SCIENCE AND ENGINEERING RESEARCH COUNCIL
RUTHERFORD APPLETON LABORATORY
COMPUTING DIVISION

SUN/27.1

Starlink Project
Starlink User Note 27.1

Issued by

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Implementation of a new Starlink directory structure

1. INTRODUCTION

It has been decided to change the directory structure of the Starlink software. Users may be affected in two ways:

1. The reorganisation is a very detailed and error prone procedure, so it is possible that some problems may appear after the reorganisation is carried out. If you find that a program which used to work properly ceases to do so after the reorganisation, please contact Mike Lawden at RAL (Tel: Abingdon 21900 X6234, Mail: MDL or STAR), and give him details of the problem.

2. Documentation which refers to directory names will probably become incorrect. In most cases, file names, logical names and symbols will remain the same. This note should help you find the new locations of Starlink files. New versions of Chapters 3 and 5 of the Starlink User Guide will be revised as soon as possible, but a complete revision of all the Starlink documentation is impractical. However, you should be able to correct the relevant parts yourself on the basis of this note.

The change over is expected to occur at RAL during the morning of Thursday 3 December, and at other sites a few days later. A login message specifying the exact date and time will be given when the reorganisation is imminent.

2 THE REASONS FOR THE CHANGE

The original structure was quite logical and "seemed a good idea at the time". However, experience has revealed at least 4 undesirable characteristics:

1. The transfer of Starlink software to other computers is unnecessarily complicated. This is mainly caused by:

   a. The multitude of top level directories.

   b. Local software being stored in sub-directories of Starlink software.

   c. Proprietary software being mixed up with our own software.

2. The installation of new software packages is difficult because files of different types are supposed to be stored in different directories. This has been overcome to some extent by the creation of [STARPACK], but this is simply an admission of the inadequacies of the original structure.

3. The original structure does not take full advantage of the facilities provided by VMS. In particular, the file type facility provides a means of identifying source code, executable code, command procedures, etc., which we have identified by different directory names. This leads to redundancy in complete file names, (e.g. [USERCOM]PROG.COM).

4. The division between 'systems' and 'user' software has proved to be more of an annoyance than an advantage, and has led to several sterile arguments about whether a particular file should be stored in a 'system' or 'user' directory.

3. THE OLD STRUCTURE

The original Starlink directory structure is illustrated in Figure 1.

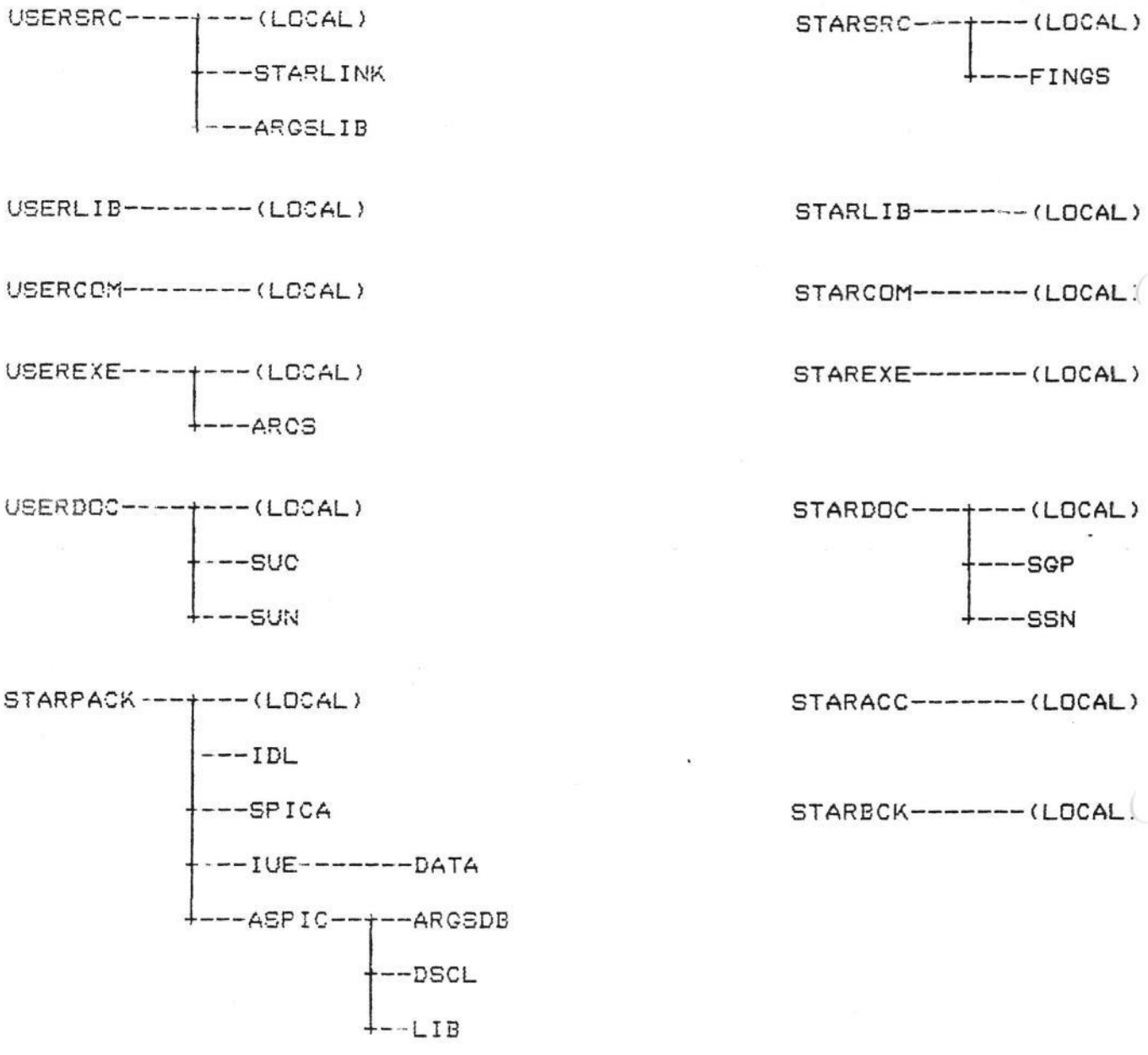

Figure 1. The old Starlink directory structure.

The top level directories can be grouped into 3 classes:

[USER*]	holds user software.
[STAR*]	holds systems software (except [STARPACK]).
[STARPACK]	holds autonomous packages.

The last part of the directory name indicates the type of file stored in it.

[*SRC]	holds source code.
[*LIB]	holds libraries of subroutines.
[*COM]	holds command files.
[*EXE]	holds executable code.
[*DOC]	holds documentation.

4. THE NEW STRUCTURE

The new Starlink directory structure, illustrated in Figure 2, attempts to avoid the undesirable characteristics of the old structure while remaining simple and logical.

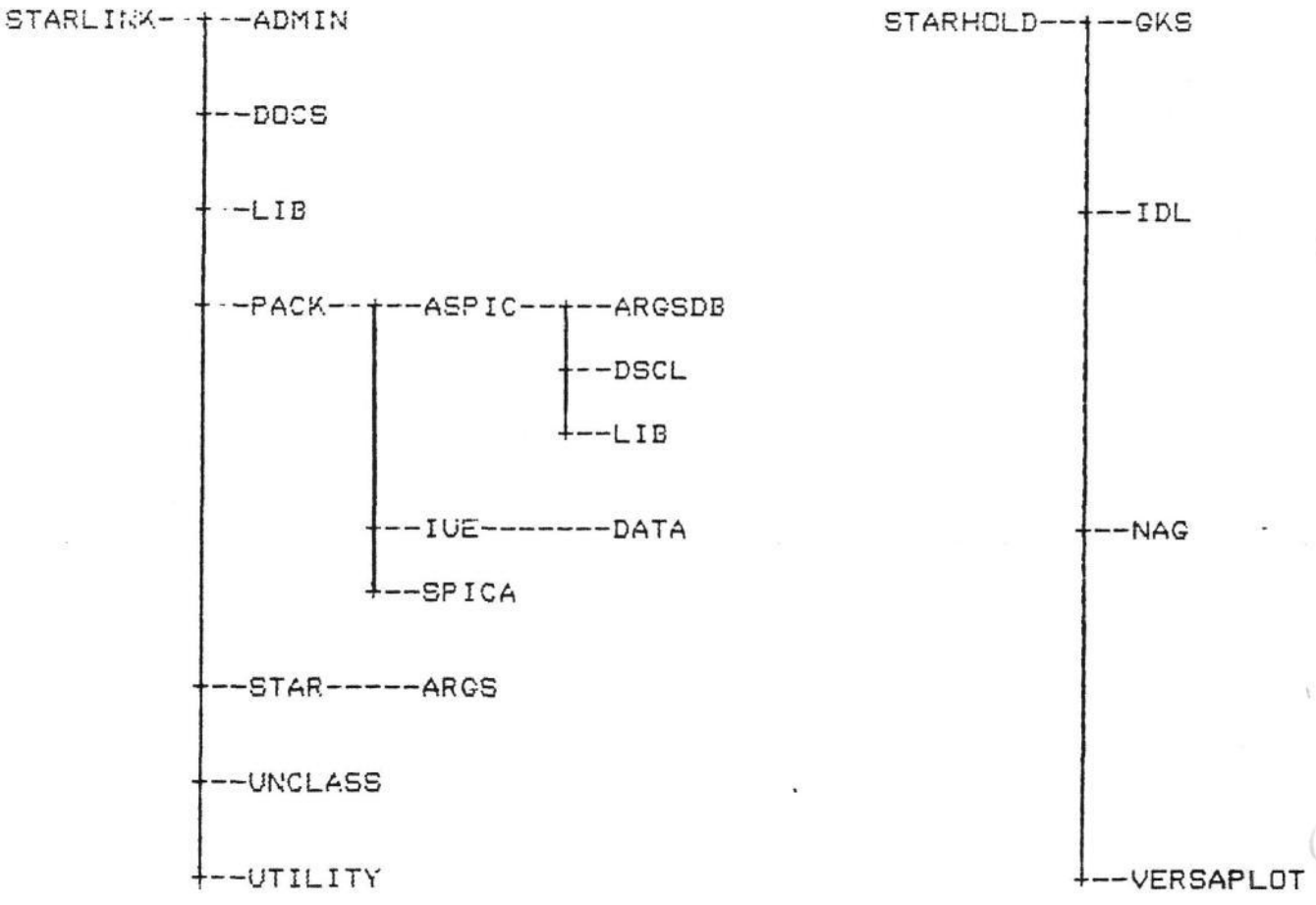

Figure 2 The new Starlink directory structure

The two main design criteria adopted were:

1. All the files belonging to a single software item should be stored at a single node of the tree. (Sub-directories may be used to group related files together if this is felt to be desirable).

2. The tree structure should reflect a natural and convenient functional division in the software.

The main problem is to satisfy the second criterion since people's views on what division is 'natural' and 'convenient' differ. Complete agreement on the new structure has proved impossible to achieve. However, widespread and lengthy discussions have taken place on the issues involved and the adopted new structure incorporates suggestions from many people.

All the 'project-wide' Starlink software is held in two directories (with their sub-directories)

[STARLINK...] holds project generated software which the project manager can distribute on his own authority.

[STARHOLD...] holds proprietary software which is used by Starlink, but which cannot be distributed without a licence.

The syntax '[name...]' means the directory '[name]' and all its subdirectories.

Starlink software which is local to an individual site is stored in directory [STARLOCAL...]. This should have the same basic structure as the directory [STARLINK...]. The contents of [STARLOCAL...] is decided upon by the local Site Manager.

The directory [STARLINK] contains 7 first level sub-directories:

ADMIN holds information used in the management and administration of Starlink.

DOCS holds Starlink documentation. In particular, it holds copies of all Starlink classified documents (SGP, SSN, SUG and SUN) available in on-line form, together with associated indexes.

LIB holds libraries of subroutines used by the linker, (of file type .OLB).

PACK	holds software which is released in the form of self contained packages, (e.g. SPICA).
STAR	holds the Starlink environment and the programs which depend on it.
UNCLASS	holds software which does not fall naturally into other directories. At the moment, it contains only device drivers.
UTILITY	holds programs which do not depend on the Starlink environment. Usually, these are single programs which carry out simple tasks like copying a magnetic tape. Thus, the name 'UTILITY' was preferred to the arcane name 'UNSTAR'.

The directory [STARHOLD] contains 4 sub-directories:

GKS	holds the GKS graphics package.
IDL	holds the IDL language software.
NAG	holds the NAG scientific subroutine library.
VERSAPLOT	holds the Versatec proprietary software.

5. THE NEW FILE LOCATIONS

5.1 Software Items

Starlink software comprises a set of software items. These are described in the Starlink Software Index (stored in file [STARLINK.ADMIN]SSI). One of the big advantages of the new structure is that all the files comprising a single software item are stored together in a single directory. The name of the directory which holds the files comprising each software item is specified below. In most cases, the file name part of the complete file specification remains the same.

Item name	Directory	
	STARLINK.	STARHOLD.
AATOS	UTILITY	
ANIUE	PACK.IUE	
ARGS driver	UNCLASS	
ARGS programs	STAR.ARGS	
ARGS subroutines	LIB	
ASPIC	PACK.ASPIC	
ASTROM	UTILITY	
CONTOUR (HIGR)	LIB	
DRP (IUE package)	PACK.IUE	
DRPLOT (HIGR)	LIB	
DSCL	PACK.ASPIC.DCSL	
FINCS	LIB	
FLOPPYCOPY	UTILITY	
GEROFF	UTILITY	
GKS		GKS
HIGR (graphics)	LIB	
HIST3D (HIGR)	LIB	
IPCSIN	STAR	
IDL		IDL
IDLP1	STAR	
IUE	PACK.IUE	
Login files	(top level)	
LWRLORES (IUE program)	PACK.IUE	
MTANAL	UTILITY	
MTCOPY	UTILITY	
MTDUMP	UTILITY	
MTRU	UTILITY	
NAG library		NAG
RUNSTAR	STAR	
SPICA	PACK.SPICA	
STAK (IUE program)	PACK.IUE	
STARLINK subroutines	STAR	
Startup files	(top level)	
STE	UTILITY	
SWPLORES (IUE program)	PACK.IUE	
TAPEID (library)	LIB	
TAPERD (IUE program)	PACK.IUE	
TRAK (IUE program)	PACK.IUE	
VERSAPLOT		VERSAPLOT
VICARIN	STAR	

5.2 Documentation

Starlink documentation is held in [STARLINK.DOCS]. The file name is based on the document code number, thus:

Starlink User Note 21 (SUN/21) is stored in file SUN21.

The file may exist in up to 3 different forms, identified by the following file types:

GRF holds raw text for processing by the GEROFF text processing program.

LIS holds processed text suitable for output at a terminal. If no .DOC file is available, this will be suitable for printing on a lineprinter.

DOC holds processed text suitable for printing on a lineprinter.

A set of GEROFF macros, suitable for the production of Starlink documentation is stored in file:

[STARLINK.DOCS]PRELUDE.GRF

You can use these by including the following line as the first line in your GEROFF file:

.af SYS$SYSDISK:[STARLINK.DOCS]PRELUDE.GRF

5.3 Information summaries

The standard information summaries are held in the following files:

[STARLINK.DOCS]DOCS	holds a list of all the classified Starlink documentation.
[STARLINK.DOCS]SUBJECT	holds a subject index to the classified Starlink documentation.
[STARLINK.ADMIN]SSF	specifies all the files and directories comprising the Starlink software.
[STARLINK.ADMIN]SSI	specifies all the software items comprising the Starlink software.

[STARLINK.ADMIN]USERNAMES specifies all the usernames used by all the users of the Starlink system at every site.

6. SIGNIFICANT OPERATIONAL CHANGES

Much Starlink software makes use of the 'Logical Name' and 'Global Symbol' facilities offered by VMS. Since the definitions of these entities can be changed, much of the reorganisation can take place without the user being aware of it. Thus, the operation of the packages ASPIC, IDL, IUE and SPICA remain unchaged.

Where a program is executed by a simple RUN command, the user must specify the new location of the executable file. Thus, the program MTANAL was originally executed by typing the command:

```
$ RUN SYS$SYSDISK:[USEREXE]MTANAL
```

After reorganisation, the correct command will be:

```
$ RUN SYS$SYSDISK:[STARLINK.UTILITY]MTANAL
```

In the rest of this section, we consider the changes caused by the reorganisation to the use of some specific software items.

6.1 Starlink Environment (RUNSTAR, STARLINK).

6.1.1 Source programs

The files FMTPAR.FOR and ERRPAR.FOR are now stored in SYS$SYSDISK:[STARLINK.STAR] instead of SYS$SYSDISK:[USERSRC] so if you 'INCLUDE' them in your source code, change 'USERSRC' to 'STARLINK.STAR'. e.g.

```
INCLUDE 'SYS$SYSDISK:[STARLINK.STAR]FMTPAR.FOR'
```

Correct the example on page 47 of SUN/4.

6.1.2 Compiling and linking programs

The subroutine library is now stored in

```
SYS$SYSDISK:[STARLINK.STAR]INTERIM.OLB
```

instead of

```
SYS$SYSDISK:[USERLIB]STARLINK.OLB
```

Also, public Starlink application programs which have not been released as Starlink software should be stored in

```
SYS$SYSDISK:[STARLOCAL.STAR]
```

instead of

```
SYS$SYSDISK:[USEREXE.LOCAL]
```

Thus, the LINK statements shown on page 32 of SUN/4 should be modified to read (e.g.)

```
$ LINK/EXE=[STARLOCAL.STAR]DISPLAY [DJP.STAR]DISPLAY -
      SYS$SYSDISK:[STARLINK.STAR]INTERIM/LIB/INC=(STL_DATA)
```

6.1.3 Running programs

Programs can still be run as before using the global symbol RUNSTAR, but its definition is now

```
$ RUNSTAR:==@SYS$SYSDISK:[STARLINK.STAR]RUNSTAR.COM
```

On pages 34 and 37 of SUN/4, please change

[USERCOM]	to	[STARLINK.STAR]
[USEREXE.LOCAL]	to	SYS$SYSDISK:[STARLOCAL.STAR]

6.2 FINGS

The library TAPEIO.OLB is now stored in [STARLINK.LIB] instead of [USERLIB]. Please correct page 2 of SUN/21. e.g.

```
$ LINK TAPECOPY,SYS$SYSDISK:[STARLINK.LIB]TAPEIO/LIBRARY
```

6.3 ARGS programs

The ARGS programs have been moved to SYS$SYSDISK:[STARLINK.STAR.ARGS] from [USEREXE.ARGS]. Some of the programs are Starlink application programs, therefore they are executed by statements such as

```
RUNSTAR SYS$SYSDISK:[STARLINK.STAR.ARGS]ARGSBASIC
```

6.4 IPCSIN, VICARIN, IDLP1

IPCSIN: in SUN/3, replace [USEREXE] by [STARLINK.STAR].
VICARIN: in SUN/7, replace [USEREXE] by [STARLINK.STAR].
IDLP1: in SUN/18, replace [USEREXE] by [STARLINK.STAR].

6.5 MTANAL, MTDUMP, MTCOPY

All: in SUN/22, replace [USEREXE] by [STARLINK.UTILITY].

7. OPPORTUNE CHANGES

This major reorganisation is an opportune moment for a general tidy-up and reassessment of the status of existing files. Many changes in detail have been made, most of which need not concern the user. However, you may need to be aware of the following changes:

1. The 'INFO' files have been eliminated. They are redundant since the Starlink Software Index specifies the identities of the files, and a user should never need to consult an 'INFO' file. Starlink suffers from enough administrative overhead without creating unnecessary work such as the maintenance of redundant 'INFO' files.

2. The following software items are obsolete and have been deleted:

   6.6 Back-up system (replaced by the BACKUP command).
   4.13 TECO - Text editor (now part of DEC software).
   2.9 TEKPAK - Primitive 4010 graphics.

3. The following software items have been reclassified as 'local':

   6.5 Accounting system
   6.13 DISPLAY

4. The following filenames have been shortened to maintain consistency and to eliminate redundancy:

   ARGSLIB to ARGS
   FINGSLIB to FINGS
   HIGRLIB to HIGR

5. Because the current Starlink system is an interim system and will be replaced in due course by a pucka system, the Starlink library and source code file names have been changed from

   STARLINK to INTERIM

6. Several missing files have been added to the documentation directory [STARLINK.DOCS].