_ FCO KA43-O001, Faulty chip resulting in heavily loaded outputs

DIGITAL	FCO	CATEGORY [O]	PAGE 1 of 4

FIELD CHANGE ORDER NUMBER: KA43-O001

APPLICABILITY: This FCO is for the VAXstation 3100, Model 76 only.

PROBLEM & SYMPTOM: National Semiconductor informed DEC of a fault in their 74F244 product that results in heavily loaded outputs of the 74F244, when multiple lines are switching, failing to stabilize per specifications. The resulting instability can cause unpredictable results if the outputs are sampled during this unstable period. (Continued on Page 2)

SOLUTION: Replace KA43 System Module.

QUICK CHECK: See Attachment A. Only after successful removal of the graphics co-processor module, per instructions in Section I of this document, can this Quick Check be performed.

PRE/CO-REQUISITE FCO:	MTTI HRS
N/A	1.0 Hrs.

TOOL/TEST EQUIPMENT:
N/A

FCO PARTS INFORMATION

FCO KIT NO.		DESCRIPTION OF CONTENTS	EQ KIT VARIATION APPLICABILITY
EQ-01607-01	1	54-19847-01 KA43 System Board	
FA-04937-01	1	FCO Document	N/A

FCO CHARGING INFORMATION

WARRANTY/CONTRACT				NONWARRANTY/NONCONTRACT				
ON-SITE		OFF-SITE		ON-SITE		OFF-SITE		MATERIAL ONLY
TRAVEL/INSTALL	EQ KIT	INSTALL	EQ KIT	TRAVEL/INSTALL	EQ KIT	INSTALL	EQ KIT	ORDER-ADMIN,HANDLING PKG,SHIPPING & EQ KIT
DEC	DEC	DEC	DEC	CUS	CUS	CUS	CUS	CUS

APPROVALS

CSSE	CS LOGISTICS	FS PRODUCT SAFETY
Bob Sherman	Helene Waluk	Robert Brister
CSSE MANAGER	This Document is published	FCO RELEASE DATE
Ron Caprio	on multiple media including Hardcopy, Customer Services	4 March 1991

MICROMEDIA Diane MacDonald	Microfiche Libraries, Customer Services CD-ROM and MDS Microfiche Libraries.	FCO REVISION A
POPULATION 550	PARTS AVAILABILITY March, 1991	

Problem/Symptoms (Continued from Page 1)

The 74F244 chip is used as a DAL bus driver providing cache tag address buffering and CMD state buffering, where the loads vary from 5 loads to 17 loads. The fault that has been observed in the PANTHER system is that the DAL lines are unstable during the ADDRESS STROBE transition from high to low (latching in the address value from the DAL). This causes addressing to incorrect locations with several possible results such as, incorrect instruction fetch, incorrect data fetch, and incorrect data write.

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* INSTRUCTIONS ON HOW TO REPLACE THE KA43 SYSTEM MODULE *
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NOTICE: THE KA43 MODULE IS IN SHORT SUPPLY. AS SOON AS YOU FINISH THIS FCO PLEASE RETURN THE MODULE SO IT CAN BE REPAIRED AND USED AGAIN.

****
* * CAUTION * *
* *
* WEAR A STATIC WRIST STRAP AND USE A STATIC MAT. *
****

I. REMOVING THE KA43 SYSTEM MODULE

1. Have the customer run shutdown on the system. After the system has been shutdown turn the power off to the system and remove all cables from the back of the system.

2. Unscrew the two captive screws on the back of the system box and slide the cover forward approximately 2 inches and lift up and off the system box.

3. Remove the drive plate. You do not have to remove any devices mounted on the drive plate to remove the drive plate from the system box. If the drive plate has devices mounted on it, then

disconnect the disk power cable from the power supply and remove the SCSI cable from the system board by spreading the tabs and pulling the cable straight up.

4. For systems with or without drives on the drive plate, you must next free the five captive screws and loosen the three slide mount screws on the drive plate. Do not remove the three slide mount screws from their mountings. Slide the drive plate forward approximately 1/2-inch and then lift it up and off the system box while feeding through the disk power cable and set plate aside.

5. Remove the Graphics Co-processor module as follows:

****
* **CAUTION** *
*
* IF YOU HAVE AN SPX COLOR GRAPHICS ACCELERATOR, THERE IS AN IC (on *
* the SPX graphics module) WHOSE PINS ARE SUSCEPTIBLE TO BENDING *
* NEAR THE REAR CORNER FURTHEST FROM THE POWER SUPPLY. BE EXTREMELY *
* CAREFUL IN HANDLING THIS MODULE SO AS NOT TO CAUSE PERMANENT DAMAGE.*
****

Remove the graphics Co-processor module from the four standoffs by grasping the module near the two connectors under the module, and lift the graphics Co-processor module off the system module. Now go to ATTACHMENT A.

II. REMOVING AND REPLACING THE MEMORY SIMMS

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* ** CAUTION ** *
*
* THE MEMORY SIMMS ARE KEYED AND SHOULD BE INSTALLED IN ONLY ONE *
* DIRECTION. EXCESSIVE FORCE APPLIED TO THE SIMMS WHEN THEY ARE *
* NOT PROPERLY ALIGNED WITH THE CONNECTOR CAN CAUSE PERMANENT *
* DAMAGE TO EITHER THE SIMM OR THE CONNECTOR. *
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1. Memory SIMMs must always be removed starting from the rear of the system module. To remove a SIMM, release the metal retainers located on each end of the memory connector on the system module and tilt the module approximately 55 degrees to the rear of the system module and lift out. Repeat the previous step for each memory SIMM. When replacing the memory SIMMs, be sure to insert the SIMM at the angle it was removed, them tilt upward until the retainers lock into place.

2. Disconnect the power cable from the system module. Remove the twelve Phillips-head screws from the system module. After removing the screws, remove the system module by carefully popping up the two front corners off the the two locating posts.

III. INSTALLING THE NEW KA43 SYSTEM MODULE

1. Using either a ROM puller or slide a small screwdriver under each end of the Ethernet ID ROM, and carefully lift the ends until you can remove the ROM from the system module.

2. Remove the Ethernet ID ROM from the new system module and replace it with the Ethernet ROM from the system module you just removed. Take the Ethernet ROM removed from the new module and install it on the old system module.

3. Place the new system module in the system box making sure the connectors slide through the openings in the rear of the system box. Push the module toward the back of the box until the front set of holes on either side of the module fit on the two locating posts on the bottom of the box. You must apply some pressure because of the elasticity of the connector shieldings surrounding the connectors at the back of the module. Check that the screw holes are aligned and install the twelve Phillips-head screws.

4. Plug in the power cable, replace the memory SIMMs, and re-install the graphics Coprocessor. Now install the drive plate and remember to connect the power cable and the data cable to the system module and replace the system box cover. Install all external cables and power up the system. If the power-up diagnostics run and the system boots, fill out a LARS, tag the old module and return it to Logistics as soon as possible so it can be repaired and used again. (See LARS example below)

NOTE For more information on replacing the system module refer to the VAXstation 3100 Model 76 Maintenance Guide (EK-VS31M-MG-001)

LARS DATA

	USA	GIA	EUROPE
Activity Codes:			
(a)Contract and Warranty	W	U	Y
(b)IN-DEC Contract/Warranty	K		
Hardware Segment Code	111		
Non Contract/Non Warranty	F	F	F
(c)RTD/Off-Ste Agreement	F		
Product Line	01		
DEC Option	KA43	KA43	KA43
Type of Call	M	M	M
Action Taken	D	D	I
Fail Area-Module-FCO Comments	KA43-O001	KA43-O001	KA43-O001
Material Used	EQ-01607-01	EQ-01607-01	EQ-01607-01

(a) Warranty Optimum, Warranty Standard and Warranty Basic (on-site) Agreements.

(b) Applies to INDEC AREA ONLY - Warranty Optimum, Warranty Standard and Warranty Basic (on-site) Agreements.

(c) RTD=Return to Digital or Off-Site Agreements; if Field Engineer On-Site, use Activity Code "F".

ATTACHMENT A

CHECKING THE KA43 SYSTEM MODULE

Using the diagram on the following page check the the devices at locations E49, E50, E54, E55, E64 and E79. These are 74F244 chips. First check to see if any of the six chips are made by National Semiconductor. If none of these chips are made by National Semiconductor the CPU module does not need to be replaced and you may put the system back together. If any of

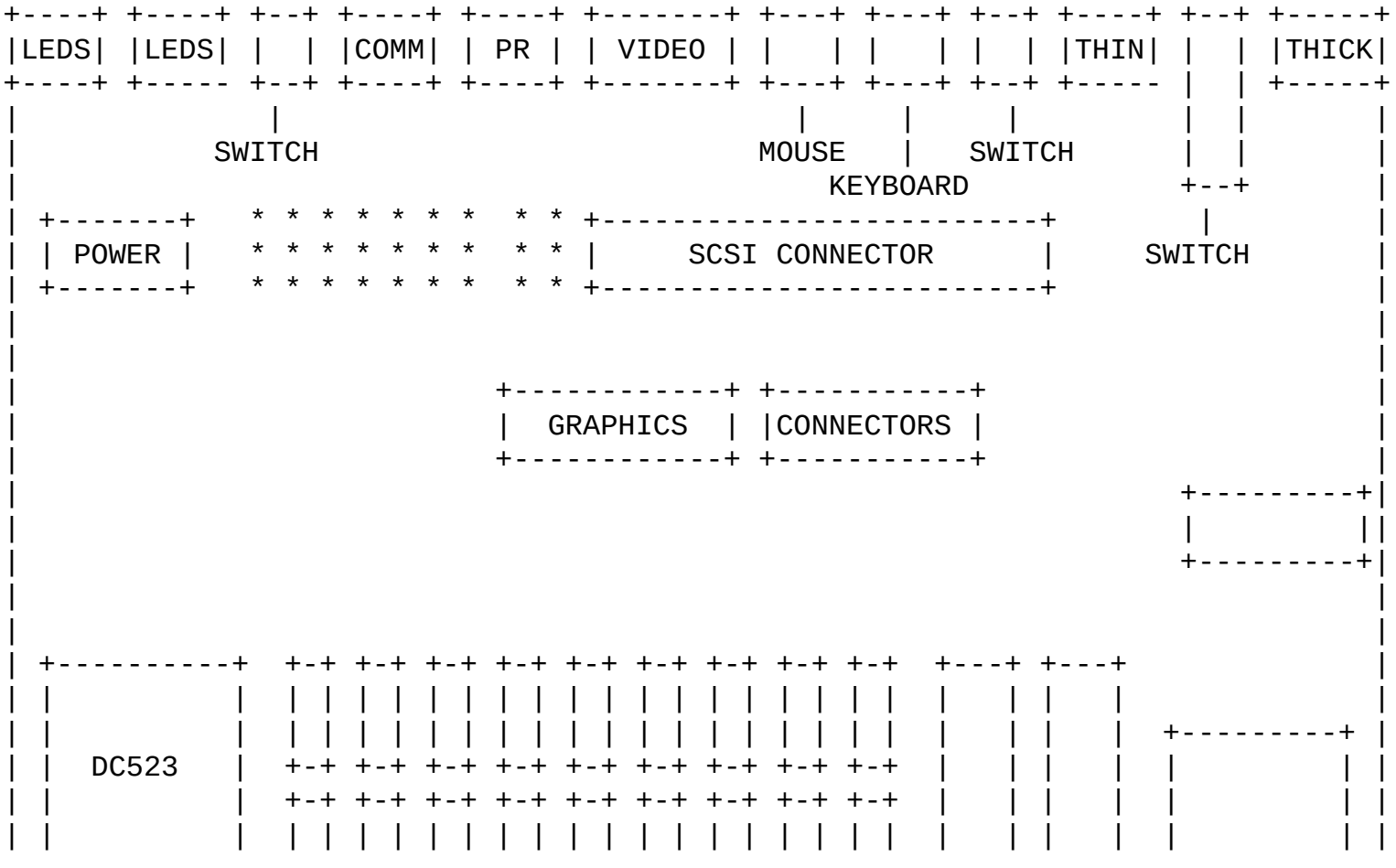
the chips are made by National Semiconductor you must check the date code to determine if the CPU needs to be replaced.

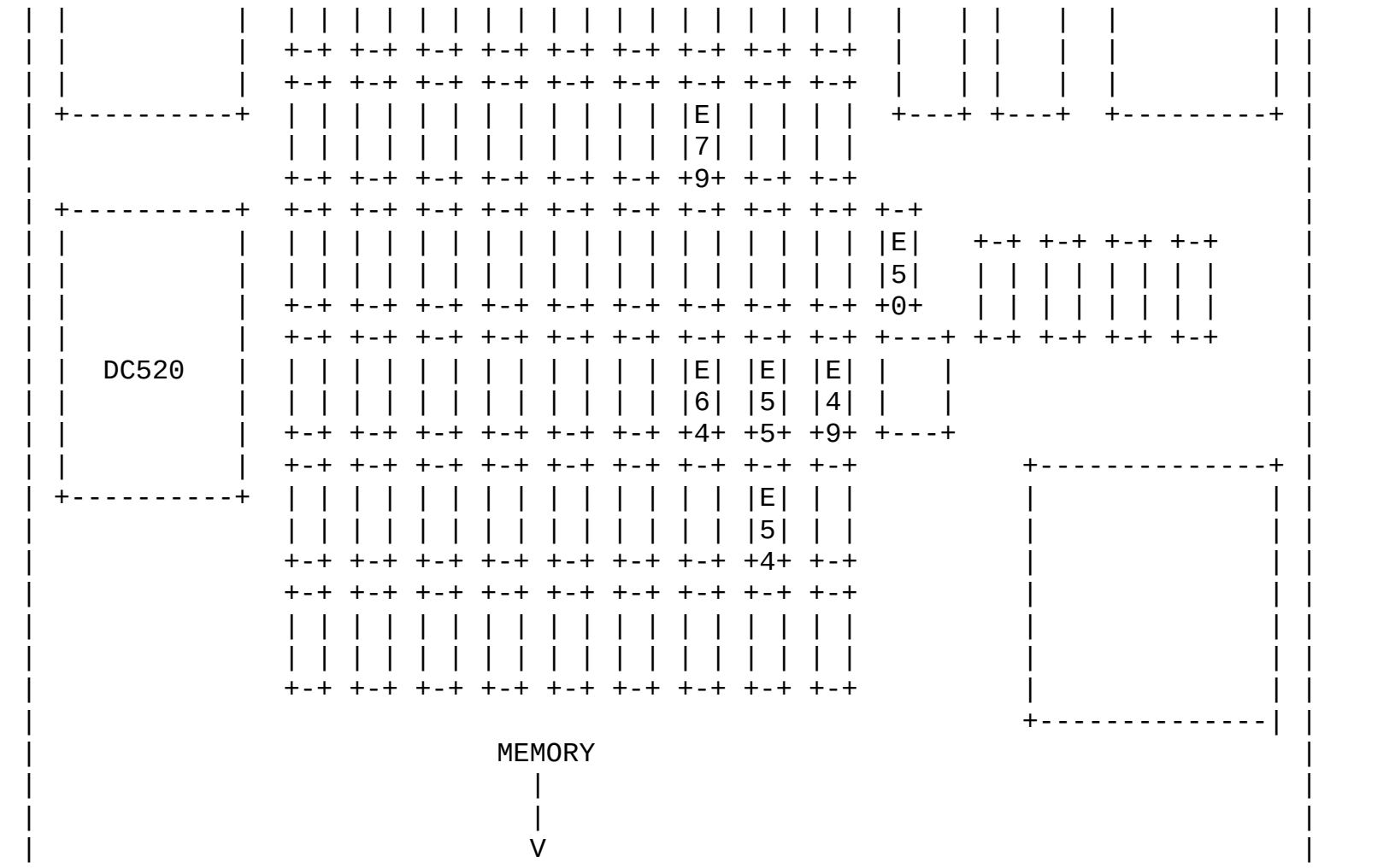
The 74F244 chips have a date code stamped on them the is in this format, "02MP036S". The "036" is the date code. The "0" is for the year 1990 and the "36" represents the week number. If the week number is between 30 and 42 the CPU module MUST be replaced. Any other date and the CPU is good and does not need to be replaced.

If the KA43 system module needs to be replaced, go to section "2. REMOVING AND REPLACING THE MEMORY SIMMS" and continue. If the KA43 system module does not need to be replaced, install the drive plate and remember to connect the power cable and the data cable to the system module and replace the system box cover.

Install all external cables and power up the system. If the power-up diagnostics run and the system boots, fill out a LARS report and the FCO is complete.

KA43 SYSTEM MODULE





\\FCO_DOCS
\\VAXstation 3100
\\74F244