EMS EEC Trading Partner Users' Manual

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LIST OF ILLUSTRATIONS

SECTION 1

INTRODUCTION

This document describes the screens for the Trading Partner (TP) interface software for the EMS EDAF/ETR (EEC) consolidation. The Exhibits displaying the interaction between the TP and the EEC are not screen shots. Therefore, the spacing on the actual displays may be different.

SECTION 2

SAMPLE TRADING PARTNER SESSION

The following discussion describes how a TP interacts with the EEC. Exhibit 2-1 illustrates the TP login along with information displayed by the Sun Operating System.

```
****************************WARNING***********************************
Unauthorized access is prohibited by Public Law 99-474
"The Computer Fraud and Abuse Act of 1986"

This is a United States Government system.  It is intended for
the communication, transmission, processing, and storage of
official and other authorized information only.

USE OF THIS SYSTEM CONSTITUTES CONSENT TO
MONITORING AT ALL TIMES AND IS NOT SUBJECT
TO ANY EXPECTATION OF PRIVACY.

AUTHORIZED USE ONLY! ACCESS TO THIS US GOVERNMENT SYSTEM CONSTITUTES CONSENT
TO MONITORING FOR LAW ENFORCEMENT AND OTHER PURPOSES.


login: 99999
Password:********
Last login: Tue Sep  4 10:39:31 from computername
```

Exhibit 2-1 Trading Partner Login

If the TP successfully logs in to the Operating System, the "Official Use" banner shown in Exhibit 2-2 displays.

```
        ----------------------------------------------------------
              F O R   O F F I C I A L   U S E   O N L Y

                     #    #####    ####
                     #    #    #   #
                     #    #    #   ####
                     #    #####      #
                     #    #  #   #    #
                     #    #   #   ####

                  U.S. Government computer

              F O R   O F F I C I A L   U S E   O N L Y
        ----------------------------------------------------------
```
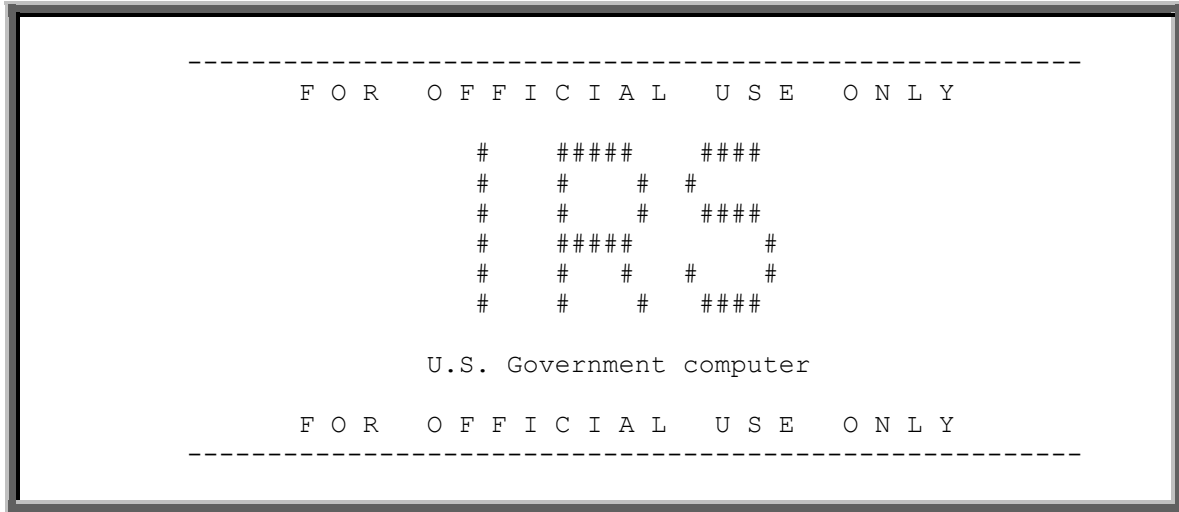
Exhibit 2-2 "Official Use" Banner

If the EEC application is not available the message shown in Exhibit 2-3 is displayed and the TP is disconnected.

```
        EFS is down| Please try later.
```
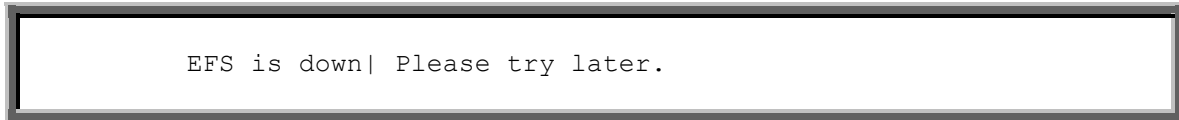
Exhibit 2-3 EFS Down Message

After each unsuccessful login, the system displays "Login incorrect." After three consecutive unsuccessful login attempts, the TP is disconnected. After six consecutive unsuccessful login attempts (in two or more consecutive sessions) the TP's account is disabled. Once the account has been disabled, any attempt to login to the account causes the system to display the message "This account is currently disabled" and the login attempt fails. If this happens, the TP should contact the Home Submission Processing Center (SPC) EMS Help Desk. The problem is documented and referred to a computer specialist.

If the TP is active, the menu shown in Exhibit 2-4 is displayed. The TP's current file transfer protocol is displayed in brackets next to the "Change File Transfer Protocol" menu item. The TP's current compression method is displayed in brackets next to the "Change Compression Method" menu item. The possible file transfer protocol (FTP) and compression method values are identified later when the "File Transfer Protocols" and "File Compression Methods" menus are discussed.

It should be noted that a TP's initial compression method is "NONE." Since the EEC does not auto-sense compressed files, a TP must select a compression method before submitting compressed files. (Selecting a compression method is discussed later in this section). If the TP has selected a compression method his/her acknowledgment files are compressed and returned using the selected compression method.

At any prompt, if the TP does not respond in a predetermined number of seconds the following message is displayed: "DISCONNECTING FROM EFS." and the TP is disconnected.

The number of seconds is configurable. One value applies to all trading partners. Currently, this timeout value is set to 60 seconds.

```
        MAIN MENU

        1) Logoff
        2) Receive/Send File(s)
        3) Change File Transfer Protocol [ZMODEM]
        4) Change Compression Method [NONE]

    Enter your choice:  2
```

Exhibit 2-4 Initial Main Menu Display

From the Main Menu, the TP can end her/his session by choosing "Logoff," receive/transmit a file by choosing "Receive/Send File(s)," change her/his file transfer protocol by choosing "Change File Transfer Protocol," or change her/his compression method by choosing "Change Compression Method."

When the TP chooses the "Receive/Send File(s)" menu item, the EEC TP interface software checks to see if there are acknowledgment files to be sent to the TP. No dummy acknowledgments are sent. If there are no acknowledgment files, the message in Exhibit 2-5 is displayed followed by the "send" prompt shown in Exhibit 2-11. This allows TPs to submit files even if there are no acknowledgment files awaiting TP receipt.

```
Number of Acknowledgment File(s) in outbound mailbox: 000
```

Exhibit 2-5 Zero Acknowledgment File Display

If there are acknowledgment files, the messages shown in Exhibit 2-6 are displayed. The message shows the number of acknowledgment files waiting to be sent to the TP. All acknowledgment files waiting delivery to the TP are delivered before the TP can submit a file. The count of acknowledgment files is updated every time the TP selects item 2) Receive/Send File(s), from the Main Menu. Additional acknowledgment files that were generated during the session are reflected in this count.

```
Number of Acknowledgment File(s) in outbound mailbox: 003

Are you ready to receive files? Y/[N]: Y or y
```

Exhibit 2-6 One or More Acknowledgment Files Display

If the TP enters anything other than "Y" or "y," the Main Menu (Exhibit 2-18) is redisplayed. If the TP fails to respond affirmatively three consecutive times he/she is disconnected.

The TP cannot send files until he/she has received her/his acknowledgment files.

If the TP responds to the prompt affirmatively, a message notifying the TP that the file transfer is about to begin is displayed. The message depends on the protocol being used. For Zmodem, any mode of Xmodem or Ymodem; the message in Exhibit 2-7 is displayed. For FTP, the message shown in Exhibit 2-8 is displayed. The file transfer begins after the appropriate notice.

```
EFS ready for modem download.
```

Exhibit 2-7 Modem Download Notice

```
Putting File(s) by FTP.
```

Exhibit 2-8 FTP "Putting Files" Notice

All acknowledgment files are sent as separate files. If the TP is also using compression, each file is separately compressed. (See Appendix A for a description of acknowledgment file names.)

If the TP interface software detects that the transmission did not complete successfully, the message in Exhibit 2-9 is displayed followed by the Main Menu (Exhibit 2-18). If this happens three times in a row, the TP is disconnected.

```
            Error transmitting Acknowledgment File(s).
```

Exhibit 2-9 Acknowledgment File Transmission Error Message

If the TP interface software does not detect an error, the message shown in Exhibit 2-10 is displayed.

```
            Acknowledgment File(s) transmission complete.
```

Exhibit 2-10 Acknowledgment File Transmission Complete Message

If a TP has been suspended, the "Suspended TP Message" is displayed and the TP is disconnected. See discussion of suspended TP and EEC virus checking on page 2-8.

Next the TP is asked if he/she wants to send a file as shown in Exhibit 2-11.

```
            Do you want to send a file? Y/[N]: Y or y
```

Exhibit 2-11 Send Tax Return File Prompt

If the TP enters anything other than "Y" or "y," the Main Menu (Exhibit 2-18) is redisplayed. If there are no acknowledgment files for the TP to receive and the TP fails to respond affirmatively three times in a row, the TP is disconnected.

Otherwise, the next prompt depends on the file transfer protocol being used. If the TP is using Zmodem, Ymodem, or any mode of Xmodem; he/she is prompted to start the file transfer as shown in Exhibit 2-12.

```
            Enter an upload command to your modem program now.
```

Exhibit 2-12 Modem Upload Prompt

If the TP is using the FTP protocol, he/she is prompted to supply a file name as shown in Exhibit 2-13. After supplying the file name

the TP is notified that the FTP transfer is beginning. This notice is also shown in Exhibit 2-13.

```
          Enter the LOCAL name of the file you
          are sending from your system: myfile

          Getting file by FTP.
```

Exhibit 2-13 FTP File Name Prompt

If the TP responds to the filename prompts in Exhibit 2-13 or with only a carriage return (<CR>), then the notice shown in Exhibit 2-14 is displayed. If the TP responds with only a <CR> three times in a row, the TP is disconnected.

```
          Invalid file name.

          Enter the LOCAL name of the file you
          are sending from your system: <CR>
```

Exhibit 2-14 Invalid File Name Message

Once the TP has been notified that the file transfer is beginning (Exhibit 2-12 or Exhibit 2-13), the TP has 60 seconds to begin his/her file transfer. If the EEC does not receive at least part of the TP's file within 60 seconds, the TP is disconnected.

If the TP interface software does not detect an error, the transmission confirmation message shown in Exhibit 2-15 is displayed followed by the Main Menu (Exhibit 2-18). If the TP hangs up without receiving the confirmation message, there is no guarantee that the EEC will process the file(s).

The transmission confirmation message contains the Global Transmission Key (GTX Key) and the reference file name. The GTX Key is the unique identifier assigned by the EEC to the file sent by the TP, and is used to track the processing of the file and its subsequent acknowledgment. The reference file name is used when constructing the name of the acknowledgment file delivered to the TP. (See Appendix A for a description of the GTX Key and its relationship to the reference file name.)

```
Transmission file has been received with the following GTX Key:

     S20041020123423.1700                    10200001
```

Exhibit 2-15 Transmission Confirmation Message Display

If the TP interface software detects that the transmission did not complete successfully, the message in Exhibit 2-16 is displayed followed by the Main Menu (Exhibit 2-18). If this happens three consecutive times, the TP is disconnected.

```
     Error receiving file.  You must send it again.
```

Exhibit 2-16 Transmission Receipt Error Message

If the TP has been suspended, he/she is not allowed to transmit new files. After receiving acknowledgment files, the TP does not receive the "Do you want to send a file?" prompt. Instead the message "SUSPENDED TRANSMITTER/ETIN" is displayed, and the TP is disconnected from EMS. A suspended transmitter is allowed to log into EMS to continue to receive acknowledgments, but is not allowed to transmit.

```
        SUSPENDED TRANSMITTER/ETIN.
```

Exhibit 2-17 Suspended TP Message

EEC checks all incoming files for viruses. If a virus is detected, EEC returns an acknowledgment to the TP in XML format. This format is used regardless of the format of the incoming transmission. The format of the XML error acknowledgment is documented in Appendix B, Error Acknowledgment Format for Detected Viruses. If EEC detects a virus, the TP is placed in suspended status. Should this occur, the TP must contact the Home Submission Processing Center (SPC) EMS Help Desk to request removal of the suspended status.

After the file transfer has completed, the Main Menu is redisplayed as shown in Exhibit 2-18. The TP can now end the session by choosing "Logoff," receive/transmit a file by choosing "Receive/Send File(s)," change the file transfer protocol by choosing "Change File Transfer Protocol," or change the compression method by choosing "Change Compression Method." In order to illustrate all the menus, the following discussion assumes the TP chooses "Change File Transfer Protocol."

```
        MAIN MENU

        1) Logoff
        2) Receive/Send File(s)
        3) Change File Transfer Protocol [ZMODEM]
        4) Change Compression Method [NONE]

    Enter your choice:  3
```

Exhibit 2-18 Redisplay of Main Menu

When the TP chooses "Change File Transfer Protocol," the menu shown in Exhibit 2-19 is displayed. Brackets frame the TP's current file transfer protocol. Before a TP can use the FTP protocol, he/she must provide certain configuration information to the IRS. If this information does not exist in the EEC database, then "FTP" is not displayed as one of the available protocols.

```
            FILE TRANSFER PROTOCOLS MENU

        1) Return to MAIN MENU
        2) [ZMODEM]
        3) XMODEM-1K
        4) XMODEM CRC
        5) XMODEM CHKSM
        6) YMODEM BATCH
        7) FTP


     Enter your choice:  7
```

Exhibit 2-19 Initial File Transfer Protocol Menu Display

The TP can change the protocol or return to the Main Menu. If the TP selects a protocol, the Main Menu is redisplayed with the selected protocol in brackets as shown in Exhibit 2-22. This protocol setting is saved in the EEC database and is used for all future incoming/outgoing file transfers unless the TP changes the protocol again. The TP's initial setting is "ZMODEM."

Any character other than one of the menu number choices is considered invalid (as shown in Exhibit 2-20).

```
            FILE TRANSFER PROTOCOLS MENU

        1) Return to MAIN MENU
        2) [ZMODEM]
        3) XMODEM-1K
        4) XMODEM CRC
        5) XMODEM CHKSM
        6) YMODEM BATCH
        7) FTP

     Enter your choice:  0 (or any other invalid character)
```

Exhibit 2-20 Invalid File Transfer Protocol Menu Selection

If the TP enters an invalid character, an invalid menu selection message along with the File Transfer Protocols Menu is displayed as shown in Exhibit 2-21. If the TP fails to make a valid selection in three attempts, the TP is disconnected.

```
        Invalid menu selection.  Try again.

            FILE TRANSFER PROTOCOLS MENU

        1) Return to MAIN MENU
        2) [ZMODEM]
        3) XMODEM-1K
        4) XMODEM CRC
        5) XMODEM CHKSM
        6) YMODEM BATCH
        7) FTP


    Enter your choice:  7
```

Exhibit 2-21 Invalid File Transfer Protocol Menu Selection Response

After the TP chooses a valid option from the File Transfer Protocols Menu or chooses "Return to MAIN MENU," the Main Menu is redisplayed.

```
            MAIN MENU

        1) Logoff
        2) Receive/Send File(s)
        3) Change File Transfer Protocol [FTP]
        4) Change Compression Method [NONE]

    Enter your choice:  4
```

Exhibit 2-22 Redisplay of Main Menu after Protocol Change

The TP can now end the session by choosing "Logoff," receive/transmit a file by choosing "Receive/Send File(s)," change the file transfer protocol by choosing "Change File Transfer Protocol," or change the compression method by choosing "Change Compression Method." In order to illustrate all the menus, the following discussion assumes the TP chooses "Change Compression Method." The File Compression Methods Menu is displayed as shown in Exhibit 2-23. Brackets frame the current compression method. The two supported compression methods are gzip (a freeware program available at www.gzip.org) and compress (a Unix compression utility).

```
            FILE COMPRESSION METHODS MENU

       1) Return to MAIN MENU
       2) [None]
       3) GZIP
       4) COMPRESS


   Enter your choice:  3
```

Exhibit 2-23 Initial File Compression Methods Menu Display

If the TP chooses a compression method, the Main Menu is redisplayed with the selected method framed by brackets as shown in Exhibit 2-26. This compression method setting is saved in the EEC database and is used for all future incoming/outgoing file transfers unless the TP changes the compression method again. The TP's initial setting is "None." Before using compression, the TP must select a method from the File Compression Methods Menu.

```
            FILE COMPRESSION METHODS MENU

       1) Return to MAIN MENU
       2) [None]
       3) GZIP
       4) COMPRESS


   Enter your choice:  5 (or any other invalid character)
```

Exhibit 2-24 Invalid File Compression Menu Selection

If the TP enters a character other than one of the menu number choices (as shown in Exhibit 2-24), an invalid menu selection message along with the File Compression Methods Menu is displayed as shown in Exhibit 2-25. If the TP fails to make a valid selection in three attempts, the TP is disconnected.

```
          Invalid menu selection.  Try again.

              FILE COMPRESSION METHODS MENU

              1) Return to MAIN MENU
              2) None
              3) [GZIP]
              4) COMPRESS

          Enter your choice:  1
```

Exhibit 2-25 Invalid File Compression Methods Menu Selection Response

If the TP chooses to return to the Main Menu, the Main Menu is displayed again as shown in Exhibit 2-26. The TP can now choose to end the session, transmit another file, or change the protocol and/or compression settings.

```
              MAIN MENU

              1) Logoff
              2) Receive/Send File(s)
              3) Change File Transfer Protocol [FTP]
              4) Change Compression Method [GZIP]

          Enter your choice:  8 (or any other invalid character)
```

Exhibit 2-26 Main Menu Display After Change Compression Method Menu

If the TP enters a character that is not one of the listed number choices, an invalid menu selection message along with the Main Menu is displayed as shown in Exhibit 2-27. If the TP fails to make a valid selection in three attempts, the TP is disconnected.

```
          Invalid menu selection.  Try again.

              MAIN MENU

              1) Logoff
              2) Receive/Send File(s)
              3) Change File Transfer Protocol [FTP]
              4) Change Compression Method [GZIP]

          Enter your choice:  1
```

Exhibit 2-27 Invalid Main Menu Selection

If the TP chooses to logoff, the TP interface software performs any necessary cleanup activities, records statistical information in the EEC database, and then displays the message shown in Exhibit 2-28. The TP should not hang up before receiving the disconnect message. If he/she does hang up prematurely, the EEC may not complete its cleanup activities. This could result in the TP receiving his/her acknowledgment files again in the next login session or in having the submission file discarded.

```
     DISCONNECTING FROM EFS.
```

Exhibit 2-28 End of TP Session Message

Exhibit 2-29 illustrates a complete TP session including login, receipt of acknowledgment files, transmission of a tax return file, and session termination.

```
****************************WARNING***********************************
                Unauthorized access is prohibited by Public Law 99-474
                     "The Computer Fraud and Abuse Act of 1986"

                   This is a United States Government system.  It is intended for
                  the communication, transmission, processing, and storage of
                         official and other authorized information only.

                         USE OF THIS SYSTEM CONSTITUTES CONSENT TO
                        MONITORING AT ALL TIMES AND IS NOT SUBJECT
                            TO ANY EXPECTATION OF PRIVACY.

AUTHORIZED USE ONLY!  ACCESS TO THIS US GOVERNMENT SYSTEM CONSTITUTES CONSENT
TO MONITORING FOR LAW ENFORCEMENT AND OTHER PURPOSES.




login: 99999
Password:********
Last login: Tue Sep  4 10:39:31 from computername


        ----------------------------------------------------------
              F O R    O F F I C I A L    U S E    O N L Y

                        #     #####    ####
                        #     #    #   #
                        #     #    #   ####
                        #     #####       #
                        #     #   #   #    #
                        #     #    #   ####


                        U.S. Government computer

              F O R    O F F I C I A L    U S E    O N L Y
        ----------------------------------------------------------

                MAIN MENU

                1) Logoff
                2) Receive/Send File(s)
                3) Change File Transfer Protocol [ZMODEM]
                4) Change Compression Method [NONE]

           Enter your choice:  2
```

**Exhibit 2-29 TP Session to Pick Up Acknowledgments
and Transmit a Tax Return File**

```
Number of Acknowledgment File(s) in outbound mailbox: 003

Are you ready to receive files? Y/[N]: Y

EFS ready for modem download.

Acknowledgment File(s) transmission complete.

Do you want to send a file? Y/[N]: Y

Enter an upload command to your modem program now.

Transmission file has been received with the following GTX Key:

S20041020123423.1700                    10200001

        MAIN MENU

          1) Logoff
          2) Receive/Send File(s)
          3) Change File Transfer Protocol [ZMODEM]
          4) Change Compression Method [NONE]

     Enter your choice:  1

     DISCONNECTING FROM EFS.
```

**Exhibit 2-29 (cont.) TP Session to Pick Up Acknowledgments
and Transmit a Tax Return File**

Appendix A

GTX Key and Acknowledgment File Name Formats

GTX KEY AND ACKNOWLEDGMENT FILE NAME FORMATS

The format of the GTX key is SYYYYMMDDhhmmss.xxxx where S is the processing site identifier, YYYY=year, MM=month, DD=day, hh=hour, mm=minutes, ss=seconds, and xxxx=milliseconds. The site identifier is 'T' for transmissions processed in Memphis and 'U' for transmissions processed in Austin.

The format of the reference name is MMDDnnnn where MM month and DD day match the GTX Key. The nnnn number is a 4-digit sequence number generated by the EEC. The reference name is used to generate the acknowledgment file name.

The EEC acknowledgment files will be named as described in Exhibit A-1.

Form and Format	ACK File Name (Note 1)	ACK File Name w/ Gzip (Note 2)	ACK File Name w/ Compress (Note 3)
112x and 99x Families (XML)			
EEC Error Acknowledgment	MMDDnnnn.NAK	MMDDnnnn.GZ	MMDDnnnn.Z
MeF Acknowledgment	MMDDnnnn.ACK	MMDDnnnn.GZ	MMDDnnnn.Z

Exhibit A-1 Ack File Names

Note 1: MM = month
DD   = day
nnnn = 4 digit sequence number

MMDD is taken from the GTX Key
nnnn is a 4-digit sequence number generated by the EEC at the time the TP submitted his/her file.

Note 2: gzip preserves the uncompressed ACK file name (e.g., MMDDnnnn.ACK) in its archive.

Note 3: Compress does not preserve the uncompressed ACK file name.

Note 4: Two acknowledgments are sent for files submitted in X12 format. When these two acknowledgment files are compressed, the files will have the same name. Therefore, compressed functional acknowledgment files will have an 'F' appended to the compressed ack file name. TPs may have to rename their compressed functional ack files before they are able to decompress the files.

If a TP submits a file that is given the GTX Key "S20041020154710.0800," the first four digits of the reference name would be "1020." The next four digits would be a sequence number generated by the EEC, e.g., "0001." The reference name would then be "10200001." An EEC error acknowledgment file would be named "10200001.NAK." An

acknowledgment from the Unisys system would be named "10200001.ACK." If the acknowledgment file is compressed with gzip it will be named "10200001.GZ." If the acknowledgment file is compressed with Unix compress it will be named "10200001.Z."

Note 5: The acknowledgment file names shown in this appendix use upper case letters. These are the names as they appear on the IRS system. Some file transfer protocols and/or some operating systems may translate the names into lower case.

Appendix B

Error Acknowledgment Format for Detected Viruses

ERROR ACKNOWLEDGMENT FORMAT
FOR DETECTED VIRUSES

This is the format for the error acknowledgment that is returned to the TP when a virus is detected in the transmission. All TP's receive the XML format acknowledgment, even if the transmission was sent using a different IRS approved format. Note that the second line of the file, the Content-Description contains a plain English description of the problem and an understanding of XML is not required to interpret the message. The shaded areas contain the GTX key, a timestamp, and the virus name. These values vary for each returned acknowledgment. The remainder of the message is constant.

```
MIME-Version: 1.0
Content-Description: Notification that transmission file T200303211345.0100 was
rejected because it contained a virus
Content-Type: text/xml; charset=UTF-8

<?xml version="1.0" encoding="UTF-8"?>
<TransmissionAcknowledgement>
      <AcknowledgementTimestamp>2003-12-13T12:05:22-05:00</AcknowledgementTimestamp>
      <TransmissionStatus>R</TransmissionStatus>
      <Errors errorCount="1">
            <Error errorId="1">
                  <ErrorCategory>Unsupported</ErrorCategory>
                  <ErrorMessage><![CDATA[A VIRUS (virus name) WAS DETECTED IN
                  THIS FILE]]></ErrorMessage>
                  <RuleNumber>T0000-009</RuleNumber>
                  <Severity>Reject and Stop</Severity>
            </Error>
      </Errors>
      <GTXKey>T200303211345.0100</GTXKey>
</TransmissionAcknowledgement>
```

Appendix C

EMS Communications
(Capabilities and Services)

SECTION 3 *TABLE OF CONTENTS*

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EMS COMMUNICATIONS
(Capabilities and Services)

Through a number of hardware and software equipment and applications, the Memphis and Austin Service Centers offer a variety of communications services and capabilities that allows TPs to file tax returns and electronic documents. These capabilities include both digital and analog communication services as well as several file transfer protocols. The use of these features is summarized in this document.

3.1 C.1   Digital Service

Use of digital services requires authorization from the IRS. Please contact the following:
   Darryl Giles (202) 283-5193
   darryl.s.giles@irs.gov
The following paragraphs describe the hardware and software necessary to use the digital communication service.

3.1.1 C.1.1 Cisco 7206 Router

Two (2) Cisco 7206 routers have been installed in both Austin and Memphis. Each Cisco 7206 has an aggregate bandwidth of 600 Mbps and contains six slots for communications adapters. While one of the routers is a hot spare, the active 7206 is configured as follows:

- One (1) Ethernet adapter with four (4) ports--10 Mbps each port

- Two (2) ISDN adapters--each adapter supports 4 ports at 128 Kbps each port

- One (1) High speed synchronous adapter, which supports eight (8) ports

- One (1) High speed synchronous adapter, which supports four (4) ports

- All high speed synchronous ports support speeds up to 2.048 Mbps. Connections to these ports are mostly through the Kentrox unit described next, although some TPs have connected to the interfaces, directly from their own high-speed communications equipment

TPs use Point-to-Point Protocol (PPP) link encapsulation methods when connecting to the ISDN ports. They use either PPP or Frame Relay link encapsulation when connecting to the high speed synchronous ports.

3.1.2 C.1.2 Kentrox D-serv

The Kentrox D-SERV is the Channel Service Unit/Digital Service Unit (CSU/DSU) to be used by TPs desiring a direct connect 56 Kbps digital

circuit. It meets all the requirements of the AT&T Technical
Publications TR 62310 and TR 41450. TPs must purchase a D-SERV unit and
a 56 Kbps digital circuit to begin testing over a dedicated line. The
D-SERV unit ordered by the TP must be designed for connection to the
Kentrox Universal Shelf listed below. If the TP has ISDN capabilities
he/she may want to test the digital services prior to the actual
installation of his/her dedicated equipment. To do this he/she may use
an existing Integrated Services Digital Network (ISDN) circuit for
testing. Information on the ISDN service is provided in a later
section of this document. The D-SERV interface cards should be
configured as follows:

- V.35 interface--configuration switch S1 UP and
  interface switches S1-S5 DOWN and S6-S10 UP.

- Constant Carrier--configuration switch S2 DOWN.

- Data Clock--56 Kbps, synchronous, internal clock.
  S3 UP, S4 DOWN, S5 UP, S6 UP and S7 DOWN.

3.1.3 C.1.3 Kentrox Universal shelf

A Kentrox Universal Shelf has been installed in the Memphis and Austin
Service Centers. Each shelf supports up to twelve 56 Kbps D-SERV
interface cards.

3.1.3.1 C.1.3.1   Communication Lines

3.1.3.1.1 C.1.3.1.1   Dedicated Lines

For a TP to connect over a dedicated line he/she must purchase the
circuit and the Kentrox CSU/DSU card. Once the TP's request for
digital service is approved, the IRS provides him/her with IP
addressing and routing information.

3.1.3.1.2 C.1.3.1.2   ISDN Circuits

Memphis and Austin each maintain a bank of ISDN lines for TP
connections. The ISDN telephone number and the SPID (Service Profile
Identifier) are provided to a TP once his/her request for connection
via ISDN is approved.

3.1.3.2 C.1.3.2   Communication Services

Connection to the EEC system using the digital communications services
provides the TP with a Transmission Control Protocol/Internet Protocol
(TCP/IP) interface. To use this service the TP must have the
following:

- A system that supports the TCP/IP protocols.

- The ability to make a TELNET connection from
  his/her system to an EEC host.

- If the TP plans on using File Transfer Protocol
  (FTP) for data transfer, his/her system must support an
  FTP server and have the ability to accept an FTP
  connection from the EEC. The TP must supply a user

logon and password for the EEC system to use when connecting to his/her FTP server.

- A router capable of supporting PPP or Frame Relay over the digital circuit.

Once the TP establishes a connection using EEC digital services the following capabilities are available.

- Connecting over a TCP/IP link allows a TP to connect to any host available to him/her at the Service Center.

- Fail over protection. EEC systems have a fail over capability and if there is a system failure a backup system becomes available. This system uses the same TCP/IP address as the primary system. This allows the TP to connect to the backup system without having to reconfigure the host address.

- Transfer of data using FTP. If a TP has a host system that supports FTP, he/she may use this as a protocol to send and receive files to the EEC system. See Section C.3, Communications Protocols for more details.

- File transfers over TELNET. If a TP uses TCP/IP to connect to the EEC system, his/her logon to the system is through TELNET. If the TP does not want to use FTP to transfer files, he/she may use another file transfer protocol such as Zmodem over the TELNET session. This capability is currently available in many of the TELNET application programs. The file transfer rate of Zmodem over a TELNET session is not as fast as FTP. For this to be used successfully the TP's TELNET program must support connections that allow all 8 bits of the data to pass through. This is often accomplished on the TELNET command line as "telnet –8 host". See Section C.3, Communications Protocols for more details.

One final aspect of a TCP/IP connection to the EEC is that TCP/IP supports multiple simultaneous connections to the same host or multiple hosts. A TP may submit files over multiple concurrent sessions. However, only one session per host can retrieve acknowledgment files.

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SECTION 4 C.2   ANALOG SERVICE

</div>

The following paragraphs describe the hardware and software necessary
to use the analog communication service.

4.1.1 C.2.1 CISCO AS5300 Access server

All analog connections to the EEC system are made through the Cisco
AS5300 access server. The access server maintains a bank of
asynchronous modems capable of 56 Kbps. Once the modem connection is
established the TP's session to the host is over a TELNET TCP/IP
service. This combination of high-speed modem and LAN connection can
result in speeds in excess of 12,000 bytes per second. It is
recommended that the TP use a 56k modem with v.90 support for speeds up
to 56K, v.34 support for speeds down to 2400 bps, v.42 support of error
correction, and v42 in support of compression. In addition to a modem,
the TP needs asynchronous terminal communication software and software
supporting one of the file transfer protocols described in the Section
C.3, Communications Protocol section below.

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SECTION 5 C.3   COMMUNICATIONS PROTOCOLS

</div>

The EMS system supports a variety of communications protocols for
transmitting and receiving data. The protocols are described
individually but a generic step by step tutorial of a connection to the
EEC system may prove helpful. This tutorial goes through the interface
at the highest level but mainly focuses on communications issues. The
following is a sample of an IMF (1040) connection.

1) The TP must have a computer system containing his/her
   software for return preparation as well as
   communications software. The communications software
   may be included, as part of the return preparation or it
   could be external and part of the computer operating
   system. For the purposes of this tutorial, a Windows
   system with an external communications interface is
   described. It should be noted that a system with
   communication embedded in the preparation software would
   have to perform the same basic functions as the external
   interface.

2) With a return file ready to process, the TP must pick a
   method of connecting to the EMS system. An easy example
   from the Windows system is to use the standard
   communications accessory, HyperTerminal.

3) HyperTerminal is a terminal emulator and to connect to
   EMS several things need to be set properly:

   - 8 bit no parity

   - Hardware flow control, also known as CTS/RTS

- **Speed--This should be set to the highest value allowed by the system. A note of caution here.**
- **Depending on the quality of the modem and phone line, TPs may have problems using the highest value allowed. If a TP has problems, he/she should decrease the speed until a reliable connection with EEC is established.**

4) The TP then issues the command to have HyperTerminal dial out to the EEC system. Telephone numbers are given to TPs once they are approved for EEC connection. The session connects and the EEC system begins a dialog with the TP. This dialog is controlled by a program know as the Trading Partner Interface.

```
****************************WARNING***********************************
Unauthorized access is prohibited by Public Law 99-474
"The Computer Fraud and Abuse Act of 1986"

This is a United States Government system.  It is intended for
the communication, transmission, processing, and storage of
official and other authorized information only.

USE OF THIS SYSTEM CONSTITUTES CONSENT TO
MONITORING AT ALL TIMES AND IS NOT SUBJECT
TO ANY EXPECTATION OF PRIVACY.

AUTHORIZED USE ONLY!  ACCESS TO THIS US GOVERNMENT SYSTEM CONSTITUTES CONSENT
TO MONITORING FOR LAW ENFORCEMENT AND OTHER PURPOSES.


login: 99999
Password:********
Last login: Tue Sep  4 10:39:31 from computername
```

5) At this point several lines of system data followed by a menu appears.

```
    ------------------------------------------------------------
            F O R   O F F I C I A L   U S E   O N L Y

                     #     #####    ####
                     #     #    #  #    #
                     #     #    #  #  ####
                     #     #####   #    #
                     #     #    #  #    #  #
                     #     #    #   ####

                     U.S. Government computer

            F O R   O F F I C I A L   U S E   O N L Y
    ------------------------------------------------------------

         MAIN MENU

         5) Logoff
         6) Receive/Send File(s)
         7) Change File Transfer Protocol [ZMODEM]
         8) Change Compression Method [NONE]

    Enter your choice:  2
```

6)   In nearly all sessions the TP selects item 2 to send or receive files. Item 3 shows the file transfer protocol configured for the TP. Item 4 shows whether or not he/she is configured for sending and receiving compressed data. This tutorial does not discuss modification of these settings.

7)   After transmitting a 2, the system notifies the TP of how many acknowledgment files are waiting for pickup. For this example we assume that 3 files are waiting. The Trading Partner Interface then sends the following:

    Number of Acknowledgment File(s) in outbound mailbox: 003

    Are you ready to receive files? Y/[N]:

8)   The TP responds with a "Y".   The system starts trying to send data using the configured protocol.   If the TP's system requires it, the TP issues a command to start receiving the data. In this tutorial the TP is configured for ZMODEM. HyperTerminal as well as most other terminal emulators automatically detect that a ZMODEM transfer has begun and starts the ZMODEM program to receive the file. Using ZMODEM, the Trading Partner Interface sends all three acknowledgment files sequentially. The TP must then take these files and process them.

9)   Assuming that all went well with the transmission of the acknowledgment files the Trading Partner Interface sends the following message:

    Acknowledgment File(s) transmission complete.

    Do you want to send a file? Y/[N]:

10)   If the TP has a file to transmit, he responds with a "Y". The Trading Partner Interface then issues the following:

    Enter an upload command to your modem program now.

11)   At this time the TP starts a ZMODEM transfer to the host and sends the file he wants to have processed. At the same time the Trading Partner Interface program starts a ZMODEM program to receive the return file.

12)   The file transfer eventually terminates. If the TP watches the ZMODEM file transfer progress, he notices a slight pause after the transfer completes and then the following message appears:

    Transmission file has been received with the following GTX Key:

    S20041020123423.1700   10200001

13)   These lines are two of the more important messages that appear, because even though the ZMODEM program completed the transfer, the operation is not really complete until these messages are displayed. If the TP disconnects after the file transfer completes but before the messages appear, the file is not guaranteed to be processed. To complete the session the TP is presented with the main menu as follows:

        MAIN MENU
        1) Logoff
        2) Receive/Send File(s)
        3) Change File Transfer Protocol (ZMODEM)
        4) Change Compression Method (NONE)

14)   The TP now selects item 1 to logoff the system. After the following message is received the TP can safely hang up.

    DISCONNECTING FROM EFS.

15)   The logoff from the system is equally as important as waiting for the transmission complete messages listed above. This ensures that the session statistics are recorded and that the data is processed.

This concludes the tutorial. An in-depth description of all supported protocols follows.

5.1.1 C.3.1 ZMODEM

ZMODEM is the most popular protocol used today. It is considered to be the fastest and provides a checkpoint restart capability that allows a file transfer to be restarted, if the transfer was disrupted because of communications errors. Because of this restart capability there are several options that may be found on the user's system that the user should be aware of:

- Restart/recovery is an option that must be configured on the TP's system if he/she wants to use the recovery feature. If the TP does not configure the ZMODEM software to recover then it will attempt to send the entire file again.

- If the TP had a disruption and attempts to send the same file without doing a restart/recovery, the transfer could fail because part of the file already exists on the EEC system. One option, file overwrite, available on most ZMODEM programs allows existing files to be overwritten. So if the transfer has been disrupted and restart/recovery is not configured, the TP must reconfigure ZMODEM to overwrite existing files.

- The problem described above can also affect other communications protocols. For example, a TP tried to send a file using ZMODEM, had a disruption, and then tried to re-send the same file using a different protocol; if the alternate protocol tries to use the same file name and does not have its option to overwrite turned on, the transfer will fail.

5.1.2 C.3.2 FTP

FTP protocol is a standard package included as part of the TCP/IP software suite. It is only available to TPs who use the Digital Communications Service For TPs using this transfer method the only configuration needed is to setup a user account for EMS to use and directories for EEC to use to "get" return files and "put" acknowledgment files. EEC transmits one file for each acknowledgment file available for processing. The file transfers are binary and the "#" hash mark is displayed for every 1,024 bytes of data transferred.

5.1.3 C.3.3 Xmodem

XMODEM is one of the early protocols developed to transfer files over an analog line. It is very slow and has limited error recovery.

5.1.4 C.3.4 Xmodem-1K

XMODEM-1K is an updated version of XMODEM that uses a packet size of 1024 bytes. This makes a dramatic improvement in throughput.

5.1.5 C.3.5 Ymodem – batch

YMODEM batch is the predecessor to ZMODEM.