

HAFa

SET HAFa JUMPERS : J1=RUN J8, J9, JA, JB, JC=F JD=T G3=1 ALL OTHER JUMPERS=1

PLACE THE HAFa BOARD IN SLOT 1F.

A KNOWN-GOOD HAIA BOARD IS REQUIRED.

SET HAIA JUMPERS : J1, J2=A J3, J4, J5, J6, J7, J8=F J9=C

PLACE HAIA IN SLOT 2L.

CONNECT A 34-PIN RIBBON CABLE FROM HAFa (JA) TO MODULE -BACKPLANE (JJA)

CONNECT A 20-PIN RIBBON CABLE FROM HAFa (JB) TO MODULE – BACKPLANE (JDB)

TURN ON THE DC POWER SUPPLY.

WAIT FOR THE MENU OF TEST, THEN TYPE “HAFa<RETURN>”.

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

“HAFa=PASSED” WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

DMPC

SET DMPC JUMPERS : J1=INT J2=COM J3=GND

CONNECT THE DMPC BOARD UNDER TEST TO THE HMPF IN SLOT 2G.

AN HRMA OR AN HRMB IS REQUIRED.

IF AN HRMA IS BEING USED THEN SET THE HRMA JUMPERS :

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

PLACE THE HRMA IN SLOT 2E. CONNECT 50PIN RIBBON CABLE BETWEEN HRMA AND DMPC.

ELSE IF AN HRMB IS BEING USED THEN SET THE HRMB JUMPERS :J20 =OUT

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

PLACE THE HRMB IN SLOT 2D. CONNECT 50PIN RIBBON CABLE BETWEEN HRMB AND DMPC.

TURN ON THE DC POWER SUPPLY.

WAIT FOR MENU OF TESTS, THEN TYPE "DMPC<RETURN>".

THE APPROX. TEST TIME IS 270 SECONDS.

"DMPC=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HAIA

SET HAIA JUMPERS : J1=A J2=A J3=F J4=F J5=F J6=F J7=F J8=F J9=C
PLACE IN SLOT 2L.

CONNECT CABLE #305A4207G2 FROM DC SOURCE TO BACKPLANE CONNECTOR JBB.

CONNECT CABLE #305A4207G3 FROM HAIA JA TO JB.

TURN ON MODULE DC POWER SUPPLY.

WAIT FOR THE PROMPT "TEST:" THEN TYPE HAIA <RETURN>

INSURE THAT THE "I/O TESTS" PASS, THEN SELECT CHANNEL "0" FOR CALIBRATION.

DURING CALIBRATION THE CRT WILL DISPLAY THE DECIMAL AND BINARY
REPRESENTATION OF THE APPLIED INPUT VOLTAGE.

SET THE VOLTAGE SOURCE FOR -10.000 VOLTS. ADJUST R1 (UPPER "OFFSET") POT FOR
READINGS WHICH TOGGLE BETWEEN -2048 & -2047 (AN OCCASIONAL -2046 IS OK).

-2048 100000000000

AND -2047 100000000000

SET THE VOLTAGE SOURCE FOR +9.9951 VOLTS. ADJUST R2 (LOWER "GAIN") POT FOR
READINGS WHICH TOGGLE BETWEEN +2048 & +2046 (AN OCCASIONAL +2045 IS OK).

+2047 011111111111

+2046 011111111110

**NOW CHANNELS 1-F NEED TO BE CHECKED JUST LIKE THE ABOVE PROCEDURE FOR CHANNEL "0"
HIT THE ESCAPE BUTTON ON THE KEYBOARD TO ENTER DIFFERENT CHANNELS**

SET THE DC VOLTAGE SOURCE TO 0.00 VOLTS (OR SET TO STANDBY MODE).

**CALIBRATION IS COMPLETE. IF BOTH THE CALIBRATION AND I/O TESTS ARE
SUCCESSFUL THEN SEAL BOTH POTS.**

HAIC

SET HAIC JUMPERS : J1,J2=A J3, J4, J5, J6, J7, J8=F J9=C

PLACE HAIC BOARD UNDER TEST IN SLOT 2L.

CONNECT CABLE #305A4207G2 FROM THE DC SOURCE TO BACKPLANE CONNECTOR (JBB).

CONNECT LOOP-BACK CABLE #305A4207G3 FROM HAIC (JA) TO HAIC (JB)

TURN ON THE DC POWER SUPPLY.

WAIT FOR THE PROMPT "TEST:" THEN TYPE "HAIC<RETURN>"

INSURE THAT THE "I/O TESTS" PASS, THEN SELECT CHANNEL "0" FOR CALIBRATION.

DURING CALIBRATION THE CRT WILL DISPLAY THE DECIMAL AND BINARY REPRESENTATION OF THE APPLIED INPUT VOLTAGE.

SET THE VOLTAGE SOURCE FOR -10.000 VOLTS . ADJUST R1 (UPPER "OFFSET") POT FOR READINGS WHICH TOGGLE BETWEEN -2048 & -2047 (AN OCCASIONAL -2046 IS OK).

-2048 100000000000

AND -2047 100000000001

SET THE VOLTAGE SOURCE FOR +9.9951 VOLTS. ADJUST R2 (LOWER "GAIN") POT FOR READINGS WHICH TOGGLE BETWEEN +2047 & +2046 (AN OCCASIONAL + 2045 IS OK).

+2047 011111111111

AND +2046 011111111110

**NOW CHANNELS 1-F NEED TO BE CHECKED JUST LIKE THE ABOVE PROCEDURE FOR CHANNEL "0"
HIT THE ESCAPE BUTTON ON THE KEYBOARD TO ENTER DIFFERENT CHANNELS**

SET THE DC VOLTAGE SOURCE TO 0.00 VOLTS (OR SET TO STANDBY MODE).

**CALIBRATION IS COMPLETE. IF BOTH THE CALIBRATION AND I/O TESTS ARE
SUCCESSFUL THEN SEAL BOTH POTS.**

HARA

SET HARA JUMPERS : J1=B J2=A J3=A J4=A J5=A J6=0

VERIFY THAT A 68A9170P0027 ROM IN SOCKET U19.

PLACE HARA IN SLOT 2M.

TURN ON THE DC POWER SUPPLY.

WAIT FOR THE TEST MENU, THEN TYPE "HARA".

THE TOTAL TEST TIME IS APPROX. 20 SECONDS.

"HARA=PASSED" WILL BE DISPLAYED FOR GOODS BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HCMA

SET HCMA JUMPERS : 1, 2=GND 1, 2=DCE B1, C1, E1, F1=0 D1=1 A, B, C, D=IN
TXCA, TXC2, RXC1, RXC2=INT PROM=32 CLK=INT
PLACE THE TEST ROM #68A9180P0001 IN SOCKET U5.
PLACE THE HCMA BOARD UNDER TEST IN SLOT 2E.
CONNECT CABLE #305A4207G1 FROM HCMA (JA) TO HCMA (JB).
TURN ON THE DC POWER SUPPLY.
WAIT FOR THE TEST MENU, THEN TYPE "HCMA<RETURN>".
THE TOTAL TEST TIME IS APPROX. 3 SECONDS.
"HCMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL
BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE
ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HCMC

SET HCMC JUMPERS : GND & DCE= 1,2 B1, C1, E1, F1=0 D1=1 A, B, C, D=IN

TXC1, TXC2, RXC1, RXC2=INT PROM=32 CLK=INT

PLACE THE TEST ROM #68A9180P0001 IN SOCKET U5.

CLIPLEAD SLOT -2E PA-17 TO PA-21 (SUGGEST USING AN EXTENDER CARD).

CONNECT CABLE #305A4207G1 FROM JCMC (JA) TO HCMC (JB).

TURN ON THE DC POWER SUPPLY.

WAIT FOR TEST MENU, THEN TYPE "HCMA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 3 SECONDS.

"HCMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HFPA

SET JUMPERS : J3=EXT J4, J5=REMOVED J7=2K J8=BD J34=OUT J35, J36, J37=IN
SET THE THUMBWHEEL SWITCH TO POSITION F.
PLACE TEST PROM "PSG304A9936AACB" IN SOCKET U3.
INSERT HFPA INTO SLOT 1D.

TURN ON THE DC POWER SUPPLY. WHILE TEST IS IN PROGRESS, THE YELLOW LED (IMOK) SHOULD BE LIT AND THE FOUR RED LED'S SHOULD DISPLAY A BINARY CODE INDICATING WHICH TEST IS IN PROGRESS.

WHEN COMPLETE, ALL FOUR LED'S ON THE BOARD SHOULD BE LIT AND THE YELLOW LED SHOULD BE FLASHING. IF THE YELLOW LED IS UNLIT AND/OR IF ALL RED LED'S ARE NOT LIT THEN THE BOARD HAS FAILED. THE TEST PERFORMED ARE :

- 1# DIGITAL I/O TEST
- 2# 200-LEVEL BUS TEST
- 3# 200-LEVEL BUS LATCH TEST
- 4# TIMER TEST (8253/4)
- 5# A/D TEST: 5V = AIN1 (40H)
- 6# A/D TEST: 0V = AIN2 (80H)
- 7# D/A, A/D TEST: D/A (PA02=7.65V) = AIN3(20H)
- 8# D/A, A/D TEST: D/A (PA69=-9.73V) = AIN4(F0H)

ROTATE THE THUMBWHEEL AND VERIFY THE FOLLOWING LED PATTERNS:

TW POSITION	LED4	LED3	LED2	LED1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
A	1	0	1	0
B	1	0	1	1
C	1	1	0	0
D	1	1	0	1
E	1	1	1	0
F	1	1	1	1
1=LIT LED				
0=UNLIT LED				

THE TEST IS COMPLETE.

HFFA – CONT.

DEBUG INFORMATION FOLLOWS:

CALIBRATION MAY BE PERFORMED IF DESIRED. FOLLOWING TABLE INDICATES EXPECTED OUTPUT FOR EACH TW POSITION. IF U1 PIN#1 IS LOW THEN THE TEST PROGRAM WILL LOOP-ON-FAILURE (STAYING IN TEST UNTIL PASS). U1 PIN #1 CAN BE HELD LOW BY PLACING BERG-JUMPER J5 TO IN. LOOP-ON-FAILURE MIGHT ALLOW SETTING THE CALIB POTS CLOSE ENOUGH TO GET TO THE END-OF-PROGRAM (AS INDICATED BY FLASHING YELLOW LED) SO THAT THE POTS CAN BE CALIBRATED USING BENCH METER.

TW	DATA	VOLTS	NOTES
0	00	-11.52	ADJUST "OFFSET" (R101=TP7 R104=TP8)
1	FF	+11.43	ADJUST "GAIN" (R102=TP7 R103=TP8)
2	CO	+5.76	NO ADJUSTMENT AVAILABLE
3	AO	+2.88	NO ADJUSTMENT AVAILABLE
4	90	+1.44	NO ADJUSTMENT AVAILABLE
5	88	+0.72	NO ADJUSTMENT AVAILABLE
6	84	+0.36	NO ADJUSTMENT AVAILABLE
7	82	+0.18	NO ADJUSTMENT AVAILABLE
8	81	+0.09	NO ADJUSTMENT AVAILABLE
9	7F	-0.09	NO ADJUSTMENT AVAILABLE
A	7E	-0.18	NO ADJUSTMENT AVAILABLE
B	7C	-0.36	NO ADJUSTMENT AVAILABLE
C	78	-0.72	NO ADJUSTMENT AVAILABLE
D	70	-1.44	NO ADJUSTMENT AVAILABLE
E	60	-2.88	NO ADJUSTMENT AVAILABLE
F	40	-5.76	NO ADJUSTMENT AVAILABLE

(THE SETTING OF EACH POT MAY AFFECT THE SETTING OF ANY OTHER POT)

HFPB

THE HFPB, HFXA, & HFXB BOARDS MUST BE TESTED AS A SET.

HFXA (SLOT 1B) :

J1=1 J2=L J3=RAM J4=ROM J5=RAM J6=ROM

U10=68A9249P1 (2K X 8 RAM) U11=68A9249P1 (2K X 8 RAM)

HFXB (SLOT 1A):

BJ3=DON'T CARE BJ4=DON'T CARE BJ5=A & C BJ6=A & C

U4=68A9196P1 (8K X 8 RAM) U5=68A9196P1 (8K X 8 RAM) U11=PSP3815PFZA01AB

HFPB (SLOT 1C):

J1=4K J2=ROM J3=RAM J4=ROM

U4=PSG304A9936AACF U5=68A9249P1 (2K X 8 RAM)

CONNECT THE 40-PIN CONNECTOR (DS3815RCJ2FL006X003) TO THE HFPB, HFXA, & HFXB

CONNECT THE RS232 TERMINAL TO HFXB.

TURN ON THE DC POWER SUPPLY. TYPE THE DESIRED TEST NAME.

THE TEST TAKES ABOUT 2 SECONDS TO COMPLETE.

Test Complete

HFPE

SET THE JUMPERS AS FOLLOWINGS:

J0=RUN J1, J2, J3, J4, J5, J6, J7, J8, J9, J10, J11, J12, J13, J14, J15, J16=F

PLACE TEST PROM "PSG304A9936AACA" IN SOCKET U2.

PLACE BOARD TO BE TESTED IN SLOT 1E.

TURN ON THE DC POWER SUPPLY. RESET THE HFPE BY SHORTING HFPE TP1 TO TP2.

NOTICE: ALL 4 HFPE LEDS MUST BE ON WHILE SHORT IS BETWEEN HFPE TP1 TP TP2.

REMOVE THE SHORT FROM HFPE TP1 TO TP2.

THE HFPE WILL NOW PERFORM A SELFTEST ROUTINE.

WHEN THE TEST IS COMPLETE (ABOUT 1 SEC.) ALL LED'S (F0, F1, F2 & IMOK)

WILL BE LIT FOR GOOD BOARDS. TEST FAILURE RESULTS IS INTERPRETED AS FOLLOWS

IMOK	F1	F2	F3	
1	1	1	1	RESET (SHORT BETWEEN TP1-TP2)
0	0	0	1	PASSED JUMPERS J1 THRU J16
0	0	1	0	PASSED IO @800H & 801H
0	0	1	1	PASSED IO @802H & 803H
0	1	0	0	PASSED RAM U3
0	1	0	1	PASSED ROM U2
1	1	1	1	PASSED ALL TESTS

THE TEST IS COMPLETE.

HFXA

THE HFPB, HFXA, & HFXB BOARDS MUST BE TESTED AS A SET.

HFXA (SLOT 1B):

J1=1 J2=L J3=RAM J4=ROM J5=RAM J6=ROM

U10=68A9249P1 (2K X 8 RAM) U11=68A9249P1 (2K X 8 RAM)

HFXB (SLOT 1A):

BJ3=DON'T CARE BJ4=DON'T CARE BJ5=A & C BJ6=A & C

U4=68A9196P1 (8K X 8 RAM) U5=68A9196P1 (8K X 8 RAM) U11=PSP3815PFZA01AB

HFPB (SLOT 1C):

J1=4K J2=ROM J3=RAM J4=ROM

U4=PSG304A9936AACF U5=68A9249P1 (2K X 8 RAM)

CONNECT THE 40-PIN CONNECTOR (DS3815RCJ2FL006X003)

CONNECT THE RS232 TERMINAL TO HFXB.

TURN ON THE DC POWER SUPPLY. TYPE THE DESIRED TEST NAME.

THE TEST TAKES ABOUT 2 SECONDS TO COMPLETE.

THE TEST IS COMPLETE.

HITA

SET HITA JUMPERS : J1=B J2=B J3=A J4=B J5=B J6=LONG J7=OFF

PLACE HITA BOARD UNDER TEST IN SLOT 2B.

TURN ON THE DC POWER SUPPLY.

WAIT FOR TEST MENU, THEN TYPE "HITA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 5 SECONDS.

"HITA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HMHA

SET HMHA JUMPERS :

J0, J1, J2, J3, J4, J5, J6, J7, J10, J11, J13, J14=0 J8=INT J9=4K J12=1 J15, J16, J17=IN

PLACE THE TEST ROM (68A9180P0003) IN SOCKET U5.

PLACE THE BOARD UNDER TEST IN SLOT 2E.

CONNECT CABLE #305A4207G4 ON HMHA JA TO JB.

TURN ON THE DC POWER SUPPLY.

WAIT FOR TEST MENU, THEN TYPE "HMHA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HMHA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HMPF

J1 (SIG) :	[D], GND	!	U22 = PSG304A9936AABM03AB	TEST SOFTWARE
J2 (TBUSS) :	[L], E	!	U23 = PSG304A9936AABM01AB	TEST SOFTWARE
J3 :	[8K], 4K	!	U24 = PSG304A9936AABM01AB	TEST SOFTWARE
			U25 = PSG304A9936AABM02AB	TEST SOFTWARE

CONNECT A DMPC TO THE HMPF UNDER TEST. PLACE THIS PAIR OF BOARDS IN SLOT 2G
SET HRMA JUMPERS AS FOLLOWS :

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

PLACE THE HRMA IN SLOT 2E. CONNECT HRMA TO DMPC USING A 50-PIN RIBBON CABLE.
CONNECT THE TERMINAL TO JB OF THE HMPF USING THE NULL MODEM.

TURN ON THE DC POWER SUPPLY.

WAIT FOR TEST MENU, THEN TYPE "HMPF<RETURN>"

"HMPF=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT
BE DISPLAYED FOR BAD BOARDS. THE TEST TIME IS APPROX. 30 SECONDS.

RUN THE HXMA TEST. (SETUP CARDS (3) PER HXMA TEST PROCEDURE.)

"HXMA = PASSED" WILL BE DISPLAY FOR GOOD BOARDS. ERROR CODES MIGHT BE
DISPLAY FOR BAD BOARDS. THE TEST TIME IS APPROXIMATELY 10 SECONDS.

RUN THE HITA TEST. (SETUP CARD PER HITA TEST PROCEDURE)

"HITA= PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE
DISPLAY FOR BAD BOARDS. THE TEST TIME IS APPROXIMATELY 5 SECONDS.

IF SOCKETS U22-U25 HAVE FIRMWARE INSTALLED, REMEMBER TO COMPARE THEM WITH A
KNOWN GOOD SET.

THE TEST IS COMPLETE.

- BE CAREFUL WHEN TESTING SOMETIMES JUMPER J1 POSITIONING IS DIFFERENT. (SIGNAL & GROUND ARE REVERSED) WHEN THIS HAS HAPPENED GARBAGE WAS DISPLAYED.

THE TEST IS COMPLETE.

HMHA

SET HMHA JUMPERS:

J0, J1, J1, J2, J3, J4, J5, J6, J7, J10, J11, J13, J14=0 J8=INT J9=4K J12=1 J15, J16, J17=IN

PLACE THE TEST ROM (68A918OP0003) IN SOCKET U5,

PLACE THE BOARD UNDER TEST IN SLOT 2E.

CONNECT CABLE #305A4207G4 ON HMHA JA TO JB.

TURN ON THE DC POWER SUPPLY.

WAIT FOR THE TEST MENU, THEN TYPE "HMHA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HMHA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL
DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE
ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HMPH

IF THE HMPH UNDER TEST WAS MADE FROM A HMPF THEN US THE SETUP INSTRUCTIONS OF THE HMPF.

IF THE HMPH UNDER TEST WAS MADE FROM A HMPJ THEN USE THE SETUP INSTRUCTIONS OF THE HMPJ.

“HMPH=PASSED” WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST TIME IS APPROX. 30 SECONDS.

THE TEST IS COMPLETE.

HMPJ

THE HMPJ UNDER TEST MUST BE USED IN PLACE OF THE HMPF THAT IS DESCRIBED IN THE SET-UP PROCEDURE.

VERIFY HMPJ JUMPERS : J1(SIG) = IN J2 (TBUSS) = L J3 = A J4 = A J5 = A J6 = A

VERIFY HMPJ PROMS AS FOLLOWINGS :

U22 = PSG304A9936AABM03AB

U23 = PSG304A9936AABM04AB

U24 = PSG304A9936AABM01AB

U25 = PSG304A9936AABM02AB

CONNECT A DMPC TO THE HMPJ. PLACE THIS PAIR OF BOARDS IN SLOT 2G.

SET JUMPERS ON TEST HRMA AS FOLLOWS :

J1=B J2=A J3=B J4=B J5=A J6=B J7=B J8=A J9=A

J10=B J11=B J12=A J13=A J14=A J15=A J16=A J17=A J18=A

PLACE TEST HRMA IN SLOT 2E. CONNECT HRMA TO DMPC USING 50-PIN-RIBBON CABLE.

CONNECT THE TERMINAL TO JB OF THE HMPJ USING THE NULL MODEM.

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HMPF<RETURN>"

"HMPF=PASSED" WILL DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT

BE DISPLAYED FOR BAD BOARDS. THE TEST TIME IS APPROX 30 SECONDS.

RUN THE HXMA TEST. (SETUP CARDS (3) PER HXMA TEST PROCEDURE.)

"HXMA = PASSED" WILL BE DISPLAY FOR GOOD BOARDS. ERROR CODES MIGHT BE

DISPLAY FOR BAD BOARDS. THE TEST TIME IS APPROXIMATELY 10 SECONDS.

RUN THE HITA TEST. (SETUP CARD PER HITA TEST PROCEDURE)

"HITA= PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE

DISPLAY FOR BAD BOARDS. THE TEST TIME IS APPROXIMATELY 5 SECONDS.

IF SOCKETS U22-U25 HAVE FIRMWARE INSTALLED, REMEMBER TO COMPARE THEM WITH A KNOWN GOOD SET.

THE TEST IS COMPLETE.

- BE CAREFUL WHEN TESTING SOMETIMES JUMPER J1 POSITIONING IS DIFFERENT. (SIGNAL & GROUND ARE REVERSED) WHEN THIS HAS HAPPENED GARBAGE WAS DISPLAYED.

THE TEST IS COMPLETE.

HPMA

SET HPMA JUMPERS : J1, J3, J4, J6, J7=B J2, J5, J9=A J8=C

PLACE TEST ROMS IN SOCKETS :

U14=68A9172P0193	U15=68A9172P0194	U16=68A9172P0195	U17=68A9172P0196
U18=68A9172P0197	U19=68A9172P0198	U20=68A9172P0199	U21=68A9172P0200
U22=68A9172P0201	U23=68A9172P0202	U24=68A9172P0207	U25=68A9172P0204
U26=68A9172P0205	U27=68A9172P0206	U28=68A9172P0207	U29=68A9172P0208

PLACE HPMA BOARD UNDER TEST IN SLOT 2E.

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HMPA<RETURN>".

TOTAL TEST TIME IS APPROX. 2 SECONDS.

"HPMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES WILL BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HPRA

SET THE JUMPERS

J0=1 J1=1 J3=1 J4=1 J5 (9) =F J6 (C) =T J7 (D) =T J8 (A) =F J9 (B) =F

J10 (8) =F J11 (SB) =MPU J12 (SA) = MPU (OSC) =INT

PLACE THE BOARD UNDER TEST IN SLOT 2K.

TURN ON THE DC POWER SUPPLY.

SET THE INSTRUMENTS :

HP 5238 COUNTER:

POWER: ON

FUNCTION: FREQ A

FREQ RESOLUTION: 10HZ

LEVEL A: MIDRANGE

COUPLING: DC

SLOPE: +

ATTEN: X10

IMPED: 1M

WAVETEK MODEL 142:

FREQ HZ: X1K

SYMMETRY: NORMAL

OFFSET: OFF

OUTPUT ATEN: 0

SELECT: SQUARE WAVE

AMPLITUDE: FULL CW

BIG DIAL: 10.0

CONNECT 50 OHM OUTPUT OF WAVETEK TO CHANNEL A OF HP COUNTER.

CONNECT CABLE #305A4207G2 FROM WAVETEK 50 OHM OUTPUT TO HPRA (JA).

APPLY A 10 KHZ 30 VP-P SQUARE WAVE.

VERIFY THAT THE FREQUENCY SEEN ON ALL FOUR CHANNELS IS 10.00 KHZ +/- 0.01 K

THE TERMINAL SHOULD DISPLAY:

U22=10.00 U23=10.00 U24=10.00 U25=10.00

THE READINGS MAY VARY FROM 9.98 TO 10.02.

WITH THE MODULE RESET SWITCH (TOP OF MODULE) IN THE RESET POSITION, ADJUST R62 FOR 10.000 VOLTS MEASURED FROM MTP1 (TEST RING AT TOP OF BOARD) TO ACOM (AVAILABLE AT THE TOP OF THE MODULE).

THE TEST IS COMPLETE.

HPRB

WHEN TESTING THIS CARD, THE SYSTEM MAY NEED RESETTING(RED BUTTON)
SEVERAL TIMES.

SET THE JUMPERS

J0=1 J1=1 J3=1 J4=1 J5 (9) =F J6 (C) =T J7 (D) =T J8 (A) =F J9 (B) =F

J10 (8) =F J11 (SB) =MPU J12 (SA) =MPU

PLACE THE BOARD UNDER TEST IN SLOT 2K.

TURN ON THE DC POWER SUPPLY.

SET THE INSTRUMENTS :

Hewlett Packard

Sweep Generator

3324A

CONNECT CABLE #305A4207G2 FROM THE OUTPUT OF THE SWEEP GENERATOR TO HPRC (JA).
APPLY 10 KHZ 30 VP-P SQUARE WAVE. VERIFY THAT THE FREQUENCY ON ALL FOUR
CHANNELS IS 10.00 KHZ +/- 0.01 KHZ. THE DISPLAY SHOULD READ:

U22=10.00 U23=10.00 U24=10.00 U25=10.00

THE READINGS MAY VARY FROM 9.98 TO 10.02.

*WHEN INSTALLING THIS CARD IT COULD SHUT DOWN THE SYSTEM, WHEN POWER IS
RECYCLED THE SYSTEM WILL REBOOT.

THE TEST IS COMPLETE.

HPRC

WHEN TESTING THIS CARD YOU WILL NEED TO RESET(RED BUTTON) AFTER TYPING HPRC AND PRESSING ENTER.

SET THE JUMPERS: J1, J2, J3, J4=1 J5, J6, J7, J8=+/- 8,9,A,B=F C,D=T

PLACE THE BOARD UNDER TEST IN SLOT 2K.

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HPRC<RETURN>".

SETUP THE INSTRUMENT: TEST INSTRUMENT NEEDED:

HEWLETT PACKARD
SWEEP GENERATOR
3324A

CONNECT CABLE #305A4207G2 FROM THE OUTPUT OF THE SWEEP GENERATOR TO HPRC (JA).
APPLY 10 KHZ 20 VP-P SQUARE WAVE. VERIFY THAT THE FREQUENCY ON ALL FOUR
CHANNELS IS 10.00 KHZ +/- 0.01 KHZ. THE DISPLAY SHOULD READ:

U22=10.00 U23=10.00 U24=10.00 U25=10.00

THE READINGS MAY VARY FROM 9.98 TO 10.02.

*WHEN INSTALLING THIS CARD IT MAY SHUT DOWN THE SYSTEM, WHEN POWER IS RECYCLED THE SYSTEM WILL REBOOT.

THE TEST IS COMPLETE.

HRCA

THIS TEST REQUIRES A KNOW GOOD NRCA AND THE MODULE AUXILARY BOARD(THIS IS A SMALL TEST FIXTURE BOX)ONLY.

SETUP THE HRCA AND NRCA AND PLACE THEM IN THEIR SLOTS:

HRCA (SLOT 1L) :

J1=IN J2=2K U30=PSP3815PRDA01AA U31=68A9249P1(2K*8RAM) U33=NONE

NRCA (SLOT 1M) :

J1=ON J2, J3, J4, J5, J6=F J7, J9, J11, J12, J14, J15, J16, J17=MISSING

J8, J10, J13, J18=IN J19, J21=RES J20=RREF

PLACE THE “MODULE-AUXILARY-BOARD” INTO ANY CONVENIENT EMPTY SLOT.

CONNECT A 10-PIN RIBBIN CABLE FROM NRCA (JA) TO “AUXILARY BOARD”.

TEST THE BOARDS BY TOGGLING SW1 (TOP) AND SW2 (LOWER) ON THE AUXILARY BOARD.

LEDS ON THE HRCA & NRCA MUST AGREE WITH THE TABLE BELOW: (X) =DON’T CARE.

AUX SW1	BOARD SW2	CR8	NRCA CR9	CR10	CR2	CR3	HRCA CR4	CR5	CR6
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
DOWN	DOWN	OFF	OFF	OFF	ON	OFF	OFF	(X)	(X)
DOWN	UP	OFF	ON	OFF	ON	OFF	ON	(X)	(X)
UP	UP	ON	ON	OFF	ON	ON	OFF	(X)	(X)
UP	DOWN	ON	OFF	OFF	ON	ON	ON	(X)	(X)
DOWN	DOWN	OFF	OFF	OFF	ON	OFF	OFF	(X)	(X)

THE TEST IS COMPLETE.

HRMA

SET THE JUMPERS :

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

PLACE THE BOARD UNDER TEST IN SLOT 2E.

CONNECT A DMPC TO THE HMPF IN SLOT 2G.

CONNECT 50-PIN RIBBON CABLE FROM THE HRMA TO THE DMPC.

TURN ON THE DC POWER SUPPLY.

WAIT FOR THE TEST MENU, THEN TYPE "HRMA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 270 SECONDS.

"HRMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HRMB

SET HRMB JUMPERS : J20=OUT

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

PLACE HRMB BOARD UNDER TEST IN SLOT 2D.

CONNECT A DMPC TO THE HMPF IN SLOT 2G.

CONNECT 50PIN RIBBON CABLE FROM DMPC TO HRMB.

TURN ON THE DC POWER SUPPLY.

WAIT FOR MENU OF TESTS, THEN TYPE "HRMB<RETURN>".

THE TOTAL TEST TIME IS APPROX. 16 SECONDS.

"HRMB=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

PLACE J20 IN THE [OUT] POSITION.

HRMD

SET THE JUMPERS :

J20=OUT

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

PLACE BOARD UNDER TEST IN SLOT 2D.

CONNECT A DMPC TO THE HMPF IN SLOT 2G.

CONNECT 50PIN RIBBON CABLE FROM DMPC TO HRMD.

TURN ON THE DC POWER SUPPLY.

WAIT FOR MENU OF TESTS, THEN TYPE "HRMB<RETURN>".

THE TOTAL TEST TIME IS APPROX. 16 SECONDS.

"HRMB=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

PLACE J20 IN THE [OUT] POSITION.

HSHA

BOARDS REQUIRED FOR THIS TEST INCLUDE:

HMPF	SLOT 2G	(DEDICATED)
HUMA	SLOT 2F	(DEDICATED)
HMHA	SLOT 2E	
HXMA	SLOT 1K	
HSHA	SLOT 1J	(BOARD TO BE TESTED)

SETUP HMHA (SLOT 2E) AS FOLLOWS:

J0=0 J1=0 J2=0 J3=0 J4=0 J5=0 J6=0 J7=1 J8=INT J9=4K J10=0
J11=0 J12=1 J13=0 J14=0 J15=IN J16=IN J17=IN
U5=68A9180P0005 (PSP3815DCP)

SETUP HSHA (SLOT 1J) AS FOLLOWS:

J1=0 J2=0 J3=0 J4=BUF J5=2716 J6=IN J7=0 J8=1 J9=0 J10=1
J11=0 J12=1 J13=0 J14=1
U3=68A9172P0191

SETUP HXMA (SLOT 1K) AS FOLLOWS:

LS1=T LS2=T LS3=T LS4=T FS1=T FS2=T FS3=T FS4=T TEST=IN
LAB5=T LAB6=T LAB7=T LAB8=T FAB5=T FAB6=T TIML=INT TIMF=INT

CONNECT CABLE #305A4207G4 FROM HMHA (JA) TO HSHA (XA).

CONNECT 10-PIN RIBBON CABLE FROM JEA TO JDA ON THE MODULE'S BACKPLANE.

TURN ON THE DC POWER SUPPLY.

WAIT FOR MENU. TYPE "HSHA<RETURN>". TOTAL TEST TIME IS ABOUT 20 SECONDS.

FOR GOOD BOARDS, THE TERMINAL WILL DISPLAY "HSHA=PASSED".

FOR BAD BOARDS, AN ERROR CODE MIGHT BE DISPLAYED.

THE TEST IS COMPLETE.

HUMA

VERIFY FOUR DAUGHTER BOARDS (304A8483G5) ARE IN PLACE.

INSERT 16 8Kx8 RAMS (68A9196P1) IN THE 28-PIN SOCKETS: U23-U38.

SET THE JUMPERS IN THE FOLLOWING MANNER:

QUAD A : J1, J2, J3=B J4=D

QUAD B : J1, J2=B J3=A J4=D

QUAD C : J1, J2, J3=B J4=E

QUAD D : J1, J2=B J3=A J4=E

J5=A J6=250

PLACE THE BOARD UNDER TEST IN SLOT 2E.

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "HUMA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 2 SECONDS.

"HUMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HUMB

INSTALL FOUR DAUGHTERS BOARDS (304A8483G5).

PLACE 16 8Kx8 RAMS (68A9196P1) IN THE 28-PIN SOCKETS: U23=U38.

SET THE JUMPERS IN THE FOLLOWING MANNER:

J1=IN JSA, JSB, JSC, JSD=2

QUAD_A : JA=EN JDA, JEA, JFA, J10A, J12A, J13A=F J11A=T

QUAD_B : JB=EN JDB, JEB, J10B, J12B, J13B=F JFB, J11B=T

QUAD_C : JC=EN JDC, JEC, JFC, J10C, J11C, J13C=F J12C=T

QUAD_D : JD=EN JDD, JED, J10D, J11D, J13D=F JFD, J12D=T

PLACE THE BOARD UNDER TEST IN SLOT 2E.

JUMPER (SHORT CIRCUIT) BETWEEN SLOT 2E PA01 & 2E PA22.

TURN ON THE DC POWER SUPPLY. WAIT FOR PROMPT "TEST:". TYPE "HUMA<RETURN>"

THE TOTAL TEST TIME IS APPROX. 2 SECONDS.

"HUMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS.

THE TEST IS COMPLETE.

HVDB

SET THE JUMPERS : RF, RE, RC CC=F RD, C8, C9, CA, CB, CD=T KWD=2

PLACE THE CHARACTER PROM (PSP4815C5GA) IN SOCKET U11.

PLACE THE BOARD UNDER TEST IN SLOT 2A.

CONNECT VIDEO CABLE #277A5771GL072 FROM HVDB (JA) TO THE VIDEO MONITOR.

TURN ON THE DC POWER SUPPLY.

WAIT FOR TEST MENU. TYPE "HVDB<RETURN>".

VERIFY THAT THE VIDEO MONITOR DISPLAY AGREES WITH THAT WHICH IS EXPECTED
(SUGGEST COMPARE WITH RESULTS FROM A KNOWN-GOOD CARD).

THE TEST IS COMPLETE.

HXCA

THE HXMA , HXCA, HXRA, & DXRA BOARDS MUST BE TESTED AS A SET USING THE HMPF & HUMA IN SLOTS 2G & 2F RESPECTIVELY. BELOW ARE THE JUMPER, RAM, & ROM REQUIREMENTS. AFTER SETUP, PLACE EACH BOARD IN ITS INDICATED SLOT.

HXMA (SLOT 1K) :

LAB5, LAB6, LAB7, LAB8, FAB5, FAB6, LS1, LS2, LS3, LS4, FS1, FS2, FS3, FS4=T
TIMF, TIML=INT TEST=IN

HXCA (SLOT 1H) :

J1=IN J2, J4, J6=T J3, J5=F J7=11MHZ U26=PSP3815PXCA

HXRA (SLOT 1J) :

J1=ACT J2=ST J3=DCOM J4, J5=CS

DXRA (MOUNTED ON HXRA IN SLOT 1J) :

J1=DMD J2=RUN J3, J4, J5, J6, J7, J9, J10=T S1 (SWITCH) =UP

CONNECT 40-PIN(4ft) RIBBON CABLE (PSP3815RCJ2FL028X014) FROM HXCA (JA) TO HXRA (JA)

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "HXCA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HXCA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXMA

THE HXMA, HXCA, HXRA, & DXRA BOARDS MUST BE TESTED AS A SET USING THE HMPF & HUMA IN SLOTS 2G & 2F RESPECTIVELY. BELOW ARE THE JUMPER, RAM & ROM REQUIREMENTS. AFTER SETUP, PLACE EACH BOARD IN ITS INDICATED SLOT.

HXMA (SLOT 1K) :

LAB5, LAB6, LAB7, LAB8, FAB5, FAB6, LS1, LS2, LS3, LS4, FS1, FS2, FS3, FS4=T
TIMF, TIML=INT TEST=IN

HXCA (SLOT 1J) :

J1=IN J2, J4, J6=T J3, J5=F J7=11MHZ U26=PSP3815PXCA

HXRA (SLOT 1J) :

J1=ACT J2=ST J3=DCOM J4, J5=CS

DXRA (MOUNTED ON HXRA IN SLOT 1J) :

J1=DMD J2=RUN J3, J4, J5, J6, J7, J8, J9, J10=T S1(SWITCH)=UP

CONNECT 40-PIN RIBBON CABLE (PSP3815RCJ2FL028X014) FROM HXCA (JA) TO HXRA (JA)

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "HXMA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HXMA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXPC

SET THE JUMPERS :

A1, A4, A16, A64=0 (TOWARD U10) A2, A8, A32, A128=1 (AWAY FROM U10)

B1, B2, B4, B8, B16, B32=1 (AWAY FROM JA) B64, B128=0 (TOWARD JA)

PROME, PROMF, RAMC, RAME, RAMF, PSEG, DIGC=F RAMD, DIGA, DIG9, DIG8, DIGB, DIGD=T
RSEG=0 ICA=2732 BANK, PROMD=32 STALL=ENAB 450/350/250=450

PLACE TEST ROMS IN SOCKETS :

U23=68A9180P0215 U24=68A9180P0216 U25=68A9180P0217 U26=68A9180P0218

PLACE THE BOARD UNDER TEST IN SLOT 2C.

CONNECT 20-PIN RIBBON CABLE FROM HXPC(JB) TO BACKPLANE(JGA).

CONNECT 20-PIN RIBBON CABLE FROM HXPC (JA) TO BACKPLANE (JHA).

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HXPC<RETURN>".

THE TOTAL TEST TIME IS APPROX. 5 SECONDS.

"HXPC=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT
BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE
ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXPDP

ALL CARDS MUST BE REMOVED FROM RACK EXCEPT HMPF(DMPC),HUMA , NRCA , AND HRCA.

SET THE JUMPERS : RAM=0 PROM, PD, PE, PF, RE, RF, DIGC=F

RD, DIGD, DIGB, DIGA, DIG9, DIG8=T 64/128=64 2K/8K=8K

J15=8K J17=RUN 1=1 2=/2 4=4 8=/8 16=16 32=/32 64=64 128=/128

PUT TEST PROMS IN SOCKETS AS FOLLOWS :

U23=PSG304A9936AABI01AA U24=PSG304A9936AABJ01AA

U25=PSG304A9936AABK01AA U26=PSG304A9936AABL01AA

PUT FOUR 8Kx8 RAMS (68A9196P1) IN SOCKETS U27, U28, U29, AND U30.

PLACE THE BOARD UNDER TEST IN SLOT 2C.

CONNECT 20-PIN RIBBON CABLE HXPDP (JB) TO BACKPLANE (JGA).

CONNECT 20-PIN RIBBON CABLE HXPDP (JA) TO BACKPLANB (JHA).

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HXPDP<RETURN>"

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HXPDP=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXPB

SET THE JUMPERS : RAM=0 PROM, PD, PE, PF, RE, RF, DIGC=F
RD, DIGD, DIGB, DIGA, DIG9, DIG8=T 64/128=64 2K/8K=8K
J15=8K J17=RUN 1=1 2=/2 4=4 8=/8 16=16 32=/32 64=64 128=/128
PUT TEST PROMS IN SOCKETS AS FOLLOWS :

U23=PSG304A9936AABI01AA U24=PSG304A9936AABJ01AA

U25=PSG304A9936AABK01AA U26=PSG304A9936AABL01AA

PUT FOUR 8Kx8 RAMS (68A9196P1) IN SOCKETS U27, U28, U29, AND U30.

PLACE THE BOARD UNDER TEST IN SLOT 2C.

CONNECT 20-PIN RIBBON CABLE HXPB (JB) TO BACKPLANE (JGA).

CONNECT 20-PIN RIBBON CABLE HXPB (JA) TO BACKPLANE (JHA).

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU, THEN TYPE "HXPB<RETURN>"
THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HXPB=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT
BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE
ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXRA

THE HXMA, HXCA, HXRA, & DXRA BOARDS MUST BE TESTED AS A SET USING THE HMPF & HUMA IN SLOTS 2G & 2F RESPECTIVELY. BELOW ARE THE JUMPER, RAM, & ROM REQUIREMENTS. AFTER SETUP, PLACE EACH BOARD IN ITS INDICATED SLOT.

HXMA (SLOT 1K) :

LAB5, LAB6, LAB7, LAB8, FAB5, FAB6, LS1, LS2, LS3, LS4, FS1, FS2, FS3, FS4=T

TIMF, TIML=INT TEST=IN

HXCA (SLOT 1H) :

J1=IN J2, J4, J6=T J3, J5=F J7=11MHZ U26=PSP3815PXCA

HXRA (SLOT 1J) :

J1=ACT J2=ST J3=DCOM J4, J5=CS

DXRA (MOUNTED ON HXRA IN SLOT 1J) :

J1=DMD J2=RUN J3, J4, J5, J6, J7, J8, J9, J10=T S1(SWITCH)=UP

CONNECT 40-PIN(4ft) RIBBON CABLE (PSP3815RCJ2FL028X014) FROM HXCA (JA) TO HXRA (JA).

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "HXRA<RETURN>".

THE TOTAL TEST TIME IS APPROX. 10 SECONDS.

"HXRA=PASSED" WILL BE DISPLAYED FOR GOOD BOARDS. ERROR CODES MIGHT BE DISPLAYED FOR BAD BOARDS. THE TEST MAY BE ABORTED FROM THE ERROR CONDITION BY TYPING <CTRL>C.

THE TEST IS COMPLETE.

HXRC & DXRC

THE HXMA, HXCA, HXRC, AND DXRC BOARDS MUST BE TESTED AS A SET USING THE HMPF AND HUMA IN SLOTS 2G AND 2F RESPECTIVELY. BELOW ARE THE JUMPER, RAM, AND ROM REQUIREMENTS. AFTER SETUP , PLACE EACH BOARD IN ITS INDICATED SLOT.

- HXRC AND DXRC (SLOT 1J)

HXRC	DXRC
J3 – DCOM	J5 – EN
J4 – CS	J2 – RUN
J5 – CS	DON'T CARES WHEN J7 = DIS
J11 – JNH	J30 = F
J7 – DIS	J31 = T
J10 – M	J32 = F
J2 – STR	J33 = F
J6 – STR	J34 = F
J8 – R	J35 = F
J1 – STR	J36 = F
J9 – M	J37 = F
	J40 = T
	J41 = F
	J42 = F
	J43 = F
	J44 = F
	J45 = F
	J46 = F
	J47 = F

1. SWITCH 1 MUST BE IN THE MIDDLE POSITION.
2. BOARD CAN ONLY BE TESTED THRU THE JA CONNECTOR.
3. THE FIRST ROW OF CHIPS RUNNING PARALLEL TO CONNECTORS JA AND JB MUST BE CHANGED.

- HXMA (SLOT 1K)
LAB5, LAB6, LAB7, LAB8, FAB5, FAB6, LS1, LS2, LS3, LS4, FS1, FS2, FS3, FS4=T
TIMF, TIML=INT (NOT ON ALL CARDS) TEST=IN
- HXCA (SLOT 1H)
J1=IN J2,J4,J6=T J3,J5=F J7=11MHZ U26=PSP3815PXCA
- CONNECT 40 PIN RIBBON CABLE FROM HXCA (JA) TO HXRA (JA)
TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "HXRA<RETURN>". THE TOTAL TEST TIME IS APPROXIMATELY 10 SECONDS.

THE TEST IS COMPLETE.

CALIBRATION INSTRUCTIONS FOR DS3800NADB

SETUP IO FUNCTIONAL VERIFICATION MODULE PER SEPARATE INSTRUCTIONS
PLACE EXTENDER CARD IN SLOT IF.
PLACE NABD JB PINS 2 TO 16
CONNECT NABD ON EXTENDER CARD
CONNECT 20 PIN RIBBON CABLE FROM BACKPLANE JJA TO NADB JA
CONNECT PRECISION VOLTAGE SOURCE TO BACKPLANE JBB-4(+) & JBB-3(-)
TURN THE MODULE POWER SUPPLY ON
WAIT FOR HMPJ RED LED TO BE ON
STRIKE "B" ON TERMINAL, HMPJ RED LED SHOULD TURN OFF
STRIKE "B" AGAIN, HMPJ YELLOW LED SHOULD TURN ON & LIST OF AVAILABLE TESTS
SHOULD PRINT OUT ON TERMINAL
TYPE "NADA" <RETURN>, TERMINAL SHOULD DISPLAY "WHICH CHANNEL (0-7) [X=EXIT]"
TYPE "0", TERMINAL SHOULD DISPLAY DATA READ FROM NADB CARD UNDER TEST
SET VOLTAGE SOURCE FOR -10.000 VDC
ADJUST R60 FOR -2047 TO -2048
SET VOLTAGE SOURCE FOR +9.995 VDC
ADJUST R61 FOR +2046 TO +2047
IT'S A GOOD IDEA TO RECHECK THE -10 VOLT SETTING, THE SETTING OF R61 SHOULD
NOT EFFECT THE SETTING OG R60, BUT IT MIGHT. IF R60 IS CHANGED THEN R61
MUST BE RECHECKED.
SEAL R60 & R61

NRCA

THIS TEST REQUIRES A KNOWN GOOD HRCA AND THE MODULE AUXILARY BOARD ONLY.
SETUP THE HRCA AND NRCA AND PLACE THEM IN THEIR RECPECTIVE SLOTS:

HRCA (SLOT 1L) :

J1=IN J2=2K U30=PSP3815PRDA01AA U31=68A9249P1(2K*8RAM) U33=NONE

NRCA (SLOT 1M) :

J1=ON J2, J3, J4, J5, J6=F J7, J9, J11, J12, J14, J15, J16, J17=MISSING

J8, J10, J13, J18=IN J19,J21=RES J20=RREF

PLACE THE "MODULE-AUXILARY-BOARD" INTO ANY CONVIENT EMPTY SLOT.

CONNECT A 10-PIN RIBBON CABLE FROM NRCA (JA) TO "AUXILARY BOARD".

TEST THE BOARDS BY TOGGLING SW1 (TOP) AND SW2 (LOWER) ON THE AUXILARY BOARD.

LEDS ON THE HRCA & NRCA MUST ARGEE WITH THE TABLE BELOW: (X) = DON'T CARE.

AUX BOARD		NRCA			HRCA				
SW1	SW2	CR8	CR9	CR10	CR2	CR3	CR4	CR5	CR6
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
DOWN	DOWN	OFF	OFF	OFF	ON	OFF	OFF	(X)	(X)
DOWN	UP	OFF	ON	OFF	ON	OFF	ON	(X)	(X)
UP	UP	ON	ON	OFF	ON	ON	OFF	(X)	(X)
UP	DOWN	ON	OFF	OFF	ON	ON	ON	(X)	(X)
DOWN	DOWN	OFF	OFF	OFF	ON	OFF	OFF	(X)	(X)

THE TEST IS COMPLETE.

NTCE

THE DEDICATED BOARDS (HMPF 2Q, & HUMA 2F) ARE REQUIRED FOR THIS TEST.

SETUP HAIA : J1, J2=A J3, J4, J5, J6, J7, J8=F J9=G U23=DS3816PTEA

PLACE HAIA IN SLOT 2L

SETUP NTCE : J1=TEST SW1=MIDDLE J2=DIVIDE_BY_2

PLACE NTCE IN SLOT 1G.

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "NTCE<RETURN>".

THE TEST TAKES ABOUT 30 SECONDS.

FOR GOOD BOARDS, THE TERMINAL WILL DISPLAY "NTCE=PASSED".

FOR GOOD BOARDS, ERROR CODES MIGHT BE DISPLAYED.

IF TEST PASSED THEN REMOVE TEST ROM U23.

THE TEST IS COMPLETE.

NTCE

THE DEDICATED BOARDS (HMPF 2G, & HUMA 2F) ARE REQUIRED FOR THIS TEST.

SETUP HAIA : J1, J2=A J3, J4, J5, J6, J7, J8=F J9=C U23=DS3815PTEA

PLACE HAIA IN SLOT 2L

SETUP NTCE : J1=TEST SW1=MIDDLE J2=DIVIDE_BY_2

PLACE NTCE IN SLOT 1G

TURN ON THE DC POWER SUPPLY. WAIT FOR TEST MENU. TYPE "NTCE<RETURN>".

THE TEST TAKES ABOUT 30 SECONDS.

FOR GOOD BOARDS, THE TERMINAL WILL DISPLAY "NTCE=PASSED".

FOR BAD BOARDS, ERROR CODES MIGHT BE DISPLAYED.

IF TEST PASSED THEN REMOVE TEST ROM U23.

. THE TEST IS COMPLETE.

SETUP DOCUMENTATION FOR THE DS3820FVMA1A1A

I. EQUIPMENT

DC POWER SUPPLY: [+5V@10A](#), [+15V@0.5A](#), [-15V@0.5A](#), [+28V@1A](#)
PRECISION DC SOURCE : (DIGITEC MODEL # 3110 OR EQUIV.)
AC SOURCE: 100-10KHZ, 20VP-P, 5MA
FREQUENCY COUNTER: 10-20KHZ, .005% ACCURACY, 4 DIGIT

CABLES:

DS3815RCL1BL014X000 (50-PIN RIBBON) (FOR E-BUS TESTS ONLY)
DS3815RCC1BL030X000 (20-PIN RIBBON, QTY=2) (HXPC/D)
DS3815RCJ2FL028X014 (40-PIN RIBBON) (HXCA, HXRA, HXMA, HFPB, JFXA/B)
DS3815RCJ2FL006X003 (40-PIN RIBBON) (HXCA, HXRA, HFPB, HFPB, HFXA/B)
DS3815RCA1AL018 (10-PIN RIBBON) (HRCA/NRCA)
305A4207G1 (RS232-LOOP-BACK) (HCMA)
305A4207G4 (LOOP-BACK, 1-9&2-10) (HMHA/HSMA)
305A4207G3 (20-PIN LOOP-BACK) (HAIA)
277A5771G7L072 (MONITOR) (HVDB)
305A4207G2 (10-PIN TO BANANA) (HPRA, HAIA, HAIB, HAIC)

ROMS & RAMS:

PSG304A9936AABM (2764) QTY=4 (HMPF)
PSG304A9936AACA (2764) (HFPE)
PSG304A9936AABI THRU PSG304A9936AABL (HXPD)
PSG304A9936AACF (2732) (HFPB)
PSG304A9936AACB (2716) (HFPA)
PSP3815PXCA (HXCA)
PSP4815CHGA (CHARACTER GENERATOR ROM) (HVDB)
PSP3815PRDA01AA (HRCA)
68A9170P0027 (HARA)
68A9172P0191 (HSHA)
68A9172P0193-P0208 (2716) QTY=16 (HPMA)
68A9180P0215-O0218 (2732) QTY=4 (HXPC)
68A9180P0001 (HCMA)
68A9180P0003 (HMHA)
68A9180P0005 (HMHA)
68A9249P1 (2K X 8 RAMS) QTY=4 (HFXA, HFPB, HRCA, HFXB)
68A9192P1 (2K X 8 EEROMS) QTY=4 (DEDICATED HUMA)
68A9196P1 (2K X 8 RAMS) QTY=16 (HXPD & HUMA)

KNOWN GOOD BOARDS:

DMPC	HMPF	HUMA	HAIA
HRMB	HFPB	HFXA	HFXB
HXMA	HRCA	NRCA	HMHA

1 AUXILIARY TEST BOARD (PER SKETCH BELOW) (FOR HRCA/NRCA)
1 DAUGHTER BOARD 304A8483G2 (FOR 2Kx8 EEROM ON DEDICATED HUMA) 1
DAUGHTER BOARD 304A8483G5 (FOR 8Kx8 RAM ON DEDICATED HUMA)

4 DAUGHTER BOARDS 304A8483G5 (FOR 8Kx8 RAM ON HUMA, DMPC TESTS)
VIDEO MONITOR, 277A5758G2 (FOR HVDB TEST ONLY)

RS232 TERMINAL WITH RS232 CABLE
NULL MODEM, DS3800HNMA1B1A

II. INSTRUCTIONS

CONNECT MODULE DC POWER SUPPLY TO JAA OF THE MODULE.
VERIFY HMPF JUMPERS

J1 (SIG):	[D], GND
J2 (TBUSS):	[L], E
J3:	[8K], 4K

VERIFY HMPF PROMS

U22=PSG304A9936AABM03AB
U23=PSG304A9936AABM04AB
U24=PSG304A9936AABM01AB
U25=PSG304A9936AABM02AB

PLACE HMPF INTO SLOT 2G.

VERIFY THE FOLLOWING ON THE DEDICATED HUMA BOARD

QUAD A: J1=B J2=B J3=B J4=1 QUAD B: J1=A J2=A J3=A J4=1

QUAD C: J1=X J2=X J3=X J4=REMOVED QUAD D: J1=X J2=X J3=X
J4=REMOVED

J5=A J6=250

SOCKETS U23-U26=8Kx8 RAMS (68A9196P1) .

SOCKETS U27-U30=2Kx8 EEROMS (68A9192P1) .

QUAD A DAUGHTER BOARD=304A8483G5

QUAD B DAUGHTER BOARD=304A8483G2.

PLACE THIS HUMA BOARD IN SLOT 2F.

CONNECT RS232 TERMINAL TO JB OF THE HMPF USING THE NULL MODEM.

SET RS232 TERMINAL FOR:

BAUD RATE = 4800
PARITY = NONE
FULL DUPLEX
CRT TYPE = ANSI