

AMENDMENT A

Effective January 1, 1968

The undersigned General Electric Company (hereinafter referred to as "GENERAL ELECTRIC") and the undersigned Massachusetts Institute of Technology (hereinafter referred to as "MIT") hereby agree to amend effective as of January 1, 1968, the Agreement effective November 5, 1965, relating to patentable inventions and other intellectual property (hereinafter referred to as the November 5, 1965 Agreement), as hereinafter set forth.

1. The term of the November 5, 1965 Agreement is hereby extended without hiatus to December 31, 1972, by changing, in Article 16, lines 1 and 2; "January 1, 1968," to -- December 31, 1972, --.
2. After Article 16 add --
  - 16a. GENERAL ELECTRIC and MIT further agree that subscribing users of Multiplexed Information and Computing Service (hereinafter referred to as MULTICS), wishing to obtain a source listing of MULTICS SOFTWARE for developing improved or extended versions of MULTICS SOFTWARE, will be required to agree not to do anything to adversely affect the rights of GENERAL ELECTRIC and MIT in and to such MULTICS SOFTWARE, and to agree to offer such improved software to GENERAL ELECTRIC and MIT for possible inclusion as MULTICS SOFTWARE subject to approval of GENERAL ELECTRIC and MIT. --
3. In Article 17, change; "Computer Equipment Department" to -- Information Systems Equipment Division --.
4. In Exhibit A, at the end of Paragraph 1.01, add; -- TECHNICAL INFORMATION does not mean software in or constituting AUTHOR MAINTAINED LIBRARY or PRIVATE SOFTWARE. Some representative items considered software within the meaning of TECHNICAL INFORMATION at the time of execution of this Agreement are set forth in Exhibit B1 attached hereto and forming a part hereof --.

5. To Exhibit A, add the following definitions: --

1.05 MULTICS shall mean a service provided by MIT utilizing the GE-645 data processing system as identified in Appendix 1 of Amendment 2 of the Basic Agreement dated April 22, 1968, and all additions, enhancements, modifications or substitutions thereof utilizing MULTICS SOFTWARE.

1.06 AUTHOR MAINTAINED LIBRARY shall mean software developed by subscribing users of MULTICS not participating in THE PROGRAM and placed by mutual consent of author or developer and GENERAL ELECTRIC and MIT into a library accessible by all users of MULTICS. AUTHOR MAINTAINED LIBRARY software shall be offered with no guarantees by the developer for free distribution to and by GENERAL ELECTRIC, MIT, and subscribing users of MULTICS.

1.07 PRIVATE SOFTWARE shall mean software developed by a subscribing user not participating in the development of THE PROGRAM with no obligation to make such software available to GENERAL ELECTRIC, MIT, or other subscribing users of MULTICS.

6. Exhibits B1 and B2 attached to this Amendment are annexed to the November 5, 1965 Agreement and made a part thereof.

IN WITNESS WHEREOF, the parties have each caused this instrument to be executed by their duly authorized representatives effective as of the 1st day of January, 1968.

GENERAL ELECTRIC COMPANY

MASSACHUSETTS INSTITUTE OF  
TECHNOLOGY

By \_\_\_\_\_

By \_\_\_\_\_

Title \_\_\_\_\_

Title \_\_\_\_\_

## EXHIBIT B1

MULTICS SOFTWARE shall mean software sufficient to operate a useful, self-maintained version of MULTICS and shall comprise the MULTICS BASIC SOFTWARE and the MULTICS SERVICE SOFTWARE and all modifications, changes and improvements thereto and copies thereof.

MULTICS BASIC SOFTWARE shall mean all software required to initiate MULTICS to the point that the file system hierarchy can be restored from backup tapes, including, but not limited to, the following:

- a. The Bootload Operating System (BOS) which provides an operating environment to prepare the MULTICS system for the execution of System Initialization Segments, Hardcore System, and Softcore System, as hereinafter defined in parts d, e, and f; for debugging; and for bringing MULTICS to an orderly halt.
- b. The Salvager System which examines and attempts to repair the File System Hierarchy after a system failure.
- c. The Checker System which provides a cross-referenced listing of the contents of a MULTICS System Tape.
- d. The System Initialization Segments which establish the MULTICS environment immediately subsequent to BOS execution.
- e. The Hardcore System which comprises all of the ring-zero components used after initialization. These components are the supervisory procedures and data which manage the utilization of MULTICS hardware.
- f. The Softcore System which comprises sufficient commands and subroutines to permit a reload of software programs from backup tapes.

MULTICS SERVICE SOFTWARE shall mean those software components which extend the MULTICS BASIC SOFTWARE capabilities to provide a self-maintaining, generally useful version of the MULTICS System, including, but not limited to, the following:

- a. The System Control which provides for controlled subscriber access to the MULTICS facilities and the maintenance of subscriber accounting information.

- b. The Development Tools used to create and maintain new versions of MULTICS.
- c. The Standard Service System Commands and Library Routines which comprise user interfaces to the MULTICS environment, debugging tools, language processors, etc. A listing of the commands and subroutines comprising the standard service system as of approximately January 1, 1970, has been taken from the table of contents of the MULTICS Programmer's Manual and annexed hereto as Exhibit B2. This listing does not contain the names of the individual procedure and data segments comprising these commands and subroutines.

## EXHIBIT B2

### STANDARD SERVICE SYSTEM COMMANDS

addname	list
archive	listacl
basic	login
bindarchive	logout
changewdir	move
copy	new_proc
create	P11
createdir	print
decam	printhomedir
delete	printwdir
deleteacl	probe
deletedir	release
deleteforce	rename
deletename	setacl
dprint	sethomedir
edm	start
fortran	status
hold	unlink
link	who

### STANDARD SERVICE SYSTEM FILE SYSTEM CALLS

hcs_\$acl_add	hcs_\$fs_search_get_wdir
hcs_\$append_branch	hcs_\$fs_search_set_wdir
hcs_\$append_branchx	hcs_\$initiate
hcs_\$append_link	hcs_\$make_seg
hcs_\$chname_file	hcs_\$set_bc
hcs_\$chname_seg	hcs_\$set_consistsw
hcs_\$del_dir_tree	hcs_\$set_copysw
hcs_\$delentry_file	hcs_\$set_relatesw
hcs_\$delentry_seg	hcs_\$star
hcs_\$fs_get_brackets	hcs_\$status
hcs_\$fs_get_dir_name	hcs_\$terminate_file
hcs_\$fs_get_mode	hcs_\$terminate_name
hcs_\$fs_get_path_name	hcs_\$terminate_noname
hcs_\$fs_get_ref_name	hcs_\$terminate_seg
hcs_\$fs_get_seg_ptr	hcs_\$truncate_file
hcs_\$fs_move_file	hcs_\$truncate_seg
hcs_\$fs_move_seg	

EXHIBIT B2

STANDARD SERVICE SYSTEM MISCELLANEOUS CALLS

alloc\_  
area\_  
check\_star\_  
clock\_  
com\_err\_  
condition\_  
cv\_bin\_  
cv\_dec\_  
date\_time\_  
decode\_object\_  
equal\_  
expand\_path\_  
freen\_  
get\_group\_id\_  
get\_pdir\_  
get\_process\_id\_  
GIOC Calls  
    hcs\_\$assign  
    hcs\_\$list\_size

GIOC Calls  
    hcs\_\$list\_change  
    hcs\_\$list\_connect  
    hcs\_\$safety  
    hcs\_\$get\_cur\_status  
    hcs\_\$get\_status  
    hcs\_\$list\_size  
    hcs\_\$unassign  
  
ioa\_  
make\_obj\_map\_  
move\_  
ms\_  
reversion\_  
signal\_  
stack\_frame\_  
ti\_  
tio\_  
unique\_bits\_  
unique\_chars\_  
unwinder\_