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'TUNITY

MOD3.2

MILESTONE 4 UPDATE DESIGN SPECIFICATION

SUPPORT ROUTINES
'TCHOW ROUTINE
BY5 DA

1 October 1974

Prepared by
Project 4253
Contract

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
ACTION
FILE TMOD-2

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FOREWORD

This document is the MOD3.2 Milestone 4 Update Design Specification for 'TCHOW which is a routine within the Support Routines of the 'TUNITY System. It contains the engineering analysis and logical design for this routine. It is also a guide to the routine listing and should be used with the appropriate version of this listing.

'TCHOW is written in the JOVIAL J4 language and is designed to be run on the CDC 3800 with a two-bank core, using the SCF System IIB software executive monitor (SYMON).

'TCHOW was generated as part of the 'TUNITY software development responsibilities under Contract [redacted]

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CONTENTS

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GLOSSARY OF SPECIAL SYMBOLS

Symbols

$\lfloor X \rfloor$	The greatest integer less than or equal to X
$\lceil X \rceil$	The least integer greater than or equal to X
$\left[\frac{A}{B}\right]_{REM}$	The integral remainder of $\frac{A}{B}$ such that $A = \left\lfloor \frac{A}{B} \right\rfloor B + \left[\frac{A}{B}\right]_{REM}$

The following symbols represent constants:

N_1 = number of chart bits in item 'TWZCB = 38
N_2 = number of WAC charts per 'TWX record = 8
N_3 = number of probabilities per 'TWXTAB word = 7

The following symbols represent variables:

P_3 = position of a digit pair (probability) in a 'TWXTAB word ($0 \leq P_3 \leq N_3 - 1$)
W_1 = index into 'TWZTAB ($0 \leq W_1 \leq 48$)
W_2 = index within a 'TWX record ('TWXTAB) to first word of a chart entry
W_3 = index into a chart entry of 'TWXTAB ($0 \leq W_3 \leq 58$)

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1. INTRODUCTION

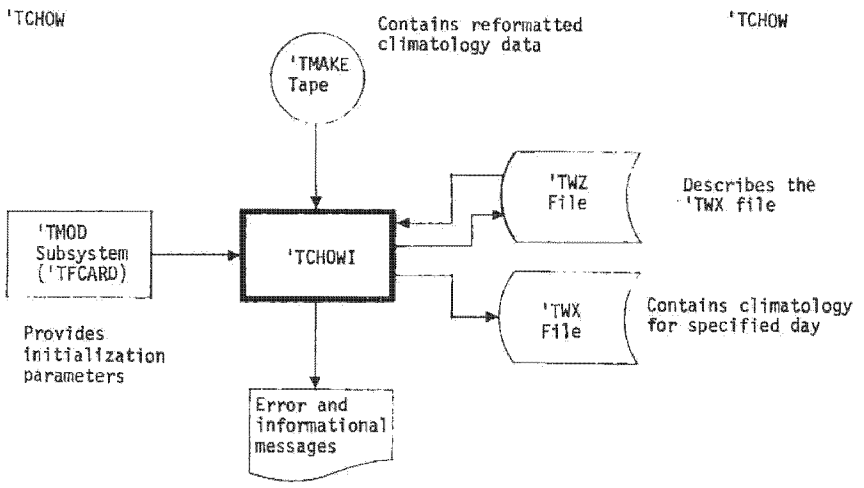
1.1 IDENTIFICATION

Name:	'TCHOW
WID:	BY5
Author:	T. J. Hiegel, J. C. Kelly
Date Documented:	4 August 1971

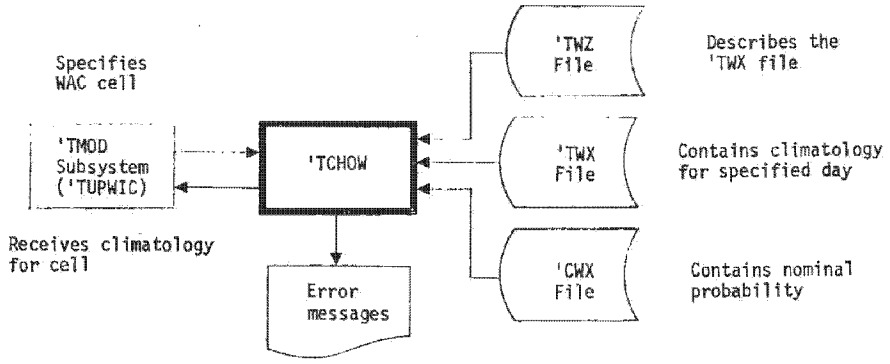
1.2 PURPOSE

'TCHOW provides climatology data for a specified day to the 'TUNITY system MOB files.

Figure 1-1 is an interface diagram of 'TCHOW.



a) Initialization Entrance



b) Computational Entrance

Figure 1-1. 'TCHOW Interface Diagram (Sheet 1 of 1)

2. DESCRIPTION

'TCHOW is called on an "as needed" basis by the MOB Processing function to supply climatology data for the WAC cell file 'TWC (and 'TWCX).

When 'TCHOW is initialized ('TCHOWI entrance) by 'TFCARD, the climatology data for the day specified in the calling sequence is transferred to disc ('TWX file) from the 'TMAKE generated tape.

During the computational calls to 'TCHOW ('TCHOW entrance) by 'TUPWIC, the input i,j coordinates for a single WAC cell are used to obtain indexing information into the 'TWX file which contains the climatology data for the appropriate date. After the data is transferred to core, if required, the cloud-free probability for the cell is extracted and returned to the calling routine ('TUPWIC) in the calling sequence. Control is then returned to the calling routine.

The 'TCHOW overview flow diagram is shown in Figure 1-2.

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'TCHOW

'TCHOW

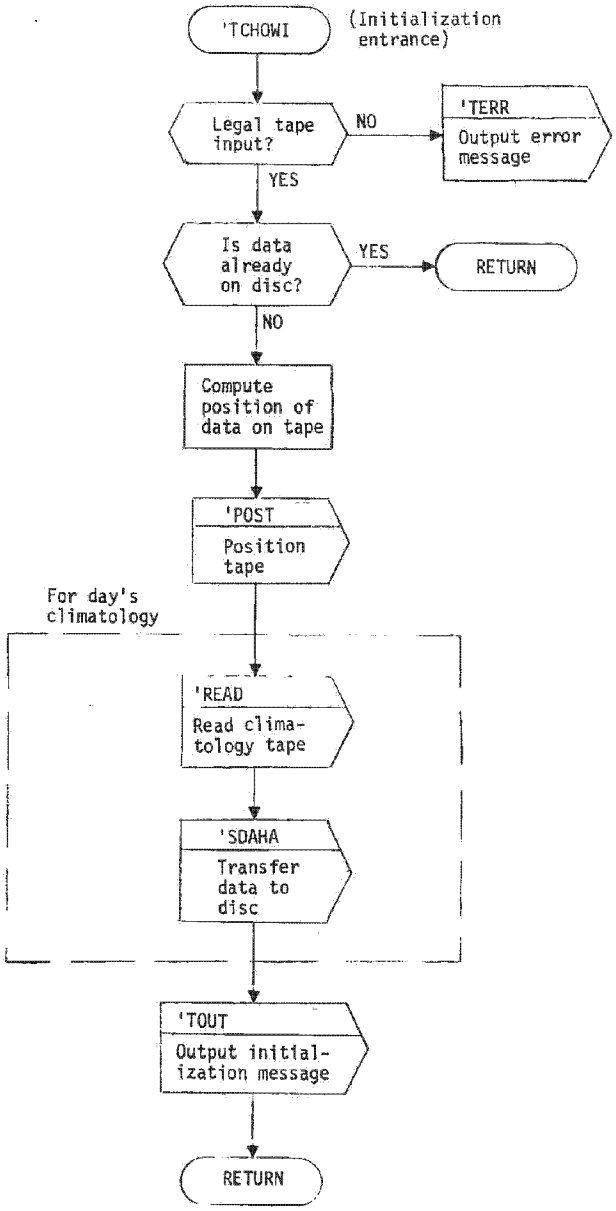

Figure 1-2. 'TCHOW Overview Flow Diagram (Sheet 1 of 2)

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'TCHOW 'TCHOW

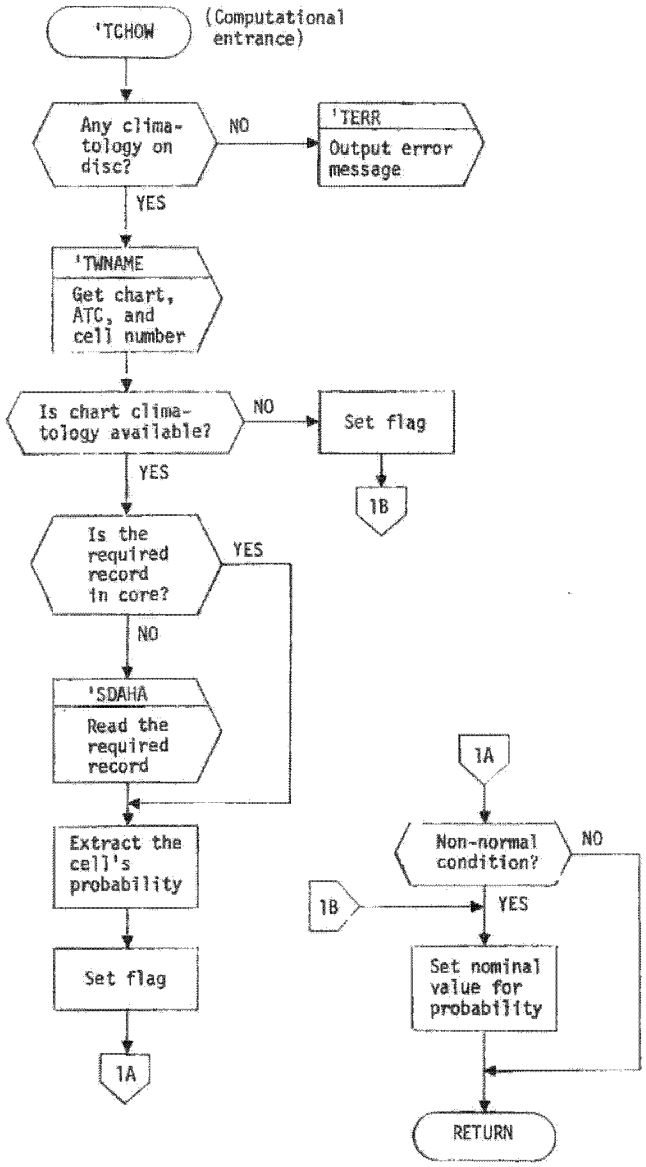

Figure 1-2. 'TCHOW Overview Flow Diagram (Sheet 2 of 2)

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3. USAGE

3.1 INPUT/OUTPUT

3.1.1 Calling Sequence

The calling sequences are as follows:

a. Initialization entrance

```
'TCHOWI(UNIT,MONTH,DAY,BUF,SIZE)  $
```

where

- UNIT = a call-by-value parameter containing the logical tape unit number for the 'TMAKE climatology tape ($0 \leq$ UNIT ≤ 19)
- MONTH = a call-by-value parameter containing the month of the year for which climatology is required ($1 \leq$ MONTH ≤ 12)
- DAY = a call-by-value parameter containing the day of the month for which climatology is required ($1 \leq$ DAY ≤ 31)
- BUF = a call-by-name parameter containing the location of the tape read-in buffer
- SIZE = a call-by-value parameter containing the size of the read-in buffer

b. Computational entrance

```
'TCHOW(II,JJ=PROB,FLAG)  $
```

where

- II = a call-by-value parameter containing the internal i coordinate of the WAC cell for which climatology is needed
- JJ = a call-by-value parameter containing the internal j coordinate of the WAC cell for which climatology is needed
- PROB = a call-by-value parameter containing the probability in percent of a 90% cloud-free WAC cell ($0 \leq$ PROB ≤ 99)
- FLAG = a call-by-value parameter indicating the status of the probability in PROB
  - 0 = no errors or special values
  - 1 = illegal input - probability cannot be determined
  - 2 = no climatology for cell contained on 'TMAKE tape - PROB is set to 'CWXNOD
  - 3 = specified cell is outside of ETAC grid - PROB is set to 'CWXNOD
  - 4 = cell is within grid limits but there is no data for the cell - PROB is set to 'CWXNOD

3.1.2 Input/Output Parameters

'TCHOW inputs and outputs are listed in Table 1-1.

3.2 INTERNAL VARIABLES

The internal variables used in 'TCHOW are listed in Table 1-2.

3.3 INTERFACES

'TCHOW interfaces are described in Table 1-3.

3.4 ERROR MESSAGES AND RECOVERY PROCEDURES

Error messages and recovery procedures governing this routine are listed in Table 1-4. These error messages are output via 'TERR.

3.5 INFORMATIONAL MESSAGES

Informational messages output by this routine are listed in Table 1-5.

Table 1-1. 'TCHOW Input/Output

Element	Table	Block	Routine	Set/Use	Special Comments
'CWX		'CWX	'TCHOW	U	
'CWXNOD		'CWX	'TCHOW	U	
'IOAA		'IOAA	'TCHOW	U	
'IOSTAT	'IOSTAT	'IOAA	'TCHOW	U	
'MNAME	'MOBCD	'TIMCON	'TCHOW	U	
'MOBCD	'MOBCD	'TIMCON	'TCHOW	U	
'PARITY	'IOSTAT	'IOAA	'TCHOW	U	
'T77		'T77	'TCHOW	B	
'T77ALP		'T77	'TCHOW	U	
'T77ATC		'T77	'TCHOW	U	
'T77CEL		'T77	'TCHOW	U	
'T77EFG		'T77	'TCHOW	U	
'T77ILG		'T77	'TCHOW	S	
'T77ILT		'T77	'TCHOW	S	
'T77WAC		'T77	'TCHOW	U	
'TIMCON		'TIMCON	'TCHOW	U	
'TOO		'TOO	'TCHOW	S	
'TOOMEG	'TOOTAB	'TOO	'TCHOW	S	
'TOOTAB	'TOOTAB	'TOO	'TCHOW	S	
'TWX		'TWX	'TCHOW	B	
'TWXDW	'TWXTAB	'TWX	'TCHOW	B	
'TWXTAB	'TWXTAB	'TWX	'TCHOW	B	
'TWZ		'TWZ	'TCHOW	B	
'TWZCB	'TWZTAB	'TWZ	'TCHOW	U	
'TWZDAY		'TWZ	'TCHOW	B	
'TWZMON		'TWZ	'TCHOW	S	

Table 1-1. 'TCHOW Input/Output (Continued)

Element	Table	Block	Routine	Set/Use	Special Comments
'TWZNC	'TWZTAB	'TWZ	'TCHOW	U	
'TWZTAB	'TWZTAB	'TWZ	'TCHOW	B	
'TWZTDY		'TWZ	'TCHOW	B	
'TWZTID		'TWZ	'TCHOW	B	
'TWZTOT		'TWZ	'TCHOW	B	
'TWZWD	'TWZTAB	'TWZ	'TCHOW	S	
'TXX		'TXX	'TCHOW	S	
'TXXHOW	'TXXTB1	'TXX	'TCHOW	S	
'TXXTB1	'TXXTB1	'TXX	'TCHOW	S	

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Table 1-2. Internal Variables

JOVIAL Symbol	Engr. Symbol	Internal Units	Description
B1	---	n.d.	'TWZCB bit number
BUF	---	n.d.	Location of tape read-in buffer (calling sequence)
CODE	---	n.d.	'TMAKE tape identification code - preset to 8H('TMAKE)
DAY	---	n.d.	Day of month for which climatology is required (calling sequence)
DAYSUM	---	n.d.	Table containing sum of days in a year up to the first day of each month (12 entries)
DAYM	---	n.d.	Item in table DAYSUM - number of days per month
DAYS	---	n.d.	Item in table DAYSUM - sum of days
DB	---	n.d.	Flag for debug output
FLAG	---	n.d.	Status flag for 'TCHOW output (calling sequence) 0 = no errors or special values 1 = illegal output 2 = no climatology for cell on 'TMAKE tape 3 = specified cell is outside of ETAC grid 4 = cell is within grid but there is no data for cell
IDWDS	---	n.d.	Number of words in ident record - preset to 60
II	---	n.d.	Internal I coordinate of the WAC cell for which climatology is needed (calling sequence)
INDNO	---	n.d.	No data indicator - preset to 98
INDOFF	---	n.d.	Off-grid indicator - preset to 99
IX1	---	n.d.	Index into 'TWXTAB
IX2	---	n.d.	Index into input buffer LOC
IX3	---	n.d.	Index into 'TWX file - record number
JJ	---	n.d.	Internal J coordinate of the WAC cell for which climatology is needed (calling sequence)
MONTH	---	n.d.	Month of the year for which climatology is required (calling sequence)
N1	---	n.d.	Number of bits in 'TWZCB - preset to 38
N2	---	n.d.	Number of charts per 'TWX record
N3	---	n.d.	Number of probabilities per word - preset to 7
NUM	---	n.d.	Number of physical records per logical record
OUT	---	n.d.	Output unit for 'TOUT - preset to 1
P3	---	n.d.	Digit pair position
PROB	---	n.d.	Probability of WAC cell being 90 percent cloud-free, in percent (calling sequence)
REC	---	n.d.	Number of record to read from 'TWX file
RECIN	---	n.d.	Number of 'TWX record in core - preset to 9999
RECWDS	---	n.d.	Size in words of a 'TMAKE tape physical record
SEQ	---	n.d.	WAC chart sequence position

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Table 1-2. Internal Variables (Continued)

JOVIAL Symbol	Engr. Symbol	Internal Units	Description
SIZE	---	n.d.	Size in words of the tape read-in buffer (calling sequence)
T1	---	n.d.	Temporary storage
T2	---	n.d.	Temporary storage
T3	---	n.d.	Temporary storage
UNIT	---	n.d.	Logical unit number for 'TMAKE climatology tape (calling sequence)
W1	---	n.d.	Index record word
W2	---	n.d.	'TWXTAB word
W3	---	n.d.	WAC chart entry word
WACPR	---	n.d.	Number of WAC charts per physical tape record - set from word 3 of ident record
WACTAB	---	n.d.	WAC chart suffix table - 7 entries preset to: A, B, C, D, E, F, blank
WACSUF	---	n.d.	Item in WACTAB - WAC chart suffix
WACWDS	---	n.d.	Number of words required for each WAC chart on the 'TMAKE tape - preset to 59
YDAY	---	n.d.	Day of the year (1-365); and "tape day" or logical tape record (0-72)

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Table 1-3. Interfaces

Routine	Purpose	Reference
'TCHOW CALLS THE FOLLOWING ROUTINES		
'DERROR	To check disc reads	1
'IOP	To read and check the input tape	2
'POST	To position the input tape	2
'SABORT	To abort the routine (to back up category 5 errors)	2
'SCNVRTI	To convert binary to BCI	2
'SDAHA	To read and write the disc	2
'TERR	To output error messages	3
'TOUT	To output informational messages	3
'TWNAME	To convert cell I, J to chart, ATC, and cell number	4

Table 1-4. Error Messages

Message No.	Message Category	Response Yes	Response No	Error Message	Description
00	5	-	-	Tape read-in buffer not large enough	a. Explanation: The size of the input buffer (as specified in parameter SIZE of the 'TCHOWI calling sequence) is not large enough to read a record from the input climatology tape. b. Effect on Operation: 'TCHOW cannot read the input tape. The routine is aborted. c. Test Performed: "Is SIZE less than RECWDS?" d. Location of Test: Figure 1-3, Sheet 5. e. Probable Cause of Error: Coding mistake in calling routine. f. Corrective Action: Value assigned to calling sequence parameter SIZE should be corrected.
01	5	-	-	'TMAKE tape is not on Unit XX	a. Explanation: A 'TMAKE generated climatology tape is not mounted on unit XX. b. Effect on Operation: 'TCHOW cannot obtain the required climatology. The routine is aborted. c. Test Performed: "Is BUF(0) not equal to CODE?" d. Location of Test: Figure 1-3, Sheet 5. e. Probable Cause of Error: Wrong tape is mounted on unit XX. f. Corrective Action: Mount and equip a 'TMAKE generated climatology tape on input unit, and restart function.

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Table 1-4. Error Messages (Continued)

Message No.	Message Category	Response Yes	Response No	Error Message	Description
02	4	-	-	Parity errors on input tape	a. Explanation: Parity errors were detected while reading the 'TMAKE climatology tape. b. Effect on Operation: The user is given the option to abort or continue. The same logical unit is read again if the user continues. c. Test Performed: Is 'PARITY equal to 1? d. Location of Test: Figure 1-3, Sheets 5,7. e. Probable Cause of Error: 1. Bad tape drive 2. Bad tape 3. Mounting tape of different density after error message 1 is outout f. Corrective Action: 1. Try different physical unit 2. Use alternate tape, or regenerate tape 3. Re-equip input unit and start over
03	5	-	-	Structure of 'TMAKE tape is incorrect	a. Explanation: The format of the input is not correct. The number of the record is not consistent with the records position on the tape. b. Effect on Operation: 'TCHOW cannot use the climatology data since the input tape is in the wrong position. The routine is aborted. c. Test Performed: "Is YDAY not equal to BYTE ($4,2$)(BUF(O)) or is I not equal to BYTE ($6,2$)(BUF(O))$?" d. Location of Test: Figure 1-3, Sheet 8. e. Probable Cause of Error: 1. Error in 'TMAKE causing an improperly formatted tape to be generated 2. Error in 'TCHOW causing the tape to be positioned to the wrong record. 3. Mounting tape of different density after error message 1 is output

Table 1-4. Error Messages (Continued)

Message No.	Message Category	Response Yes	Response No	Error Message	Description
					f. Corrective Action: 1. Check 'TMAKE code 2. Check 'TCHOW code 3. Re-equip input unit and start over
04	5	-	-	'TCHOW not initialized	a. Explanation: 'TCHOW was not initialized via the 'TCHOWI entrance. b. Effect on Operation: 'TCHOW cannot operate since there is no climatology data in the 'TWX file. The routine is aborted. c. Test Performed: "Is 'TWZDAY greater than zero?" d. Location of Test: Figure 1-3, Sheet 1. e. Probable Cause of Error: Mistake in subsystem using 'TCHOW. f. Corrective Action: Initialize 'TCHOW at an appropriate place in the subsystem needing climatology data.
05	5	-	-	Illegal date in climatology request	a. Explanation: An illegal date was input via the 'TCHOWI calling sequence. b. Effect on Operation: 'TCHOW cannot process the initialization request. The routine is aborted. c. Test Performed: "Is MONTH less than 1 or greater than 12 or is DAY less than 1 or greater than DAYM($MONTH$)?" d. Location of Test: Figure 1-3, Sheet 5. e. Probable Cause of Error: Mistake in subsystem calling 'TCHOWI. f. Corrective Action: Calling routine should be corrected.

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Table 1-5. Informational Messages

Informational Message	Description
'TCHOW INITIALIZED FOR DD MMM (REC NN)--TAPE-TO-DISC DATA TRANSFER WAS XXXXXXXXXXX	This message is output every time the 'TCHOWI entrance is called. The following variables are displayed: DD = day of month ($1 \leq DD \leq 31$) MMM = month of year (three letter code) NN = logical record number ($0 \leq NN \leq 72$) XXXXXXXXXXX = "REQUIRED" if a tape-to-disc data transfer was made = "NOT REQUIRED" if a tape-to-disc data transfer was not needed

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4. LIMITATIONS

4.1 USAGE LIMITATIONS

Before entrance 'TCHOW is called, climatology must be transferred to the 'TWX file by an initialization call to 'TCHOWI; otherwise the routine aborts.

4.2 DATA LIMITATIONS

The climatology for one WAC cell per call is returned to the using routine.

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5. METHOD AND FLOW DIAGRAM

5.1 INITIALIZATION

Before 'TCHOW can be used to output climatology data, it must be initialized by a call to 'TCHOWI. First, the identification record (see Appendix B, Part II) of the input tape is read into core and checked to determine if a 'TMAKE generated tape is being used. If a 'TMAKE tape is not input, error message 1 is output via 'TERR. Second, the input buffer is checked for adequate size. It must be at least as large as the physical records on the 'TMAKE tape or error message 0 is output.

Next, the input day (DAY) and month (MONTH) are converted to a logical tape record or tape "day". The relationship between logical tape records and day of the year is shown in Table 1-6.

Table 1-6. Day of Year/Logical Tape Record Mapping

Logical Tape Record	Day of Year
0	3 - 7
1	8 - 12
2	13 - 17
.	.
.	.
.	.
71	358 - 362
72	363, 364, 365, 1, 2

NOTE: 1. Each tape record contains the average climatology for 5 days

2. Data for February 29th has been eliminated.

Since the climatology tape does not contain any data for February 29th, the data for February 28th is used for this day. However, when February 29th is input, the 'TWZ parameters, 'TWZDAY and 'TWZMON, are set to 29 and 2 respectively.

If climatology already resides in the 'TWX file and it is identical to the requested data, no tape-to-disc data transfer needs to be made. In this case, item 'TXXHOW is set to 0 and control is returned to the calling routine.*

*'TXXHOW is used as a flag by 'TUPWIC as follows: 'TXXHOW=1 indicates that climatology is required for all the WAC cells in the 'TWC file; 'TXXHOW=0 indicates that climatology is required for the new WAC cells only. 'TFCARD initializes 'TXXHOW (sets it to 1) before 'TCHOWI is called, and 'TCHOWI sets it to 0 if the data on disc is the same as the data requested.

When the requested climatology is different from that in 'TWX (or there is none in 'TWX) the required data must be transfered from the 'TMAKE tape and stored in the 'TWX file. Before the input tape is positioned and read, the tape identification ('TWZTID), total number of WAC charts on the tape ('TWZTOT), and the indexing information for the data ('TWZTAB) are set up in the 'TWZ block. Also, 'TWZDAY, 'TWZMON, and 'TWZTDY are set to zero.

The input tape is positioned with 'POST to the first physical record for the requested day's climatology. The total number of physical records for one day's data is given by:

$$NUM = \left\lceil \frac{('TWZTOT)}{(WACPR)} \right\rceil \qquad (1\text{-}1)$$

where

'TWZTOT = total number of WAC charts on the tape

WACPR = number of WAC charts per physical record

Then the first record is determined with the following equation:

$$\text{First physical record for day} = (YDAY)(NUM)+2 \qquad (1\text{-}2)$$

where

YDAY = logical tape record (0-72)

NUM = is defined in Equation (1-1)

the constant term compensates for the ident record and the fact that 'POST considers the first tape record to be record number 1.

Each physical record for the day is read into core and the data is transferred one chart at a time to 'TWXTAB. When 'TWXTAB is filled, it is written onto disc. Tape records are read into core as required during this data transfer cycle.

When all of the climatology for the day has been stored on disc, the items 'TWZDAY, 'TWZMON, and 'TWZTDY are set to DAY, MONTH, and YDAY, respectively, and control is returned to the calling routine.

5.2 CLIMATOLOGY REQUEST PROCESSING

The 'TCHOW entrance provides climatology data (probability of being 90 percent or more cloud-free in percent) for one WAC cell per call. The cell for which climatology is required is specified by giving the internal i and j coordinates to 'TCHOW via the calling sequence. If there is no data in the 'TWX file when 'TCHOW is entered, error message number 4 is output.

'TWNAME is used to convert the internal i and j to a WAC chart, ATC, and cell number. A check is then made to determine if there is any climatology data for the chart in 'TWX. The position of the chart bit within the index record is found with the following equations:

$$\text{Word within index record} = W_1 = \left\lfloor \frac{C}{N_1} \right\rfloor \tag{1-3a}$$

$$\text{Bit within word } W_1 = B = \left[\frac{C}{N_1} \right]_{REM} \tag{1-3b}$$

where

C = normalized WAC chart number (sequence number for chart when charts 1A-1F are taken into account; $0 \leq C < 1856$)

N_1 = number of chart bits per word = 38

A complete description of the index record is given in Appendix B, Part II. If the chart's climatology is not on the tape (chart bit = 0), FLAG is set to 2, PROB is set to 'CWXNOD, and control is returned to the calling routine.

If data is available for the chart, the 'TWX record containing the chart's climatology is computed with

$$\text{'TWX record} = REC = \left\lfloor \frac{S}{N_2} \right\rfloor \tag{1-4}$$

where

S = sequence position of the chart's data in logical record

$$= (\text{'TWZNC})_{W_1} + \sum_{i=0}^{B} \left(\text{bit } i \text{ of } (\text{'TWZCB})_{W_1} \right) - 1$$

= the total number of "1" bits up to, but not including, the Cth chart's bit

N_2 = number of WAC charts per 'TWX record = 8

W_1 = is defined by Equation (1-3a)

B = is defined by Equation (1-3b)

$(\text{'TWZNC})_{W_1}$ = running count of WAC charts preceding word W_1

$(\text{'TWZCB})_{W_1}$ = WAC chart bits where a bit set to 1 indicates the presence of a chart's climatology for WAC charts associated with word W_1

If the required 'TWX record is already in core (if REC equals RECIN), no disc read is necessary.

The first word of a chart's data within 'TWXTAB is given by

$$\text{First word} = W_2 = (\text{WACWDS}) \left[\frac{S}{N_2}\right]_{REM} \tag{1-5}$$

where

WACWDS = number of words per WAC chart = 59

and

S and N_2 are as defined in Equation (1-4).

The location within the chart's "entry" of the word containing the probability for the specified cell is computed with

$$\text{Word within chart entry} = W_3 = \left\lfloor \frac{16(A-1) + (L-1)}{N_3} \right\rfloor + 1 \tag{1-6}$$

where

A = ATC number within chart = 'T77ATC ($1 \le A \le 25$)

L = cell number within ATC = 'T77CEL ($1 \le L \le 16$)

N_3 = number of probabilities per word = 7

Next, the position of the digit pair (probability) within the word, W_3, is calculated with

$$\text{Digit pair position} = P_3 = (N_3 - 1) - \left[\frac{16(A-1) + (L-1)}{N_3}\right]_{REM} \tag{1-7}$$

where

P_3 = an integer such that $0 \le P_3 \le N_3 - 1$

A, L, N_3 = are as defined in Equation (1-6).

Finally, the probability for the cell is extracted using the following equation:

$$\text{90\% cloud-free probability for cell} = \text{PROB} = \left[\frac{\left\lfloor \frac{\text{'TWXDW}(W_2 + W_3)}{P_3} \right\rfloor}{\frac{100}{100}}\right]_{REM} \tag{1-8}$$

where

'TWXDW is a data word in 'TWXTAB

W_2 is defined in Equation (1-5)

W_3 is defined in Equation (1-6)

P_3 is defined in Equation (1-7)

Before control is returned to the calling routine, PROB is compared against INDOFF (off-grid flag) and INDNO (no data flag). If PROB equals INDOFF or INDNO, the status flag is set to 3 or 4, respectively, and PROB is set to 'CWXNOD.

The 'TCHOW detailed flow diagram is shown in Figure 1-3.

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'TCHOW 'TCHOW

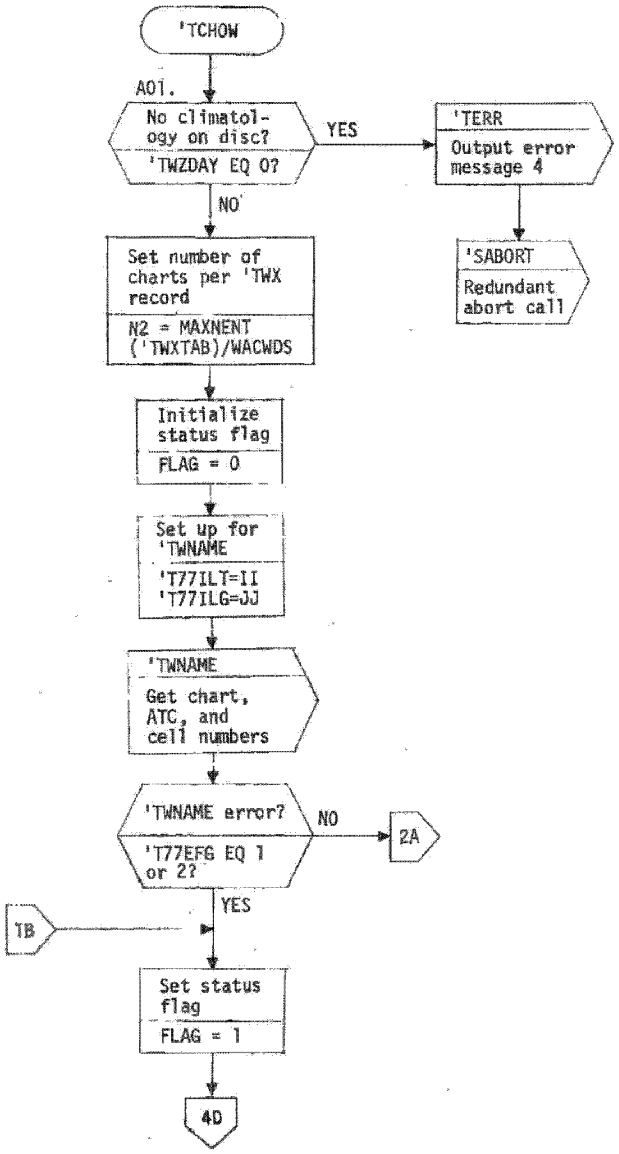

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 1 of 10)

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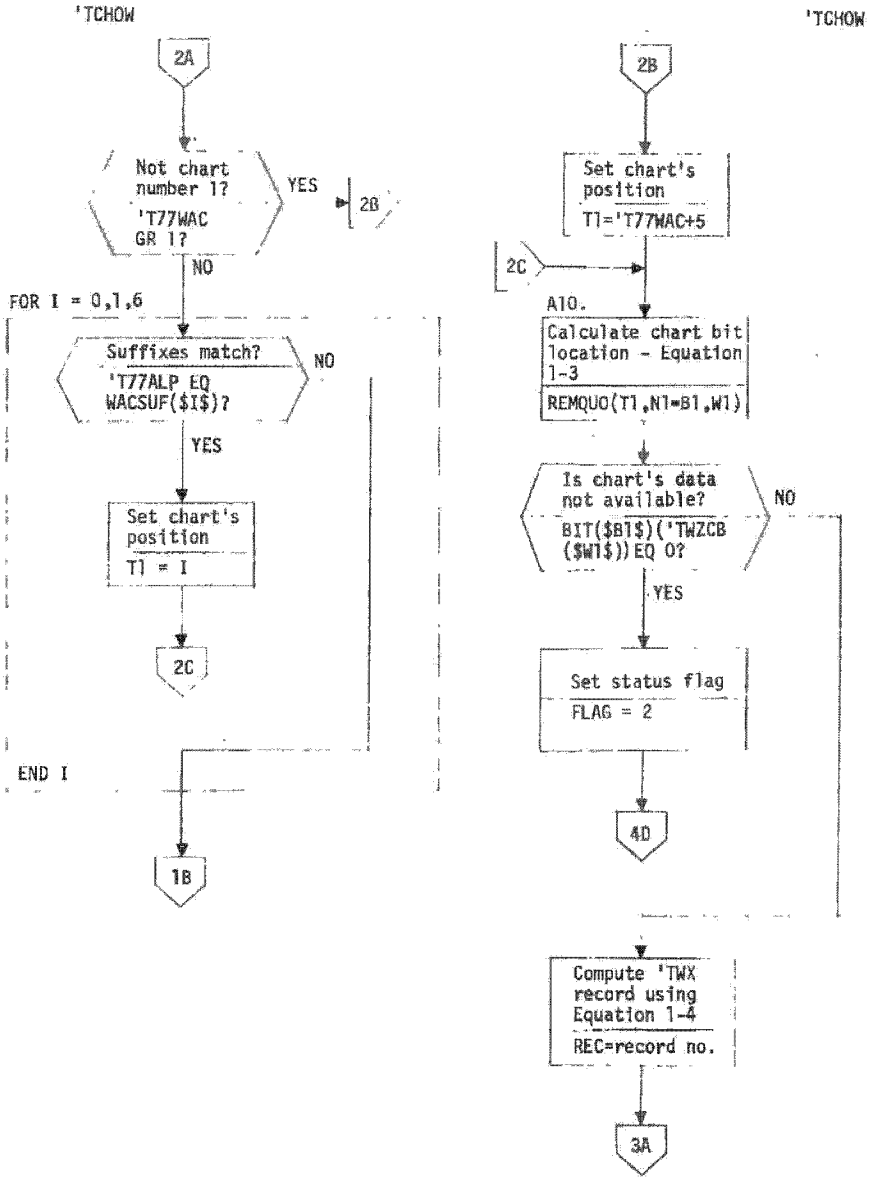

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 2 of 10)

~~SECRET/Hx~~

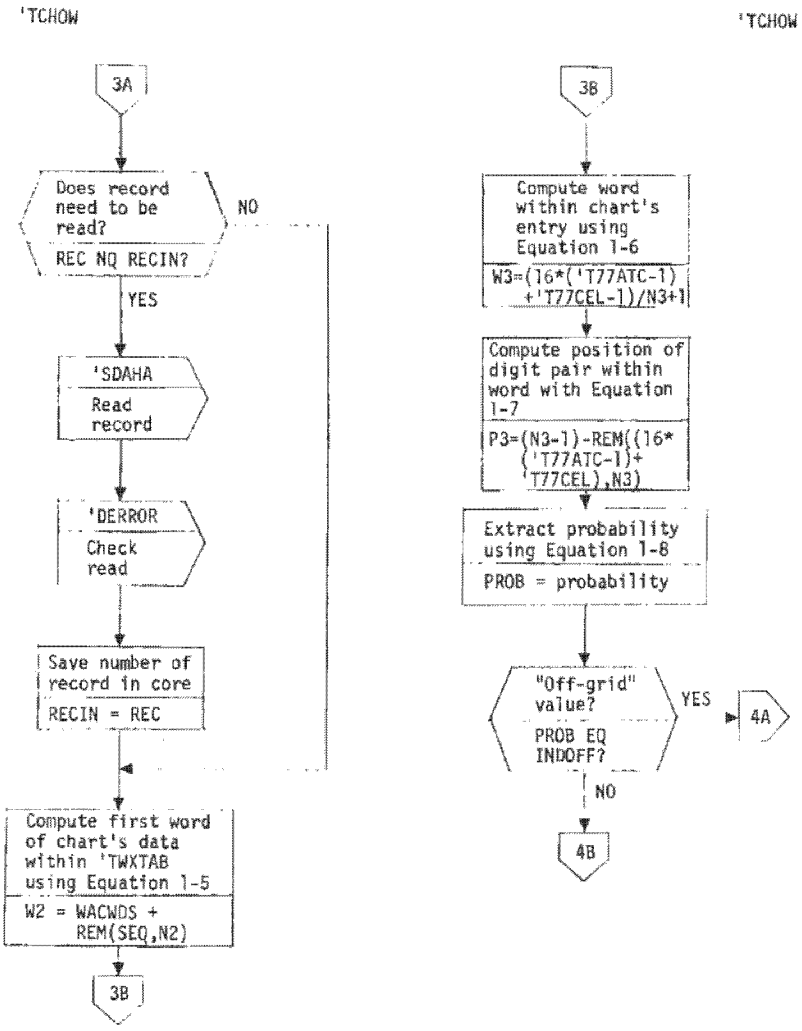

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 3 of 10)

~~SECRET/Hx~~

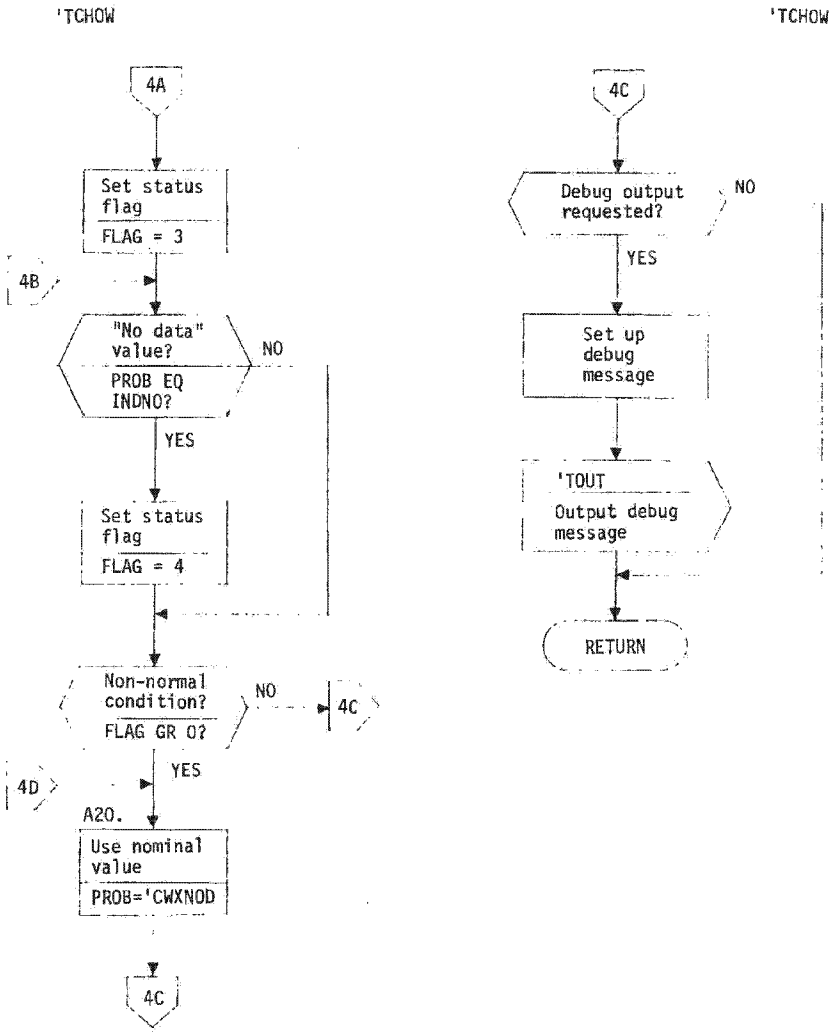

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 4 of 10)

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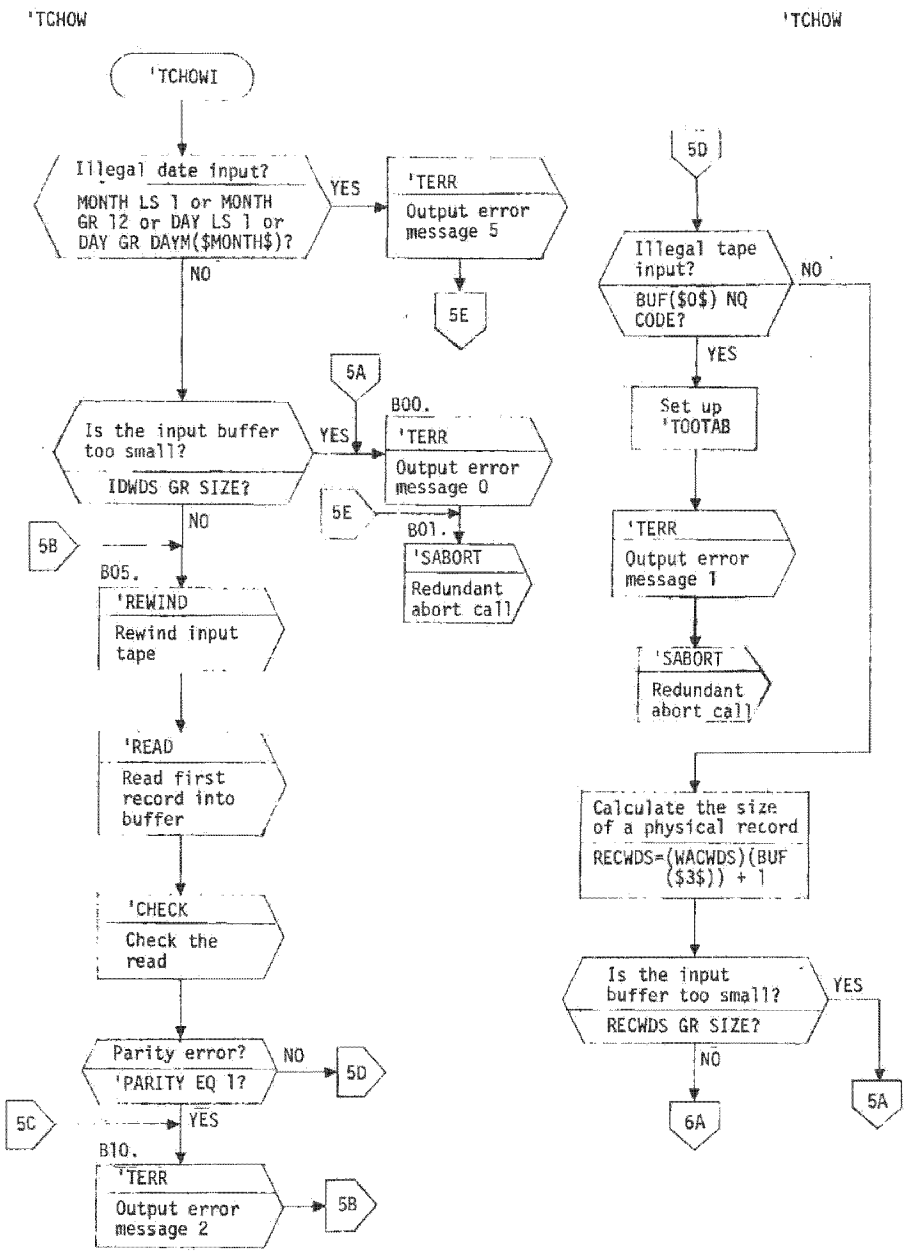

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 5 of 10)

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'TCHOW 'TCHOW

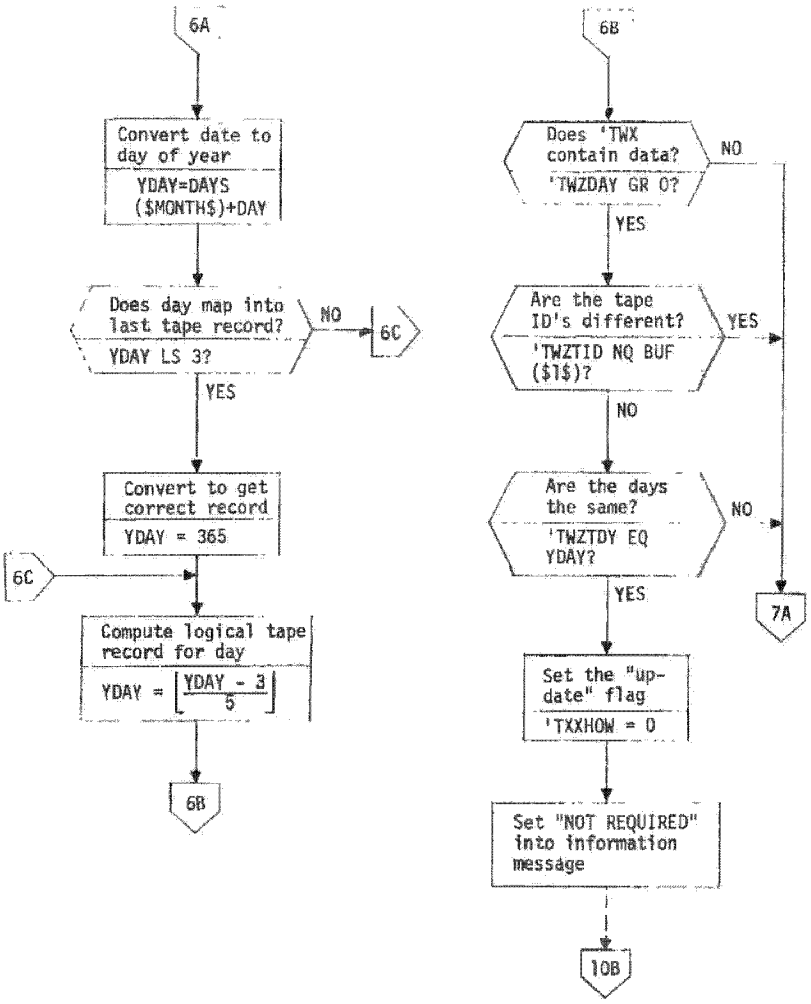

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 6 of 10)

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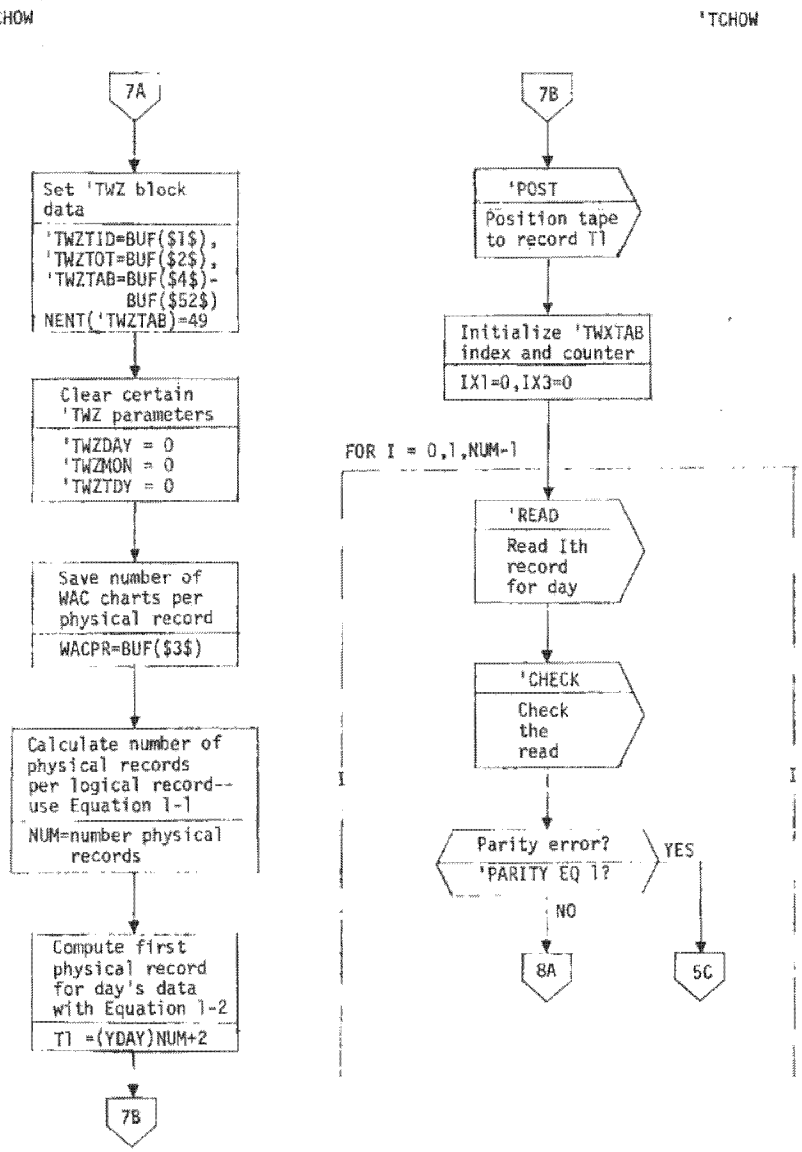

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 7 of 10)

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'TCHOW 'TCHOW

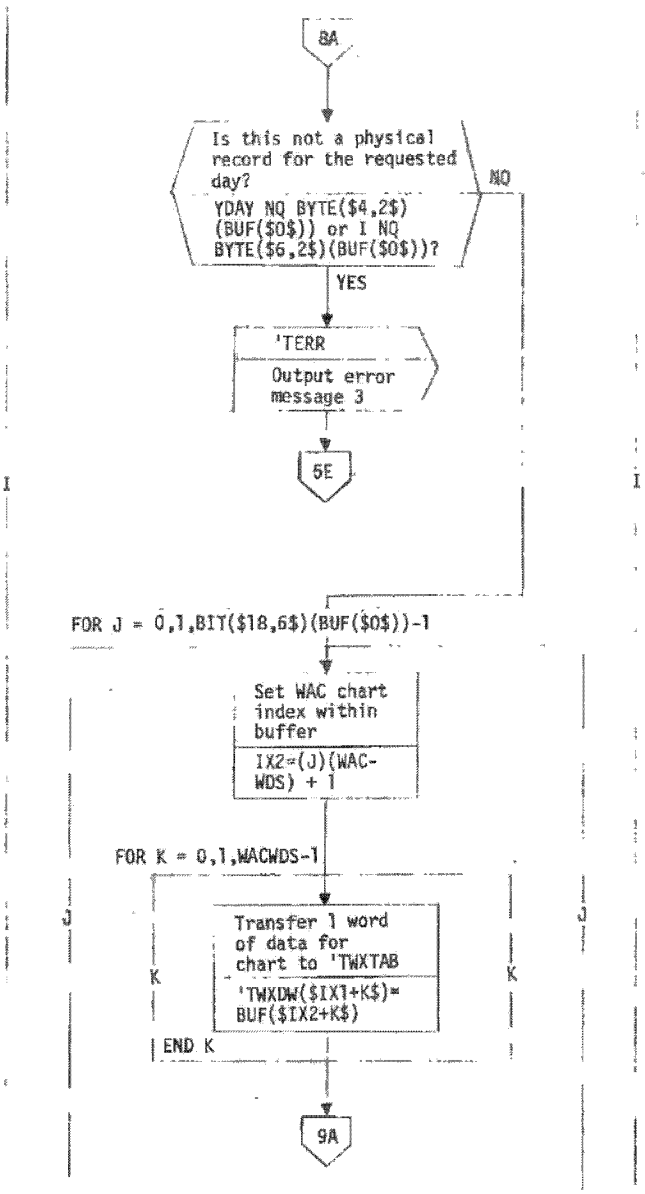

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 8 of 10)

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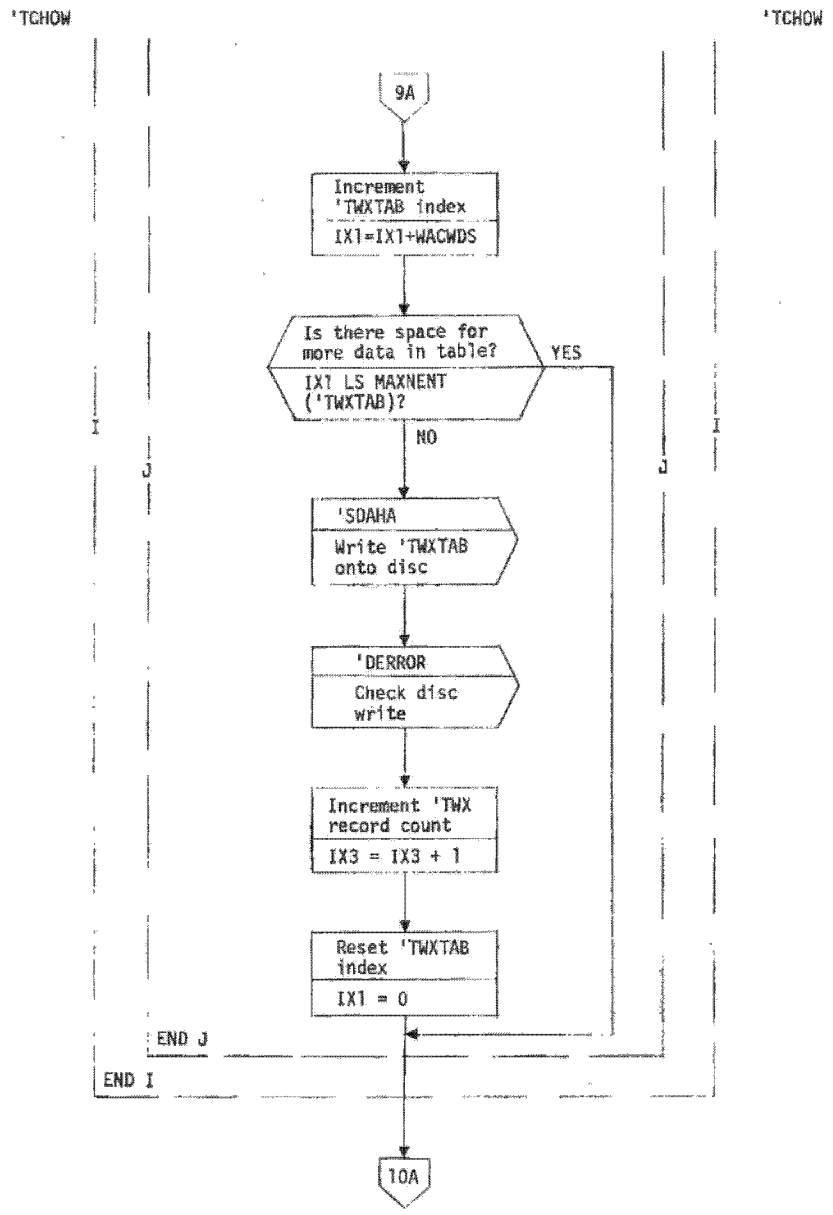

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 9 of 10)

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'TCHOW 'TCHOW

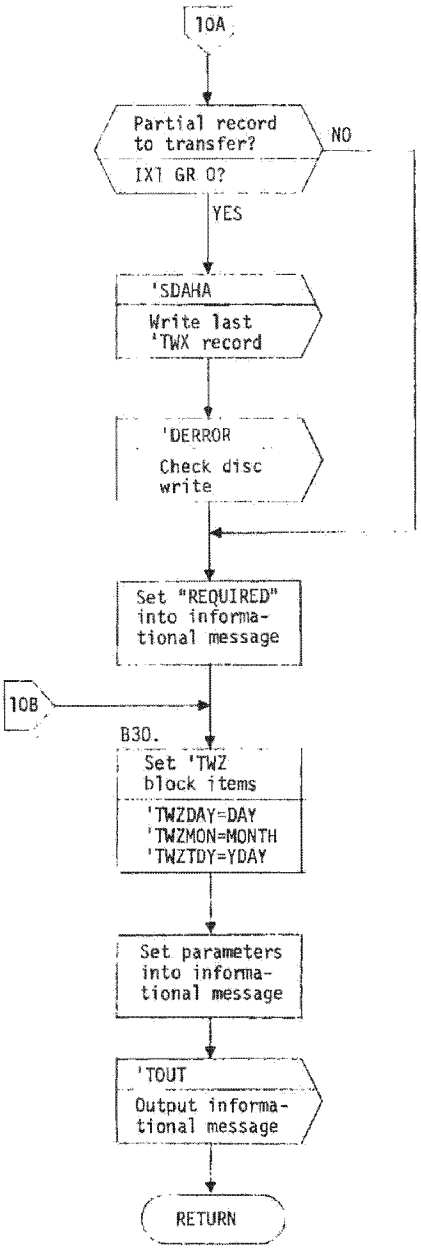

Figure 1-3. 'TCHOW Detailed Flow Diagram (Sheet 10 of 10)

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6. STORAGE AND TIMING

6.1 STORAGE

'TCHOW uses 460 words of core storage. The breakdown is as follows:

a. Instructions 350 words
b. Data 110 words

6.2 TIMING

The execution time for the 'TCHOW entrance is given by

$$T = r \cdot t_{DR} + t_N + t_I$$

where

t_{DR} = disc read time = 25 ms
r = 0 if no disc read required
= 1 if disc read required
t_N = time per 'TWNAME call = 0.5 ms
t_I = time required to operate 'TCHOW code = 1 ms

Using this equation gives an execution time of 1.5 ms without a disc read and 26.5 ms with a disc read.

Execution time for the 'TCHOWI entrance was determined by timing studies with data for 197 WAC charts on the input tape. Results show that initialization takes from 10 to 60 seconds depending on which logical record must be transferred to disc.

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7. CLOSED SUBROUTINES

NONE.

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Approved for Release: 2025/07/25 C05128199