

MC8/LA and MC8/LB
INSTALLATION INSTRUCTIONS
FOR MEMORY EXTENSION OPTIONS

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INSTALLATION INSTRUCTIONS
FOR
MC8/LA and MC8/LB MEMORY EXTENSION OPTIONS

1. PURPOSE OF OPTION

The MC8/LA option provides the PDP-8/L Programmed Data Processor with 4096 additional 12-bit (no parity) words of core storage: The MC8/LB provides 4096 13-bit (including parity) words of storage.

2. APPLICABILITY

This installation bulletin is applicable to any properly functioning PDP-8/L that is already equipped with a BA08 Peripheral Expander option cabinet.

3. PARTS LIST

The parts supplied with this option are listed in Table 1 and shown in Figure 1.

Table 1
List of Parts Required for Option Installations

<u>Quantity</u>	<u>Type Number</u>	<u>Model Used In</u>	<u>Use</u>	<u>Location</u>	
				<u>Row</u>	<u>Slot</u>
6	G020	MC8/LA	Sense Amplifier	A	8
				A	9
				A	10
				B	8
				B	9
				B	10
				A	8
				A	9
				A	10
				A	11
				7	G020
B	9				
B	10				
B	10				

Table 1 (Cont)
List of Parts Required for Option Installations

<u>Quantity</u>	<u>Type Number</u>	<u>Model Used In</u>	<u>Use</u>	<u>Location</u>	
				<u>Row</u>	<u>Slot</u>
8	G221	All	Memory Selector	C	3
				C	4
				C	8
				C	9
				D	3
				D	4
				D	8
5	G228	MC8/LA	Inhibit Driver	D	9
				A	5
				B	4
				B	5
6	G228	MC8/LB	Inhibit Driver	C	2
				D	2
				A	4
				A	5
1	G610 30005256-1 G611	MC8/LA	A-Diode Board 12-Bit Memory Stack B-Diode Board	B	4
				B	5
				C	2
				D	2
1	G610 30005256-2 G612	MC8/LB	A-Diode Board 13-Bit Memory Stack 13-Bit B-Diode Board	C,D	5
				C,D	6
				C,D	7
4	G624	All	Resistor Board	A	2
				A	3
				B	2
				B	3
1	G785	All	Power Connector	A,B	28
1	G826	All	Regulator Control	A,B	1
2	M111	All	Inverter	A	24
				A	25

Table 1 (Cont)
List of Parts Required for Option Installations

<u>Quantity</u>	<u>Type Number</u>	<u>Model Used In</u>	<u>Use</u>	<u>Location</u>	
				<u>Row</u>	<u>Slot</u>
3	M113	All	10 2-Input NAND Gates	A	21
				A	22
				B	13
1	M115	All	8 3-Input NAND Gates	A	19
2	M117	All	6 4-Input NAND Gates	A	18
				A	20
3	M216	All	6 Flip-Flops	A	16
				A	17
				B	12
2	M310	All	Delay Line	A	13
				A	14
1	M360	All	Variable Delay	A	12
1	M617	All	6 4-Input NOR Buffer	B	11
5	M903	All	Cable Connector to Central Processor *	A or B	29
				A or B	30
				A or B	31
				A or B	35
				A or B	36
2	W025	All	Cable Connector for Memory Stack	A,B	6
				A,B	7

*These cables go into Row B Slots 34, 35, and 36 in the Central Processor

4. SPECIAL TOOLS AND TEST EQUIPMENT

No special tools are required to install this option. To verify that the option has been properly installed, the diagnostic programs listed in Table 2 are required.

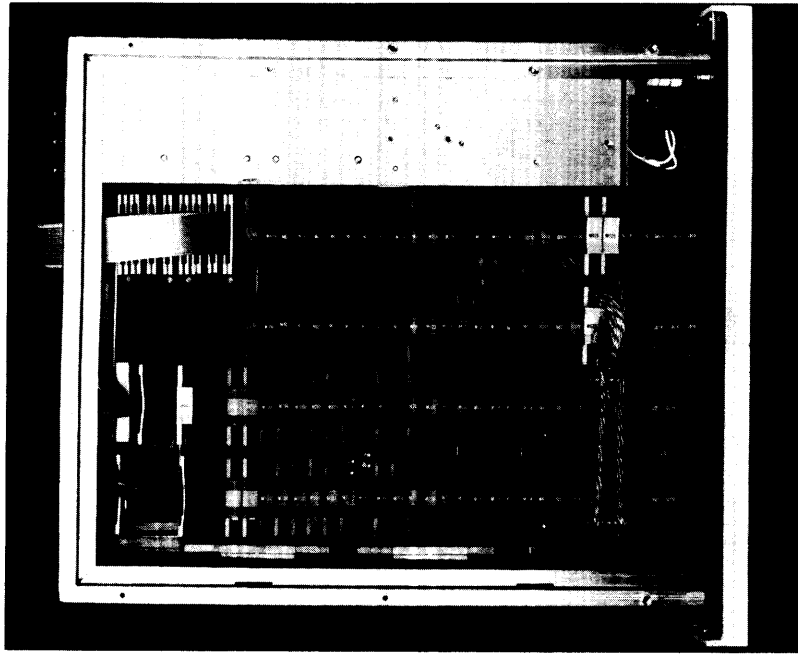


Figure 1 Location of Modules in BA08

Table 2
List of Equipment Required for Option Testing

<u>Item</u>	<u>Used For</u>
MAINDEC-08-D1EB Document and Diagnostic Binary Tape	Extended Memory Checkerboard Test This test checks worst-case half-select noise conditions to determine operational states of core memory.
MAINDEC-8L-D1GA Document and Diagnostic Binary Tape	Extended Memory Control Test This test checks the Extended Memory Control Logic for proper operation.
MAINDEC-08-D1HA Document and Diagnostic Binary Tape	Extended Memory Address Test This test checks all memory address not occupied by the program to insure that each address can be uniquely addressed.
MAINDEC-08-D4BA Document and Diagnostic Binary Tape	Extended Memory Parity Test This test checks for worst-case half-select noise conditions within the parity bit plane.

5. INSTALLATION PROCEDURE

a. Unpacking

The MC8/L Memory Extension Control option is shipped in a cardboard box. Carefully open the box and remove its contents.

CAUTION

The Core Memory unit is very fragile and should be handled with extreme care.

Check each item against the packing memo to insure that all hardware and software items are there. The container and packing should be saved in case it is necessary to return the Memory Extension Control option for service.

b. Connections and Module Installation

Determine the proper locations for each module either from Table 1 or DEC Drawing D-MU-BA08-04 (Module Utilization BA08).

CAUTION

Install the modules in their respective connectors using great care during the installation to prevent breaking either the modules or connectors.

When installing the memory unit, the core memory goes in Rows C and D, Slots 5 and 7, and extends over Slot 6. The cable connectors (W025) are inserted in Rows A and B with the inhibit stack connector (either black and white pairs or black and multicolored pairs, an extra twisted pair on pins BS and BT, and a name plate on one side) in Slot 6; and the sense amplifier stack connector (either red and white, red and blue, or white and multicolored pairs) in Slot 7.

The interconnecting cables (M903) go from Row A or B Slots 29, 30, and 31 of the BA08 to Row B Slots 34, 35, and 36 respectively, in the PDP-8/L. These cables should be fed through the openings in the side of the frames on the BA08 and the PDP-8/L.

After all modules and cable connectors are installed, the MC8/L Extended Memory Control option is ready for testing.

6. CHECKOUT PROCEDURE

a. Initializing

Before operating the power switch, check the modules in both the PDP-8/L and the BA08 to make sure each module and cable are securely seated in their connectors. Turn the power switch on the PDP-8/L ON (the switch key vertical) and make sure the power switch on the BA08 is on. The computer panel lights will light in some random pattern, the fans in the computer will come on, and the teletype will come on. (See DEC-8L-HRZA for detailed computer check-out operation if necessary.)

b. Preliminary

To check the Extended Memory Control unit, first place the memory protect switch down, and leave it in the down position for all the following tests except Memory Protect. The computer must be halted to activate any of the keys such as START, CONTINUE, EXAMINE, DEPOSIT, and LOAD ADDRESS. If the computer does not respond as expected, depress the STOP key and try again. Also, make sure the handle of the ON-OFF key is in the vertical position. (The computer can be on with the key functions locked out if the key is turned to the extreme clockwise position.) The computer will not run continuously unless the SINGLE STEP switch is up.

c. Diagnostic Tests

To check the MC8/L put the DATA FIELD switch in the up or 1 position, put the SWITCH REGISTER switches in the down or 0 positions and operate the LOAD ADDR key. Put the SWITCH REGISTER switches in the up or 1 position and operate the DEP key several times. Place the SWITCH REGISTER switches in the down or 0 positions and operate the LOAD ADDR key. Place the SWITCH REGISTER switches in the down or 0 position again and operate the EXAM key. The contents of the MEMORY BUFFER register should read all 1's and continued operation of the EXAM key for the same number of times as the DEP key was operated will cause the MEMORY BUFFER to read all 1's. This test insures that the MC8/L is performing the read/write function properly.

To test the data field put the DATA FIELD switch in the down or 0 position and the SWITCH REGISTER switches in the down or 0 position and operate the LOAD ADDR key. Deposit 2525₈ in several successive addresses. Next put the DATA FIELD switch in the up or 1 position and the SWITCH REGISTER switches in the down or 0 position and operate the LOAD ADDR key and then the EXAM. The MEMORY BUFFER should read all 1's as the EXAM key is operated the same number of times again.

Load RIM in memory 0, then load the BIN loader in memory 0, then use the MAINDEC-8L-DIGA document and binary tape to run the Extended Memory Control Test.

Next the Extended Memory Address Test can be run using MAINDEC-08-D1HA-D and the binary tape. The document explains the proper procedure to be used with this diagnostic tape in performing this test.

Run the Extended Memory Checkerboard Test next to check the Extended Memory Control Unit. Document MAINDEC-08-D1EB-D explains the proper procedure to be used with this diagnostic tape in performing this test.

The Extended Memory Parity Test should be run next on all MC8/LB units. Document MAINDEC-08-D4BA-D explains the proper procedure to be used with this diagnostic tape in performing this test.

This concludes the installation and testing of the MC8/L Extended Memory Control option. If the above tests show problem areas refer to Document DEC-8L-H1BA-D for the proper maintenance procedures to be followed in correcting all problems.