ASAPS Kernel V1.3 functions

Deliverables:

A set of "C" language ASAPS functions provided in object code format.

These functions are provided in a library file in the installed directory along with **ipscore.c** (source code of a test program), **ipscore.h** (source code of a header file containing definitions of structures, constant values and function prototypes) and required ASAPS static data files (**dec, hrnos, lsi10.sdb, nfcon.sdb, fdc.sdb, mgpd.01- mgpd.12**).

Instructions for use of the set of "C" language ASAPS functions:

```
/* function prototypes */
int IPS_BUF(struct IPS_Circuit *, struct IPS_BUF_Sys *, struct IPS_BUF_Dat *, char
*ASAPSDIR);    /* returns FALSE if an exception occurred */

int IPS_PL(struct IPS_Circuit *, struct IPS_PL_Hd *, struct IPS_PL_Dat DAT[2], struct IPS_FSet
*, char *ASAPSDIR);       /* returns FALSE if an exception occurred */
```

The above two functions provide the entry and data returned from the ASAPS core software.

IPS_PL is for the pipeline stages to obtain the probability, pathloss, path_delay and takeoff angle for each of the modes supported for each frequency specified. Input is to be provided as pointers to the location of the data structures IPS_Circuit, IPS_FSet (detailed in **ipscore.h**) and to a C string continuing the path to the ASAPS data files. The returned data are placed in the data structures IPS_PL_Hd and IPS_PL_Dat array.

IPS_PL_Hd is a simple structure containing the distance between terminals in km, bearing from Tx to Rx, bearing from Rx to Tx, number of modes supported and a pointer to allocated memory for an array of atmospheric plus galactic radio noise for each frequency.

The IPS_PL_Dat array contains the data for up to the first four supported mode-layer combinations. Array element 0 contains the data for the first mode via the E and F layers. Similarly element 1 contains the data for the second supported mode. The associated structure mol[2/1] contains the data for the MUF, OWF, UD and FMIN frequencies (see ASAPS user guide for definition), and for each of the specified frequencies entered.

IPS_PL returns a nonzero TRUE if no problems are encountered (N.B. always check return value).

IPS_BUF is for the channel selection stage to obtain the Best Usable Frequency (BUF) (see ASAPS User Guide for definition), Signal/Noise at BUF, probability at BUF and Mode of the BUF. Input is to be provided as pointers to the location of the data structures IPS_Circuit, IPS_BUF_Sys (detailed in **ipscore.h**) and to a C string continuing path to ASAPS data. The returned data are placed in the data structure IPS_BUF_Dat. If the string Mode in IPS_BUF_Dat is equal to ".." no frequency in any of the modes/layers met the requirements laid down in IPS_BUF_Sys (all other variables in IPS_BUF_Dat are undefined).

IPS_BUF returns a nonzero TRUE if no problems are encountered.

Note: All required data structures are described in the file **ipscore.h** including units required and ranges. (N.B. NO range checking is performed. You must make sure all data is within the ranges specified) An example of how to use the functions is in the file **ipscore.c**.