

DIGITAL SOFTWARE NEWS

FOR THE

PDP-8 & PDP-12

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DIGITAL SOFTWARE NEWS
FOR THE PDP-8 AND THE PDP-12

Digital Software News for the PDP-8 & PDP-12 is designed to provide users of PDP-8 and PDP-12 software with up to date information on software problems, programming notes, and new and revised software. Each article, other than announcements and documentation corrections, is coded sequentially by system program in the lower right corner for ease in maintaining a quick reference file. The original material for such a file is supplied in the Software Performance Summary for the PDP-8 & PDP-12. This publication which is placed in each basic software kit, is a collection of all current information on known software problems, patches, and programming notes. As new versions correct software problems and obsolete patches, and reprinted manuals include programming notes and manual corrections, new articles in the Digital Software News will announce the revised software and specify by code which article should be removed from your Software Performance Summary file. Articles may also be replaced when new information becomes available; such as, procedure to circumvent a problem may replace the original report of the problem. All articles in the Digital Software News which should be added to your file will be appropriately coded.

Any questions or problems on the articles contained in these publications or concerning the use of Digital's software should be reported to the Software Specialist or Sales Engineer at your nearest Digital Office.

Additional copies of the current Software Performance Summary and updated issues of the PDP-8 and PDP-12 software price lists are available at no charge upon request from the Program Library. As with usual orders for software, the Program Library will accept orders received directly from U.S. customers. All other customer orders must be routed through the nearest Digital Representative.

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PDP-8 NEW AND REVISED SOFTWARE

These prices apply to U.S. customers only. All others should consult their DEC field office for applicable charges and for placing their order.

PDP-8E MEMORY EXTENSION AND TIME SHARE CONTROL TEST

MAINDEC-8E-D1HB

Locations 732-755 were changed to correct the CIF-JMP Test error indication problem. In addition, the MQ is now used to indicate good results of the instruction buffer; and the AC is used to indicate bad results of the instruction buffer.

Customers may order this software for the applicable fee:

Paper Tape Binary	MAINDEC-8E-D1HB-PB	\$5.00
Document	MAINDEC-8E-D1HB-D	\$5.00

MI8-E BOOTSTRAP DIAGNOSTIC

MAINDEC-8E-D1IA

This program is now available from the Program Library for use with the PDP-8E. Customers may order this software for the applicable fee:

Paper Tape Binary	MAINDEC-8E-D1IA-PB1	\$5.00
Paper Tape Binary	MAINDEC-8E-D1IA-PB2	\$5.00
Document	MAINDEC-8E-D1IA-D	\$5.00

PDP-8 NEW AND REVISED SOFTWARE

PDP-8, 8/I EXTENDED MEMORY CHECKERBOARD

MAINDEC-Ø8-D1EC

This program was changed to correct the following problem:
After relocation to the next existing memory
field, the program did not check the information
relocated.

Customers may order this software for the applicable fee:

Document	MAINDEC-Ø8-D1EC-D	\$5.00
Paper Tape Binary	MAINDEC-Ø8-D1EC-PB	\$5.00

Note that the source tape is not available.

TC58 DATA RELIABILITY TEST (7 TRACK)

MAINDEC-08-D9AD

In this program, the "SMA STL" instruction was used illegally in
even parity pattern no. 6 generation.

In this new revision, this problem has been corrected as follows:

4625/ STL
4626/ SMA

Customers may order this software for the applicable fee:

Document	MAINDEC-08-D9AD-D	\$8.00
Paper Tape Binary	MAINDEC-08-D9AD-PB	\$5.00

Note that the source tape is not available.

PDP-8 NEW AND REVISED SOFTWARE (Continued)

TD8-E DECTAPE FORMATTER

DEC-8E-EUZH

This program has been resubmitted as final with corrections to the following problems.

1. WRITE, WRITE LOCK OUT, and SELECT were not checked on either unit before it started to format.
2. The switch on the M868 was not checked to be in the WTM position before writing the mark and timing tracks.
3. The switch on the M868 was not checked to be in the off position before reading the mark track.

Customers may order this software for the applicable fee:

Paper Tape Binary	DEC-8E-EUZH-PB	\$5.00
Document	DEC-8E-EUZH-D	\$5.00

Note that the source tape is not available.

EDUSYSTEM 20 AND 50

Problem with 8/e KL8-e (Teletype Interface)

When running on the PDP-8e, both Edusystem 20 and 50 (TS8-E) sometimes have keyboards "go dead" for apparently no known reason.

The problem is apparently caused by the "build-up" of static electricity in terminal users' metal chairs, and the subsequent discharge on contact with the teletype. The problem only exists with respect to terminals connected directly to the Processor, and one recommendation for overcoming the problem is to use wooden chairs.

The problem may be compensated for by means of software. A patch for TS8-E Version 8.22B follows. A correction for Edu. 20 is currently not available, however a new version will be available in the near future which will include a software fix.

TS8/E VERSION 8.22B

/PATCH TO TS8/E VERSION 8.22B
/RE-ENABLES KEYBOARD INTERRUPTS
/TO CORRECT FOR KL8-E HARDWARE BUG

Ø114 KDEV=Ø114 /POINTS TO BEGINNING ON KEYBOARD DEVICE CODES
Ø113 TDEV=Ø113 /POINTS TO END OF KEYBOARD DEVICE CODES

2412 *2412

2412 4773 L2TIME, JMS I PATCHL /TO PATCH - WAS "ION"

2573 *2573

2573 7152 PATCHL, PATCH
NULJOB, /NORMAL NULL JOB

715Ø *715Ø

715Ø ØØØØ PATCH, Ø
7151 2374 ISZ PATCNT /ONLY EVERY SO MANY SYSTEM TICKS
7152 5372 JMP PATCH2 /OTHERWISE, JUST RETURN TO NORMAL

7153 1375 TAD PATINI /RESET COUNTER

7154 3374 DCA PATCNT

7155 1114 TAD KDEV /SET POINTER TO KEYBOARD DEVICE CODES

7156 3376 DCA PATPTR

7157 2376 PATCH1, ISZ PATPTR /ON TO NEXT KEYBOARD

TS8/E VERSION 8.22B (Continued)

7160	1776	TAD I PATPTR	/GET DEVICE CODE
7161	1377	TAD C6005	/MAKE IT INTO "KIE"
7162	3364	DCA .+2	/SET TO EXECUTE IT
7163	7001	IAC	/"1" IN AC TO ENABLE
7164	0000	.-.	
7165	1376	TAD PATPTR	/CHECK FOR END OF DEVICE CODES
7166	7041	CIA	
7167	1113	TAD TDEV	
7170	7700	SMA CLA	
7171	5357	JMP PATCH1	/NOT YET - KEEP GOING
7172	6001	PATCH2, ION	/TURN INTERRUPT BACK ON
7173	5750	JMP 1 PATCH	/AND RETURN TO NORMAL
7174	7740	PATCNT, -40	
7175	7740	PATINI, -40	
7176	0000	PATPTR, 0	
7177	6005	C6005, 6005	
		\$\$\$\$\$	

LAB-8/e DAQUAN

Tape Problem

Because DAQUAN program tape (DEC-LBOU8ØB-PB) was assembled without the needed floating point package, it will not run. A new tape is being generated, and as soon as possible, the Program Library will be updating all customers who received their machines after September 1, 1971.

Serious problem reported in BASICE.27

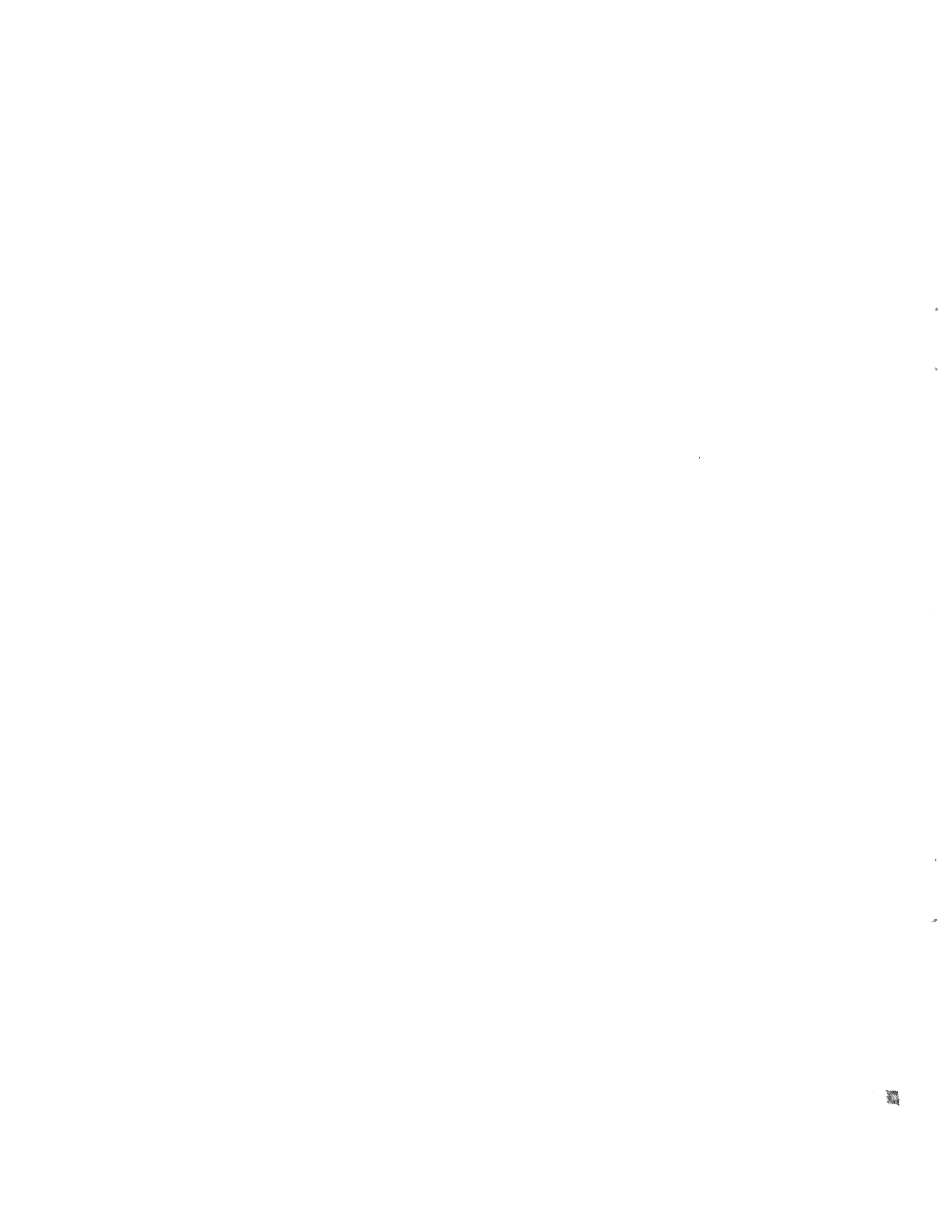
Occasionally, when a user types a control C, BASIC will malfunction possibly with no indication of trouble. The conditions necessary to produce this error are time dependent, and therefore may never be noticed. The cause is failure to clear a flag when control C is typed.

To temporarily correct this problem, after BASIC is loaded, change location 7160 in field 0 from a 0776 to a 7756. This will completely solve the problem. However, the "LIST*" command must not be used if this patch is inserted.

If a LIST* command is given, BASIC will not reset the flag and all output will have additional fill characters after the carriage return-line feed.

This problem will be solved in future revisions which will be announced in the newsletter.

Note: Customers should be aware that future versions of BASIC will have different core locations assigned to its values, and thus user overlays probably will no longer function. It may be necessary for them to reassemble their overlays for the new releases of BASIC.



MI8-E BOOTSTRAP DIAGNOSTIC

MAINDEC-8E-D1IA, Patch

This program does not check the possibility that the MI8-E option under test could have affected the memory locations between the bootstrap block of data information and the diagnostic. Insert the following patch to correct the problem.

LOW VERSION		HIGH VERSION	
<u>LOCATION</u>	<u>CONTENTS</u>	<u>LOCATION</u>	<u>CONTENTS</u>
74Ø	537Ø	474Ø	537Ø
77Ø	4341	477Ø	4341
771	5215	4771	5215

PAL-8

Programming Note on use of conditionals

It is possible to construct useful pseudo-ops such as IFNEG and IFPOS as in the following example:

```
IFNEG expression <statements> (assemble statements
                                if expression is
                                negative)
```

can be written as:

```
IFNZRO expressions &40000 <statements>
```

while its complement.

IFPOS expression statements, can be implemented by writing:

```
IFZERO expression &40000 <statements>
```

To prevent PAL-8 from printing nonsatisfied conditional assembly statements in the listing, the following solution, employing complementary conditionals, is suggested:

```
IFNDEF  LTAPE <XLIST >
IFDEF   LTAPE <
        HERE
        GOES
        THE
        CODE
IFNDEF  LTAPE <XLIST >
```


PS/8 MULTI-BLOCK DIRECTORIES

COMPRESSION OF FRAGMENTED DIRECTORY SEGMENTS

When a directory extends beyond the first block, the following situations can occur:

1. If the last entry in a block is an "empty" and you delete the first file in the succeeding block, two consecutive empties will appear in the directory listing.
2. If you delete a file from a directory block, (other than the last block in use) an empty file equal to the length of the file deleted will be created. However, the only way another file may be added to that block is by transferring a file of known length that can be accomodated in an existing empty file. Temporary (newly created files) files are always added at the end of the directory unless you specify a maximum length with the square bracket option. Therefore, "full" directory blocks may have far less than the minimum number of file entries.
3. When you move a file of known or maximum specified length, it will replace the first empty file with a length closest to the desired length. This feature works across blocks beginning with the first block.

Item 3 is an explanation of why files go where they go. Fragmented directory segments are compressed using the IS option in PIP.

This removes all empties by rewriting the files and the directories. This file will have a maximum number of file entries in each directory block up to the last block in use.

TSS-8

Disk/Core Redefinitions

Changes in the number of disks or number of core fields on a Time-Shared 8 system do not require reassembly of the entire Monitor. Following is the information necessary to make the appropriate changes.

Users who are not familiar with the DISKLOOK section of INIT that starts at location 0200 should read Chapter 4 of the Time-Sharing System Manager's Guide. The locations that are listed here refer to Version 22B of the Time-Shared 8 Monitor. Locations in earlier versions may differ slightly from these.

To change the number of disks, either RF/RS08 or DF32:

loc. 23527 becomes -DSKSIZ
loc. 23742 becomes DSKSIZ
where DSKSIZ = (# of disks)x100 (octal)

Having made these two changes it is necessary to "REFRESH the disk" using INIT. This, of course, requires reloading all of the files.

Although it is not really necessary to change the Monitor when adding more core, for consistency here are the changes that can be made. Additional core fields can be utilized by correctly answering the INIT question:

OF USER FIELDS?

This number is two less than the total number of fields in the system (8K resident Monitor).

To correct the Monitor for added core fields:

loc. 25400 becomes CORMEM
If 680-type teletype interfacing,
loc. 33437 becomes CIF CDF + CORMEM
loc. 33444 becomes COREXT
If not 680 interfacing,
loc. 33430 becomes CIF CDF + CORMEM
loc. 33435 becomes COREXT
Where CORMEM = (highest field #)x10 (octal)
and COREXT = CORMEM if RF/RS08
= 200 + CORMEM if DF32

PDP-12 PROGRAMMING NOTE

Software Solution to a DJR Problem

A problem occurs when returning to a main program after executing a subroutine in another instruction field. The problem occurs when the DJR is used in the subroutine to save the contents of location \emptyset of the subroutine's instruction field.

The following text describes the problem and gives two ways of programming around it.

In PDP-12 (L Mode) programming the JMP \emptyset (zero) instruction, when used in a subroutine, returns the program counter to the calling program because location \emptyset of the current instruction field (IF) will contain the return jump instruction. If the subroutine is in a different IF than the calling program then the instruction sequence LIF (), JMP (subroutine) causes the return jump instruction to be placed in location \emptyset of the instruction field containing the subroutine. Program control returns to the calling program in a direct, convenient way by the LIF () and JMP \emptyset instructions at the end of the subroutine. Normally, a JMP \emptyset instruction that follows the LIF () instruction places the program counter at location \emptyset of the current (subroutine) IF instead of in the new (calling program) IF.

If the subroutine contains JMP commands then the contents of location \emptyset are preserved by using the DJR instruction before each JMP instruction. However, if, by the circumstances of the subroutine, a DJR is not cleared (i.e. by a JMP ($\neq\emptyset$)) before the LIF () JMP \emptyset sequence, then the program counter goes to location \emptyset in the IF of the calling program instead of the IF of the subroutine. That is, the DJR instruction not only inhibits the changing of location \emptyset of the same IF but it also causes the program counter to go to location \emptyset of the new IF when the JMP \emptyset is executed. Although this return to location \emptyset in the calling program's IF could be utilized, it is not consistent with the procedure of saving the return jump in location \emptyset of the subroutine's IF and then protecting that return jump with the DJR.

Two procedures are presented to circumvent the problem of returning to the wrong IF. Note in procedure 1 that extra instructions, DJR and JMP $+.1$, must be inserted in the subroutine, and in procedure 2 the instructions JMP $+.3$, LIF 1 and JMP BSUB must be added to the calling program so that the program counter will return to the proper instruction after the subroutine is executed.

MISCELLANEOUS 2

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Software Solution to a DJR Problem (Continued)

Procedure 1

Storage Location	Calling Program (IF 2)
4000	0000 Contents are not changed by
.	JMP SUB
.	.
.	.
4060	LIF 1
4061	JMP SUB
4062	ADA (Program control returns here after executing the subroutine)
4063	.
.	.
.	.
.	.

Storage Location	Subroutine (IF 1)
2000	JMP 0062 (Return JMP placed here after execution of 4061)
.	.
.	.
.	.
2120	SUB, STA i
2121	0
.	.
.	.
.	.
2140	DJR
.	.
.	.
.	.
2150	APO
2151	JMP .+4
.	.
.	.
.	.
2167	DJR (If previous JMP is not executed then this DJR and JMP clears the DJR and saves the contents of 2000) (Program counter goes to 2000, then the IF is changed to 2 and the program counter goes to location 4062)
2170	JMP .+1
2171	LIF 2
2172	JMP Ø

Software Solution to a DJR Problem (Continued)

Procedure 2

Storage Location		Calling Program (IF 2)
4000		JMP 062 (Return jump after
.		executing JMP ASUB)
.		.
.		.
4060		.
4061		JMP ASUB
4062		ADA (Program control returns
.		here after executing the
.		subroutine and the jump
.		at location 4000)
.		.
.		.
4111		JMP .+3
4112	ASUB,	LIF 1
4113		JMP BSUB
4114		.
.		.
.		.
.		.

Storage Location		Subroutine (IF 1)
2000		JMP 114 (Return jump after executing
.		JMP BSUB)
.		.
.		.
2120	BSUB,	STA i
2121		0
.		.
.		.
.		.
2140		.
.		(DJR is not required. The
.		contents of location 2000
.		are not used to return to
.		the calling program)
.		.
.		.

Software Solution to a DJR Problem (Continued)

2150	APO	
2151	JMP .+4	
.	.	
.	.	
.	.	
2170	DJR	(This DJR will cause the program counter to go to 4000 at the execution of the JMPØ instruction at 2172)
2171	LIF2	
2172	JMPØ	

PDP-12 MASH USER'S MANUAL

Additional notes on Automatic Mode

The following information on the automatic mode should be inserted in the MASH User's Manual (DEC-12-SQ2A-D), as the third paragraph on page 16.

If G is typed again, automatic mode initiates a series of scans that last until the chromatograph run is complete. Pressing one of the right switches on the console terminates scanning and returns the program to the TIC vs. Time plot.

