RSX-11/IAS SIG DECUS U.S. CHAPTER

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The Newsletter of the RSX-11/IAS Special Interest Group

Contributions should be sent to: Editor, The Multi-Tasker, c/o DECUS, One Iron Way, MR2-3/E55, Marlboro, MA 01752

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Members in Australia or New Zealand should send contributions to: Clive Edington, CSIRO, Computing Research 314 Albert St., East Melbourne, VIC 3002, Australia

Letters and articles for publication are requested from members of the SIG. They may include helpful hints, inquiries to other users, reports on SIG business, summaries of SPR's submitted to Digital or other information for the members of RSX-11/IAS SIG.

All contributions should be "camera-ready copy" e.g. sharp black type in a 160x240 mm area (8 1/2" x 11" paper with 1" margins) and should not include xerox copies. If you use RUNOFF to prepare your contribution the following parameters have been found to be satisfactory:

.PAPER SIZE 60,80 .LEFT MARGIN 8 .RIGHT MARGIN 72 .SPACING 1

These parameters assume output on a lineprinter with a pitch of 10 char/inch. Adjust the parameters to maintain the same margins if another pitch is used.

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FROM THE EDITOR

This issue has more articles on the Miami Symposium. It includes a brief transcript of the Customer Services Q&A Session and some trip reports by three of the attendees. Also, Jim Kauffman of Digital has submitted a copy of the overheads he used for the Queue Manager Session.

I apologize for the lateness of this issue. It is now July 15 and the edition should have been sent to Decus two weeks ago. The fault is all mine. The next issue will also probably be delayed as I am taking some vacation. Bear with me, and some day we will get back on schedule.

Ralph Stamerjohn
Multi-Tasker Editor

HINTS AND THINGS

"Hints and Things" is a monthly potpouri of helpful tidbits and rumors. Readers are encouraged to submit items to this column. Any input about any way to make life easier on RSX/IAS is needed. Please beware that items in this column have not been checked for accuracy.

NON-PHYSICAL DEVICE SPOOLING

The following article is from Frank Penner, Searle Research and Development, Box 5110, Chicago, Illinois, 60680.

It is possible with the RSX-11M V3.2 Queue Manager to spool to other than physical device names.

```
INS $LPP/TASK=SAP0
QUE SA0:/SPOOL/FLAG:0/FORM:0/EX
QUE LP0:/ASSIGN:SAQ0
```

The first two commands will create a queue for the non-existent device SAO:. The last command assigns that queue to the physical device queue LPO:. The secret is the /EX switch which is obscurely documented in the V3.2 release notes, section 5.14.2. This device independent queue will enable you to hard code into your programs and command files commands like:

```
PRI SA0:=FILE.EXT
```

When you reconfigure your system, just change your startup command file.

SLAVING THE CONSOLE ON SYSTEM BOOT

The following article is from Ted Bardusch, Radio KING AM 1090, 333 Dexter Avenue North, Seattle, Washington, 98124. Phone (206) 343-3666.

In RSX-11M 3.2, any person with access to the computer and console terminal can boot up the system and have a live privileged terminal. The SAV task can be stopped by a ^C, whereupon the entire protection scheme is void. The obvious solution is to SET /SLAVE=TT0:, but this will not work, since SAV actually resets the U2.SLV bit during wakup.

The following patch to SAVE.MAC will force the console to wake up as a slaved terminal, so that ^C will be ineffectual. If a ^Z is entered, to exit AT., the terminal is dead. If you incorporate this patch, modify your STARTUP.CMD file to include SET /NOSLAVE=TI: at the end (after SET /NOPRIV=TI:).

You will find SAVE.MAC in [12,10] on RLUTIL (RL01 kits). Apply the following SLP file to it:

```
SAVE.MAC;2=SAVE.MAC;1
\
-/RP013/
;
;       TB001   01-JUN-81 SLAVE CO: ON WAKEUP
-/NONSLAVED/,,/; TB001/
%
        BIS     #U2.SLV,U.CW2(R0)       ; SLAVE CO:
/
```

Then assemble it with:

```
>MAC [1,24]SAVE=[11,10]RSXMC/PA:1,[1,1]EXEMC/ML,[12,10]SAVE
```

Then remove the RLUTIL pack, mount MAPSRC, LBR[1,24]SAV/RP=SAVE, then TKB @SAVBLD. Be sure you have assigned TK: and MP: before doing the TKB. These instructions have been tested with no problems arising. If you do have any problems, feel free to contact me.

SYSTEM-WIDE COMMAND FILES

The following article is from I. Holtz, Unilever N.V., Engineering Division, Schiedamsedijk 18, 3134KK Vlaardingen, Netherlands.

We run a large program development RSX11M system and found that several users were "inventing" command files which were of general interest. To avoid unnecessary duplication we modified MCR to allow "system wide" command files. An MCR command, starting with '#' will be expanded into @LB0:[1,5] so that AT. may find the appropriate command file. To install this facility on a multi user system, apply the following correction file to [12,10]MCRDIS.MAC and follow the release notes (pages 12-14) to update an MCR source module.


```
MCRDIS.MAC/AU/-BF=MCRDIS.MAC
\
-2,2
        .IDENT  /02.20A/
-51
;
;       IH01.1          ADD '#' FOR SYSTEM-GLOBAL INDIRECT COMMANDS
%
-/MCR2:/
-/17$:/,,/;IH01.1/
17$:    TST     DISLEN          ;LOOKING AT FIRST COLUMN?
        BNE     19$             ;BR IF NOT
        CMPB    R1,#'#          ;IS IT GLOBAL .CMD
        BNE     19$             ;IF NOT IGNORE
        CMP     R2,#11.         ;MUST BE MORE THAN 11
        BLE     19$             ;ELSE IGNORE
        ADD     R2,R3           ;POINT OVER TOP OF BUFFER
        DEC     R3              ;POINT BUFFER TOP +1
        SUB     #10.,R2         ;THROW 10. CHARS AWAY AT THE END
        MOV     R2,-(SP)        ;SAVE R2 FOR LATER
16$:    MOVB    -10.(R3),-(R3)  ;MAKE A 9 BYTE HOLE IN BUFFER
        SOB     R2,16$          ;MOVE THE REMAINDER 9.BYTES UP
        MOV     #10.,R1         ;INSERT 10.CHARS
        MOV     R1,DISLEN       ;SET OUTPUT LENGTH OK
        MOV     #101$,R2        ;USE R2 TO POINT THE STRING
18$:    MOVB    (R2)+,(R0)+     ;SET STRING INTO COMPACTED BUFFER
        SOB     R1,18$          ;DO THE 10. CHARS
        MOV     R0,R3           ;MAKE SURE R3 AND R0 POINT RIGHT
        MOV     (SP)+,R2        ;RESTORE R2
        BR      6$              ;DO REST OF BUFFER
101$:   .ASCII  /@LB0:[1,5]/    ;GLOBAL STRING
19$:    MOVB    R1,(R0)+        ;NO, STORE CHAR IN BUFFER
/
```

TTDRV BREAKTHROUGH WRITE BLOCKING

The following article is from C.T. Mickelson, Goodyear Aerospace Corporation, 1210 Massillon Road, Akron, Ohio, 44315.

In our word processing applications it has become necessary to find a way to block breakthrough write functions from BRO and other tasks during production of final letter quality manuscript copy. An examination of the status bits defined in UCBDF$ for the U.TSTA words shows that the 40000 bit in U.TSTA and the 2000, 1000, 20, 4, 2, and 1 bits in U.TSTA+4 are not currently defined. If one of these bits could be set by an IO.ATT sub-function, when an IO.WBT function was directed to the attached terminal, the bit could be used to block the breakthrough write from destroying the manuscript being output on the terminal. The enclosed patches to TTATT and TTINI use the 1 bit fo U.TSTA+4 to accomplish this function. This feature is activated by a QIO call with function code IO.ATT!TF.WBT. The feature is cancelled by an IO.DET QIO. The continued use of this bit for this feature can not be guaranteed in RSX11M V4.

```
TTATT.MAC=[11,10]TTATT.MAC;-1/AU/-BF
\
-2,2
        .IDENT  /V02B/
-36
;  CTM01        1-JUN-81
;               BLOCK BREAKTHROUGH WRITE FOR ATTACHED TERMINALS
%
-/PPATT:/,,/;CTM01/
        .IF DF  T$$BTW
        BIT     #TF.WBT,I.FCN(R3) ;BLOCK BREAKTHROUGH WRITES?
        BEQ     45$             ;NO
        BIS     #1,4(R5)        ;YES - SET WBT BLOCK BIT IN U.TSTA+4
45$:
        .ENDC   ;T$$BTW
-/PPDET:/,,/;CTM01/
-/10$:/
        .IF DF  T$$BTW
        BIC     #1,4(R5)        ;DON'T BLOCK WBT ANY MORE
        .ENDC   ;T$$BTW
/

TTINI.MAC=[11,10]TTINI.MAC;-1/AU/-BF
\
-2,2
        .IDENT  /V01.24/
-27
;  CTM01        1-JUN-81
;               BLOCK BREAKTHROUGH WRITE FOR ATTACHED TERMINALS
%
-/QPWLB:/
-/BEQ...ERRPRI/,,/;CTM01/
        BIT     #1,U.TSTA+4(R5) ;TEST FOR BLOCKED WBT
        BNE     ERRPRI
/
```

The following patch to TTICH can be used to eliminate the alternate escape characters (ASCII codes 175 and 176) when a terminal is SET /NOLOWER.

```
TTICH.MAC=[11,10]TTICH.MAC;-1/AU/-BF
\
-2,2
        .IDENT  /V01.46/
-67
;  CTM02        1-JUN-81
;               DELETE 175 AND 176 AS ALTERNATE ESCAPE CHARACTERS
%
-/I2DEF1:/
-/CMPB...R2,#175/,.+2,/;CTM02/
/
```

Apply these updates to the TTDRV modules in UIC [11,10]. Then assemble the new modules, add them to the TTDRV object library and task build a new terminal driver. The new driver can be added by using VMR on your virgin system image.

SOFTWARE PERFORMANCE REPORTS

This section contains SPR's submitted to the Multi-Tasker by users. SPR's should always be sent to DIGITAL. However, if you feel that a report should be published in the Multi-Tasker, you may send a duplicate copy to the editor at the addresses listed on the cover. Publication of an SPR in the Multi-Tasker does not imply endorsement by the SIG. Implementation of suggested fixes must be at the reader's own risk. The SPR's published in this column may be abstracts of the original submission and have not been checked for accuracy.

The following SPR on IAS V3.0 PIP was submitted by Linda Brown (I have misplaced her address). Linda does not know if the problem was corrected in IAS V3.1. Linda also submitted the response she got from Digital.

PIP exits with outstanding I/O when it is given a command:

```
PIP [x,y],[n,m]/LI
```

and the UIC [n,m] does not exists.

The problem is that there is a conflict in event flag usage between PIP and FCS which causes PIP to exit before its terminal output is completed. PIP uses the multi-buffering feature of FCS and, therefore, at times has asynchronous I/O requests pending. FCS uses event flag 32. to synchronize these requests. However, PIP also uses event flag 32. to output error messages. By making PIP's error event flag unique, we will be assured all I/O is complete before PIP exits. To make this change, do the following:

1. Ensure the directories [11,5], [111,5], [11,1] and the files [11,5]PIPBLD.CMD or PURPIP.CMD, [11,5]PIPBLD.ODL, [11,5]PIP.OLB, and [11,5]PIPUTL.OLB exists on your system disk (these files can be copied from your objects distribution media).

2. Edit the file [11,5]PIPBLD.CMD or [11,5]PURPIP.CMD to include the new line:

   ```
   GBLPAT=PIP:.EFEFN:4
   ```

3. Re-taskbuild PIP or PURPIP.

4. Reboot the system, remove the old PIP, install the new PIP, and save your system.

The following SPR on RSX-11M + V1.0 TKB was submitted by Richard Kirkman, ATMOS, Oxford, England. Richard also submitted the answer he got from Digital.

TKB will not allow a user-mode shared library to be linked to a supervisor mode library.

The following patches remove this restriction as long as no overlays are used in the supervisor mode library.

```
        .TITLE  STINP
        .IDENT  /11B/
;
; MODIFICATIONS:
;
;       11A - FIX TO POINT TO BEGINNING OF FILE IF CURRENT
;             FILE IS SAME AS PREVIOUS.
;
;       11B - FIX TO WORK WITH CONCATENATED FILES.
;
        .PSECT
.BLK.=.

.=.BLK.+4
OPEN:

        .PSECT  $$STIN,I,GBL
$STIN=.

.=$STIN+32
        CALL    PAT5
.=$STIN+52
RET1:
.=$STIN+436
        JMP     PAT2
        NOP
        NOP
NOCC:
.=$STIN+530
CC:
.=$STIN+562
        JMP     PAT3
RET2:
.=$STIN+606
        JMP     PAT4
.=$STIN+700
ALCMT:

.=$STIN

        .PSECT  $$PAT1
$$PAT1=.
```



```
PAT1:   MOV     $INPPT,R0
        CLR     R1
        MOV     #1,R2
        CLR     R3
        CALL    .POINT
        RETURN

PAT2:   BIT     #SW$CC,E$LSWT(R0)
        BNE     10$
        JMP     NOCC
10$:    TST     REWND
        BNE     20$
        CALL    PAT1
        MOV     #1,REWND
20$:    JMP     CC

PAT3:   CALL    PAT1
        CALL    ALCMT
        JMP     RET2

PAT4:   CLR     REWND
        JMP     RET1

PAT5:   CLR     REWND
        CLR     OPEN
        RETURN

REWND:  .BLKW   1

.=$$PAT1

        .END


        .TITLE  P2LBR
        .IDENT  /07B/
;
; MODIFICATIONS:
;
;       07A - CHECK FOR SUPERVISOR LIBRARY WHEN VERIFYING LIBRARY
;             DOES NOT INTERESCT WITH OTHER LIBRARIES.
;
;       07B - ALLOW USER MODE SHARED REGION TO LINK TO SUPERVISOR
;             MODE LIBRARY.
;
        .MCALL  CLOSE$,NMBLK$

        .PSECT
.BLK.=.

.=.BLK.+2
LBRNB:  NMBLK$
.=.BLK.+412
        BEQ     63$
.=.BLK.+442
```

```
63$:
.=.BLK.+672
        JMP     PAT2
.=.BLK.+720
RET1:
.=.BLK.+730
        NOP
        NOP
        NOP
        NOP
        NOP
        NOP
.=.BLK.+1074
        CALL    PAT1
.=.BLK.+1422
FNDLF:

.=.BLK.

        .PSECT  $$PAT1
$$PAT1=.

PAT1:   BIT     #LD$SUP,L$DFLG(R5)
        BEQ     10$
        CALL    $VTKMP
        BR      20$
10$:    CALL    $VLBMP
20$:    RETURN

PAT2:   CLOSE$  $INIPT
        CLR     LBRNB+N.FVER
        CALL    FNDLF
        JMP     RET1

.=$$PAT1

        .END
```

Assemble the patch files and update the object modules. The modules to be updated (TKB) must be extracted from the distribution version of the object library (TKB.OLB). Furthermore, the updated module must be replaced into a copy of the library that will accumulate all patches made to TKB.

```
P2LBR.OBJ;2=P2LBR.OBJ;1/CS:77417,P2LBR.POB/CS:32450
STINP.OBJ;2=STINP.OBJ;1/CS:52754,STINP.POB/CS:43751
```

Replace the module and retaskbuild TKB.

RSX/IAS CUSTOMER SERVICES Q&A

Margaret H. Knox

University of Texas
Austin, Texas

This is a brief summary of the questions and answers from the RSX/IAS Customer Services Question and Answer Session at the Miami Symposium. It is not a verbatim transcript. The following people were panelists:

Angela Cossette - Corporate Administration Systems
Steve Doan - Telephone Support
Saundra Dickinson - Software Services
Haywood Gandy - Documentation

Also answering questions were:

Chuck Turley - IAS
Steve Paavola - RSX-11M

1. IAS updates to manuals do not fit, page size is wrong, holes punched in wrong place, etc. Gandy & Turley: Will look at this to make sure it doesn't happen again.

2. TSC will not fill out SPRS. Doan: As of 2 months ago TSC will submit duplicatable SPRS.

3. I have a 3 month old open problem with TSC. Been told that TSC cannot get to developers. Doan: Local software manager should be escalating the problem. Talk to me later so I can get particulars.

4. I need 1600 BPI autopatch and can't get it. Dickinson: Yes you can. Paavola: Should not be having problem for RM03 kit but there is an RK07 kit problem for 1600 BPI.

5. Very tiresome to hand compare patches that turn out to be identical in M and M+ section. Also please note in Dispatch index which items are in an Autopatch kit. Cossette: Looking at number 2 now.

6. RSX-11D Dispatch used to include raw SPRS. Why did they stop? Cossette: Perhaps because 75% said see attachment.

7. KED SPR (A level product), KED thrashes when checkpointed. Six months later a patch to disable part of KED's functionality arrives. It has never been published. Paavola: No consistent policy on publishing

SPR's. I'm trying to get a consistent policy to publish all responses with fixes.

8. No documentation is provided on exactly what is needed to do sysgen, for example, you need unmapped UIC's for a mapped sysgen! TSC doesn't know either. Paavola: Noted.

9. Consistency of TSC people is poor. Some are great, some terrible. Why not provide a questionaire for feedback. Doan: We're trying to stabilize work force and not be all things to all people. And DEC already has too many surveys. Rebuttal: Classify the contacts. Doan: TSC could store that information.

10. TSC gave me three wrong answers for M+ so we've dropped TSC. I also can't get 1600 BPI autopatch (TS11) and field service can't get 1600 BPI diagnostics.

11. I want the following options in autopatch: save files (applause); density question. My Dispatches arrive on time and quality is good.

12. I've tallied the responses I've gotton for my SPRs:

    10 - next release (there is no next release of IAS)
    11 - I sent in patches and got 6 thank yous, 5 no mention
    5 - no answer
    3 - sorry it took so long
    6 - solved problem (3 were trivial)
    6 - unacceptable answers

    I got 6/41 viable response! Dickinson: IAS will get Dispatch but no new releases. Your concern for not getting you value is noted.

13. Oct. '79 Dispatch (IAS) listed undocumented messages. But later manuals still do not include them. Turley: Fell in a crack or was a joint product.

14. I got my SPR response in 1 day but local office had sat on it for 4 months. Doan: Cannot deal with tapes or printouts.

15. We're a multiple CPU shop, salesmen will sell anything but there are 4 field service product lines. I want one FS representative.

16. Can't get IAS answers locally. Got a name but the name keeps changing and I'm never told ahead of time.

17. Give a copy of all SPR responses to TSC please! Doan: I agree. TSC should now be getting them.

18. FORTRAN and Datatrieve violate patching algorithms. Doan: A lot of interest in this, CSSE looking at it.

19. TSC quality control is poor. Doan: Call back or call me.

20. I have an information overload on raw SPRs. How many would there be? Cossette, Dickinson: We'll check.

Angela then summarized: I've brought blank SPR forms with me; you get a blank form with each response; quality has improved and will continue to improve; you will now know if your SPR will not be published.

Haywood then requested: Please sign up for the new Documentation Directory.

Steve Doan invited everyone for the TSC session.

I took a poll (approximately 250 people) of which was the best customer service, and which service is the worst. One vote for each category per person. Overwhelmingly, field service was best and sales was the worst. Choices were field service, documentation, TSC, software services, and sales.

UND, A PROGRAM TO UNDELETE FILES

Richard Kirkman

Department of Atmospheric Physics
Clarendon Laboratory
Oxford, Great Britain

The following is a listing of UNDelete, a program which attempts to recover Files-11 files from a disk on which they have been accidentally deleted to another disk. The files are created in your current UIC on the output disk. Any file which is recovered should be checked for validity, since all the program does is to find a suitable index file entry and copy all the blocks associated with that file header.

The program is in terrible state. The first version was made one night when at 7 p.m. I was told someone just erased some 200 output files, the results of days of processing using tapes and disk. This version is only minimally cleaned up (it actually has a command line, the original was hardwired for the owning UIC and input and output disks). However it may be of interest to someone else in DECUS.

```
        .TITLE  UNDLT
        .IDENT  /X01.01/
;
; Author:       Richard JD Kirkman
; Date :        10th August-80
; Name:         UNDelete
; Function:     To attempt to recover a recently deleted file.
;
; Algorithm:    Accepts uic of owner, input and output disks (must be different)
;               Scans indexfile of input disk for deleted files, and uses
;               IO.RLB from priv task to read all blocks of a file which matches
;               according to the map area of the file.
;
; Note: This program will only succeed in recovering a file,if the file header
; has not been reused.  It will not check if the data blocks have been reused
; but will simply create a new file containing all the listed blocks with the
; listed attributes.
;
        .MCALL  GCML$,GCMLB$,CSI$,CSI$1,CSI$2,CSI$ND
        .MCALL  FHDOF$
        .MCALL  NMBLK$,FDOP$A,FDRC$A,FDBK$A,OPEN$R,READ$
        .MCALL  EXIT$S,QIOW$S,ALUN$S,QIOW$,DIR$,GLUN$S
        .MCALL  OPEN$W,FINIT$,FDBDF$,FSRSZ$,CLOSE$,WRITE$,WAIT$
        FHDOF$  DEF$L
;
        CSI$
CSIBLK: .BLKB   C.SIZE
GCLBLK: GCMLB$  4,UND,,1
OWNER:  .WORD   0               ;UIC OF OWNER
STBK:   .BLKW   8.
BUF:    .BLKB   80.
;
HDR:    .BLKW   256.
DATA:   .BLKW   256.
;
;
        .ENABL  LC
ERR1:   .ASCII  /UNDelete - Devices must be distinct/
ERR1L=.-ERR1
ERR2:   .ASCII  /UNDelete - syntax "UND>DUO:=INO:[101,201]"/
ERR2L=.-ERR2
TXTLIN: .ASCII  /UNDELETE [x01.01] Recovery of /
T1:     .ASCII  /                  to /
T2:     .ASCII  /           /
TXTL=.-TXTLIN
        .EVEN
        .DSABL  LC
QIO1:   QIOW$   IO.WLB,5,5,,,,<ERR1,ERR1L,40>
QIO2:   QIOW$   IO.WLB,5,5,,,,<ERR2,ERR2L,40>
QIO3:   QIOW$   IO.WLB,5,5,,,,<TXTLIN,TXTL,40>
;
FDB:    FDBDF$
        FDRC$A  FD.RWM
        FDBK$A  DATA,1000
        FDOP$A  2,,DFNB,FO.WRT
DFNB:   NMBLK$  FILE,DAT,0
INDX:   .WORD   0,0,5,INXU,10.,INXF
INXU:   .ASCII  /[0,0]/
INXF:   .ASCII  /INDEXF.SYS/
        .EVEN
INXFDB: FDBDF$
```



```
        FDRC$A  FD.RWM
        FDBK$A  HDR,1000
        FDOP$A  3,INDX,,FO.RD
        FSRSZ$  1       ;1 FOR GCML
;
; PROGRAM ENTRY POINT
;
;
START:  FINIT$
        ALUN$S  #1,#"TI,#0
        GCML$   #GCLBLK                 ;GET A COMMAND LINE
        BCC     10$
        EXIT$S                          ;ASSUME EOF
10$:    CSI$1   #CSIBLK,GCLBLK+G.CMLD+2,GCLBLK+G.CMLD
        BCS     SYNERR
        CSI$2   #CSIBLK,OUTPUT          ;GET OUT DEV
        BCS     SYNERR
        BITB    #<CS.NMF!CS.DIF!CS.WLD!CS.MOR>,C.STAT(R0)
        BNE     SYNERR
        BITB    #CS.DVF,C.STAT(R0)
        BEQ     SYNERR
        CALL    DEVICE
        ALUN$S  #2,R3,R4
;
        CSI$2   #CSIBLK,INPUT
        BCS     SYNERR
        BITB    #<CS.NMF!CS.WLD!CS.MOR>,C.STAT(R0)
        BNE     SYNERR
        BITB    #<CS.DVF>,C.STAT(R0)
        BEQ     SYNERR
        MOV     #CSIBLK+C.DIRD,R2
        MOV     #OWNER,R3
        CALL    .ASCPP
;
        CALL    DEVICE
        ALUN$S  #3,R3,R4
        ALUN$S  #4,R3,R4
        CALL    DEVCHK
        BCS     DEVERR
        CALL    INDEX           ;HANDLE THSI INDEXFILE
        BR      START
SYNERR: DIR$    #QIO2
        BR      START
DEVERR: DIR$    #QIO1
        BR      START
;
; DEVICE CHECK, RETURNS C IF BOTH DEVICES ON LUN2 3 ARE SAME
;
DEVCHK: MOV     #HDR,R0
        GLUN$S  #3,R0           ;GET INFP ON INPUT
        MOV     (R0),R1         ;SAVE INFO
        MOVB    2(R0),R5
        MOV     #T1,R2
        MOV     R0,R4
        MOVB    (R4)+,(R2)+
        MOVB    (R4)+,(R2)+
        MOVB    (R4)+,R4
        ADD     #'0,R4
        MOVB    R4,(R2)+
        MOVB    #':,(R2)+
```

```
        MOV     OWNER,R3
        CLR     R4
        CALL    .PPASC
        GLUN$S  #2,R0
        CMP     R1,(R0)
        BNE     10$                 ;DEVICES DIFFER = OK
        CMPB    R5,2(R0)            ;UNITS
        BNE     10$
        SEC
        RTS     PC
10$:    MOV     #T2,R4
        MOVB    (R0)+,(R4)+
        MOVB    (R0)+,(R4)+
        MOVB    (R0)+,R0
        ADD     #'0,R0
        MOVB    R0,(R4)+
        MOVB    #':,(R4)+
        DIR$    #QIO3
        CLC
        RTS     PC
;
;
;
; DEVICE - ROUTINE TAKES CSIBLK & RETURN DEVICE NAME IN R3, UNIT IN R4
; FOR ALUN SERVICE
;
DEVICE: MOV     #CSIBLK+C.DEVD,R0       ;POINT TO DESC
        MOV     (R0)+,R1                        ;GET LENGTH
        MOV     (R0),R0                 ;AND POIJTNER
        MOVB    (R0)+,R3                ;SET 1ST CHAR
        SWAB    R3
        CLRB    R3
        BISB    (R0)+,R3                ;SET OTHER CHAR
        SWAB    R3                      ;GET ORDER CORRECT
        CLR     R4                      ;UNIT DEF = 0
        SUB     #2,R1                   ;USED 2 OF LENGTH
        BEQ     10$                     ; IF DONE STOP
1$:     CMPB    (R0),#':                ; OR IF ":"
        BEQ     10$                     ; THEN ALSO DONE
        MOVB    (R0)+,R2                ; ELSE GET CHAR
        SUB     #'0,R2                  ; AS INTEGER
        ASL     R4
        ASL     R4
        ASL     R4                      ; MULT OLD R4 BY 8.
        ADD     R2,R4                   ;AND ADD IN VALUE
        DEC     R1                      ;ADJUST COUNT
        BGT     1$                      ;MORE TO DO
10$:    RTS     PC                      ;R3,R4 SETUP.. R0,R1,R2 DESTROYED
;
; ROUTINE TO HANDLE INDEXFILES
; LUN 2,LUN3,LUN4 ASSIGNED AS REQUIRED!
;
INDEX:
        MOV     #STBK,INXFDB+F.STBK
        OPEN$R  #INXFDB
        BCC     10$
        HALT
10$:
        MOV     STBK+4,INXFDB+F.HIBK
        MOV     STBK+4,INXFDB+F.EFBK
        MOV     STBK+6,INXFDB+F.HIBK+2
```



```
        MOV     STBK+6,INXFDB+F EFBK+2
        READ$   #INXFDB ;BOOT
        WAIT$   R0
        READ$   #INXFDB
        WAIT$   R0
        MOV     HDR,R5
20$:    READ$   #INXFDB
        WAIT$   R0
        SOB     R5,20$              ;SKIP BITMAP
30$:    READ$   #INXFDB
        BCS     50$
        WAIT$   R0
        BCS     50$
        CMP     HDR,#27027          ;NEVER USED
        BNE     40$
        TST     HDR+2
        BNE     40$                 ;IN USE STILL
        CALL    CHECK
        BCS     40$
        CALL    COPY
40$:    BR      30$
50$:    CLOSE$  #INXFDB
        RETURN                      ;FOR NEW COMMAND
;
;
; THIS IS THE MAIN ROUTINE TO COPY A FILE, ENTERED AFTER CHECKING HEADER
; IS DELETED AND ACCEPTABLE
;
;
COPY:   ;ENTERED HERE WITH HDR (256 WORDS) FILE HEADER FOR FILE TO BE COPIED
        ;LUN 2 IS ASSIGNED TO OUTPUT DEVICE
        ;LUN 3 IS OPEN IN INDEXFILE
        ;LUN 4 IS FOR BLOCK READS OF INPUT DISK
; FUNCTIONS TO PERFORM
;A)     OPEN OUTPUT FILE OF RELEVANT NAME ON LUN2
;B)     FOR ALL BLOCKS IN HEADER OF FILE, COPY BLOCK TO DATA BUFFER
;       AND THEN USE WRITE$ TO PUT IN OUTPUT FILE
;C)     COPY ATTRIBUTES BACK TO FDB &CLOSE
;D)     RETURN - DONE
;
        MOV     #HDR,R1             ;GET INFO ADDRESS
        MOVB    H.IDOF(R1),R2       ;GET OFFSET TO ID AREA
        MOVB    H.MPOF(R1),R3       ;AND TO MAP AREA
        ASL     R2
        ASL     R3
        ADD     R1,R2
        ADD     R1,R3
        MOV     #DFNB+N.FNAM,R4     ;GET ADDRESS TO STUFF NAME INFO
        MOV     #5,R5               ;5 WORDS ( FILENAME,TYP;EXT)
10$:    MOV     (R2)+,(R4)+         ;
        SOB     R5,10$              ;
        OPEN$W  #FDB                ;OPEN FILE FOR WRITING
        BCC     20$                 ;
        HALT
20$:    CALL    COPYBK
        MOV     #HDR,R1
        MOV     #FDB,R0             ;
        ADD     #H.UFAT,R1          ;POINT TO USER ATTRIB FOR FILE
        MOV     #7,R5               ;7 WORDS
30$:    MOV     (R1)+,(R0)+
        SOB     R5,30$
```

```
        CLOSE$  #FDB            ;CLOSE WITH INFO RESTORED
        RTS     PC
;
; ROUTINE TO COPY THE FILE BLOCKS POINTED TO BY THE MAP AREA
;
;
COPYBK: ; FILE NOW OPEN ON LUN 2
        ;R3 HAS ADDRESS OF MAP AREA
        CLR     R5
        BISB    M.USE(R3),R5
        ADD     #M.RTRV,R3      ;IS NOW POINTER TO FIRST GROUP
10$:    TST     R5              ;IF NILL OR <0 THEN DONE
        BLE     50$             ;NOW DONE
        CLR     R1
        CLR     R4
        BISB    (R3)+,R4
        BISB    (R3)+,R1
        MOV     (R3)+,R2
20$:    QIOW$S  #IO.RLB,#4,#4,,,,<#DATA,#1000,,R4,R2>
        WRITE$  #FDB
        BCC     30$
        HALT
30$:    WAIT$   R0
        BCC     40$
        HALT
40$:
        ADD     #1,R2   ;STEP ON BLOCK #
        ADCB    R4              ;IN DOUBLE PREC
        DEC     R1              ;DONE WHEN NEG
        BPL     20$             ;AT LEAST 1 MORE TO GO
        SUB     #2,R5           ;
        BR      10$
50$:    RTS     PC
;
; ROUTINE TO CHECK IF FILE IS TO BE COPIED TO OUTPUT MEDIA
;
; ENTERED WITH BLOCK "HDR" CONTINING FILE'S HEADER
;
; RESULT        C SET   - DO NOT COPY
;               C CLEAR - COPY TO OTHER MEDIA
;
;
CHECK:  CMP     HDR+H.FOWN,OWNER        ;CORRECT USER??
        BNE     10$
; INSERT OTHER CHECKS OR MAKE BELOW INTO RPR, SETTING C IF ANSWER N
;
;
; NOW DISPLAY NAME OF FILE BEING COPIED
;
        MOV     #BUF,R0
        MOV     #HDR+S.HDHD,R5
        MOV     (R5)+,R1
        CALL    $C5TA
        MOV     (R5)+,R1
        CALL    $C5TA
        MOV     (R5)+,R1
        CALL    $C5TA
        MOVB    #'.,(R0)+
        MOV     (R5)+,R1
        CALL    $C5TA
        MOVB    #';,(R0)+
```



```
        MOV     (R5)+,R1
        MOV     R5,R2
        CALL    $CBOMG
        MOVB    #40,(0)+
        MOV     #BUF,R1
        SUB     R1,R0
        QIOW$S  #IO.WVB,#1,#1,,,,<R1,R0,#40>
        CLC
        RTS     PC
10$:    SEC
        RTS     PC
;
;
        .END    START
```

Task build with following:-

```
UND/PR:0/CP=UND
/
RESSUP=[3,54] FCSFSL/SV
STACK=64
TASK=...UND
PRI=100
UIC= [377,377]
/
```

MIAMI DECUS SYMPOSIUM TRIP REPORTS

Ralph Stamerjohn

Multi-Tasker Editor

Most of the attendees at the Spring 1981 Decus Symposium in Miami Beach write trip reports when they return to their organizations. At the end of the Symposium, I invited everyone to copy the Multi-Tasker in their trip reports and promised I would publish whatever I received. Also, I invited people to submit their thoughts on the value of Decus and the symposium. This way, all RSX/SIG members would get a feeling for the Symposium.

The following are abstracts from the three submissions I received. I have editted out items which pertain only to the author's site. I think the reports give an excellent summary of what a Decus Symposium is all about.

Dale A. DeMott

Caterpillar Tractor Company
East Peoria, Illinois

During the period 17-21 May, 1981, I attended the Spring Decus Symposium at Miami Beach. During this period I was present at a total of more than twenty different sessions covering a wide variety of topics ranging from RSX-11M technical sessions to sessions of more general interest such as RSX-11M/M+ product reviews, local area networks, alternative operating systems for PDP-11's, DEC field service and telephone/SPR support, and system optimization.

The symposium provided one of the greatest concentrations of DEC system expertise that I have experienced. This has led me to conclude that you need to carefully limit your involvement at the symposium to your specific areas of need or endeavor. I quickly found myself becoming saturated by trying to take in and absorb too much. If other people need exposure to certain informational areas, then they should attend the symposium themselves to obtain that information.

The specific value and benefits of the symposium, I believe, would depend upon an individual's job orientation. For the application oriented person (i.e. anyone who is a user of DEC systems but is not directly responsible for maintaining the DEC supplied portions(s) of that system) then occasional attendance at a Decus Symposium would be beneficial for the ideas and thought processes that exposure to other users and new products can generate. It is unlikely, however, that the symposium would provide the specific detailed information that would be required to implement any of those ideas.

On the other hand, for the individual engaged in technical support of DEC products whose job requires detailed knowledge of the system executive, hardware interfacing, etc., the benefits of the symposium are not only invaluable, but

attendance at every symposia should be required. I make this statement for many reasons.

The symposium provides the best single method that I have seen of direct contact with Digital. The menu, product panels, Q&A sessions, etc. all provide formal communications which I firmly believe do effect the direction of DEC product development and of which we should be taking advantage. Perhaps more important is the informal contact provided with the developers of the DEC products that we use. The influence coming from these open discussions is immeasurable, but my own experience dictates must be present. I know, for instance, that the course of my own software development has often been strongly influenced because of an informal comment or suggestion coming from within our own user community.

The symposium also draws together the highest level of expertise available in the world with respect to the use and maintenance of DEC software and systems. If questions can be answered, they can be answered there. Continuing symposia attendance promotes the development of personal relationships which can be drawn upon throughout the year to broaden an available technical base.

The symposium has made me aware of the benefits of participating in a Decus local user's group. This could not be done without a corporate commitment to the time and resources required but the returns would certainly make it worthy. Symposia tapes would be received free-of-charge and on a much more timely basis. We have historically drawn heavily from software on the symposia tapes and the LUG could provide the facility for organizing, distributing, and assesing the value and applicability of these programs. Finally, the LUG can provide the vehicle for drawing together the substantial local PDP-11/RSX community, thereby permitting the free interchange of valuable information and avoiding needless redundancy of effort.

While the value of many aspects of symposia attendance is mostly intuitive, the value of other aspects can be quantitized and, to some degree, measured. It is not difficult to apply simple financial analysis to the cost versus returns of Decus attendance to determine the knowledge, software, etc. obtained will generate sufficient savings within months to more than cover the cost of attendance.

In summary, I have found myself enlightened on many, many subjects. I liken this to the development of electronics technology whose growth will not diminish in the foreseeable future. I am convinced, given the technical orientation of these symposia which is so specific to the products and services that we use, that I and others of similar orientation could return indefinitely to symposia and never leave without being able to remote more than was expended in having attended.

Julia Hodson

EG&G Special Projects
Las Vegas, Nevada

As a 'first-timer' at Decus, I am replying to your request for first impressions. Overall, I found the sessions interesting, well-planned, and informative. There were holes in each day that allowed me time to enjoy the

exhibit area and talk to other users.

The few complaints I have may be caused by misconceptions. I thought I might be able to copy some useful things to tape so I brought one along. This turned out to be wasted. Also, I found my varied interests made the first day very hectic, while my non-use of such things as PDS, RMS, and similar packages made Wednesday a very light day.

The special session I attended on Sunday [ED: New User's Orientation] was superb. It gave me enough information to work from and a source to refer to for future help.

The Q&A and Magic sessions were especially interesting. My main question on the Q&A session is "Why are so many users so intent on ways to bastardize supplied DEC utilities instead of ways to utilize the same packages?" So many of the questions started with "If I could have the source for ... I could make it do what I want it to do!"

The RSX papers were interesting. We are about to convert a system from an RSX PDP-11/70 to a VAX/VMS 11/780. The experience of the man who spoke on that topic was welcome news.

I would like to see continued support for sessions such as Magic and Q&A and more guidance for new attendees as to "What are working groups" and "How do I know what working groups I may be interested in." Finally, the IAS friends I have were sad to hear of IAS'S terminal status. Perhaps an IAS support working group could be added to the present list [ED: at the end of the symposia, such a group was formed].

J.L. Hamilton

E-Systems Inc.
Greenville, Texas

From 17 May 1981 through 22 May 1981, I attended the 1981 Digital Equipment Computer Users Society (DECUS) Spring Symposium held in Miami Beach. Approximately 4000 attendees were present. For this symposium, there were twelve concurrent sessions enabling a wide range of subjects to be sampled. The reason for attending was to increase my knowledge of the operating system (RSX-11M) used by the electronic techniques PDP-11/45 minicomputer.

Two symposia are sponsored by Decus each year at which users of Digital Equipment Corporation (DEC) computers and DEC interact on technical issues of mutual interest. DEC supplies travel funds and time for developers, engineers, service personnel, and managers to attend these symposia. These DEC representatives are available to talk freely with attendees on a one-on-one basis.

The Decus symposium is really a collection of all the Special Interest Groups (SIG) that interact with DEC. These groups represent people with interests in RSX-11M as well as other fields (structured languages, VAX, site management, laboratory applications, engineering graphics, and more). The DEC hardware and software specialists are available for discussions with individuals in addition

to their scheduled presentations of topics of interest. Membership in a SIG as well as attendance to the symposium is limited to Decus members [ED: Decus membership is free]. Also, Decus members may belong to Local Users Groups (LUG). I am currently on the steering comittee of the North texas Local Users Group (NTLUG). Local meetings every other month provide for local interests and a possible forum for a discussion of common problems and interests. The last meeting of NTLUG was held at the E-Systems Greenville Division on May 21, 1981 and was very successful in presenting the E-Systems PDP-11/55 as a modern software development system. Many favorable comments were made about the quality and quantity of the software available. Through NTLUG, free software is available that has been submitted by the general community at each symposium. The tape for this symposium will be available in approximately one month and will consist of 28 megabytes of source code.

One of the main features of each symposium is the exhibit hall where DEC exhibits new equipment and features. On display for user interaction were 3 VAX/780, 2 VAX/750, a PDP-11/44, a DECsystem-20 mainframe, plus a sampling of several types of terminals - including the new DEC color graphics units. All computers were hooked through DEC's network (DECNET) to one another and into the Digital Engineering Network. All terminals were available for use by attendees and the relative merits of each system and terminal were easily ascertained. Displays featuring DEC software, hardware, and educational services were also present as well as laboratory and word processing equipment.

The session I attended that were in my SIG (RSX-11M) were:

- RSX/IAS Roadmap
- RSX/IAS SIG Opening Session
- RSX Product Panel
- RSX/IAS SPR's Question and Answers
- My Favorite RSX/IAS SIG Tape Program
- RSX-11M Magic Session
- Field Service Response to San Diego Menu Items
- RSX Queue Manager and Despooler
- RSX/IAS Working Group Session
- RSX/IAS Menu Session
- RSX Word Processing Product Overview
- RSX System Tuning Workshop
- RSX-11M Questions and Answers
- RSX Papers
- RSX/IAS SIG Closing Session

During the RSX Working Group Session there was a discussion of the enhancements made to the RSX-11M operating system accounting system developed by Jim Downward of KMS Fusion. The report programs developed for this system by me were presented and favorably received. The system performance measurement and accounting development working group steering committee decided on further work to be attempted by KMS Fusion and E-Systems.

This symposium also initiated a Software Clinic where attendees could talk with many different "doctors" about particularly stubborn hardware and software problems. This was well received and will probably remain a feature of future symposia.

Other meetings I attended on areas other than my special interest field were:

- Site Management SIG Business Meeting
- Files-11 Tutorial
- System and Site Management Panel
- PDP-11 Fortran IV Plus Workshop
- Fortran Execution Profiles
- VAX/VMS Real-Time Applications Panel
- VAX SIG System Improvement Request
- SPM-11M Software Performance Monitor

Among the sessions that time and convenience prevented me from attending were sessions on the VAX and VAX operating system and the following others that would have been informative:

- Office Systems of the Future and How to Get There
- Current DECNET/Network Applications
- Programming the IEEE-488 BUS on VMS and RSX-11M
- TEDI - A New Text Editor
- Custom Tailoring EDT V2.0
- On the Fragmentation of Disks
- New Site Preparation

The current status of DEC products and future plans were very educational and should help in future decisions. There were many other attributes of this symposium that are of benefit to E-Systems. Included in these are:

1. A large amount of system tuning ideas were obtained in the System Performance Workshop and Pool Clinic. These ideas should help in the increased throughput in the area of program development.

2. It was confirmed that only the next version of the operating system will be supported by our machine. Further versions cannot be used by our machine without the addition of larger disk storage space. New versions appear on the average of every 18 months. By not updating to the new version, DEC will no longer provide software support and compatability with other machines will be lost.

3. I found out an undocumented bug in one of the utilities that is used extensively on our machine and the appropriate action was taken.

4. I found out from a software services representative from DEC that a current patch not yet applied to our system is wrong and not to apply it.

5. A method of increasing the throughput of task building was revealed that will be implemented on our system.

6. A preview of the new industry standard Fortran was shown. This will be the ANSI Fortran-77 and should be acquired.

7. DEC stated flatly that they are not going to produce an interactive Fortran debugger for our operating system. This annoucement was greeted with considerable demonstration by approximately 200 angry attendees.

   [ED: many other items in the list were removed because they were

specific to the author's site]

In conclusion, I feel that my participation in the Spring Decus Symposium was both beneficial to me and E-Systems as well as being prestigious to E-Systems by placing us in the forefront of development work being done with DEC equipment. Potential savings in development time and software acquistion more than make up for the minimal cost of attending. I recommend that we send at least one person to both the Spring and Fall Symposium each year.

RSX-11 QUEUE MANAGER AND DESPOOLER

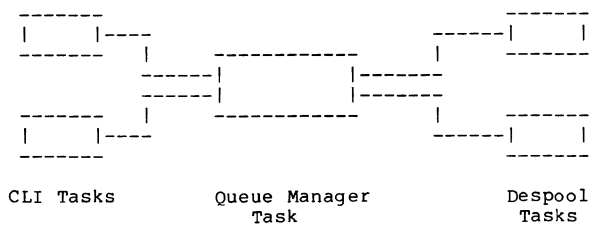
Presented:
Spring DECUS
Miami Beach
19 May, 1981

- RSX-11M V3.2 and RSX11M-PLUS V1.Ø Queue Manager
- Information can be found in:
  - The MULTI-TASKER, March 1981
  - RSX-11 Utilities Manual, Chps 6,7
  - RSX-11M/M-PLUS Batch and Queue Operations Manual
- Expectations
  - Overview of Current Queue Systems
  - System Manager Viewpoint
  - Not a User-Written Despooler Tutorial

QUEUE SYSTEMS

- Definition - Set of tasks that synchronize and control access to a serial, shared resource
- Basic Operation - Take in user-specified Jobs, store them in ordered queues, and release them sequentially to the most appropriate processing device
- Types of Queue Systems
  - Original PRT...
    - FCS Interface
    - No Options
    - No Queue Features
    - RSX-11M only

- RSX-11M/M-PLUS Queue Manager
  - Common Sources
  - Not Available on Unmapped systems
  - Requires following EXEC support:
    - Stop Bit Support
    - Parent/Offspring Support
    - Exit Status
    - AST Support
    - Send/Receive Data Directives
  - Components of the System
    - Despool Task
    - Queue Manager Task
    - CLI Interface



DESPOOLER TASK

- Processes "JOBS" given to it by the Queue Manager

- Components
  - Hardware Device (Symbiont)
  - Despooler Task (ddPn)

- Types of Despoolers
  - Print Processors
  - Batch Processors
  - Application Processors

QUEUE MANAGER TASK (QMG)

- Controls access to shareable serial resources
  - Prevents multiple user interference
  - Allows issuing task to continue before Job completes

- Basic Operation - Accepts a Job from a CLI interface, stores it within ordered queues, and releases it to a Despooler at an appropriate time

- Stores Queues and Despooler information in Disk File:
  - SYØ:[1,7]QUEUE.SYS RSX-11M
  - LBØ:[1,7]QUEUE.SYS RSX11M-PLUS

- Supports up to:
  - 16 Queues (includes default queue PRINT)
  - 15 Processors (Despoolers)
  - 16 Batch Queues (M-PLUS only)
    (includes default queue BATCH)

- Queues
  - Types
    - Active
    - Held
    - Time-Blocked
  - Ordered by:
    - Priority
    - Length of time in queue if same priority
  - Naming Conventions
    - Device Specific Queues - must have one named ddQn for every spooled device ddn:
    - General Queues - queue with any name that has no specific associated processor
      - Can be assigned to any processor
      - BATCH and PRINT are system defaults
      - M-PLUS allow specific creation of these; 11M does not

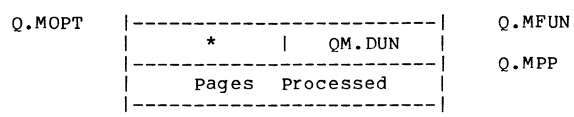
- Assignment Changes
  - Any queue can be assigned to any processor
  - A queue can be assigned to multiple processors
  - Multiple queues can be assigned to one processor

OUTPUT PROCESSOR INTERFACE

- Uses
  - Send/Receive Data Directives
  - Exit With Status
  - Receive Data AST
- QMG stays stopped until a packet arrives, then unstops, and processes
- QMG also unstops occassionally to service time based requests
- QMG communicates with processors to:
  - Start Processor
  - Cause Processor to Exit
  - Process a JOB
  - Stop an Active Processor
  - Continue a Processor

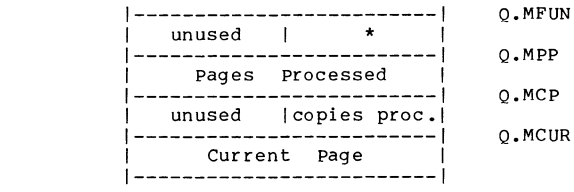
- Processor (Despooler Task) communicates to QMG to acknowledge certain actions via packets:

DONE



* QM.FIL - File Done
QM.JOB - JOB Done

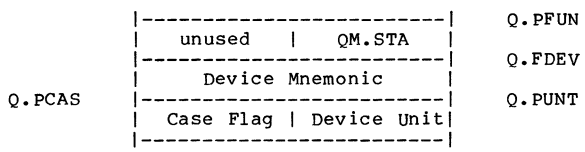
PAUSE



* QM.SPA - Solicited Pause
QM.UPA - Unsolicited Pause

o Processor STARTUP - Initialize the processor

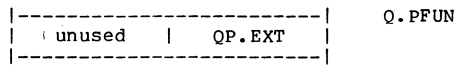
  o QMG attaches device to processor
  o QMG connects to processor
  o QMG request the processor
  o Line printer processor assigns LUN to LPn:
  o Processor stops itself and waits for data packets
  o Application processors ignore the device checks



QMG -> PRO : STARTUP

o Processor Exit - terminates the specified processor

  o QMG unstops processor, sends packet
  o Processor returns exit status
  o QMG detaches device (if not application processor)



QMG -> PRO : EXIT
PRO -> QMG : exit status

o Processing a Job - series of packet communications causing a Job to be defined and each file within it to be processed

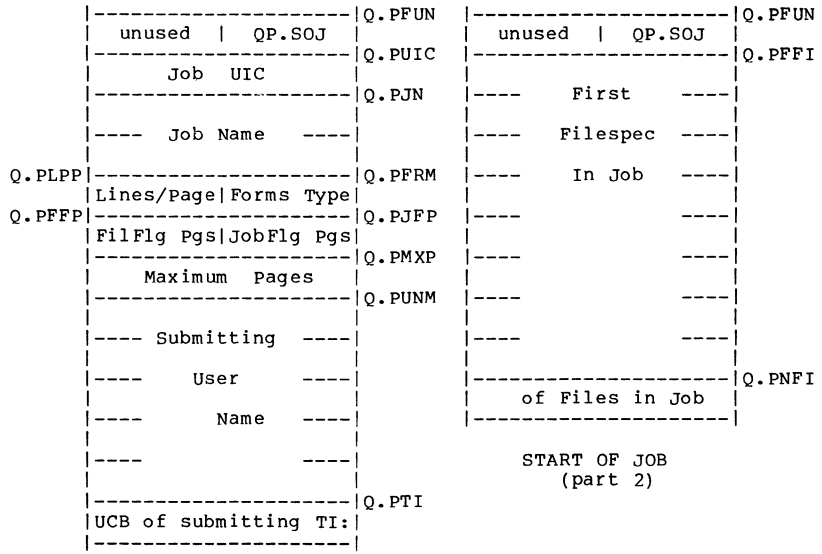
  o Packets involved:

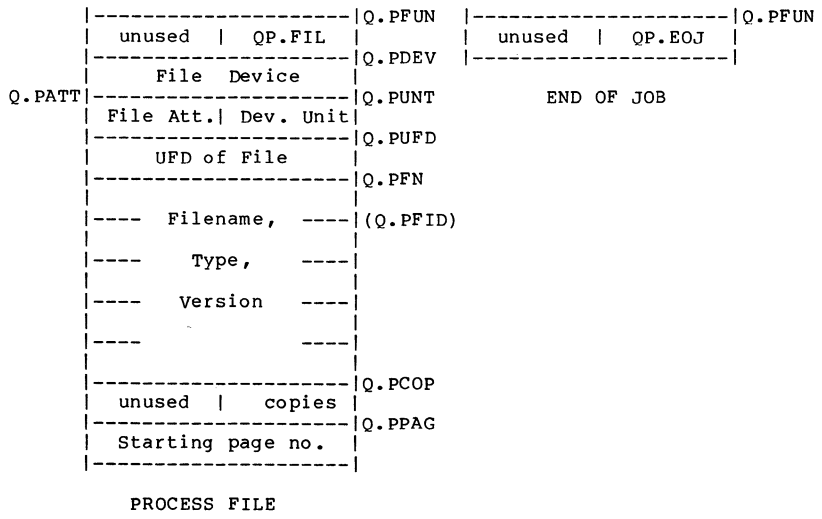
    o START OF JOB - 2 sequentially sent packets indicating start of processing for a series of files

    o PROCESS FILE - describes single file to be processed next

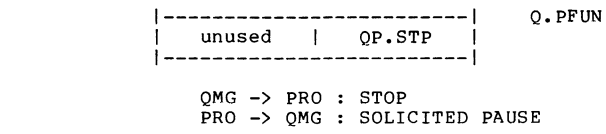
    o END OF JOB - indicates all files and the Job are completed; also used to delete an active job if issued before the last file is finished

```
    QMG -> PRO : START OF JOB
    QMG -> PRO : START OF JOB (part 2)
|-> QMG -> PRO : PROCESS FILE
|-< PRO -> QMG : DONE (file)
    QMG -> PRO : END OF JOB
    PRO -> QMG : DONE (job)
```





o STOP an Active Processor - tells processor to halt and await further instructions

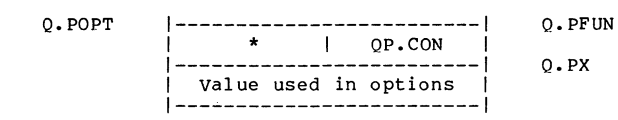


QMG -> PRO : STOP
PRO -> QMG : SOLICITED PAUSE

o Sequence for deleting an active Job

QMG -> PRO : STOP
PRO -> QMG : SOLICITED PAUSE
QMG -> PRO : END OF JOB
PRO -> QMG : DONE

o CONTINUE a processor - restart a processor that previously was stopped



* QP.CUR - at current page
  QP.AT - at page X
  QP.FWD - forward X pages
  QP.BAK - back X pages
  QP.ALN - align to top of form

QMG -> PRO : CONTINUE

CLI INTERFACES

- Definition - a system task that communicates with QMG to specify Job parameters and queue system control commands

- RSX-11M
  - QMGPRT (FCS Interface)
    - Installs as PRT...
    - Serves as interface for
      .PRINT
      PRINT$
      Utilities with /SP
    - Doesn't accept parameters
    - Compatible with old spooler
  - QMGCLI
    - Installed as:
      ...PRI for specifying Jobs
      ...QUE for queue display and manipulation

- RSX11M-PLUS
  - QMGPRT (FCS Interface)
  - Assorted DCL commands
  - QMGCLI (MCR Interface)
    - only installed as ...QUE

BRINGING UP QMG

- Install:
  - QMG
  - LPP as LPPx (one per printer)
  - BPR as BAPx (M-PLUS only)
  - QMGPRT
  - QMGCLI (both: ...QUE, 11M: ...PRI)
- Start the Queue Manager
- Initialize the Queues (M-PLUS)
- Initialize Processors
- Assign Queues to Processors

- RSX-11M

```
>INS $QMG
>INS $LPP/TASK=LPPØ/SLV=YES
>INS $QMGPRT
>INS $QMGCLI/TASK=...QUE
>INS $QMGCLI/TASK=...PRI/CKP=NO
>QUE /START:QMG
>QUE LPØ:/SPOOL/FORM:Ø/FLAG:1
>QUE LPØ:/ASSIGN:PRINT
```

- RSX11M-PLUS

```
>INS $QMG
>INS/TASK:LPPØ/SLAVE $LPP
>INS/TASK:PRT... $QMGPRT
>START/QUEUE/MANAGER
>INIT/QUEUE LPQØ
>INIT/PRINTER LPPØ/FORM:Ø/FLAG:1
>ASSIGN/QUEUE PRINT LPPØ
>INS/TASK:BAPØ $BPR
>INIT/BATCH_PROCESSOR BAPØ
>ASSIGN/QUEUE BATCH BAPØ
```

OTHER QUEUE CONTROL COMMANDS

QMGCLI	DCL
QUE /STOP	STOP /QUEUE /PROCESSOR
QUE /START	START /QUEUE /PROCESSOR
QUE /DEASSIGN	DEASSIGN /QUEUE
QUE /HOLD	HOLD /QUEUE
QUE /REL	RELEASE /QUEUE
QUE /DEL	DELETE /QUEUE[/ERASE] /PROCESSOR
QUE /MOD	SET QUEUE
QUE /LI	SHOW QUEUE