISION STATUS

REV	INIT	DESCRIPTION OF CHANGE	DATE COMPLETED
----	----	-----	-----
0	REV	FIRST MADE FOR DS3800HLNE 1A1A	28-APR-86
1	REV	VARIOUS CHANGES PER DB	08-MAY-86
2	DB	REMOVED REFERENCES TO HLNC	20-SEP-86

## 9.0 HLNC.FUN FUNCTIONAL TEST INSTRUCTIONS

---

### 9.1 SCOPE

---

THIS DOCUMENT DESCRIBES THE SETUP AND FUNCTIONAL TEST PROCEDURE FOR PWB DS3800HLNC. PRIOR TO PERFORMING THIS TEST, THE PWB SHOULD HAVE PASSED TEST ON THE 2270.

### 9.2 SPECIAL TEST EQUIPMENT

---

1. FUNCTIONAL TEST MODULE: FVE
2. TEST SUPPORT CARDS AND SETUP. (NOTE: HLNC IN 2D OR 2F OR BOTH CAN BE BOARD UNDER TEST. USE SAME PROCEDURE FOR TESTING EITHER ONE BOARD OR TWO BOARDS AT A TIME.)

SLOT 2B	HMPJ	ROM SET "SD_80_MONITOR_RAM_1E"	
SLOT 2D	HLNC	PROM "PSP3815PLNC01AB" IN SOCKET U27	
		PROM "PSP3815PLNC02AB" IN SOCKET U28	
		J1-J3, J5-J9	"F"
		J4	"T"
		J10-J13	"A"
SLOT 2C	HLND	J1	"T"
		J2-J8	"F"
		J9	IN
SLOT 2F	HLNC	PROM "PSP3815PLNC01AB" IN SOCKET U27	
		PROM "PSP3815PLNC02AB" IN SOCKET U28	
		J1-J3, J6-J9	"F"
		J4, J5	"T"
		J10-J13	"A"
SLOT 2E	HLND	J1, J2	"T"
		J3-J8	"F"
		J9	IN
	HMAC#1	JA1-JA3	"T"
		JB1-JB3	"T"
		J5B, D	"GND"
		J5C, E	OPEN
	HMAC#2	JA1-JA3	"T"
		JB1-JB3	"T"
		J5B, D	"GND"
		J5C, E	OPEN

### 9.3 POWER SUPPLY REQUIREMENTS

---

THIS TEST IS WRITTEN ASSUMING THE USE OF POWER SUPPLY TYPE DS3820PSLA1A1A.

### 9.4 INITIAL SETUP

---

1. PLUG CARDS IN MODULE PER SECTION 9.2

2. CABLE INTERCONNECTIONS.

CABLE TYPE	FROM	TO
------------	------	----

---

Seal all pots.  
END OF TEST

=====

TROUBLE SHOOTING INFORMATION

-----

U1 and U18 combination can be verified as follows:  
Connect voltmeter to U18.6(+) ACOM(-). Output the data to address  
9F00 and verify the voltmeter reading. (OW9F00,data,data,data,etc.)

U2 and U19 combination can be verified as follows:  
Connect voltmeter to U19.6(+) ACOM(-). Output the data to address  
9F02 and verify the voltmeter reading. (OW9F02,data,data,data,etc.)

There is no adjustment (assuming that R120 is set properly).  
If the output does not change when the data is changed then the  
D/A chip is probably bad or the module wiring and/or the  
processor(HMPF) card.

DATA	OUTPUT(ideal)
----	-----
0000	0.0000
0002	-00.0012
0006	-00.0024
000E	-00.0048
001E	-00.0097
003E	-00.0195
007E	-00.0390
00FE	-00.0781
01FE	-00.1562
03FE	-00.3125
07FE	-00.6250
0FFE	-01.2500
1FFE	-02.5000
3FFE	-05.0000
7FFE	-10.0000

=====

08JAN86 JMT	CHANGED OUTPUT DATA AT TEST STEP 8.
20AUG86 DB	added module FVH
11SEP86 DB	corrected step 9.6.7, spread limits at 9.6.4
03MAR87 DB	added verify U15 & U16 leakage
20JAN88 DB	cosmetic
06JUN88 db	changes for module FVE.

U15 pin 2 U15 pin 7

Measure voltage between DCOM(U15.2) & X1(U15.4). Must be less than  $\pm .80$  VDC. If fails then replace U15.

Measure voltage between DCOM(U16.2) & X2(U16.4). Must be less than  $\pm .80$  VDC. If fails then replace U16.

Measure voltage between DCOM & ACOM(C20-). Must be less than  $\pm .80$  VDC.

Adjust R122 for  $0.000 \pm .002$  VDC at TP1(X1) (Adjust as close as possible to 0.0)

Adjust R121 for  $0.000 \pm .002$  VDC at TP7(X2) (Adjust as close as possible to 0.0)

Remove clipleads from across C100 & C101.

Put berg jumpers back in the "V" position.

Using the output word command (EXAMPLE: OW9F00,data) output data to the addresses listed below and verify the voltmeter readings.  
(Type two "B" to initialize HMPF MONITOR program)

ADDRESS	DATA	TP2-X1 (TP3) <sup>DCOM</sup>	JA2-X1 (TP3)
9F00	0000	-0.010 +0.010	-0.025 +0.025
9F00	3FFE	-4.990 -5.010	+4.975 +5.025
9F00	7FFE	-9.985 -10.015	+9.975 +10.025

Example OW9F00, 0000 Enter

  

ADDRESS	DATA	TP8-X2 (TP9) <sup>DCOM</sup>	JA6-X2 (TP9)
9F02	0000	-0.010 +0.010	-0.025 +0.025
9F02	3FFE	-4.990 -5.010	+4.975 +5.025
9F02	7FFE	-9.985 -10.015	+9.975 +10.025

Output data 3FFF at address 9F00 & data 7FFF at address 9F02 and verify the proper dc output voltage at PA78 for each of the logic input conditions listed in the following table:  
(all outputs must be  $\pm 1\%$ )

INPUTS				OUTPUTS
PA63	PA44	PA37	PA65	PA78
0	0	0	1	-5V
0	0	1	1	-5V
0	1	0	1	+2.8V
0	1	1	1	+4.6V
1	0	0	1	-10V
1	0	1	1	-10V
1	1	0	1	+5.6V
1	1	1	1	+9.9V

(0=closed to DCOM, 1=open from DCOM)

USE ACOM as comparison

CPB-ACOM (A=1)

DCOM=CR1

Output data 7FFF to address 9F00 & 9F02. (OW9F00, 7FFF & OW9F02, 7FFF)

Disconnect all JA connections (pull plug).

Change jumpers INH1 & INH2 from "OUT" to "IN".  $\rightarrow$  PA02 = 0

Verify both relays & both LED'S cycle ON for about 1/5 sec and then off for about 10 to 20 sec.  
(the two circuits might not cycle synchronous)

Open PA02 from DCOM.

The relay & LED cycling should discontinue with LEDS remaining off. Close PA02 to DCOM and reconnect JA connector.

Output data 05FF to address 9F00 and 9F02.

Verify +5.0  $\pm .5$ V at both (CR51) anode and (CR53) anode.  
(ACOM) (TP3)

HCVA1H1F.FUN

## PREFACE

Functional verification tests for the DS3800HCVA.

## EQUIPMENT

- ✓ Test module FVE (L-BUS).
- ✓ Extender card DS3800XEXA1B1A (or equiv).
- ✓ FVE switch box with ribbon cables (20 pin) and (10 pin).
- ✓ DS3800HMPJ processor card *(already wired)*
- ✓ Monitor.proms "SD\_86\_MONITOR\_RAM\_TE".  
(other processors with their monitors might work as well?)
- ✓ Computer terminal (RS232C) with cable.
- ✓ Null modem DS3800HNMA1B1A (or equiv).

## SETUP

*use*  
*anpg* { ~~Connect FVE switch box JG to module backplane JG. Already wired~~

Setup HMPJ : U22=01AA U23=02AA J1=SIG J2=L J3,J4,J5,J6=A.

Place HMPJ in module slot 1F.

Connect RS232C computer terminal (CRT) to null modem JB.

Connect null modem JA to HMPG JB.

Set null modem berg-jumper to "SPEC".

Set CRT baud rate to any of the following speeds:

300 600 1200 2400 4800 9600 19200

*If using DS3800HMPG, place in module slot 1F (this is the only processor card module)*

Set HCVA berg jumpers :

J1A/B, J2A/B	"V"
J3	"RUN"
J4, J5	"S"
J8-JC	"T"
JD	"F"
INH1, INH2	"OUT"

Plug HCVA into module slot 1B.

~~Connect FVE switch box JA to HCVA JA (10 pins). Already wired~~

Close HCVA PA02 to DCOM.

Close HCVA PA65 to DCOM.

## TEST PROCEDURE

*Check +/- 15 V on DC to DC converter (U14)*  
*Connect JE on backplane to JA on card*

There are four commons on the HCVA. They are DCOM, ACOM, X1, & X2. Each measurement must be made with respect to the correct common. The following chart shows which common should be used:

<u>DCOM (Pin 12 U17)</u>	<u>ACOM (Pin 4 U14)</u>	<u>X1 (TP3)</u>	<u>X2 (TP9)</u>
Logic levels	U14 PIN 6	TP1	TP7
	PA78	TP2	TP8
	JA2	JA6	
	CR51 ANODE	CR53 ANODE	

Turn power on.

Adjust R120 for as close to +10.000 VDC as possible at U14-6. *(ACOM)*  
(MUST BE WITHIN 8 MILLIVOLT)

Remove berg jumpers J1A, J1B, J2A, & J2B.

Short J1A "I" post to J1B "I" post.

Short J2A "I" post to J2B "I" post.

Cliplead across C100. CR61 must be on. *(11)*

Cliplead across C101. CR60 must be on. *(11)*

*Leave clipleads on*

ADER SWITCH BOXES (connect to module backplane headers)

4AH

JK (HMPK)  
 JK01=DCOM  
 JK02=P5  
 JK28(PA02), JK30(PA10), JK32(PA21)=TESTPOINT  
 JK07(PA08), JK09(PA18), JK09(PA22), JK10(PA23), JK11(PA24), JK12(PA25)=SWITCH TO DCOM  
 JK13(PA37), JK14(PA44)=SWITCH TO DCOM & 10K PULLUP TO P5  
 JK15(PA62), JK16(PA63), JK17(PA65), JK18(PA67), JK19(PA69), JK20(PA71), JK21(PA78), JK22(PA80)=1K+LED TO P5

JK (HMPG)  
 JK01=DCOM  
 JK02=P5  
 JK28(PA02), JK32(PA21), JK34(PA32)=TESTPOINT  
 JK07(PA08), JK09(PA22), JK10(PA23), JK11(PA24), JK12(PA25), JK15(PA62), JK16(PA63), JK17(PA65), JK20(PA71)=SWITCH TO DCOM  
 JK18(PA67), JK19(PA69), JK21(PA78), JK22(PA80)=1K+LED TO P5

JB (HCVA)  
 JB01=DCOM  
 JB03(PA02), JB04(PA37), JB05(PA44), JB06(PA63), JB07(PA65)=SWITCH TO DCOM  
 JB08(PA78)=TESTPOINT

JD (HCMB)  
 JD01=DCOM  
 JD03(PA06)=SWITCH TO DCOM

#### CH BOX LOADS

JA (connects to HCVA front edge)

JA01 JA05 = 10ohm 1/4watt  
 JA02 JA04 = 10ohm 1/4watt  
 JA06 JA08 = 10ohm 1/4watt  
 JA09 JA10 = 10ohm 1/4watt  
 JA02 JA03 = 500ohm 1/2watt  
 JA06 JA07 = 500ohm 1/2watt  
 JA04 JA05 = short circuit  
 JA08 JA09 = short circuit

.....

=FVE.WRL

88 db chad JK03 TO JK28, JK04 TO JK30, JK05 TO JK32, JK06 TO JK34.