IDENTIFICATION

BSS LOADER WITH FORTRAN FEATURE, BFF LOADER
704 SAP PROGRAM
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OSE

To replace the 9 card BSS loader and to allow assembly of one FORTRAN subprogram at object time, loading this subprogram and any other already-assembled subprograms into core for immediate running. May be used for example, to cause evaluation of a function whose precise form is not known when the rest of the FORTRAN program is coded.

ICTIONS

A main program may not be assembled at object time, nor may more than one subprogram. The remainder of the program with the exception of FORTRAN library subroutines must be available on FORTRAN produced binary cards or their equivalent, hereafter called the binary deck.

No subprogram in the binary deck may have the same name as that of the subprogram to be assembled.

If library subroutines are required by the subprogram, they must be in the binary deck or must be called from the FORTRAN library under Sense Switch 5 control as mentioned in the next section.

Check sums are not tested.

METHOD

This loader uses the following properties of the FORTRAN assembler at this installation:

1. Single subprogram assembly occurs when Sense Switch 6 is in the UP position.

2. On single assembly, the source program is read from cards.

3. Reading of these cards terminates at the encounter of the canonical END card, e.g:

bbbbbbENDb(0,1,1,1,1) (b = Blank)

DISCLAIMER
Although this program has been carefully tested by its contributor, no guarantee is made of its correct functioning under all conditions, and no responsibility is taken by him in case of possible failure.

4. The newly assembled subprogram and all library subprograms requested are available in binary symbolic form on logical tape 3 if the last integer in the END card list is a one, or if this integer is a two and Sense Switch 5 is DOWN.

5. Following single assembly, the FORTRAN system performs a LOAD CARDS sequence.

The subprogram-loading portion of the BSS loader has been modified by G.A. Westlund to circumvent timing difficulties in loading from tape.

USAGE

To use FORTRAN assembly feature:

Raise Switch 6; arrange tapes as for usual FORTRAN assembly. Ready loader card 00, FORTRAN symbolic source cards for the subprogram to be assembled, cards 01 through 10, the binary deck, and a FORTRAN transfer card in that order in the card reader. Press LOAD CARDS. At the stop HPR 15_8 in location 61_8 press START. Unless the subprogram failed to assemble or other subprograms are missing (see below), the object program will now be executed.

To use as ordinary BSS loader:

No tapes are used by the loader. Omit card 00. Ready cards 01 through 10, the complete binary deck and a FORTRAN transfer card in that order in the card reader. Press LOAD CARDS. Unless subprograms are missing (see below), the object program will now be executed.

Missing subprograms will cause the stop HPR15_8 in location 61_8. If a subprogram was just assembled under Switch 6 control, press START to cause it to be read from tape 3. If this has already been done or if the loader was used as a BSS loader, depressing Switch 6 allows the missing subprograms to be read from binary FORTRAN cards by pressing START. The names of the missing subprograms will be listed in BCD in locations 77453_8, 77454_8, ...at the HPR 15 stop.

CODING INFORMATION

The loader contains cards 00 through 10.

The first binary subprogram is relocated from location 100_8.

```
        REM BFF LOADER = BSS LOADER WITH FORTRAN FEATURE
        REM OPTIONAL(SWITCH 6)ASSEMBLY OF ONE SUBPROGRAM
        REM AT OBJECT TIME
        FUL
        REM
        ORG 0              CARD 00
        LXA 0,7            BOOTSTRAP
        CPY 2,4            .
        TXI *-1,4,-1       .
        HTR 0,7            EOF
        SWT 6              TEST SWITCH 6
        TRA *+3            UP, REWIND TAPE 1, CALL FORTRAN
        RCD                DOWN, GO TO CARD 01
        TRA*+3             WHICH FOLLOWS
        REW 1              .
        RTB 1              .
        CPY 0              FORTRAN SOURCE PROGRAM, IF ANY
        CPY 1              IS PLACED BETWEEN CARDS 00 AND 01
        TRA 0              *
        REM
        ORG 0              CARD 01
        LXA 0,1            BOOTSTRAP
        CPY 2,1            .
        TXI *-1,1,-1       .
        HTR 11             EOF
        LXA *-1,1          PLANT 11 WORDS
        CLA PLANT+11,1     AT LOCATION
        STO SEARCH+11,1    SEARCH
        TIX *-2,1,1        .
        RCD                .
        CPY 0              .
        CPY 1              GO TO CARD 02
        TRA 0              *
 PLANT  HPR READ-1         MISSING SUBROUTINES STOP
        CLA RCD            .
        SWT 6              TEST SWITCH 6
        CLA RTB3           UP, AT TAPE 3
        STA READ           DOWN, AT CARD READER
        TRA READ-1         SEEK SUBROUTINES
        RTB 3              IMAGE TO PLANT AT READ
        LXD TXL,3          TO HERE ON END OF FILE
        SWT 6              TEST SWITCH 6
        TRA PASS2          UP, SIMULATE TRANSFER CARD
        TRA READ           DOWN, SEEK MORE CARDS
        REM
 LIST   SYN 32575
 TABL   SYN 32554
TOOMCH  SYN LIST-20
SEARCH  SYN 49             NEW LOCATION OF SEARCH
 RTB3   SYN SEARCH+6       LOCATION OF RTB 3 INSTRUCTION
 EOF    SYN SEARCH+7       REPLACES END OF FILE STOP
        REM
        ORG 0              CARD 02
 VR     LXA 0,1
 SM     CPY 2,1
        TXI SM,1,-1
 TG     HTR 0,1
        LTM
 X      RCD
```

```
RB     CPY LIST-21,1
LB     TXI RB,1,-1
R      HTR **
       TXH X,1,-200
       LXD M,1
       SXD M,1
       STZ LIST-20
READ   RCD
       CPY VR
       TRA TEST
TXL    TXL EOF,0,0        GO TEST SWITCH 6 ON END OF FILE
END    STZ 0,2
       TIX END,2,1
       TOV PROG
PROG   TRA **
T      HTR **
S      HTR 64             RELOCATE FROM OCTAL 100
ADDRS  HTR 32767
       ORG LIST+1
TEST   CLA VR
       CPY SM
       LXD VR,1
       TMI M1
       TZE READ
       TXH VR,1,32
M1     LXD M3,2
M2     CPY 24,2
       TXI M2,2,-1
M3     HTR 2
       TMI PASS1
       STZ PRTST
       TXL REG,1,31
       STA T
       ADD S
       STA S
       CLA SM
       STA U
       TRA READ
REG    STA R
       ARS 15
U      PDX 0,4
       TXL NR,4,1
       TSX LT,2
       STA R
NR     CAL VR
       ARS 18
       ADD R
       STA TR
       LXD VR,2
TR     TXL VR,2,0
       STA TA
       STA SA
       STA SC
       STA TC
B      STA CP
       PXD 0,2
       ARS 18
       ADD M2
       TXL M4,4,1
```

```
        ADD M3
M4      STA M5
M5      LDQ **,2
CP      STQ **,2
        TIX M5,2,1
        NOP
        NOP
RT      TXL READ,4,1
        TXH SR,4,3
RL      LDQ RBN
DB      CLA LBN
        LGL 1
        SLW LBN
        TPL AB
TD      CLA **,1
        ARS 18
        TSX CB,2
        ALS 18
SD      STD **,1
AB      CLA LBN
        LGL 1
        SLW LBN
        TPL TV
TA      CLA **,1
        TSX CB,2
SA      STA **,1
TV      TIX DB,1,1
        TRA READ
CB      STA R
        CLA LBN
        LGL 1
        SLW LBN
        TMI LTA
LT      SLW 1
LTA     CLS R
        ADD I
        TPL ADDS
        SLT 1
        TRA PROGRM
DATA    CLA R
        ADM U
        TRA 1,2
ADDS    SLT 1
        TRA DATA
PROGRM  SUB S
        TRA 1,2
PASS1   PDX 0,2
        TXL PASS2,2,0
        ADD TAG
        ADD DECTWO
        STD STOP
        SUB M
        STD OVLP
        ACL VR
        SUB DECTWO
        ARS 18
DECTWO  TIX TXB,2,2
TXB     TSX B,4
SR      LXD TAG,1
```

```
        CLA PRTST
        TZE ONLY1
        CLA LBN
        STO TABL-1,1
        CLA RBN
        STO TABL,1
        TIX NCARDS,1,2
ONLY1   CLA S
        STZ TABL-1,1
        STO TABL,1
        LXD LBN,4
        TXH CLAS,4,0
        CLA BTMASK
        STO TABL-1,1
CLAS    CLA LBN
        STD TABL-1,1
        STA T
        ADD S
        STA S
        PAX 0,2
OVLP    TXH TG,2,0
        CLA U
        SUB RBN
        PAX 0,4
        PXD 0,4
        ARS 18
        TZE ACLA
        CAS ADDRS
ACLA    CLA ADDRS
        NOP
        STO ADDRS
        SUB S
        TMI TOOMCH
NCARDS  SXD PRTST,2
        STZ LBN
        TXI LTT,1,2
LTT     CLA TABL,1
        TSX CB,2
        STA TABL,1
        TXI STOP,1,2
STOP    TXL LTT,1,0
        SXD TAG,1
M       TNX READ,0,TABL
VEC     CAL TABL+1,2
        TNZ G3
        CLA TABL+2,2
        STA PROG
        TRA PASS2
G3      ANA BTMASK
        TNZ PASS2
        CLA TABL+1,2
OLDU    PDX 0,4
        ARS 18
        ADD TABL+2,2
        STA A
        STA AA
        STA AAA
        STA ABB
NXTVC   LXD TAG,1
```

```
 A       CAL 0,4
         ANA BTMASK
         TZE TIXVEC
 ABB     CLA 0,4
NXTNAM   CAS TABL+1,1
 TTR     TTR G4
         TRA FIX
 G4      TIX NXTNAM,1,2
SAVNAM   STO RBN
         LXD TWTY,1
 CMPR    CLA LIST,1
         TZE STONAM
         CAS RBN
 TWTY    TNX G2,0,20
         TRA TIXVEC
 G2      TIX CMPR,1,1
         HTR PASS2
STONAM   CLA RBN
         STO LIST,1
         STZ LIST+1,1
         TRA TIXVEC
 FIX     CLA TTR
 AA      STO 0,4
         CLA TABL+2,1
 AAA     STA 0,4
TIXVEC   TIX NXTVC,4,1
 PASS2   TXI TAG,2,2
 TAG     TXL VEC,2,0
         CLA TABL+1
         TNZ SEARCH
         TXI END,2,212
 RCD     RCD              IMAGE TO PLANT AT READ
BTMASK   TXL 0,0,0
 PRTST   HTR 0
 LBN     SYN 24
 RBN     SYN 25
         END 0
```