8 FUNCTIONAL TEST PROCEDURE FOR ANALYST D/MAESTRO D MODULE

8.1 Functional test with SW6/SW6.1/SW7

PURPOSE	PROCEDURE	OBSERVATION	DISPLAY (FOR MDL ONLY)
1. Preset SW6/SW6.1/SW7	- Power up SW6/SW6.1/SW7 (by pressing ACL)	- "Module" LED is OFF	
	- Press LEVEL	- Red solid "A1" LEDs (SW6/SW6.1) or "A3" LEDs (SW7) come on	
	- Press STOP	- All LEDs come off	
2. Check MD/MDL connection	- Install MD/MDL into SW6/SW6.1/SW7	- "Module" LED is ON	
	- Press GO		1/0:01
3. Check MD/MDL level E1	- Press LEVEL, COLOR, COLOR, COLOR, COLOR (in addition press "-" twice for SW7)	- Red solid "E1" LEDs come on	1/0:05
	- Press NORMAL		0:XX 0:00 with left side timer counting up
Note: QA would set F1 level on testing			
4. Check BOOK move	- Press ANALYSIS		
	- Move D2, D4, D7, D5, C2, C4, E7, E6		
	- Press NORMAL		
	- Move B1, C3	- SW6/SW6.1/SW7 should response immediately with [c7-c5] (old book) or with [g8-f6] (new book). If it doesn't, the unit is defective	
Move to mouse	- Move h2, h4	- Black LED blinks and computer shows its move after a few seconds	
5. Check CHECKMATE	- Press NEWGAME		
	- Press ANALYSIS		A 1.
	- Move F2, F4, E7, E5, G2, G4		A 2. g2-g4
	- Press PLAY		Play.....d8-h4
	- Move D8, H4	- "Check, end" LEDs come on.	0:XX 0:00 with left side timer counting up
6. Remove MD/MDL	- Press STOP	- ALL LEDs come off.	
	- Remove MD/MDL		
	- Press GO		
	- Press LEVEL	- Red solid "A1" LEDs come on	
7. Reinstall MD/MDL	- Press STOP	- All LEDs come off	
	- Reinstall MD/MDL into SW6/SW6.1/SW7		
	- Wait for 10 seconds		
	- Press GO/LEVEL	- Red solid "E1", and "module" LEDs come on	1/0:05
8. Finish	- Press STOP	- All LEDs come off	
	- Remove MD/MDL		

Note: For MDL8 and MD10, test for EGRII should carry out after step 7.
Setup position Wkh2, Pb5, Nc8, Bka8, Pc7

PROCEDURE	OBSERVATION
- Press NEWGAME	- "Module" LED should still be on
- Press SETUP, FUNCTION, NEWGAME	
- Press KING	
- Put white KING on H2 square	
- Press PAWN	
- Put white PAWN on B5	
- Press KNIGHT	
- Put white KNIGHT on C8	
- Press TAB/COLOR, KING	
- Put Black KING on A8	
- Press PAWN	
- Put Black PAWN on C7	
- Press TAB/COLOR	
- Press NORMAL, PLAY, INFO, +	- Computer shows its move C8-B6 after a few seconds
- Move C8, B6, C7, B6	- Computer should shows its move instantly
- Make the move indicated and press PLAY	- Same as above
- Repeat the above step until computer shows B7-B8	
- Move B7, B8, D8, E7	- White LED blinks and computer shows its move after a few seconds. "Module" LED should still be on.

8.2 QC test mode on MD/MDL

Objective:
To check LCD segments.
To check expansion socket U4.
Will check data/address/CE/OE/V+/GND lines.

Procedure:
1. Plug in EGR II program (EGR II 707)
2. Connect an electronic device (No. M6A-PE-001) to MD/MDL to enable QC test mode.
   The MD/MDL program will execute the internal RAM/ROM, LCD and PIO check.
3. Switch on the tester via a +9V DC 300mA adapter.
4. Measure the voltage at pin 27 of U4 with CRO or a digital multimeter with reference to GND at pin 14.

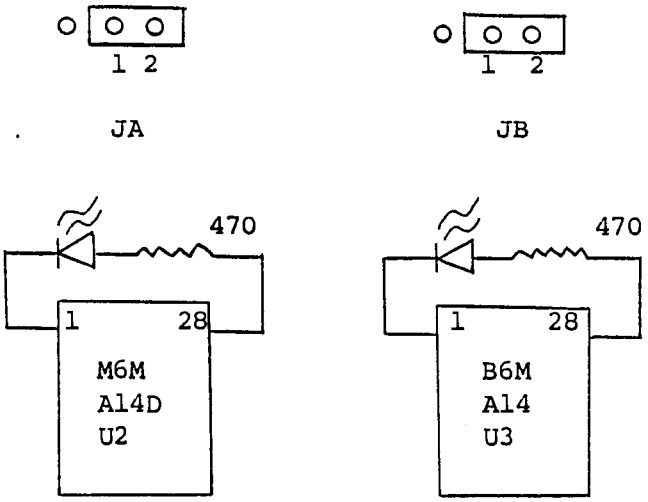
Result:
1. DATA LINE LEDs 1-8 : Scanning one by one in cycle (2-3 sec. per second) then all.
   Cycle LEDs A & B : Change one state after data line LEDs having completed one scanning cycle.
   NMI LED V+, GND : Normally off, lights up (fail) if the pin is shorted to either V+ or ground.
2. After scanning DATA LINE LEDs,
   LED 1,2,3,4,5,6,7,8 should light up simultaneously for 6 seconds.
   LED 1,2, 4,5,6, 8 light up simultaneously instead means that the expansion socket U4 is defective.

3. LCD scanning in groups (for MDL only)
   -vertical column dot matrix scrolling
   -horizontal column dot matrix scrolling
   -white pieces
   -black pieces
   -clock symbols
   - ! " # $ % & ' ( ) * + , - . /
   -0 1 2 3 4 5 6 7 8 9 : ; < = > ?
   -@ A B C D E F G H I J K L M N O
   -P Q R S T U V W X Y Z [Y] ^ _
   -` a b c d e f g h i j k l m n o
   -p q r s t u v w x y z { | } → ←
   -OK
   If something goes wrong, "ERROR" will be shown instead of "OK".
4. The voltage at pin 27 of U4 toggles between 5V and 0V

8.3 Check U2, U3 pin 1 bank switching (for future 27C512 expansion)

Procedure:

1. With EGRII.707 installed, connect jumper selector JA, JB to "position 2".
2. For MD/MDL 4/6 MHz module, replace test EPROMs at socket U2, U3 as follows:



   Switch on the tester via a +9V DC 300mA adapter
3. For 8/10MHz MDL/MD module, measure the voltage at pin 1 of U2 and U3 with CRO or digital multimeter.

Result:

1. DATA LINE LEDs 1-8: Scanning one by one in cycle (2-3 sec. per cycle)
   Cycle LEDs A & B: Change one state after data line LEDs having completed one scanning cycle.
   NMI LED V+, GND: Normally off, lights up (means fail) if the pin is shorted to either V+ or ground.
   After scanning DATA LINE LEDs, LED 1 to 8 should light up simultaneously for 6 second.

2. For 4/6MHz, the two LEDs on the EPROMs should flash briefly for every 4 seconds.

DATA LINE LED & PROGRAM relationship

Position	U2	U3	U4	U6	U5
LED	1	2	3	8	4
	5	6	7		
Function	Program	Book	Expansion	RAM1	RAM2

3. For 8/10 MHz, MD/MDL modules, the voltage at pin 1 of U2 and U3 toggles between 5V and 0V. If not, the unit fails.

Note: Reset the jump to "position 1".
Remove the testing EGRII ROM for 4/6MHz MD/MDL module.

8.4 Burn-in test for production line

This test is mainly an actual functional test on the module that execute automatically with SW6/SW6.1/SW7 connected together.

Procedure	MD/MDL display
1. Connect the module (after casing) to the SW6/SW6.1 installed with a special self play ROM or to SW7 (OSA1.4 H0317.B auto play function for SW6/SW6.1)	
2. Power up the unit	- Module LED turn on - The left hand side clock start counting up (for MDL)
3. Press LEVEL, COLOR, COLOR, COLOR, COLOR (in addition, press "-" twice when connected with SW7) (QA will set level F1 for burn-in test)	- Red solid "E1" LEDs come on - MDL display shows 1/0:05
4. Press NORMAL	- For MDL, the left hand side clock is running
5. Press FUNCTION, SETUP, NEW GAME for SW6/SW6.1 Press PAWN, FUNCTION, LEVEL, NEW GAME for SW7 The computer will start playing for both sides automatically.	
6. Press INFO Watch for any hang up, disconnection or MDL LCD malfunction within burn-in test.	
7. Observe the module LED	- Module LED should still be on and white or black LED blinks
8. Press PLAY before exiting the test	- White/Black LEDs toggle. Module LED should still be on.
9. Press STOP to exit the test	
10. Remove the module	

Note: If the module LED turns off within the burn-in test or after pressing PLAY in step 8, the unit fails.

Test in production:	For 4/6MHz module, burn-in for 4 hours.
	For 8/10MHz module, burn-in for 24 hours.
Test for QA:	For 4/6MHz module, burn-in for 4 hours.
	For 8MHz module, burn-in for 24 hours.
	For 10MHz module, burn-in for 48 hours.