A Few Peephole Optimisations Applicable
to Iterators

This newsletter extends Newsletter 122 by recording a
few peephole optimisations applicable to sets used as iterators.

    i.   The construction

(1) $\qquad\qquad (\forall x \varepsilon s - t)$ *block;*

can be improved to the equivalent

(1') $\qquad t_o = t;\ (\forall x \varepsilon s\ |\ s\ \underline{ne}\ t_o)$ *block;;*

Note that execution of (1') certainly involves no more work
than execution of (1), and in addition avoids the formation
of the set s-t together with the space allocation and garbage
collection overhead which might be implied.

    ii. Similarly,

(2) $\qquad\qquad (\forall x \varepsilon s * t)$ *block;*

can be improved to

(2') $\qquad t_o = t;\ (\forall x \varepsilon s\ |\ x \varepsilon t_o)$ *block;*

or still better to

(2'') $\qquad\qquad s_o = s;\ t_o = t;$

$\qquad$ if $(\#\ s_o)\ \underline{lt}\ \#\ t_o$ then $\langle s_o, t_o \rangle = \langle t_o,\ s_o \rangle;;$

$\qquad\qquad (\forall x \varepsilon s_o\ |\ x \varepsilon t_o)$ *block;*

iii. Again using the same idea,

(3)
$$(\forall x\epsilon\ s\ +\ t)\ block;$$

can be improved to

(3')
$$s_o = s;\ t_o = t;$$
$$(\forall x\epsilon s_o)\ block;$$
$$(\forall x\epsilon t_o\ |\ x\ \underline{n}\epsilon\ s_o)\ block;$$