Sat 15-Feb-1986 16:52:23

Print request number 808

Station: $36

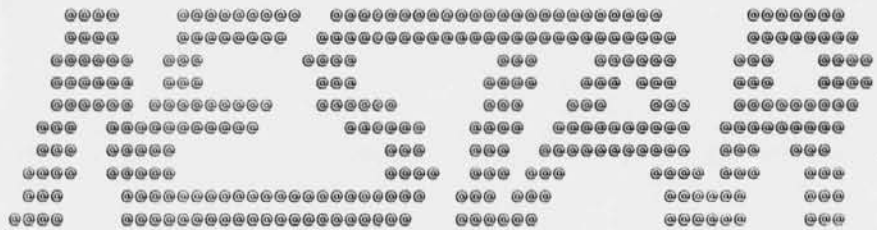
Name: L J Shustek

File Server: BUTLER ($FE)

NFS Pathname:

Filename (s):

Print Server: LENNON ($8A)
Printer: LASER
Setup: LANDSCAPE
Priority: Standard
Copies: 1
Eject: 0



```
                                page    58,132
                                title   TALK - Multiple station conversation program

                        ;-----------------------------------------------------------------------------
                        ;
                        ;       TALK initialialization.
                        ;
                        ;               Everything above here stays resident.
                        ;               Everything below here is transient.
                        ;
                        ;       See the TALKC.ASM and TALKH.ASM files for lots more information
                        ;       about TALK and how it's organized.
                        ;
                        ;-----------------------------------------------------------------------------

                                .sall           ;suppress macro expansions

                                subttl  ...Transient initialization code...

                        ;;              include m:struct.mac            ;structure macros (not listed)
                                .list

                    C                   include talkv.asm               ;symbols and variables
                    C
                    C   ;-----------------------------------------------------------------------------
                    C   ;
                    C   ;  talkv.asm    TALK symbols and variables
                    C   ;
                    C   ;-----------------------------------------------------------------------------
                    C
                    C   version         macro
                    C                   db      '0.48'                  ;version number
                    C                   endm
                    C
= 0D04              C   talk_wks        equ     0d04h ;+channel!;well-known socket base.  Change it
                    C                                                   ;whenver packet format changes!
                    C
                    C                   .lfcond
= FFFF              C   c_true          equ     0ffffh
= 0000              C   c_false         equ     0000h
                    C
=                   C   show_rumors     equ     c_true                  ;show rumored stns in stn_list?
=                   C   assert          equ     c_true                  ;generate internal error checking?
                    C
                    C
                    C                   extrn   window:near
                    C
                    C   cgrp            group   hseg,vseg,cseg
                    C
0000                C   hseg            segment common 'hsegcl' ;dummy (this assembler'll kill me yet)
0000                C   hseg            ends
                    C
0000                C   vseg            segment common 'vsegcl'
```

...Transient initialization code...

```
                        C
                        C  ;
                        C  ;                LEVEL 4 SYMBOLS
                        C  ;
                        C
= 0000                  C  on_nic           equ     0
= 0000                  C  l4_in_our_seg    equ     0
                        C
                        C  ;;               include e:l4asm.itf             ;level 4 interface
                        C                   .list
                        C
                        C
                        C  ;
                        C  ;                SYMBOLS
                        C  ;
                        C
= 0004                  C  ntasks           equ     4                       ;number of tasks
= 0258                  C  max_stn_list     equ     600                     ;max size of station list
= 00C8                  C  max_grp_list     equ     200                     ;max size of group list
= 0010                  C  max_groups       equ     16                      ;max number of groups (<=16)
= 0010                  C  max_namesize     equ     16                      ;largest name allowed
                        C                                                   ; (for internal debug only)
= 0003                  C  n_pages          equ     3                       ;number of display pages
                        C
= 0003                  C  how_often        equ     3                       ;3 x 55 = 165 msec check for msgs
= 0006                  C  timeout          equ     6                       ;6 x 55 = 330 msec timeouts
= 0002                  C  retries          equ     2                       ;number of retries
                        C
= 0097                  C  logoff_msg_type  equ     97h                     ;logoff message type
= 0098                  C  logon_msg_type   equ     98h                     ;logon message
= 0099                  C  genl_msg_type    equ     99h                     ;talk general message type
= 0096                  C  rqscrn_msg_type  equ     96h                     ;requestscreen message type
= 0095                  C  scrn_msg_type    equ     95h                     ;screen message type
= 0094                  C  kbchar_msg_type  equ     94h                     ;kb char message type
                        C
= 00AA                  C  stn_subtype      equ     0aah                    ;subtype for station recs
= 00BB                  C  grp_subtype      equ     0bbh                    ;subtype for groups recs
= 00CC                  C  txt_subtype      equ     0cch                    ;subtype for text
                        C
                        C
= 0016                  C  key_int          equ     16h                     ;rom bios keyboard int
= 0000                  C  key_read         equ     0                       ;read key function
= 0001                  C  key_stat         equ     1                       ;key status function
= 0002                  C  key_shift        equ     2                       ;key shift status func.
= 0063                  C  key_talk         equ     99                      ;nestar extended info for talk
= 0062                  C  key_nwcmds       equ     98                      ;nestar extended info for nwcmds
= 0061                  C  key_talk_send    equ     97                      ;nestar extended cmd for send_msg
= 0060                  C  key_talk_stop    equ     96                      ;nestar extended cmd for "suspend TALK"
= 005F                  C  key_talk_start   equ     95                      ;nestar extended cmd for "resume TALK"
                        C
                        C  ; Nestar extended int 16h functions return AH negated to indicate that they
                        C  ; did something;  if the program (eg TALK) is not installed then the rom bios
                        C  ; will return with AH unchanged.
                        C  ;
```

```
                        level_four_interface

                    C   ; The extended-info call (key_talk, key_nwcmds, etc.) returns the following
                    C   ; flags in AL, or'd by all copies of the program:
                    C
= 0001              C   key_ext_active  equ     01                  ;extended info flag: active
= 0002              C   key_ext_idle    equ     02                  ;extended info flag: idle
                    C
                    C
= 0011              C   equip_int       equ     11h                 ;equipment determination int
                    C
= 001A              C   timer_int       equ     1ah                 ;rom bios timer int
= 0000              C   timer_read      equ     0                   ;read timer into cx:dx
                    C
= 0010              C   video_int       equ     10h                 ;rom bios video int
= 0002              C   video_setcursor equ     2                   ;set cursor from dx
= 0003              C   video_getcursor equ     3                   ;get cursor in dx
= 0006              C   video_scroll    equ     6                   ;scroll or clear screen
= 000A              C   video_write_ch  equ     10                  ;write single character
= 000E              C   video_write_tty equ     14                  ;write tty function
                    C
                    C
= 0021              C   dos_int         equ     21h                 ;dos function call interrupt
                    C
= 0002              C   dosint_printc   equ     02h                 ;print character in dl
= 0009              C   dosint_prints   equ     09h                 ;print string at ds:dx until '$'
= 0031              C   dosint_exitstay equ     31h                 ;exit but stay resident
= 004C              C   dosint_exit     equ     4ch                 ;exit program normally
                    C
= 002C              C   psp_environ     equ     2ch                 ;offset of env segment in psp
                    C
                    C
= 0008              C   timer_tick      equ     08h                 ;timer tick hardware interrupt
= 0043              C   timer_ctrl      equ     043h                ;timer (8253) control register
= 00A6              C   timer_ctrl_msb  equ     0a6h                ;  load msb of counter 2
                    C
= 0042              C   timer_ch2       equ     042h                ;timer (8253) channel 2 data
= 0061              C   kb_ctrl         equ     061h                ;keyboard (8255) control: 02h is spkr
= 0003              C   kb_ctrl_spkr    equ     003h                    speaker enable bits
                    C
                    C
= 0007              C   bell            equ     07h                 ;bell
= 0008              C   bs              equ     08h                 ;backspace
= 000A              C   lf              equ     0ah                 ;linefeed
= 000D              C   cr              equ     0dh                 ;carriage return
= 001B              C   esc             equ     1bh                 ;escape
                    C
= 4800              C   key_up          equ     4800h               ;keyboard arrow keys
= 5000              C   key_down        equ     5000h
= 4B00              C   key_left        equ     4b00h
= 4D00              C   key_right       equ     4d00h
                    C
= 3B00              C   key_f1          equ     3b00h               ;keyboard F1 key
= 3D00              C   key_f3          equ     3d00h               ;keyboard F3 key
                    C
= 5200              C   key_ins         equ     5200h               ;keyboard INS key
```

```
                        level_four_interface

= 5300                  C  key_del          equ     5300h                   ;keyboard DEL key
                        C
= 4700                  C  key_home         equ     4700h                   ;keyboard home key
= 4900                  C  key_pgup         equ     4900h                   ;keyboard pageup key
= 4F00                  C  key_end          equ     4f00h                   ;keyboard end key
= 5100                  C  key_pgdn         equ     5100h                   ;keyboard pagedown key
                        C
                        C
= 0000                  C  window_define    equ     0                       ;window define
= 0001                  C  window_open      equ     1                       ;window open
= 0002                  C  window_close     equ     2                       ;window close
= 0003                  C  window_print     equ     3                       ;window print character
= 0004                  C  window_getcurs   equ     4                       ;window get cursor
= 0005                  C  window_setcurs   equ     5                       ;window set cursor
= 0006                  C  window_select    equ     6                       ;window select
= 0007                  C  window_init      equ     7                       ;window initialization
= 0008                  C  window_setattr   equ     8                       ;window set char attribute
= 0009                  C  window_pageop    equ     9                       ;window page operations
                        C
= 0601                  C  select_dwin      equ     window_select*256+1     ;select display window
= 0602                  C  select_twin      equ     window_select*256+2     ;select typing window
= 0603                  C  select_swin      equ     window_select*256+3     ;select station window
= 0604                  C  select_gwin      equ     window_select*256+4     ;select group window
                        C
                        C
                        C  ;
                        C  ;                LOCAL STORAGE
                        C  ;
                        C
0000  03 14 15 54 41 4C C                   db      3h,14h,15h,'TALK'       ;debug marker (pi)
      4B                C
                        C
                        C
                        C  ;        Tasks
                        C
                        C
= 0002                  C  tcbsize          equ     2                       ;size of tcb
0007                    C  tcbs             label   word                    ;task control blocks (TCB)
0007  0F00 R            C  task0            dw      offset cgrp:stack0
0009  1158 R            C  task1            dw      offset cgrp:stack1
000B  13B0 R            C  task2            dw      offset cgrp:stack2
000D  1608 R            C  task3            dw      offset cgrp:stack3
                        C
000F  0000              C  curtask          dw      0                       ;current TCB offset
                        C
0011  ????              C  savss            dw      ?                       ;keyboard int stack
0013  ????              C  savsp            dw      ?
                        C
                        C
                        C
                        C  ;        State flags.    1 is affirmative, 0 is negative.
                        C
                        C
0015  53 54 41 54 45 53 C                   db      'STATES'                ;debug marker
```

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                                level_four_interface

001B  00                      C  tasks_active     db      0                       ;task dispatcher active
001C  00                      C  send_busy        db      0                       ;send task is busy
001D  00                      C  recv_busy        db      0                       ;receive task is busy
001E  00                      C  timer_int_busy   db      0                       ;timer interrupt is busy
001F  00                      C  14_exit_busy     db      0                       ;14 exit routine is busy
0020  00                      C  kb_int_busy      db      0                       ;keyboard interrupt is busy
0021  00                      C  other_conn_busy  db      0                       ;another (fs?) connection is busy
0022  00                      C  windows_open     db      0                       ;windows are open
0023  00                      C  do_open          db      0                       ;request to open windows
0024  00                      C  do_stop          db      0                       ;request to stop all tasks
0025  00                      C  first_dispatch   db      0                       ;request dispatch to initialize
0026  00                      C  open_recvd       db      0                       ;14_openrcv returned TRUE
0027  00                      C  send_msg_rqst    db      0                       ;send-msg request from kb_int
0028  00                      C  suspended        db      0                       ;suspended by int16h special fct
0029  00                      C  popped_up        db      0                       ;windows auto-popped up
                              C
                              C
                              C  ;       Options
                              C
                              C
002A  00                      C  test_mode        db      0 ;boolean              ;test mode is on
002B  00                      C  auto_popup       db      0 ;boolean              ;windows popup automatically?
002C  00                      C  timestamp        db      0 ;boolean              ;timestamp messages?
002D  00                      C  auto_popdown     db      0 ;boolean              ;windows popdown automatically?
002E  010E                    C  popdown_time     dw      15*18 ;(seconds*ticks)  ;auto popdown time
0030  00                      C  channel          db      0                       ;channel (added to wks!)
                              C
0031  00                      C  color            db      0                       ;color attribute modifier
0032  07                      C  char_normal      db      07h                     ;normal character attribute
0033  0F                      C  char_bold        db      0fh                     ;bold (highlighted) character
0034  01                      C  char_line        db      01h                     ;underlined character
0035  09                      C  char_boldline    db      09h                     ;bold underlined character
                              C
                              C
                              C  ;       Windows
                              C
                              C
                              C  ; (If you change these window sizes, check the window buffers as well!)
                              C  ; (You might also want to check the keyboard buffer size.)
                              C
0036  57 49 4E 44 4F 57      C                  db      'WINDOWS'               ;debug marker
      53                      C
003D                          C  gwin_upperleft  label   word                    ;upper left corner of group window
003D  05                      C  gwin_left_col   db      5
003E  00                      C  gwin_top_row    db      0
003F                          C  gwin_lowerright label   word                    ;lower right corner of group window
003F  4E                      C  gwin_right_col  db      78
0040  02                      C  gwin_bottom_row db      2
                              C
0041                          C  swin_upperleft  label   word                    ;upper left corner of station window
0041  05                      C  swin_left_col   db      5
0042  02                      C  swin_top_row    db      2
0043                          C  swin_lowerright label   word                    ;lower right corner of station window
0043  4E                      C  swin_right_col  db      78
```

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                        level_four_interface

0044  06                 C  swin_bottom_row db      6
                         C
0045                     C  dwin_upperleft  label   word                    ;upper left corner of display window
0045  05                 C  dwin_left_col   db      5
0046  06                 C  dwin_top_row    db      6
0047                     C  dwin_lowerright label   word                    ;lower right corner of display window
0047  4E                 C  dwin_right_col  db      78
0048  14                 C  dwin_bottom_row db      20
                         C
0049                     C  twin_upperleft  label   word                    ;upper left corner of typing window
0049  05                 C  twin_left_col   db      5
004A  14                 C  twin_top_row    db      20
004B                     C  twin_lowerright label   word                    ;lower right corner of typing window
004B  4E                 C  twin_right_col  db      78
004C  17                 C  twin_bottom_row db      23
                         C
                         C
                         C  ;       Buffers
                         C
                         C
004D  42 55 46 46 45 52  C                  db      'BUFFERS'               ;debug marker
      53                 C
0054  00                 C  kbd_buffer_full db      0                       ;1 if buffer is full
0055  00 18              C  kb_cursor       db      0,24                    ;keyboard cursor
                         C
0057  ????????           C  send_msg_ptr    dd      ?                       ;ptr to kb_int send_msg buffe
005B  ??                 C  send_msg_stn    db      ?                       ;stn to send msg to
005C  ??                 C  send_msg_stat   db      ?                       ;status of kb_int send_msg
                         C
005D  14                 C  keychar         db      14h                     ;trigger is ctrl-t default
005E  00                 C  keychar_scan    db      0                       ;scan code if above is zero
                         C
                         C
= 008F                   C  kbd_bufsize     equ     2*(78-5-1)-1                    ;keyboard buffer size
= 0014                   C  from_to_size    equ     20                      ;max size of "from->to":
= 03C3                   C  rcv_bufsize     equ     kbd_bufsize+max_stn_list+max_grp_list+from_to_size
= 03C3                   C  snd_bufsize     equ     kbd_bufsize+max_stn_list+max_grp_list+from_to_size
                         C
005F     8F [            C  kbd_buffer      db      kbd_bufsize dup(?)      ;keyboard buffer
              ??         C
                 ]       C
                         C
00EE     8F [            C  kbd_buffer_prev db      kbd_bufsize dup(?)      ;previous keyboard buffer
              ??         C
                 ]       C
                         C
017D  03C3 [             C  rcv_buffer      db      rcv_bufsize dup(?)      ;receive message buffer
              ??         C
                 ]       C
                         C
0540  03C3 [             C  snd_buffer      db      snd_bufsize dup(?)      ;send message buffer
              ??         C
                 ]       C
                         C
```

                        level_four_interface

```
                        C
0903  0000              C  kbd_prevbufsiz  dw      0                       ;size of previous kbd line
0905  0000              C  kbd_prevbufptr  dw      0                       ;offset into previous kbd line
0907  00                C  kbd_prev_ins    db      0                       ;insert mode w/rt previous kbd line
                        C
0908  ????              C  snd_buffer_size dw      ?                       ;size of message in snd_buffer
090A  ????              C  snd_buffer_txt  dw      ?                       ;offset of start of text part
                        C
                        C
                        C
                        C  ;       Station and group lists
                        C
                        C
                        C  ; Note that various code walks through the stn_rec and grp_rec using lods
                        C  ; instructions which must be changed if fields are added or removed.
                        C  ; Search for "stn_" or "grp_" to find those occurences.
                        C
                        C
090C  4C 49 53 54 53    C                  db      'LISTS'                 ;debug marker
                        C
= 0001                  C  ch_stn          equ     1                       ;stn list changed
= 0002                  C  ch_stn_atr      equ     2                       ;stn list attributes changed
= 0004                  C  ch_grp          equ     4                       ;grp list changed
= 0008                  C  ch_grp_atr      equ     8                       ;grp list attributes changed
                        C
0911  05                C  lists_chgd      db      ch_stn+ch_grp           ;station/group list changed flags
                        C
                        C
0912  0000              C  stn_list_size   dw      0                       ;current size of station list, +0
0914  01                C  stn_count       db      1                       ;count of stations
0915  00                C  rumor_count     db      0                       ;count of rumors
                        C
0916  0258 [            C  stn_list        db      max_stn_list dup(?)     ;station list, with variable-length
            ??          C
              ]         C
                        C
                        C                                                  ; records as follows:
                        C  stn_rec         struc
0000  ??                C  stn_addr        db      ?                       ;station addr, or zero if end
0001  ??                C  stn_flags       db      ?                       ;station flags -- see below
0002  ????              C  stn_groupmask   dw      ?                       ;group membership mask
0004  ??                C  stn_name1       db      ?                       ;length of following name
0005  ?? ??             C  stn_name        db      ?,?;...                 ;station name
0007                    C  stn_rec         ends
= 0005                  C  stn_rec_fsize   equ     5                       ;length of fixed part of stn_rec
                        C
                        C  ; The stn_groupmask is a set of bits representing group membership.  If the
                        C  ; first (msb) is on, we are a member of the first group in the group list,
                        C  ; and so on for up to 16 (max_groups) groups.
                        C
                        C  ; stn_flags bits:
                        C
= 0080                  C  rumor           equ     80h                     ;this stn is only a rumor, i.e.
                        C  ;                                               ;we got it from someone else
```

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                                level_four_interface

                                C
                                C
0B6E  0005                      C  grp_list_size   dw      5                       ;current size of group list, +0
0B70  01                        C  grp_count       db      1                       ;count of groups
                                C
0B71  03 41 4C 4C 00            C  grp_list        db      3,"ALL",0
0B76     C8 [                   C                  db      max_grp_list dup (?)    ;group list, with records:
           ??                   C
              ]                 C
                                C
                                C
                                C  grp_rec         struc
0000  ??                        C  grp_name1       db      ?                       ;length of name
0001  ?? ??                     C  grp_name        db      ?,?;...                 ;group name
0003                            C  grp_rec         ends
= 0001                          C  grp_rec_fsize   equ     1                       ;length of fixed part of grp_rec
                                C
0C3E     11 [                   C  grp_number_map  db      max_groups+1 dup (0)    ;group number map[1..16]
           00                   C
              ]                 C
                                C
                                C
                                C
                                C  ; Destination of messages.
                                C  ; Represents the relative group or station number (1..n) to which
                                C  ; messages should be sent.
                                C
0C4F  01                        C  dest_grp        db      1                       ;relative group number
0C50  01                        C  dest_stn        db      1                       ;relative station number
0C51  00                        C  is_dest_stn     db      0                       ;1 if destination is stn
                                C
0C52  ??                        C  send_ok_count   db      ?                       ;count of successful sends
0C53  ??                        C  send_ng_count   db      ?                       ;count of unsuccessful sends
                                C
                                C
                                C  ;       Network stuff
                                C
                                C
0C54  4E 57                     C                  db      'NW'                    ;debug marker
0C56  ??                        C  rcv_arcnet      db      ?                       ;arcnet addr of stn rcvd from
0C57  ??                        C  snd_arcnet      db      ?                       ;arcnet addr of stn sent to
0C58  00                        C  brdcst_arcnet   db      0                       ;arcnet addr of stn which broadcast
0C59  ??                        C  our_arcnet      db      ?                       ;our arcnet address
0C5A  ??                        C  rcv_msg_type    db      ?                       ;incoming message type
0C5B  ??                        C  last_open_rcv   db      ?                       ;last time we did open_recv
                                C                                                  ;  (low bits of clock only)
0C5C  0D04                      C  wks             dw      talk_wks                ;our well-known socket
                                C                                                  ;  (modified by channel number)
0C5E  00 00 00 00               C  rcv_rb          dd      0                       ;ptrs to transport level
0C62  00 00 00 00               C  snd_rb          dd      0                       ;   request blocks (rbs)
0C66  ????????                  C  l4_publics      dd      ?                       ;ptr to L4 publics
0C6A  0000                      C  our_l4_debug    dw      0                       ;the l4 debug value
0C6C  ????????                  C  old_l4_exit     dd      ?                       ;existing l4 exit rtn
                                C
```

```
                                C
                                C
                                C  ;       DOS stuff
                                C
                                C
0C70  44 4F 53                  C                   db      'DOS'                   ;debug marker
0C73  ????                      C  psp              dw      ?                       ;ptr to dos psp
                                C
0C75  ????????                  C  old_key_vector   dd      ?                       ;existing key interrupt rtn
0C79  ????????                  C  old_time_vec     dd      ?                       ;existing timer interrupt rtn
                                C
0C7D  0000                      C  ticks            dw      0                       ;count of timer ticks
                                C
0C7F  0000                      C  tweedle_ptr      dw      0                       ;offset into tweedle array
                                C
0C81  08 0A 08 00               C  tweedle1         db      8,10,8,0                ;ROLM-like phone for background msg
0C85  0E 0C 0B 00               C  tweedle2         db      14,12,11,0              ;low-med-high for window popup
0C89  09 00                     C  tweedle3         db      9,0                     ;short beep for incoming msg
0C8B  04 03 02 00               C  tweedle4         db      4,3,2,0                 ;chirp for new user
0C8F  3C 3C 00                  C  tweedle5         db      60,60,0                 ;low boop for failure to send
0C92  0F 0F 0F 0B 0B 0B         C  tweedle6         db      15,15,15,11,11,11       ;ambulance sound for errors
0C98  0F 0F 0F 0B 0B 0B         C                   db      15,15,15,11,11,11,0
      00
                                C
0C9F  0A                        C  kb10             db      10
0CA0  0444                      C  kw1092           dw      1092                    ;18.2 * 60 for time conversion
                                C
                                C
                                C  ;       Task stacks
                                C  ;
                                C  ; Note that ALL stacks must be large, because the keyboard interrupt process
                                C  ; can be recursive without bound when the keyboard buffer overflows.  This is
                                C  ; a serious and fatal flaw in the rom bios.  Try it with virgin ibm software!
                                C  ; You too can crash your machine by typing fast!
                                C  ;
                                C
0CA2  53 54 41 43 4B 53         C                   db      'STACKS'                ;debug marker
0CA8  0258 [                    C                   db      600 dup(70h)            ;0: keyboard interrupt process
              70
                ]               C
                                C
0F00                            C  stack0           label   word
0F00  0258 [                    C                   db      600 dup(71h)            ;1: keyboard process
              71
                ]               C
                                C
1158                            C  stack1           label   word
1158  0258 [                    C                   db      600 dup(72h)            ;2: receive process
              72
                ]               C
                                C
13B0                            C  stack2           label   word
13B0  0258 [                    C                   db      600 dup(73h)            ;3: send process
              73                C
```

```
                                level_four_interface

                        ]       C
                                C
1608                            C  stack3          label   word
                                C
                                C
                                C  ;
                                C  ; Window buffers.  At some point we could move them to between the resident
                                C  ; code and the initialization code, so they can be shrunk to fit.
                                C  ; At the moment they are exactly the size needed and are part of the resident
                                C  ; segment.
                                C  ;
                                C  ; Note that the size of the user window can be changed by an invocation
                                C  ; parameter, and the size of the display window changes to accomodate it.
                                C  ; Thus the boundaries between the various windows may not be exactly as
                                C  ; shown below, but the total space will be no more than what we allocate.
                                C  ;
                                C  ; Remember to change the window definitions up above if you change window
                                C  ; sizes, and also check the initialization code.
                                C  ;
                                C
1608  53 43 52 45 45 4E        C                  db      'SCREENS'                ;debug marker
      53                        C
                                C
160F                            C  window_buffers  label   byte                     ;start of all the window buffers
160F                            C  group_window    label   byte                     ;start of the group window
                                C
                                C  ;               #pages      height      width    2 bytes per char
                                C  ;               -------    --------   --------  --
160F  01BC [                    C          db         1     * (2-0+1)  * (78-5+1) * 2 dup (?)  ;the group window
              ??                C
                        ]       C
                                C
17CB  01BC [                    C          db         1     * (4-2+1)  * (78-5+1) * 2 dup (?)  ;the station window
              ??                C
                        ]       C
                                C
1987  1D7C [                    C          db      n_pages  * (20-4+1) * (78-5+1) * 2 dup (?)  ;the display window
              ??                C
                        ]       C
                                C
3703  0250 [                    C          db         1     * (23-20+1)* (78-5+1) * 2 dup (?)  ;the typing window
              ??                C
                        ]       C
                                C
                                C
                                C
3953                            C  vseg            ends
                                C

0000                               cseg            segment public 'code'
                                                   assume  cs:cgrp,es:nothing,ds:nothing

                                   public  talkinit
```

```
                        level_four_interface

                                extrn   parm_len:byte, parm_str:byte                    ;in talkh
                                extrn   send_task:near,rcv_task:near,kb_task:near       ;in talkc
                                extrn   key_int_rtn:far,timer_int_rtn:far              ;in talkc
                                extrn   to_hex:near,release_rbs:near,talk_exit:near    ;in talkc
                                extrn   l4_entries:dword,al4locate:near,l4_exit_rtn:far ;in talkc

0000                    talkinit        proc    near
0000  FC                               cld                             ;direction forward
0001  2E: 8C 1E 0C73 R                 mov     psp,ds                  ;save the addr of the dos PSP
0006  8C C8                            mov     ax,cs
0008  8E C0                            mov     es,ax                   ;es:=cs
000A  8E D8                            mov     ds,ax                   ;ds:=cs
                                       assume  ds:cgrp,es:cgrp

                        ;       Check if TALK is already installed and exit if so

000C  B4 63                            mov     ah,key_talk
000E  CD 16                            int     key_int                 ;special extended function
0010  80 FC 9C                         cmp     ah,not key_talk         ;
                                       $if     e
0015  E9 0525 R                          jmp   error_install
                                       $endif

                                       %out    ...command line parsing

                        ;
                        ;       Parse the command line parameters.
                        ;
                        ;       ds:si is the current pointer, and cx the current length.
                        ;

0018  8A 0E 0000 E                     mov     cl,parm_len             ;parm length
001C  B5 00                            mov     ch,0
001E  8D 36 0000 E                     lea     si,parm_str             ;offset of parms
0022  E8 076E R                        call    str_skip_blanks         ;skip leading blanks
0025  E8 0757 R                        call    str_upper               ;convert to upper case

0028                    scan_keywords:

0028  8D 3E 045A R                     lea     di,qdebug               ;check for "DEBUG" ------------
002C  E8 0779 R                        call    str_scan
                                       $ifnot  c
0031  C7 06 0C6A R 0010                  mov   our_l4_debug,10h;allow debugging messages
0037  EB EF                              jmp   scan_keywords
                                       $endif


0039  8D 3E 0460 R                     lea     di,qtest                ;check for "TEST" ------------
003D  E8 0779 R                        call    str_scan
                                       $ifnot  c
0042  C6 06 002A R 01                    mov   test_mode,1             ;test version which isn't resident
0047  EB DF                              jmp   scan_keywords
                                       $endif
```

```
0049  8D 3E 0450 R                          lea     di,qtimestamp           ;check for "TIMESTAMP" ------------
004D  E8 0779 R                            call    str_scan
                                           $ifnot  c
0052  C6 06 002C R 01                        mov   timestamp,1             ;timestamp messages
0057  EB CF                                  jmp   scan_keywords
                                           $endif


0059  8D 3E 0465 R                          lea     di,qkey                 ;check for "KEY" --------------
005D  E8 0779 R                            call    str_scan
                                   $ifnot  c
0062  E8 07E0 R                            call    str_to_num              ;get character number

                                       $if c                       ;no number,
0067  8D 3E 0469 R                        lea     di,qf                   ;check for 'Fn'
006B  E8 0779 R                            call    str_scan
                                           $if     c
0070  E9 051B R                    j_error_key:    jmp   error_key
                                           $endif
0073  E8 07E0 R                            call    str_to_num              ;get n in (1..10)
0076  72 F8                                  jc    j_error_key
0078  48                                   dec     ax                      ;to 0..9
0079  78 F5                                 js    j_error_key
007B  3D 0009                              cmp     ax,9
007E  77 F0                                  ja    j_error_key
0080  04 3B                               add     al,59                   ;create 59..68 extended code
0082  A2 005E R                           mov     keychar_scan,al
0085  C6 06 005D R 00                     mov     keychar,0

                                       $else                               ;got a number....
008D  A2 005D R                            mov     keychar,al              ;store trigger char
0090  0A C0                                or      al,al                   ;extended code?
                                           $if     z                       ;yes...
0094  E8 07E0 R                             call  str_to_num              ;get second number
0097  72 D7                                   jc  j_error_key
0099  A2 005E R                              mov   keychar_scan,al         ;and save it
                                           $endif                          ;extended code
                                       $endif

009C  EB 8A                                jmp     scan_keywords
                                   $endif                                  ;"KEY" parameter


009E  8D 3E 046B R                         lea     di,qpopup               ;check for "POPUP" ------------
00A2  E8 0779 R                            call    str_scan
                                           $ifnot  c
00A7  C6 06 002B R 01                        mov   auto_popup,1
00AC  E9 0028 R                              jmp   scan_keywords
                                           $endif


00AF  8D 3E 0471 R                         lea     di,qpopdown             ;check for "POPDOWN" ------------
00B3  E8 0779 R                            call    str_scan
```

```
                        level_four_interface

                                        $ifnot  c
00B8  C6 06 002D R 01                     mov   auto_popdown,1
00BD  E8 07E0 R                           call  str_to_num          ;did he supply a number (in seconds)?
                                          $ifnot c
00C2  3D 0258                               cmp ax,10*60            ;max of 10 minutes
                                            $if a                   ; (to avoid tick overflow)
00C7  E9 052F R                               jmp error_popdown
                                            $endif
00CA  F7 26 0492 R                          mul k18                 ;convert to ticks
00CE  A3 002E R                             mov popdown_time,ax
                                          $endif
00D1  E9 0028 R                           jmp   scan_keywords
                                        $endif


00D4  8D 3E 0479 R                      lea     di,qchannel         ;check for "CHANNEL" ------------
00D8  E8 0779 R                         call    str_scan
                                        $ifnot  c
00DD  E8 07E0 R                          call   str_to_num          ;must supply a channel number
                                          $if c
00E2  E9 0534 R                            jmp  error_channel
                                          $endif
00E5  3D 000A                             cmp   ax,10               ;range is 0..9
                                          $if   ae
00EA  E9 0534 R                             jmp error_channel
                                          $endif
00ED  A2 0030 R                           mov   channel,al
00F0  05 0D04                             add   ax,talk_wks         ;add channel to base wks
00F3  A3 0C5C R                           mov   wks,ax              ;save well-known socket
00F6  E9 0028 R                           jmp   scan_keywords
                                        $endif


00F9  8D 3E 0487 R                      lea     di,quserwindow      ;check for "USERWINDOW" ------------
00FD  E8 0779 R                         call    str_scan
                                        $ifnot  c
0102  E8 07E0 R                          call   str_to_num          ;must supply number of lines
                                          $if c
0107  E9 053E R             j_error_userwind:   jmp error_userwind
                                          $endif
010A  3D 000A                             cmp   ax,10               ;range is 1..10
010D  77 F8                                 ja  j_error_userwind
010F  0B C0                               or    ax,ax
0111  74 F4                                 jz  j_error_userwind
0113  02 06 0042 R                       add   al,swin_top_row      ;compute new bottom row of user window
0117  FE C0                               inc   al                  ; (including bottom border)
0119  A2 0044 R                           mov   swin_bottom_row,al  ;store as bottom row of user window
011C  A2 0046 R                           mov   dwin_top_row,al     ;and as top row of display window
011F  E9 0028 R                           jmp   scan_keywords
                                        $endif


0122  8D 3E 0481 R                     lea     di,qcolor           ;check for "COLOR" ------------
0126  E8 0779 R                         call    str_scan
```

```
                                level_four_interface

                                        $ifnot  c
012B  E8 07E0 R                          call   str_to_num              ;must supply a color modifier
                                          $if c
0130  E9 0539 R                             jmp error_color
                                          $endif
0133  3D 00FF                            cmp   ax,255                   ;range is 0..255
                                          $if   ae
0138  E9 0539 R                             jmp error_color
                                          $endif
013B  A2 0031 R                           mov   color,al                 ;save the color modifier
013E  30 06 0032 R                        xor   char_normal,al           ;modify colors with it
0142  30 06 0033 R                        xor   char_bold,al
0146  30 06 0034 R                        xor   char_line,al
014A  30 06 0035 R                        xor   char_boldline,al
014E  E9 0028 R                           jmp   scan_keywords
                                        $endif


                                ;       Add other parameter parsing here...             --------------

0151  E3 08                             jcxz    parms_done             ;check for nothing else on
0153  80 3C 0D                          cmp     byte ptr[si],cr        ;  the command line
                                        $ifnot  e
0158  E9 0520 R                           jmp   error_parms
                                        $endif
015B                            parms_done:

                                        %out    ...var initialization


                                ;       Initialize the task stacks

015B  B9 0000 E                         mov     cx,offset cgrp:kb_task          ;keyboard task
015E  BB 0002                           mov     bx,task1-tcbs
0161  E8 0702 R                         call    init_task
0164  B9 0000 E                         mov     cx,offset cgrp:rcv_task         ;receive task
0167  BB 0004                           mov     bx,task2-tcbs
016A  E8 0702 R                         call    init_task
016D  B9 0000 E                         mov     cx,offset cgrp:send_task;send task
0170  BB 0006                           mov     bx,task3-tcbs
0173  E8 0702 R                         call    init_task


                                ;       Define the four windows.

0176  8D 3E 0495 R                      lea     di,borders+1                    ;modify border color attributes
017A  B9 0024                           mov     cx,4*9                          ;4 windows, 9 specifiers for each
017D  A0 0031 R                         mov     al,color
                                        $do
0180  30 05                               xor   [di],al                         ;modify it
0182  83 C7 02                           add   di,2
                                        $repeatloop
```

```
0187  B4 08                    mov   ah,window_setattr       ;set attribute for scrolled lines
0189  A0 0032 R                mov   al,char_normal
018C  E8 0000 E                call  window

018F  8D 3E 160F R             lea   di,window_buffers       ;di = start of window buffers

0193  B8 0604                  mov   ax,select_gwin          ;---group window---
0196  E8 0000 E                call  window
0199  8B 0E 003D R             mov   cx,gwin_upperleft
019D  8B 16 003F R             mov   dx,gwin_lowerright
01A1  B3 01                    mov   bl,1                    ;one page
01A3  B8 000F                  mov   ax,window_define*256+15 ;define it, wrap limit 15
01A6  E8 0000 E                call  window
01A9  8D 36 0494 R             lea   si,group_border
01AD  B4 07                    mov   ah,window_init          ;initialize the buffer
01AF  E8 0000 E                call  window
01B2  8B F8                    mov   di,ax                   ;di = buffer for next window

01B4  B8 0603                  mov   ax,select_swin          ;---station window---
01B7  E8 0000 E                call  window
01BA  8B 0E 0041 R             mov   cx,swin_upperleft
01BE  8B 16 0043 R             mov   dx,swin_lowerright
01C2  B3 01                    mov   bl,1                    ;one page
01C4  B8 000F                  mov   ax,window_define*256+15 ;define it, wrap limit 15
01C7  E8 0000 E                call  window
01CA  8D 36 04A6 R             lea   si,station_border
01CE  B4 07                    mov   ah,window_init          ;initialize the buffer
01D0  E8 0000 E                call  window
01D3  8B F8                    mov   di,ax                   ;di = buffer for next window

01D5  B8 0601                  mov   ax,select_dwin          ;---display window---
01D8  E8 0000 E                call  window
01DB  8B 0E 0045 R             mov   cx,dwin_upperleft
01DF  8B 16 0047 R             mov   dx,dwin_lowerright
01E3  B3 03                    mov   bl,n_pages              ;number of pages
01E5  B8 000F                  mov   ax,window_define*256+15 ;define it, wrap limit 15
01E8  E8 0000 E                call  window
01EB  8D 36 04B8 R             lea   si,display_border
01EF  B4 07                    mov   ah,window_init          ;initialize the buffer
01F1  E8 0000 E                call  window
01F4  8B F8                    mov   di,ax                   ;di = buffer for next window

01F6  B8 0602                  mov   ax,select_twin          ;---typing window---
01F9  E8 0000 E                call  window
01FC  8B 0E 0049 R             mov   cx,twin_upperleft
0200  8B 16 004B R             mov   dx,twin_lowerright
0204  B3 01                    mov   bl,1                    ;one page
0206  B8 000F                  mov   ax,window_define*256+15 ;define it, wrap limit 15
0209  E8 0000 E                call  window
020C  8D 36 04CA R             lea   si,typing_border
0210  B4 07                    mov   ah,window_init          ;initialize the buffer
0212  E8 0000 E                call  window
```

```
0215  B9 0009 90                        mov     cx,l_talk_name                  ;put name in upper left corner
0219  8D 36 04FB R                      lea     si,talk_name                    ;of group window
021D  8D 3E 1613 R                      lea     di,group_window+4
                                        $do
0221  A4                                  movsb
0222  47                                  inc   di                              ;(skip attribute bytes)
                                        $repeatloop

0225  80 3E 0030 R 00                   cmp     channel,0                       ;if channel # is not default
                                        $ifnot  e
022C  B9 0008 90                          mov   cx,l_channel_name               ;put channel number
0230  8D 36 0504 R                        lea   si,channel_name
0234  8A 1E 003F R                        mov   bl,gwin_right_col               ;on right of top border
0238  2A 1E 003D R                        sub   bl,gwin_left_col          ; of group window
023C  32 FF                               xor   bh,bh
023E  81 EB 000A                          sub   bx,l_channel_name+2
0242  D1 E3                               sal   bx,1 ;(for attributes)
0244  8D BF 160F R                        lea   di,group_window[bx]
                                          $do
0248  A4                                    movsb
0249  47                                    inc di      ;(skip attribute)
                                          $repeatloop
024C  A0 0030 R                           mov   al,channel
024F  04 30                               add   al,'0'
0251  AA                                   stosb
                                        $endif


0252  B8 0602                          mov     ax,select_twin                  ;default window is typing
0255  E8 0000 E                        call    window

                                        assume  ds:nothing,es:nothing


                              ;       Initialize the network

                                        l4_call l4locate                ;find transport-level routines
025B  3C 00                             cmp     al,l4_ok                ;  ds:di points to L4 publics
                                        $ifnot  e
025F  E9 050C R                           jmp   error_nwinit
                                        $endif
0262  2E: 89 3E 0C66 R                  mov     word ptr l4_publics,di  ;save ptr to L4 publics
0267  2E: 8C 1E 0C68 R                  mov     word ptr l4_publics+2,ds
026C  2E: A1 0C6A R                     mov     ax,our_l4_debug         ;set l4 debugging flag
0270  87 45 06                          xchg    ax,ds:[di].l4_debug
0273  2E: A3 0C6A R                     mov     our_l4_debug,ax         ;save old value
0277  8A 5D 05                          mov     bl,ds:[di].our_arc
027A  2E: 88 1E 0C59 R                  mov     our_arcnet,bl           ;save our arcnet address
027F  2E: 88 1E 0916 R                  mov     stn_list.stn_addr,bl    ;also as first station
0284  2E: C6 06 0917 R 00               mov     stn_list.stn_flags,0    ;and zero its flags
028A  2E: C7 06 0918 R 8000             mov     stn_list.stn_groupmask,8000h  ;only group is "ALL"

0291  2E: A1 0C5C R                     mov     ax,wks                  ;setup listen on our socket
                                        l4_call ignore                  ; (clear any old listens first)
```

```
029A  2E: A1 0C5C R                     mov     ax,wks
029E  B3 01                             mov     bl,1                    ;broadcast is ok
                                        14_call listen
02A5  3C 00                             cmp     al,sock_ok
                                        $ifnot  e
02A9  E9 0516 R                         jmp     error_socket
                                        $endif

02AC  E8 06DA R                         call    get_rb                  ;get rcv rb pointer in ds:si
02AF  2E: 89 36 0C5E R                  mov     word ptr rcv_rb,si      ;save it
02B4  2E: 8C 1E 0C60 R                  mov     word ptr rcv_rb+2,ds

02B9  E8 06DA R                         call    get_rb                  ;get send rb ptr in ds:si
02BC  2E: 89 36 0C62 R                  mov     word ptr snd_rb,si      ;save it
02C1  2E: 8C 1E 0C64 R                  mov     word ptr snd_rb+2,ds

                                        %out    ...parse environment strings


                        ;       Setup our station record, using the name from the "user=xxxx"
                        ;       environment string, if present.

02C6  2E: 8E 1E 0C73 R                  mov     ds,psp                  ;get the psp segment
02CB  8D 36 0443 R                      lea     si,cs:quser
02CF  E8 071B R                         call    get_env_string          ;look for 'USER='
                                                                        .
                                        $ifnot  z                       ;if found,
02D4  BE 0000                           mov     si,0                    ;move following name
                                        $do
02D7  26: 8A 05                           mov   al,es:[di]
02DA  0A C0                               or    al,al
                                          $exitif z
02DE  E8 07CD R                           call  chk_bad_char            ;checking for illegal chars
                                          $if   e
02E3  E9 052A R                             jmp error_name
                                          $endif
02E6  2E: 88 84 091B R                    mov   stn_list[si].stn_name,al
02EB  47                                  inc   di
02EC  46                                  inc   si
                                        $repeat
02EF  2E: C6 84 091B R 00               mov     stn_list[si].stn_name,0 ;end name with zero
02F5  8B C6                             mov     ax,si                   ;length of name
02F7  3C 10                             cmp     al,max_namesize
                                        $if     g
02FB  E9 052A R                           jmp   error_name
                                        $endif
02FE  2E: A2 091A R                     mov     stn_list.stn_namel,al   ;save length of name
0302  83 C6 06                          add     si,stn_rec_fsize+1      ;total length of stationlist
0305  2E: 89 36 0912 R                  mov     stn_list_size,si;  (including ending zero)

                                        $else
030D  2E: C6 06 091B R 24               mov     stn_list.stn_name,'$'   ;else use "$nn" as the name
0313  2E: A0 0C59 R                     mov     al,our_arcnet           ; where "nn" is our station addr
0317  B1 04                             mov     cl,4
```

```
0319  D2 C8                                    ror     al,cl
031B  E8 0000 E                                 call    to_hex
031E  2E: A2 091C R                             mov     stn_list.stn_name+1,al
0322  2E: A0 0C59 R                             mov     al,our_arcnet
0326  E8 0000 E                                 call    to_hex
0329  2E: A2 091D R                             mov     stn_list.stn_name+2,al
032D  2E: C6 06 091E R 00                       mov     stn_list.stn_name+3,0
0333  2E: C6 06 091A R 03                       mov     stn_list.stn_namel,3
0339  2E: C7 06 0912 R 0009                     mov     stn_list_size,stn_rec_fsize+3+1  ;total stn_list size
                                                $endif


                                ;
                                ;       Record any group membership from the "group=xxx,yyy,..."
                                ;       environment string, if present.
                                ;

0340  2E: 8E 1E 0C73 R                                 mov     ds,psp                  ;get the psp segment
0345  8D 36 0449 R                                     lea     si,cs:qgroup
0349  E8 071B R                                       call    get_env_string          ;look for 'GROUP='

                                                $ifnot  z                               ;found; ptr in es:di
034E  8C C0                                            mov     ax,es
0350  8E D8                                            mov     ds,ax                   ;move ptr to ds:si
0352  8B F7                                            mov     si,di
0354  8C C8                                            mov     ax,cs
0356  8E C0                                            mov     es,ax                   ;prepare es for movsb

0358  E8 0757 R                                        call    str_upper               ;convert to upper case
                                                       $do
035B  E8 079B R                                          call  str_name                ;get a name
                                                         $exitif c
0360  83 FB 10                                           cmp   bx,max_namesize
                                                         $if   g
0365  E9 052A R                                            jmp error_name
                                                         $endif
0368  8D 3E 0B70 R                                      lea   di,grp_list-1           ;point di to zero at the
036C  2E: 03 3E 0B6E R                                   add   di,grp_list_size;  end of the group list

0371  2E: 01 1E 0B6E R                                   add   grp_list_size,bx;update size of group list
0376  2E: 83 06 0B6E R 01                                add   grp_list_size,grp_rec_fsize

037C  8A C3                                              mov   al,bl                   ;size of this name
037E  AA                                                 stos  es:grp_list.grp_namel
037F  2B CB                                              sub   cx,bx                   ;how much is left after the name
0381  51                                                 push  cx                      ;save remaining count
0382  8B CB                                              mov   cx,bx
0384  F3/ A4                                            rep   movsb                   ;move the name
0386  B0 00                                              mov   al,0
0388  AA                                                 stosb                         ;move ending zero

0389  2E: FE 06 0B70 R                                   inc   grp_count               ;update count of groups
038E  2E: 8A 0E 0B70 R                                   mov   cl,grp_count            ;update our groupmask
0393  33 DB                                              xor   bx,bx
```

```
                                level_four_interface

0395  F9                                 stc
0396  D3 DB                              rcr   bx,cl
0398  2E: 09 1E 0918 R                   or    stn_list.stn_groupmask,bx
039D  59                                 pop   cx                        ;restore remaining count
                                       $repeat                           ;continue for all names
                                $endif


                                       %out    ...interrupt installers


                                ;       Print the installation message.
                                ;
                                ; We do this before installing the interrupt vectors so that if the program
                                ; is aborted with ctrl-C, we don't leave the vectors installed without
                                ; staying resident.


03A0  8D 16 04DC R                       lea     dx,cs:install_ok_msg
03A4  8C C8                              mov     ax,cs
03A6  8E D8                              mov     ds,ax                   ;ds:dx points to the string
03A8  B4 09                              mov     ah,dosint_prints
03AA  CD 21                              int     dos_int

03AC  2E: C6 06 001B R 01                mov     tasks_active,1          ;set busy flag to keep things
                                                                         ;quiet until all interrupt routines
                                                                         ;are installed


                                ;
                                ;       install the int 16 keyboard interceptor
                                ;

03B2  BE 0000                            mov     si,0            ;point es:si at keyboard vector
03B5  8E C6                              mov     es,si
03B7  BE 0058                            mov     si,key_int*4
03BA  B8 0000 E                          mov     ax,offset cgrp:key_int_rtn
03BD  8C CB                              mov     bx,cs           ;bx:ax is pointer to intercept
03BF  26: 87 04                          xchg    ax,es:[si]      ;swap old pointer for new
03C2  26: 87 5C 02                       xchg    bx,es:[si+2]
03C6  2E: A3 0C75 R                      mov     word ptr old_key_vector,ax      ;save old vector
03CA  2E: 89 1E 0C77 R                   mov     word ptr old_key_vector+2,bx

                                ;
                                ;       install the L4 exit routine
                                ;

03CF  2E: C5 36 0C66 R                   lds     si,l4_publics                   ;install l4 exit routine
03D4  B8 0000 E                          mov     ax,offset cgrp:l4_exit_rtn
03D7  8C CB                              mov     bx,cs                           ;bx:ax is pointer to exit rtn
03D9  87 44 2E                           xchg    ax,ds:[si].user_exit_vector     ;swap old pointer for new
03DC  87 5C 30                           xchg    bx,ds:[si].user_exit_vector+2
03DF  2E: A3 0C6C R                      mov     word ptr old_l4_exit,ax         ;save old vector
```

```
                        level_four_interface

03E3  2E: 89 1E 0C6E R                  mov     word ptr old_14_exit+2,bx


                        ;
                        ;       install the timer tick interrupt routine
                        ;

03E8  FA                                cli
03E9  BE 0000                           mov     si,0            ;point es:si at interrupt vector
03EC  8E C6                             mov     es,si
03EE  BE 0020                           mov     si,timer_tick*4
03F1  B8 0000 E                         mov     ax,offset cgrp:timer_int_rtn
03F4  8C CB                             mov     bx,cs           ;bx:ax is pointer to intercept
03F6  26: 87 04                         xchg    ax,es:[si]      ;swap old pointer for new
03F9  26: 87 5C 02                      xchg    bx,es:[si+2]
03FD  2E: A3 0C79 R                     mov     word ptr old_time_vec,ax ;save old vector
0401  2E: 89 1E 0C7B R                  mov     word ptr old_time_vec+2,bx
0406  FB                                sti


                        ;       Release the tasks

0407  2E: C6 06 0025 R 01               mov     first_dispatch,1;flag to force a dispatch
040D  2E: C6 06 001B R 00               mov     tasks_active,0          ;clear busy flag


                        ;       If test mode, loop in the foreground reading from the keyboard

0413  2E: F6 06 002A R 01               test    test_mode,1
                                        $ifnot  z
                                        $do
041B  B4 00                               mov   ah,key_read             ;read a key
041D  CD 16                               int   key_int
041F  3C 21                               cmp   al,"!"                  ;if bang,
                                          $if   e
0423  E8 0000 E                            call talk_exit               ; exit
0426  B8 4C00                              mov  ax,dosint_exit*256
0429  CD 21                                int  dos_int                 ; and return to dos
                                          $endif
042B  B2 21                               mov   dl,"!"                  ;otherwise print bang
042D  B4 02                               mov   ah,dosint_printc
042F  CD 21                               int   dos_int
                                        $repeat                         ;and repeat
                                        $endif


                        ;       If not test mode, exit but stay resident

0433  BA 0000 R                         mov     dx,offset cgrp:talkinit         ;end of resident part
0436  83 C2 10                         add     dx,16                           ;round up
0439  B1 04                             mov     cl,4
043B  D3 EA                             shr     dx,cl                           ;in paragraphs
043D  B4 31                             mov     ah,dosint_exitstay
043F  B0 00                             mov     al,0                            ;exit code
```

```
                                level_four_interface

0441  CD 21                                    int     dos_int


                                ;       Initialization data

0443  05 55 53 45 52 3D         quser           db      5,"USER="
0449  06 47 52 4F 55 50         qgroup          db      6,"GROUP="
      3D
0450  09 54 49 4D 45 53         qtimestamp      db      9,"TIMESTAMP"
      54 41 4D 50
045A  05 44 45 42 55 47         qdebug          db      5,"DEBUG"
0460  04 54 45 53 54           qtest           db      4,"TEST"
0465  03 4B 45 59              qkey            db      3,"KEY"
0469  01 46                    qf              db      1,"F"
046B  05 50 4F 50 55 50         qpopup          db      5,"POPUP"
0471  07 50 4F 50 44 4F         qpopdown        db      7,"POPDOWN"
      57 4E
0479  07 43 48 41 4E 4E         qchannel        db      7,"CHANNEL"
      45 4C
0481  05 43 4F 4C 4F 52         qcolor          db      5,"COLOR"
0487  0A 55 53 45 52 57         quserwindow     db      10,"USERWINDOW"
      49 4E 44 4F 57

0492  0012                      k18             dw      18

0494                            borders         label   byte
0494  20 07 C9 07 CD 07         group_border    db      " ",7,201,7,205,7,187,7,186,7,186,7,199,7,196,7,182,7
      BB 07 BA 07 BA 07
      C7 07 C4 07 B6 07
04A6  20 07 C7 07 C4 07         station_border  db      " ",7,199,7,196,7,182,7,186,7,186,7,199,7,205,7,182,7
      B6 07 BA 07 BA 07
      C7 07 CD 07 B6 07
04B8  20 07 C7 07 C4 07         display_border  db      " ",7,199,7,196,7,182,7,186,7,186,7,199,7,205,7,182,7
      B6 07 BA 07 BA 07
      C7 07 CD 07 B6 07
04CA  20 07 C7 07 C4 07         typing_border   db      " ",7,199,7,196,7,182,7,186,7,186,7,200,7,205,7,188,7
      B6 07 BA 07 BA 07
      C8 07 CD 07 BC 07

04DC  54 41 4C 4B 20 76         install_ok_msg  db      'TALK version '
      65 72 73 69 6F 6E
      20
                                                version
04ED  20 69 6E 73 74 61                         db      ' installed.',cr,lf,'$'
      6C 6C 65 64 2E 0D
      0A 24

04FB  54 41 4C 4B 20            talk_name       db      'TALK '
                                                version
= 0009                          l_talk_name     equ     $-talk_name

0504  43 68 61 6E 6E 65         channel_name    db      'Channel '
      6C 20
= 0008                          l_channel_name  equ     $-channel_name
```

```
                                level_four_interface


                                ;       Fatal errors

050C  BA 0553 R                 error_nwinit:   mov     dx,offset cgrp:msg_nwinit
050F  EB 32                                     jmp     short error_msg
0511  BA 056B R                 error_rb:       mov     dx,offset cgrp:msg_rb
0514  EB 2D                                     jmp     short error_msg
0516  BA 0585 R                 error_socket:   mov     dx,offset cgrp:msg_socket
0519  EB 28                                     jmp     short error_msg
051B  BA 059B R                 error_key:      mov     dx,offset cgrp:msg_key
051E  EB 23                                     jmp     short error_msg
0520  BA 05B9 R                 error_parms:    mov     dx,offset cgrp:msg_parms
0523  EB 1E                                     jmp     short error_msg
0525  BA 05E5 R                 error_install:  mov     dx,offset cgrp:msg_install
0528  EB 19                                     jmp     short error_msg
052A  BA 05FF R                 error_name:     mov     dx,offset cgrp:msg_name
052D  EB 14                                     jmp     short error_msg
052F  BA 064A R                 error_popdown:  mov     dx,offset cgrp:msg_popdown
0532  EB 0F                                     jmp     short error_msg
0534  BA 0673 R                 error_channel:  mov     dx,offset cgrp:msg_channel
0537  EB 0A                                     jmp     short error_msg
0539  BA 0695 R                 error_color:    mov     dx,offset cgrp:msg_color
053C  EB 05                                     jmp     short error_msg
053E  BA 06B5 R                 error_userwind: mov     dx,offset cgrp:msg_userwind
0541  EB 00                                     jmp     short error_msg

0543  8C C8                    error_msg:      mov     ax,cs                   ;ds:dx points to string
0545  8E D8                                     mov     ds,ax
0547  B4 09                                     mov     ah,dosint_prints
0549  CD 21                                     int     dos_int
054B  E8 0000 E                                 call    release_rbs             ;release any rbs
054E  B8 4C10                                   mov     ax,dosint_exit*256+16   ;exit w/ error code 16
0551  CD 21                                     int     dos_int

0553  54 41 4C 4B 3A 20        msg_nwinit      db      'TALK: 14_locate error',cr,lf,'$'
      6C 34 5F 6C 6F 63
      61 74 65 20 65 72
      72 6F 72 0D 0A 24
056B  54 41 4C 4B 3A 20        msg_rb          db      'TALK: No RBs available.',cr,lf,'$'
      4E 6F 20 52 42 73
      20 61 76 61 69 6C
      61 62 6C 65 2E 0D
      0A 24
0585  54 41 4C 4B 3A 20        msg_socket      db      'TALK: Bad 14_listen',cr,lf,'$'
      42 61 64 20 6C 34
      5F 6C 69 73 74 65
      6E 0D 0A 24
059B  54 41 4C 4B 3A 20        msg_key         db      'TALK: Bad key specification',cr,lf,'$'
      42 61 64 20 6B 65
      79 20 73 70 65 63
      69 66 69 63 61 74
```

```
      69 6F 6E 0D 0A 24
05B9  54 41 4C 4B 3A 20       msg_parms       db      'TALK: Unrecognized command line parameter',cr,lf,'$'
      55 6E 72 65 63 6F
      67 6E 69 7A 65 64
      20 63 6F 6D 6D 61
      6E 64 20 6C 69 6E
      65 20 70 61 72 61
      6D 65 74 65 72 0D
      0A 24
05E5  54 41 4C 4B 20 61       msg_install     db      'TALK already installed.',cr,lf,'$'
      6C 72 65 61 64 79
      20 69 6E 73 74 61
      6C 6C 65 64 2E 0D
      0A 24
05FF  54 41 4C 4B 3A 20       msg_name        db      'TALK: User or group name too big or ',cr,lf
      55 73 65 72 20 6F
      72 20 67 72 6F 75
      70 20 6E 61 6D 65
      20 74 6F 6F 20 62
      69 67 20 6F 72 20
      0D 0A
0625  20 20 20 20 20 20                   db      '      contains invalid characters.',cr,lf,'$'
      63 6F 6E 74 61 69
      6E 73 20 69 6E 76
      61 6C 69 64 20 63
      68 61 72 61 63 74
      65 72 73 2E 0D 0A
      24
064A  54 41 4C 4B 3A 20       msg_popdown     db      'TALK: Popdown timeout larger than 600.',cr,lf,'$'
      50 6F 70 64 6F 77
      6E 20 74 69 6D 65
      6F 75 74 20 6C 61
      72 67 65 72 20 74
      68 61 6E 20 36 30
      30 2E 0D 0A 24
0673  54 41 4C 4B 3A 20       msg_channel     db      'TALK: Bad channel specification',cr,lf,'$'
      42 61 64 20 63 68
      61 6E 6E 65 6C 20
      73 70 65 63 69 66
      69 63 61 74 69 6F
      6E 0D 0A 24
0695  54 41 4C 4B 3A 20       msg_color       db      'TALK: Bad color specification',cr,lf,'$'
      42 61 64 20 63 6F
      6C 6F 72 20 73 70
      65 63 69 66 69 63
      61 74 69 6F 6E 0D
      0A 24
06B5  54 41 4C 4B 3A 20       msg_userwind    db      'TALK: Bad userwindow specification',cr,lf,'$'
      42 61 64 20 75 73
      65 72 77 69 6E 64
      6F 77 20 73 70 65
      63 69 66 69 63 61
      74 69 6F 6E 0D 0A
      24
```

```
06DA                            talkinit        endp

                                                %out    ...utility routines

                                ;
                                ;       get_rb  Get an RB.  Fatal exit if none.
                                ;               Setup our standard timeouts and retry counts.
                                ;               Returns ptr to RB in ds:si.
                                ;

06DA                            get_rb          proc    near
                                                14_call activate_rb
06DF  8C D8                                     mov     ax,ds                           ;test for valid pointer
06E1  0B C0                                     or      ax,ax
                                                $if     z
06E5  E9 0511 R                                   jmp   error_rb                        ;no: fatal error
                                                $endif
06E8  C7 44 48 0006                             mov     [si].rb_to_accept_wait,timeout  ;accept timeout
06ED  C7 44 4C 0006                             mov     [si].rb_to_ack_wait,timeout     ;ack wait
06F2  C7 44 50 0006                             mov     [si].rb_to_pkt_wait,timeout     ;packet wait
06F7  C7 44 4E 0002                             mov     [si].rb_message_tries,retries   ;message tries
06FC  C7 44 4A 0002                             mov     [si].rb_conn_tries,retries      ;connect tries
0701  C3                                        ret
0702                            get_rb          endp


                                ;-----------------------------------------------------------------------------
                                ;
                                ; INIT_TASK      Initialize a task's stack.
                                ;               BX is the offset of the tcb, CX is the initial IP.
                                ;
                                ;-----------------------------------------------------------------------------

0702                            init_task       proc    near
0702  8B D4                                     mov     dx,sp                   ;save our stack pointer
0704  2E: 8B A7 0007 R                          mov     sp,tcbs[bx]             ;get the task's stack pointer
0709  51                                        push    cx                      ;push the return address (initial IP)
070A  B8 1234                                   mov     ax,1234h
070D  B9 0009                                   mov     cx,9                    ;push 9 other dummies
                                                $do
0710  50                                          push  ax
                                                $repeatloop
0713  2E: 89 A7 0007 R                          mov     tcbs[bx],sp             ;save his updated stack pointer
0718  8B E2                                     mov     sp,dx                   ;restore our stack
071A  C3                                        ret
071B                            init_task       endp
```

```
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                                ;-----------------------------------------------------------------------------
                                ;
                                ;       get_env_string
                                ;
                                ;       Search the DOS environment for a named string.
                                ;
                                ; Input:  cs:si points to stringname, starting with its length, ending w/ "=".
                                ;         ds:0  points to the Program Segment Prefix
                                ; Output: es:di point to the environment string value, terminated w/ 0.
                                ;         cx is the length of the string.
                                ;         NZ set if stringname was found, else Z.
                                ;         Destroys: ax.
                                ;
                                ;-----------------------------------------------------------------------------

071B                            get_env_string  proc    near
071B  1E                                        push    ds                      ;save ptr to PSP
071C  8E 06 002C                                mov     es,ds:psp_environ       ;setup es:di to env strings
0720  BF 0000                                   mov     di,0
0723  8C C8                                     mov     ax,cs                   ;setup ds:si to stringname
0725  8E D8                                     mov     ds,ax

                                        $do                                     ;loop for all env. strings
0727  56                                        push    si                      ;save start of stringname
0728  B5 00                                     mov     ch,0                    ;get stringname length in cx
072A  8A 0C                                     mov     cl,ds:[si]
072C  46                                        inc     si
072D  F3/ A6                                    repe    cmpsb                   ;compare stringname to env.
072F  5E                                        pop     si                      ;restore start of stringname
0730  74 12                                     je      get_env_found           ;exit if found
                                                $do
0732  26: 80 3D 00                                cmp   byte ptr es:[di],0      ;no match: skip parm value
                                                  $exitif e
0738  47                                          inc   di
                                                $repeat
073B  47                                        inc     di                      ; and ending zero
073C  26: 80 3D 00                              cmp     byte ptr es:[di],0      ;end of environment?
                                        $repeatuntil    e                       ;no: keep searching
0742  1F                                        pop     ds                      ;restore ptr to psp
0743  C3                                        ret                             ;exit with z set; "not found"

0744  8B CF                     get_env_found:  mov     cx,di                   ;found: compute length in cx
                                                $do
0746  26: 80 3D 00                                cmp   byte ptr es:[di],0
                                                  $exitif e
074C  47                                          inc   di
                                                $repeat
074F  87 CF                                     xchg    cx,di
0751  2B CF                                     sub     cx,di
0753  0C 01                                     or      al,1                    ;set NZ for "found"
0755  1F                                        pop     ds
0756  C3                                        ret                             ;and return
```

```
0757                                    get_envv_string endp
```

```
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                                ;
                                ; str_upper:    Convert a string to upper case
                                ;
                                ;       ds:si   is the start of the string
                                ;       cx      is the length of the string
                                ;
                                ;       destroys: ax
                                ;

0757                            str_upper       proc    near
0757  E3 14                                      jcxz    str_upper_xit
0759  56                                        push    si
075A  51                                        push    cx

075B  AC                        str_upper_loop: lodsb
075C  3C 61                                     cmp     al,'a'
075E  72 09                                     jb      str_upper_nxt
0760  3C 7A                                     cmp     al,'z'
0762  77 05                                     ja      str_upper_nxt
0764  2C 20                                     sub     al,'a'-'A'
0766  88 44 FF                                  mov     -1[si],al
0769  E2 F0                    str_upper_nxt:  loop    str_upper_loop

076B  59                                        pop     cx
076C  5E                                        pop     si
076D  C3                        str_upper_xit:  ret
076E                            str_upper       endp



                                ;
                                ; str_skip_blanks       Skip leading blanks in a string
                                ;
                                ;       ds:si   is the start of the string
                                ;       cx      is the length of the string
                                ;

076E                            str_skip_blanks proc    near
076E  E3 08                                     jcxz    str_skip_ret

0770  80 3C 20                  str_skip_loop:  cmp     byte ptr[si]," ";repe scasb doesn't work right,
0773  75 03                                     jne     str_skip_ret            ; and besides, uses es:si
0775  46                                        inc     si
0776  E2 F8                                     loop    str_skip_loop

0778  C3                        str_skip_ret:   ret
0779                            str_skip_blanks endp
```

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                        ;
                        ; str_scan      Scan a string for a keyword.
                        ;
                        ;       ds:si   is the start of the string
                        ;       cx      is the length of the string
                        ;       es:di   is the start of the keyword, which begins with a byte length
                        ;
                        ;       On return, jnc if the keyword was found, skip following blanks, and
                        ;       update si,cx for the remainder of the string.
                        ;
                        ;       Destroys: ax, di

0779                    str_scan        proc    near
0779  53                               push    bx

077A  56                               push    si                      ;save start of string
077B  51                               push    cx                      ;and its length
077C  32 FF                            xor     bh,bh
077E  26: 8A 1D                        mov     bl,es:[di]              ;keyword length from es:di
0781  47                               inc     di
0782  87 D9                            xchg    bx,cx                   ;keyword length in cx
0784  2B D9                            sub     bx,cx                   ;remaining string length in bx
0786  7C 0E                            jl      str_scan_false          ;string was too short: fail
0788  F3/ A6                   repe    cmpsb                           ;compare to string
078A  75 0A                            jne     str_scan_false          ;no match
078C  8B CB                            mov     cx,bx                   ;match: return remaining length
078E  58                               pop     ax                      ;discard saved start/length
078F  58                               pop     ax
0790  E8 076E R                        call    str_skip_blanks         ;skip following blanks
0793  F8                               clc                             ;set success flag
0794  EB 03                            jmp     short str_scan_xit

0796  59                        str_scan_false: pop     cx              ;restore length of the string
0797  5E                               pop     si                      ;  and its start
0798  F9                               stc                             ;set failure flag

0799  5B                        str_scan_xit:   pop     bx
079A  C3                               ret
079B                    str_scan        endp
```

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                                ;
                                ; str_name      Scan a string for a name terminated with blank or comma.
                                ;               Discard leading blanks or commas.
                                ;               Abort (with stack bad!) to error_name if it has a bad
                                ;               character.
                                ;
                                ;               ds:si is the start of the string
                                ;               cx    is the length of the string
                                ;
                                ;               Return NC if name found, length in BX.
                                ;               Return C  if name not found.
                                ;               si/cx is unchanged, except for leading blank/comma discard.
                                ;               Destroys ax.
                                ;

079B                            str_name        proc    near

079B  E3 2E                     str_name_lead:  jcxz    str_name_none
079D  E8 076E R                                 call    str_skip_blanks         ;skip leading blanks
07A0  E3 29                                     jcxz    str_name_none
07A2  80 3C 2C                                  cmp     byte ptr ds:[si],','    ;and commas
07A5  75 04                                     jne     str_name_name
07A7  46                                        inc     si
07A8  49                                        dec     cx
07A9  EB F0                                     jmp     short str_name_lead

07AB  56                        str_name_name:  push    si                      ;save ptr to start
07AC  51                                        push    cx                      ;save length
07AD  46                        str_name_name1: inc     si
07AE  49                                        dec     cx
07AF  E3 12                                     jcxz    str_name_end
07B1  8A 04                                     mov     al,byte ptr ds:[si]
07B3  E8 07CD R                                 call    chk_bad_char            ;check for unprintables
                                                $if     e
07B8  E9 052A R                                   jmp   error_name
                                                $endif
07BB  3C 2C                                     cmp     al,','                  ;scan for comma
07BD  74 04                                     je      str_name_end
07BF  3C 20                                     cmp     al,' '                  ;or blank
07C1  75 EA                                     jne     str_name_name1

07C3  8B DE                     str_name_end:   mov     bx,si                   ;compute length in bx
07C5  59                                        pop     cx                      ;and restore ptr/length
07C6  5E                                        pop     si
07C7  2B DE                                     sub     bx,si
07C9  F8                                        clc                             ;return NC
07CA  C3                                        ret

07CB  F9                        str_name_none:  stc                             ;return C if no name
07CC  C3                                        ret

07CD                            str_name        endp
```

```
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                                ;
                                ; chk_bad_char  Check if the char (al) is bad, ie not printable.
                                ;               We are quite liberal in this, and allow all sorts of
                                ;               weird characters except those that cause cursor motion.
                                ;
                                ;               Return z if bad.  Destroys nothing.
                                ;

07CD                            chk_bad_char    proc    near
07CD  3C 0D                                     cmp     al,cr
07CF  74 0E                                       je    chk_bad_z
07D1  3C 08                                     cmp     al,bs
07D3  74 0A                                       je    chk_bad_z
07D5  3C 07                                     cmp     al,bell
07D7  74 06                                       je    chk_bad_z
07D9  3C 0A                                     cmp     al,lf
07DB  74 02                                       je    chk_bad_z
07DD  3C 00                                     cmp     al,0
07DF  C3                        chk_bad_z:      ret
07E0                            chk_bad_char    endp
```

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                                ;(This is a modified version of cwp's routine from his string package)

                                ;
                                ; str_to_num: Convert the front of a string to a number.  Does NOT change
                                ; string at all.  This routine handles decimal, and hex if the number is
                                ; prefixed by "$".   Any non-digit stops the conversion.  Blanks following
                                ; the number are skipped.
                                ;
                                ;   entry:
                                ;     si:string
                                ;     cx:length of string
                                ;   exit:
                                ;     ax:number
                                ;     si:remaining part of string
                                ;     cx:length of remaining part of the string
                                ;     cy:on if bad number
                                ;

07E0                            str_to_num      proc    near
07E0  53                                        push    bx
07E1  52                                        push    dx
07E2  57                                        push    di

07E3  B8 0000                                   mov     ax,0            ;clear total
07E6  B7 00                                     mov     bh,0            ;use for byte to word
07E8  BA 000A                                   mov     dx,10           ;default base is decimal
07EB  8B FE                                     mov     di,si           ;keep a pointer to first char
07ED  E3 58                                     jcxz    str_num_err     ;exit if string empty
07EF  80 3C 24                                  cmp     byte ptr [si],'$'       ;hex prefix ?
07F2  75 07                                     jne     no_prefix
07F4  BA 0010                                   mov     dx,16           ;base is hex
07F7  46                                        inc     si              ;move past prefix
07F8  49                                        dec     cx
07F9  E3 4C                                     jcxz    str_num_err
07FB                            no_prefix:
07FB                            s_t_n_loop:
07FB  8A 1C                                     mov     bl,[si]         ;get a char
07FD  80 FB 30                                  cmp     bl,'0'          ;check for dec. digit
0800  7C 33                                     jl      delim_check     ;exit on non-digit
0802  80 FB 39                                  cmp     bl,'9'
0805  7E 22                                     jle     dec_digit
0807  80 FB 61                                  cmp     bl,'a'          ;check for lower case
080A  7C 08                                     jl      not_lower
080C  80 FB 66                                  cmp     bl,'f'
080F  7F 24                                     jg      delim_check     ;nothing above 'f'
0811  80 EB 20                                  sub     bl,'a'-'A'      ;convert to upper
0814                            not_lower:
0814  80 FB 41                                  cmp     bl,'A'          ;check for hex digit
0817  7C 1C                                     jl      delim_check
0819  80 FB 46                                  cmp     bl,'F'
081C  7F 17                                     jg      delim_check
081E  83 FA 10                                  cmp     dx,16           ;hex digit, are we in hex mode ?
```

```
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0821  75 12                          jne     delim_check     ;exit if wrong mode
0823  80 EB 37                       sub     bl,'A'-10       ;convert hex to num.
0826  EB 04 90                       jmp     s_t_n_add
                        ;
0829                    dec_digit:
0829  80 EB 30                       sub     bl,'0'          ;convert dec. to num.
082C                    s_t_n_add:
082C  52                             push    dx              ;save base
082D  F7 E2                          mul     dx
082F  5A                             pop     dx
0830  03 C3                          add     ax,bx
0832  46                             inc     si              ;move to next char.
0833  E2 C6                          loop    s_t_n_loop      ;do for all digits

0835                    delim_check:                         ;now any non-digit is ok end of number
0835                    str_num_exit:
0835  8B DE                          mov     bx,si
0837  2B DF                          sub     bx,di           ;how many chars scanned
0839  83 FB 01                       cmp     bx,1            ;two or more digits is fine
083C  7F 13                          jg      str_num_ok
083E  0B DB                          or      bx,bx           ;zero digits is no good
0840  74 05                          jz      str_num_err
0842  83 FA 0A                       cmp     dx,10           ;if base was decimal, one char. is ok
0845  74 0A                          je      str_num_ok

0847                    str_num_err:                         ;---Failure exit---
0847  2B F7                          sub     si,di           ;# of bytes we scanned
0849  03 CE                          add     cx,si           ;restore length of string
084B  8B F7                          mov     si,di           ;restore pointer to start of string
084D  F9                             stc                     ;set fail flag
084E  EB 05 90                       jmp     str_num_exit_2
                        ;
0851                    str_num_ok:                          ;---Sucess exit---
0851  E8 076E R                      call    str_skip_blanks ;skip following blanks
0854  F8                             clc                     ;set success flag, return updated si/cx
0855                    str_num_exit_2:
0855  5F                             pop     di
0856  5A                             pop     dx
0857  5B                             pop     bx
0858  C3                             ret
0859                    str_to_num   endp

0859                    cseg         ends
                                     end
```

Macros:

Name	Length
$DO	.000E
$DOJCXZ	.0001
$DOJMP	.0001
$DOLOOP	.0001
$DOUNTIL	.0002
$DOWHILE	.0002
$ELSE	.0006
$ELSEIF	.0008
$ELSEIFNOT	.0008
$ENDIF	.0009
$EXITIF	.0004
$GETN	.0001
$GETT	.0001
$IF	.0006
$IFNOT	.0006
$JMP	.0001
$LAB	.0001
$PUTN	.0001
$PUTT	.0001
$REPEAT	.0007
$REPEATLOOP	.0007
$REPEATUNTIL	.0007
$REPEATWHILE	.0007
L4_CALL	.0003
VERSION	.0002

Structures and records:

Name	Width / Shift	# fields / Width	Mask	Initial
ETHER_HEADER	.002E	0015		
ARC_CODE	0000			
GARBAGE	0001			
PACKET_NUM	0002			
FRAGMENT	0003			
CHECKSUM	0004			
E_LENGTH	0006			
TRANS_CTRL	0008			
PACKET_TYPE	0009			
DEST_NETWORK	000A			
DEST_HOST	000E			
DEST_SOCKET	0014			
SRC_NETWORK	0016			
SRC_HOST	001A			
SRC_SOCKET	0020			
CONN_CTRL	0022			
DATA_TYPE	0023			
SOURCE_ID	0024			
DEST_ID	0026			
SEQ_NUM	0028			

```
  ACK_NUM. . . . . .  002A
  ALLOC_NUM. . . . . .  002C
GRP_REC. . . . . .0003  0002
  GRP_NAMEL. . . . . .  0000
  GRP_NAME . . . . . .  0001
HOST_ID. . . . . .0006  0001
LEVEL_4_PUBS . . . . . .004B  001D
  L4_VERSION . . . . . .  0000
  L4_FEATURES. . . . . .  0002
  L4_STATUS. . . . . .  0004
  OUR_ARC. . . . . .  0005
  L4_DEBUG . . . . . .  0006
  L4_IN_USE. . . . . .  0008
  LONG_PKT_MODE. . . . . .  0009
  OUR_ETHER. . . . . .  000A
  FREE_HEAD. . . . . .  0010
  ACTIVE_HEAD. . . . . .  0014
  D_TO_ACCEPT_WAIT . . . . . .  0018
  D_CONN_TRIES . . . . . .  001A
  D_TO_ACK_WAIT. . . . . .  001C
  D_MESSAGE_TRIES. . . . . .  001E
  D_TO_PKT_WAIT. . . . . .  0020
  TO_PKT_KEEP. . . . . .  0022
  TO_TA_WAIT . . . . . .  0024
  OLD_DISKIO_VECTOR. . . . . .  0026
  ABORT_VECTOR . . . . . .  002A
  USER_EXIT_VECTOR . . . . . .  002E
  NIC_SEG. . . . . .  0032
  PUB_SPARE1 . . . . . .  0034
  PUB_SPARE2 . . . . . .  0036
  PUB_SPARE3 . . . . . .  0038
  PUB_SPARE4 . . . . . .  003A
  OLD_BOOT_VECTOR. . . . . .  003C
  BOOT_HOST. . . . . .  0040
  BOOT_RB. . . . . .  0046
  BOOTED_FROM_NET. . . . . .  004A
REQ_BLOCK. . . . . .0086  0043
  NEXT . . . . . .  0000
  RB_SIG . . . . . .  0004
  PROTOCOL_MODE. . . . . .  0006
  RB_IN_USE. . . . . .  0007
  CONN_STATUS. . . . . .  0008
  SEND_STATUS. . . . . .  0009
  SEND_PTR . . . . . .  000A
  SEND_LENGTH. . . . . .  000E
  HDR_ARC_CODE . . . . . .  0010
  HDR_GARBAGE. . . . . .  0011
  HDR_PACKET_NUM . . . . . .  0012
  HDR_FRAGMENT . . . . . .  0013
  HDR_CHECKSUM . . . . . .  0014
  HDR_E_LENGTH . . . . . .  0016
  HDR_TRANS_CTRL . . . . . .  0018
  HDR_PACKET_TYPE. . . . . .  0019
  HDR_DEST_NETWORK . . . . . .  001A
```

```
  HDR_DEST_HOST. . . . . .      001E
  HDR_DEST_SOCKET. . . . . .    0024
  HDR_SRC_NETWORK. . . . . .    0026
  HDR_SRC_HOST . . . . . .      002A
  HDR_SRC_SOCKET . . . . . .    0030
  HDR_CONN_CTRL. . . . . .      0032
  HDR_DATA_TYPE. . . . . .      0033
  HDR_SOURCE_ID. . . . . .      0034
  HDR_DEST_ID. . . . . .        0036
  HDR_SEQ_NUM. . . . . .        0038
  HDR_ACK_NUM. . . . . .        003A
  HDR_ALLOC_NUM. . . . . .      003C
  RECV_STATUS. . . . . .        003E
  RECV_TYPE. . . . . .          003F
  RECV_PTR . . . . . .          0040
  RECV_LIMIT . . . . . .        0044
  RECV_LENGTH. . . . . .        0046
  RB_TO_ACCEPT_WAIT. . . . . .  0048
  RB_CONN_TRIES. . . . . .      004A
  RB_TO_ACK_WAIT . . . . . .    004C
  RB_MESSAGE_TRIES . . . . . .  004E
  RB_TO_PKT_WAIT . . . . . .    0050
  PEND_VALID . . . . . .        0052
  PEND_TYPE. . . . . .          0053
  HIS_ARC. . . . . .            0054
  HIS_BCST . . . . . .          0055
  RB_SPARE1. . . . . .          0056
  RB_SPARE2. . . . . .          0058
  RB_SPARE3. . . . . .          005A
  RB_SPARE4. . . . . .          005C
  CONN_STATE . . . . . .        005E
  SEND_STATE . . . . . .        005F
  SEND_CHANGED . . . . . .      0060
  SEND_CURSOR. . . . . .        0062
  SEND_REMAINING . . . . . .    0066
  OUR_ACK_REQ. . . . . .        0068
  OUR_REQ_VALID. . . . . .      006A
  RECV_STATE . . . . . .        006B
  RECV_CHANGED . . . . . .      006C
  RECV_CURSOR. . . . . .        006E
  HIS_SEQ. . . . . .            0072
  HIS_ACK. . . . . .            0074
  HIS_ALLOC. . . . . .          0076
  PEND_BUF . . . . . .          0078
  PEND_HDR . . . . . .          007A
  PEND_START . . . . . .        007E
  SEND_RETRIES . . . . . .      0080
  MESS_START_SEQ . . . . . .    0082
  ACK_FLAGS. . . . . .          0084
  L2_SEQ . . . . . .            0085
STN_REC. . . . . .  .0007       0005
  STN_ADDR . . . . . .          0000
  STN_FLAGS. . . . . .          0001
  STN_GROUPMASK. . . . . .      0002
```

```
  STN_NAMEL. . . . . .      0004
  STN_NAME . . . . . .      0005
TIME_OUT_REC . . . . . .000A    0005
  TO_ACCEPT_WAIT . . . . . .    0000
  CONN_TRIES . . . . . .    0002
  TO_ACK_WAIT. . . . . .    0004
  MESSAGE_TRIES. . . . . .  0006
  TO_PKT_WAIT. . . . . .    0008

Segments and Groups:

                N a m e                 Size    Align   Combine Class

CGRP . . . . . .GROUP
  HSEG . . . . . .          0000    PARA    COMMON  'HSEGCL'
  VSEG . . . . . .          3953    PARA    COMMON  'VSEGCL'
  CSEG . . . . . .          0859    PARA    PUBLIC  'CODE'

Symbols:

                N a m e                 Type    Value   Attr

ADDR_ALL . . . . . .Number  FFFF
AL4LOCATE. . . . . .L NEAR  0000    CSEG    External
ASSERT . . . . . .Alias     C_TRUE
AUTO_POPDOWN . . . . . .L BYTE  002D    VSEG
AUTO_POPUP . . . . . .L BYTE  002B    VSEG
BAD_NIC. . . . . .Number  0002
BAD_RAM. . . . . .Number  0004
BAD_RIM. . . . . .Number  0003
BAD_SOCK . . . . . .Number  0004
BELL . . . . . .Number  0007
BORDERS. . . . . .L BYTE  0494    CSEG
BRDCST_ARCNET. . . . . .L BYTE  0C58    VSEG
BS . . . . . .Number  0008
CHANNEL. . . . . .L BYTE  0030    VSEG
CHANNEL_NAME . . . . . .L BYTE  0504    CSEG
CHAR_BOLD. . . . . .L BYTE  0033    VSEG
CHAR_BOLDLINE. . . . . .L BYTE  0035    VSEG
CHAR_LINE. . . . . .L BYTE  0034    VSEG
CHAR_NORMAL. . . . . .L BYTE  0032    VSEG
CHK_BAD_CHAR . . . . . .N PROC  07CD    CSEG    Length =0013
CHK_BAD_Z. . . . . .L NEAR  07DF    CSEG
CH_GRP . . . . . .Number  0004
CH_GRP_ATR . . . . . .Number  0008
CH_STN . . . . . .Number  0001
CH_STN_ATR . . . . . .Number  0002
CN_ACCEPT_WAIT . . . . . .Number  0005
CN_ESTABLISHED . . . . . .Number  0000
CN_FAIL. . . . . .Number  0002
CN_NOT_CONN. . . . . .Number  0001
CN_OPEN_RCVD . . . . . .Number  0006
CN_PARM_ERROR. . . . . .Number  0004
CN_STATE_ERROR . . . . . .Number  0003
```

```
COLOR. . . . . .L BYTE  0031    VSEG
CR . . . . . .Number  000D
CURTASK. . . . . .L WORD  000F    VSEG
C_FALSE. . . . . .Number  0000
C_TRUE . . . . . .Number  FFFF
DEC_DIGIT. . . . . .L NEAR  0829    CSEG
DELIM_CHECK. . . . . .L NEAR  0835    CSEG
DEST_GRP . . . . . .L BYTE  0C4F    VSEG
DEST_STN . . . . . .L BYTE  0C50    VSEG
DISPLAY_BORDER . . . . . .L BYTE  04B8    CSEG
DOSINT_EXIT. . . . . .Number  004C
DOSINT_EXITSTAY. . . . . .Number  0031
DOSINT_PRINTC. . . . . .Number  0002
DOSINT_PRINTS. . . . . .Number  0009
DOS_INT. . . . . .Number  0021
DO_OPEN. . . . . .L BYTE  0023    VSEG
DO_STOP. . . . . .L BYTE  0024    VSEG
DWIN_BOTTOM_ROW. . . . . .L BYTE  0048    VSEG
DWIN_LEFT_COL. . . . . .L BYTE  0045    VSEG
DWIN_LOWERRIGHT. . . . . .L WORD  0047    VSEG
DWIN_RIGHT_COL . . . . . .L BYTE  0047    VSEG
DWIN_TOP_ROW . . . . . .L BYTE  0046    VSEG
DWIN_UPPERLEFT . . . . . .L WORD  0045    VSEG
EQUIP_INT. . . . . .Number  0011
ERROR_CHANNEL. . . . . .L NEAR  0534    CSEG
ERROR_COLOR. . . . . .L NEAR  0539    CSEG
ERROR_INSTALL. . . . . .L NEAR  0525    CSEG
ERROR_KEY. . . . . .L NEAR  051B    CSEG
ERROR_MSG. . . . . .L NEAR  0543    CSEG
ERROR_NAME . . . . . .L NEAR  052A    CSEG
ERROR_NWINIT . . . . . .L NEAR  050C    CSEG
ERROR_PARMS. . . . . .L NEAR  0520    CSEG
ERROR_POPDOWN. . . . . .L NEAR  052F    CSEG
ERROR_RB . . . . . .L NEAR  0511    CSEG
ERROR_SOCKET . . . . . .L NEAR  0516    CSEG
ERROR_USERWIND . . . . . .L NEAR  053E    CSEG
ESC. . . . . .Number  001B
FALSE. . . . . .Number  0000
FIRST_DISPATCH . . . . . .L BYTE  0025    VSEG
FROM_TO_SIZE . . . . . .Number  0014
GENL_MSG_TYPE. . . . . .Number  0099
GET_ENV_FOUND. . . . . .L NEAR  0744    CSEG
GET_ENV_STRING . . . . . .N PROC  071B    CSEG    Length =003C
GET_RB . . . . . .N PROC  06DA    CSEG    Length =0028
GOOD_RB_SIG. . . . . .Number  6272
GROUP_BORDER . . . . . .L BYTE  0494    CSEG
GROUP_WINDOW . . . . . .L BYTE  160F    VSEG
GRP_COUNT. . . . . .L BYTE  0B70    VSEG
GRP_LIST . . . . . .L BYTE  0B71    VSEG
GRP_LIST_SIZE. . . . . .L WORD  0B6E    VSEG
GRP_NUMBER_MAP . . . . . .L BYTE  0C3E    VSEG    Length =0011
GRP_REC_FSIZE. . . . . .Number  0001
GRP_SUBTYPE. . . . . .Number  00BB
GWIN_BOTTOM_ROW. . . . . .L BYTE  0040    VSEG
```

```
GWIN_LEFT_COL. . . . . .L BYTE  003D    VSEG
GWIN_LOWERRIGHT. . . . . .L WORD  003F    VSEG
GWIN_RIGHT_COL . . . . . .L BYTE  003F    VSEG
GWIN_TOP_ROW . . . . . .L BYTE  003E    VSEG
GWIN_UPPERLEFT . . . . . .L WORD  003D    VSEG
HOW_OFTEN. . . . . .Number  0003
IF$1002. . . . . .L NEAR  013B    CSEG
IF$102 . . . . . .L NEAR  0039    CSEG
IF$1052. . . . . .L NEAR  015B    CSEG
IF$1100. . . . . .L NEAR  0180    CSEG
IF$1150. . . . . .L NEAR  0221    CSEG
IF$1202. . . . . .L NEAR  0252    CSEG
IF$1250. . . . . .L NEAR  0248    CSEG
IF$1302. . . . . .L NEAR  0262    CSEG
IF$1352. . . . . .L NEAR  02AC    CSEG
IF$1400. . . . . .L NEAR  0340    CSEG
IF$1402. . . . . .L NEAR  030D    CSEG
IF$1450. . . . . .L NEAR  02D7    CSEG
IF$1451. . . . . .L NEAR  02EF    CSEG
IF$1502. . . . . .L NEAR  02E6    CSEG
IF$152 . . . . . .L NEAR  0049    CSEG
IF$1552. . . . . .L NEAR  02FE    CSEG
IF$1602. . . . . .L NEAR  03A0    CSEG
IF$1650. . . . . .L NEAR  035B    CSEG
IF$1651. . . . . .L NEAR  03A0    CSEG
IF$1702. . . . . .L NEAR  0368    CSEG
IF$1752. . . . . .L NEAR  0433    CSEG
IF$1800. . . . . .L NEAR  041B    CSEG
IF$1852. . . . . .L NEAR  042B    CSEG
IF$1902. . . . . .L NEAR  06E8    CSEG
IF$1950. . . . . .L NEAR  0710    CSEG
IF$2000. . . . . .L NEAR  0727    CSEG
IF$202 . . . . . .L NEAR  0059    CSEG
IF$2050. . . . . .L NEAR  0732    CSEG
IF$2051. . . . . .L NEAR  073B    CSEG
IF$2100. . . . . .L NEAR  0746    CSEG
IF$2101. . . . . .L NEAR  074F    CSEG
IF$2152. . . . . .L NEAR  07BB    CSEG
IF$252 . . . . . .L NEAR  009E    CSEG
IF$300 . . . . . .L NEAR  009C    CSEG
IF$302 . . . . . .L NEAR  008D    CSEG
IF$352 . . . . . .L NEAR  0073    CSEG
IF$402 . . . . . .L NEAR  009C    CSEG
IF$452 . . . . . .L NEAR  00AF    CSEG
IF$502 . . . . . .L NEAR  00D4    CSEG
IF$52. . . . . .L NEAR  0018    CSEG
IF$552 . . . . . .L NEAR  00D1    CSEG
IF$602 . . . . . .L NEAR  00CA    CSEG
IF$652 . . . . . .L NEAR  00F9    CSEG
IF$702 . . . . . .L NEAR  00E5    CSEG
IF$752 . . . . . .L NEAR  00ED    CSEG
IF$802 . . . . . .L NEAR  0122    CSEG
IF$852 . . . . . .L NEAR  010A    CSEG
IF$902 . . . . . .L NEAR  0151    CSEG
```

```
IF$952 . . . . . .L NEAR  0133    CSEG
IF$L . . . . . .Number  0000
IF$N . . . . . .Number  0866
IF$NS. . . . . .Number  0868
IF$NS1 . . . . . .Number  0866
IF$NS2 . . . . . .Number  0802
IF$NS3 . . . . . .Number  073A
IF$T . . . . . .Number  0002
IF$T1. . . . . .Number  0002
IF$T2. . . . . .Number  0001
IF$T3. . . . . .Number  0002
INFINITY . . . . . .Number  FFFF
INIT_TASK. . . . . .N PROC  0702    CSEG    Length =0019
INSTALL_OK_MSG . . . . . .L BYTE  04DC    CSEG
IS_DEST_STN. . . . . .L BYTE  0C51    VSEG
J_ERROR_KEY. . . . . .L NEAR  0070    CSEG
J_ERROR_USERWIND . . . . . .L NEAR  0107    CSEG
KB. . . . . .L WORD  0492    CSEG
KB10 . . . . . .L BYTE  0C9F    VSEG
KBCHAR_MSG_TYPE. . . . . .Number  0094
KBD_BUFFER . . . . . .L BYTE  005F    VSEG    Length =008F
KBD_BUFFER_FULL. . . . . .L BYTE  0054    VSEG
KBD_BUFFER_PREV. . . . . .L BYTE  00EE    VSEG    Length =008F
KBD_BUFSIZE. . . . . .Number  008F
KBD_PREVBUFPTR . . . . . .L WORD  0905    VSEG
KBD_PREVBUFSIZ . . . . . .L WORD  0903    VSEG
KBD_PREV_INS . . . . . .L BYTE  0907    VSEG
KB_CTRL. . . . . .Number  0061
KB_CTRL_SPKR . . . . . .Number  0003
KB_CURSOR. . . . . .L BYTE  0055    VSEG
KB_INT_BUSY. . . . . .L BYTE  0020    VSEG
KB_TASK. . . . . .L NEAR  0000    CSEG    External
KEYCHAR. . . . . .L BYTE  005D    VSEG
KEYCHAR_SCAN . . . . . .L BYTE  005E    VSEG
KEY_DEL. . . . . .Number  5300
KEY_DOWN . . . . . .Number  5000
KEY_END. . . . . .Number  4F00
KEY_EXT_ACTIVE . . . . . .Number  0001
KEY_EXT_IDLE . . . . . .Number  0002
KEY_F1 . . . . . .Number  3B00
KEY_F3 . . . . . .Number  3D00
KEY_HOME . . . . . .Number  4700
KEY_INS. . . . . .Number  5200
KEY_INT. . . . . .Number  0016
KEY_INT_RTN. . . . . .L FAR  0000    CSEG    External
KEY_LEFT . . . . . .Number  4B00
KEY_NWCMDS . . . . . .Number  0062
KEY_PGDN . . . . . .Number  5100
KEY_PGUP . . . . . .Number  4900
KEY_READ . . . . . .Number  0000
KEY_RIGHT. . . . . .Number  4D00
KEY_SHIFT. . . . . .Number  0002
KEY_STAT . . . . . .Number  0001
KEY_TALK . . . . . .Number  0063
```

```
KEY_TALK_SEND. . . . . .Number  0061
KEY_TALK_START . . . . . .Number  005F
KEY_TALK_STOP. . . . . .Number  0060
KEY_UP . . . . . .Number  4800
KW1092 . . . . . .L WORD  0CA0    VSEG
L4_ENTRIES . . . . . .V DWORD 0000    CSEG    External
L4_EXIT_BUSY . . . . . .L BYTE  001F    VSEG
L4_EXIT_RTN. . . . . .L FAR   0000    CSEG    External
L4_IN_OUR_SEG. . . . . .Number  0000
L4_OK. . . . . .Number  0000
L4_PUBLICS . . . . . .L DWORD 0C66    VSEG
LAST_OPEN_RCV. . . . . .L BYTE  0C5B    VSEG
LF . . . . . .Number  000A
LISTS_CHGD . . . . . .L BYTE  0911    VSEG
LOGOFF_MSG_TYPE. . . . . .Number  0097
LOGON_MSG_TYPE . . . . . .Number  0098
L_CHANNEL_NAME . . . . . .Number  0008
L_TALK_NAME. . . . . .Number  0009
MAX_ENTRY. . . . . .Alias   OFF_L4GET_PTRS
MAX_GROUPS . . . . . .Number  0010
MAX_GRP_LIST . . . . . .Number  00C8
MAX_NAMESIZE . . . . . .Number  0010
MAX_STN_LIST . . . . . .Number  0258
MSG_CHANNEL. . . . . .L BYTE  0673    CSEG
MSG_COLOR. . . . . .L BYTE  0695    CSEG
MSG_INSTALL. . . . . .L BYTE  05E5    CSEG
MSG_KEY. . . . . .L BYTE  059B    CSEG
MSG_NAME . . . . . .L BYTE  05FF    CSEG
MSG_NWINIT . . . . . .L BYTE  0553    CSEG
MSG_PARMS. . . . . .L BYTE  05B9    CSEG
MSG_POPDOWN. . . . . .L BYTE  064A    CSEG
MSG_RB . . . . . .L BYTE  056B    CSEG
MSG_SOCKET . . . . . .L BYTE  0585    CSEG
MSG_USERWIND . . . . . .L BYTE  06B5    CSEG
NIL. . . . . .Number  0000
NOT_LOWER. . . . . .L NEAR  0814    CSEG
NO_L4. . . . . .Number  0005
NO_NIC . . . . . .Number  0001
NO_PREFIX. . . . . .L NEAR  07FB    CSEG
NTASKS . . . . . .Number  0004
N_PAGES. . . . . .Number  0003
OFF_ABORT_CONN . . . . . .Number  0009
OFF_ACK_NOW. . . . . .Number  0006
OFF_ACTIVATE_RB. . . . . .Number  0001
OFF_CONNECT. . . . . .Number  0007
OFF_DISCONN. . . . . .Number  0008
OFF_IGNORE . . . . . .Number  0004
OFF_L4CHURN. . . . . .Number  000C
OFF_L4GET_PTRS . . . . . .Number  000D
OFF_L4INIT . . . . . .Number  0000
OFF_LISTEN . . . . . .Number  0003
OFF_OPEN_RECV. . . . . .Number  0005
OFF_RECV_MSG . . . . . .Number  000B
OFF_RELEASE_RB . . . . . .Number  0002
```

```
OFF_SEND_MSG . . . . . .Number  000A
OLD_KEY_VECTOR . . . . . .L DWORD 0C75   VSEG
OLD_L4_EXIT. . . . . .L DWORD 0C6C   VSEG
OLD_TIME_VEC . . . . . .L DWORD 0C79   VSEG
ONE_SECOND . . . . . .Number  0012
ON_NIC . . . . . .Number  0000
OPEN_RECVD . . . . . .L BYTE  0026   VSEG
OTHER_CONN_BUSY. . . . . .L BYTE  0021   VSEG
OUR_ARCNET . . . . . .L BYTE  0C59   VSEG
OUR_L4_DEBUG . . . . . .L WORD  0C6A   VSEG
PARMS_DONE . . . . . .L NEAR  015B   CSEG
PARM_LEN . . . . . .V BYTE  0000   CSEG   External
PARM_STR . . . . . .V BYTE  0000   CSEG   External
POPDOWN_TIME . . . . . .L WORD  002E   VSEG
POPPED_UP. . . . . .L BYTE  0029   VSEG
PSP. . . . . .L WORD  0C73   VSEG
PSP_ENVIRON. . . . . .Number  002C
QCHANNEL . . . . . .L BYTE  0479   CSEG
QCOLOR . . . . . .L BYTE  0481   CSEG
QDEBUG . . . . . .L BYTE  045A   CSEG
QF . . . . . .L BYTE  0469   CSEG
QGROUP . . . . . .L BYTE  0449   CSEG
QKEY . . . . . .L BYTE  0465   CSEG
QPOPDOWN . . . . . .L BYTE  0471   CSEG
QPOPUP . . . . . .L BYTE  046B   CSEG
QTEST. . . . . .L BYTE  0460   CSEG
QTIMESTAMP . . . . . .L BYTE  0450   CSEG
QUSER. . . . . .L BYTE  0443   CSEG
QUSERWINDOW. . . . . .L BYTE  0487   CSEG
RCV_ARCNET . . . . . .L BYTE  0C56   VSEG
RCV_BUFFER . . . . . .L BYTE  017D   VSEG   Length =03C3
RCV_BUFSIZE. . . . . .Number  03C3
RCV_MSG_TYPE . . . . . .L BYTE  0C5A   VSEG
RCV_RB . . . . . .L DWORD 0C5E   VSEG
RCV_TASK . . . . . .L NEAR  0000   CSEG   External
RECV_BUSY. . . . . .L BYTE  001D   VSEG
RELEASE_RBS. . . . . .L NEAR  0000   CSEG   External
RETRIES. . . . . .Number  0002
RQSCRN_MSG_TYPE. . . . . .Number  0096
RUMOR. . . . . .Number  0080
RUMOR_COUNT. . . . . .L BYTE  0915   VSEG
SAVSP. . . . . .L WORD  0013   VSEG
SAVSS. . . . . .L WORD  0011   VSEG
SCAN_KEYWORDS. . . . . .L NEAR  0028   CSEG
SCRN_MSG_TYPE. . . . . .Number  0095
SELECT_DWIN. . . . . .Number  0601
SELECT_GWIN. . . . . .Number  0604
SELECT_SWIN. . . . . .Number  0603
SELECT_TWIN. . . . . .Number  0602
SEND_BUSY. . . . . .L BYTE  001C   VSEG
SEND_MSG_PTR . . . . . .L DWORD 0057   VSEG
SEND_MSG_RQST. . . . . .L BYTE  0027   VSEG
SEND_MSG_STAT. . . . . .L BYTE  005C   VSEG
SEND_MSG_STN . . . . . .L BYTE  005B   VSEG
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SEND_NG_COUNT. . . . . .L BYTE  0C53    VSEG
SEND_OK_COUNT. . . . . .L BYTE  0C52    VSEG
SEND_TASK. . . . . .L NEAR  0000    CSEG    External
SHOW_RUMORS. . . . . .Alias   C_TRUE
SND_ARCNET . . . . . .L BYTE  0C57    VSEG
SND_BUFFER . . . . . .L BYTE  0540    VSEG    Length =03C3
SND_BUFFER_SIZE. . . . . .L WORD  0908    VSEG
SND_BUFFER_TXT . . . . . .L WORD  090A    VSEG
SND_BUFSIZE. . . . . .Number  03C3
SND_RB . . . . . .L DWORD 0C62    VSEG
SOCK_IN_USE. . . . . .Number  0003
SOCK_NOT_FOUND . . . . . .Number  0001
SOCK_OK. . . . . .Number  0000
STACK0 . . . . . .L WORD  0F00    VSEG
STACK1 . . . . . .L WORD  1158    VSEG
STACK2 . . . . . .L WORD  13B0    VSEG
STACK3 . . . . . .L WORD  1608    VSEG
STATION_BORDER . . . . . .L BYTE  04A6    CSEG
STN_COUNT. . . . . .L BYTE  0914    VSEG
STN_LIST . . . . . .L BYTE  0916    VSEG    Length =0258
STN_LIST_SIZE. . . . . .L WORD  0912    VSEG
STN_REC_FSIZE. . . . . .Number  0005
STN_SUBTYPE. . . . . .Number  00AA
STR_NAME . . . . . .N PROC  079B    CSEG    Length =0032
STR_NAME_END . . . . . .L NEAR  07C3    CSEG
STR_NAME_LEAD. . . . . .L NEAR  079B    CSEG
STR_NAME_NAME. . . . . .L NEAR  07AB    CSEG
STR_NAME_NAMEL . . . . . .L NEAR  07AD    CSEG
STR_NAME_NONE. . . . . .L NEAR  07CB    CSEG
STR_NUM_ERR. . . . . .L NEAR  0847    CSEG
STR_NUM_EXIT . . . . . .L NEAR  0835    CSEG
STR_NUM_EXIT_2 . . . . . .L NEAR  0855    CSEG
STR_NUM_OK . . . . . .L NEAR  0851    CSEG
STR_SCAN . . . . . .N PROC  0779    CSEG    Length =0022
STR_SCAN_FALSE . . . . . .L NEAR  0796    CSEG
STR_SCAN_XIT . . . . . .L NEAR  0799    CSEG
STR_SKIP_BLANKS. . . . . .N PROC  076E    CSEG    Length =000B
STR_SKIP_LOOP. . . . . .L NEAR  0770    CSEG
STR_SKIP_RET . . . . . .L NEAR  0778    CSEG
STR_TO_NUM . . . . . .N PROC  07E0    CSEG    Length =0079
STR_UPPER. . . . . .N PROC  0757    CSEG    Length =0017
STR_UPPER_LOOP . . . . . .L NEAR  075B    CSEG
STR_UPPER_NXT. . . . . .L NEAR  0769    CSEG
STR_UPPER_XIT. . . . . .L NEAR  076D    CSEG
SUSPENDED. . . . . .L BYTE  0028    VSEG
SWIN_BOTTOM_ROW. . . . . .L BYTE  0044    VSEG
SWIN_LEFT_COL. . . . . .L BYTE  0041    VSEG
SWIN_LOWERRIGHT. . . . . .L WORD  0043    VSEG
SWIN_RIGHT_COL . . . . . .L BYTE  0043    VSEG
SWIN_TOP_ROW . . . . . .L BYTE  0042    VSEG
SWIN_UPPERLEFT . . . . . .L WORD  0041    VSEG
S_T_N_ADD. . . . . .L NEAR  082C    CSEG
S_T_N_LOOP . . . . . .L NEAR  07FB    CSEG
TALKINIT . . . . . .N PROC  0000    CSEG    Global  Length =06DA
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TALK_EXIT. . . . . .L NEAR  0000    CSEG    External
TALK_NAME. . . . . .L BYTE  04FB    CSEG
TALK_WKS . . . . . .Number  0D04
TASK0. . . . . .L WORD  0007    VSEG
TASK1. . . . . .L WORD  0009    VSEG
TASK2. . . . . .L WORD  000B    VSEG
TASK3. . . . . .L WORD  000D    VSEG
TASKS_ACTIVE . . . . . .L BYTE  001B    VSEG
TCBS . . . . . .L WORD  0007    VSEG
TCBSIZE. . . . . .Number  0002
TEST_MODE. . . . . .L BYTE  002A    VSEG
TF_ACK_WAIT. . . . . .Number  0006
TF_FAIL. . . . . .Number  0002
TF_IDLE. . . . . .Number  0000
TF_IN_PROG . . . . . .Number  0005
TF_NOT_CONN. . . . . .Number  0001
TF_NOT_IMPL. . . . . .Number  0008
TF_PARM_ERROR. . . . . .Number  0004
TF_RECV_OVFL . . . . . .Number  0007
TF_STATE_ERROR . . . . . .Number  0003
TICKS. . . . . .L WORD  0C7D    VSEG
TIMEOUT. . . . . .Number  0006
TIMER_CH2. . . . . .Number  0042
TIMER_CTRL . . . . . .Number  0043
TIMER_CTRL_MSB . . . . . .Number  00A6
TIMER_INT. . . . . .Number  001A
TIMER_INT_BUSY . . . . . .L BYTE  001E    VSEG
TIMER_INT_RTN. . . . . .L FAR   0000    CSEG    External
TIMER_READ . . . . . .Number  0000
TIMER_TICK . . . . . .Number  0008
TIMESTAMP. . . . . .L BYTE  002C    VSEG
TOO_MANY_SOCKS . . . . . .Number  0002
TO_HEX . . . . . .L NEAR  0000    CSEG    External
TRUE . . . . . .Number  0001
TWEEDLE1 . . . . . .L BYTE  0C81    VSEG
TWEEDLE2 . . . . . .L BYTE  0C85    VSEG
TWEEDLE3 . . . . . .L BYTE  0C89    VSEG
TWEEDLE4 . . . . . .L BYTE  0C8B    VSEG
TWEEDLE5 . . . . . .L BYTE  0C8F    VSEG
TWEEDLE6 . . . . . .L BYTE  0C92    VSEG
TWEEDLE_PTR. . . . . .L WORD  0C7F    VSEG
TWIN_BOTTOM_ROW. . . . . .L BYTE  004C    VSEG
TWIN_LEFT_COL. . . . . .L BYTE  0049    VSEG
TWIN_LOWERRIGHT. . . . . .L WORD  004B    VSEG
TWIN_RIGHT_COL . . . . . .L BYTE  004B    VSEG
TWIN_TOP_ROW . . . . . .L BYTE  004A    VSEG
TWIN_UPPERLEFT . . . . . .L WORD  0049    VSEG
TXT_SUBTYPE. . . . . .Number  00CC
TYPING_BORDER. . . . . .L BYTE  04CA    CSEG
VIDEO_GETCURSOR. . . . . .Number  0003
VIDEO_INT. . . . . .Number  0010
VIDEO_SCROLL . . . . . .Number  0006
VIDEO_SETCURSOR. . . . . .Number  0002
VIDEO_WRITE_CH . . . . . .Number  000A
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VIDEO_WRITE_TTY. . . . . .Number  000E
WINDOW . . . . . .L NEAR  0000          External
WINDOWS_OPEN . . . . . .L BYTE  0022    VSEG
WINDOW_BUFFERS . . . . . .L BYTE  160F  VSEG
WINDOW_CLOSE . . . . . .Number  0002
WINDOW_DEFINE. . . . . .Number  0000
WINDOW_GETCURS . . . . . .Number  0004
WINDOW_INIT. . . . . .Number  0007
WINDOW_OPEN. . . . . .Number  0001
WINDOW_PAGEOP. . . . . .Number  0009
WINDOW_PRINT . . . . . .Number  0003
WINDOW_SELECT. . . . . .Number  0006
WINDOW_SETATTR . . . . . .Number  0008
WINDOW_SETCURS . . . . . .Number  0005
WKS. . . . . .L WORD  0C5C    VSEG
XNS_ECHO . . . . . .Number  0003
XNS_ERROR. . . . . .Number  0002
XNS_NONE . . . . . .Number  0000
XNS_PEP. . . . . .Number  0005
XNS_RIP. . . . . .Number  0001
XNS_SPP. . . . . .Number  0004

13206 Bytes free

Warning Severe
Errors  Errors
0       0
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