Notes from Task Force on Computing
Meeting on Communications/Networking
Held February 12, 1979

1. Networking activities at Stanford Computing Centers

A. For terminal connections, most or all use
   - phone company lease lines (point to point)
   - phone company dial-up lines (switched)
   - Stanford-owned hardware lines

B. Connections to national "network systems" include
   - ARPANET - A/I, Sumex, SCORE
   - TYMNET - Sumex, Campus Facility
   - TELNET - Sumex, Campus Facility

C. Local Area Networking
   - A/I is developing DIALNET, which will permit both local area connections
     (fairly inexpensively) and connections to computers with dial in ports in
     other places in the world (not so inexpensive depending on distance and
     time of day)

   - Campus Facility is implementing both DECNET (for DEC computer inter-
     connections) and SNA (for IBM devices/computer)

   - The large DEC CPU community is investigating some version of ETHERNET
     as a local area network connecting Margaret Jacks, new SCIP building,
     Sumex, and possibly GSB/LOTS. This link would permit transferring messages
     and files between CPU's--thus allowing access to many CPU's from a given
     terminal (the TRAN switch on the Campus Facility does the latter but not
     the former)

   - A consultant, Ari Ollikainen, has been retained and will be working under
     Chuck Dickens and Ed Feigenbaum in exploring networking alternatives.

2. Some issues discussed

A. Non standardization of computer terminals.

   This is already a problem at some existing facilities, and will become a
   greater problem when we attempt to communicate with a large number of
   diverse CPU's over a network.

B. Commercially available local area networks.

   None appear to exist today. AT&T has its ACS packet network but is
   encountering regulatory problems causing delays. Commercial ETHERNET's
   will probably be available in 3-5 years. XEROX and DEC are working on this.
There is a trade-off with ETHERNET's between length and bandwidth, although this can be overcome by creating "gateways" between multiple ETHERNETS.

The area is complex. We will need to proceed carefully to avoid a boondoggle. Tom Rindlfliesch identified many key concerns on his handout.

C. Reasons for a network.

Les Earnest felt access to a very, very large storage center (and perhaps laser printers) might justify a high bandwidth network, in which case the electronic mail part is a bonus.

Tom Rindlfliesch discussed other reasons, building on the Booz, Allen and Hamilton (Gib Hoxie) presentation at the prior meeting).

Psychological aspects were touched upon. There is a barrier to learning how to use computerized mail, etc.--however, once overcome, people rarely go back--and generally start asking for more (features, capabilities, faster bps rates, etc.).

3. Brief notes from facility presentations

A. LOTS - Terminals only. Have 32 in Terman which are hardwired (operate at 9600 bps)--used Ad Hoc protocols which may be a future problem.

B. Campus Facility - support 2780 type Remote Job Entry (RJE) with 8 lines operating at 2400 bps or 4800 bps--working on standardizing terminals, developing full screen (page mode) terminal editing as work processing enhancement, may use microcomputer as concentrator (using work done at SLAC).

C. Sumex - Early efforts were in connecting terminals to host, but now need to interconnect small CPU's in flexible manner as numbers (of small CPU's) grows rapidly--we need a mechanism for intelligently planning a networking environment. Probably needs to be incremental in implementing to avoid catastrophe.

D. SLAC - Developing smart terminal interface which will allow 4 terminals to share a line. Also working on a ETHERNET derivative called AERIAL. The "ring" is scheduled to start operation in October 1979--and will create demands for external access to SLAC Computing Facilities. May join a national network such as TELENET.

E. IMSSS - Have minimized phone company costs by building/buying most of their terminal support facilities. They have a voice synthesizer which can be "commanded" by touch tone phone codes to read back stored messages.

F. RLIN - Have six owners (Stanford, Yale, Columbia, Univ. of Penn., Univ. of Mich., and N. Y. Public) and several others about to join (Princeton, Cornell, Dartmouth, John Hopkins, Rutgers, Iowa and Iowa State, NYU, and CUNY). Looking at Host to Host links with OCLC, Wash., and Library of Congress. Expect to support 600-1000 terminals, which may require regional CPU sites. On January 1, 1981, Library of Congress plans to invoke new coding scheme--which means libraries must close existing card catalogs and start new ones. This will cause movement towards new storage forms.
(microfische, on-line catalogs, etc.). The amount of records stored may require move to new technology, such as video disks. Updating/synchronizing distributed data bases will be a tricky business.