

## ASYNCHRONOUS FILE TRANSFER TO IBM PC's

by

Jerome Hoerger, Computer Systems Analyst  
Business Data Systems Division  
Mail Stop 179, Langley Research Center  
FTS 928-2721

The Asynchronous File Transfer System is used for interactively selecting and transmitting text files from the BSDS host processor to an IBM Personal Computer. The IBM asynchronous communications support package is used for handling the communications on the Personal Computer. An application program (NATURAL, COBOL, etc.) is used for selecting and formatting the records to be transmitted, and three subroutine modules residing on the BSDS host processor are used for interfacing the application program and the communications software.

Each record transmitted to the Personal Computer must be in the standard ASCII format as illustrated below. This record format is directly accessible by BASIC and many of the Personal Computer software packages provide utility programs for converting them to the format required for the particular package in question.

### Standard ASCII Format

```
data,data,"data, data",dataCRLF
```

In this format each data value is separated by a comma. A data value that has a comma embedded within it must be enclosed within quotation marks. The record is terminated with a carriage return (CR) and line feed (LF) character sequence.

### Hardware and Software Requirements

The following hardware and software is needed to access the BSDS host processor:

#### IBM Personal Computer

- 64K bytes memory
- Asynchronous Communications Adapter
- IBM Disk Operating System (DOS) and Disk BASIC
- IBM Asynchronous Communications Support Version 2.0 (modified by BSDS)

### How To Use the Asynchronous File Transfer Facility

Prior to using the Asynchronous File Transfer Facility, a terminal specification for accessing the BSDS host processor must be defined. The terminal definition parameters must be set as follows:

- 1 - Line Bit Rate (300 or 1200)
- 2 - Type of Parity Checking (Even)
- 3 - Number of Stop Bits (1 Bit)
- 4 - XON/XOFF Support (Absent)
- 5 - Line Turnaround Char Sent to Host (XOFF)
- 6 - Local or Host Character Echoing (Local)
- 7 - First Character To Be Deleted (All)
- 8 - Second Character To Be Deleted (LF)
- 9 - Third Character To Be Deleted (XON)
- 10 - Fourth Character To Be Deleted (None)
- 11 - Line End Character Send by Host (CR)

The application program is responsible for selecting and formatting the records making up the file to be transmitted. Each record must be terminated with a carriage return character (ASCII Code - OD). Consult the Personal Computer documentation for restrictions on the ASCII file format. The application program can be written in any language supported by COM-LETE (BDS's teleprocessing monitor).

The subroutine modules must be called by the application program to facilitate the file transfer. These modules are described below.

FILEOP - The FILEOP module should be called prior to entering file capture mode on the Personal Computer. It sends the message READY DISK FOR FILE TRANSFER to the Personal Computer and waits for the operator to ready the disk and reenter terminal mode. After terminal mode has been entered, the operator must depress the return key to inform the host processor the file transfer is ready to be started.

Format - CALL 'FILEOP'. (COBOL)  
CALL 'FILEOP' #DUMMY (NATURAL)

Arguments - #DUMMY - Identifies a dummy argument required for the NATURAL CALL statement.

FILEWT - The FILEWT module must be called for each record to be transmitted. This module converts the record passed by the application program into a format suitable for transmission. A line feed (LF) character is appended to the end of the record prior to transmission.

Format - CALL 'FILEWT' USING #RECORD. (COBOL)  
CALL 'FILEWT' #RECORD (NATURAL)

Arguments - #RECORD - Identifies the record to be transmitted. The maximum length is 250 characters.

FILECL - The FILECL module must be called after all records have been transmitted. This module sends an end-of-file character (hexadecimal 1A) and the message FILE TRANSMISSION COMPLETE to the Personal Computer. This message will be

recorded on the Personal Computer's disk but will not be included as part of the file due to the end-of-file indicator preceding it. When the terminal operator receives this message, the file capture mode on the Personal Computer should be ended. The operator then returns to terminal mode.

Format - CALL 'FILECL'. (COBOL)  
CALL 'FILECL' #DUMMY (NATURAL)

Arguments - #DUMMY - Identifies a dummy argument required for the NATURAL CALL statement.

Sample Program -

```
RESET #Q (A1) #C (A1) #CR (A1) #DUMMY (A1)
      #RECORD (A250)
MOVE H'OD' TO #CR
MOVE ', ' TO #C
MOVE H'7F' TO #Q
CALL 'FILEOP' #DUMMY
READ TERM-CONF WITH DECAL
COMPRESS #Q MAKE #Q #C DECAL #C #Q CONTACT #Q #C PHONE
        #C #Q ACCESS #Q #CR INTO #RECORD LEAVING
        NO SPACE
CALL 'FILEWT' #RECORD
LOOP
CALL 'FILECL' #DUMMY
ENC
```