[See end of this file for revision history]

A FIX FOR PROBLEMS WITH PATCHX.CPE

Many developers have reported problems with PATCHX. There were many reported symptoms but the most common was that certain parts of the new kernel did not seem to function correctly, particularly if another program was run immediately after PATCHX.

A close investigation of the PATCHX.CPE program showed that:-

1) It has an obsolete MW3 start-up!

2) It has cache coherency problems: This is because it runs from cached memory and copies to cached memory yet it does not flush the cache before executing the new kernel. This means that if any of the old kernel remains in the cache when the replacement is executed then the cpu will execute a mixture of the old and new kernel code!

We have isolated the new kernel data from PATCHX.CPE and incorporated them into the NEWDEX installation program along with the original debugger stub update (necessary for debugging with callbacks and for hardware data-breakpoint support).

The result is SNPATCH.CPE which installs much faster than PATCHX and does not suffer from the aforementioned cache coherency problems.

Note that SNPATCH replaces both PATCHX *and* NEWDEX. You would be advised to delete those latter programs from your PC.

So, for those of you setting up the PSX in a batch file...

change this:

```
RESETPS 1
RUN /w4 PATCHX
DELAY
RUN /w4 NEWDEX
```

to this:-

```
RESETPS 1
RUN /w4 SNPATCH
```

...and the result is a lot faster and more reliable.

NOTE: The kernel installed by SNPATCH is the same as the one in PATCHX, We just install it correctly. Unfortunately the kernel itself is a little unstable for a short while (less than 0.5 sec) so if you want to RUN something else in the same batch file that runs SNPATCH then you would be advised to insert a small (0.5 sec) delay before you RUN your app. There is a suitable DELAY program in this archive, (execute DELAY /? for help):-

```
RESETPS 1
RUN /w4 SNPATCH
DELAY
RUN /w4 MYPROG
```

WHILE WE HAVE YOUR ATTENTION: *** IMPORTANT WARNING ***

WE KNOW THAT SOME OF YOU ARE USING OBSOLETE MW3 VERSIONS OF LIBSN

You may have updated LIBSN at an earlier date and then overwritten it
with an older LIBSN from a recent library update. PLEASE CHECK NOW!
The current LIBSN.LIB is about 19 Kbytes in size and contains C++ support
and user-definable ramsize support. Do not worry about the
larger size - the extra modules are only linked if referenced.

To check that you are using the correct LIBSN change to your GNU
library directory and enter:-

```
PSYLIB /l libsn.lib
```

The resulting output should include the PUREV module near the top
(this is the __pure_virtual function support required by GNU C++ from
version 2.6.3 on). If you have this module then you can be fairly
sure you have an up-to-date LIBSN.LIB

If you do not have this module in your lIBSN.LIB then you should
stop what you are doing and update to the latest LIBSN immediately.

If you continue to use an old MW3 LIBSN you *will* have problems
because the MW3 start-up read dip switches to determine ram size at
startup. Since the ISA card PSX does not have these DIP switches it
will not correctly initialise the stack and heap!

ALSO NOTE that you should not use 8M.OBJ and 2M.OBJ to adjust
your program for DTL-H2000 or production Playstion.
Use the variables referenced by LIBSN.LIB start-up (e.g. _ramsize).
See the readme with LIBSN for further details.

*** ANOTHER WORD OF WARNING ***

Although SN Systems are not aware of the mechanism used by many of
the kernel functions, in light of the PATCHX problems we would advise
any developers to beware of other cache coherency problems in their
own code.

The only similar situation which comes to mind would apply to anyone
using code overlays on the Playstation. You should be aware than any
data read or copied into memory is not placed into the instruction
cache. Therefore, if this data contains program code to be executed you
should force the cpu to flush the instruction cache before calling
the new program code.

Source code for SNPATCH is available for your reference. Although
it is written in assembly language you can very easily assemble
fragments using ASMPSX to produce object modules for linking to C.

REVISION HISTORY

After running SNPATCH you will find that RUN (by itself) will report
a higher version number (currently 4.04)...

***07-Mar-95

SNPATCH with debug stub 4.03 fixes a problem in 4.02 whereby a
pollhost() call in a callback (e.g. VBL) causes fileserver operations
(or printf()) in your main program to fail (or even hang).

*** 31-May-95

SNPATCH 4.04:

A minor update on SNPATCH 4.03, this just adds one more handy break
function to the debug stub:-

        BREAK $0407

...which pauses program execution at that point. Execution can be
resumed by hitting f9 (RUN) in the debugger.

Remember that this will only function if the debug stub is hooked in.
i.e. it won't work if you code is booted of CD using a RESETPS 0

This has also been added to LIBSN.H as a macro for use from C:-

#define PSYQpause() asm("break 1031")   /* inline to keep variable scope */

Please copy the enclosed LIBSN.H file to your Playstation GNU include
directory.

To use this in your C source add a line like:-

        PSYQpause();

Note that the C local variable scope at the pause point is preserved
if you are debugging.

*** 23-Aug-95

SN versions of SCE's PATCHJ.CPE and PATCHW.CPE

Note: PATCHJ is identical to the old PATCHX and it's equivalent is
the old SNPATCH. For consistency I have renamed this to SNPATCHJ.CPE

SNPATCHW.CPE is our fixed version of SCE's PATCHW.CPE

Here is the data from SCE:-

>Updates of patchx.cpe:
>==
>
>In addition to the existing KANJI fonts, the user-defined character
>font (245 characters) is added to PlayStation for overseas as the
>built-in font data.
>
>   * Latin alphabets with diacritical marks
>   * Greek alphabets with diacritical marks
>   * Kyrill alphabets
>   * Latin alphabets
>
>   We release patchw.cpe for these data. And the name, patchx.cpe,

>is changed to patchj.cpe. Patchw.cpe can be treated in the same way
>as patchj.cpe.
>
> patchj.cpe : for SCEI's titles
> patchw.cpe : for SCEA's or SCEE's titles
>
>   Use Krom2RawAdd2() instead of Krom2RawAdd() when the access to
>the user-defined character data is made after the executing of
>patchw.cpe. Krom2RawAdd2() is included in libgpu.lib of PS-X
Library
>Version 3.2 or later.
>
>   Refer to 'Updates of KANJI Font Utility' for details (Patchy.cpe
>which was included in this package is the same file as patchw.cpe).
>

-- Andy Beveridge