THE LINK GUIDE

An overview of networking within IFCTR computers

for information to
IFCTR staff and guests

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INTRODUCTION

This document provides a guide on the use of network services to login on the various IFCTR computers, and to exchange data within them and with the outside world.

This document will not tell you exactly how to do it : it will tell you where to look for !!

An introductory section provides some general users' information, as well as a description of the current configuration of computing facilities (formerly provided in a separate document).

<u>The users' information is intended for visitors and guests, and in general for those accustomed to computer usage, who want to know the peculiar arrangements at IFCTR</u> (i.e. VMS and Unix users may note that there are commands added at IFCTR, or that some commands behave differently from what they are used to; IRAF or MIDAS users may note some local arrangements which may be unfamiliar to them, etc.).

This issue 2.1 complements the previous one (2.0) of April 1992 (in turn superseding the previous 1.0 November 1990 release) and is updated to the configuration of April 1993, which include :

   The new Sun IPX as well as the Sun IPC and the three DEC 5000 workstations
   The new devices on Sun and DEC workstations
   The insertion of PC's in the LAN (with notes about the e-mail point of view)
   [The use of domain names with NIS/Yellow Pages]
   [The use of the BIND domain name server]
   [The changes to Internet numbers (now in class B)]
   [The new arrangement of "institute" subdomains within CNR]

Updates are marked with a bar on the right margin.

The old HP 1000 computer has now been definitively phased out. ‖

This document is concerned with communications between the following computers available at IFCTR (all the computers in via Bassini are connected to the same Local Area Network):

The IBM 4381 (located at SIAM, via Ampere 56) ‖
The VAX 8250 (property of ASI, located at IFCTR via Bassini 15)
The Sun workstations of IFCTR
The DECstations 5000 (property of ASI, located at IFCTR) ‖

It is not concerned with the network connections of the CAD/CAE HP9000 workstations of IFCTR, nor of the various PCs, which are all on the same LAN network. Some hints about the PC connections will be however given. The general modalities of connection should be similar to those used for the Unix workstations in case of TCP-IP links, and for VAX in case of Decnet links.

The document will be organized in an introductory section and three major sections, according to the type of network service. Three possible services will be considered :

Intro: Users' information and configuration
section A : Remote login connections
section B : File transfer connections
section C : Electronic mail connections

Within each section the communication between each computer and the others will be treated in separate subsections. Connections with the outside world will be treated together with homogeneous computers (i.e. Bitnet and Internet with IBM, or Internet with Unix, and SPAN/Decnet with VAX).

HARDWARE CONFIGURATION

The following table gives an overview of the present configuration of machines at IFCTR, including all machines in via Bassini (even if not described any further) and some machines in via Ampere. For each machine the Internet and Decnet name and number are given as applicable.

Some further machine-specific information is provided after the table.

Machine	Where is it ?	Internet		Decnet	
		name	number	name	number
VAX	VAX room	vax.ifctr.mi.cnr.it	155.253.2.40	IFCTR	39610
Sun 4/330	Terminal room	gaia.ifctr.mi.cnr.it	155.253.2.41	n/a	n/a
HP 9000	Mauro (CAE)	hermes.ifctr.mi.cnr.it	155.253.2.42	n/a	n/a
HP 9000	Andrea (CAD)	hp319.ifctr.mi.cnr.it	155.253.2.43	n/a	n/a
HP 9000	Andrea (CAD)	hp360.ifctr.mi.cnr.it	155.253.2.44	n/a	n/a
PC	Bruno	deimos.ifctr.mi.cnr.it	155.253.2.45	reserved	39809
Sun IPC	Bianca	aphrodite.ifctr.mi.cnr.it	155.253.2.46	n/a	n/a
Sun IPC	Dario	ares.ifctr.mi.cnr.it	155.253.2.47	n/a	n/a
Sun IPC	Sandro	zeus.ifctr.mi.cnr.it	155.253.2.48	n/a	n/a
Ds 5000/240	Terminal room	kronos.ifctr.mi.cnr.it	155.253.2.49	DEC	39808
PC	Mauro	phobos.ifctr.mi.cnr.it	155.253.2.80	n/a	n/a
Mac IIsi	Lucio	triton.ifctr.mi.cnr.it	155.253.2.81	TRITON	39807
PC	Students room	n/a	n/a	SELENE	39811
PC	Giuseppe	n/a	n/a	SPOCK	39810
PC	Gabriele	pan.ifctr.mi.cnr.it	155.253.2.82	PAN	39806
Sun IPX	Terminal room	helios.ifctr.mi.cnr.it	155.253.2.83	n/a	n/a
Phaser	Terminal room	io.ifctr.mi.cnr.it	155.253.2.84	n/a	n/a
PC	XMM room	hades.ifctr.mi.cnr.it	155.253.2.85	n/a	n/a
PC	XMM room	titan.ifctr.mi.cnr.it	155.253.2.86	n/a	n/a
Ds 5000/33	Lucio	poseidon.ifctr.mi.cnr.it	155.253.2.87	n/a	n/a
Ds 5000/33	Enrico	ouranos.ifctr.mi.cnr.it	155.253.2.88	n/a	n/a
CISCO router	Downstairs	bassini-gw.mi.cnr.it	155.253.2.1	SIAM03	39124
CISCO router	SIAM Ampere	ampere-gw.mi.cnr.it	155.253.1.1	SIAM01	39125
CISCO router	CILEA	milano-router.net.cnr.it	155.253.254.2	SIAM02	39123
IBM	SIAM Ampere	imisiam.siam.mi.cnr.it	155.253.1.40	n/a	n/a
Vaxstation	SIAM Ampere	imisiamx.siam.mi.cnr.it	155.253.1.9	SIAMVX	39122

The following figure shows the actual connection on the LAN and to the outside.

IBM 4381

It is a mainframe with several fast disks, located (together with its peripherals like tape drives) at SIAM in via Ampere. It is managed by SIAM (contact: Fulvio Naldi at SIAM).

The IBM can be used from via Bassini either directly using the 3270 terminals (or PCs), or preferably via remote login from any of the other machines.

VAX 8250

It has been supplied by ASI for SAX and is property of ASI, together with the majority of its peripherals. It is not planned for it to grow beyond the current configuration, which includes :

- Σ A single 625 Gb disk (being this the only disk, it is also the system disk; for this reason there are no quotas implemented : however users are warned to make sparing use of disk space). The disk name is `DUA0:`
- Σ A double-density 1600 e 6250 bpi 1/2 ' tape drive (name `MUA0:`)
- Σ A LN03 laser printer (which can be used for ASCII text, TeX, and LN03 graphics; since it is the only printer, no queue name is needed for access)
- Σ 7 terminal ports (used for the 4 VT340, 1 HP terminals and some PCs). It is planned to connect also the HP7550 plotter. No further terminals can be added (it is suggested to connect PCs over Ethernet instead).

Unix Workstations

The Sun and DECstation workstations are used for astronomical work and are managed jointly. The HP9000 workstations are used for CAD and CAE and are not treated here.

Sun

There are 5 Sun workstations. One (`helios`) is a Sun IPX and acts as substitute server. The older Sun 4/330 (`gaia`) and `helios` are also used for common users' support, while the three "*planet*" Sun IPC (`aphrodite`, `ares` and `zeus`) are intended for "personal" use. These machines are intended essentially for astronomical image processing.

Each planet workstation has its own CPU and disk (plus a floppy disk drive), and is in principle capable of running standalone (but for the software which is mounted over the network, which includes e.g. IRAF and MIDAS). The local disk is used by the system or, for the rest, by the person hosting the machine in his/her room.

`helios` is serving as master server for the NIS (formerly Yellow Pages) of which the other machines are clients. In addition all common software is installed on `helios`'s disks, which are NFS-mounted over the network, and all peripherals are connected to it. The peripheral configuration includes :

∑ Three disks (one 330 Mb and two 625 Mb units) and one disk array (2.5 Gb). Their partitioning and allocation is described in the Users' Information section.
∑ 8mm Exabyte drive (double density, 2.3 and 5.0 Gbyte, respectively as `/dev/nrst0` and `/dev/nrst8`
∑ Kennedy 1/2' inch tape drive (triple-density : 800, 1600 and 6250 bpi, respectively as `/dev/nrst1`, `/dev/nrst9` and `/dev/nrst17`)
∑ CD-ROM drive : `/dev/sr0`
∑ Apple LaserWriter printer : this can be ordinarily used to print **only** PostScript files. To print ASCII (text) files use the `vprint` or `print` command to print on the VAX LN03 printer. (`print` will use the PostScript printer if the LN03 is not accessible).
∑ floppy disk drive on `helios`
∑ older 1/4 ' cassette drive (low density) : `/dev/nrst0` (this is now located on `gaia`)
∑ Tektronix Phaser colour printer `io` (to be used for colour PostScript only)

DECstation

There are one DECstation 5000/204 workstation (`kronos`) and two DECstation 5000/33 , supplied by ASI for SAX and property of ASI. Despite the different operating system (Ultrix), the different peripherals, and the fact it is acting as nameserver and mail gateway for `ifctr.mi.cnr.it`, `kronos` is configured as one of the "*planet*" Suns, however the other two DEC "*outer planets*" are in a special client-server relation to it.

The DECstation group is in principle capable of running standalone (but for some marginal software which is mounted over the network).

`kronos` is serving as primary name server for the Internet domain `ifctr.mi.cnr.it` (although it is a NIS client of `helios`); it is also the default mail exchanger for the domain (all inbound mail is handled here). In addition Ultrix-specific common software is installed on `kronos`'s disks, which are NFS-mounted over the network, and all peripherals are connected to it. The peripheral configuration includes :

∑ Three disks (one 625 Mb unit and two 1.35 Gb s) on `kronos` (while `poseidon` has 425 Mb + 1.35 Gb, and `ouranos` 425+300 Mb). Their partitioning and allocation is described in the Users' Information section.

∑ the TK-50 compatible cassette drive is now floating, to be attached according to convenience as `/dev/nrmt0h` (eventually replacing DAT)

∑ 1/2 inch tape drive (double density 1600 and 6250 bpi, respectively as `/dev/nrmt1l` and `/dev/nrmt1h`)

∑ 4 mm DAT drive (double density 2 and 4 Gbytes, respectively as `/dev/nrmt0l` and `/dev/nrmt0h`)

∑ CD-ROM drive (`/dev/rz6`)

∑ it uses the remote printers as described above for Sun

Personal Computers

Personal computers are by definition personal. This means they are managed by whoever is hosting them in his/her room. It is of no concern to this document to list all PCs available in the institute nor to describe all possible software installed on them.

It is only recalled here the type of connection of some of those which are connected to the Ethernet LAN.

Location	Name of the PC	Type of connection
Lucio (for Macintosh)	TRITON.ifctr.mi.cnr.it	Decnet (TSSNet) and Internet (LAN Workplace and Brown Univ. tn3270)
Bruno (for MS-DOS)	deimos.ifctr.mi.cnr.it phobos.ifctr.mi.cnr.it	Internet (HP ARPA), simple product
Giuseppe or Bruno (for MS-DOS)	SELENE, SPOCK, PAN	Decnet (PCSA; may load s/w from DOS virtual disk on Vax or be installed standalone) May include X11
Andy or Bruno or Marco Pirovano (for MS-DOS)	hades.ifctr.mi.cnr.it titan.ifctr.mi.cnr.it	Internet (FTP Inc. TCP-IP), more complete product, including MS-Windows support.

SOFTWARE CONFIGURATION

Software available on VAX

IRAF, STSDAS (available, not installed), Portable MIDAS (available, not installed), PGPLOT and QDP (SAX ITESRE version), XANADU (=XSPEC+XRONOS+XIMAGE), Exosat Database, TeX and LaTeX, Supermongo, Decnet, Decnet/PCSA, UCX (TCP/IP), RdB, CDD, DTR, LSE, SCA, GKS, Fortran and C. Decnet and Decwindows are native with the operating system.

Software available on Sun

IRAF, STSDAS, RVSAO, PROS, Portable MIDAS, XANADU/XSPEC (available, deinstalled), DNI (Decnet, to be deinstalled), TeX and LaTeX, Supermongo, Lotus, SAOImage, IDL, Fortran. TCP-IP, X11 (OpenWindows) and C are native with the operating system.

Software available on DEC

IRAF, STSDAS, Portable MIDAS, PGPLOT and QDP (SAX ITESRE version), SAOImage, IDL, Decnet/Ultrix, Fortran, GKS. TCP-IP, X11 (DECWindows) and C are native with the operating system.

The following table reports a list of the various software packages installed on the main IFCTR machines (Vax and "astronomical" Unix workstations).

Initials indicate:
GB=G.Bonelli, PAC=P.A.Caraveo, LC=L.Chiappetti, BG=B.Garilli, SM=S.Mereghetti

Package	Version	System	Information		Support
IRAF	2.8	VAX	Origin	NOAO Tucson	
			Requested by:	LC,PAC	
			Installed by:	LC	limited
			Mantained by:		
			Doc:	see IRAF for Sun	
IRAF	2.10.1	Sun	Origin	NOAO Tucson	
			Requested by:	PAC,LC,BG	
			Installed by:	BG,LC	limited
			Mantained by:	BG,LC	limited
			Doc:	manuals are available in terminals' room	
IRAF	2.10.1	DEC	Origin	NOAO Tucson	
			Requested by:	LC	
			Installed by:	LC	limited
			Mantained by:	LC	limited
			Doc:	see IRAF for Sun	

Package	Version	System	Information		Support
MIDAS	91NOV	Sun	Origin	ESO Garching	
			Requested by:	BG,LC	
			Installed by:	LC,BG	limited
			Mantained by:	BG,LC	limited
			Doc:	manuals are available in terminals' room	
MIDAS	91NOV	DEC	Origin	ESO Garching	
			Requested by:	LC	
			Installed by:	LC	limited
			Mantained by:	LC	limited
			Doc:	see MIDAS for Sun	
STSDAS	1.2	Sun	Origin	STScI Baltimore	
			Requested by:	PAC,BG,LC	
			Installed by:	BG,LC	limited
			Mantained by:	BG,LC	limited
			Doc:	manuals are available in terminals' room	
STSDAS	1.2	DEC	Origin	STScI Baltimore	
			Requested by:	LC	
			Installed by:	LC	limited
			Mantained by:	LC	limited
			Doc:	see STSDAS for Sun	
PGPLOT incl. QDP	SEP91 based on 4.9	VAX	Origin	ITESRE Bologna	
			Requested by:	SAX DAWG	
			Installed by:	LC	as agreed
			Mantained by:	SAX DAWG	as agreed
			Doc:	c/o LC	
PGPLOT incl. QDP	SEP91 based on 4.9 plus NOV92 patch	DEC	Origin	ITESRE Bologna	
			Requested by:	SAX DAWG	
			Installed by:	LC	as agreed
			Mantained by:	SAX DAWG	as agreed
			Doc:	c/o LC	
XANADU	unknown	VAX	Origin	Exosat Obs. ESTEC	
			Requested by:	P.Giommi	
			Installed by:	P.Giommi, A.Wolter	
			Mantained by:		none
			Doc:	usual ESTEC documentation is received	

Package	Version	System	Information		Support
Exosat database	unknown	VAX	Origin	Exosat Obs. ESTEC	
			Requested by:	P.Giommi	
			Installed by:	P.Giommi, A.Wolter	
			Mantained by:		none
			Doc:	usual ESTEC documentation is received	
TeX and LaTeX	2.0 2.09	VAX	Origin	copy from Istituto di Fisica, Milano	
			Requested by:	GB	
			Installed by:	GB	none
			Mantained by:		none
			Doc:	some is available	
TeX and LaTeX	3.14t3	Sun	Origin	ftp from Washington University archive	
			Requested by:	BG	
			Installed by:	BG	limited
			Mantained by:		
			Doc:	online man pages	
Smongo	unknown	VAX	Origin	copy from Istituto di Fisica, Milano	
			Requested by:	GB	
			Installed by:	GB	none
			Mantained by:		none
			Doc:	some is available	
Smongo	2.0.7 ?	Sun	Origin	unknown	
			Requested by:	BG	
			Installed by:	BG	limited
			Mantained by:		
			Doc:	see smongo for VAX	
Lotus	1.0 ?	Sun	Origin	acquired from (?) Sun	
			Requested by:	BG	
			Installed by:	BG	limited
			Mantained by:		
			Doc:		

Package	Version	System	Information		Support
RVSAO	unknown	Sun	Origin	ftp from (?) SAO	
			Requested by:	BG	
			Installed by:	BG	limited
			Mantained by:	BG	limited
			Doc:		
SAOImage	1.06	DEC	Origin	NOAO Tucson	
			Requested by:	comes with IRAF	
			Installed by:	LC	limited
			Mantained by:	LC	limited
			Doc:	some available	
SAOImage	1.06	Sun	Origin	NOAO Tucson	
			Requested by:	comes with IRAF	
			Installed by:	LC	limited
			Mantained by:	LC	limited
			Doc:	some available	
IDL	2.2.1	Unix	Origin	acquired from RSI : 1 node locked license on zeus, + 1 floating network license	
			Requested by:	SM,LC	
			Installed by:	SM,LC	limited
			Mantained by:		RSI
			Doc:	manuals available	
PROS	2.0	Sun	Origin	CfA Cambridge Mass	
			Requested by:	SM,BG	
			Installed by:	SM,BG	limited
			Mantained by:	SM,BG	limited
			Doc:	some available	

Networking and system software

Package	Version	System	Information		Support
UCX	1.3	VAX	Origin	Digital	
			Requested by:	ASI	
			Installed by:	LC	yes
			Mantained by:	LC	yes
			Doc:	manuals available	
TCP-IP	??	PC	Origin	FTP Inc.	
			Requested by:	Pirovano	
			Installed by:	Andy, Bruno	limited
			Mantained by:	Pirovano	yes
			Doc:	manuals available	
Decnet/ PCSA	unknown	VAX + PCs	Origin	Digital	
			Requested by:	BG,GB	
			Installed by:	GB	limited
			Mantained by:		
			Doc:	manuals c/o GB	
ASI bundle	various	VAX and DEC	Origin	Digital	
			Requested by:	ASI	
			Installed by:	LC	none
			Mantained by:		none
			Doc:	manuals available	

The ASI bundle includes : on VAX RdB, CDD, DTR, SCA, LSE and GKS, and on DEC GKS. These products have been installed in the first version they have been received and are not used nor supported. Further versions may be available but have not been installed.

The following products are considered together with the operating system, even if they are sold separately, because of their importance : Fortran compiler on Sun; Fortran and C compiler on VAX, Fortran and Decnet/Ultrix on DEC.

USERS' INFORMATION

Guests without account wanting to access their remote node are referred to the "Remote Login" introduction in Section A (or to the **Quick Reference Card**).

All users should note that updated useful information is periodically posted as *news files*. There are separate news files for VAX and Unix, but they are accessed using a similar command `news`. A list can be obtained using the command `news list`. **Users all encouraged to read the news**.

Having an account on VAX

User accounts can have any name (first name, surname, initials etc. ; students' accounts usually are equal to the surname). Once an account is created (with no password or with password `ABCDEF`), it is care of the user to set a password for it with command `SET PASSWORD`.

Disk space on VAX

Each `user` will have as home directory `DUA0:[user]`. All his/her files and subdirectories will be created here. Users are warned that for technical reasons it is not possible to enable quotas on disk `DUA0:` : therefore it is **their responsibility** to avoid their disk space grows too big !!

In order to avoid problems with disk space, directories and files are assigned by default a version limit of 5 (no more than 5 versions of same file can exist at any time). The *system login* and *logout* procedures will take care of reducing this to 2 versions (1 for `.EXE` files), so no more than 2 versions of the same file survive across a logout. Additionally they will delete (unconditionally or on request) a number of temporary files (e.g. those created by TeX or Fortran).

Login procedure on VAX

Each user is free to set up his/her own `LOGIN.COM` to add his/her own commands or to override the *system login procedure* (described further below). No standard `LOGIN.COM` will be provided.

Home directory arrangement

It is suggested that users do not keep "normal" files, but only subdirectories or "required" files (created by system, or like `LOGIN.COM`) in their home directory. This is much neater.

Mail users are encouraged to create a mail subdirectory to avoid having lots of `.MAI` files liying around. For more helpful hints see `NEWS 10`.

may need a `.SMONGO` file (ask Bianca for a template) : this has to reside in the home directory.
Users of the `EDIT/TPU` (EVE) editor may wish to have an `EVE$INIT.EVE` file (ask Lucio for a template)
Instructions for IRAF users are reported further below.
If the user has files named `LOGOUTMSG.COM` and `LOGOUT.COM` they are executed (in this order) when the user logs out.

System login procedure

There are a number of things which are automatically set up for the user by the system login procedure (or the system startup procedure). These include :

setting necessary symbols and logical names to invoke commonly used programs *et sim.*
typing the message of the day (**please read it** !)
setting the terminal appropriately
setting the process name according to user and terminal (e.g. `LUCIO_TNA2, TANZI_TXA4`)
setting a number of local commands, including some deviations from usual VMS usage (so-called UNIQ interface; see below)
setting default file protection to read/execute for world and group (anybody can read your files but not tamper with them), leaving of course full access for owner
doing disk cleanup as described above (part is done at logout)
setting the prompt to the last two components of the current directory path.

Local arrangements at IFCTR

The commands in the UNIQ interface with modified VMS functionality are :

`DIR` provides a "long" directory listing (use `DIRE` for a short one)
`DELETE` deletes automatically all versions of a file (you do not have to specify `;*` at the end). Use `VMSDELETE` if you need the original VMS command.
`RENAME` allows only change of name in the same directory (`MOVE` is provided to change directory with same name). Use `VMSRENAME` if you need the original VMS command.
`TYPE` stops at each page
`FTP` uses the Unix interface

The UNIQ commands which add functionality to VMS (either allowing to issue Unix-like commands or to issue new commands) are briefly listed below (for a full description see separate documentation for UNIQ) :

```
unalias, pwd, his[tory], date, who, ping, echo, mkdir, cd, rmdir

browse, status, off, q[ueue], protuser, protother, qdisk, qdir, size,
deprint, id[entify], tape, isup, elite, small, landscape
```

In particular users may like the fact that directory related commands (`DIR`, `CD`, `MKDIR` and `RMDIR`) offer the possibility to address directories in a more friendly way than usual VMS (similar to Unix or DOS). See the UNIQ documentation, but note the following forms :

```
CD sub1           for SET DEF [.sub1]
CD \dir1          for SET DEF [dir1]
CD sub1\sub2       for SET DEF [.sub1.sub2]
CD disk:\dir1     for SET DEF disk:[dir1]
```

In addition `CD` (to be used instead of `SET DEF`) checks the existence of the directory *before* going there, and also updates the current prompt, so that you always know where you are (if you get lost issue command `PROMPT`).

Users may also note that the `elite`, `small` and `landscape` commands print with neater fonts than the default `PRINT` command.

The UNIQ documentation contains <u>instructions about customization</u> of the above (like disabling the unusual behaviour of `DELETE` and `RENAME`, defining a different format for `DIR`, defining a different prompt).

Having an account on Unix

It is important that users understand that they will have a **single** (NIS) account valid on **all** Unix machines (Sun and DECstation). Users shall not be confused by this fact : each workstation is a separate CPU, and they will be using the CPU on which they logged in. However, since all disks are shared via NFS, they can (and typically will) be accessing disks on a remote machine.

User accounts can have any name (first name, surname, initials etc. ; students' accounts usually are equal to the surname; if an user has also a VAX account in general the same name will be used; however deviations are possible since Unix accounts have to be shorter than 9 characters). Once an account is created (with no password), it is care of the user to set a password for it with command `passwd`. Users shall note that they will also have a mail alias, so that mail sent to `alias@ifctr.mi.cnr.it` reaches them on one machine (one only) of their choice. Usually the alias is the same as the Unix and VAX account name, but does not have to.

Disk space for Unix workstations

The disk arrangement of the Unix workstation is shown in the figure on next page. Each physical disk includes one or more *filesystems*. The system disk of each machine always includes the `/` and `/usr` filesystem (for DECstation also `/var`) which are local (not visible over the network). Planet workstations have an additional filesystem named as the machine, in addition they can all see the `/usr` of `helios` as `/sunusr` (all DECstations see also the `/usr` of `kronos` as `/decusr`) (Public filesystems on `helios`, visible from any Sun and most DECs, are `/home`, `/data` and `/data1`, while public filesystems on `kronos`, visible from the DECs are `/decsw` and `/decdata`). `/home`, `/data` and `/decdata` are described here below. `/data1` and `/decsw` hold public software. In addition `/scratch` can hold users' temporary data.

Each `user` will have in general as home directory `/home/user` (only *planet* workstations masters will have it under `/planet/user`). He/she will have an additional personal directory `/data/user` (or if a DECstation user instead or also `/decdata/user`). In principle all users' permanent files and subdirectories (programs, text) should be put under `/home/user`, while data files for IRAF and MIDAS must be kept under `/data/user` (see below in the IRAF and MIDAS sections). Both disks are subject to quota : in particular the quota on `/home` is very limited, therefore users are strongly encouraged to keep their data files on `/data.`

In general users shall not access any other disk (except for planet workstation owners and for temporary scratch directories on `/scratch`: see `news 14` for information).

Unix users with a VAX account may access their VAX directory `DUA0:[user]` as `/vax/user`. However legibility of VAX files depends on the format in which they are stored (ASCII text files must be `STREAM_LF`; binary FITS files can be shared transparently; most other files in generally don't).

Login procedure in Unix

Experienced Unix users shall note the following local arrangements concerning the login files :

The default shell for users is the C-shell (`csh`). Choice of other shells is possible (Bourne `sh`, `tcsh` on Sun, `sh` and Korn `ksh` on DECstation), however these are not supported and users' will lose the benefit of the common Institute setup.

Users **shall not** use `.login` and `.cshrc` as *private* login files. These files are arranged at account creation as links to a standard systemwide version. A private login file can be created (in the home directory) with the name of `.mycshrc`.

Home directory arrangement

It is strongly suggested that users do not keep "normal" files, but <u>only subdirectories or "required" files</u> (typically system *hidden* files) in their `/home` and `/data` directory. This is much neater.

In particular there are a number of hidden files (the name starts with a dot and they are not visible in "short" directory listings) which are created during the account setup. Some of them are links to a standard systemwide version and shall not be modified (indicated as   ). Some others are provided for convenience but can be freely modified by the user (indicated as $\sum$).

        `.cshrc` : the (system) login file executed in each shell and window
        `.login` : the (system) login file executed only once at true login
        `.logout` : the (system) logout procedure
        `.ttyswrc` (these are used for definition of functional keys under some common window terminal emulators)
        `.xinitrc` (needed on Sun for OpenWindows)
$\sum$ `.mycshrc` : the optional private login file
$\sum$ `.mypaths` : an optional private file to set up paths
$\sum$ `.sunview` (on Sun under SunView defines what windows are open when you start the window system)
$\sum$ `.openwin-init` (on Sun under OpenWindows defines what windows are open when you start the window system)
$\sum$ `.netrc` (for ftp users; see section B on file transfer, and `help netrc`)
$\sum$ `.defaults` (on Sun under SunView only; standard settings; managed by the defaults editor)
$\sum$ `.Xdefaults` (on Sun under OpenWindows and on DECstation) Contains standard settings, to be edited by experts only.
$\sum$ all other dot-files may be created by some system application to store standard settings
        `default.DECterm` (on DECstation only; standard setup for window terminal emulator)

System login procedure

There are a number of things which are automatically set up for the user by the system login procedure (emulated by the `.cshrc` and `.login`) including :

> setting the appropriate path
> setting the terminal
> typing the message of the day (**please read it** !)
> selecting the window system (Sun only, see below)
> setting environment variables and aliases to invoke commonly used programs *et sim.*
> setting a number of local commands, including some deviations from usual Unix usage (so-called UNIQ interface; see below)
> setting the prompt to the last component of the current directory path (plus the command number)

Sun users shall in particular note that the `.login` procedure will offer them four alternatives for the window system, in order :

> SunView with default (`.sunview`) window configuration
> SunView with configuration suitable for IRAF (see IRAF section below)
> OpenWindows with configuration suitable for MIDAS (see MIDAS section below)
> OpenWindows with default (`.openwin-init`) window configuration

A negative reply to all alternatives will log in as console. One can still enter SunView or OpenWindows with commands `sunview` and `ow` (or `owin`), and IRAF or MIDAS with `ifciraf` or `ifcmidas`.

The above does not apply to DECstation, which presents a prompter window and always starts in DECWindows (using Motif as default window manager).

Local arrangements at IFCTR

The UNIQ commands which add functionality to Unix (either allowing to issue VMS-like commands or to issue new commands) are briefly listed below (for a full description see separate documentation for UNIQ) :

```
help, dir, copy, del[ete], ren[ame], move, type, search, edit, phone

makexec, qdisk, overwrite, browse, status, off, q[ueue], protuser,
protother, qdir, qdisk, size, deprint, id[entify], tape, isup
```

The following Unix commands are modified in a way customary in Unix :

```
cd, pwd, rmdir, cp, rm, his
```

In particular `dir` uses a long directory format, `cd` updates the current prompt, `rmdir` does an <u>unconditional</u> recursive directory removal, `cp` and `rm` are <u>not protected</u> (while `copy` and `delete` are and should be used instead).

The UNIQ documentation contains <u>instructions about customization</u> of the above .

Using printers from Unix

To print one has commands :

- Σ `psprint` or `lpr` to print black-and-white PostScript to the Apple,
- Σ `cprint` to print colour PostScript to the Phaser (use sparingly), and
- Σ `print` or `vprint` to print non-PostScript files from Unix : normally they both go to the LN03 (but if unavailable `print` redirects the prints to the Apple converting text into PostScript).

See `news 4` for details.

Using IRAF

Entering IRAF

All IRAF users (particularly those used to a standard arrangement) should note the following peculiar local arrangement at IFCTR. From whatever machine and window environment, the correct command which **must** be used to enter IRAF in the proper way is :

    ifciraf

On Sun

By default IRAF runs under SunView on Sun. If you are *logged as console* and issue command `ifciraf` (or if you enter IRAF at *login level* selecting "*IRAF SunView*"), the SunView environment is started with a specific window arrangement including :

    a console window
    an Unix window (blue border)
    a gterm window where IRAF cl is running (red border), with graphics
    an imtool image display

The window arrangement is controlled by file `~/iraf/.sunview` (the `.sunview` file in the `iraf` subdirectory of the user's home directory, usually `/home/user/iraf`). Note that this is different by the default `.sunview` file in the users' home directory (used by "*default SunView*").

This file and the `iraf` subdirectory will be created when the account is set up. The `iraf` subdirectory will contain also an `uparm` subdirectory and a `login.cl` file. Note that `ifciraf` always runs the IRAF `cl` from the `iraf` subdirectory.

If you are already in SunView, issuing command `ifciraf` from a gterm window will start IRAF cl from the `iraf` subdirectory *and in such window*. It is not allowed to run IRAF in other window types, since it will not work.

If you are logged in remotely from a terminal, issuing command `ifciraf` will start IRAF `cl` from the `iraf` subdirectory. If you are on a VAX terminal issue a `stty vt240` as first command in IRAF. One will not be able to do image display, but can do graphics according to the terminal capability (however please try to avoid this use of IRAF, since it will interfere with who is working on the console).

If you are in OpenWindows, issuing command `ifciraf` will open two additional windows :

    a xterm window where IRAF cl runs, with graphics
    a saoimage image display

In the `xterm` window do a `stty xterm` as first command in IRAF, if instructed to do so (this might be unnecessary).

If you are already in OpenWindows and issue command `ifciraf` from an `xterm`, this will start IRAF `cl` from the `iraf` subdirectory in the `xterm` window. Again issue a `stty xterm` as first command in IRAF.

On DECstation

If you are in DECWindows (Motif), issuing command `ifciraf` will open two additional windows :

> a `xterm` window where IRAF `cl` runs, with graphics
> a `saoimage` image display

otherwise it will simply start IRAF `cl` from the `iraf` subdirectory. If, instead of `xterm`, you are using a terminal or `dxterm`, you should issue an `stty vt240` once in IRAF, but the graphic performance will be bad.

The same `iraf` subdirectory described above in the Sun case will be used.

Note for users of both Unix systems

Users of both Sun and DECstation will have in general three copies of the `login.cl` file in their `iraf` subdirectory :

> `login.cl.SUN`   version appropriate for Sun
> `login.cl.DEC`   version appropriate for DECstation
> `login.cl`   a copy of one of the above for the system last being used

The `ifciraf` command will copy the `SUN` or `DEC` file over `login.cl` before starting IRAF. Therefore do not apply any editing to `login.cl` (which is transient and will be overwritten) but instead to one or both of the other files (both if the editing applies to both systems).

On VAX

It is possible to run IRAF on VAX (although only an older version is kept there mainly to support the case of a failure on the Unix tape drive; anyhow only one-dimensional work can be done since the VAX has no image display). The command is always : `ifciraf`.

An `[.IRAF]` subdirectory with an `uparm` subdirectory and a `login.cl` file. must exist in the users' home directory. Note that `ifciraf` always runs the IRAF `cl` from the `[.IRAF]` subdirectory. The `[.IRAF]` subdirectory is not created by default, since most users do not need this on Vax.

Disk space in IRAF

IRAF users shall be familiar with the way IRAF handles data files. All IRAF image files are double : an image has an header portion (`file.imh` or `file.hhh`) and a data portion (`file.pix` or `file.hhd`). For this reason **one shall never copy or manipulate IRAF files using system commands, but only from within IRAF**. This includes the case of saving files to tape for export to other sites (**usage of the FITS format is strongly recommended since it is the only truly portable format**). Failure to comply with the above rules may result in lot of **trouble** in accessing the files (**usually in the impossibility to access them**).

In particular header and data portions can be stored in separate directories. The traditional arrangement in IRAF is to store headers in the current directory and data in the `imdir` directory. At IFCTR two options are offered at the moment of setting up the account, according to the *Cuius Regio Eius Religio* principle :

Traditional (Bianca's) arrangement. Headers are stored in the `iraf` subdirectory (usually `/home/user/iraf`) and data in the `imdir` directory (usually `/data/user/iraf` at start).

Simplified (Lucio's) arrangement. Headers and data are both stored in the same `imdir` directory (this requires a `chdir  imdir` to be added to the default `login.cl`, which is done during setup).

Users shall note that an IRAF file stored on Sun, or DEC, or VAX is **not compatible** with an IRAF file stored on another system. A neat way to overcome all these problems is to keep data in FITS format (e.g. in dedicated subdirectories for each object like `/data/*user*/fits/*object*)`, and to load within IRAF only those needed during a session.

On Sun

The IFCTR arrangement for Sun IRAF users is to use as `imdir` the directory `/data/*user*/iraf`. This is set up automatically in the appropriate `login.cl` and the user has nothing to do to use it.

The headers can go in `imdir` or in `/home/*user*/iraf` according to the policy chosen at setup (see previous section).

On DECstation

The current arrangement for DEC IRAF users is to use as `imdir` the directory `/decdata/*user*/iraf`. Again this is set up automatically in the appropriate

`login.cl` and the user has nothing to do to use it.

The headers can go in `imdir` or in `/home/`*`user`*`/iraf` according to the policy chosen at setup (see previous section).

Note for users of both Unix systems

The above arrangement keeps separate IRAF files for Sun and DECstation. This is enforced automatically by `ifciraf` which selects the appropriate `login.cl`. This is very good to avoid the confusion which will arise if files in Sun and DEC internal format were stored in the same directory. There is no way for IRAF running on one system to automatically read correctly data written on the other system, or to tell whether they are OK for a given system.

The recommended behaviour for IRAF users on both systems is to **keep the bulk of their data in FITS** (on either machine), and to load (on one or the other machine) only those used in the current IRAF session. **Usage of FITS will also allow easy exchange with MIDAS**.

It is also possible to access files stored on the other machine using *IRAF networking*, and specifying explicitly the machine on which the file resides (**but this will not perform any conversions !!**); note the following example:

> An user running on Sun accesses files created in Sun-IRAF format
> a file stored on Sun as `[/data/user/iraf/]file`
> a file stored on DEC as `kronos!/decdata/user/iraf/file`
>
> An user running on DEC accesss files created in DEC-IRAF format
> a file stored on DEC as `[/decdata/user/iraf/]file`
> a file stored on Sun as `helios!/data/user/iraf/file`

The statement in issue 2.0 of this document claiming that IRAF networking will handle data conversion **was wrong.** There is **no way** to automatically convert Sun and DEC formats, unless one uses an intermediate FITS file.

On VAX

The IFCTR arrangement for VAX IRAF users is to use as `imdir` the directory `[IRAFDATA.`*`user`*`.iraf]` This is set up automatically in the appropriate `login.cl` and the user has nothing to do to use it.

The headers can go in `imdir` or in `[`*`user`*`.iraf]` according to the policy chosen at setup (see general section).

Note that VAX IRAF files cannot be accessed at all from Unix. It is necessary to pass thru FITS files, which can be accessed transparently as `/vax/user/dir/file.`

Accessing peripherals in IRAF

This section concerns usage of tape drives and printers. In case of doubt user shall note that **the IRAF name of tapes and printers is clearly written on the coloured labels attached to the devices themselves**.

On Sun and DECstation

Both Apple and LN03 <u>printers</u> can be used for <u>IRAF graphics</u> from any workstation. Their IRAF names are respectively `lpr` and `ln03`. (Note that using the LN03 implies a file transfer to the VAX, and a postprocessing there - converting SGI format to LN03 - which may imply a few minutes delay).

Only the Apple printer is used for <u>hardcopies</u> (e.g. the ones initiated by `imtool` and `gterm`).

It is not possible to access directly any printer for <u>text printing</u> within IRAF. It is suggested to redirect the text output to a file, and to `vprint` this file. It is not possible to use a pipe with `vprint`.

It is possible to <u>read and write FITS tapes</u> from IRAF *withour any limitations in the current release of IRAF* (see `news 1`, `news 3` and `help devices`). Current tape drive names are (older names may be supported as aliases):

Kennedy, 800 bpi	`mts800`	attached on `helios` (see note below for
Kennedy, 1600 bpi	`mts1600`	usage from other machines)
Kennedy, 6250 bpi	`mts6250`	
Exabyte, 2.3 Gbyte	`mtsexa2`	
Exabyte, 5.0 Gbyte	`mtsexa5`	
Digital, 1600 bpi	`mtd1600`	attached on `kronos` (see note below for
Digital, 6250 bpi	`mtd6250`	usage from other machines)
DAT 2 Gbyte	`mtdat2`	
DAT 4 Gbyte	`mtdat4`	
Usage of the QIC or TK50 cassette is no longer possible in IRAF		

These units can be used directly from an IRAF running on `helios` or `kronos`, depending on which station the drive is attached to. To use them from IRAF running on a planet workstation, the drive name **shall** be prefixed by `sun!` or `dec!` respectively (e.g. `sun!mts800`). Note that the `helios!` or `kronos!` notation **does not work**, you **must** use `sun!` or `dec!` (this is used to prevent conflicts with IRAF networking for disk access).

<u>On VAX</u>

IRAF on VAX has access to the LN03 printer (`ln03`) and to the tape drive (`mta` or `mta.1600` at 1600 bpi, `mta.6250` at 6250 bpi). Networked access between VAX and Unix is not possible.

Using MIDAS

Entering MIDAS

All MIDAS users (particularly those used to a standard arrangement) should note the following peculiar local arrangement at IFCTR. From whatever machine and window environment, the correct command which **must** be used to enter MIDAS in the proper way is :

```
ifcmidas
```

This replaces the `$inmidas` and `$gomidas` commands, takes care of all necessary set up, and suppresses the annoying question about "MIDAS unit". At IFCTR each user can run a single copy of MIDAS at any one time (so called `NOPARALLEL` mode).

On Sun

MIDAS can only run under OpenWindows on Sun to have imaging capabilities. If you are *logged as console* and issue command `ifcmidas` (or if you enter IRAF at *login level* selecting "*MIDAS OpenWindows*"), the OpenWindows environment is started with a specific window arrangement including :

> a console window
> an Unix window (blue letters)
> a window where MIDAS is running (red letters) as a 00 MIDAS unit

The window arrangement is controlled by file ~/midas/.openwin-init (the .openwin-init file in the `midas` subdirectory of the user's home directory, usually `/home/`*user*`/midas`). Note that this is different by the default .openwin-init file in the users' home directory (used by "*default OpenWindows*").

This file and the `midas` subdirectory will be created when the account is set up. The `midas` subdirectory is the `MIDWORK` directory : the place where an user can put his/her private MIDAS procedures (`.prg` files), including the important `login.prg`.

Note that `ifcmidas` always runs MIDAS using this as `MIDWORK`, but starting from the user data directory (see below section on disk arrangement).

If you are already in OpenWindows, issuing command `ifcmidas` from a window will start MIDAS *in such window* and with full imaging capabilities (00 MIDAS unit).

In both cases the graphics and image windows shall be started within MIDAS (manually with `CREATE/DISPLAY` and `CREATE/GRAPHICS`, in the `login.prg` or in a separate `.prg` file, maybe with separate `.prg` files according to desired number, size and position of graphic windows).

<u>If you are logged in remotely from a terminal or you are in SunView</u>, issuing command `ifcmidas` will start MIDAS without graphic capabilities (zz MIDAS Unit).

On DECstation

The command `ifcmidas` will simply start MIDAS in the current window. It is suggested that this is a separate window not to be used for anything else, since MIDAS does funny things with terminal setup.

The same `midas` subdirectory described above in the Sun case will be used.

If you are running under DECWindows, you will have graphic capabilities (00 MIDAS unit) as described above for Sun. If you are running remotely graphics is disabled (zz MIDAS unit)

Note for users of both Unix systems

There are no special notes for what concern entering MIDAS.

DEC users shall note that DECwindows is click-to-type, so they should **remember to click** in the top bar when moving from one window (terminal, graphics, image) to another before starting any input.

Disk space in MIDAS

MIDAS users shall be familiar with the way MIDAS handles data files. MIDAS will access files in the directory from which it started (this is called the data directory, and is defined below for Sun and DECstation), or from any other directory if the complete path name is used.

Users shall note that a MIDAS file stored on Sun, or DEC (or VAX) is **not compatible** with a MIDAS file stored on another system. A neat way to overcome all these problems is to keep data in FITS format (e.g. in dedicated subdirectories for each object like /data/*user*/fits/*object*), and to load within MIDAS only those needed during a session.

On Sun

The IFCTR arrangement for Sun MIDAS users is to use as data directory the directory /data/*user*/midas. This is set up automatically and the user has nothing to do to use it.

The MIDWORK directory is generally /home/*user*/midas (or anyhow a subdirectory of the user's home directory).

On DECstation

The current arrangement for DEC MIDAS users is to use as data directory the directory /decdata/*user*/midas. Again this is set up automatically and the user has nothing to do to use it.

The MIDWORK directory is generally /home/*user*/midas (or anyhow a subdirectory of the user's home directory).

Note for users of both Unix systems

The above arrangement keeps separate MIDAS files for Sun and DECstation. This is enforced automatically by ifcmidas which selects the appropriate data directory. This is very good to avoid the confusion which will arise if files in Sun and DEC internal format were stored in the same directory. There is no way for MIDAS running on one system to automatically read correctly data written on the other system, or to tell whether they are OK for a given system.

The recommended behaviour for MIDAS users on both systems is to **keep the bulk of their data in FITS** (on either machine), and to load (on one or the other machine) only those used in the current MIDAS session. **Usage of FITS will also allow easy exchange with IRAF**.

Accessing peripherals in MIDAS

This section concerns usage of tape drives and printers. In case of doubt user shall note that **the MIDAS name of tapes and printers is clearly written on the coloured labels attached to the devices themselves**.

On Sun and DECstations

Both Apple and LN03 <u>printers</u> can be used for <u>MIDAS graphics</u> (`ASSIGN/PLOT`, `SEND/PLOT` and similar) from any Sun. Their MIDAS names are respectively `lasera` and `laserb`. (Note that using the LN03 implies a file transfer to the VAX - which may imply a few minutes delay).

Only the Apple printer `lasera` and the Tektronix Phaser `colour` are used for <u>hardcopies</u> (e.g. `ASSIGN/DISPLAY` or `COPY/DISPLAY`).
Only the LN03 `laserb` is used for text printing (`ASSIGN/PRINT`)

The colour printer (with MIDAS name `colour`) can be used *so far only* for <u>hardcopies</u> (e.g. `ASSIGN/DISPLAY` or `COPY/DISPLAY`). **Attempts to use it for graphics will fail and produce black-and-white output.**

It is possible to <u>read and write FITS and IHAP tapes</u> from MIDAS Current tape drive names are:

Kennedy, 800 bpi	`tapes800`	on `helios`
Kennedy, 1600 bpi	`tapes1600`	
Kennedy, 6250 bpi	`tapes6250`	
Exabyte, 2.3 Gbyte	`tapeexa2`	
Exabyte, 5.0 Gbyte	`tapeexa5`	
Digital, 1600 bpi	`taped1600`	on `kronos`
Digital, 6250 bpi	`taped6250`	
DAT 2 Gbyte	`tapedat2`	
DAT 4 Gbyte	`tapedat4`	

Usage of the QIC or TK50 cassette is no longer possible in MIDAS

These units can be used directly from a MIDAS running on any workstation, which will connect to the MIDAS tapeserver daemon running on `helios` or `kronos`.

Please read carefully the help files of `INTAPE/FITS` and `OUTTAPE/FITS` when you plan to transfer data to other installations. Note that : old installations, like IHAP, read only basic FITS (no floating point, blocking factor 1); new installations may read also the newer format (this is OK for MIDAS-IRAF exchange); a blocking factor of 10 is the maximum allowed by the standard and is recommended for tape efficiency (some systems, like IRAF, recognize higher blocking factors, but they are not standard).

A. REMOTE LOGIN SERVICES

A *remote login* service is defined as one which allows to open an interactive session onto a machine different from the one to which the terminal one is working on is attached.

The following table directs you where to find information about the connection you are interested on :

Refer to : IBM to IBM   (A.1.1) for Internet connections
Refer to : VAX to VAX   (A.2.2) for Decnet connections

```
          from IBM    from VAX    from Unix    from PC

to IBM    A.1.1       A.2.1       A.3.1        A.4.1
to VAX    A.1.2       A.2.2       A.3.2        A.4.2
to Unix   A.1.3       A.2.3       A.3.3        A.4.3
to PC     n/a         n/a         n/a          n/a
```

Note that the Unix case covers both Sun and DECstation. Any difference will be highlighted in the relevant section.

See also the Quick Reference Card for helpful hints.

In particular visitors without an account at IFCTR should note the possibility of logging on their home computer as follows:

if remote computer is a Decnet `node` :

From a terminal log on `IFCTR` Vax as user `GUEST`
then specify the `node` name

if remote computer is an Internet `node.domain` :

From a terminal log on `IFCTR` Vax as user `GUEST`
then specify the full internet node with domain

A. REMOTE LOGIN SERVICES

A.1 from IBM

A.1.1 from IBM to IBMs

This section assumes you are using an IBM-3270 compatible terminal (i.e. a "full screen" terminal).

When you are logged in on the `IMISIAM` IBM, you can log in under *another* username on the *same* machine with either of the modalities described below (`PASSTHRU` and `telnet`).

From the IBM you can log in to other IBMs (and other computers with appropriate emulation) in the *Italian PVM/SNA* network only, using the command

`PASSTHRU`

followed eventually by the node name (if not you are presented a screen menu of reachable nodes). Use `PASSTHRU IMISIAM` for the local node
(`PASSTHRU` is faster for the local node, while there is no reason to use it instead of `telnet` for remote nodes).

From the IBM you can log in to *any machine in the Internet*, using the command

`telnet node`

where `node` can be the node name or Internet number (for the local node use name `imisiam.siam.mi.cnr.it`, or 155.253.1.40, the latter is faster). There is an online help (`HELP TELNET`). To access this command, you should have first executed the following commands (once in the session, typically in your profile):

`PRODOTTI` first, and `INTERNET` next

Please note the 3270 full screen emulation works perfectly if the other computer is an IBM, while if it is a VMS or Unix system you will be working in line mode (see the above HELP file for suggestions on control characters etc.).

`Files: none`

A. REMOTE LOGIN SERVICES

A.1 from IBM

A.1.2 from IBM to VAX

The direct `TELNET` connections between IBM and VAX is now supported by the current version of the UCX TCP/IP software on VAX . To login onto the VAX you should no longer pass through the Sun.

Make sure you have issued the `PRODOTTI` and `INTERNET` commands (see A.1.1), then do :

```
telnet vax.ifctr.mi.cnr.it
```

Note you will be using line mode, and your terminal will be set up strangely. You will be missing many characters from the keyboard (e.g. square brackets). There is NO good way of emulating a VT100 or like from a 3270 due to RADICAL differences in the communication protocol (I could show you at least 50 documents saying that).

```
Files: none
```

A. REMOTE LOGIN SERVICES

A.1 from IBM

A.1.3 from IBM to Unix

This is a TCP/IP Telnet connection. Make sure you have issued the `PRODOTTI` and `INTERNET` commands (see A.1.1) then do :

```
telnet name.ifctr.mi.cnr.it
```

where *name* is the name of one of the workstations (use `helios` for the Sun IPX). You will get the Unix prompt and log in normally. Note you will be
using line mode, and your terminal will be set up strangely. You will be missing many characters from the keyboard (e.g. square brackets). The only editor you can use is `vi` (in "open" mode). I have found no satisfactory way of issuing a `stty` or `tset` command (the main reason is that there is no public `termcap` for a 3270; an unofficial one is available, but does not cure all problems).

```
Files: none
```

A. REMOTE LOGIN SERVICES

A.2 from VAX

A.2.1 from VAX to IBM

This section assumes you are using a VT340 or VT100 terminal, or a suitable emulator.

There is currenlty no direct *working* telnet connection between VAX and IBM (the connection itself is operating and you can issue the command `telnet ibm`, but terminal echo is not working ... that is, you are not able to see what you type, but only the IBM replies). You can however pass through
one of the Unix workstations, or through the `SIAMVX` Vaxstation (for this refer to SIAM documentation available on `gopher`).

One way is to use your normal VAX and Unix accounts, and follow instructions in A.2.3 (from VAX to Unix) and A.3.1 (from Unix to IBM). Another way is to use *special service accounts* with no password, set up on `helios`.

If you want to use the service accounts do the following :
log on the VAX as user `SUN` (no password)
at the `helios` Sun prompt log on as user `ibm` (no password)
con la Decstation poseidon non funziona la mappatura di tastiera

If you are already logged in on the VAX, you can do a `telnet helios`, and then log on the Sun as user `ibm` .

(Note that the `ibm` account does not necessarily work through any Unix workstation. Moreover `helios` will not allow logins as user `ibm` from console, or from a Sun window, but only from a remote terminal).

With the new mode of connection, the `ibm` account on `helios` will connect to the IBM using `tn3270`, a variant of telnet which performs 3270 emulation. This assumes you are using on the VAX a terminal of class VT200 (or higher), in 80 column mode, and sets it accordingly.

Concerning the IBM often used functional keys (PF1-PF12), and other keys (like those used to go to CP or to change page), the standard VT340 keypad (see Table I) is remapped to emulate 3270 functions as shown in Table IIa. Note that `return` acts at the same time as a new line and an enter. To move the next line only use the VT340 `delete` key. The "delete-to-end-of-line" function is `<ctl-e>`. For less usual key mapping see section A.3 (Unix to IBM).

This emulation is quite good (easy keyboard mapping, good cursor movement

emulation), although it occasionally has problems with full screen displays larger than 80 columns or longer than 24 lines. If the screen looks garbled, clean it with a `<ctl-z>`.

```
Files: on VAX: [SUNPRINT.HOME.SUN]LOGIN.COM
       on Sun: /home/ibm/.login and /home/ibm/.cshrc
```

If you use telnet directly from the VAX or from Unix (instead of tn3270) to connect with the IBM (which is now an **obsolete** way, and is **not recommended**), you will be prompted to select terminal type :

then reply either `8` or `L` (to work in *full screen* or *line mode*)

If you select line mode, you will be working as an IBM old-style (teletype) terminal (this mode might be useful if you connect remotely over the network, as it is less prone to hangups)

If you select full screen mode, a software called SIM3278 will emulate a 3270 terminal for you. This involves some further details about the use of functional keys and full screen applications (e.g. `XEDIT`, `MAIL` etc.). Since this mode is quite uncomfortable, and a better 3270 emulation is offered by the `ibm` account, **it is discouraged to use this mode** for the reasons explained below.

With the current version of SIM3278 and appropriate terminal setting handled by the `ibm` Sun account, you can correctly use the arrow keys to move the cursor on the screen.

Concerning the IBM often used functional keys (PF1-PF12), and other keys (like those used to go to CP or to change page), the standard VT340 keypad (see Table I) is remapped to emulate 3270 functions as shown in Table IIb.
However you must press carriage return after each key !!!

This is sometimes inconvenient, as carriage return also moves the cursor to the next line (there is no separate "enter" key). In a few cases (screen forms, like the `NAMES` or `FILELIST` screens) you can move from one field to the next with the `TAB` (`BACKWARD` and `FORWARD`) emulated keys (see Table IIb) in a more efficient way.

One further problem with full screen applications occurs if the application writes something (typically a protected line) on the last line of the screen, or if the command line is the last line of the screen ("enter" is also a line feed !). This will cause the screen to scroll up. If you work in full screen mode all synchronization between screen positions and file positions will be lost.Try to avoid having the command line on the last line, or avoid using the particular application in full screen mode.

There are 3270 keyboard function which are badly emulated :

insert character: type `<ctl-A>`, then input your text, then press return. You will not see your text being inserted while you type, but only after you press return (this is not really too bad)

delete character: the sequence to delete one character is `<ctl-B>` followed by a return. Unfortunately this advances the cursor to the next line (which is quite uncomfortable).

goto next line : `<ctl-[>` followed by `return`

delete to end of line : `<ctl-[>` e followed by `return`

If you have an `ESCAPE` key you can use that instead of `<ctl-[>`

It is possible that a further release of SIM3278 (to be installed at SIAM) will cure some of those problems.

A. REMOTE LOGIN SERVICES

A.2 from VAX

A.2.2 from VAX to VAXes

From the `IFCTR` VAX you can most naturally login to any VAX directly reachable in Decnet (directly reachable means the other machine should be either on the Local Area Network, or have an area and number which is not "hidden", i.e. barred by network routers).

To reach a node you can always use its Decnet number, or you can use the name, provided it is registered in our local database. If you want a node registered, or to search the node name-number correspondence, please contact me. (To search the name or number you can do it yourself using the `NCP` command).

To log onto another node when logged on our VAX do :

        SET HOST *node*

(see `HELP SET HOST` for further details).

    Guests which do not have an account on our node, can log on the VAX using account `GUEST` (no password), and from there jump to their remote node.

The `GUEST` account prompts them for the name or number of the node they want to reach. Enter a valid node, and your session will be connected. When you have finished enter another node, or type 0 to exit.

    One further consideration may be useful to those which want to log on a remote node just for the purpose of editing a remote file. This is a very inefficient procedure, as any single keystroke (included cursor movements) has to travel to the remote node and be echoed back, which may make it painfully slow.

An interesting alternate solution is to edit the remote file locally, as follows :

        EDIT *remotenode*"*user password*"::*remotefilename*

This way EDIT starts (on the local node) reading the remote file in memory (this may take some time), then you can work locally very fast. When you then `EXIT` the memory content is written back to the remote file (this again takes some time). If you are unsure of the connection, you can always save a local copy, issuing a `WRITE` *localfilename* command before the `EXIT`.

Files: PROCNAME.COM and SETTERM.COM on [LOCAL.SYLOGIN]
    [SUNPRINT.HOME.GUEST]LOGIN.COM

A. REMOTE LOGIN SERVICES

A.2 from VAX

A.2.3 from VAX to Unix

The remote login connection from VAX to Unix workstations over the Ethernet LAN occurs normally via TCP-IP. In the case of the Decstations it may also occur via a Decnet emulator. You can either :

`telnet` *name* (where *name* is `helios` for the Sun IPX, `kronos` for the DECstation 5000/240 etc.)

login as user `SUN` (no password), without using a private VAX account (this is a telnet connection to `helios`)

Note that it is **no longer possible to use Decnet** to connect to the Suns

`SET HOST DEC` from your VAX account (this works for `kronos`) or

login as user `DEC` (no password), without using a private VAX account (this is a telnet connection to `kronos`)

In either cases, the login procedure on Unix should detect you are connecting from the VAX, and assumes you are using a VT200 compatible terminal. Your termcap is set up correctly for this type of terminal (in normal mode, i.e. 80-column).

If you need a different setting (e.g. if you want a 132-column smooth scroll terminal), which is recorded in the Sun `termcap` file as a *termcap_entry*, you should include the following line in your `.mycshrc` file :

```
set preferred = "termcap_entry"
```

```
Files: on VAX: PROCNAME.COM, SETTERM.COM and SUNTERM.COM on
            [LOCAL.SYLOGIN], plus [SUNPRINT.HOME.SUN]LOGIN.COM
    on Sun: /usr/local/.login and /usr/local/.cshrc
```

A. REMOTE LOGIN SERVICES

A.3 from Unix

The modality to make a remote login from Unix may be different according to the windowing environment one is in, i.e. whether one is using the bare console, a SunView window, an OpenWindows or DECWindows window or a terminal. Connections from Sun using a terminal (which is necessarily a remote logon from the point of view of the Sun) will not be considered here.

A.3.1 from Sun to IBM

This is a TCP/IP connection using telnet. See the telnet manual page in the Sun manual (or do `help telnet`). See also `help tn3270`.

A.3.1.1 from Sunview

A complete full-screen emulation to log on the IBM from the Sun is possible when you are running SunView. You should have a file `.te100rc.ibm` (possibly linked to the file of same name in `/usr/local`) in your home directory if you want to use full screen mode and have correct keyboard mapping.Then from any shell you can give the command:

```
ibm
```

This will start an (obviously blue) window, containing a VT100 emulator, and open `tn3270` (a special version of `telnet`) which puts you in full screen mode. See below A.3.1.4 for keyboard mapping.

When you log off the IBM the window will disappear.

If you use the (now **obsolete**) command `oldxibm` which, instead of tn3270, uses plain telnet, than it will make a question :

reply either 8 or L (to work in full screen or line mode)

If you select line mode, you will be working as an IBM old-style (teletype) terminal.

If you select full screen mode, a software called SIM3278 will emulate a 3270 terminal for you. This involves some further details about the use of functional keys and full screen applications (e.g. XEDIT, MAIL etc.), which are given further below.

A.3.1.2 from console

You should **not** normally use this possibility, and you cannot use efficiently the full screen mode. **This mode is therefore discouraged**.To start the connection issue command :

    `xibm` for tn3270 emulation or

    `oldxibm` then reply `L` to the next question for line mode emulation

<u>If you select full screen mode,</u> no keyboard mapping is done, and you are forced to use the default tn3270 keyboard mapping (which is quite unusual, and is reported below in A.3.1.4).

<u>If you select line mode</u>, and you will be working as an IBM old-style (teletype) terminal. Do not attempt to use full screen mode with plain telnet.

A.3.1.3 from OpenWindows

You are now able to use this possibility, and use the full screen mode. To start the connection (which automatically uses files `.xterm.ibm*` in `/usr/local` to have correct keyboard mapping) issue command :

    `ibm`

This will start a blue `xterm` window, and run `tn3270` (a special version of `telnet`) which puts you in full screen mode. This will appear identical to the version running under SunView. See below A.3.1.4 for keyboard mapping.

When you log off the IBM the window will disappear.

    If you use the (now obsolete) command `oldxibm` which, instead of tn3270, uses plain telnet, than it will make a question

    then reply `L` or `8` to the next question (to work in full screen or line mode)

If you select line mode, you will be working as an IBM old-style (teletype) terminal. This mode may be useful (in either OpenWindows or SunView) if you want to use the cut-and-paste facility to move text from the IBM window to another Sun window.

If you select full screen mode, this will in principle work, as xterm is VT125 compatible. Unfortunately we are not aware of a way to control the keyboard mapping using OpenWindows. You will not be able to change page. **Therefore use of this mode is discouraged**

A.3.1.4 keyboard mapping

There are three main cases of keyboard mapping :

The IFCTR customized mapping using `tn3270` (command `ibm` under SunView or OpenWindows, see A.3.1.1 or A.3.1.3)

The default mapping using `tn3270` directly (see `help tn3270`) from any window (including the console, see A.3.1.2)

The mapping with the obsolete SIM3278 mode (see A.3.1.1 or A.3.1.3)

It is **recommended** to use the customized mapping, which is automatically available using command `ibm`. This mapping is shown in Table IIIa (for all Suns with type-4 keyboards) and Table IIIa bis (for `helios` which has a type-5 keyboard). Note that the PF keys are mapped to the top functional keys, as well as to (some) keys of the numeric keypad. However, since the cursor keys on the keypad are mapped to themselves, it is not possible to map all keys. This is thought to be the best mapping possible given Sun type-4 keyboard peculiarities. Users wanting to customize their keyboard should contact me.

Note that `return` acts at the same time as a new line and an enter. To move the next line only use the VT340 `delete` key. The "delete-to-end-of-line" function is `<ctl-e>`. All other functions are the standard tn3270 mapping.

The default tn3270 maps is available using `help map3270`, and is shown in the next page. It applies to <u>all</u> tn3270 connections in <u>any</u> window. In the case the connection is started by the `ibm` command, keys indicated in **boldface** are remapped for convenience as in Table IIIa.

MAP3270(5)   FILE FORMATS   MAP3270(5)

IBM 3270 KEY DEFINITONS FOR AN ABOVE DEFINITION
     The charts below show the proper keys to emulate each 3270
     function when using the default key mapping supplied with
     tn3270(1) and mset(1).

          Command Keys   IBM 3270 Key   Default Key(s)
                                  Enter
RETURN
                                  Clear
control-z
          Cursor Movement Keys
                                  New Line   control-n or
                                                               Home
                                  Tab   control-i
                                  Back Tab   control-b
                                  Cursor Left   control-h
                                  Cursor Right   control-l
                                  Cursor Up   control-k
                                  Cursor Down   control-j or
                                                               LINE FEED
          Edit Control Keys
                                  Delete Char   control-d or
                                  RUB
                                  Erase EOF   control-e
                                  Erase Input   control-w
                                  Insert Mode   ESC Space
                                  End Insert   ESC Space
          Program Function Keys
                                  PF1   ESC 1
                                  PF2   ESC 2
                                  ...   ...
                                  PF10   ESC 0
                                  PF11   ESC -
                                  PF12   ESC =
                                  PF13   ESC !
                                  PF14   ESC @
                                  ...   ...
                                  PF24   ESC +
          Program Attention Keys
                                  PA1   control-p 1
                                  PA2   control-p 2
                                  PA3   control-p 3
          Local Control Keys
                                  Reset After Error   control-r
                                  Purge Input Buffer   control-x
                                  Keyboard Unlock   control-t
                                  Redisplay Screen   control-v
          Other Keys
                                  Erase current field   control-u

FILES
     /etc/map3270

With the current version of SIM3278 and appropriate terminal setting handled by the Sun `oldxibm` command, you can correctly use the arrow keys to move the cursor on the screen. **However usage of this mode is discouraged** for the reasons explained below.

Concerning the IBM often used functional keys (PF1-PF12), and other keys (like those used to go to CP or to change page), the Sun keypad is remapped to emulate 3270 functions as shown in Table IIIb. This is the best mapping allowed by the VT100 emulation, though not optimal.In all cases you must press carriage return after each key !!!

This is sometimes inconvenient, as carriage return also moves the cursor to the next line (there is no separate "enter" key). In a few cases (screen forms, like the `NAMES` or `FILELIST` screens) you can move from one field to the next with the `TAB` (`BACKWARD` and `FORWARD`) emulated keys (see Table IIIb) in a more efficient way.

Advanced users may want to customize a private version of the mapping control file `.te100rc.ibm`, or `.xterm.ibm`.

One further problem with full screen applications occurs if the application writes something (typically a protected line) on the last line of the screen, or if the command line is the last line of the screen ("enter" is also a line feed !). This will cause the screen to scroll up. If you work in full screen mode all synchronization between screen positions and file positions will be lost.Try to avoid having the command line on the last line, or avoid using the particular application in full screen mode.

There are 3270 keyboard function which are badly emulated :

insert character: type `<ctl-A>`, then input your text, then press return. You will not see your text being inserted while you type, but only after you press return (this is not really too bad)

delete character: the sequence to delete one character is `<ctl-B>` followed by a return. Unfortunately this advances the cursor to the next line (which is quite uncomfortable).

goto next line : `<escape>` followed by return

delete to end of line : `<escape>` e followed by return

You may replace the `<escape>` key with `<ctl-[>`

It is possible that a further release of SIM3278 (to be installed at SIAM) will cure some of those problems.

```
Files: on /usr/local: .login, .cshrc, xibm,
                      te100rc.ibm, xterm.ibm,    map3270
```

A.3.1.bis from DECstation to IBM

This is a TCP/IP connection using telnet. See the telnet manual page in the Ultrix manual (or do `help telnet`). See also `help tn3270`.

If you are using DECWindows, you can start a blue DECterm window with a tn3270 full screen emulator issuing command :

    ibm

This performs exactly as described above in A.3.1 for the case of Sun. Note however what follows :

> The appearance of the window, the setup of the terminal emulator and the keyboard mapping are controlled by file `ibm.DECterm` in `/usr/declocal`.

> The keyboard mapping is similar to the one used on VAX (see Table IIa), since the DECstation keyboard is a standard DEC LK201 keyboard.

> There may be problems using QuickCopy to paste blocks longer than one line while in IBM `XEDIT` input mode since newlines will be interpreted as carriage returns and terminate input mode.

```
Files: on /usr/local: .login, .cshrc, xibm,
       on /usr/declocal: ibm.DECterm, map3270
```

A. REMOTE LOGIN SERVICES

A.3 from Unix

The modality to make a remote login from Unix may be different according to the windowing environment one is in, i.e. whether one is using the bare console, a SunView window, an OpenWindows or DECWindows window or a terminal. Connections from Sun using a terminal (which is necessarily a remote logon from the point of view of the Sun) will not be considered here.

A.3.2 from Sun to VAX

One may use a `rlogin` or `telnet` connection from any Sun workstation. `rlogin` is preferred. It is no longer possible to use the SunLink dni Decnet emulator. Remember the following ways to terminate the connection :

    rlogin: ~.   (tilde-dot)
    Decnet: ctl-Y (twice)

A.3.2.1 from Sunview

The most complete mode to log on the VAX from the Sun is possible when you are running SunView. You should have a file `.te100rc.vax` (possibly linked to the file of same name in `/usr/local`) in your home directory if you want to have an acceptable keyboard mapping. Then from any shell you can give the command:

    vax

This will start a green window, containing a VT100 emulator, presenting you the VAX prompt. If you do not login within a few minutes the window will disappear.

Once logged on, you are working in a VT100 environment. The VAX terminal will be set appropriately by the system login procedure. The title of the frame changes to your VAX username and remote terminal name.

The keyboard mapping will be the one described in Table IV. This is the closest match to the standard Digital `EDT` keyboard, which preserves the use of the arrow keys. Note that the "`DO`" function (used with the `COMMAND` and `FIND` keys) is assigned to the `ENTER` mapped key.

Advanced users might want to customize the keyboard mapping, making a private version of the control file `.te100rc.vax`.

If you accidentally delete such file, you will be using instead a different default mapping

(with closer match to the EDT keypad, but arrow keys located uncomfortably in the top row of functional keys). This mapping is shown in Table V.

A.3.2.2 from OpenWindows

When you are running OpenWindows you have different ways to access the VAX. The simplest one is as follows (automatically using files .xterm.vax* in /usr/local to have an acceptable keyboard mapping) : from any shell you can give the command:

```
vax
```

This will start a green xterm window, presenting you the VAX prompt. If you do not login within a few minutes the window will disappear.

Once logged on, you are working in a VT100 environment. The VAX terminal will be set appropriately by the system login procedure. You will be working similarly to the case of SunView (A.3.2.1 above). In particular the
keyboard mapping will be the one described in Table IV or IVbis (depending whether you are
on a type-4 or type-5 keyboard). This is the closest match to the standard Digital EDT keyboard, which preserves the use of the arrow keys.
Note that the "DO" function (used with the COMMAND and FIND keys) is assigned to the ENTER mapped key.

Advanced users might want to customize the keyboard mapping, making a private version of the control file .xterm.vax. Unless you do this, **you should never delete such file**, or you will be losing all keyboard mapping.

Alternatively you may use a DECterm window running on the VAX and talking to the Sun X server. See news 3 on Vax

A.3.2.3 from anywhere

From any environment (a SunView shelltool, command tool or gterm, an OpenWindows xterm, or the bare console), you can access the VAX using the command :

```
xvax
```

The VAX will still assume a VT100 terminal, which may or may be not appropriate (it is appropriate in an xterm, but not in other OpenWindow tools), however the keyboard mapping may be odd, and outside control.

This mode could be useful for a better use of the cut-and-paste facility to move text from the VAX window to another window, or to use the scrollbars. It is not recommended for editing.

There is no sense in logging on the VAX from the Sun bare console.

```
Files: on /usr/local: .login, .cshrc, .te100rc.vax .xterm.vax
```

A.3.2.bis from DECstation to VAX

This is a TCP/IP connection using telnet. If you are using DECWindows, you can start a green DECterm window with a VT340 emulator issuing command:

```
vax
```

This performs exactly as described above in A.3.2 for the case of Sun. Note however what follows :

> The appearance of the window, the setup of the terminal emulator and the keyboard mapping are controlled by file `vax.DECterm` in `/usr/declocal`

> The keyboard mapping is similar to the one used on VAX (see Table I), since the DECstation keyboard is a standard DEC LK201 keyboard.

> Users wishing to use a Decnet connection instead of a TCP-IP one may use command `decvax` (instead of vax), with similar modalities.

```
Files: on /usr/local: .login, .cshrc
       on /usr/declocal: vax.DECterm
```

A. REMOTE LOGIN SERVICES

A.3 fromUnix

A.3.3 from Unix to Unix

The modalities for remote login among Unix machines (including login on the same machine under a different username) are twofold :

You can use `telnet` to login to any Internet machine you can access (this may include also non-Unix machines, and is typically used for machine on wide-area networks).

You can use `rlogin` to log to another Unix machine only (or to the VAX) and anyhow only on the same local area network.

Both commands are documented in the Sun and Ultrix manuals and on-line help.

Note that to have multiple terminal windows under your username *you do not need remote login*, just use SunView or OpenWindows or DECWindows normally !

It is worth reminding that usernames on the Suns and DECstation on the LAN are shared by all machines (due to the NIS, sometimes called Yellow Pages, for which `helios` runs as master server). This means your username and password enables you to log in on any machine. **You do not need normally remote login**. However your home directory is residing on a specific machine. This means you are at any time using:

> the CPU of the machine on which you are logged
> the disk of the machine on which is your home directory
> any other disk of any other machine accessible via NFS

In practice this means that if the machine on which you have home directory is off or being rebooted, your home directory is not available (and you will be using the root directory of the current machine). At present not all the home disks of the planet workstations (i.e. other than `helios`) are cross-mounted, therefore the master user of a planet workstation will be able to log on from `helios`, and from his/her planet, but not necessarily from any other planet.

A.3.3.1 from Sun to Sun

In SunView you can open a `rlogin` window using the main menu (have a look at the SunView manuals).

<u>Please note</u> that, from a window logged under an username other than your main username (i.e. via `telnet` or `rlogin`) you cannot use the "vax" command to access the VAX.

If you open a SunView window or an OpenWindow xview tool on the Sun (either a normal shell under your login account, or a `telnet` or `rlogin` to another account), the initialization file `.cshrc` will label the window header with the username and pseudoterminal name. The same will occur if you `telnet` or `rlogin` from within an existing window (the header will be relabelled), however when you disconnect the remote connection, the label might remain pointing to the remote username (this should not normally happen). To bring it back to where it belongs, issue command :

```
identframe
```

Files: on /usr/local .cshrc

A.3.3.2 from DECstation to Sun

From the DECstation you can open a golden DECterm window onto one of the Sun workstations *node* issuing command :

```
sun node username
```

The setup of the terminal and its position are optimal for the Sun, and are controlled by file `sun.DECterm` on `/usr/declocal`

Files: /usr/declocal/sun.DECterm

A. REMOTE LOGIN SERVICES

A.4 fromPC

A.4.1 from PC to IBM

In order to make an effective use of the IBM, the PC shall implement an emulation of an IBM 3270 terminal. The following alternatives are available:

For IBM-compatible (MS-DOS) PCs :

Use a <u>direct coaxial connection</u> and a 3270-emulation card (does not require Ethernet). This is available on several PCs in the institute with different types of cards and related software (contacts: Bruno, Franz, Bianca). It is possibly available on the SELENE PC.

Use an <u>Ethernet card with TCP-IP software</u>, which may or may not provide 3270 emulation (FTP Inc. TCP-IP does): see A.4.3 below.

For Macintosh PCs :

Use a <u>direct coaxial connection</u> with dedicated card (does not require Ethernet) and software (contact: Istituto di Fisica dei Plasmi ?). Not currently installed on any Mac at IFCTR.

Use an <u>Ethernet card with tn3270 TCP-IP software</u> (contact: Lucio). A good public domain package is *Brown University tn3270*. Easy customization of keyboard mapping (see Table VI).

The above data are provided for information only, without any commitment of fitness for a particular purpose, nor of support by the named contacts.

A. REMOTE LOGIN SERVICES

A.4 fromPC

A.4.2 from PC to VAX

In order to connect a PC with a VAX the following alternatives are available:

For IBM-compatible (MS-DOS) PCs :

Use a <u>direct serial connection</u> and a terminal emulator (does not require Ethernet). This was available on some PCs in the institute (e.g. with the *SmartTerm* software; contact: Giuseppe). Its use was discontinued when Ethernet connections became available and is **discouraged** due to the lack of free terminal ports on the VAX.

Use an <u>Ethernet card with TCP-IP software</u> : see A.4.3 below.

Use an <u>Ethernet card with Decnet software</u> : this might also include DECwindows support if enough memory is available. We have bought a *Decnet/PCSA* license. A minimal installation is possible, using a DOS virtual disk on the VAX (contact and manuals c/o: Giuseppe). Installed on SELENE, SPOCK and PAN.

For Macintosh PCs :

Use a <u>direct serial connection</u> plus some terminal emulator software (*White Pine VT241* terminal emulators available c/o Lucio, see next item, no support given). Not currently installed on any Mac at IFCTR.

Use an <u>Ethernet card with TCP-IP software</u> : see A.4.3 below

Use an <u>Ethernet card with Decnet software</u>. One (expensive) license for *TSSNet* software (quite good) has been acquired and is installed on TRITON (contact: Lucio; contact Alderan for other possibilities).

The above data are provided for information only, without any commitment of fitness for a particular purpose, nor of support by the named contacts.

A. REMOTE LOGIN SERVICES

A.4 fromPC

A.4.3 from PC to Unix

To connect with the Unix (and also other) machines on the LAN one need to install an Ethernet card in the PC with some TCP-IP software. The following alternatives are available:

For IBM-compatible (MS-DOS) PCs :

Hewlett Packard ARPA services. Telnet with VT100 emulation, and ftp client. Installed on `deimos` and `phobos` (contact: Bruno).

FTP INC. TCP-IP software. SIAM has bought a multi-user license for this product. It is a quite good Telnet with IBM 3270, and Digital VT100 emulation, and ftp client and server. It works under MS-Windows. Installed on `hades` and `titan` (contact: Andy or Marco Pirovano).

Other licensed or *public domain* TCP-IP software, like *NCSA Telnet*

For Macintosh PCs :

Licensed software like *LAN Workplace* (telnet with VT100 emulation, ftp client with nice interface, finger and whois) or *MacTCP* (the driver provided with *MacX* does not work). Installed on `TRITON` (contact: Lucio; contact Alderan for other possibilities).

Public domain software like *Brown University tn3270* (see A.4.1 above)

The above data are provided for information only, without any commitment of fitness for a particular purpose, nor of support by the named contacts.

B. FILE TRANSFER SERVICES

A *file transfer service* is defined as one which allows to exchange files of arbitrary format and content within different machines. This service is different from the electronic mail service (see C), as the latter is confined to simple text files, and uses an envelope (address) to reach the destination, while this is more or less transparent in the case of file transfer.

With file transfer you can exchange file of arbitrary format and content (including binary files, or even executables), however it is dependent on the context of the sending and receiving machines (e.g. their operating system) whether you will be able to validly use such files, preserve the data integrity, or need some special reformatting.

There are different modalities of file transfer, to copy a file from node P to node Q :

the "sendfile" modality, in which you (on node P) send the file to an username on node Q, irrespective of the fact you know the other user's password, or have access to his disks. The file is sent to a spool area, and the user on node Q shall explicitly receive it.

the "put" modality, in which you (on node P) write the file to some remote place on node Q. This implies you have write access to that particular place. As nobody likes foreigners to write into its own private area, generally this means either you have to know the password of the Q user, or you write to a public place, and inform the user to explicitly retrieve the data later to his private area.

the "get" modality, in which you (on node Q) retrieve the file from remote node P. This implies you have read access to that particular place. This may also require you need the password of the file owner on P (it is however more common that users allow public read access to their files).

the "file sharing" is when you see a remote disk as it were a local disk (e.g. with NFS, the Network File System). Here too, you may have read or write limitations, as you have on your local disk.

The following table directs you where to find information about the connection you are interested on :

Refer to : IBM to IBM (B.1.1) for Internet connections
Refer to : VAX to VAX (B.2.2) for Decnet connections

	from IBM	from VAX	from Unix	from PC
to IBM	B.1.1	B.2.1	B.3.1	B.4.1
to VAX	B.1.2	B.2.2	B.3.2........	B.4.2
to Unix	B.1.3	B.2.3	B.3.3	B.4.3
to PC	B.1.4	B.2.4	B.3.4	B.4.4

Note that the Unix case covers both Sun and DECstation. Any difference will be highlighted in the relevant section.

The following discussion briefly recalls the principal ways by which you can allow *outside users* to

copy data from IFCTR or to put data onto IFCTR machines. The remaining sections are mainly oriented to describe how you transfer files *between local* machines or how you transfer files from/to the outside *being logged at IFCTR.*

See also the Quick Reference Card for helpful hints.

To allow an outside user to <u>copy a file from you</u>, you should first make sure that the file is world-readable (the Uniq command `protuser r-x file` allows on Vax and Unix to set appropriate protections). Eventually it has also to be in a world-readable directory.

<u>If your correspondent is using Decnet </u>(see B.2.2) he does not need to know any password to copy the file, provided he indicates the exact path to it :

```
COPY IFCTR::DUA0:[directory]file *.*
```

<u>If your correspondent is using Internet</u> `ftp`, he needs an username and password. All IFCTR computers (but not the SIAM IBM) recognize the username `public` with password `access` (note that instead we are not providing the `anonymous` ftp service).

To allow an outside user to <u>copy a file to you</u>, you should in principle prepare a world-writable directory where he can put the files (the Uniq command `protuser rwx file` allows on Vax and Unix to set appropriate protections). However, unless you disclose your private password to him (**strongly discouraged**), the procedure has to go in several steps :

1)   Your correspondent copies the file to a public area, or to a private world-writable area using a public account. The files **will be owned by this account.**
2)   He sends a mail to you to notify of the succesful transfer.
3)   You copy the file from the public or private area using the public account, so that **you become the owner** of the copy
4)   You **delete the file** owned by the public account.

<u>If your correspondent is using Decnet</u> (see B.2.2) he does not need to know any password to copy the file, provided he indicates the exact path to it or uses the default scratch area:

```
COPY hisfile IFCTR::DUA0:[directory]*.*
COPY hisfile IFCTR:*.*
```

To get the file owned by you, and to delete the one owned by the public account (for Decnet transactions this is `FAL$SERVER`) you do (the example shows the case of the default scratch area; analogously for the other case):

```
COPY IFCTR::hisfile [yourdirectory]*.*
DELETE IFCTR::hisfile
```

<u>If your correspondent is using Internet</u> `ftp`, he will use the username `public` with password `access` to put the file to a world-writable area you prepared.

To get the file owned by you, and to delete the one owned by the public account, you should be logged in as you, ftp to your same computer using the `public` account, `cd` to the directory where *hisfile* is, do a `get hisfile yourfile`, followed by a `rm hisfile` to delete the file. (It is suggested that you use different names, this is not strictly required on all systems, but in general makes things simpler).

B. FILE TRANSFER SERVICES

B.1 from IBM

B.1.1 from IBM to IBMs

There are three ways to transfer files on the IBM :

To transfer a file from/to a local user ("file sharing" mode) you simply `LINK` and `ACCESS` the other user disk. Then you will see such disk as one of your own disks, and you can use command `COPY`. See `HELP CP LINK` and `HELP CMS ACCESS`.

You will generally need either a `READ` or `WRITE` password to be able to link the other disk. For protection, it is usual to access somebody else's disk in read mode and copy from there ("get"), rather than the other way round.

To transfer a file to any Bitnet user, either local or remote, you can use the `SENDFILE` command (see `HELP SENDFILE`). The IBM standard `SENDFILE` will send a file of any valid format to any true Bitnet node. There are variants of `SENDFILE` (make sure which one you have, you can have many `SENDFILE EXEC` !!), which allow to send also outside Bitnet (but the file integrity is not guaranteed, generally this occurs encapsulating everything in a mail envelope, see C.1.1).

You need only to know the user and node name of the destination to be able to use `SENDFILE`, and can do it at any time (if there is no link to the destination, the file will be queued for later processing, so called "store-and-forward").

Finally, to transfer a file to *any machine in the Internet* (including the local node), you can use the command

```
ftp node
```

where `node` can be the node name or Internet number (for the local node use name `imisiam.siam.mi.cnr.it`, or 155.253.1.40, the latter is faster). There is online help (`HELP FTP`). To access this command, you should have first executed the following commands (once in the session, typically in your profile):

```
PRODOTTI first, and INTERNET next
```

You can use either a "put" or "get" mode. You can change directory at the remote node, list remote directories, and even delete remote files. All ftp subcommands are explained in the online help file.

To access a remote user, you must specify a password. Additionally, if you want to ftp-

access a "remote" IBM virtual disk, bear in mind what follows:

You can treat the disk `aaa` of `user` as a directory (and `CD` to it), with the name `user.aaa` (e.g. `EXOSAT.191`). Additionally you will have to specify the disk password (read or write), when prompted, or using the `ACCT` command.

Disk passwords are needed only if there is an IBM system at the other end, otherwise the user password is enough.

```
Files: none
```

B. FILE TRANSFER SERVICES

B.1 from IBM

B.1.2 from IBM to VAX

The IBM to VAX connection is a TCP-IP connection, using FTP. From the IBM you can "put" files onto the VAX or "get" files from the VAX. You should make sure to have executed the `PRODOTTI` and `INTERNET` commands once, then proceed as follows :

```
VAXKEYBO or equivalent
FTP vax.ifctr.mi.cnr.it
give your VAX username when prompted
give your VAX password when prompted
give command SENDSITE
then issue any ftp command (put, get, etc.)
```

Commands are described in `HELP  FTP`. To change directory on the VAX you use the VMS syntax. This means you need square brackets. Since the 3270 keyboard does not have any, you must remap it : for this purpose you can get a copy of `VAXKEYBO EXEC` from me, and adapt it as you prefer.
Keyboard mapping is not necessary if you are working from a VAX terminal or a workstation.

The use of the `SENDSITE` command is necessary only if you are `putting` files onto the VAX. It is necessary to disable the sending of the IBM `SITE` subcommand (done by `put`), which is not recognised by UCX 1.3 (the software running on the VAX). Failure to do so will disable your entire session,
Note also that UCX will open a "network session" on the VAX, executing your `LOGIN.COM`, and will create a `FTP$SERVER.LOG` file in your home directory. See the `NEWS` on VAX for more details.

It is possible to write `EXECs` to issue FTP commands automatically (e.g. to copy files from/to a predefined place on VAX, or to print them on the VAX printer). **No general utility will be provided**, as the variety of modalities of file exchange (e.g. ASCII and binary modes) is quite large. You can however obtain a copy of my `TOVAX  EXEC,` `FROMVAX EXEC` (documented separately) and `PRINTVAX EXEC` and adapt it as you wish. **You are discouraged to explicitly indicated passwords in your FTP-EXEC files !**.

Please note binary file transfer from/to IBM to/from VAX has not been tested

Files: VAXKEYBO EXEC, TOVAX EXEC, FROMVAX EXEC, SERVEFTP EXEC, FTPDIR
        EXEC, FPTCLEAR EXEC, FTPUSER EXEC, PRINTVAX EXEC (these files
        are not publicly supported)

B. FILE TRANSFER SERVICES

B.1 from IBM

B.1.3 from IBM to Unix

The IBM to Unix connection is a TCP-IP connection, using FTP. From the IBM you can "put" files onto the Unix workstation or "get" files from the workstation. You should make sure to have executed the `PRODOTTI` and `INTERNET` commands once, then proceed as follows :

```
FTP name.ifctr.mi.cnr.it
give your Unix username when prompted
give your Unix password when prompted
then issue any ftp command (put, get, etc.)
quit
```

The `name` will be the name of the Unix workstation (e.g. `helios, poseidon`, etc.).

Commands are described in `HELP FTP`. To change directory on the workstation you use the Unix syntax. You will not have problem with the keyboard, unless your Unix filenames contain unusual characters.

It is possible to write `EXECs` to issue FTP commands automatically (e.g. to copy files from/to a predefined place on the workstation). **No general utility will be provided**, as the variety of modalities of file exchange (e.g. ASCII and binary modes) is quite large. You can however write your own, based on the examples described in B.1.2 above. **You are discouraged to explicitly indicated passwords in your FTP-EXEC files !**.

Please note binary file transfer from/to IBM to/from Unix has not been tested

```
Files: TOSUN EXEC, FROMSUN EXEC, TODEC EXEC, FROMDEC EXEC (plus others
       described in B.1.2 above : note that these files are not public-
       ly supported)
```

B. FILE TRANSFER SERVICES

B.1 from IBM

B.1.4 from IBM to PCs

Transferring files between a PC and the IBM while being logged on the IBM is possible only if the PC has a resident FTP server (most TCP-IP implementations for PC have only an FTP client).

The only implementations of which I am aware are *Brown University tn3270* for MacIntosh and possibly *FTP Inc. TCP-IP* for DOS (see A.4.1).
Of course the Mac shall be switched on ; moreover tn3270 shall be running (it is **not** an INIT), and you should know the username and password set on the Mac.
Similarly for a DOS PC this should be switched on and the appropriate server running (usually this is done from MS-Windows to avoid the PC being locked running the server only). Consult your s/w documentation about setting password protection.

```
Files: none on IBM
```

B. FILE TRANSFER SERVICES

B.2 from VAX

B.2.1 from VAX to IBM

The VAX to IBM connection is a TCP-IP connection, using FTP. From the VAX you can "put" files onto the IBM or "get" files from the IBM. The FTP command provided by the VMS-to-Ultrix-Connection (UCX) software comes in two flavours, a VMS one and a Unix one.

We actually force default use of the Unix-style command and make reference to it only, as it is virtually identical with the one documented for IBM and Unix. The UNIQ interface in the system login procedure is arranged so that the `ftp` command corresponds to the Unix interface (formerly `ftpu`), and the `FTPV` alias is defined for the VMS interface. Note that the VAX `HELP` refers to the VMS interface.

To open an FTP connection to the IBM, you proceed as follows:

```
ftp ibm or imisiam.siam.mi.cnr.it
your IBM username when prompted
your IBM password when prompted
then issue any ftp commands
quit
```

With UCX 1.3 this command is now perfectly operative. You should note however that, in order to access an IBM disk (address *aaa* of machine *user*) with the `cd` command, you call it *user.aaa* (e.g. `EXOSAT.191`), and additionally you have to supply the the `READ` or `WRITE` password with the `ACCT` command (see B.1.1 above). Due to a bug in UCX 1.3 this command cannot be given directly, but should be given (immediately after login or after each `CD` command) as `QUOTE ACCT` *password*.

It is possible to write `.COM` files to issue FTP commands automatically (e.g. to copy files from/to a predefined place on IBM). **No general utility will be provided**, as the variety of modalities of file exchange (e.g. ASCII and binary modes) is quite large. You can however obtain a copy of my `TOIBM.COM`, `FROMIBM.COM` (documented separately) and adapt it as you wish. **You are discouraged to explicitly indicated passwords in your FTP-`COM` files !**.

Please note binary file transfer from/to IBM to/from VAX has not been tested

```
Files: TOIBM.COM, FROMIBM.COM, SERVEFTP.COM, FTPCLEAR.COM, FTPDIR.COM,
       FTPUSER.COM, FTPDISKPW.COM on DUA0:[LUCIO.BIN]
```

B. FILE TRANSFER SERVICES

B.2 from VAX

B.2.2 from VAX to VAXes

From the VAX you can use either Decnet to transfer files with any VAX in Decnet (either directly reachable, or by making bridge on a known Decnet node), or use Internet to transfer files with Internet nodes via a suitable gateway.

Usage of Internet connections for remote nodes other than those on the Local Area Network is now fully supported (by name, as well as by Internet number) and will not be described. Refer to B.2.1 and B.2.3 for Internet transfers with IBM and Unix for similarity. (Of course ftp works also with the VAX itself, just "ftp vax" this is quite useful to transform a VAX file in STREAM_LF format, see B.2.3). From the outside you get onto our VAX via Internet with ftp vax.ifctr.mi.cnr.it.

Decnet file access allows "put" and "get" just issuing the normal VMS COPY command. You can also use the DIR and DELETE commands, as well as TYPE remote files. You can even EDIT a remote file (without a remote login) : this latter procedure is described in A.2.2.

To reach a node you can always use its Decnet number, or you can use the name, provided it is registered in our local database. If you want a node registered, or to search the node name-number correspondence, please contact me. (To search the name or number you can do it yourself using the NCP command).

The node name of our VAX is IFCTR and its number is 39610 (this is the number you will use; in the case you have to communicate it to a foreign system manager for insertion in its database, you should quote it as 38.698; note that 38*1024+698 = 39610).

To copy a file (according to the order of copy, ie. whether a "put" or a "get") use syntax :

```
COPY localfile remotefile
COPY remotefile localfile
```

Where the remote file specification in its full form is like follows :

```
remotenode"user password"::[directories]name.typ;v
```

If the remote node is not directly known (i.e. it has an "hidden" node or area number), you can specifiy it as : bridgenode::remotenode:: , where bridgenode is a known node (for example, if you are outside the Local Area
Network and want to reach our DECstation 5000/240, you cannot, as it has an

hidden number, unless you use the notation `IFCTR::DEC::`).

The amount of access control information (username and password) which you have to specify to access a remote file depends on the arrangement on both nodes (in some cases you may skip it).

We recall here (see A.2.2) how to edit a remote file locally, using:

```
EDIT remotenode"user password"::remotefilename
```


Files: None

B. FILE TRANSFER SERVICES

B.2 from VAX

B.2.3 from VAX to Unix

There are different modalities to exchange files from VAX to local Unix workstations, using either the normal Internet `ftp` command, or the Decnet commands (it is instead not currently possible to NFS-mount the Unix disk onto the VAX). Note that none of the Suns can now be reached in Decnet; the DECstation `kronos` is instead node `DEC`.

A set of tests of file exchange modalities has been made. Details are provided in a separate document ("A report on tests of VMS-Unix file exchange", by L.Chiappetti, 22 Aug 1990), and will not be repeated here.Please consult that document and the relevant manuals, to find the way best suited to you (or experiment yourself).

The **recommended** way is to use the Internet FTP command (this comes in two flavours, a VMS one and an Unix one, the <u>latter being used by default</u>, as it has the same syntax used on IBM and Unix, see B.2.1 above), which allows "put" and "get" modes, and handles ASCII and binary files in the best way:

```
ftp name
give your Unix username when prompted
give your Unix password when prompted
then issue any ftp command
quit
```

where `name` is the name of the workstation (e.g. `helios, poseidon`). Note that the Internet mode works for all Unix workstation, while the Decnet mode described below works only for `kronos` (whose Decnet name is `DEC`) and none of the other workstations. See B.2.1 above about usage of `.COM` files.

It is **not recommended** to use Decnet `COPY`, as it may give problems with directory or file names, however it is possible. It is also possible to use the `DIR` or `TYPE` command to access Unix directories and files (the `TYPE` command is quite useful to look at a Unix file without a remote login). The full form of access to a Unix file on `kronos` is:

```
DEC"user password"::"/dir/dir../file" or
DEC"user password"::filesystem:[dir.dir.dir]file
```

```
Files:  TOSUN.COM, FROMSUN.COM, TODEC.COM, FROMDEC.COM plus rest listed
        in B.2.1 above
```

B. FILE TRANSFER SERVICES

B.2 from VAX

B.2.4 from VAX to PCs

Transferring files between a PC and the VAX while being logged on the VAX is possible **only** if the PC has a resident program running at its end listening for connects (Decnet FAL or Internet FTP server -usually TCP-IP implementations for PC have only an FTP client). This form of file transfer is possible:

via Decnet:

To IBM-compatible MS-DOS PCs with *Decnet-PCSA* installed (see A.4.2), provided the FAL is running on the PC (this has to be run manually).

To MacIntosh PCs with a Decnet emulator like *TSSNet* (this is possible at all times while the PC is switched on, since TSSNet FAL is always active): see A.4.2.

via Internet

Refer to section B.1.4.

```
Files: none on VAX
```

B. FILE TRANSFER SERVICES

B.3 from Unix

B.3.1 fromUnix to IBM

This is a TCP/IP connection using ftp. See the ftp manual page in the Sun or Ultrix manual (or do `help ftp`). You can "put" and "get" files to/from the IBM. Proceed as follows :

```
ftp ibm
your IBM username when prompted
your IBM password when prompted
any valid ftp command
quit
```

Please note that to address an IBM disk (address *aaa* of machine *user*) with the `cd` command, you call it `user.aaa` (e.g. `EXOSAT.191`), and additionally you have to supply the disk read or write password with the `account` command (<u>be careful</u>, this is called `account` **NOT** `acct` in Unix).

Note you can bypass most of the above, and tell the workstation that, when you FTP-log on to the IBM, you want to use a predefined username and password, and even go to a predefined directory, if you appropriately configure your `.netrc` file. This even allows to define user macro commands for often used commands. `.netrc` is described in the ftp and netrc manual pages (`help ftp` and `help netrc`).

Note it is also possible to write shell scripts containing ftp commands, e.g. to automatize file transfer from often used directories. **No public support nor general utility will be provided**, as the variety of modalities of file exchange (e.g. ASCII and binary modes) is quite large. You can however obtain a copy of my scripts `toibm`, `fromibm` (documented separately) and adapt it as you wish. **You are discouraged to explicitly indicated passwords in your FTP scripts !**.

Transfer of binary files from/to Unix to/from IBM has not been tested.


```
Files: toibm, fromibm, serveftp, ftpclear, ftpdir, ftpuser, ftpdiskpw
       on /poseidon/lucio/bin
```

B. FILE TRANSFER SERVICES

B.3 from Unix

B.2.3 from Unix to VAX

There are three modes of exchanging data between a Unix workstation with Decnet (`kronos`) and the VAX (when the transfer is initiated from the workstation), and two from any other Unix workstation (when the transfer is initiated from the workstation). They are :

the Internet `ftp` command ("put" and "get"), which is the **recommended way** for exchange of generic files

the Internet NFS file sharing, which allows transparent access to the VAX disk. This however may have problem with ASCII files, while it is the **suggested way** for FITS files.

the Decnet/Ultrix emulation with `dcp` and `dls`, which is quite slow, and is not recommended (moreover this is available only from `kronos`).
Decnet is no longer available from Suns.

The merits and disadvantages of the three methods are described in a separate document ("A report on tests of VMS-Unix file exchange", by L.Chiappetti, 22 Aug 90), to which the reader is referred. Ftp is described in the Sun manual pages (and online as help ftp), and Decnet/Ultrix commands in the relevant DEC manuals. No special knowledge is necessary to use NFS.

To transfer a file from/to the VAX using ftp proceed as follows :

```
ftp vax
your VAX username when prompted
your VAX password when prompted
any valid ftp command
quit
```

Please note that VMS directories are addressed in VMS syntax.

Note you can bypass most of the above, and tell the workstation that, when you FTP-log on to the VAX, you want to use a predefined username and password, and even go to a predefined directory, if you appropriately configure your `.netrc` file. This even allows to define user macro commands for often used commands (or to handle square brackets and allow a more Unix-like syntax) .netrc is described in the ftp and netrc manual pages (`help ftp` and `help netrc`).

Note it is also possible to write shell scripts containing ftp commands, e.g. to automatize file transfer from often used directories. **No public support nor general utility will be provided**, as the variety of modalities of file exchange (e.g. ASCII and binary modes) is quite large. You can however obtain a copy of my scripts `tovax, fromvax` (documented separately) and adapt it as you wish. **You are discouraged to explicitly indicated passwords in your FTP scripts !**.

ftp is the recommended way for exchange of ASCII files

To use `dcp` to copy a VAX file to a DEC file or viceversa, see the Decnet/Ultrix manual. You will have to specify your VAX username and password (either in the access string, or in the command string, or in an environment variable). This command is quite clumsy and is not recommended.

You can use NFS to access (copy or type) a file on VAX in a transparent way using the normal commands you use for Unix files (`copy` or `cp`, `type` or `cat`). The entire VAX disk is mounted on any Unix workstation as an NFS filesystem `/vax`, so you can access a file on :

`DUA0:[`*`DIR.DIR`*`]`*`NAME.TYP`* using `/vax/`*`dir/dir/name.typ`*

See the UCX manual for the naming convention used when accessing VMS files with multiple versions.

You can even make an Unix *soft link* to a file physically residing on VAX : this means you have <u>only one physical</u> version of the file to mantain ! Beware that if the file on VAX is ASCII text it must be in `STREAM_LF` format in order to be usable on Unix (it does not normally make sense to share binary files this way).

Note also that NFS gives <u>transparent</u> access to the VMS files. This is so transparent, that a normal VMS text file (not compatible with Unix) will be unchanged (and therefore look very funny). VMS `STREAM_LF` files are Unix-compatible and will be all right (this is the normal way in which NFS will copy an Unix file to VAX). They will be all right on <u>both</u> systems <u>irrespective</u> of the warning given by VAX `EDIT`.

The simplest way available on VAX to convert other file formats to `STREAM_LF.`is to make an ftp onto itself.

Please note that none of the commands described performs byte-swapping when transferring binary files. This is actually <u>correct</u> for FITS files (which do not require it), and is why they could be copied straight with an Unix copy command via NFS. If you need byteswapping on a binary file, the easiest way is to use Unix command `dd` (see manual page, or online help), accessing the VAX file transparently via NFS.

```
Files: tovax, fromvax, and others listed in B.3.1 above; all files are
       on /poseidon/lucio/bin
```

B. FILE TRANSFER SERVICES

B.3 from Unix

B.3.3 from Unix to Unix

The native ways of file exchange on Unix systems are file sharing via NFS for machines on a Local Area Network, and the Internet ftp command for remote machines on the Internet.

These commands of course work perfectly on any of our Unix workstations. In general one could use NFS for shared filesystems, and ftp in all other occurrences (filesystem is not mounted, or towards a remote machine, like towards VAX and IBM, see B.3.1 and B.3.2).

Full access to Internet through a suitable gateway is now possible and fully supported. Just do :

```
ftp node.domain
```

```
Files: None
```

B. FILE TRANSFER SERVICES

B.3 from Unix

B.3.4 from Unix to PCs

Transferring files between a PC and an Unix workstation while being logged on the workstation is possible **only** if the PC has a resident program running at its end listening for connects (Decnet FAL or Internet FTP server -usually TCP-IP implementations for PC have only an FTP client). This form of file transfer may be possible:

via Decnet: (from `kronos` only)

Refer to B.2.4 above.

via Internet (from any workstation)

Refer to B.1.4 above.

```
Files: none on Unix
```

B. FILE TRANSFER SERVICES

B.4 from PC

B.4.1 from PC to IBM

Transferring files between a PC and the IBM is possible while working on the PC in the following circumstances (refer to A.4.1 for more details):

For IBM-compatible (MS-DOS) PCs :

Use a <u>direct coaxial connection</u> and a 3270-emulation card provided one has the right software for file transfer at either end (modalities vary according to the software; consult the appropriate manual or ask the relevant person)

Use an <u>Ethernet card with TCP-IP software</u>, which generally provides an ftp client function (you ftp to IBM, modalities vary according to the software).

For Macintosh PCs :

Use a <u>direct coaxial connection</u> : situation not known

Use an <u>Ethernet card with any TCP-IP software</u> which provides an ftp client function (note that *tn3270* does **not** provide a client function but only a server, which means transfers are *initiated from the IBM side*; *LAN Workplace* provides an ftp client)

B. FILE TRANSFER SERVICES

B.4 from PC

B.4.2 from PC to VAX

Transferring files between a PC and the VAX is possible while working on the PC in the following circumstances (refer to A.4.2 for more details):

For IBM-compatible (MS-DOS) PCs :

Use a <u>direct serial connection</u> and a terminal emulator (does not require Ethernet) like *SmartTerm* : you can copy files both ways capturing the screen output or reading form a PC file instead than from the keyboard. Slow and limited, but works.

Use an <u>Ethernet card with TCP-IP software</u> : which generally provides an ftp client function (you ftp to VAX, modalities vary according to the software).

Use an <u>Ethernet card with Decnet software</u> : like *Decnet/PCSA*. Includes a nice `NETCOPY` command, and the possibility to define DOS virtual disks on the VAX (see manual c/o Giuseppe). Installed on `SELENE`, `SPOCK` and `PAN`.

For Macintosh PCs :

Use a <u>direct serial connection</u> plus some terminal emulator : situation not known.

Use an <u>Ethernet card with TCP-IP software</u> : see B.4.3 below

Use an <u>Ethernet card with Decnet software</u>. like *TSSNet* : it provides a NetCopy program with a very friendly interface. Installed on `TRITON`

B. FILE TRANSFER SERVICES

B.4 from PC

B.4.3 from PC to Unix

Transferring files between a PC and an Unix workstation is possible while working on the PC in the following circumstances (refer to A.4.2 for more details):

For IBM-compatible (MS-DOS) PCs :

Hewlett Packard ARPA services. or *FTP Inc. TCP-IP* or any other TCP-IP software provided it has ftp client. HP-ARPA is installed on `deimos` and `phobos` (contact: Bruno), FTP Inc. software is installed on `hades` and `titan` (contact: Andy and Marco Pirovano).

For Macintosh PCs :

TCP-IP software like *LAN Workplace* (providing ftp client with nice interface). Installed on `TRITON.` Note that *Brown University tn3270* does **not** provide ftp client but only server.

B. FILE TRANSFER SERVICES

B.4 from PC

B.4.4 from PC to PC

Transferring files between two PCs is possible only if one is able to listen to the other. This is normally not guaranteed (e.g. most TCP-IP software for PC provides just ftp client, i.e. talker, but not server, i.e. listener). The following combinations are possible in line of principle but **have not been tested**.

via Decnet :

Any two PCs running a Decnet `FAL` shall be able to exchange files like between a PC and a VAX.

On `TRITON` Macintosh the *TSSNet* `FAL` is always active (therefore any other PC shall be able to copy files from the Mac).

On *Decnet/PCSA* MS-DOS PCs (like `SELENE`, `SPOCK` and `PAN`) the `FAL` must be activated when one wants to allow another PC to NetCopy files from his own.

via Internet :

Any PC running an ftp client might copy files from `TRITON`, provided *tn3270* server is running there (must be activated manually). Moreover a password is needed to access `TRITON`. Therefore this is of dubious usage.

Any two DOS PCs running FTP Inc. TCP-IP may exchange files if an FTP server is running on one (perhaps under MS-Windows so that one can go on working), and a client on the other one, and the appropriate security steps are taken.

C. E-MAIL SERVICES

An *electronic mail (e-mail)* service is defined as one which allows to send text files (limited to ASCII text, and limited in record size to 80 characters for most practical purposes) to a remote user. This service is different from the file transfer service (see B), as the latter caters for files of more general format. Moreover you often need to be authorized to do a file transfer (know a password), while you can send a mail to anybody.

Do NOT use e-mail to transfer files, particularly between local machines !
It is STUPID and inefficient
and does not guarantee the file is usable at destination.

Note that the present document does not give <u>ANY</u> detail on how to use the `MAIL` utility on the different machines, but just how to *address* one machine from the other. A separate document could be provided to highlight the differences between the IBM and VAX mail systems.

Lots of documentation are available about e-mail, in printed form and on-line. Please contact me if you want to read some.

The following table directs you where to find information about the connection you are interested on :

Refer to : IBM to IBM (C.1.1) for Internet connections
Refer to : VAX to VAX (C.2.2) for Decnet connections

```
             from IBM      from VAX     from Unix      from PC

to IBM    C.1.1         C.2.1        C.3.1            n/a
to VAX    C.1.2         C.2.2        C.3.2            n/a
to Unix   C.1.3         C.2.3        C.3.3........C.2.4
to PC.....n/a........C.2.4......C.3.4... ....C.3.4              ‖
```

Remember that, as a part of the setup of your account(s) at IFCTR, things will normally be reached <u>on a machine you select</u>, <u>under a name you select</u> for *yourself*, both from Internet and Decnet as :

    Internet: *yourself*@ifctr.mi.cnr.it
    Decnet: IFCTR::*yourself*

These are the (only) addresses you should give to your correspondents. See the Quick Reference Card for helpful hints.

C. E-MAIL SERVICES

C.1 from IBM

C.1.1 from IBM to IBMs, Bitnet and Internet nodes

You send mail with command `MAIL`, and administer your address list with `NAMES`. Refer to `HELP MAIL` and `HELP NAMES` for further documentation.

The local IBM Bitnet node is `IMISIAM`, known also with the full (Internet) name of `IMISIAM.SIAM.MI.CNR.IT`.

To address any Bitnet node (IBM or not) you use the following address :

user@node

To address any Internet node (IBM or not) in a valid Internet domain, you use the following address :

user@node.domain

To address a node in a domain accessible only through a gateway, you use the following address :

user%node.domain@gateway

You can keep your addresses in your `NAMES` files, and refer to long and complicated addresses with simple nicknames. The ordinary IBM `NAMES` commands handles ungracefully long addresses : on request I can provide access to a better utility (`LNAME` by Alain Fontaine).

You may want to receive mail addressed to you as `you@ifctr.mi.cnr.it` on your account on the IBM. **To arrange this please contact me.**

Mail from the IBM travels directly to destination via the `MAILER` (Bitnet) or `SMTP` (Internet) virtual machine (it exits to the backbone in 3 hops). If the path to the destination is interrupted the mail is queued up somewhere on the way. Delivery may not be immediate, but mail is never lost.

Files: LNAME EXEC and related files

C. E-MAIL SERVICES

C.1 from IBM

C.1.2 from IBM to VAX and Decnet

You **must** send mail to an user <u>on our local VAX</u> (provided he/she elected to receive his/her mail there) using the following address (which automatically points to the correct gateway):

> `user@IFCTR.MI.CNR.IT`

You can send mail to <u>other</u> VAXes and Decnet (SPAN,HEPNET) nodes (original addresses of the form `node::user`), using one of the following addresses :

> `user@node.decnet`   (recommended)
> `user@node.dnet`   (alternate)

Any other form in use in the past shall not be used any more !!
In particular **do not send** to user@ifctr.decnet for any reason (when user is an alias if loops). It is acceptable to use user%node.decnet@ifctr.mi.cnr.it and user%node@imisiamx.

In case the original address was `bridge::node::user`, you shall use one of the forms :

> `user%node@bridge.decnet`   (recommended)
> `user%node%bridge.decnet@ifctr.mi.cnr.it`   (alternate)

The default gateway service is currently handled by PMDF on `IMISIAMX` (alias `SIAMVX`, a VaxStation at SIAM) if you use the recommended form. **Only** in case this is announced to be down you can use the alternate form, which is routed via the `kronos` DECstation.

If you want to receive Internet mail on the VAX addressed to you as `you@ifctr.mi.cnr.it` **please contact me for arrangements.**

Mail from the IBM using the recommended address travels to destination via `SMTP`, the PMDF gateway on `IMISIAMX` and the CISCO router in via Ampere (4 hops), while mail using the alternate address comes via two CISCO routers to via Bassini, is gatewayed by the `kronos` DECstation, passes thru the `IFCTR` VAX and gets out again via the two CISCO routers (from Bassini to Ampere and then out, total 8 hops). *Therefore the alternated address is slower.* If the Decnet path to the destination is interrupted the mail is queued up at the gateways. Delivery will be tried again periodically for a maximum of three days, then mail will be sent back to you..

Files: None

C. E-MAIL SERVICES

C.1 from IBM

C.1.3 from IBM to Unix

You can send a mail to an user on one of our local Unix workstations (provided he/she elected to receive his/her mail there) using the following address :

`user@ifctr.mi.cnr.it`

Do not specify the name of the workstation but only the domain `ifctr.mi.cnr.it`.

If you want to send Internet mail to any other Internet node in the world, see C.1.1 above for instructions.

Mail from the IBM travels via SMTP to the `kronos` Decstation, which is the entrance gateway for `ifctr.mi.cnr.it` and takes care of delivering it to the appropriate machine (Unix workstation, Vax or IBM, 5 hops to generic Unix machine).

`Files: none`

C. E-MAIL SERVICES

C.2 from VAX

C.2.1 from VAX to IBM and Internet

You can send mail to an user on the local IBM, using the following address :

`GATEWAY::"user@imisiam.siam.mi.cnr.it"`

You can send mail to any user on a Bitnet (pseudo-domain `.bitnet`) or Internet node, using the following (similar) address :

`GATEWAY::"user@node.domain"`

From a VAX other than our local one, you can make bridge on our VAX and use its gatewaying facilities, just as follows :

`IFCTR::GATEWAY::"user@node.domain"`

If you want mail from Decnet relayed automatically to your IBM or Unix account, it is possible to set up a "pseudo user name" on the VAX, which actually points to `GATEWAY::"yourname"`. This is true both if you have or not have a VAX account. Your Decnet correspondents will see you on whatever machine, as if it were a normal VAX user `IFCTR::yourname`. **Please see me for arrangements.**

Mail for `GATEWAY` usually travels via the `kronos` Ultrix Decstation (which queues it if the path to destination is interrupted) and then directly to destination (5 hops to backbone). In case of unavailability of `poseidon` the gateway can be reset to another one. You can also explicitly replace `GATEWAY::` with either `MILANO::` or `PISA::` to use the PMDF gateways at `IMISIAMX` (alias `SIAMVX`, a Vaxstation at SIAM) or at CNUCE.

Files: [LOCAL.SYLOGIN]NETSTUFF.COM

C. E-MAIL SERVICES

C.2 from VAX

C.2.2 from VAX to VAXes and Decnet in general

You send mail with VMS command `MAIL`. Refer to `HELP MAIL` and to the `MAIL` manual for further documentation.

The local VAX Decnet node is `IFCTR` (alias `39610`).

To address any Decnet node you use the following address :

```
node::user                  (if directly connected)
bridgenode::node::user   (otherwise)
```

See C.2.1 on how to reach a node in Bitnet or Internet from the VAX.

Mail for `Decnet` travels directly via the CISCO routers (4 hops to the backbone). As usual for Decnet, mail departs only if the remote node is reachable.

C. E-MAIL SERVICES

C.2 from VAX

C.2.3 from VAX to Unix

You **cannot** send Decnet mail using a Decnet (`node::user`) address to any of our workstations (since there is no Decnet installed), but only to `kronos` using `DEC::` as node name.

You can however take advantage of the aliases provided, and send to a local user (who has elected to receive his/her mail on a Unix machine) just mailing to his/her username, like he/she were a local user on the Vax:

```
USER
```

See C.2.1 above for the case of sending mail to Internet nodes outside our local area network.

Using mail to local Unix workstations with explicit Internet addressing is formally discouraged.

```
Files: None
```

C. E-MAIL SERVICES

C.2 from VAX

C.2.4 from VAX to PC and viceversa

Bidirectional Decnet mail is possible only to a (switched on) PC running a resident MAIL object. This is currently the case only of the TRITON Macintosh (with *TSSNet* Decnet emulator).

Note in particular that MS-DOS PCs with *Decnet/PCSA* (like SELENE, SPOCK or PAN) are able to send Decnet mail but **not to receive** it.

C. E-MAIL SERVICES

C.3 from Unix

C.2.3 from Unix to IBM, Bitnet and Internet

You can send mail from any workstation to an user on our IBM, using an address as follows :

```
user@imisiam.siam.mi.cnr.it    (recommended)
user@ibm                              (shortcut)
user                                  (only IFCTR users)
```

The latter form (plain `user` name, which is not necessarily the same as their account name on the IBM) works only for those users which have elected to receive their mail on the IBM.

To address any Internet node in a valid Internet domain, you use the following address :

```
user@node.domain
```

To address any Bitnet node from Unix, you use the following address :

```
user@node.bitnet
```

To address a node in a domain accessible only through a gateway, you use the following address :

```
user%node.domain@gateway
```

Please note that a mail coming from one of our workstations will appear to come from you@ifctr.mi.cnr.it. It will not contain trace of the machine from which it was sent. Any reply will arrive on the machine you selected as your mailbox host.

Internet mail from Unix workstation travels directly to destination (4 hops to backbone) via Internet mechanisms (sendmail). If the path to the destination is interrupted, or the remote machine is by any mean momentarily not reachable, the mail is queued up locally. Delivery may not be immediate, but mail is never lost. Bitnet mail is gatewayed on the `imisiam` IBM.


```
Files: None
```

C. E-MAIL SERVICES

C.3 from Unix

C.3.2 from Unix to VAX and Decnet

There is no *direct* Decnet connection from most workstations (namely not from the Suns, but only from Ultrix). However a local gateway facility is arranged so that the following addresses can be used :

In general you **shall** send mail to an user <u>on our local VAX</u> (provided he/she elected to receive his/her mail there) using the first address shown below (i.e. treat him/her as a local user); only in case the user has not set such arrangements use the second form:

```
user
user@vax.decnet
```

You can send mail to <u>other</u> VAXes and Decnet (SPAN,HEPNET) nodes (original addresses of the form `node::user`), using the following address :

```
user@node.decnet        (recommended)
```

In case the original address was `bridge::node::user`, you shall use the forms :

```
user%node@bridge.decnet            (from Suns and DECstations)
vax::bridge::node::user            (from kronos)
```

In the latter cases (bridging) it is not guaranteed that the originating address as seen at destination could be used to compose a reply.

Mail to Decnet from a Sun or planet DECstations travels to destination via the `kronos` DECstation. The latter machine is in principle capable of delivering Decnet mail, however, being it an hidden Decnet node, it actually bridges over `IFCTR` Vax (mail will appear to come from `IFCTR::DEC::something`). This makes a total of 6 hops to the backbone. If the Decnet path to the destination is interrupted the mail is queued up on `kronos`. Delivery will be tried again periodically for a maximum of three days, then mail will be sent back to you..

Files: `/etc/sendmail.cf` on all machines, and particularly on `kronos`

C. E-MAIL SERVICES

C.3 from Unix

C.3.3 from Unix to Unix

You can send mail to another user on a local workstation (provided he/she elected to receive his/her mail there) using the following address :

```
user                    (on any local workstation)
user@ifctr.mi.cnr.it    (remotely, i.e. from outside IFCTR)
```

See C.3.1 above for the case of sending mail to Internet nodes outside our local area network.

Using mail to local Unix workstations with explicit Internet addressing is formally discouraged.

```
Files: /etc/sendmail.cf on each workstation
       /etc/aliases on helios
```

C. E-MAIL SERVICES

C.3 from Unix

C.3.4 from Unix to PC and viceversa

Bidirectional TCP-IP mail is possible only to a (switched on) PC running a mail server <u>at the moment</u> in which mail is being sent. I am not aware of such software for Macintosh. *FTP-Inc. TCP-IP* provides such a server for DOS PCs, and also provides a way to *send* mail to Internet. However the way to *receive* mail is unfortunate, since it is quite unlikely that the server on the PC will be active at the right moment, and **mail can get lost**. Alternately it is possible to configure the PC as client of a server (a workstation) running an appropriate protocol to store mail for the PC (e.g. *FTP-Inc. TCP-IP* supports the Post Office Protocol POP). However this requires additional work from the Unix side.

For this reason using PCs for Internet mail is at the moment not supported.