DATARAM

DR-275

INSTALLATION GUIDE

P/N 06508 REV A

Dataram Corporation ☐ Princeton Road ☐ Cranbury, New Jersey 08512 ☐ (609) 799-0071 ☐ TWX: 510-685-2542

REVISIONS

REV	SHEET	DESCRIPTION	APPROVED	DATE
A	All	Release to Production	E.H.C.	12-17-54

APPROVALS

DRAWN D. L. Lowery 12-3-54 (Chg.)

TECH WRITER Karl J. Kaufman 12-4-54

ENGINEER E. H. Colton

ENGR. MGR. R K [illegible] 12-54

INSTALLATION

The DR-275 occupies one standard hex card slot of the VAX 11/750 or VAX 11/730.

Switch Settings and Jumper Options

Switch Settings

Switch 1-1, located on the rear of the card, must be in the ON position (switch up) for the DR-275 to be enabled. When the switch is in the ON position, the green L.E.D. will light, indicating that the correct +5V battery backup is applied to the board and the board is enabled.

Jumper Settings

All jumpers are factory installed; there are no selectable options.

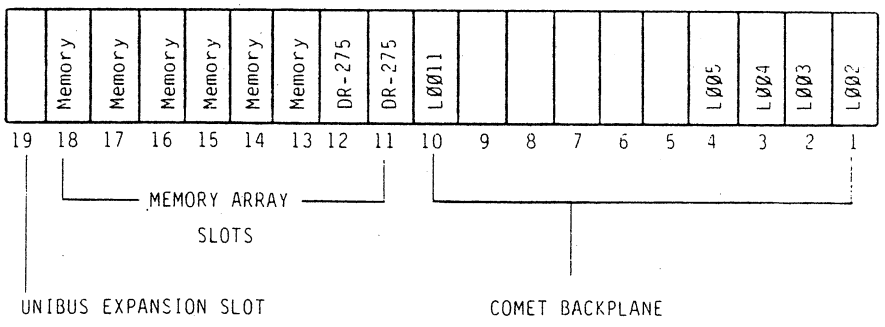
Computer Installation

The DR-275 may be installed in the VAX 750 or VAX 730 as follows:

VAX 11/750

The DR-275 may be installed in any current VAX 11/750 computer or in any earlier version where appropriate modifications have been made to the backplane, as described in the VAX 11/750 upgrade kit. These modifications enable the VAX 11/750 to accommodate a maximum of 8 MBytes of memory, or accommodate a mixture of memory boards utilizing 16K MOS and 64K MOS RAM technology.

The following slots of the VAX 11/750 have been specified for memory.



VAX 11/730

The VAX 11/730 consists of from 1 to 5 memory array modules that use 64K MOS RAM chips for data storage. Up to five 1 MByte array modules can be installed to give a 5 MByte maximum memory capacity. The minimum memory configuration is 1 MB.

Card slots for the VAX 11/730 backplane are:

1	Disk Controller	7	Memory Array
2		8	Memory Array
3		9	Memory Array
4	Memory Controller	10	Memory Array
5	Writable Control Store	11	
6	DR-275 Memory Array	12	Terminator Quad Slot

Diagnostics

The DR-275 is completely compatible with all Digital Equipment Corporation memory diagnostics. No software patches are needed.

The RAM array of the DR-275 is layed out in 4 rows (Rows A-D) of 39 columns (0-38) as marked on the DR-275 silk screen. The following table shows the correlation between DEC's chip numbers and Dataram's row and column numbers for the RAM storage array.

DEC COMPONENT NUMBER	DATARAM ROW/COLUMN #	DEC COMPONENT NUMBER	DATARAM ROW/COLUMN #
E100	A-27	E130	A-24
E101	A-11	E131	A-8
E103	D-27	E132	A-36
E104	D-11	E133	D-24
E105	B-27	E134	D-8
E106	B-11	E135	B-24
E108	C-27	E136	B-8
E109	C-11	E137	B-36
E110	A-26	E138	C-24
E111	A-10	E139	C-8
E112	A-38	E140	A-31
E113	D-26	E141	A-15
E114	D-10	E142	A-35
E115	B-26	E143	D-31
E116	B-10	E144	D-15
E117	B-38	E145	B-31
E118	C-26	E146	B-15
E119	C-10	E147	B-35
E120	A-25	E148	C-31
E121	A-9	E149	C-15
E122	A-37	E150	A-30
E123	D-25	E151	A-14
E124	D-9	E152	A-34
E125	B-25	E153	D-30
E126	B-9	E154	D-14
E127	B-37	E155	B-30
E128	C-25	E156	B-14
E129	C-9	E157	B-34

DEC COMPONENT NUMBER	DATARAM ROW/COLUMN #
E158	C-30
E159	C-14
E160	A-29
E161	A-13
E162	A-33
E163	D-29
E164	D-13
E165	B-29
E166	B-13
E167	B-33
E168	C-29
E169	C-13
E170	A-28
E171	A-12
E172	A-32
E173	D-28
E174	D-12
E175	B-28
E176	B-12
E177	B-32
E178	C-28
E179	C-12
E180	A-19
E181	A-3
E182	D-35
E183	D-19
E184	D-3
E185	B-19
E186	B-3
E187	C-35
E188	C-19
E189	C-3
E190	A-18
E191	A-2
E192	D-34
E193	D-18
E194	D-2
E195	B-18
E196	B-2
E197	C-34
E198	C-18
E199	C-2
E200	A-17
E201	A-1
E202	D-33
E203	D-17
E204	D-1
E205	B-17
E206	B-1
E207	C-33
E208	C-17
E209	C-1
E210	A-16

DEC COMPONENT NUMBER	DATARAM ROW/COLUMN #
E211	A-0
E212	D-32
E213	D-16
E214	D-0
E215	B-16
E216	B-0
E217	C-32
E218	C-16
E219	C-0
E220	A-23
E221	A-7
E222	D-38
E223	D-23
E224	D-7
E225	B-23
E226	B-7
E227	C-38
E228	C-23
E229	C-7
E230	A-22
E231	A-6
E232	D-37
E233	D-22
E234	D-6
E235	B-22
E236	B-6
E237	C-37
E238	C-22
E239	C-6
E240	A-21
E241	A-5
E242	D-36
E243	D-21
E244	D-5
E245	B-21
E246	B-5
E247	C-36
E248	C-21
E249	C-5
E250	A-20
E251	A-4
E253	D-20
E254	D-4
E255	B-20
E256	B-4
E258	C-20
E259	C-4

Locating Bad RAMs

If the diagnostic refers to a bad RAM by address and bit number, it can be located as follows:

1. Subtract starting address of board from the error address.

2. If the difference between the starting address and error address is between:

OCTAL

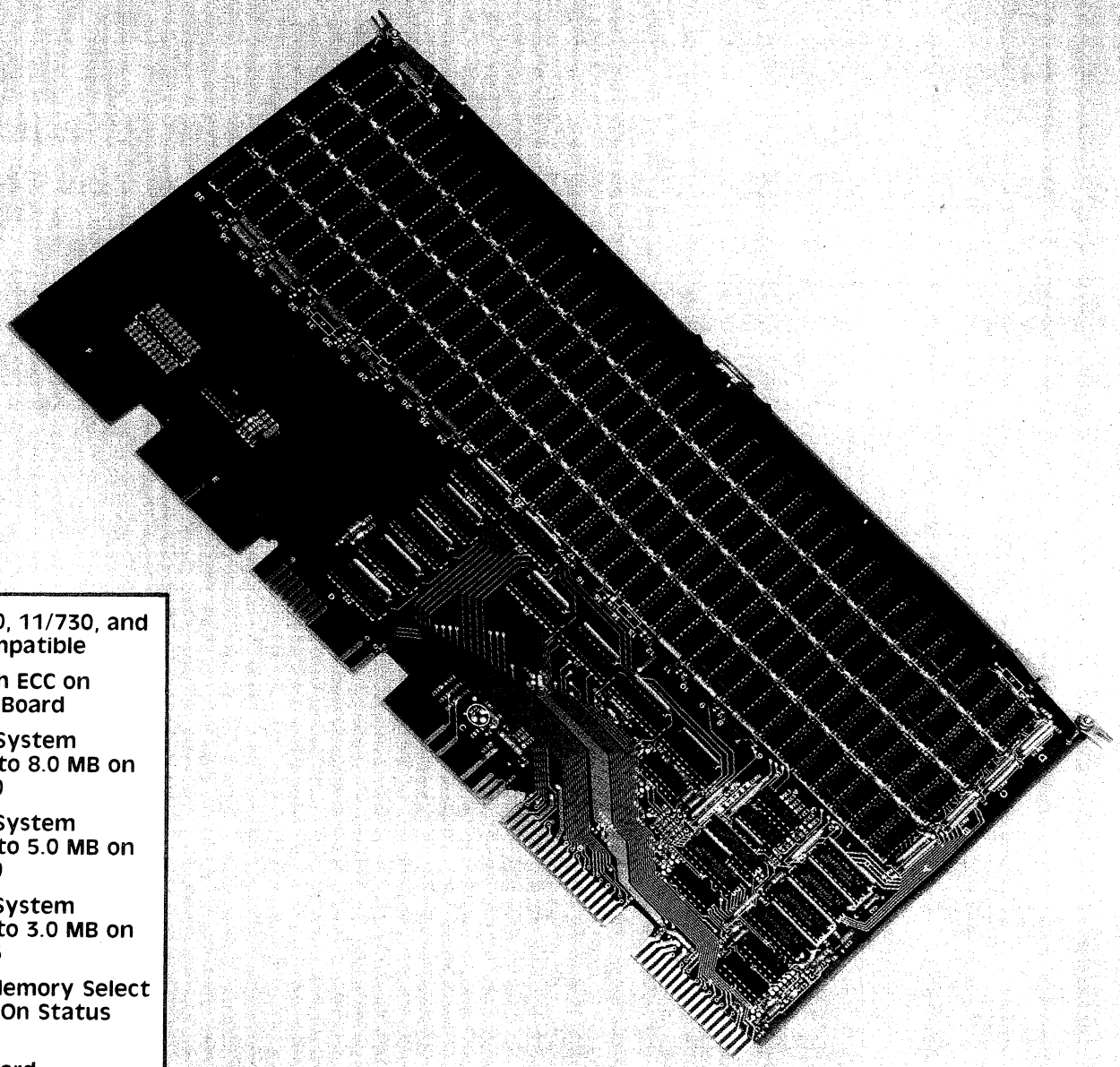
0 - 177777	0 - 64K - Bad RAM is located in Row A.
200000 - 377777	64K - 128K - Bad RAM is located in Row B.
400000 - 577777	128K - 192K - Bad RAM is located in Row C.
600000 - 77777	192K - 256K - Bad RAM is located in Row D.

This bit number (0-31) corresponds to the column number as labeled on the DR-275 silk screen. For the check bits the following applies:

CHECK BIT NUMBER	**DR-275 COLUMN NUMBER**
CBO 1	32
CBO 2	33
CBO 4	34
CBO 8	35
CBO 16	36
CBO 32	37
CBO T	38

VAX-COMPATIBLE MEMORY

VX RAM



- VAX-11/750, 11/730, and 11/725 Compatible
- 1.0 MB with ECC on Single Hex Board
- Maximum System Expansion to 8.0 MB on VAX-11/750
- Maximum System Expansion to 5.0 MB on VAX-11/730
- Maximum System Expansion to 3.0 MB on VAX-11/725
- On-Board Memory Select and Power-On Status Indicators
- Memory Board ENABLE/DISABLE Switch

The Dataram DR-275 VAX Semiconductor Array Board provides 1.0 MB data storage on a single hex-width printed circuit board using 64K x 1 dynamic RAMs. The DR-275 operates either with or in place of Digital Equipment Corporation's MS730 semiconductor memory array.

VAX-11/750 computers upgraded with the DEC MS750-DX upgrade kit enables a total system capacity of 8.0 MB. DR-275 operation in VAX-11/730 systems requires presence of the 11/730 compatible control board. Total VAX-11/730 system capacity is 5.0 MB. Total VAX-11/725 system capacity is 3.0 MB.

Each 39-bit word contains 32 data bits and seven error-checking and correction (ECC) bits.

Dataram does more with memory **DATARAM**

VAX-COMPATIBLE MEMORY

VX RAM

ECC bits provide single-bit error correction and double-bit error detection.

Two on-board LEDs signal when the memory is accessed and when it is powered on, aiding both in status reporting and in trouble-shooting. A diagnostic ENABLE/DISABLE switch electrically isolates the board from the backplane without removing it from the chassis. The DR-275 is compatible with battery backup operation.

When used in systems containing battery backup power, power consumption is greatly reduced during AC power failures, while maintaining data integrity.

SPECIFICATIONS

Capacity ..... 256K x 39 (1.0 MB)

Operating Speeds

Mode	Typical* Cycle nsec	Typical* Access nsec
Read	500	270
Write	500	100
Read-Modify-Write	850	270/630
Initialize	500	—
Refresh	500	—
Exchange	1500	270/830

*Determined by VAX memory controller board.

Maximum Power Requirements

	Operating Amps	Standby Amps	Battery Backup Amps
+5	.70	.70	—
+5B	1.90	1.00	1.00
Total	2.60	1.70	1.00

Mechanical

Dimensions ..... DEC standard hex board 15.687" (398.45 mm) x 8.075" (205.10 mm) x .440" (11.17 mm)

Weight ..... 1.25 pounds (.567 Kg)

Environmental Specifications

Temperature

Operating ..... 0°C to +55°C
Storage ..... -40°C to +80°C

Humidity

Operating ..... 0 to 90% (without condensation)
Non-operating ..... 0 to 95% (without condensation)

Altitude

Operating ..... 1000 ft. (300 m) below to 10,000 ft. (3000 m) above mean sea level
Non-operating .... 1000 ft. (300 m) below to 20,000 ft. (6000 m) above mean sea level

Vibration ..... Withstands normal stresses encountered in transportation

Indicators ..... Run
Battery backup

Switches ..... Enable/Disable

Dataram Corporation ☐ Princeton Road ☐ Cranbury, New Jersey 08512 ☐ (609) 799-0071 ☐ TWX: 510-685-2542

DATARAM