```
this.enabled=.f.
if thisform.check1.value=0 and thisform.check2.value=0 and thisform.check3.value=0
    do Comm_Port_OFF
    thisform.portled.backcolor = rgb(255,0,0)
else
    if bootloader_main.bootloader_main.comm.portopen = .f.
        do Comm_Port_On
        thisform.portled.backcolor = rgb(92,255,92)
    endif
endif

if bootloader_main.bootloader_main.comm.portopen = .f.
    this.enabled=.t.
    RETURN
endif

public insentence
insentence = ""
do while bootloader_main.bootloader_main.comm.inbuffercount#0
    insentence = insentence + GetSerialStr()
enddo
if len(insentence)#0
    now = seconds()
    do while (seconds() < now+5) .and. len(insentence)<89+1536
        insentence = insentence + GetSerialStr()
        if at("BOOT",insentence)#0
            EXIT
        endif
    enddo
    do case
        case at("BOOT",insentence)#0.and. thisform.check3.value = 1
            this.enabled=.f.
            *thisform.command2.click
            ********************************************************************************
            *S - start programming, read first 8 bytes (4 words) to store erase memory
            *       program in new reset vector and set to allow programming.
            *       data recieved in following format.
            *   byte number     data
            *   1               length LSB       must be on 64 byte boundry and greater than 64
            *   2               length MSB
            *   3               chksum
            *
            *Z - Program up to 16 bytes into program memory. data recieved in following format.
            *   Byte number     data
            *   1               length 1-16
            *   2               Location LSB
            *   3               Location MSB
            *   4               data byte (1)
            *   ---             ---
            *   length+3        data byte (length)
            *   length+4        checksum
            *
            *   if location == 0 then save first 8 bytes (4 words) into store.
            *
            *F - finish programming, write first 8 bytes (4 words) from store and reset proces
sor.
            *
            *R - Reset Processor
            ********************************************************************************
            ***reread the file size so the display % are correct
            thisfilename = alltrim(thisform.hexfilename)
            z=ADIR(filesizearray,thisfilename)   && Create array
            thisform.filesize= filesizearray(1,2)
            thisform.label1.caption =  alltrim(thisfilename) + "    " +trans(thisform.filesize)+
"bytes"
            ***
            public filehandle
            filehandle = fopen (thisform.hexfilename,0) &&read only buffered
            if filehandle = -1
                messagebox("File could not be opened",48,"Firmware Uploader")
                RETURN
                this.enabled=.t.
            endif
            app_message("Establishing Contact...")
            if PingLogger("X")
```

handwritten note: bootloader_main, bootloader_main . comm

is the microsoft active X communications object .

```
                    if PingLogger("P")
                        if PingLogger("B")
                            ***send start sentence
                            app_message("Sending Start Sentence")
                            if thisform.speedoption.value = 1
                                do PutSerialchar with "T"
                            else
                                do PutSerialchar with "S"
    *                       endif
                            do PutSerialchar with chr(0)
                            do PutSerialchar with chr(112)
                            do PutSerialchar with chr(255-112)
                            nowtime = seconds()
                            do while bootloader_main.bootloader_main.comm.inbuffercount=0 .and. sec
   onds()< nowtime+2
                            enddo
                            serial_data = GetSerialChar()
                            if serial_data # "f"
                                messagebox("Timeout while waiting for 'f' from 'S' command",48,"Boo
  t Loader - Upload")
                                =fclose(filehandle)
                                this.enabled=.t.
                                RETURN
                            endif
                            checksum = 0
                            thischar = " "
                            watchstring = ""
                            longwatchstring = ""
    *                       app_message("Uploading Hex file to Micro")
    *                       if thisform.speedoption.value = 1
    *                           ***change to higher baud
    *                           if bootloader_main.bootloader_main.comm.portopen = .t.
    *                               bootloader_main.bootloader_main.comm.portopen = .f.
    *                           endif
    *                           bootloader_main.bootloader_main.comm.commport = thisform.commselect
  .value
    *                           bootloader_main.bootloader_main.comm.settings = "115200,n,8,1"
    *                           bootloader_main.bootloader_main.comm.portopen = .t.
                            endif
                            bytessent = 0
                            app_status = "Uploading..."
                            do while not feof(filehandle)
                                do while thischar # ":" and not feof(filehandle)
                                    thischar = fread(filehandle,1)
                                enddo
                                hexout = ""
                                thischar = fread(filehandle,1)
                                if not feof(filehandle)
                                    do PutSerialchar with "Z"
                                else
                                    EXIT
                                endif
                                do while thischar # chr(13) and not feof(filehandle)
                                    for void = 1 to DelayBeforeCharSend
                                    endfor
                                    nextchar = fread(filehandle,1)
                                    thisnumber = asciihex2bin(thischar+nextchar)
                                    watchstring = watchstring +thischar+nextchar+space(1)
                                    do PutSerialchar with chr(thisnumber)
                                    bytessent = bytessent+2
                                    checksum = checksum + thisnumber
                                    thischar = fread(filehandle,1)
                                enddo
                                thisform.label2.caption = watchstring
                                watchstring = ""
                                nowtime = seconds()
                                do while bootloader_main.bootloader_main.comm.inbuffercount=0 .and.
  seconds()< nowtime+2
                                enddo
                                serial_data = GetSerialChar()
                                if serial_data # "f"
                                    Messagebox("Timeout waiting for 'f' between records using 'Z' c
  ommand",48,"Boot Loader - Upload")
                                    =fclose(filehandle)
                                    this.enabled=.t.
                                    RETURN
```

```
                                    endif
                                    thisprogress = trans((bytessent/thisform.filesize)*100,"999")+"%"
                                    app_message(thisprogress)
                                    _screen.caption = thisprogress
                            enddo
                            =fclose(filehandle)
                            *** send the finish command
                            do PutSerialchar with "F"
*                           if thisform.speedoption.value = 1
*                               ***change to lower baud
*                               if bootloader_main.bootloader_main.comm.portopen = .t.
*                                   bootloader_main.bootloader_main.comm.portopen = .f.
*                               endif
*                               bootloader_main.bootloader_main.comm.commport = thisform.commselect
.value
*                               bootloader_main.bootloader_main.comm.settings = "19200,n,8,1"
*                               bootloader_main.bootloader_main.comm.portopen = .t.
*                           endif
                        else
                            Messagebox ("Firmware Upload Command Not Acknowledged",48,"Boot Loader
- Upload")
                            =fclose(filehandle)
                            app_message("Firmware Upload Command Not Acknowledged")
                            this.enabled=.t.
                            RETURN
                        endif
                    else
                        Messagebox("Program Not Acknowledged",48,"Boot Loader - Upload")
                        =fclose(filehandle)
                        app_message("Program Not Acknowledged")
                        this.enabled=.t.
                        RETURN
                    endif
                else
                    Messagebox("Connection Not Acknowledged",48,"Boot Loader - Upload")
                    =fclose(filehandle)
                    app_message("Connection Not Acknowledged")
                    this.enabled=.t.
                    RETURN
                endif
                app_status = "Waiting to Auto Upload"
                app_message("Hex file Uploaded OK")
                _screen.caption = "TruTrack Boot Loader Ver "  + left(getversion(),at(".",getversio
n(),2)-1)
                ?? chr(7) && ring the bell when we are finished the upload
            case at("SFR",insentence)#0
                select sfr
                go top
                datapointer = at(insentence,"SFR")
                datapointer = datapointer+4
                for a = 1 to 86
                    replace char with substr(insentence,datapointer,1)
                    datapointer = datapointer+1
                    skip
                endfor
                do fillsfr
                if thisform.check1.value = 1
                    if wexist("sfr")
                        select sfr
                        go top
                        activate window sfr
                    else
                        do form sfr
                    endif
                endif
                public array memdata(1536)
                for a = 1 to 1536
                    memdata(a) = asc(substr(insentence,datapointer,1))
                    datapointer = datapointer+1
                endfor
                select mem
                zap
                for bigcount = 0 to 95
                    thisline = " "
                    append blank
                    replace addr with right(trans((bigcount*16),"@0"),4)
```

```
            for littlecount = 0 to 15
                thismem= bigcount*16+littlecount
                thisline =  thisline + right(trans(memdata((bigcount*16)+littlecount+1),"@0
      ,  "

                if littlecount = 7 &&space the center col
                    thisline =  thisline + "   "
                endif
            endfor
            replace line with thisline
        endfor
        if thisform.check2.value = 1
            if wexist("mem")
                select mem
                go top
                activate window mem
            else
                do form mem
            endif
        endif
        thisform.command5.enabled = .t.
    endcase
endif
this.enabled=.t.
RETURN
```