

APPENDIX

10. SCOPE

10.1 This Appendix contains the Program Data Pages, Data Flow Charts, and the Program Listings for the test programs for the UNIVAC 1219 B Computer.

10.2 Data Pages and Flow Charts location. - The Program Data Pages and Data Flow Charts are located as follows:

Specification Number	Program Test Title	Data Pages and Flow Charts	Program Listings
SB-10163-1	EIO (Input-Output)	45	128
SB-10163-2	Integrated Command-Arithmetic	157	624
SB-10163-3	Integrated Memory	161	836
SB-10163-4	Command	165	439
SB-10163-5	Arithmetic	543	624
SB-10163-6	Control Memory	666	737
SB-10163-7	Main Memory	766	836
SB-10163-8	Input-Output Signals	869	875

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SPECIFICATION SYMBOL  
SB-10163

TITLE: INPUT/OUTPUT TEST

DECK IDENTIFIER: FACT

CS-1 LABEL: EIO KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by FLR DATE: 8 Dec. 67

NUMBER OF  $L_4$  OUTPUT INSTRUCTIONS: 163

#### DESCRIPTION:

This routine is the executive routine for the Input/Output Test. In addition to controlling execution of the test, this routine processes the parameters necessary for the Externally Specified Index, Externally Specified Address, and Continuous Data Mode modes of operation.

TITLE: INPUT/OUTPUT TEST**INPUT PARAMETERS (Listed Sequentially):**

AL register - Output channel number	CDMBIT - CDM bit
AU register - Maximum channel index	ESABUF - ESA data
INIT3 - Mode of operation index	ESABUF+1 - Externally Specified Address
CDMASK - CDM MASK	ZILCH - zero
INCHA - Input channel number	
CHOUT - Output channel number	
DO+2 - Output TBCW	
DO+3 - Output IBCW	
DO+5 - Input TBCW	
DO+6 - Input IBCW	

**OUTPUT PARAMETERS (Listed Sequentially):**

DO+2 - Output TBCW  
 DO+3 - Output IBCW  
 DO+5 - Input TBCW  
 DO+6 - Input IBCW  
 FLAG1 - Input Monitor flag  
 FLAG - Output Monitor flag

**ABNORMAL EXITS (Listed Sequentially):**

MNER - Monitor interrupt received on wrong channel

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

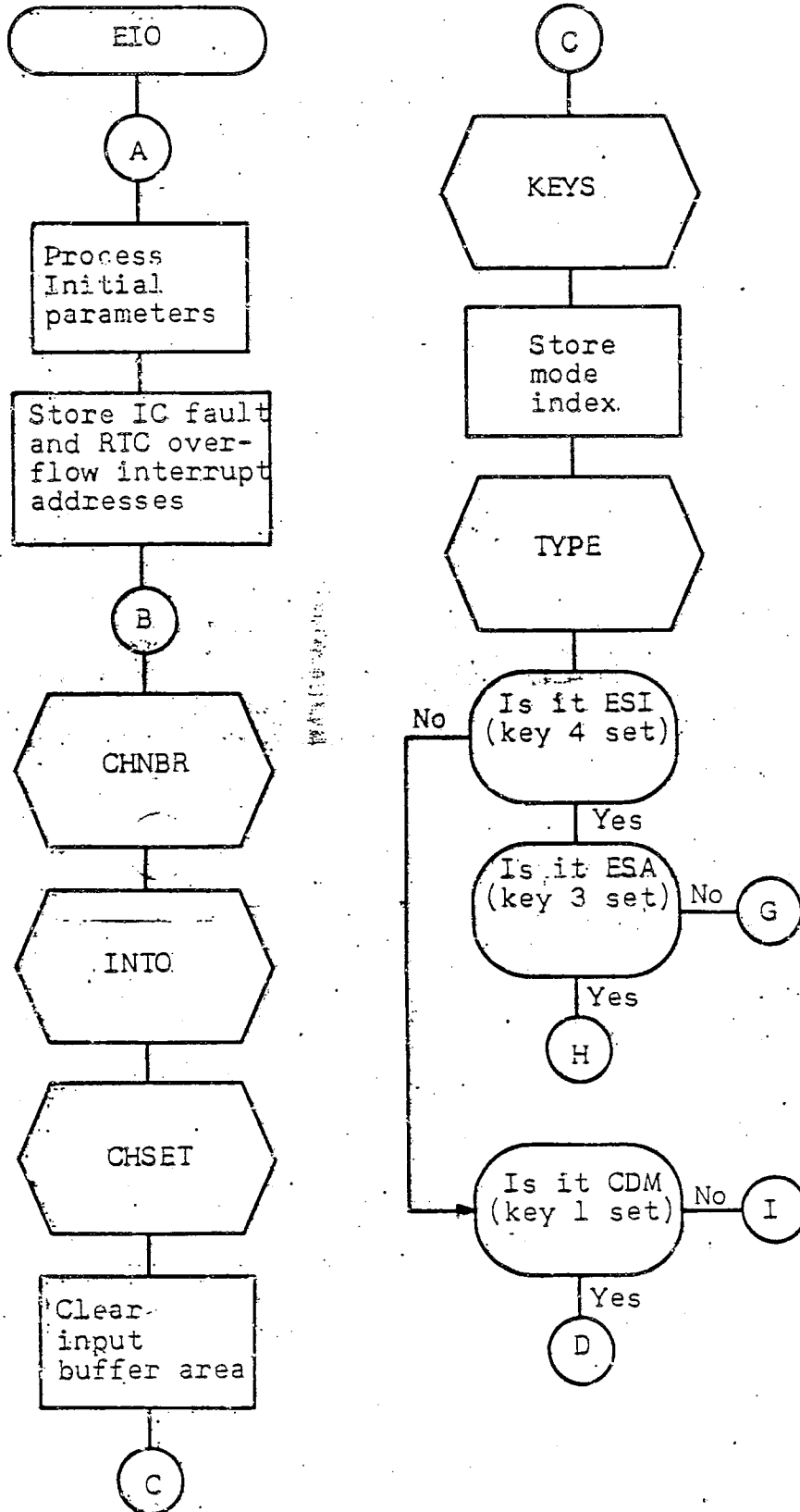
DO	CLKOF
MON	CLKM
GARD	INTO
VERFY	CHSET
ICFLT	CHNBR
EFINT	KEYS

**SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

If PROGRAM STOP 0 is set, the computer will stop when an error is detected. The error indications are as follows:

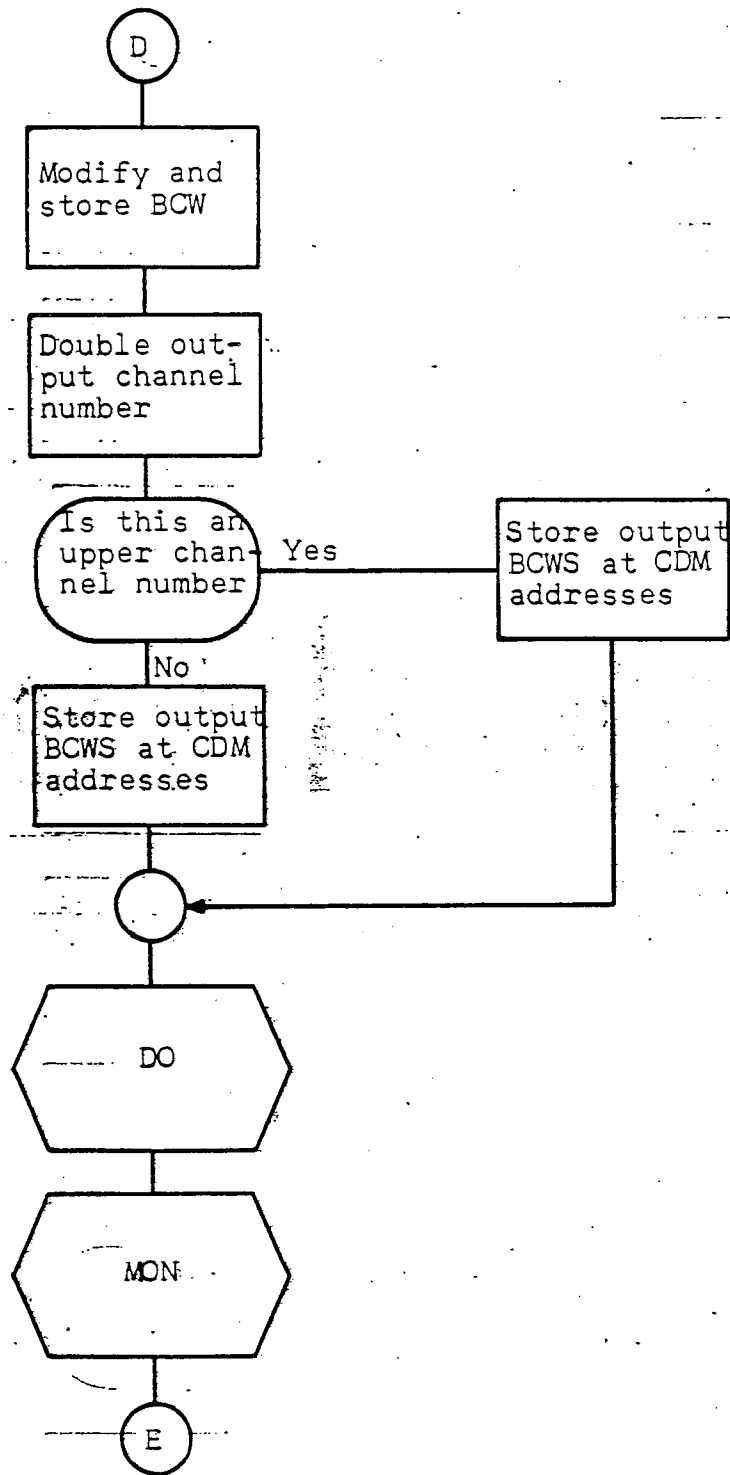
P Register	Type of Error and Error Indication
1210	ESA error AU = Correct data word AL = Incorrect data word
1421	Input or output monitor interrupt not received. If AU = 77777 and AL = 0, input monitor interrupt was not received. IF AU = 0 and AL = 0, both input and output monitor interrupt not received.
1472	Guard error. Input data overlapped initial or terminal buffer limit. AL = word found overlapping.
1520	Verify error (ESI mode) AU = Correct word (output) AL = Incorrect word (input)
1531	Verify error (CDM - 1st data transfer) AU = Correct word AL = Incorrect word
1542	Verify error (CDM - 2nd data transfer) AU = Correct word AL = Incorrect word
1567	Verify error (CDM - 3rd data transfer) AU = Correct word AL = Incorrect word
1600	Verify error (CDM - 4th data transfer) AU = Correct word AL = Incorrect word
1611	Verify error (Single or Dual Mode) AU = Correct word AL = Incorrect word
1624	Monitor error. Input or output monitor interrupt received for channel other than the one being tested. AL = 777777
1656	ESI Interrupt error. Index was not correctly stored at Monitor address +1 for channel being tested. AU = Correct index AL = Incorrect index

P Register	Type of Error and Error Indication
1723	Intercomputer Timeout Interrupt error. Interrupt received too soon or not at all. AU = Value of clock. AL = 1777, interrupt received too soon. AL = 4003, interrupt received too late or not at all.
2056	External Interrupt Error. External Function sent but External Interrupt not received AL = 777777
2062	External Interrupt Error. External Interrupt word received does not equal the External Function word sent. AU = External Function word AL = External Interrupt word
2075	External function monitor error. Interrupt not received.
2103	External function monitor error. Interrupt received for channel other than the one being tested.
2120	External Interrupt Error. External Interrupt received for channel other than the channel being tested. AL = 777777
2143	RTC Overflow Interrupt error. Interrupt not received. AL = 777777
2177	RTC Monitor Interrupt error. Interrupt received too late or not at all. AL = 777777

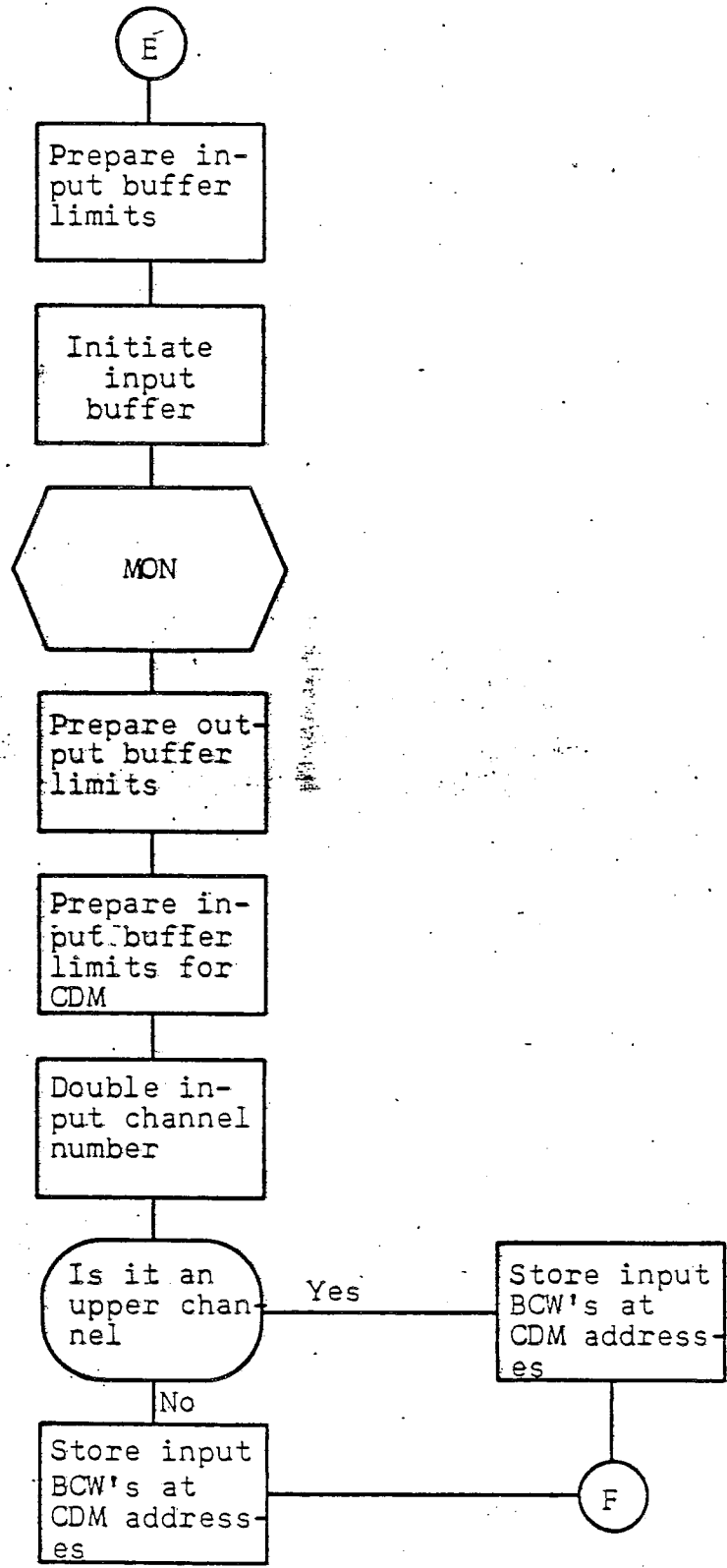


EIO

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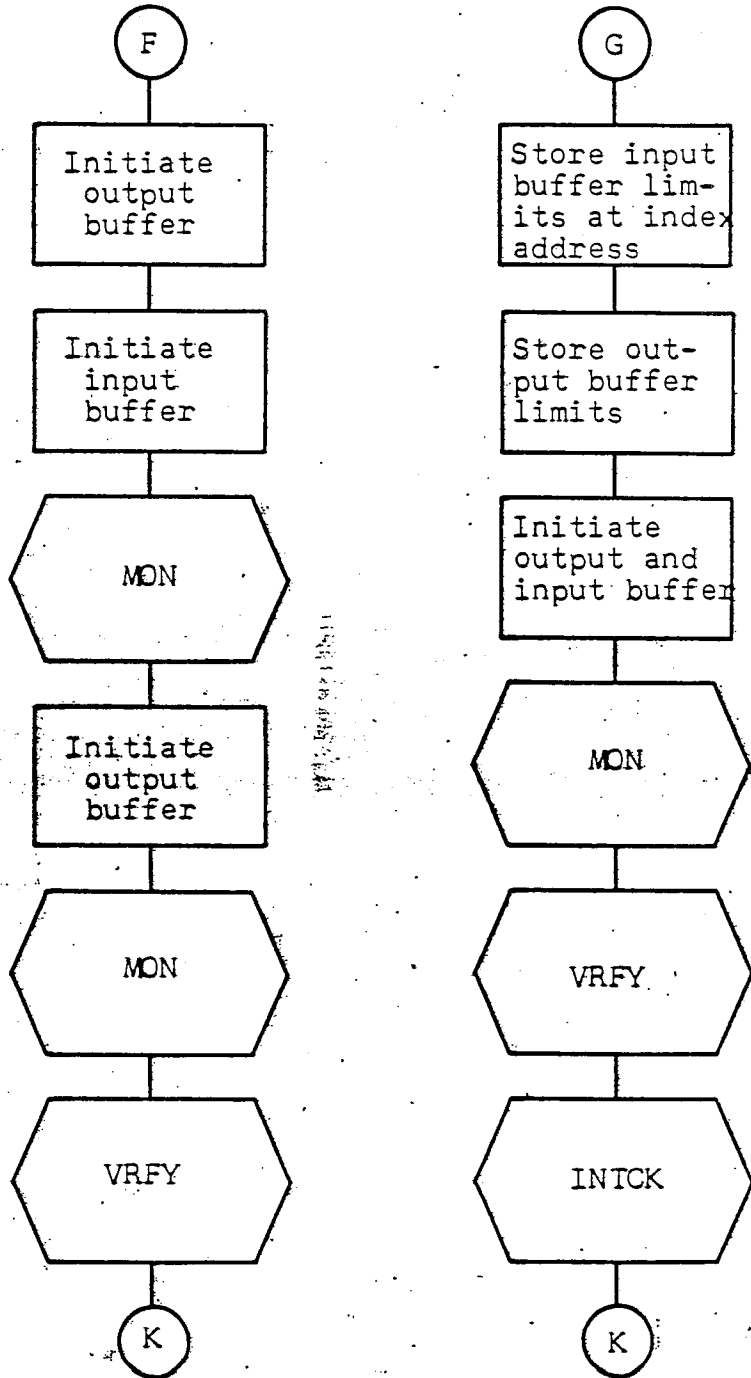


EIO (cont).



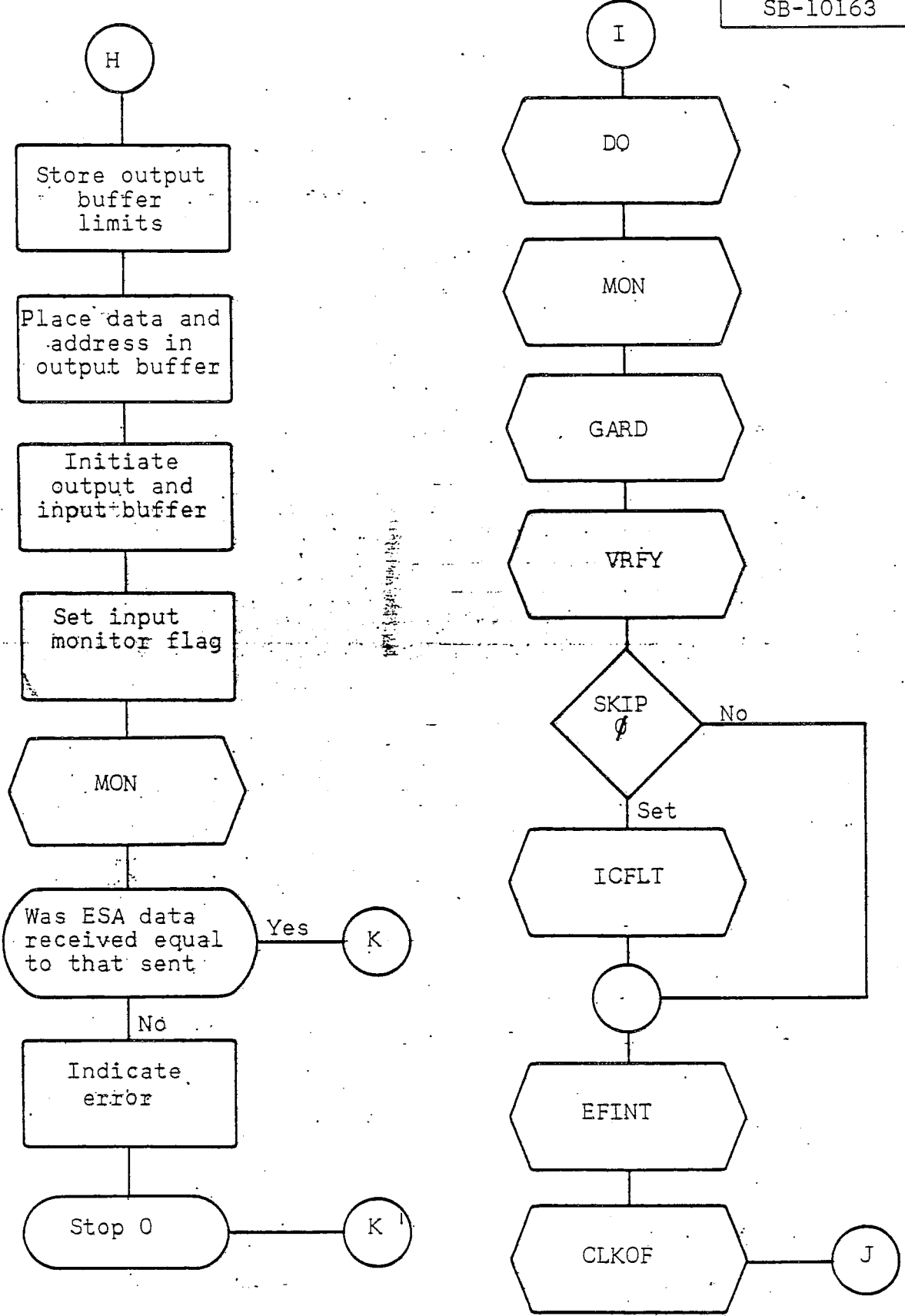
EIO (cont).





EIO (cont).

SPECIFICATION SYMBOL  
SB-10163



E10 (Cont.)

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SPECIFICATION SYMBOL

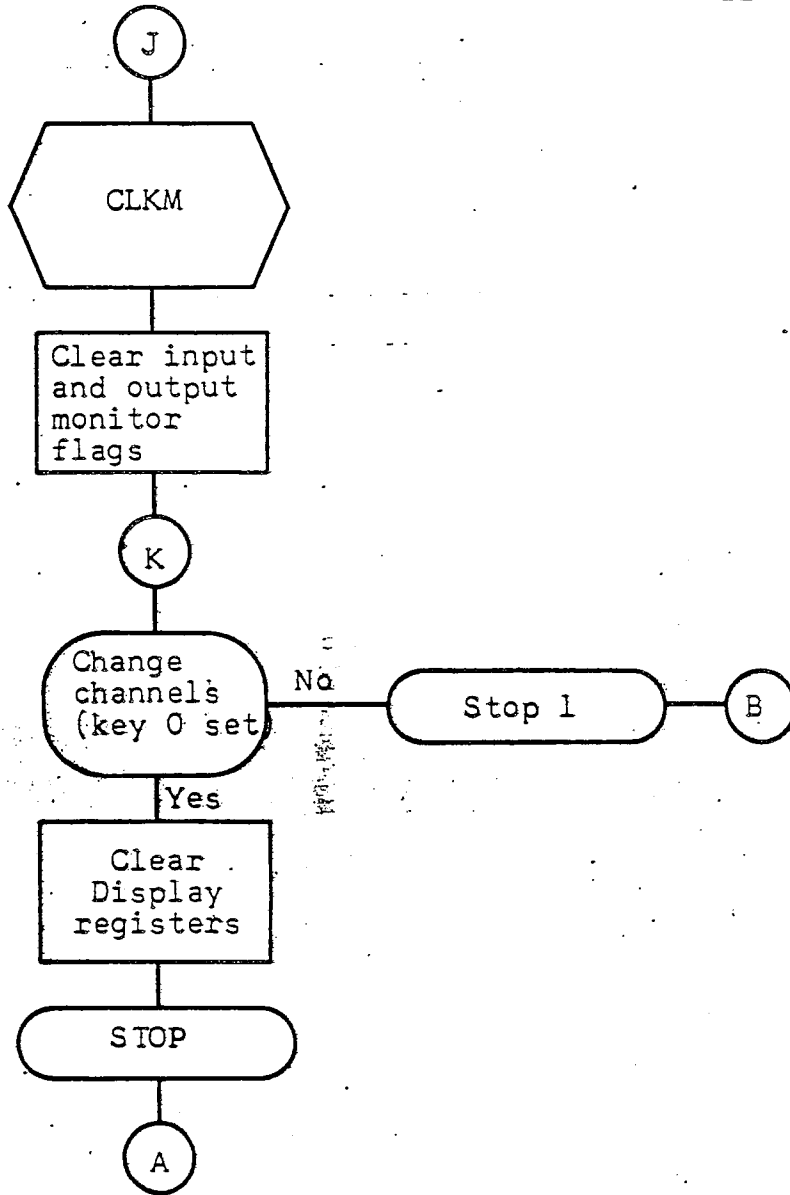
SB-10163

TITLE: STORE MONITOR INTERRUPTSDECK IDENTIFIER: FACTCS-1 LABEL: INTO KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L OUTPUT INSTRUCTIONS: 36

## DESCRIPTION:

This routine stores the input and output monitor entrance addresses and also the error interrupt entrance addresses. It is referenced by the executive routine.

If an input or output monitor interrupt is received on the wrong channel, the program will go to the error interrupt routine.



EIO (cont).

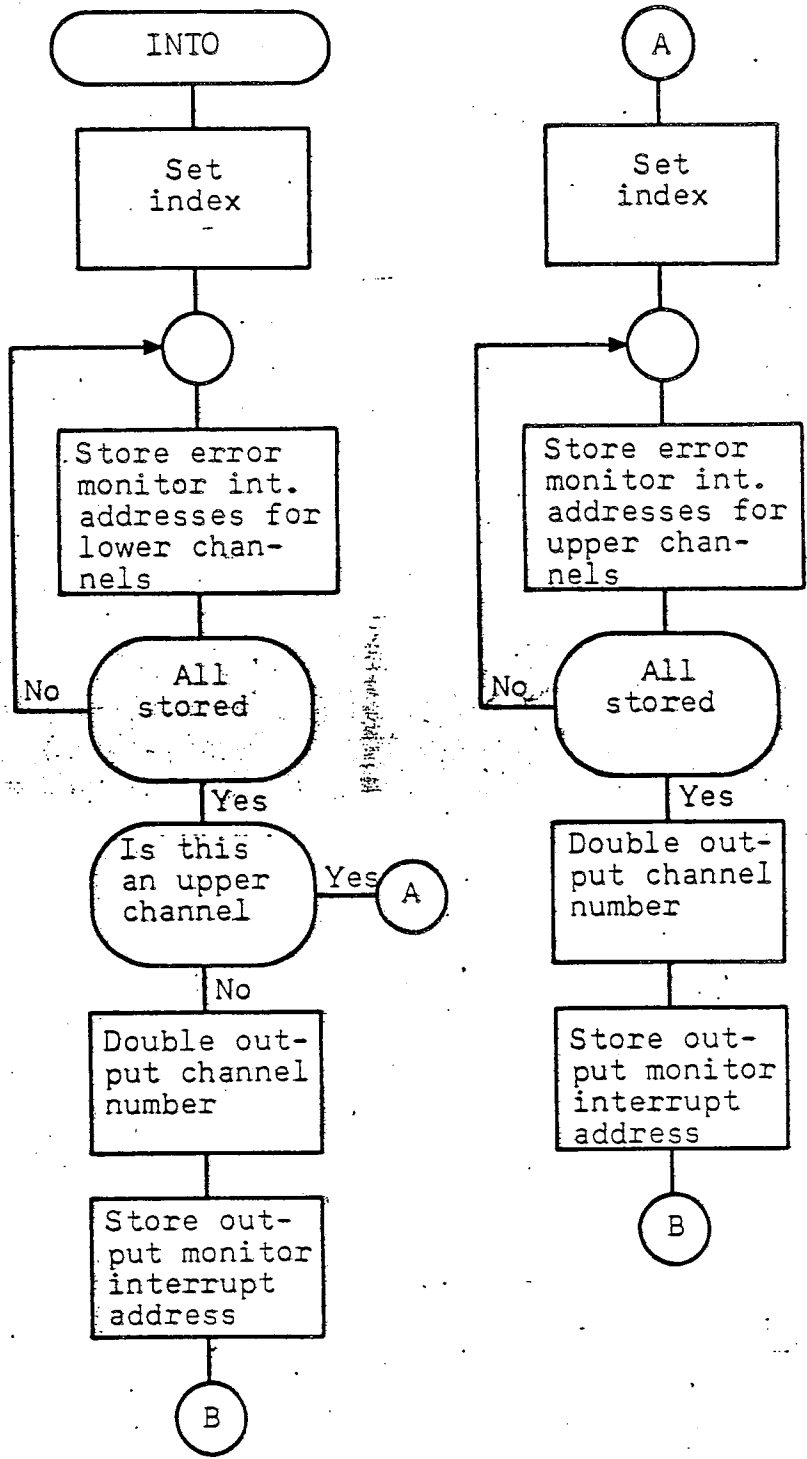
SPECIFICATION SYMBOL  
SB-10163TITLE: STORE MONITOR INTERRUPTS**INPUT PARAMETERS (Listed Sequentially):**

INIT7 - Error entrance instruction  
INIT11 - Constant  
CHOUT - Output channel number  
INIT6 - Output monitor entrance instruction  
INCHA - Input channel number  
INIT10 - Input monitor entrance instruction

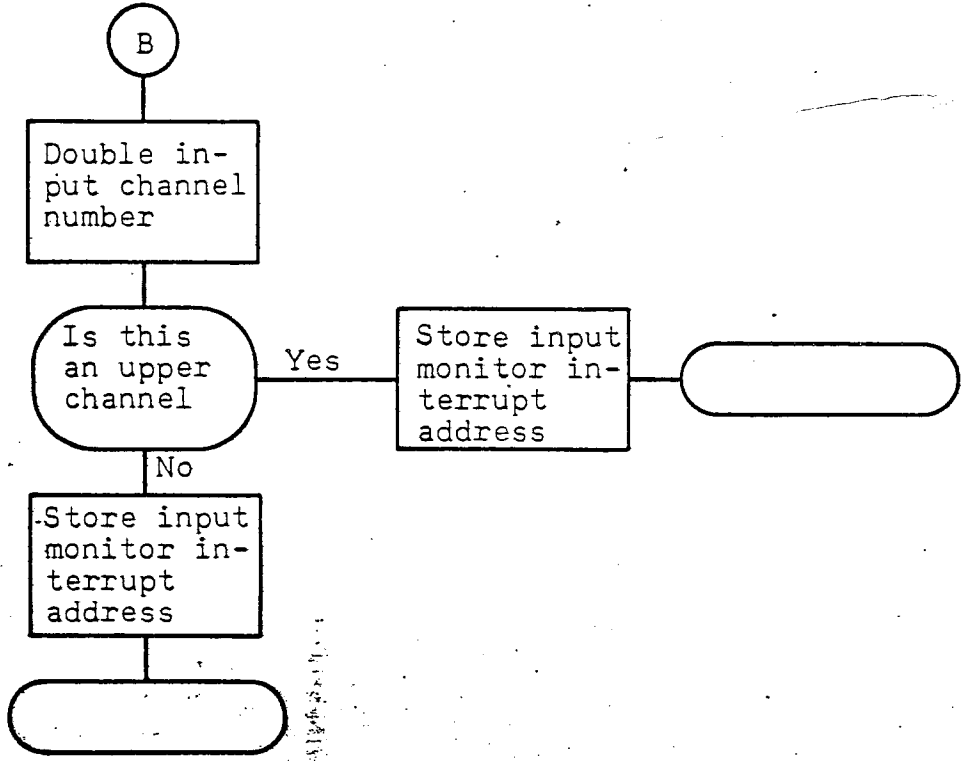
**OUTPUT PARAMETERS (Listed Sequentially):**

BO index register

**ABNORMAL EXITS (Listed Sequentially):****NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**



INTO



INTO (cont).

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SPECIFICATION SYMBOL  
SB-10163

TITLE: STORE CHANNEL NUMBERS

DECK IDENTIFIER: FACT

CS-1 LABEL: CHSET

KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 29

#### DESCRIPTION:

This routine stores the input and output channel numbers in the various Input/Output instructions. It is referenced by the executive routine.



SPECIFICATION SYMBOL  
SB-10163

TITLE: STORE CHANNEL NUMBERS

**INPUT PARAMETERS (Listed Sequentially):**

INIT2 - Mask	ICINT2-1 - Output instruction
DO+1 - Output instruction	ICINT2 - Output instruction
CHOUT - Output channel number	DO+4 - Input instruction
EIO5-1 - Output instruction	INCHA - Input channel number
EIO6-1 - Output instruction	EIO4-1 - Input instruction
EIO11-1 - Output instruction	EIO5+2 - Input instruction
EIO13-1 - Output instruction	EIO11+2 - Input instruction
ICFLT+3 - Output instruction	EIO13+2 - Input instruction
EFINT2 - Output instruction	

**OUTPUT PARAMETERS (Listed Sequentially):**

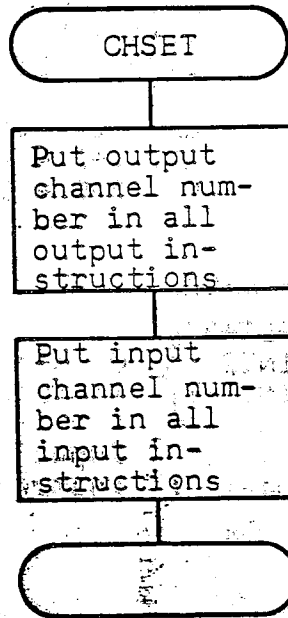
INIT2	} Output instruction	ICFLT+3	} Output instruction	EIO5+2	} Input instruction
DO+1		EFINT2		EIO11+2	
EIO5-1		ICINT2-1		EIO13+2	
EIO6-1		ICINT2			
EIO11-1		DO+4			
EIO13-1	EIO4-1	} Input instruction			

**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**



SPECIFICATION SYMBOL  
SB-10163TITLE: DETERMINE I/O MODEDECK IDENTIFIER: FACTCS-1 LABEL: KEYS KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 11**DESCRIPTION:**

This routine evaluates the setting of the PROGRAM SKIP switches to determine the mode of operation requested. It is referenced by the executive routine.

A sum in the A lower register is produced from the switch evaluations. This sum is stored and used by the next subroutine, TYPE.

SPECIFICATION SYMBOL  
SB-10163

**TITLE:** DETERMINE I/O MODE

**INPUT PARAMETERS (Listed Sequentially):**

**OUTPUT PARAMETERS (Listed Sequentially):**

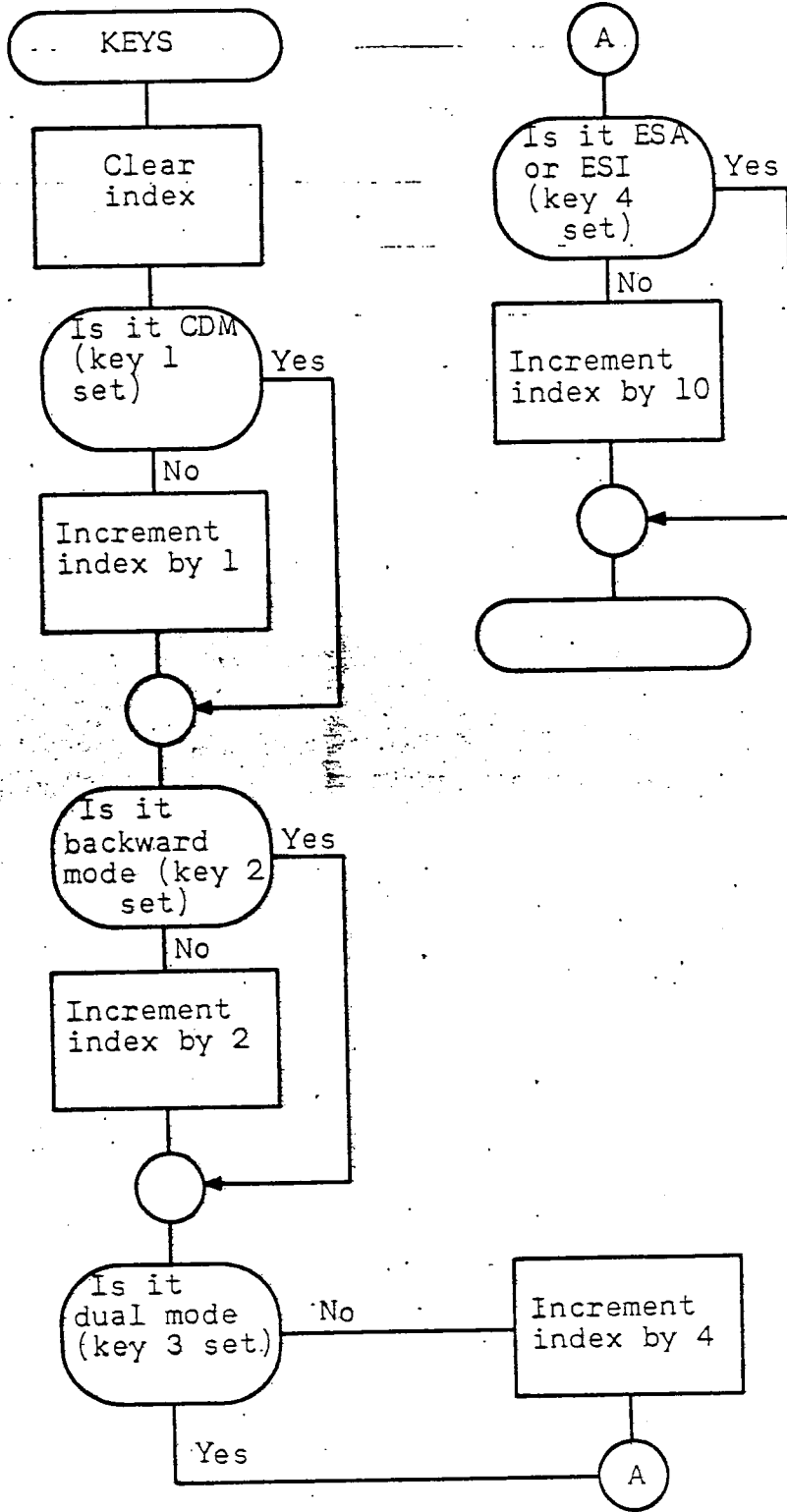
A lower register

**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**



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SPECIFICATION SYMBOL  
SB-10163

TITLE: STORE BUFFER LIMITS

DECK IDENTIFIER: FACT..

CS-1 LABEL: TYPE KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L OUTPUT INSTRUCTIONS: 17

#### DESCRIPTION:

This routine stores the input and output buffer limits for the mode of I/O selected. It is referenced by the executive routine.

TITLE: STORE BUFFER LIMITS

**INPUT PARAMETERS (Listed Sequentially):**

INIT3 - mode of operation index  
AUPARM - AU register

**OUTPUT PARAMETERS (Listed Sequentially):**

DO+2 - Output TBCW  
DO+3 - Output IBCW  
DO+5 - Input TBCW  
DO+6 - Input IBCW

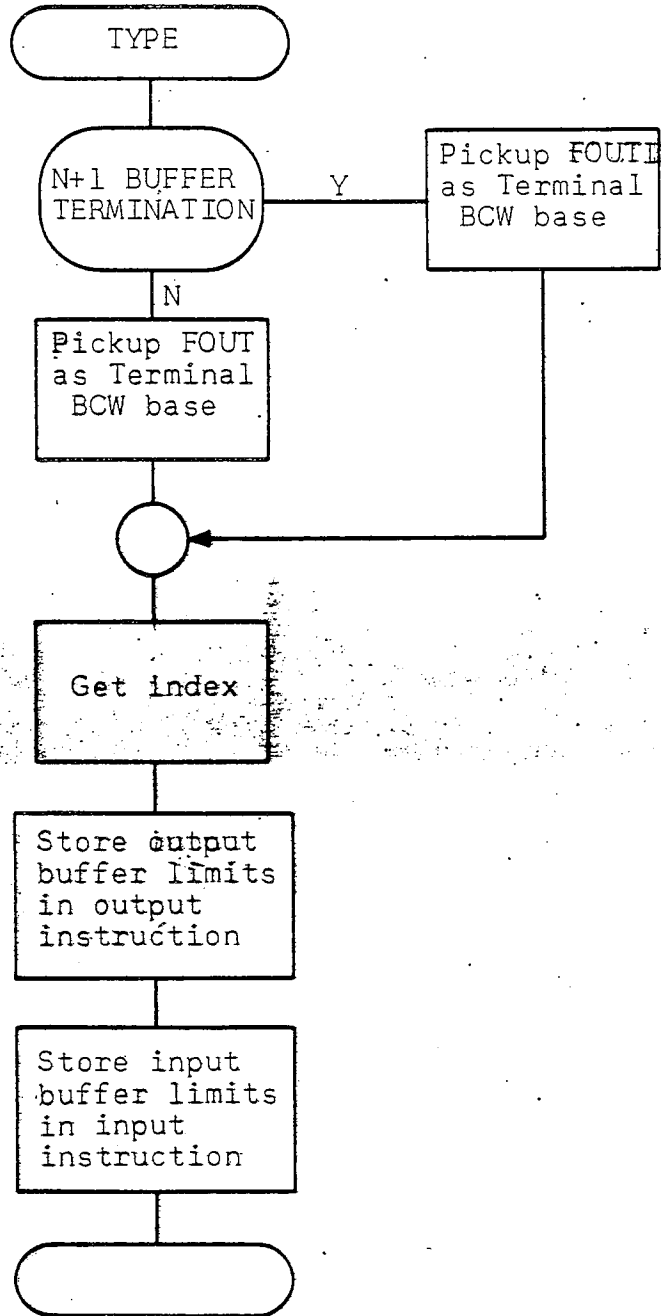
**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

FOUT - table of buffer limits  
FOUT - table of buffer limits

**ALARMS AND/OR REMARKS:**





2.22 Remote monitoring and remote control test. - In the following test, unless otherwise specified, all the controls, indicators, and switches are located on the Computer Remote Control assembly.

2.22.1 Remote monitoring test. - The remote monitoring test shall be performed as follows:

- a. Manually load the program specified in table V into the Computer memory if it is not already in memory.
- b. Manually load 340020 at address 000000 and 000000 at address 000001.
- c. Connect the Computer Remote Control (Item 9) to J17 of the Computer using interconnecting cables (Item 8).
- d. Operate the REMOTE switch to OFF.
- e. Observe that the REMOTE indicator is not lit and that the POWER ON indicator is lit.
- f. Operate the BATTLE SHORT switch on the Computer to ON.
- g. Observe that the BATTLE SHORT indicator lights.
- h. Operate the BATTLE SHORT switch on the Computer to OFF.
- i. Observe that the BATTLE SHORT indicator extinguishes.
- j. Set the VOLTAGE FAULT indicator-switch on the Computer.
- k. Observe that the ABNORMAL CONDITION indicator lights.
- l. Master Clear the Computer.
- m. Observe that the ABNORMAL CONDITION indicator extinguishes.
- n. Operate a CLOCK switch on the Computer to the NARROW position.
- o. Observe that the MARGIN indicator lights.
- p. Operate the CLOCK switch on the Computer to the NORMAL position.
- q. Observe that the MARGIN indicator extinguishes.

2.22.2 Remote control test. - The remote control test shall be performed as follows:

- a. Set OP STEP MODE on the Computer.
- b. Set several indicator-switches in several registers on the Computer.
- c. Operate the REMOTE switch to ON.
- d. Observe that the LOCAL CONTROL indicator on the Computer extinguishes and the REMOTE indicator on the Computer Remote Control lights.
- e. Momentarily operate the START/MASTER CLEAR switch to MASTER CLEAR.
- f. Observe that the RUN MODE indicator lights, that the P register is equal to 0, and that the indicators set in step b. extinguish (all on the Computer).
- g. Momentarily operate the LOAD/STOP switch to LOAD.
- h. Observe that the LOAD MODE indicator is lit and that the SI register equals 00500 (both on the Computer).
- i. Momentarily operate the START/MASTER CLEAR switch to MASTER CLEAR.
- j. Select all PROGRAM STOPS.
- k. Momentarily operate the START/MASTER CLEAR switch to START several times.
- l. Observe that the PROGRAM STOP 0, 1, 2, 3, 4, and 5 indicators, on both the Computer and the Computer Remote Control, light and extinguish in sequence at a rate governed by the START switch action.
- m. Repeatedly operate the START/MASTER CLEAR switch to START while selecting the PROGRAM SKIP switches.
- n. Observe that as a PROGRAM SKIP switch is selected its corresponding PROGRAM STOP indicator, on both the Computer and Computer Remote Control, no longer lights. (The 5 STOP indicator remains lit.)
- o. Release all PROGRAM STOPS and SKIPS.
- p. Momentarily operate the START/MASTER CLEAR switch to MASTER CLEAR.
- q. Operate the AUTO RECOVERY switch to ON.
- r. Manually set the P register on the Computer equal to 000001.

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SPECIFICATION SYMBOL SB-10163	

TITLE: INITIATE BUFFERS

DECK IDENTIFIER: FACT

CS-1 LABEL: DO KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 9

**DESCRIPTION:**

This routine initiates the input and output buffers. It is referenced by the executive routine.

SPECIFICATION SYMBOL  
SB-10163TITLE: INITIATE BUFFERS

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

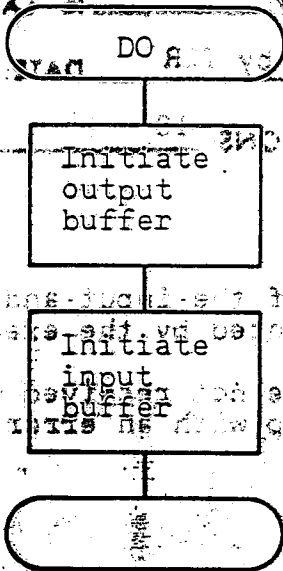
SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:

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JONNYR WOLFE  
05/11-63

SPECIFICATION SYMBOL  
SB-10163



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SPECIFICATION SYMBOL

SB-10163

TITLE: MONITOR CHECK

DECK IDENTIFIER: FACT

CS-1 LABEL: MON KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 13

#### DESCRIPTION:

This routine checks to see if the input and output monitors have been received. It is referenced by the executive routine.

If the monitor interrupts are not received within a specified period of time the program will stop with an error indication.

SPECIFICATION SYMBOL

SB-10163

TITLE: MONITOR CHECK**INPUT PARAMETERS (Listed Sequentially):**

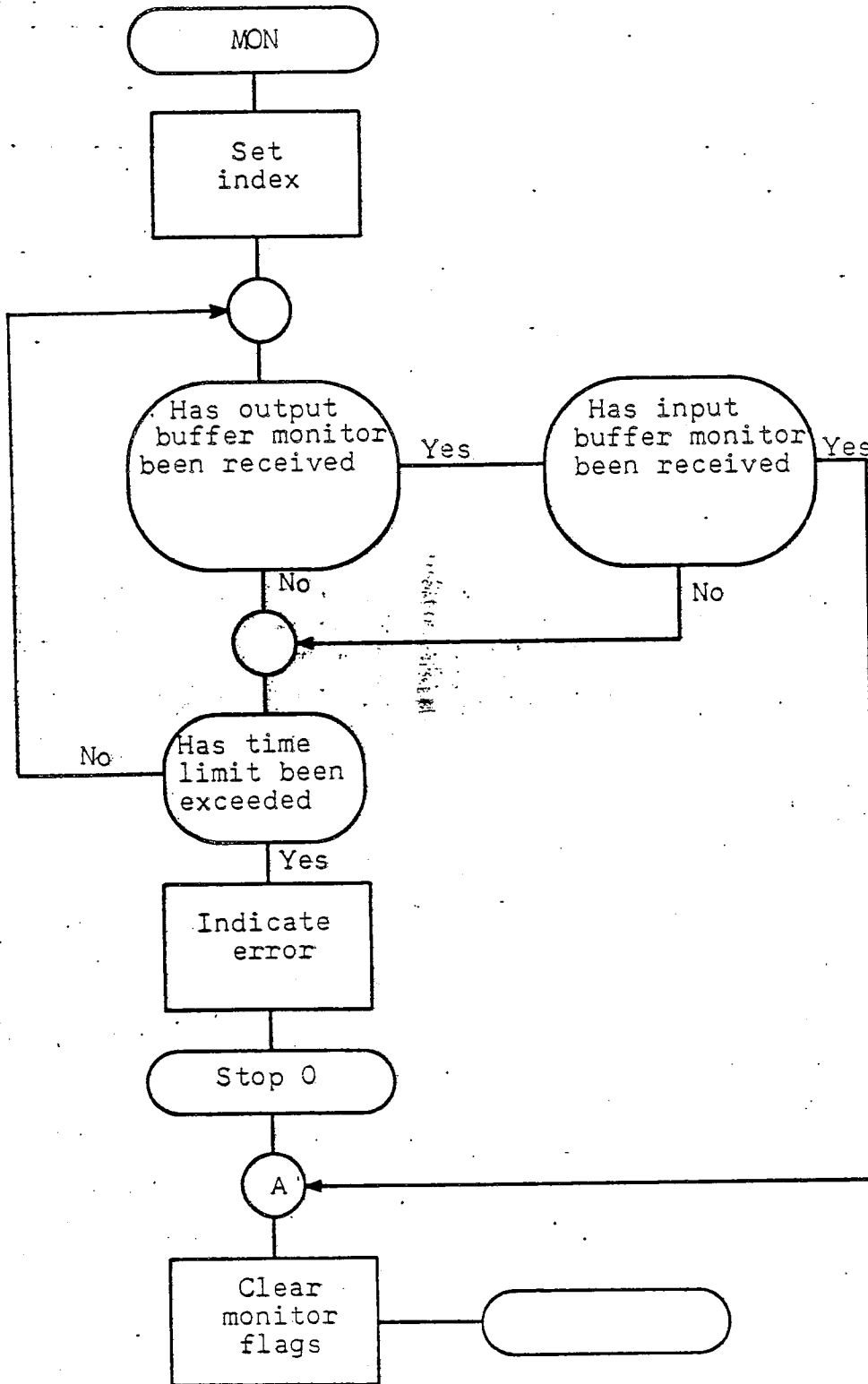
FLAG2 - Constant  
FLAG - Output monitor flag  
FLAG 1 - Input monitor flag

**OUTPUT PARAMETERS (Listed Sequentially):**

FLAG - Output monitor flag  
FLAG1 - Input monitor flag

**ABNORMAL EXITS (Listed Sequentially):****NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

If PROGRAM STOP 0 is set, the computer will stop with an error indication if the time limit for the interrupts has been exceeded.





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SPECIFICATION SYMBOL  
SB-10163TITLE: INPUT AREA CHECKDECK IDENTIFIER: FACTCS-1 LABEL: GARD KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 35

## DESCRIPTION:

This routine checks the area adjacent to the input buffer. It is referenced by the executive routine.

The three addresses preceding and the three addresses following the input limits are checked to see that no data overflowed into these areas.

**TITLE:** INPUT AREA CHECK

**INPUT PARAMETERS (Listed Sequentially):**

GARD2 - Constant

**OUTPUT PARAMETERS (Listed Sequentially):**

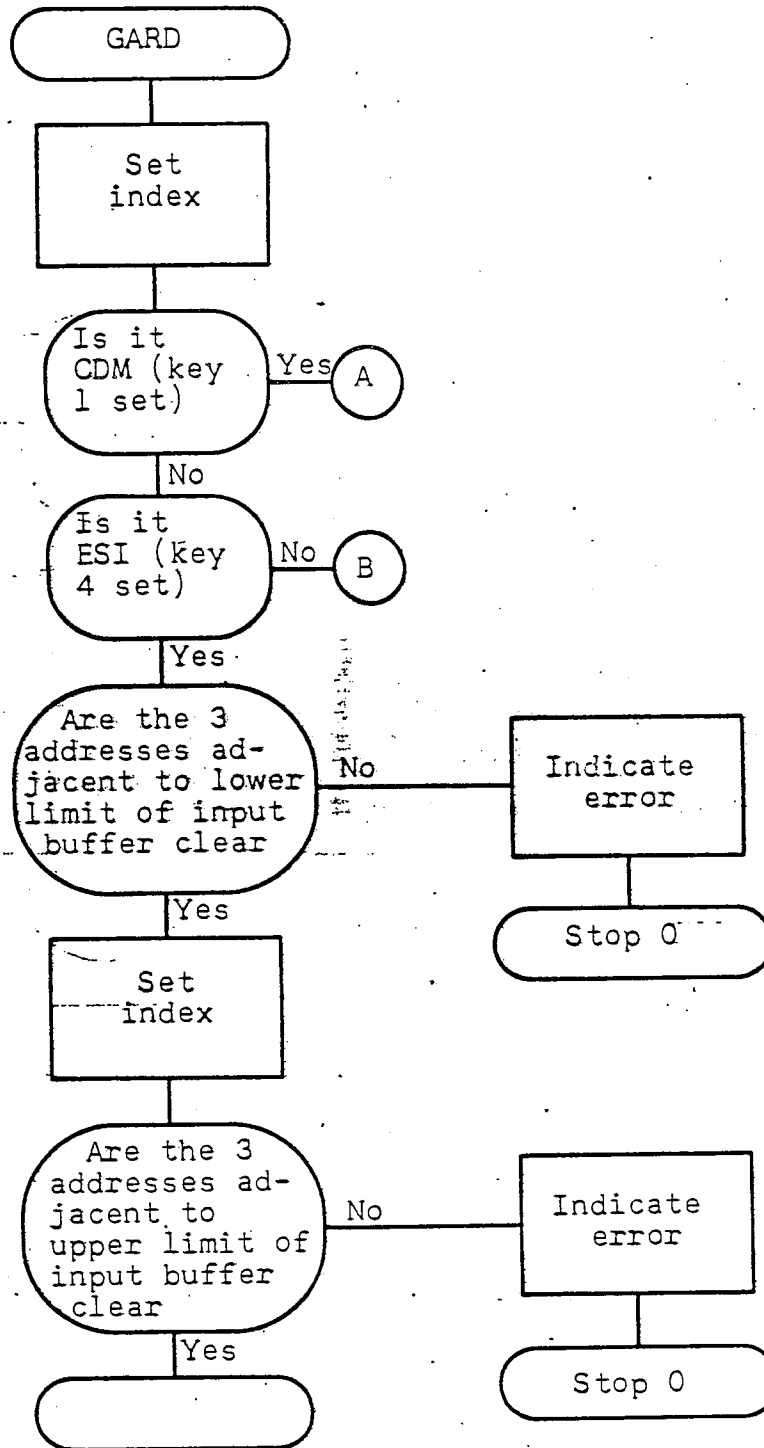
**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

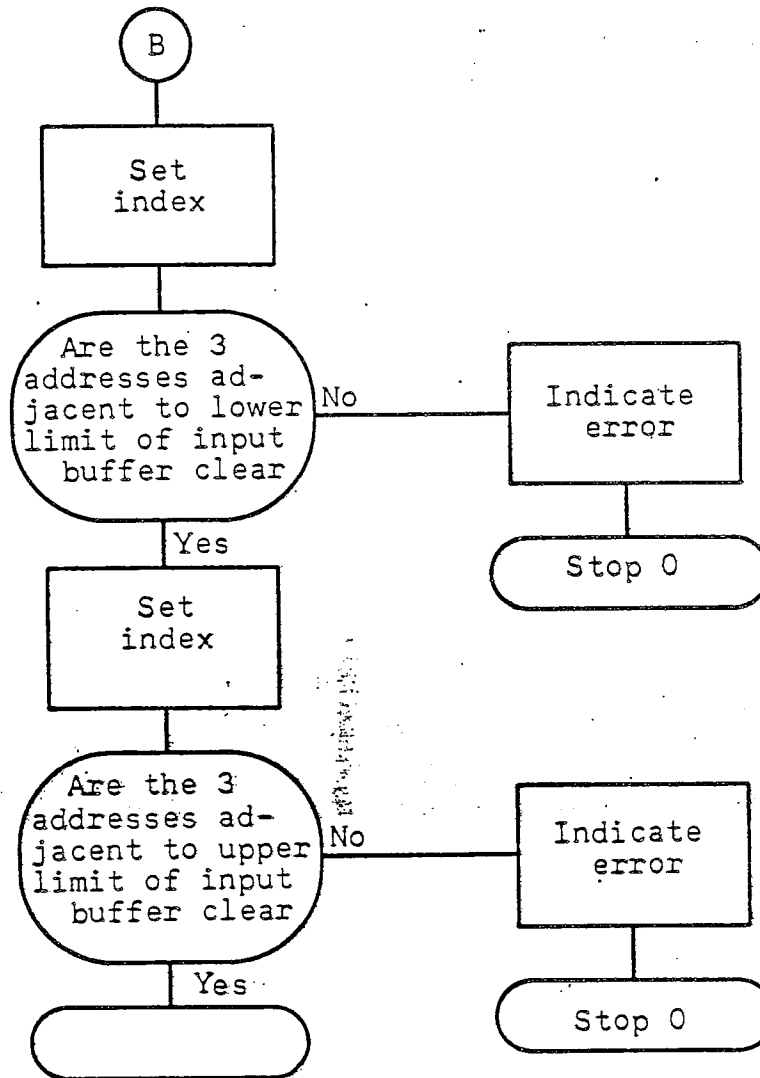
**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**

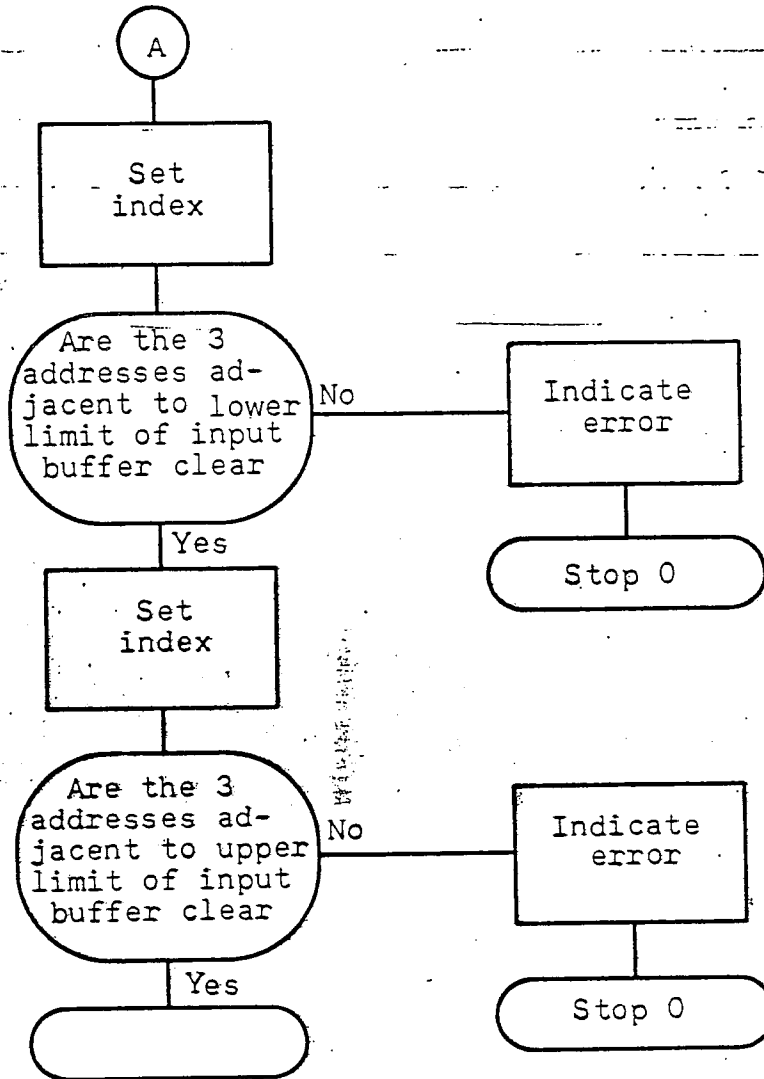
If PROGRAM STOP 0 is set and an error is found, the computer will stop with an error indication.



GARD (cont).



- GARD (cont).



GARD (cont).

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SPECIFICATION SYMBOL  
SB-10163TITLE: VERIFY DATADECK IDENTIFIER: FACTCS-1 LABEL: VRFY KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 66

## DESCRIPTION:

This routine verifies that the data received on a transfer was correct. It is referenced by the executive routine.

The data received is compared to the data sent to check for correctness.

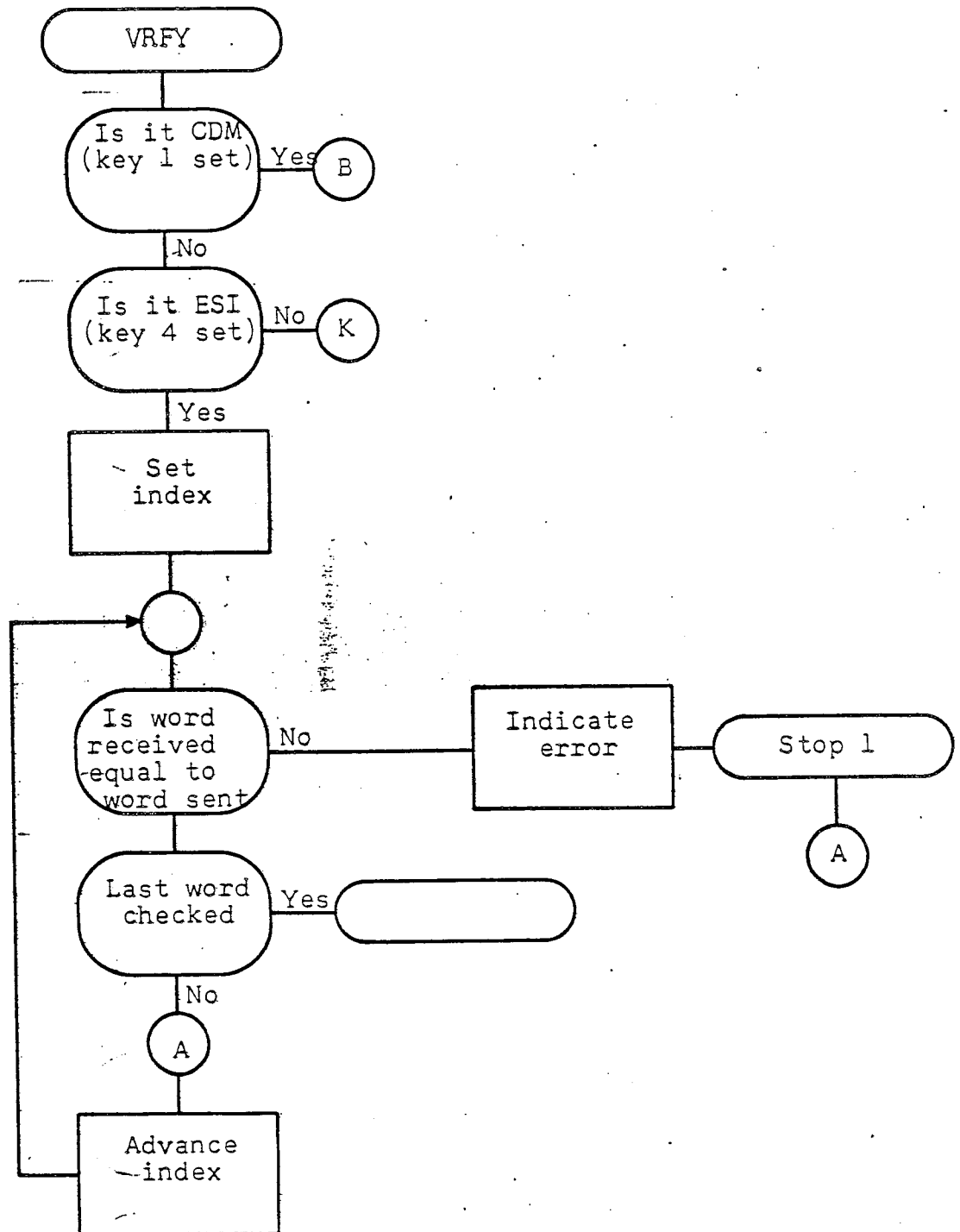
SPECIFICATION SYMBOL  
SB-10163TITLE: VERIFY DATA**INPUT PARAMETERS (Listed Sequentially):**

INBUF+N  
INBUF+N     Input buffer area  
BUFOUT  
BUFOUT+N    Output buffer area

**OUTPUT PARAMETERS (Listed Sequentially):**

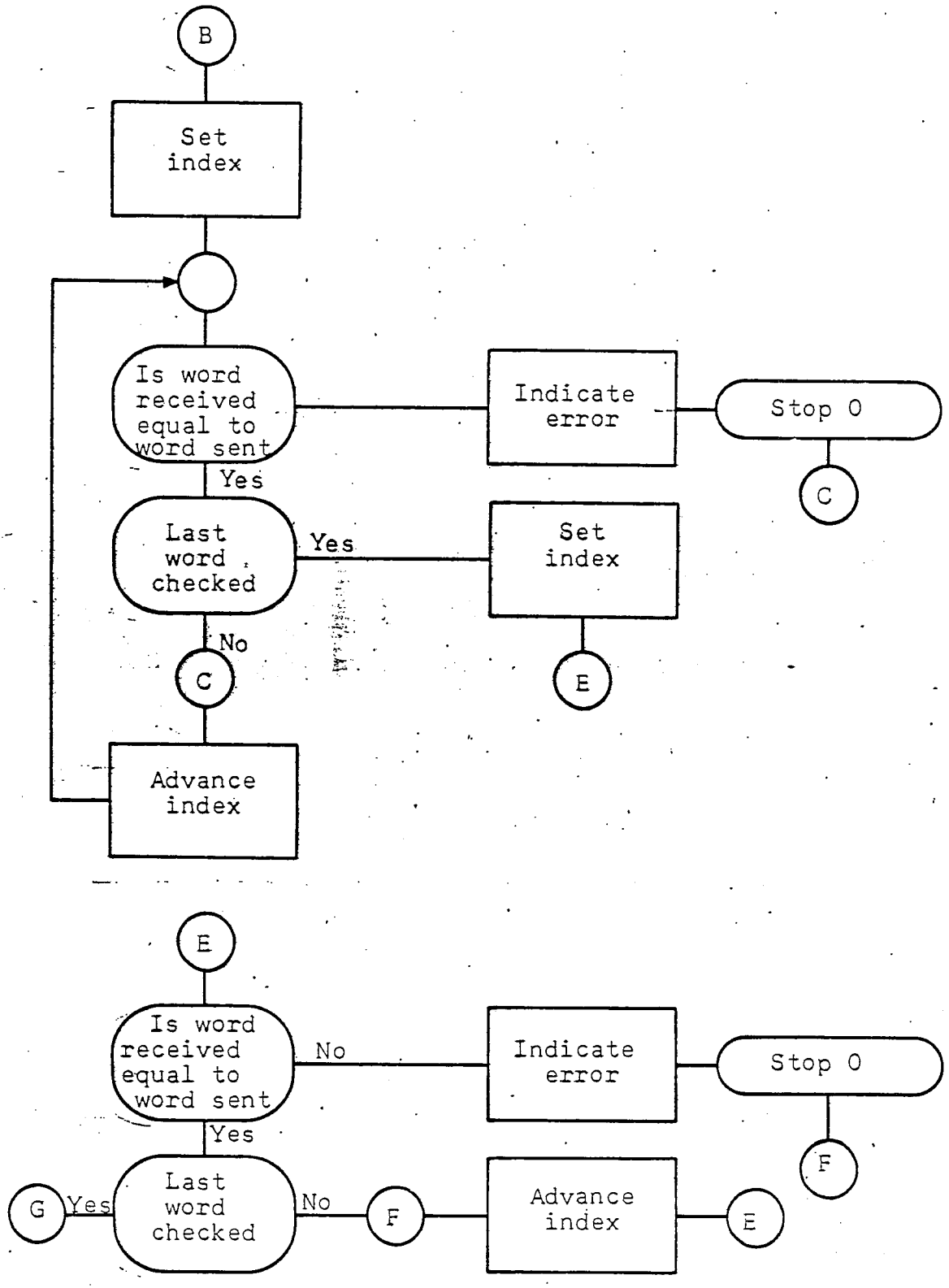
A upper register

**ABNORMAL EXITS (Listed Sequentially):****NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

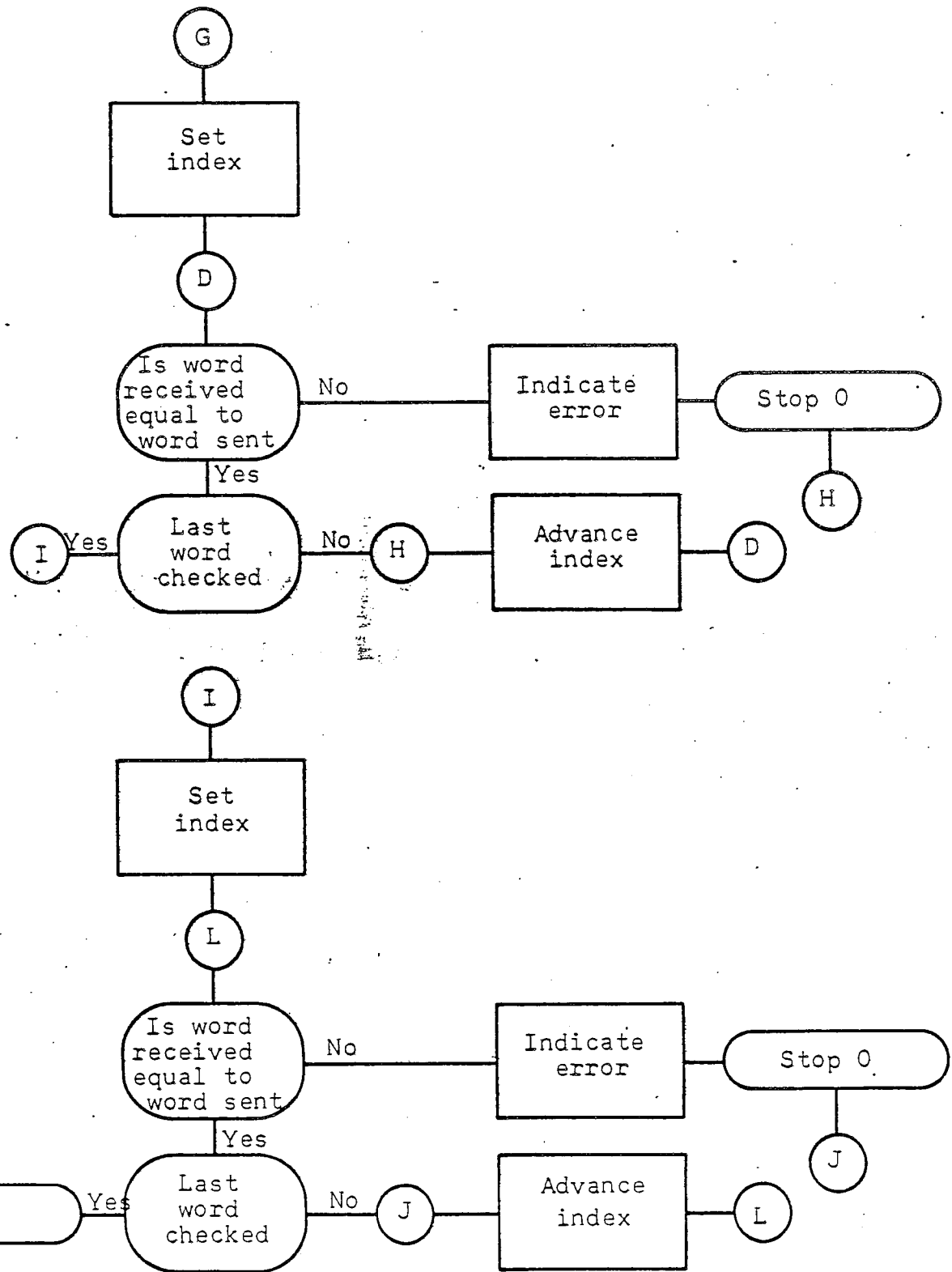


VRFY

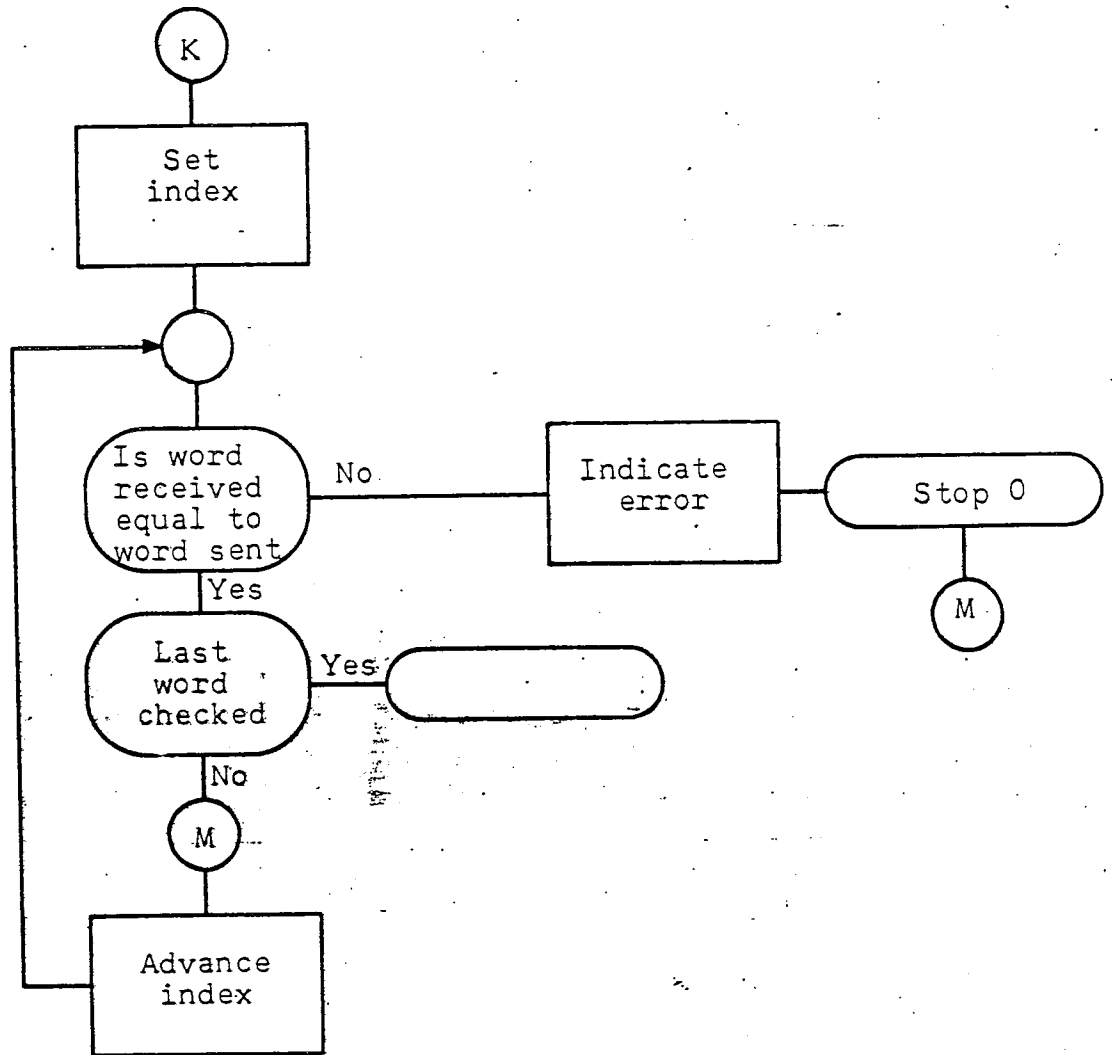




VRFY (cont).



VRFY (cont).



VRFY (cont).

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SPECIFICATION SYMBOL  
SB-10163TITLE: OUTPUT MONITOR INTERRUPTDECK IDENTIFIER: FACTCS-1 LABEL: MNOUT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 6

## DESCRIPTION:

This routine sets the output monitor flag. It is entered when the output monitor interrupt is received.

TITLE: OUTPUT MONITOR INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

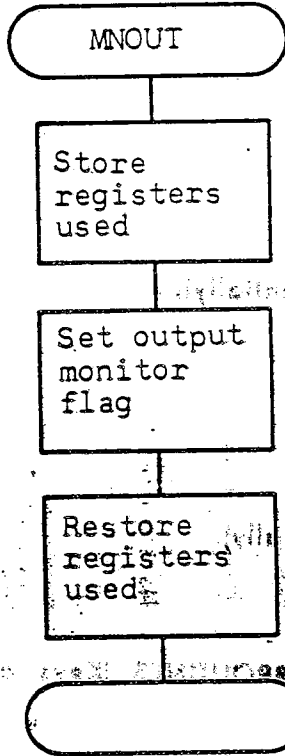
FLAG - Output monitor flag

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:



SPECIFICATION SYMBOL

SB-10163

TITLE: ERRONEOUS MONITOR INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

A lower register

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:

If PROGRAM STOP 0 is set and an erroneous monitor interrupt is received, the computer will stop with the A lower register set to all ones.

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SPECIFICATION SYMBOL SB-10163	

TITLE: ERRONEOUS MONITOR INTERRUPT

DECK IDENTIFIER: FACT

CS-1 LABEL: MNER KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 6

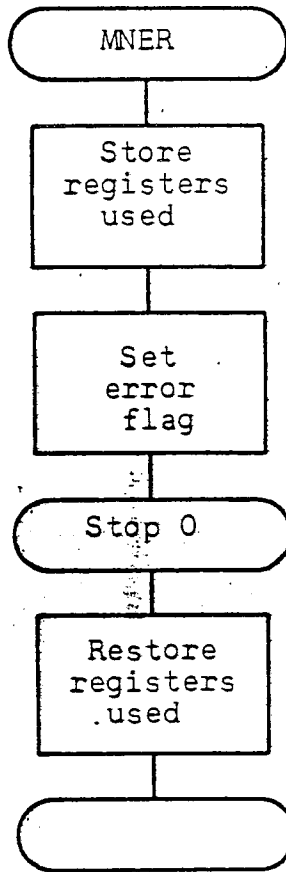
**DESCRIPTION:**

This routine processes any monitor interrupts that are received for a channel other than the channel that is presently being tested.

This routine is entered when a monitor interrupt is received on the wrong channel. This is accomplished by storing the error monitor entrance address at all monitor interrupt addresses except those for the channel being tested.



SPECIFICATION SYMBOL  
SB-10163



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SPECIFICATION SYMBOL  
SB-10163TITLE: INPUT MONITOR INTERRUPTDECK IDENTIFIER: FACTCS-1 LABEL: MNIN KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modigied by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 6

## DESCRIPTION:

This routine sets the input monitor flag. It is entered when the input monitor interrupt is received.

SPECIFICATION SYMBOL  
SB-10163TITLE: INPUT MONITOR INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

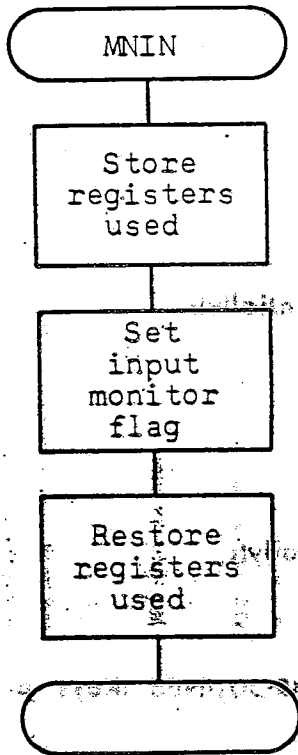
FLAG1 - Input monitor flag

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:



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SPECIFICATION SYMBOL  
SB-10163

TITLE: ESI INTERRUPT CHECK

DECK IDENTIFIER: FACT

CS-1 LABEL: INTCK KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 18

DESCRIPTION:

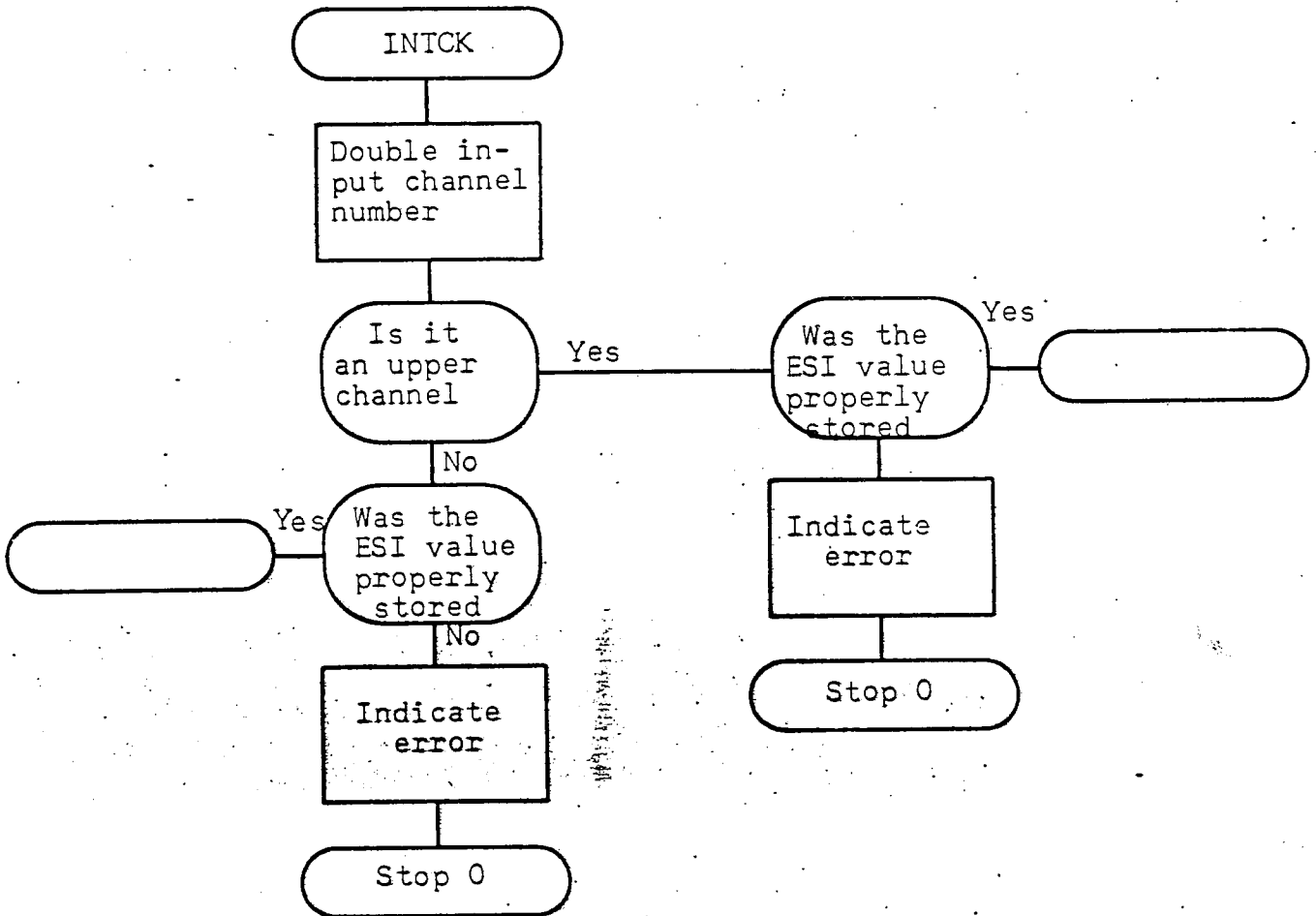
This routine verifies that the proper Externally Specified Index was stored in the proper address upon completion of an Externally Specified Index mode of Input/Output. It is referenced by the executive routine.

SPECIFICATION SYMBOL  
SB-10163TITLE: ESI INTERRUPT CHECK**INPUT PARAMETERS (Listed Sequentially):**INCHA - Input channel number  
K50 - Constant**OUTPUT PARAMETERS (Listed Sequentially):**

A upper register

**ABNORMAL EXITS (Listed Sequentially):****NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

If PROGRAM STOP 0 is set and the index stored is not correct, the computer will stop with the incorrect index in the A lower register and the correct index in the A upper register.



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SPECIFICATION SYMBOL  
SB-10163TITLE: DETERMINE CHANNEL NUMBERDECK IDENTIFIER: FACTCS-1 LABEL: CHNBR KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 42**DESCRIPTION:**

This routine determines which input and output channels are to be tested from the initial parameters selected. It is referenced by the executive routine.

This routine processes all channels selected from lowest to highest channel. The input channel number will be 2 greater than the output channel number except where the input channel number equals or exceeds the maximum number of I/O channels being tested. If this is the case, the input channel tested will 0 or 1 respectively.



TITLE: DETERMINE CHANNEL NUMBER

**INPUT PARAMETERS (Listed Sequentially):**

CHNBR7 - Input and output channel number.  
K77 - Constant

**OUTPUT PARAMETERS (Listed Sequentially):**

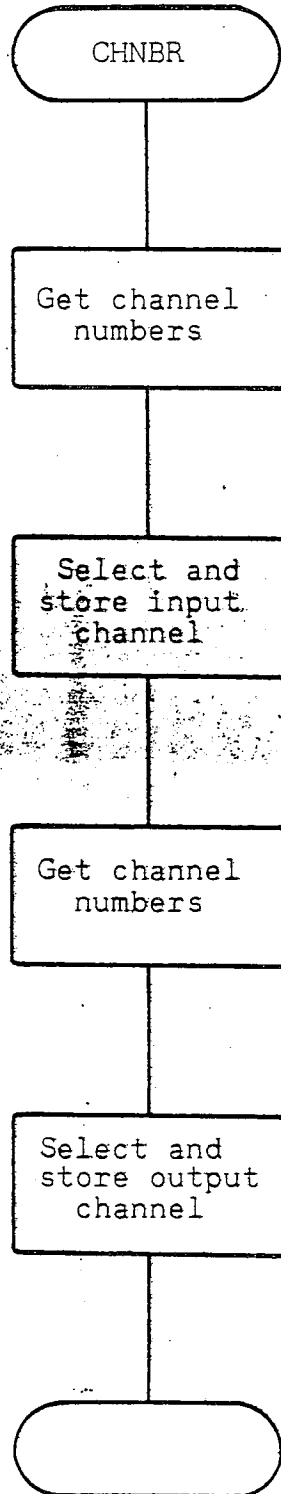
CHOUT - Output channel number.  
INCHA - Input channel number.  
CHANBR7 - Input and output channel number.

**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**



SPECIFICATION SYMBOL SB-10163

PREVIOUS SYMBOL SB-10163

TITLE INTERCOMPUTER TIMEOUT FAULT

DECK IDENTIFIER 1001

CS-1 LABEL IDENTIFIER IS LABEL DUPLICATES

PROGRAMMER DATE 8 Dec 67

NUMBER OF OUTPUT INSTRUCTIONS 24

DESCRIPTION

This routine detects an intercomputer fault and then verifies that an intercomputer fault has occurred. This sheet intentionally left blank in the executive routine.

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SPECIFICATION SYMBOL

SB-10163

TITLE: INTERCOMPUTER TIMEOUT FAULT

DECK IDENTIFIER: FACT

CS-1 LABEL: ICFLT

KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: \_\_\_\_\_ FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 24**DESCRIPTION:**

This routine causes an Intercomputer fault and then verifies that an Intercomputer fault interrupt is received. It is referenced by the executive routine.

SPECIFICATION SYMBOL  
SB-10163TITLE: INTERCOMPUTER TIMEOUT FAULT**INPUT PARAMETERS (Listed Sequentially):**

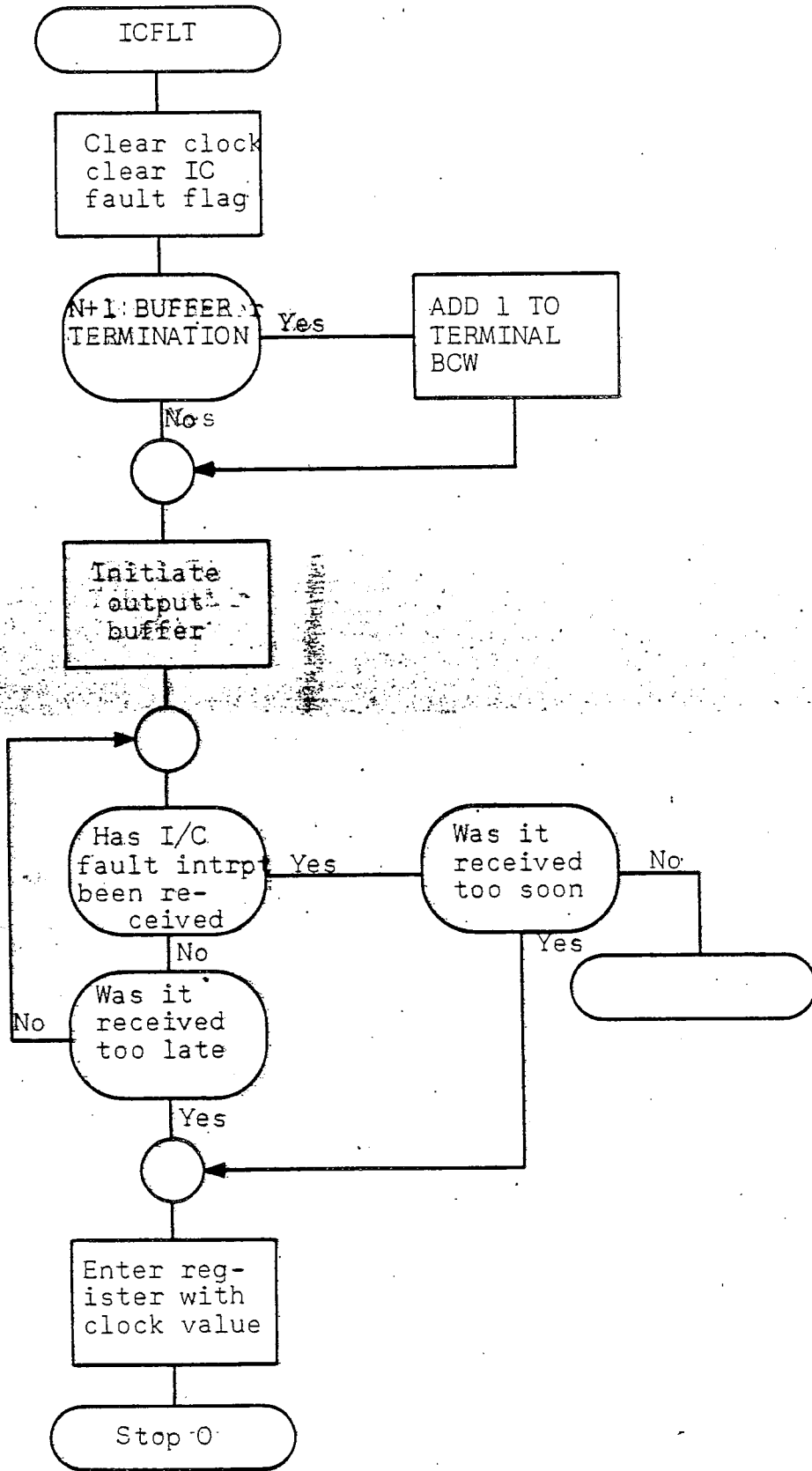
IC FLAG - Intercomputer fault interrupt flag  
CCOUNT - constant  
15 - clock

**OUTPUT PARAMETERS (Listed Sequentially):**

A upper register

**ABNORMAL EXITS (Listed Sequentially):****NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

If the Intercomputer fault interrupt is not received or if it is received too soon or too late the computer will stop if PROGRAM STOP 0 is set. The A upper register will contain the value of the clock.



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SPECIFICATION SYMBOL  
SB-10163TITLE: INTERCOMPUTER TIMEOUT FAULT INTERRUPTDECK IDENTIFIER: FACTCS-1 LABEL: ICINT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 1967NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 8**DESCRIPTION:**

This routine processes the Intercomputer Timeout Fault interrupt. It is entered when the interrupt is received.

This routine sets a flag and frees the Input/Output section.

TITLE: INTERCOMPUTER TIMEOUT FAULT INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

ICFLAG - Intercomputer Timeout Fault Interrupt flag.

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

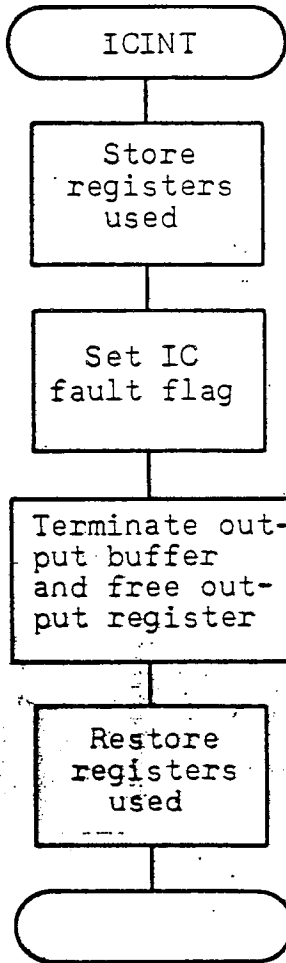
SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:



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SPECIFICATION SYMBOL  
SB-10163



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SPECIFICATION SYMBOL SB-10163
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TITLE: EXTERNAL FUNCTION - EXTERNAL INTERRUPT CHECK

DECK IDENTIFIER: FACT

CS-1 LABEL: EFINT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 109

#### DESCRIPTION:

This routine sends an External Function with monitor on the output channel and verifies that the proper External Interrupt was received on the input channel. It also verifies that the External Function Monitor interrupt was received on the output channel. It is referenced by the executive routine.

A bit by bit comparison is done to verify that the word sent as an External Function is the same as the word stored as the External Interrupt word. If the External Interrupt is received on the wrong channel, the Erroneous Interrupt (EFERR) is entered.

SPECIFICATION SYMBOL  
SB-10163TITLE: EXTERNAL FUNCTION - EXTERNAL INTERRUPT CHECK**INPUT PARAMETERS (Listed Sequentially):**

INCHA - Input channel number  
K17 - Constant  
EFINTE - Erroneous interrupt entrance address  
EFINTA - Interrupt entrance address  
EFINT6 - External Function word  
EFLAG - External Interrupt flag  
INCHA - Input channel number

**OUTPUT PARAMETERS (Listed Sequentially):**

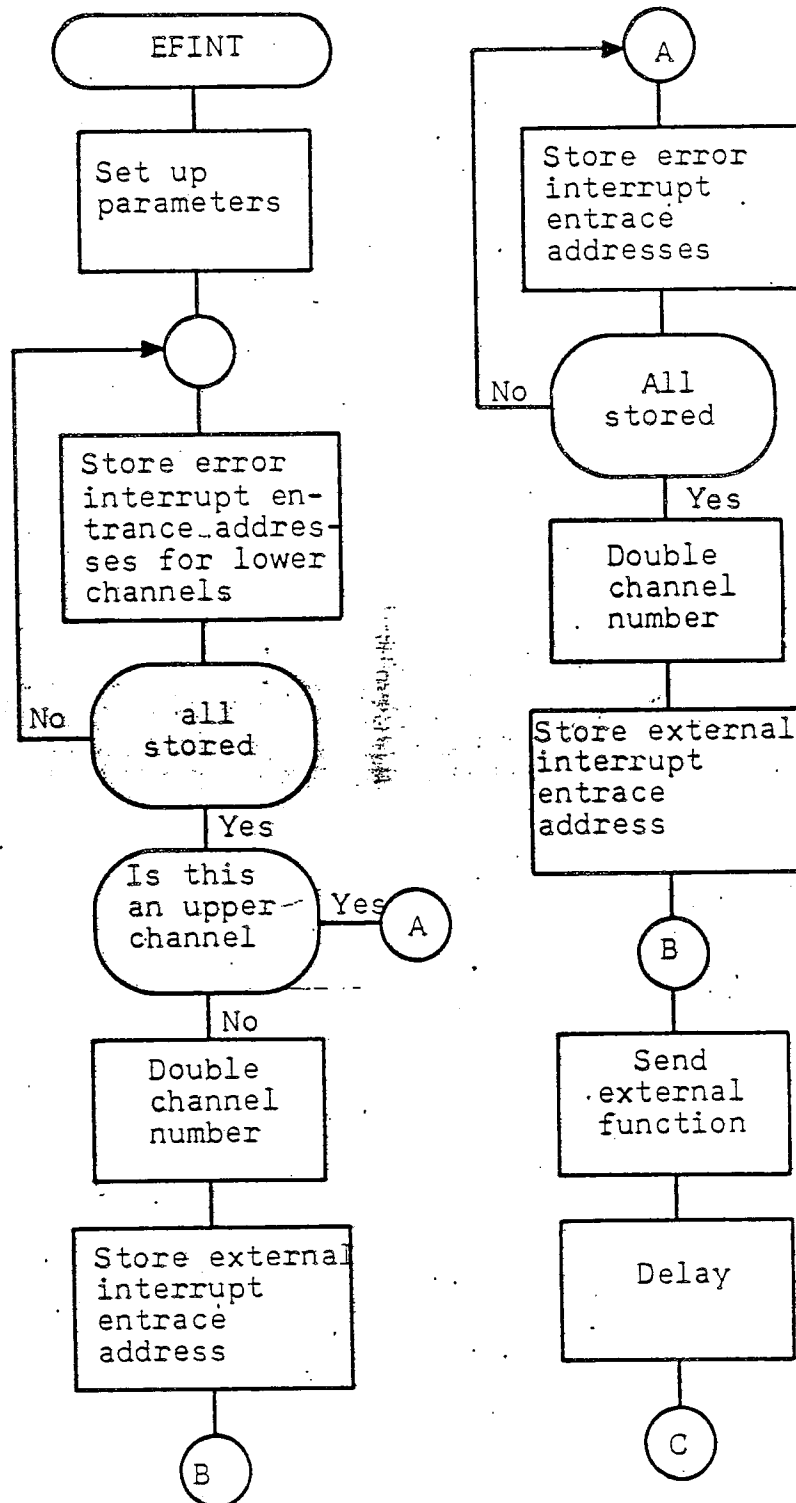
A lower register  
EFLAG - External Interrupt flag

**ABNORMAL EXITS (Listed Sequentially):**

EFERR - program stops here if interrupt received on wrong channel

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):****SYSTEM DATA REFERENCES:****ALARMS AND/OR REMARKS:**

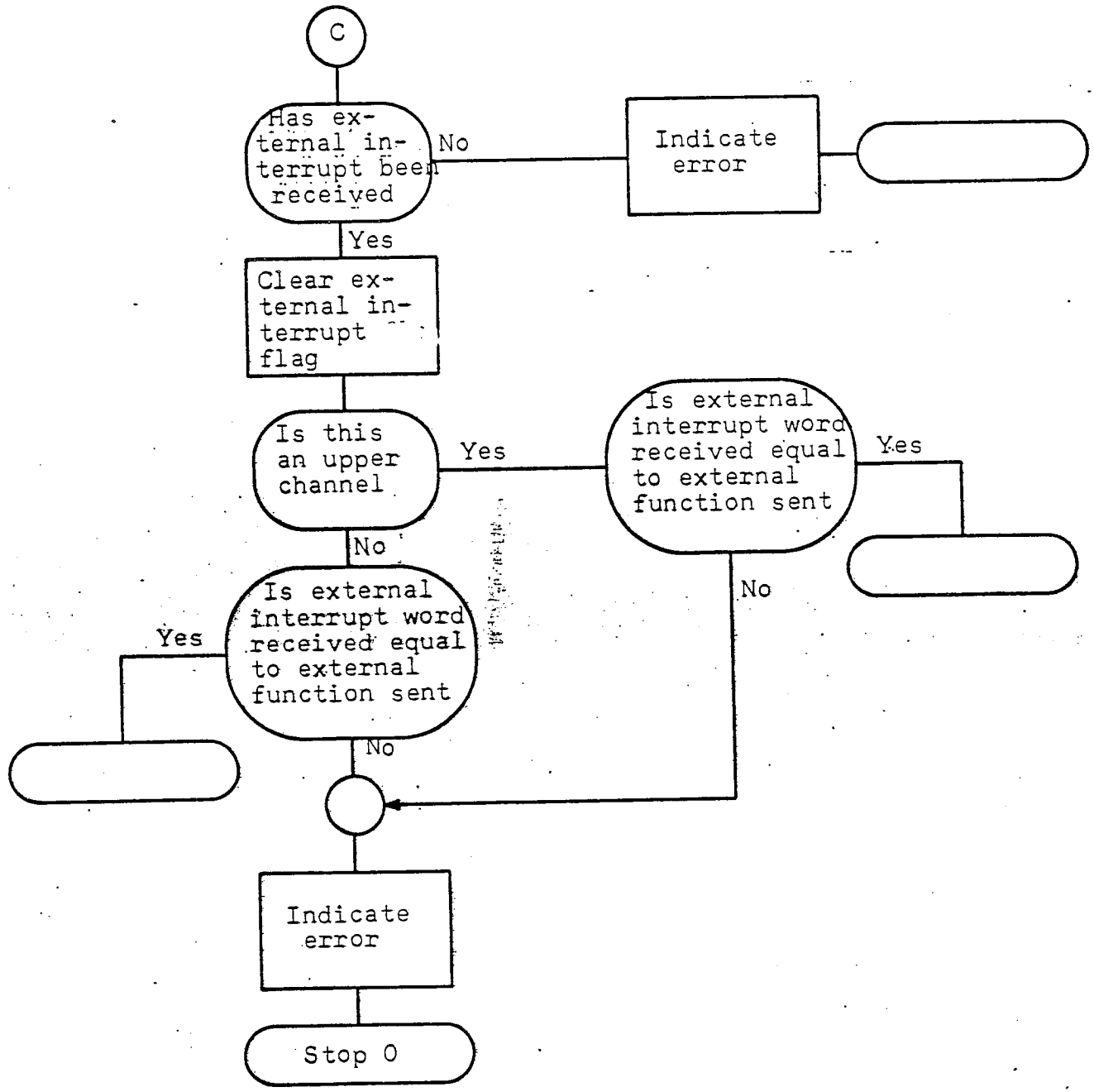
If PROGRAM STOP 0 is set and the External Interrupt received is not equal to the External Function sent, the computer will stop with A lower set to all ones.



1.5  
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SPECIFICATION SYMBOL  
SB-10163



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**SPECIFICATION SHEET**

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SPECIFICATION SYMBOL SB-10163
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TITLE: EXTERNAL INTERRUPT

DECK IDENTIFIER: FACT

CS-1 LABEL: EXINT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 7

**DESCRIPTION:**

This routine sets a flag when the External Interrupt is received.  
It is entered when the External Interrupt is received.

TITLE: EXTERNAL INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

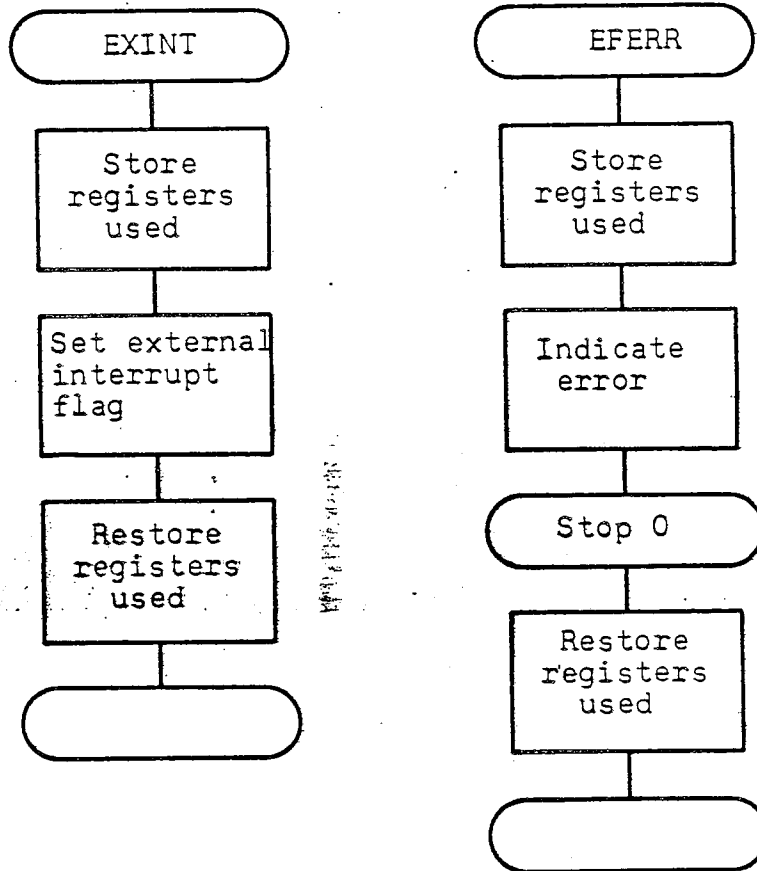
EFLAG - External Interrupt flag

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:





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SHEET 114

REVISION     SPECIFICATION SYMBOL  
SB-10163TITLE: CLOCK OVERFLOW INTERRUPT CHECKDECK IDENTIFIER: FACTCS-1 LABEL: CLKOF KEY:            IS LABEL DUPLICATE?           PROGRAMMER: FLS modified by TLR. DATE: 8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 14

## DESCRIPTION:

This routine sets up the conditions necessary to cause the RTC Overflow Interrupt and then checks that the Interrupt was properly received. It is referenced by the executive routine.

This routine checks a flag for receipt of the interrupt. If certain parameters are set, there is an error display if the interrupt is not received within an allotted time period.

TITLE: CLOCK OVERFLOW INTERRUPT CHECK

**INPUT PARAMETERS (Listed Sequentially):**

CFLAG - RTC Overflow Interrupt flag

**OUTPUT PARAMETERS (Listed Sequentially):**

CFLAG - RTC Overflow Interrupt flag

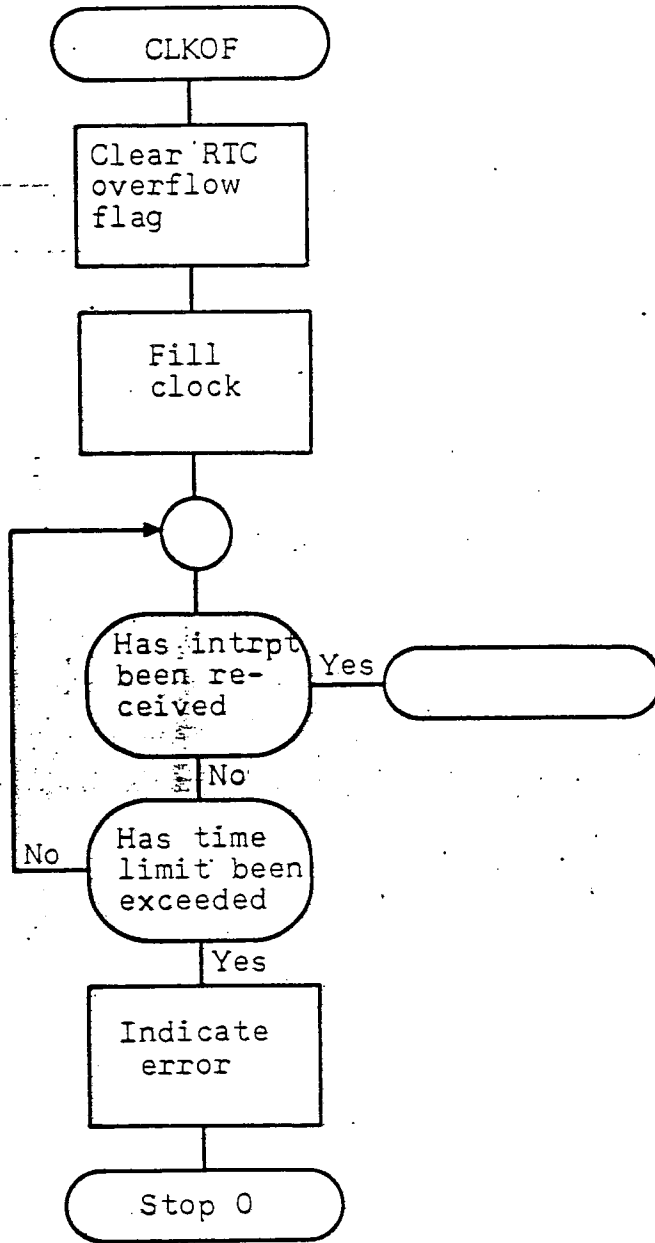
**ABNORMAL EXITS (Listed Sequentially):**

**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**

If PROGRAM STOP 0 is set and the RTC Overflow Interrupt has not been received within certain time limits, the computer will stop with the A lower register set to all ones.



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SPECIFICATION SYMBOL  
SB-10163

TITLE: RTC OVERFLOW INTERRUPT

DECK IDENTIFIER: FACT

CS-1 LABEL: COINT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 7

DESCRIPTION:

This routine sets a flag when the RTC Overflow Interrupt is received. It is entered when the Interrupt is received.

SPECIFICATION SYMBOL

SB-10163

TITLE: RTC OVERFLOW INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

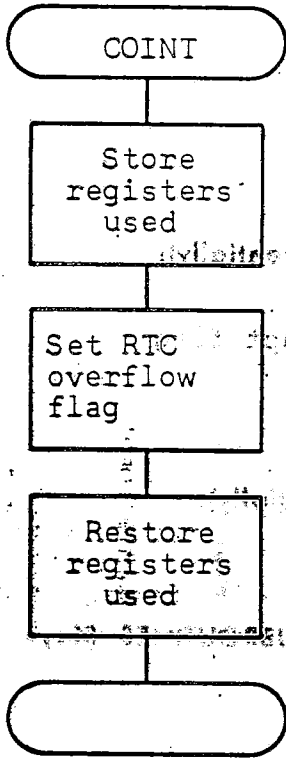
CFLAG - RTC Overflow Interrupt flag

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:



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SPECIFICATION SYMBOL

SB-10163

TITLE: RTC MONITOR CHECKDECK IDENTIFIER: FACTCS-1 LABEL: CLKM KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67NUMBER OF  $L_4$  OUTPUT INSTRUCTIONS: 19

## DESCRIPTION:

This routine sets up the parameters necessary to cause the RTC Monitor Interrupt and then checks for the proper receipt of that Interrupt. It is referenced by the executive routine. A further check is made to see that the Interrupt is not received too soon or too late.

**TITLE:** RTC MONITOR CHECK

**INPUT PARAMETERS (Listed Sequentially):**

CLKMI - RTC Monitor Interrupt address  
CMFLAG - RTC Monitor Interrupt flag

**OUTPUT PARAMETERS (Listed Sequentially):**

CMFLAG - RTC Monitor Interrupt flag

**ABNORMAL EXITS (Listed Sequentially):**

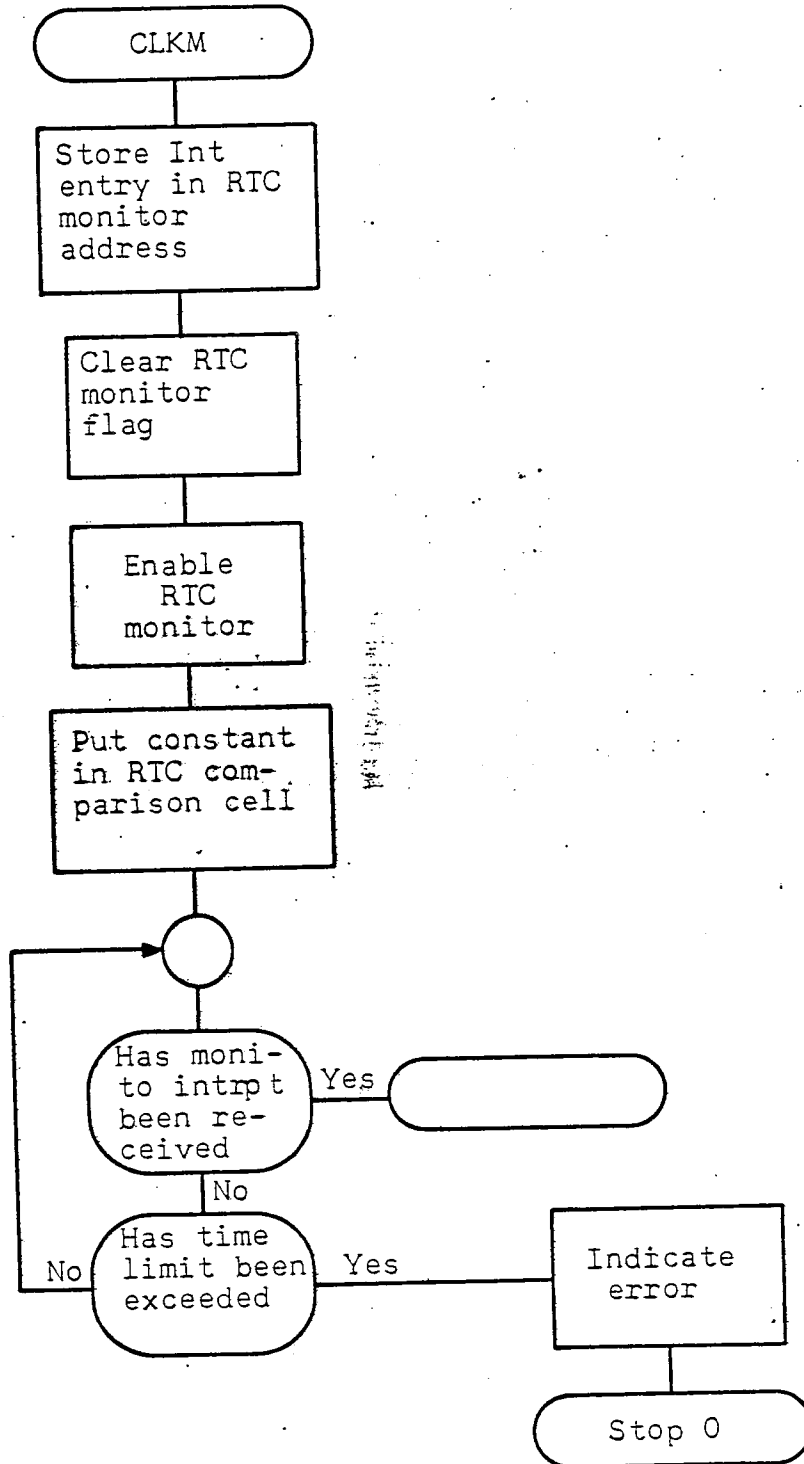
**NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):**

**SYSTEM DATA REFERENCES:**

**ALARMS AND/OR REMARKS:**

If PROGRAM STOP 0 is set and the Interrupt is received too early or not at all, the computer will stop with the A lower register set to all ones.





### PROGRAM DATA PAGE

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SPECIFICATION SYMBOL
SB-10163

TITLE: RTC MONITOR INTERRUPT

DECK IDENTIFIER: FACT.

CS-1 LABEL: CMINT KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_

PROGRAMMER: FLS modified by TLR DATE: 8 Dec. 67

NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 7

**DESCRIPTION:**

This routine sets a flag when the RTC Monitor Interrupt is received. It is entered when the Interrupt is received.

SPECIFICATION SYMBOL  
SB-10163TITLE: RTC MONITOR INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

CMFLAG - RTC Monitor Interrupt flag

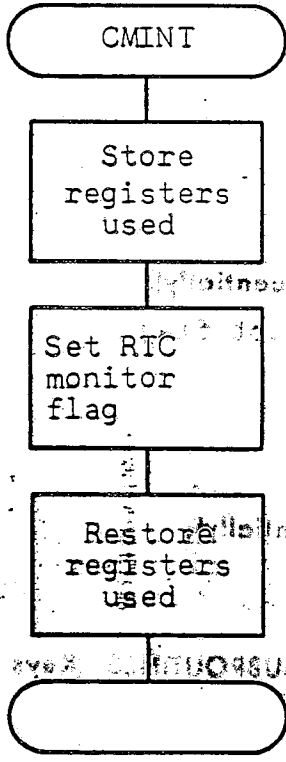
ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:

SPECIFICATION SYMBOL  
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SPECIFICATION SYMBOL

SB-10163

TITLE: ERRONEOUS EXTERNAL INTERRUPTDECK IDENTIFIER: FACTCS-1 LABEL: EFERR KEY: \_\_\_\_\_ IS LABEL DUPLICATE? \_\_\_\_\_PROGRAMMER: FLS modified by TLR DATE: '8 Dec. 67NUMBER OF L<sub>4</sub> OUTPUT INSTRUCTIONS: 7**DESCRIPTION:**

This routine comes to a stop with an error indication if certain parameters are set and the External Interrupt is received on the wrong channels. It is entered if an External Interrupt is received on the wrong channel.

SPECIFICATION SYMBOL

SB-10163

TITLE: ERRONEOUS EXTERNAL INTERRUPT

INPUT PARAMETERS (Listed Sequentially):

OUTPUT PARAMETERS (Listed Sequentially):

A lower register

ABNORMAL EXITS (Listed Sequentially):

NEXT LEVEL PROCEDURES OR SUBROUTINES (Keys of Duplicate Labels Specified):

SYSTEM DATA REFERENCES:

ALARMS AND/OR REMARKS:

If PROGRAM STOP 0 is set and the External Interrupt is received on the wrong channel, the computer will stop with the A lower register set to all ones.