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|-------|--|--|--|
| TITLE | SOFTWARE PERFORMANCE SPECIFICATION Paper Tape System and BIC Test | | |
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SECTION I TEST PROGRAM OVERVIEW

1.1 INTRODUCTION

The 620 Paper Tape System and BIC Test determines whether or not the high speed paper tape system and BIC are functioning correctly. The paper tape punch and paper tape reader can be tested with the same controller or with separate controllers. Punch, step-read, and continuous-read modes are checked. The BIC is thoroughly tested in a special BIC subtest but can also be employed in the punch and continuous - read areas.

The special case of the abnormal device stop occurring prior to the first data transfer is not tested.

The 620 Paper Tape System and BIC Test operates with the 620 Test Executive and thus uses standard teletype I/O routines and is equipped with both a Console Mode and a Teletype Mode (see Manual No. 98A9952-06R).

1.2 PROGRAM DESIGN OVERVIEW

The program first allows the user to indicate whether he wishes to test the BIC or the paper tape system. If he wishes to test the paper tape system (punch and/or reader), he may test the punch process in sense, PIM, or BIC mode; the step-read process in sense or PIM mode; or the continuous-read process in sense; PIM, or BIC mode. If he wishes to test the BIC, he may test it with or without a BIC - through interrupt. All device addresses, trap locations, and interrupt masks are input from the user. Data patterns are set by the user in the paper tape section of the test.

The BIC section of the test checks all critical address ranges for the initial and final BIC registers. The provided test tape (92V0107-023) must be used for this test.

1.3 HARDWARE SUMMARY

The following hardware items are required or are optional to use this program:

1. A 73/620 series computer with at least 4K of memory.
2. A High Speed Paper Tape Reader.
3. A High Speed Paper Punch*.
4. (Optional) PIM.

*The test may be employed if only the High Speed Paper Tape Punch or only the High Speed Paper Tape Reader is available.



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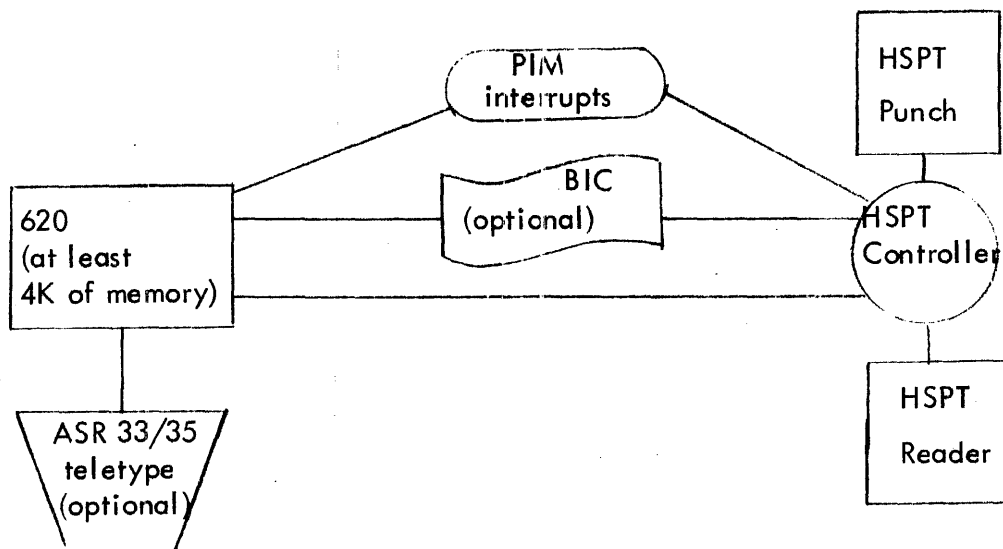
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5. (Optional) BIC (necessary for BIC section of test).

A hardware diagram is given below:



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SECTION 2 EXTERNAL SPECIFICATIONS

2.1 GENERAL

The external specification provides all the operating procedures and information pertinent to user interface.

2.2 LOADING PROCEDURE

The 620 Paper Tape and BIC Test is available as an object tape.

2.2.1

The user must secure a copy of the 620 Test Executive object tape (part number 92U0107-001). The device used to load the tapes can be the ASR33 or ASR35 teletype paper tape reader or the high speed paper tape reader. The 620 Test Executive is loaded first and executed to set the Console/Teletype Mode flag (see 2.3) according to the user's entry point. The 620 Paper Tape and BIC Test is then loaded either by typing an "L." from the 620 Test Executive (if a teletype is being used), or by loading it from the console.

2.2.2

The user must then load the programs by manually starting the appropriate Executive loader (see manual number 98A9952-06R).

2.3 OPERATING PROCEDURE

After loading the 620 Test Executive, and the 620 Paper Tape and BIC Test, and setting the Console/Teletype Mode flag by entry point to the 620 Test Executive, the user sets the program counter to 0500 and resets SS3. The two procedures for Console and for Teletype Mode are given next.

2.3.1 Sense Switch Settings

| <u>Switch</u> | <u>'Set'</u> | <u>'Reset'</u> |
|---------------|--------------------------|----------------------|
| 1 | Suppress error printouts | Print Error messages |



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SS2 Halt on error (continue after error halt) Do not halt on error

SS3 Terminate current operation Continue test
 return to beginning of test

2.3.2 Teletype Mode

After starting the program at 0500, the teletype prints:

620 PAPER TAPE AND BIC TEST
PT PUNCH DA =

The user then inputs the octal device address of the high speed paper tape punch followed by a period or comma.

The teletype then prints:

PT READER DA =

The user then inputs the octal device address of the high speed paper tape reader followed by a period or comma.

The teletype then prints:

BIC TEST REQUESTED?

The user then responds with a 'Y' or an 'N' for 'yes' or 'no', respectively (no period or comma is input). if 'Y' is input see 2.3.2.2.

2.3.2.1

If 'N' is input, the test types:

BIC USED?

The user then responds with a 'Y' or an 'N' (no period or comma is input).

If the answer was 'Y', the test types:

BIC DA =

The user then inputs the octal device address of the BIC followed by period or comma.



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The test then continues at 2.3.2.1.2.

If the answer was 'N' to BIC USED?, the test types:

PIM USED?

The user then responds with a 'Y' or an 'N' (no period or comma is input).

If the answer was 'N', the test then continues at 2.3.2.1.2.

2.3.2.1.1

If the answer was 'Y', the test types:

PIM DA =

The user then inputs the octal device address of the PIM followed by a period or comma.

The test then types:

TRAP LOCATION =

The user then inputs the octal address of the trap branch for the interrupt line being used followed by a period or comma.

The test then types:

INTERRUPT MASK =

The user then inputs the interrupt mask which masks-out all interrupts but the one being used followed by a period or comma. See table in 2.3.4.

2.3.2.1.2

After the I/O mode information is set, the test types:

INPUT TEST TYPE

The user then inputs 'P', 'R', or 'H' for 'punch', 'step-read', or 'continuous-read', respectively. If he wishes to use the data set last used (or on the first pass, the assembler default), he then inputs '.'. Otherwise he inputs ',' and the test types:

INPUT LOWER LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE



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The user then inputs 3 octal values* in succession corresponding, respectively, to these terms and separated by commas or periods and ending with a period or comma.

The test then types:

CYCLES =

The user then inputs the number of cycles in octal or 0 for continuous, followed by a period or comma.

If the 'R' parameter was input for the test type, the test types:

TIME DELAY =

The user then inputs a positive number which produces a time delay of 13 times that number times the CPU cycle time. This delay is executed prior to executing the step-read command after the buffer ready is sensed. If the user inputs a negative number, a random number generator is invoked to give successive random wait periods to be executed instead. The value input must be followed by a period or comma.

After all this information is input the test is performed according to the given parameters. An error condition produces a descriptive message as given in 2.4. When the test is done the following is printed:

BIC TEST REQUESTED?

The process is then restarted, with the difference that device addresses, trap locations, and interrupt masks are input only once, unless SS3 is hit or the test restarted at 0500.

2.3.2.2

If 'Y' is input to 'BIC TEST REQUESTED?', the user must place the provided test tape (92V0107-023) in the reader positioned anywhere on the initial blank leader. The test types the following:

BIC DA =

The user then inputs the BIC device address in octal, followed by a period or comma. The test then types:

PIM USED?

The user responds by inputting 'Y' or 'N' (no period or comma is input). If 'N'

* When using the BIC to output or input data a maximum of 0400 is allowed for the data block size parameter, due to the provided buffer length.



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is input the interrupt parameters are skipped.

If 'Y' is input, the test types:

PIM DA =

The user then inputs the octal value of the PIM device address followed by a period or comma.

The test then types:

TRAP LOCATION =

The user then inputs the address for the trap branch for the interrupt line to be used. This is followed by a period or comma.

The test then types:

INTERRUPT MASK =

The user then inputs the interrupt mask which masks-out the interrupt lines not used, followed by a period or comma. See table in 2.3.4.

The test then types:

CYCLES =

The user then inputs the number of cycles in octal or 0 for continuous followed by a period or comma.

The BIC test is then performed. The BIC test tape is read into the memory at the critical location^s. If an error occurs, a descriptive message is typed (as given in 2.4).

When the test is through, the test types:

BIC TEST REQUESTED?

The process is then restarted, with the difference that device addresses, trap locations, and interrupt masks are input only once, unless SS3 is hit or the test restarted at 0500.

2.3.3 Console Mode

After starting the program at 0500, the program halts with 020 in the instruction



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register. The user sets the A-register to the high speed paper tape punch device address and the B-register to the high speed paper tape reader address. He then hits 'RUN' and the program halts with 021 in the instruction register. The user then sets the A-register to '1' or '0' for BIC test or no BIC test, respectively. The user then hits 'RUN'. If the BIC test was specified see 2.3.3.2.

2.3.3.1

If the BIC test is not indicated, the test halts with 022 in the instruction register. The user sets the A-register to '-1', '0', or '1' for BIC mode, sense mode, and PIM mode, respectively. If the BIC mode is specified, the user must put the BIC device address in the B-register. 'RUN' is then hit. If sense or BIC mode was specified, the test goes to 2.3.3.1.2.

2.3.3.1.1

If PIM mode was specified, the test halts with 023 in the instruction register. The user then places the PIM device address in the A-register, the trap location in the B-register, and the interrupt mask in the X-register (see table 2.3.4). The user then hits 'RUN'. (see 2.3.3.1.2)

2.3.3.1.2

The test halts with 024 in the instruction register. The user then sets the A-register to 0, 1, or 2 for the punch test, the step-read test, or the continuous-read test, respectively. He then hits 'RUN'.

In any case the test then halts with 026 in the instruction register. The user then places the lower data limit in the A-register, the upper data limit in the B-register, and the data block size* in the X-register. He then hits 'RUN'.

The test then halts with 027 in the instruction register. The user then sets the A-register to the cycle count (0 means continuous) and hits 'RUN'.

If the step-read option was specified, the test halts with 025 in the instruction register. The user sets the A-register to a positive number or a negative number. If the number is positive, a time delay of 13 times that number times the CPU cycle time is executed prior to executing the step-read command after the buffer ready is sensed. If the number is negative, a random number generation is invoked to give successive random wait periods to be executed instead.

After all this information is obtained, the test is performed according to the given

* When using the BIC to output or input data a maximum of 0400 is allowed for the data block size parameter, due to the provided buffer length.



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parameters. An error condition produces a halt as given in 2.6.

When the test is done, a halt occurs with 021 in the instruction register and the process repeats. The difference is that device addresses, trap locations, and interrupt masks are input only once, unless SS3 is hit or the test restarted at 0500.

2.3.3.2

If the user specified that he wishes to perform the BIC test, the test halts with 030 in the instruction register. The user must place the provided test tape (92V0107-023) in the reader positioned anywhere on the initial blank leader. The user then sets the A-register to the BIC device address, and the B-register to '1' for PIM used or '0' for no PIM used. The user then hits 'RUN.' If no PIM is specified, the PIM parameters are skipped.

If PIM is specified, the test halts with 031 in the instruction register. The user then sets the PIM device address in the A-register, the trap location in the B-register, and the interrupt mask in the X-register (see 2.3.4). The user then hits 'RUN'.

The test next halts with 032 in the instruction register. The user then sets the A-register to the number of cycles that the test is to be performed (a 0 means continuous). The user then hits 'RUN'.

The test is now performed according to the given parameters. An error condition produces a halt according to 2.6.

When the test is done, a halt occurs with 021 in the instruction register and the process repeats. The difference is that device addresses, trap locations, and interrupt masks are input only once, unless SS3 is hit or the test restarted at 0500.

2.3.4 Interrupt Table

| <u>Interrupt Line</u> | <u>Most Common Trap Location</u> | <u>Interrupt Mask</u> |
|-----------------------|----------------------------------|-----------------------|
| 0 | 0100 | 0376 |
| 1 | 0102 | 0375 |
| 2 | 0104 | 0373 |
| 3 | 0106 | 0367 |
| 4 | 0110 | 0357 |
| 5 | 0112 | 0337 |
| 6 | 0114 | 0277 |
| 7 | 0116 | 0177 |



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2.4 OUTPUT STATEMENTS

620 PAPER TAPE AND BIC TEST

PT PUNCH DA =

PT READER DA =

BIC USED?

PIM USED?

PIM DA =

TRAP LOCATION =

BIC DA =

INPUT TEST TYPE

BUFFER READY TIME-OUT

BIC BUSY TIME-OUT

BIC ABNORMAL STOP

ERROR(s)

INPUT LOWER DATA LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE

CYCLES =

INTERRUPT MASK =

BIC TEST REQUESTED?

| | | |
|---------|----------|------------|
| SECTION | ACTUAL | |
| X | YYYYYY } | error data |

| | | | |
|--------|----------|---------|------------|
| CHIP | EXPECTED | ACTUAL | |
| XXXXXX | YYYYYY | ZZZZZ } | error data |

BIC-THROUGH INTERRUPT WHEN BIC BUSY

NO BIC-THROUGH INTERRUPT

TIME DELAY =



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2.5 INPUT STATEMENTS

The following statements require the subsequent input of an octal value, followed by a period or comma.

PT PUNCH DA =

PT READER DA =

PIM DA =

TRAP LOCATION =

BIC DA =

CYCLES =

INTERRUPT MASK =

TIME DELAY =

The following statement requires the subsequent input of a sequence of 3 octal values separated and terminated by periods or commas or a mixture of both.

INPUT LOWER DATA LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE

The following statements require the input of 'Y' or 'N'.

BIC USED?

PIM USED?

BIC TEST REQUESTED?

The following statement requires the input of 'P', 'R', or 'H' followed by a comma or period.

INPUT TEST TYPE

2.6 HALT TABLE

Instruction Register

Significance

020

Set: A=HSPT punch device address, B=HSPT reader device address.



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| <u>Instruction Register</u> | <u>Significance</u> |
|-----------------------------|---|
| 021 | Set: A = '1' for BIC test, '0' for no BIC test. |
| 022 | Set: A = '-1' for BIC used, '1' for PIM used, '0' for sense mode, B = BIC device address(if appropriate) |
| 023 | Set: A = PIM device address, B = trap location, X = interrupt mask. (buffer-ready interrupts) |
| 024 | Set: A = '0' for punch test, '1' for step-read test, '2' for continuous-read test. |
| 025 | Set: A = time delay for step-read test. |
| 026 | Set: A = lower data limit, B = upper data limit, X = data block size. |
| 027 | Set: A = cycle count, '0' for continuous. |
| 030 | Set: A = BIC device address, B = '1' for PIM used, '0' for no PIM used. |
| 031 | Set: A = PIM device address, B = trap location, X = interrupt mask. (BIC-through interrupts-BIC test) |
| 032 | Set: A = cycle count, '0' for continuous. |
| 01 | Buffer ready time-out. |
| 02 | BIC-busy time-out. |
| 03 | BIC abnormal stop. |
| 04 | Data error(s) read, number of errors in A-register. |
| 05 | (Halt on error mode) A = error data, B = expected data. |
| 06 | Data error(s) read (BIC test), number of errors in A-register. |
| 07 | Halt on error mode (BIC test), A contains error data, B contains expected data, and X contains the chip number. |
| 010 | BIC -through interrupt when BIC busy. |
| 011 | No BIC -through interrupt. |



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2.7 MEMORY MAP

| <u>Location</u> | <u>Contents</u> |
|-----------------|--|
| 0-0200 | Test Executive Area |
| 0200-0212 | Indirect Pointers |
| 0220-0377 | BIC Test Buffer |
| 0400-0477 | Test Executive Area |
| | Jump to Mainline |
| | User Interface Routine |
| 0502-01101 | I/O Buffer |
| 01102-01133 | Data and Flag Area |
| 01134-01644 | Mainline User |
| | Interface Routine |
| 02000-02010 | BIC Test Buffer |
| 02011-02274 | Punch Test Routine |
| 02275-02400 | PIM Enable, Sense |
| | Buffer Ready Routine |
| 02401-02555 | Punch (or Read) BIC Mode) |
| 02556-03110 | Step Reader Test Routine |
| 03111-03137 | Error Save Area |
| 03140-03307 | High Speed Reader |
| | Test Routine |
| 03310-03543 | Read (Sense or PIM Mode) |
| 03544-03602 | Pseudo-Random |
| | Number Generator |
| 03603-03707 | Parameter Setting Subroutine |
| 04000-04010 | BIC Test Buffer |
| 04011-05203 | BIC Test Routine |
| 05204-05230 | Device Address Setter |
| 05231-05617 | Message Buffers |
| 05620-07777 | Test Executive |
| 0220-0377 | BIC Test Buffers |
| 0502-0512 | (If Memory Equipped with such addresses) |
| 01000-01010 | |
| 02000-02010 | |
| 04000-04010 | |
| 010220-010377 | |
| 020220-020377 | |
| 040220-040377 | |



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2.8 UNDERSTANDING THE BIC TEST PRINTOUT.

| <u>Section</u> | <u>Memory Address To Be Trapped Into</u> | <u>Data To Be Input</u> | <u>Address Logic On BIC Activated</u> |
|----------------|--|-------------------------|---------------------------------------|
| 1 | 220 - 377 | 220 - 377 | 7 - 0 |
| 2 | 502 - 512 | 102 - 112 | 8 Plus 7 - 0 |
| 3 | 1000 - 1010 | 0 - 10 | 9 Plus 7 - 0 |
| 4 | 2000 - 2010 | 0 - 10 | 10 Plus 7 - 0 |
| 5 | 4000 - 4010 | 0 - 10 | 11 Plus 7 - 0 |
| 6 | 10220 - 10377* | 220 - 377 | 12 Plus 7 - 0 |
| 7 | 20220 - 20377* | 220 - 377 | 13 Plus 7 - 0 |
| 8 | 40220 - 40377* | 220 - 377 | 14 Plus 7 - 0 |

*If these memory locations do not exist, no error printout will occur.



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SECTION 3 INTERNAL SPECIFICATIONS

3.1 GENERAL DESCRIPTION

The 620 Paper Tape System and BIC test consists of 5 major subsections each consisting of a set of routines. Some of the subroutines used in the major sections are common to more than one section.

The major sections are 1) Mainline User Interface Routine, 2) Punch Test Routine, 3) Step Speed Reader Test Routine, 4) High Speed Reader Test Routine, 5) BIC Test Routine.

3.2 COMPONENT SPECIFICATIONS

Title: Mainline User Interface Routine

Symbolic Name: EP01

Purpose: To allow the user to communicate the test specifications to the program and to comply with those directives by setting various values and by branching to the appropriate test routine.

Description: HSPT ready and punch device address, I/O mode, and the test to be performed are communicated to the program via a teletype (Teletype Mode), or via the 620 console (Console Mode). The appropriate test is then invoked.

Entry Points: Location 0500, EP01, EP10, EP10+5. The first two entry points cause test to type test I.D. The third entry point causes the parameters like device addresses and trap locations to be input the fourth entry point ships these inputs.

Calling Sequence: EP01 is not a closed routine and is entered either by a JMP instruction, or by setting the entry address in the P-register, clearing the Instruction-register, and hitting run.

Entrance Parameters: None

Exit Point: None

Exit Parameters: Not applicable



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Table or Files Modified or Read: \$PCH, \$RRD, \$PIM, \$BIC, MODE, MASK PMLO, PRFL, PMFL, and BCFL are altered.

Tables or Files Created: Not applicable

Called By: Not applicable

Called From: OUTD, OUTC, INPG, INPD, OUTG.

Exception Conditions: In teletype mode, when an overtly invalid parameter is input by the user, 'INVALID' is typed and the parameter must be re-input.

Timing: Not applicable
(Test is HSPT - bound, timewise)

Size: See Memory Map

Comments: Start test at 0500 and a jump to EP01 is automatically executed. Always run the test only when the Maintain II Test Executive also resides in memory and make sure the Teletype/Console Mode Flag in the Test Executive is first set.

Special Notation: Not applicable

Hardware Details: 620 computer

Flowcharts: See 3.3.

Title: Punch Test Routine

Symbolic Name: PTST

Purpose: To test the high speed paper tape punch according to user given parameters.

Description: Data parameters are obtained from the user through subroutine PARS, unless the user wishes to use the default parameters (i.e. - the last data parameters input; or on the first time, the assembled parameters). Subroutines are then invoked to punch the specified data. Errors are reported to the user.



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Entry Points: PTST

Calling Sequence: The Punch Test Routine is not a closed subroutine and is entered by a jump to PTST, or a console start from PTST.

Entrance Parameters: HSPT device addresses and I/O mode information must be set at entry time. The Teletype/Console Mode Flag must also be set.

Exit Point: PTST normally returns to EP01 at either EP10 or EP10+5.

Exit Parameters: Not applicable

Table or File Modified or Read: \$PCH, \$PIM, \$BIC, MODE, TSTF, TOFL, LOLM, UPLM, BLSZ, CYCL, CRCY, CRCD, CRCT, MASK, PMLO

Tables or Files Created: Not applicable

Called By: Entered from EP01

Called From: INPG, OUTC, PARS, DVAD, PPUN, PPNB

Exception Conditions: Errors are reported to the user. In general, hit 'SYSTEM RESET' and 'RUN' to continue.

Timing: HSPT - bound

Size: See Memory Map

Comments: None

Special Notation: None

Hardware Details: 620 computer, HSPT controller with HSPT punch. PIM, BIC optional

Flowcharts: See 3.3



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Title: Step Speed Reader Test Routine

Symbolic Name RTST

Purpose: To test the high speed paper tape reader in step speed according to user given parameters.

Description: Data parameters are obtained from the user through subroutine PARS, unless the user wishes to use the default parameters (i.e. - the last data parameters input or on the first time the assembled parameters). A delay parameter is also obtained from the user. Subroutines are then invoked to read the tape in step, speed and compare with the specified data. Errors are reported to the user.

Entry Points: RTST and special HTST entry points RT05 and RT01+2.

Calling Sequence: The Step Speed Test Routine is not a closed subroutine and is entered by a jump to RTST, or a console start from RTST.

Entrance Parameters: HSPT device addresses and I/O mode information must be set at entry time. The Teletype/Console Mode Flag must also be set.

Exit Point: RTST normally returns to EP01 at either EP10 or EP10+5.

Exit Parameters : Not applicable

Table or Files Modified or Read: \$RRD, \$PIM, \$BIC, MODE, TSTF, IOFL, LOLM, UPLM, BLSZ, CYCL, CRCY, CRCD, CRCT, MASK, PMLO, DELY

Tables or Files Created: Input Buffer - BUFF is used.

Called By: Entered from EP01 and HTST.

Called From: INPG, PARS, OUTC, OUTD, DVAD, CLER, PRDR, QUTE,

Exception Conditions: Errors are reported to the user. In general (except for data errors) hit 'SYSTEM RESET' and 'RUN' to continue.

Timing: HSPT - bound

Size: See Memory Map



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Comments: None
Special Notation: None
Hardware Details: 620 computer, HSPT controller with HSPT reader, PIM optional.
Flowcharts: See 3.3

Title: High Speed Reader Test Routine
Symbolic Name: HTST
Purpose: To test the high speed paper tape reader in continuous mode according to user given parameters.
Description: Data parameters are obtained from the user through subroutine PARS, unless the user wishes to use the default parameters (i.e. - the last data parameters input, or, on the first time, the assembled parameters). Subroutines are then invoked to read the tape in continuous mode and compare with the specified data. Errors are reported to the user.
Entry Points: HTST
Calling Sequence: The High Speed Test Routine is not a closed subroutine and is entered by a jump to HTST, or a console start from HTST.
Entrance Parameter: HSPT device addresses and I/O mode information must be set at entry time. The Teletype/Console Mode Flag must also be set.
Exit Point: HTST normally returns to EP01 at either EP10 or EP10+5.
Exit Parameters: Not applicable
Tables or Files Modified or Read: \$RRD, \$PIM, \$BIC, MODE, TSTF, IOFL, LOLM, UPLM, BLSZ, CYCL, CRCY, CRCD, CRCT, MASK, PMLO
Tables or Files Created: Input Buffer - BUFF is used.
Called By: Entered from EP01
Called From: Enters RTST, calls INPG, OUTC, PARS, DVAD, CLER, PPNB.

Exception Conditions: Errors are reported to the user. In general (except for data errors) , hit 'SYSTEM RESET' and 'RUN' to continue.

Timing: HSPT - bound

Size: See Memory Map

Comments: None

Special Notation: None

Hardware Details: 620 computer, HSPT controller with HSPT reader. PIM and BIC optional.

Flowcharts: See 3.3

Title: BIC Test Routine

Symbolic Name: BTST

Purpose: To thoroughly test the BIC using the high speed paper tape reader.

Description: Data parameters are obtained from the user to give the program I/O Mode information and cycle count. Subroutine are then invoke to BIC in from the given BIC Test Tape. The results are compared with the specified data. Mechanical or data errors are reproted to the user.

Entry Points: BTST

Calling Sequence: The BIC Test Routine is not a closed subroutine and is entered by a jump to BTST, or a console start from BTST.

Entrance Parameters: HSPT device addresses must be set at entry time. The Teletype/ Console Mode Flag must also be set.

Exit Point: BTST normally returns to EP01 at EP10 or EP10+5.

Exit Parameters: Not applicable

Table or Files Modified or Read: \$RRD, \$PIM, \$PM2, \$BIC, MODE, TSTF, BTMD, IOFL, CRCY, CYCL, MSK2, PML2, PMF2, BCFL

Tables or Files Created: A set of input areas are used.



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Called By: Entered from EP01

Called From: DVAD, OUTD, INPG, OUTC, INPD, OUTG, CLER, PRDR, BCIN, CMPR, QUTE

Exception Conditions: Errors are reported to the user. In general (except for data errors), hit 'SYSTEM RESET' and 'RUN' to continue.

Timing: HSPT - found

Size: See Memory Map

Comments: None

Special Notation: None

Hardware Details: 620 computer, HSPT controller with HSPT reader, BIC. PIM options .

Flowcharts: See 3.3



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3.3

FLOWCHARTS



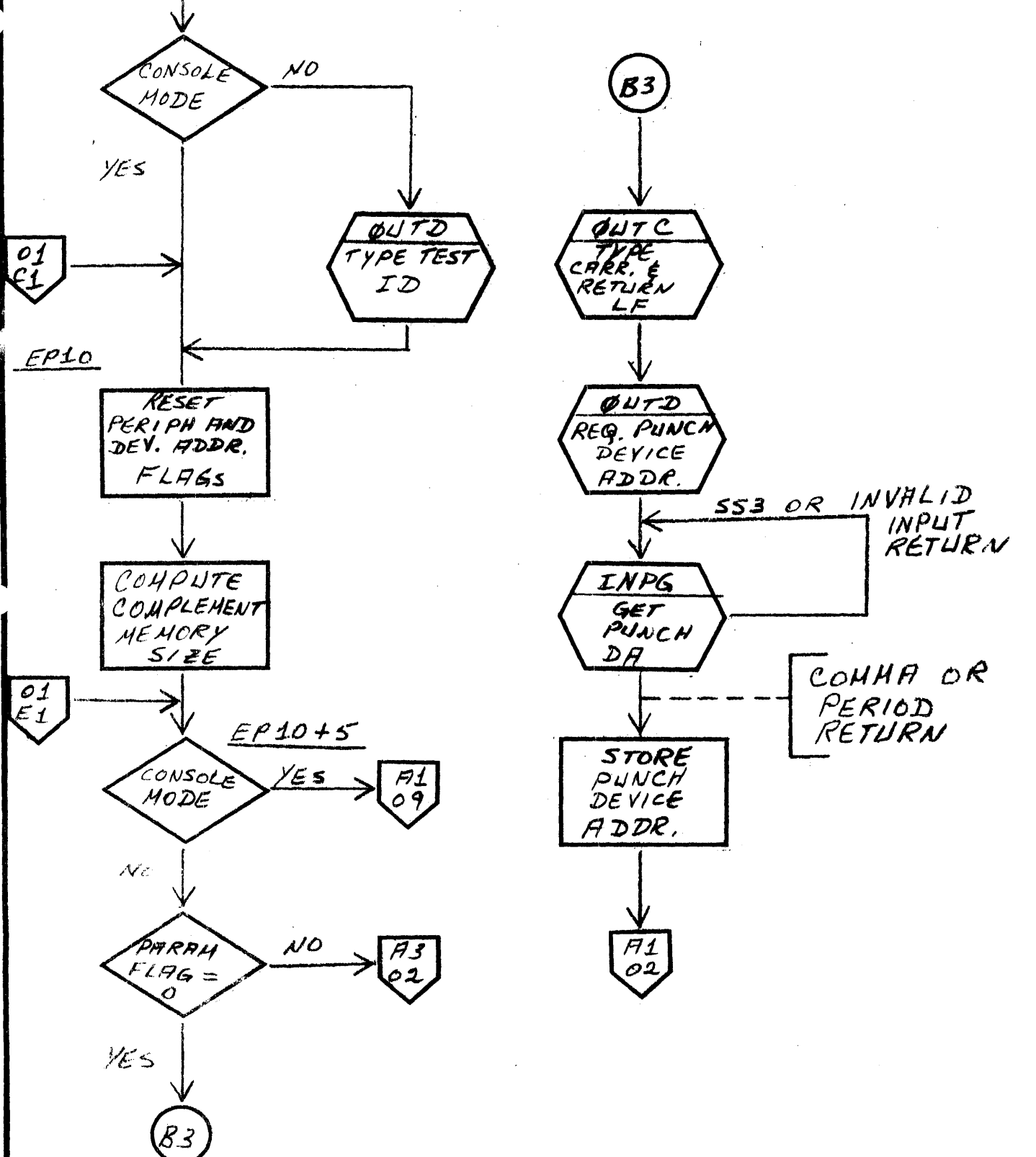
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ENTRY 0500
EP01

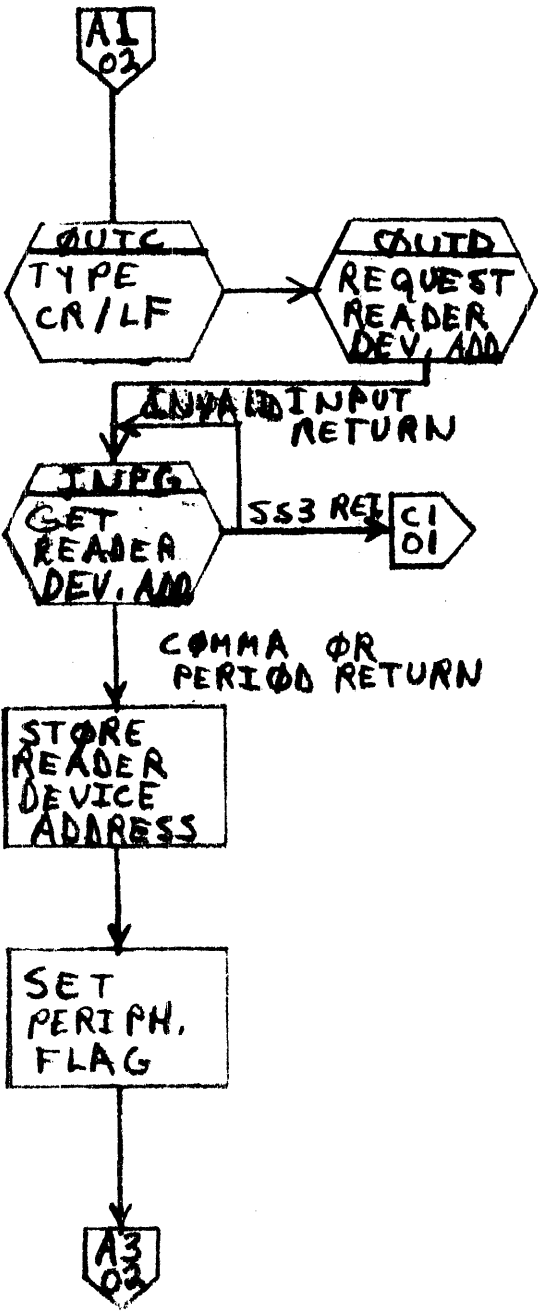


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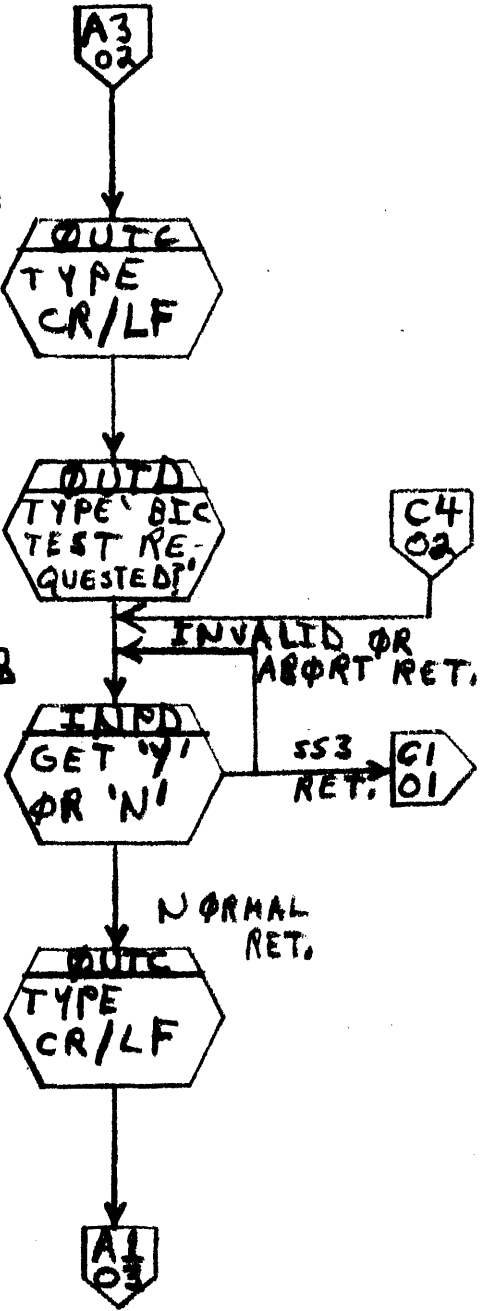
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EPI1



C4 02

EPO2



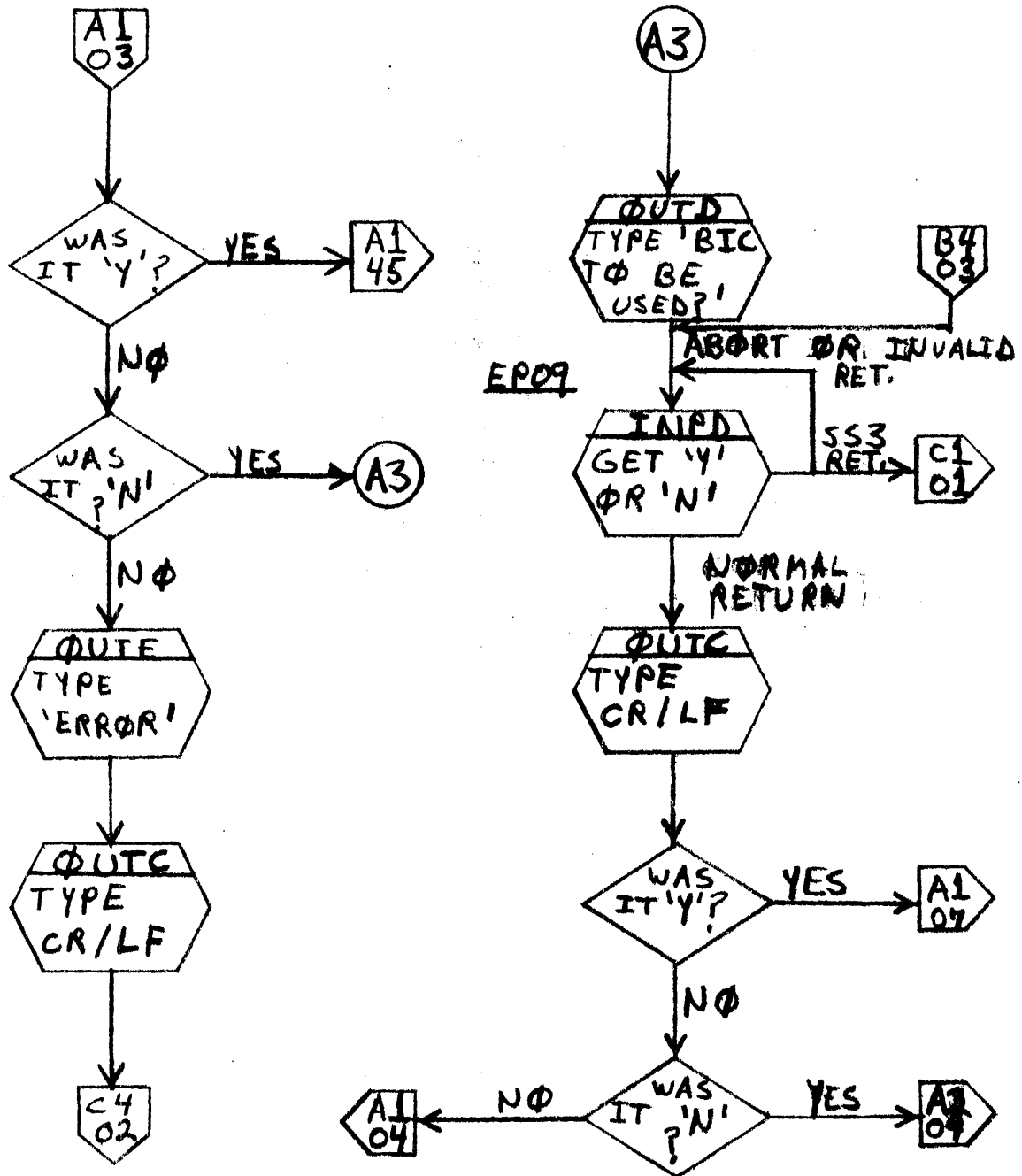
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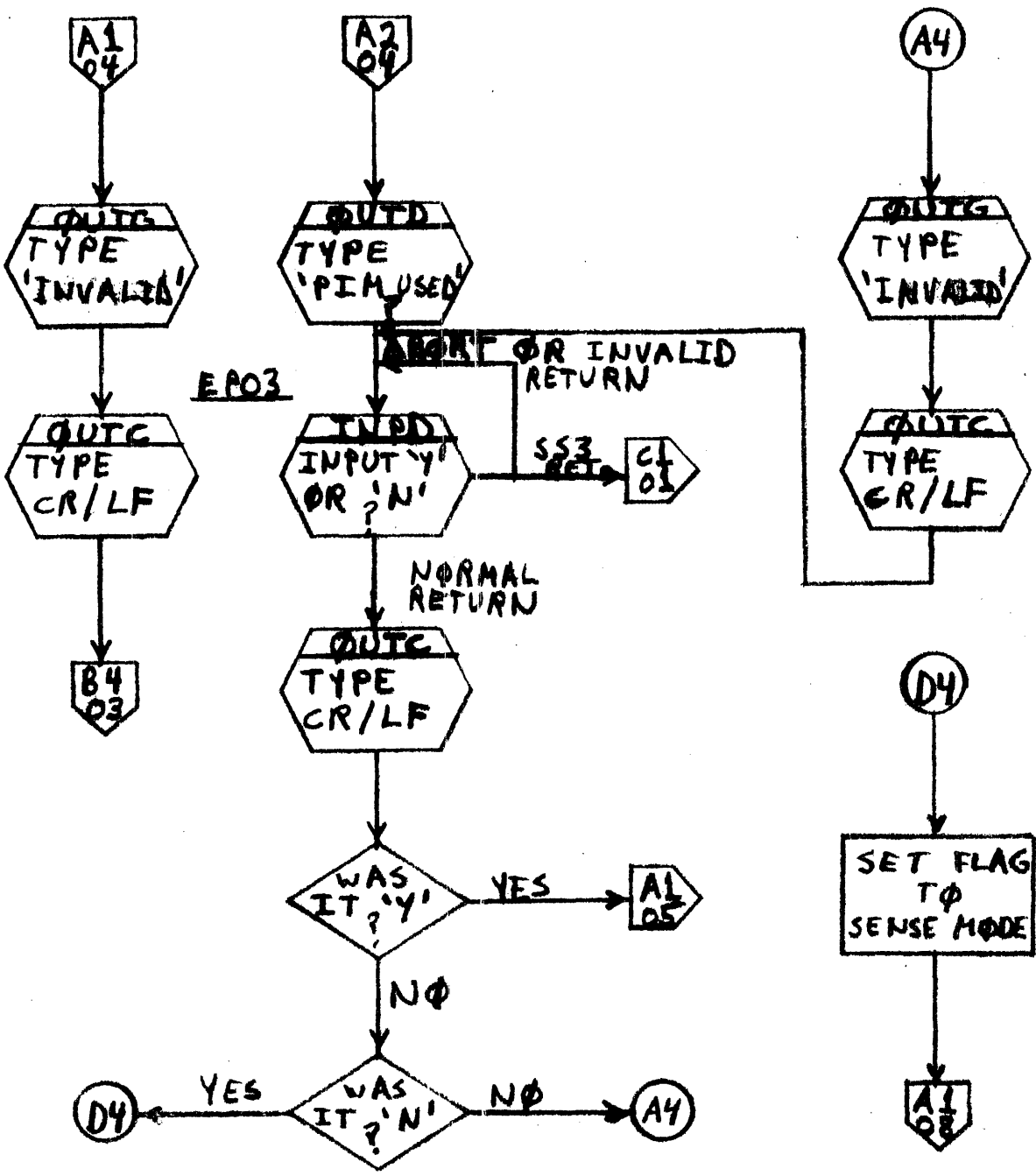
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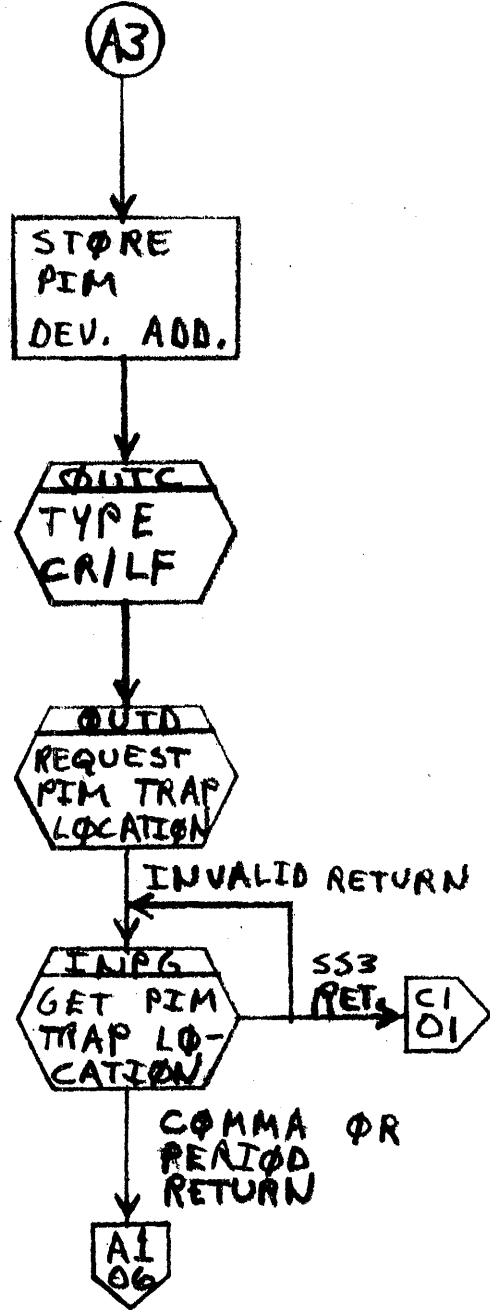
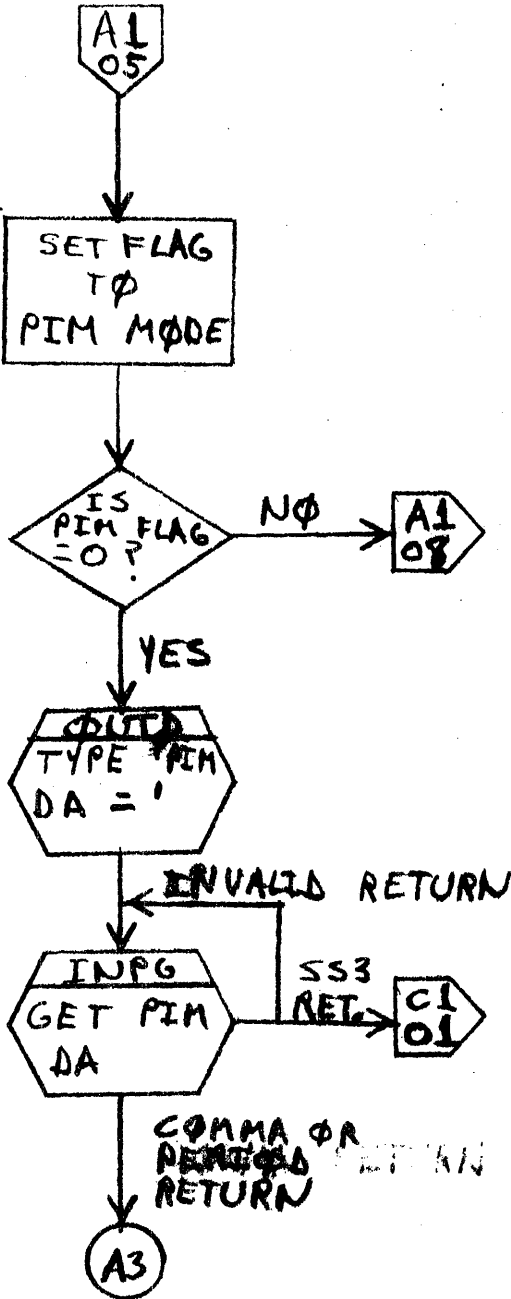
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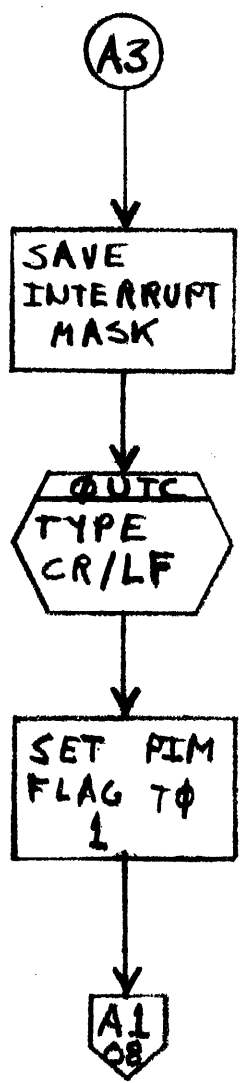
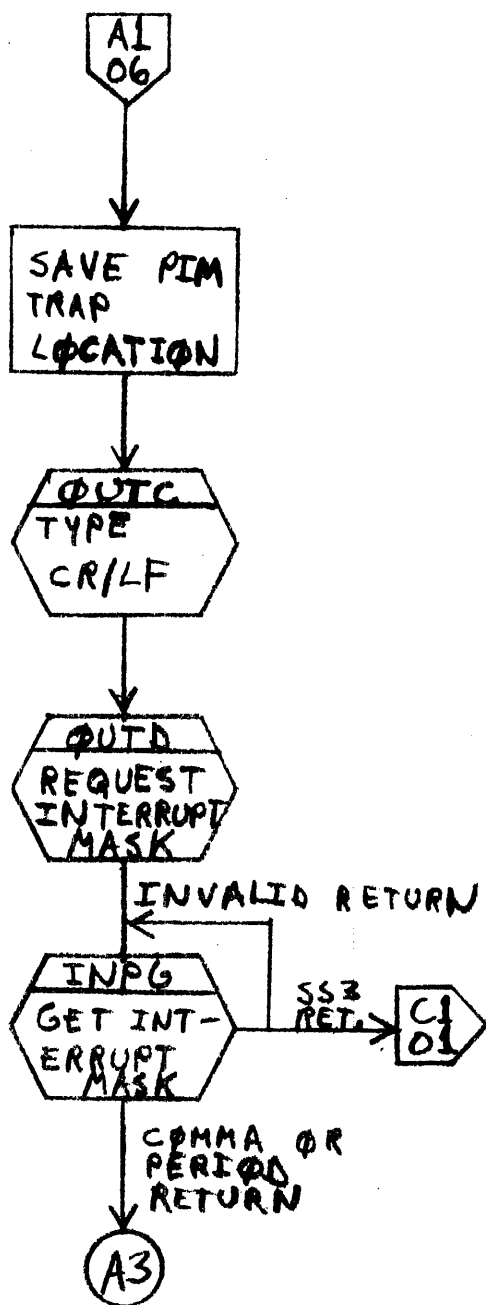
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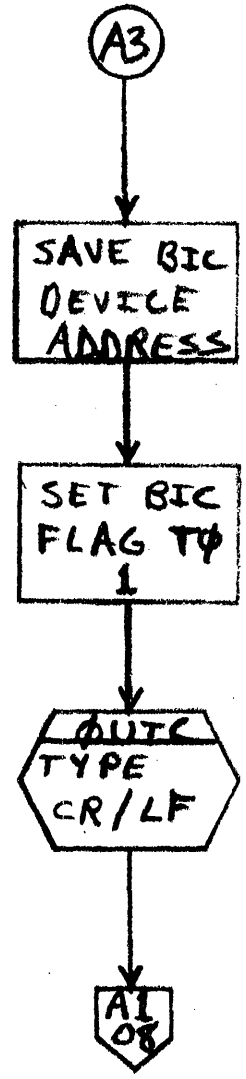
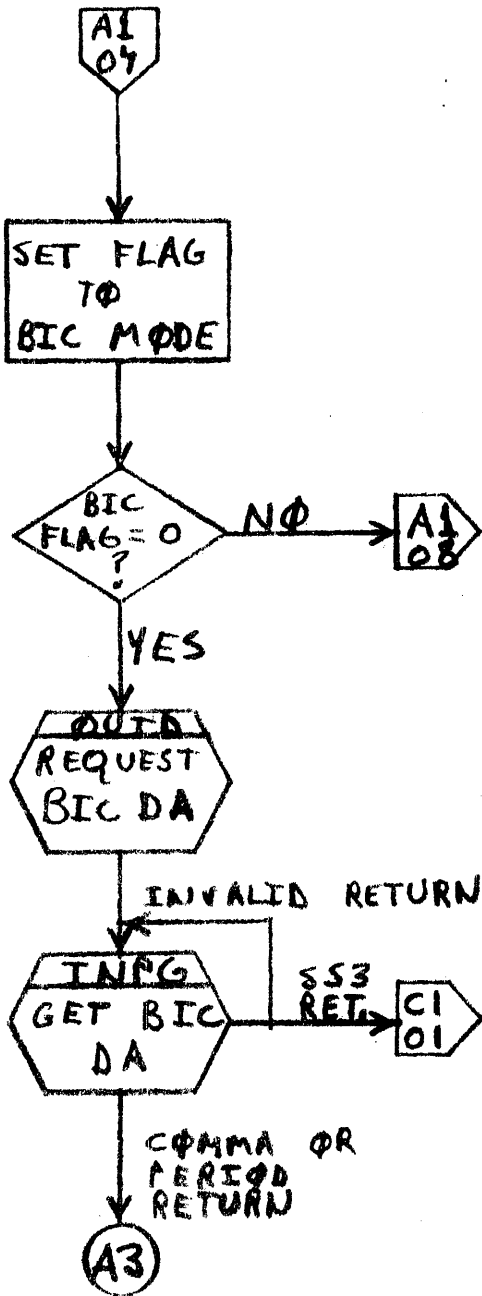


EP04





EPO5



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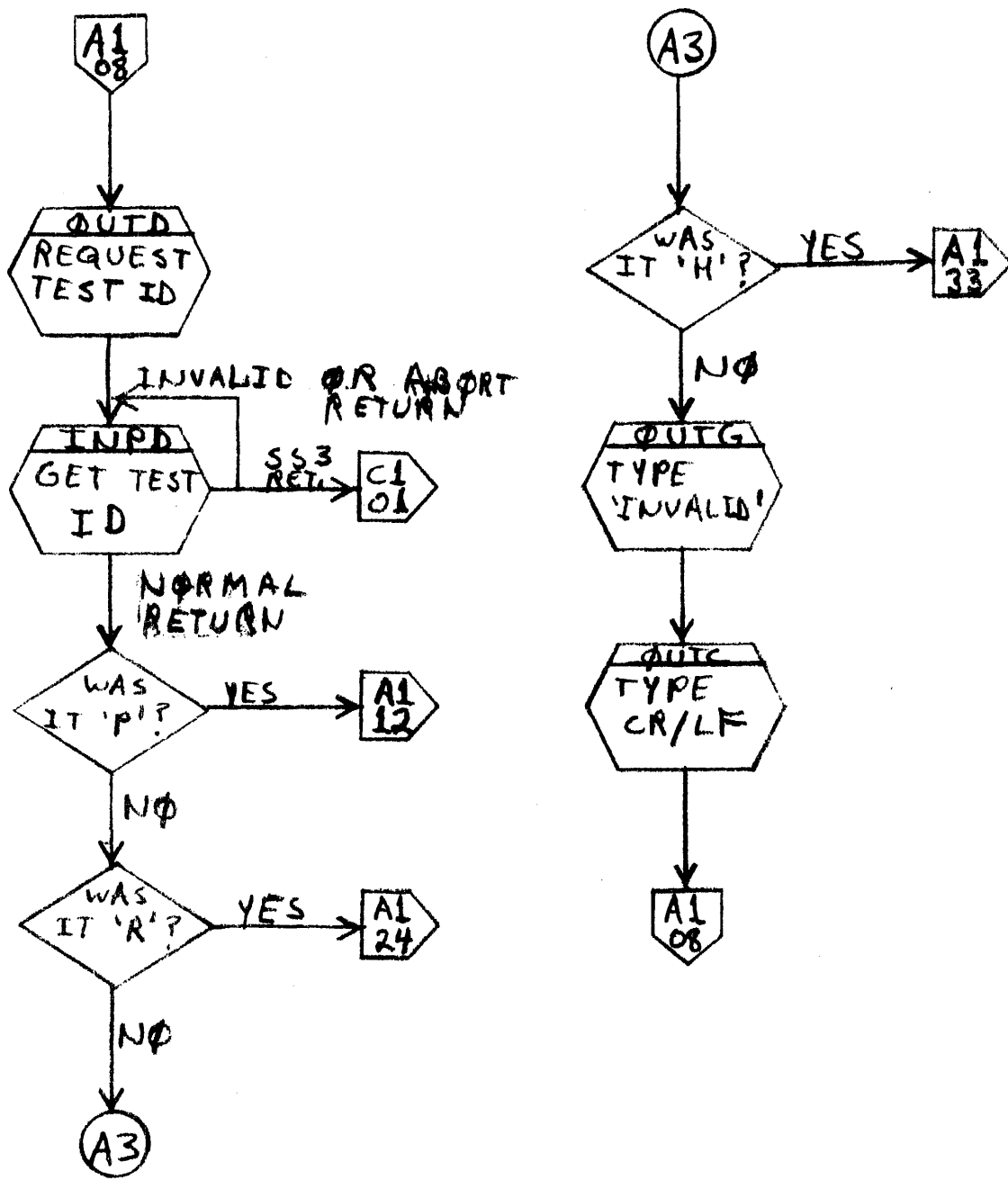
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EPO6



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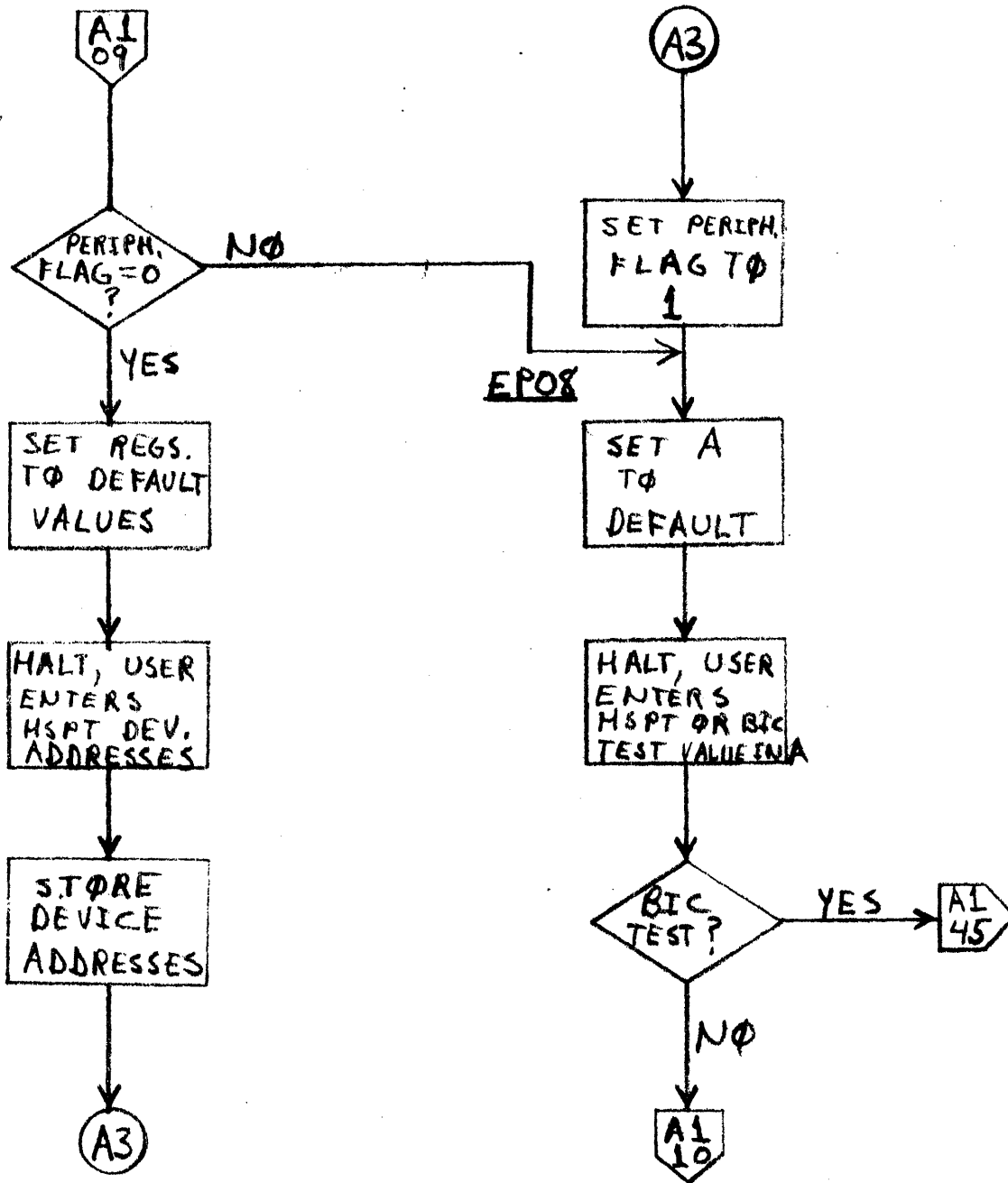
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EPO7



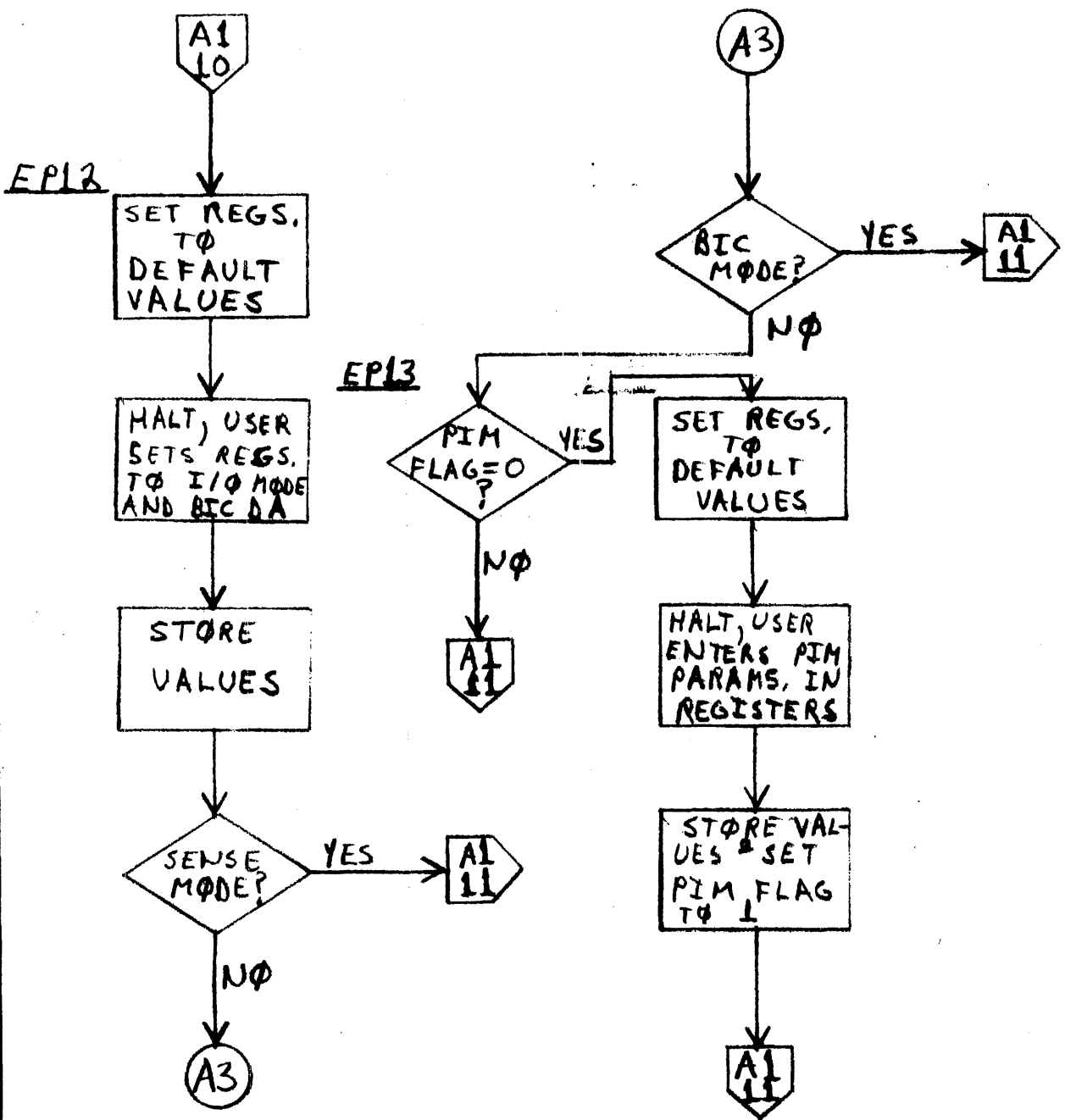
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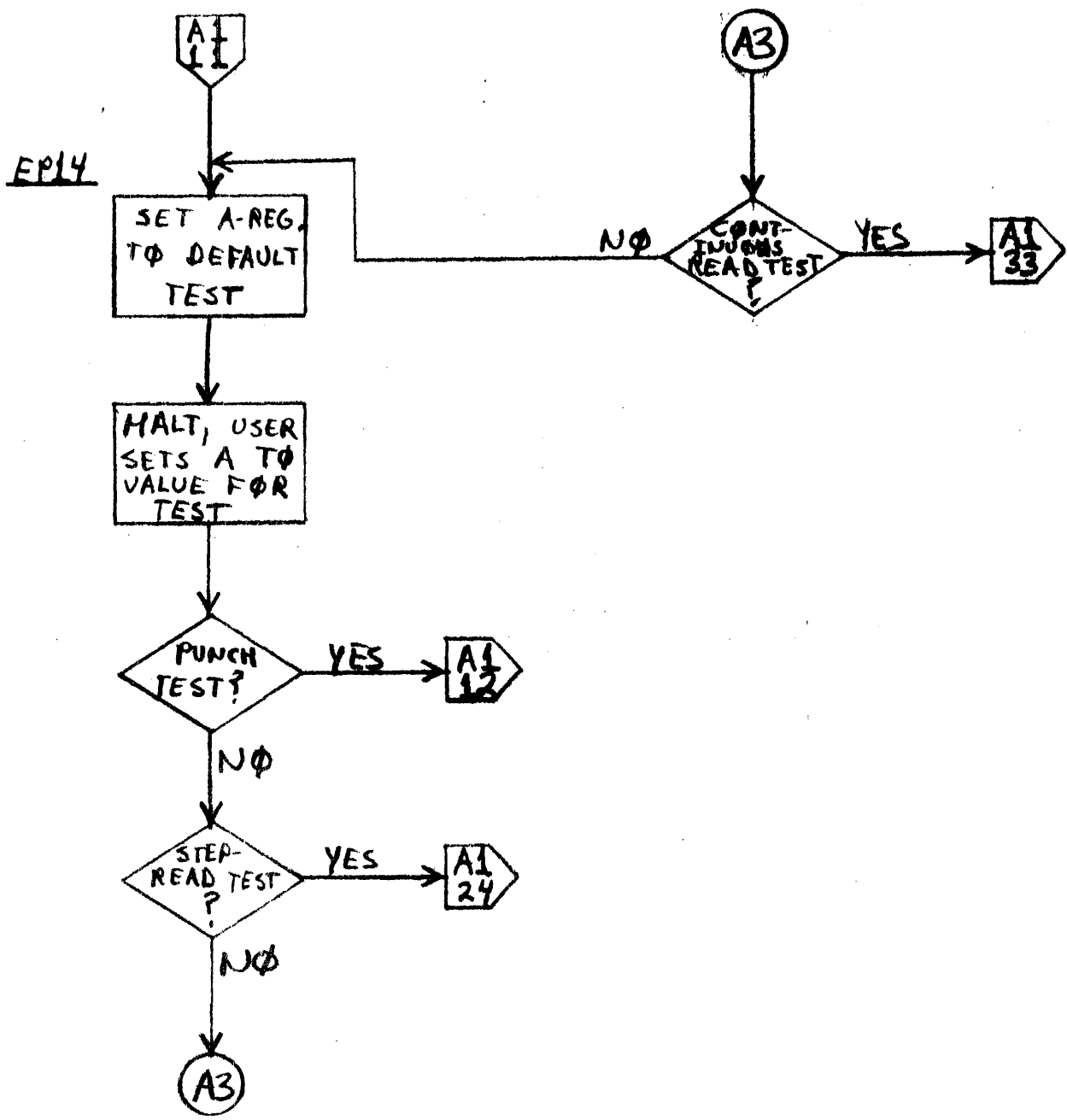
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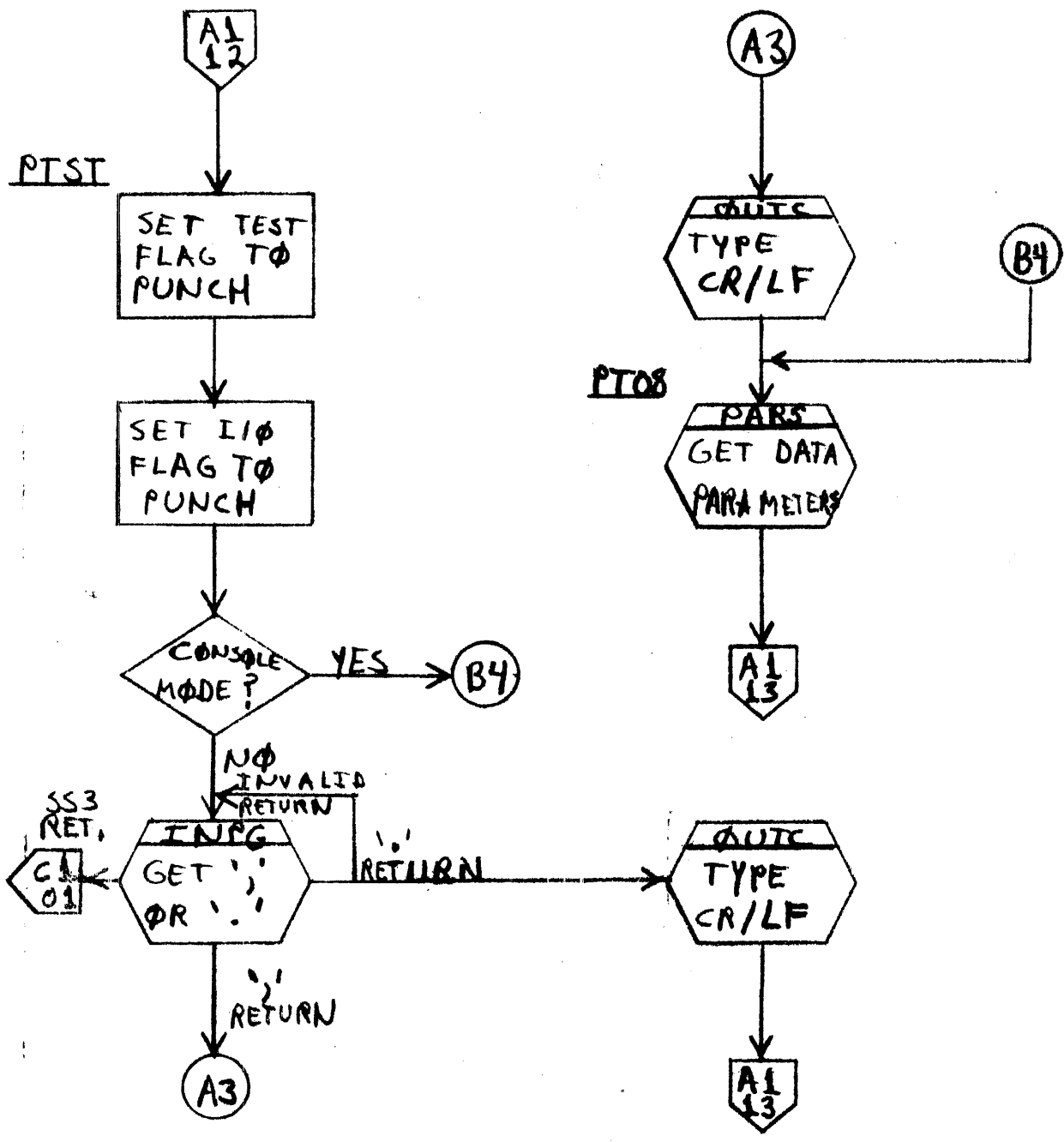
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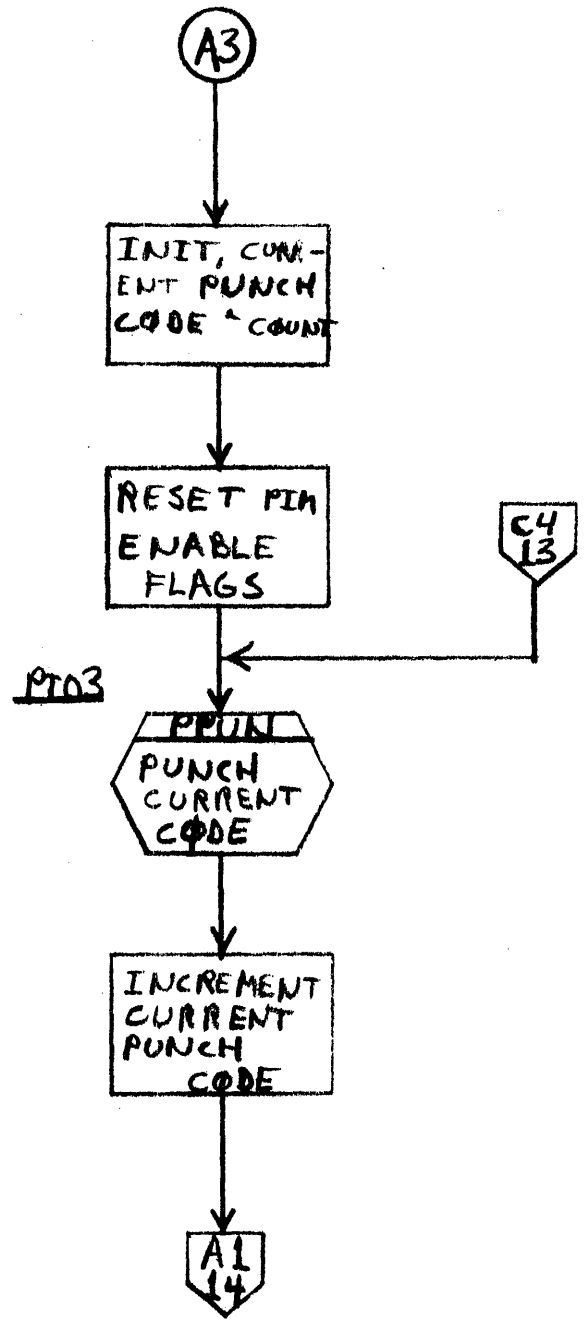
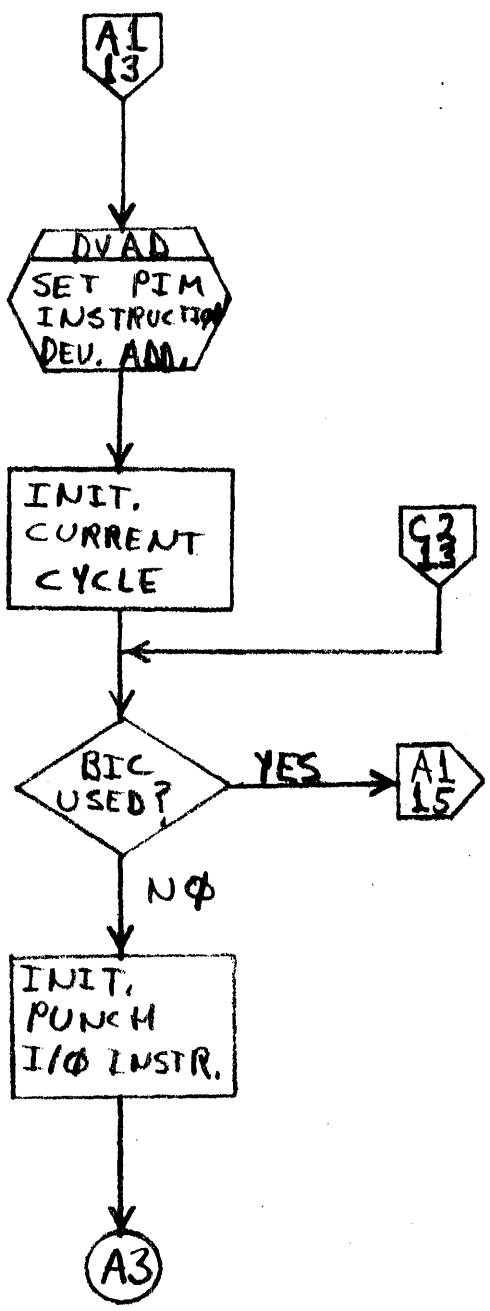
REV





EPL4





PTO2

PTO3

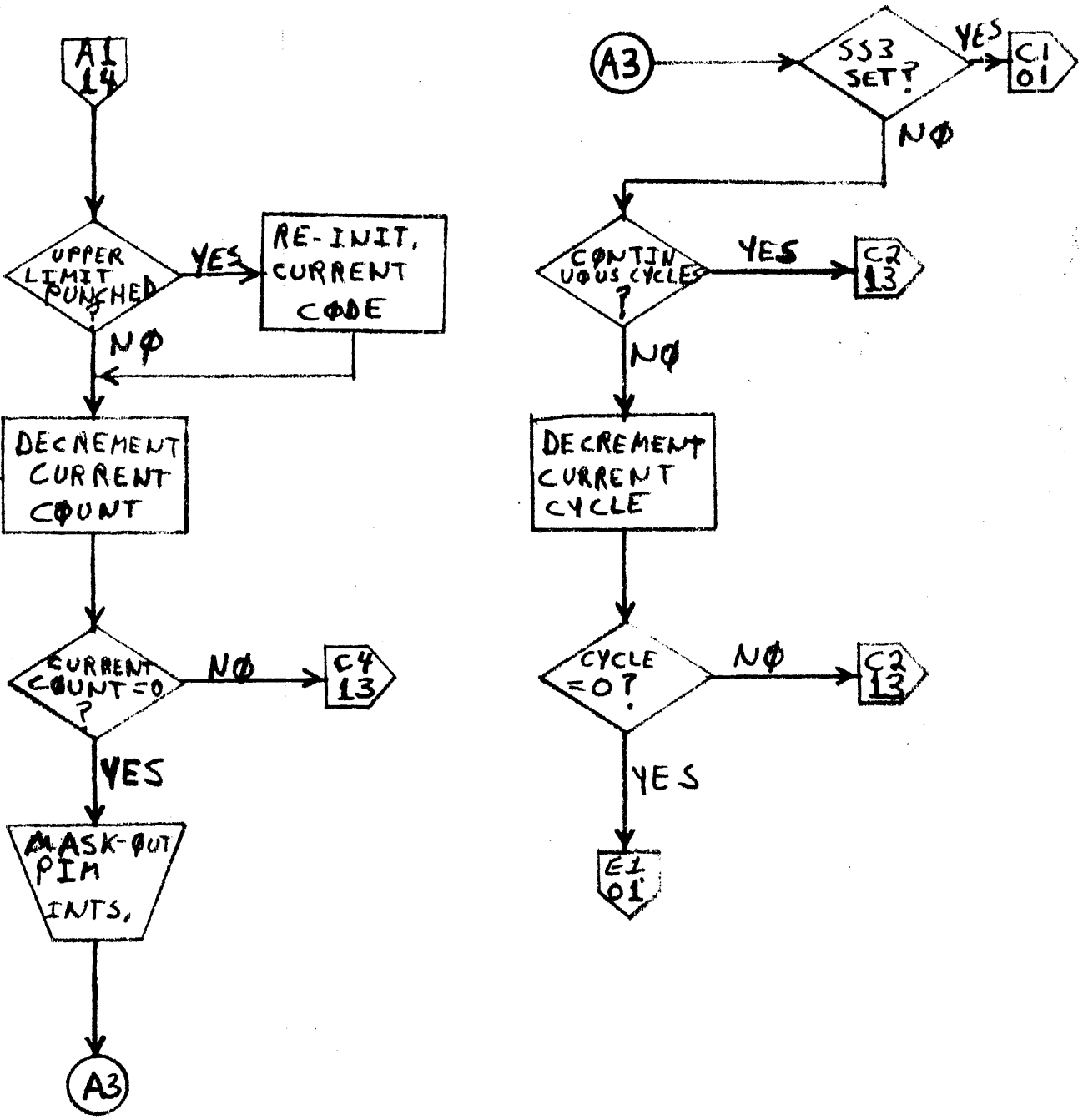


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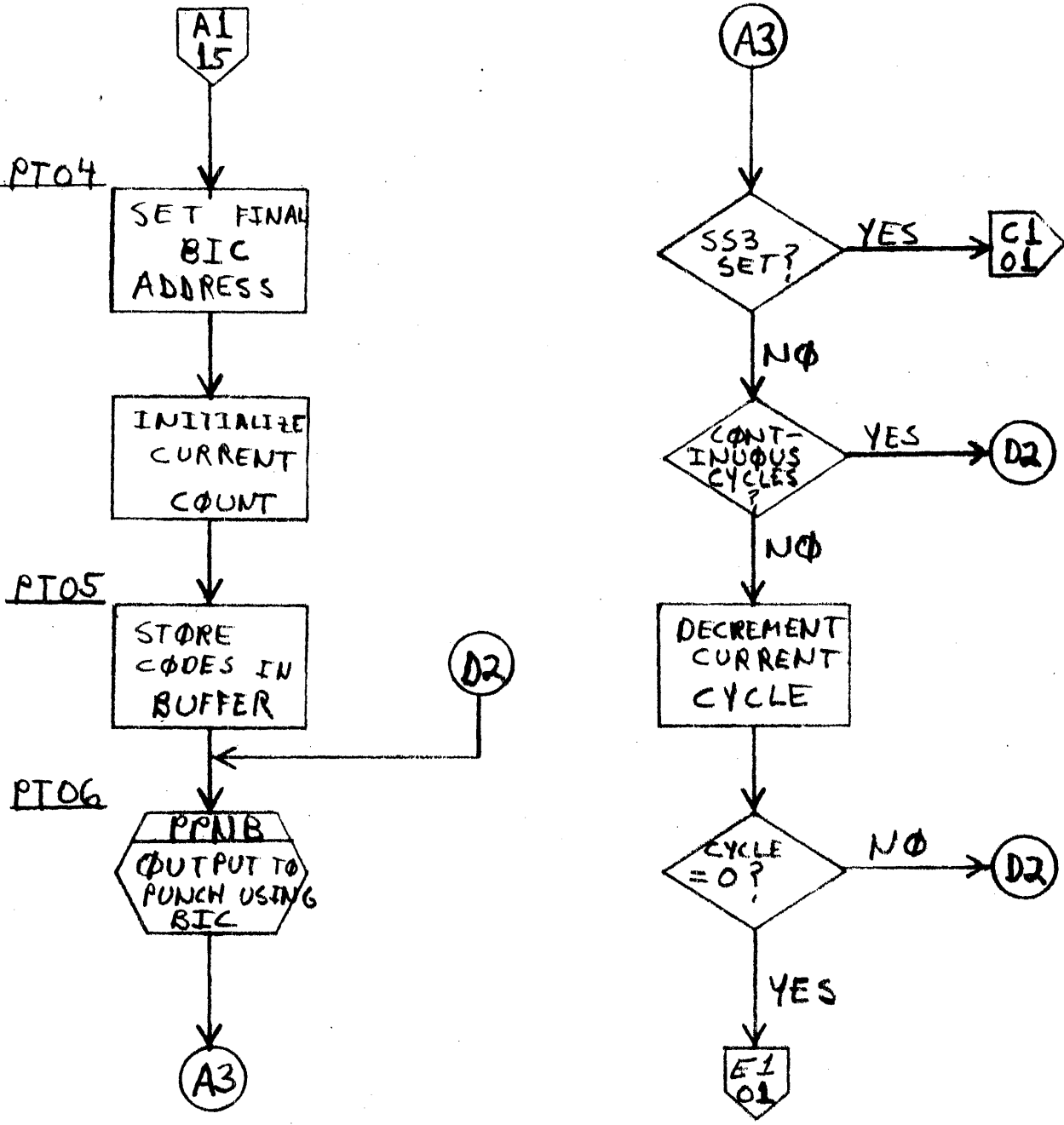


PT07



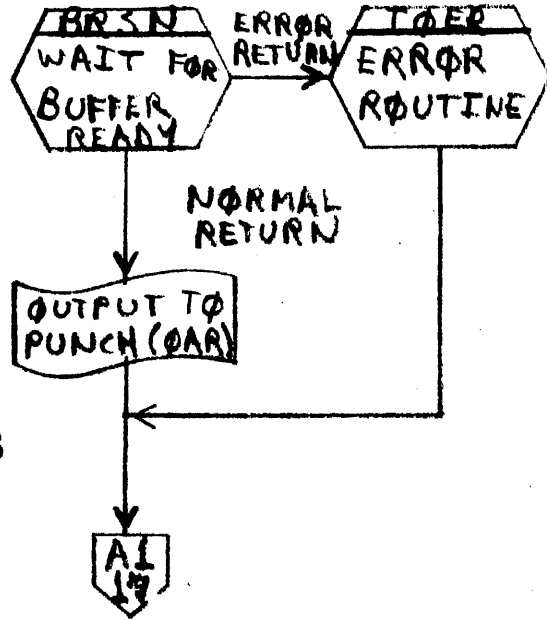
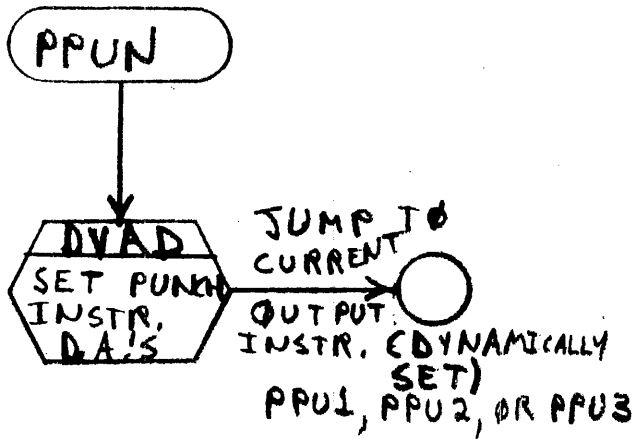
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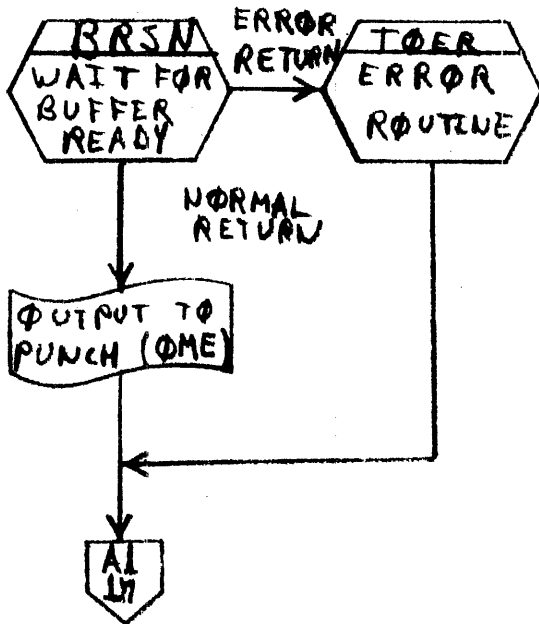


PUNCH (SENSE OR PIM MODE)

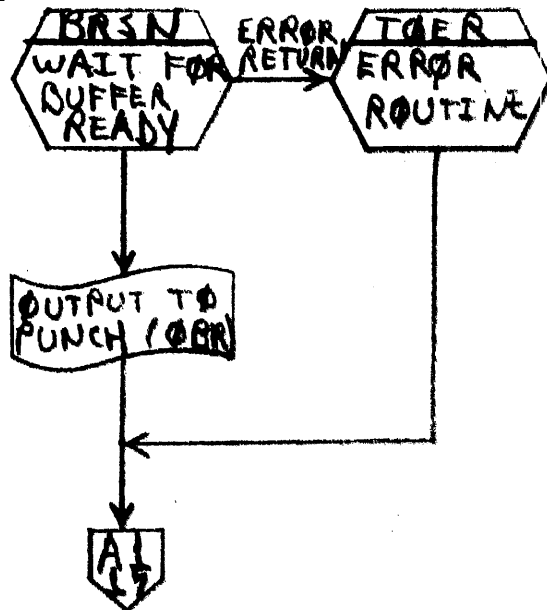
PPU2



PPU1



PPU3



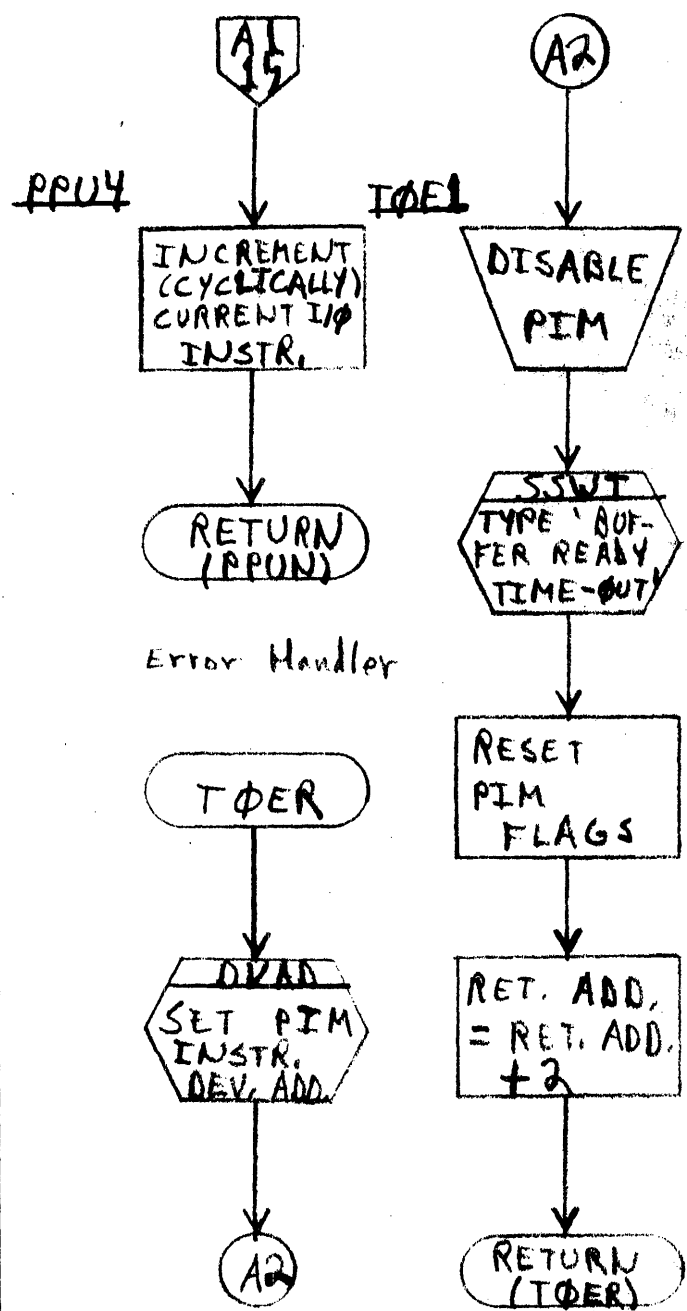
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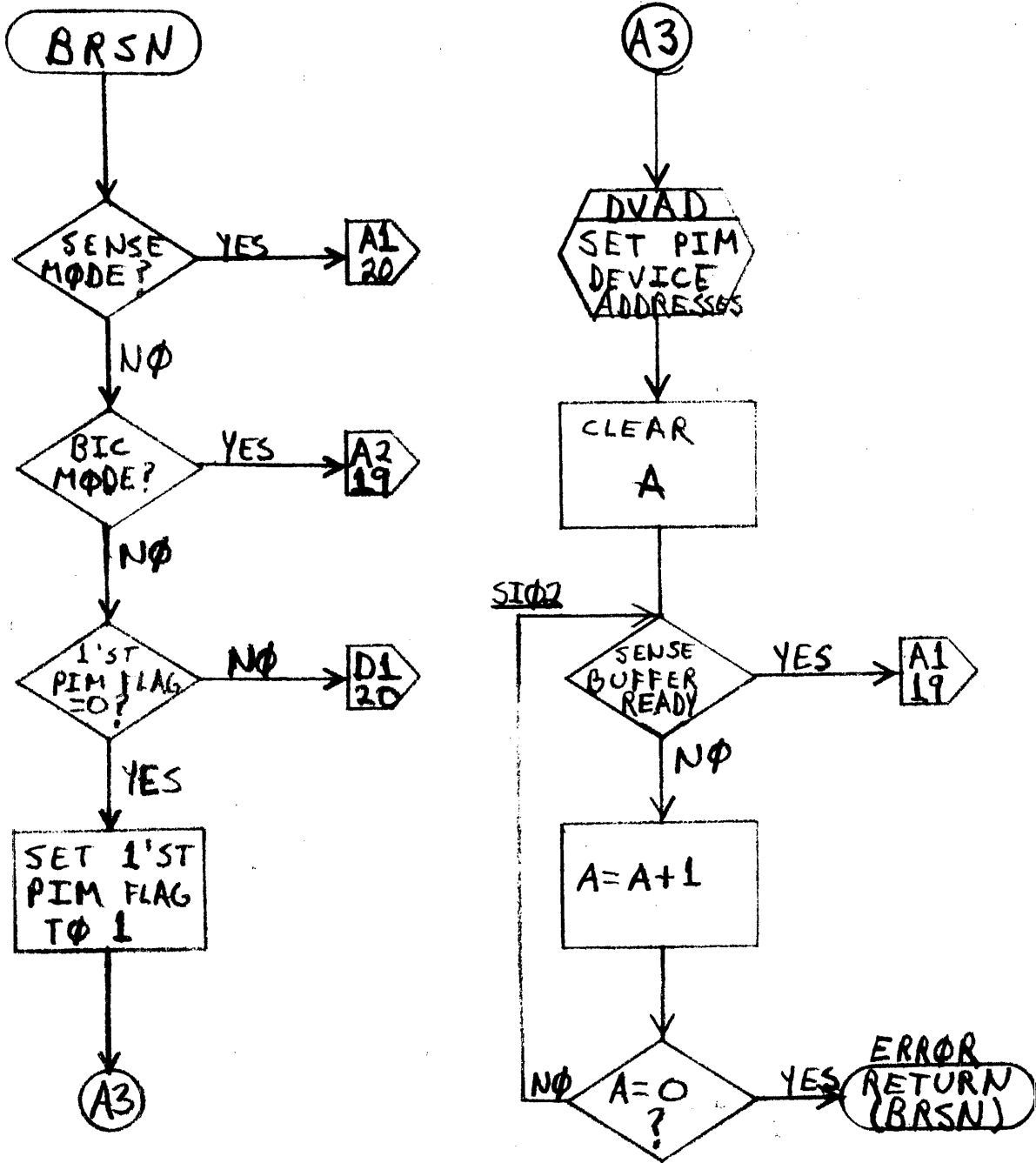
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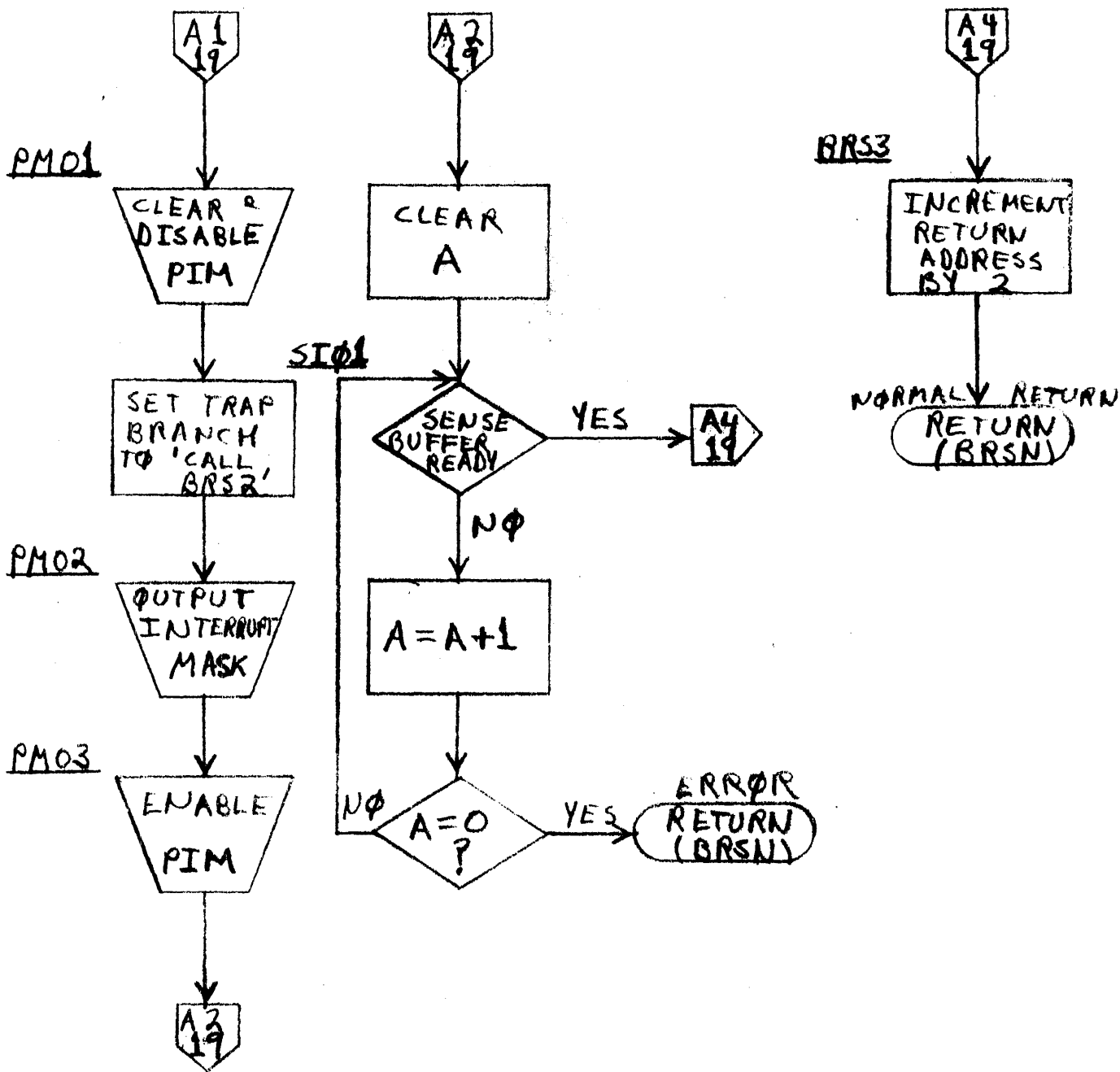
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PIM ENABLE/SENSE BUFFER READY ROUTINE





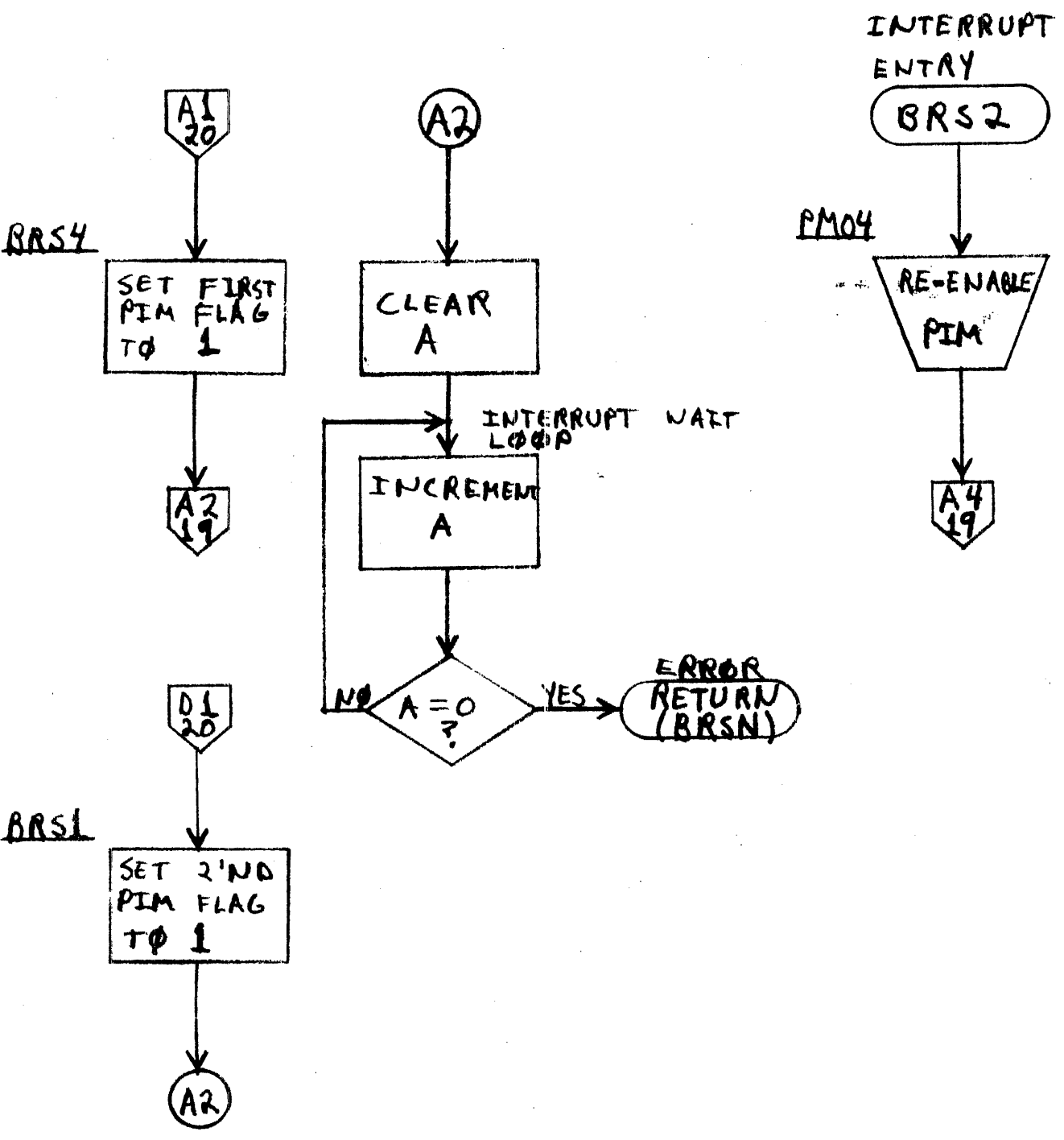
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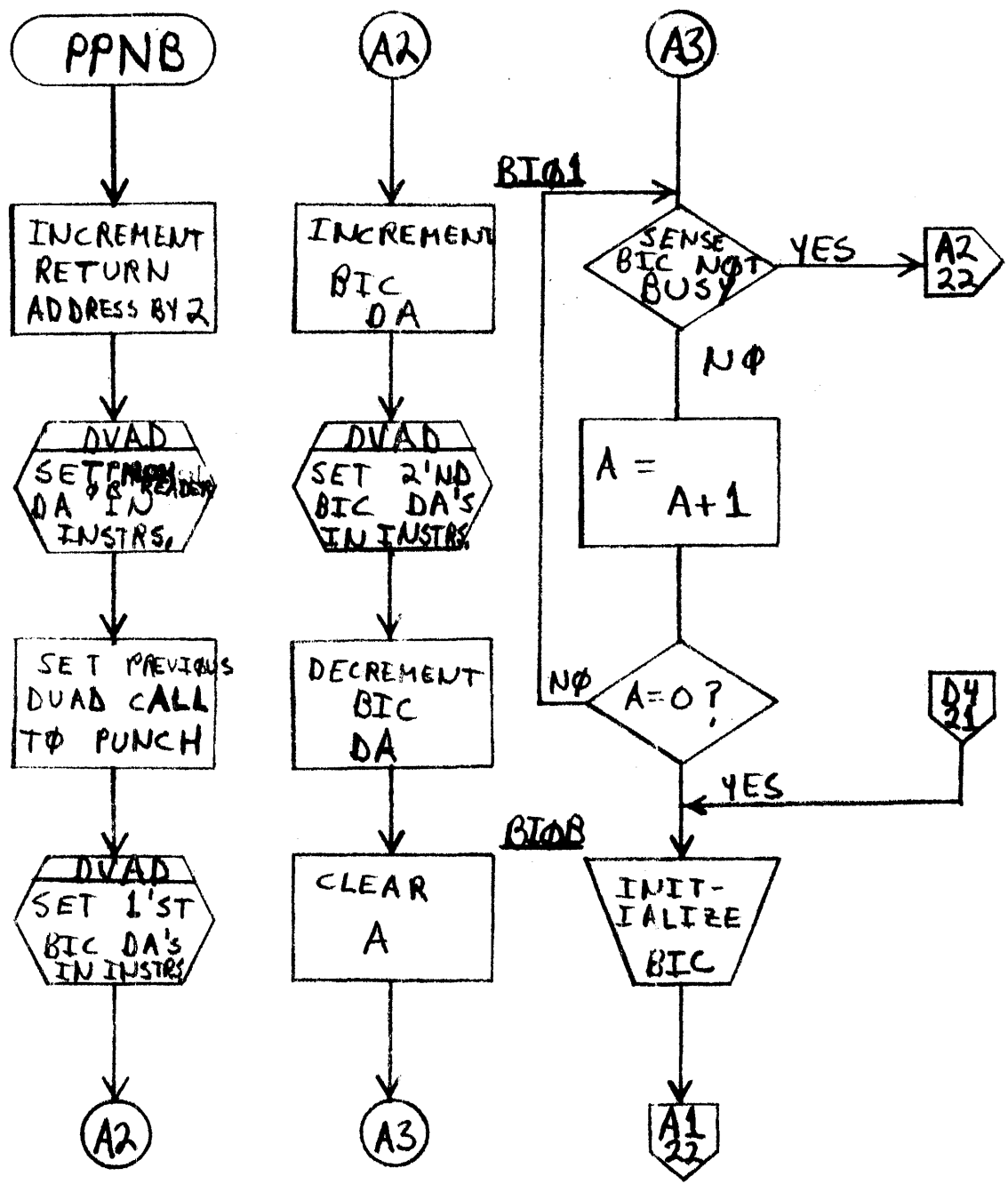
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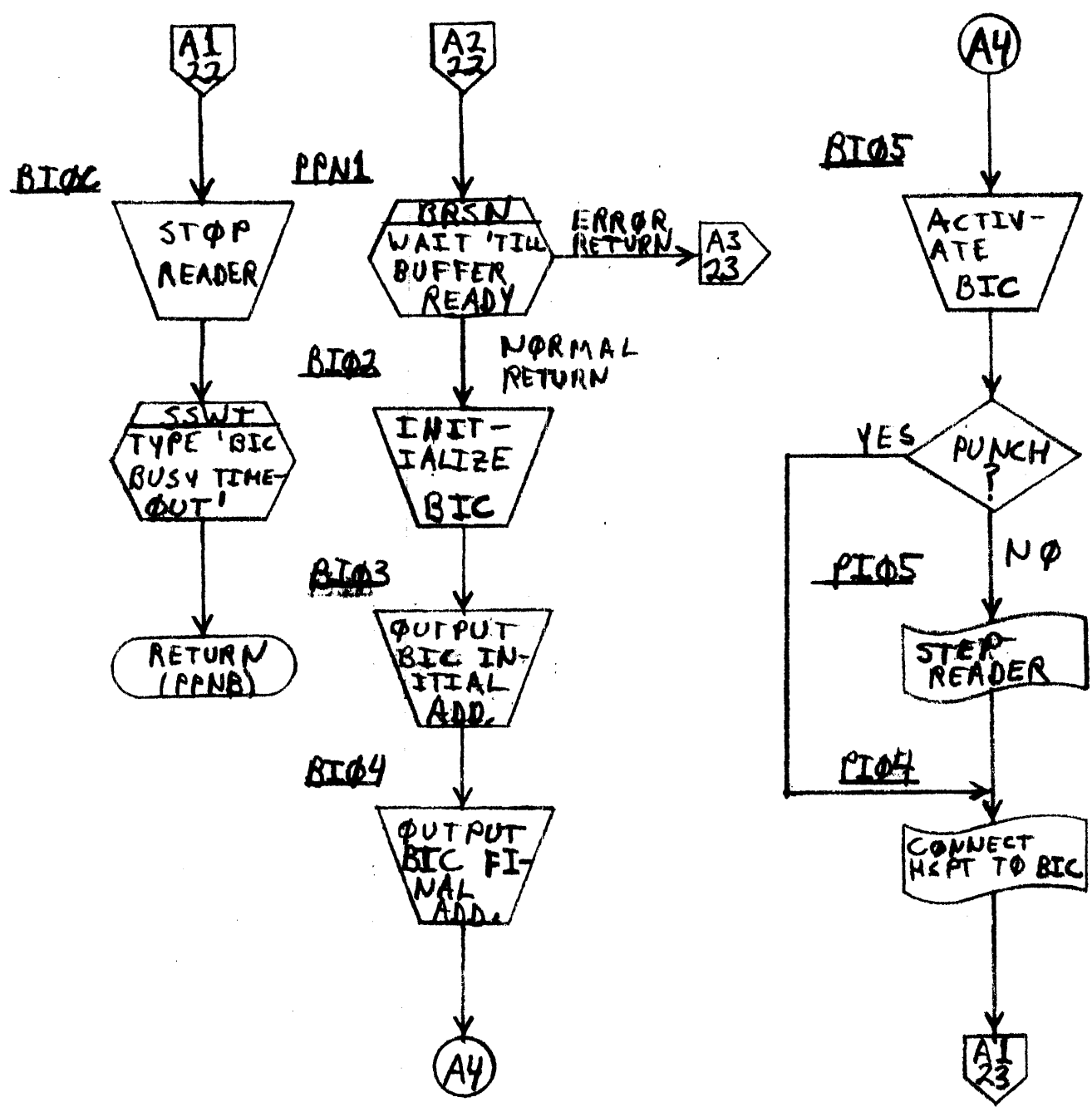
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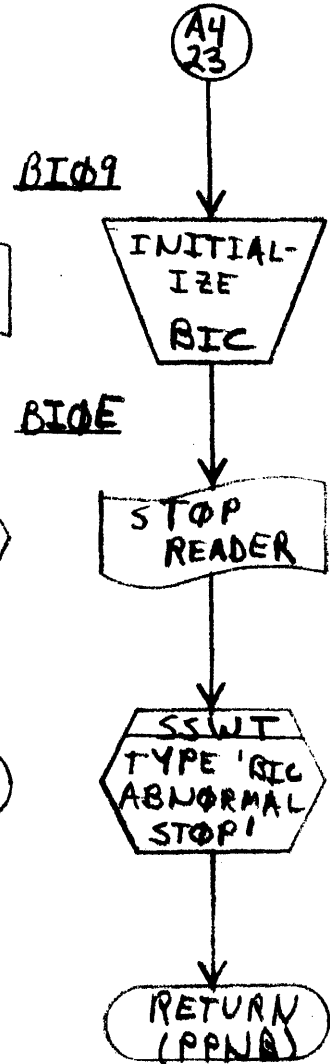
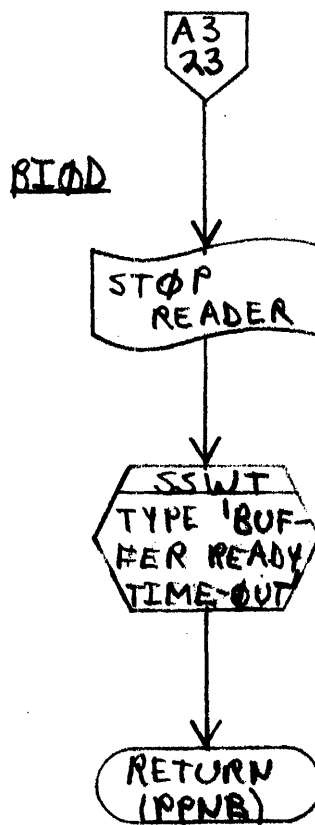
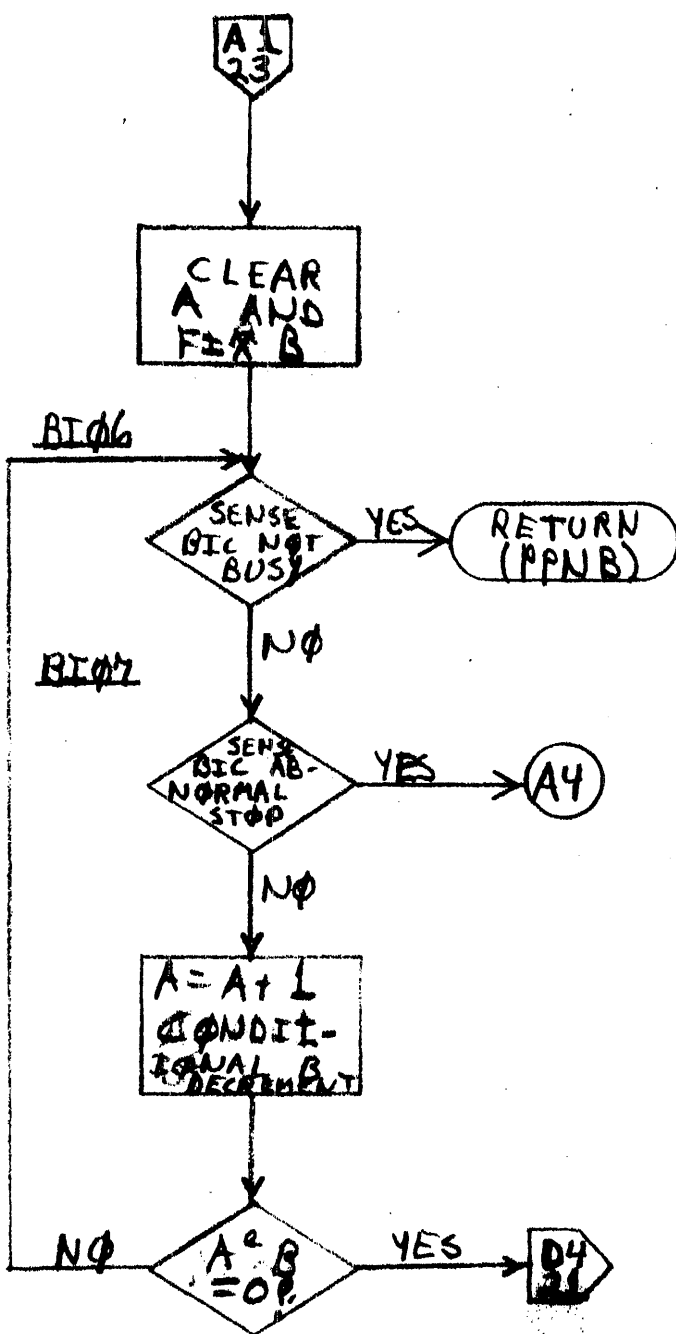
REV

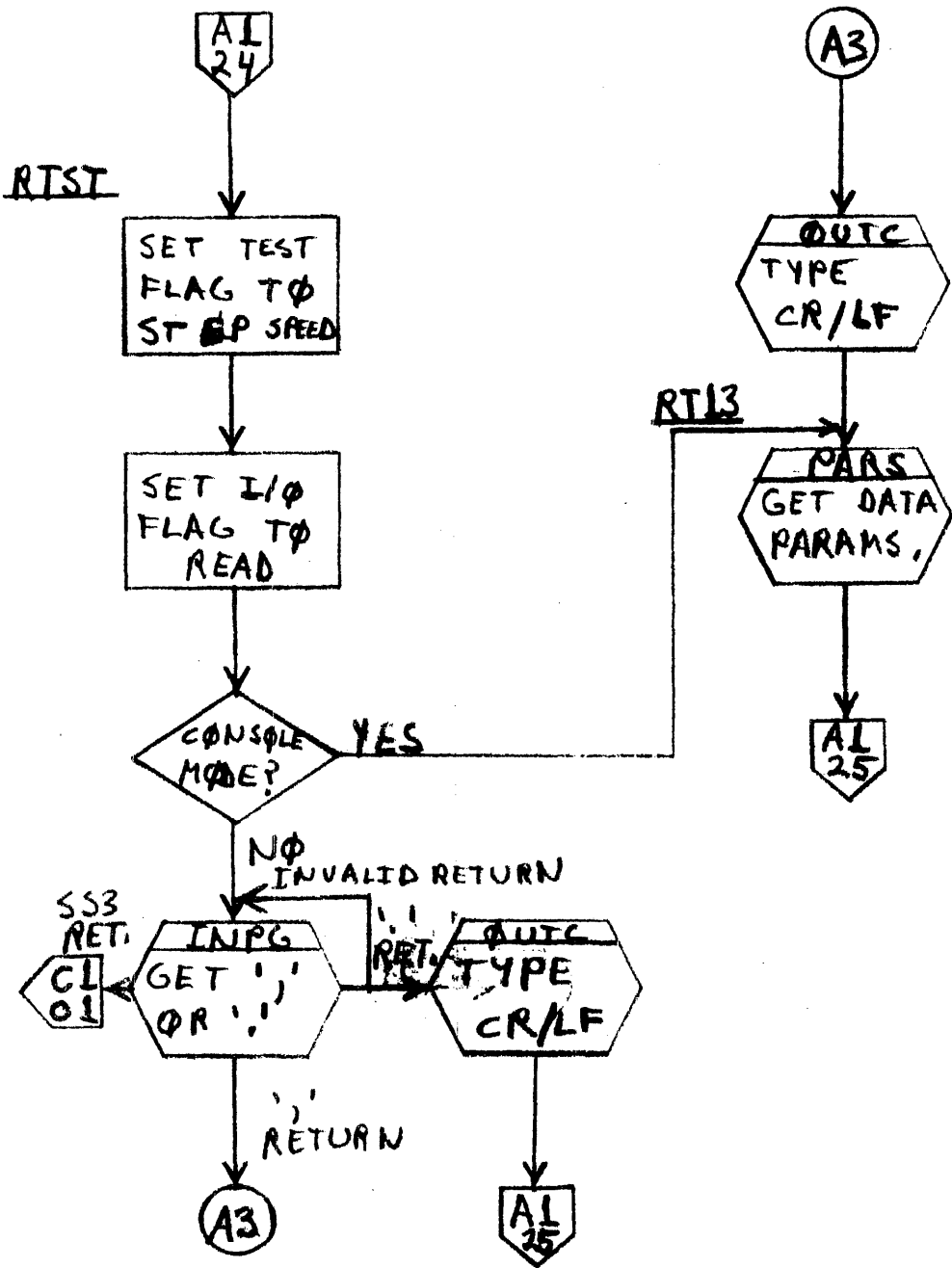


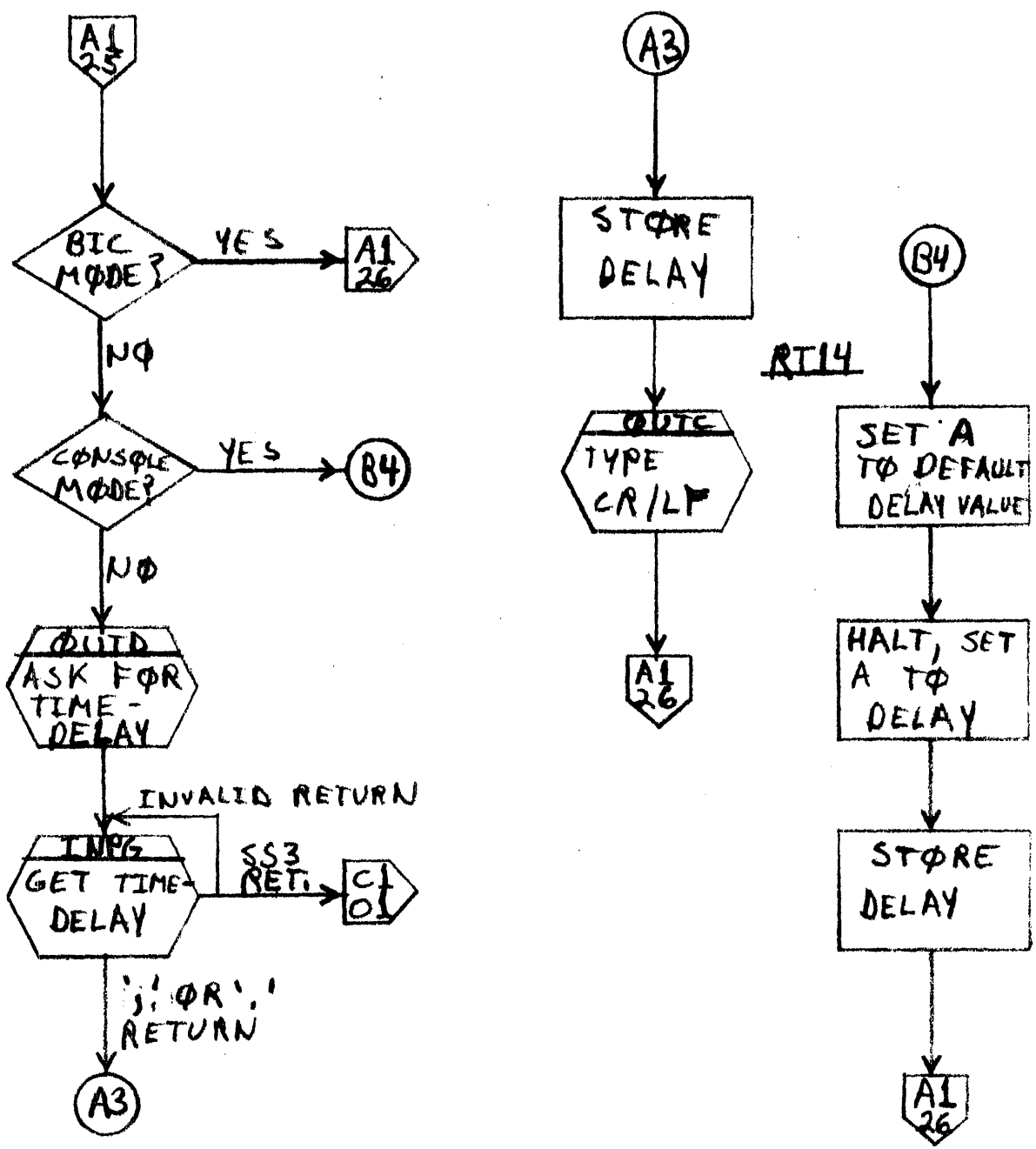
PUNCH (OR READ) (BIC MODE)

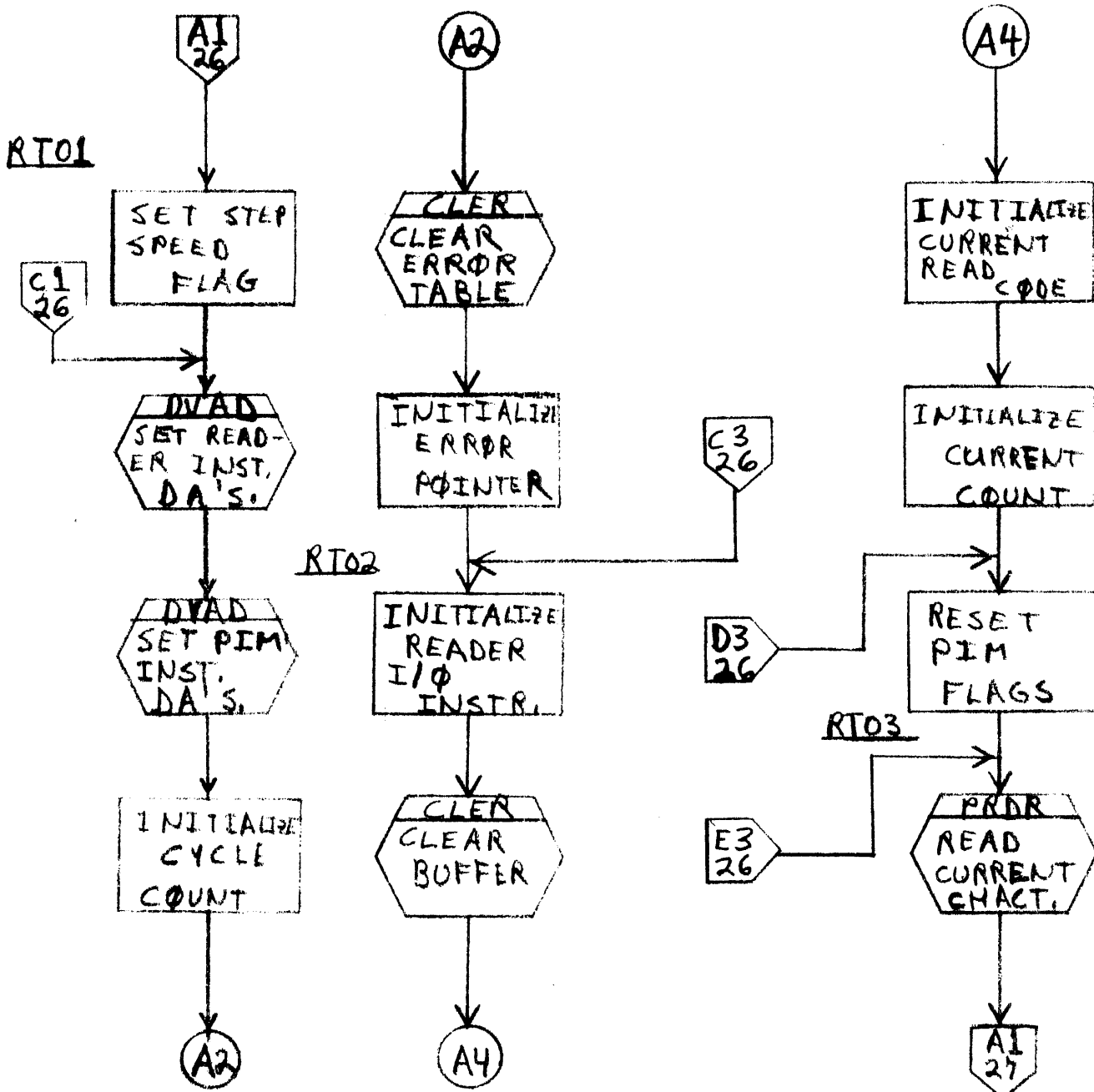












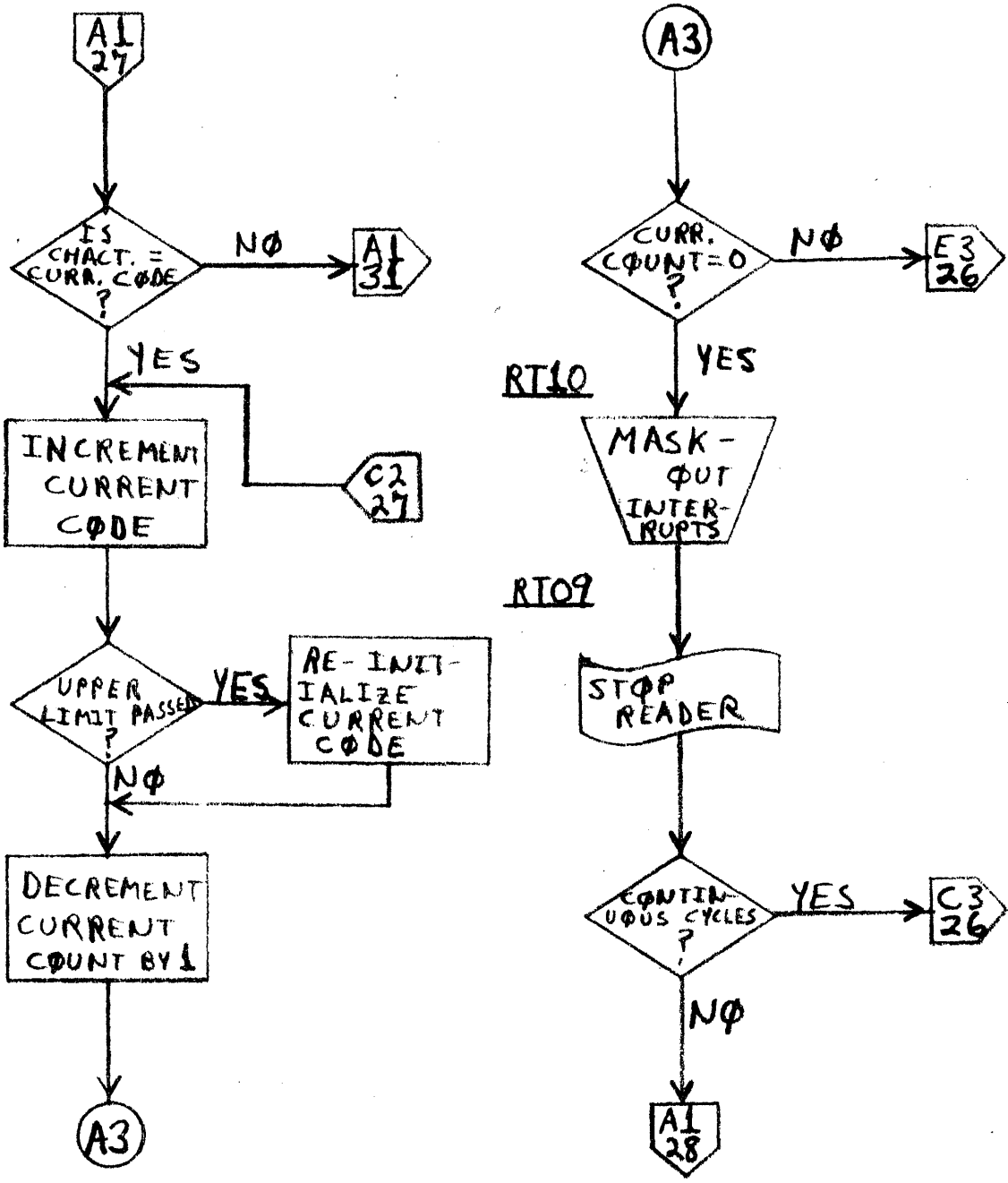
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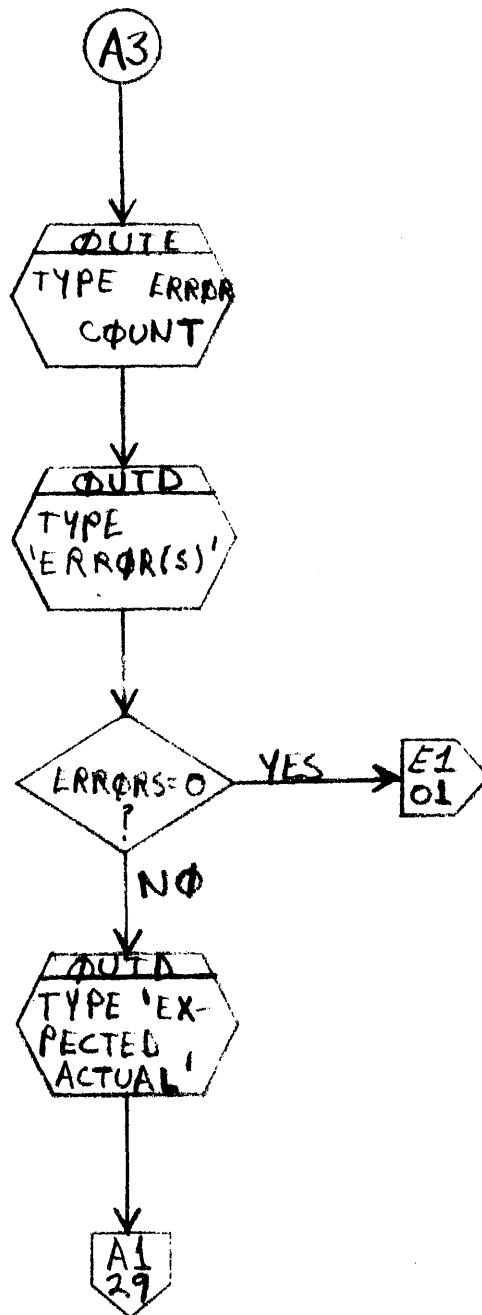
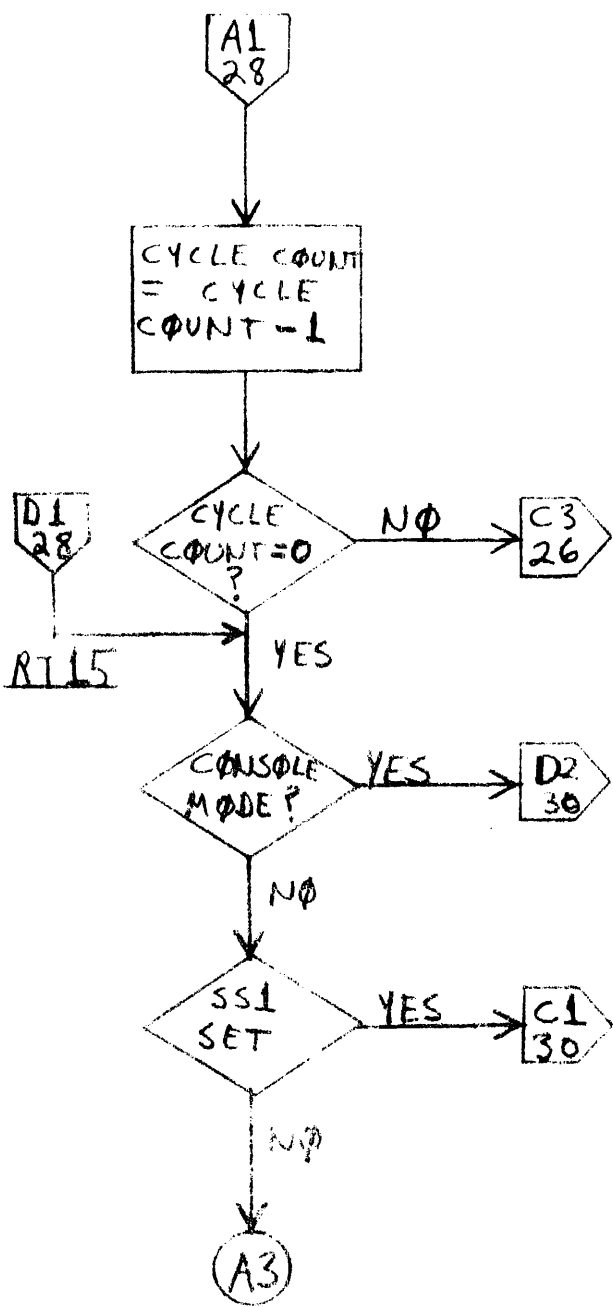
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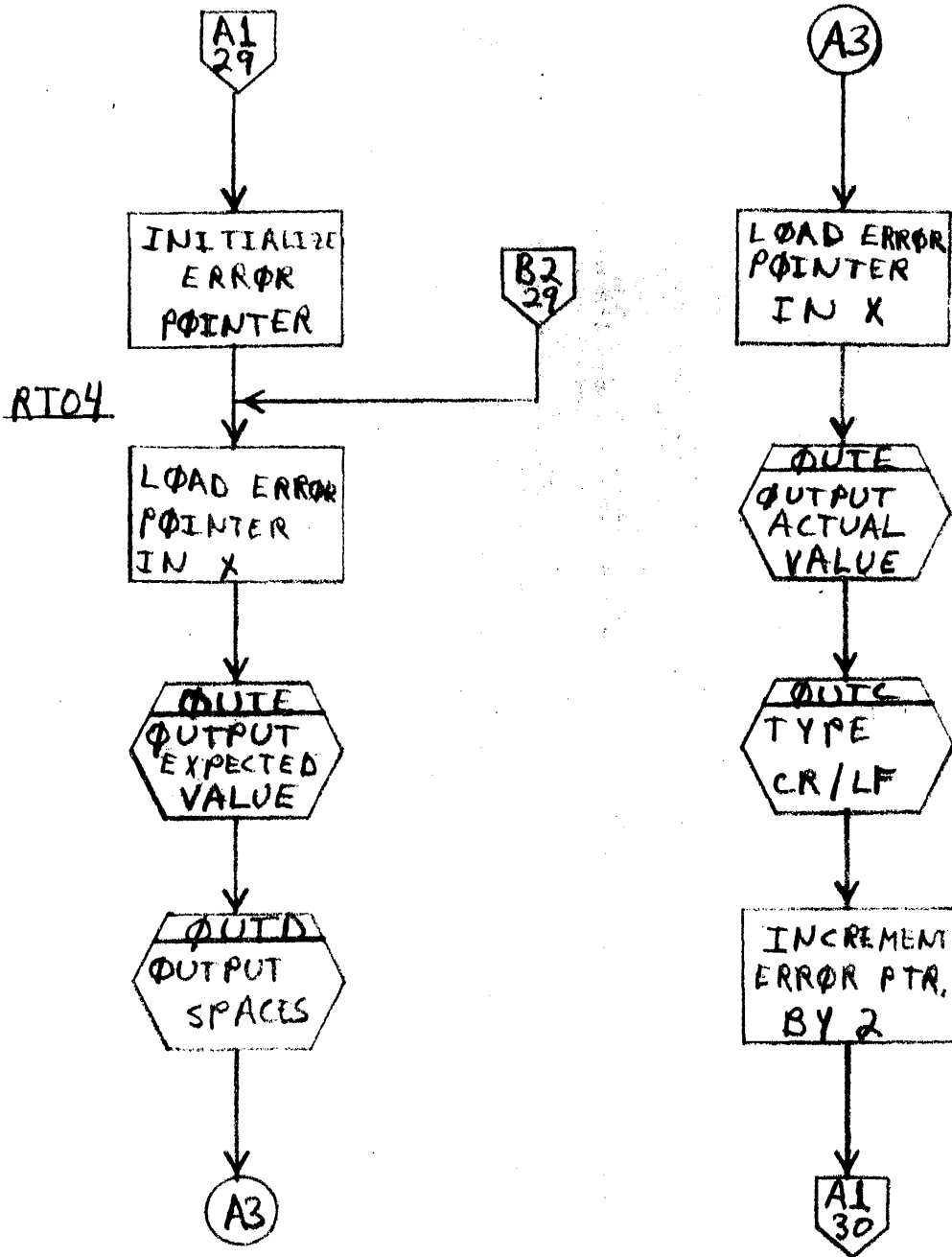
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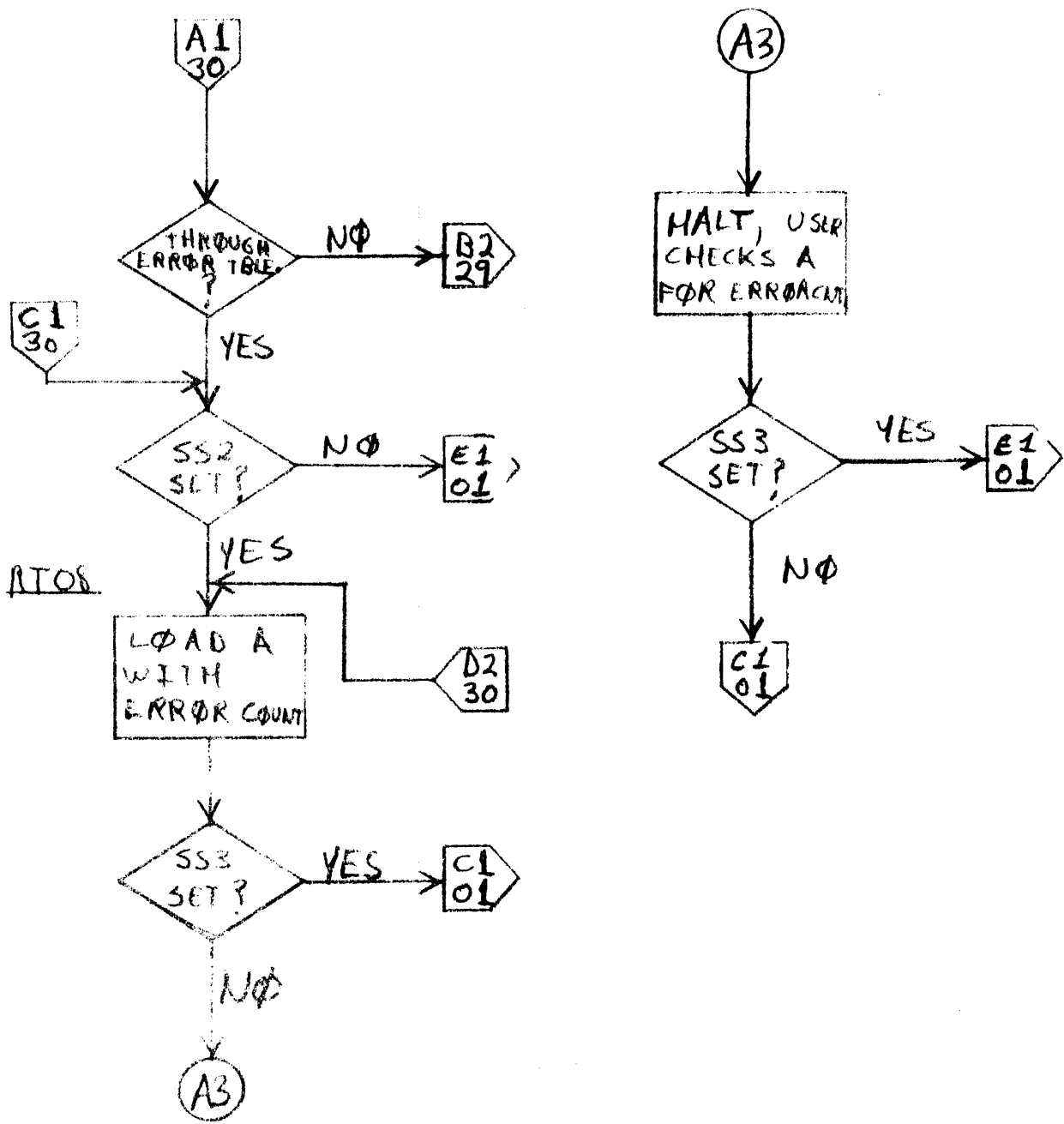


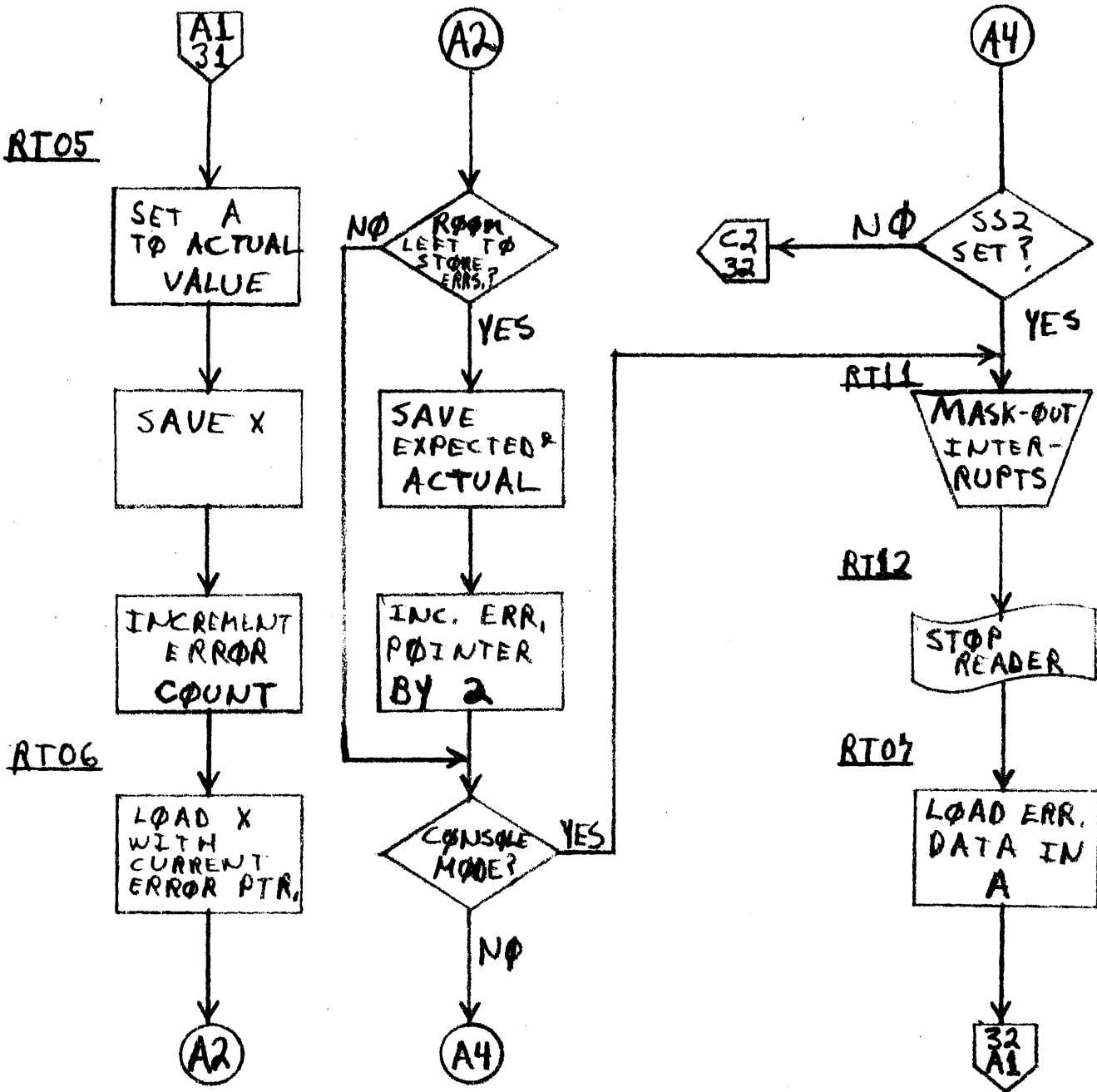
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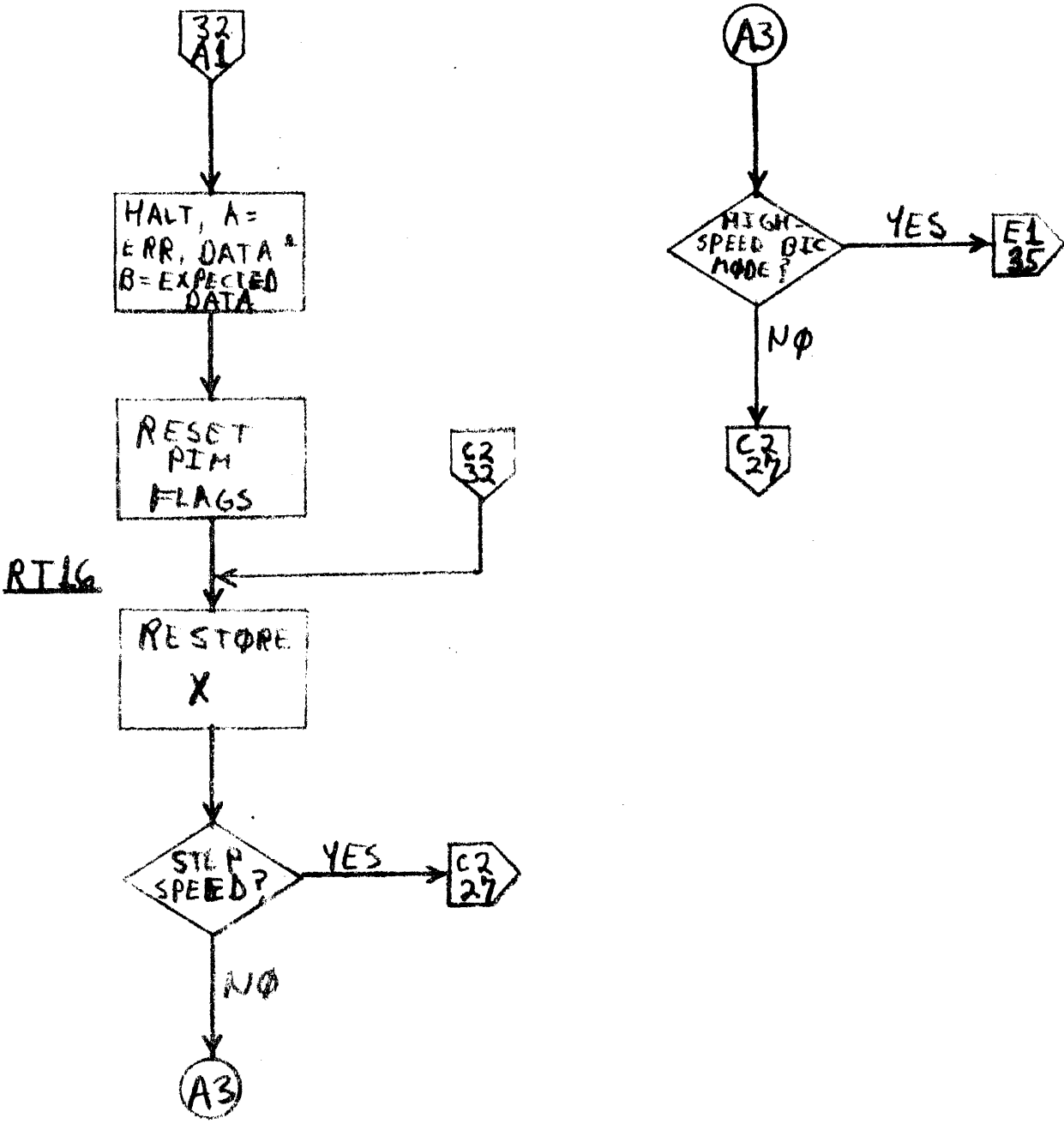
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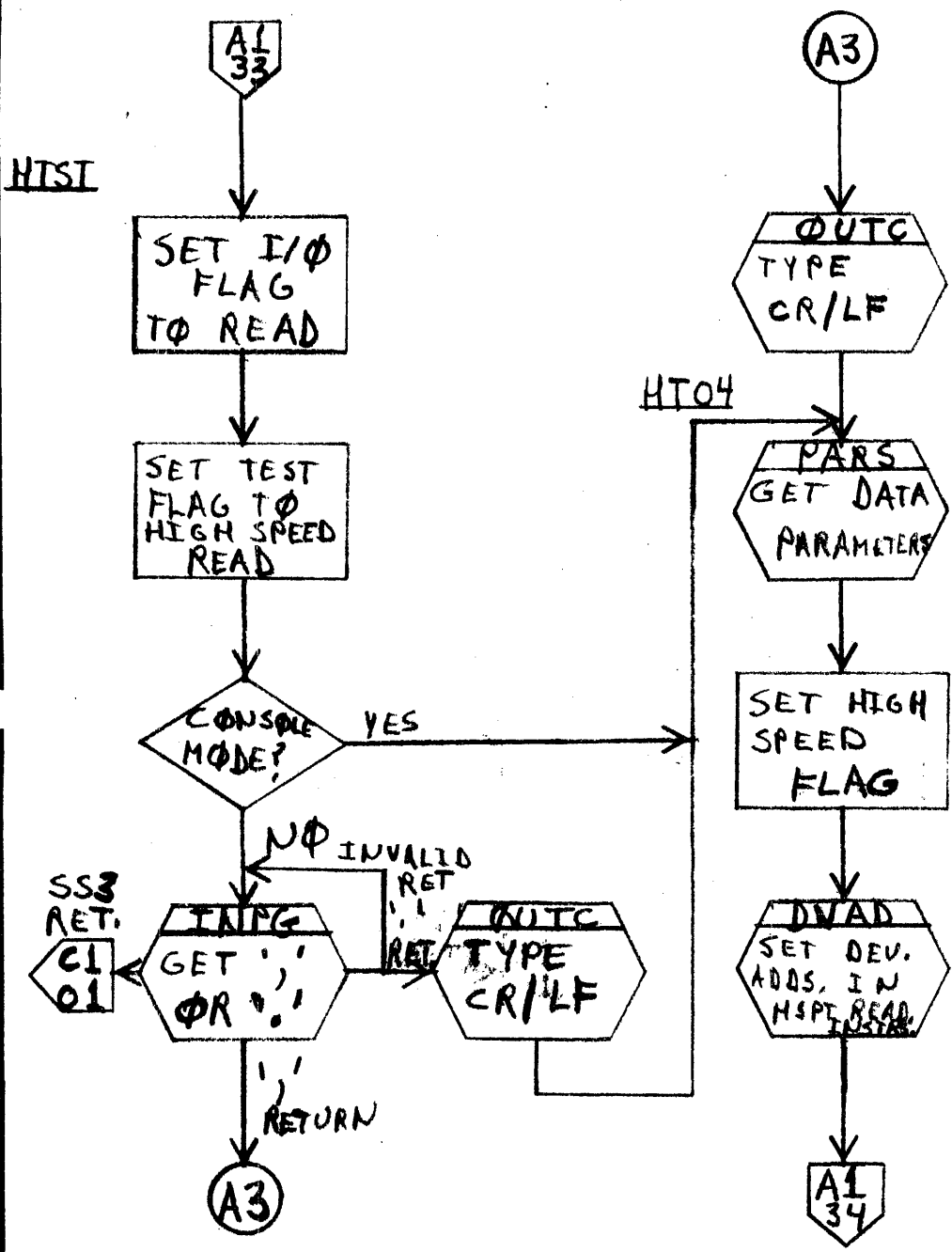
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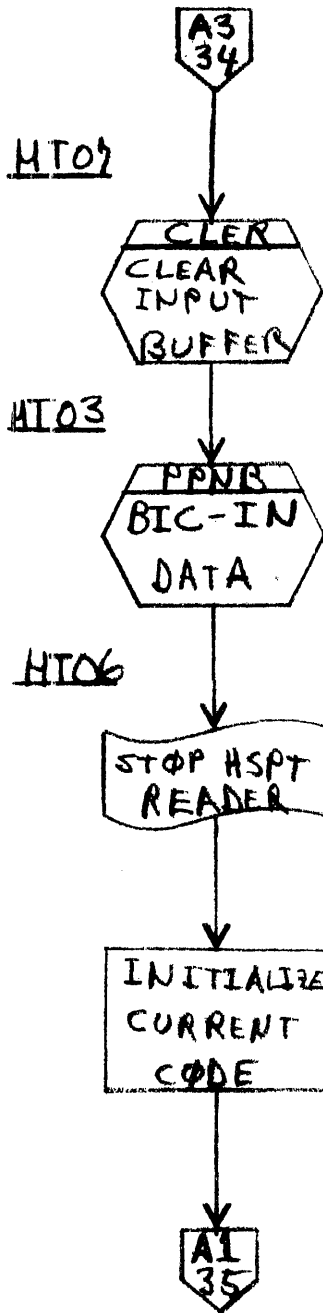
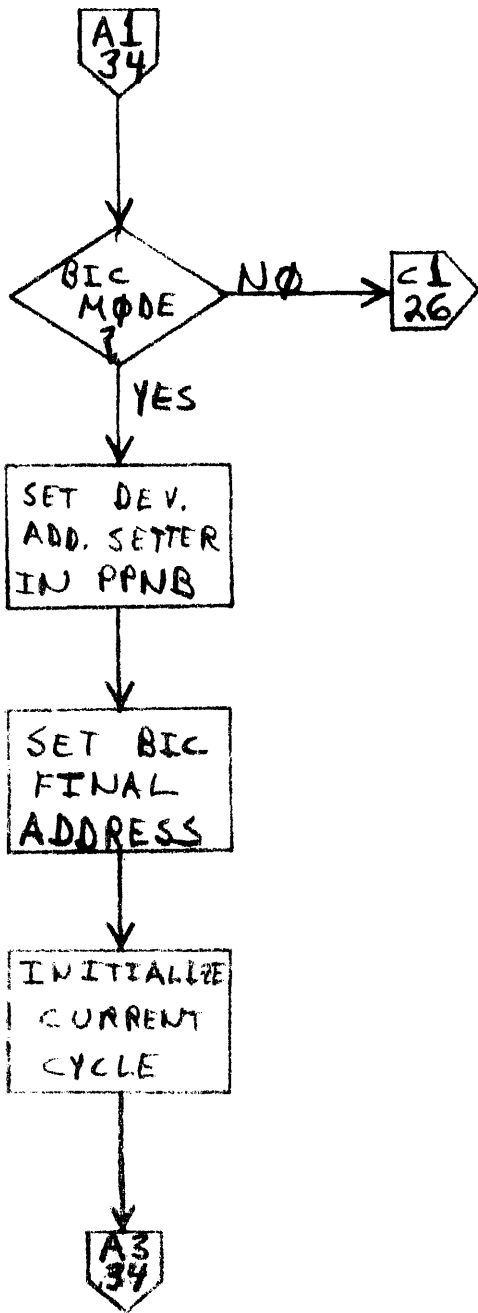
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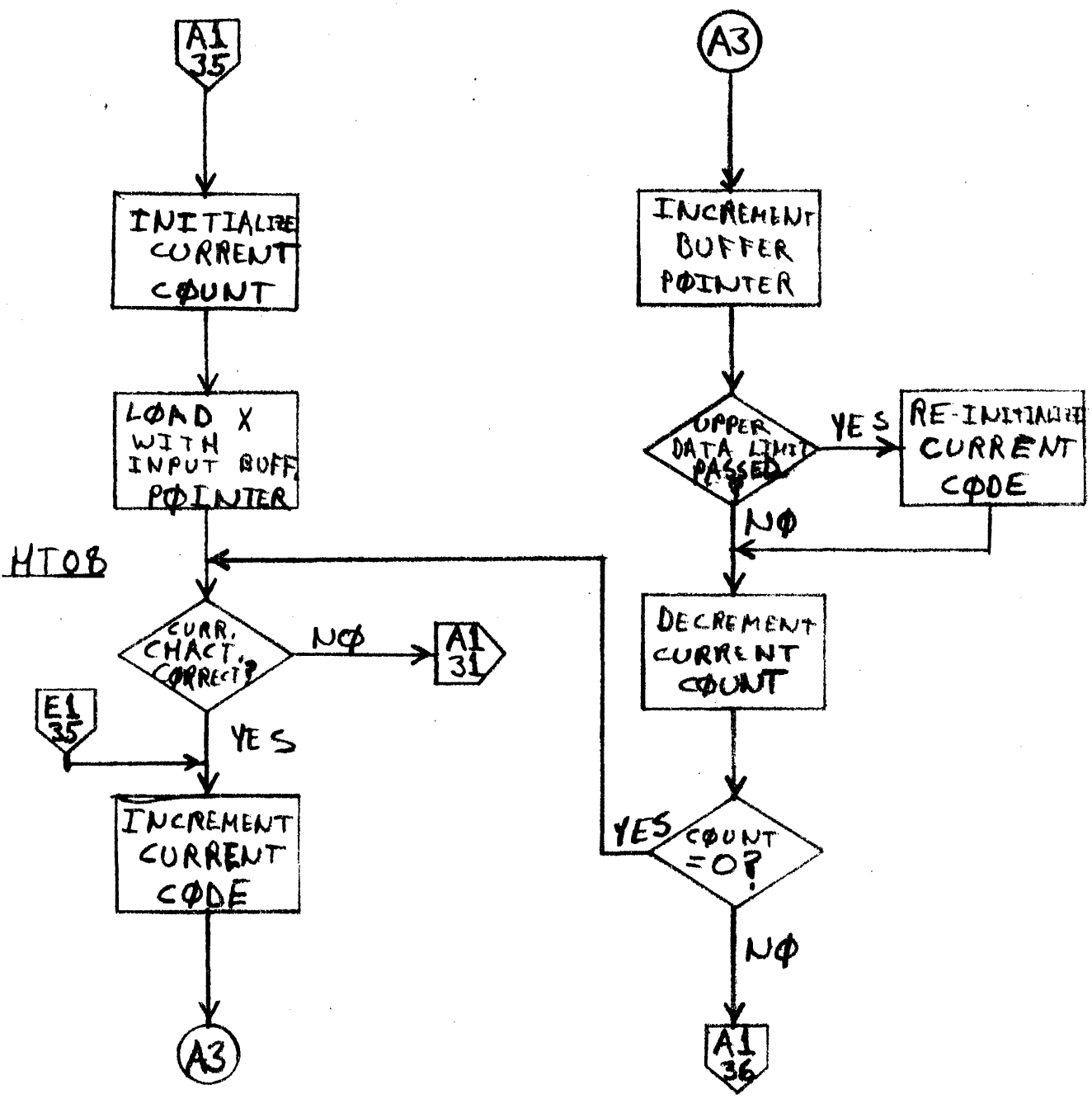
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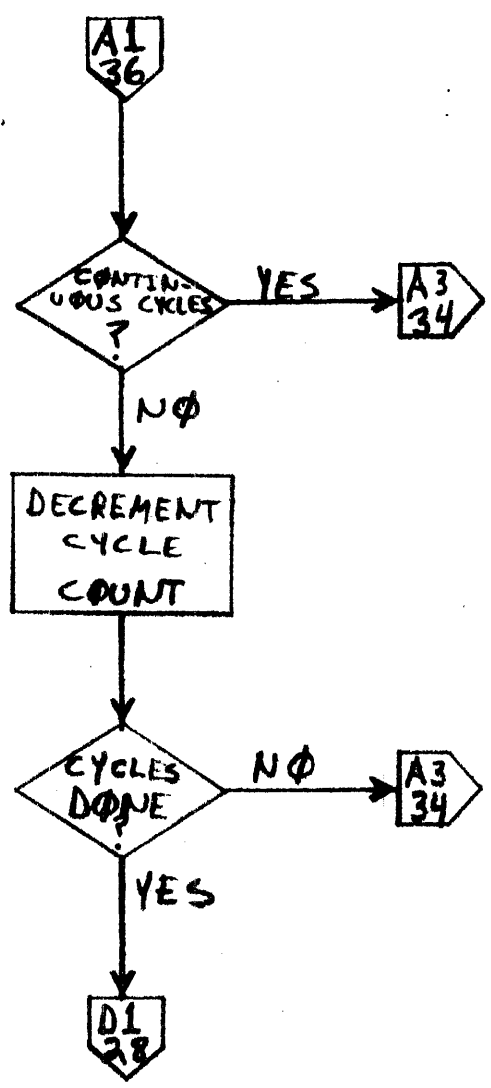
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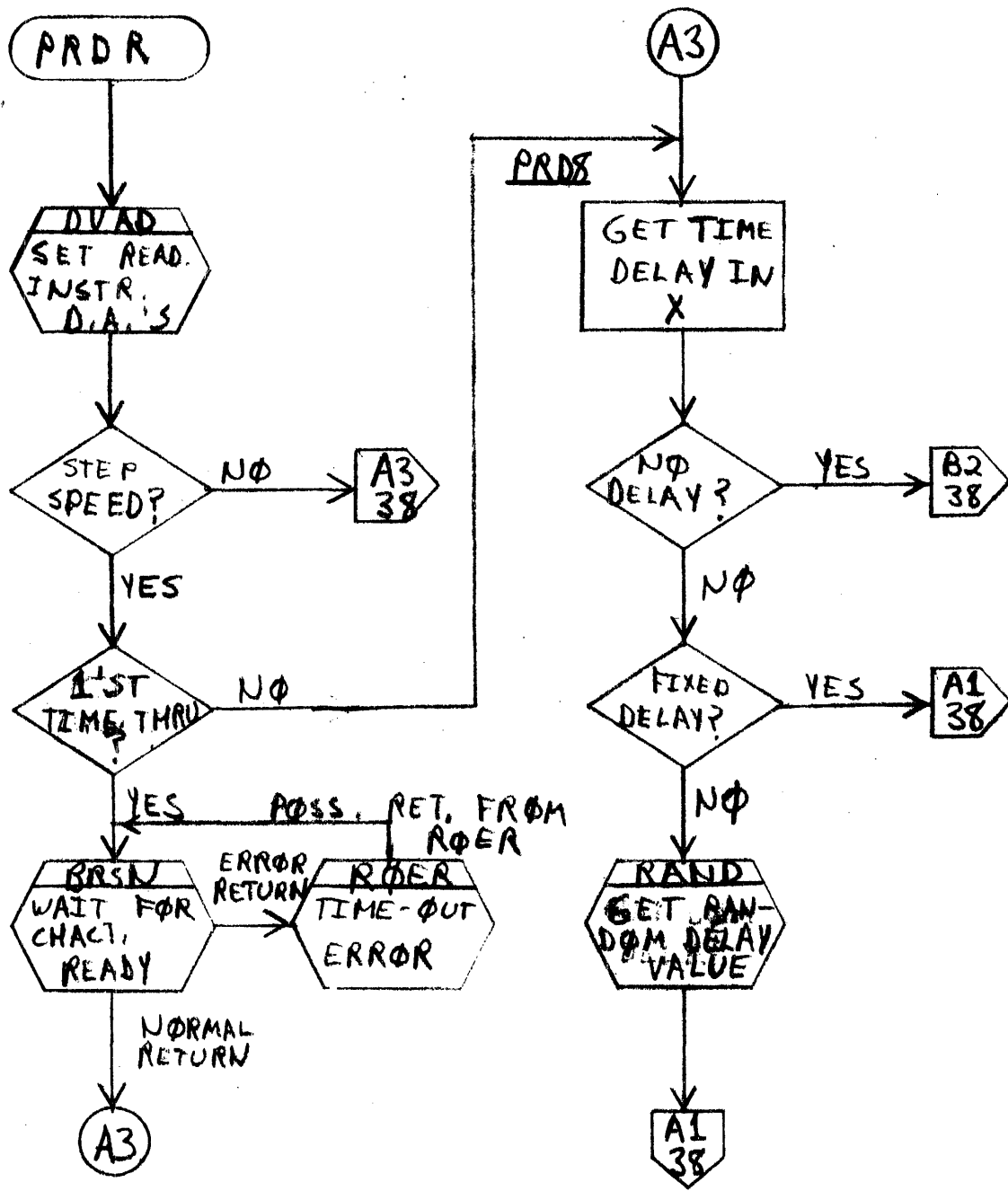
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READ (SENSE OR PIM MODE)

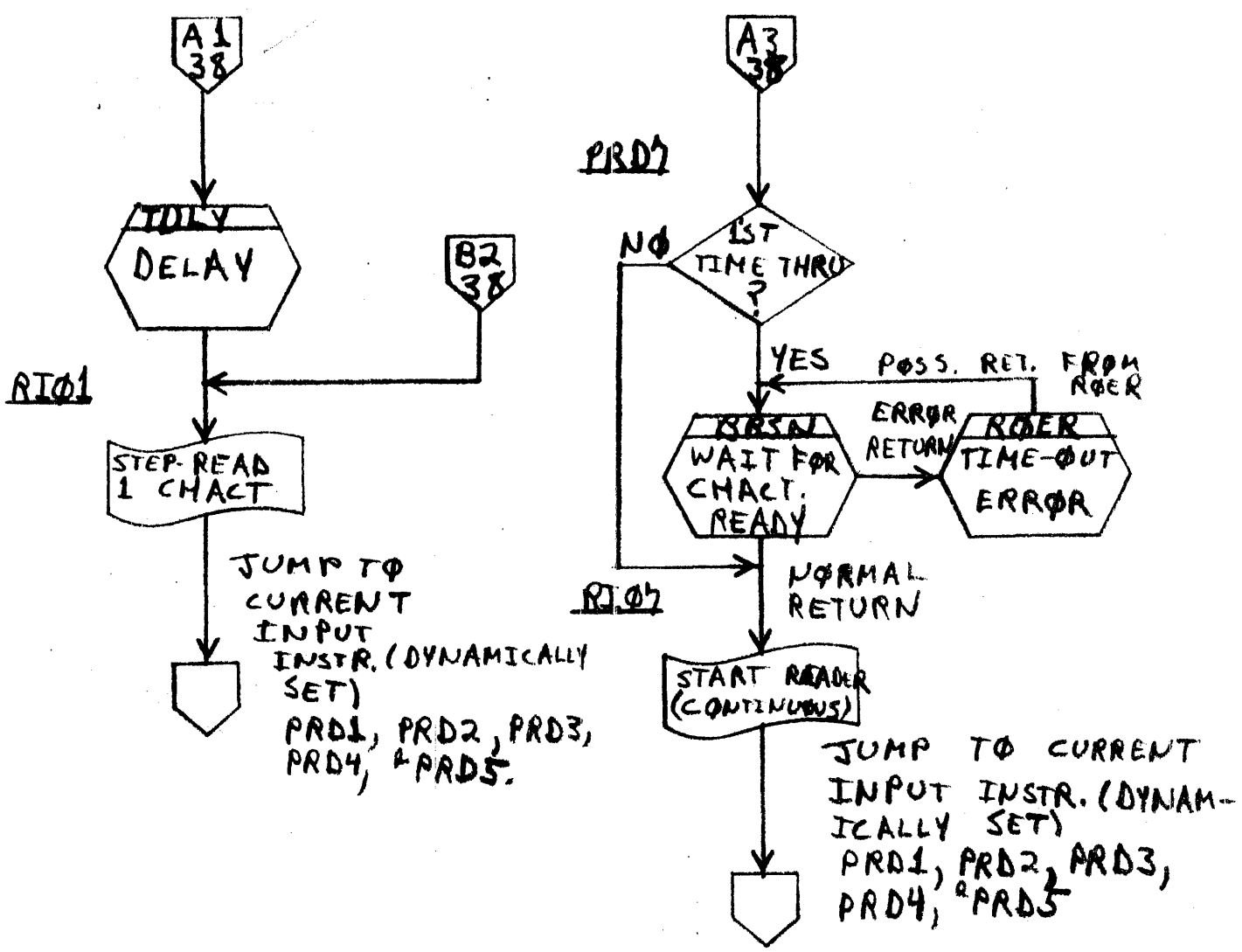


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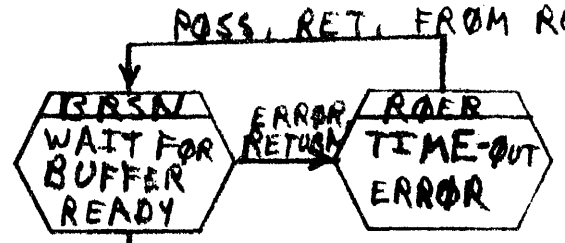
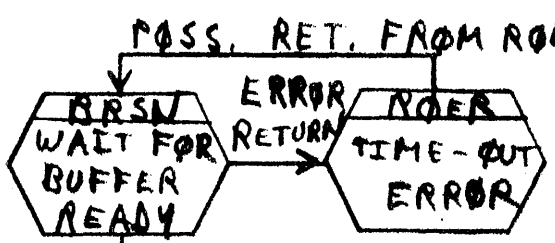
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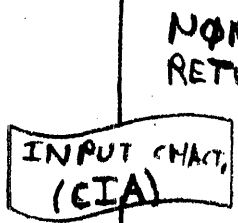


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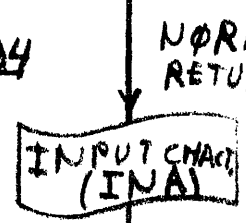
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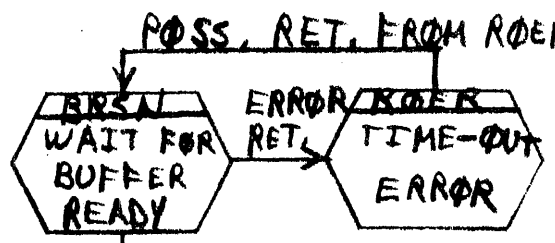
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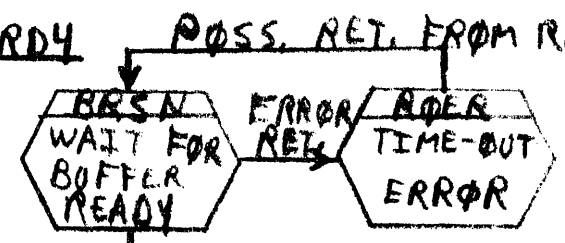
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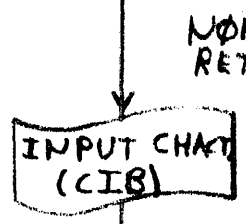
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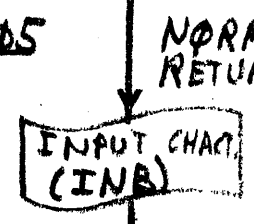
PRD4



RIQ3



RIQ5



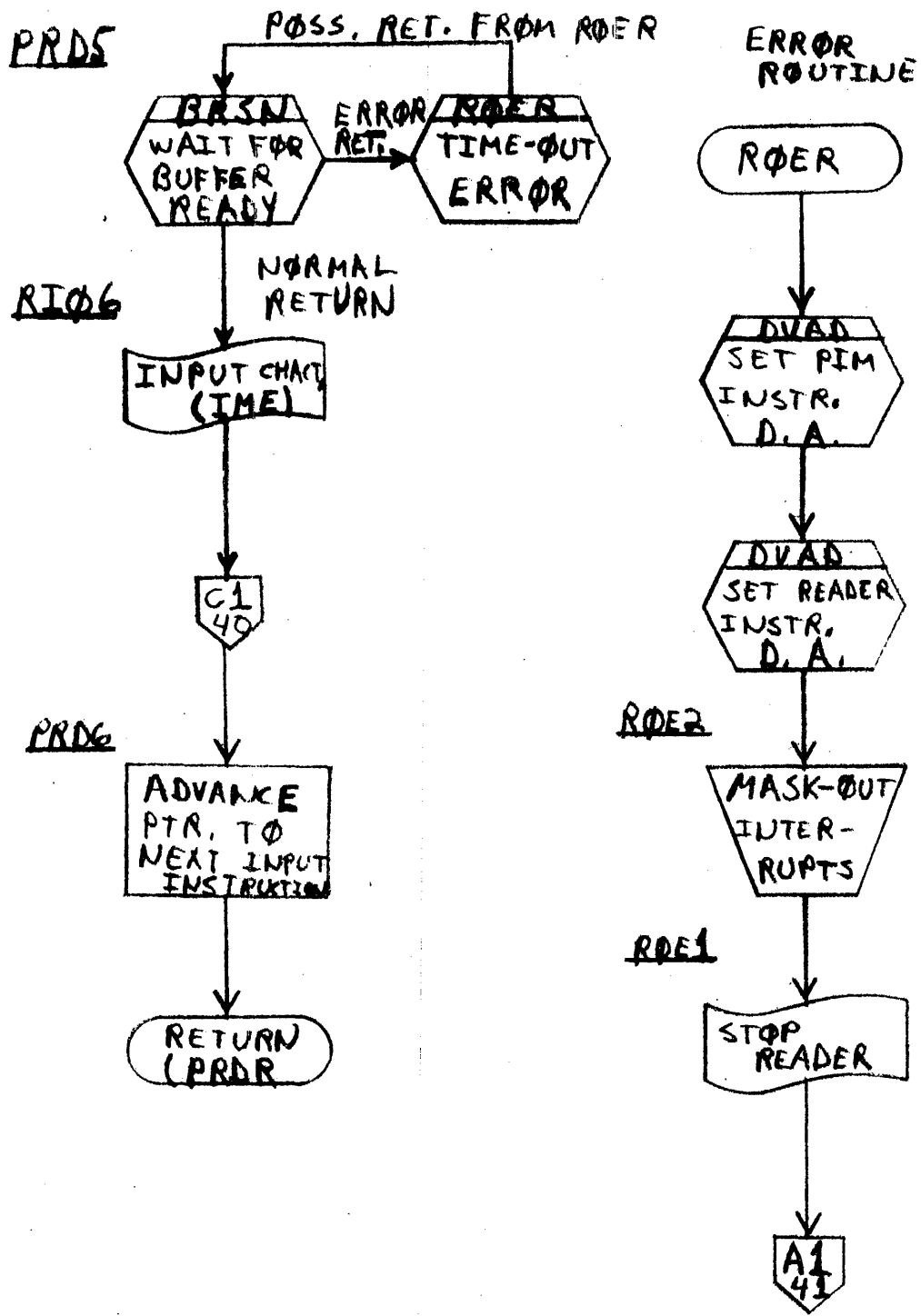
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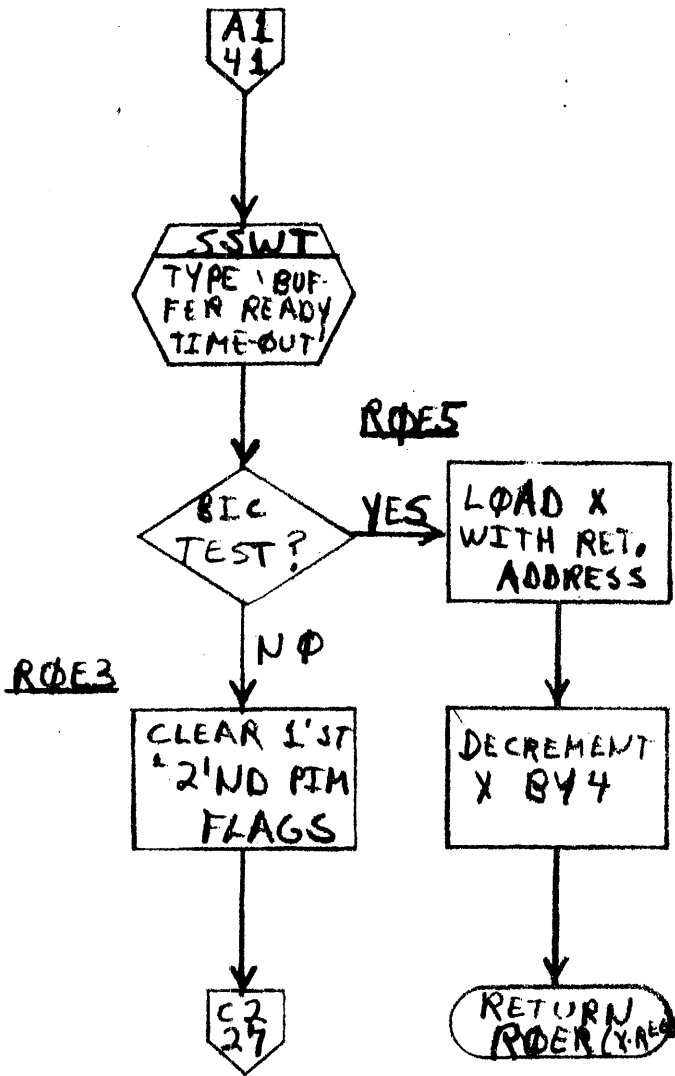
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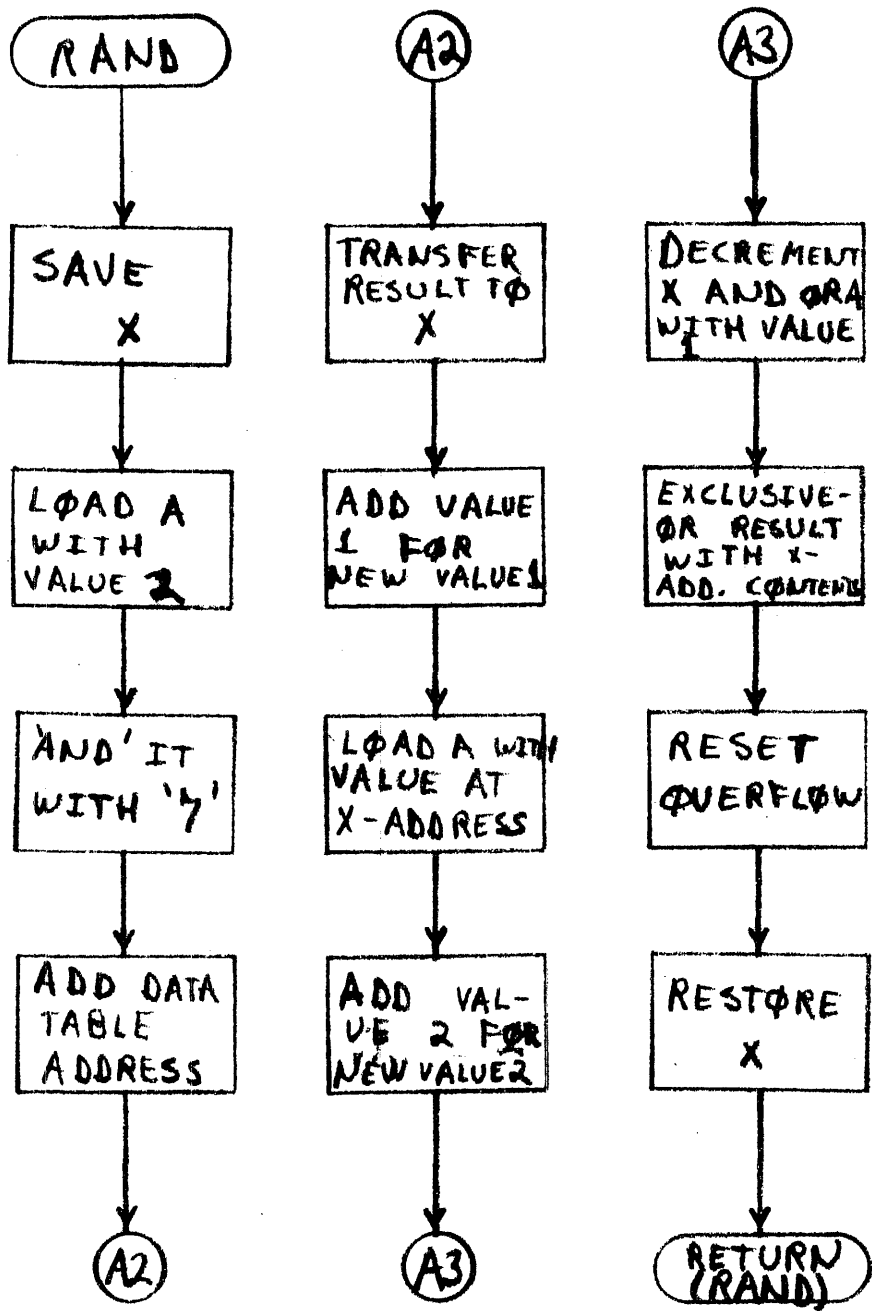
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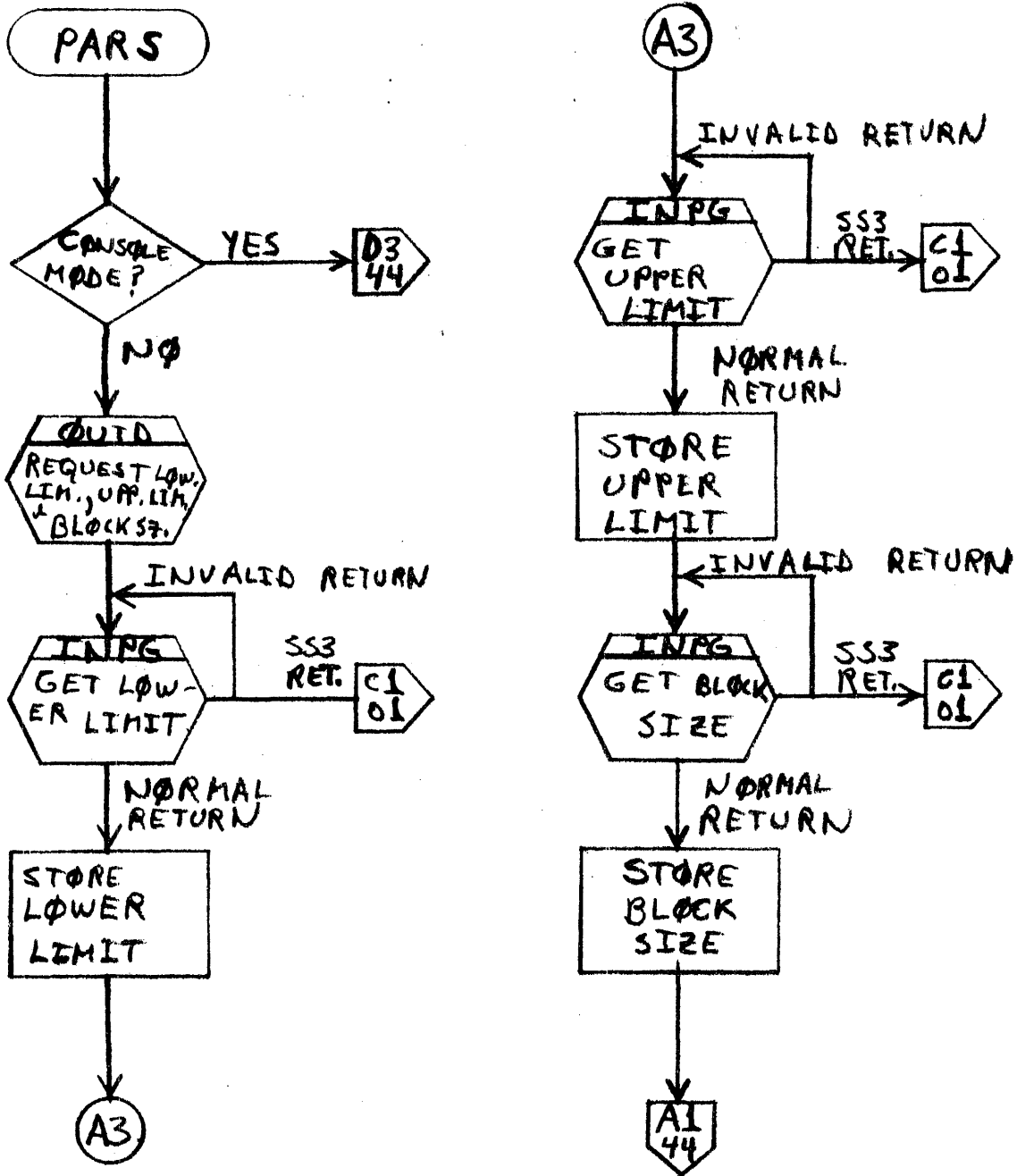
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PSUEDO-RANDOM NUMBER GENERATOR

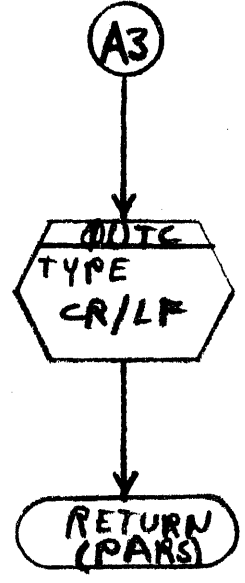
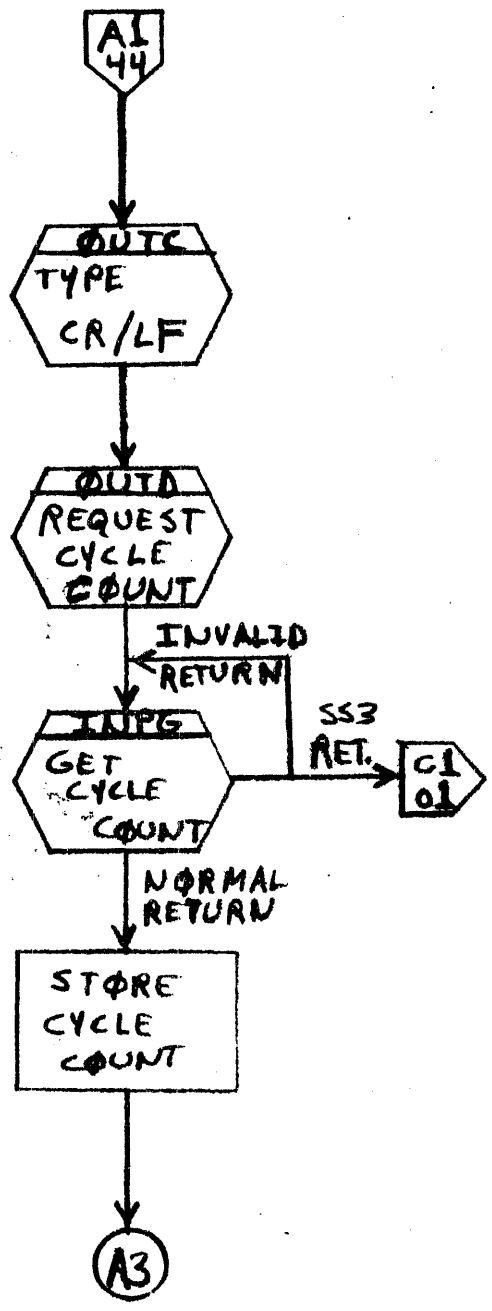


PARAMETER SETTING SUBROUTINE FOR PTST, RTST, & HTST

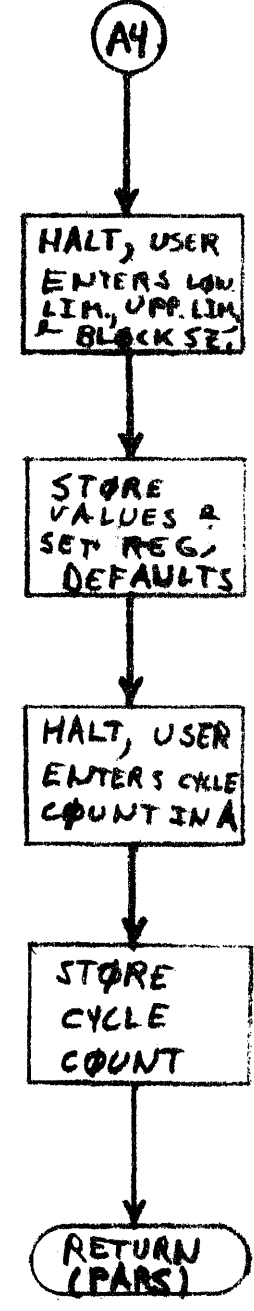
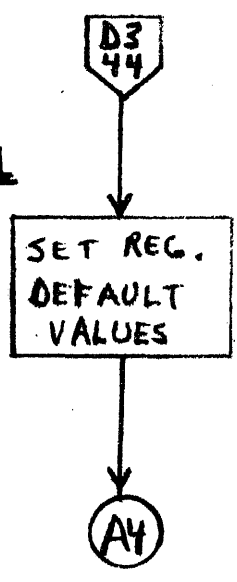


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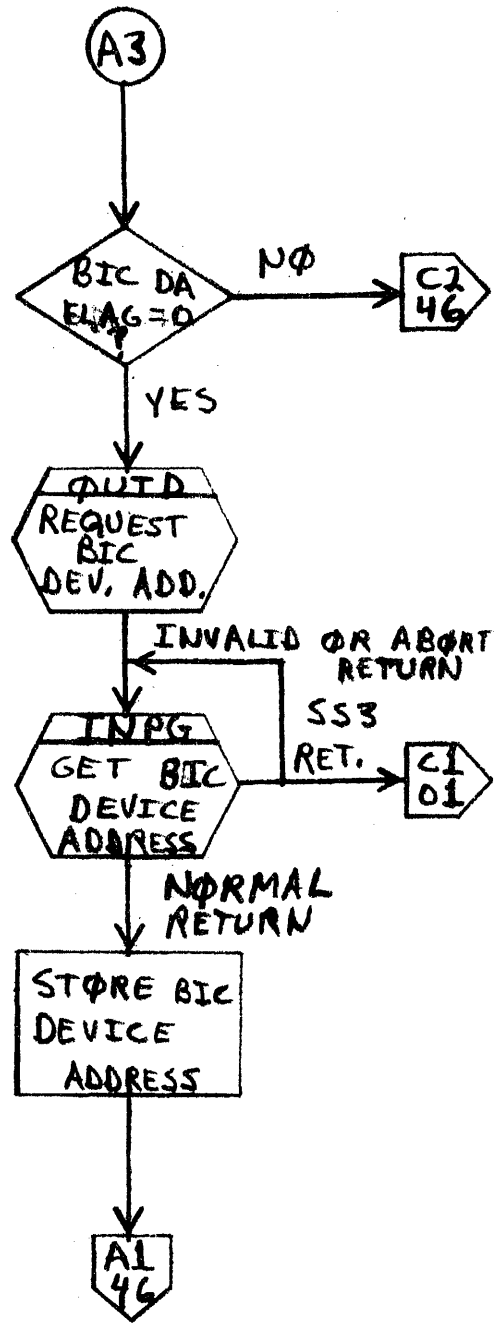
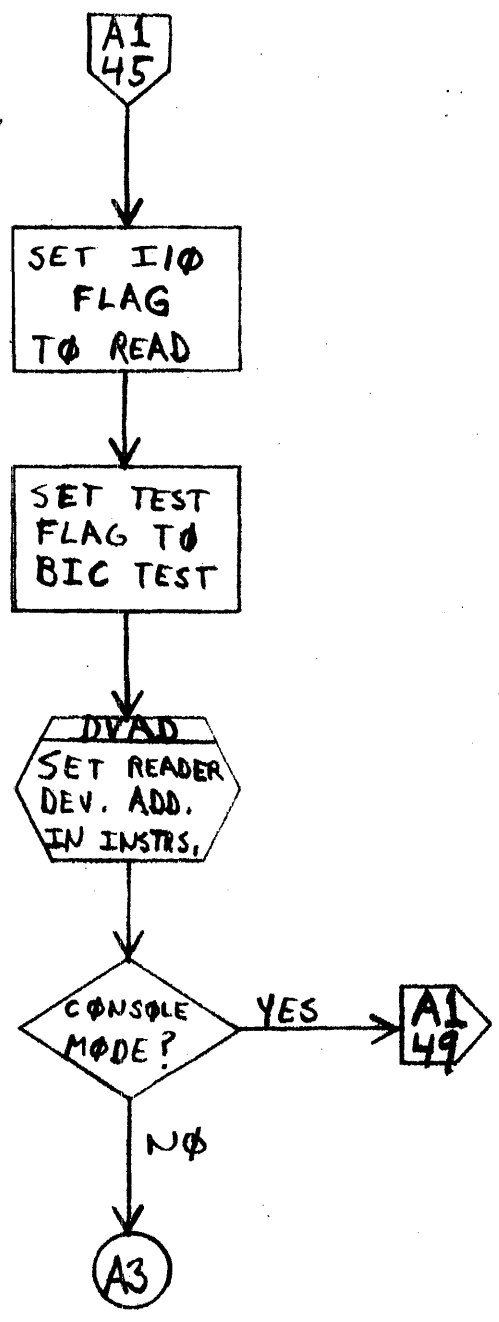
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PAR1



BTST

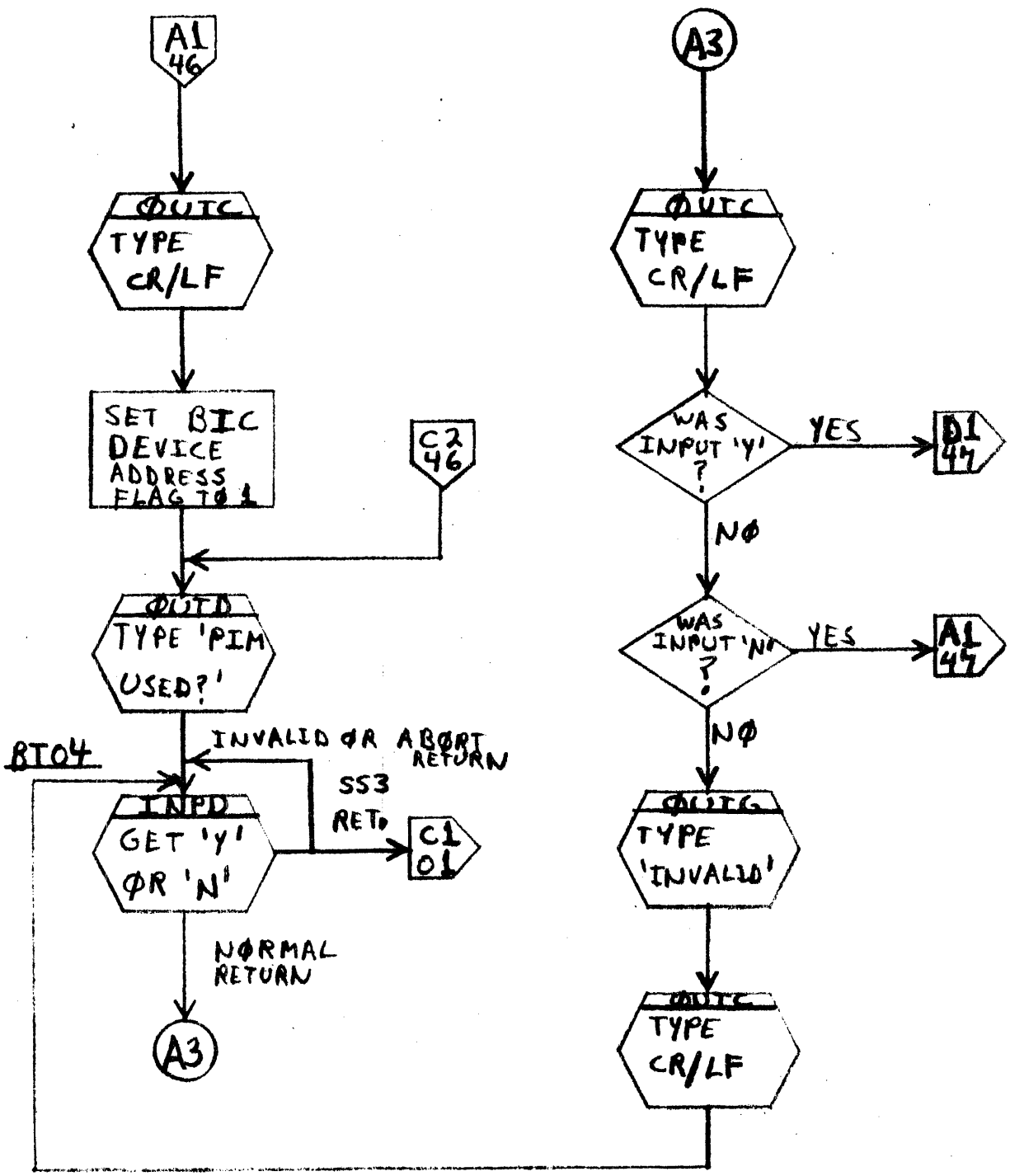


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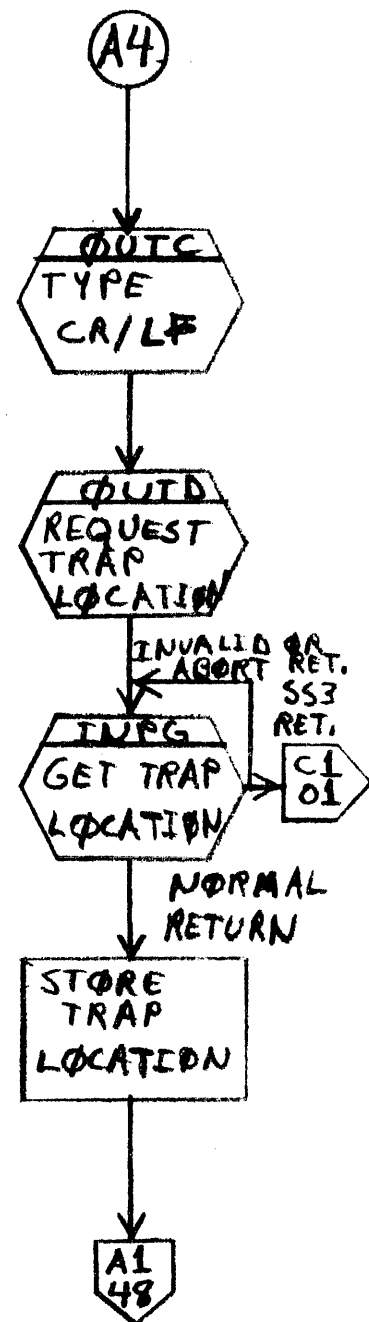
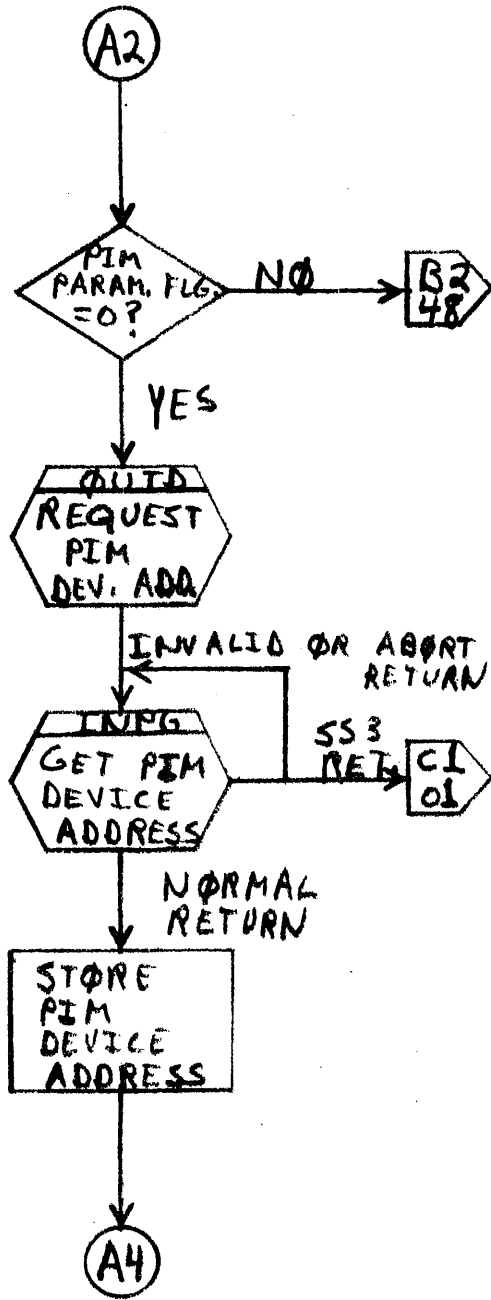
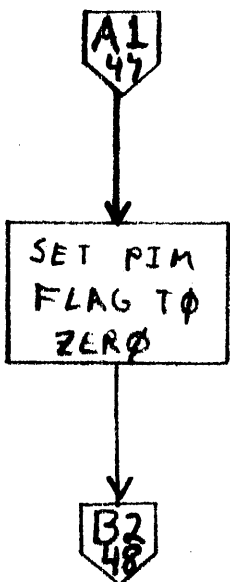
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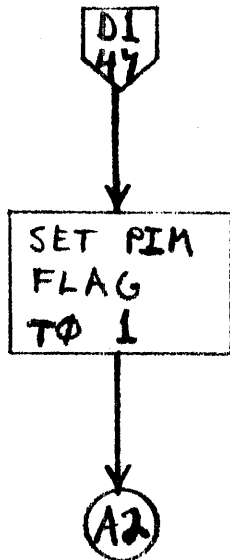
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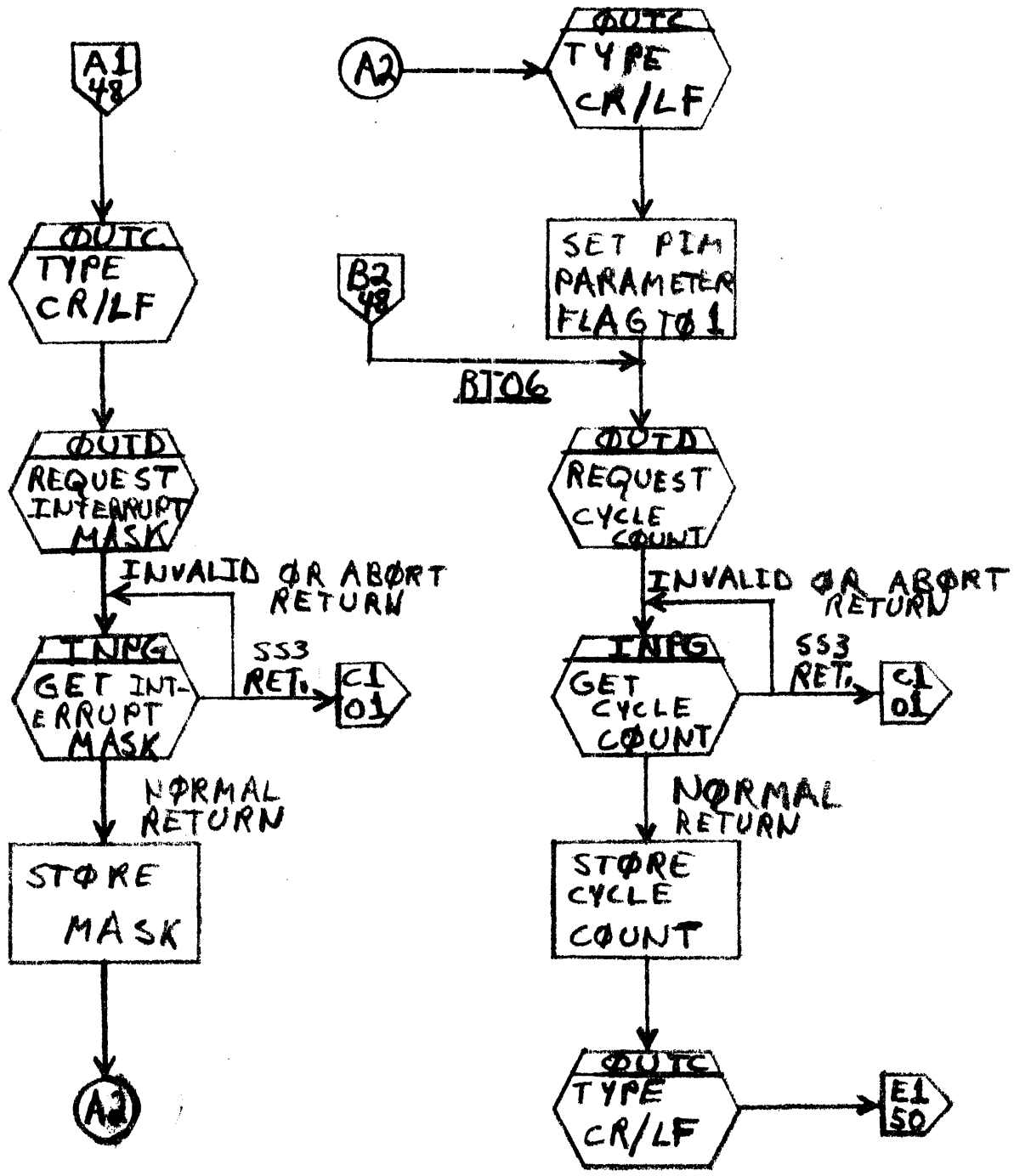


BIOS

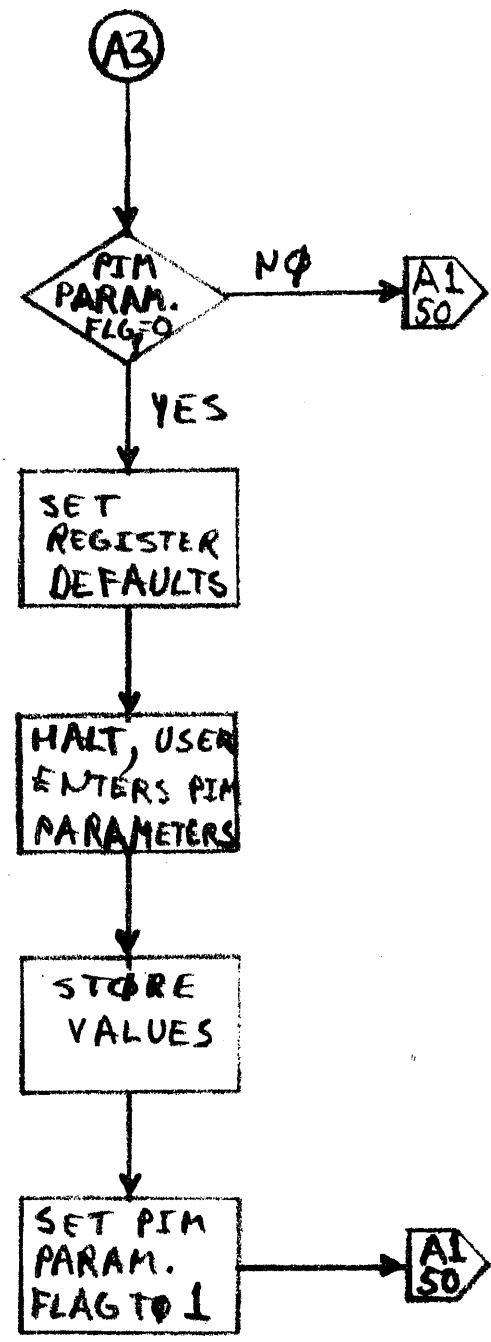
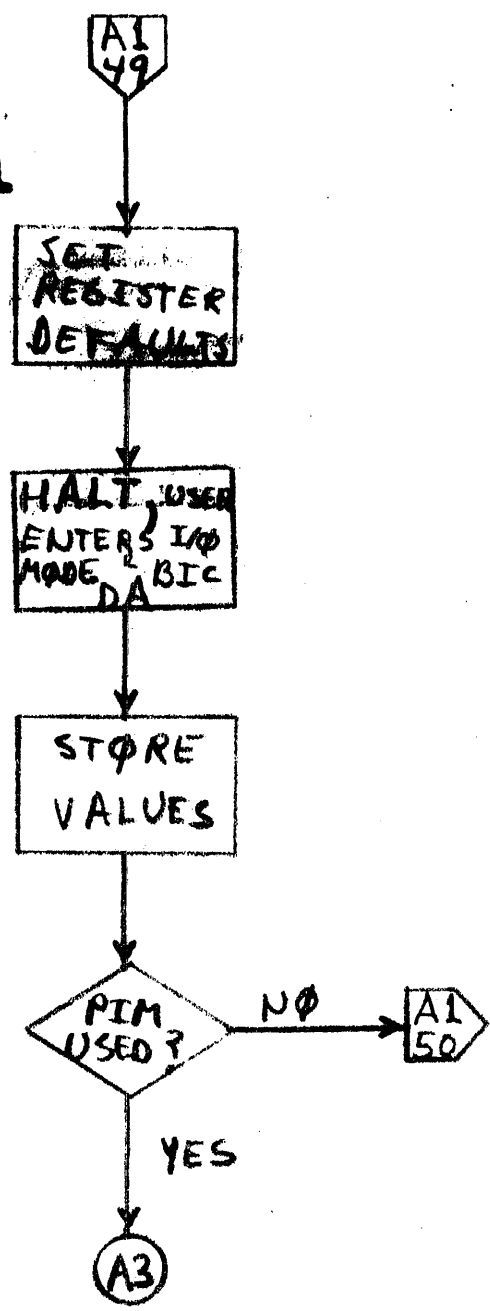


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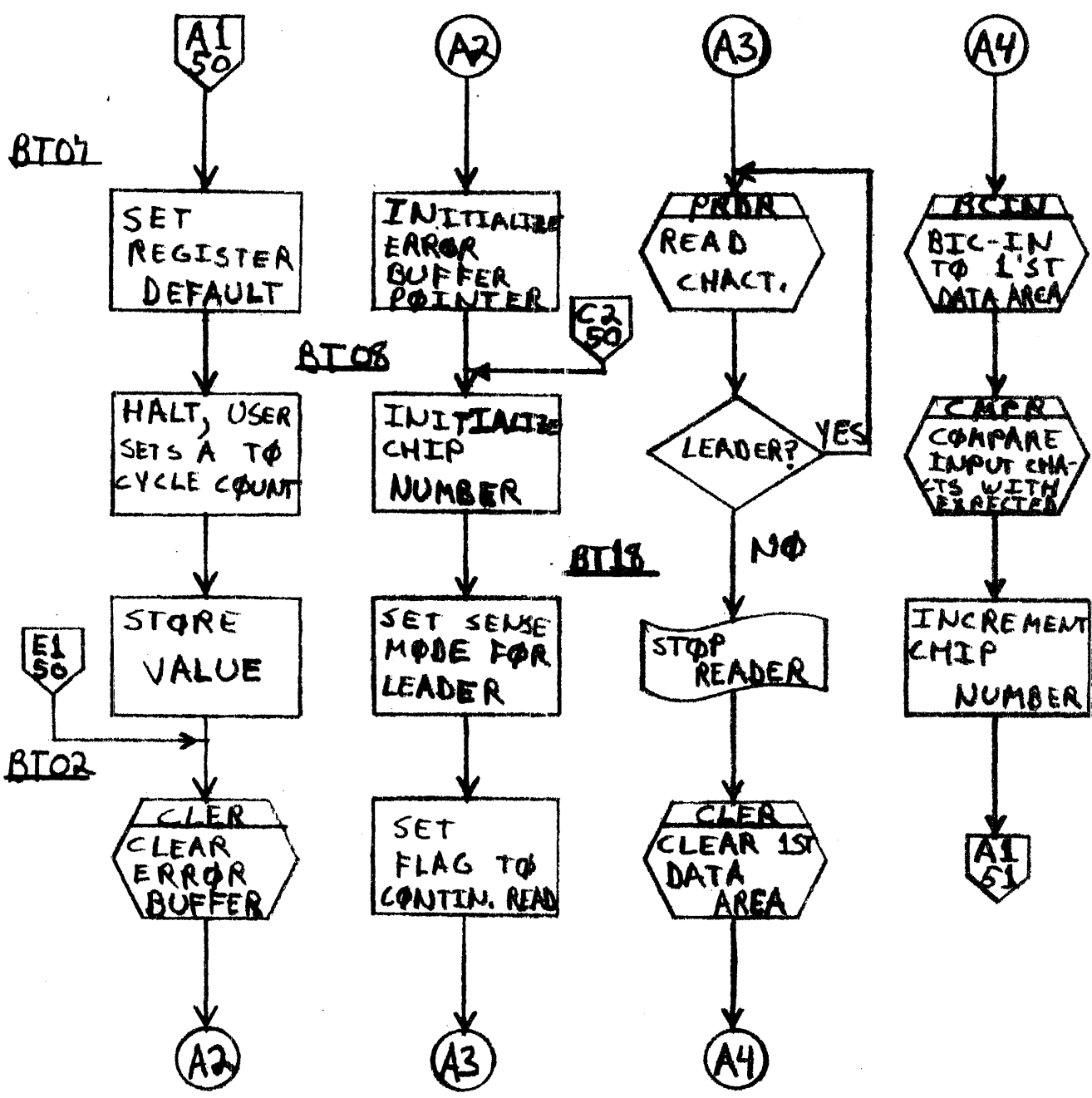
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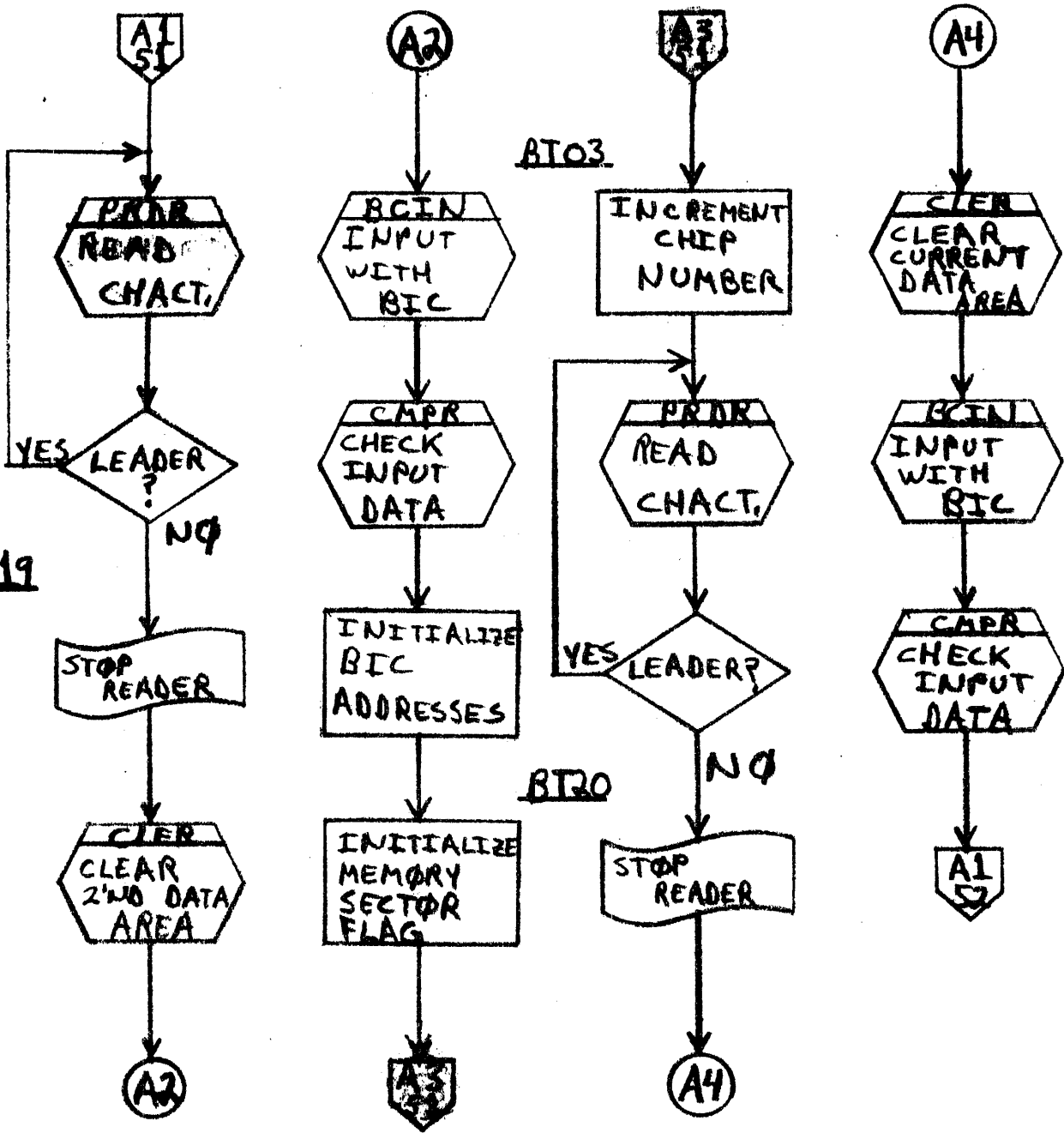
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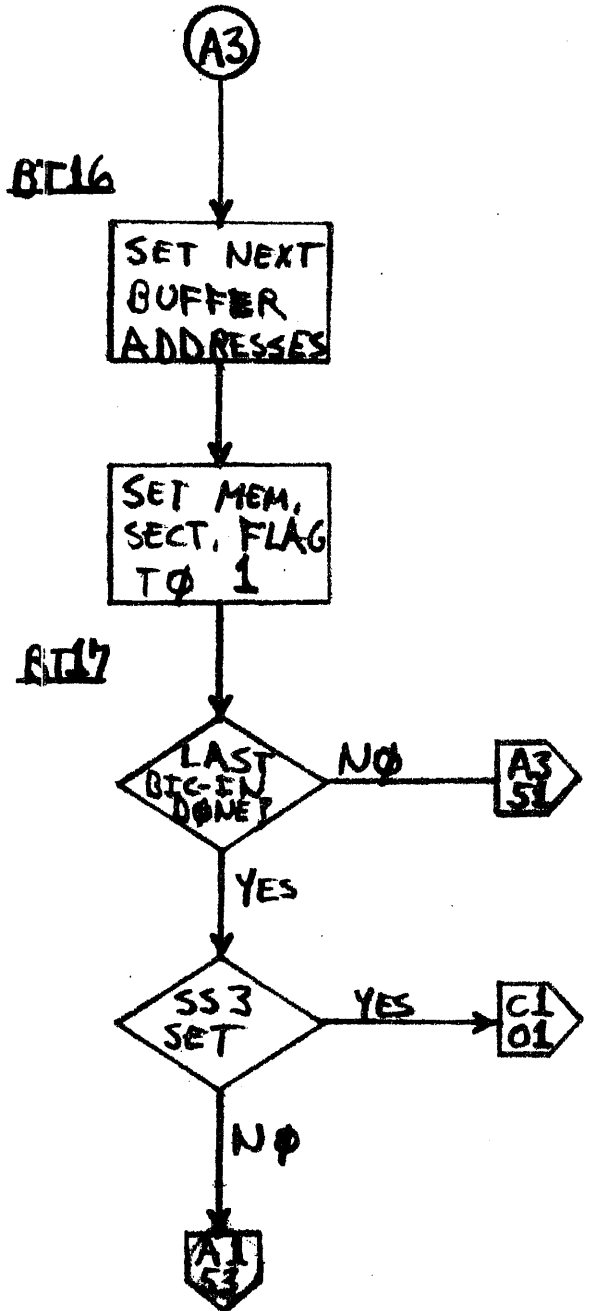
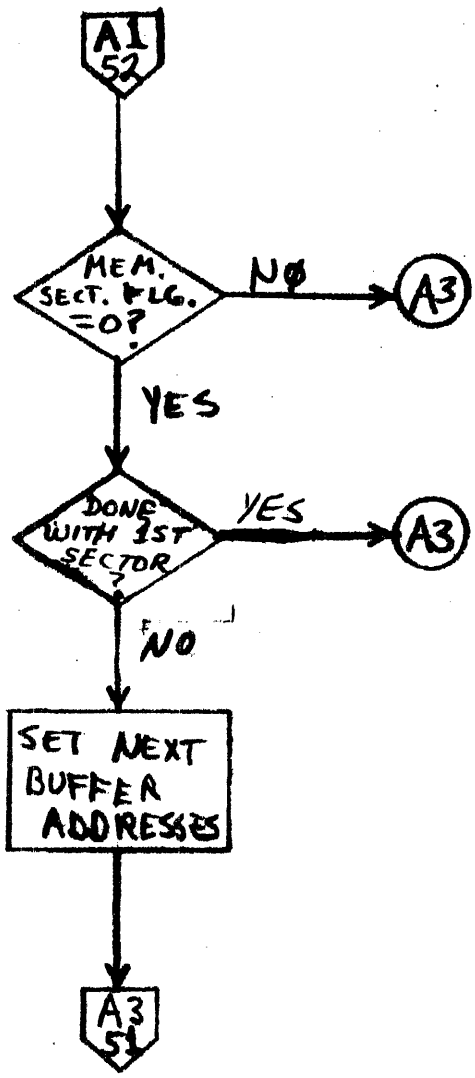
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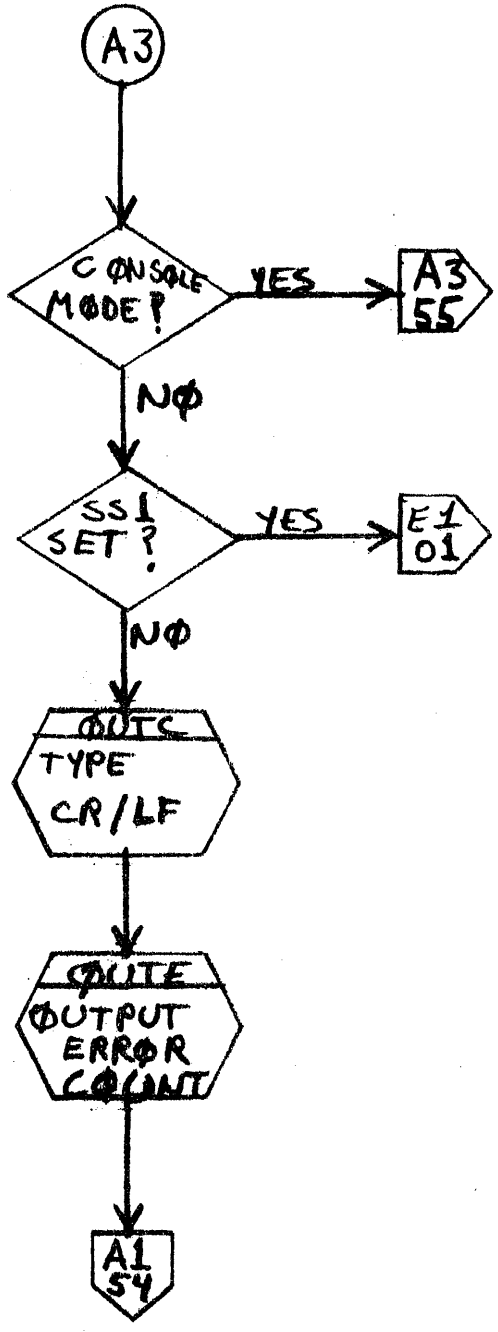
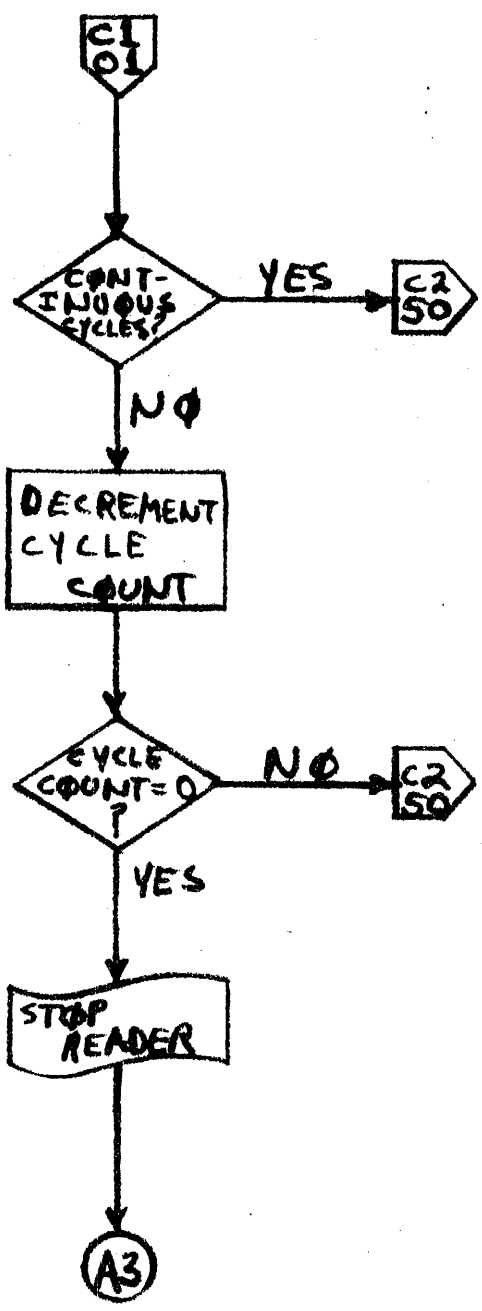
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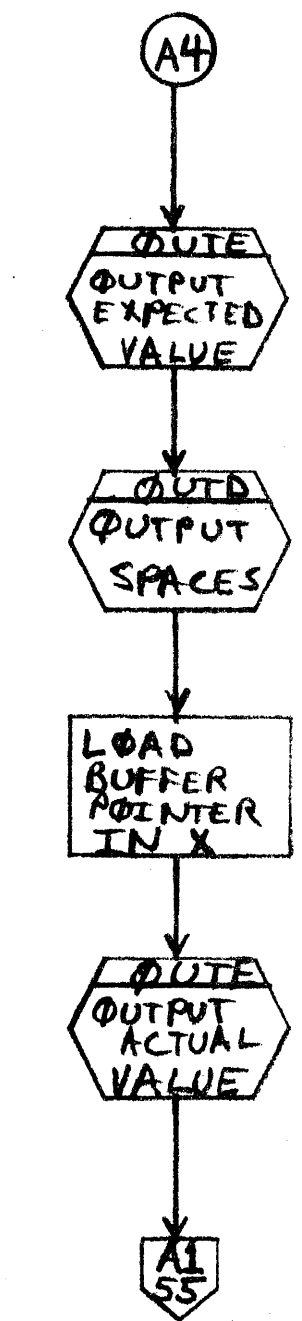
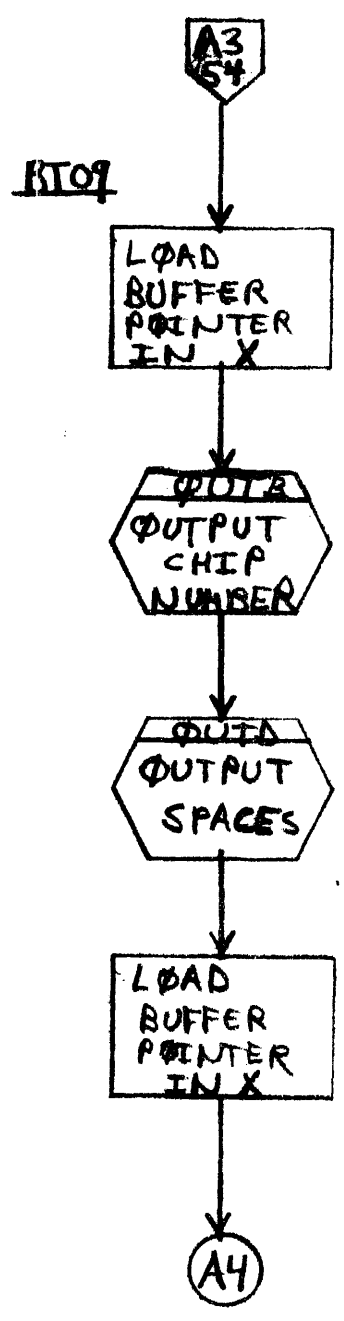
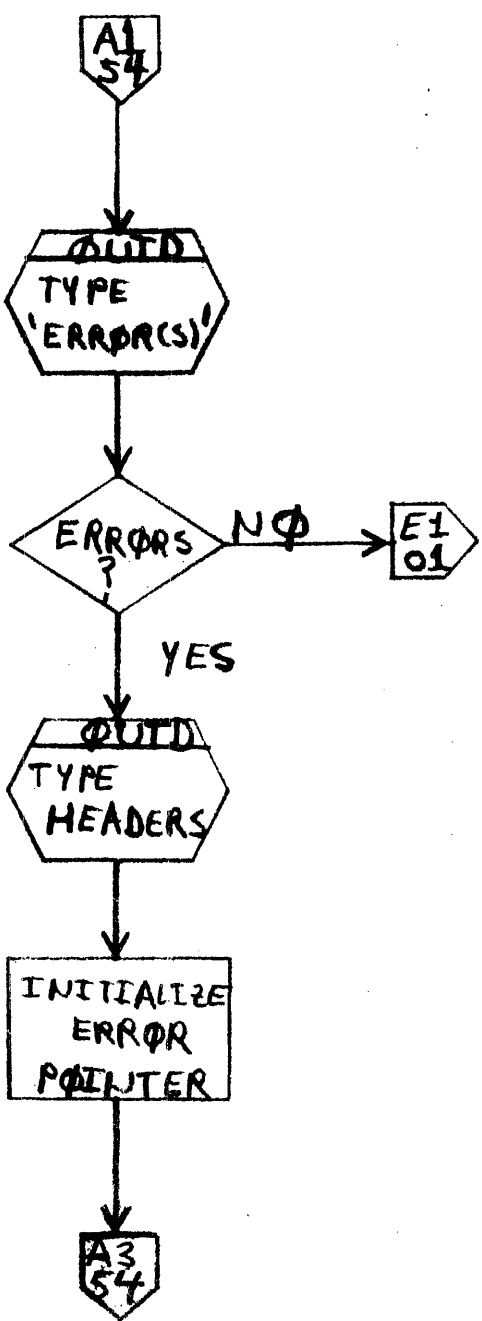


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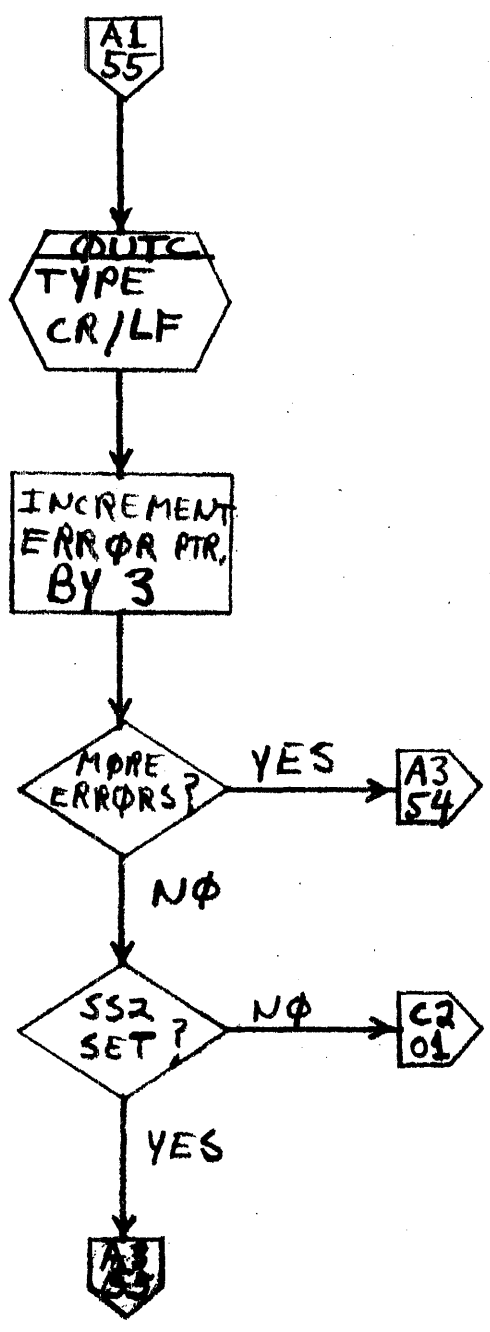


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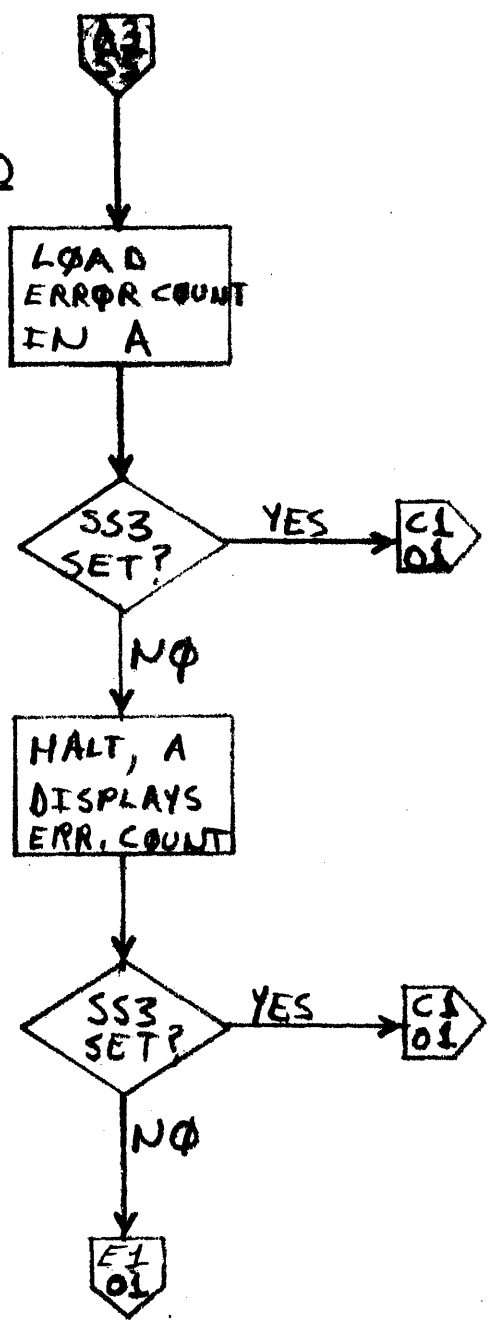
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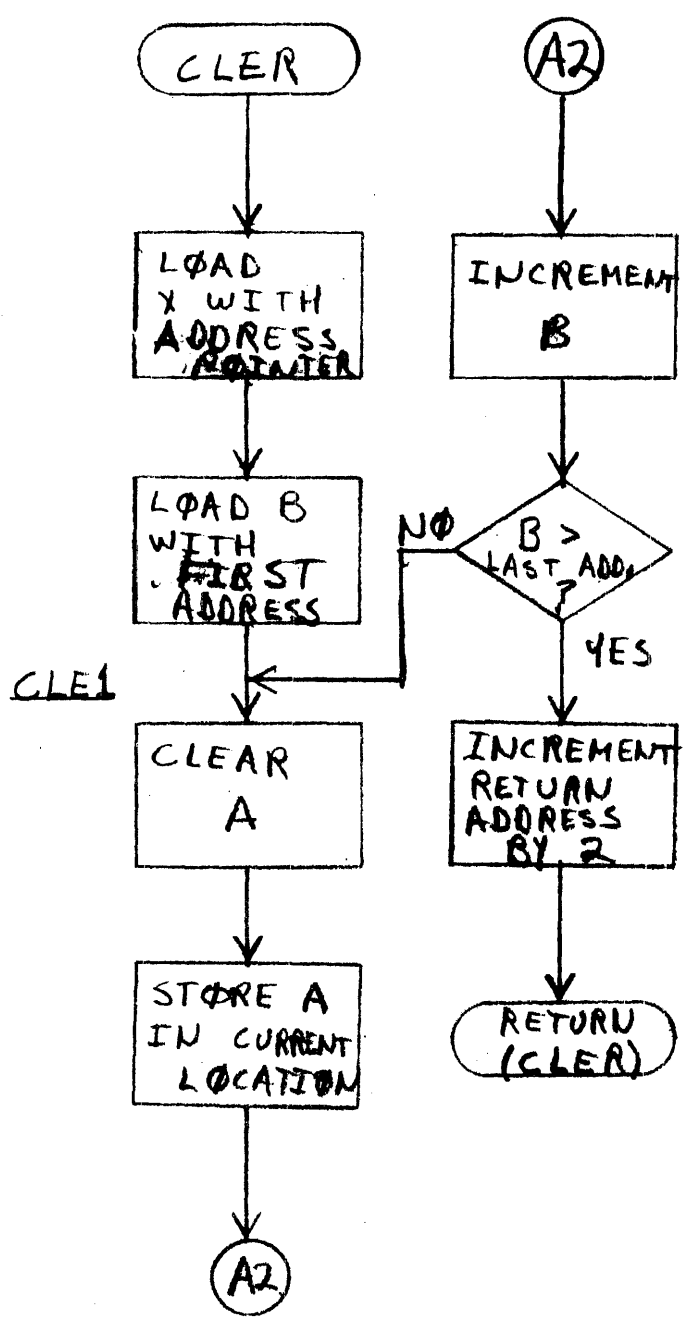
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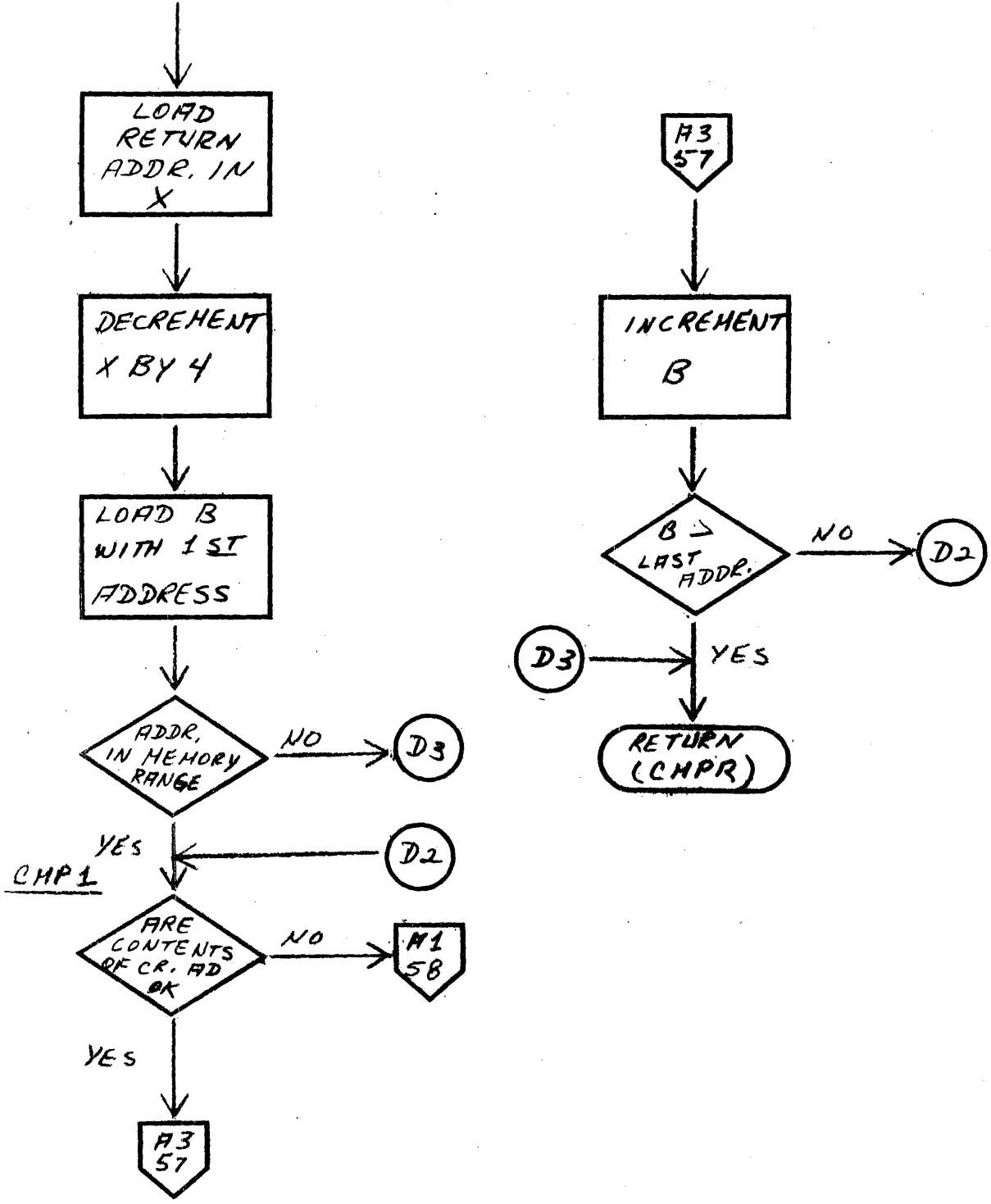
REV. **D**

BUFFER CLEARING SUBROUTINE

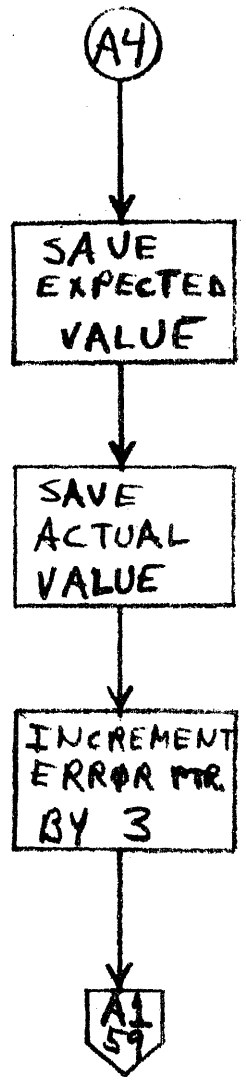
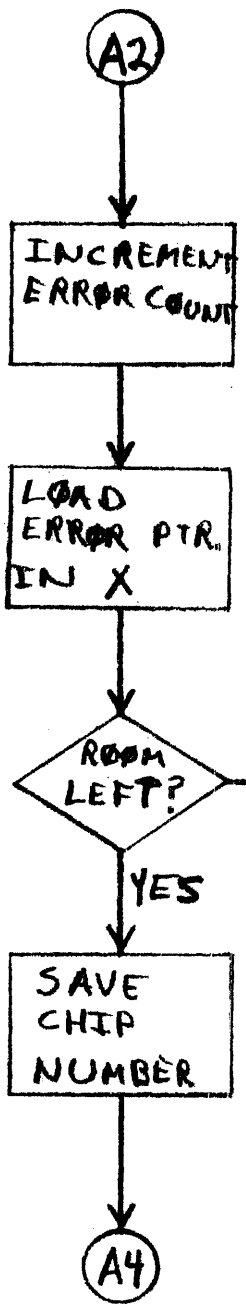
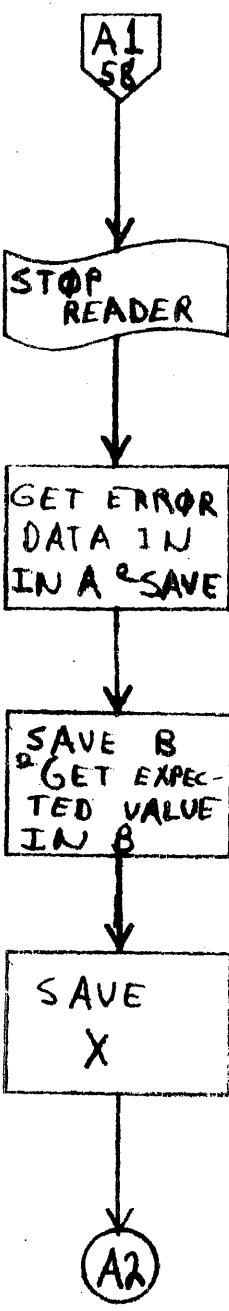


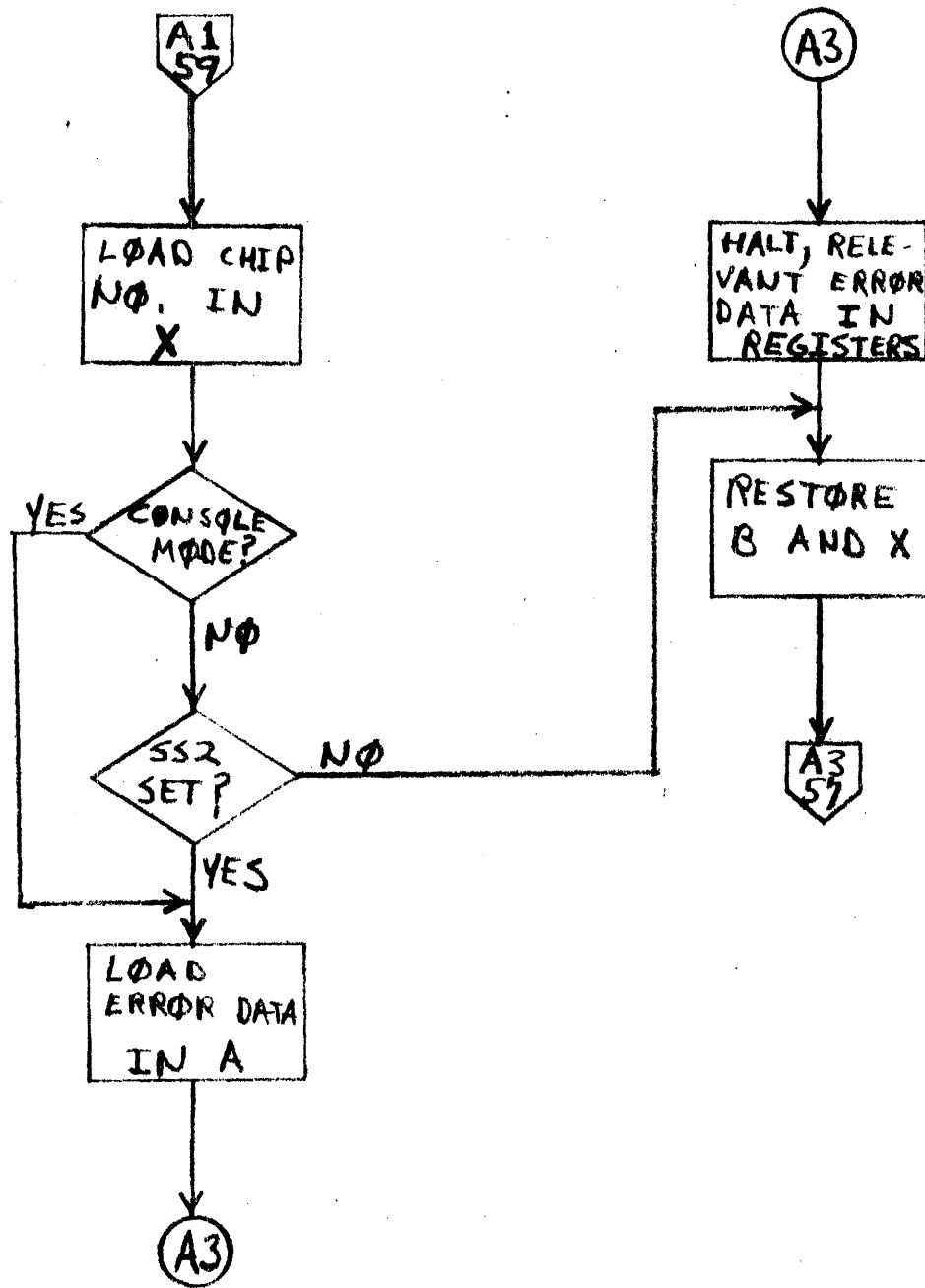
CMPR

COMPARE SUBROUTINE



CAPA





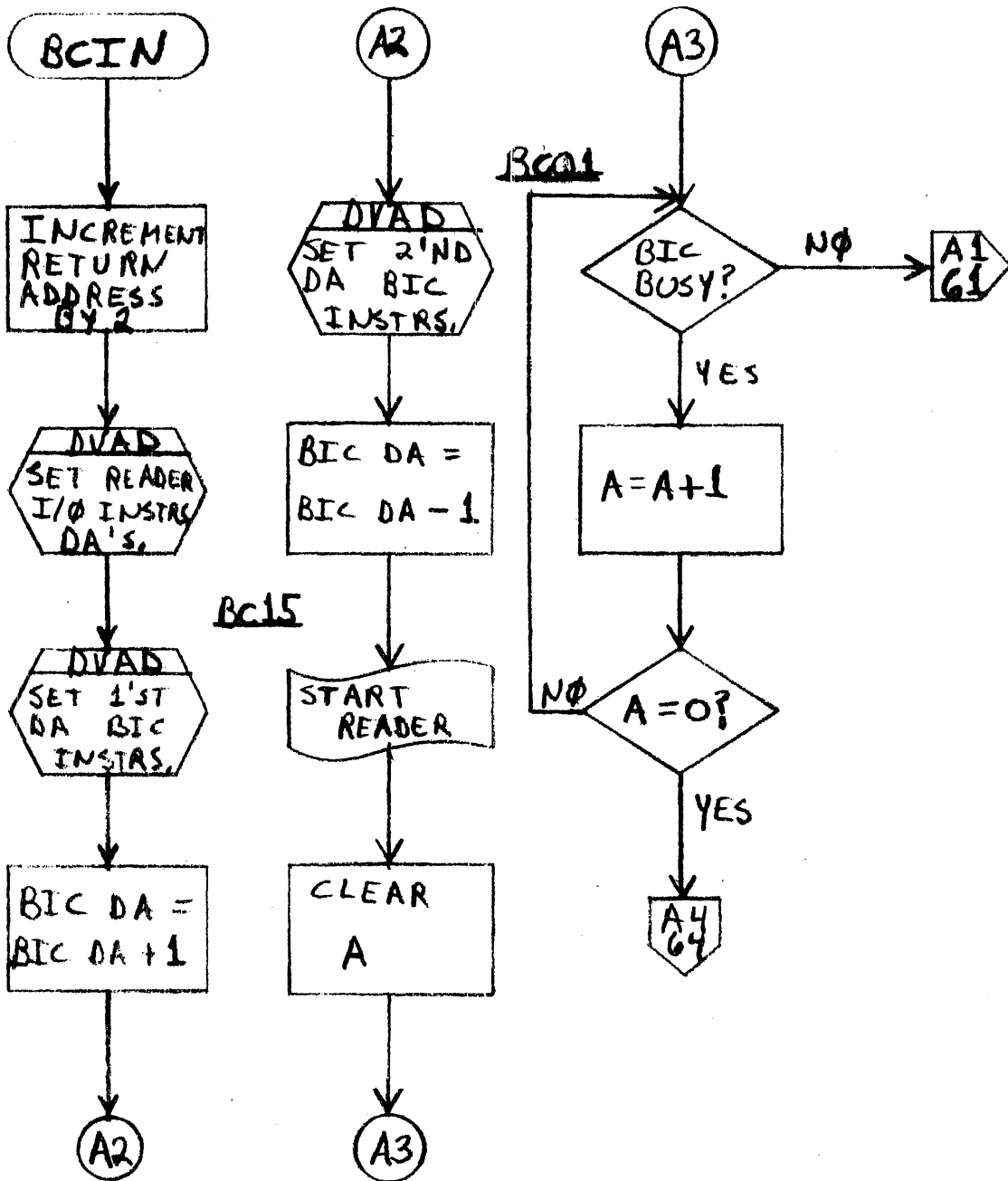
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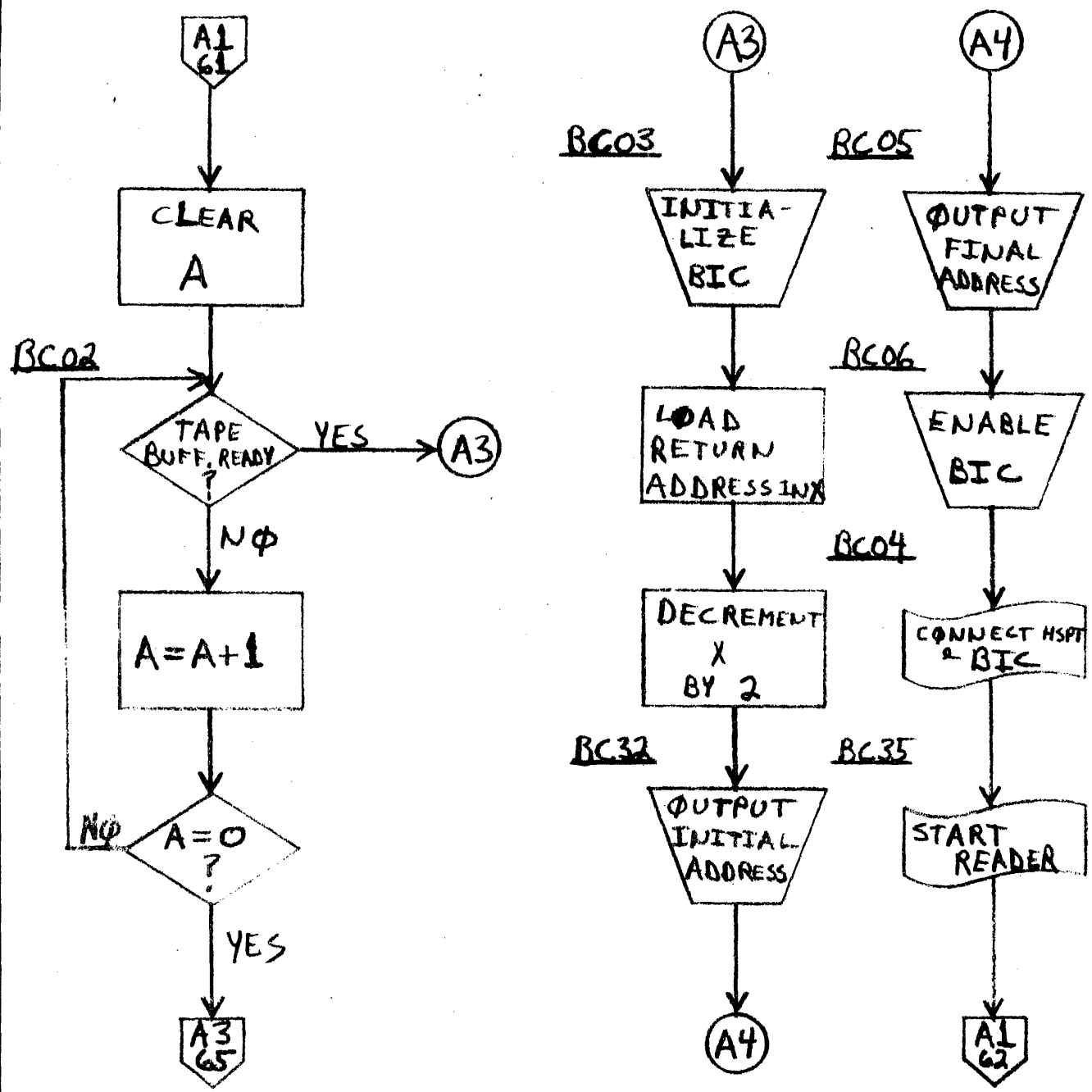
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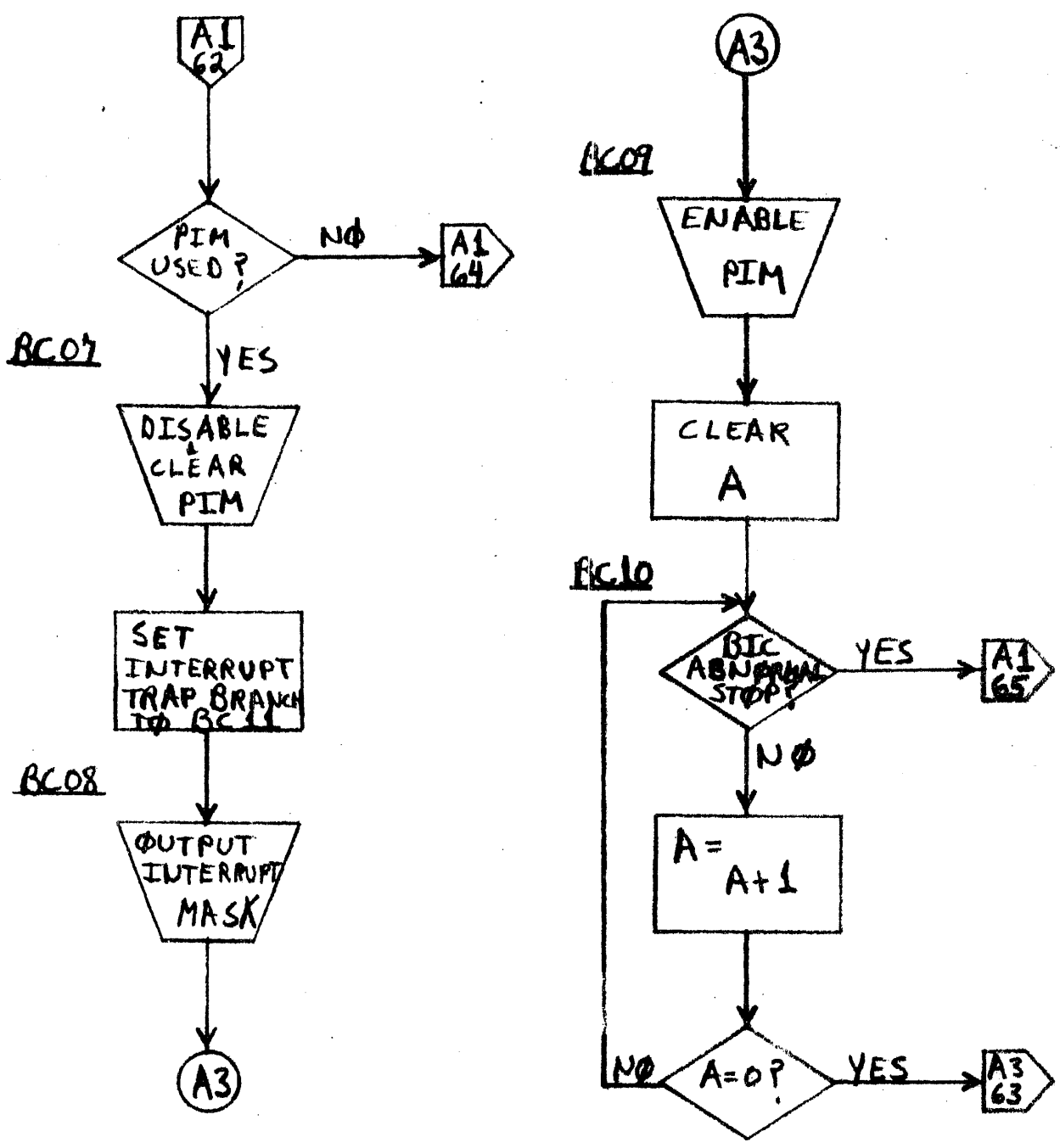
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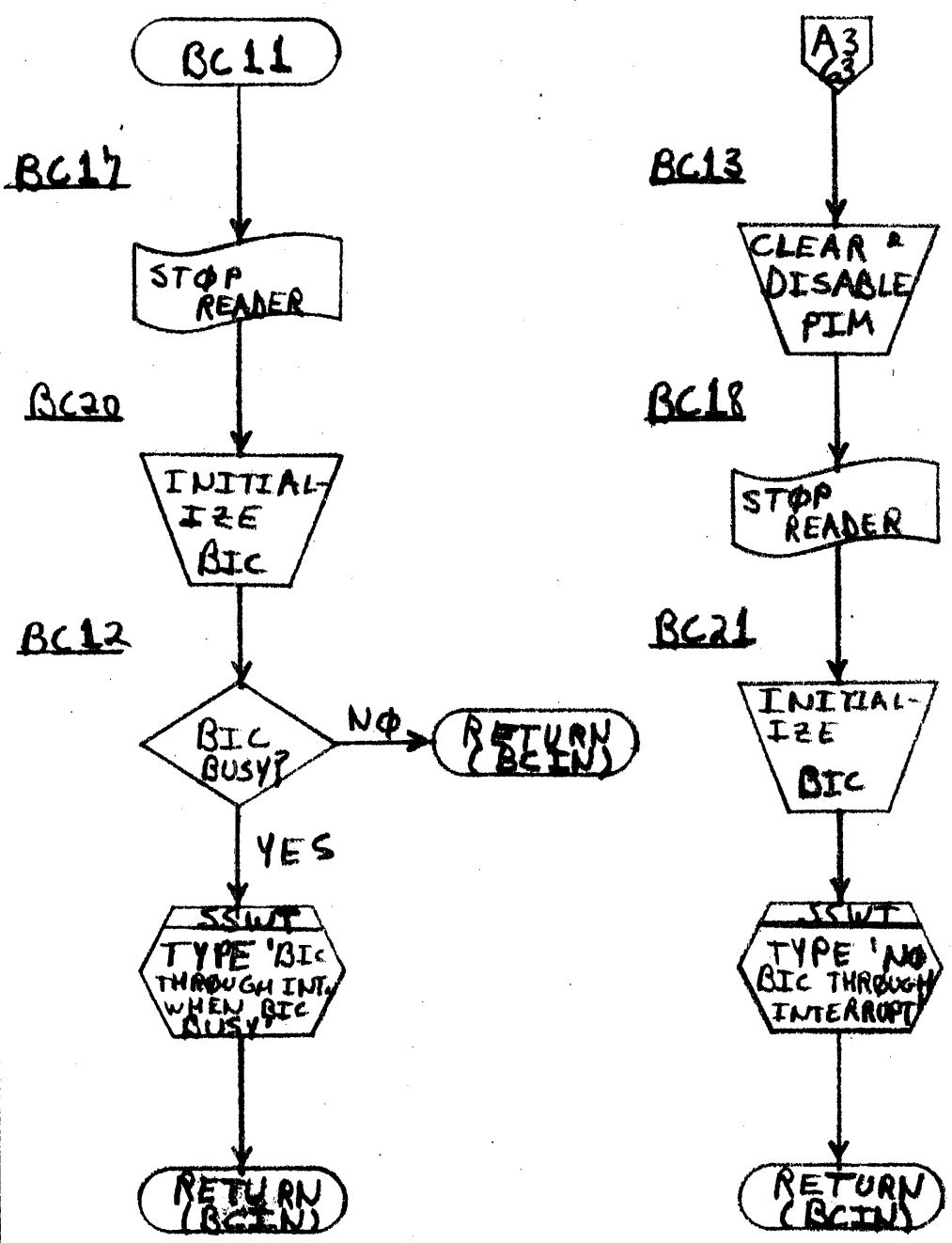
READ (BIC MODE, OPTIONAL END INTERRUPT)







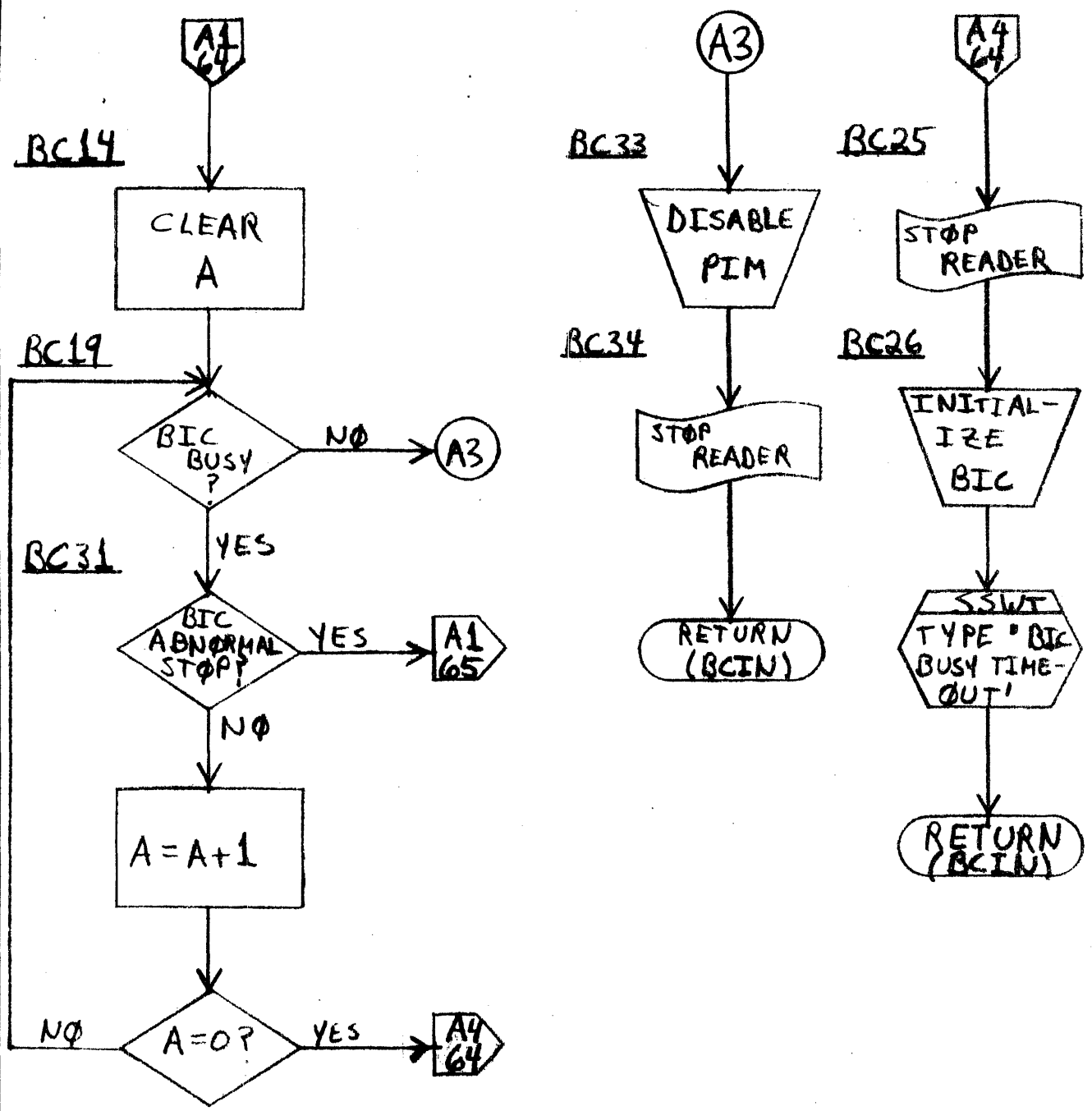
BIC-THROUGH INTERRUPT ENTRY

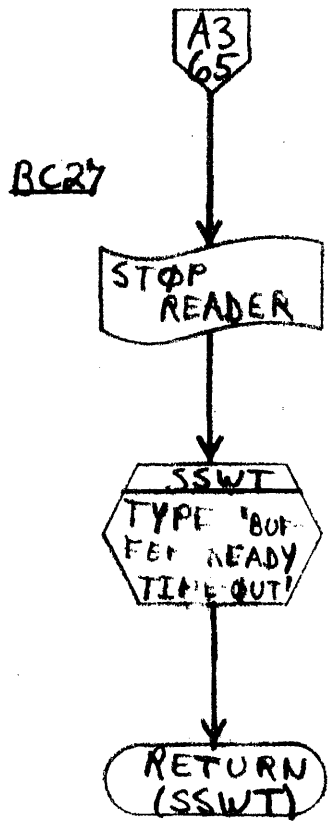
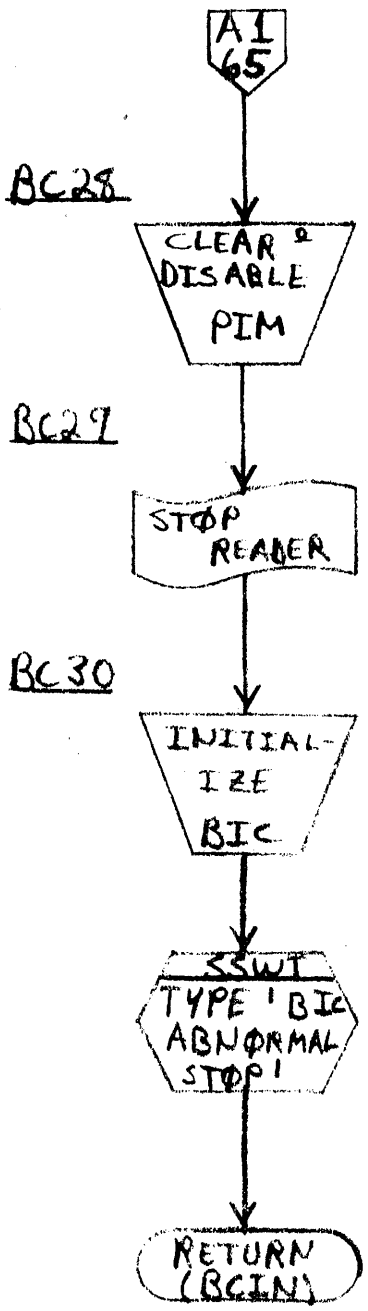


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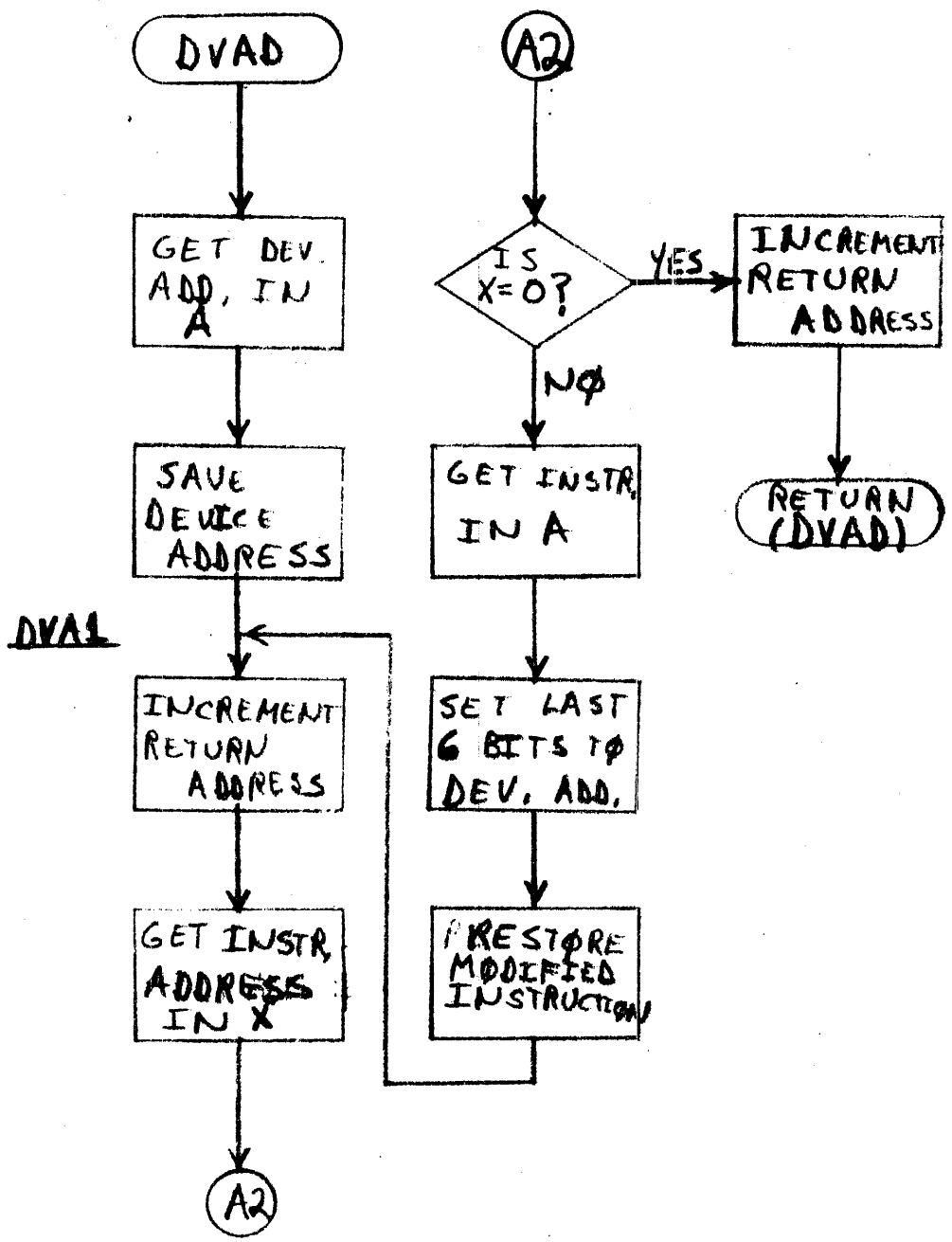
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DEVICE ADDRESS SETTER



SECTION 4
TEST SPECIFICATIONS

4.1 OBJECTIVES

The purpose of this section is to describe to what extent the program has been validated in terms of variations in applicable hardware, configurations and other external input parameters. Using the teletype mode of operation, actual hardcopy of each test variance is presented. This will provide an aid in evaluating future claimed discrepancies observed in the program.

4.2 CONFIGURATIONS

This program has been exercised on the following hardware configurations:

- 1) 622/i - 16K memory
- 2) 620/f - 32K memory

4.3 DETAILED DESCRIPTIONS

4.3.1 The following hard copy printout is provided to validate the responses received for each respective input.



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THIS IS THE 620 TEST EXECUTIVE
MEMORY SIZE IS 16K

L.

620 PAPER TAPE AND BIC TEST

PT PUNCH DA = 37.
PT READER DA =37.
BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

N

INPUT TEST TYPE

P.

BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

Y

PIM DA =40.

TRAP LOCATION = 100.

INTERRUPT MASK =376.

INPUT TEST TYPE

P,

INPUT LOWER DATA LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE
0,20,34.

CYCLES =3.

BIC TEST REQUESTED?

N

BIC USED?

Y

BIC DA =22.

INPUT TEST TYPE

P.

BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

N

INPUT TEST TYPE

R.

TIME DELAY =400000.

000000 ERROR(S)



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BIC TEST REQUESTED?
 N
 BIC USED?
 N
 PIM USED?
 Y
 INPUT TEST TYPE
 R.
 TIME DELAY =100000.
 000000 ERROR(S)

BIC TEST REQUESTED?
 N
 BIC USED?
 N
 PIM USED?
 N
 INPUT TEST TYPE
 N INVALID
 INPUT TEST TYPE
 H.
 000000 ERROR(S)

BIC TEST REQUESTED?
 N
 BIC USED?
 N
 PIM USED?
 Y
 INPUT TEST TYPE
 H.
 000000 ERROR(S)

BIC TEST REQUESTED?
 N
 BIC USED?
 Y
 INPUT TEST TYPE
 H.
 000000 ERROR(S)

BIC TEST REQUESTED?
 N
 BIC USED?
 N
 PIM USED?
 N
 INPUT TEST TYPE
 R.

TIME DELAY =0.
 000124 ERROR(S)

| EXPECTED | ACTUAL |
|----------|--------|
| 000000 | 000001 |
| 000001 | 000002 |
| 000002 | 000003 |
| 000003 | 000004 |
| 000004 | 000005 |
| 000005 | 000006 |
| 000006 | 000007 |
| 000007 | 000010 |
| 000010 | 000011 |
| 000011 | 000012 |



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BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

Y

INPUT TEST TYPE

H.

000123 ERROR(S)

| EXPECTED | ACTUAL |
|----------|--------|
| 000001 | 000000 |
| 000002 | 000001 |
| 000003 | 000002 |
| 000004 | 000003 |
| 000005 | 000004 |
| 000006 | 000005 |
| 000007 | 000006 |
| 000010 | 000007 |
| 000011 | 000010 |
| 000012 | 000011 |

BIC TEST REQUESTED?

N

BIC USED?

Y

INPUT TEST TYPE

H.

620 PAPER TAPE AND BIC TEST

PT PUNCH DA = 37.

PT READER DA =37.

BIC TEST REQUESTED?

N

BIC USED?

Y

BIC DA =

PT PUNCH DA = 37.

PT READER DA =37.

BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

Y

PIM DA =40.

TRAP LOCATION = 100.

INTERRUPT MASK =376.

INPUT TEST TYPE

R.

TIME DELAY =0.

000123 ERROR(S)

| EXPECTED | ACTUAL |
|----------|--------|
| 000001 | 000000 |
| 000002 | 000001 |
| 000003 | 000002 |
| 000004 | 000003 |
| 000005 | 000004 |
| 000006 | 000005 |
| 000007 | 000006 |
| 000010 | 000007 |
| 000011 | 000010 |
| 000012 | 000011 |



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BIC TEST REQUESTED?

Y

PIM USED?

N

CYCLES =1.

000005 ERROR(S)

| SECTION | EXPECTED | ACTUAL |
|---------|----------|--------|
| 1 | 000220 | 000221 |
| 2 | 000102 | 000103 |
| 3 | 000000 | 000001 |
| 5 | 000000 | 000001 |
| 7 | 000220 | 000221 |

BIC TEST REQUESTED?

Y

PIM USED?

N

CYCLES =1.

000006 ERROR(S)

| SECTION | EXPECTED | ACTUAL |
|---------|----------|--------|
| 1 | 000220 | 000221 |
| 2 | 000102 | 000103 |
| 3 | 000000 | 000001 |
| 5 | 000000 | 000001 |
| 7 | 000220 | 000221 |
| 7 | 000222 | 000223 |

BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

N

INPUT TEST TYPE

P,

INPUT LOWER DATA LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE
377,377,1.

CYCLES =1.

BIC TEST REQUESTED?

N

BIC USED?

N

PIM USED?

N

INPUT TEST TYPE

P,

INPUT LOWER DATA LIMIT, UPPER DATA LIMIT, AND DATA BLOCK SIZE
220,377,160.

CYCLES =1.

BIC TEST REQUESTED?



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