TSS 516 - GE COMMUNICATION

This document describes the use of the 516 programs which communicate with the GE machine. In this document GE is synonymous with the HIS Honeywell computer currently installed at the Murray Hill central computing facility. All programs are invoked by a single line command but are actually executed in the background by a GE GREMLIN in parallel with other processes initiated by the user. All programs may be invoked at the SYS? level or at the FSNAP- level. The requests for GE service are put on a queue and serviced by the GE GREMLIN in the background. The GREMLIN dials up the GE system by means of an automatic calling unit (801) and sends the user's job to the GE via a high speed 204 dataphone when the GE answers the phone. If no answer is received the GREMLIN goes to sleep and will retry automatically every 5 minutes until all jobs on the queue have been sent. There is currently a restriction in that no more than 5 jobs are sent in any one transmission session.

In order to send any jobs to the GE, a user requires an IDENT file which contains the user's IDENT card and also his USERID card if any files are sent to or taken from the user's GE PRMFL area. The contents of his IDENT file must be as follows:

```
$      IDENT   Mxxxx,MxxxUSERNAME
$      USERID  CATSPASSWORD
```

The $ SNUMB and $ SGRADE (sgrade=1) cards are appended to each job sent to the GE computer. The various GE communication programs can be broken up into categories. The first group of

programs consist of those which make use of the peripherals on the GE. Another group of programs uses the 516 computer as a remote job entry terminal. The third group of programs makes use of the GE PRMFL area for the storing and retrieving of files.

The first group of programs consist of:

GELIST,FN1,FN2,...   (up to 10 files max.)

GEPNCH,FN1,FN2,...   (up to 10 files max.)

GE*L*B,FN

GEPLOT,FN

GEBKUP,FN1,FN2,...   (up to 10 files max.)

GELIST will produce a listing of up to 10 different files on the GE line printer whereas GEPNCH will produce punched decks of up to 10 different files on the GE card punch. Moreover, GELIST will punch any binary information and GEPNCH will list any holorith information. GE*L*B is used to produce a listing and a binary object deck of a file which has been assembled using the 516 assembler. This command actually produces a listing of the file FN*L and a punched deck of the file FN*B, both of which were produced by the assembler. The GEPLOT command will produce a STARE output plot of the data contained in the file FN. The file FN contains the plot options required by TPLOT, a title, subtitle,x-axis label, y-axis label and the (x,y) pairs of points. Generally the data is produced by an FSNAP program and the output file is then sent to the GE for remote plotting. More detailed information is contained in 516 DOC #47. The GEBKUP command (B - is the equivalent one letter command) is used to produce compressed decks of TSS 516 files on the GE card punch for file backup and archiving purposes. The decks so produced may be

loaded into the user's directory at any time by means of the FLOAD command. These two commands are discussed further in 516 DOC #43.

The second group of GE communication programs consist of the following:

GE,FN

GEDECK

GEMAC,SKELDECK,FN1,FN2,....   (up to 3 files max.)

These commands may be used to enter any jobs remotely to the GE computer. The GE command sends the file FN to the GE exactly as is and thus must contain an IDENT card as the first card in the deck setup. Output may be directed to the GE machine by including a $ SYSOUT P* card in the deck setup and a $ SYSOUT C* card if card output is expected. A $ SYSOUT J* card must be included to output the accounting information on the GE machine. The GEDECK command may be invoked to send a deck of cards directly from the card reader (on 516 computer) to the GE computer without using any 516 file space. The GEMAC command is used to send a job specified by a skeleton deck and up to 3 files whose names are passed as arguments, to the GE. The skeleton deck normally contains a number of control cards and a number of special character combinations which specify the arguments which are to be filled in. The following sequence of card images is an example of such a skeleton deck (..STARE in the GLOBAL directory):

```
    <!=IDENT,!>
$        SELECT   CC/XYMASK
.$       SYSOUT   J*
$        SYSOUT   P*
```

```
$      DATA      I*,NCKSUM,CUPY
       START
<!#1!>
       END JOB
$      ENDCOPY
$      SELECT   CC/GRAPHB
$      SYSOUT   J*
$      SYSOUT   P*
$      ENDJOB
```

This job would be sent to the GE by means of:

SYS?GEMAC,..STARE,XYDATA

Here the file ..stare contains the control cards and some special character combinations to pull in arguments. The first line of the deck starts with <! and ends with !> designating this as a string of characters which are to be interpreted. The result is that the user's IDENT file is put on the GE queue. The next 4 card images are copied directly onto the queue. The next line containing <!#1!> causes the first file named as an argument after the skeleton deck (e.g. XYDATA) to be copied onto the GE queue. Then the next 5 card images are copied directly onto the queue. Control is returned to the user and the job is sent to the GE by the GE GREMLIN process.

In general all GE jobs are put on the queue by the segmented program GEJOB. This program copies the skeleton deck pointed to by a character pointer passed to GEJOB character for character except for the following sequences of characters which it recognizes as special and treats as described subsequently:

<!=FN,!>   copies contents of explicitly named

file onto the queue

<!$n!> copies contents of file whose name

is pointed to by the character pointer

in argument number "n" onto the queue

<!#n!> copies the text pointed to by the

character pointer in argument number "n"

(to end of this text) onto the queue

<!%n!> copies the text pointed to by the

character pointer in argument number "n"

(up to the next comma) onto the queue

<!'!> puts a request for output from the

GE on the GE output queue.

In the above character sequences the argument number "n" follow-

ing the characters $,# and % may be any hexadecimal number from 1

to F inclusive. It should be noted that the characters $,# and %

actually move the character pointers in the arguments to the next

argument in the user's input argument string. The user is free

to make up any skeleton deck consisting of control cards, data

and/or these special character sequences.

The third group of GE communication programs consists of:

GESAVE,FN,CAT/FILE

GEFILE,CAT/FILE

GEBORT,7Bxxx

GEGET,7Bxxx

GESTAT

The first of these commands makes a copy of the user's file

FN onto the user's GE PRMFL area on the file given by the

CAT/FILE descriptor.   The skeleton deck used to execute this

command follows (..GESAVE in the GLOBAL directory) :

```
<!=IDENT,!>
$         SELECT  CC/..TIMS
$         PRMFL   OT,R/W,,<!#2!>
$         SYSOUT  J*
$         SYSOUT  P*
$         DATA    I*,,COPY
INPUT,ASIS
<!$1!>
$         ENDCOPY
$         ENDJOB
```

A user may insert line numbers in the file on the GE by mak-
ing his own version of ..GESAVE in his directory with the line
INPUT,ASIS modified to be INPUT,INSERT. Other options may also
be included on this card image. The GEFILE command is used to
obtain a copy of a file on the GE PRMFL area specified by
CAT/FILE into a file on the 516 computer named by the SNUMB,
7Bxxx which was assigned to this job when put on the GE queue.
The skeleton deck for this command (..GEFILE in the GLOBAL direc-
tory) follows:

```
<!=IDENT,!>
$         SELECT  CC/..TIMS
$         SYSOUT  J*
$         PRMFL   OT,R/W,,<!#1!>
OUTPUT,ASIS
$         ENDJOB
<!/!>
```

Again the options on the OUTPUT,ASIS card image may be

altered by the individual user. A request for output is put on the GE output queue by the special character combination <!'!>. By invoking the GESTAT command a list of the jobs waiting for output from the GE will be printed out. The list gives the SNUMB numbers as well as the corresponding passwords of the users who put the requests on the output queue. Jobs are automatically taken from the queue when output arrives successfully from the GE. Requests for output may be taken from the queue manually by means of the GEBORT command (provided it is invoked by the user who put the request on the queue or by the master user). In a similar manner requests for output may be added to the queue by means of the GEGET command.

A special command has been implemented for submitting FORTRAN jobs to the GE computer in the batch world and receiving output back at the 516 computer. The command   GEFORT,PROG,DATA uses the following skeleton deck setup (..GEFORT in the GLOBAL directory)

```
<!=IDENT,!>
$       OPTION   FORTRAN
<!$!!>
$       SYSOUT   J*
$       SYSOUT   P*
$       SYSOUT   C*
$       EXECUTE
$       SYSOUT   J*
$       SYSOUT   C*
$       SYSOUT   P*
$       REMOTE   06,7B
```

```
    <!$2!>

$       ENDJOB

    <!'!>
```

The actual fortran program is contained in file PROG and may con-
sist of source code (in which the first card may be $ FORTRAN or
$ FORTREX) or object decks or any combination thereof. The data
for the program is contained in file DATA. If no data is re-
quired for the FORTRAN program, a dummy empty file may be provid-
ed. Output from the FORTRAN program will be returned to a 516
file named by the SNUMB of the job submitted to the GE. If the
user wishes to run a special FORTRAN program which exceeds the
standard FORTRAN options he may make up another version of
..GEFORT in his directory with the required options.

A number of commands are provided for the user to examine
the status of the jobs on the GE queue so as to determine when
and if a user's jobs have been submitted to the GE. The GESTAT
command, as mentioned previously, tells the user which jobs are
on the output queue. The STATUS (S is the equivalent one letter
command) command may be invoked to determine how many jobs are
still to be submitted to the GE. For example:

```
        ---    565/03    ---

        ---    GEDATA    ---
```

indicates that there are 3 jobs yet to be submitted, namely
7B563, 7B564 and 7B565. Invoking the SYSNAP (U is the equivalent
one letter command) command will tell one what state the GE
GREMLIN is in. A few examples are as follows:

```
    GE GREM  .GESWT  100  116
```

        (GREMLIN in a 5 minute wait state)

GE GREM .GESWT 100 216

(GREMLIN in process of submitting a job)

, GE GREM GEOUTQ 600 316

(GREMLIN attempting to get output from GE)

A GE message file is also maintained in the GLOBAL directory which keeps a record of the most recent GE transactions. This message file may be examined by means of the P,..GEMSG command. The file ..GEMSG contains the following types of messages:

5381

(GE 201 phone number dialed)

03/27/72pm 02:47:49

(date and time at which GE answered)

7Bxxx

(attempt to send job to GE)

LINE DISCONNECTED — DIS

(normal disconnect, job sent successfully)

GET 7Bxxx

(attempt to get output from GE for SNUMB = 7Bxxx)

Normally when the GE is up and running, the jobs will be submitted without delay and output will be received after 5 to 10 minutes. If for some reason the jobs are not being sent to the GE and/or the 516 does not accept any more jobs for the queue and the GE 201 data-phone link is not down, one may (as a last resort only) issue the GEPOKE command. This will break any latches which may be set in the queues and wake up the GE GREMLIN for transmission to the GE.

All commands discussed above submit jobs to the GE by means of putting them on a queue and then returning control to the

user. A command does exist, however, for transmitting a file of
commands to the GE directly and receiving the output from the GE
directly into a 516 file. This command   GERAOL,GIN,GOUT   sends
input to the GE from the file GIN and receives output into GOUT
while providing the user with a list of the transactions as com-
munication is being carried out. This command is used mainly for
debugging purposes at present.