SINGER
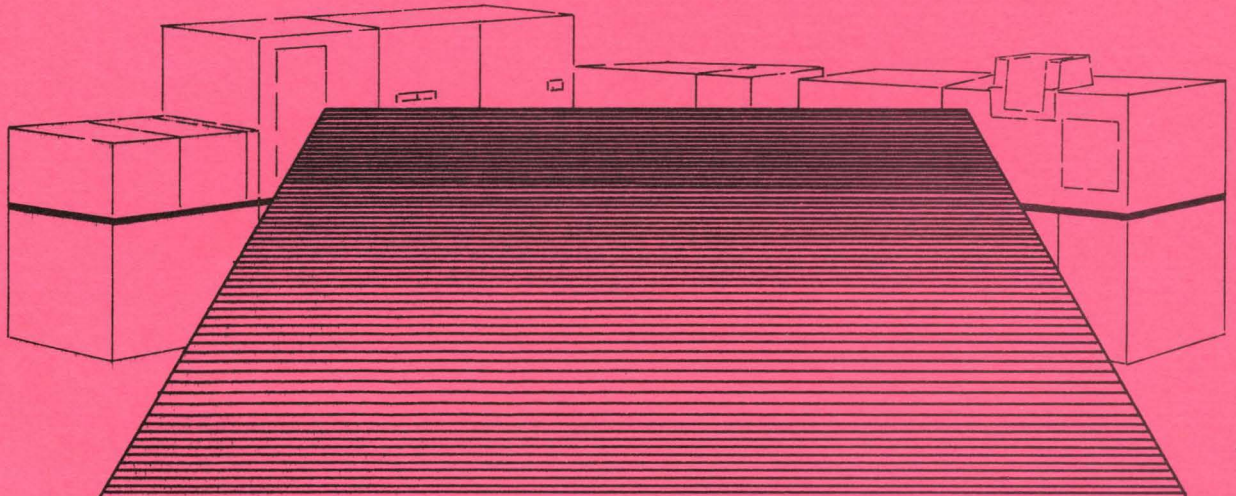## FRIDEN DIVISION

SYSTEM TEN
IOC LOADING PACKAGE

- PUNCHED CARDS OR PAPER TAPE
- MODEL 70 WORKSTATION
- 7102 COMMUNICATIONS TERMINAL

GENERAL DESCRIPTION

The System Ten IOC Loading Package is comprised of four programs; two of these are loading programs (the Object Card Loader and the 7102 Paper Tape Loader), and the other two are optional Clear Core Prologues that are run with a loading program.

Programs in the IOC Loading Package are designed to prepare the central processing unit of System Ten for loading and executing programs written in Assembler I language.

MEMORY REQUIREMENTS

The two loaders described in this manual affect the first 300 locations in a given partition. The prologues initially use part of these locations, but are overlaid by the loader after execution of the prologue.

Each of the programs described herein works in a given partition. They do not use locations in Common.

INPUT/OUTPUT REQUIREMENTS

The Object Card Loader and the 7102 Paper Tape Loader are run with users' object text programs. Either of the two Clear Core Prologues may be run with the Object Card Loader.

EQUIPMENT CONFIGURATION

The following minimum equipment configuration is required to run the Object Card Loader and, optionally, either Clear Core Prologue:

Model 20 CPU, minimum 1K partition

Model 30 Card Reader

Model 70 Workstation (or 7102 Communications Terminal)

The following minimum configuration is required to run the 7102 Paper Tape Loader:

Model 20 CPU, minimum 1K partition

7102 Communications Terminal (with attached Paper Tape Reader)

TABLE OF CONTENTS

FUNCTION

The Object Card Loader loads object programs from a card reader. All object deck cards must be in the ASSEMBLER I object card format. A bootstrap instruction must be entered from the workstation to load the Object Card Loader.

An out-of-sequence card in the object deck will interrupt the loading operation, and the sequence number of the card encountered, as well as that of the card expected, will be printed on the output device indicated.

Initial Loading Activities

Bootstrap information to load the Loader is entered from the workstation and is stored in locations 0000-0009.

Location 0010 is set to blank, as a halt constant for debugging.

The three index registers (locations 0011-0038) are initialized to zero. These values are modified later as specified by the user's program.

The host partition number (00-19) is determined by the Loader and stored in locations 0047-0048.

Post-Loading Storage Status

0000-0009	Bootstrap information
0010	Blank
0011-0038	Index registers (zero, unless otherwise specified in the object deck program)
0039	Unused
0040-0044	Error register
0045-0046	Zeros
0047-0048	Partition number
0049	Unused
0050-0299	Object Card Loader

EQUIPMENT

Required

Card Reader, Workstation.

Optional

None.

AUXILIARY SOFTWARE

None.

OPERATING INSTRUCTIONS

Deck Parameters

1. Bootstrap information (1001010290, where the first character (1) = the device number of the card reader) will be entered from the keyboard of the Workstation.

2. Indicate in column 1 of card 2 the device number where sequence error messages (if any) are to be printed. (Normally, this is 0.)

3. Sequence checking capability requires an R in column 31 of card 3. To disable this sequence check, change this character to a U.

Deck Order for Object Card Loading

USER'S OBJECT CARD DECK

OBJECT CARD LOADER (4 CARDS)
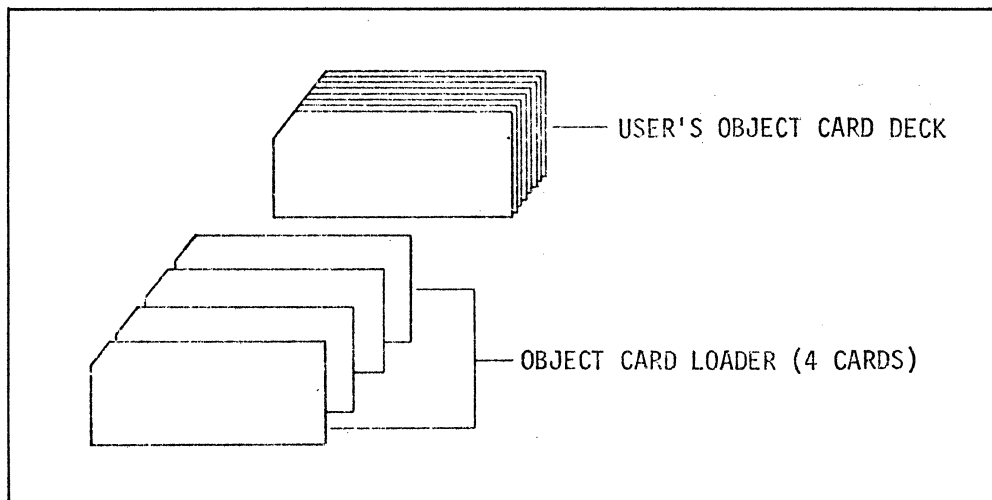
OBJECT CARD LOADER

P010810000PPQ0110187RORX050060P010240296POPP05000000000000 **LAST CARD**

POPP050050* 0000TS10PPQ7740182RORQ050090PPQ0110186RORS050260P010350255P01P210250

001W710009 *   1P085400311P12040045PPPOTQP189ROQU050110P003010010R001170012

P00P010070POPP050130 0000   0000 QP1X9401821P188401820010110080ROQY050070.

————————————————DEVICE # WHERE ERROR MESSAGE WILL BE PRINTED

————————————————SEQUENCE CHECK?: R = YES
                                   U = NO

Procedure: Workstation = device 0

1. Clear the card reader buffers by depressing the LOAD and LOCAL buttons simultaneously.

2. Obtain a load condition on the Workstation.

3. Stack the cards in the input hopper in the following order:

   Four-card Object Card Loader
   User's object card program deck

4. Press the card reader ON-LINE button.

5. Enter the bootstrap information (1001010290, where the first character (1) = device number of the card reader) at the keyboard of the Workstation.

NORMAL EVENTS

The Object Card Loader affects locations 0010-0049 as described above, and checks for sequence errors in the user's deck. Upon successful completion of loading, control passes to the user's program.

ABNORMAL EVENTS

Sequence Error:

If the user's object cards are out of order, the message NNNN MMMM is displayed on the output device, where

NNNN = four digit sequence number (from columns 77-80) found on the card being processed

MMMM = four digit sequence number expected by the loader,

and loading stops. The out-of-sequence card will be the third one down in the output hopper.

Recovery, Sequence Error:

1. Find the card of sequence number MMMM.

2. Reorder it and the cards that should follow it in proper sequence and place them back in the input hopper.

3. Press the card reader's LOAD and LOCAL buttons simultaneously to clear the card reader's buffers.

4. Ascertain that the Workstation is in Load condition, then enter the information POPP050070 ("branch to location 70") on the keyboard.

5. Press the card reader's ON-LINE button.

PROGRAMMING HINTS

1. Programs may have an origin as low as 300.

2. To resume loading the program after an overlay, branch to location 0060.

3. If the user's program is part of a stack of object programs, the end of each job execution except the last should be a branch to location 0050 to load the next program.

FUNCTION

The Absolute Clear Core Prologue is an optional auxiliary program which allows the user to unconditionally set locations 0300 through the last available address in a partition either to blank or to a user-specified character. It has no effect on locations 0000-0299.

This Prologue must be processed with the Object Card Loader and a user's object card program.

EQUIPMENT

Required

Card Reader, Workstation.

Optional

None

AUXILIARY SOFTWARE

Must be run with Object Card Loader.
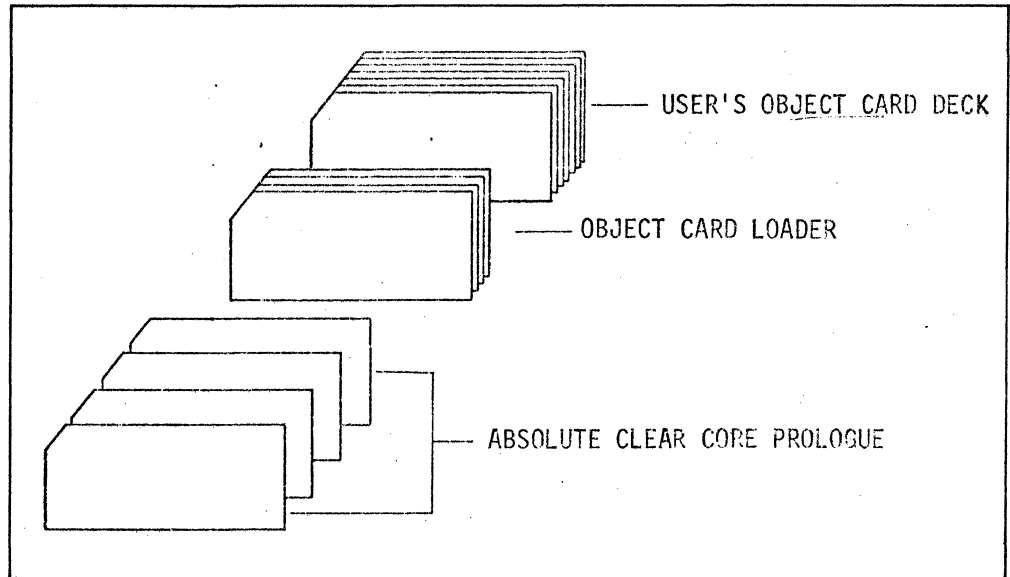
OPERATING INSTRUCTIONS

Deck Parameters

The character in column 45 of card 2 will be placed in all locations from 0300 through the last available address in this partition. This character may be a blank (b).

Deck Order for Loading

The four-card Absolute Clear Core Prologue is placed in front of the Object Card Loader.

Procedure: Workstation = device 0

1. **Clear the card reader** buffers, by depressing the LOAD and LOCAL buttons simultaneously.

2. Obtain a load condition on the Workstation.

3. Stack the cards in the input hopper in the following order:

        Absolute Clear Core Prologue deck
        Object Card Loader
        User's object card program deck

4. Press the card reader ON-LINE button.

5. Enter the bootstrap information (1001010290, where the first character (1) = device number of the card reader) at the keyboard of the Workstation.

NORMAL EVENTS

The Absolute Clear Core Prologue sets locations 0300 through the end of the partition to the character punched in column 45 of card 2, after which control passes to the Object Card Loader. Upon completion of the loading operation, control will then pass to the user's program.

ABNORMAL EVENTS

No provisions.

PROGRAMMING HINTS

1. The Absolute Clear Core Prologue will operate only in partitions that have loading devices.

2. The default fill character is a blank (ƀ).

3. Cards 3 and 4 of this Prologue contain characters necessary to fill the character-count expectations of the bootstrap instruction. Do not remove these cards from the deck.

ABSOLUTE CLEAR CORE PROLOGUE

THIS CARD IS NECESSARY FOR THE BOOTSTRAP INSTRUCTION

THIS CARD IS NECESSARY FOR THE BOOTSTRAP INSTRUCTION

4P13040086TOPP05011OPPP8640026ROPP0500800100

UOPT000000 0000 00001P12540021PPPOTQ0026ROPV050030P000PQ0026P01231029900300

CHARACTER INDICATED IN COL. 45 (IN THIS CASE ₿) WILL BE PLACED IN LOCATIONS 0300 THROUGH LAST AVAILABLE ADDRESS IN PARTITION.

CARDS 3 AND 4 ARE NECESSARY TO FILL CHARACTER-COUNT REQUIREMENTS; DO NOT REMOVE THEM FROM PROLOGUE.

FUNCTION

The Selective Clear Core Prologue is an optional auxiliary program which allows the user to set a group or groups of selected sequential locations within a partition to * or to a user-specified character. It does not affect the contents of the unselected locations.

This Prologue must be processed with the Object Card Loader and a user's object card program.

EQUIPMENT

Required:

Card Reader, Workstation.

Optional:

None.

AUXILIARY SOFTWARE

Must be run with Object Card Loader.

OPERATING INSTRUCTIONS

Deck Parameters

1. The character the user wishes to place in the specified locations should be punched in column 30 of card 3 of the Selective Clear Core Prologue.

2. The inclusive lower limit of the core locations to be affected by this Prologue must be indicated in columns 37-40 of card 1, and must not be lower than 0300.

3. The inclusive upper limit of the core locations to be affected must be indicated in columns 31-34 of card 3, and must not exceed the highest location in this partition.

Example

To pre-set locations 0500-0699 to numeric 0, leaving the remainder of the working core area unchanged, punch 0500 in columns 37-40 of card 1; on card 3 punch 0 in column 30, and 069ϑ in columns 31-34.

Deck Order for Loading

The four-card Selective Clear Core Prologue deck is placed in front of the Object Card Loader.
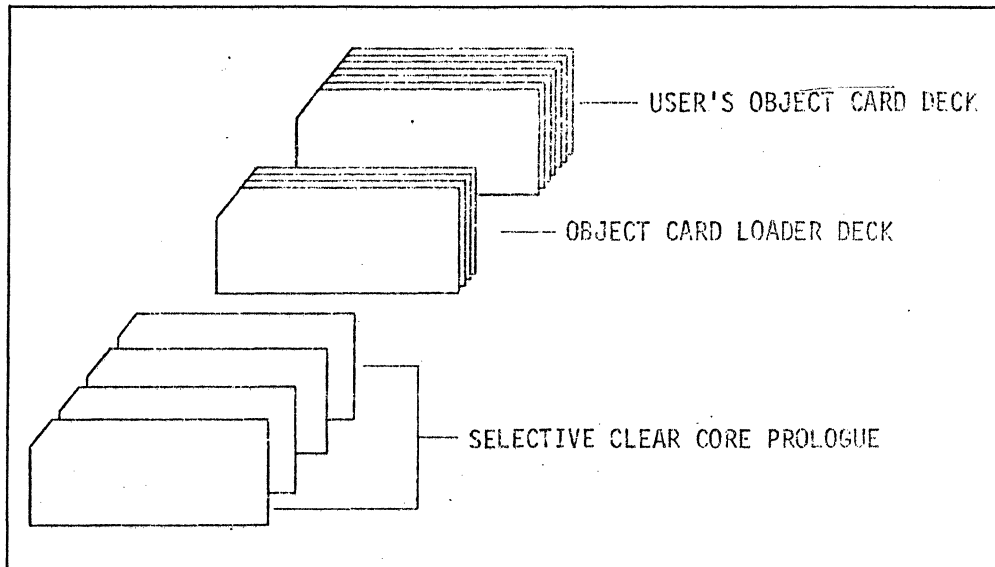
Procedure: Workstation = device 0

1. Clear the card reader buffers by depressing the LOAD and LOCAL buttons simultaneously.

2. Obtain a load condition on the host partition.

3. Stack the cards in the input hopper in the following order:

    Selective Clear Core Prologue deck(s)
    Object Card Loader
    User's object card program deck

4. Press the card reader ON-LINE button.

5. Enter the bootstrap information (1001010290, where the first character (1) = device number of the card reader) at the keyboard of the Workstation.

NORMAL EVENTS

The Selective Clear Core Prologue sets the specified locations to the character indicated, or to * if no character is indicated, after which control passes to the Object Card Loader. Upon completion of the loading operation, control will then pass to the user's program.

ABNORMAL EVENTS

No provisions.

SPECIAL FEATURE

Several different groups of working core area, each group with a different character assigned to it, may be created by reproducing the Selective Clear Core Prologue deck and indicating the parameters for each group. Only one character and one set of upper and lower limits may be specified by each Selective Clear Core Prologue deck, but there may be as many Prologue decks as there are groups desired. Since the last instruction in this Prologue is a branch back to the Bootstrap instruction, each pass through a Prologue deck will result in the next deck being loaded; that deck may be either another Selective Clear Core Prologue deck or, if it was the last Prologue deck, the Object Card Loader.

PROGRAMMING HINTS

1. The default fill character is *.

2. The default lower and upper limits are 0300 and 0302, inclusive.

3. A minimum of three locations will be affected by execution of this Prologue, with either default or specified limits.

4. Card 4 of this Prologue contains characters necessary to fill the character-count expectations of the bootstrap instruction. Do not remove this card from the deck.

Selective Clear Core Prologue

THIS CARD IS NECESSARY FOR THE BOOTSTRAP INSTRUCTION

P010640111U0PY000000010000001*0302

P0000000004P19040096U0PU050000PPQ9440116R0PP05014OP01Y610090P01Y7100951P19810095

P00T640091P00T640096lP19840096P01991 0300 P0200401944PPY640194PPQ944019OS0PY050120

COLS. 37-40 INDICATE LOWER LIMIT OF AREA TO BE AFFECTED (0300).

COLS. 31-34 INDICATE UPPER LIMIT OF AREA TO BE AFFECTED (0302).

COL. 30 CONTAINS CHARACTER (*) USER WISHES TO PLACE IN LOCATION SPECIFIED.

CARD 4 IS NECESSARY TO FILL CHARACTER-COUNT REQUIREMENTS; DO NOT REMOVE IT
FROM PROLOGUE.

FUNCTION

The Paper Tape Loader loads object programs from the paper tape reader. Object text must be in the same format as object code produced by Assembler I. A bootstrap instruction should be entered from the 7102 keyboard (device 0).

Initial Loading Activities

Bootstrap information to load the Loader is entered from the 7102 keyboard, and is stored in locations 0000-0009.

Location 0010 is set to blank, as a halt constant for debugging.

The three index registers (locations 0011-0038) are initialized to zero. These values are modified later as specified by the user's program.

The host partition number (00-19) is determined by the Loader and stored in locations 0047-0048.

Post-Loading Storage Status

0000-0009	Bootstrap information
0010	Blank
0011-0038	Index registers (contents to be specified in the user's object program)
0039	Unused
0040-0044	Error register
0045-0046	Zeros
0047-0048	Partition number
0049	Unused
0050-0299	Paper Tape Loader

EQUIPMENT

Required:

7102 Communications Terminal, with attached paper tape reader.

Optional:

None.

AUXILIARY SOFTWARE

None.

OPERATING INSTRUCTIONS

Parameters

There are no user-set variables in the Paper Tape Loader.

Order

Each 80-character text image must be followed by a DC3 control character, and a carriage return control character. Assembler I can generate these automatically at the end of each card image.

Procedure

1. Mount the Paper Tape Loader on the paper tape reader.

2. Obtain a load condition through the 7102 terminal.

3. From the 7102 keyboard, enter the bootstrap instruction 9001010290 (where 9 = device number of the paper tape reader).

4. When an L is displayed on the 7102 printer, the Loader has been loaded. Dismount the Loader, mount the user's object code program (on paper tape), and punch any one character on the 7102 keyboard.

NORMAL EVENTS

The Paper Tape Loader is loaded into locations 0010-0299; the last character, a DC3, stops the paper tape reader, and an L is displayed on the 7102 printer. When the user's program has been mounted, and the response character entered from the keyboard, the user's program is loaded and control passes to it.
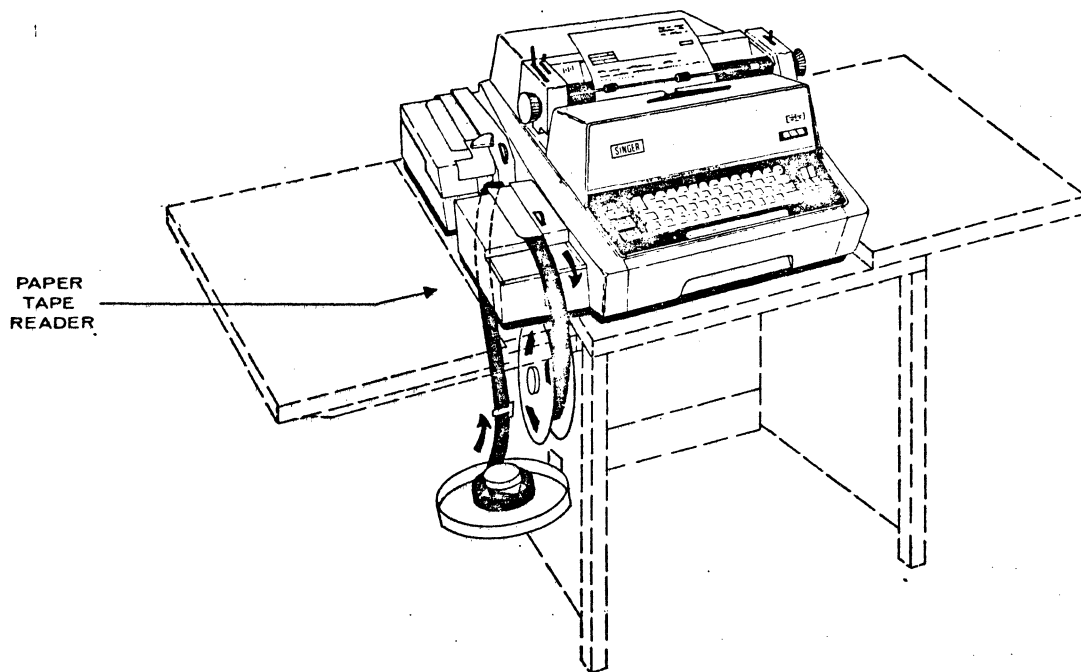
PAPER
TAPE
READER

7102   COMMUNICATIONS TERMINAL

ABNORMAL EVENTS

Read Error

If a read error occurs during object program loading, the message *ERROR is displayed on the 7102 printer.

Recovery, Read Error

1. Adjust the paper tape to point to the beginning of the text image in error.

2. From the 7102 keyboard, enter UUPW000000 (branch unconditionally to location 0070).

3. Press the READ button on the keyboard.