alpha micro SOFTWARE NOTES

V4.5(2)
V4.5A(1)

September 1981
Volume II, Number 6

Contents of this Issue

ALPHA MICROSYSTEMS
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SOFTWARE NOTES - SEPTEMBER 1981

INTRODUCTION

This is the Alpha Micro Software Notes, a publication designed to give technical software information to our OEM/dealer network. Please address all inquiries or suggestions concerning this newsletter to:

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Irvine, CA 92713

NOTE: Because no software patches were issued by the Advanced Products Development Group during the month of July, we did not produce an August issue of the Software Notes.

SOFTWARE HINTS

AlphaBASIC File Locking Programming Hint

One of our dealers contributed the following programming hint, which is most useful for those of you whose AlphaBASIC programs use file locking:

> If your programs use FLOCK or XLOCK to lock file records, you probably know that these programs use up system queue blocks. Occasionally other programs can snap up all available queue blocks (e.g., PRINT/WAIT) just as XLOCK or FLOCK are about to process your program's request-- this can cause the system to crash because no more queue blocks are available. If this has happened to you, you may want to check to make sure that an arbitrary number of queue blocks are free before executing your XLOCK or FLOCK call. To do so, include a test before calling XLOCK or FLOCK that checks memory location 144. (Location 144 contains the number of free queue blocks.) For example:

```
IF WORD(144) >= ENOUGH THEN GOTO LOCK'FILE
  PRINT "Sorry.  Not enough queue blocks available. Try again later."
  GOTO END'TRX
LOCK'FILE: ....
```

Just a note of caution: We cannot guarantee that location 144 will always contain the number of free queue blocks. Check the SYS.MAC file each AMOS Release to see if the location of QFREE has changed. (Currently, if you assemble that file, you will see that the octal location of QFREE is 220 (144, decimal).)

SORT Minimum Memory and Disk Requirements

Several readers have asked us what the minimum memory and disk requirements are of SORT.PRG. The minimum memory requirement is 1K of free memory (that is, 1K of memory in addition to the amount of memory required to load SORT), and the minimum disk requirement is twice the size of the file. (If the file is random, that disk area must be contiguous.)

LOOKUP Monitor Call

The discussion of the LOOKUP monitor call in the AMOS Monitor Calls Manual, (DWM-00100-43) does not discuss the code returned by LOOKUP. LOOKUP returns any of the standard error codes (e.g., protection violation, file not found, etc.). However, note that the byte returned is negative. Before comparing it to the standard error codes, remember to negate the number first.

SOFTWARE CHANGE NOTICES

All of the patches in this month's issue are to the monitor, SYSTEM.MON. Notice that two of the patches given below require that you use MONGEN to generate a new version of the monitor after those patches are made. You MUST use MONGEN after these patches are made-- if you do not, your system will not boot with the patched monitor.

As with all patches to the monitor, we do not give "before and after" hash totals-- this is because the hash total of the monitor differs depending on what disk driver has been MONGENed into that monitor. Since you do not have a hash total to look at to ensure that the patch was made correctly, we suggest that you perform monitor patches by making a copy of the monitor, making the patch to the copy, and then using MONTST to test the copy. (Remember that the System Disk must be installed on the first fixed surface of the System Drive in order to use MONTST. Also, on non-MPC systems, the job using MONTST must be operating in the first memory partition on the system.) We step through this recommended procedure in each of the patches below.

SYSTEM.MON (Version 4.5)

If your monitor is version 4.5, make the following two patches in the order given:

Patch #1 (4.5) - WAKE and ASSIGN Monitor Calls

This patch corrects problems in the AMOS 4.5 monitor with the ASSIGN and WAKE monitor calls for bank switched systems. The symptoms of these problems are that the ASSIGN call does not exclude multiple jobs from a non-sharable device; and, the WAKE call causes the SLEEP monitor call to return an improper return code when a job is awakened from another bank.

Note that you MUST use MONGEN to generate a new monitor after making this patch; this is because the patch extends into a portion of the current driver area, and you must use MONGEN to re-embed the driver.

NOTE: The underlined question marks below indicate that the contents of that memory location may be anything.

```
.LOG SYS:(RET)
Logged into SYS:
.COPY NEWSYS=SYSTEM.MON(RET)
SYSTEM.MON to NEWSYS.MON
Total of 1 file transferred
.DDT NEWSYS.MON(RET)
PROGRAM BASE IS XXXXXX
PROGRAM SIZE IS 34530
210/    SUB -(R1),(R4)+          24224(RET)

20324/  SUB -(R1),(R4)+          24224(RET)

12676/  CMP 6(SP),#12            CMP 4(SP),#12(RET)

12620/  CALL 23160               CALL PC,24124(RET)

24124/  ??????                  MOV R2,-(SP)↓
24126/  ??????                  CALL PC,23160↓
24132/  ??????                  0 ↓
24134/  ??????                  MOV (SP)+,R2↓
24136/  ??????                  RTN PC(RET)

3616/   BR 3622                  BR 3630(RET)

3622/   MOV @R4,R3               CMP R4,#162↓
3626/   CMP 6(R3),R0             BEQ 3664↓
3630/   BPT                      MOV @R4,R3↓
3632/   BNE 3620                 CMP 2(R3),#3552↓
3640/   MOV 130(R0),R3           BNE 3620↓
3642/   SVCA 30                  CMP 6(R3),R0↓
3646/   HALT                     BNE 3620↓
3650/   RSTS                     SVCA 33↓
3652/   SVCA 37                  MOV R3,@R4↓
3654/   RSVC                     MOV 130(R0),R3↓
3660/   HALT                     JMP @#24140(RET)

24140/  ??????                  MOV 42(R0),R1↓
24144/  ??????                  SVCA 45↓
24146/  ??????                  BIC #4,16(R3)↓
24154/  ??????                  SVCA 45↓
24156/  ??????                  SVCA 37↓
24160/  ??????                  10↓
24162/  ??????                  BIS #4,16(SP)↓
24170/  ??????                  LEA PC,@#3664(RET)

^C.
```

[Continued...]

```
.SAVE NEWSYS.MON(RET)
SAVE NEWSYS.MON
.DEL *(RET)
NEWSYS.MON
.
.MONGEN(RET)
Input monitor name: NEWSYS.MON(RET)
New disk driver name: HWK500.DVR(RET)
New monitor name: NEWSYS.MON(RET)
.
.SAVE NEWSYS.MON(RET)
ERASE NEWSYS.MON,       SAVE NEWSYS.MON
.DEL *(RET)
NEWSYS.MON
.MONTST NEWSYS.MON,SYSTEM.INI(RET)
```

NOTE: When MONGEN asks for the new disk driver name, give it the name of the driver used by your System Device (e.g., SMD410.DVR, HWK500.DVR, etc.).

Then use MONTST to test the new monitor. If the system does not boot with NEWSYS.MON, reset the system (which will use the old SYSTEM.MON) and use DDT to verify that the patch was entered correctly. If the system boots properly, rename NEWSYS to SYSTEM.MON so that your system can boot from the new monitor on a hardware reset:

```
.RENAME SYSTEM=NEWSYS.MON(RET)
NEWSYS.MON to SYSTEM.MON
```

Patch #2 (4.5) Monitor Version Number Update

After you have installed the patch above, enter the following patch to update the monitor version number to 4.5(2).

Whenever you use the SYSTAT or SYSTEM command, you see a line showing your current monitor version. The following patch changes this line to show 4.5(2), indicating that you have implemented the patches in this issue of the Software Notes. This patch to the monitor does not affect the operation of the monitor; it just gives you a quick way to see if all patches have been implemented.

IMPORTANT NOTE: This patch assumes that you have previously entered the AMOS 4.5 patches given in the June and July issues of the Software Notes. (That is, this patch assumes that your monitor is currently version 4.5(1).) If the previous 4.5(1) patch was not made to your monitor, this patch will not affect the monitor version number.

```
.SET OCTAL (RET)
.LOG SYS:(RET)
Logged into SYS:
.DDT SYSTEM.MON(RET)

PROGRAM BASE IS xxxxx
PROGRAM SIZE IS xxxxx

14/     SUB     -(R4),0(R1)     24462↓
16      ???                     0 (RET)

^C
.SAVE SYSTEM.MON (RET)
ERASE SYSTEM.MON,       SAVE SYSTEM.MON
.DEL SYSTEM.MON(RET)
SYSTEM.MON
.
```

After entering the patch, you can verify its effect by rebooting the system and using the SYSTEM command or the SYSTAT command; either will display the new monitor version. For example, if you reboot and issue the SYSTEM command, you see:

```
.SYSTEM (RET)
The following programs are allocated in system memory:
        STD     DVR
        AMS     DVR
Total resident monitor size is 15466 bytes
Monitor version is 4.5(2)
```

SYSTEM.MON (Version 4.5A)

If your monitor is version 4.5A, make the following three patches in the order given:

Patch #1 (4.5A) - Bootstrap Loaders on an MPC System

PRILOD, HWKLOD, SMDLOD, and MONTST do not work correctly on some systems that use the AM-700 Memory Partition Controller. The following patch to the monitor resolves this problem:

```
.LOG SYS:(RET)
Logged into SYS:
.COPY NEWSYS=SYSTEM.MON(RET)
SYSTEM.MON to NEWSYS.MON
Total of 1 file transferred
.DDT NEWSYS.MON (RET)
PROGRAM BASE IS XXXXXX
PROGRAM SIZE IS 45006
44110/  CLRB @#177460          JMP @#45006(RET)

45006/  ??????                 MOV #105537, @#0↓
45014/ ??????                  MOV #177460, @#2↓
45022/ ??????                  MOV #37, @#4↓
45030/ ??????                  CALL PC, @#0↓
45034/ ??????                  JMP @#44114(RET)

^C
.SAVE NEWSYS(RET)
SAVE NEWSYS
.DEL * (RET)
NEWSYS.MON
.MONTST NEWSYS.MON,SYSTEM.INI(RET)
```

If the system boots correctly, you may now rename NEWSYS.MON to SYSTEM.MON so that the system will automatically boot with it. (First, to be safe, you might want to rename SYSTEM.MON to another name-- for example, SYSTEM.SAV.)

```
.RENAME .SAV=SYSTEM.MON (RET)
SYSTEM.MON to SYSTEM.SAV
.RENAME SYSTEM=NEWSYS.MON(RET)
NEWSYS.MON to SYSTEM.MON
```

NOTE: You do not need to use MONGEN to generate a new monitor after making this patch.

Patch #2 (4.5A) - WAKE Monitor Call

This patch to the 4.5A SYSTEM.MON fixes a problem with the WAKE monitor call. The symptom of the problem is that the SLEEP monitor call returns an

improper return code if a job is awakened from another memory bank.

Note that you MUST use MONGEN to generate a new monitor after making this patch; this is because the patch extends into a portion of the current driver area, and you must use MONGEN to re-embed the driver.

NOTE: The underlined question marks below indicate that the contents of that memory location may be anything.

```
.SET OCTAL<RET>
.LOG SYS:<RET>
Logged into SYS:
.COPY NEWSYS=SYSTEM.MON<RET>
SYSTEM.MON to NEWSYS.MON
Total of 1 file transferred
.DDT NEWSYS.MON<RET>
PROGRAM BASE IS XXXXXX
PROGRAM SIZE IS 45040
210/    SUB -(R2),0(R4)          24364<RET>

20452/  SUB -(R2),0(R4)          24364<RET>

3640/   BR 3644                  BR 3652<RET>

3644/   MOV @R4,R3               CMP R4,#162↓
3650/   CMP 6(R3),R0             BEQ 3706↓
3652/   BPT                      MOV @R4,R3↓
3654/   BNE 3642                 CMP 2(R3),#3574↓
3662/   MOV 130(R0),R3           BNE 3642↓
3664/   SVCA 30                  CMP 6(R3),R0↓
3670/   HALT                     BNE 3642↓
3672/   RSTS                     SVCA 33↓
3674/   SVCA 37                  MOV R3,@R4↓
3676/   RSVC                     MOV 130(R0),R3↓
3702/   HALT                     JMP @#24264<RET>

24264/  ??????                   MOV 42(R0),R1↓
24270/  ??????                   SVCA 45↓
24272/  ??????                   BIC #4,16(R3)↓
24300/  ??????                   SVCA 45↓
24302/  ??????                   SVCA 37↓
24304/  ??????                   10↓
24306/  ??????                   BIS #4,16(SP)↓
24314/  ??????                   LEA PC,@#3706<RET>

^C
```

[Continued...]

```
.SAVE NEWSYS.MON(RET)
SAVE NEWSYS.MON
.DEL *(RET)
NEWSYS.MON
.
.MONGEN(RET)
Input monitor name: NEWSYS.MON(RET)
New disk driver name: HWK500.DVR(RET)
New monitor name: NEWSYS.MON(RET)
.
.SAVE NEWSYS.MON(RET)
ERASE NEWSYS.MON,      SAVE NEWSYS.MON
.DEL *(RET)
NEWSYS.MON
.MONTST NEWSYS.MON,SYSTEM.INI(RET)
```

NOTE: When MONGEN asks for the new disk driver name, give it the name of the driver used by your System Device (e.g., SMD410.DVR, HWK500.DVR, etc.).

Then use MONTST to test the new monitor. If the system does not boot with NEWSYS.MON, reset the system (which will use the old SYSTEM.MON) and use DDT to verify that the patch was entered correctly. If the system boots properly, rename NEWSYS to SYSTEM.MON so that your system can boot from the new monitor on a hardware reset:

```
.RENAME SYSTEM=NEWSYS.MON(RET)
NEWSYS.MON to SYSTEM.MON
```

Patch #3 (4.5A) Monitor Version Number Update

After you have installed the two patches above, enter the following patch to update the monitor version number to 4.5A(1).

Whenever you use the SYSTAT or SYSTEM command, you see a line showing your current monitor version. The following patch changes this line to show 4.5A(1), indicating that you have implemented the patches in this issue of the Software Notes. This patch to the monitor does not affect the operation of the monitor; it just gives you a quick way to see if all patches have been implemented.

```
.SET OCTAL RET
.LOG SYS: RET
Logged into SYS:
.DDT SYSTEM.MON RET

PROGRAM BASE IS xxxxx
PROGRAM SIZE IS xxxxx
14/     0      30450↓
16/     0      51 RET

^C
.SAVE SYSTEM.MON RET
ERASE SYSTEM.MON,       SAVE SYSTEM.MON
.DEL SYSTEM.MON RET
SYSTEM.MON
.
```

After entering the patch, you can verify its effect by rebooting the system and using the SYSTEM command or the SYSTAT command; either will display the new monitor version. For example, if you reboot and issue the SYSTEM command, you see:

```
.SYSTEM RET
The following programs are allocated in system memory:
        STD     DVR
        AMS     DVR
Total resident monitor size is 15466 bytes
Monitor version is 4.5a(1)
```