```
3408  004113' 001000 000312        49560          JZ     EXCHQT          ;IF SO TIME TO TRADE
3409  004114' 000000 004100'
3410  004115' 000000 004067'
3411                                49580   IFE    LENGTH=2,<
3412                                49600   ;
3413                                49620   ; WHEN AN "IF" TAKES A FALSE BRANCH IT MUST FIND THE APPROPRIATE "ELSE"
3414                                49640   ; TO START EXECUTION AT, "DATA" COUNTS THE NUMBER OF "IF"S
3415                                49660   ; IT SEES SO THAT THE "ELSE" CODE CAN MATCH "ELSE"S WITH
3416                                49680   ; "IF"S, THE COUNT IS KEPT IN [D]
3417                                49700   ;
3418  004116' 001000 000326        49720          SUI    IFTK            ;IS IT AN "IF"
3419  004117' 000000 000212
3420  004120' 000000 000302        49740          JNZ    REMER           ;IF NOT, CONTINUE ON
3421  004121' 000000 004103'
3422  004122' 000000 004114'
3423  004123' 001000 000270        49760          CMP    B               ;SINCE "REM" CAN'T SMASH
3424                                49780                                 ;[D,E] WE HAVE TO BE CAREFUL
3425                                49800                                 ;SO ONLY IF B DOESN'T EQUAL
3426                                49820                                 ;ZERO WE INCREMENT D, (THE "IF" COUNT)
3427  004124' 001000 000212        49840          ADC    D               ;CARRY ON IF [B] NOT ZERO
3428  004125' 001000 000127        49860          MOV    D,A>            ;UPDATE [D]
3429  004126' 001000 000303        49880          JMP    REMER>
3430  004127' 000000 004103'
3431  004130' 000000 004121'
3432                                49900   ;
3433                                49902   ; WITHOUT STRINGS THERE IS NO NEED TO WATCH QUOTATIONS
3434                                49904   ; SO [B] IS SET UP AS THE SECONDARY TERMINATOR
3435                                49906   ; AND A SCAN IS MADE FOR [B] OR ZERO
3436                                49908   ;
3437                                49920   IFE    STRING,<
3438                                49940   DATA:  XWD    "01000,1         ;MAKE [C]=":" AND SKIP
3439                                49960          ":"
3440                                49980   REM:   XWD    "01000,16        ;MAKE [C]=0
3441                                50000          XWD    "01000,0         ;ZERO AND NO-OPERATION
3442                                50020   LOOPDR: MOV   A,M
3443                                50040          ORA    A               ;ALWAYS STOP ON ZERO
3444                                50060          RZ
3445                                50080          CMP    C               ;CHECK FOR ":" IN DATA
3446                                50100          RZ
3447                                50120          INX    H               ;LOOK AT NEXT CHARACTER
3448                                50140          JMP    LOOPDR>
3449                                50160   PAGE
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3450                                50180   SUBTTL "LET"
3451  004131' 001000 000315        50200   LET:   CALL   PTRGET          ;GET THE POINTER TO THE VARIABLE
3452  004132' 000000 005505'
3453  004133' 000000 004127'
3454                                50220                                 ;NAMED IN TEXT AND PUT
3455                                50240                                 ;IT ON THE STACK, [H,L] REMAINS
3456                                50260                                 ;THE TEXT POINTER AND A,PSW ARE SETUP
3457                                50280                                 ;AS THE TERMINATING CHARACTER,
3458  004134' 001000 000317        50300          SYNCHK EQULTK          ;CHECK FOR "="
3459  004135' 000000 000260
3460  004136'                      50320   REDINP:
3461                                50340   IFN    STRING,<
3462  004136' 001000 000072        50360          LDA    VALTYP
3463  004137' 000000 001543'
3464  004140' 000000 004132'
3465  004141' 001000 000365        50380          PUSH   PSW>
3466  004142' 001000 000325        50400          PUSH   D
3467  004143' 001000 000315        50420          CALL   FRMEVL          ;GET THE VALUE OF THE FORMULA
3468  004144' 000000 005536'
3469  004145' 000000 004137'
3470                                50440                                 ;INTO FAC
3471  004146' 001000 000343        50460          XTHL                   ;[H,L]=POINTER TO VARIABLE
3472                                50480                                 ;TEXT POINTER TO ON TOP OF STACK
3473  004147' 001000 000042        50500          SHLD   TEMP            ;SAVE VARIABLE POINTER FOR "FOR"
3474  004150' 000000 001603'
3475  004151' 000000 004144'
3476                                50520   IFN    STRING,<
3477  004152' 001000 000321        50540          POP    D               ;GET TEXT POINTER OFF
3478  004153' 001000 000361        50560          POP    PSW             ;GET THE VALTYP OF THE
3479                                50560                                 ;VARIABLE INTO [A]
3480  004154' 001000 000325        50581          PUSH   D               ;RESAVE THE TEXT-POINTER
3481                                50582   IFE    LENGTH=2,<
3482  004155' 001000 000376        50584          CPI    3               ;SEE IF ITS A STRING
3483  004156' 000000 000003
3484  004157' 001000 000345        50586   INPCOM: PUSH  H               ;SAVE THE POINTER AT THE VALUE POSITION
3485  004160' 000000 000302        50588          JNZ    COPNUM          ;NUMERIC, SO FORCE IT AND COPY
3486  004161' 000000 004237'
3487  004162' 000000 004150'
3488  004163' 001000 000315        50590          CALL   CHKSTR>         ;MAKE SURE THE FORMULA WAS A STRING
3489  004164' 000000 000000'
3490  004165' 000000 004161'
3491                                50600   IFN    LENGTH=2,<
3492                                50620          RAR                    ;CARRY SET FOR STRING OFF
3493                                50640                                 ;FOR NUMERIC
3494                                50660          CALL   CHKVAL          ;MAKE SURE VALTYP MATCHES CARRY
3495                                50680                                 ;AND SET THE ZERO FLAG
3496                                50700          JZ     COPNUM          ;ON A NUMERIC COPY
3497                                50860                                 ;IF A NUMBER  COPY
3498                                50880   INPCOM: PUSH  H>              ;SAVE POINTER AT VARIABLE
3499  004166' 001000 000052        50900          LHLD   FACLO           ;GET POINTER TO THE DESCRIPTOR OF THE RESULT
3500  004167' 000000 001637'
3501  004170' 000000 004164'
3502  004171' 001000 000345        50920          PUSH   H               ;SAVE THE POINTER AT THE DESCRIPTOR
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3503   004172' 001000 000043   50940           INX    H
3504   004173' 001000 000043   50960           INX    H
3505   004174' 021000 000367   50980           PUSHM
3506   004175' 021000 000321   51000           POP    D
3507   004176' 001000 000052   51020           LMLD   STKTOP     ;SEE IF IT POINTS INTO STRING SPACE
3508   004177' 000000 001615'
3509   004200' 000000 004167'
3510   004201' 001000 000347   51040           COMPAR            ;IF NOT DON'T COPY
3511   004202' 001000 000321   51060           POP    D          ;GET BACK THE POINTER AT THE DESCRIPTOR
3512   004203' 001000 000322   51080           JNC    DNTCPY     ;DON'T COPY LITERALS
3513   004204' 000000 004217'
3514   004205' 000000 004177'
3515   004206' 001000 000052   51100           LMLD   VARTAB     ;NOW, SEE IF ITS A VARIABLE
3516   004207' 000000 001621'
3517   004210' 000000 004204'
3518   004211' 001000 000347   51120           COMPAR            ;BY SEEING IF THE  DESCRIPTOR
3519   004212' 001000 000153   51140           MOV    L,E
3520   004213' 001000 000142   51160           MOV    H,0
3521   004214' 001000 000334   51180           CC     STRCPY     ;IS BEYOND [VARTAB], IF SO COPY
3522   004215' 000000 007601'
3523   004216' 000000 004207'
3524   004217' 001000 000052   51200   DNTCPY: LDAX   D          ;GET THE LENGTH AND SAVE IT
3525   004220' 001000 000365   51220           PUSH   PSW        ;SINCE WE ARE GOING TO SET IT TO
3526                           51240                             ;0 SO FRETMP DOESN'T UPDATE FRETOP
3527   004221' 001000 000257   51260           XRA    A          ;SET IT TO 0 -- ELIMINATING NULL
3528                           51280                             ;STRING IN FRETMP IS HARMLESS
3529   004222' 001000 000022   51300           STAX   D          ;PUT 0 IN THE LENGTH FIELD
3530   004223' 001000 000315   51320           CALL   FRETMP     ;FREE IT UP
3531   004224' 010440'
3532   004225' 000000 004215'
3533   004226' 001000 000361   51340           POP    PSW        ;GET LENGTH BACK
3534   004227' 001000 000167   51360           MOV    M,A        ;REPLACE IT [ FRETMP RETURNS [D,E] IN [H,L] ]
3535   004230' 001000 000353   51380           XCHG              ;PUT THE DESCRIPTOR POINTER BACK IN [D,E]
3536   004231' 001000 000341   51400           POP    H          ;GET THE PLACE OF THE NEW VARIABLE
3537                           51420           IFN    LENGTH=2,<
3538                           51440           CALL   MOVE>      ;COPY THE DESCRIPTOR
3539                           51460           IFE    LENGTH=2,<
3540   004232' 001000 000315   51480           CALL   VMOVE>
3541   004233' 000000 000000*
3542   004234' 000000 004224'
3543   004235' 001000 000341   51500           POP    H          ;GET THE TEXT POINTER BACK
3544   004236' 001000 000311   51520           RET>
3545   004237'                 51540   COPNUM:
3546                           51560           IFE    LENGTH=2,<
3547   004237' 001000 000346   51580           ANI    6          ;SETUP DISPATCH TO FORCE
3548   004240' 000000 000006   51600                             ;FORMULA TYPE TO CONFORM
3549                           51620                             ;TO THE VARIABLE ITS BEING ASSIGNED TO
3550                           51640           LXI    H,FRCTBL   ;TABLE OF FORCE ROUTINES
3551   004241' 001000 000041
3552   004242' 000000 000664'
3553   004243' 000000 004233'
3554   004244' 001000 000117   51660           MOV    C,A        ;[B,C]=TWO BYTE OFFSET
3555   004245' 001000 000006   51680           MVI    B,0
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3556   004246' 000000 000000
3557   004247' 001000 000011   51700           DAD    B
3558   004250' 001000 000176   51720           MOV    A,M        ;[H,L]=ADDRESS TO GO TO
3559   004251' 001000 000043   51740           INX    H
3560   004252' 001000 000146   51760           MOV    H,M
3561   004253' 001000 000157   51780           MOV    L,A
3562   004254' 001000 000001   51800           LXI    B,PUTVAL   ;RETURN TO PUTVAL
3563   004255' 000000 004261'
3564   004256' 000000 004242'
3565   004257' 001000 000305   51820           PUSH   B          ;DISPATCH TO FORCE
3566   004260' 021000 000351   51840           PCHL
3567   004261' 001000 000341   51860   PUTVAL: POP    H          ;GET THE POINTER OF WHERE TO STORE
3568                           51880                             ;THE VALUE
3569   004262' 001000 000345   51900           PUSH   H          ;SAVE IT BACK
3570   004263' 001000 000315   51920           CALL   VMOVMF>    ;MOVE THE VALUE IN
3571   004264' 000000 000000*
3572   004265' 000000 004255'
3573                           51940           IFN    LENGTH=2,<
3574                           51960           PUSH   H          ;SAVE THE VARIABLE POINTER FOR "FOR"
3575                           51980           CALL   MOVMF>     ;TRANSFER THE VALUE
3576   004266' 001000 000321   52000           POP    D          ;"FOR" WANTS VARIABLE POINTER IN
3577                           52020                             ;[D,E] FOR FNDFOR
3578   004267' 001000 000341   52040           POP    H          ;GET THE TEXT POINTER
3579   004270' 001000 000311   52060           RET
3580                           52080           PAGE
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3581                                      52100    SUBTTL ON GOTO CODE
3582                                      52120    IFN    LENGTH,<
3583
3584    004271'  001000  000315           52160    ONGOTO:  CALL    GETBYT          ;GET VALUE INTO [E]
3585    004272'  000000  011020'
3586    004273'  000000  004264'
3587    004274'  001000  000176           52180             MOV     A,M             ;GET THE TERMINATOR BACK
3588    004275'  001000  000107           52200             MOV     B,A             ;SAVE THIS CHARACTER FOR LATER
3589    004276'  001000  000376           52220             CPI     GOSUTK          ;AN "ON ... GOSUB" PERHAPS?
3590    004277'  000000  000214
3591    004300'  001000  000312           52240             JZ      ISGOSU          ;YES, SOME FEATURE USE
3592    004301'  000000  004306'
3593    004302'  000000  004272'
3594    004303'  001000  000317           52260             SYNCHK  GOTOTK          ;OTHERWISE MUST BE "GOTO"
3595    004304'  000000  000210
3596    004305'  001000  000053           52280             DCX     H               ;BACK UP CHARACTER POINTER
3597    004306'  001000  000113           52300    ISGOSU:  MOV     C,E             ;GET COUNT INTO  [C]
3598    004307'  001000  000015           52320    LOOPON:  DCR     C               ;SEE IF ENOUGH SKIPS
3599    004310'  001000  000170           52340             MOV     A,B             ;PUT DISPATCH CHARACTER IN PLACE
3600    004311'  001000  000312           52360             JZ      GONE2           ;IF DONE, GO OFF
3601    004312'  000000  003376'
3602    004313'  000000  004301'
3603    004314'  001000  000315           52380             CALL    LINGT2          ;SKIP OVER A LINE #
3604    004315'  000000  003643'
3605    004316'  000000  004312'
3606    004317'  001000  000376           52400             CPI     44              ;A COMMA
3607    004320'  000000  000054
3608    004321'  001000  000300           52420             RNZ                     ;IF A COMMA DOESN'T DELIMIT THE END OF
3609                                      52440                                     ;THE LAST LINE # MUST BE THE END OF THE LINE
3610    004322'  001000  000503           52460             JMP     LOOPON>         ;CONTINUE GOBBLING LINE #S
3611    004323'  000000  004307'
3612    004324'  000000  004315'
3613
3614                                      52500    PAGE
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3615                                      52520    SUBTTL IF ... THEN CODE
3616    004325'  001000  000315           52540    IF:      CALL    FRMEVL          ;EVALUATE A FORMULA
3617    004326'  000000  005336'
3618    004327'  000000  004323'
3619                                      52560             IFE     LENGTH,<
3620                                      52580             IFN     STRING,<
3621                                      52600             LDA     VALTYP          ;GET VALUE TYPE INTO [A]
3622                                      52620             PUSH    PSW>>           ;SAVE THE VALUE TYPE ON THE STACK
3623    004330'  001000  000176           52640             MOV     A,M             ;GET TERMINATING CHARACTER OF FORMULA
3624                                      52660             IFE     LENGTH,<
3625                                      52680             CALL    PUSHF           ;ONTO THE STACK
3626                                      52700             MVI     D,0             ;KEEPS RELATIONAL OPERATOR MEMORIES
3627                                      52720                                     ;LESS THAN  =4
3628                                      52740                                     ;EQUAL      =2
3629                                      52760                                     ;GREATER THAN =1
3630                                      52780    LOOPIF:  SUI     GREATK          ;CHECK FOR A RELATIONAL OPERATOR
3631                                      52800             JC      ENDREL          ;NOPE
3632                                      52820    NUMREL=LESSTK-GREATK+1            ;NUMBER OF RELATIONAL OPERATORS
3633                                      52840             CPI     NUMREL          ;IS THIS ONE OF THEM?
3634                                      52860             JNC     ENDREL          ;NO SEE WHAT WE HAVE
3635                                      52880             CPI     1               ;SETUP BITS BY MAPPING
3636                                      52900             RAL                     ;0 TO 1, 1 TO 2 AND 2 TO 4
3637                                      52920             ORA     D               ;OR WITH EARLIER BITS
3638                                      52940             MOV     D,A             ;STORE NEW BITS
3639                                      52960             CHRGET                  ;GET NEW CHARACTER
3640                                      52980             JMP     LOOPIF          ;SEE IF RELATIONAL
3641                                      53000    ENDREL:  MOV     A,D             ;GET REALTIONAL MEMORIES
3642                                      53020             ORA     A               ;SEE IF THERE ARE ANY
3643                                      53040             JZ      SNERR           ;NO RELATIONAL OPERATORS!
3644                                      53060             PUSH    PSW             ;SAVE RELATIONAL MEMORIES
3645                                      53080             CALL    FRMEVL>         ;PICK UP FIRST NON-RELATIONAL
3646                                      53100                                     ;CHARACTER AGAIN AND INTERPRET FORMULA
3647                                      53120                                     ;ANSWER LEFT IN FAC
3648    004331'  001000  000376           53140             IFE     LENGTH=2,<CPI   44      ;A COMMA?
3649    004332'  000000  000054
3650    004333'  001000  000314           53160             CZ      CHRGTR>         ;IF SO SKIP IT
3651    004334'  000000  003426'
3652    004335'  000000  004326'
3653                                      53180             IFN     LENGTH,<
3654    004336'  001000  000376           53200             CPI     GOTOTK          ;ALLOW "GOTO" AS WELL
3655    004337'  000000  000210
3656    004340'  001000  000312           53220             JZ      OKGOTO>
3657    004341'  000000  004346'
3658    004342'  000000  004334'
3659    004343'  001000  000317           53240             SYNCHK  THENTK          ;MUST HAVE A THEN
3660    004344'  000000  000245
3661    004345'  001000  000053           53260             DCX     H
3662    004346'                           53280    OKGOTO:
3663                                      53300             IFE     LENGTH,<
3664                                      53320             POP     PSW
3665                                      53340             POPR                    ;POP OFF NUMBER
3666                                      53360             IFN     STRING,<
3667                                      53380             XTHL>                   ;COMPARE FORMULA TYPES
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3666                            53400            IFE     STRING,<PUSH    H>      ;SAVE THE TEXT POINTER
3669                            53420            PUSH    PSW             ;RESAVE RELATIONAL MEMORIES
3670                            53440            IFN     STRING,<
3671                            53460            LDA     VALTYP          ;GET VALUE TYPE
3672                            53480            CMP     H               ;(H) HAS OLD VALTYP ARE THEY =?
3673                            53500            JNZ     TMERR           ;IF NOT ITS A TYPE ERROR
3674                            53520            ORA     A               ;SEE WHAT TYPE IT WAS
3675                            53540            JZ      NUMCMP          ;ZERO MEANS IT WAS NUMERIC
3676                            53560            CALL    STRCMP          ;MUST BE STRING,SO STRING COMPARE
3677                            53580            JMP     SKPNCM>         ;SKIP OVER NUMERIC COMPARE
3678                            53600    NUMCMP:  CALL    FCOMP           ;COMPARE THE 2 SIDE OF THE RELATION STATEMENT
3679                            53620    SKPNCM:  INR     A               ;BUILD RELATIONAL BITS
3680                            53640            RAL                     ;LESS=4 EQUAL=2 GREATER=1
3681                            53660                                    ;SINCE CARRY IS ON ONLY IN
3682                            53680                                    ;377 CASE (FCOMP & STRCMP)
3683                            53700            POP     B               ;POP OFF WHAT RELATIONAL OPERATOR WAS
3684                            53720            ANA     B>              ;SEE IF WE MATCHED
3685                            53740            IFN     LENGTH,<
3686                            53742            IFE     LENGTH=2,<
3687    004346' 001000 000315   53744            CALL    VSIGN##>
3688    004347' 000000 000000*
3689    004350' 000000 004341'
3690                            53746            IFN     LENGTH=2,<
3691                            53760            FSIGN>>                  ;0=FALSE ALL OTHERS=TRUE
3692                            53780            IFE     LENGTH,<
3693                            53800            POP     H>              ;POP OFF TEXT POINTER
3694                            53820            IFE     LENGTH=2,<
3695    004351' 001000 000312   53840            JZ      FALSIF>         ;HANDLE POSSIBLE "ELSE"
3696    004352' 000000 004363'
3697    004353' 000000 004347'
3698                            53860            IFN     LENGTH=2,<
3699                            53880            JZ      REM>            ;IF TEST FAILED -- JUST SKIP REST OF THE LINE
3700    004354' 001000 000327   53900    DOCOND:  CHRGET                  ;PICK UP THE FIRST LINE # CHARACTER
3701    004355' 001000 000332   53920            JC      GOTO            ;LINE NUMBER MEANS "GOTO"
3702    004356' 000000 004010'
3703    004357' 000000 004352'
3704    004360' 001000 000303   53940            JMP     GONE3           ;INTERPRET NEW STATEMENT
3705    004361' 000000 003575'
3706    004362' 000000 004356'
3707                            53960            IFE     LENGTH=2,<
3708                            53980            ;
3709                            54000            ; "ELSE" HANDLER, HERE ON FALSE "IF" CONDITION
3710                            54020            ;
3711    004363' 001000 000026   54040    FALSIF:  MVI     D,1             ;NUMBER OF "ELSE"S THAT MUST
3712    004364' 000000 000001
3713                            54060                                    ;BE SEEN, "DATA" INCREMENTS THIS
3714                            54080                                    ;COUNT EVERY TIME AN "IF" IS SEEN
3715    004365' 001000 000315   54100    SKPMRF:  CALL    DATA            ;SKIP A STATEMENT
3716    004366' 000000 004072'
3717    004367' 000000 004561'
3718                            54120                                    ;"!" IS STUCK IN FRONT OF "ELSE"S
3719                            54140                                    ;SO THAT "DATA" WILL STOP BEFORE "ELSE" CLAUSES
3720
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3721    004370' 001000 000267   54160            ORA     A               ;END OF LINE?
3722    004371' 001000 000310   54180            RZ                      ;IF SO, NO "ELSE" CLAUSE
3723    004372' 001000 000327   54200            CHRGET                  ;SEE IF WE HIT AN "ELSE"
3724    004373' 001000 000376   54220            CPI     ELSETK
3725    004374' 000000 000220
3726    004375' 001000 000302   54240            JNZ     SKPMRF          ;NO, STILL IN THE "THEN" CLAUSE
3727    004376' 000000 004365'
3728    004377' 000000 004366'
3729    004400' 001000 000025   54260            DCR     D               ;DECREMENT THE NUMBER OF "ELSE"S THAT
3730                            54280                                    ;MUST BE SEEN
3731    004401' 001000 000302   54300            JNZ     SKPMRF          ;SKIP MORE IF HAVEN'T SEEN
3732    004402' 000000 004365'
3733    004403' 000000 004376'
3734                            54320                                    ;ENOUGH
3735    004404' 001000 000303   54340            JMP     DOCOND>         ;FOUND THE RIGHT "ELSE" -- GO EXECUTE
3736    004405' 000000 004554'
3737    004406' 000000 004402'
3738
3739                            54380    PAGE
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