Preparing Programs and Running them under the Basic System

General Advice

A program running in the '74, possibly transferring information up and down the link to ISYS produces little or no visible effect other than the wait light being extinguished on the control console. It is difficult to tell whether the program has started, done anything or stopped in good order, or even if it is the expected program at all! For this reason it is advisable to code any program to identify itself initially at the Olivetti and to print a further message on completion.

IMP programs have available 2 procedures which are useful for this purpose. They enable the program to make use of the switches and display lights on the control console. The procedures are:-

```
routine display (integer val);  ! produces the 16 bit VALue on the
                                display console lights. The first call writes
                                to the lower row, the second to the upper and so
                                on alternately.
integerfunction switches;       ! produces the 16 bit value read from
                                the data switches on the control console.
```

Preparing IMP77 Object files

This is a 2 stage process under ISYS. The source must first be compiled to produce the object file. Then the object file must be linked with all pre-defined procedures to produce a loadable object file. The 2 commands involved are:-

```
*imp <source> / <object>, <listing>

*link <object> / <loadable object>
```

The initial object file is of no permanent use in the context of this course, so it is sensible to avoid the proliferation of unecessary files by linking it to itself i.e.

```
*link object/object
```

ALWAYS REMEMBER TO LINK AFTER COMPILATION

Preparing HAL70 programs

The definitions used to enable the I/O SVC's to be expressed as "readsym", "printsym", "selin" etc.. are contained in the file (pub).SYSDEF. This should be prefixed to all HAL source which wishes to make use of the system I/O. At least 3 ways of doing this are available. In order of preference at an early stage (but reverse of that order once experienced) they are:-

(i) Having prepared the source, concatenate it to .sysdef by means of the transfer command (which will concatenate its 3 input streams if they exist)

```
*t .sysdef,source / finalsrce
```

(ii) Create the final source by editing from .sysdef initially

```
*e .sysdef / finalsource
>m0g0
```

iii) Include .sysdef as a second input stream direct to the HAL assembler

```
*hal source, .sysdef / obj, listing
```

In this case HAL reads from input stream 2 before input stream 1, but input stream 2 must only contain definitions, and it will not appear on the listing file.

Having prepared a final source by method (i) or (ii) it should be assembled by a command of the form:-

```
*hal finalsrce/ object, listing
```

The object file so produced can be loaded directly by the system in the '74.

Loading Prepared Programs

The instructions for doing this are given in detail in the handout on the basic system. This note is principally concerned with what to do if anything goes wrong! The loading operation should complete almost instantaneously, if it does not, then there is something wrong. In this circumstance the transfer from ISYS will not complete. The simplest and safest way to return things to their initial state is to depress the INT key on the '74. This will stop the processor and intialise the link within it. ISYS will detect this initialisation as an error and will print the following message on the console:-

```
LT3 NOT READY (01)
```

where the 3 may be replaced by the number of the '74 which you are using. This message requires a response from the user. A carriage return will cause ISYS to try further to complete the transfer - NOT the appropriate response in this case. Typing the letter "e" causes ISYS to bring the transfer to an end. It will print out the number of bytes read from the file, but these will NOT have been sent down the link.

Having recovered in this manner try loading again (location 60). But if there are further problems go back to square one, i.e. load the system from scratch!!!

IF IN DOUBT RELOAD