

DECSYSTEM-20
SWS MONITOR INTERNALS
MONITOR TABLES
PRELIMINARY VERSION

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RSTS	RSX	TYPESET-8
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Monitor Program Logic Manual

DIGITAL

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TYPESET-10	TYPESET-11	TYPESET-20
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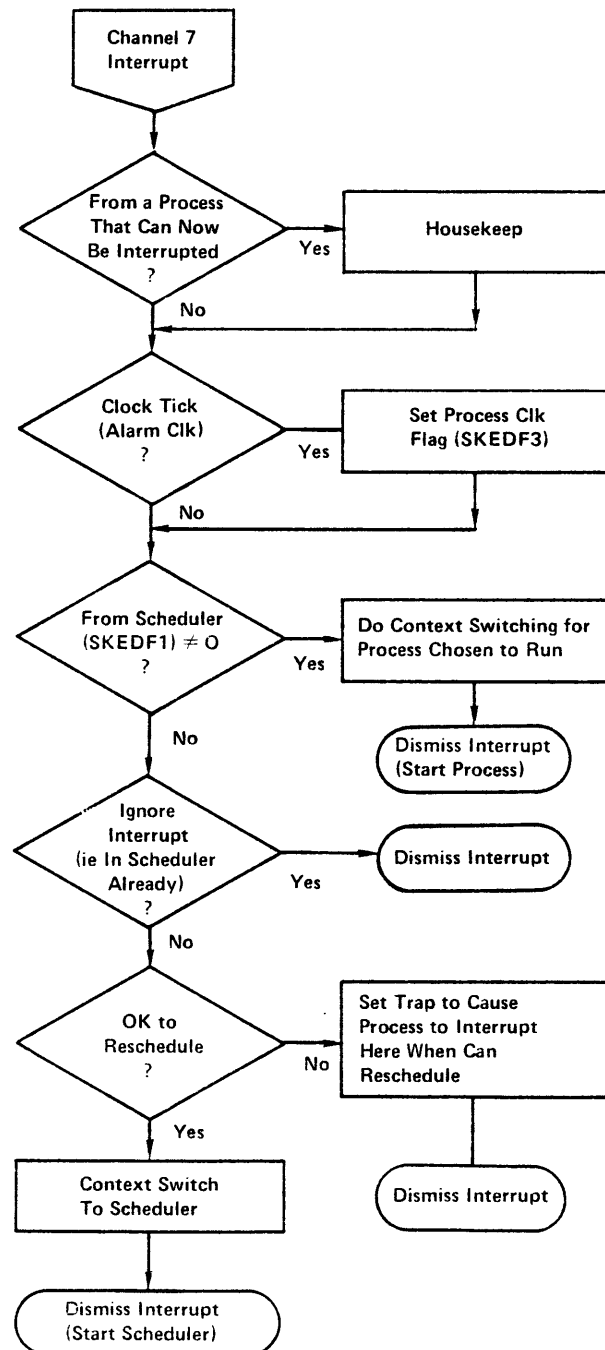
DECSYSTEM-20 MONITOR FLOWCHARTS

- I. Scheduler
- II. Page Fault Handling
- III. JSYS Calls - Device Independent Level
- IV. JSYS Calls - Disk Dependent Level
- V. JSYS Calls - Magtape Dependent Level
- VI. Requesting DSK/MTA I/O & Interrupt Handling
- VII. JSYS Calls - TTY Dependent Level
- VIII. Requesting TTY I/O & Interrupt Handling

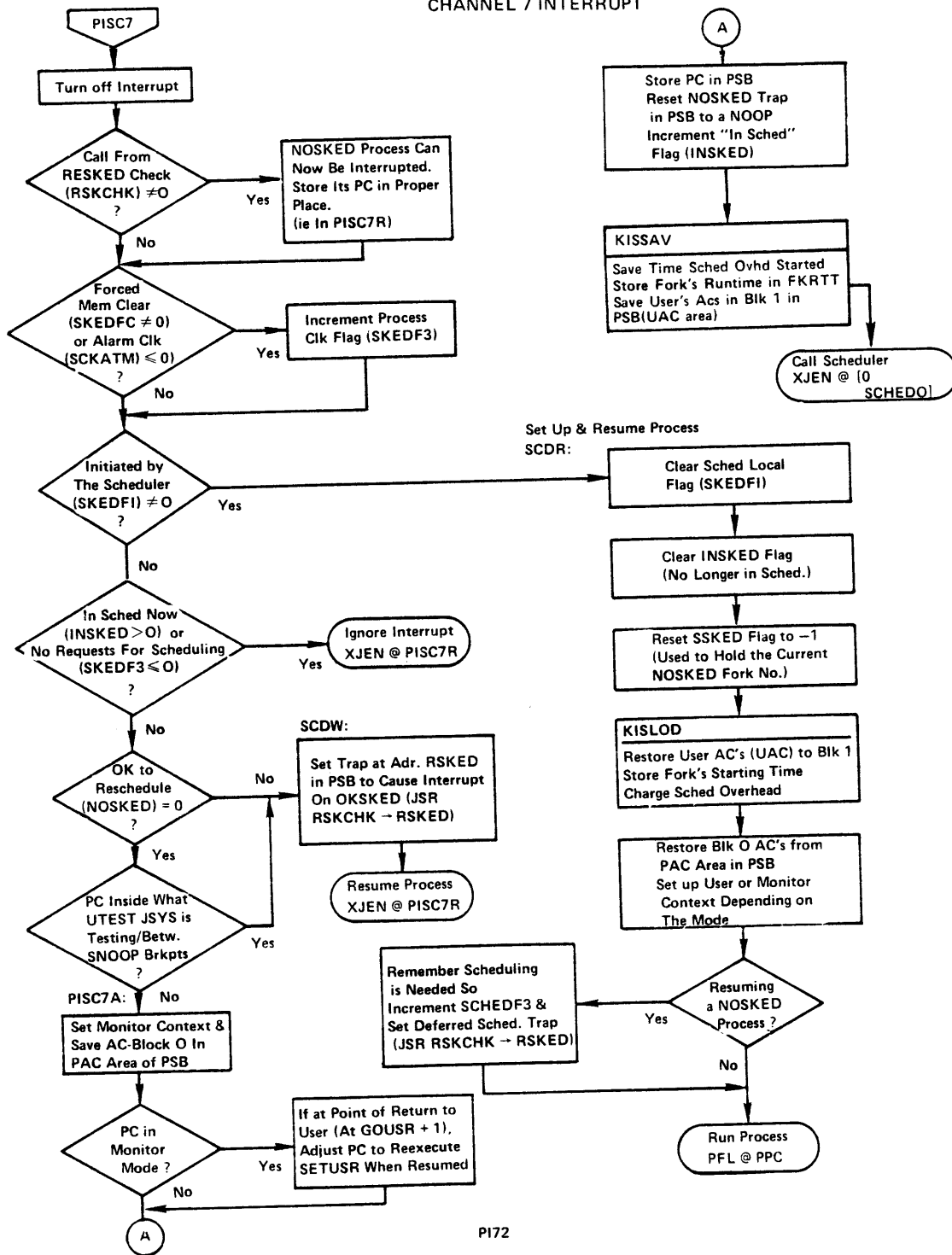
SCHEDULER FLOWCHARTS

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SCHEDO - Process Controller	SCH1
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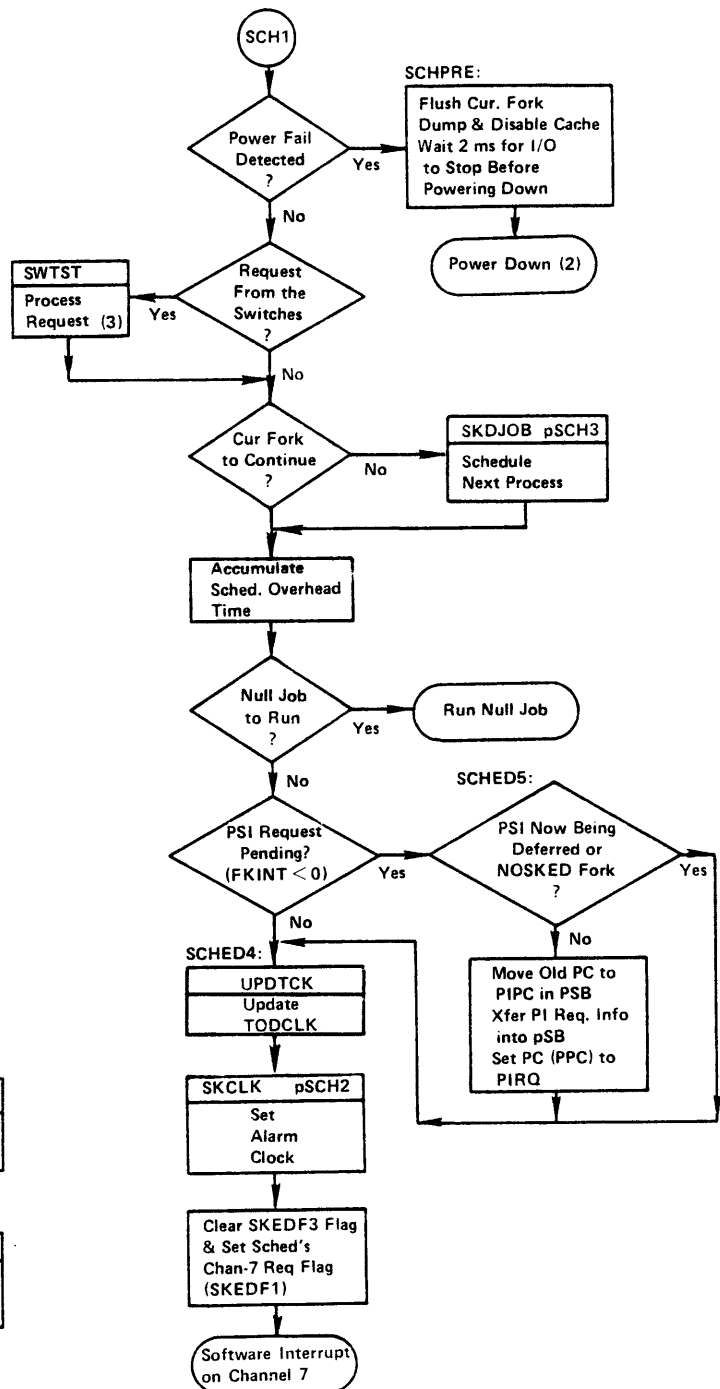
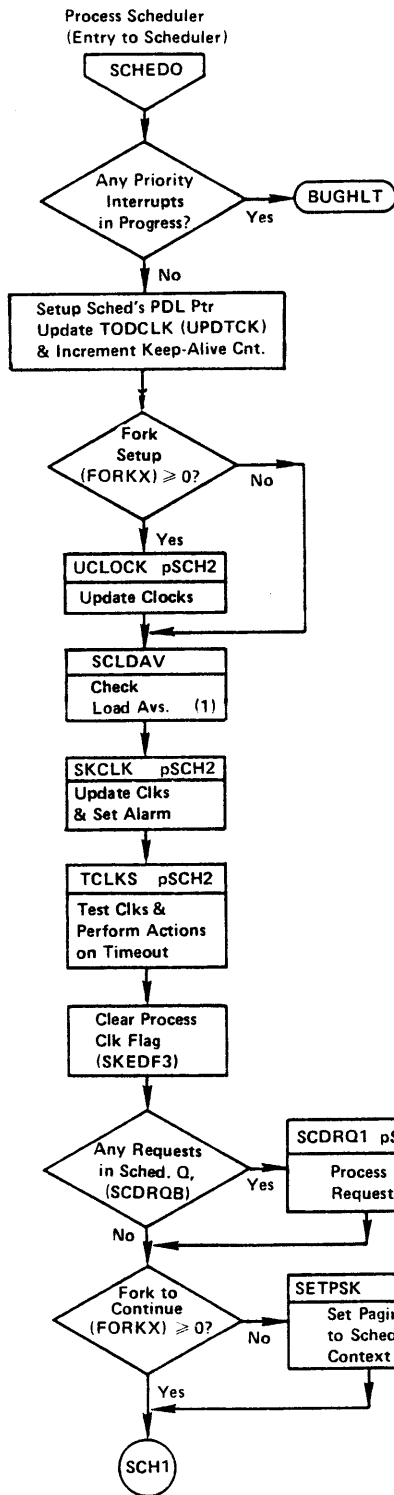
CHANNEL 7 INTERRUPT AN OVERVIEW



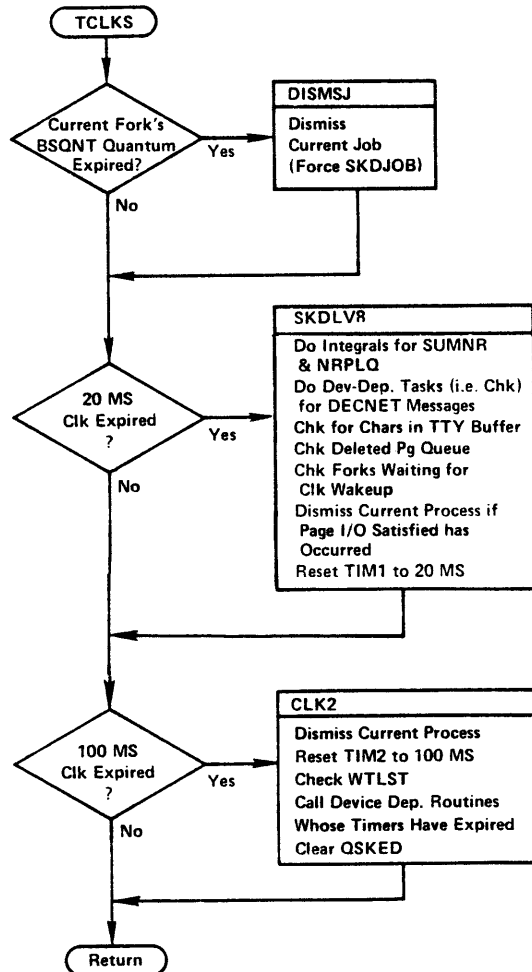
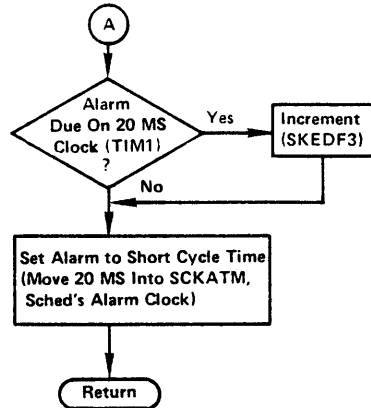
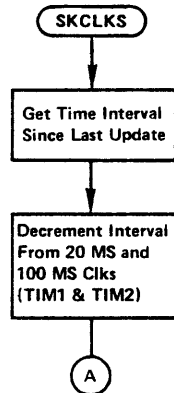
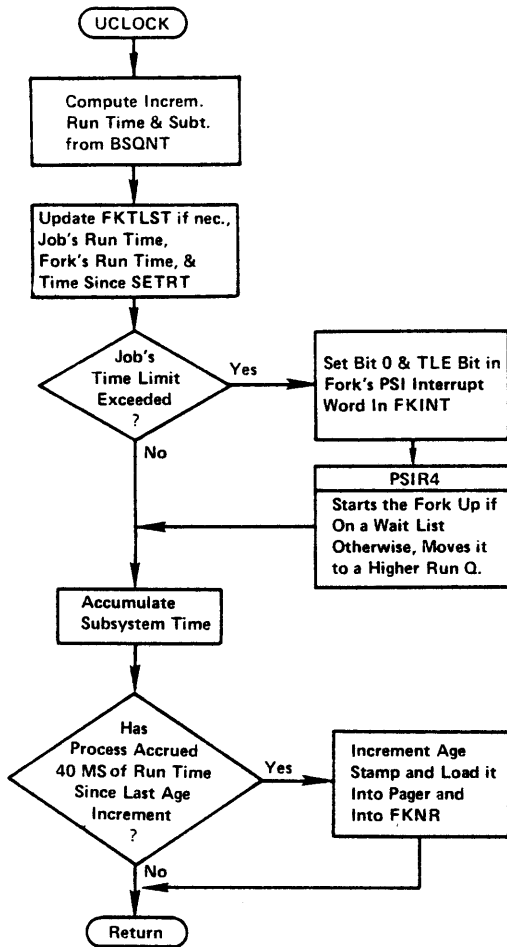
CHANNEL 7 INTERRUPT



PI72

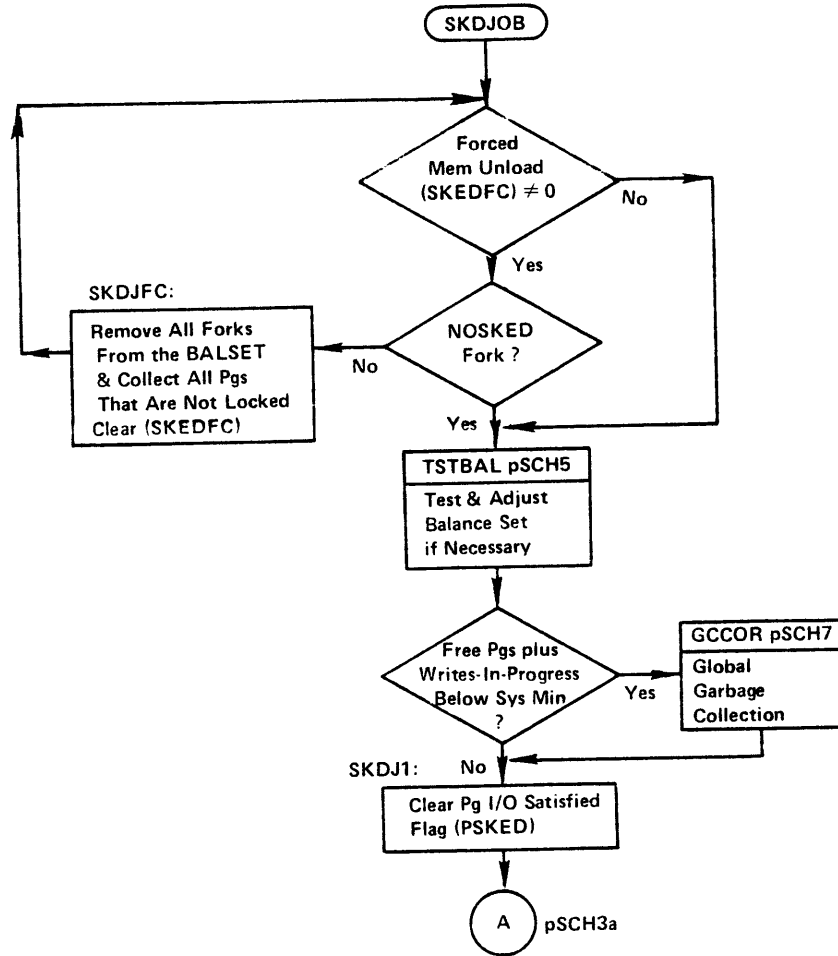


SCH1

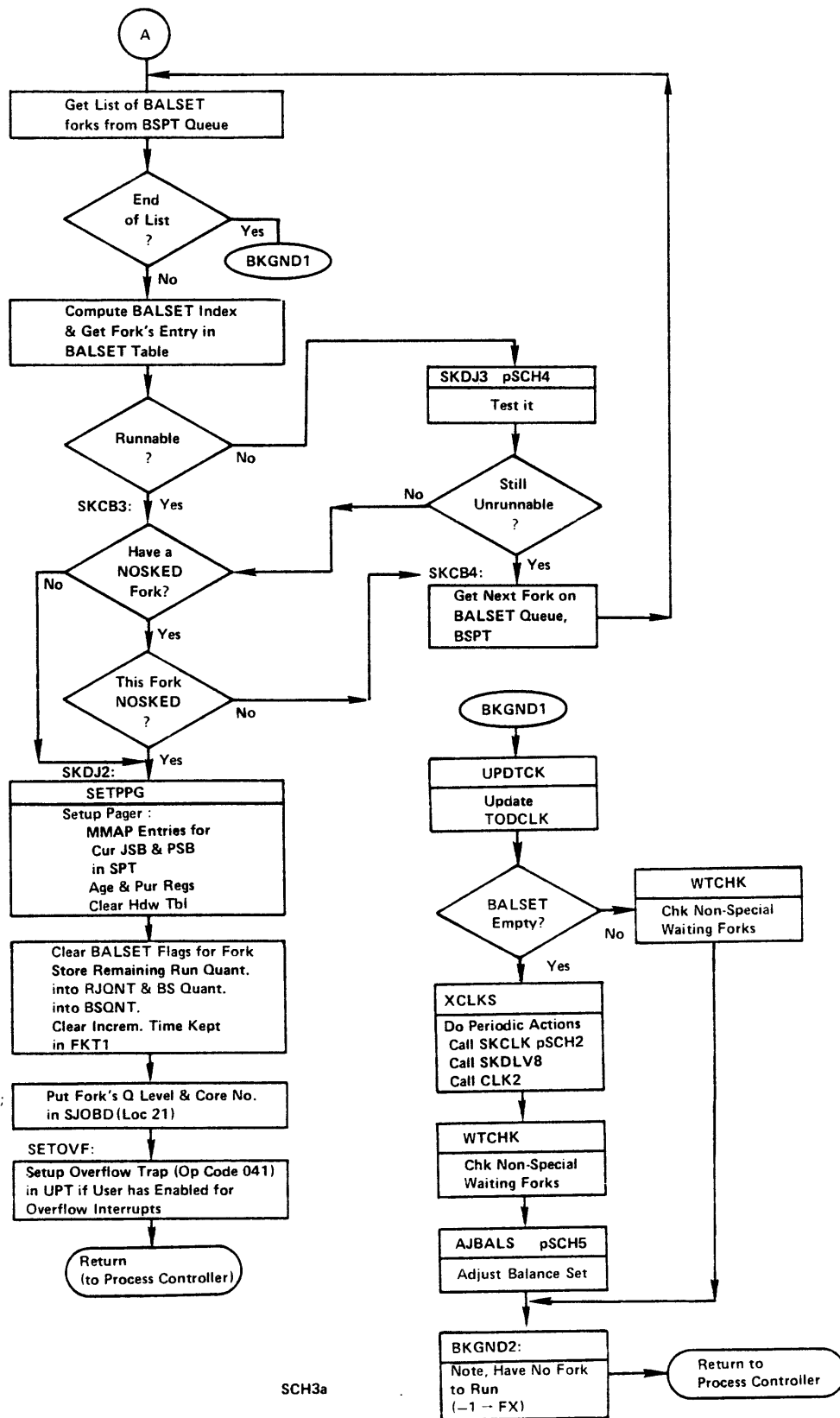


SCH2

Balance Set Scheduler
Called to Select Process to Run

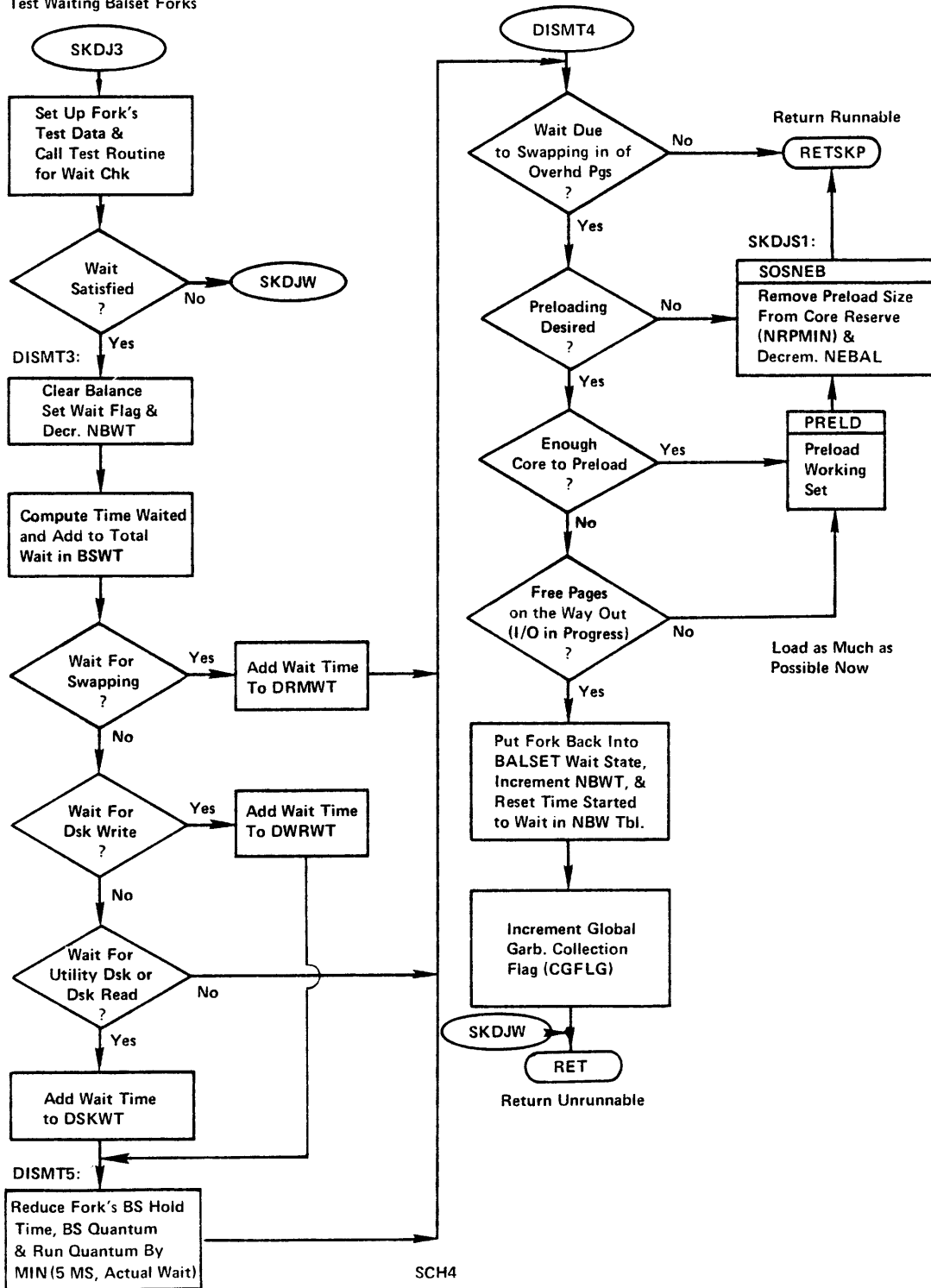


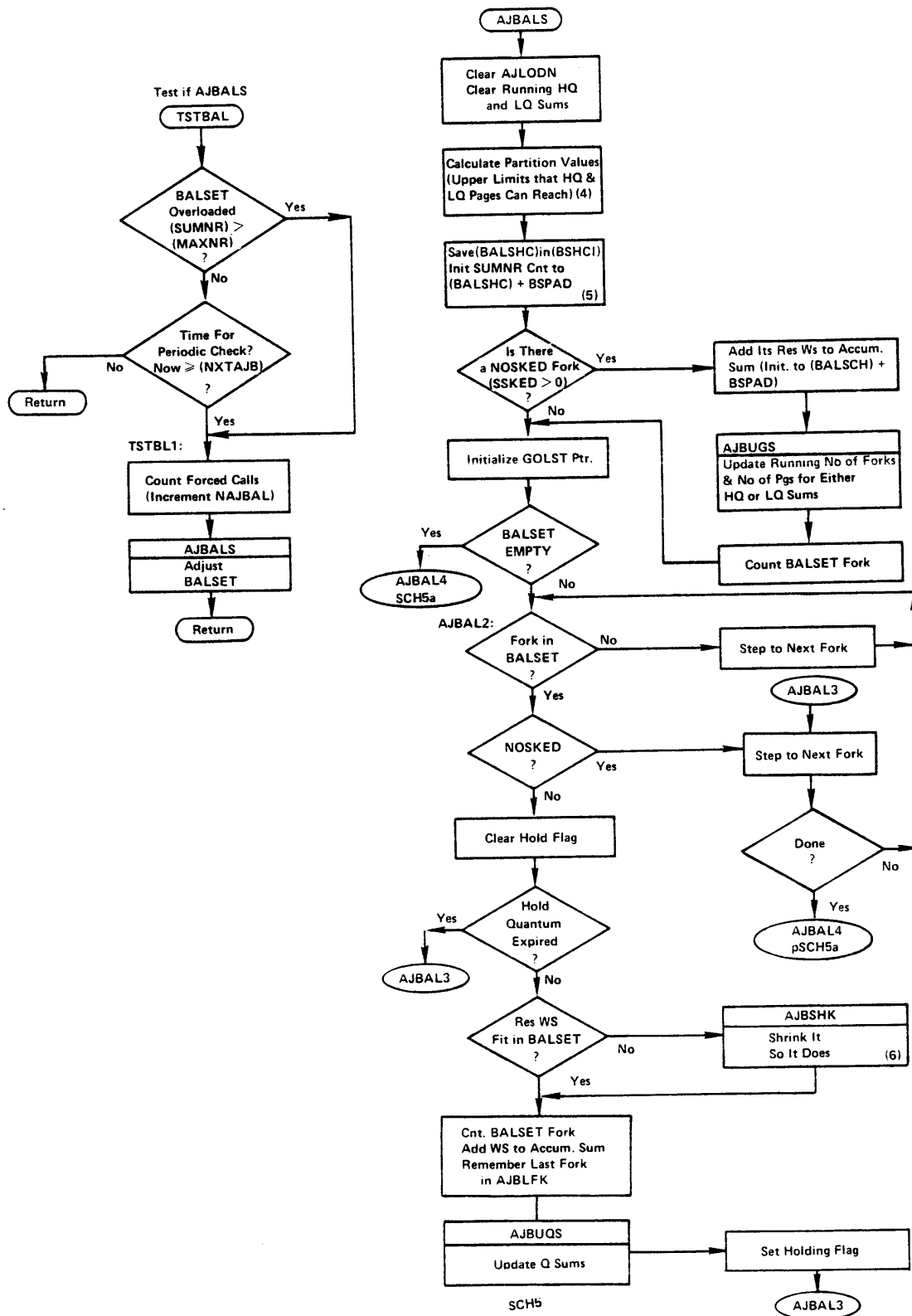
SCH3

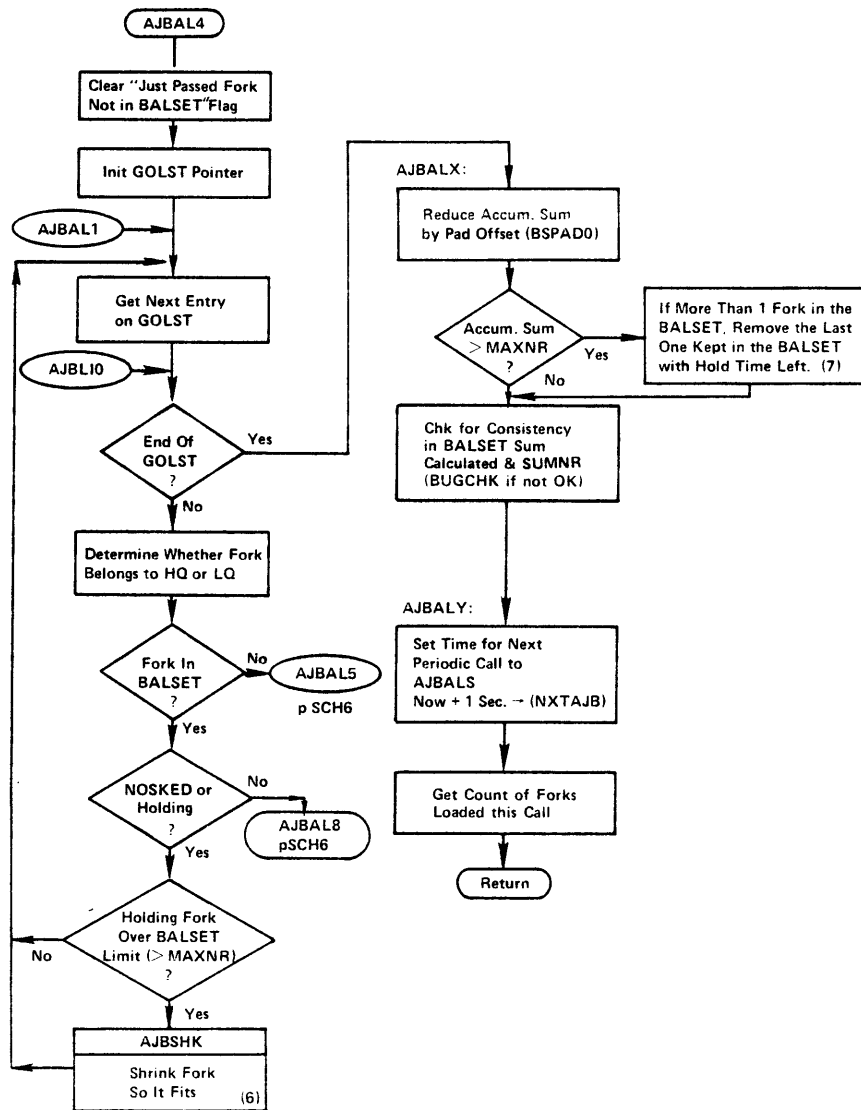


SCH3a

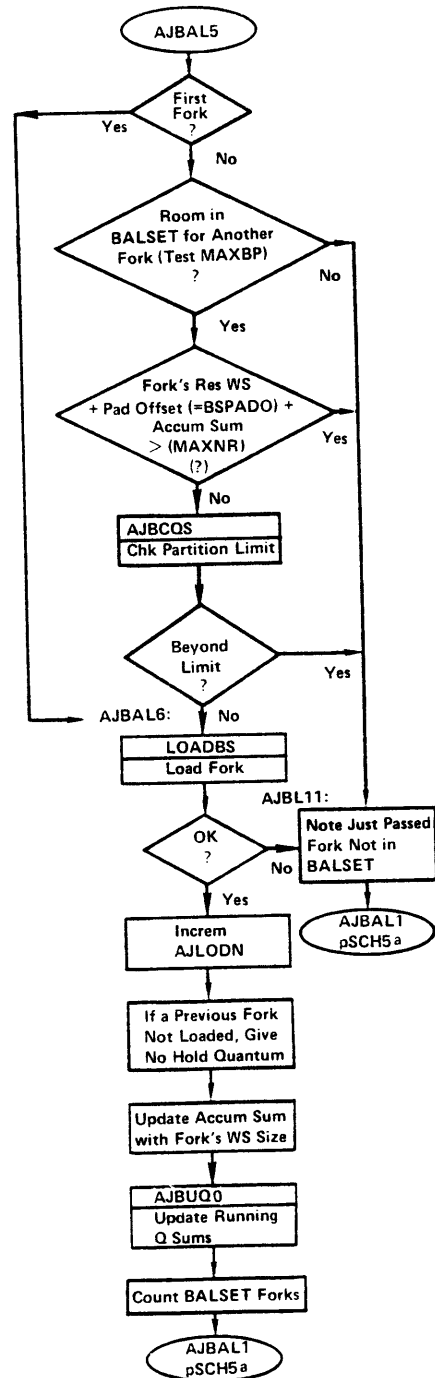
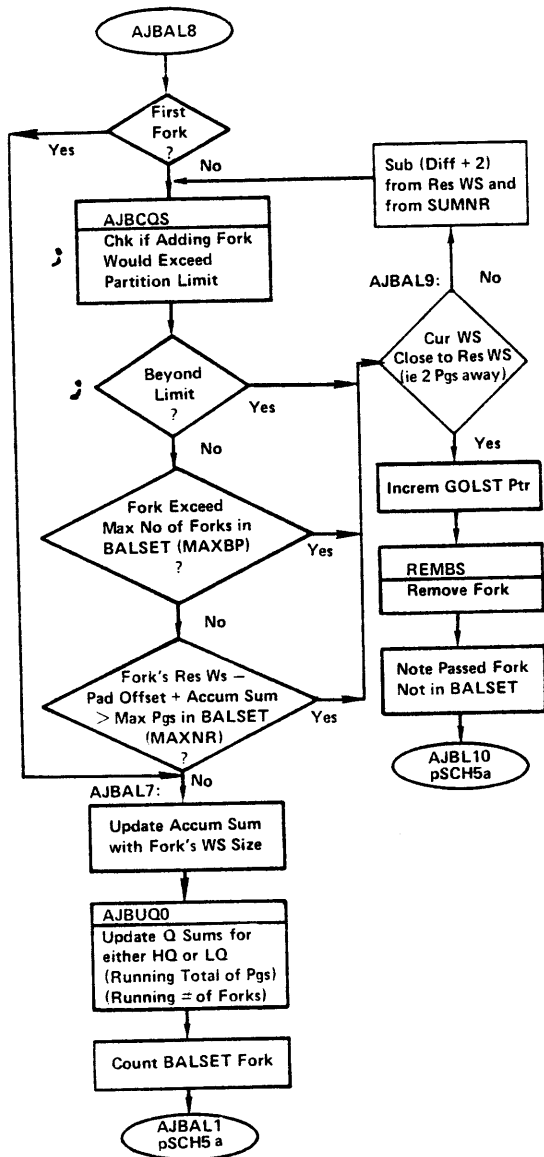
Test Waiting Balset Forks



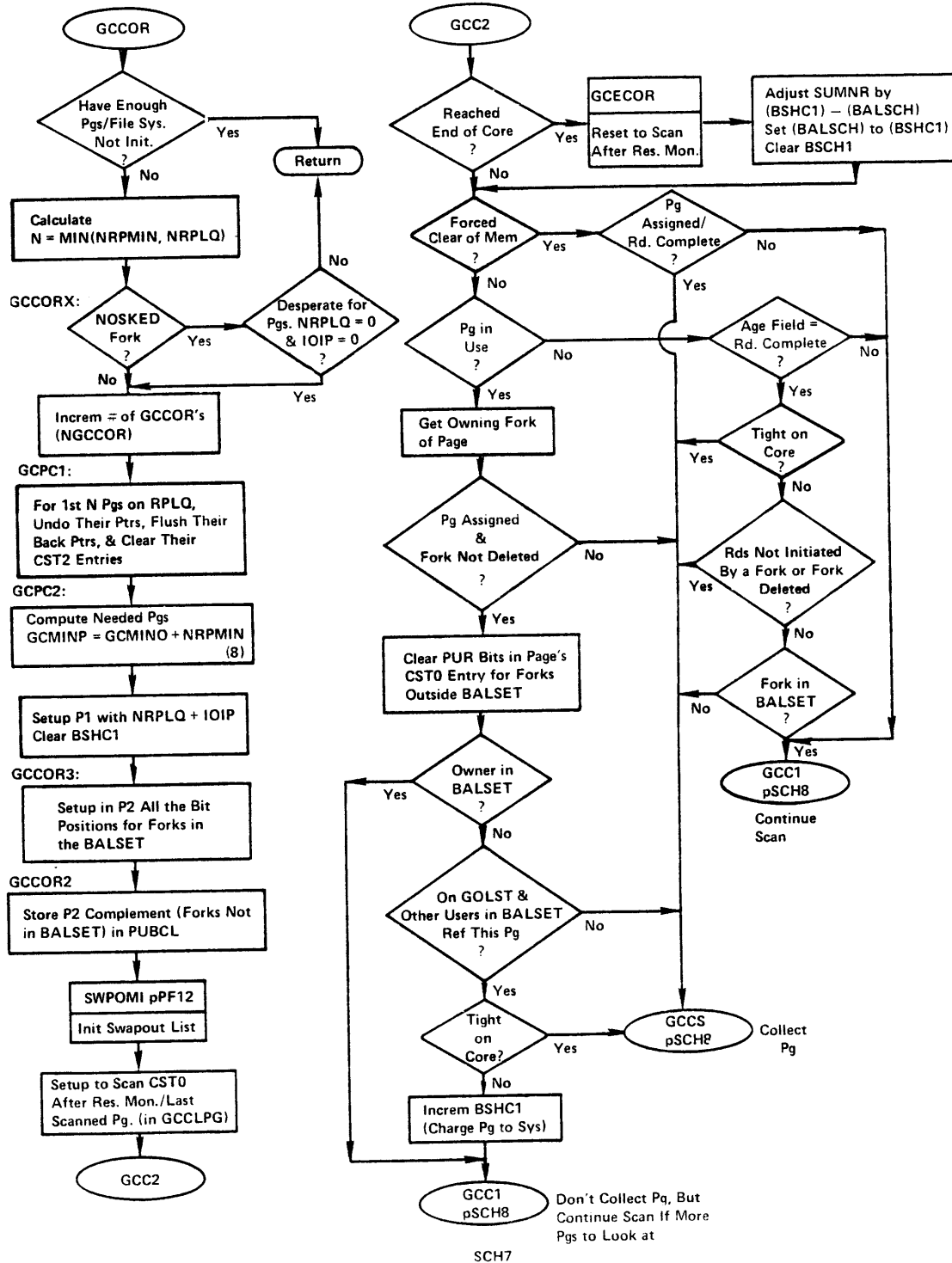


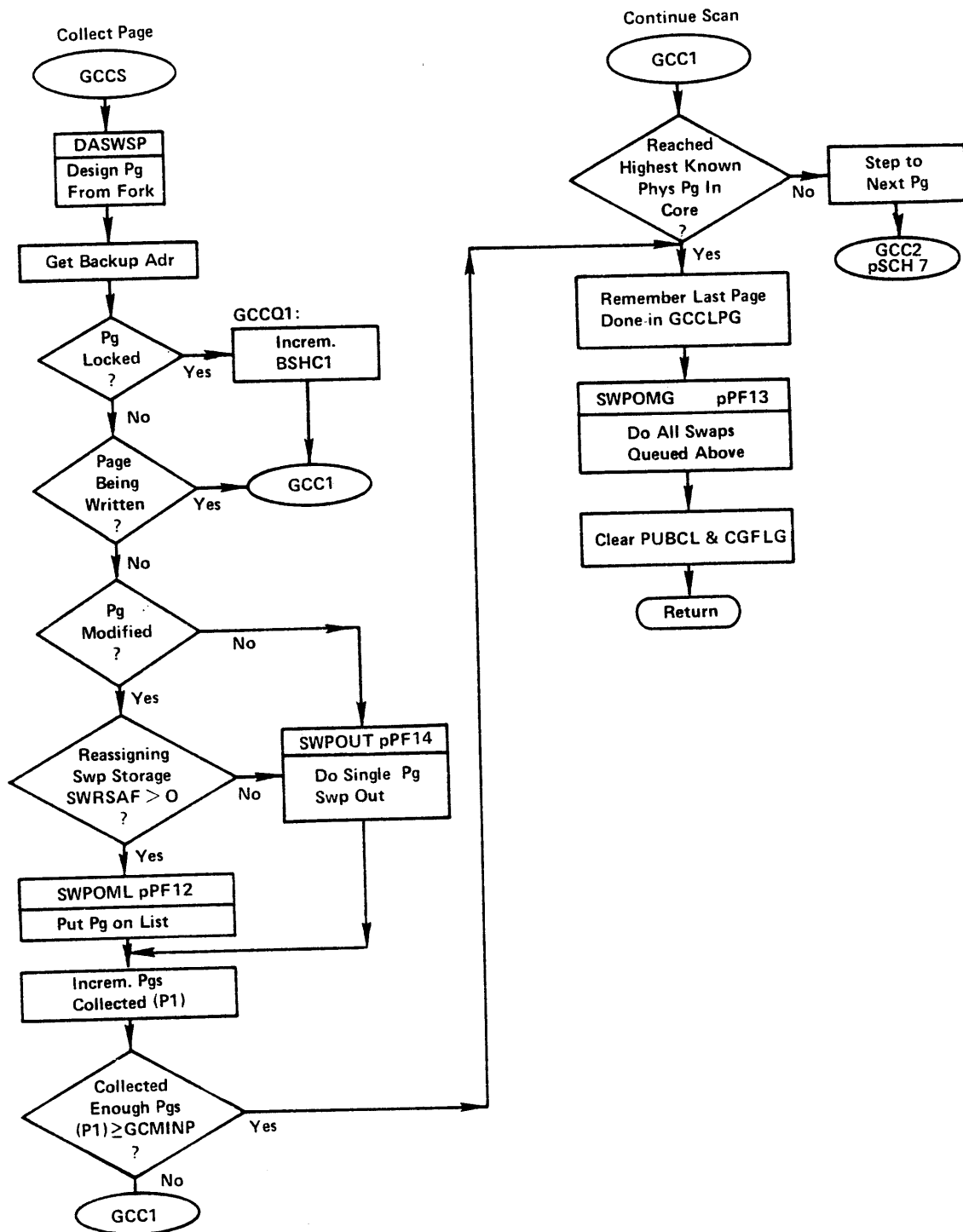


SCH5a

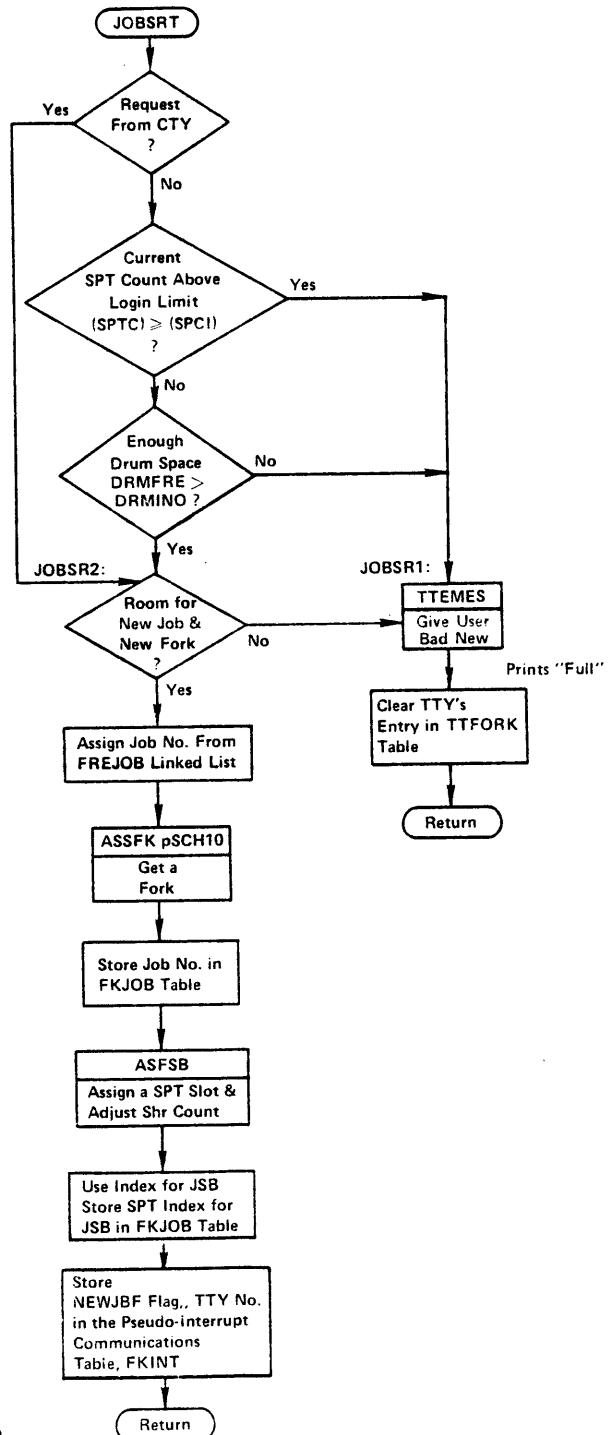
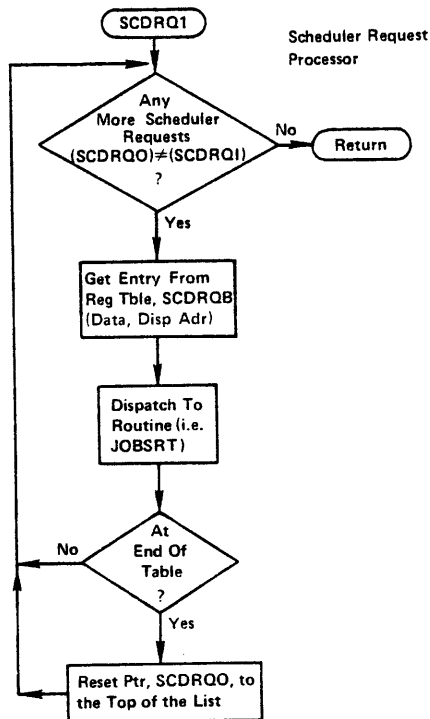


SCH6

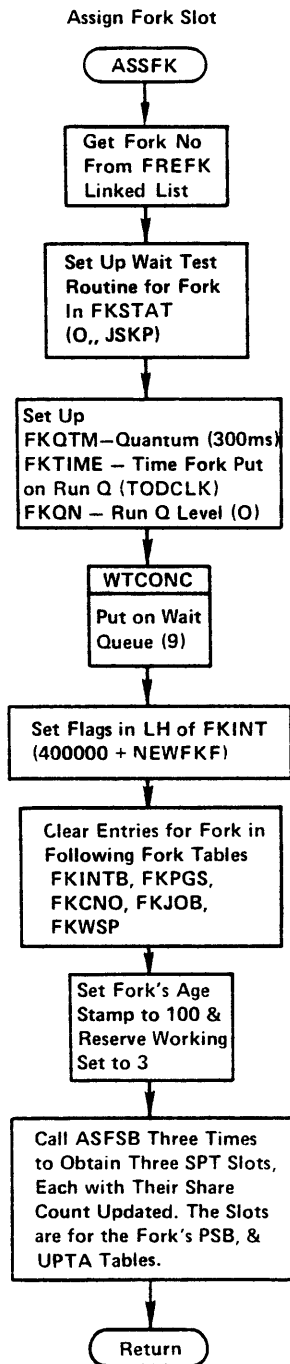




SCH8



SCH9



SCHIO

Scheduler Comments

SCHEDO:

- (1) Running averages, exponentially weighed over intervals of 1, 5, and 15 minutes, are maintained for the number of runnable processes overall, as well as for those in High Run Queues and those in the Low Run Queues.
- (2) Final phase of powerdown seq. clears the priority interrupt system and causes the system to loop in the ACs until power actually vanishes. If the power fail interrupt was spurious, the loop will time out after a few seconds and the system will be continued at address SYSRST.
- (3) A very limited set of central functions for debugging purposes has been built into the Scheduler. To invoke a function, the appropriate bit or bits are set into loc 20 (SCTLW) via MDDT. The word is scanned from left to right (JFFO); the first bit found set on the scan selects the function.

Bit 0 Causes the scheduler to dismiss the current process and to stop timesharing. Useful to effect a clean manual transfer to Exec-mode DDT. System may be resumed at SCHEDO if no IOB reset is done.

Bit 1 Causes job specified by (20)_{RH} to be run exclusively.

Bit 2 Forces running of Job 0 back-up function before halting the system.

If loc 30 (SHLTW) is set not equal to 0, the system will crash. (Same as setting bit 2 of SCTLW word.)

AJBALS

- (4) Upper Limit for LQ=MAXNR-MIN [Max HQ Reserve, HQ Load Avg.* (16)]
 Upper Limit for HQ=MAXNR-MIN [Max LQ Reserve, No. of LQ forks * (32)]

- (5) SUMNR reflects the number of timesharing pages in use. Its value after AJBALS equals the number of pages reserved for balance set members plus BALSHC (the number of pages shared, but not owned, by balance set members plus the number of locked pages).

BSPAD reflects the number of pages set aside for balance set members as their working set reserves grow. The real value of BSPAD is offset by a factor of BSPADO. When forks are trying to stay in the balance set, the adjustment algorithm allows the pad offset to be subtracted from the accumulated sum before it checks if the fork can fit.

$$\text{i.e., } \left(\text{BSPAD} + \sum_{i=1}^n \text{Res. WS}_i \right) - \text{BSPADO} + \text{Res. WS}_{n+1} \geq \text{MAXNR}$$

The adjustment algorithm does the opposite (i.e., adds the BSPADO factor) for forks trying to get into the balance set. The overall affect of this is to ensure (as much as possible) a certain number of pages be available for balance set forks.

- (6) The shrink algorithm shrinks the fork's reserve working set by:
 MIN [Reserve WS - Current WS, Accum. Sum + Fork's Res WS-MAXNR]

Notice that the fork's reserve working set will not be reduced below its current working set.

- (7) This is the rare case of forks, with hold-time left, expanding. The lowest priority one is removed. If there is only one fork in the balance set, it is not removed. (Note: it is possible for one fork to be greater than MAXNR due to the BALSHC count changing).

GCCOR

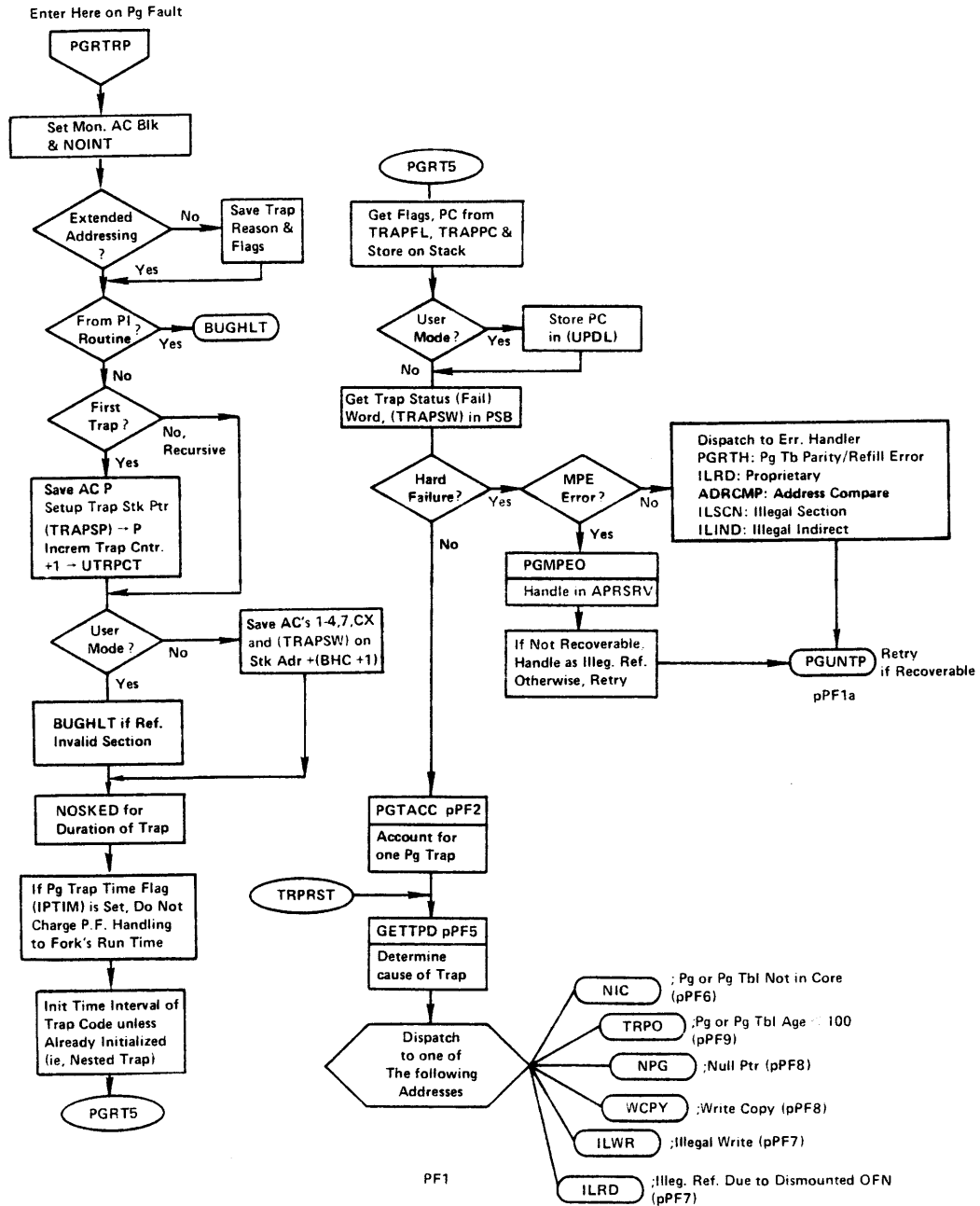
- (8) If it is a forced clear, then GCMINO is made very large so all of core will be collected. However, its usual value is much lower. (Currently 64 decimal).

ASSFK

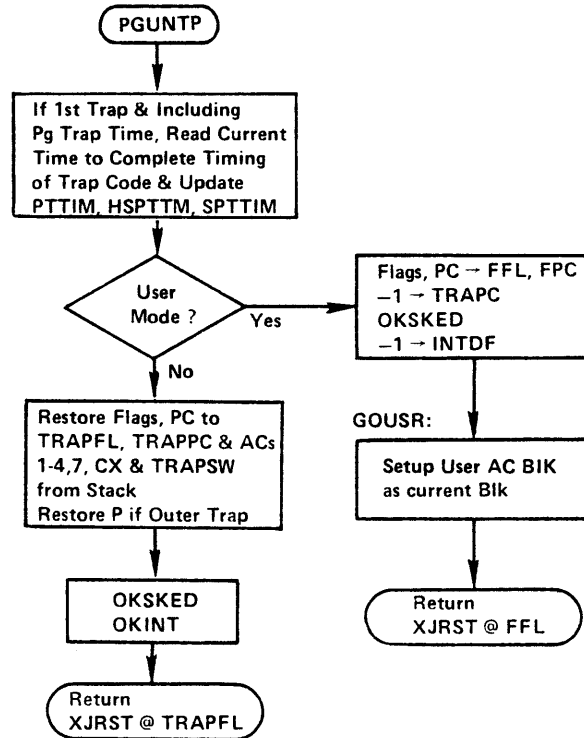
- (9) The fork is actually placed on the GOLST at this time. WTCONC, after putting a fork on WTLST, checks if the wait condition is satisfied. The test routine, JSKP, gives a skip return indicating that the wait is satisfied. This causes UNBLK1 to be called which in turn calls SCHEDJ to unblock the fork and to requeue it from the WTLST to the GOLST.

PAGE FAULT HANDLING FLOWCHARTS

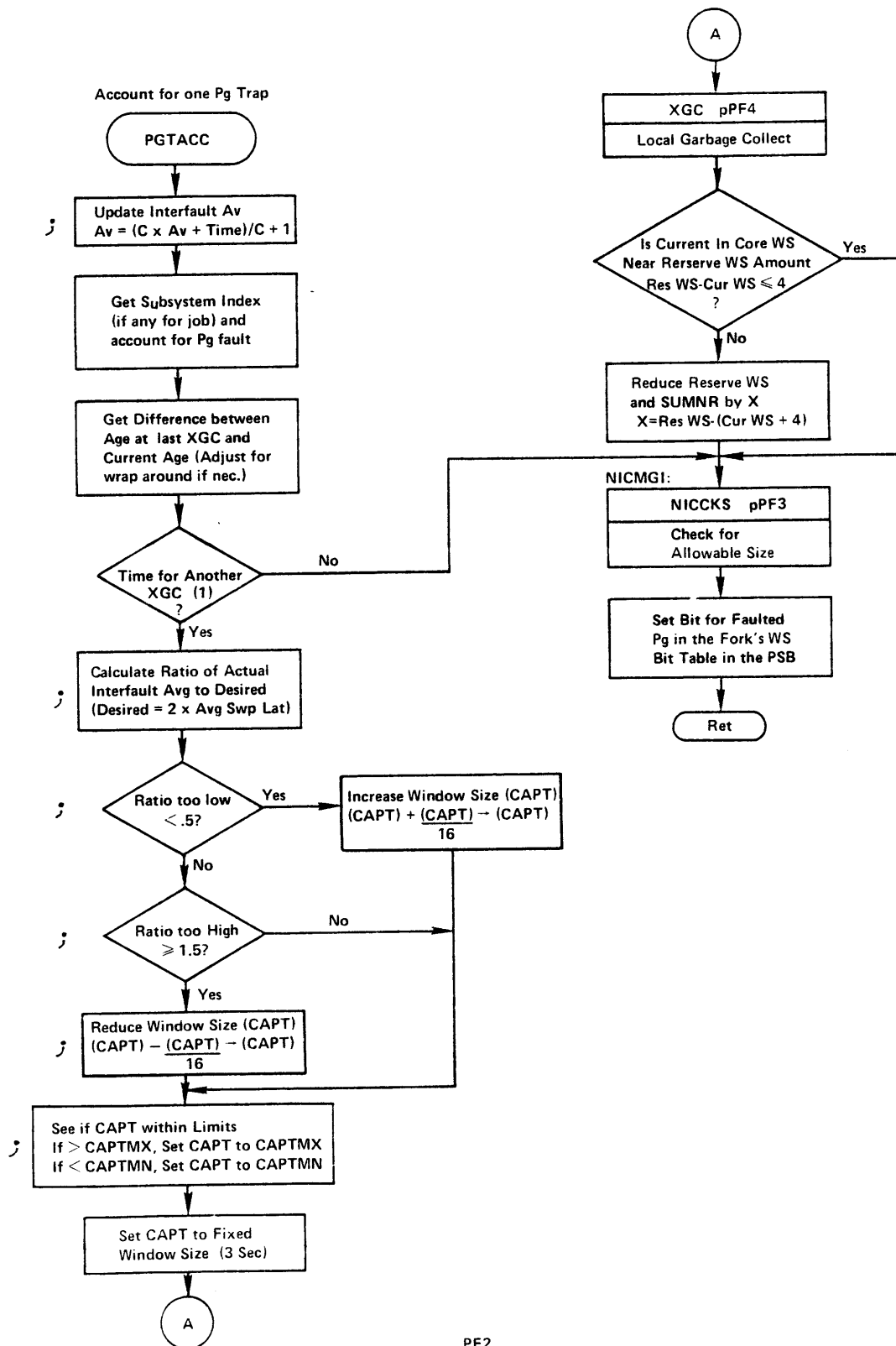
PGRTRP -	Performs the Principal Accounting, Analysis, and Resolution of Page Faults	PF1
PGTACC -	Accounts for Page Traps	PF2
XGC -	Local Garbage Collection	PF4
	SWPOUT - Swapping Out a Page	PF14
NICCKS -	Check In-Core Size Limits	PF3
GETTPD -	Determine Cause of Trap	PF5
NIC -	Not in Core Trap	PF6
	SWPINW - Swap In and Wait	PF10
	SWPIN - Swap In a Page	PF11
WCPY -	Write Copy Trap	PF8
ILRD -	Illegal Read Trap	PF7
ILWR -	Illegal Write Trap	PF7
TRPO -	Age < 100 Trap	PF9



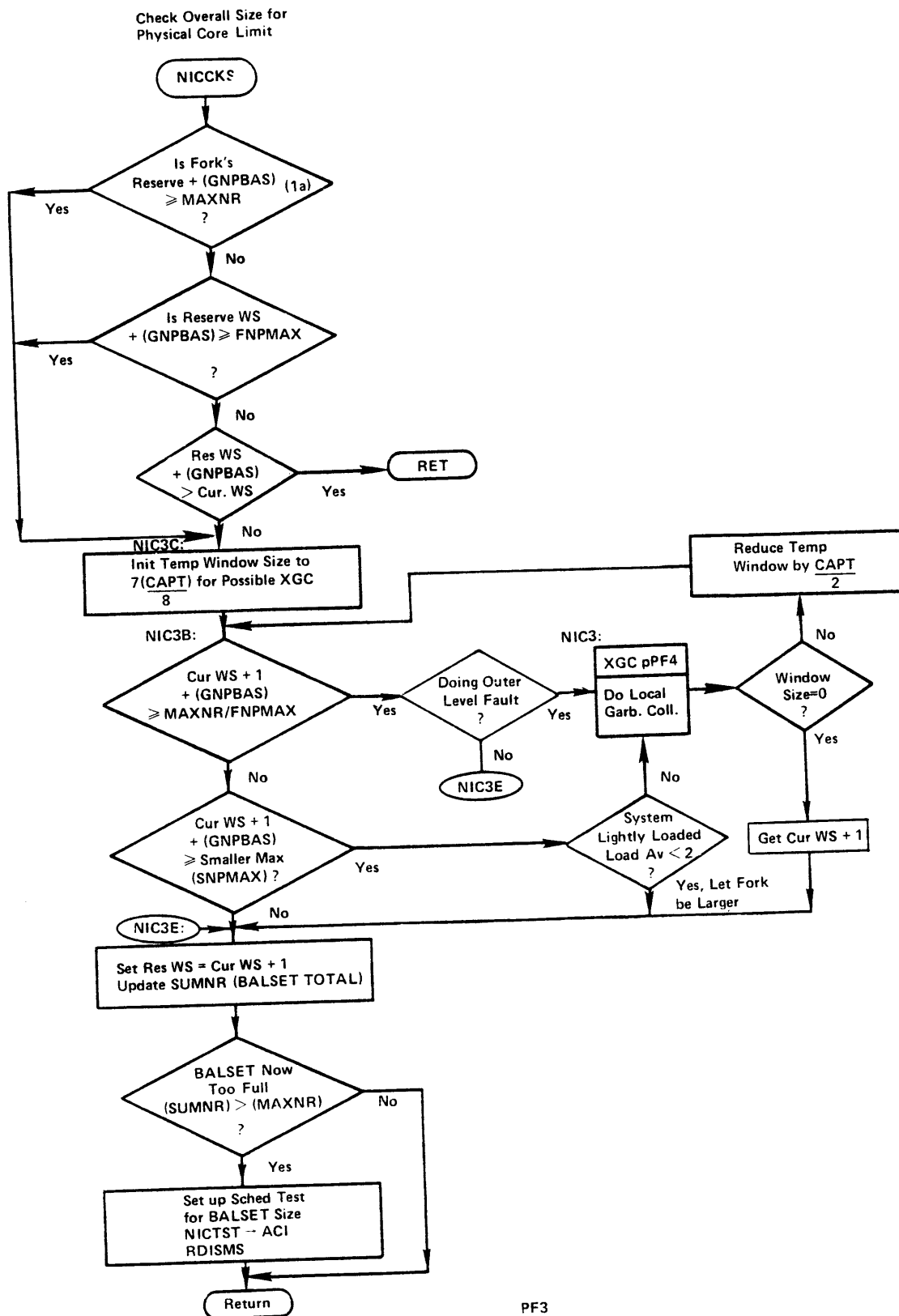
Page OK to Ref.



PF1a

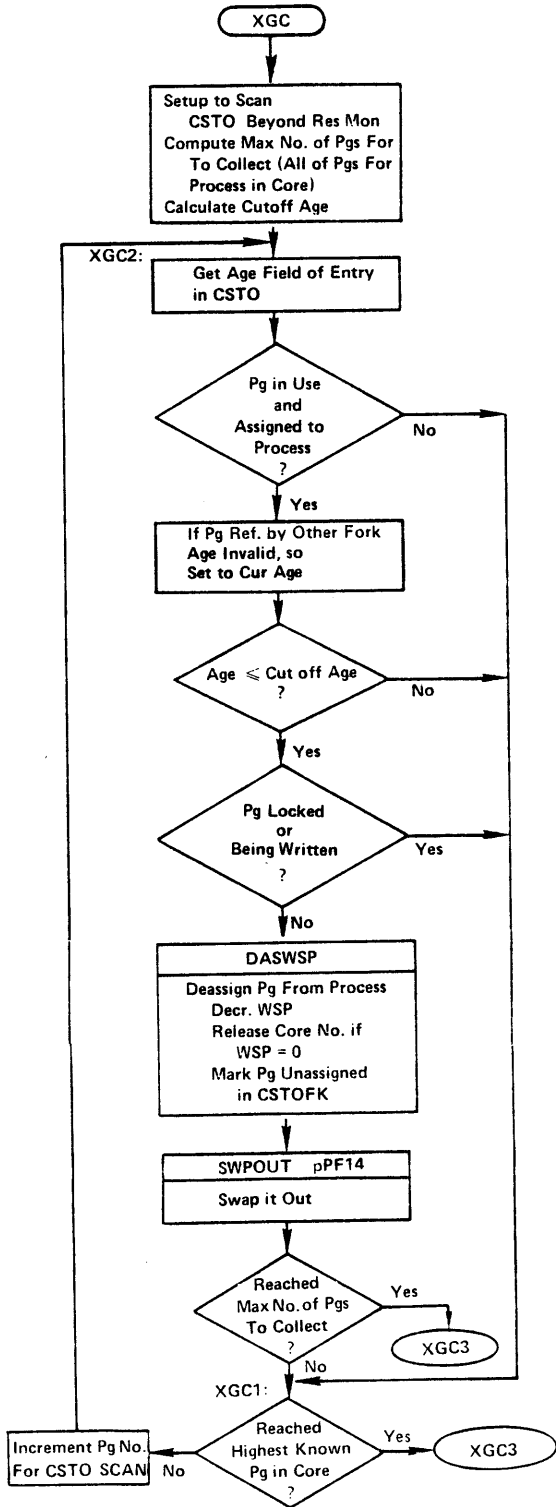


PF2

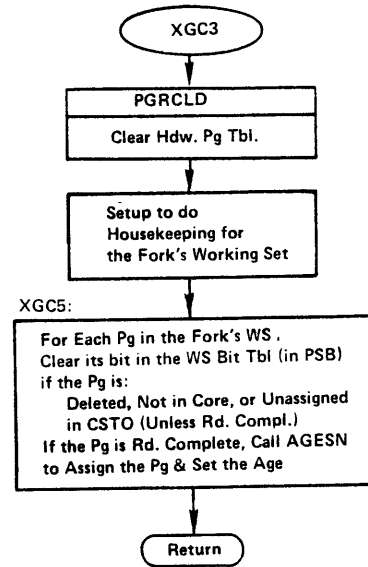


PF3

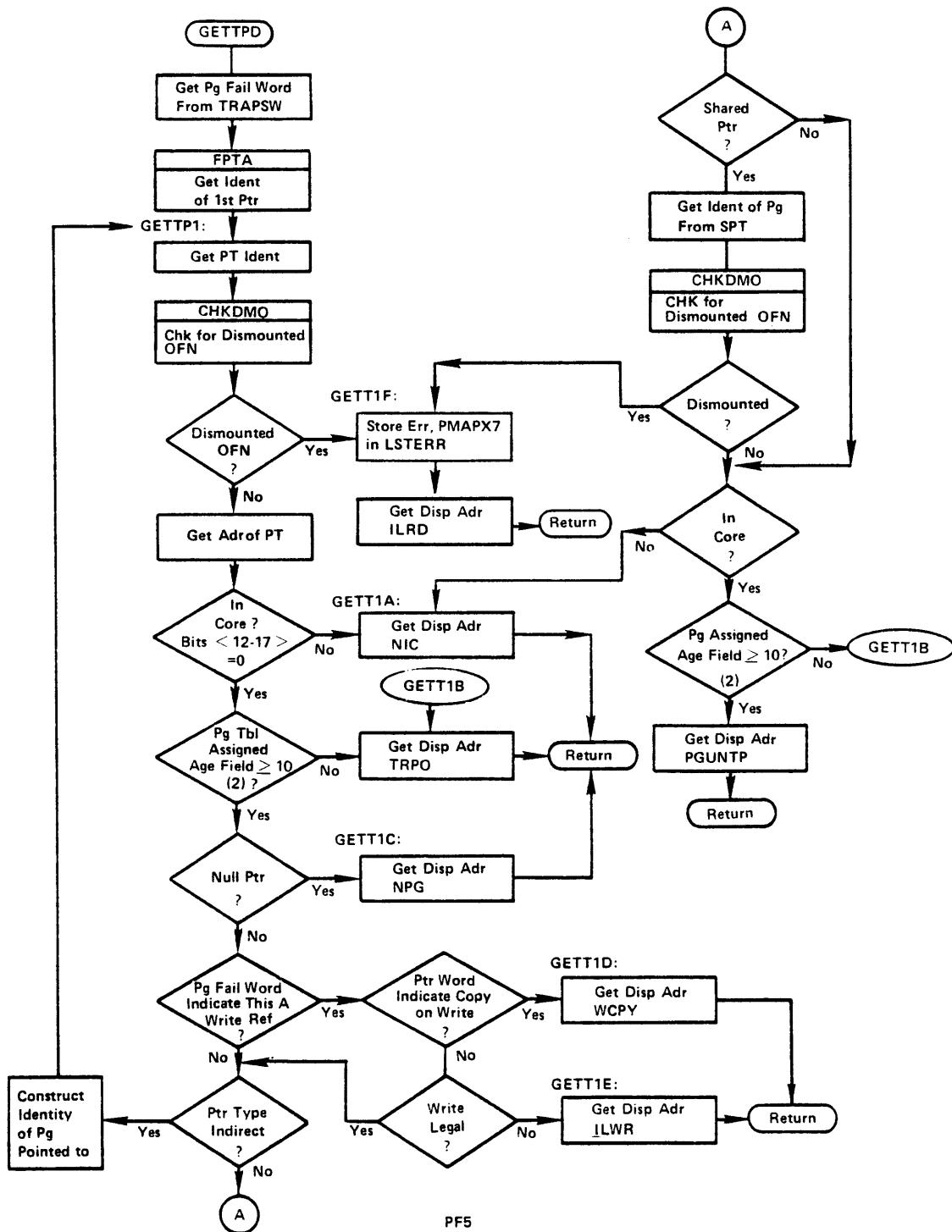
Local Garbage Collection



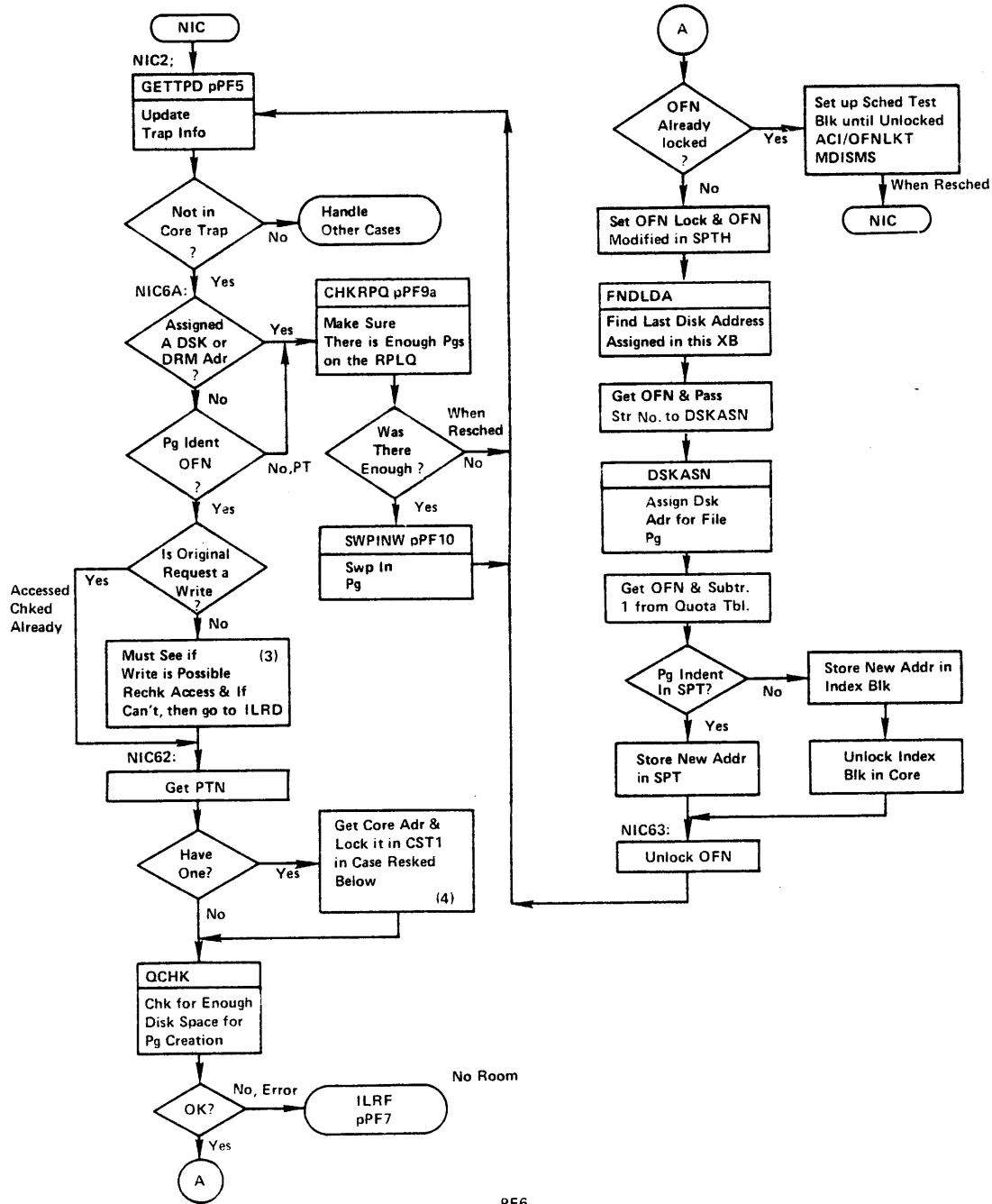
pF4



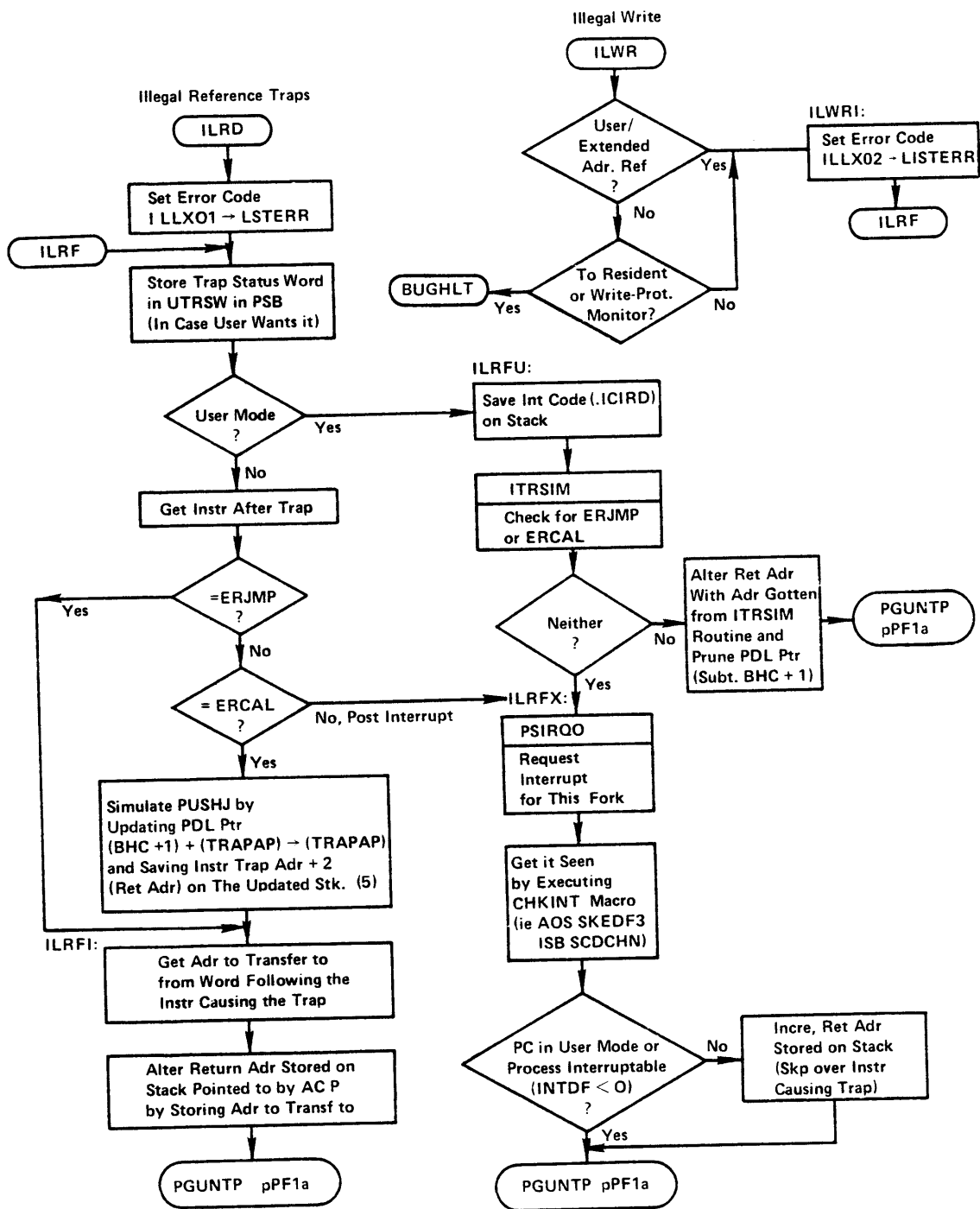
Determine Cause of Trap



PF5

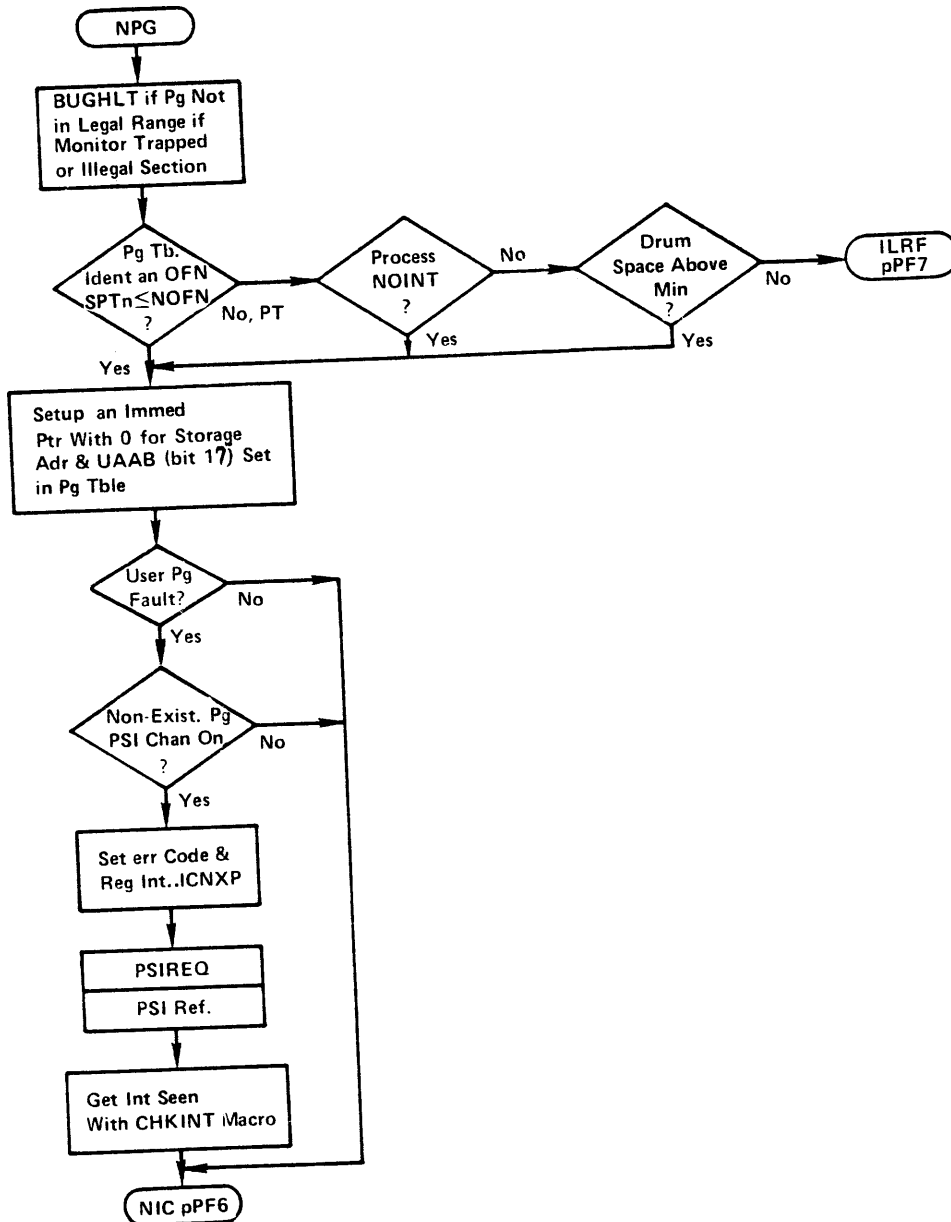


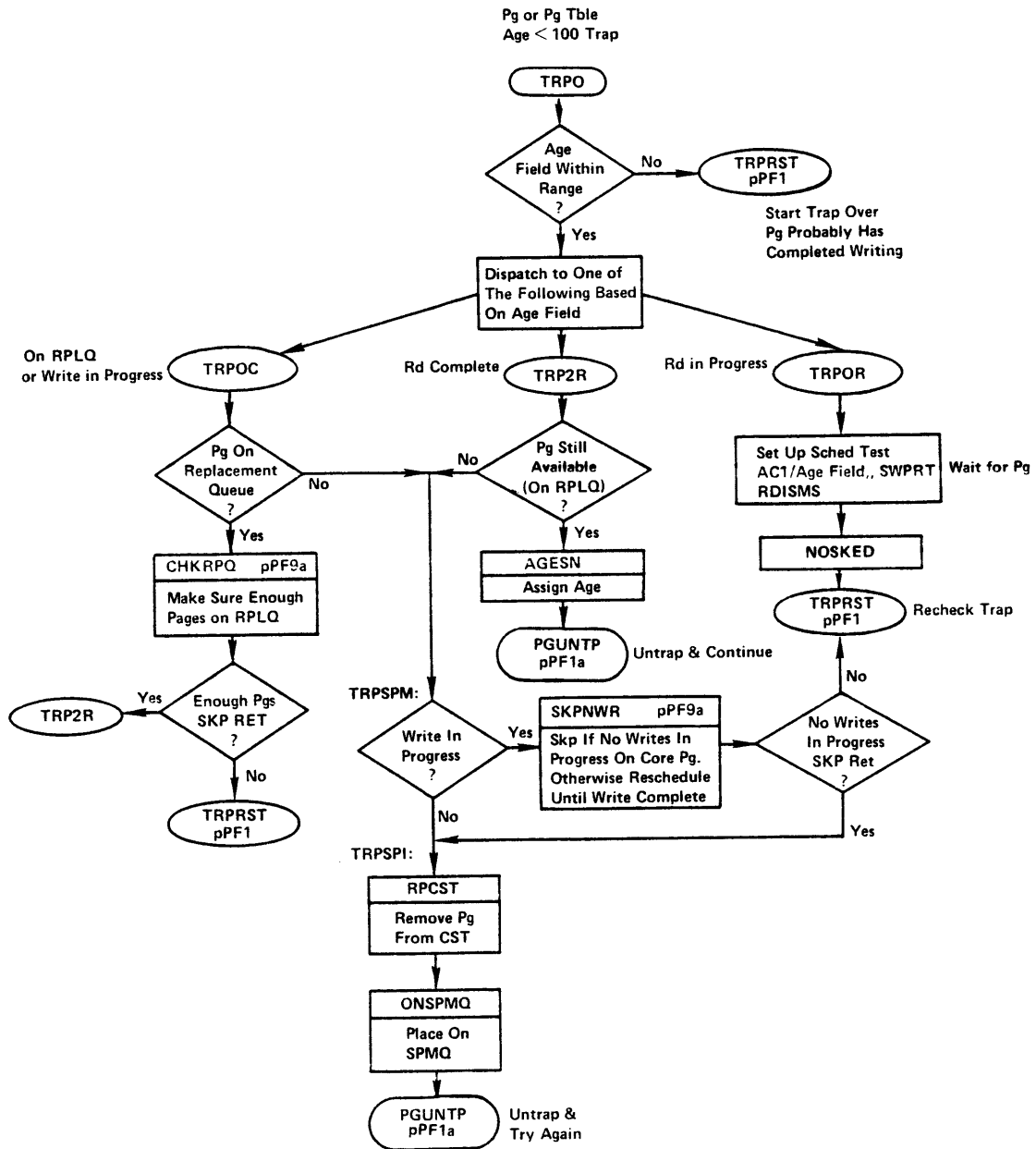
PF6



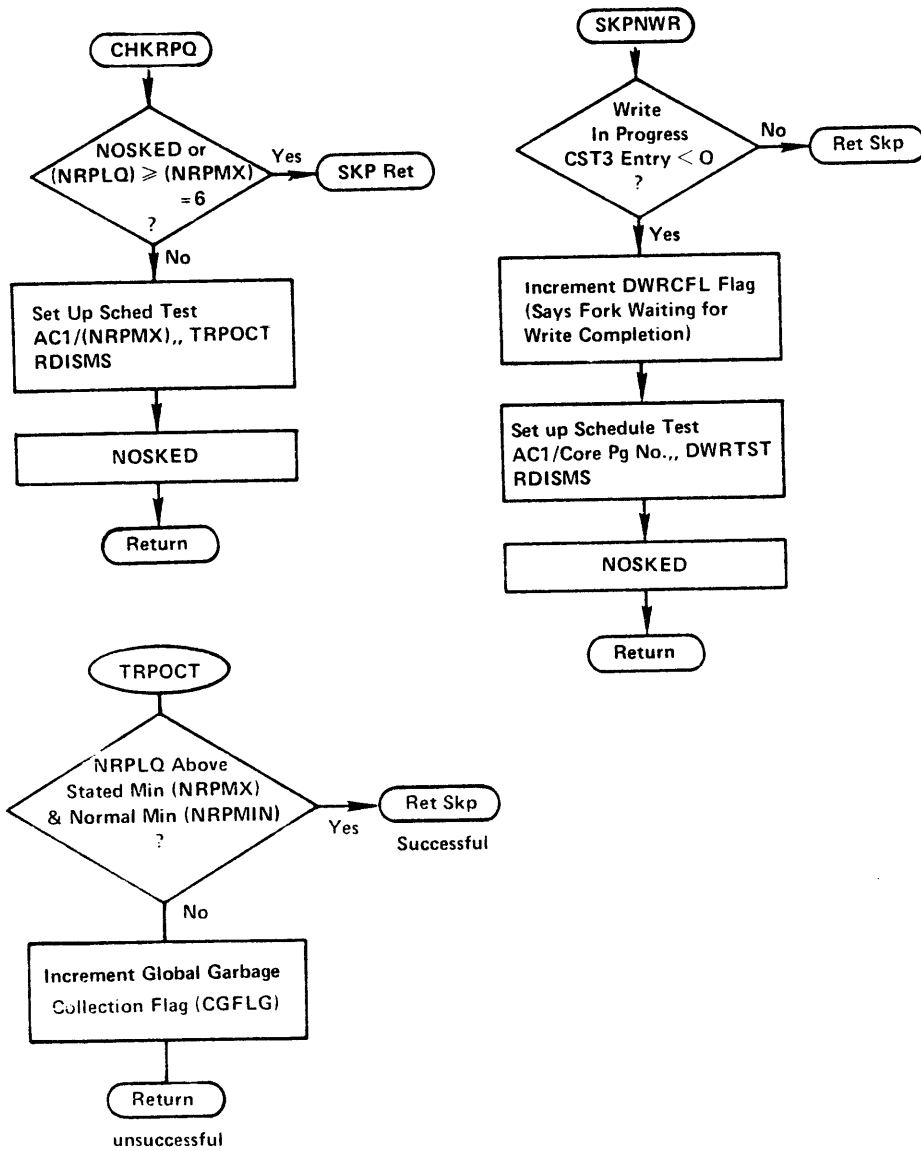
PF7

Pg Not in Existence Trap



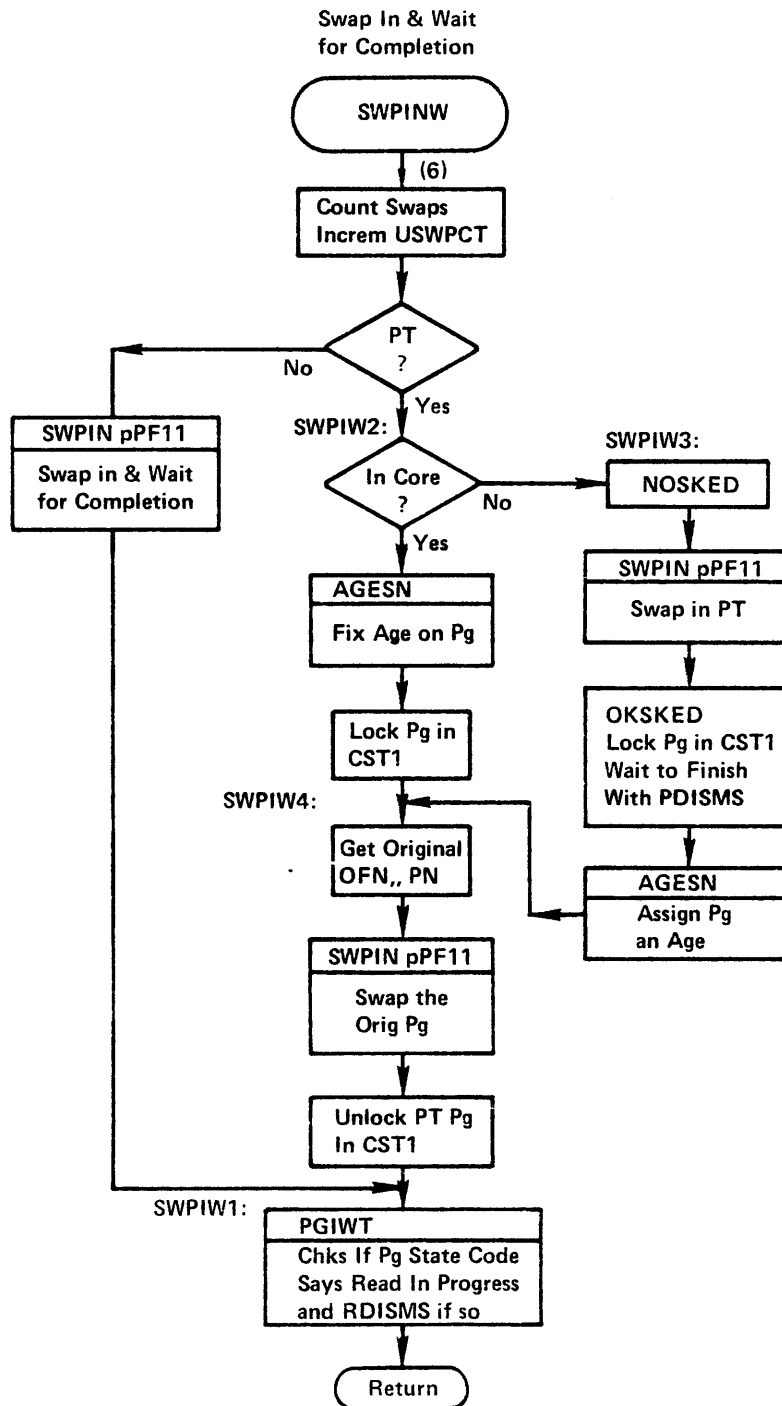


PF9

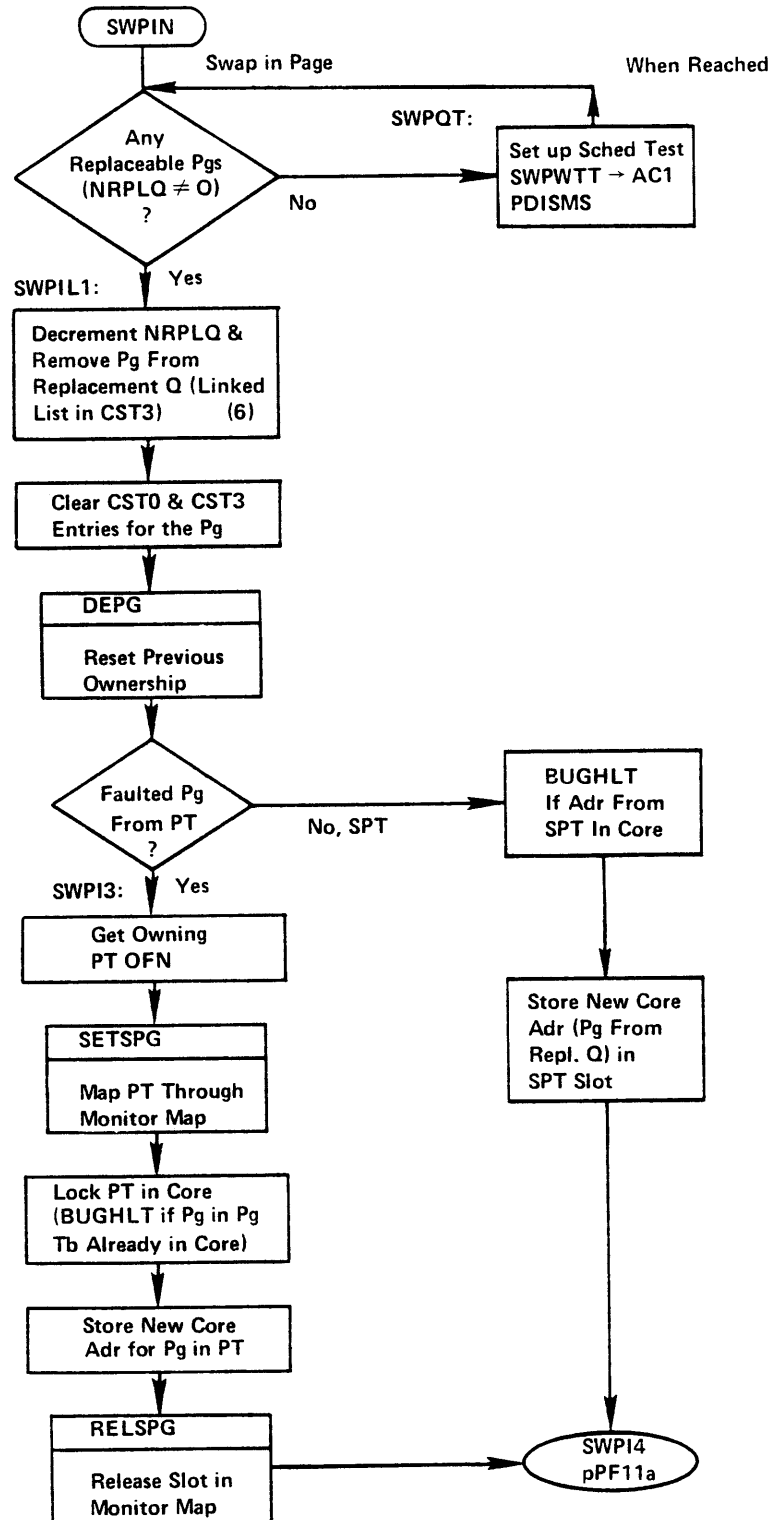


PF9a

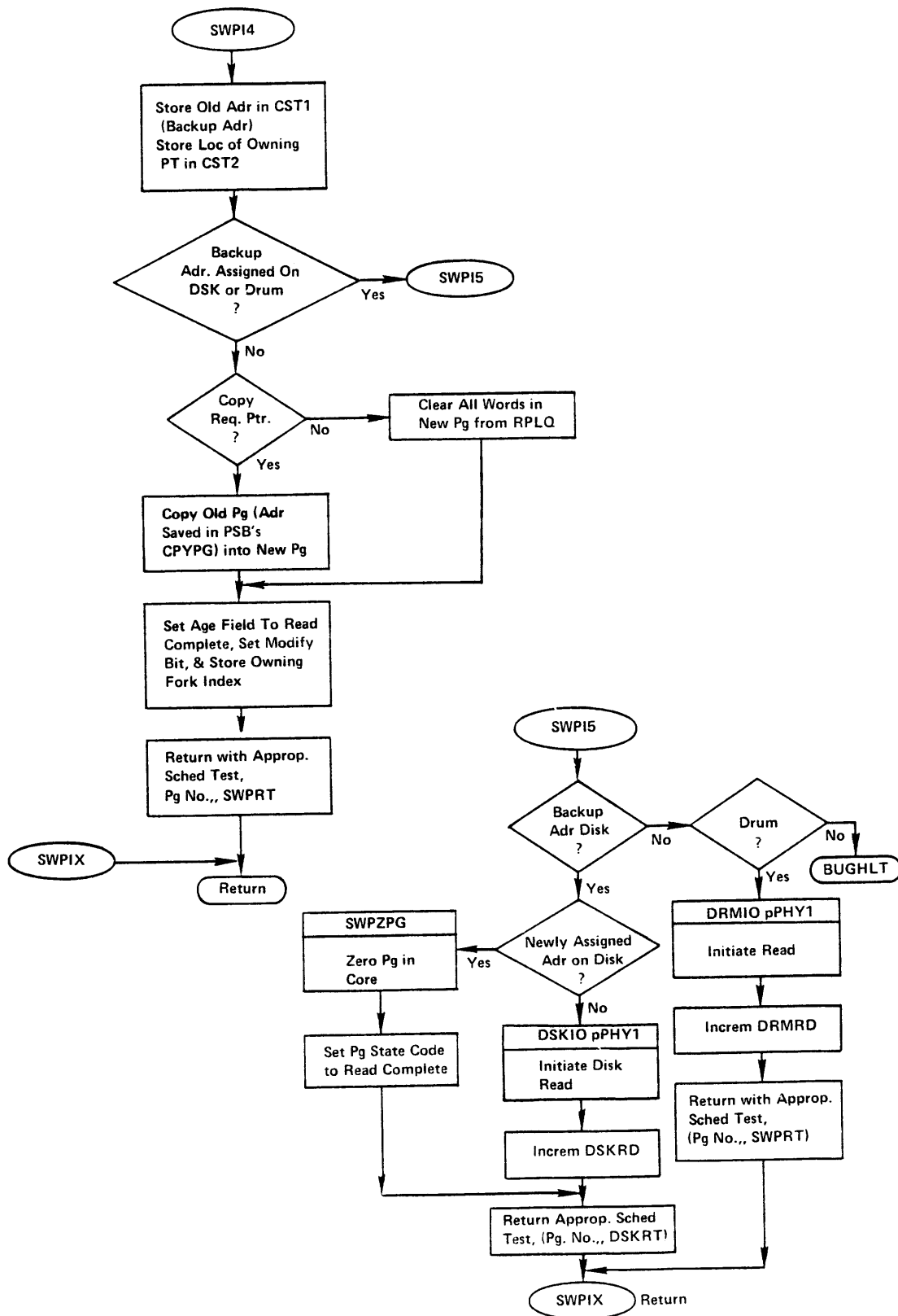
REQUESTING DRUM OR DISK READ
(PAGE LEVEL)



REQUESTING DRUM OR DISK READ (Continued)
(PAGE LEVEL)



PF11



PF11a

MULTIPLE PAGE SWAP OUT ROUTINE

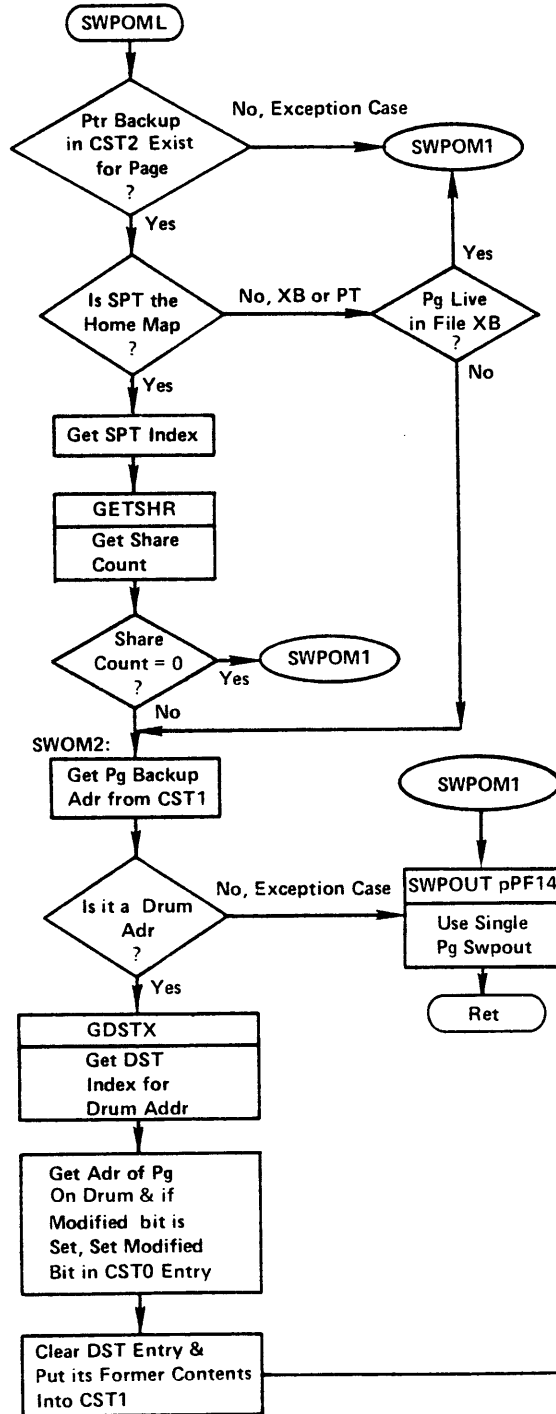
SWPOM1 - Init List

SWPOML - Called to Add Page to Swap Out List if Possible

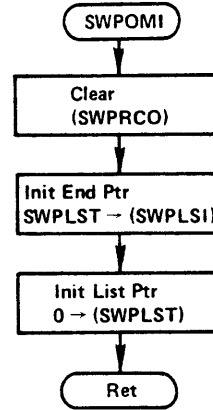
SWPOMG - To Begin I/O for All Pages on Swap Out List

SWPOUT - Initiate Swap Out of Single Page

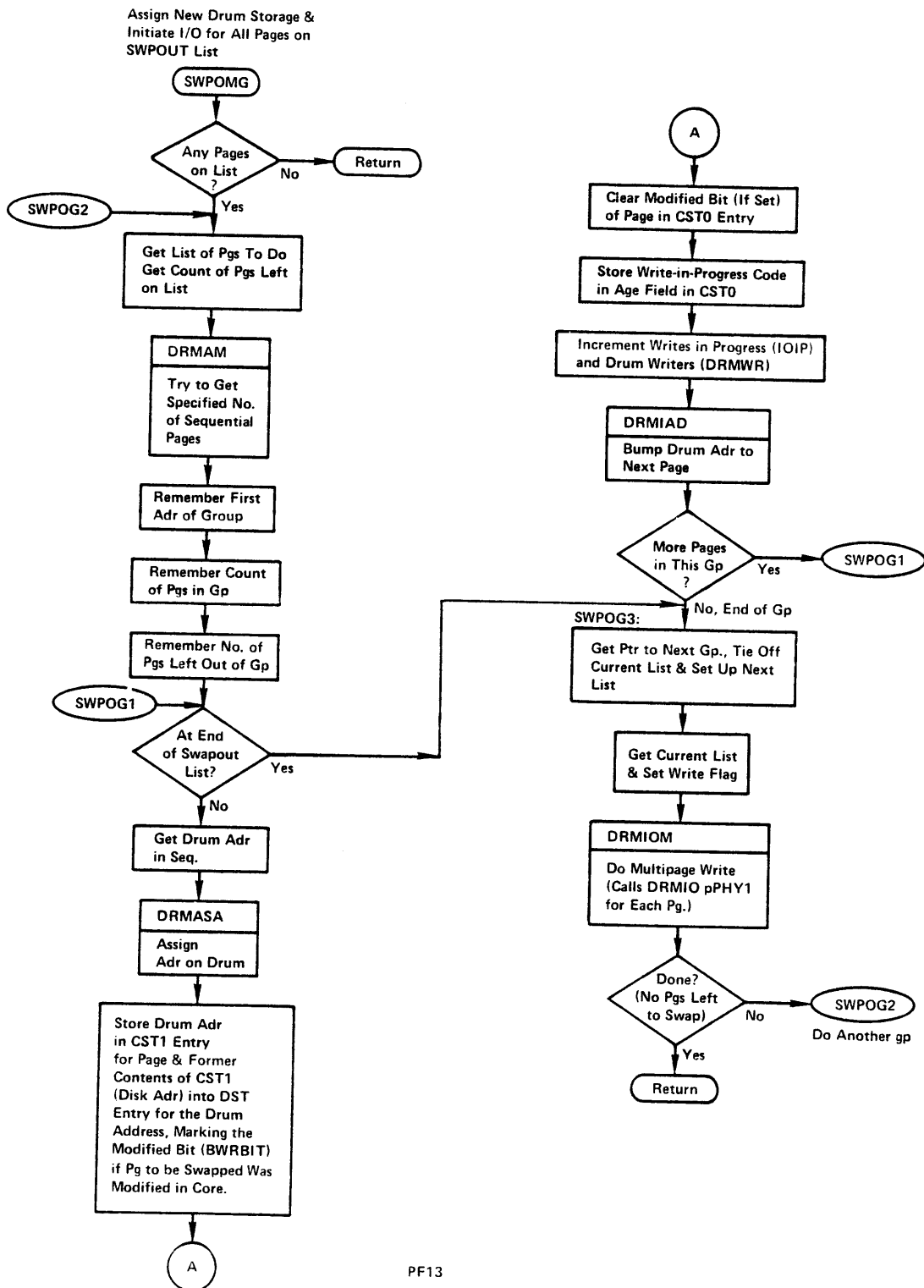
Add Pg to Swap Out List if Possible



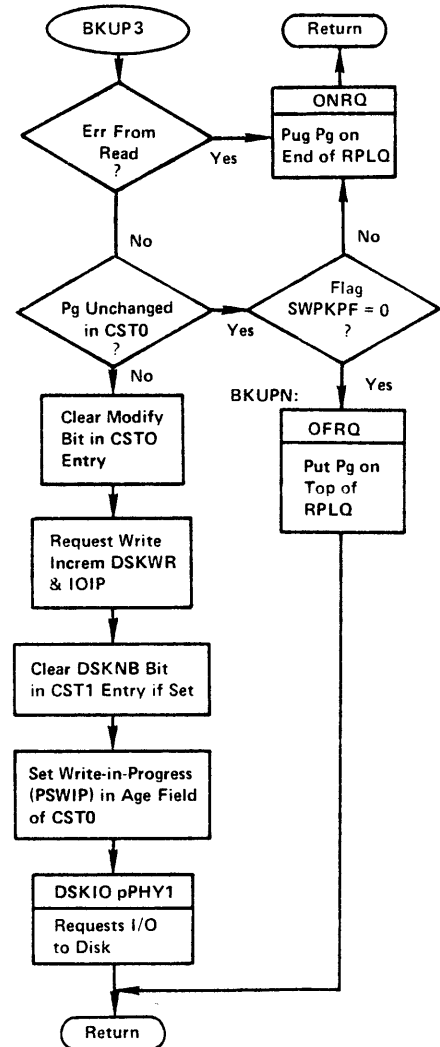
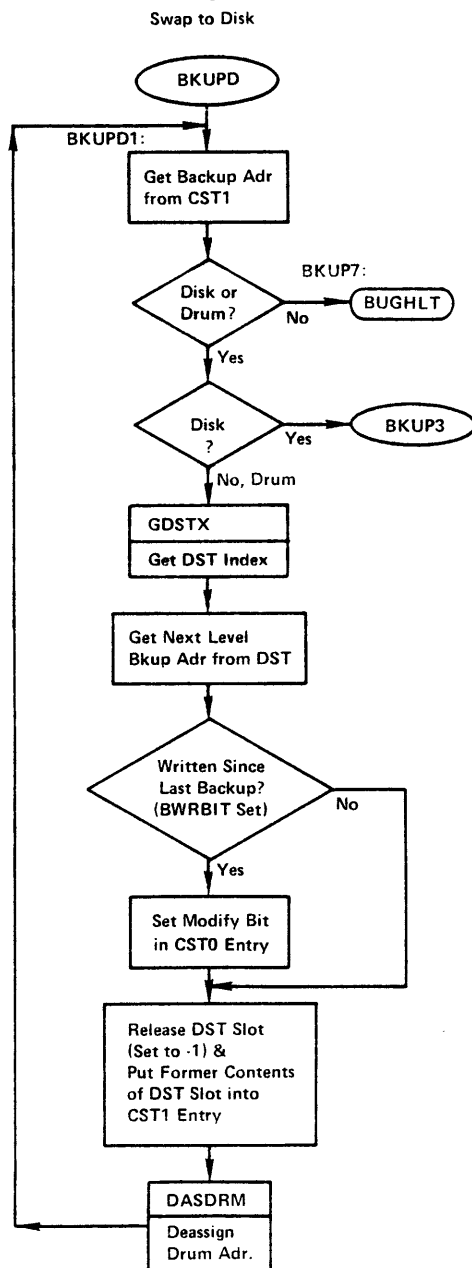
Init Swap Out List



PF12



PF13



PF15

Page Fault Handling Comments

PGTACC

- (1) Checks if process has accrued more than or equal to the number of age ticks of GCRATE. Currently, this is set to 50, which implies 2 sec. of process virtual time (i.e., the age stamp is incremented every 40 ms of process run time).

NICCKS

- (1) GNPBAS is currently initialized at system startup to zero and is incremented/decremented only when pages are locked/unlocked. It is currently only tested by NICCKS as well.

GETTPD

- (2) The age field when used to hold the age stamp, will always have a value of 100 or greater. This checks if any of the lefthand 6 bits of the age field are set.

NIC

- (3) Could take the ILRD path, for example, when OPENed file for write, but PMAped for each of a nonexistent page. A page would have to be created which would then imply a write which was not enabled under PMAP.
- (4) If file page faulted does not have its own SPT slot, but has to be mapped (using indirect pointer) via the index blk slot in the OFN area, then the index blk will be locked in core. (So can't be swapped in case of reschedule.)
- (5) Note in the predispatch code that AC1 was stored in BHC + 1 and AC, P, which holds a push down list pointer, was saved in TRAPAP.

SWPINW

- (6) SWPINW will invoke SWPIN to swap in a page into a page from the RPLQ. However, this same code can also be entered with different flag settings and be used to swap in a page into a page from the special memory queue (SPMQ), a queue used by the memory error handling code.

SWPOUT

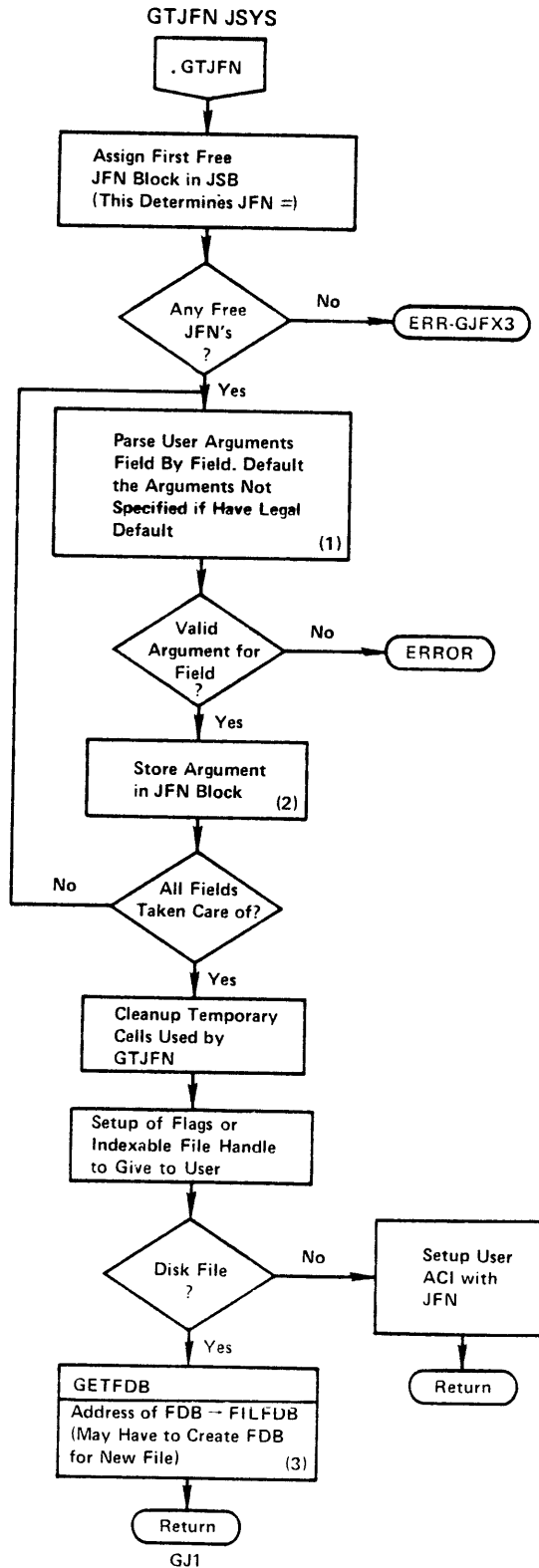
- (7) SWPOUO is called from:

SWPOTO which clears the SWPKPF bit (for top of RPLQ) before calling SWPOUO and

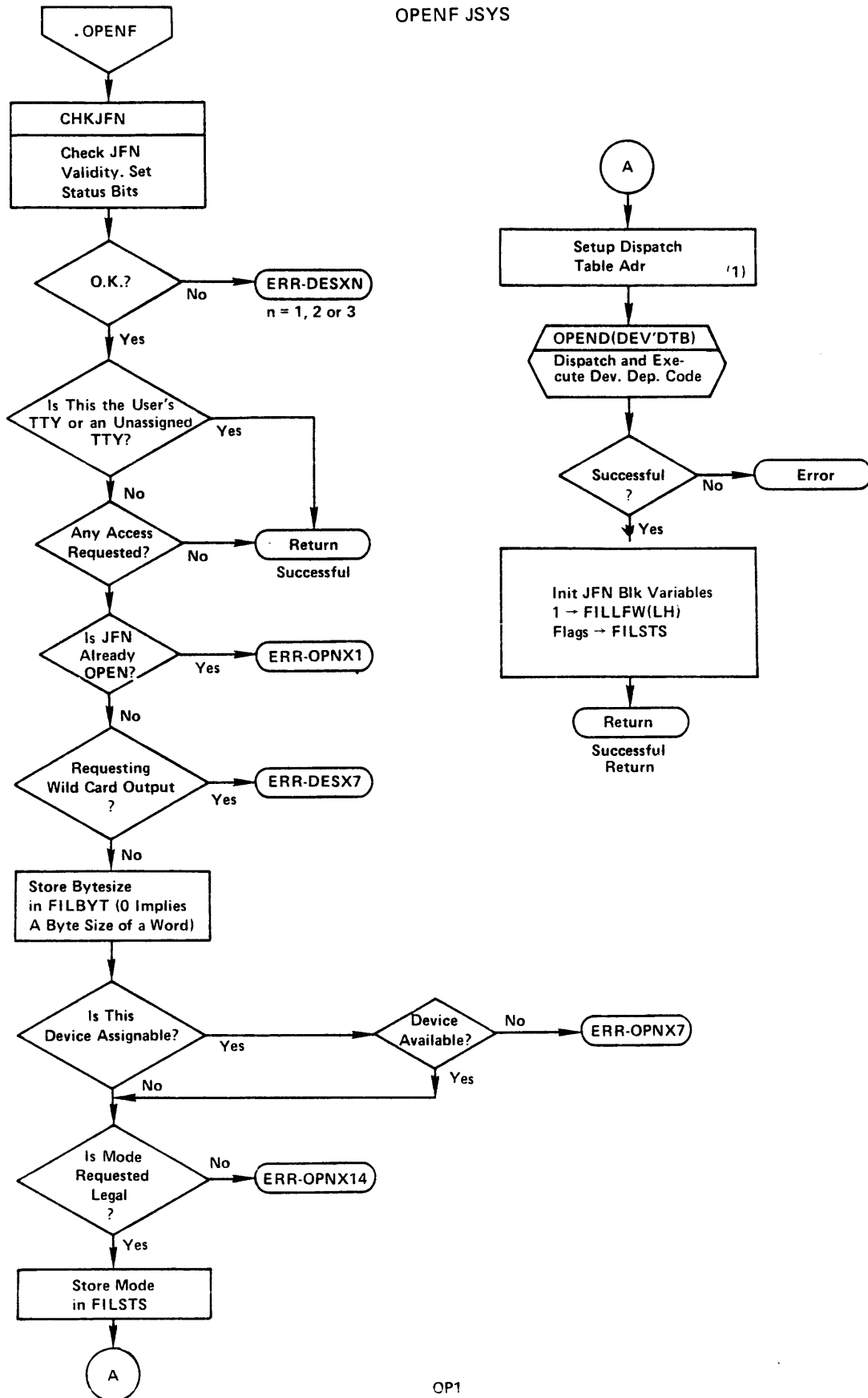
SWPOTK (called from the UPDPGS JSYS) which sets the SWPKPF bit (for end of RPLQ) before calling SWPOUO.

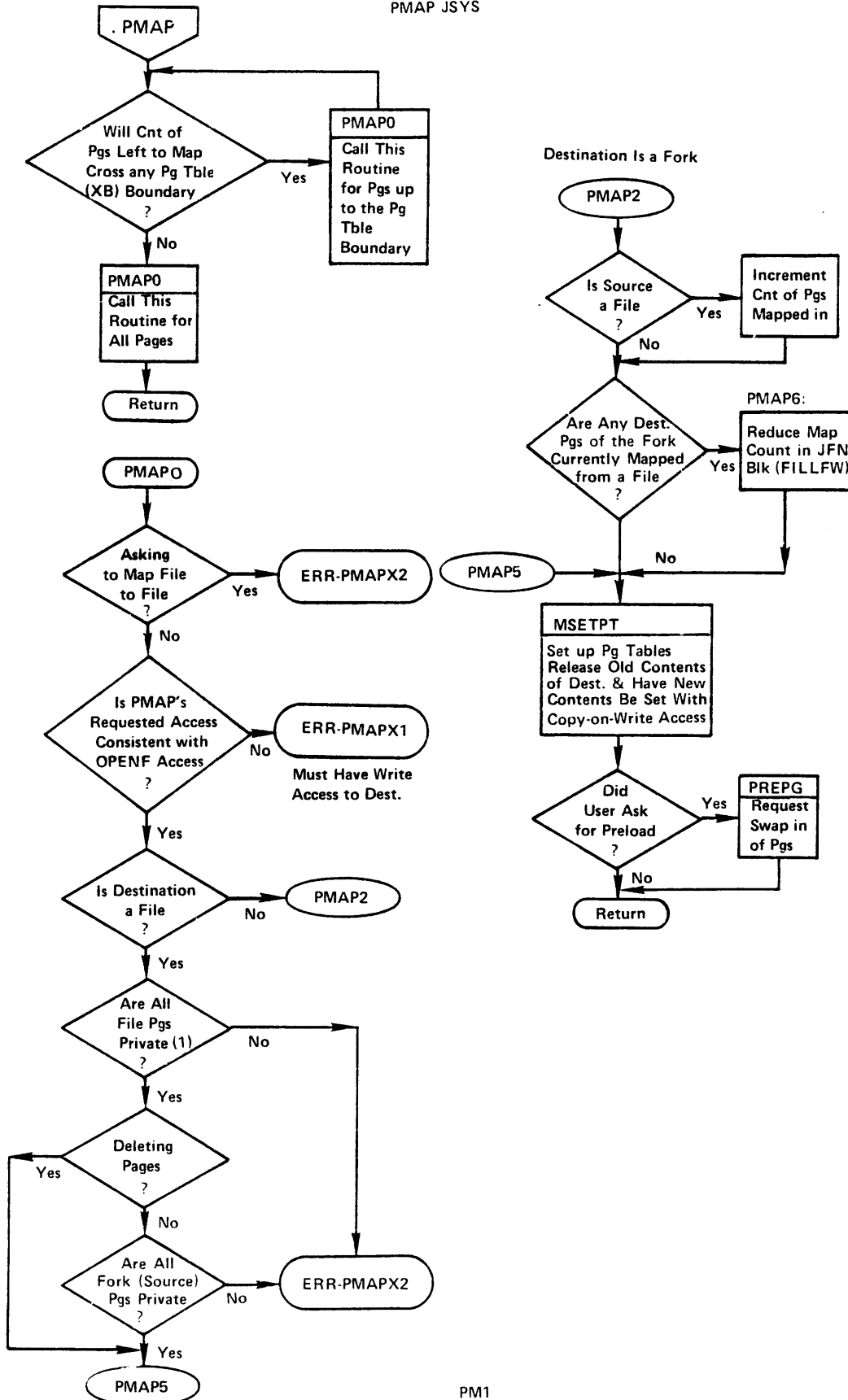
JSYS CALL FLOWCHARTS
DEVICE INDEPENDENT LEVEL

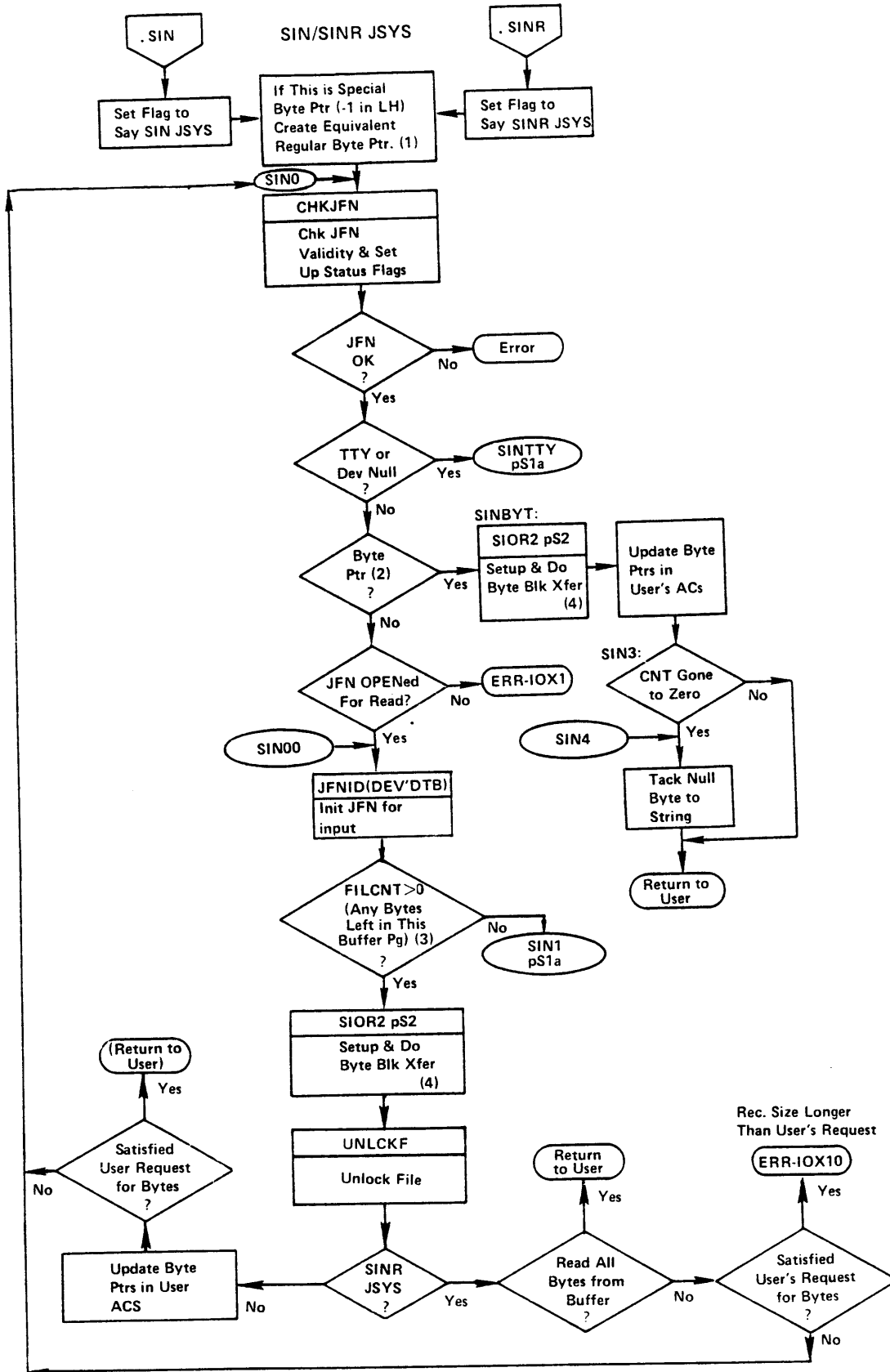
GTJFN -	Get a JFN	GJ1
OPENF -	Open a File	OP1
SIN/SINR-	Sequential Input	S1
	BYTINA - Call Device Dependent Code to Get a Byte	S2
	SIOR2 - String I/O Multiple Byte Transfer	S2
SOUT/SOUTR -	Sequential Output	S3
	BYTOUA - Send Byte to a Service Routine	S4
PMAP -	Map a File or Fork	PM1
UFPGS -	Update File Pages	UD1
CLOSEF -	Close a File	CL1



OPENF JSYS

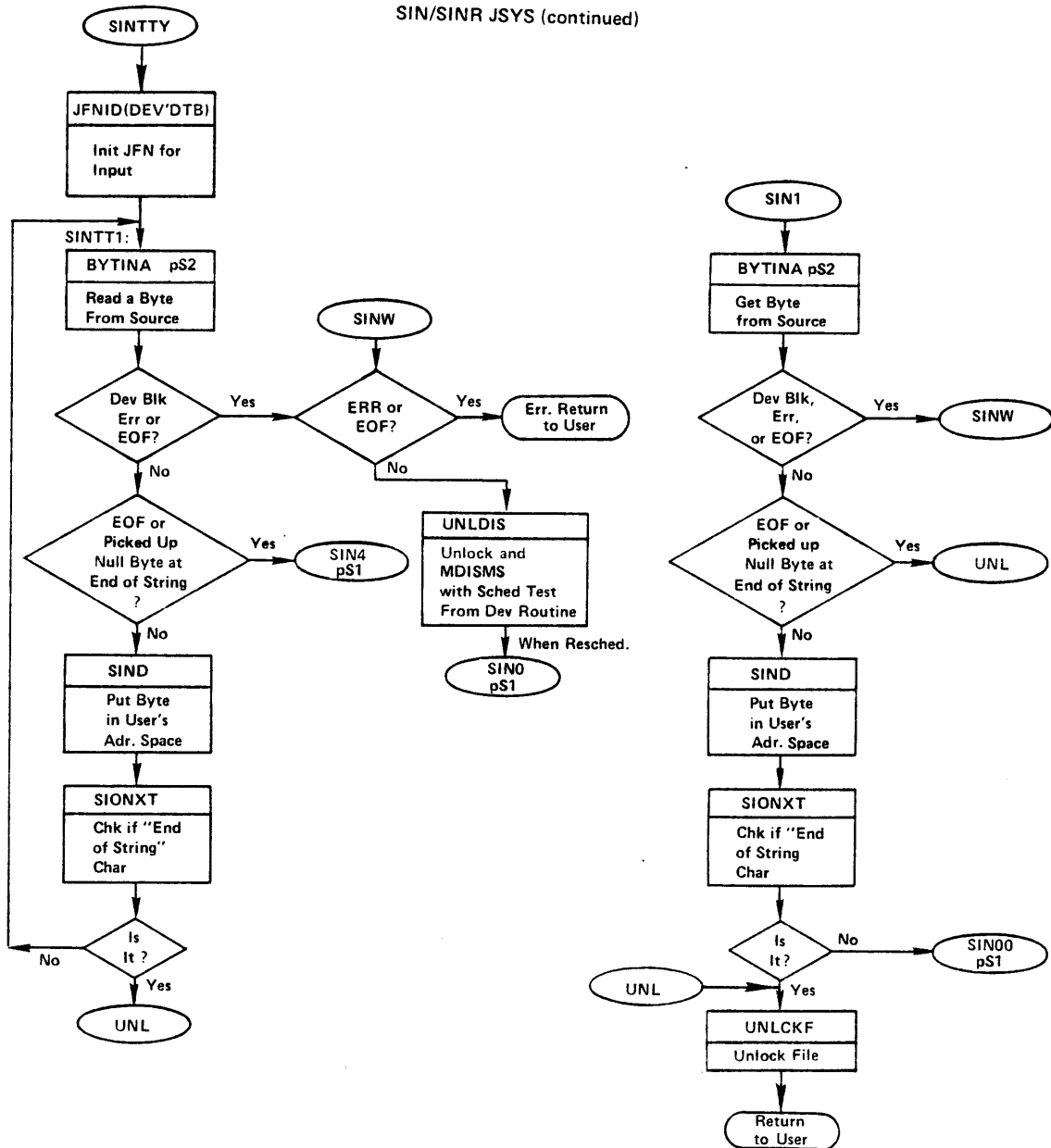




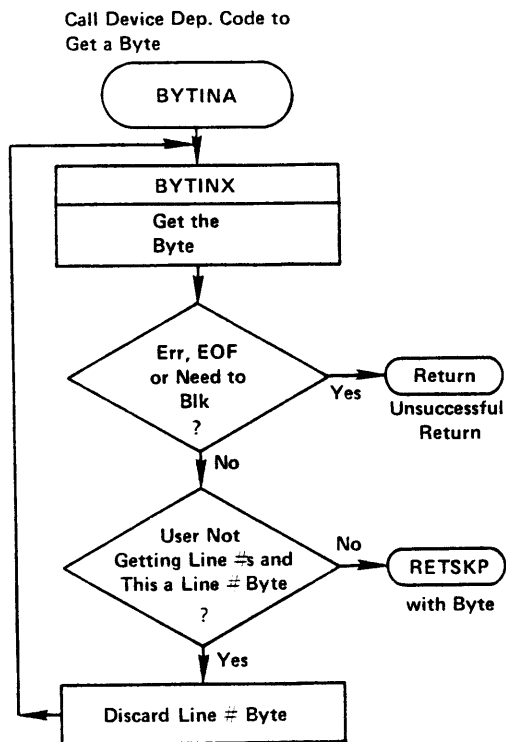


S1

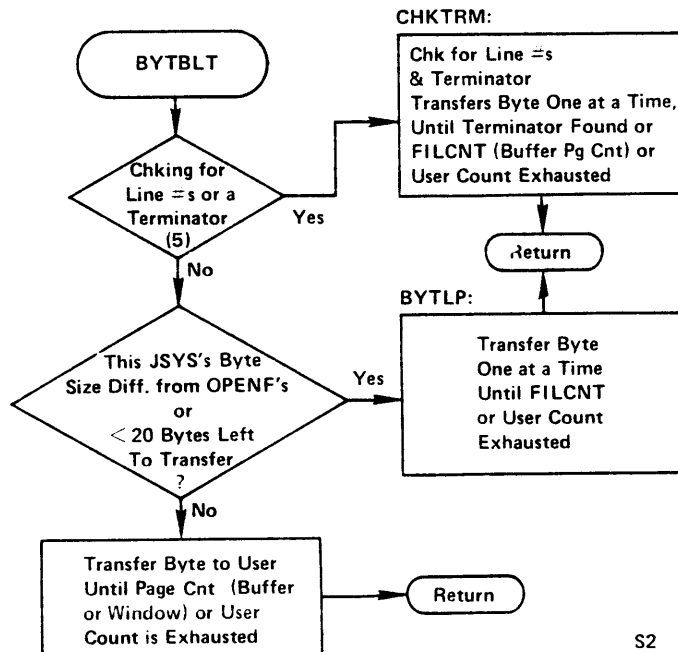
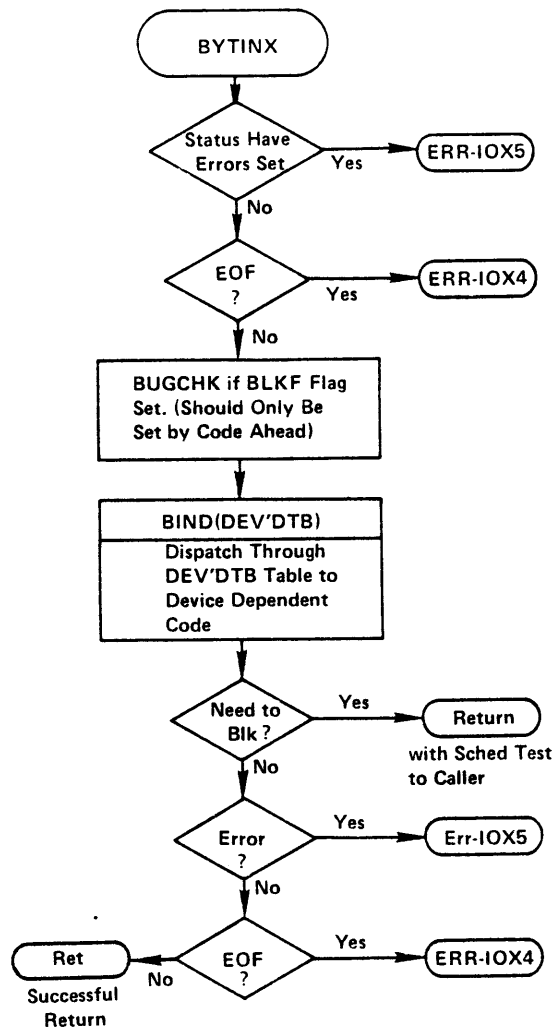
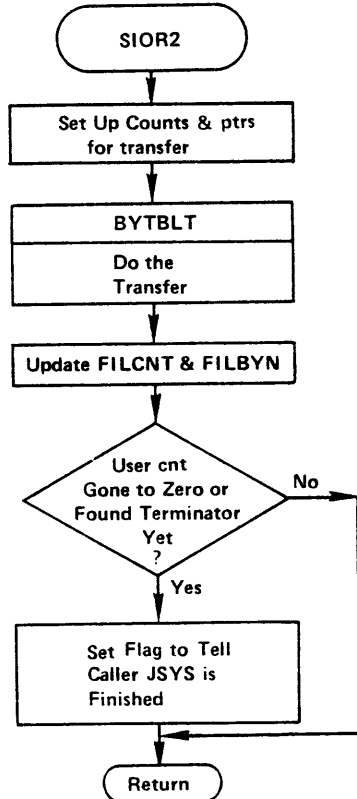
SIN/SINR JSYS (continued)



S1a



String Input/Output Multiple Byte Xfer

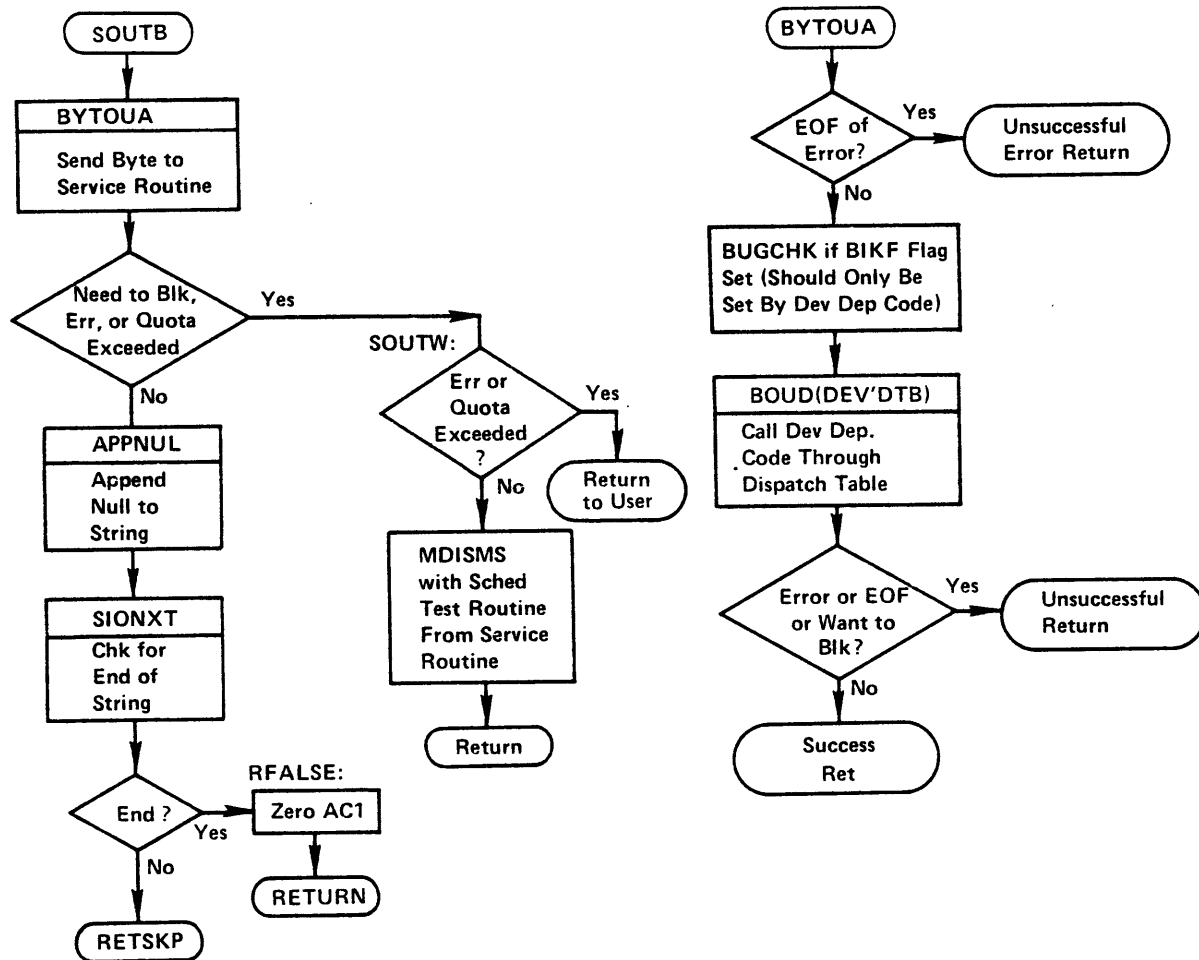


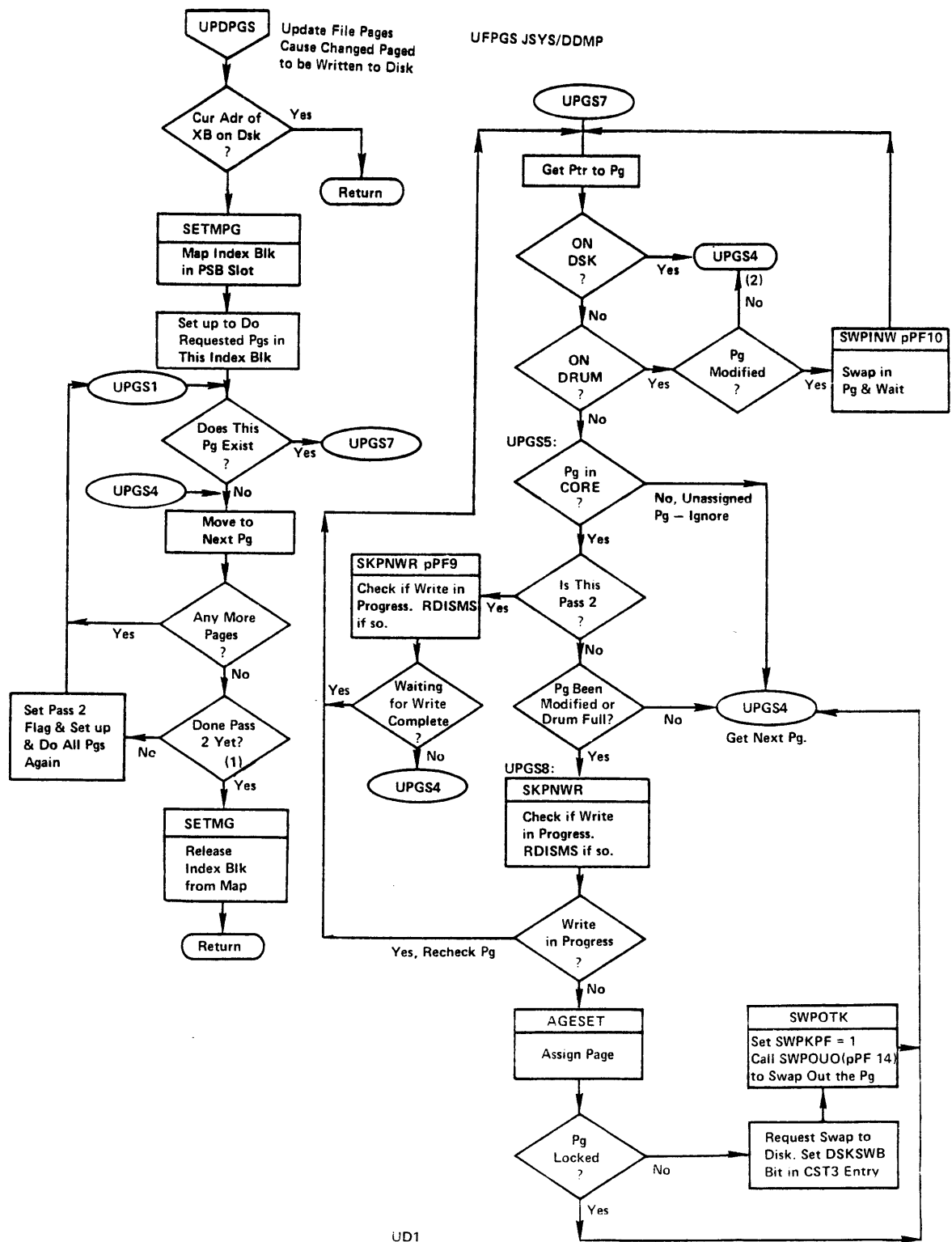
S2

```

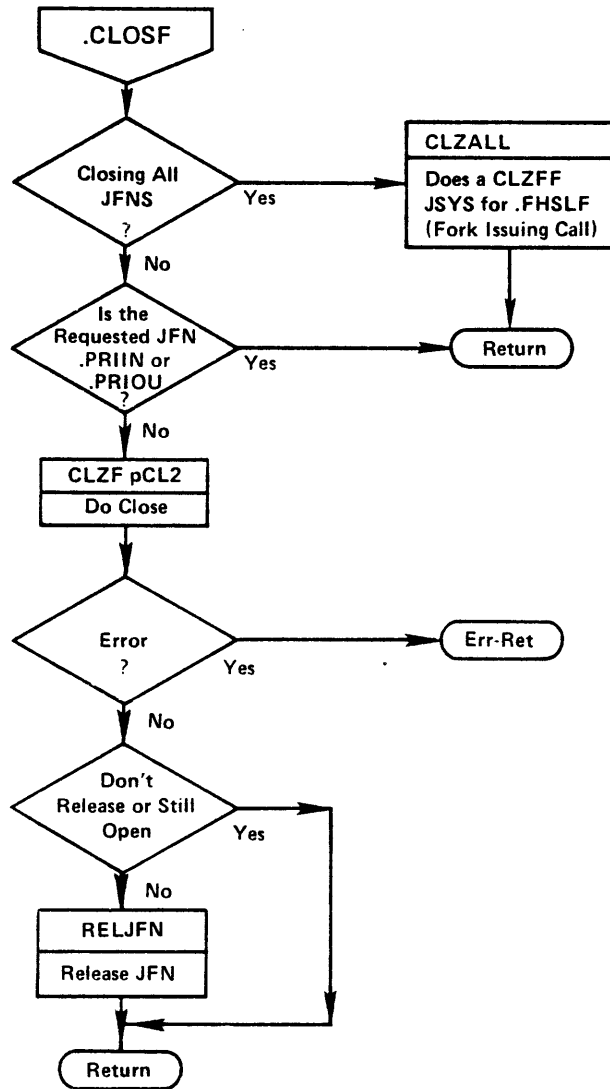
graph TD
    SOUT([SOUT]) --> SetFlagSOUT[Set Flag to Remember Doing a SOUT]
    SOUTR([SOUTR]) --> SetFlagSOUTR[Set Flag to Remember Doing a SOUTR]
    
    SetFlagSOUT --> IfUsingSpecialPtr[If Using (-1, Addr) Special Byte Ptr, Change to 7-Bit Byte Ptr.]
    SetFlagSOUTR --> IfUsingSpecialPtr
    
    IfUsingSpecialPtr --> SOUT0_Split(( ))
    SOUT0_Split --> CHKJFN[SOUT0:  
CHKJFN  
Chk JFN Validity  
(Err Ret if Not OK)  
Setup JFN Status]
    SOUT0_Split --> SOUTTY_Split(( ))
    SOUTTY_Split --> JFNOD_DEVDTB_1[JFNOD(DEV'DTB)  
Init JFN for Output]
    SOUTTY_Split --> SOUTT1_Split(( ))
    
    CHKJFN -- Yes --> TTYorNUL{TTY or NUL?}
    TTYorNUL -- Yes --> SOUTTY_Split
    TTYorNUL -- No --> BytePtr{Byte Ptr?}
    BytePtr -- Yes --> SOUBYT_Split(( ))
    SOUBYT_Split --> SIOR2_pS2_1[SIOUR2 pS2  
Setup & Do Byte Blk Transfer (4)]
    SIOR2_pS2_1 --> UpdateUserACS_1[Update User ACS]
    UpdateUserACS_1 --> APPNULL_1[APPNULL  
Append NULL]
    APPNULL_1 --> ReturnToUser_1([Return to User])
    BytePtr -- No --> OpenForWriteAccess{Open for Write Access?}
    OpenForWriteAccess -- No --> ERR_IOX2(ERR-IOX2)
    OpenForWriteAccess -- Yes --> JFNOD_DEVDTB_2[JFNOD(DEV'DTB)  
Init JFN for Output]
    
    JFNOD_DEVDTB_2 --> SOUTR_JSYS{SOUTR JSYS?}
    SOUTR_JSYS -- Yes --> SOUTRR([SOUTRR])
    SOUTR_JSYS -- No --> FILCNT{FILCNT = 0  
Need to Call Dev Dep Code?}
    FILCNT -- Yes --> SOUTT1_Split
    FILCNT -- No --> SIOR2_pS2_2[SIOUR2 pS2  
Setup & Do Byte Transfer (4)]
    SIOR2_pS2_2 --> UpdateUserAC2[Update User AC2 Byte Ptr  
Update FILBYT]
    UpdateUserAC2 --> AnyMoreBytes{Any More Bytes to Transfer?}
    AnyMoreBytes -- Yes --> UNLCKF_1[UNLCKF  
Unlock the JFN]
    UNLCKF_1 --> SOUT0_Split
    AnyMoreBytes -- No --> SOUTRR_JSYS{SOUTRR JSYS?}
    SOUTRR_JSYS -- Yes --> RECOUT_DEVDTB[RECOUT(DEV'DTB)  
Call Dev Dep Code to do a Record Out]
    RECOUT_DEVDTB --> WantToBlk{Want to Blk?}
    WantToBlk -- No --> UNLCKF_2[UNLCKF  
Unlock the JFN]
    UNLCKF_2 --> SOUT0_Split
    WantToBlk -- Yes --> UNLDIS[UNLDIS  
Unlock & DISMS]
    UNLDIS --> SOUT0_Split
    SOUTRR_JSYS -- No --> ReturnToUser_2([Return to User])
    
    SOUTT1_Split --> SOUTB_pS4_1[SOUTB pS4  
Send Byte Through Dev.  
Dep. Code]
    SOUTB_pS4_1 --> RETSKP_1{RETSKP?}
    RETSKP_1 -- Yes --> SOUTT1_Split
    RETSKP_1 -- No --> DeviceBlk_1{Device Blk?}
    DeviceBlk_1 -- Yes --> ReturnToUser_1
    DeviceBlk_1 -- No --> SOUT0_Split
    
    SOUTT1_Split --> SOUTB_pS4_2[SOUTB pS4  
Call Device Dep Code to Write Out the Record]
    SOUTB_pS4_2 --> RETSKP_2{RETSKP?}
    RETSKP_2 -- Yes --> SOUTT1_Split
    RETSKP_2 -- No --> DeviceBlk_2{Device Blk?}
    DeviceBlk_2 -- Yes --> UNLDIS
    DeviceBlk_2 -- No --> ReturnToUser_2

```

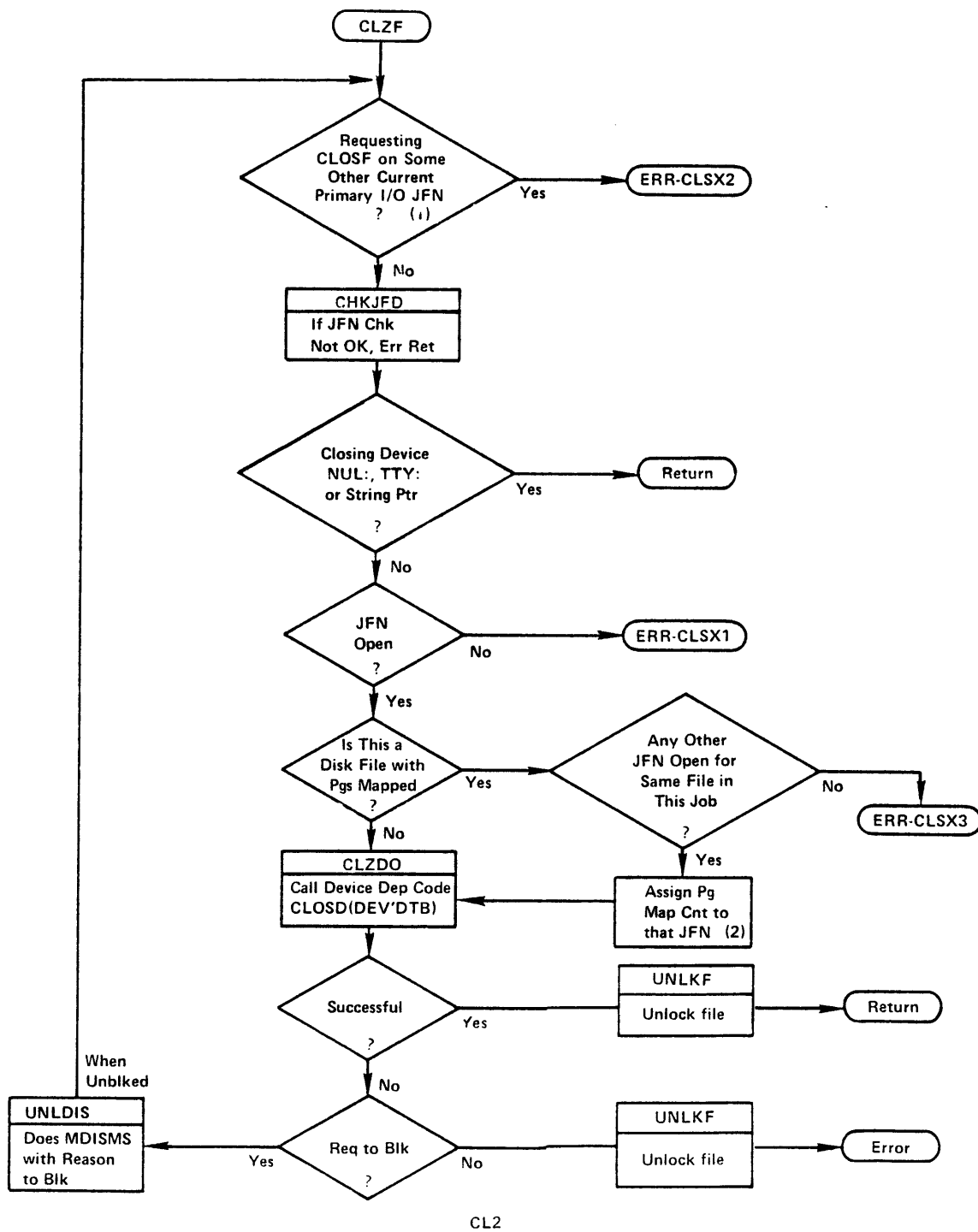




CLOSF JSYS



CL1



GTJFN Comments

- (1) This code is looking for a file specification of the form:

Dev:Directory Name,type,gen;T(temporary);P(protection);A(account)

One or more fields can be defined by logical names.
If any fields are omitted from the specification, the system will default the values as follows:

Device	DSK:
Directory	Connected directory
Name	No default for disk Null for other devices
Generation	Highest existing for input Next highest for output
Protection	As specified for directory or protection of next lower generation
Account	Current user account

- (2) The internal GTJFN code uses several locations in the JFN block as temporary cells. These locations have two names in the JFN block table descriptions. The JFN block storage locations set up or used by GTJFN are:

FILLCK*	FILDDN	FILNEN
FILTMP*	FILPRT	FILVER
FILACT*	FILSTS1	FILCOD (LH)
FILOPT*	FILLNM*	
FILDEV	FILDNM	

*Used internally only by the GTJFN JSYS.

- (3) The creation process of the FDB simply asks for space in the directory for the FDB.

.OPENF Comments

- (1) Cell FILDEV in the JFN blk has the device dispatch table address. For example, for disk, GTJFN sets the dispatch table address to DSKDTB. If spooling to disk, GTJFN sets the dispatch table address to SPLDTB, but the OPENF code changes the dispatch table address to DSKDTB and sets up a file specification in the JFN block.

.SIN/.SOUT Comments

- (1) TOPS-20 allows a user to specify a special byte pointer of -1,, Address which is interpreted as a 7-bit byte size beginning on the word boundary, Address.
- (2) A user can do I/O from one place to another in core by specifying byte pointers for both source and destination. This differs from BLT in that the use can transfer on non-word boundaries.
- (3) For disk files, FILCNT will be the number of bytes remaining in the window page. For magtape and other devices it will be the number of bytes remaining in the current page of the buffer.
- (4) The routine BYTBLT only moves data up to the page boundary of the current buffer page.
- (5) If the user has not specified OF%PLN in the OPENF, line numbers are stripped off the beginning of each line. (See SIN JSYS in Monitor Calls manual for definition of terminator.)

.PMAP Comments

- (1) A page is private if it is not shared between a file and a fork.

UPDPGS Comments

- (1) Routine scans page table twice: first time to request writes on all changed pages. Second time to wait for completion of writes. (This is faster than waiting for each write to complete as it is requested.)
- (2) If page has not been modified, a check is made to see if the drum is full and if so, to release this page back to the drum. The map pointer to the page will be changed to its disk address.

CLOSF Comments

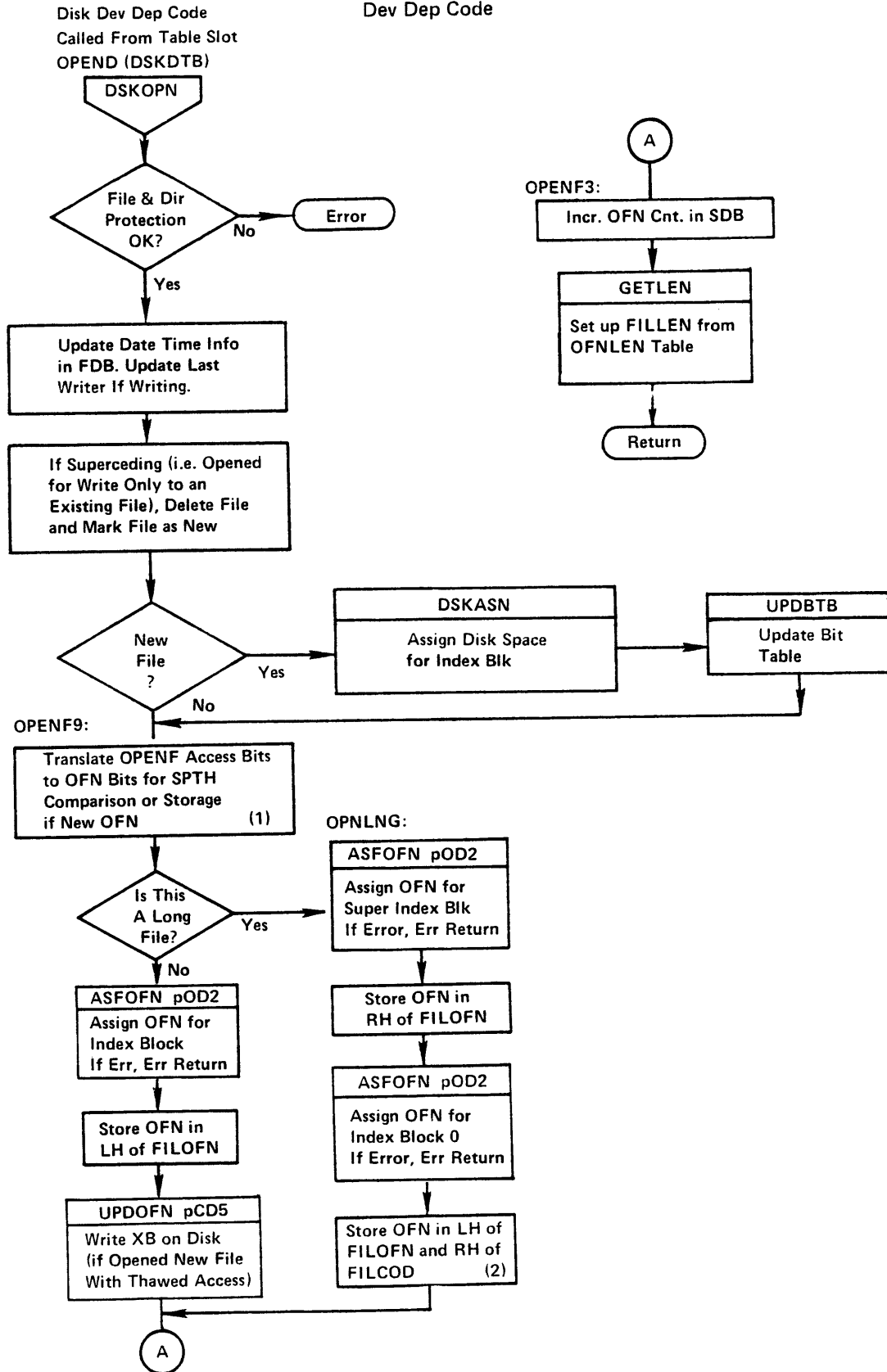
- (1) If user has switched primary I/O to some other JFN and attempts to close it, an error results.
- (2) The page map count in FILEW reflects the number of pages mapped and a CLOSF can't be done on a file if this count is greater than 0.

JSYS CALL FLOWCHARTS

DSK DEPENDENT LEVEL

DSKOFN - Disk Opening of a File	OD1
ASFOFN - Assign OFN	OD2
UPDOFN - Update OFN	OD1
DSKSQI/O -Disk Sequential Input/Output	SD1
NEWWND - New Window Page (Next Page of File)	SD2
DSKCLZ - Disk Closing of a File	CD1
RELOFN - Release OFN	CD2
DASOFN - Deassign OFN	CD3
MOVDSK - Move Page Back to Disk	CD3

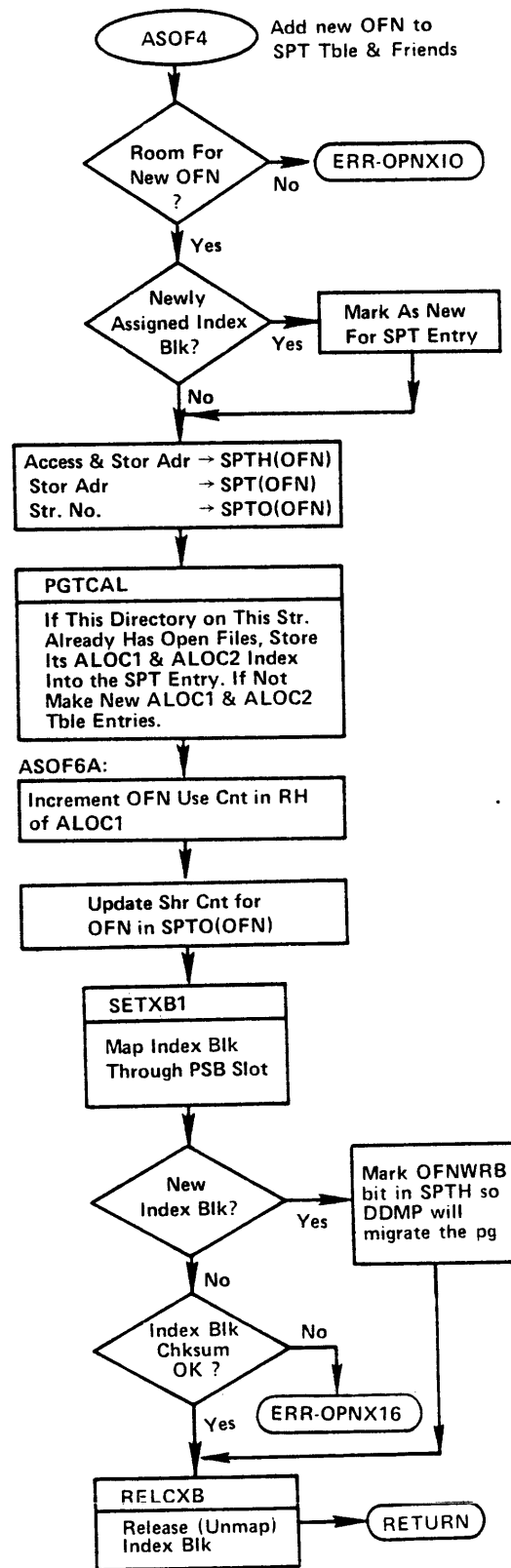
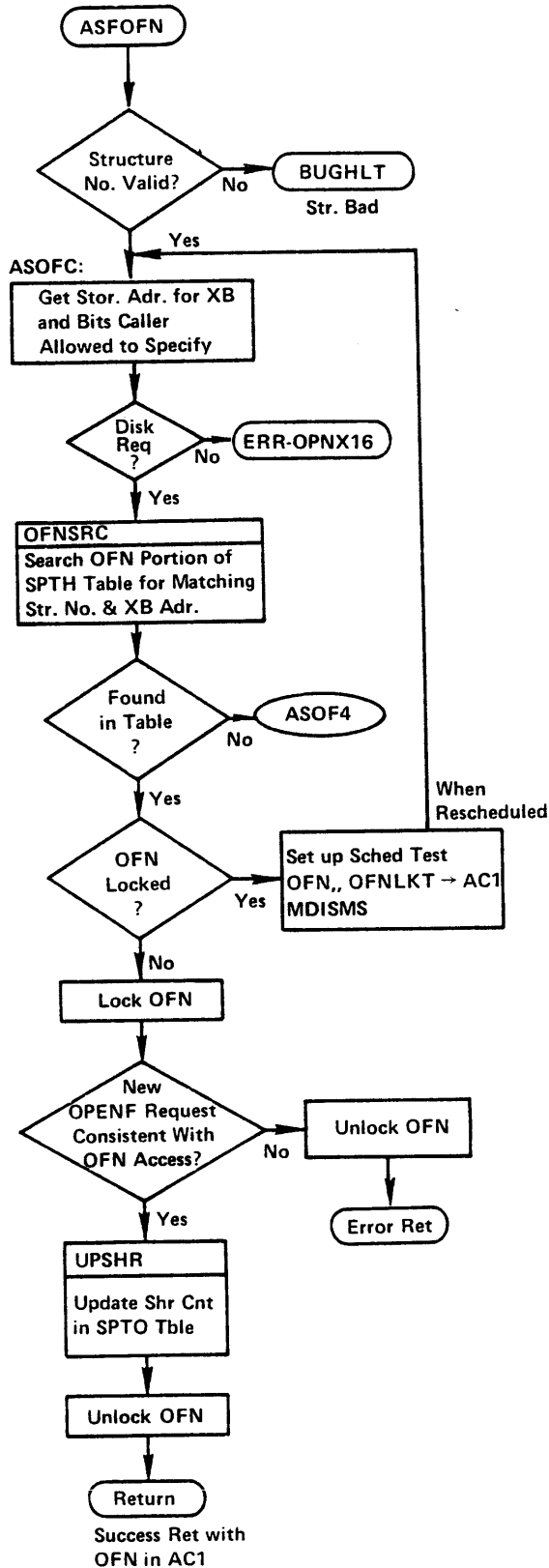
OPENF-DISK
Dev Dep Code



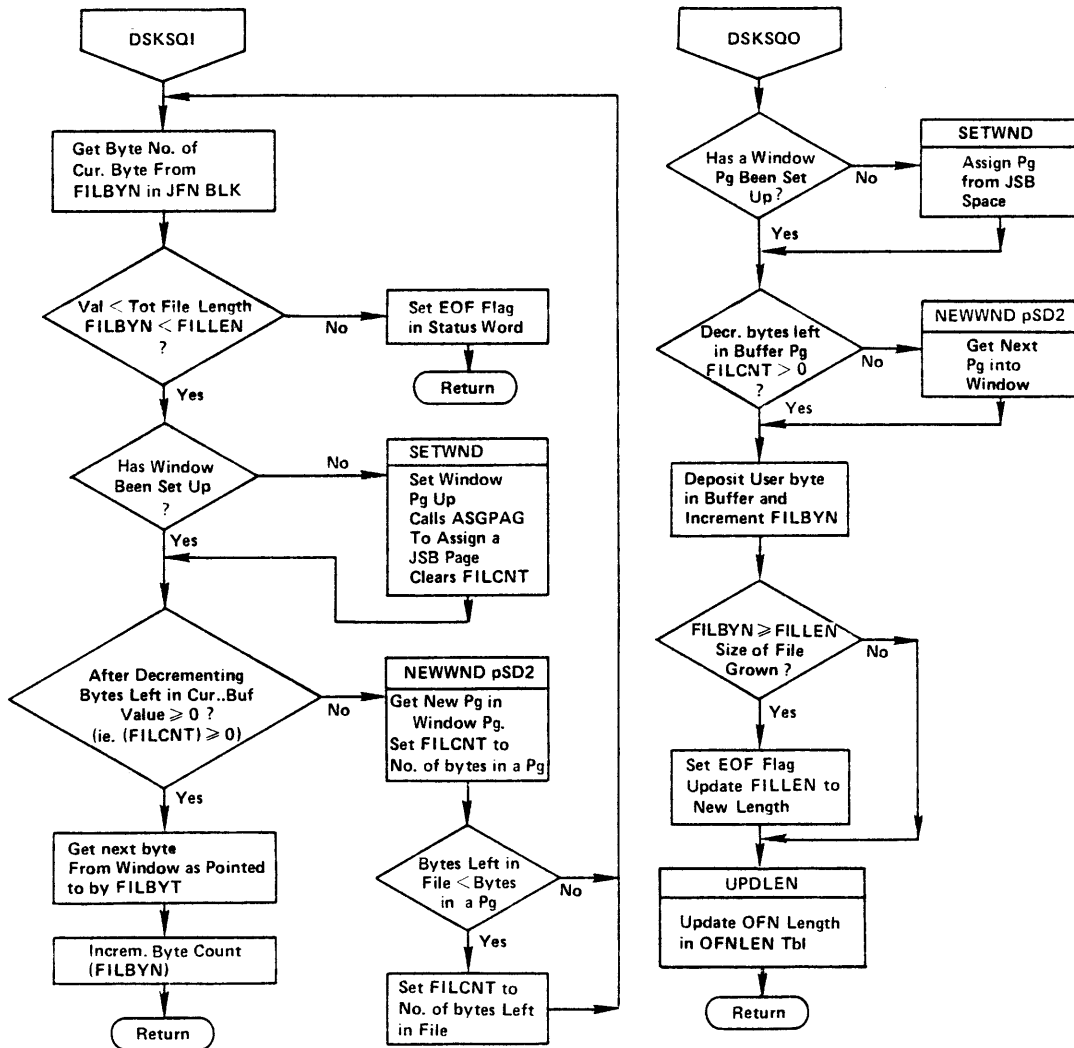
OD1

Assign OFN

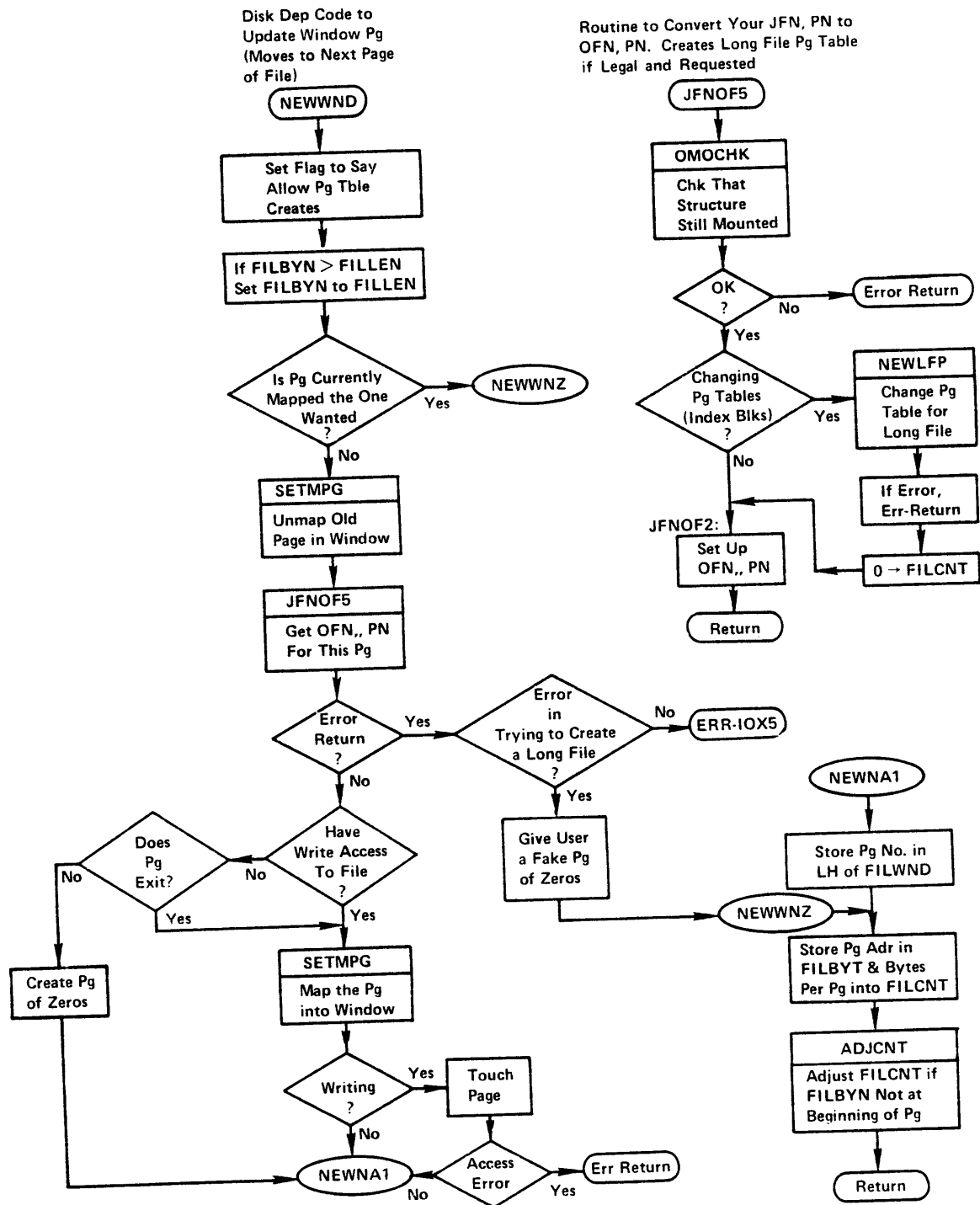
OPENF - DISK (Cont)



SEQUENTIAL I/O-DSK
(String & Byte Dev Dep Code)

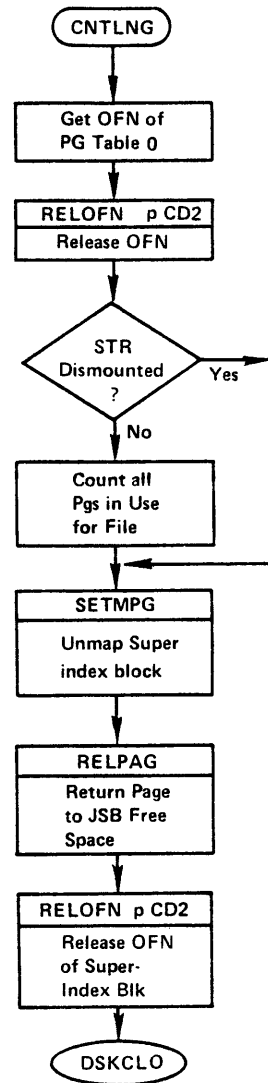
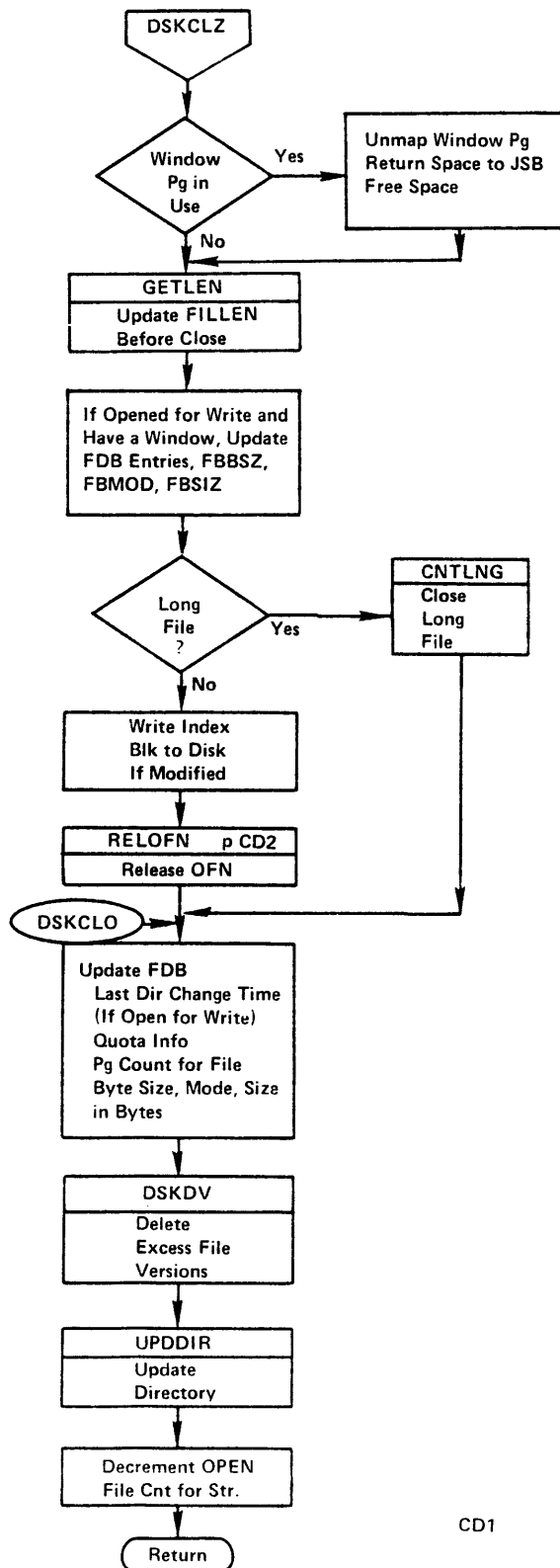


SD1



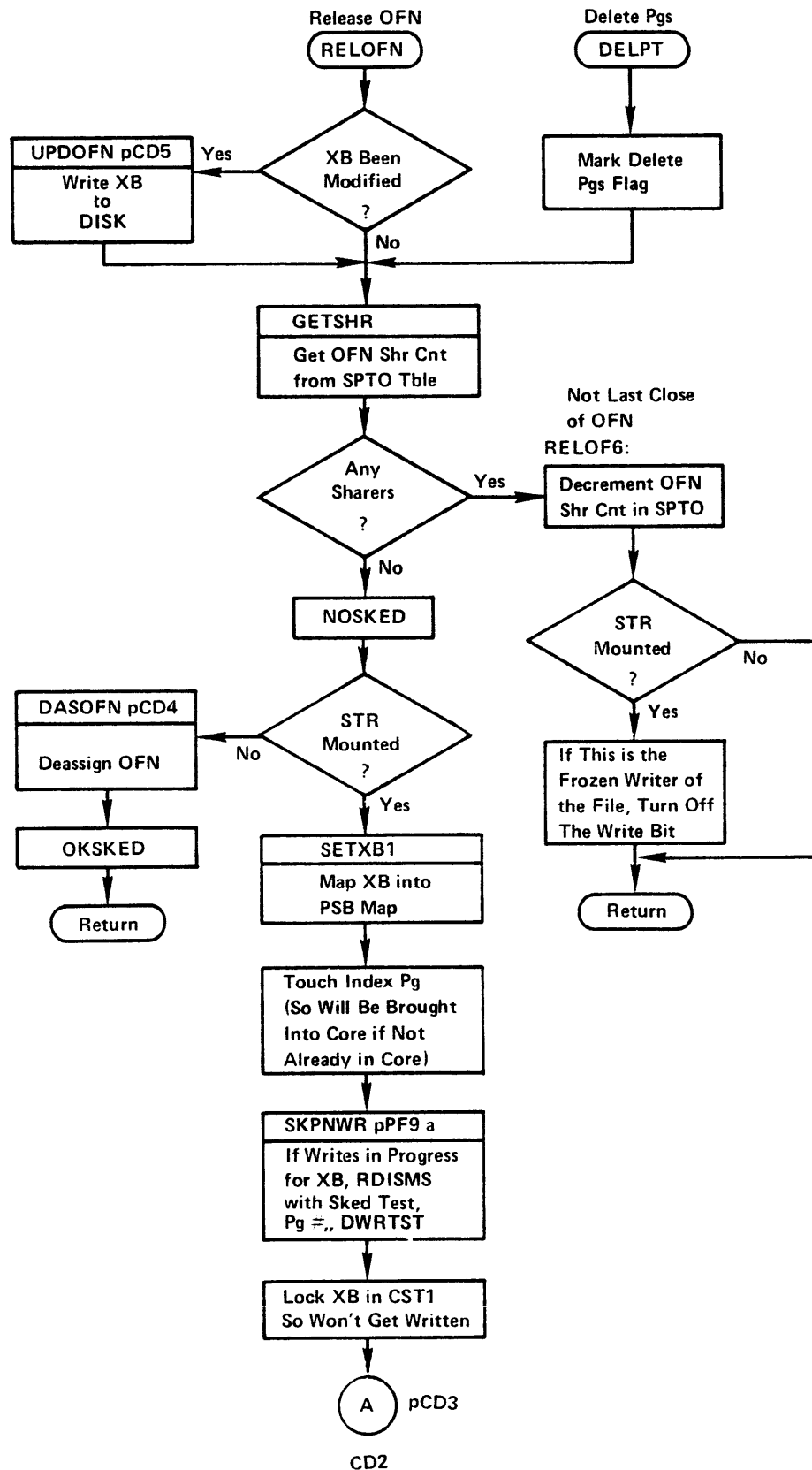
SD2

CLOSF — DSK
Dev. Dep. Code

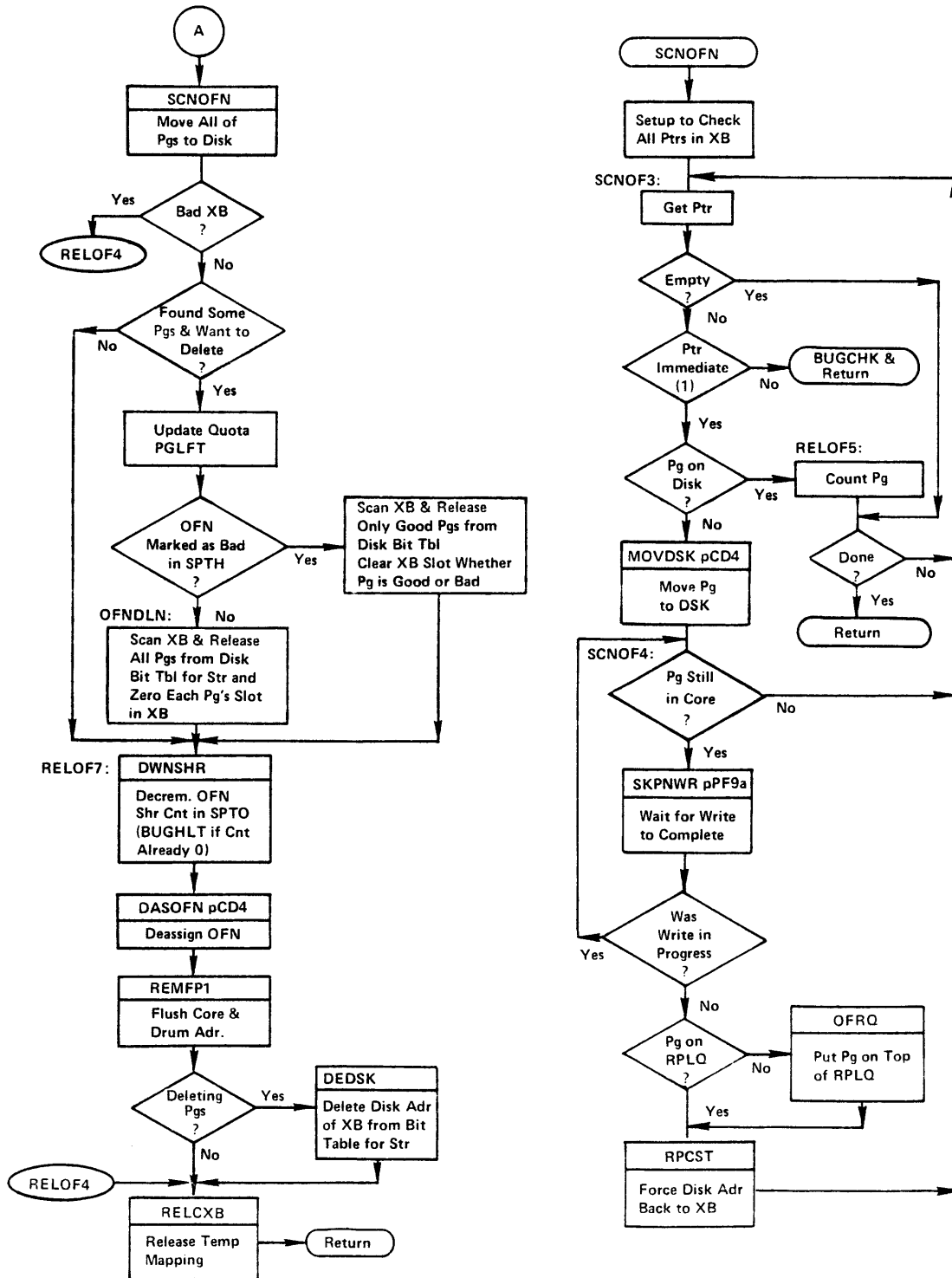


CD1

CLOSF-DSK (Continued)

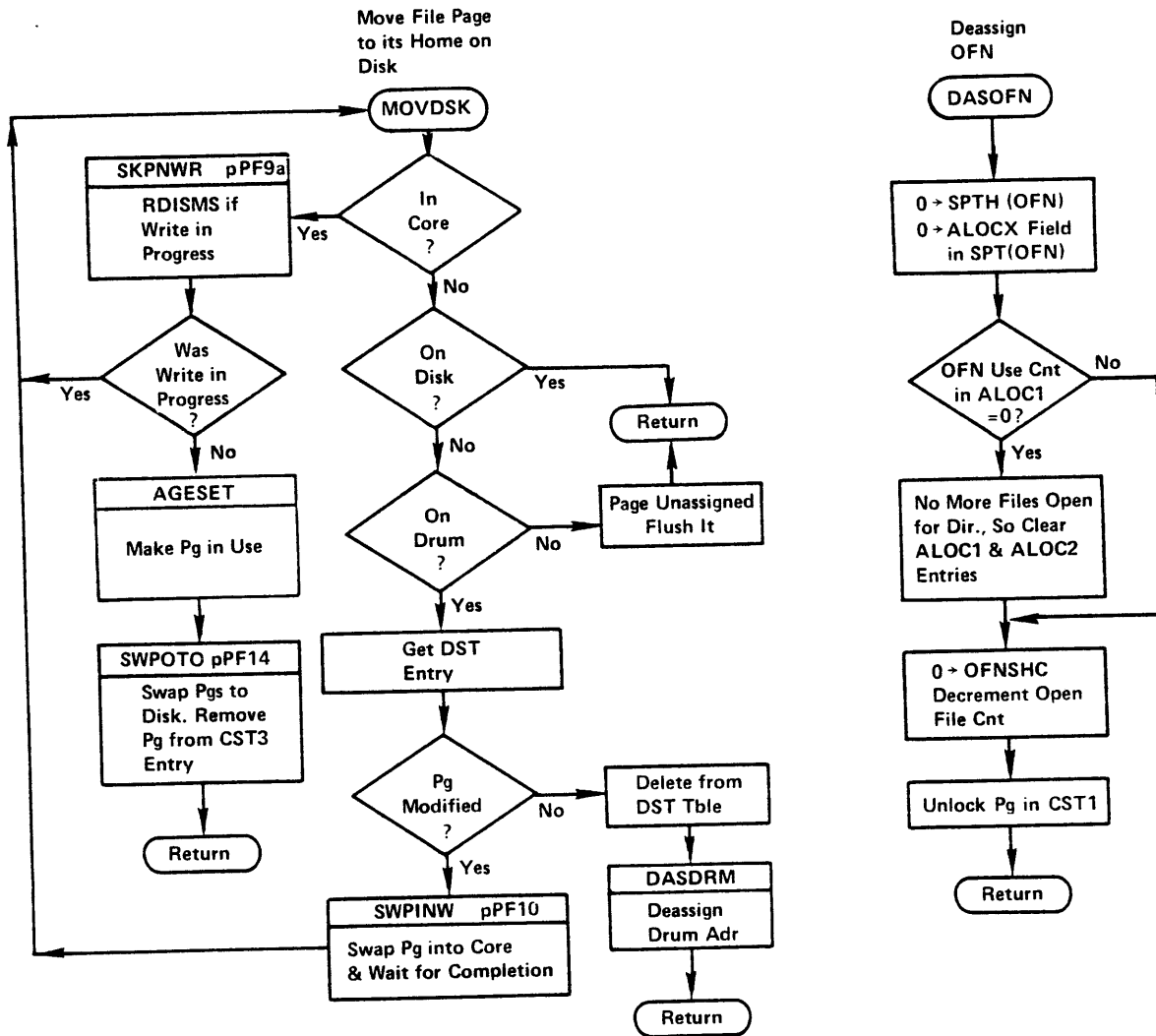


CLOSF-DSK (Continued)

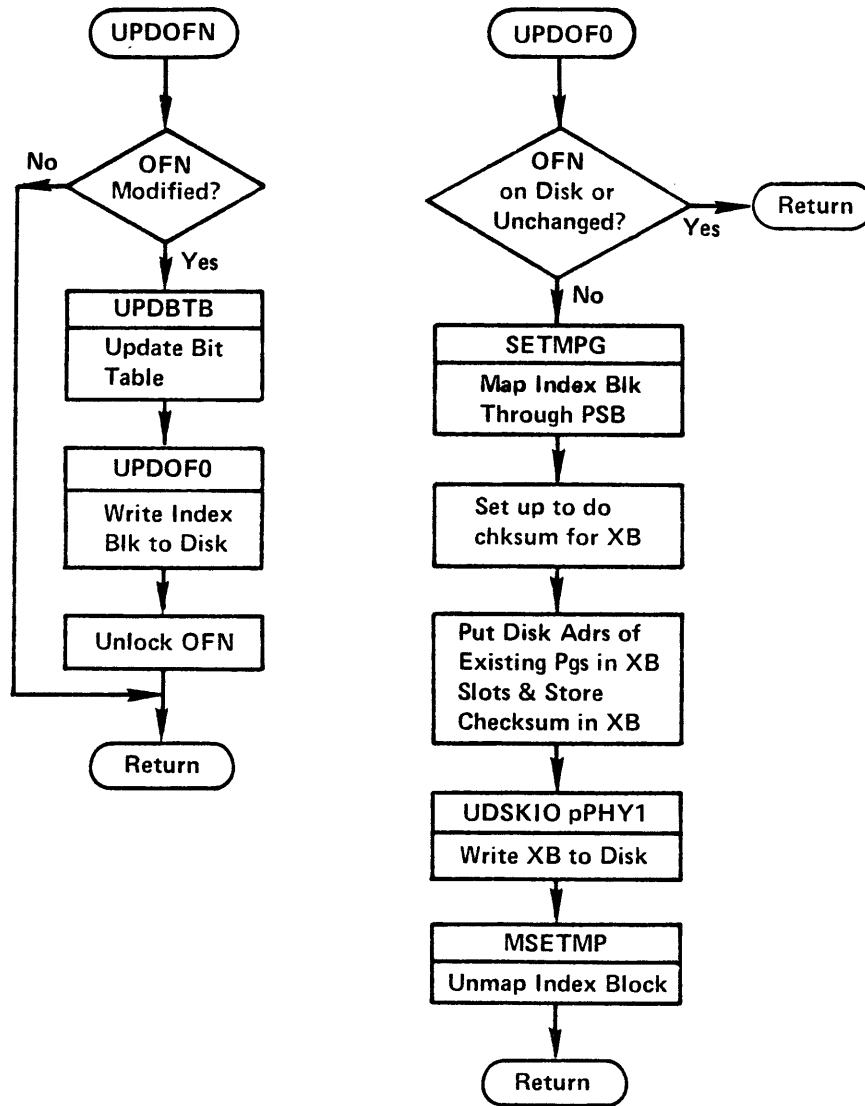


CD3

CLOSF - DISK (Continued)



CLOSF-DISK (continued)



OPENF-DISK Comments

- (1) OFN bits: 0=read, 10=write, 11=thawed, 01=restricted
- (2) For a long file, the OFN of index block 0 is remembered in the JFN blk and used as the identity of the file by the ENQ/DEQ facility.

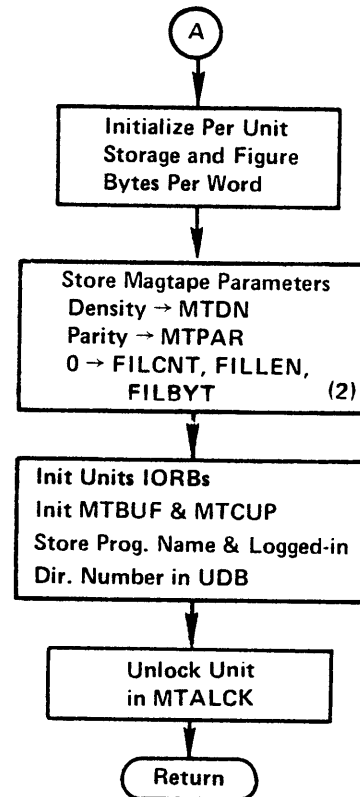
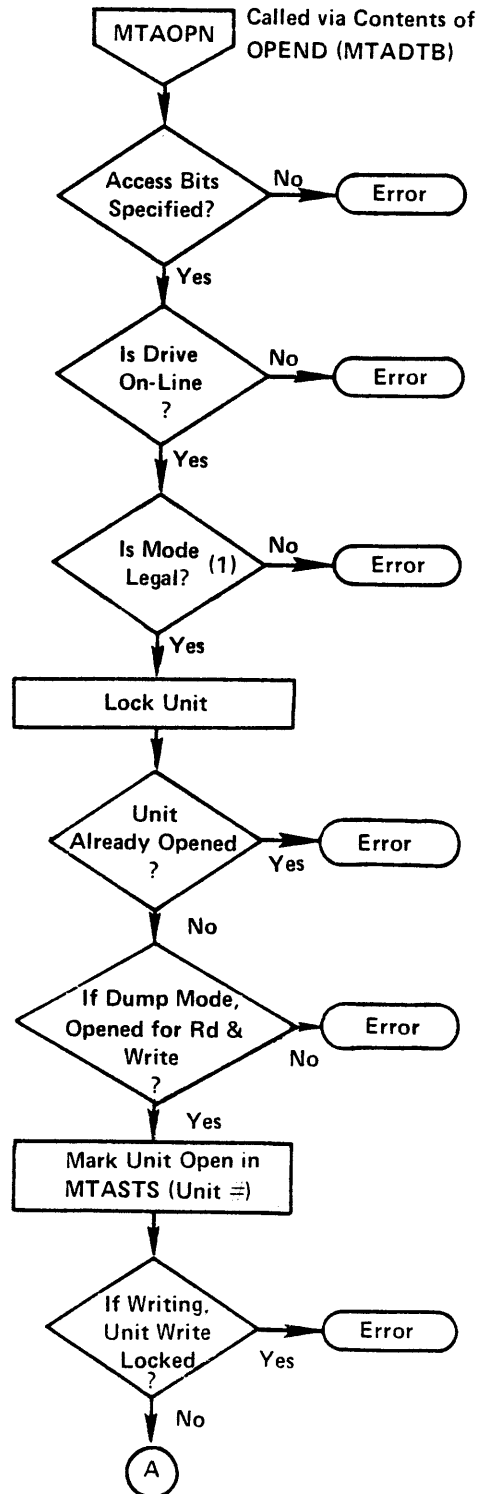
CLOSF-DISK Comments

- (1) All storage addresses placed in an index blk have the pointer type field set to immediate.

JSYS's CALLS
MTA DEPENDENT LEVEL

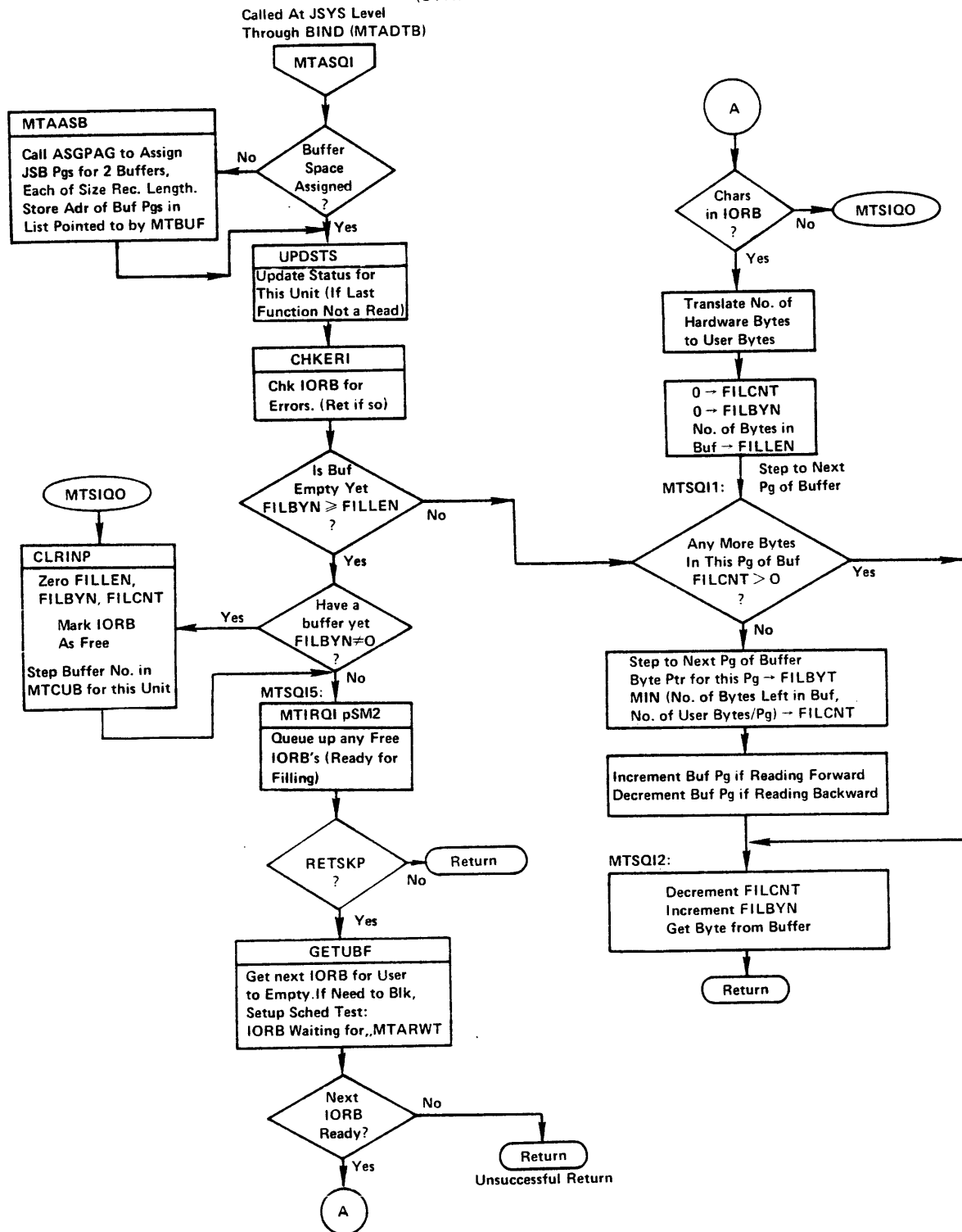
MTAOPN -	Magtape Opening of a File	OM1
MTASQI -	Magtape Sequential Input	SM1
	MTAIRQ - Queue Up Specified IORB	SM2
MTASQO -	Magtape Sequential Output	SM3
MTACLZ -	Magtape Closing of a File	CM1

OPENF – MAGTAPE DEVICE DEPENDENT CODE

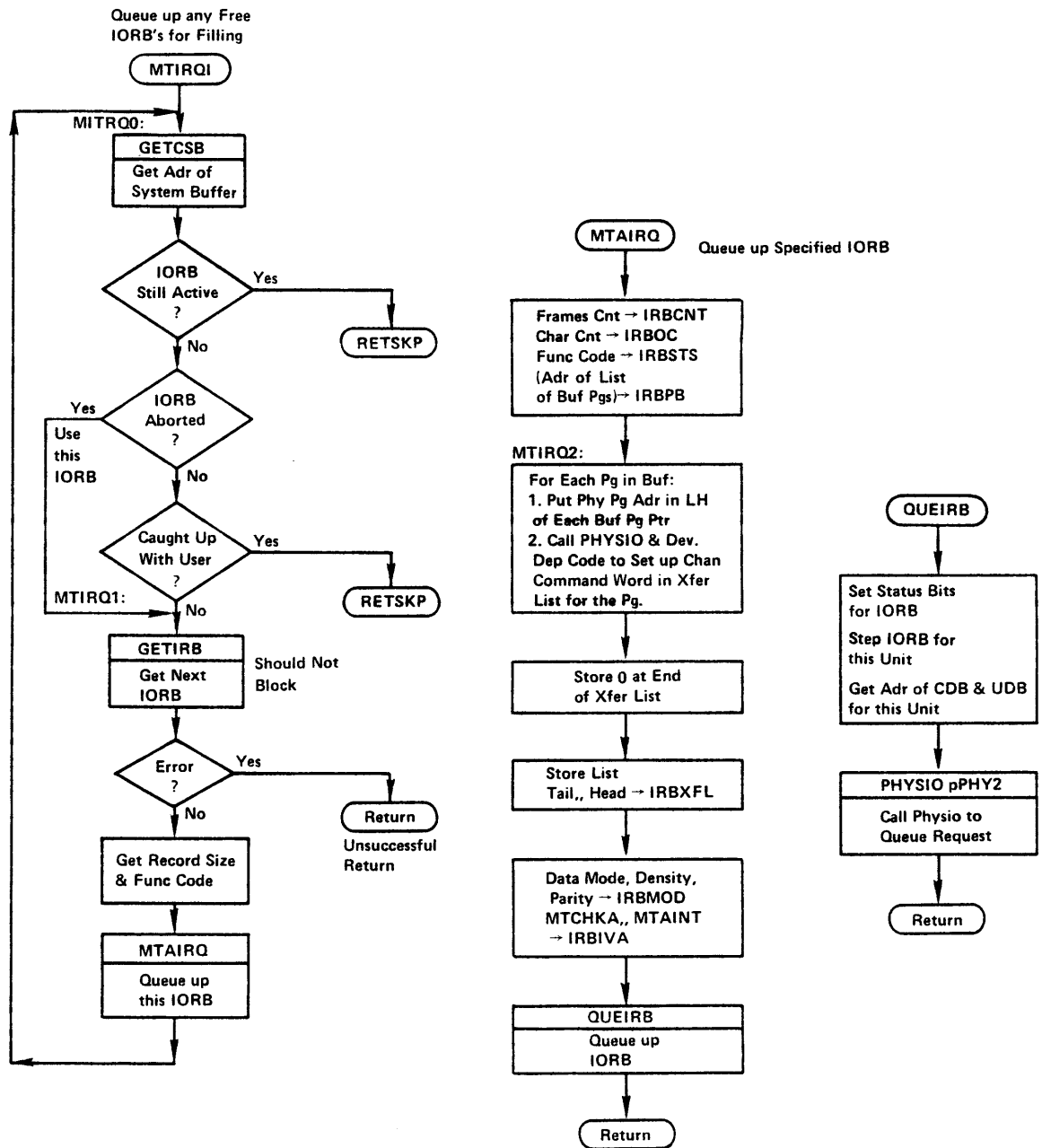


OM1

SEQUENTIAL INPUT - MTA
(STRING & BYTE DEV. DEP. CODE)

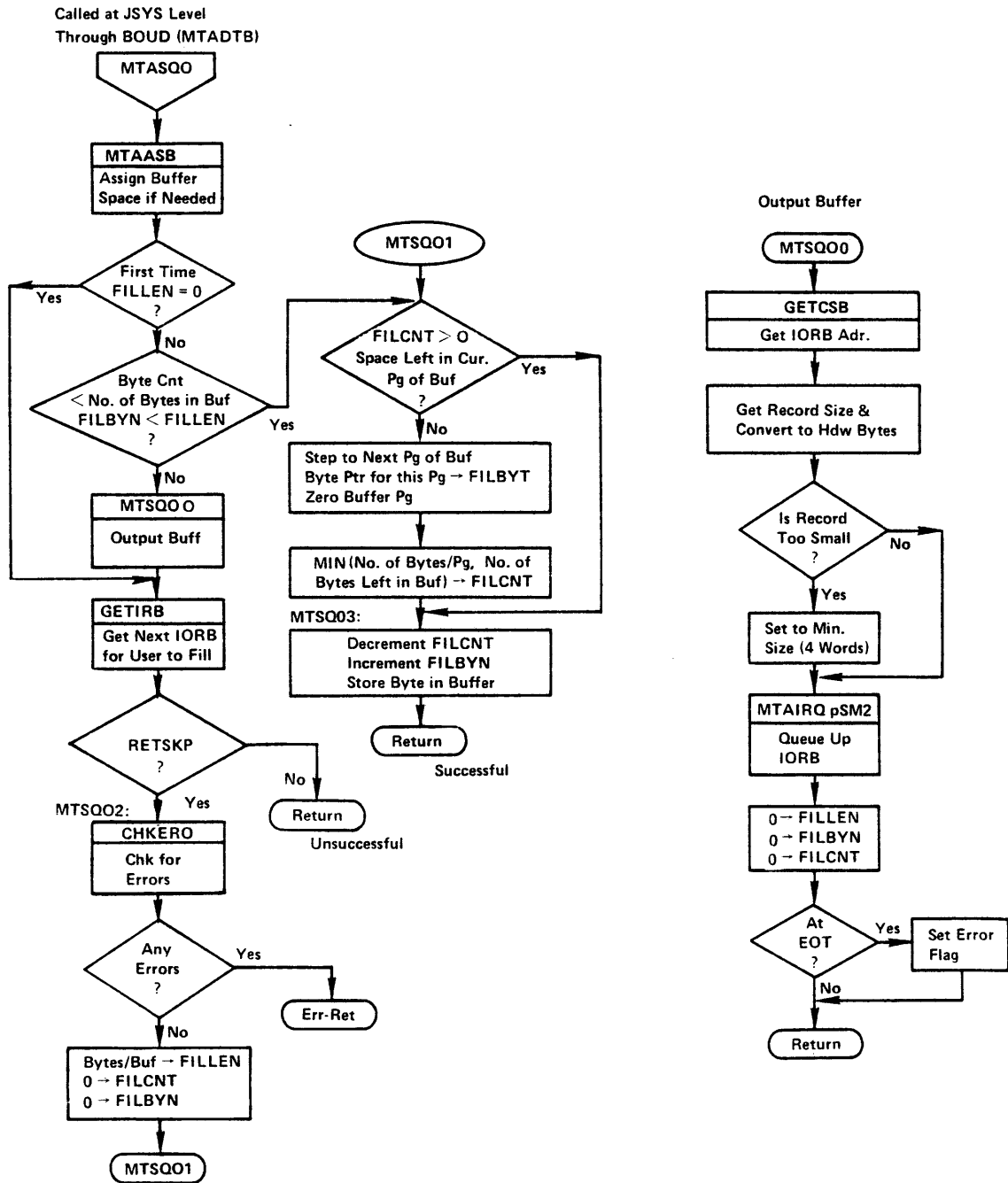


SM1



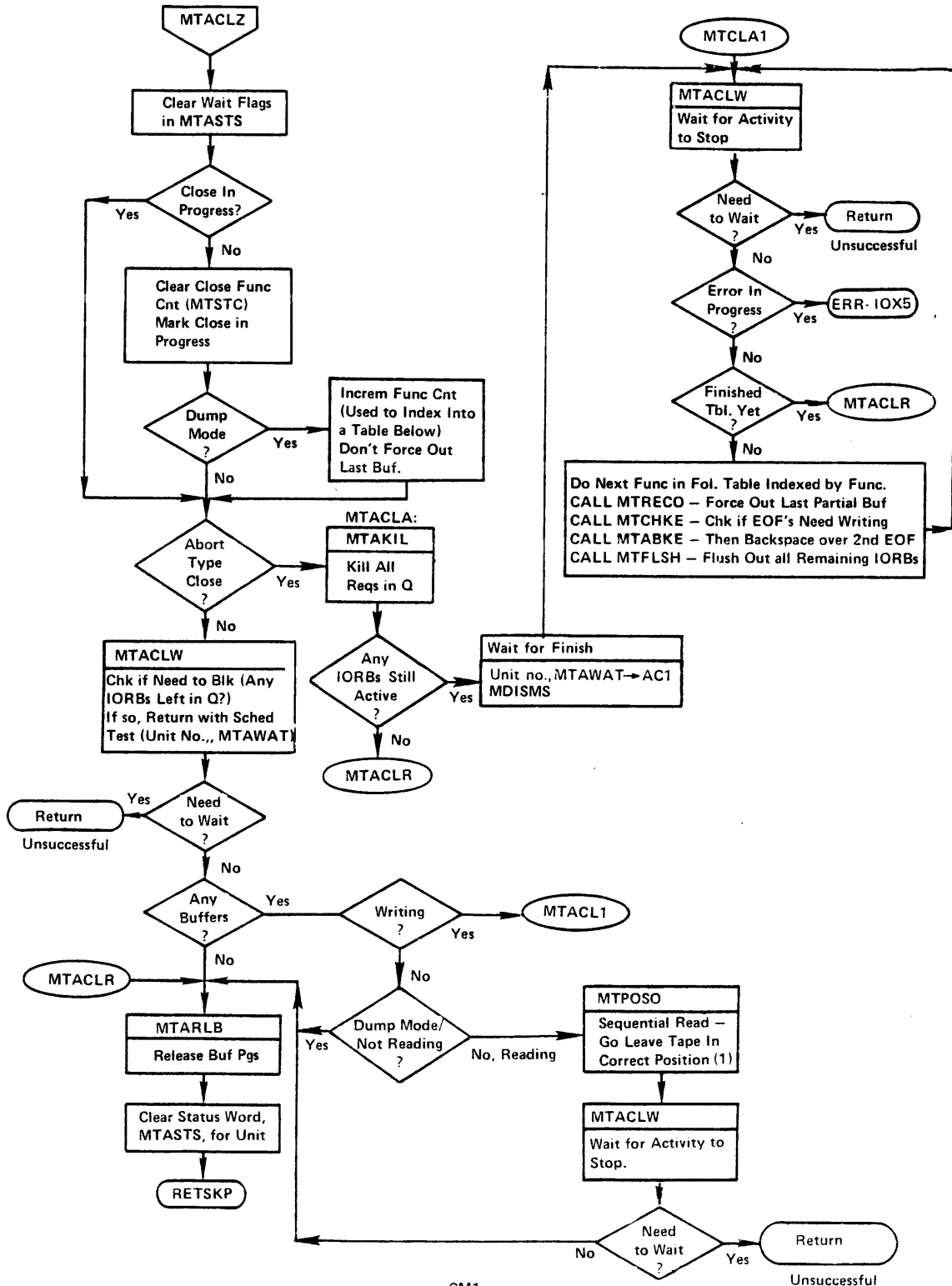
SM2

SEQUENTIAL OUTPUT – MTA
STRING & BYTE DEV. DEP. CODE



SM3

CLOSF - MAGTAPE



CM1

OPENF-MAGTAPE Comments

- (1) One can open for read and write only in dump mode.
- (2) FILCNT/Count of bytes left to use in current page of
buffer.
FILLLEN/Count of bytes in buffer.
FILBYN/Buffer byte number user is referencing.

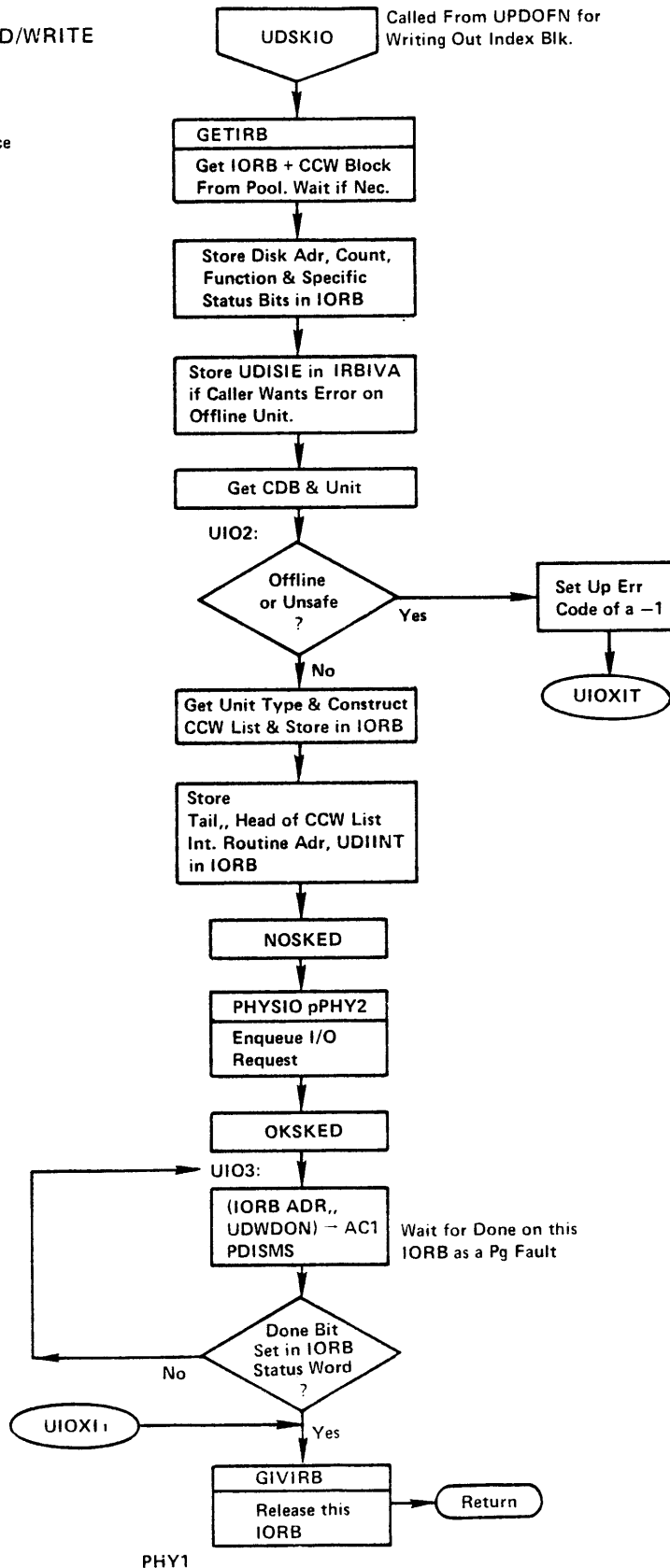
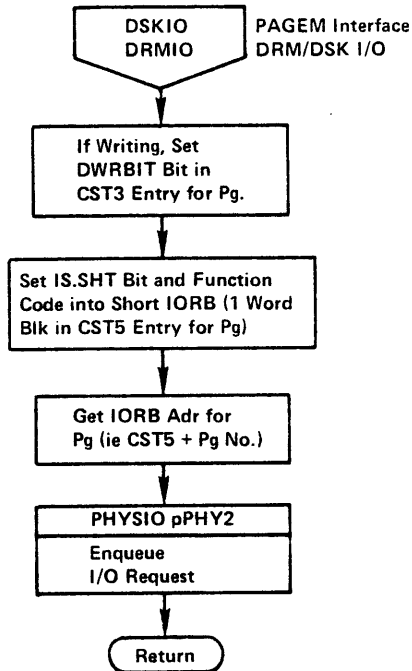
CLOSF - MAGTAPE Comments

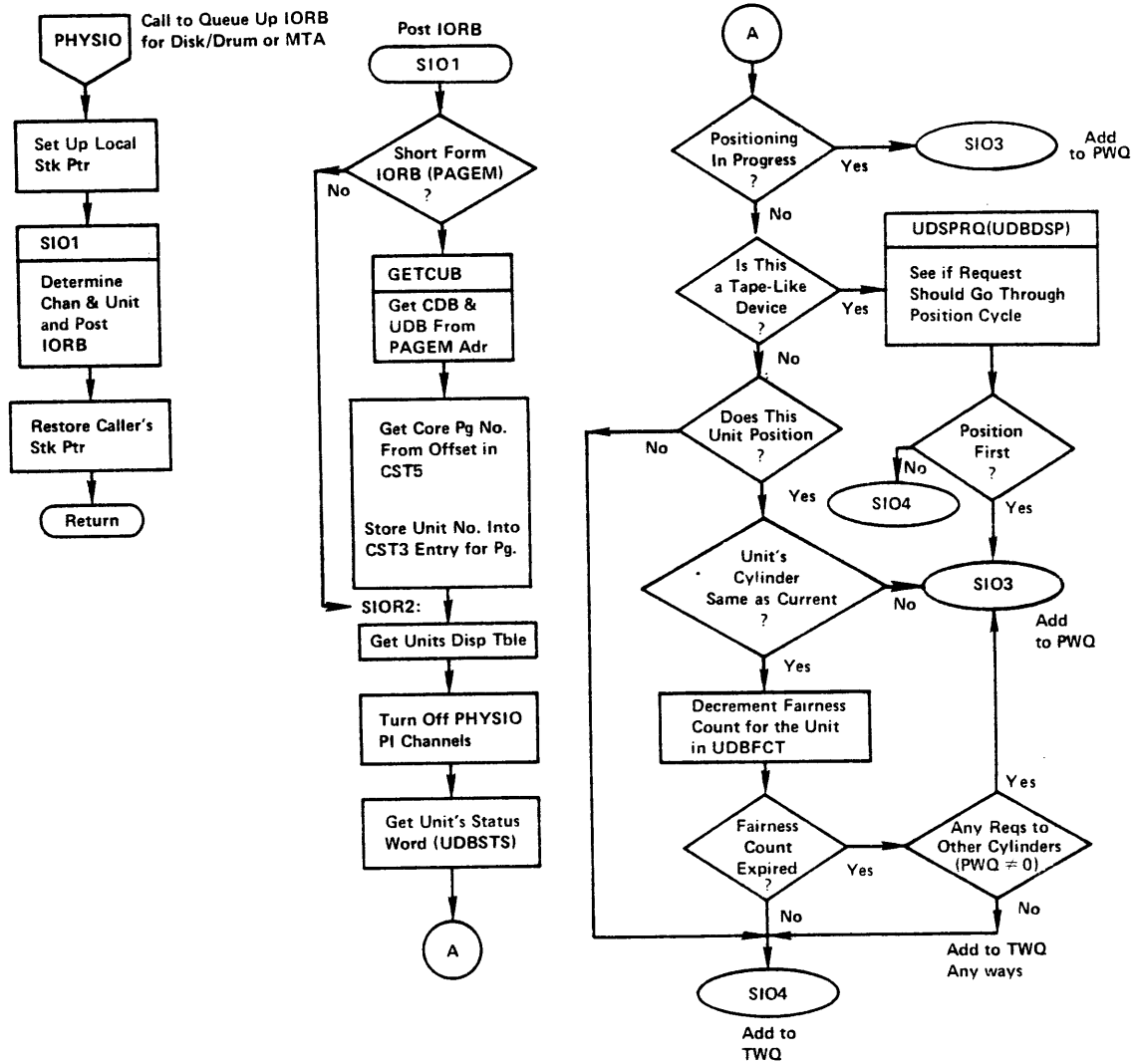
- (1) Since the monitor reads ahead, backspacing to just after last user record read may be necessary.

REQUESTING DISK/MTA I/O & INTERRUPT HANDLING FLOWCHARTS
(PHYSIO LEVEL)

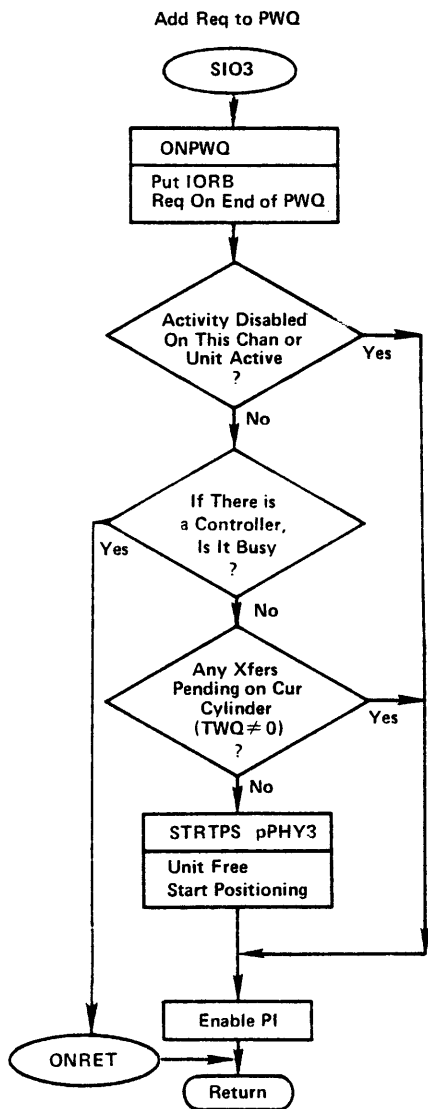
DRMIO/DSKIO/UDSKIO - Requesting Drum or Disk Read/Write	PHY1
PHYSIO - Queue Up IORB Request for Disk, Drum or Magtape	PHY2
SIO1 - Post IORB	PHY2
STRTPS - Start Unit Positioning	PHY3
STRTIO - Start Unit Transferring	PHY3a
PHYINT - Disk and Magtape Interrupt Handler	PHY4
DONIRB - Post IORB as Done	PHY5
SWPDON/UDIINT - Housekeep for Drum/Disk Done	PHY8
MTAINT - Housekeep for Magtape Done	PHY9
SCHSEK - Schedule "Best" Seek Request	PHY6
SCHXFR - Schedule "Best" Transfer Request	PHY7

REQUESTING DRUM OR DISK READ/WRITE (PHYSIO LEVEL)

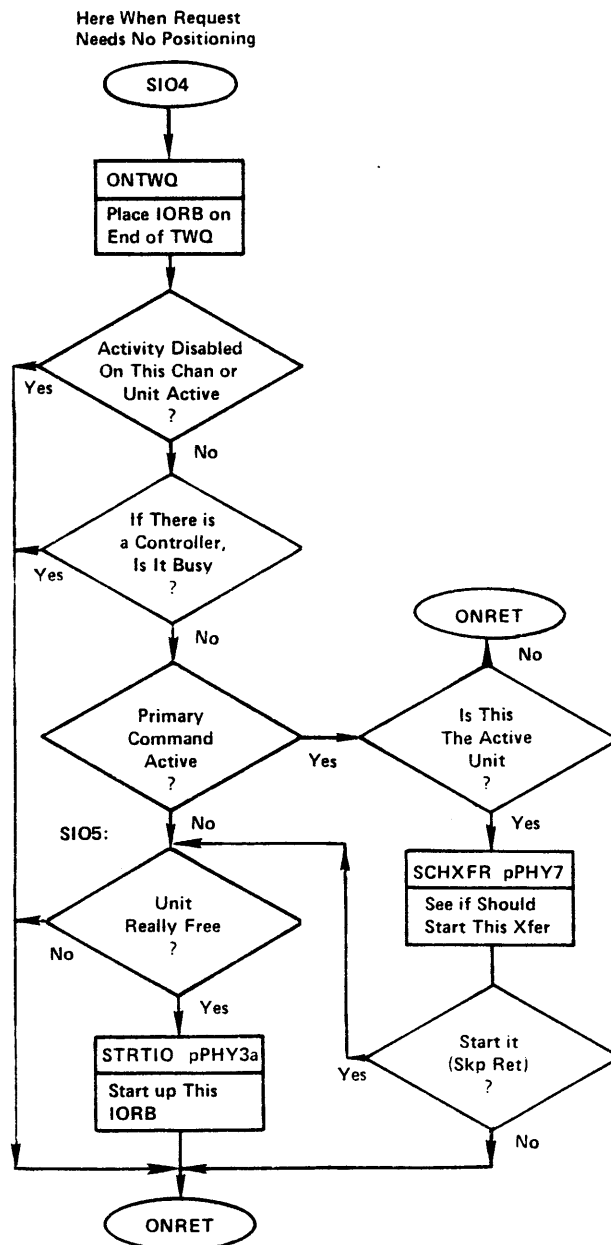




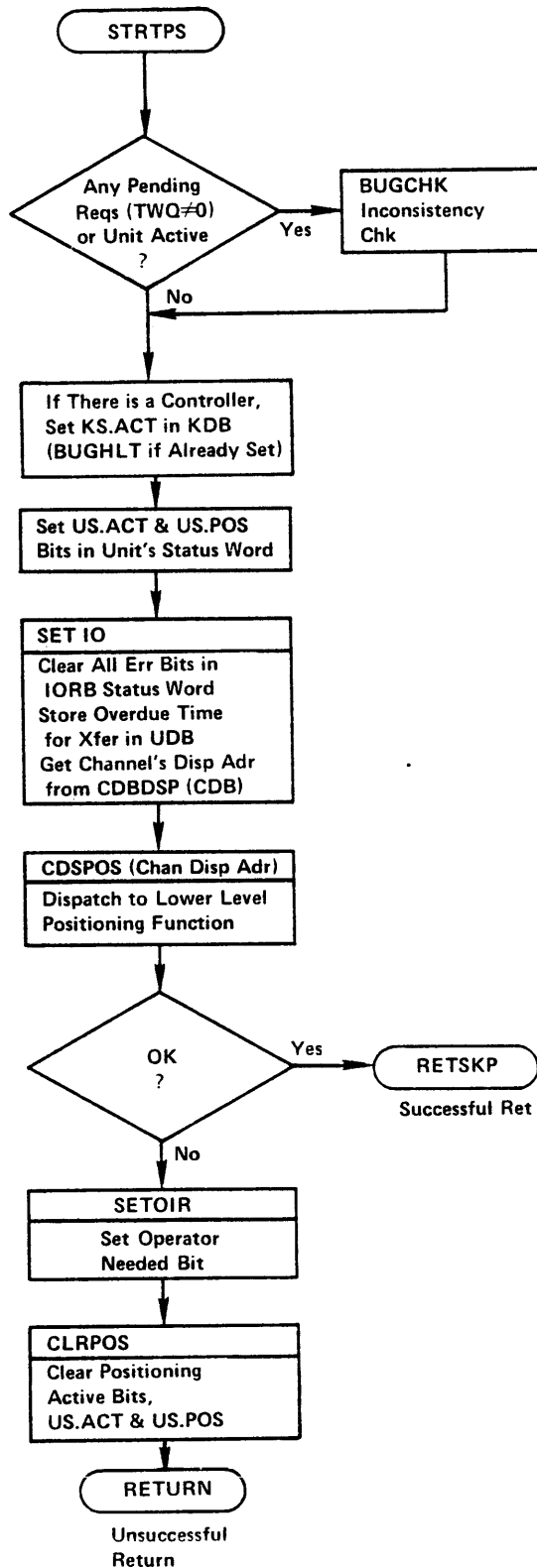
PHY2



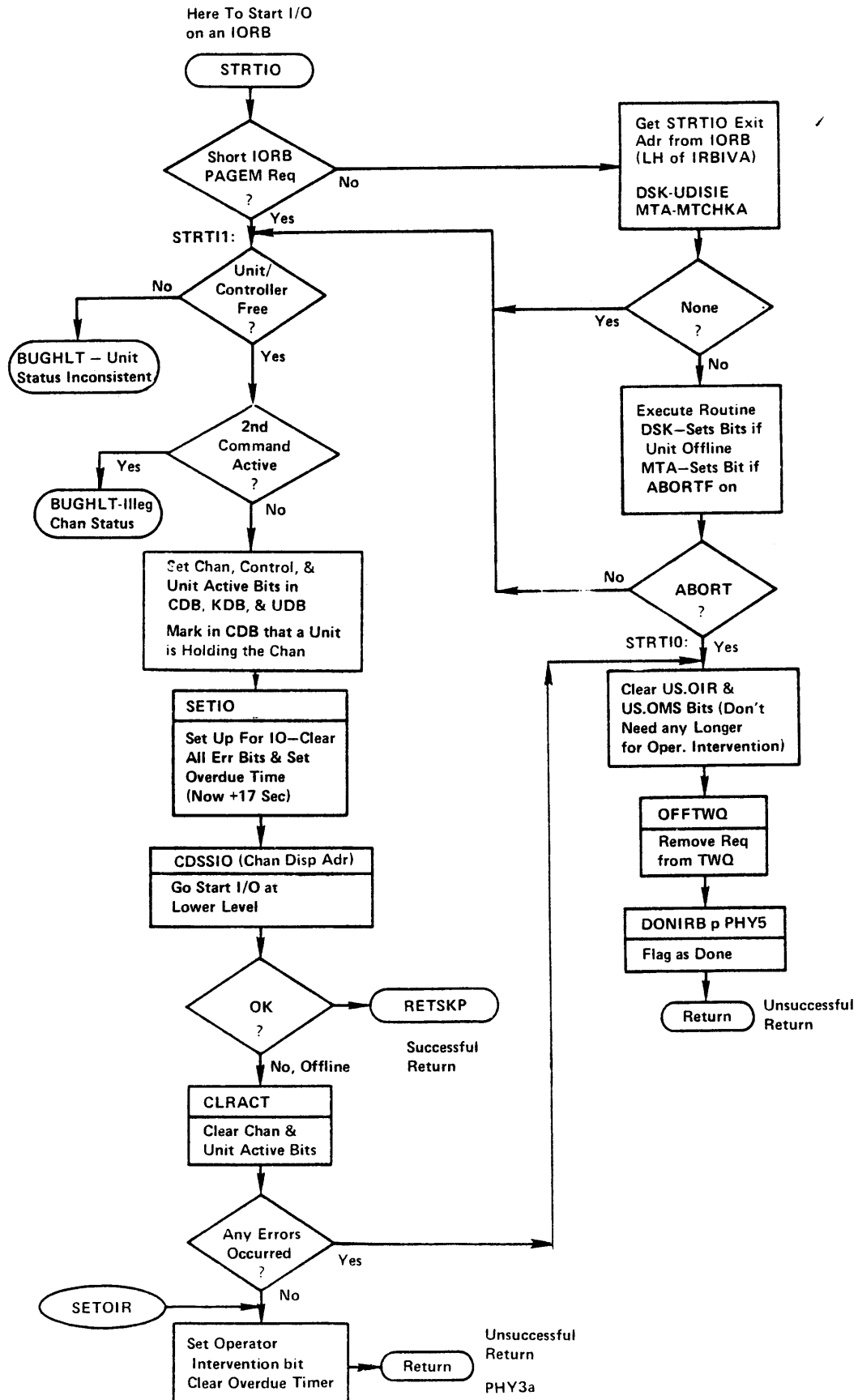
PHY2a

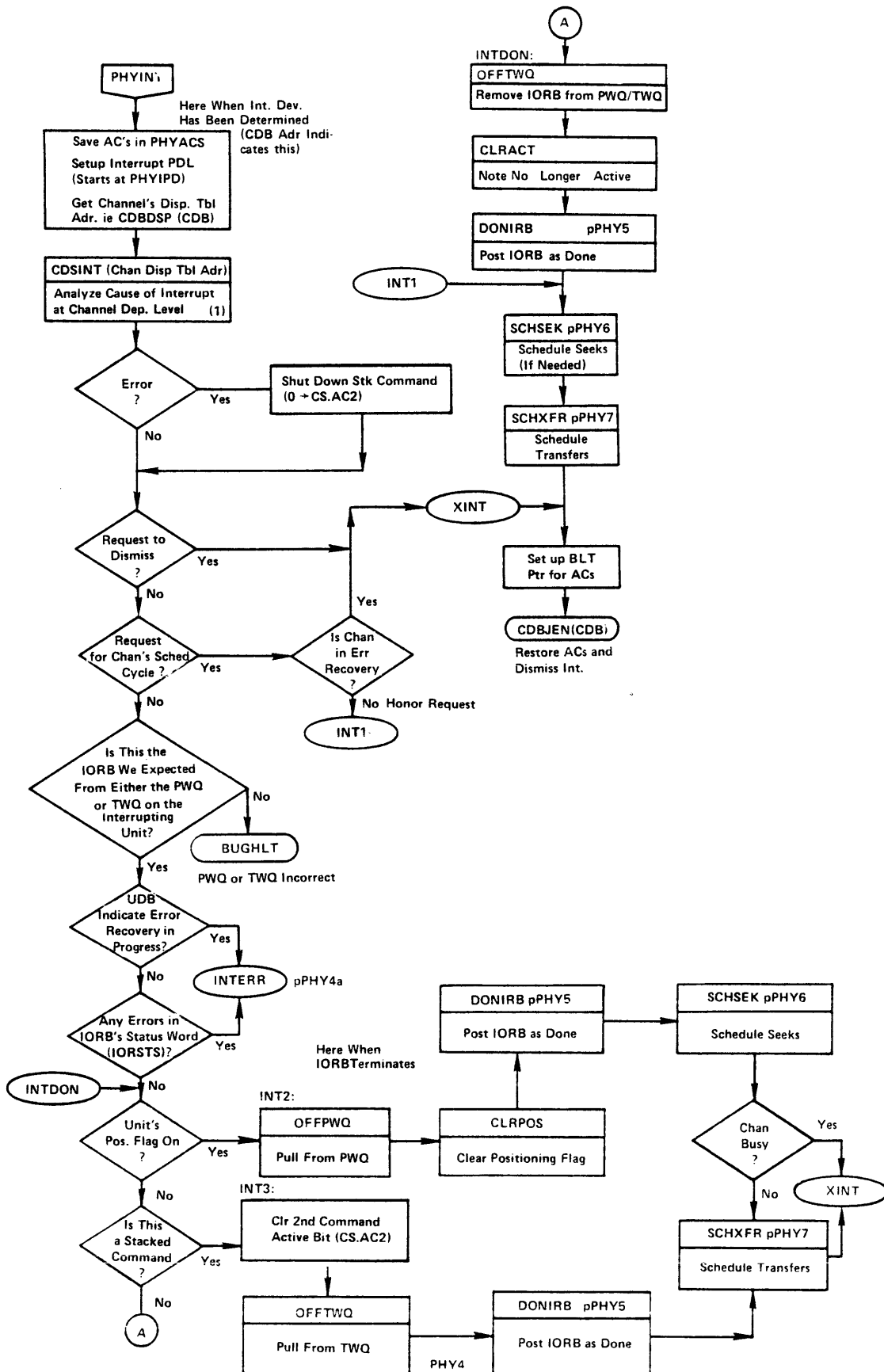


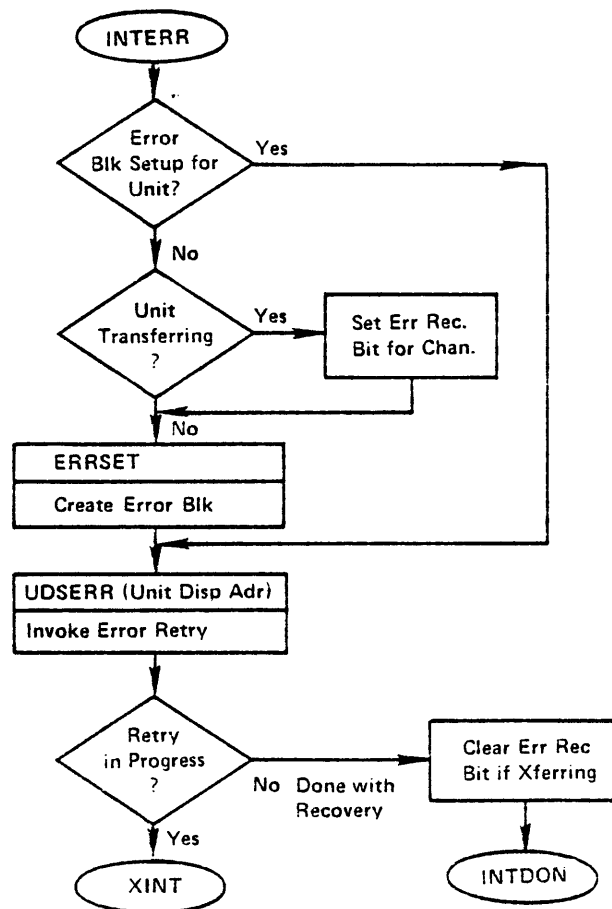
Here to Start Positioning
for an IORB



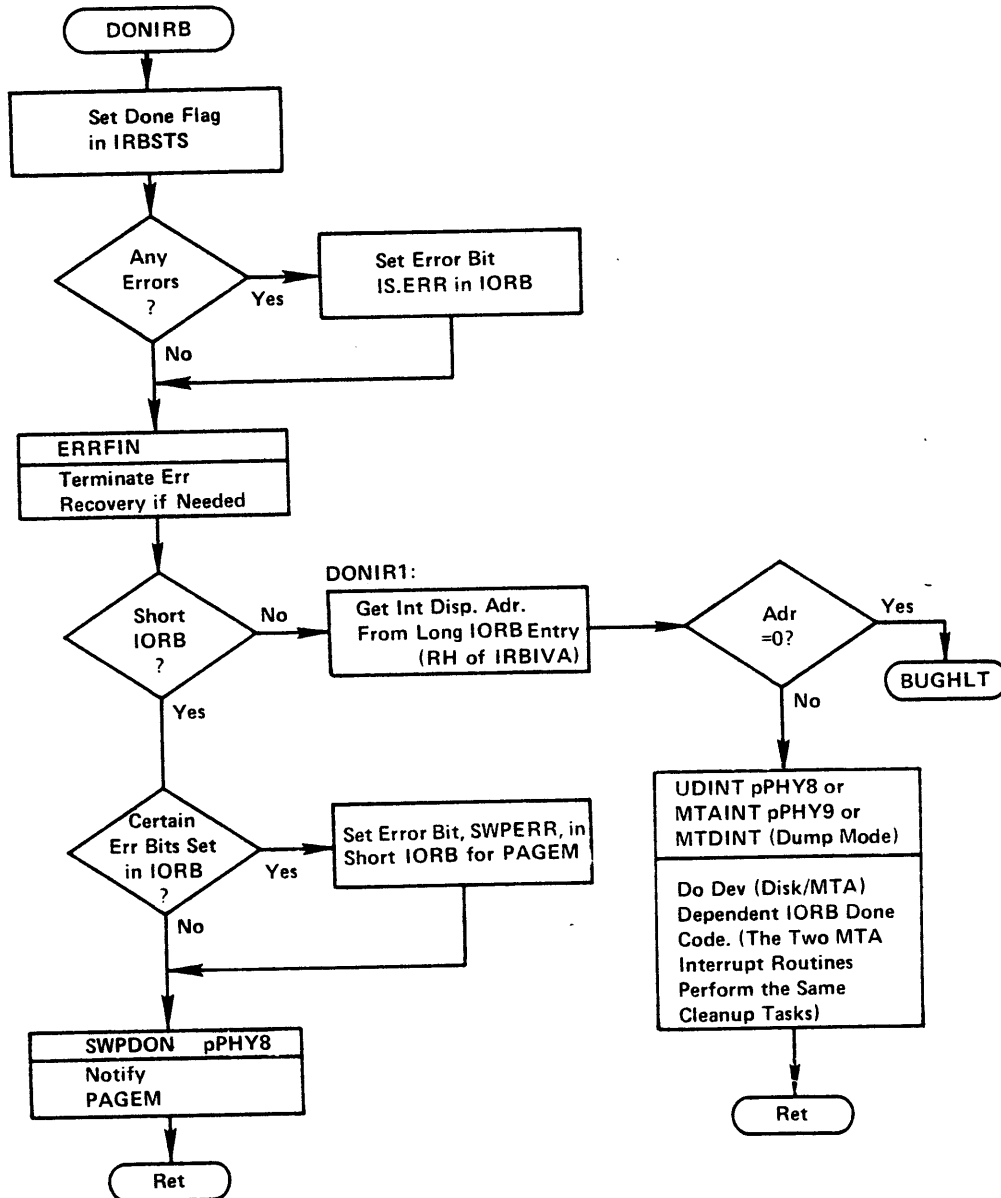
PHY3



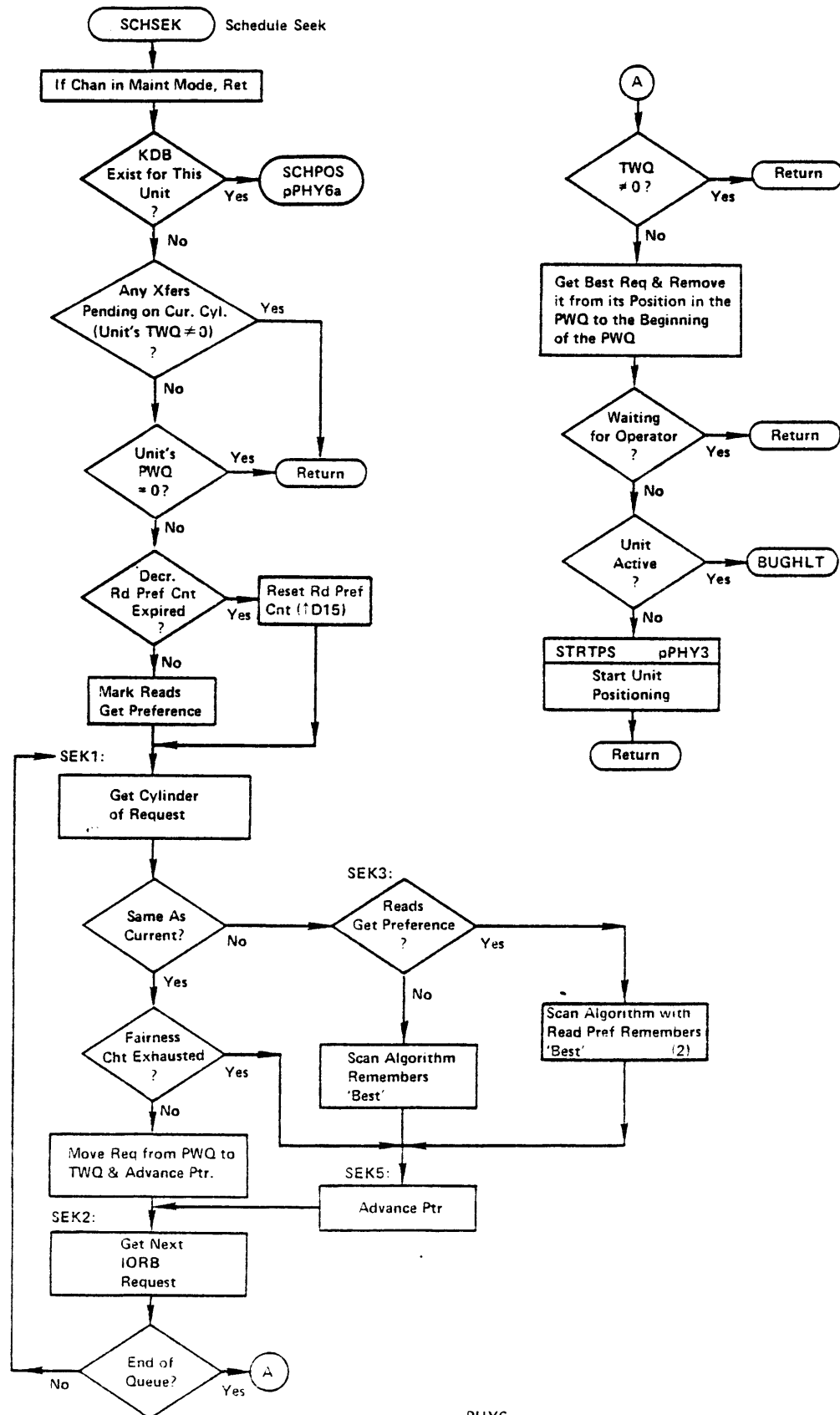




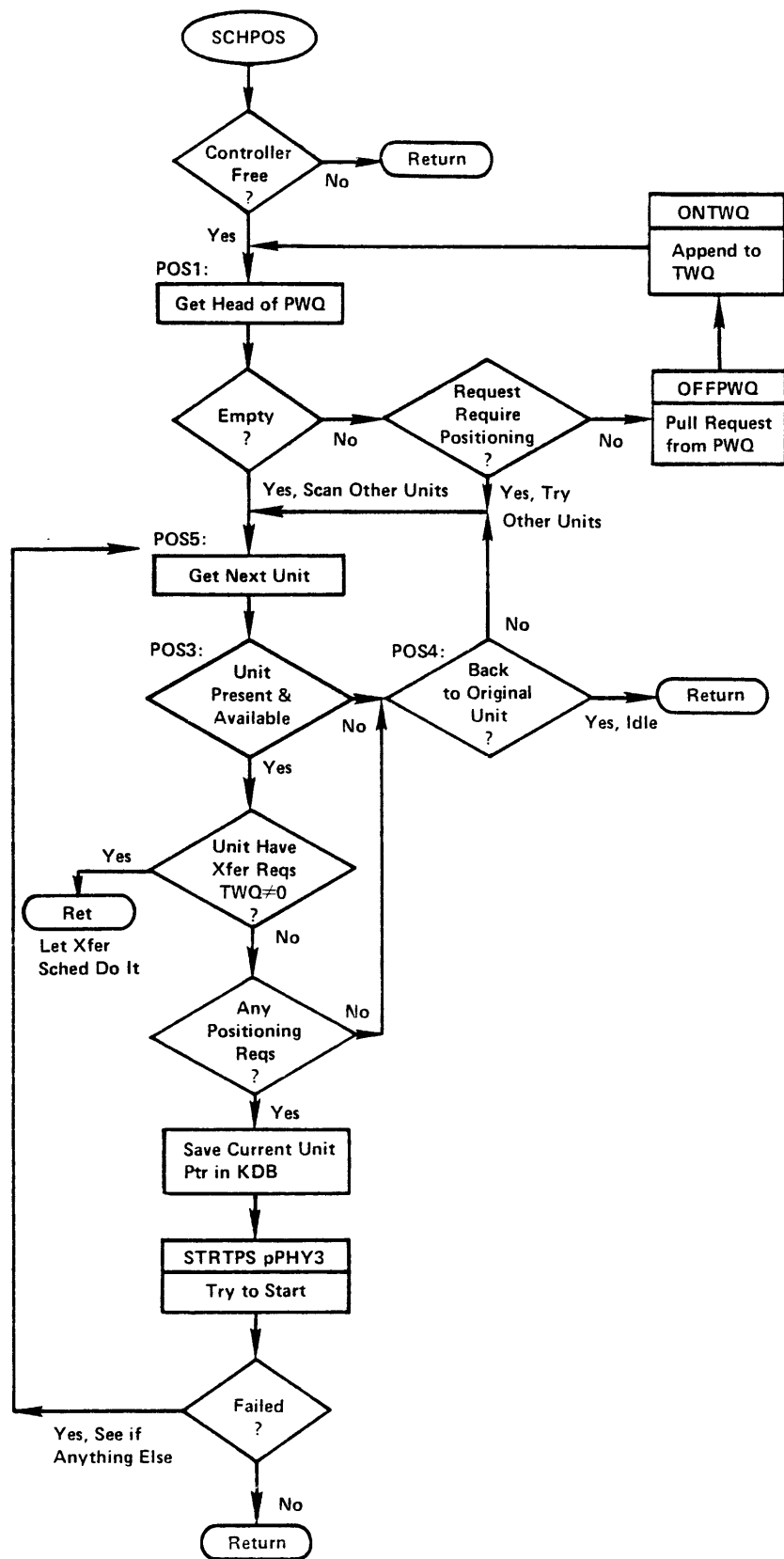
Here to Post an IORB Complete



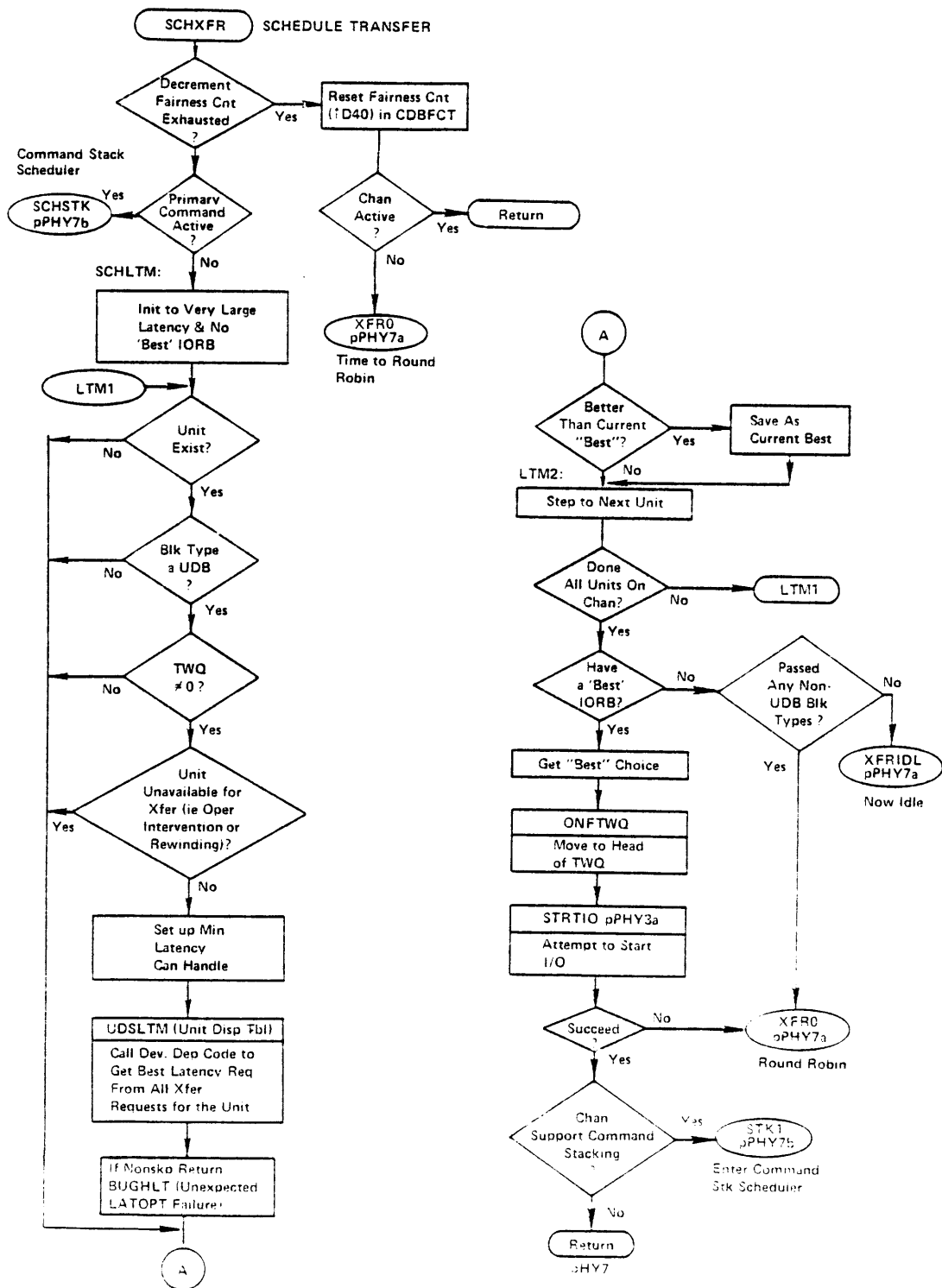
PHY5

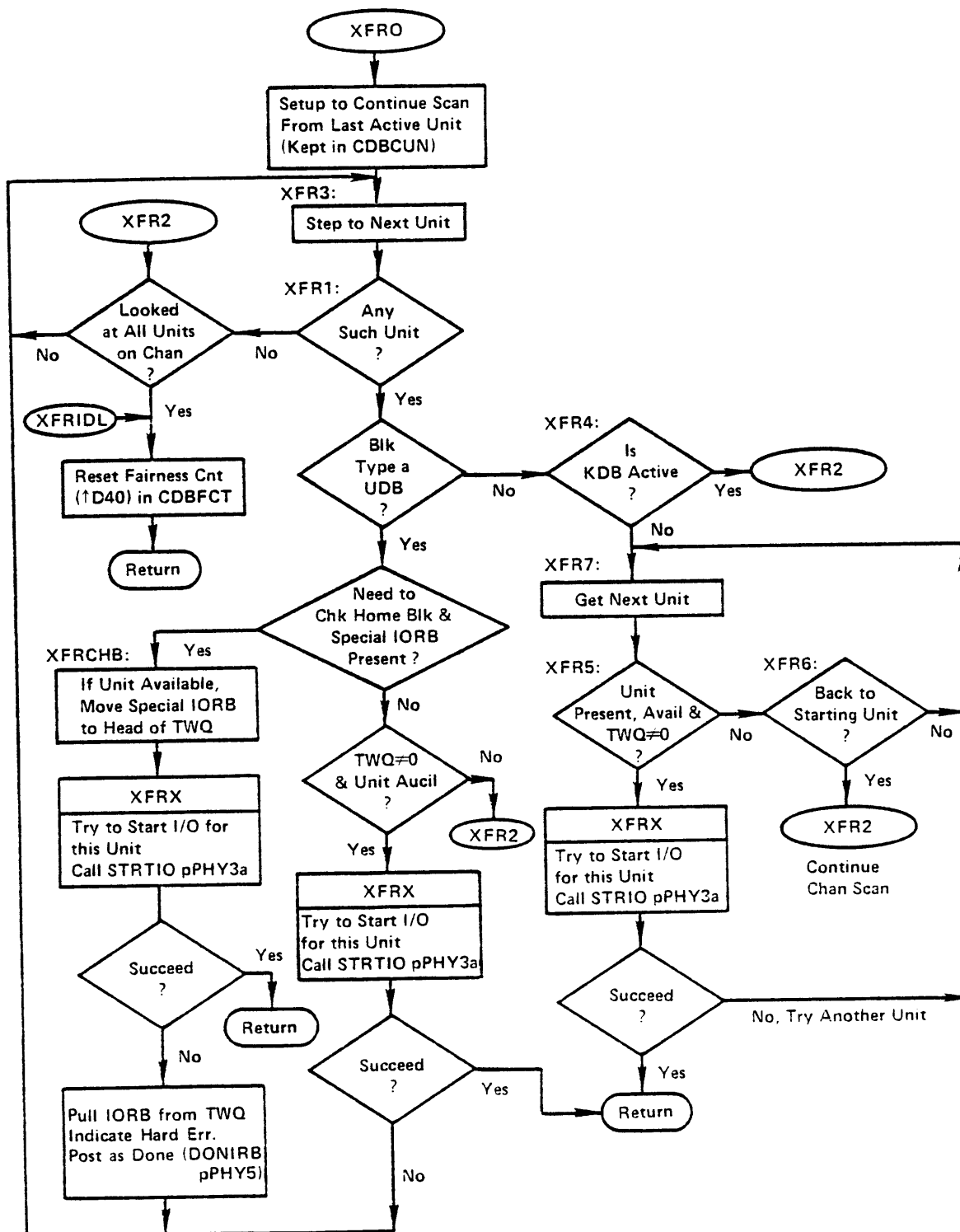


PHY6

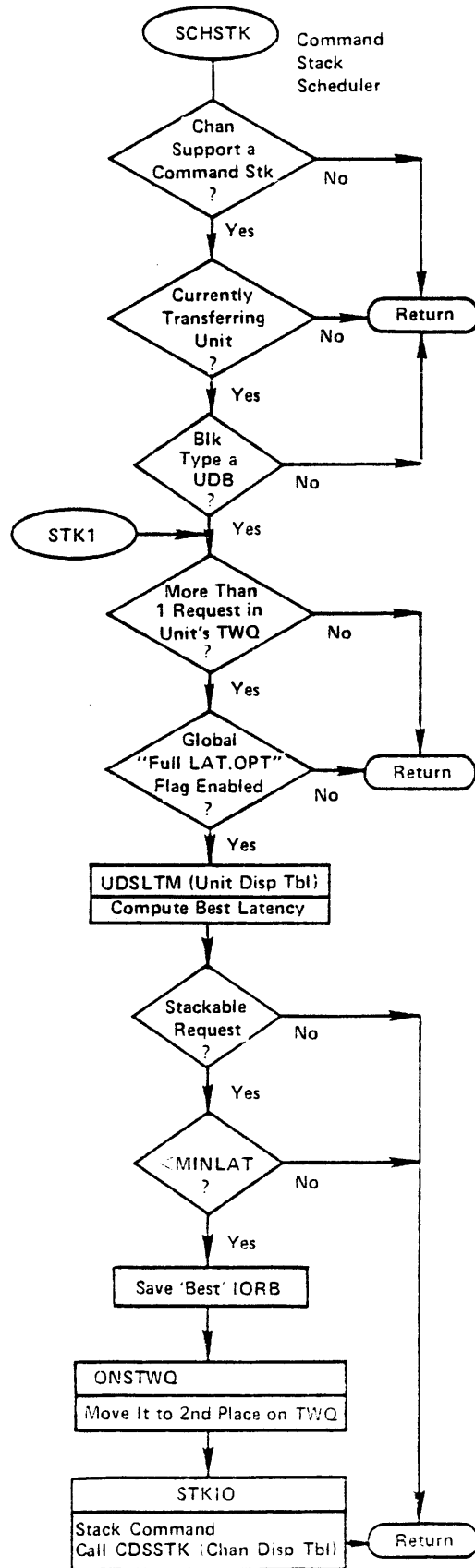


PHY6a



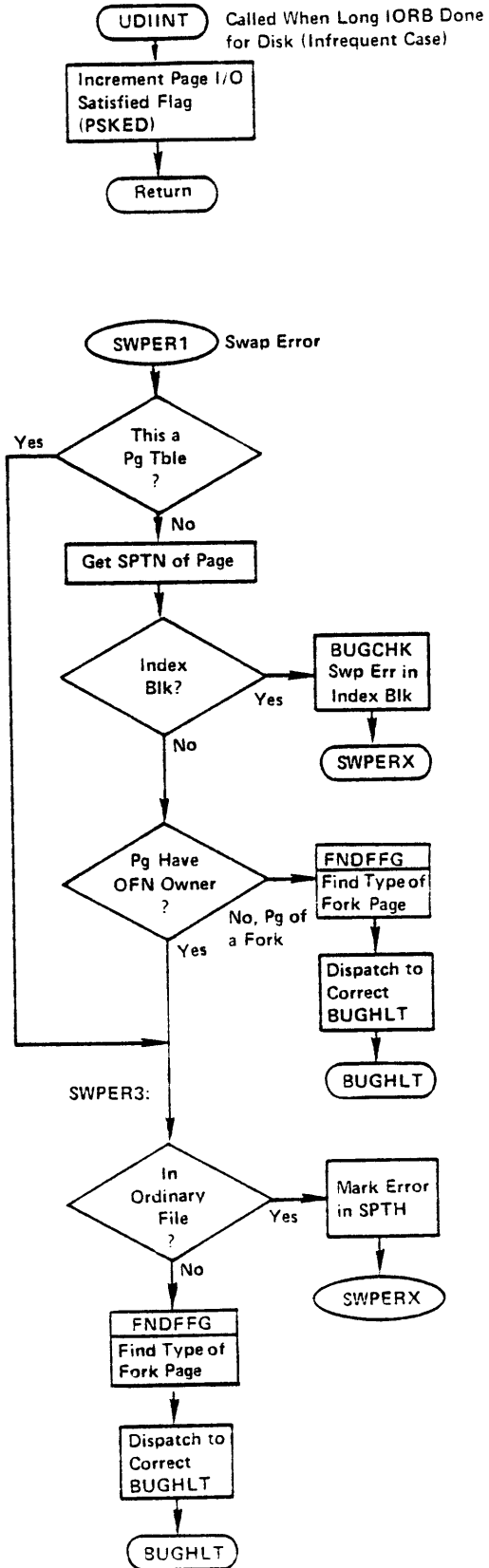
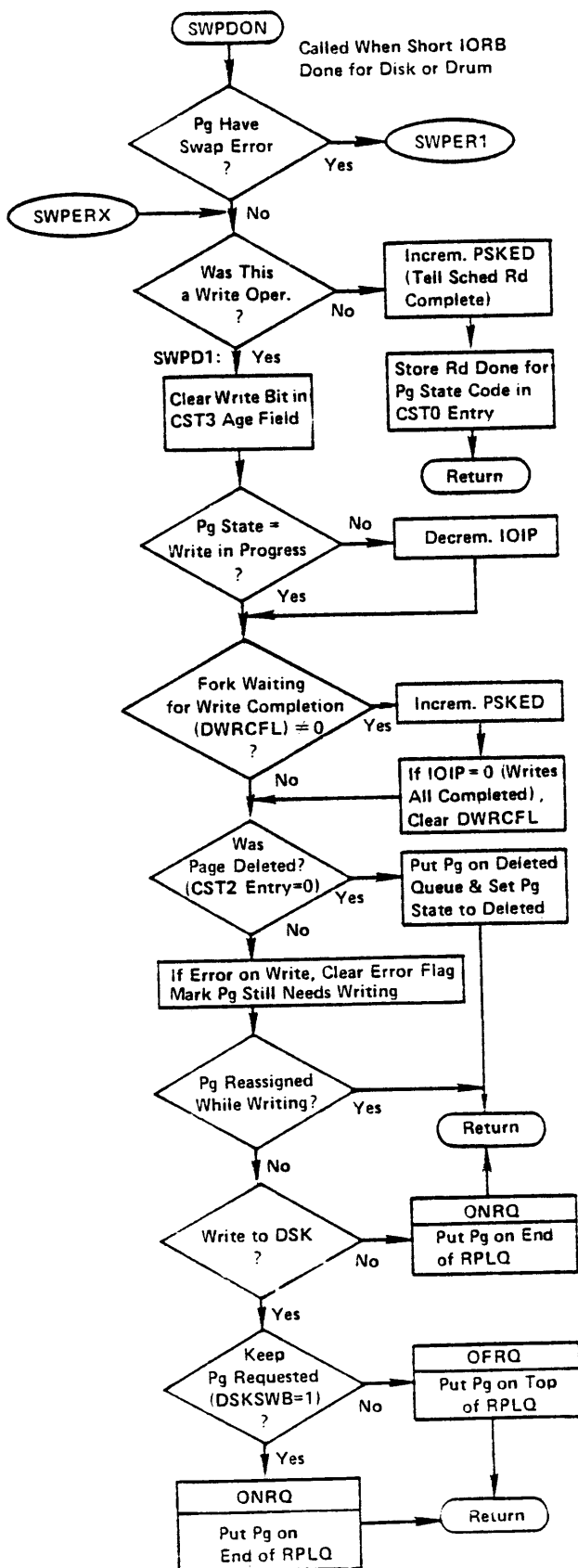


PHY7a



PHY7b

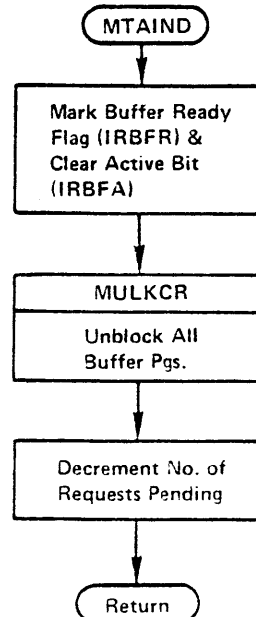
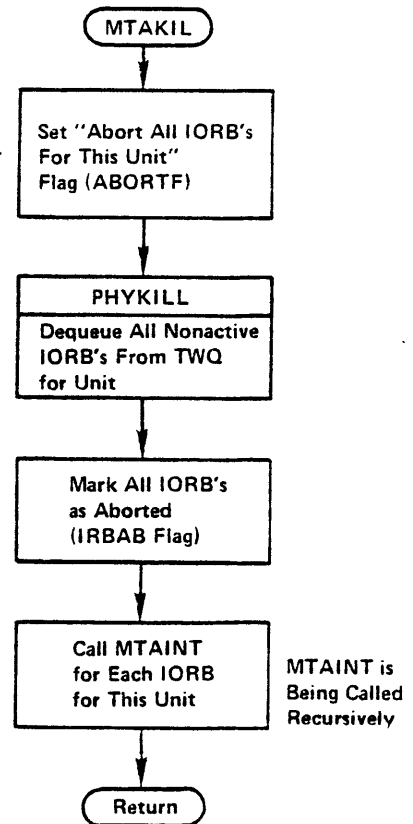
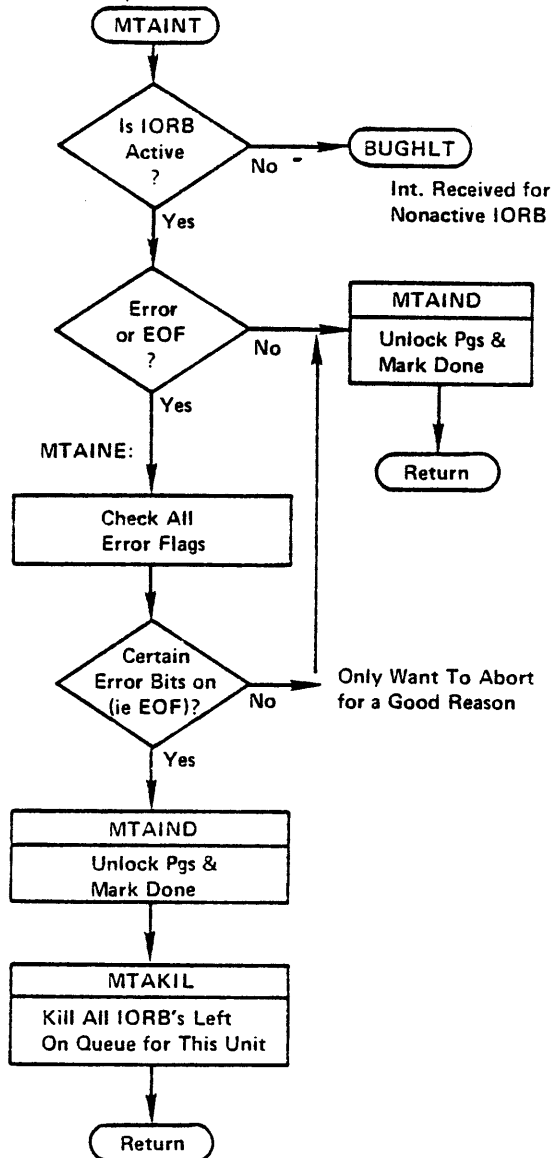
"INTERRUPT DONE" DSK/DRUM DEPENDENT CODE



PHY8

"INTERRUPT DONE" MAGTAPE DEPENDENT CODE

Called When Non-Dump Xfer Done For
MTA At Interrupt Level



PHY9

Requesting DISK/MTA I/O Comments

SI01

(1) The algorithm for queuing up a MTA request is:

If the request requires positioning, append the request to the PWQ.

If the request requires no positioning (i.e., Read/Write Forward or Read Reverse) append the request to the TWQ only if the PWQ is empty. Otherwise, append it to the PWQ.

DSK/MTA Interrupt Handling Comments

PHYINT

- (1) The channel dependent routine (RH2INT for RH20s) is called to analyze the interrupt. Lower level routines called by RH2INT (i.e., Unit dependent routines) return an argument in AC, P4, to PHYINT to indicate whether to dismiss the interrupt ($P4 = 0$), to schedule another channel cycle right away ($P4 < 0$) or to housekeep the current request ($P4 > 0$) before scheduling another channel cycle. The channel dependent routine also records error information so that PHYINT can see if error recovery is in progress or should be started.

The request to dismiss ($P4 = 0$) is invoked for example when the done flag is on and the channel is not occupied. The request for an immediate channel cycle ($P4 < 0$) is made when a positioning done interrupt has occurred and there is no transfer in progress. Transfer Done requests will require further housekeeping ($P4 > 0$) by PHYINT before scheduling another channel cycle.

SCHSEK

- (2) The scan algorithm with read preference in effect performs as follows:

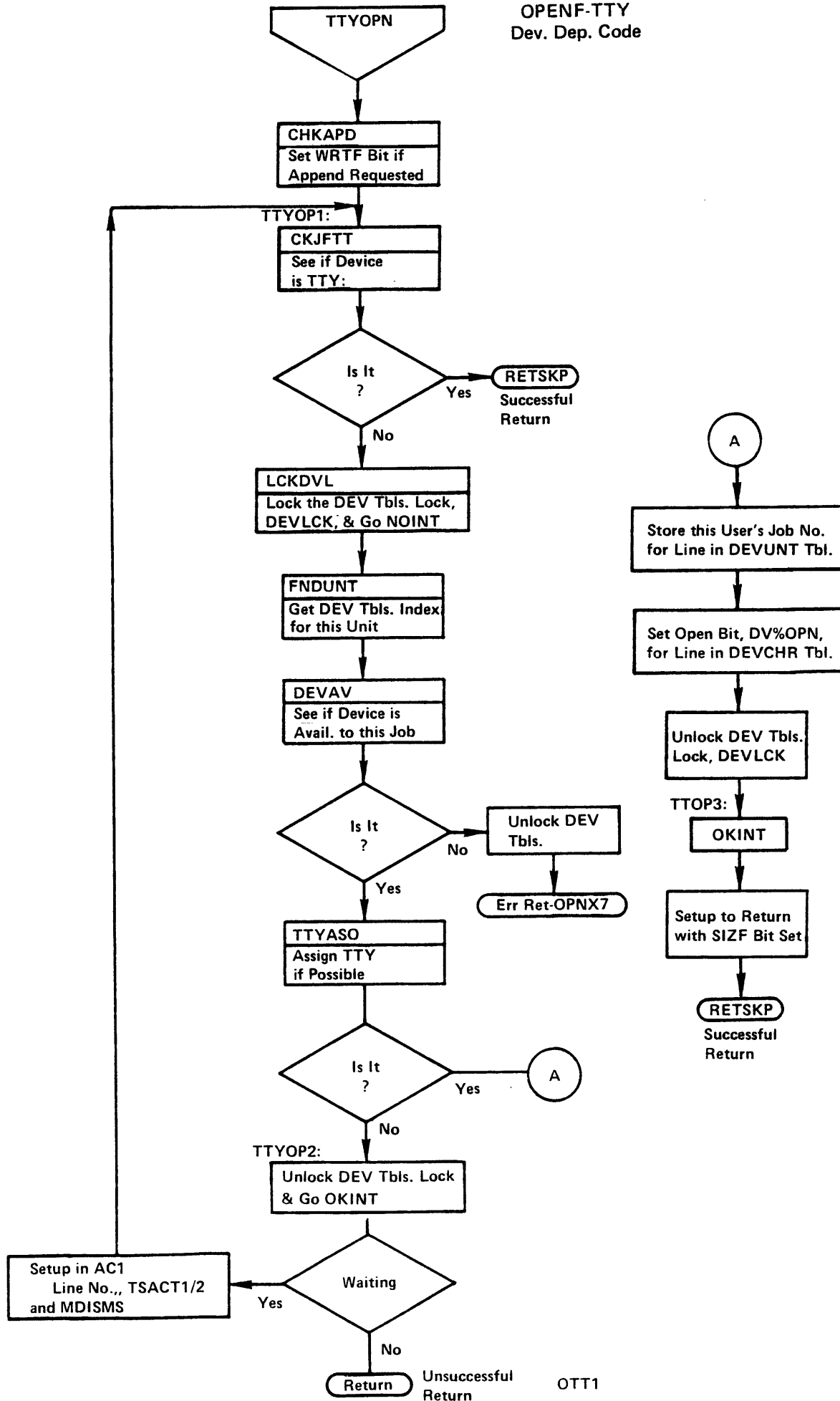
Take the next higher-numbered cylinder read request from the current cylinder. If none, take the next higher-numbered cylinder (write) request from the current cylinder.

If none, take the lowest numbered cylinder read request from the current cylinder. If none, take the lowest numbered cylinder (write) request from the current cylinder.

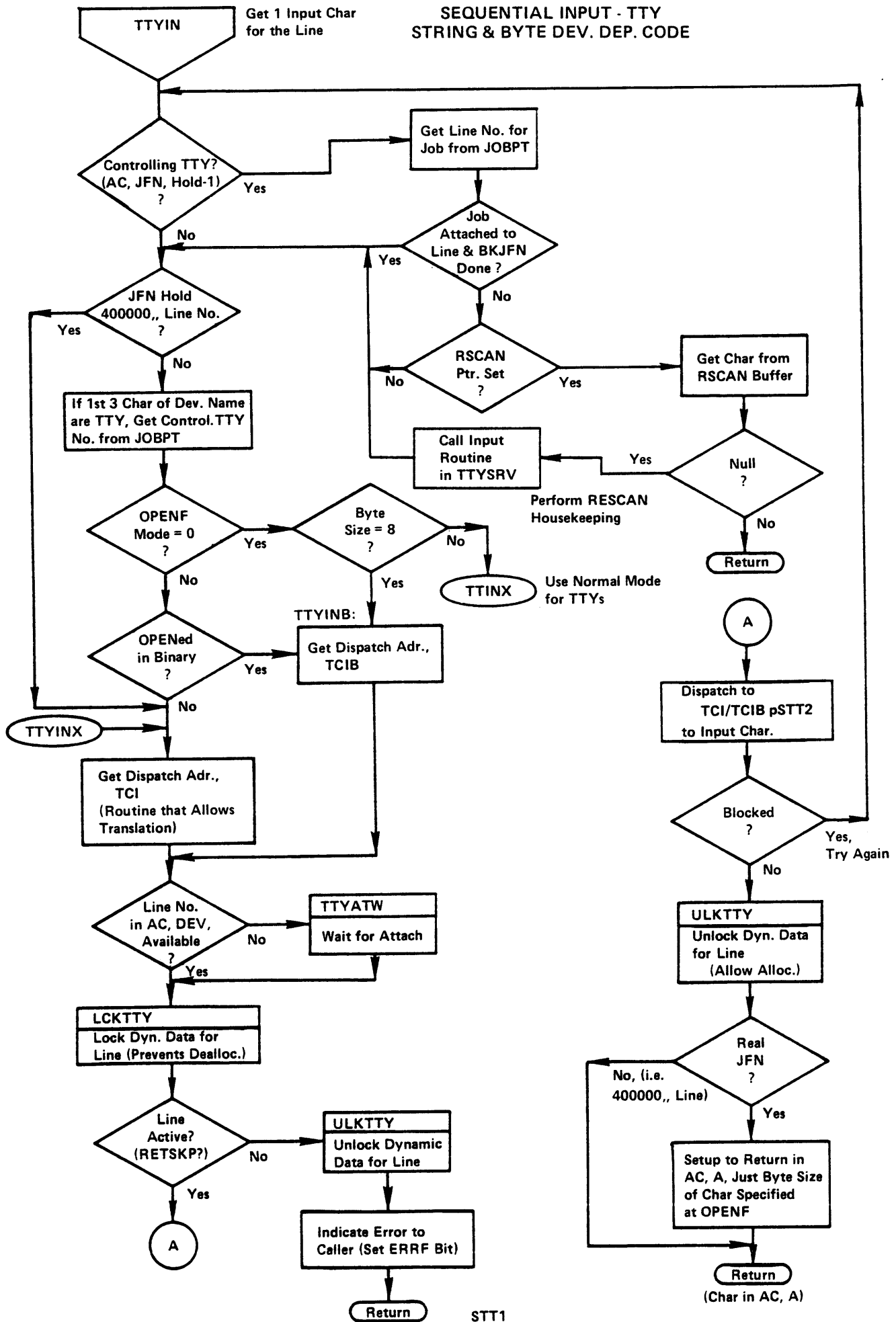
JSYS CALL FLOWCHARTS

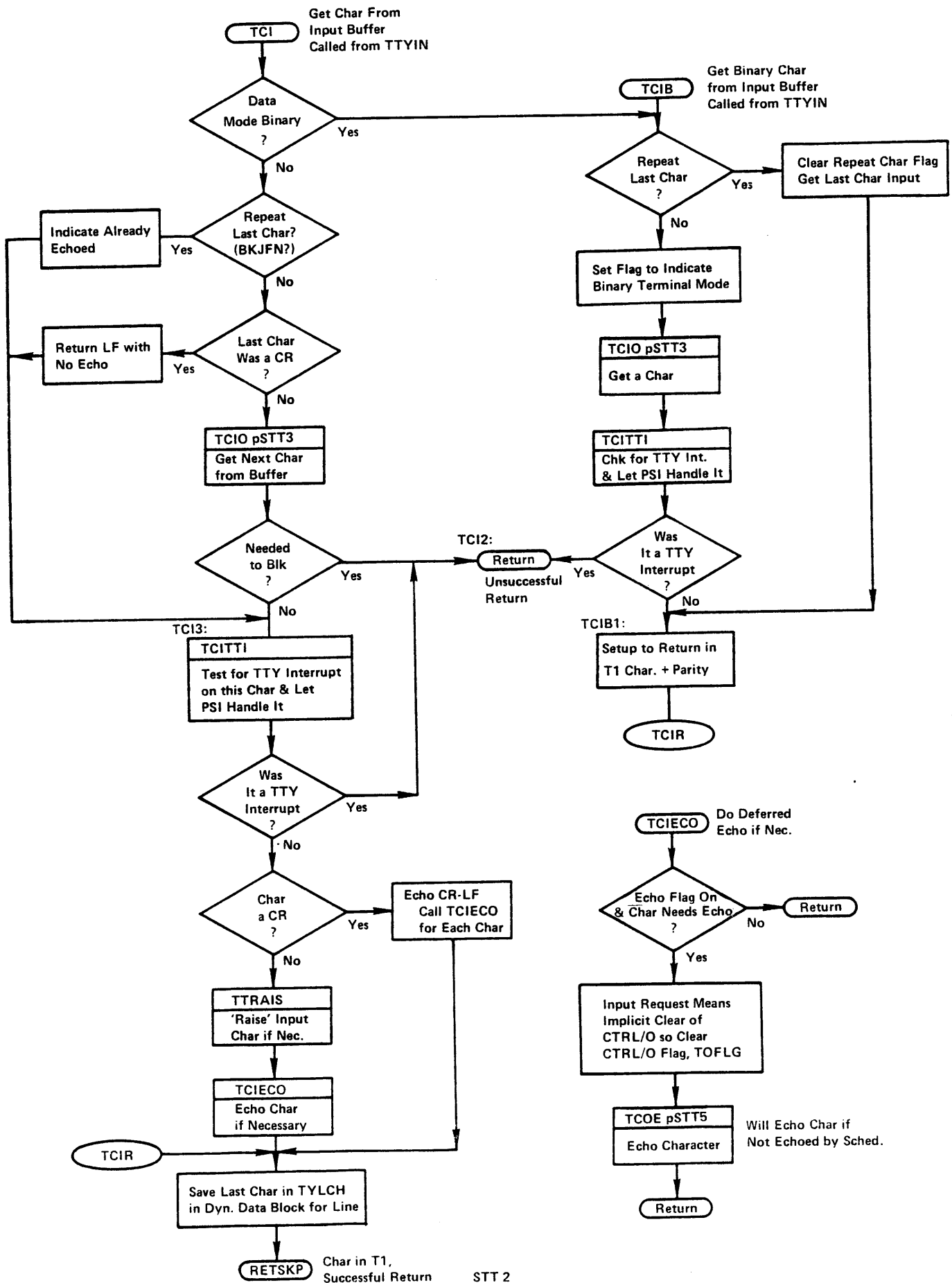
TTY DEPENDENT LEVEL

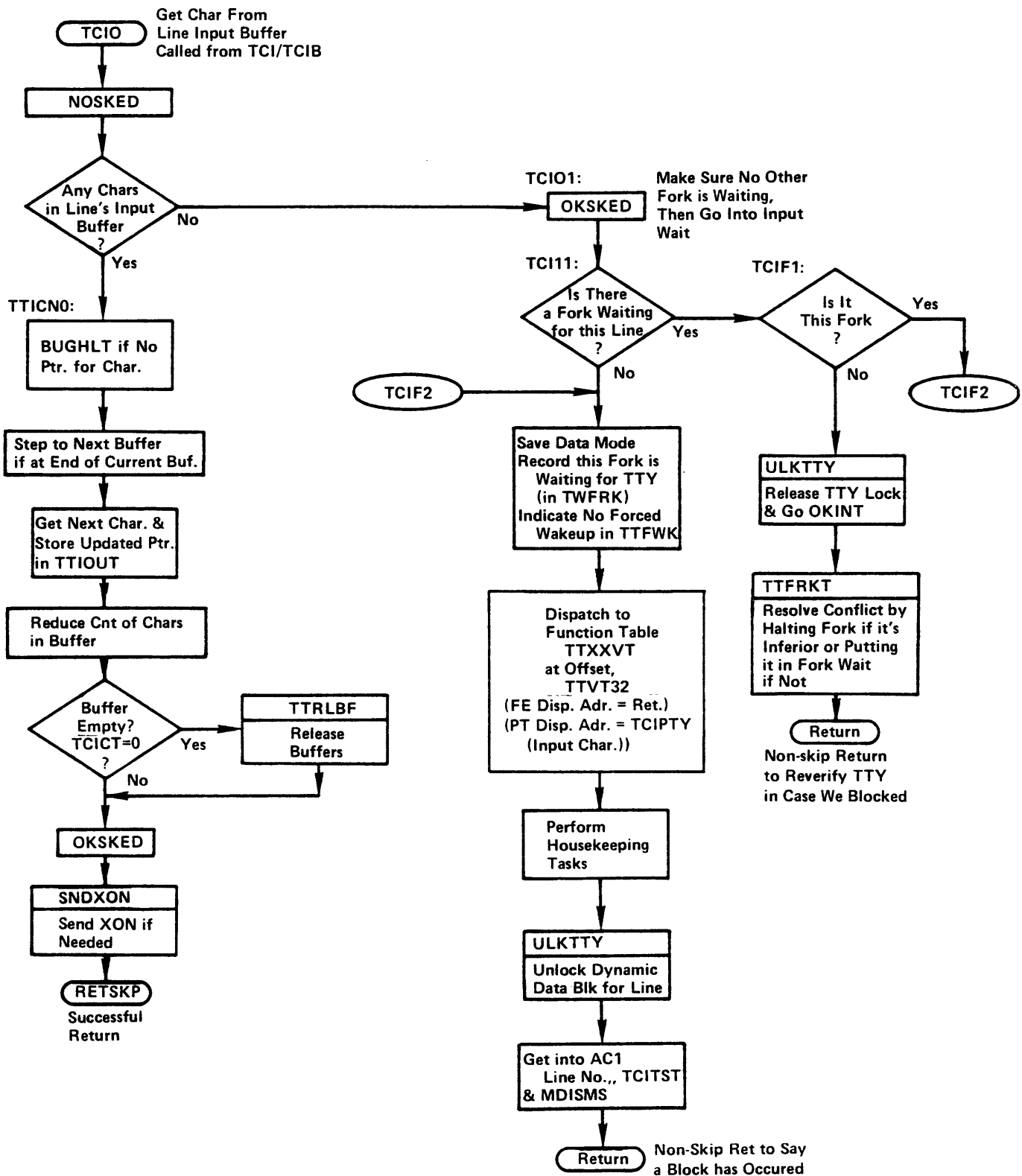
TTYOPN - Teletype Opening of a File	OTT1
TTYIN - Teletype Sequential Input	STT1
TCI/TCIB - Get Character from Line's Input Buffer	STT2
TCIO - Get a Character	STT3
TCOE - Echo Character	STT5
TTYOUT - Teletype Sequential Output	STT4
TCO/TCOB - 1st Level: Output a Single Character - Translate According to Fork's Specification	STT5
TCOY - 2nd Level: Do Links & Formats for a Particular Device	STT6
TCOUT - 3rd Level: Do Buffering and Output 1 Character	STT7
TTSND - Send Character to Line	STT8
TTYCLS - Teletype Closing of a File	CLTT1



SEQUENTIAL INPUT - TTY
STRING & BYTE DEV. DEP. CODE

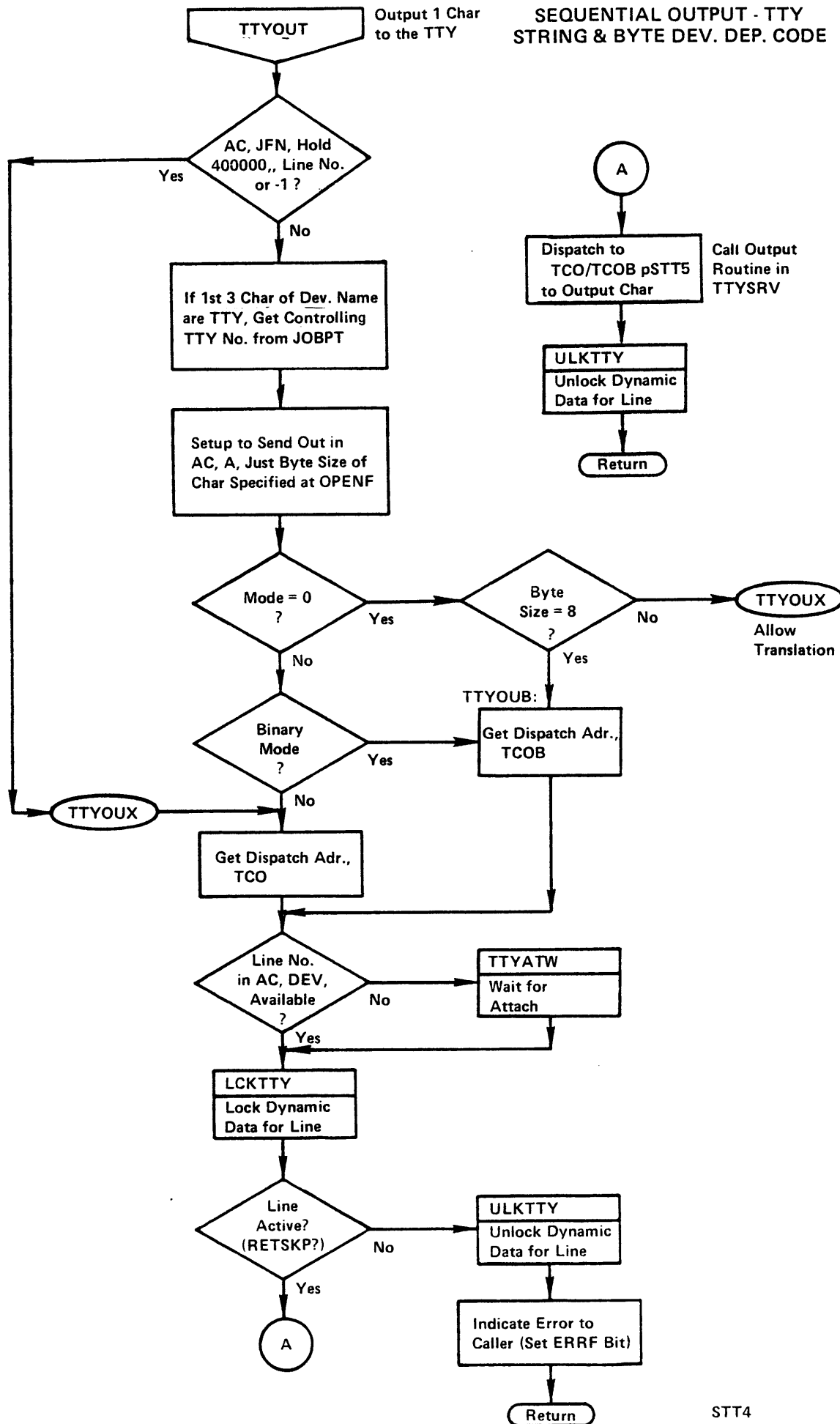




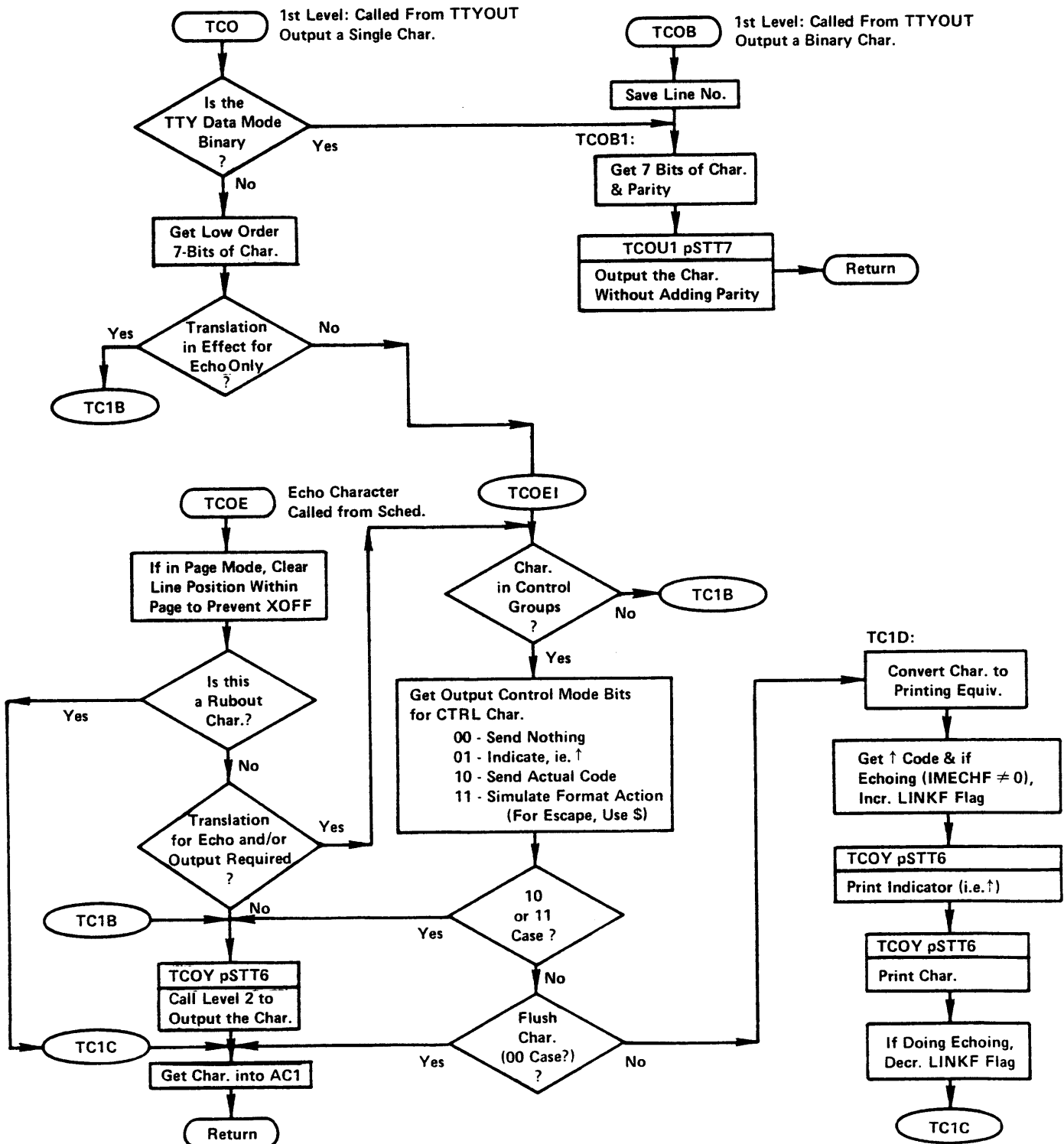


STT3

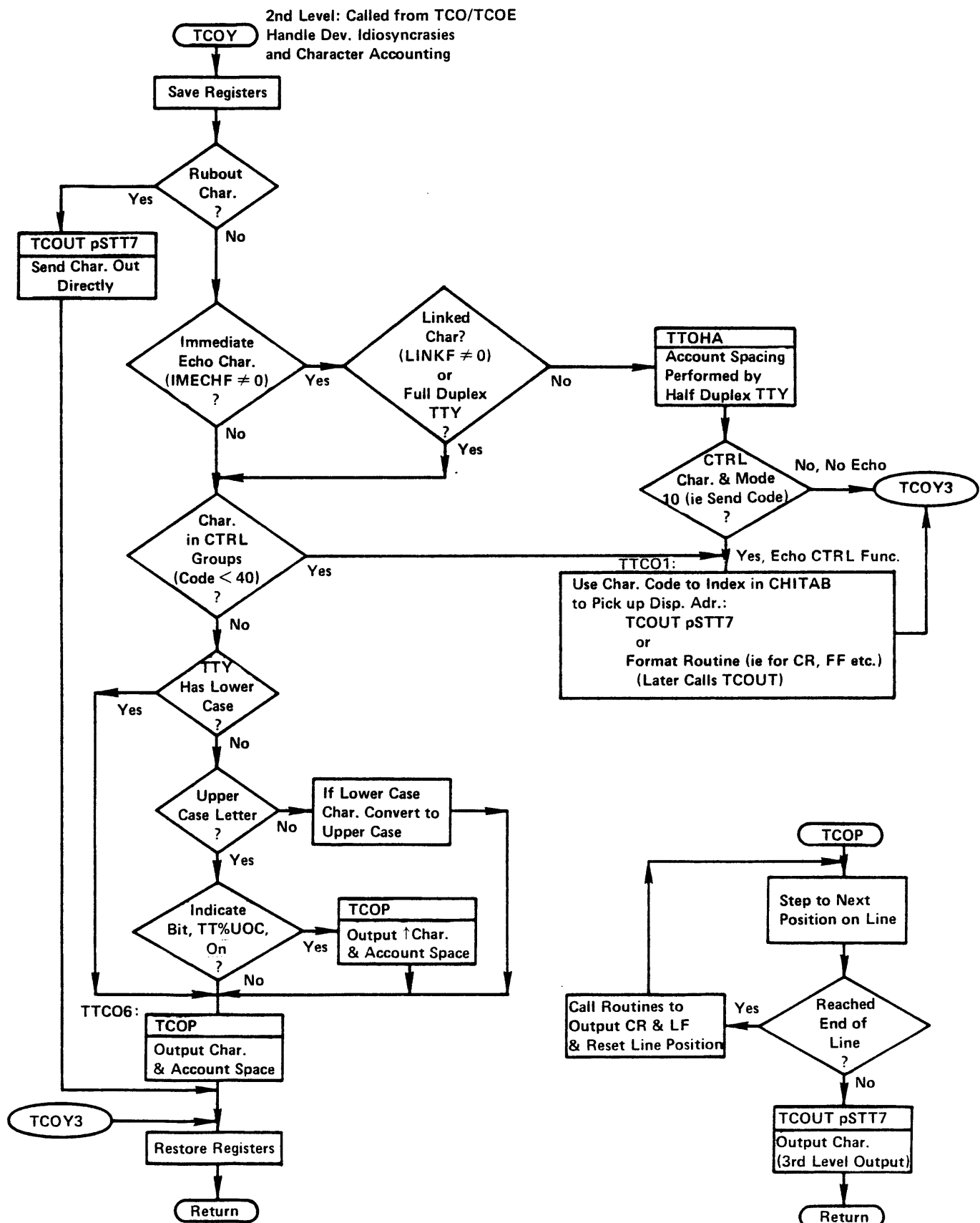
SEQUENTIAL OUTPUT - TTY
STRING & BYTE DEV. DEP. CODE



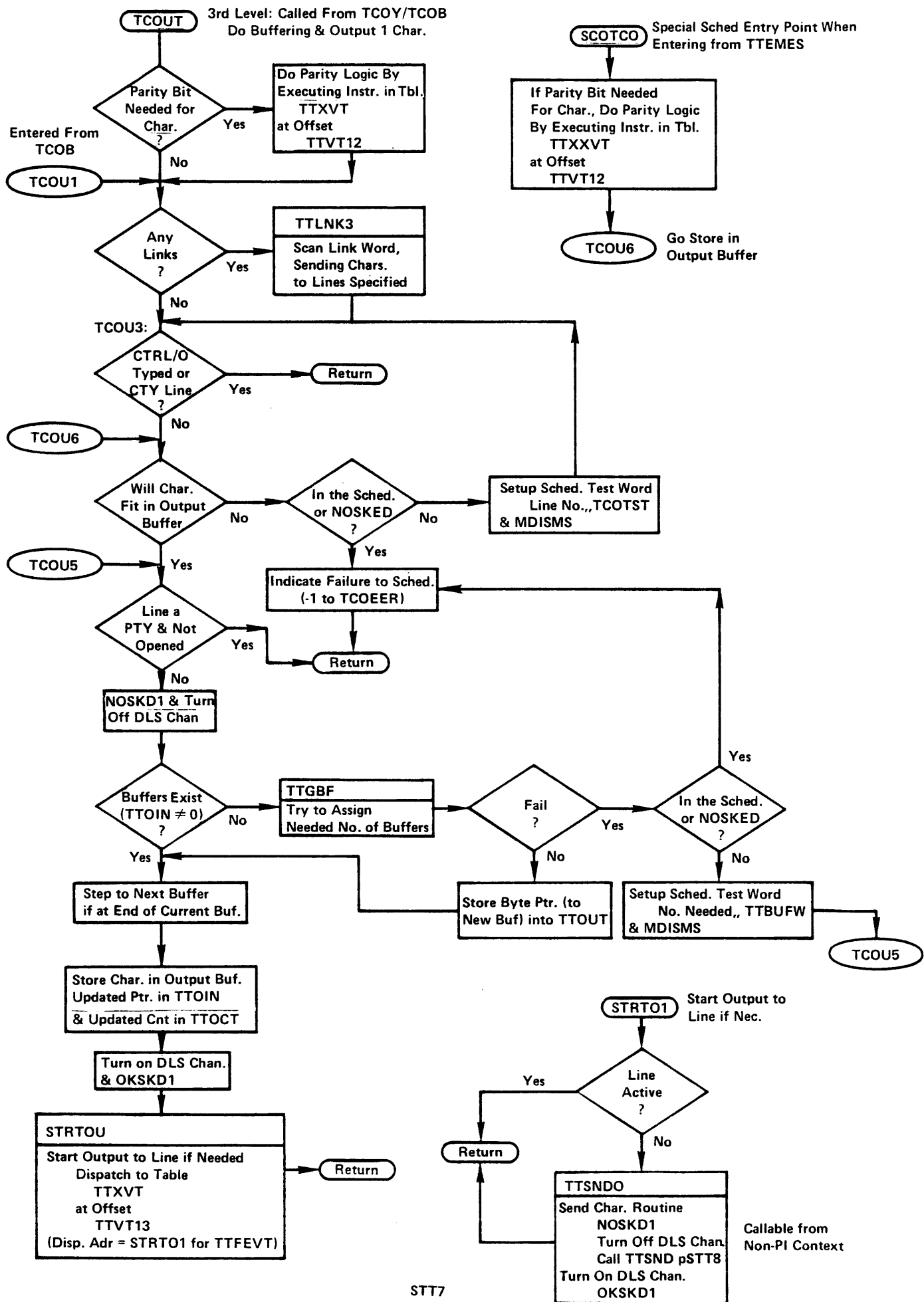
TCO - 1st Level - Translate According to Program's Desires
TCOY - 2nd Level - Do Links & Format for a Particular Device
TCOUT - 3rd Level - Do Buffering, etc.

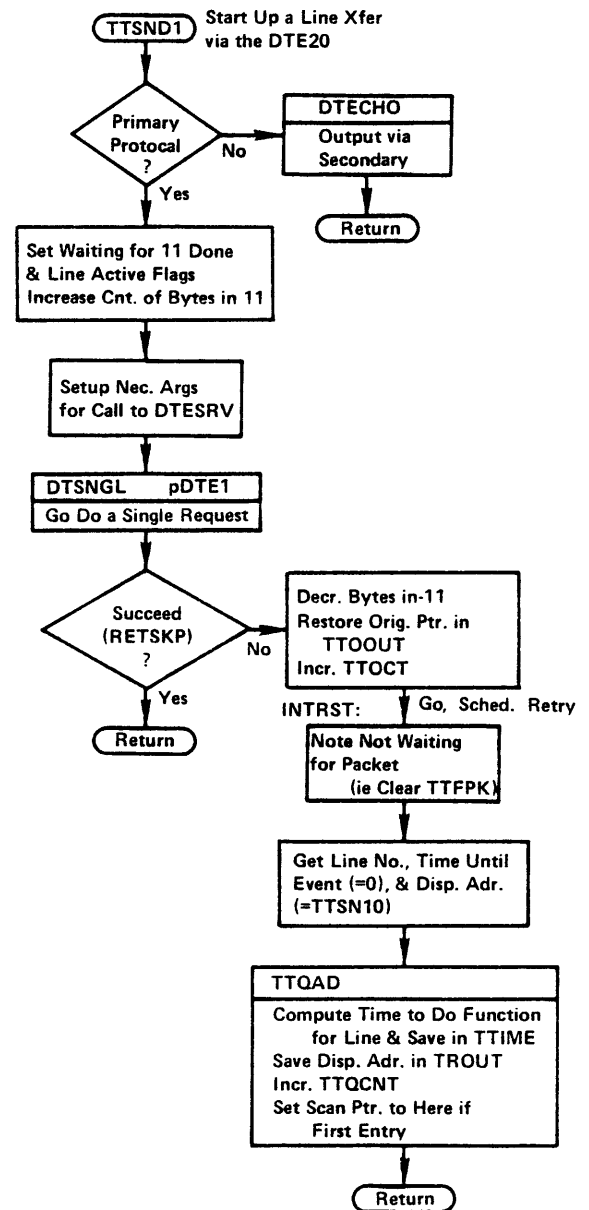
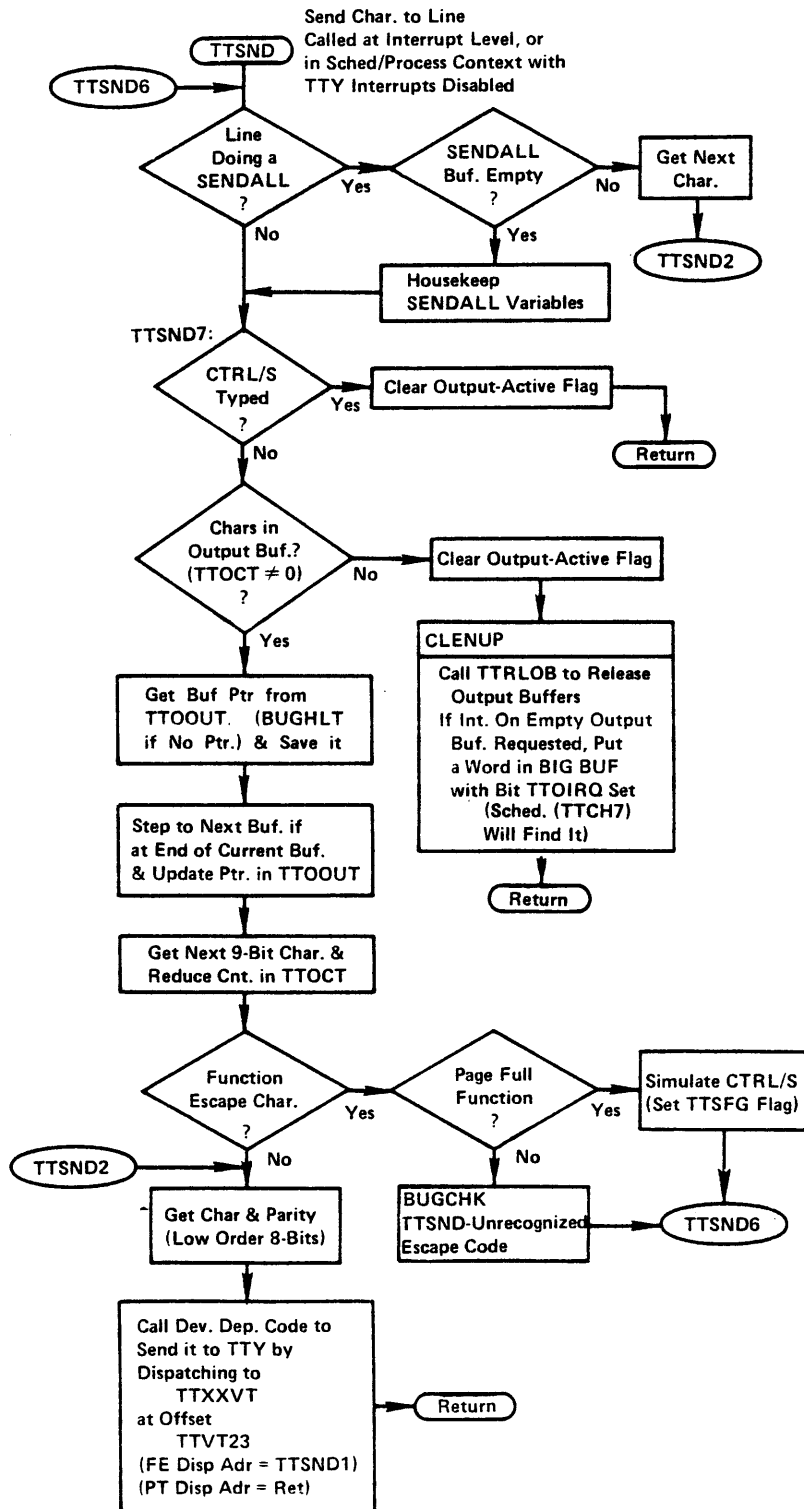


STT5



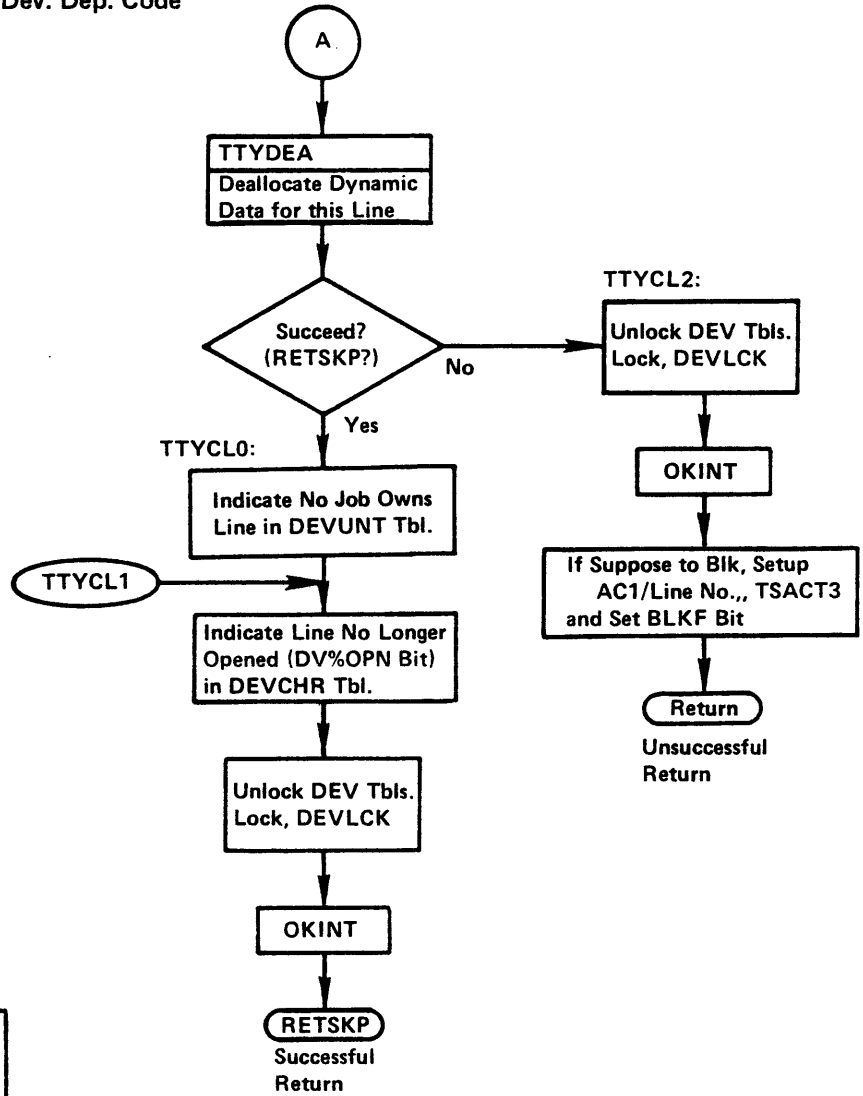
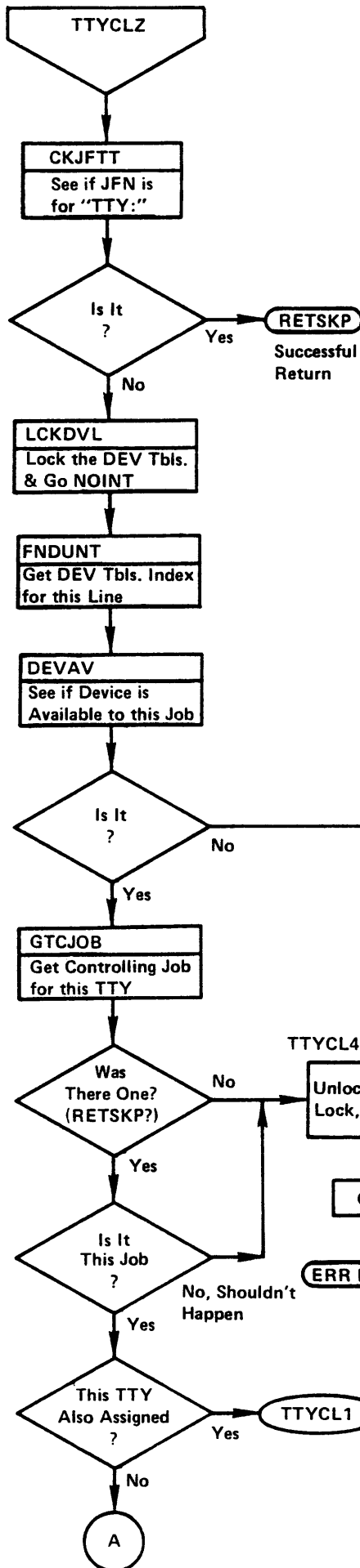
STT6





STT8

CLOSF-TTY
Dev. Dep. Code



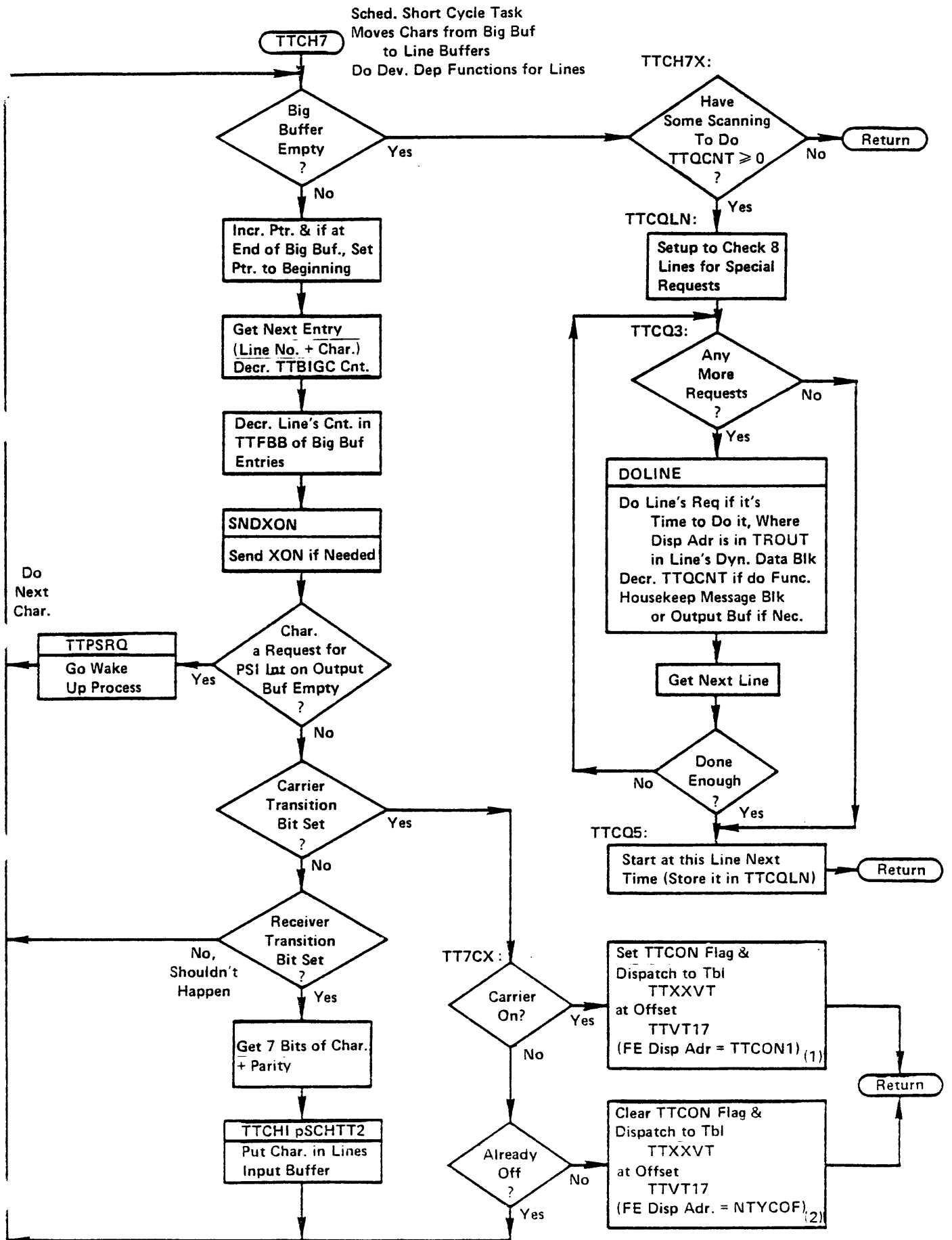
CLTT1

SCHEDULER TTY INPUT ANALYSIS & STORAGE

TTCH7 - Moves Characters from the Big Buffer to Line Buffers	SCHTT1
TTCHI - Initiates a PSI Interrupt if Needed, Echoes if Appropriate & Wakes Up Waiting Forks	SCHTT2

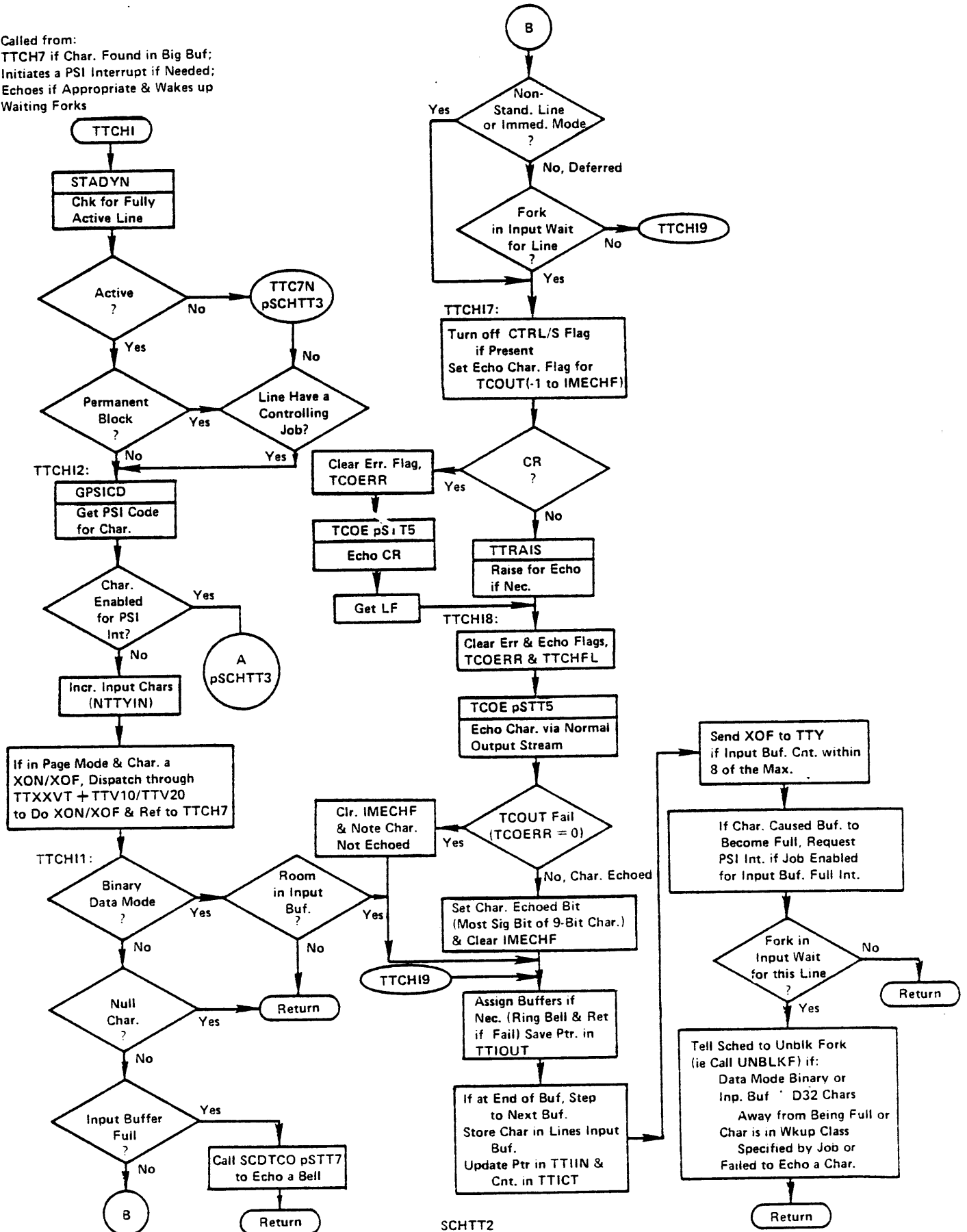
-

SCHEDULER TTY INPUT ANALYSIS & STORAGE

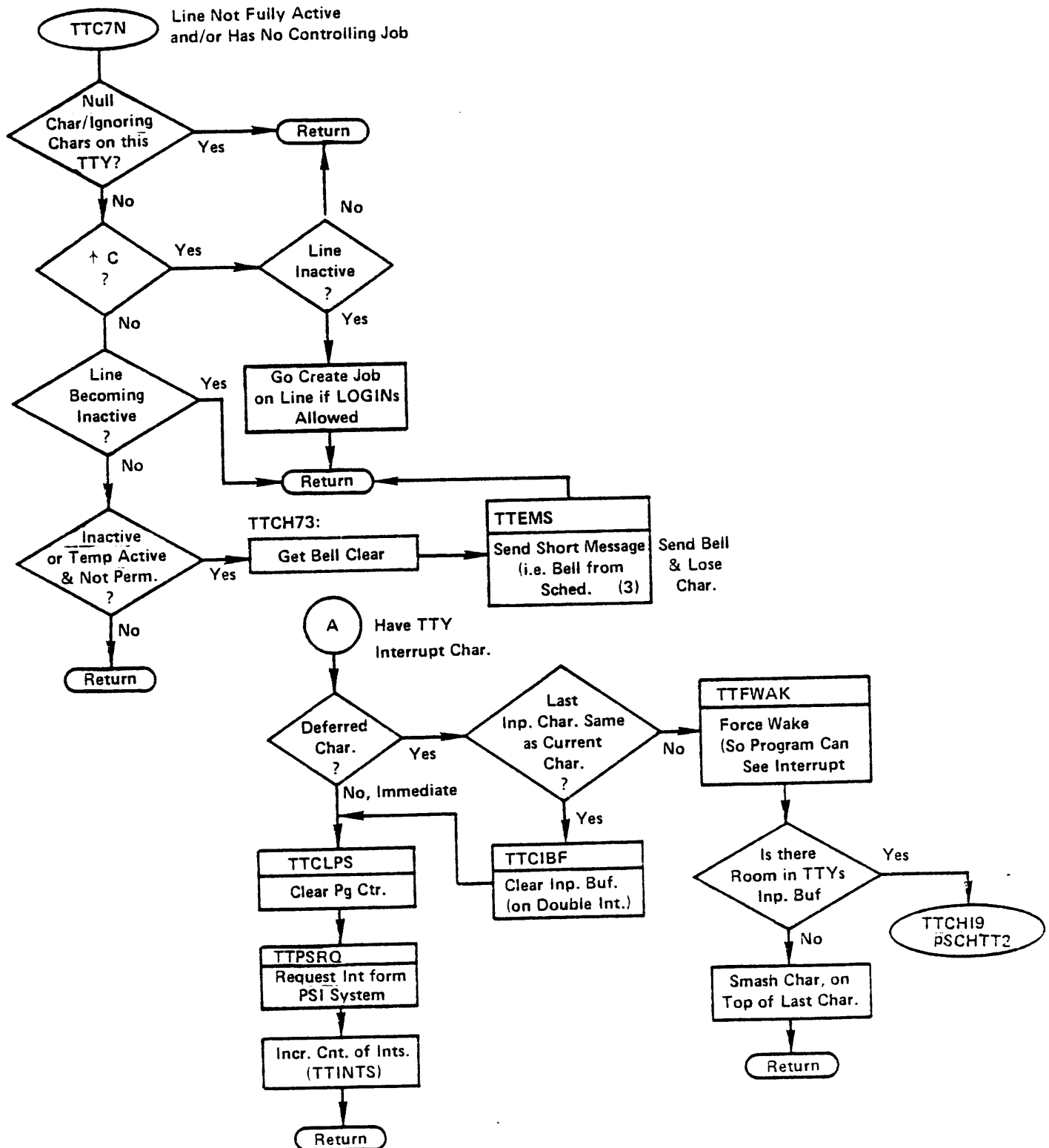


SCHTT1

Called from:
 TTCH7 if Char. Found in Big Buf;
 Initiates a PSI Interrupt if Needed;
 Echoes if Appropriate & Wakes up
 Waiting Forks



SCHTT2



SCHTT 3

Scheduler TTY Input Comments

TTCH7

- (1) The carrier-on routine for the FE device is TTON1. If the line is in use or a job is being created, it just returns. Otherwise, it creates a job by the CTRL/C mechanism (i.e., putting a request in Scheduler's Request Queue, SCDRQB) before returning.
- (2) The carrier-off routine for the FE device is NTYCOF. It flushes outputs and issues an interrupt via the PSI system if process has enabled for carrier-off interrupt. It then issues a monitor-internal interrupt via routine, PSIR4, which causes the top fork to go to JOBCOF in MEXEC to cause the job to be detached.

TTC7N

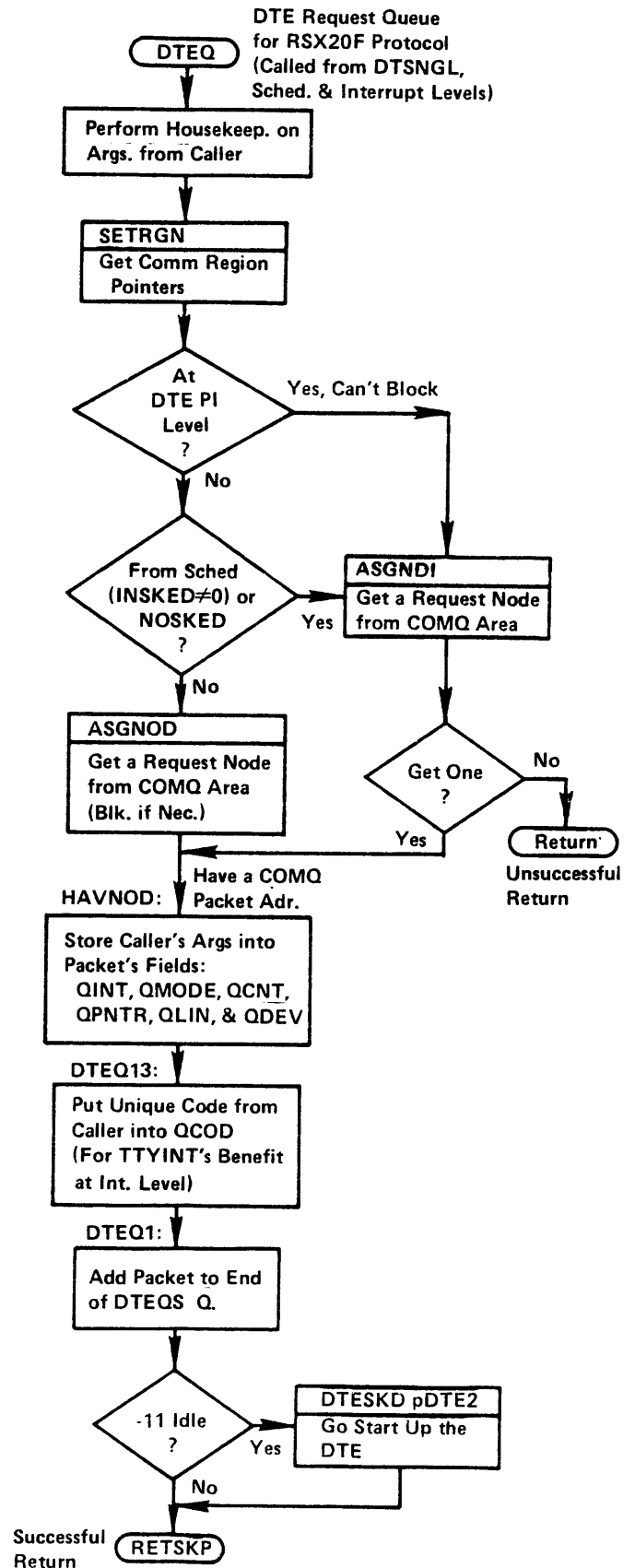
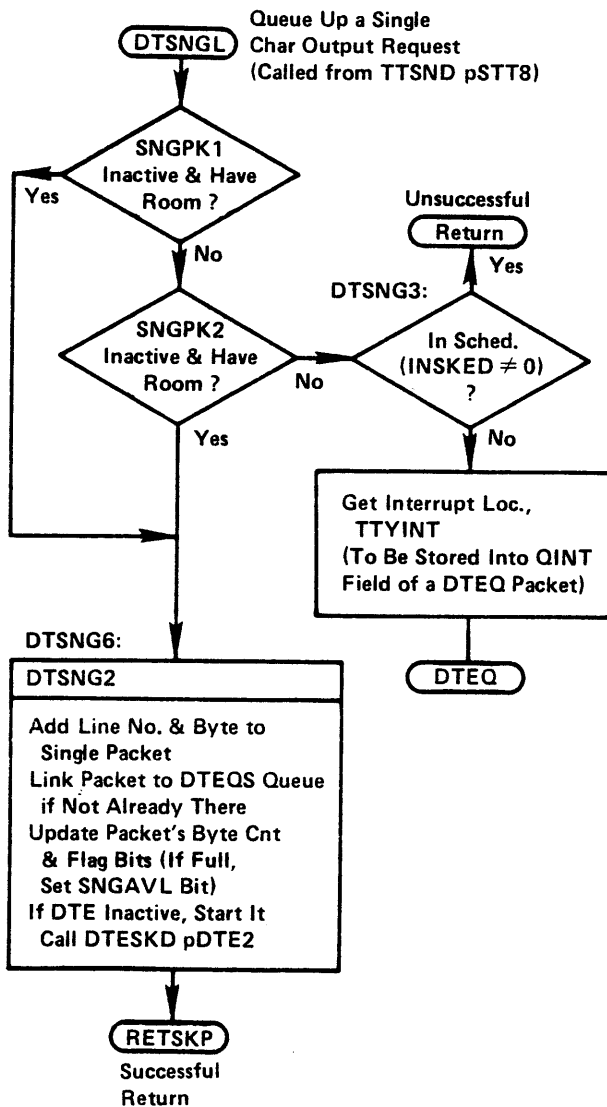
- (3) TTEMES is called at Scheduler Level to send a short message to a line. If the line is active, it appends characters to the line's output buffer. If the line is not active, it creates a message-length dynamic block for the line and puts the characters into this block.

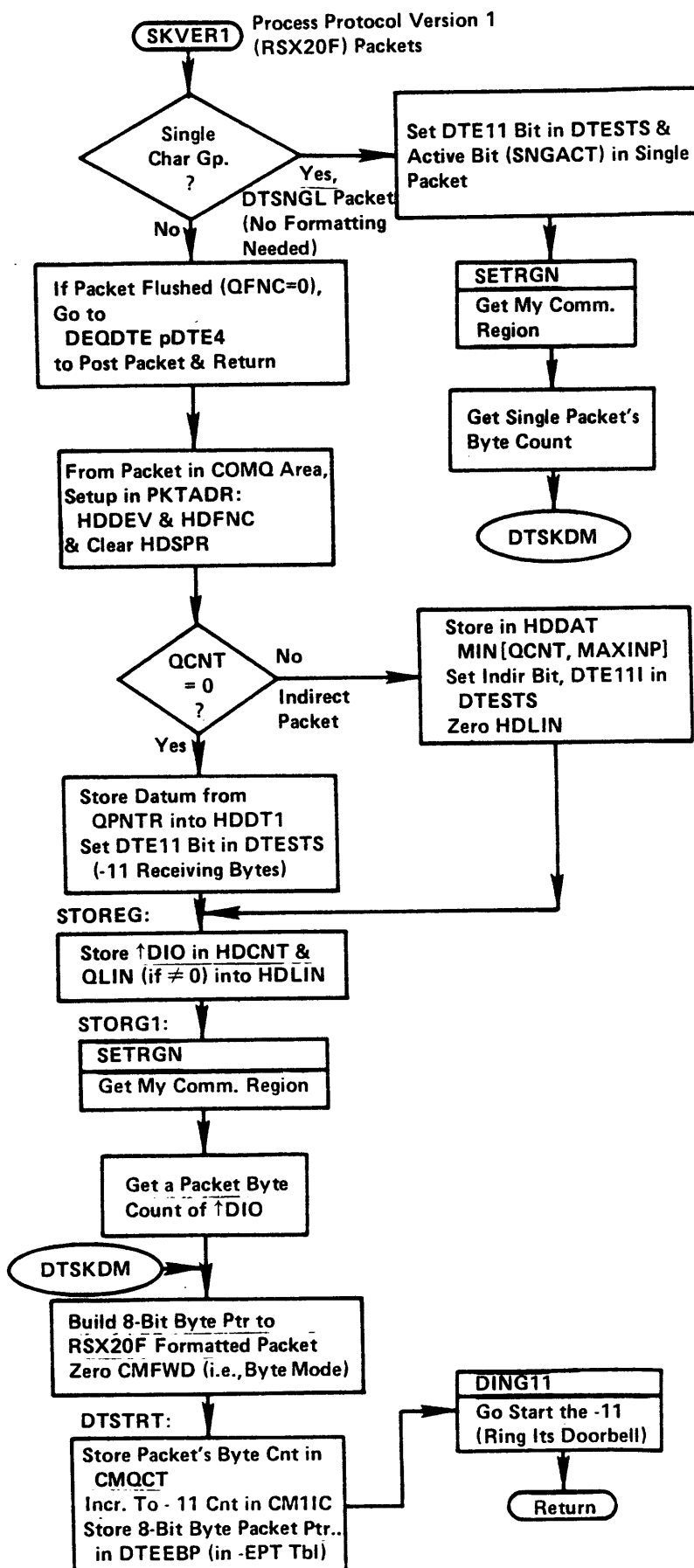
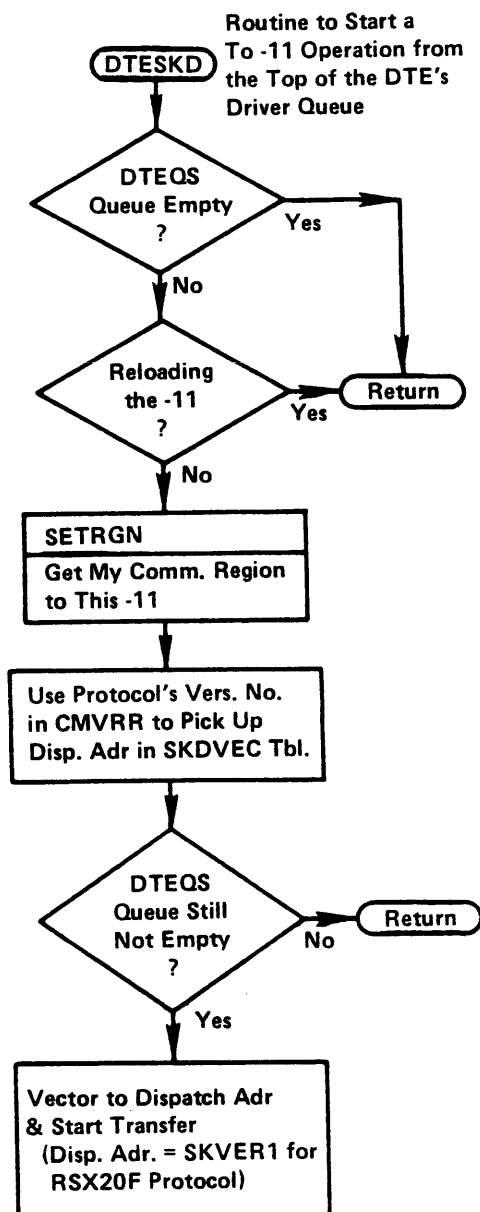
TTEMES calls SCDTCO (pSTT7) to output each character via TCOU to the buffer or message block.

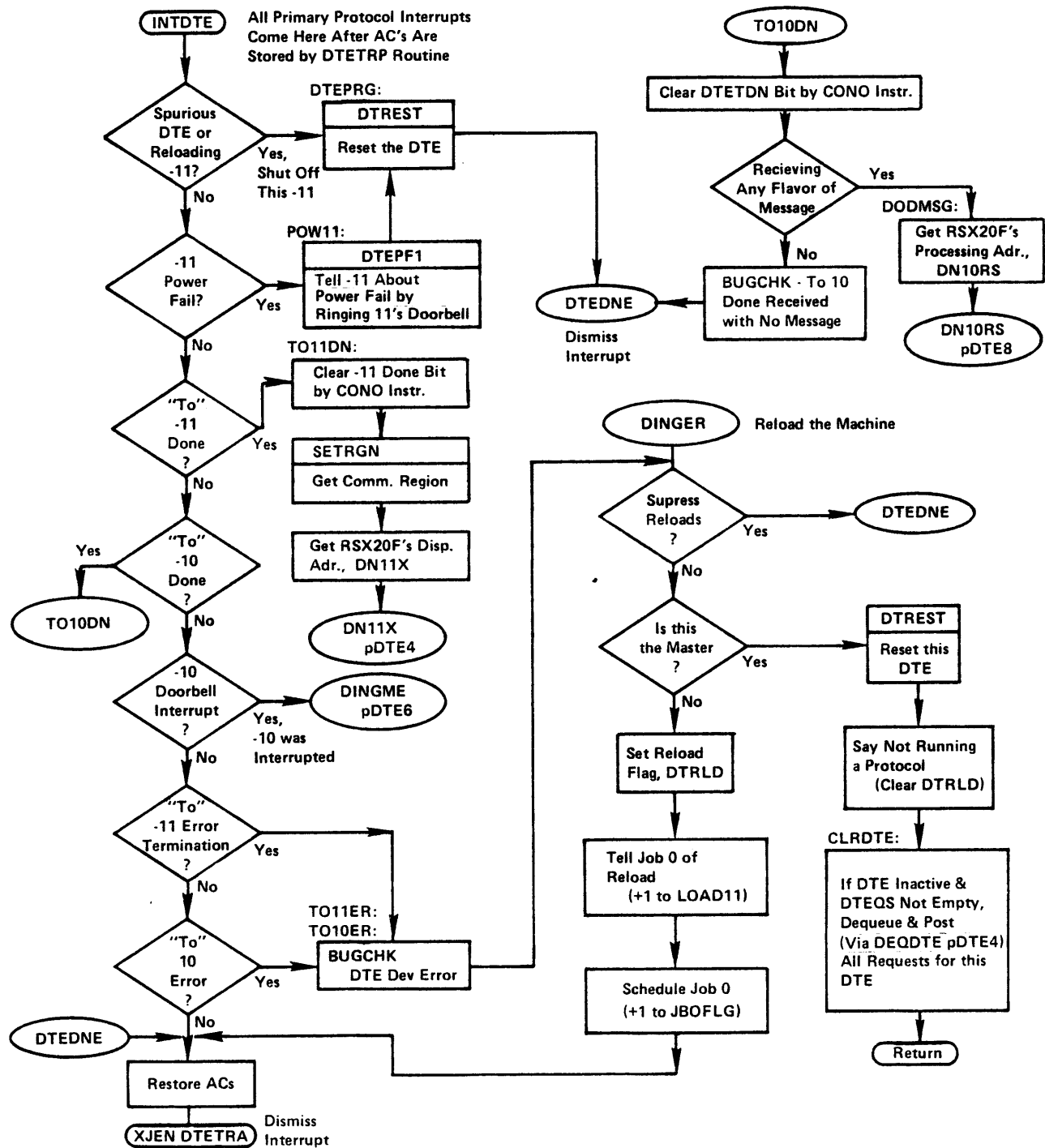
REQUESTING DTE OUTPUT & DTE INTERRUPT HANDLING FLOWCHARTS
(DTE PROTOCOL HANDLER)

DTSNGL - Queue Up a Single Character Output Request	DTE1
DTEQ - DTE Request Queues for RSX20F Protocol	DTE1
DTESKD - Start a To -11 Operation	DTE2
SKVER1 - Process RSX20F Packet	DTE2
INTDTE - DTE Interrupt Handler	DTE3
DN11X - To -11 Done	DTE4
DEQDTE - Dequeue Completed Request, Post it, and Schedule Next One	DTE4
TTYINT - Complete a TTY Output Request	DTE5
DNSNGL - Post Single Character Done	DTE4
DINGME - 10 Received a Doorbell Interrupt	DTE6
DOFRGM - Start a To -10 Transfer	DTE7
DN1ORS - To -10 Done	DTE8
TAKLC2 - Process To -10 Done for RSX20F Protocol	DTE9
BIGST2 - Store Character into the Big Buffer	DTE10

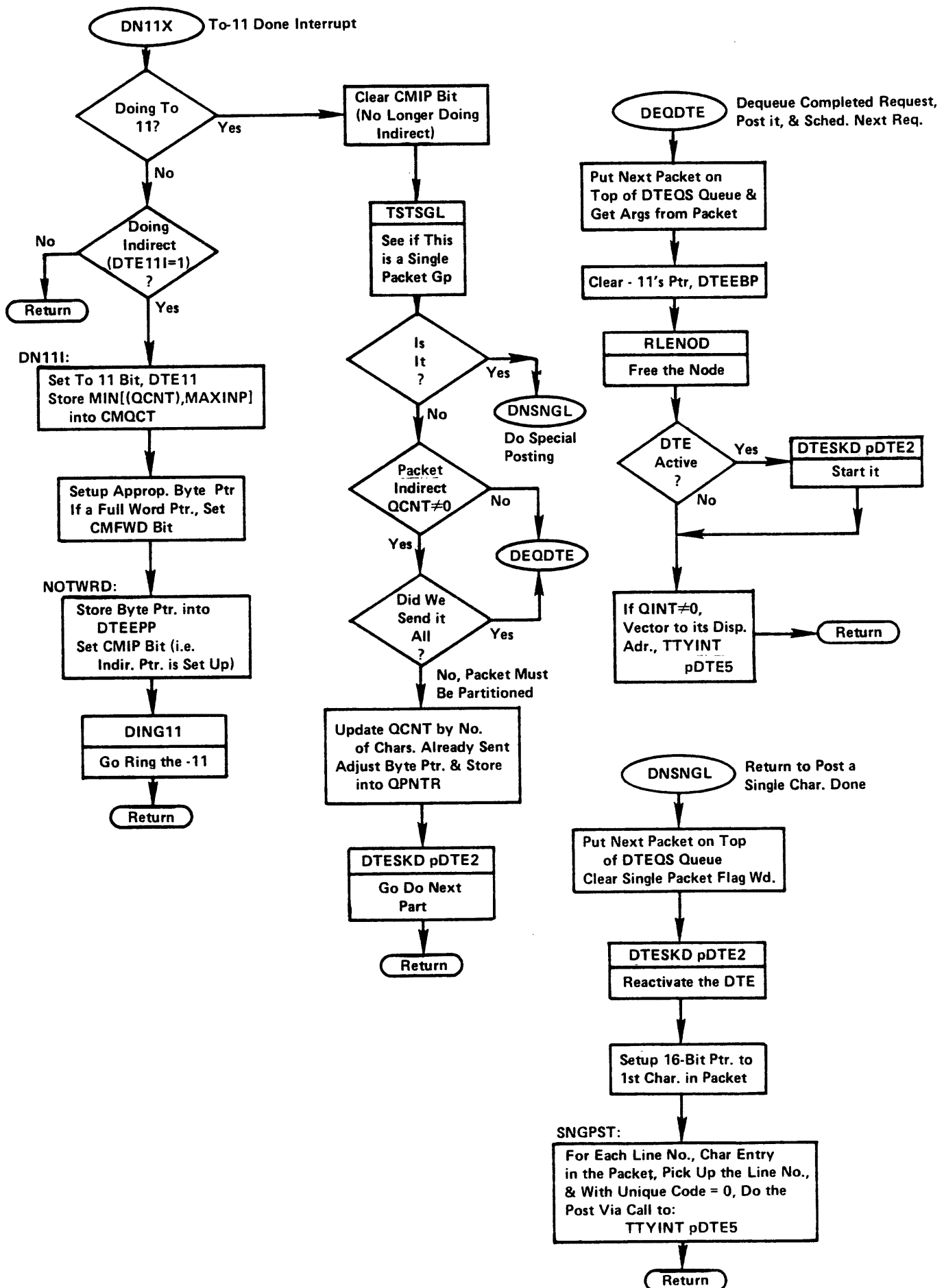
REQUESTING DTE OUTPUT Called From Interrupt, JSYS & Scheduler Levels



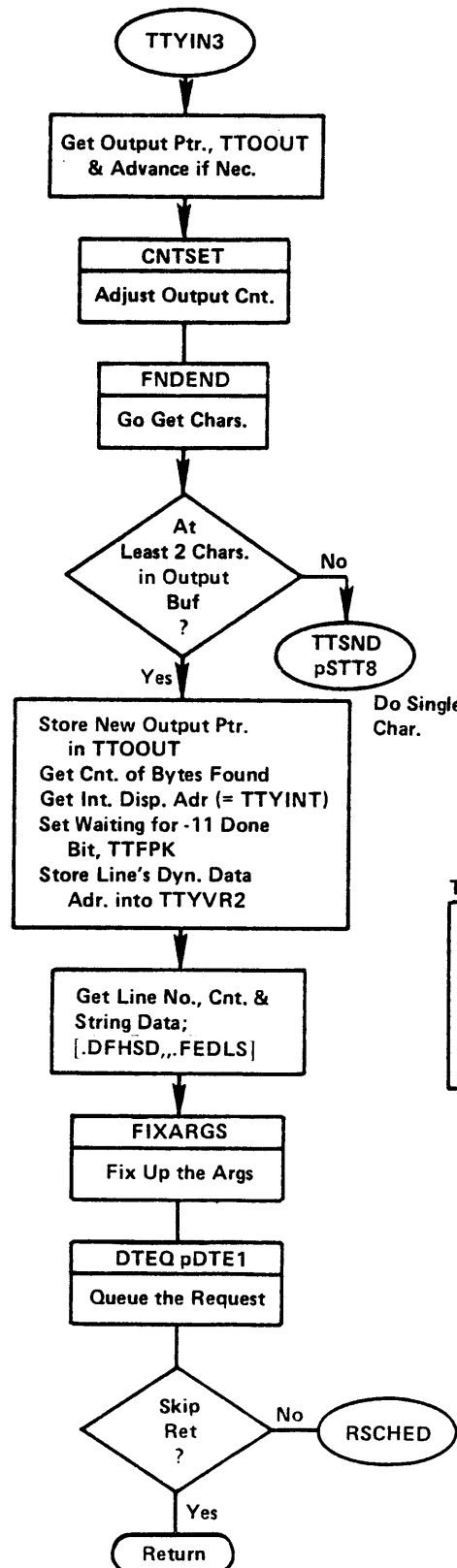
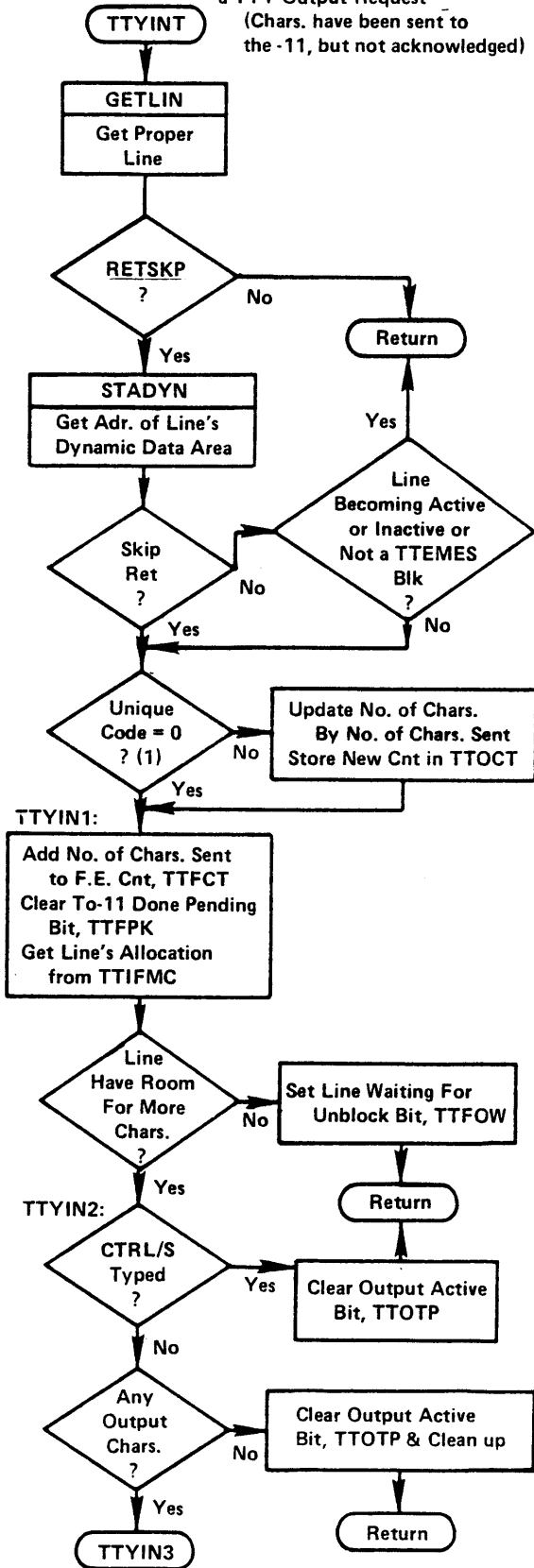




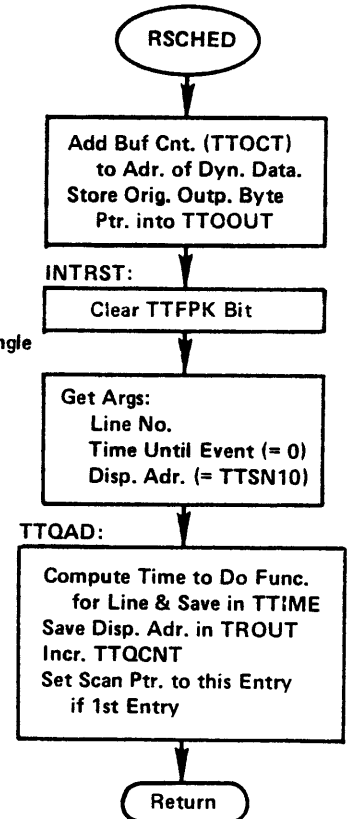
DTE3



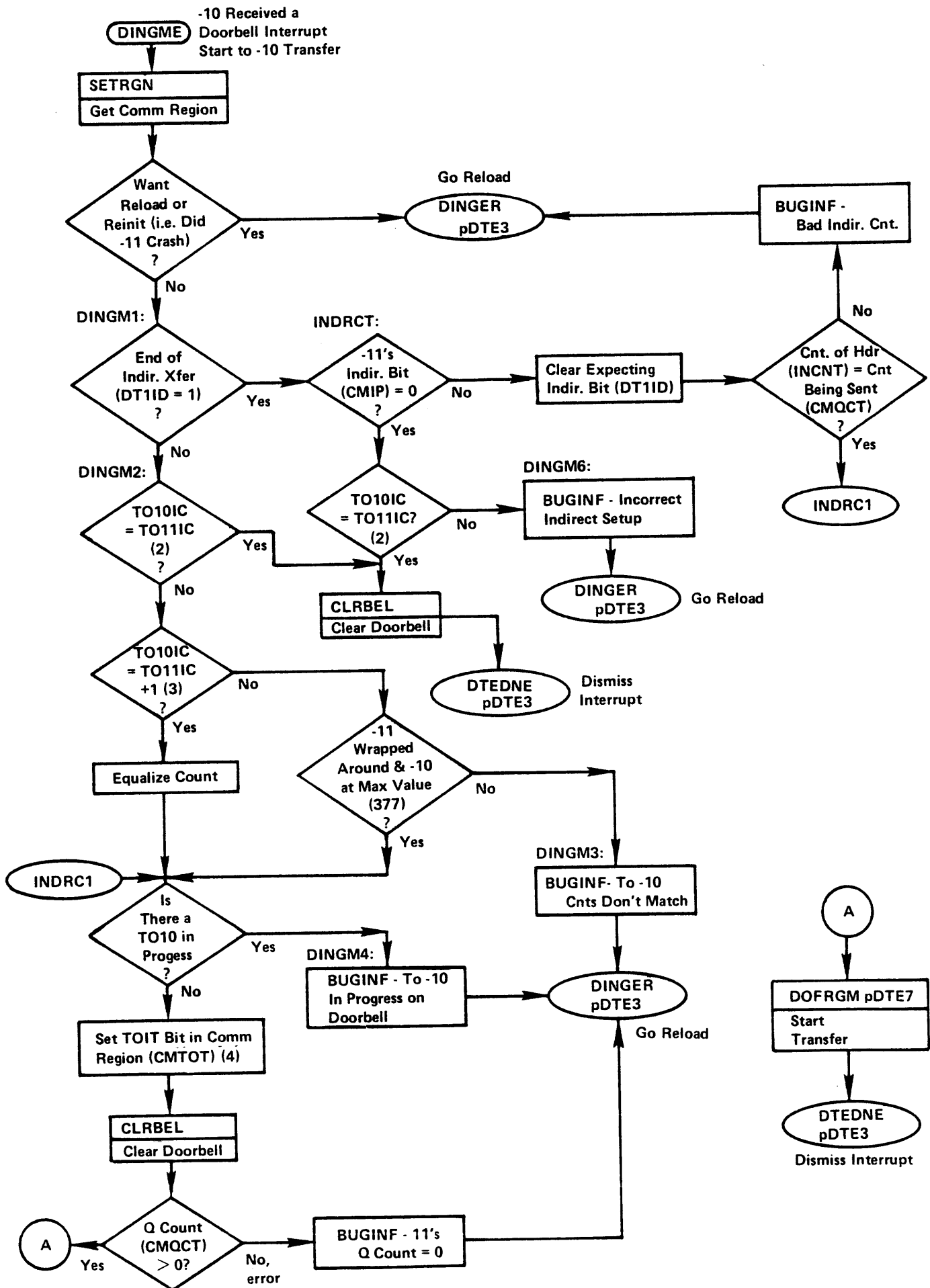
Called at Int. Level to Complete
a TTY Output Request
(Chars. have been sent to
the -11, but not acknowledged)

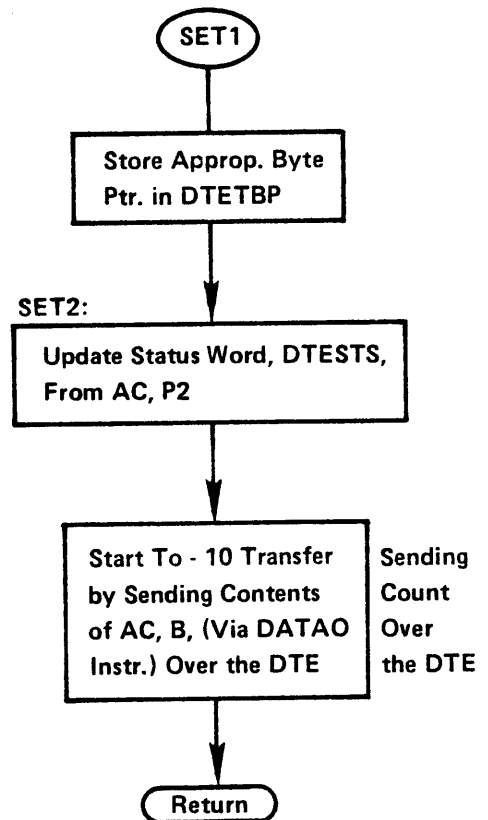
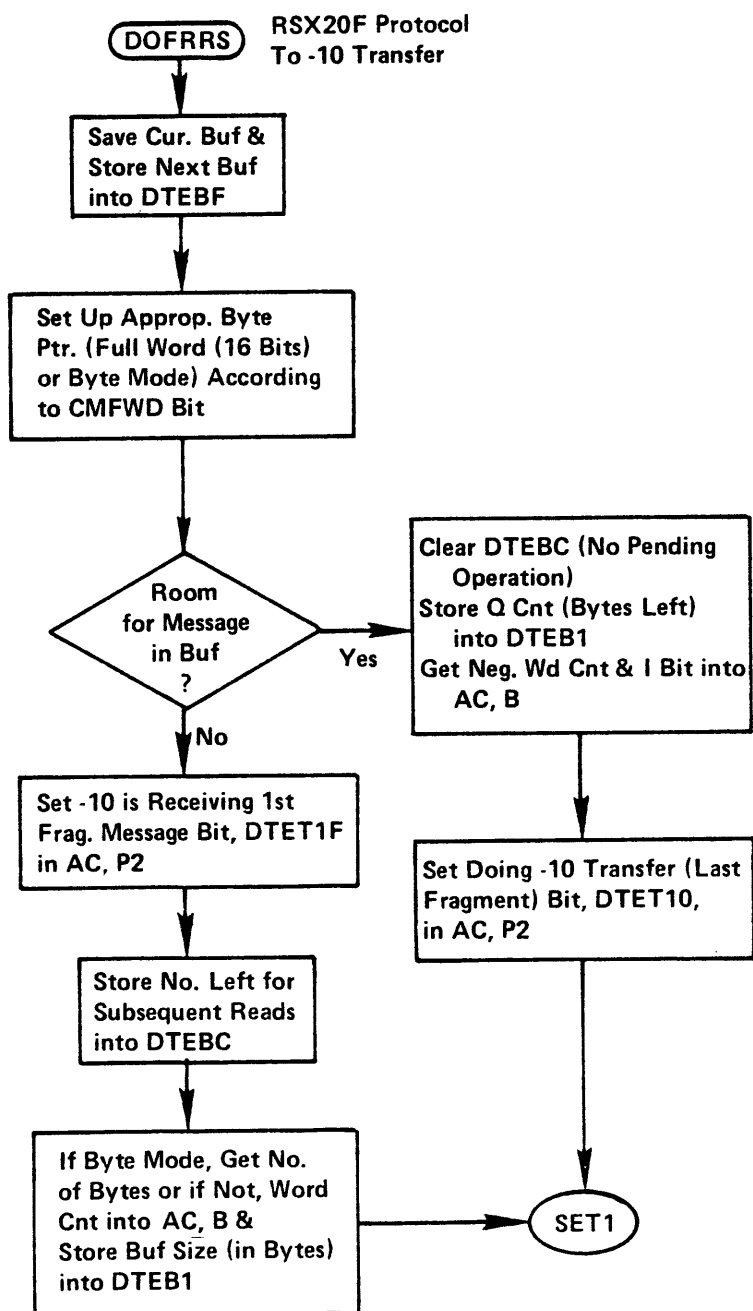
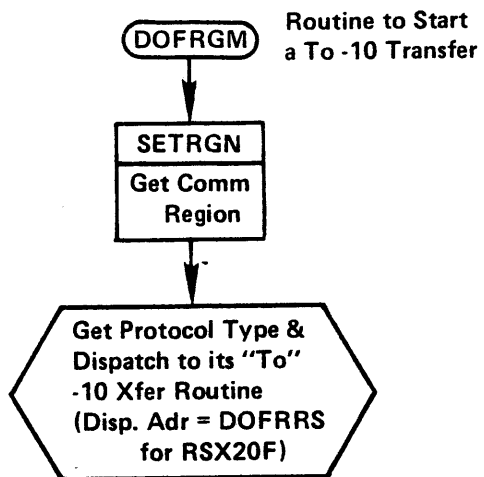


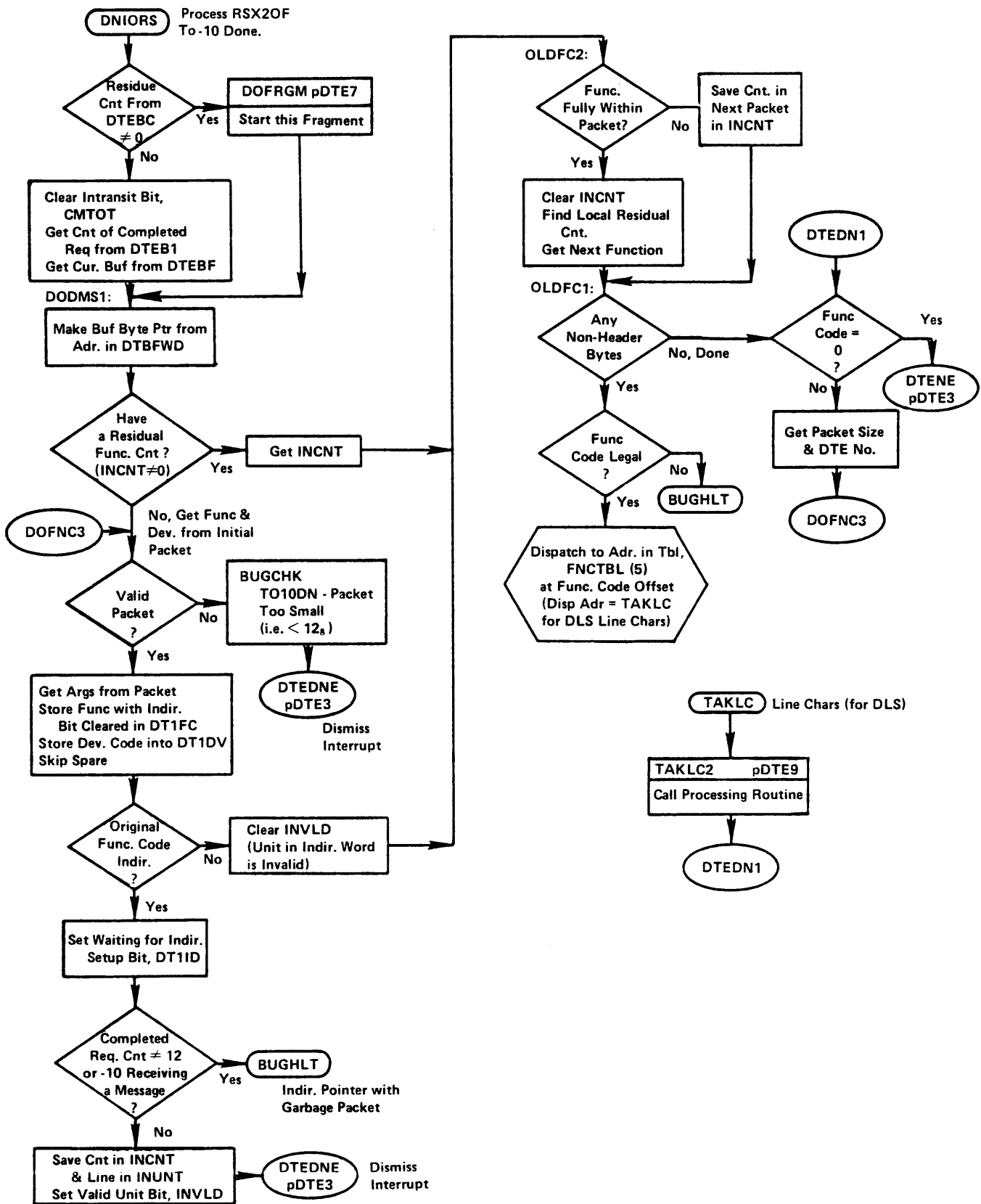
DTEQ Failed;
Restore Cnts. &
Arrange Sched. to
Restart Output



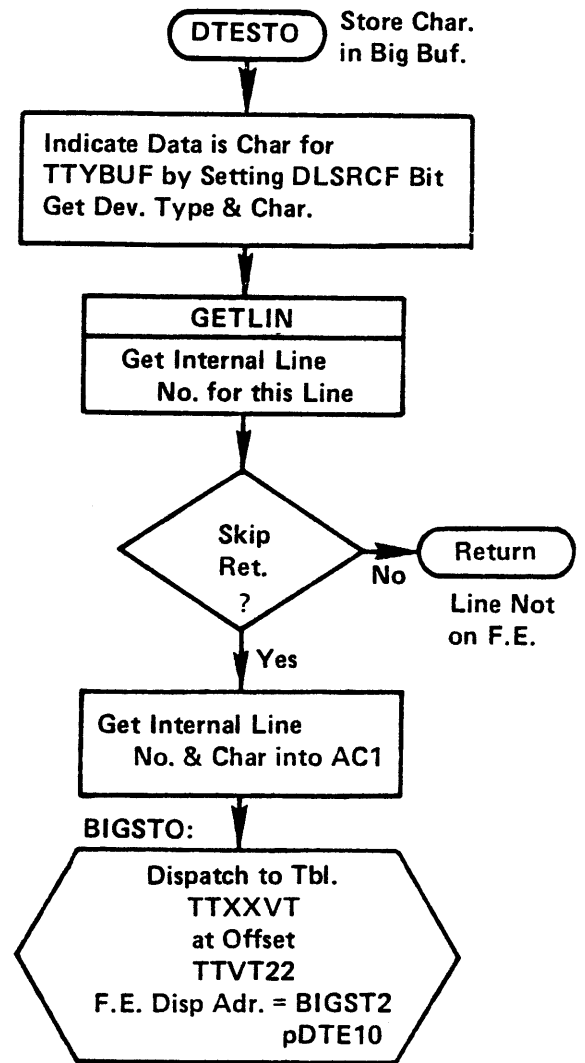
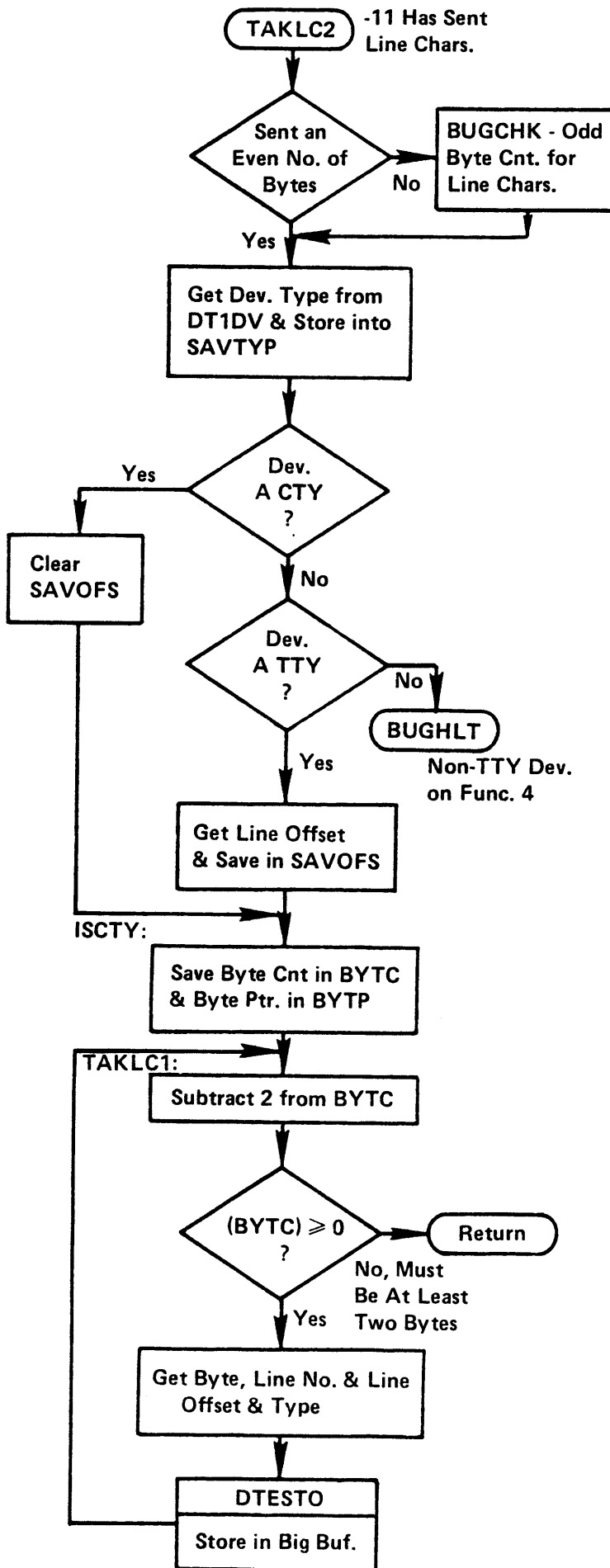
DTE5

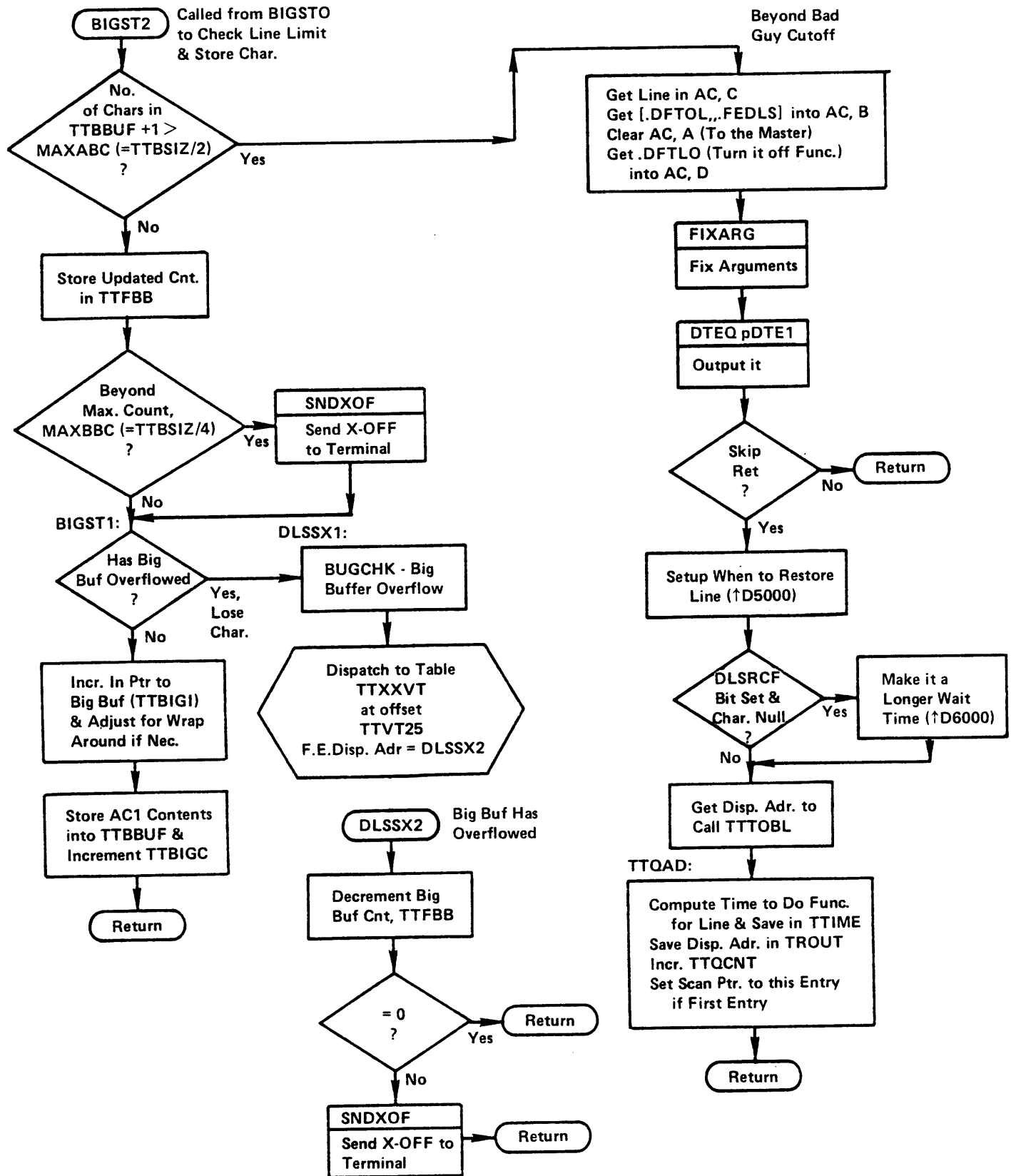






DTE8





DTE10

DTE Interrupt Handling Comments

TTYINT

- (1) The Unique Code argument of form ($\emptyset$, count) tells TTYINT the number of characters that have been sent to the -11 in some call to DTEQ that specified TTYINT as its return address.

Count = $\emptyset$ implies this was a single character (DTSNGL was called) and buffer counts have already been updated.

Count $\neq \emptyset$ implies this was multiple characters and the count must be updated.

DINGME

- (2) TOL $\emptyset$ IC and TOLLIC are wrap-around counters of Indirect Transfers where TOL $\emptyset$ IC is maintained by the -11 and TOLLIC is maintained by the -1 $\emptyset$. If the two wrap-around counters are equal, it means the transfer finished correctly.
- (3) If the difference between the wrap-around counters is greater than 1, the -11 has tried to send a direct transfer before the last indirect transfer finished or a doorbell has been lost in a previous transaction.
- (4) Receiver sets TOIT equal to 1 in Sender's section of Receiver's communication region after Sender sets @ or increments Q count and rings the doorbell; Receiver clears TOIT upon getting To-Receiver Done (This assures that the Receiver doesn't lose an interrupt).

DN1ORS

(5) The function table has dispatches for such features as:

- F.E. telling about the CTY
- String data for the CDR
- Line characters (for DLS)
- -ll Sending error information
- -ll wants or is sending time of day
- Line dialed up, hung up or line buffer empty
- Set line speed or allocation
- Take -ll reload information
- Acknowledge all devices and units
- Take KLINIK data.

Monitor Tables

ALOC1	INIDEV
ALOC2	INIDVT
BALSET	INIDV1
BAT	IORE
BTB	JOBDIR
CDB	JOBNAM
CDR	JOBPNM
CDS	JOBPT
CHNPIT	JOBRT
CHNTAB	JOBRTL
CSTO	JSB
CST1	KDB
CST2	LPT
CST3	MTA
CST5	NAMUTP
DEVCHR	NBQ
DEVCH1	NBW
DEVCH2	PHYCHT
DEVDSP	PHYUNT
DEV'DTB	PSB
DEVNAM	PTYSTS
DEVUNT	SCDRQB
DIRECTORY	SDB
DRMBBT	SNAMES
DRMCNT	SNBLKS
DSKSIZ	SPFLTS
DSKSZ'n	SPT
DSKUTP	SPTH
DST	SPTO
DTE	SSIZE
DTEDTV	STARTUP
FCMODx	STIMES
FDB	STRTAB
FE	TTBFRC
FKCNO	TTBUFS
FKINT	TTCS
FKINTB	TTDPSI
FKJOB	TTExx
FKNR	TTFEWD
FKPGS	TTFLGS
FKPGST	TTFORK
FKPT	TTIxx
FKQ1	TTLINK
FKQ2	TTLPOS
FKSTAT	TTMOD1
FKTIME	TTOxx
FKWSP	TTPSI
HOM	TTSPWD
HOME	TTYPE
HOMTAB	UDB
IDXFIL	UDIORB
INDEX	UDS

Name: ALOC1
Description: Used to help enforce disk quotas for each active directory. This table is of length NOFN (size of OFN area in SPT).
Defined in: STG
Reference by: PAGEM

Format

ALOC1	ADIRN	ODIRC
	Directory No.	OFN Count
	.	.
	.	.
	.	.
	.	.
	.	.

Note: Each SPT entry in the OFN area contains an index into this table.

Name: ALOC2
Description: Used in disk quota enforcement for each active directory. This table is of length NOFN (size of OFN area is SPT).
Defined in: STG
Referenced by: DISC, PAGEM

Format

ALOC2	PGLFT	
	Count of Pages Left for This Directory	
	.	.
	.	.
	.	.
	.	.
	.	.

Note: Each SPT entry in the OFN area contains an index into this table.

Name: BALSET

Description: Balance Set Table. This table contains the set of most eligible forks for CPU service whose combined working set sizes are balanced with the amount of physical core available. Only forks in this table can be chosen to run. Position in this table is arbitrary and has no effect on run priority (Position on GOLST determines this).

Defined in: SCHED

Referenced by: PAGEM

Format

BALSET	Fork Status																
	Fork Index																

BALSET	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35	
	-----+-----																																				

Symbol	Bits	Content
--------	------	---------

BSWTS	0	If 1, fork waiting for I/O (disk or drum);
BSNSK	1	If 1, fork is NOSKED (no scheduling of other forks allowed) or NOSWAP
BSNUL	2	If 1, free BALSET slot (Deleted entry)
BSHLD	4	If 1, fork being held in Balance Set

to other things
BSNSK - no scheduling of other forks allowed
BSHLD - may be held in Balance Set

BATBL 1 = 2

Sector NUMBER of first bad block

Name: BAT

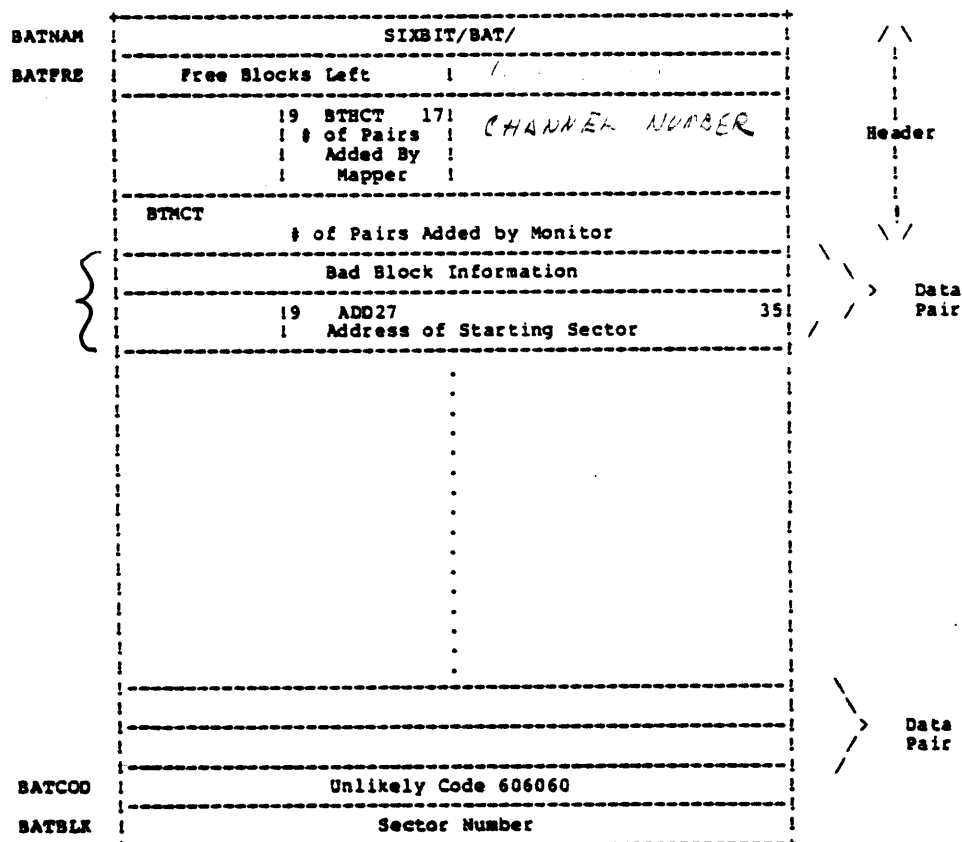
Description: Bad Allocation Table. The BAT Block is one sector in length (128 words). It consists of 4 words of header, followed by data; each 2 word data entry indicates the bad spots on the disk.

Defined in: PROLOG

Referenced by: DSKALC, DISC, DEVICE, PHYH2

Format

DATA PAIR



Data Pair	0	8	18	20	21	22	23	35
word 1	BATNB	Bad Blks Cnt	BTCT	Controller	Type	APRNM	APR Serial	

Bits	Pointer	Content
0-8	BATNB	Count of Bad Blks in Pair
18-20	BTCT	Massbus Controller #
21	BACT	Type field in BAT Pair
23-35	APRNM	APR Serial #

word 2	Bits	Pointer	Content
	18-35	ADD18	Old style disk address of starting sector
	9-35	ADD27	New style address of starting sector

Name: BTB

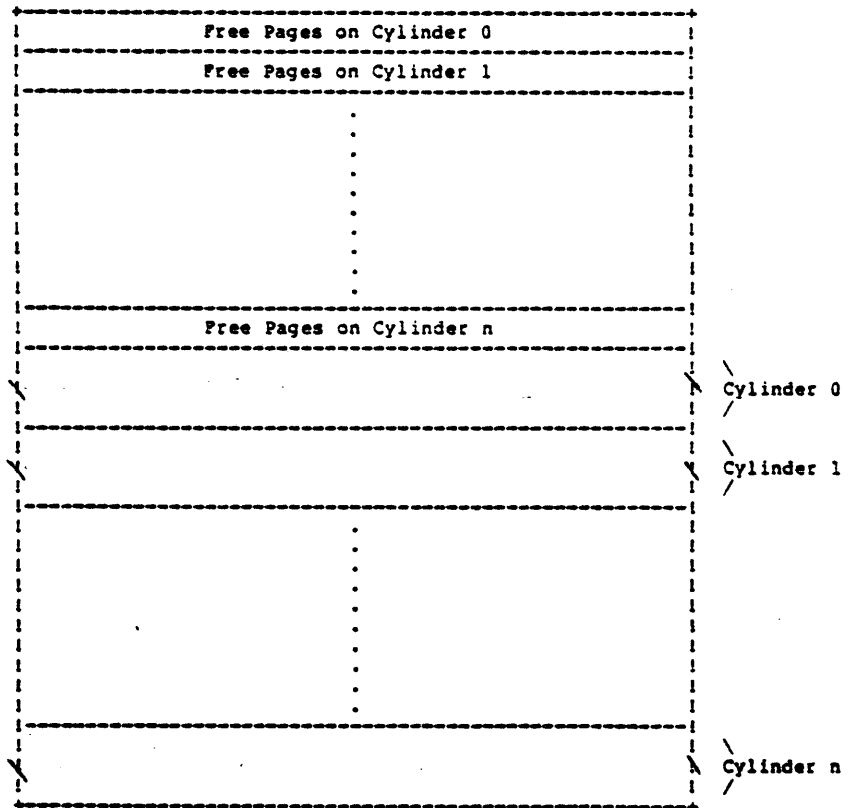
Description: Bit Table for Disk. This table has mapped into it, STRNAM:<ROOT-DIRECTORY>DSKBTB.L, when pages are allocated or deallocated from the disk unit(s) belonging to structure, STRNAM. The bit table indicates which pages are assigned (bits off) and which are available (bits on).

It consists of two parts; the top half contains the number of free pages for each cylinder in the structure and the bottom half contains a bit map (1 bit per page) for all pages of each cylinder in the structure.

Defined in: STG

Referenced by: DSKAL:

Format



Note: In the bit map each cylinder starts on a word boundary and contains as many full words as are needed for all of its pages.

Name: CDB

Description: Channel Data Block. This table, one per channel, contains channel dependent instructions and data, pointers to the units (i.e. UDBs) belonging to the channel and information about the currently active unit. When the channel interrupts, control passes (via a JSP instruction) to CDBINT. The CDB address is stored in AC, P1, and the principal analysis routine, PHYINT, is called.

Defined in: PHYPAR

Referenced by: PHYSIO, PHYH2, PHYM2, PHYF4

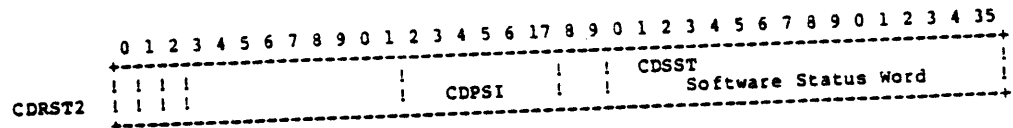
Format	
CDBINT	0 (PC stored here on interrupt)
-2	MOVEM P1, .+2+CDBSVQ
-1	JSP P1, PHYINT
CDBSTS	Status and Configuration Information
CDBMBW	Memory Bandwidth Scheduling Information
CDBODT	Overdue Timer when Data Transfer Active
CDBICP	EXEC Virtual Address of INAD/ICW
CDBIUN	Initial AOBJN Pointer to UDB Table
CDBCUN	Current AOBJN Pointer to UDB Table
CDBDSP	Unit Utilities Dispatch : Main Entry Dispatch : (Channel Dispatch Table)
CDBFCT	Fairness Count for Latency
CDBPAR	Channel Memory Parity Errors
CDBNXM	Channel NXMs
CDBXFR	Currently Transferring UDB
CDBCCL	Channel Command List (3 words)
CDBUDB	UDB Table (8 words)
CDBSVQ	P1 Saved Here on Vector Interrupt Entry
CDBJEN	BLT 17, 17 (Interrupt Dismiss) DATA0 R8, CDBRST JEN @CDBINT
CDBRST	Location Used by CDBJEN
CDBCNI	Channel COMI at Start of Interrupt
CDBOMR	Fork Who Has Channel in Maint. Mode
CDBADR	Number of This Channel (CHNTAB index)
CDBCS0	Channel Status 0 at Error
CDBCS1	Channel Status 1
CDBCS2	Channel Status 2
CDBCC1	First CCW
CDBCC2	Second CCW
CDBOVR	Number of Overruns
CDBICR	Initial STCR When Device Started
CDBDDP	Start of Device Dependent CDB

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35	
CDBSTS	1	1	1	1	1	1	1																								1				1		1

Symbol	Bits	Content
CS.FOL	0	Offline
CS.AC1	1	Primary command active
CS.AC2	2	Secondary command active
CS.MAI	3	Channel is in maint. mode
CS.MRQ	4	Maint. mode requested for some unit
CS.ERC	5	Error recovery in progress
	30-32	PIA field
	33-35	Channel type field

CDBDSP
See Tables UDS and CDS

Bits	Pointer	Content
0	CDAII	CDR opened in ASCII
1	CDATN	CDR needs attention
2	CDMSG	Suppress system messages
3	CDOPN	CDR is open
4	CDER	Error in this CDR
12	CDCNT	Count of bytes now in buffer
13	CDEOF	EOF button was pushed
14	CDBUF	Buffer for process level
15	CDPIR	Process needs interrupt
16	CDPI	Buffer for PI level
17	CDON	If one, doing a buffer by process



Bits	Pointer	Content
0	CDSHA	"Status has arrived" flag
1	CDMWS	MTOPR is waiting for status to arrive
2	CDRLD	Front end has reloaded
12-17	CDPSI	PSI chan. no. for on-line transitions
20-35	CDSST	Software status word

Symbol	Bits	Content
.DVFFE	28	Device has a fatal, unrecoverable error
.DVFLG	29	Error logging information follows
.DVFEF	30	EOF
.DVFIP	31	I/O in progress
.DVFSE	32	Software condition
.DVFHE	33	Hardware error
.DVFOL	34	Offline
.DVFNX	35	Nonexistent device

Name: CDS

Description: Channel Dispatch Service Routine Table.
This table contains vectored addresses to channel dependent functions, and is given in its generalized form. The specific channel dispatch table for the RH20 begins at RH2DSP in PHYH2. See PHYPAR for definitions of arguments given and returned on calls to these channel routines.

Defined in: PHYPAR

Referenced by: PHYH2, PHYM2, PHYP4, PHYSIO, STG

Format

CDSINI	Initialize and Build Data Structure
	*** Unused ***
CDSSIO	Start I/O on IORB (skips if started O.K.)
CDSPOS	Do Positioning to Idle Unit (skips if O.K.)
CDSLTM	Return Latency and Best Request (i.e. best IORB)
CDSINT	Interrupt Entry
CDSCCW	Generate Single CCW Entry
CDSHNG	Hung Reset
CDSRST	On Restart, Reset Channel and All Devices
CDSCHK	Periodic Check Entry, PIA, etc.

Name: CHNPIT

Description: Channel Priority Interrupt Table. This table contains the head of the list of channels on each PI level indexed by priority interrupt level.

Defined in: STG

Referenced by: STG

Format

CHNPIT	List Pointer	
	.	
	.	
	.	
	.	

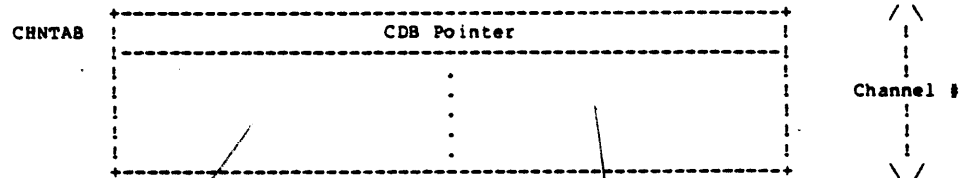
Name: CHNTAB

Description: Channel Table, indexed by channel number, contains channel data block (CDB) pointers.

Defined in: STG

Referenced by: DSKALC, PHYH2, PHYSIO

Format



Priority levels 1, 2, or 3

address of interrupt routine for that channel

PAGE STATE Codes (CSTQ - CSTATE FIELD)

PSRPQ = 0 REPLACABLE QUE
PSDEL = 1 DELETED (ON DELETED QUE)
PSRDY = 2 READ COMPLETED
PSWIP = 3 WRITE IN PROGRESS
PSRIP = 6 READ IN PROGRESS
PSSPQ = 7 PAGE IN SPECIAL MEMORY QUE
PSASN = 10 PAGE ASSIGNED TO PROCESS if GE. PSASN

CSTPST

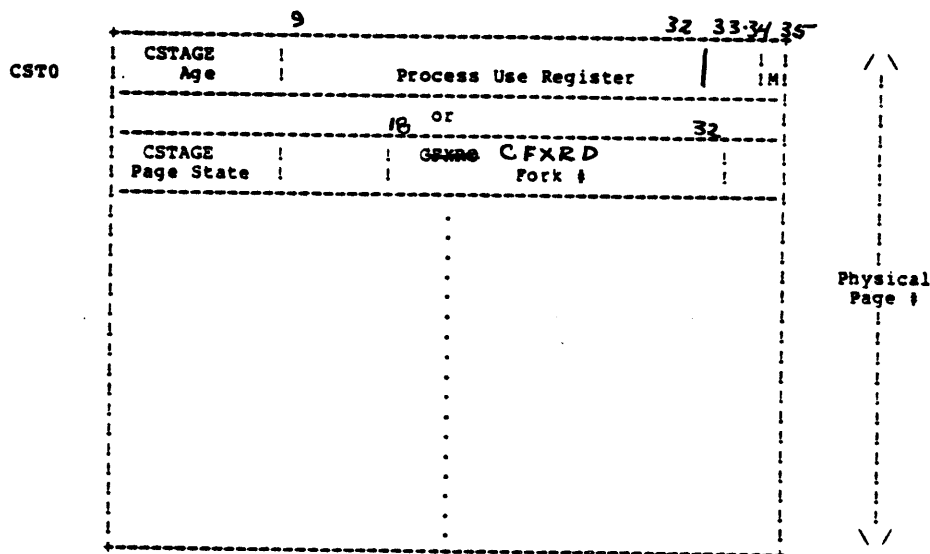
PSTAVL = 0 AVAILABLE FOR RPLQ WHEN FREED (.MCPSA)
PSTSPM = 1 PLACE ON SPMQ WHEN FREED (.MCPSS)
PSTOFL = 2 OFFLINE - ACTION AS PSTSPM (.MCPSO)
PSTERR = 3 OFFLINE DUE TO ERROR ACTION AS PSTSPM (.MCPSE)

Description: Core Status Table 0 (sometimes referred to as CST). Each entry in this table, indexed by physical page #, is principally defined by the pager. If the page is in use, the entry contains the age stamp for the page, which processes have referenced it and whether the page has been modified. The age stamp field is used to show the page's state if it is not assigned to a process.

Defined in: STG (MASKS - etc IN PROLOG)

Referenced by: APRSRV, DSKALC, PAGEM

Format



Bits	Pointer	Content
0-8	CSTAGE	If page in use, contents of pager age register (>= 100) at last age register reload
9-32		Process use register if age field indicates page is in use (i.e., age >= 100). Bit n is 1 if process with core number n has referenced it.
33-34	CORMB	This is the "modified" bit which is set by the pager on any write reference. This bit will be 1 if the page has been written since the last operation.
0-8	CSTAGE	If page not in use, this field indicates (right-justified) the page state as follows: PSRPQ = 0 On replaceable queue PSDEL = 1 To be put on replaceable queue PSRDN = 2 Read completed PSWIP = 4 Write in progress PSRIP = 6 Read in progress PSSPQ = 7 Page on special memory queue PSASN = 10 Page assign to process if age field >= PSASN. (The age field should always be strictly greater than 10 since it is initialized to 100 and increases in value as the process runs.)
15-32	CFXRD	Number of fork which initiated read if page not in use (i.e. age field < 10).
33-34	CSTPST	Special page state
35	CORMB	

PLK CNT = LOCK COUNT MASK

Description: Core Status Table 2 (Home Map Location). This table, indexed by physical page number, is referenced only by the software and is parallel to CST0. It contains the home map location for the page (i.e., the page table which contains the core address pointing to the page). If the left half is 0, the home map is the SPT and the right half contains the SPT index. If the left half is not 0, the home map is a page table or index block, where PTN is the SPT index of that map and PN is the page number within that map.

Referenced in: PAGEM

[illegible]

Name: CST3

Description: Core Status Table 3. This table, indexed by physical core page number, is referenced only by the software and is parallel to CST0. An entry in this table is used for a variety of purposes, generally as a list pointer for groups of pages on various queues. For example, when on the replaceable queue, the left half and right half contain backward and forward list pointers, respectively. When on a swapping device queue, the right half contains a forward list pointer and B0 is 1 if write and 0 if read.

When the page is in use (not linked on one of the queues) it contains the local disk address for PHYSIO and the fork # assigned to the page.

Defined in: STG

Referenced by: PAGEN, PHYSIO, SCHED

Format

CST3	Backward List Pointer		Forward List Pointer		Physical Page #
	or				
			Forward List Pointer		
	or				
	CSTOPK		CSTLDA		
	Flags	Fork #	Local Disk Address		
	.				
	.				
	.				
	.				
	.				
	.				
	.				

1	1	1	1	CSTOPK		1	CSTLDA	
1	1	1	1		Fork #	1		Local Disk Address

MASK			
Symbol	Bits	Mask	Content
DWRBIT	0		Write in progress. This bit is 1 if the page was referenced and assigned while a write to the swapping storage was in progress. The bit is cleared by the swapper when the write completes.
SWPERR	1		Set if an unrecoverable error occurred when reading in this page from disk/drum
DSKSWB	2		Swap to disk requested by DDMP (periodic routine that trickles file pages to the disk) or by monitor when certain monitor calls are issued, e.g., CLOSF
	3-14	CSTOPK	Process to which this page is assigned (7777 if not assigned).
	15-35	CSTLDA	Local disk address

[illegible]

Description: Device Characteristics Table. This table contains indexed information about each device unit and is initialized from the INIDVT table at system startup time. See INIDVT table for bit definitions.

Referenced by: DEVICE, DISC, GTJFN, JSYSA, JSYSP, MEXEC

[illegible]

Name: DEVCH1

Description: Device Characteristics Table 1. This table, contains another word of information about each device unit in the system and is initialized from the INIDVT table at system start up time.

Defined in: STG

Referenced by: DEVICE, DISC, GTJPN, JSYSA, JSYSF

Format

DEVCH1	Device Characteristics (word 2)		/\
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!
	.	!	!\

Symbol	Bit	Content
DI&SPL	0	Device is spooled
DI&ALC	1	Device is under control of allocator
DI&VVL	2	Volume valid
DI&NIU	3	Device slot not is use
DI&INI	4	Device is being initialized (currently for structures only)

Name DEVCH2

Description: Device Characteristics Table 2. This table contains spool directory information and is parallel to the DEVCH1 table.

Defined in: STG

Referenced by: DISC, JSYSA

Format

[illegible]

[illegible]

Name: DEV'DTB

Description: Dispatch Table. Each device has its own dispatch table that conforms to the format described below. An error return dispatch address is placed in those words which have no corresponding device function. The naming convention for these tables is the device name concatenated with DTB (i.e. MTADTB, DSKDTB, TTYDTB, etc.)

Defined in: PROLOG

Referenced by:

Format

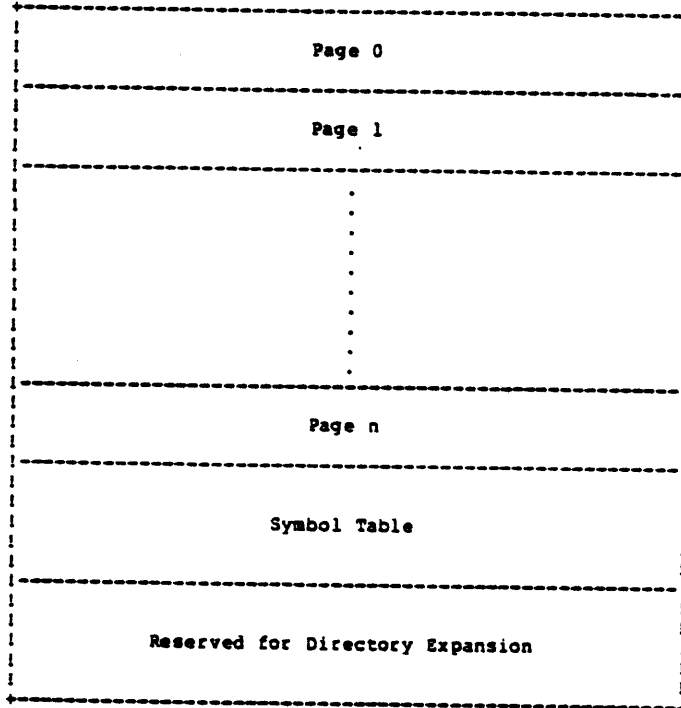
DLUKD	Directory Setup
NLUKD	Name Lookup
ELUKD	Extension Lookup
VLUKD	Version Lookup
PLUKD	Protection Insertion
ALUKD	Account Insertion
SLUKD	Status Modification
OPEND	Open File
BIND	Sequential Byte Input
BOUTD	Sequential Byte Output
CLOSD	Close File
REND	Rename File
DELD	Delete File
DMPID	Dump Mode Input
DMPOD	Dump Mode Output
MNTD	Mount
DSMD	Dismount
INDD	Initialize a Directory
MTPD	MTAPE Operations
GDSTD	Get Device Status
SDSTD	Set Device Status
RECOUT	Force Record Out (SOUTR)
RFTADD	Read File Time and Date
SFTADD	Set File Time and Date

[illegible]

[illegible]

Name: DIRECTORY
Description: Directory Format. The following illustrations show the format of a TOPS-20 directory.
Defined: PROLOG
Referenced by: DIRECT, DISC, DSKALL

Overview of a Directory



First Page of a Directory

0	17	18	23	24
DRTP	400300	DRVER	DRHLN	
		Ver. #	Length of Header	
DRRPW		DRNUM		
Relative Page # in DIR		Directory Number		
DRFPB	Pointer to First Free Block			
DRSBT	Address of Bottom of Symbol Table			
DRSTP	Address of Top of Symbol Table			
DRFTP	Address of Last Used Word+1 for Strings and PDBs			
DRFBT	Pointer to Free Bit Table			
DRDPW	Default File Protection			
DRPRT	Default Directory Protection			

DRDBK	Backup Specification
DRLIQ	Logged In Quota
DRLOQ	Logged Out Quota
DRDCA	Current Directory Allocation
DRNAM	Pointer to Directory Name String
DRPSW	Pointer to Password String
DRPRV	Privilege Bits
DRMOD	Mode Bits
DRDAT	Date and Time of Last LOGIN
DRGDP	Pointer to User Group List
DRDGP	Pointer to Directory Group List
DRUDT	Date and Time of Last Update to Directory
Spare Words	
Free Space for Strings and FDBs	

Subsequent Directory Pages

DRITYP	400300	DRVER	DRHLN
		Ver. #	Length of Header
DRRPN		DRNUM	
Relative Page # in DIR		Directory Number	
DRFPB	Pointer to First Free Block		
Free Space for Strings and FDBs			

Symbol Table

```

SYMTY      SYMDN
400400      Dir. # of Sym.Tbl.
-1
SYMETI  SYMAD
Type 1      Address of FDB
SYMVL
First 5 Characters of Name or Account
.
.
.
.
.
.

```

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+-----+
!      !
!Type !                      Address of FDB      !
+-----+

```

Bits	Pointer	Content	
0-2	SYMET	Entry Type	
		0 = .ETNAM	Name
		2 = .ETUNS	User Name
		4 = .ETACT	Account
3-35	SYMAD	Address of FDB	

User Name String

UNTYP	400004	UNLEN	Length
UNSHR	Share Count of User Name String		
UNVAL	ASCII User Name String		

Name String

NMTYP	400001	1	NMLEN
		1	Length
NRVAL	ASCII Name String		

Extension String

EXTYPE	400002	EXLEN	Length
ASCIZ Extension String			

Account String

ACTYP	400003	ACLEN	Length
ACSHR	Share Count		
ACVAL	ASCIZ Account String		

Free Space

FRTYP	400500	FRVER	FRLEN	Length
FRNFB	Pointer to Next Free Block/0 if at end			
Remainder of Free Block				

Free Bit Table

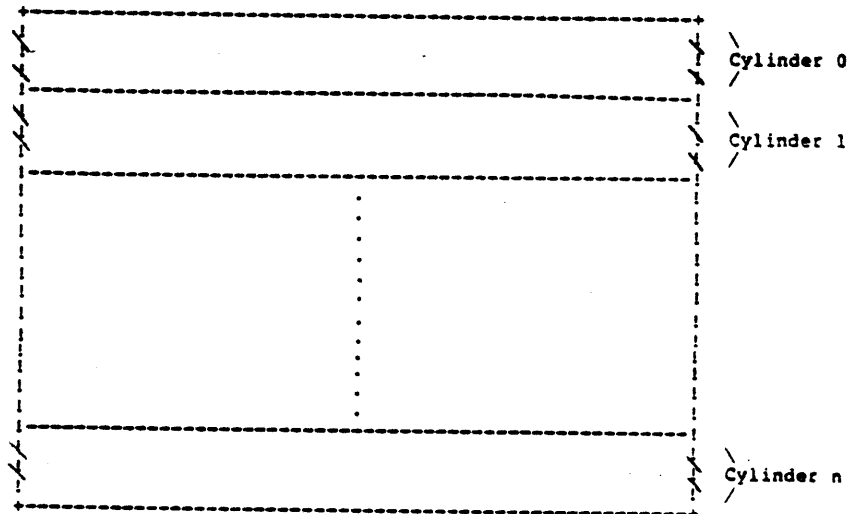
400600	Ver. #	Length
Bit Table Containing 1 Bit per Directory Page		
0 = No Room on the Page		
1 = There is Room on the Page		

Group List

400700	Ver. #	Length
Group #	Group #	
Group #	0	

Name: DRMBBT
Description: Drum Bit Table. This bit table indicates which pages are in use and which pages are available in the swapping area.
Defined in: STG
Referenced by: SWPALC

Format



Note: The bit map for each cylinder starts on a word boundary and contains as many full words as are needed for all of its pages.

DRMCWT	Drum Free Page Count - Cylinder 0	
	.	
	.	
	.	
	.	DRMMXB
	.	
	.	
	Drum Free Page Count - Cylinder n	

Name: DSKSIZ

Description: Disk Size Pointer Table. This table contains pointers to the disk size data tables. DSKSIZ is parallel to DSKUTP which contains codes for the known disk types. When an entry is added to DSKUTP, a corresponding entry must be added to DSKSIZ to point to the correct size data for that type of disk.

Defined in: STG

Referenced by: DSKALC

Format

DSKSIZ	+		+
		Pointer to RP04 Table DSKSZ0	
		Pointer to RP05 Table DSKSZ0	
		Pointer to RP06 Table DSKSZ1	
	+		+

Name: DSKSZ'n

Description: Disk Size Table (for type n). The resident table contains size data (for disks) based on type.

n = 0 for RP04 and RP05
n = 1 for RP06

Defined in: STG

Referenced by: DSKALC

Format

DSKSZ'n/SEPGG'n	Sectors per Page
SECCY'n	Sectors per Cylinder
PAGCY'n	Pages per Cylinder
CYLUN'n	Cylinders per Unit
SECUN'n	Sectors per Unit
BTWCY'n	Bit Words in Bit Table per Cylinder
MINFP'n	Minimum Free Pages for Free Choice Allocation

Name: DSKUTP

Description: Disk Unit Type. This table contains the unit types used by the file system.

Defined in: PHYSIO

Referenced by: DSKALC

Format

DSKUTP	-----	
		RP04 Disk Unit Code (.UTRP4 = 1)

		RP05 Disk Unit Code (.UTRP5 = 5)

		RP06 Disk Unit Code (.UTRP6 = 6)

Description: Drum Status Table. This table is indexed as a function of the drum (swapping space) address. The routine GDSTX converts a drum address into a DST index. The DST holds the address of the next lower level of storage (usually disk) for the page stored at that address on the drum.

BWRBIT (bit 11) indicates if the page has been changed since being read from the lower level storage. The page will only be copied back on to the lower level storage if BWRBIT is set (i.e., page modified) when the page is no longer in use. A slot no longer in use contains a -1.

Referenced by: PAGEM

[illegible]

Name: DTE
Description: Storage area for DTEs
Defined in: STG
Referenced by: DTESRV, APRSRV, MEXEC, SCHED

Format

UPFLAG	Word to Generate Continued Message
LOAD11	Page to do -11 Reboot
LODFRK	Handle of Monitor Fork Doing -11 Reboot
DTEDTE	The Interrupting DTE
CTYUNT	PE Physical Unit for TS TTY
	Driver Queue Header for DTE 1
DTEQS	.
	Driver Queue Header for DTE n
COMQ	Area for Queue Packets
COMH	Queue Header
DTESTS	DTE 1 Status Word
	.
	DTE n Status Word
DTEST	DTE 1 Secondary Status Word
	.
	DTE n Secondary Status Word
DTEBFF	Buffer Pool (2 buffers/DTE)
DTEFWD	Header Word for DTE 1 Buffer
	.
	Header Word for DTE n Buffer
	Interrupt Return PC
DTESKP	Local PDL Stack
DTEACB	Block to Save ACs
DTEIND	Storage for Indirect Function for DTE 1
	.
	Storage for Indirect Function for DTE n
PKTADR	Storage for Queue Packets (1/DTE)
COMBUP	Communications Region for All DTEs
TAD11	Time Packet from -11 (3 words)
TOLL1M	Time Packet to -11 (3 words)

Name: DTEDTV
Description: Protocol Device Dispatch Table.
Defined in: STG
Referenced by: DTESRV

Format

DTEDTV	Reserved for Unknown Device	
	TTYDTV	
	TTYDTV	
	TTYDTV	
	TTYDTV	
	LPTDTV	
	CDRDTV	
	FEDTV	

[illegible]

Name: FDB

Description: File Description Block. All attributes of a file are stored in its description block (FDB) maintained in the file's directory. An FDB is built in the directory's free space area when a file is created.

Defined in: PROLOG, MONSYM

Referenced by: DISC, DIRECT, DSKALC, GTJEN, JSYSA, JSYSP, FILINI, LINEPR, IO, SYSERR, DTESRV

	10		17:18	23:24	35
	FBTYP		FBVER	FBLFN	
.FBHDR	400100		Ver. #	Length	
	FBFLG				
.FBCTL	Flags				
	FBEXL				
.FBEXL				Link to FDB of Next Extension	
	FBADR				
.FBADR				Disk Address of File's Index Block	
	FBPRT				
.FBPRT	500000			File Access Bits	
	FBCRE				
.FBCRE				Date and Time of Last Write to File	
	FBWNO		FBATO		
.FBUSE	DIR # of Last Writer		DIR # of Author		
	FBAUT				
.FBAUT				Pointer to Author String	
	FBLWR				
.FBLWR				Pointer to Last Writer String	
	FBGEN		FBDNR		
.FBGEN	Generation Number		Directory Number		
	FBACT				
.FBACT				500000,,0 + Account Number or Pointer to Account String	
	FBGNR	516	111	114	17:18
.FBBYV	# Gens.	FBBSZ	Size	FBMOD	FBNPG
					Page Count
	FBSTZ				
.FBSTZ				# of Bytes in File	
	FBCRV				
.FBCRV				Date and Time of Creation	
	FBWRT				
.FBWRT				Date and Time of Last User Write	
	FBREF				
.FBREF				Date and Time of Last Monwrite Access	
	FBWNR		FBNRF		
.FBCNT	# of Writes		# of References		
	FBDK0				
.FBDK0				Backup Word #1	
	FBDK1				
.FBDK1				Backup Word #2	
	FBDK2				
.FBDK2				Backup Word #3	
	FBDK3				
.FBDK3				Backup Word #4	
	FBDK4				
.FBDK4				Backup Word #5	
	FBUSW				
.FBUSW				User Settable Word	
	FBGNL				
.FBGNL				Link to FDB of Next Generation	

.FBNAM	FBNAM	Pointer to File Name Block
.FBEXT	FBEXT	Pointer to Extension Block
.FBLWR		Pointer to Last Writer String

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35	
.FBCTL	1	1	1	1	1	1	1	1	1	1																	

Symbol	Bits	Pointer	Content
FB&TMP	0		File is temporary
FB&PRM	1		File is permanent
FB&EX	2		No extension for this file yet; file doesn't really exist.
FB&DEL	3		File is deleted
FB&NXF	4		File doesn't exist (first write not complete)
FB&LNG	5		Long file
	6		Reserved for DEC
FB&DIR	7		File is a directory
FB&NOD	8		File is not saved by backup system
FB&BAT	9		File may have bad pages
FB&FCF	14-17		File class field 0 = .FBNRM Not an RMS file 1 = .FBRMS RMS file

Note: See Monitor Call's Reference Manual (Chapter 2) for more information.

Name: FE

Description: Storage area for front end devices. Each entry is FEN words long (except FEUNVW), where FEN equals the number of front end devices.

Defined in: STG

Referenced by: PESRV

Format

FEUBDO	Flags	FEFEM	FEFRK
		FE Alloc	Fork # Owning Device
FEUDB1	FEICT	FEICH	PEPEI
	Current Input	Maximum Input	Bytes Now in FE
	Byte Count	Byte Count	
FEUDB2	PEIPT	Input Byte Pointer	
FEUDB3	FEIBF	FEOPF	
	Input Buffer Address	Output Buffer Address	
FEUDB4	Input Input Pointer		
FEUNVW	10 21	Input Input Pointer	
	1# FEs		

The buffer area for the front end is in the monitor's nonresident address space.

FEUBFF	1 Page in Length
--------	------------------

	0 1 2 3 4 5	12	17
FEUDB	1 1 1 1 1	FEFEM	FEFRK
	1 1 1 1 1	FE Alloc	Fork # Owning Device

Bit(s)	Pointer	Content
0-1	FEDTE	DTE owning this device
2	FEBLK	Unit is blocked
3	FEPSST	Waiting for DTE Post
4	FEOPF	Input EOF declared by FE
5	FEVDT	FE assignment is valid
12-17	FEFEM	FE Allocation
18-35	FEFRK	Fork # owning device

Description: Fork Core Number Table. This table, indexed by fork #, contains the core number (given when a process enters the balance set) for each fork. The core number is used to set a corresponding bit in the pager's process use register (PUR) when the fork is chosen to run.

Referenced by: PAGEM, SCHED

[illegible]

Description: Fork Interrupt Table. This table, indexed by fork #, contains the pseudo-interrupt communication register for each fork. The left half of each entry contains bits recording the type of request. The symbols for these requests have right half bit assignments (i.e. bits 20-31) but are tested against the left half of the table.

Defined in: STG

Referenced by: TTYSRV, FORK, MEXEC, SCHED

Format

[illegible]

Symbol	Bit	Content
	0	Interrupt Request(s) pending
	1	Fork not interrupttable
NEWFKF (B20)	2	Initiate new fork
NEWJBF (1B21)	3	Initiate new job
PSIIF (1B22)	4	Channel interrupt requested in FKINTB
PSIT1F (1B23)	5	Terminal code Interrupt, Phase 1
PSIT2F (1B24)	6	Terminal code Interrupt, Phase 2
SUSFKR (1B25)	7	Suspend fork request
PSIWT (1B26)	8	Job was in wait state
PSILOB (1B27)	9	Logout job request
FRZB1 (1B28)	10	Direct freeze has been done
FRZB2 (1B29)	11	Indirect freeze has been done
PSICOB (1B30)	12	Carrier off action request
PSITLE (1B31)	13	Time Limit Exceeded interrupt

[illegible]

Description: Fork Number of Reserve Pages Table. This table, indexed by fork #, contains in the right half the current reserve working set size for each fork. Also, it contains in the left half the current age stamp (to be loaded into the pager's age register when the fork is chosen to run) and the age stamp value at the last time local garbage collection (removal of less frequently used pages) took place for the fork.

Referenced by: PAGEM, SCHED

[illegible]

[illegible]

[illegible]

Description: Fork List Pointer Table. This table, indexed by fork #, gives the chain of forks for each list of forks in the system. That is, it holds the linked list of forks on TTILST, CLKLST, GOLST, etc. A fork is either on one of the wait-lists or the go-list. The right half contains the list pointer to the next fork on the same list and the left half contains WTLST or GOLST. If the left half contains WTLST, the type of wait-list can be obtained from the right half of FKQ2.

Referenced by: APRSRV, FORK, MEXEC, PAGEM, SCHED

fork# = index

[illegible]

GOLST

WTLST - some want list, not nec. WTLST

[illegible]

Description: Fork Run Queue Table 2. This table, indexed by fork #, contains the queue level number and fork location [i.e., list address (TTILST, (GOLST, etc.) or BALSET table index] for each fork.

Referenced by: PAGEM, SCHED

[illegible]

Description: Fork Status Table. This table, indexed by fork #, gives the address of each blocked fork's test routine which when called determines if wait satisfied has occurred for the fork.

Referenced by: DIRECT, FORK, SCHED

[illegible]

Name: PKTIME

Description: Fork Time Table. This table, indexed by fork #, gives the time of day (TODCLK) at which each fork was put on its current run queue.

Defined in: STG

Referenced by: SCHED

Format

[illegible]

[illegible]

Name: HOM

Description: Home Block. Block on each disk unit which contains vital statistics that cannot be built in when a monitor is generated. These are primarily parameters of the unit and the STR to which it belongs.

Defined in: DSKALC

Referenced in: DSKALC, PHYSIO, JSYSA

HOMNAM	SIXBIT/HOM/
HOMID	SIXBIT/Unit ID/
HOMPHY	Physical Disk Address of This Home Block Physical Disk Address of Other Home Block
HOMSNM	SIXBIT/Structure Name/
HOMLUN	# of Packs in STR Logical Unit # Within STR
HOMBOM	Block # of This Home Block Block # of Other Home Block
HOMP4S	# of Pages for Swapping on This Structure
HOMFST	First Swapping Track on Unit
HOMRXB	Address of Index Block of ROOT-DIRECTORY
HOMBXB	Address of Index Block of BACKUP-COPY-OF-ROOT-DIRECTORY
HOMFLG	Flags
HOMSIZ	Number of Sectors in This Unit
HOMBTB	Number of Tracks in Structure
HOMNID	Pack Unique Code
HOMFEO	Front End File System (sector #)
HOMFEL	Front End File System (# of sectors)
	Reserved for Expansion
HOMUID	12 Character Unit I.D. (PDP-11 Format)
HOMOID	12 Character Owner I.D. (PDP-11 Format)
HOMFSN	12 Character File System Name (PDP-11 Format)
HOMCOD	0 1 707070
HOMSLF	0 1 This Block #

Name: HOME
 Description: Home Table. This table contains the disk pages for the HOME and BAT blocks and the 11 Bootstrap program.
 Defined in: STG
 Referenced by: DSKALC

Format

HOME	0 (11 Bootstrap)
	1 (Home Block)
	2 (BAT Block)
	3 Reserved
	4 .
	5 .
	6 .
	7 .
	10 .
	11 .
	12 (Secondary Home Block)
	13 (Secondary Home Block)

Description: This table contains the logical to physical mapping (channel and unit) per logical unit, and its length equals the maximum number of packs in a structure.

Referenced by: DSKACL

[illegible]

Name: IDXFIL
 Defined in: PROLOG
 Referenced in: FILINI, DIRECT

Description: The Index table of the structure currently mapped for a process. Each structure has an index table file. The file is indexed by 2* directory number as each entry is two words long. For each directory on the structure, an entry will contain the address of the FDB for the directory and the disk address of the index block for the directory.

The table, IDXFIL is mapped from the file STRNAM:<ROOT-DIRECTORY>INDEX-TABLE.BIN into the PSB area. When a structure is mounted (physically) the system gets on OFN for this file and stores it in entry, STRIDX, in the SDB table for that structure. The table entries are created at this time (mount-time).

Format	
IDXFIL:	/ \
.	
.	
.	
Address of FDB	Dir No.*2
Disk Address of Index Block	
.	
.	
.	
	\ /

Name: INDEX

Description: The Index Block (1 page) exists for each disk file and contains pointers to where each of the file's pages resides on disk. If more than one index block is needed for non-directory files, a super index block (1 page) is created which points to the home disk address of each index block. (Note that the maximum file size is 512*512 pages.)

When the file is referenced, an in-core copy of the index block is maintained which keeps track of the file's active pages in the system. (i.e. Whether the pages are in-core, on the swapping area, or on disk.)

Defined in:

Referenced by: PAGEM, PHYSIO

Format

0	8	
C		Storage Address
H		
0	E	8
	C	
	K	Storage Address
0		8
	S	
	D	Storage Address
0	M	8
		Storage Address
		Storage Address
		.
		.
		.
		Storage Address

Name: INIDEV
Description: Initialize Devices. This table contains calls to initialize devices after loading the swappable monitor.
Defined in: STG
Referenced by: FILINI

Format

INIDEV	+		
		CALL MTA	
		CALL LPT	
		RET	
	+		

Description: Device Initialization Table. This static table generated at assembly time, contains a 4 word block for each type of device on the system. It is used at system startup time to initialize the device tables, DEVCHR, DEVCHI, DEVNAM, & DEVUNT.

Referenced by: DEVICE

SIXBIT/Name/		
Device # = 0	!	DISPATCH ADR.
CHAR1! <TYPE>B17!		Modes
CHAR2 + Number of Units		
	.	
	.	
	.	
	.	
	.	
	.	
	.	
	.	
	.	
Name		
Device # = n	!	Disp Adr.
Char1 ! <TYPE>B17 !		Modes
Char2 + Number of Units		

Symbol	Bit	Meaning
DV%OUT	0	Can do output
DV%IN	1	Can do input
DV%DIR	2	Has a directory
DV%AS	3	Is assignable
DV%MDD	4	Is a multiple directory device
DV%AV *	5	Is available to this job
DV%ASN *	6	Is assigned by ASD
DV%MDDV	7	Is a mountable device
DV%MT *	8	Is mounted

Symbol	Value	Meaning
.DVDSK	0	Disk
.DVMTA	2	Magnetape
.DVPTP	5	Spooled PTP
.DVLPT	7	Spooled & physical line printer
.DVCDR	10	Spooled & physical card reader
.DVFE	11	Front End Device
.DVTTY	12	Terminal
.DVPTY	13	Pseudo TTY
.DVNUL	15	Null Device
.DVPLT	17	Spooled Plotter
.DVCDP	21	Spooled Card Punch

MODES can be a combination of the following:

Symbol	Bit	Meaning
DV%M0	35	Can be opened in mode 0
DV%M1	34	" 1
DV%M2	33	" 2
DV%M3	32	" 3
DV%M4	31	" 4
DV%M5	30	" 5
DV%M6	29	" 6
DV%M7	28	" 7
DV%M10	27	" 10
DV%M11	26	" 11
DV%M12	25	" 12
DV%M13	24	" 13
DV%M14	23	" 14
DV%M15	22	" 15
DV%M16	21	" 16
DV%M17	20	" 17

CHAR2 can be a combination of the following:

Symbol	Bit	Meaning
Dl%SP	0	Is spooled
Dl%ALC *	1	Is under control of allocator
Dl%VVL *	2	Volume valid
Dl%NIU *	3	Device slot not in use
Dl%INI *	4	Device is being initialized (currently for structures only)

* These bits are zero at assembly time and are set by the monitor when appropriate in their corresponding device tables. (i.e. DEVCHR or DEVCH1)

Name: INIDV1
Description: Device initiation for front end devices.
Defined in: STG
Referenced by: DTESRV

Format

INIDV1	+	-----	+
		CALL FE	
		CALL CDR	
		RET	
	+	-----	+

Name: IORB

Description: I/O Request Block. Whenever a request for massbus I/O (i.e. DSK or MTA) occurs, an IORB is built for that request. It is of the long form described below for magtape requests and special disk I/O. However, the most common IORB format for disk I/O is a one word IORB, consisting of just the status word, IRBSTS, and stored in the CST5 table.

Defined: PHYPAR

Referenced by: PHYSIO, STG

Format

IRBSTS	Status	IRLNK	Next IORB
IRBMOD	Mode, Priority, Density, Parity		
IRBCNT	Count of Bytes Transferred		
IRBXFL	IRBTL	IRBHD	Transfer List Tail
IRBIVA	Address of Termination Routine		
IRBAOR	Physical Device Address (if needed)		
IRBLEN	Device Dependent Data		

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
IRBSTS	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Symbol	Bits	Pointer	Content
IS.SHT	0		Short form (PAGEM) request
IS.DON	1		Done with this job
IS.ERR	2		Error on this operation
IS.NRT	3		No more retries
IS.WGU	4		Wrong unit interrupted
IS.TPM	5		Hit tape mark
IS.EOT	6		On write only, hit physical EOT
IS.WLK	7		Write locked
IS.IER	8		Inhibit error recovery
IS.DER	9		Data error
IS.HER	10		Hardware error on device
IS.BOT	11		Hit BOT
IS.ATL	12		Record too long (buffer too small)
IS.IEL	13		Inhibit error logging
	14-17	IFSCN	Function code
	18-35	IRLNK	When referring to link

Function Codes for ISFCN

Symbol	Code	Function
IRPRD	1	Read data
IRPRDF	2	Read data and format (count, key, header)
IRPWRT	3	Write Data
IRPWTF	4	Write format
IRPSEK	5	Seek
IRFFSB	6	Forward space block
IRBSSB	7	Backspace block
IRPWTM	10	Write tape mark
IRFERG	11	Erase gap
IRPREW	12	Rewind
IRPRUN	13	Rewind and unload
IRPRDR	14	Read reverse
IRPRCR	15	Recovery read

```

      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
      +-----+
IRBMOD |-----|-----|-----|-----|-----|-----|-----|-----|-----|
      +-----+

```

Bits	Pointer	Content
15-17	IRBDM	Data Mode
27-30	IRBPRI	Priority
31	IRBPAR	Parity
32-35	IRBDN	Density

Data Modes for IRBDM

Symbol	Code	Meaning
IRMWRD	1	Word mode
IRM6BT	2	Six bit
IRM7BT	3	Seven bit
IRM8BT	4	Eight bit
IRMMAX	5	Maximum legal mode

If device is disk, IRBLEN becomes:

```

IRBLEN |-----|-----|-----|-----|-----|-----|-----|-----|-----|
      |             Transfer List             |
      |-----|-----|-----|-----|-----|-----|-----|-----|
      |             0             |
      +-----+

```

If device is magtape, IRBLEN becomes:

```

MTIRSD |-----|-----|-----|-----|-----|-----|-----|-----|-----|
      |   Flags   | Unit No. | IPtr to Buffer of Page Ptrs |
MTIRBL |-----|-----|-----|-----|-----|-----|-----|-----|
      |             | Original Count |
      |-----|-----|-----|-----|-----|-----|-----|-----|
      |             Transfer List             |
      +-----+

```

```

      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
      +-----+
MTIRSD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
      +-----+
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|
      |             | Unit No. | | IRBPA |-----|-----|-----|-----|-----|
      |-----|-----|-----|-----|-----|-----|-----|-----|-----|
      |             | Ptr to Buffer of Page Ptrs |
      +-----+

```

Bits	Pointer	Content
0	IRBPR	Buffer ready for use
1	IRBFO	Current buffer flag
2	IRBFA	Active flag, IORS being filled or emptied by service routine
3	IRBAS	ICRS aborted due to an error
4	IRBFF	IOBS free
9-17	IRBUN	Unit number
18-35	IRBPS	Pointer to buffer of page pointers

Description: Job Directory Table. This table, indexed by job #, contains the number of the attached directory and the login directory for each job.

Referenced by: APRSRV, TTYSRV, DIRECT, DISC, DTESRV, FILINI, IPCF,
JSYSA, MAGTAP, MEXEC

[illegible]

Name: JOBNAM

Description: Job Name Table. This table, indexed by job #, contains an index into the subsystem name tables (SNAMES, STIMES, etc.) indicating what subsystem, if any, each job is running. The name index is for statistics only and is not used by the monitor.

Defined In: STG

Referenced by: FORK, MEXEC, PAGEM, PHYSIO, SCHED

Format

JOBNAM	!!!	!	Name Index	!	/ \
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!
		.		!	!

Bit	Pointer	Content
0	DIAFL	Job has DIAG resource
1	HIBFL	Flag used by HIBER JSYS. If set, implies a wakeup signal to THIBR

Name: JOBPNM
Description: Job Program Name. This table, indexed by job #, contains each job's program name.
Defined In: STG
Referenced by: DTESRV, IPCP, MAGTAP, MEXEC

Format

JOBPNM	Program Name		/ \
	.		
	.		
	.		
	.		
	.		
	.		
	.		
	.		
	.		
	.		
	.		
			\ /

Name: JOBPT

Description: Job Process Table. This table, indexed by job #, contains the number of the controlling terminal, or -1 for a detached job, and the index of the top fork of the job.

Defined in: STG

Referenced by: TTYSRV, DEVICE, FILMSC, FORK, IO, IPCF, JSYSA, MEXEC, SCHED

Format

JOBPT	+-----+-----+		/ \
	Controlling Terminal Top Fork Index		
	+-----+-----+		
	+-----+-----+		
			\ /

Name: **JOBRT**

Description: Job Runtime Table. This table, indexed by job #, contains the total runtime of each job (sum of all forks) in milliseconds. If a word contains a -1, the job does not exist.

Defined in: STG

Referenced by: ENQ, FORK, IPCF, JSYSA, MEXEC, SCHED

Format

[illegible]

Name: JOBRTL

Description: Job Runtime Limit. This table, indexed by job #, contains each job's runtime limit.

Defined in: STG

Referenced by: FORK, JSYSA, MEEXEC, STG

Format

JOBRTL	Runtime Limit		/ \
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
		\ /	

Job #

Name: JSB
Description: Job Storage Block
Defined in: STG
Referenced by: PAGEM, SCHED, FORK

Format

JOBMAP	Object Map for Job-Common Area
SYSFK	Job Fork Index to System Fork Index
FKPTRS	Fork Pointers (Structure)
FKPSIE	Term Interrupt Enabled Word
FKDPSI	Deferred Term Interrupts Mask
PREJFK	Free Job Fork Slot List
FKLOCK	Lock for Fork Structure Modification
CTRLTT	Line Number of Controlling TTY
TTSPSI	Code Enabled Anywhere in This Job
TTSDPS	Term Int Code Deferred
TTJTIW	Terminal Interrupt Enable Mask
CONSTO	Console Time On
ACCTPT	Account Number + 582 or Account String Pointer
LOGBUF	Login-Out EFACT Data (must precede ACCTSR)
ACCTSR	Account String
USRNAM	User Name String
JFNLCK	Lock to Prevent Tampering with JFNs
MAXJFN	
ENQLST	ENQ Quotas and Pointer to ENQ Q List
LNTABP	Pointer to Logical Name Table
LNMLCK	Lock for Logical Name Data Base
JOBUNT	Connected Disk Unit
JBCLCK	Lock for ASGPAG
JBCOR	Page Allocation Bit Table for Job Storage Area
JSBFAE	Ptr. to 1st Free Block 0
	Lock
	Space Counter
	Most Common Block Size
	Temp
	Temp
JSPREE	Free Storage Area in Job Block
JSSTRT	JSSTRT JSSTN
	Flags Structure Unique Code
	JSGRP
	AOBJN Pointer to List of Groups
	JSADN
	Unused Accessed DIR for This STR

/ \
! !
! !
! !
Job area
free
storage
header
! !
/ \

	(3 Words per Structure)
JSSTLK	Lock on the JSSTRT Block
JSBSDN	JSUC ! JSDIR Connected STR Unique Code ! Directory #
ACCTSL	
MODES	DDBMOD Word from LOGIN
GROUPS	Groups to Which LOGIN User Belongs
RSCNPT	RESCAN Pointer
RSCNBP	Ptr. to RESCAN Buffer (max. size is 777)
JSINFO	PID of Private <SYSTEM>INFO for JOB
JSCDR	Next Version # (or -1) ! Adr. of Spool Set String
JSBTLW	! TLECHN ! TLEFRK Fork to Interrupt! !Channel #! on Time Limit Exceeded
JSMTAL	MTA Parity, Density, Mode, and Default Record Size
JBFLAG	Spooler Flags !
JSPSTK	Stack of Things to be Done on Fork Cleanup
JSPLCK	Lock for This JSPSTK Structure
JFNx	JFN Descriptor Block
	.
	.
	.

Each JFN uses a block of 18 words. (Since JFNs can grow beyond the end of the JSB into successive pages, the JFN blocks must be the last storage defined in the JSB.)

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+
JSSTRT ! ! ! ! ! JSSTN !
! ! ! ! ! Structure Unique Code !
+-----+

```

Bit	Pointer	Content
0	JSSDM	Structure is dismounted
1	JSMCI	Mount count has been incremented by structure
2	JSXCL	Structure is mounted exclusively by the structure

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+
JSBTLW ! ! ! ! ! TLECHN ! TLEFRK Fork !
! ! ! ! ! Channel # !to Interrupt on Time Limit Exceeded !
+-----+

```

Bits	Pointer	Content
12-17	TLECHN	Channel number
17-35	TLEFRK	Fork to interrupt on time limit exceeded

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+
JSMTAL ! ! ! ! ! JSMTD !JSMTM ! JSMTM ! JSMTM !
! ! ! ! ! Density! Mode ! Default Record Size !
+-----+

```

Bits	Pointer	Content
10	JSMTM	Parity
11-14	JSMTD	Density
15-17	JSMTM	Mode
18-35	JSMTM	Default record size

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+
JBFLAG ! ! ! ! !
+-----+

```

Symbol	Bits	Pointer	Content
SP1BAT	0		
SP1BAT	0		Job is being controlled by BATCH
SP1DFS	1		Spooling is deferred
	18		Job has been in the mini-exec

JFN descriptor block format:

FILBYT(1)	Byte Pointer to Current Window		
FILBYN(2)	Byte # of Current Byte		
FILLEN(3)	Total File Length in Bytes		
FILCNT	Bytes Remaining in Current Buffer		
FILLCK	File Lock Word		
FILWND(4)	Current Page #	!Location of Current Window	
FILSTS	File Status Bits	Status	! Mode
FILDEV	STR	Structure Number	!DEV'DTB (i.e.Dev Disp. Tbl)
FILOFN	OPN for This File	! OPN of Long File PT Table	
FILLFW(5)	Count of Pages Mapped	! Loc. of Page Table Table	
FILDDN	!Ptr. to Device String Block!		Directory #
FILDNM	Directory Name String		!
FILNEN	File Name String Blk. Ptr.		! Ext. String Blk. Ptr.
FILVER	Fork # of JFN Originator		! Version #
FILMS1	FILDMS	FILNMS	
	Directory Wild Mask	! Name Wild Mask	
FILMS2(6)	FILEMS	!	
	Extension Wild Mask	!	
FILFDB	Address of FDB in the Directory		
FILCOD	FILUC	FILPO	
	STR Unique Code	! PTO OPN for Long File	

These definitions are used in the above positions only during the GTJFN procedure:

- (1) FILTMP / Ptr. to temp string block for default ,, Ptr. to temp string block
- (2) FILPTR / Ptr. to protection string or protection #
- (3) FILACT / Ptr. to account string or account #
- (4) FILOPT / Byte ptr. to store string in GTJFN
- (5) FILNM / Ptr. to RTEXT buffer ,, Ptr. to logical name chain **
- (6) FILIDX / 0 ,, Index into device tables for original devices GTJFNd (i.e., doesn't change during spooling)

** Logical Name Header Format

LNNCNT	!!	LNMSTP
Depth Count	!!	Step Counter
LNNLNK		LNMPT
Link to Next BLK		Logical Name String Ptr

Bits	Pointer	Content
0-17	LNNCNT	Depth count for logical names
18	LNMIDX	Index into logical name tables
19-35	LNMSTP	Step counter at time of chaining
0-17	LNNLNK	Link to next chain block
18-35	LNMPT	Pointer to logical name string

Name: KDB
 Description: Kontroller Data Block (TM02 only)
 Defined in: PHYPAR
 Referenced by:

Format

KDBSTS	+	-----	+
		Flags ! Unit Type	
KDBIUN		-----	
		Initial AOBJN Word to UDB Table	
KDBSCUN		-----	
		Current AOBJN Word to UDB Table	
KDBDSP		-----	
		Dispatch for Service Routine	
KDBUDS	\	-----	\
	\	UDS Table (8 words long)	\
KDBDDP	\	-----	\
	\	Start of Device Dependent Code	\

	+	-----	+

Referenced by: LINPR

Symbol	Bits	Pointer	Content
	0-11	LPTPE	Bytes now in front end
	12-23	LPTMX	Maximum bytes allowed in front end
LP&LHC	24	LPLHC	Loading-has-completed flag for RAM or VFU
LP&HE	25	LPTHE	Hard error on this LPT:
LP&OBF	26	LPOBF	Output is being flushed
LP&HWS	27	LPHWS	MTOPR is waiting for a status to arrive
LP&ER	28	LPTER	LPT had an error
LP&OL	29	LPTOL	LPT on-line
LP&TSL	30	LPTSL	LPT is over allocation
LP&TWT	31	LPTWT	Request on Q.
LP&THN	32	LPTHN	DTEQ failed
LP&OPN	33	LPOPN	LPT is opened
LP&ALI	34	ALTI	Interrupt buffer pointer
LP&ALP	35	ALTP	Buffer Pointer

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35		
	+	-----+																																				
	!	LPPSI					!	LPPAG										!	!	!	LPSST										!							
LPTST1	!	PSI Chan. #!					!	Page Counter										!	!	!	Software Status Word										!							
	+	-----+																																				
	Symbol	Bits						Pointer						Content																								
		0-5						LPPSI						Channel # on which PSI's are desired																								
		6-17						LPPAG						Page Counter																								
	LPALCP	18						LPLCP						Lower case printer																								
	LPASHA	19						LPSHA						Status has arrived																								
		20-35						LPSST						Software status word																								

Symbol	Bits	Content
	0-27	
.DVFFE	28	Device has a fatal, unrecoverable error
.DVFLG	29	Error logging information follows
.DVFEF	30	EOP
.DVFIIP	31	I/O in progress
.DVFSE	32	Software condition
.DVFHE	33	Hardware error
.DVFOL	34	Offline
.DVFNX	35	Nonexistent device

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
LPTERR	!	LPFRK	!	LPERR	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	!	Fork ID of Owning PSI Process	!	Last Error Indication	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Symbol	Bits	Pointer	Content
	0-17	LPFRK	Fork ID of owning PSI process
LPMSG	18	LPMSG	If on, suppress standard messages
LPAPCI	19	LPAPCI	Page counter has interrupted
	20-35	LPERR	Last error indication

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
LPTCLS	!	LPBSZ	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	!	Byte Size	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Symbol	Bits	Pointer	Content
	0-5	LPBSZ	Byte size of OPENP
LPRLD	16	LPRLD	Front end was reloaded
LPNOE	17	LPNOE	Note occurrence of EOP

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
PGDATA	!	PGFMC	!	PGCTR	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!
	!	Function Code: Load Page Ctr.	!	Page Counter Value	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Symbol	Bits	Pointer	Content
	0-15	PGFMC	Function code: load page counter
	16	PGENB	Enable interrupts
	17-31	PGCTR	Page counter value
LPPIRP	32	LPPIRP	Interrupt request pending
LPPIRB	33	LPPIRB	RAM or VFU being reloaded
LPPLTR	34	LPPLTR	Translation RAM requires reloading
LPPLVP	35	LPPLVP	VFU requires reloading

Name: MTA

Description: Magtape storage area; each entry (unless otherwise noted) is MTAN words long where MTAN equals the number of magtape units on the system.

Defined in: STG

Referenced by: MAGTAP

Format	
MTALCK	Lock Word
MTASTS	Status of Unit
MTARSL	Resident Storage for Magtape
MTINDEX	Number of Real MTAs on System
MTACUTB	CDB Table UDB Table
MTAPBP	Space for Buffer Page Pointers
MTIRBP	Space for IORBs
MTIOWD	IOWD for Next Transfer
MTAOLS	Length of last xfer !
MTBIOW	Backup IOWD for Next Transfer
MTARCE	Total Error Count
REWCNT	Number of Rewinding Units
MTERAS	Rewrite Erase Counter
MTPNTR	IOWD During Transfer
MTAUNT	Unit Currently Attached to Controller
MTERRC	Retry Counter
MTERFL	State of Retry
MTACOM	COMO Word of Current Operation
MTDINR	Return Address for Data Interrupt
MTACLS	Clock Routine Switch, 0 for No Clock Wanted
CHCML	DP10 Command List
MTIOBF	Flag - Non-0 if TMIOB

The following MTA storage items are in the nonresident area of the monitor.

MTANR1	Flags, Density, Mode		MTRS	Bac size in Edw. Bytes
	MTBYT	Initial LN of FILBYT		
MTANR2			Ptr. to Buffer Pages List	
MTANR3	MTBHW	MTUBP	MTCSB	MTCUB
MTANR4	MTCIRB		MTCUP	Current User Page
	Current IORB in Use			
MTANR5	MTUBB	MTUBP		User Bytes per Page
	User Bytes per Buffer			
MTANR6	MTLCTC	MTLIRB		Last Dump Mode IORB Adr.
	Last Transfer Count			

Name: NAMUTP

Description: Name Unit Type Pointers. This table contains pointers to unit type names for disks and mag tapes.

Defined in: PHYSIO

Referenced by: PHYSIO

Format

```

NAMUTP      POINT 7,[ASCII/ (Illegal Type: 0) /]
            POINT 7,[ASCII/RP04/]

```

Name: NBQ

Description: Negative Balance Set Hold Quantum. This table maintains for each fork in the balance set the minimum hold quantum to be used before the process becomes eligible for removal from the balance set. (Parallel table to BALSET)

Defined in: SCHED

Referenced by: SCHED

Format

NBQ	Negative BALSET Hold Quantum	
	.	
	.	
	.	
	.	
	.	
	.	
	.	
	.	
	.	

Note: Balance Set Hold Time is not used in Release 2.

Description: Balance Set Wait Time. This table records the time of day each fork in the balance set goes into a balance set wait state waiting for disk/drum I/O. When "wait satisfied" occurs, total wait time can be calculated and stored for system statistics. (Parallel table to BALSET)

Referenced by: SCHED

[illegible]

Name: PHYCHT
Description: Table of known channel dispatch routines used by
PHYSIO for the different types of devices.
Defined in: STG
Referenced by: PHYSIO

Format

PHYCHT	+-----+-----+	
	Flags	Channel Dispatch
	.	
	.	
	.	
	.	
	.	
	.	
	.	

Note: This table currently contains only one entry .CTRH2,,RH2DSP

Name: PHYUNT
Description: Table of known unit dispatch routines, (i.e., one
for disk and one for magtape).
Defined in: STG
Referenced by: PHYH2

Format

PHYUNT	Type	Unit Dispatch Address

Name: PSB
 Description: Process Storage Block
 Defined in: PROLOG
 Referenced by: APRSRV, DATIME, DIRECT, DISC, DSKALC, DTESRV,
 ENQ, FESRV, FILINI, FILMSC, FORK, FREE, GTJFN,
 IO, IPCF, JSYSA, JSYSF, LINEPR, LOGNAM, MAGTAP,
 MEXEC, PAGEM, PHYSIO, POSTLD, SCHED, SYSERR

Format

UACB	Monitor Call AC Stack
JOBNO	Job # to Which Fork Belongs
JOBBIT	SCHED Control Bits
PNPMAX	Maximum Number of Pages in Working Set for This Fork
JOBCX0	Variables for Scheduler Time Guarantee
JOBCX1	Variables for Scheduler Time Guarantee
RUNT2	Run Time Fractional Parts of a Millisecond
FKTAB	Local Fork Handle to Job Handle Table
FORKN	Job Fork # at Top Fork This Fork
FKRT	Fork Run Time
PRARGP	Pointer to Process Arguments
MPP	Monitor Saved Stack Pointer at Last MENTR
PRIMRY	Primary I/O Indirection Pointers
SLOWP	Slow MON Routine Flag
INTDF	Defer Interrupts IF .GE. 0
INTDFP	SOS INTDF or JSYS PSISV1
MJRSTP	JRSTP @FPC or JSYS PSISV0
ACBAS	Current AC Stack Pointer
ITFPC	PC on Interrupt to MEXEC
TRPID	IDENT of PT or Page Causing Trap
TRPPTR	Storage Address or Pointer Causing Trap
UAC	User ACs (from AC block 1)
PAC	Process ACs
PPC	Process PC
ENSKR	Scheduler TEMP (return)
ENSKR+1	Scheduler TEMP (return)
SKDPC	Scheduler TEMP (return)
NSKED	No-Schedule Word
RSKED	No-Schedule Trap
TRAPSK	Stack Used During Pager Traps
TRAPSW	Trap Status Word
TRAPAP	Page Trap Saved P
UTRSW	Saved TRAPSW for User
UMUOW	Save MUOW Word for User
KIMUUL	Last UOW Word from User

PGTIM	Time Since Age REG Tick
IPTIM	Time Since Last Page Fault
TRAPC	Pager Trap Recursion Count
UTRPCT	Count of Pager Traps for This Process
USWPCT	Count of SWPINW Calls for This Process
PTTIM	Time Spent in Pager Traps
IFAV	Inter-Fault Average, Continuously Maintained
CAPT	Working Set Window Size (in MS)
WSPGS	Working Set Pages Bit Table
MONBK	Interrupt to MON if Non-Zero
PIPC	Saved PC During Initial PI Service
	Second Word for JRST When Called with JSR
PIPDB	PSI Routine Stacks
PIAC	Saved User ACs During Break Start
PSICHA	Channel Assigned to TERM Code
PMSK	PSI Request Word Being Passed to PSI Service
PSIBW	Break Waiting Word
FORCTC	Channel Which Caused Forced Fork Termination
PSICEM	Channel Enabled Word
SUPCHN	Channels Reserved by Superior
PSIBIP	Break in Progress Word (Levels)
HWPTA	Hardware Storage (EPT cells)
PSIPT	PSI Storage List Pointer
PIOLDS	FKSTAT Prior to PSI If Was Waiting
LEVCHN	Level Table Address Channel Table Address
PSISYS	Non-Zero If PSI System Off
MONCHN	Channels Reserved by Monitor
DRLOC	Location in Directory During Searches
DRINP	Pointer to Input Name During Lookup
DRINL	Length of Input String
DBMSK	Mask of 0 Bits in Last Word of String
DRSCN	Pointer to FDS Link During Lookup
DROFN	OPN of Last Directory Mapped
STRINF	File Structure Information
ENTVEC	Entry Vector Pointer
PATADR	10/50 Compatability Entry Vector
PATU40	Where to Store C(40), Setup as UNOVEM 1,XX
PATUPC	Where to Store PC, Setup as UNOVEM 1, XX
DMSADR	DMS Entry Vector
DMSU40	Where to Store C(40) on DMS Call
DMSUPC	Where to Store PC of DMS Call

CAPMSK	Capability Mask
CAPENB	Capabilities Enabled
SNPPGS	Count ! Page # of First Page
SNPLST	Flags ! Link to 1st BP for Fork
LSTERR	Last Error Number
ERRSAV	Block of Error Parameters
UPDL	PDL for Monitor Calls
PSBMAP	Map for Process Area

Referenced by: FILMSC

Format

[illegible]

Name :

SCDRQB

Description:

Scheduler Request Table. During the scheduler's overhead cycle, the initial job startup request is placed in this table when the first CTRL/C is processed. The table is later examined in the same cycle and all entries are processed by dispatching to each entry's dispatch address.

Defined in:

SCHED

Referenced by:

SCHED, TTYSRV

Format

[illegible]

Name: SDB

Description: Structure Data Block. This block, one per structure, contains information about the structure's units, master directory (i.e. Root-Directory), bit map for disk page allocation/deallocation, and assigned swapping area. It also contains mount and open-file information. SDBBLK is the name of the storage area reserved for handling SDBs.

Referenced by: DSKALC, FILINI, PHYSIO

Format

	STRNAM	
SDBNAM	Structure Name (in SIXBIT)	
	STRNUM	
SDBNUM	Number of Units in Structure	
	STRSIZ	
SDBSIZ	Size (in sectors) of Each Unit in Structure	
	STRSTS	STRJOB
SDBSTS	Status Flags	Initing Job #
	STRRXB	
SDBRXB	Address of Root Directory Index Block	
	STRBXB	
SDBBXB	Address of Backup Copy of Root Directory Index Block	
	STRNSS	
SDBNSS	Number of Swapping Sectors per Unit	
	STRFSS	
SDBFSS	First Swapping Sector per Unit	
	STRBTB	
SDBBTB	OPN of Bit Table	
	STRFC	
SDBFC	Count of Free Pages on Structure	
	STRDO	STRIDX
SDBIDX	Handle of Root Directory	OPN of Index Table
	STRLOD	
SDBLOD	Last Directory Number on This Structure	
	STRLCA	
SDBLCA	Last Cylinder Assigned by DSKASN	
	STRCYL	
SDBCYL	Total Cylinders in Structure	
	STRBO	
SDBSTO	Length of Top Half of Bit Table	
	STRBL	
SDBSTL	Length of Bottom Half of Bit Table	
	STRTYP	
SDBTYP	Address of DSKSI2 Table for This Type of Disk	
	STRLK	STRUC
SDBFLK	File Lock Count	Unique Code in SDB
	STRMC	STROF
SDBCNT	Mount Count	Open File Count
	Pack Unique Code for Media Identification	
SDBPUC		
	STRUDB	
SDBUDB	Flags	Pointer to UDB
	.	.
	.	.

```

      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+
SDBSTS ! ! ! !                               ! ! !                               !
+-----+

```

Symbol	Bits	Pointer	Content
MS\$PS	0	STPS	Structure is public
MS\$DIS	1	STDIS	Structure is being dismounted
MS\$DOM	2	STDOM	Structure is domestic
	16	STIDX	Index table file OFN has been set up
	17	STCRD	Creating Root Directory on this Structure
	18-35	STRJB	Initializing job # (only legal user while structure is being initialized)

Name: S NAMES

Description: Subsystem Names. Each entry contains a subsystem program name.

Defined in: STG

Referenced by: MEXEC

Format

[illegible]

[illegible]

Description: Subsystem Page Faults. Each entry contains the accumulated number of page faults of a subsystem program. This is a parallel table to SNAMES.

Referenced by: MEXEC, PAGEM

[illegible]

DSKNB = 1B15 with DSKAB newly assigned address.

NOFN = NUMBER OF OFN SLOTS

Name: SPTH

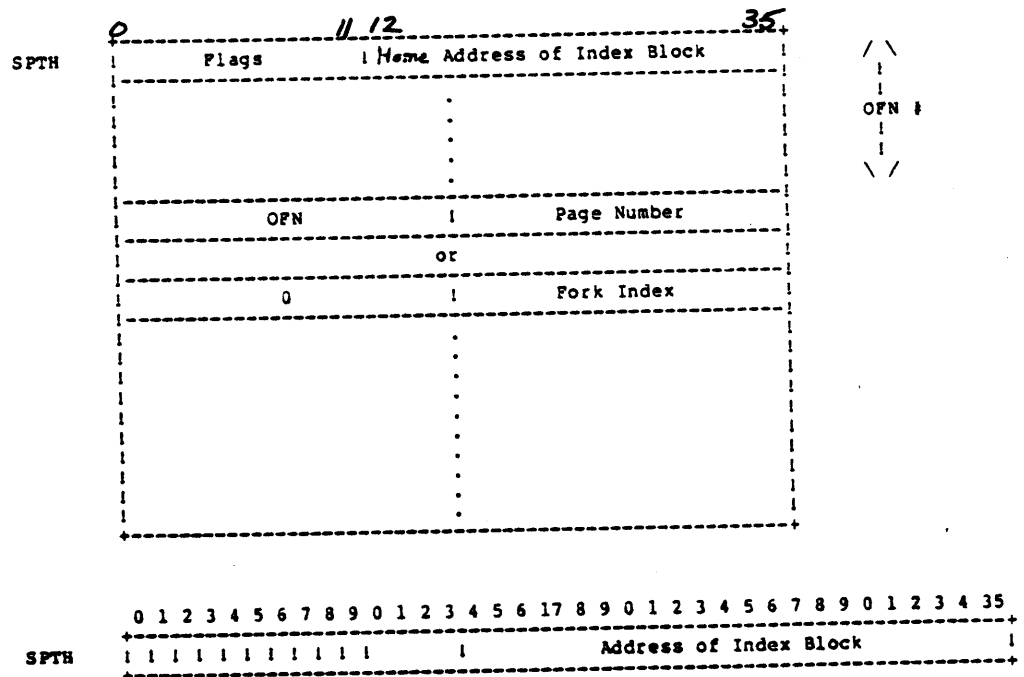
Description: Parallel table to SPT. This table is referenced only by the software and is divided into two parts. The first part, indexed by OFN, is used to point to the home address of each open file (i.e., to its index block) and to hold status information about each OFN.

The second part is used mainly to show the page's origin. For a shared file, this is indicated by OFN ,, Page Number , where page number is within open file, OFN. For PSBs, JSBs, and UPTs, the SPTH word contains 0 ,, Fork Index. The free slots in this part are on a list chained through the SPT where the free list pointer resides in FRESPT.

Defined in: STG

Referenced by: DISC, DSKALC, FILINI, PAGEM

Format



Symbol	Bits	Content
FILWB	1	File write bit in SPTH and ASOPN argument
THAWB	2	Thawed bit
FILNB	3	"File new" bit
SPTLKB	4	LH of SPTH(OFN), XB(Index Block) in use by DDMP
OFNWRS	5	OFN has been modified
OFNBAT	6	Index block contains a bad block
OFNERR	7	Error in file (i.e., MPE)
OFNDMO	8	OFN is on a dismounted structure
OFNDUD	9	Suppress DDMP

SPAREN 10-11 SPARE BITS IN SPTH

Note: A file is opened by searching the OFN part of SPTH for the index block address. If the address is found and the write and thawed bits are legal, it is a shared opening and the same index is used. If the address is not found, a new entry is made from one of the free (-1) slots in SPTH.

[illegible]

Referenced by: MEXEC

Format

[illegible]

Name: STARTUP

Description: Startup Transfer Vectors. This table, in resident locations 140-147, contains the startup vectors for the monitor as well as vectors to enter EDDT.

Defined in: STG

Referenced by: STG, POSTLD

Format

EVDDT	JRST DDTX	(EDDT)
	JRST SYSDDT	(Reset and go to EDDT)
EVDDT2	JRST DDTX	(Copy of EDDT in case other clobbered)
EVDDT2	JRST SYSLOD	(Initialize disk file system)
	0	
EVRST	JRST SYSRST	(Restart)
EVLDDGO	JRST SYSGO	(Reload and start)
EVGO	JRST SYSGO1	(Start)

Name: STIMES

Description: Subsystem Runtimes. Each entry contains the accumulated runtime of a subsystem program. This is a parallel table to SNAMES.

Defined in: STG

Referenced by: MEXEC

Format

STIMES	+-----+-----+	
	+-----+-----+	

Name: STRTAB

Description: Structure Data Block Table. This table, indexed by structure number, contains pointers to each structure data block in the system.

Defined in: STG

Referenced by: DSKALC, PHYSIO

Format

[illegible]

Referenced by: TTYSRV

Format

[illegible]

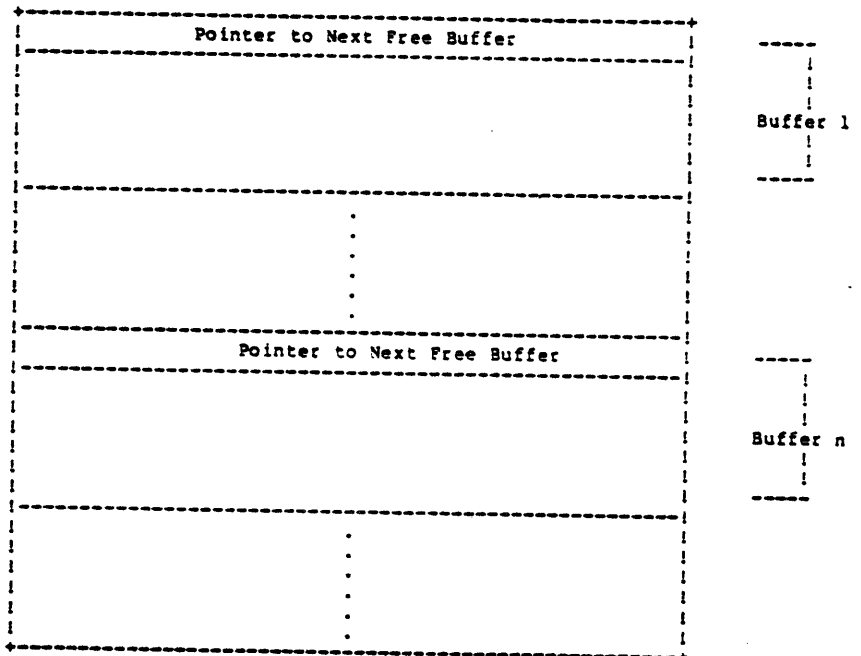
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
	+-----+																																			

Bits	Pointer	Content
0-7	TTOWN	Number of characters in output buffer for wakeup after buffer
8-12	TTIN	Number of input buffers to assign
13-17	TTNOU	Number of output buffers to assign
18-26	TTIMAX	Maximum bytes in input buffer(s)
27-35	TTOMAX	Maximum bytes in output buffer(s)

Description: Teletype Buffers. This storage area contains the input and output buffers for each line (TTY and PTY) on the system. Input and output pointers to each buffer are kept in tables in core. These buffers are fixed length and are assigned on demand. When there is no character activity, the buffers are deassigned.

Referenced by: TTYSRV

TTBUPS



Note: The free buffers are linked and are pointed to by TTFREE.

Referenced by: TTYSRV

Format

[illegible]

Description: Teletype Deferred Pseudo Interrupt Table. This table, indexed by line number, contains the deferred pseudo interrupt code for each terminal. The bit for the terminal code is on if a deferred interrupt is assigned. (i.e. Channel interrupt processing on character typed will wait until the character is read by the program.)

Referenced by: TTYSRV, FORK, MEXEC

[illegible]

Description: Teletype Echo Output Buffer Tables. There are 3 echo output buffer tables (TTECT, TTEIN, TTEOUT), each indexed by line number. Each entry in TTECT contains a character counter. TTEIN and TTEOUT contain input and output pointers to the echo output buffer for each line. The echo buffer is used when the line's output buffer is full.

Defined in: STG

Referenced by: TTYSRV

[illegible]

Bits	Pointer	Content
0	TTFPK	Waiting for "to -ll done"
1-8	TTFCT	Bytes now in front end
9-16	TTFMC	Maximum count for front end buffer
17	TTFOW	Line allocation exceeded
18	TTFEM	Line is remote
19	TTFSP	Remote and needs speed set
20	TTFXO	Needs x-on sent
21	TTNTS	Don't send system messages
22-27		Not used
28-35	TTFB8	Number of entries in Big Buffer, TTBBFU

Referenced by: TTYSRV, JSYSA

Format

[illegible]

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
TTPLGS	!	!	!	!	!					!																!	!	!	!	!		!	!	!	!	!

Symbol	Bits	Pointer	Content
	0		Line is active (interrupt expected from hardware)
TTIMEP	1		Mechanical form feed
TTITAB	2		Mechanical tab
TTTICA	3		Lower case
	4-9		Not used
	10-17	TTPLEN	Page Length
TTIWAK	18-23		Wake up control characters
TTIECO	24		Echos on
TTIECH	25		Echo immediate
TTIAIK	26		Accept links
TTIAAD	27		Accept advise
TTIDAM	28-29		Terminal data mode
TTIUOC	30		Flag upper case
TTILIC	31		Raise lower case
TTIDUH	32-33		Duplex mode
TTIPGH	34		Page mode
TTICAR	35		Carrier on

Name:	TTFORK
Description:	Teletype Fork Table. This table, indexed by line number, contains information about the terminal's ownership and input wait states.
Defined in:	STG
Referenced by:	TTYSRV, DEVICE, FILMSC, FORK, IO, JSYSA, MEXEC, SCHED

Format

[illegible]

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
TFORK | Ownership Status | | | Fork # in input wait |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

Bits	Content
0-17	Controlling job number, -1 if not a controlling terminal, or -2 if becoming a controlling terminal
18	On if no fork is in input wait
19	Force wakeup because input buffer is full
20-35	Fork number in input wait, or -1 if none

[illegible]

Name:	TTLINK
Description:	Teletype Linked Lines. This table, indexed by line number, contains the linked lines for each terminal.
Defined in:	STG
Referenced by:	TTYSRV

Format

[illegible]

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+-----+-----+-----+
TTLINK ! First Line ! Second Line ! Third Line ! Fourth Line !
+-----+-----+-----+-----+

```

Bits	Content
0-9	First line linked to, -1 if none
10-17	Second line linked to, -1 if none
18-26	Third line linked to, -1 if none
27-35	Fourth line linked to, -1 if none

[illegible]

Name:	TTMOD1
Description:	Teletype Mode Table. This table, indexed by line number, contains character and mode information for each terminal.
Defined in:	STG
Referenced by:	TTYSRV

Format

[illegible]

```

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 17 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 35
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
TTYMOD1  ! !  TTYLCH      !  !  !  !  !  !  !  !
          ! !  Last Char. !  !  !  !  !  !  !  !
+-----+-----+-----+-----+-----+-----+-----+
                                     Tabs Table Address

```

Symbol	Bits	Pointer	Content
DCXLIN	0		Line is on a DC10
	1-9	TTYLCH	Last character removed from input line buffer
	10-11	TTYLMD	Terminal data mode for last character
TTSPFLG	12		Stop Output (CTRL/S was typed)
TTRFLG	13		Repeat last input character (BKJFN)
TTWFLG	14		Wait restarted if 1 at TCITST (Blocked on input)
TTOPFLG	15		Flush output (CTRL/O was typed)
	16-17		Not used
	18-35		Tab's table address

Description: Teletype Output Buffer Tables. There are 3 output buffer tables (TTOCT, TTOGOUT), each indexed by line number. Each entry in TTOCT contains a character count. TTOIN and TTOGOUT contain pointers for adding characters to and removing characters from the line output buffers.

Referenced by: TTYSRV

[illegible]

[illegible]

Name: TTYPE

Description: Teletype Type Table. This table, indexed by line number, contains the type of terminal on the line.

Defined in: STG

Referenced by: TTYSRV

Format

[illegible]

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35
TTYTYPE	-----																																			
	TTPWID																																			
	Page Width																	Terminal Type																		

Bits	Pointer										Content																									
0-7	TTPWID										Page width																									
8-17											Not used																									

Name: UDB

Description: Unit Data Block. This block, one per unit, contains information about the current activity on the unit.

Defined in: PHYPAR

Referenced by: PHYSIO

Format

UDBSTS	Status and Configuration Information	
UDBMBW	Memory Bandwidth Scheduling Information	
UDBOOT	Overdue Timer for Seeks and the Like	
UDBERR	Error Recovery Status Word	
UDBERP	Error Reporting Work Area if Nonzero	
UDBDSP	Unit Routine Main Entry Dispatch	
UDBCDB	Secondary CDB	Primary CDB
UDBADR	Secondary Unit Address	Primary Unit Address
UDBAKA	Current CDB	Current Chain Address
UDBVID	Volume ID	
UDBSTR	Pointer to Structure Data Block	
UDBKDB	Pointer to KDB, if any	
UDBDSN	Drive Serial Number	
UDBSEK	Seeks	
UDBRED	Reads (Sectors if disk, Frames if tape)	
UDBWRT	Writes (Sectors if disk, Frames if tape)	
UDBSRE	Soft Read Errors	
UDBSWE	Soft Write Errors	
UDBHRE	Hard Read Errors	
UDBHWE	Hard Write Errors	
UDBPS1	Current Cylinder (if Disk), File (if Tape)	
UDBSP2	Current Sector (if Disk), Record (if Tape)	
UDBPWO	Position Wait Queue Tail	Position Wait Queue Head
UDBTWO	Transfer Wait Queue Tail	Transfer Wait Queue Head
UDBONR	Fork Which Owns This Unit (Maint. Mode)	
UDBERC	Current Retry Count	
UDBSPE	Soft Positioning Error	
UDBHPE	Hard Positioning Error	
UDBPMH	Program Name to Log on Error	
UDBUDR	User Directory Number to Log on Error	
UDBSIZ	Unit Size (Number of Cylinders)	
UDBFCT	Seek Fairness Count	
UDBCHB	IOCB Used by Home Block Check	
UDBDDP	Device Dependent Part	

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	17	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	35	
UDBSTS	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!	!

Symbol	Bits	Pointer	Content
US.OFS	0		Offline or unsafe
US.CHB	1		Check home blocks before any normal I/O
US.POS	2		Positioning in progress
US.ACT	3		Active
US.BAT	4		Bad blocks on this unit
US.BLK	5		Lock bit for this units BAT blocks
US.PGM	6		Dual port switch in (A or B) (RP04,5,6)
US.MAI	7		Unit is in MAINT mode
US.MRQ	8		MAINT mode is requested on this unit
US.BOT	9		Unit is at BOT
US.REW	10		Unit is rewinding
US.WLK	11		Unit is write locked
US.MAL	12		MAINT mode allowed on this unit
US.OIR	13		Operator intervention required. Set at interrupt level, checked at SCHED.
US.OMS	14		Once a minute message to operator. Used in conjunction with US.OIR
US.PRQ	15		Positioning required on this unit
US.TAP	16		Tape type device
US.IDB	17		Tape - IDB seen on previous operation
	32-35	USTYP	Unit Type

Type Code for USTYP

Symbol	Code	Unit
.UTRP4	1	RP04
.UTRS4	2	RS04
.UTT16	3	TU16
.UTTM2	4	TM02 (as unit)
.UTRP5	5	RP05
.UTRP6	6	RP06

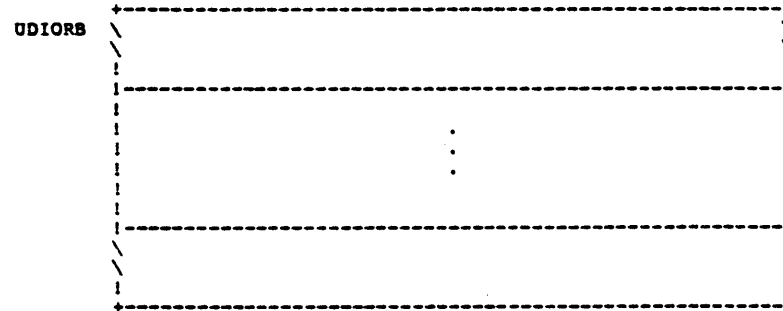
Name: UDIORB

Description: Pool for UDSKIO IORBS. The free IORBS are linked together and this list is pointed to by UIOLST.

Defined in: STG

Referenced by: PHYSIO

Format



Name: UDS

Description: Unit Dispatch Service Routine Table. This table, one per unit type, contains vectored addresses to unit dependent functions, and is given in its generalized form. The specific unit dispatch tables are RP4DSP (in PHYP4) for the disk device, and TM2DSP (in PHYM2) for the magtape device. See PHYPAR for definitions of arguments given and returned on calls to these unit routines.

Defined in: PHYPAR

Referenced by: PHYSIO, PHYH2, PHYM2(MTA), PHYP4(DSK), STG

Format

UDSINI	Initialize
UDSSIO	Start I/O on an IORB, skips if O.K.
UDSINT	Interrupt Routine (called on interrupts for XFER done)
UDSERR	Initiate Error Retry (skips if no more retrys)
UDSHNG	Hung Reset (called from TIMER to reset hung devices)
UDSCNV	Convert Unit Linear Address to CYL, SURF, SEC
UDSLTM	Return Latency or Best Request
UDSPOS	Start Position on IORB (skips if O.K.)
UDSATN	Attention Interrupt