CONTROL DATA CORPORATION

DESIGN DOCUMENT AUTHORIZATION

DIVISION: Terminal Systems Development Division

P.O.D. NUMBER:

[ ] PROD. DVLPMT AUTH [ ] GEN. INT. DESIGN [ ] OTHER

[ ] PROD. OBJ [X] EXT. REF. SPEC.

[ ] GEN. EXT. DESIGN [ ] INT. MAIN. SPEC.

RECEIVED
MAR 8 1973
IDD ARDEN HILLS

DISCLAIMER: THIS DOCUMENT IS A WORKING PAPER ONLY AND DOES NOT NECESSARILY REPRESENT ANY OFFICIAL INTENT ON THE PART OF CONTROL DATA CORPORATION.

PRODUCT NUMBER / NOMENCLATURE

HASP MULTI-LEAVING PROTOCOL

APPROVAL SIGNATURES		DATE
PREPARED BY: J. D. Grigsby	J.D. Grigsby	1/15/73
PROJECT MANAGER		
SUPERVISOR: K. H. Kimmerle	K.H. Kimmerle	2/6/73
DEPARTMENT MANAGER: R. L. Meyer	R.L. Meyer	3/7/73
DIRECTOR - SOFTWARE: M. J. McHale	M.J. McHale	3/8/73
- HARDWARE: M. J. McHale	M.J. McHale	3/8/73
GENERAL MANAGER: H. R. Benjamin	H.R. Benjamin mgr	3/8/73
OTHER		

REVISIONS

LTR	DESCRIPTION	INITIAL	DATE	
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.
				PAGE / REV.

TABLE OF CONTENTS

1.0 SCOPE

The purpose of this document is to define a communication protocol which is known as MULTI-LEAVING. This protocol is used on IBM 360 and 370's when operating under HASP* and when computer-to-computer communication is desired. The MULTI-LEAVING protocol provides the capability to transmit a variable number of data streams between two computers in a two-way alternate, synchronous transmission mode using either ASCII or EBCDIC code. Line speeds up to 50,000 bps are attainable with the MULTI-LEAVING protocol, and transmission can be in either a transparent or a non-transparent mode.

* HASP operates on the OS/MFT/MVT operating system.

2.0 APPLICABLE DOCUMENTS

The following documents provide a background which is useful in understanding the contents of this document:

IBM No. GA27-3004-2, General Information - Binary Synchronous Communication

IBM No. C33-4001-4, IBM System/360 Model 20 Input/Output Control System for the Binary Synchronous Communications Adapter

IBM No. 360D-05.1.014 HASP II Manual

COPE.3X Simulation of IBM MULTI-LEAVING Remote Terminal (HASP)

3.0 GENERAL DESCRIPTION

3.1 MULTI-LEAVING Protocol Definitions

The MULTI-LEAVING protocol consists of the bi-directional transmission of informational blocks between two or more computers in a transparent or a non-transparent mode. The informational blocks are defined to be the following types of blocks:

1. Control blocks
2. Data blocks

Control blocks contain control characters, control bytes, and data records. (Section 4.3) Control characters are defined in Section 4.1. Data records are character strings and their associated character string control bytes, SCB (Section 4.2.5).

Each data record in the data block is associated with a specific peripheral device. In order to facilitate identification, a stream number and a device type are assigned to the data record via a record control byte, RCB (Section 4.2.3). Each record control byte has a sub-record control byte, SRCB, associated with it to provide additional information about the data record (Section 4.2.4).

A data block may consist of several data records, all of which may or may not be from the same device. In order to control the flow of data from or to any particular device, a function control sequence, FCS, is added to each data block (Section 4.2.2)

To faciliate error detection, a block control byte, BCB, is added to each data block (Section 4.2.1)

3.2 MULTI-LEAVING Protocol Operations Description

The following narrative is a general description of how the MULTI-LEAVING protocol operates:

> The terminal software is loaded (Section 6.1) and the communication line is initialized (Section 6.2). After the SIGN-ON command is transmitted, the terminal and the central processor transmit idle blocks until a function is desired (Section 6.3).
>
> When a function other than a console message or console command (Section 4.4.1) is desired, the processor desiring to initiate the function transmits a request to initiate a function transmission RCB (Section 4.2.3). The processor that receives the request to initiate a function transmission RCB, transmits a permission to initiate a function transmission RCB if the

data from the requesting processor can be processed. If the data cannot be processed, or if the function is now in process, the request to initiate a function transmission RCB is ignored.

When a permission to initiate a function transmission RCB is received, the requesting processor begins transmitting data blocks to the other processor. Data blocks can be transmitted until an EOF (End of File) is encountered, at which time a zero length record is transmitted (Section 4.4.2). In order to transmit more data blocks, on the same device stream, the request to initiate a function transmission RCB sequence of events must be initiated again. If a request to initiate a function transmission RCB is not received before data blocks are received, the data blocks are ignored.

Data blocks are transmitted one block at a time. Before another block can be transmitted, the receiving processor must transmit a positive response. A positive response is an acknowledge control block or a data block.

Console functions (operator messages and operator commands) do not have to follow the request to initiate - permission to initiate sequence. A console function may be initiated anytime that the wait-a-bit bit in the FCS is not set.

4.0 MULTI-LEAVING BLOCK DESCRIPTIONS

4.1 Control Blocks

Four types of control blocks are used in the MULTI-LEAVING protocol. These control blocks are:

1. Acknowledge block
2. Negative block
3. Enquiry block
4. Idle block

A description of the blocks and the block usage are contained in the following subsections.

4.1.1 Acknowledge Block {ACK}

The acknowledge block {ACK} consists of the following control characters:

SYN,SYN,SYN,DLE,ACK0,PAD
where SYN = synchronization control character
DLE = data link escape control character
ACK0 = affirmative acknowledgement control character
PAD = pad control character {all 1 bits}

The ACK block is transmitted to indicate that the previous block was received without error and no data is available for transmission.

4.1.2 Negative Acknowledge Block {NAK}

The negative acknowledge block {NAK} consists of the following control characters:

SYN,SYN,SYN,NAK,PAD
where SYN = synchronization control character
NAK = negative acknowledgement control character
PAD = pad control character {all 1 bits}

The NAK block is transmitted to indicate that the previous block was received in error and retransmission is necessary.

NOTE: A NAK block is never transmitted as a response to a NAK block.

4.1.3 Enquiry Block

The enquiry block consists of the following control characters:

SYN,SYN,SYN,SOH,ENQ,PAD
where SYN = synchronization control character
SOH = start of header control character
ENQ = enquiry control character
PAD = pad control character (all 1 bits)

The enquiry block is transmitted to establish communications with HASP at the central processor. The enquiry block is only used at system loading time.

4.1.4 Idle Block

The idle block is an ACK block which is used to maintain communications and avoid an unprogrammed time-out when neither processor has any data to transmit. The idle block is transmitted at least every two seconds.

4.2 Data Block Control Bytes

The control bytes, that are referenced in Section 3 and are part of each data block, are described in the following subsections.

4.2.1 Block Control Byte (BCB)

The block control byte bit representation is as follows:

Bit no. 0 7
0XXXCCCC
where: 0 = 1 (must always be on)
XXX = 000 = Normal block
= 001 = Ignore sequence count
= 010 = Reset expected block sequence to CCCC*
= 011 or 100 = Reserved
= 101 or 110 = Available for user modification
= 111 = Reserved for future expansion
CCCC = Modulo 16 block sequence count

* Reset block count on first transmission (SIGN-ON,etc.)

4.2.2 Function Control Sequence {FCS}

The function control sequence bit representation is as follows:

```
Bit No. 0      78      F
        0SRRABCD0TRRWXYZ
```

where: 0 = 1 {Must always be on}
S = 1 = Suspend all stream transmissions {Wait-A-Bit}
= 0 = Normal state

Note - for the following bits
- a bit = 1 = continue function transmission
- a bit = 0 = suspend function transmission

T = Remote Console stream identifier
R = Reserved for future expansion
ABCDWXYZ = Various function stream identifiers*

* These stream identifiers are oriented to the recipient. For example: if the central processor sends an FCS to the terminal, then the ABCDWXYZ bits represent card reader function stream identifiers. The card reader function stream identifiers are assigned in the following order:

Card Reader No. 1 = A
No. 2 = B
No. 3 = C
No. 4 = D
No. 5 = W
No. 6 = X
No. 7 = Y
No. 8 = Z

If the terminal sends an FCS to the central processor, then the ABCDWXYZ bits represent punch and printer function stream identifiers. The card punch and line printer function stream identifiers are assigned in the following order:

Printer No. 1 = A = Punch No. 8
Printer No. 2 = B = Punch No. 7
Printer No. 3 = C = Punch No. 6
Printer No. 4 = D = Punch No. 5
Printer No. 5 = W = Punch No. 4
Printer No. 6 = X = Punch No. 3
Printer No. 7 = Y = Punch No. 2
Printer No. 8 = Z = Punch No. 1

4.2.3 Record Control Byte (RCB)

The record control byte bit representation is as follows:

```
Bit No. 0      7
        0IIITTTT

where:  0 = 0 = End of transmission block (IIITTTT=0)
          = 1 = All other RCB's
      III = Stream identifier if TTTT ≠ 0
      III = Control information if TTTT = 0 (control record)
          = 000 = Reserved for future expansion
          = 001 = Request to initiate a function transmission*
          = 010 = Permission to initiate a function transmission*
          = 011 and 100 = Reserved
          = 101 = Available for local modification
          = 110 = Bad BCB on last block received
          = 111 = General Control Record (type indicated
                  in SRCB)
     TTTT = Record type identifier
          = 0000 = Control record
          = 0001 = Operator message display request
          = 0010 = Operator command
          = 0011 = Normal input record
          = 0100 = Print record
          = 0101 = Punch record
          = 0110 = Data set record
          = 0111 = Terminal message routing request
          = 1000-1100 = Reserved for future expansion
          = 1101-1111 = Available for local modification
```

* The RCB for these functions is contained in the SRCB.

4.2.4 Sub-Record Control Byte (SRCB)

The sub-record control byte bit representation is as follows:

```
Bit = 0      7
      0SSSSSSS

where:  0 = 1 (Must always be on)
        SSSSSSS = additional record information - dependant
                  on record type

If record type is General Control Record:
        SSSSSSS=1000001 = Initial terminal SIGN-ON
Other bit representations for General Control Records
have been assigned but are not now implemented by IBM
(APPENDIX B).
```

If record type is Request or Permission to initiate a function transmission:

SSSSSSS = Stream identifier and record type identifier as described in RCB.

If record type is Bad BCB on last block received:

SSSSSSS = expect block count modulo 16-right justified.

If record type is Print record:

SSSSSSS = MCCCCCC

where: M = 0 = Normal carriage control
= 1 = Reserved for future use
CCCCCC = Carriage control information
= 1000NN = Space immediately NN spaces
= 11NNNN = Skip immediately to channel NNNN
= 0000NN = Space NN lines after print
= 01NNNN = Skip to channel NNNN after print
= 000000 = Suppress space

If record type is Punch record:

SSSSSSS = MMBRRSS

where: SS = Punch stacker selection information
B = 0 = Normal EBCDIC card image
= 1 = Column binary card image {not now supported}
MM = 00 = SCB count units = 1
= 01 = SCB count units = 2 {not now supported}
= 10 = SCB count units = 4 {not now supported}
= 11 = Reserved
RR = Reserved for future expansion

If record type is Input record:

SSSSSSS = MMBRRRR

where: MM = 00 = SCB count units = 1
= 01 = SCB count units = 2 {not now supported}
= 10 = SCB count units = 4 {not now supported}
= 11 = Reserved
B = 0 = Normal EBCDIC card image
= 1 = Column binary card image {not now supported}
RRRR = Reserved for future expansion

If record type is Message routine record:

SSSSSSS = T

where: T = Remote system number {1 ≤ T ≤ 99}
= Remote system group {100 ≤ T ≤ 127}
= 0 = Broadcast to all remote systems

4.2.5 String Control Byte (SCB)

The string control byte bit representation is as follows:

```
Bit No. 0       7
        0KTCCCCC
```

where: 0 = 0 = End of record (KTCCCCC=0)
= 1 = All other SCB's
K = 0 = Duplicate character string
T = 0 = Duplicate character is a blank
= 1 = Duplicate character is a non-blank (character follows SCB)
CCCC = Duplication count
K = 1 = Non-duplicate character string
TCCCCC = Character string length

If KTCCCCC = 0 and 0=1, SCB indicates record is continued in the next transmission block.

4.3 Data Block Description

Data blocks consist of data records, the control bytes described in the previous sub-sections and the following test control characters:

SYN = synchronization control character
DLE = data link escape control character
SOH = start of header control character - used only if non-transparent mode
STX = start of test control character
ETB = end of transmission block control character
CRC-16 = cyclic redundancy checking control characters (2 bytes)
PAD = pad control character (all 1 bits)

A typical data transmission block is shown in Figure 4.3.1.

FIGURE 4.3.1 TYPICAL MULTI-LEAVING DATA TRANSMISSION BLOCK

SYN		
SYN	-	Synchronization Characters
SYN		
DLE	-	BSC Leader {SOH if no transparency feature}
STX	-	BSC START-OF-TEXT
BCB	-	Block Control Byte
FCS	-	Function Control Sequence {2 bytes}
RCB	-	Record Control Byte for record 1
SRCB	-	Sub-Record Control Byte for record 1
SCB	-	String Control Byte for record 1
DATA	-	Character String
SCB	-	String Control Byte for record 1
DATA	-	Character String
SCB=0	-	Terminating SCB for record 1
RCB	-	RCB for record 2
SRCB	-	SRCB for record 2
SCB	-	SCB for record 2
DATA	-	Character String
SCB=0	-	Terminating SCB for record 2
RCB=0	-	Transmission Block Terminator
DLE	-	BSC Leader - {SYN if no transparency feature}
ETB	-	BSC Ending Sequence
CRC-16	-	Cyclic Redundancy Check Characters {2 bytes}
PAD	-	All 1 Bits

The following examples are representative of the various record types. {It is assumed that all of the examples start with SYN,SYN,SYN,DLE,STX, or SOH and end with DLE, or SYN, ETB, CRC-16, PAD. DLE is used if transmission is in transparent mode.}

Example No. 1 - A request to initiate a transmission function for printer no. 2

```
BCB = 1000XXXX          - Normal block - count = XXXX
FCS = 1000YYYY,1100YYYY - Normal state, identifiers YYYY,YYYY
SRCB= 10100100          - Request to initiate a function
                          transmission
RCB = 0                 - Transmission block terminator
```

Example No. 2 - A permission to initiate a transmission function for card punch no. 1.

```
BCB
FCS
RCB = 10100000          - Permission to initiate a function
                          transmission
SRCB= 10010101          - Card punch stream no. 1
RCB = 0                 - Transmission block terminator
```

Example No. 3 - A card reader record from card reader no. 2.

```
 Card record =
Column No. 1   5   10   15      23   29
          LABEL    AAAAAA      EXAMPLE
```

```
BCB
FCS
RCB = 10100011          - Card reader stream no. 2
SRCB = 10000000         - SCB count unit no. 1, EBCDIC
                          card image
SCB = 11000101          - Nonduplicate character string-
                          length 5 characters
  L                     - Data characters
  A
  B
  E
  L
SCB = 10000100          - Duplicate character string, blank -
                          length 4 characters
SCB = 10100110          - Duplicate character string,
                          non-blank - length 6 characters
```

```
  A
SCB = 10000111      - Duplicated character
                    - Duplicate character string,
                      blank - length 7 characters
SCB = 11000111      - Nonduplicate character string -
                      length 7 characters
  E                 - Data characters
  X
  A
  M
  P
  L
  E
SCB = 10011111      - Duplicate character string, blank -
                      length 31 characters
SCB = 10010100      - Duplicate character string,
                      blank - length 20 characters
SCB = 0             - End of record
RCB = 0             - Transmission block terminator
```

4.4 Short Block Descriptions

There are several blocks that appear to be data blocks but are really special case data blocks. These short blocks are:

Operator console blocks
End of file blocks
FCS change blocks
SIGN-ON blocks
BCB error blocks

The SIGN-ON blocks are described in the Terminal Start-Up Section (6.0), and BCB error blocks are described in the Error Conditions Section (5.0).

4.4.1 Operator Console Blocks

Blocks which contain operator console messages or commands are special in that no additional records are packed into the data block following a console record.

Example: Assume a card reader is reading cards and the operator keyes in a console command to the central processor. The data block contains the data cards read up to the point that the console record is available. From that point on, the data block looks as follows:

RCB = 10010010	- Operator command - stream no. 1
SRCB = 10000000	
SCB	- SCB describing console character string
DATA	- Data may be divided into many character strings
SCB = 00000000	- End of record
RCB = 00000000	- Transmission block terminator
DLE or SYN	- DLE if transparent mode
ETB	- End of block
CRC-16	- Cyclic redundancy check
PAD	- All 1 bits

A request to initiate a transmission function is not required to transmit console records. The only restriction is that the Wait-A-Bit is not set in the FCS.

4.4.2 End of File Blocks (EOF)

Blocks which contain end of files are special in that no additional records from the same device stream are packed into the data block following an EOF. Data blocks which are terminated by an EOF contain a final record which is as follows: for card reader stream no. 1.

RCB = 10010011	- Card reader stream no. 1
SRCB = 10000000	- SCB count units =1, EBCDIC card images
SCB = 00000000	- EOF
RCB = 00000000	- Transmission block terminator
DLE or SYN	- DLE if transparent mode
CRC-16	
PAD	

In order to transmit more records for a device stream that contained an EOF, the request to initiate a function transmission must be transmitted again (Section 3.2). If another device stream contains data for transmission, if the device stream has permission available in the data block, then the last RCB in the above example would be a device stream RCB followed by data instead of a transmission block terminator.

4.4.3 FCS Change Blocks

The FCS change block is transmitted when the status of one or more of the streams has changed, and there is no data to transmit. The FCS change block is as follows:

```
SYN
SYN
SYN
DLE or SOH  - DLE if transparent mode
STX
BCB
FCS         - Changed FCS
RCB = 0     - Transmission block terminator
DLE or SYN  - DLE if transparent mode
ETB
CRC-16
PAD
```

5.0 ERROR CONDITIONS

The error conditions that can occur are dependent in large part on what hardware is used by a terminal. A few error conditions that are not hardware dependent are the following:

CRC-16 Error
Illegal Block Make-up
Unknown response
Time-out
BCB Error

5.1 CRC-16 Error (Cyclic Redundancy Checking)

Cyclic redundancy checking is a type of error checking which is employed to help insure error free data transmission. A cyclic redundancy check is a division performed by both the transmitting and receiving processors using the numeric binary value of the message as a dividend and a constant as a divisor. The quotient is discarded, and the remainder serves as a check character. The receiving processor compares the transmitted remainder to its computed remainder. If the two remainders are equal, there is no error. If the two remainders are not equal, an error has occurred. CRC occurs only on data blocks.

If a CRC-16 error occurs, the receiving processor transmits a NAK block (Section 4.1.2) to the transmitting processor which informs the transmitting processor that a retransmission of the last block is required. If the retransmitted block is correct, the processing continues.

5.2 Illegal Block Make-Up Error

A data block must end with an ETB control character. If the data block does not end with an ETB, then an illegal block make-up error occurs. The required error recovery procedure for this error is to have the receiving processor transmit a NAK block (Section 4.1.2) to the other processor. The NAK block informs the other processor that a retransmission of the last block is required. If the retransmitted block is correct, the processing continues.

5.3 Unknown Response Error

An unknown response error occurs when the response received from the transmitting processor is not one of the following:

1. A data block beginning with DLE, STX control characters - transparent mode.

2. A data block beginning with SOH,STX control characters - non-transparent mode
3. An ACK block {Section 4.1.1}.
4. A NAK block {Section 4.1.2}

If an unknown response error occurs, the receiving processor transmits a NAK block to the other processor which informs the other processor that a retransmission of the last block is required. If the retransmitted block is correct, the processing continues.

5.4 Time-out Error

From the moment communications are established until the last block is transmitted after SIGN-OFF, transmission blocks are expected at one processor or the other at least every two seconds after a block was transmitted by the receiving processor, or time-out error occurs.

If a time-out error occurs, the receiving processor transmits a NAK block to the other processor which informs the other processor that a retransmission of the last block is required. If the retransmitted block is correct, the processing continues.

5.5 BCB Error

Every data block contains a BCB byte {Section 4.2.1}, and in each BCB byte is a block sequence count. The data blocks are transmitted in sequentially ascending order unless an ignore or reset BCB byte is transmitted. If the block sequence count in the data block is not equal to the block sequenc count expected by the receiving processor, a BCB error occurs.

If a BCB error occurs and the block sequence count is a duplicate of a block sequence count previously received {expected block sequence count minus received block sequence count ≤ 2}, the data block is ignored and processing continues as if an FCS change block or an ACK block was received.

If a BCB error occurs and the block sequence count is not a duplicate block sequence count as described in the previous paragraph, a BCB error block is transmitted from the terminal to the central processor}. The BCB error block informs the other processor that a block sequence count error occurred, and the processor is to back up the file to the missing block or is to transmit a reset BCB byte. The format of the BCB error block is:

```
SYN
SYN
SYN
DLE or SOH          - DLE if transparent mode
STX
BCB = 1001XXXX      - ignore sequence checking, XXXX = received
                      block sequence count
FCS
RCB = 11100000      - Bad BCB on last block
SRCB= 1000YYYY      - YYYY = expected block sequence count
SCB = 00000000      - End of Record
RCB = 00000000      - Transmission block terminator
DLE or SYN          - DLE if transparent mode
ETX
CRC-16
PAD
```

6.0 TERMINAL START-UP AND TERMINATION

Terminal start-up is accomplished via a three step process.
1. Terminal initialization
2. Communication line initialization
3. SIGN-ON

6.1 Terminal Initialization

The terminal software is loaded and put into execution. The loading can be via paper tape, cards, mag. tape, or mass storage depending on the terminal hardware. The initialization processor establishes the I/O buffers and other necessary parameters. After all the buffers are set, a card is read from the card reader. If the card is a blank card, the default SIGN-ON parameters are used.* If the card is a /* SIGNON card {Section 6.3}, the parameters on the /* SIGNON card are used instead of the default parameters. If the card is neither a blank card or a /* SIGNON, an error has occurred. The recovery from this error is to be defined by the implementor of the MULTI-LEAVING protocol.

* Default SIGN-ON parameters are assembled into the terminal software.

6.2 Communication Line Initialization

After the terminal is initialized, the communication line is initialized. The line is initialized by enabling the communication adapter and the data set. Communications are then established with HASP via the following procedure:

1. An Enquiry block {Section 4.1.3} is transmitted to the central processor from the terminal.

2. If the central processor can process the terminal data, an ACK block is transmitted from the central processor to the terminal. If the central processor cannot process the terminal data, the Enquiry block is ignored.

3. If an ACK block is received by the terminal, a buffer is constructed and the SIGN-ON record is queued for transmission to HASP {the central processor}.

4. If I/O errors occur or an ACK block is not received, step 1 is repeated.

5. After the SIGN-ON record is transmitted and a response is received, the terminal is ready to do normal processing.

6.3 SIGN-ON Block

A SIGN-ON block is transmitted to the central processor to inform the central processor that a terminal is signing on. The data portion of the SIGN-ON block is the SIGN-ON record. The format of the SIGN-ON card is:

```
column 1          16            25
       /*SIGNON   REMOTEnn        password
```

where nn = a one or two digit decimal number which correlates this remote terminal with information about it in the central computer.

password = blank unless a password is required.

The SIGN-ON block format is:

```
SYN
SYN
SYN
DLE or SOH              - DLE if transparent mode
STX
BCB = 10100XXX          - reset count to XXXX
FCS
RCB = 11110000          - General Control Record
SRCB= 11000001          - Initial SIGN-ON
SIGN-ON Record
RCB = 00000000          - Transmission block terminator
DLE or SYN              - DLE if transparent mode
ETX
CRC-16
PAD
```

6.4 SIGN-OFF Block

Terminal processing termination is accomplished via the /* SIGNOFF card. The /* SIGNOFF card when transmitted to the central processor as a record in a data block has the same effect as an EOF block (Section 4.4.2). In addition to terminating the input stream, the /* SIGNOFF record causes communications with the terminal to be terminated after completion of the current device streams. The /* SIGNOFF card format is:

```
column 1
       /*SIGNOFF
```

7.0 MULTI-LEAVING COMMUNICATIONS

This section contains examples which show normal MULTI-LEAVING communications and error conditions communications.

Example no. 1 - Terminal number 2 is signed on, and two jobs are transmitted to the central processor. The last card transmitted is a /* SIGNOFF card.

Terminal transmits	Central Processor Transmits
Enquiry Block	ACK block
SIGN-ON block {Terminal 2}	ACK block
Request to initiate card reader function transmission	Permission to initiate card reader function transmission
Data block no.1 from card reader {Job no. 1}	ACK block
⋮	⋮
Data block no. X from card reader {Job no. 1}	ACK block
EOF block from card reader {Job no. 1} {May contain data prior to EOF}	ACK block
Request to initiate card reader function transmission	Permission to initiate card reader function transmission
Data block no. 1 from card reader {Job no. 2}	ACK block
⋮	⋮
Data block no. N from card reader {Job no. 2}	ACK block
Data block that contains /* SIGNOFF record	Disconnect

Example no. 2 - Terminal number 1 is signed on, and one job is transmitted to the central processor and two job print streams (only printer) are transmitted to the terminal (Print stream is from previous jobs and is available at SIGN-ON time). The last input record transmitted is a /* SIGNOFF card. Assume each print stream is 3 blocks long and the job input stream is 4 blocks long.

Terminal transmits	Central Processor Transmits
Enquiry block	ACK block
SIGN-ON block (Terminal 1)	Request to initiate print function transmission
Permission to initiate print function transmission	Print data block no. 1 (Job no. 1)
Request to initiate card reader function transmission	Permission to initiate card reader function transmission
Card reader data block no. 1	Print data block no. 2 (Job no. 1)
Card reader data block no. 2	Print data block no. 3 (Job no. 1) - EOF block
Card reader data block no. 3	Request to initiate print function transmission
Permission to initiate print function transmission	Print data block no. 1 (Job no. 2)
Card reader data block no. 4 (SIGN-OFF card)	Print data block no. 2 (Job no. 2)

Example no. 3 - Terminal is already signed on and idling. A job is read in and a punch and print stream are transmitted. After completion of the transmissions, return to an idle state. Card reader stream is 4 blocks long, and print and punch streams total 3 blocks long.

Terminal Transmits	Central Processor Transmits
ACK block {2 second interval}	ACK block {2 second interval}
Request to initiate card reader function transmission	Permission to initiate card reader function transmission
Card reader data block no. 1	Request to initiate printer function transmission
Permission to initiate printer function	Request to initiate punch function transmission
Permission to initiate punch function transmission	Data block no. 1 {Printer and punch}
Card reader data block no. 2	Data block no. 2 {Print EOF block and partial punch block}
Card reader data block no. 3	Data block no. 3 {Punch EOF block}
Card reader data block no. 4	ACK block
ACK block	ACK block {2 second interval}
ACK block {2 second interval}	ACK block {2 second interval}

Example no. 4 - Terminal was previously signed on. A job is read in and transmitted to the central processor. A transmission error occurs {CRC-16 error or illegal block make-up or unknown response error or time-out error} and recovery is accomplished. The card reader stream is 4 blocks long.

Terminal Transmits	Central Processor Transmits
ACK block {3 second interval}	ACK block {2 second interval}
Request to initiate a card reader function transmission	Permission to initiate a card reader function transmission
Data block no. 1	ACK block
Data block no. 2 {Transmission error}	NAK block
Data block no. 2	ACK block
Data block no. 3	ACK block
Data block no. 4 {EOF block}	ACK block
ACK block {2 second interval}	ACK block {2 second interval}

Example no. 5 - Terminal was previously signed on. A job is read in and transmitted to the central processor while a print job is transmitted to the terminal. A CRC-16 error occurs on one of the print blocks and the NAK block from the terminal is then lost. This causes a BCB error which is recovered from. The card reader stream is 4 blocks long and the printer stream is 5 blocks long.

Terminal Transmits	Central Processor Transmits
ACK block {2 second interval}	ACK block {2 second interval}
ACK block {2 second interval}	Request to initiate print function transmission
Permission to initiate print function transmission	Print data block no. 1
ACK block	Print data block no. 2
Request to initiate card reader function transmission	Permission to initiate card function transmission
Card reader data block no. 1	Print data block no. 3
Card reader data block no. 2	Print data block no. 4 {CRC-16 error}
NAK block {lost}	NAK block
Card reader data block no. 3*	Print data block no. 5
BCB error block	Print data block no. 4
Card reader data block no. 4 {EOF block}	Print data block no. 5 {EOF block}
ACK block	ACK block {2 second interval}
ACK block {2 second interval}	ACK block {2 second interval}

* NAK block is never transmitted in response to a NAK block.

Example no. 6 - Terminal was previously signed on. A printer stream no. 1 is transmitted to the terminal, but while the transmission is occurring, printer stream no. 1 becomes not available. Printer stream no. 1 is 4 blocks long.

Terminal Transmits	Central Processor Transmits
ACK block {2 second interval}	ACK block {2 second interval}
ACK block {2 second interval}	Request to initiate print function transmission
Permission to initiate print function transmission	Printer stream no. 1 data block no. 1
ACK block	Printer stream no. 1 data block no. 2
FCS change block {printer stream no. 1 not available - bit A=0} See Section 4.2.2	ACK block
ACK block {2 second interval}	ACK block {2 second interval}
	Idle until printer is available
FCS change block {printer stream no. 1 now available - bit A=1}	Printer stream no. 1 data block no. 3
ACK block	Printer stream no. 1 data block no. 4 {EOF block}
ACK block	ACK block {2 second interval}
ACK block {2 second interval}	ACK block {2 second interval}

Example no. 7 - Terminal was previously signed on. A printer stream is transmitted to the terminal. While the transmission is occurring, a operator console command is keyed in.

Terminal Transmits	Central Processor Transmits
ACK block {2 second interval}	ACK block {2 second interval}
ACK block {2 second interval}	Request to initiate printer function transmission
Permission to initiate printer function transmission	Printer data block no. 1
ACK block	Printer data block no. 2
⋮	⋮
Operator Console Block	Printer data block no. X
ACK block	Printer data block no. X+1
⋮	⋮
ACK block	Printer data block no. N {EOF block}
ACK block	ACK block {2 second interval}
ACK block {2 second interval}	ACK block {2 second interval}

8.0 GLOSSARY

ACK - Affirmative acknowledgment {Section 4.1.1}

BCB - Block control byte {Section 4.2.1}

Control Block - Transmission block consisting only of control characters {Section 4.1}

CRC-16 - Cyclic redundancy check for 8-bit bytes {2 bytes long} {Section 5.1}

Data Block - Transmission block consisting of control characters, control bytes, and data {Section 4.3}

DCT - Device control table

Device Stream - A stream identifier associated with a specific device

DLE - Data link escape {Section 4.1}

EBCDIC - Extended binary coded decimal interchange code {Appendix C}

ENQ - Enquiry {Section 4.1.3}

EOF - End of file {Section 4.4.2}

ETB - End of transmission block {Section 4.3}

FCS - Function control sequence {Section 4.2.2}

HASP - Houston Automatic Spooling and Priority system

MULTI-LEAVING - Communication protocol that operates under HASP for computer-to-computer communications.

NAK - Negative acknoweldgment {Section 4.1.2}

Non-transparent mode - Mode in which data-link line control characters are recognized as that.

PAD - A byte containing all 1 bits {Section 4.2 and 4.3}

RCB - Record control byte {Section 4.2.3}

SCB - String control byte {Section 4.2.5}

SOH - Start of heading {Section 4.3}

SRCB - Sub-Record control byte {Section 4.2.4}

STX - Start of text {Section 4.3}

SYN - Synchronous idle {Section 4.1 and 4.3}

Transparent mode - A versatile mode that treats the data-link line-control characters only as specific bit patterns.

Wait-A-Bit - Suspend all stream transmissions {Section 4.2.2}

APPENDIX A

IBM 360/20 TERMINAL LISTING

```
 LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                  1507 *                                                                F3024000
                                  1508 *                     CONFIGURATION VARIABLES                    F3026000
                                  1509 *                                                                F3028000
                                  1510 &RMTID   SETA  2 ******************REMOTE'S IDENTIFICATION      F3030000
                                  1511 &MACHINE SETA  20                    MODEL OF REMOTE TERMINAL CPU F3032000
                                  1512 &SUBMOD  SETA  2                     SUB-MODEL 2 (MODEL 20)       F3034000
                                  1513 &LINESPD SETA  2000                  COMMUNICATION LINE SPEED     F3036000
                                  1514 &CORESIZ SETA  8                     AMOUNT OF CORE AVAILABLE TO PROGRAM F3038000
                                  1515 &XPARENT SETC  'YES'                 ADAPTER TRANSPARENCY FEATURE F3040000
                                  1516 &HICORE  SETA  &CORESIZ              HIGHEST CORE LOCATION AVAILABLE F3042000
                                  1517 &RTPORG  SETA  X'80'                 ORIGIN OF PROGRAM            F3044000
                                  1518 &ERRMSGN SETA  10                    MAX NUM ERROR MSG QUEUED     F3046000
                                  1519 &ERRTXTL SETA  13                    LENGTH OF TEXT + BLANK       F3048000
                                  1520 *                                                                F3050000
                                  1521 *        CONFIGURATION                                           F3052000
                                  1522 *                                                                F3054000
                                  1523 &PDEV(1) SETA  2203                  PRINTER 1 MACHINE NUMBER     F3056000
                                  1524 &PDEV(2) SETA  0                     PRINTER 2 MACHINE NUMBER     F3058000
                                  1525 &PDEV(3) SETA  0                     PRINTER 3 MACHINE NUMBER     F3060000
                                  1526 &PDEV(4) SETA  0                     PRINTER 4 MACHINE NUMBER     F3062000
                                  1527 &PDEV(5) SETA  0                     PRINTER 5 MACHINE NUMBER     F3064000
                                  1528 &PDEV(6) SETA  0                     PRINTER 6 MACHINE NUMBER     F3066000
                                  1529 &PDEV(7) SETA  0                     PRINTER 7 MACHINE NUMBER     F3068000
                                  1530 &PADR(1) SETC  '4'                   PRINTER 1 ADDRESS            F3070000
                                  1531 &PADR(2) SETC  '00F'                 PRINTER 2 ADDRESS            F3072000
                                  1532 &PADR(3) SETC  'FFF'                 PRINTER 3 ADDRESS            F3074000
                                  1533 &PADR(4) SETC  'FFF'                 PRINTER 4 ADDRESS            F3076000
                                  1534 &PADR(5) SETC  'FFF'                 PRINTER 5 ADDRESS            F3078000
                                  1535 &PADR(6) SETC  'FFF'                 PRINTER 6 ADDRESS            F3080000
                                  1536 &PADR(7) SETC  'FFF'                 PRINTER 7 ADDRESS            F3082000
                                  1537 &RDEV(1) SETA  2501                  READER 1 MACHINE NUMBER      F3084000
                                  1538 &RDEV(2) SETA  0                     READER 2 MACHINE NUMBER      F3086000
                                  1539 &RDEV(3) SETA  0                     READER 3 MACHINE NUMBER      F3088000
                                  1540 &PDEV(4) SETA  0                     READER 4 MACHINE NUMBER      F3090000
                                  1541 &RDEV(5) SETA  0                     READER 5 MACHINE NUMBER      F3092000
                                  1542 &RDEV(6) SETA  0                     READER 6 MACHINE NUMBER      F3094000
                                  1543 &RDEV(7) SETA  0                     READER 7 MACHINE NUMBER      F3096000
                                  1544 &RADR(1) SETC  '1'                   READER 1 ADDRESS             F3098000
                                  1545 &RADR(2) SETC  'FFF'                 READER 2 ADDRESS             F3100000
                                  1546 &RADR(3) SETC  'FFF'                 READER 3 ADDRESS             F3102000
                                  1547 &RADR(4) SETC  'FFF'                 READER 4 ADDRESS             F3104000
                                  1548 &RADR(5) SETC  'FFF'                 READER 5 ADDRESS             F3106000
                                  1549 &RADR(6) SETC  'FFF'                 READER 6 ADDRESS             F3108000
                                  1550 &RADR(7) SETC  'FFF'                 READER 7 ADDRESS             F3110000
                                  1551 &UDEV(1) SETA  1442                  PUNCH 1 MACHINE NUMBER       F3112000
                                  1552 &UDEV(2) SETA  0                     PUNCH 2 MACHINE NUMBER       F3114000
                                  1553 &UDEV(3) SETA  0                     PUNCH 3 MACHINE NUMBER       F3116000
                                  1554 &UDEV(4) SETA  0                     PUNCH 4 MACHINE NUMBER       F3118000
                                  1555 &UDEV(5) SETA  0                     PUNCH 5 MACHINE NUMBER       F3120000
                                  1556 &UDEV(6) SETA  0                     PUNCH 6 MACHINE NUMBER       F3122000
```

```
 LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F150CT70  11/21/72
                                  1557 &UDEV(7)  SETA  0                  PUNCH 7 MACHINE NUMBER                F3124000
                                  1558 &UADR(1)  SETC  '3'                PUNCH 1 ADDRESS                       F3126000
                                  1559 &UADR(2)  SETC  'FFF'              PUNCH 2 ADDRESS                       F3128000
                                  1560 &UADR(3)  SETC  'FFF'              PUNCH 3 ADDRESS                       F3130000
                                  1561 &UADR(4)  SETC  'FFF'              PUNCH 4 ADDRESS                       F3132000
                                  1562 &UADR(5)  SETC  'FFF'              PUNCH 5 ADDRESS                       F3134000
                                  1563 &UADR(6)  SETC  'FFF'              PUNCH 6 ADDRESS                       F3136000
                                  1564 &UADR(7)  SETC  'FFF'              PUNCH 7 ADDRESS                       F3138000
                                  1565 &WDEV(1)  SETA  0                  CONSOLE MACHINE NUMBER                F3140000
                                  1566 &WADR(1)  SETC  '01F'              CONSOLE ADDRESS                       F3142000
                                  1567 &ADAPT    SETC  '020'              ADDRESS OF COMMUNICATIONS ADAPTER     F3144000
                                  1568           AIF   (&HICORE GT 32).HISKP1                                  F3146000
                                  1569 &L        SETA  2                  LENGTH ATTRIBUTE OF ACONS             F3148000
                                  1570           AGO   .HISKP                                                  F3150000
                                  1571 .HISKP    ANOP                                                          F3156000
                                  1572 &R(1)     SETB  1                  NO NON DUAL READER                    F3158000
                                  1573 &R(2)     SETB  1                  NO DUAL 2520                          F3160000
                                  1574 &R(3)     SETB  1                  NO DUAL 1442                          F3162000
                                  1575 &R(4)     SETB  1                  NO 2540 PUNCH                         F3164000
                                  1576 &R(5)     SETB  1                  NO NON DUAL PUNCH                     F3166000
                                  1577 &R(6)     SETB  1                  NOT MOD 20                            F3168000
                                  1578 &R(7)     SETB  1                  NO DUAL 2560                          F3170000
                                  1579 &R(8)     SETB  1                  NO SINGLE POCKET 1442                 F3172000
                                  1580 &PRTSIZE  SETA  120                MAXIMUM PRINT LINE SIZE               F3174000
                                  1581 &WTOSIZE  SETA  120                LENGTH OF CONSOLE INPUT AREA          F3176000
                                  1582 *                                                                        F3178000
                                  1583 *                        INTERNAL VARIABLES                              F3180000
                                  1584 *                                                                        F3182000
                                  1585 &NUMBUFS  SETA  8                  NUMBER OF TP BUFFERS                  F3184000
                                  1586 &TPBFSIZ  SETA  512 ***************DEFAULT BUFFER SIZE                   F3186000
                                  1587 &MLBFSIZ  SETA  400                MULTI-LEAVING BUFFER SIZE      V03.1  F3188000
                                  1588 &TPBFSIZ  SETA  &MLBFSIZ           TRANSMISSION BUFFER SIZE              F3190000
                                  1589 &TPBFSIZ  SETA  &TPBFSIZ+&TPBFSIZ-&TPBFSIZ/2*2    FORCE BUFSIZE EVEN  F3192000
                                  1590 &NUMTANK  SETA  8                  NUMBER OF DECOMPRESSION TANKS         F3194000
                                  1591 &CMPTYPE  SETA  3 ****************COMPRESSION TECHNIQUE INDICATOR       F3196000
                                  1592 *                                  (0 = NO COMPRESSION )                 F3198000
                                  1593 *                                  (1 = TRAILING BLANK ELIMINATION )     F3200000
                                  1594 *                                  (2 = BLANK COMPRESSION ONLY )         F3202000
                                  1595 *                                  (3 = COMPRESS ALL IDENTICAL CHARS )   F3204000
                                  1596 &CCT      SETA  4                  MINIMUM EQUAL CHARACTERS TO COMPRESS  F3206000
                                  1597 &LOGCLAS  SETA  0                  LOWEST ERROR SEVERITY TO LOG          F3208000
                                  1598 &GEN      SETC  'NOGEN'            SET TO GEN FOR ALL MACRO PRINT        F3210000
                                  1599 &PRTCONS  SETA  0                  PRINT CONSOLE MESSAGES OPTION         F3212000
                                  1600 &LOCCOM   SETA  0                  LOCAL COMMAND OPTION                  F3214000
                                  1601 &HOME     SETA  0                  HOME LOOP OFF                         F3216000
                                  1602 *                                                                        F3218000
                                  1603 *        FUNCTION CONTROL MASKS FOR TCTS                                 F3220000
                                  1604 *                                                                        F3222000
                                  1605 &CPCS     SETA  X'0000'            CONTROL RECORD PROCESSOR              F3224000
                                  1606 &PPCS(1)  SETA  X'0800'            PRINTER 1                             F3226000
                                  1607 &PPCS(2)  SETA  X'0400'            PRINTER 2                             F3228000
                                  1608 &PPCS(3)  SETA  X'0200'            PRINTER 3                             F3230000
                                  1609 &PPCS(4)  SETA  X'0100'            PRINTER 4                             F3232000
                                  1610 &PPCS(5)  SETA  X'0008'            PRINTER 5                             F3234000
                                  1611 &PPCS(6)  SETA  X'0004'            PRINTER 6                             F3236000
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72
                                 1612 &PPCS(7)  SETA  X'0002'          PRINTER 7                    F3238000
                                 1613 &UPCS(1)  SETA  X'0001'          PUNCH 1                      F3240000
                                 1614 &UPCS(2)  SETA  X'0002'          PUNCH 2                      F3242000
                                 1615 &UPCS(3)  SETA  X'0004'          PUNCH 3                      F3244000
                                 1616 &UPCS(4)  SETA  X'0008'          PUNCH 4                      F3246000
                                 1617 &UPCS(5)  SETA  X'0100'          PUNCH 5                      F3248000
                                 1618 &UPCS(6)  SETA  X'0200'          PUNCH 6                      F3250000
                                 1619 &UPCS(7)  SETA  X'0400'          PUNCH 7                      F3252000
                                 1620 &WPCS(1)  SETA  X'0040'          CONSOLE                      F3254000
                                 1621 &OPCS(1)  SETA  X'0000'          OPERATOR COMMAND PCS         F3256000
                                 1622 &RPCS(1)  SETA  X'0800'          READER FUNCTION 1            F3258000
                                 1623 &RPCS(2)  SETA  X'0400'          READER FUNCTION 2            F3260000
                                 1624 &RPCS(3)  SETA  X'0200'          READER FUNCTION 3            F3262000
                                 1625 &RPCS(4)  SETA  X'0100'          READER FUNCTION 4            F3264000
                                 1626 &RPCS(5)  SETA  X'0008'          READER FUNCTION 5            F3266000
                                 1627 &RPCS(6)  SETA  X'0004'          READER FUNCTION 6            F3268000
                                 1628 &RPCS(7)  SETA  X'0002'          READER FUNCTION 7            F3270000
                                 1629 *         RECORD CONTROL BYTES                                F3272000
                                 1630 *                                                             F3274000
                                 1631 &CRCB     SETA  X'80'            CONTROL RECORD CONTROL BYTE  F3276000
                                 1632 &PRCB(1)  SETA  X'94'            STREAM 1 PRINT RECORDS       F3278000
                                 1633 &PRCB(2)  SETA  X'A4'            STREAM 2 PRINT RECORDS       F3280000
                                 1634 &PRCB(3)  SETA  X'B4'            STREAM 3 PRINT RECORDS       F3282000
                                 1635 &PRCB(4)  SETA  X'C4'            STREAM 4 PRINT RECORDS       F3284000
                                 1636 &PRCB(5)  SETA  X'D4'            STREAM 5 PRINT RECORDS       F3286000
                                 1637 &PRCB(6)  SETA  X'E4'            STREAM 6 PRINT RECORDS       F3288000
                                 1638 &PRCB(7)  SETA  X'F4'            STREAM 7 PRINT RECORDS       F3290000
                                 1639 &URCB(1)  SETA  X'95'            STREAM 1 PUNCH RECORDS       F3292000
                                 1640 &URCB(2)  SETA  X'A5'            STREAM 2 PUNCH RECORDS       F3294000
                                 1641 &URCB(3)  SETA  X'B5'            STREAM 3 PUNCH RECORDS       F3296000
                                 1642 &URCB(4)  SETA  X'D5'            STREAM 3 PUNCH RECORDS  seeee?  F3298000
                                 1643 &URCB(4)  SETA  X'C5'            STREAM 4 PUNCH RECORDS       F3300000
                                 1644 &URCB(5)  SETA  X'D5'            STREAM 5 PUNCH RECORDS       F3302000
                                 1645 &URCB(6)  SETA  X'E5'            STREAM 6 PUNCH RECORDS       F3304000
                                 1646 &URCB(7)  SETA  X'F5'            STREAM 7 PUNCH RECORDS       F3306000
                                 1647 &WRCB(1)  SETA  X'91'            MESSAGE TO TERM OPERATOR     F3308000
                                 1648 &ORCB(1)  SETA  X'92'            OPERATOR COMMAND RCB         F3310000
                                 1649 &RRCB(1)  SETA  X'93'            STREAM 1 TO HASP             F3312000
                                 1650 &RRCB(2)  SETA  X'A3'            STREAM 2 TO HASP             F3314000
                                 1651 &RRCB(3)  SETA  X'B3'            STREAM 3 TO HASP             F3316000
                                 1652 &RRCB(4)  SETA  X'C3'            STREAM 4 TO HASP             F3318000
                                 1653 &RRCB(5)  SETA  X'D3'            STREAM 5 TO HASP             F3320000
                                 1654 &RRCB(6)  SETA  X'E3'            STREAM 6 TO HASP             F3322000
                                 1655 &RRCB(7)  SETA  X'F3'            STREAM 7 TO HASP             F3324000
                                 1656 *                                                             F3326000
                                 1657 *         THE FOLLOWING VALUES REPRESENT THE LIMIT OF QUEUING F3328000
                                 1658 *         FOR EACH INDICATED DEVICE.                          F3330000
                                 1659 *         THE 'BL' VALUES REPRESENT THE MAXIMUM NUMBER OF BUFFERS F3332000
                                 1660 *         FROM HASP WHICH WILL BE QUEUED ON THE DEVICE.       F3334000
                                 1661 *         THE 'TL' VALUES REPRESENT THE NUMBER OF DECOMPRESSED F3336000
                                 1662 *         RECORDS WHICH WILL BE QUEUED.NOTE THAT SINCE ONE    F3338000
                                 1663 *         DECOMPRESSED RECORD WILL ALWAYS BE IN PROCESS,THE DEVICE F3340000
                                 1664 *         WILL REQUIRE ONE TANK MORE THAN THE TANK LIMIT(A 2540 F3342000
                                 1665 *         PUNCH REQUIRES 2 MORE FOR ERROR RECOVERY PURPOSES). F3344000
                                 1666 *                                                             F3346000
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72

                                 1668 *                                                              F3350000
                                 1669 *         DECOMPRESSION TANK LIMITS                            F3352000
                                 1670 *                                                              F3354000
                                 1671 *               PRINTERS                                       F3356000
                                 1672 &PTLM(1)  SETA  1                 PRINTER 1-DECOMPRESSION LIMIT F3358000
                                 1673 &PTLM(2)  SETA  &PTLM(1)          PRINTER 2-DECOMPRESSION LIMIT F3360000
                                 1674 &PTLM(3)  SETA  &PTLM(1)          PRINTER 3-DECOMPRESSION LIMIT F3362000
                                 1675 &PTLM(4)  SETA  &PTLM(1)          PRINTER 4-DECOMPRESSION LIMIT F3364000
                                 1676 &PTLM(5)  SETA  &PTLM(1)          PRINTER 5-DECOMPRESSION LIMIT F3366000
                                 1677 &PTLM(6)  SETA  &PTLM(1)          PRINTER 6-DECOMPRESSION LIMIT F3368000
                                 1678 &PTLM(7)  SETA  &PTLM(1)          PRINTER 7-DECOMPRESSION LIMIT F3370000
                                 1679 *               PUNCHES                                        F3372000
                                 1680 &UTLM(1)  SETA  1                 PUNCH 1 - DECOMPRESSION LIMIT F3374000
                                 1681 &UTLM(2)  SETA  &UTLM(1)          PUNCH 2 - DECOMPRESSION LIMIT F3376000
                                 1682 &UTLM(3)  SETA  &UTLM(1)          PUNCH 3 - DECOMPRESSION LIMIT F3378000
                                 1683 &UTLM(4)  SETA  &UTLM(1)          PUNCH 4 - DECOMPRESSION LIMIT F3380000
                                 1684 &UTLM(5)  SETA  &UTLM(1)          PUNCH 5 - DECOMPRESSION LIMIT F3382000
                                 1685 &UTLM(6)  SETA  &UTLM(1)          PUNCH 6 - DECOMPRESSION LIMIT F3384000
                                 1686 &UTLM(7)  SETA  &UTLM(1)          PUNCH 7 - DECOMPRESSION LIMIT F3386000
                                 1687 *               CONSOLE                                        F3388000
                                 1688 &WTLM(1)  SETA  &NUMTANK-2        CONSOLE DECOMPRESSION LIMIT   F3390000
                                 1689 *               CONTROL RECORD PROCESSOR                       F3392000
                                 1690 &CTLM     SETA  &NUMTANK          CONTROL DECOMPRESSION LIMIT   F3394000
                                 1691 *                                                              F3396000
                                 1692 *         BUFFER QUEUING LIMITS                                F3398000
                                 1693 *                                                              F3400000
                                 1694 *               PRINTERS                                       F3402000
                                 1695 &PBLM(1)  SETA  2                 PRINTER 1-BUFFER QUEUING LIMIT F3404000
                                 1696 &PBLM(2)  SETA  &PBLM(1)          PRINTER 2-BUFFER QUEUING LIMIT F3406000
                                 1697 &PBLM(3)  SETA  &PBLM(1)          PRINTER 3-BUFFER QUEUING LIMIT F3408000
                                 1698 &PBLM(4)  SETA  &PBLM(1)          PRINTER 4-BUFFER QUEUING LIMIT F3410000
                                 1699 &PBLM(5)  SETA  &PBLM(1)          PRINTER 5-BUFFER QUEUING LIMIT F3412000
                                 1700 &PBLM(6)  SETA  &PBLM(1)          PRINTER 6-BUFFER QUEUING LIMIT F3414000
                                 1701 &PBLM(7)  SETA  &PBLM(1)          PRINTER 7-BUFFER QUEUING LIMIT F3416000
                                 1702 *               PUNCHES                                        F3418000
                                 1703 &UBLM(1)  SETA  2                 PUNCH 1 - BUFFER QUEUING LIMIT F3420000
                                 1704 &UBLM(2)  SETA  &UBLM(1)          PUNCH 2 - BUFFER QUEUING LIMIT F3422000
                                 1705 &UBLM(3)  SETA  &UBLM(1)          PUNCH 3 - BUFFER QUEUING LIMIT F3424000
                                 1706 &UBLM(4)  SETA  &UBLM(1)          PUNCH 4 - BUFFER QUEUING LIMIT F3426000
                                 1707 &UBLM(5)  SETA  &UBLM(1)          PUNCH 5 - BUFFER QUEUING LIMIT F3428000
                                 1708 &UBLM(6)  SETA  &UBLM(1)          PUNCH 6 - BUFFER QUEUING LIMIT F3430000
                                 1709 &UBLM(7)  SETA  &UBLM(1)          PUNCH 7 - BUFFER QUEUING LIMIT F3432000
                                 1710 *               CONSOLE                                        F3434000
                                 1711 &WBLM(1)  SETA  3                 CONSOLE BUFFER QUEUING LIMIT  F3436000
                                 1712 *               CONTROL RECORD PROCESSOR                       F3438000
                                 1713 &CBLM     SETA  &NUMBUFS          CONTROL BUFFER QUEUING LIMIT  F3440000
                                 1714 .NOSETCS  ANOP                                                 F3442000
                                 1715           PRINT &GEN                                           F3444000
                                                PRINT NOGEN
```

```
                        1718            AIF   (&MACHINE EQ 20).LOAD20                                  F3450000
                        1719 .LOAD20    ANOP                                                           F3456000
                        1720            PUNCH ' 0  0+ &&  $  0   0 N 0+ $  0 NNN &&0XE # 00  00  00 XF3458000
                                                K   0;    0<   ¬  R     J   '    PUNCH LAST LOADER CARD  F3460000
                        1721 .SKIP      ANOP                                                           F3462000
```

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT			P150CT70 11/21/72
000000				1724	HASPRTP	START 0		F3468000
				1725	*			F3470000
				1726	*	DEBUGGING VARIABLES		F3472000
				1727	*			F3474000
				1728	&DEBUG	SETA 1		F3476000
				1729	&TRACE	SETA 0	NO TRACE DEGRADATION	F3478000
				1730	&REP	SETA 1	PATCH MODE ON	F3480000
				1731	*			F3482000
				1732	*	CONFIGURATION DEPENDENT EQUATES		F3484000
				1733	*			F3486000
				1734		$CONFIG		F3488000
				1753	&A	SETA 1		F3490000
				1754	*			F3492000
				1755	*	SYMBOLIC DEFINITIONS USED TO REFER TO TCT LOCATIONS		F3494000
				1756	*	** SEE GLOBAL STORAGE FOR UNIQUE PROCESSORS EQUIVALENT DEFS		F3496000
				1757	*			F3498000
000000				1758	TCTDSECT	DSECT		F3500000
				1759		DEFTCT T	DEFINE TCT SYMBOLS	F3502000
				1779	*			F3504000
				1780	*	TCTSTAT BIT DEFINITIONS		F3506000
				1781	*			F3508000
000008				1782	TCT1403	EQU X'08'	TCT STATUS FLAGS FOR 1403, SW ON	F3510000
000008				1783	TCT1443	EQU X'08'	TCT STATUS FLAGS FOR 1443, SW ON	F3512000
000008				1784	TCT2203	EQU X'08'	TCT STATUS FLAGS FOR 2203, SW ON	F3514000
000000				1785	TCT2501	EQU X'00'	TCT STATUS FLAGS FOR 2501	F3516000
000000				1786	TCT2520	EQU X'00'	TCT STATUS FLAGS FOR 2520	F3518000
000001				1787	TCT25200	EQU X'01'	TCT STATUS FLAGS FOR 2520 DUAL	F3520000
000008				1788	TCT1442	EQU X'08'	TCT STATUS FLAGS FOR 1442	F3522000
000002				1789	TCT14420	EQU X'02'	TCT STATUS FLAGS FOR 1442 DUAL	F3524000
000004				1790	TCT2540	EQU X'04'	TCT STATUS FLAGS FOR 2540	F3526000
000002				1791	TCT25600	EQU X'02'	TCT STATUS FLAGS FOR 2560 DUAL	F3528000
000000				1792	TCT2560	EQU X'00'	TCT STATUS FLAGS FOR 2560	F3530000
000010				1793	TCT1052	EQU X'10'	TCT STATUS FLAGS FOR 1052	F3532000
000010				1794	TCT2152	EQU X'10'	TCT STATUS FLAGS FOR 2152	F3534000
000004				1795	TCTREL	EQU X'04'	INTERLOCK RELEASE REQ FOR CONSOLE	F3536000
000003				1796	TCTDUAL	EQU TCT14420+TCT25200	EITHER DUAL DEVICE	F3538000
000080				1797	TCTOPEN	EQU X'80'	TCT OPEN BIT	F3540000
000040				1798	TCTACT	EQU X'40'	ACTION REQUIRED ON THIS TCT	F3542000
000008				1799	TCTREQ	EQU X'08'	CONSOLE REQUEST BIT	F3544000
000008				1800	TCTPRTSW	EQU X'08'	PRINTER AVAILABLE FOR CONSOLE	F3546000
000020				1801	TCTSTOP	EQU X'20'	TCT IS IN STOPPED STATE	F3548000
				1802	*		.S COMMAND REQUIRED TO START UP	F3550000
				1803	*	TCTUCB BIT DEFINITIONS		F3552000
000080				1805	TCTNOINT	EQU X'80'	NO INTERRUPTS ON DEVICE ALLOWED	F3556000
				1807	*	DUMMY TCT DEVICE DEFINITIONS FOR CTLTCT		F3560000
000000				1809	CO	EQU X'00'	DUMMY OPCODE FOR CONTROL	F3564000

```
   LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F3566000
000000                           1810 C01      EQU   X'00'          DUMMY OPCODE FOR CONTROL               F3566000
000000                           1811 CF0      EQU   X'00'          DUMMY FLAGS FOR CCW                    F3568000
000000                           1812 TCT0     EQU   0              DUMMY DEVICE STATUS                    F3570000

                                 1814 ***      TCTECB BIT DEFINITIONS                                      F3574000

000010                           1816 TCTBUSY  EQU   X'10'          DEVICE BUSY BIT                        F3578000

                                 1818 ***      TCTSENSE BIT DEFINITIONS (FIRST BYTE)                       F3582000

000040                           1820 TCTINREQ EQU   X'40'          INTERVENTION REQUIRED BIT              F3586000
```

LOC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT F150CT70 11/21/72

```
000000                  1824 BUFDSECT DSECT                  TRANSMISSION BUFFER DSECT          F3594000
000000                  1825 BUFBEGIN DS    0F               BEGINNING OF THE BUFFER            F3596000
                        1826 BUFCHAIN $ACON 0                BUFFER CHAIN FIELD                 F3598000
000002                  1828 BUFCOUNT DS    H                COUNT OF BYTES TO TRANSMIT         F3600000
000004                  1829 BUFSTAT  DS    C                BUFFER STATUS BYTE                 F3602000
000005                  1830 BUFSTART DS    CL2              TRANSMISSION CONTROL BYTES         F3604000
000007                  1831 BUFBCB   DS    C                BLOCK CONTROL BYTE                 F3606000
000008                  1832 BUFFCS   DS    CL2              FUNCTION CONTROL SEQUENCE          F3608000
                        1833 BUFDATA  DS    (&TPBFSIZ-5)C    DATA PORTION OF TP BUFFER          F3610000
00000A                       BUFDATA  DS    (400-5)C DATA PORTION OF TP BUFFER
000198                  1834 BUFEND   DS    0F               FULL ALIGNMENT FOR THE NEXT        F3612000

                        1836 *                                                                  F3616000
                        1837 *               BUFFER STATUS BIT DEFINITIONS                      F3618000
                        1838 *                                                                  F3620000

000001                  1840 BUFFAKE  EQU   X'01'            DUMMY BUFFER INDICATOR             F3624000
000002                  1841 BUFRESP  EQU   X'02'            RESPONSE ONLY IN BUFFER            F3626000
000004                  1842 BUFNAK   EQU   X'04'            NAK RESPONSE BEING SENT            F3628000
000008                  1843 BUFTEXT  EQU   X'08'            BUFFER CONTAINS TEXT INFORMATION   F3630000
000010                  1844 BUFUCHEK EQU   X'10'            UNIT CHECK EXPECTED                F3632000
```

14112 G.B.

```
000000                          1847 TANKDSEC DSECT                    UNIT RECORD TANK DSECT                  F3638000
                                1848 TANKCHN  $ACON ,                  TANK CHAIN FIELD                        F3640000
000002                          1850 TANKRCB  DS    C                  TANK RECORD CONTROL BYTE                F3642000
000003                          1851 TANKSRCB DS    C                  TANK SUB-RECORD CONTROL BYTE            F3644000
000004                          1852 TANKCNT  DS    H                  COUNT OF DATA BYTES IN TANK             F3646000
                                1853 TANKDATA DS    CL&PRTSIZE         DATA AREA IN THE TANK                   F3648000
000006                               TANKDATA DS    CL120 DATA AREA IN THE TANK
```

```
   LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

000000                            1857 LOGDSECT DSECT                    LOG DESECT                        F3656000
000000                            1858 LOGID    DS    C                  LOG IDENTIFICATION                F3658000
000001                            1859 LOGCLASS DS    C                  SEVERITY  CODE OF MESSAGE          F3660000
000002                            1860 LOGCOUNT DS    H                  COUNT OF TOTAL ERRORS             F3662000
                                  1861 LOGTEXT  DS    CL(&ERRTXTL-1)     TEXT OF MESSAGE                   F3664000
000004                                 LOGTEXT  DS    CL(13-1) TEXT OF MESSAGE
000010                            1862 LOGEND   DS    0C                 END OF DSECT                      F3666000
```

14112 G.B.

```
000000                          1865 HASPRTP  CSECT                                                  F3672000
                                1866          AIF   (&MACHINE EQ 20).ORG20                        F3674000
000000                          1867 .ORG20   ANOP                                                   F3766000
                                1868          ORG   HASPRTP              TO BEGINNING OF CSECT     F3768000
000000                          1869          DS    (&HRTPORG)C          PROGRAM ORIGIN            F3770000
                                              DS    (128)C PROGRAM ORIGIN
```

```
000080                          1871 HASPRJE  EQU   *                                                    F3774000
                                1872          AIF   (&MACHINE EQ 20).EIGHTR  SKIP FIRST 8 REGS IF 360/20  F3776000
                                1873 .EIGHTR  ANOP                          MODEL 20 BEGIN               F3794000
000008                          1874 R8       EQU   8                       *                            F3796000
000009                          1875 R9       EQU   9                       *                            F3798000
00000A                          1876 R10      EQU   10                      *                            F3800000
00000B                          1877 R11      EQU   11                      *                            F3802000
00000C                          1878 R12      EQU   12                      *                            F3804000
00000D                          1879 R13      EQU   13                      *                            F3806000
00000E                          1880 R14      EQU   14                      *                            F3808000
00000F                          1881 R15      EQU   15                      *                            F3810000
000007                          1882 TCTR     EQU   7                       TCT BASE REGISTER            F3812000

                                1884 *                                                                     F3814000
                                1885 *                                                                     F3816000
                                1886 *        REGISTER ASSIGNMENTS AND/OR TYPICAL ASSIGNMENTS              F3818000
                                                                                                           F3820000

                                1888 *        R15 = WORK REG (SECONDARY LINK OR PARAMETER REGISTER)        F3824000
                                1889 *        R14 = LINK REG                                               F3826000
                                1890 *        R13 = BUFFER POINTER                                         F3828000
                                1891 *        R12 = RESERVED                                               F3830000
                                1892 *        R11 = WORK                                                   F3832000
                                1893 *        R10 = WORK                                                   F3834000
                                1894 *        R9  = WORK                                                   F3836000
                                1895 *        R8  = PARAMETER REGISTER                                     F3838000
                                1896          AIF   (&MACHINE EQ 20).X1                                    F3840000
                                1897 .X1      AIF   (&MACHINE EQ 20).BASOK1                                F3858000
                                1898 .BASOK1  ANOP                                                         F3864000
                                1899          USING HASPRJE-&HRTPORG,0,1,2,3 PROVIDE FOR 16K               F3866000
000000                                        USING HASPRJE-128,0,1,2,3 PROVIDE FOR 16K
000080                          1900          DS    (X'24')C                SPACER FOR MODEL 20            F3868000
                                1901 .BASOK2  ANOP                                                         F3870000
                                1902          AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).ERRLOG               F3872000
                                1903 .ERRLOG  ANOP                                                         F3902000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F150CT70 11/21/72
                                  1906           PRINT GEN                                          F3908000
                                  1907 $START    $GENCOM                                            F3910000
0000A4                            1908+$START    DS     0H
0000A4 4700 0258           00258  1909+$CONTCOM  NOP    $CONTROL      CONTROL RECORD PROCESSOR
0000A8 4700 089E           0089E  1910+$TPGETCM  NOP    $TPGET        INPUT BUFFER MANAGER
0000AC 4700 0354           00354  1911+$PCOMM1   NOP    $PRTN1        ENTRY POINT TO PRINT
0000B0 47F0 0432           00432  1912+$RCOMM1   B      $RRTN1        ENTRY POINT TO READ CARD
0000B4 4700 054C           0054C  1913+$UCOMM1   NOP    $URTN1        ENTRY TO PUNCH CARD
0000B8 4700 0DC2           00DC2  1914+$COMCOM   NOP    $COMSUP       COMMUNICATIONS SUPERVISOR
0000BC 47F0 00A4           000A4  1915+          B      $START
                                  1916           PRINT &GEN                                         F3912000
                                                 PRINT NOGEN

                                  1918 $CHNTEMP  $ACON  0             DISABLED TEMPORARY WORK      F3916000
000CC2 0000
000CC4 00000000                   1920 $LOGINFO  DC     A(0)         INFORMATION TO BE LOGGED     F3918000
                                  1921 $LOGSAVE  $ACON  0            $LOG REG SAVE AREA           F3920000
0000CA                            1923 $COMDCOM  DS     0C                                        F3922000
0000CA                            1924 $INPCOM   DS     0C                                        F3924000
0000CA                            1925 $DATCOM   DS     0C                                        F3926000
000CCA                            1926 $ROUCOM   DS     0C                                        F3928000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    F15OCT70  11/21/72
                                  1928          PRINT GEN                                                                F3932000
                                  1930 &B       SETA  1                  SET SYMB TO CHAIN TCTS TOGETHER         F3936000
                                  1931 &A       SETA  1                                                          F3938000
                                  1932 &D       SETA  1                  SIGNAL ORG TO GENTCT                    F3940000
                                  1933 $CTLTCT  $GENTCT C,&CFCS,&CRCB,FFF,0,&CTLM,&CBLM,&CFCS,&CRCB CONT TCT   F3942000
 0000CA                           1934+$TCT1    DS    0H                 ORIGIN OF TOTAL CONTROL TABLE
                                  1935+*
                                  1936+*        SYMBOLIC DEFINITIONS USED BY PROCESSOR TO REFER TO TCT
                                  1937+*
 0000CA                           1938+CTCT     DS    0H
 0000CA                           1939+CCTNEXT  DS    H
 0000CC                           1940+CCTFCS   DS    AL2                FUNCTION CONTROL SEQUENCE MASK
 0000CE                           1941+CCTRCB   DS    CL1                RECORD CONTROL BLOCK MASK
 0000CF                           1942+CCTSTAT  DS    CL1                STATUS FLAGS
 0000D0                           1943+CCTCOM   DS    H
 0000CE                           1944+CCTINRCB EQU   CCTRCB             READER RCB IDENTIFICATION
                                  1945+*
                                  1946+*        NORMAL DEVICE EXTENTION
                                  1947+*
 0000D2                           1948+CCTTANK  DS    H
 0000D4                           1949+CCTBUFER DS    H
                                  1950+*
                                  1951+*              TNKLM,TNKCT AND BUFLM,BUFCT MUST APPEAR IN SEQ AND STRT
                                  1952+*                    ON HALF WORD BOUNDARIES
 0000D6                           1953+CCTTNKLM DS    CL1                MAX NUM OF TANKS ASSIGNABLE TO DEV
 0000D7                           1954+CCTTNKCT DS    CL1                CURRENT NUM ASSIGNED
 0000D8                           1955+CCTBUFLM DS    CL1                MAX NUM OF BUFFERS ASSIGNABLE TO DV
 0000D9                           1956+CCTBUFCT DS    CL1                CURRENT NUM ASSIGNED
 0000CA                           1957+         ORG   $TCT1+
                                  1958+*
                                  1959+*        STORAGE ALLOCATION AND INITIAL VALUES FOR TCT
                                  1960+*
 0000CA                           1961+$CTLTCT  DS    0H
 0000CA 00DA                      1962+         DC    Y($TCT2)
 0000CC 0000                      1963+         DC    AL2(0)
 0000CE 80                        1964+         DC    AL1(128)
 0000CF 00                        1965+         DC    AL1(TCT0)
 0000D0 00A8                      1966+         DC    Y($CCOMM1)
                                  1967+*        NORMAL EXTENTION TO TOTAL CONTROL TABLE
 0000D2 0000                      1968+         DC    Y(0)
 0000D4 0000                      1969+         DC    Y(0)
 0000D6 08                        1970+         DC    AL1(8)
 0000D7 00                        1971+         DC    X'00'              CURRENT NUMBER OF TANKS IN Q
 0000D8 08                        1972+         DC    AL1(8)
 0000D9 00                        1973+         DC    X'00'              CURRENT NUMBER OF BUFFERS IN Q
```

14112 G.B.

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                  F15OCT70  11/21/72

                                    1974 &A       SETA  1                                                                F3944000
                                    1975 &D       SETA  &CONSOLE            SIGNAL DSECT OR ORG TO GENTCT                F3946000
                                    1976          AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).TCTWTO                       F3948000
                                    1977 .TCTWTO  ANOP                                                                 F3956000
                                    1978 &D       SETA  &NUMPRT             SIGNAL DSECT OR ORG TO GENTCT                F3958000
                                    1979 .TCTPRTL AIF   (&A GT &NUMPRT).TCTPRT                                         F3960000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F150CT70  11/21/72

                                  1981          $GENTCT P,&PFCS(&A),&PRCB(&A),&PADR(&A),&PDEV(&A),&PTLH(&A),  CP3964000
                                                      &PBLM(&A),&PFCS(&A),&PRCB(&A) PRINTER TCT                F3966000
0000DA                            1982+$TCT2    DS    0H                  ORIGIN OF TOTAL CONTROL TABLE
                                  1983+*
                                  1984+*        SYMBOLIC DEFINITIONS USED BY PROCESSOR TO REFER TO TCT
                                  1985+*
0000DA                            1986+PTCT     DS    0H
0000DA                            1987+PCTNEXT  DS    H
0000DC                            1988+PCTFCS   DS    AL2                 FUNCTION CONTROL SEQUENCE MASK
0000DE                            1989+PCTRCB   DS    CL1                 RECORD CONTROL BLOCK MASK
0000DF                            1990+PCTSTAT  DS    CL1                 STATUS FLAGS
0000E0                            1991+PCTCOM   DS    H
0000DE                            1992+PCTINRCB EQU   PCTRCB              READER RCB IDENTIFICATION
                                  1993+*
                                  1994+*        NORMAL DEVICE EXTENTION
                                  1995+*
0000E2                            1996+PCTTANK  DS    H
0000E4                            1997+PCTBUFER DS    H
                                  1998+*
                                  1999+*              TNKLM,TNKCT AND BUFLM,BUFCT MUST APPEAR IN SEQ AND STRT
                                  2000+*              ON HALF WORD BOUNDARIES
0000E6                            2001+PCTTNKLM DS    CL1                 MAX NUM OF TANKS ASSIGNABLE TO DEV
0000E7                            2002+PCTTNKCT DS    CL1                 CURRENT NUM ASSIGNED
0000E8                            2003+PCTBUFLM DS    CL1                 MAX NUM OF BUFFERS ASSIGNABLE TO DV
0000E9                            2004+PCTBUFCT DS    CL1                 CURRENT NUM ASSIGNED
0000DA                            2005+         ORG   $TCT2
                                  2006+*
                                  2007+*        STORAGE ALLOCATION AND INITIAL VALUES FOR TCT
                                  2008+*
0000DA                            2009+         DS    0H
000CDA 00EA                       2010+         DC    Y($TCT3)
0000DC 0800                       2011+         DC    AL2(2048)
0000DE 94                         2012+         DC    AL1(148)
000CDF 08                         2013+         DC    AL1(TCT2203)
000CE0 00AC                       2014+         DC    Y($PCOMM1)
                                  2015+*        NORMAL EXTENTION TO TOTAL CONTROL TABLE
000CE2 0000                       2016+         DC    Y(0)
0000E4 0000                       2017+         DC    Y(0)
0000E6 01                         2018+         DC    AL1(1)
0000E7 00                         2019+         DC    X'00'               CURRENT NUMBER OF TANKS IN Q
0000E8 02                         2020+         DC    AL1(2)
000CE9 00                         2021+         DC    X'00'               CURRENT NUMBER OF BUFFERS IN Q
                                  2022 &A       SETA  &A+1                                                   F3968000
                                  2023          AGO   .TCTPRTL                                              F3970000
                                  2024 .TCTPRTL AIF   (&A GT &NUMPRT).TCTPRT                                 F3960000
                                  2025 .TCTPRT  ANOP                                                         F3972000
                                  2026 &A       SETA  1                                                      F3974000
                                  2027 &D       SETA  &NUMRDR             SIGNAL DSECT OR ORG TO GENTCT      F3976000
                                  2028 .TCTRDRL AIF   (&A GT &NUMRDR).TCTRDR                                 F3978000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F150CT70  11/21/72
                                  2030          AIF   (&S(&A) NE 0).TCTRDR1
                                  2031          $GENTCT R,&RFCS(&A),&RBCB(&A),&HADR(&A),&RDEV(&A),0,0,          F3982000
                                                      &RFCS(&A),&RBCB(&A) READER TCT                              CF3984000
0000EA                            2032+$TCT3    DS    0H                  ORIGIN OF TOTAL CONTROL TABLE           F3986000
                                  2033+*
                                  2034+*        SYMBOLIC DEFINITIONS USED BY PROCESSOR TO REFER TO TCT
                                  2035+*
0000EA                            2036+RTCT     DS    0H
0000EA                            2037+RCTNEXT  DS    H
0000EC                            2038+RCTFCS   DS    AL2                 FUNCTION CONTROL SEQUENCE MASK
0000EE                            2039+RCTRCB   DS    CL1                 RECORD CONTROL BLOCK MASK
0000EF                            2040+RCTSTAT  DS    CL1                 STATUS FLAGS
0000F0                            2041+RCTCOM   DS    H
0000EE                            2042+RCTINRCB EQU   RCTRCB              READER RCB IDENTIFICATION
                                  2043+*
                                  2044+*        TANK EXTENTIONS FOR READER AND CONSOLE PROCESSORS
                                  2045+*
0000F2                            2046+RCTTANK1 DS    H
0000F4                            2047+RCTTRCB1 DS    CL1                 RCB IDENTIFICATION
0000F5                            2048+RCTTSRC1 DS    CL1                 SRCB IDENTIFICATION
0000F6                            2049+RCTTCT1  DS    H                   NUMBER OF DATA CHARACTERS
0000F8                            2050+RCTTDTA1 DS    CL(RSIZE+4)
000140                            2051+RCTTANK2 DS    H
000142                            2052+RCTTRCB2 DS    CL1                 RCB IDENTIFICATION
000143                            2053+RCTTSRC2 DS    CL1                 SRCB IDENTIFICATION
000144                            2054+RCTTCT2  DS    H                   NUMBER OF DATA CHARACTERS
000146                            2055+RCTTDTA2 DS    CL(RSIZE+4)
0000EA                            2056+         ORG   $TCT3
                                  2057+*
                                  2058+*        STORAGE ALLOCATION AND INITIAL VALUES FOR TCT
                                  2059+*
0000EA                            2060+         DS    0H
0000EA 01A6                       2061+         DC    Y($TCT4)
0000EC 0800                       2062+         DC    AL2(2048)
0000EE 93                         2063+         DC    AL1(147)
0000EF 00                         2064+         DC    AL1(TCT2501)
0000F0 00B0                       2065+         DC    Y($RCOMM1)
                                  2066+*        INPUT TANKS FOR READER AND CONSOLE
0000F2 0000                       2067+         DC    Y(0)
0000F4 93                         2068+         DC    AL1(147)
0000F5 80                         2069+         DC    X'80'               SRCB
0000F6 0050                       2070+         DC    H'80'               DATA LENGTH
0000F8 4040404040404040           2071+         DC    CL(RSIZE+4)' '
000140 0000                       2072+         DC    Y(0)
000142 93                         2073+         DC    AL1(147)
000143 80                         2074+         DC    X'80'               SRCB
000144 0050                       2075+         DC    H'80'               DATA LENGTH
000146 4040404040404040           2076+         DC    CL(RSIZE+4)' '
                                  2077          AGO   .TCTRDR2                                                  F3988000
                                  2078 .TCTRDR2 ANOP                                                            F4000000
                                  2079 &A       SETA  &A+1                                                      F4002000
                                  2080          AGO   .TCTRDRL                                                  F4004000
                                  2081 .TCTRDRL AIF   (&A GT &NUMRDR).TCTRDR                                    F3978000
                                  2082 .TCTRDR  ANOP                                                            F4006000
                                  2083 &A       SETA  1                                                         F4008000
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F1SOCT70  11/21/72

                                 2084 &D       SETA  &NUMPUN          SIGNAL DSECT OR ORG TO GENTCT      F4010000
                                 2085 .TCTPUNL AIF   (&A GT &NUMPUN).TCTPUN                              F4012000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F15OCT70  11/21/72

                                   2087          $GENTCT U,&UFCS(&A),&URCB(&A),&UADR(&A),&UDEV(&A),&UTLM(&A),  CF4016000
                                                       &UBLM(&A),&UFCS(&A),&URCB(&A) PUNCH TCT                  F4018000
000 1A6                            2088+$TCT4    DS    0H                    ORIGIN OF TOTAL CONTROL TABLE
                                   2089+*
                                   2090+*        SYMBOLIC DEFINITIONS USED BY PROCESSOR TO REFER TO TCT
                                   2091+*
000 1A6                            2092+UTCT     DS    0H
000 1A6                            2093+UCTNEXT  DS    H
000 1A8                            2094+UCTFCS   DS    AL2                   FUNCTION CONTROL SEQUENCE MASK
000 1AA                            2095+UCTRCB   DS    CL1                   RECORD CONTROL BLOCK MASK
000 1AB                            2096+UCTSTAT  DS    CL1                   STATUS FLAGS
000 1AC                            2097+UCTCOM   DS    H
000 1AA                            2098+UCTINRCB EQU   UCTRCB                READER RCB IDENTIFICATION
                                   2099+*
                                   2100+*        NORMAL DEVICE EXTENTION
                                   2101+*
000 1AE                            2102+UCTTANK  DS    H
000 1B0                            2103+UCTBUFER DS    H
                                   2104+*
                                   2105+*              TNKLM,TNKCT AND BUFLM,BUFCT MUST APPEAR IN SEQ AND STMT
                                   2106+*                                    ON HALF WORD BOUNDARIES
000 1B2                            2107+UCTTNKLM DS    CL1                   MAX NUM OF TANKS ASSIGNABLE TO DEV
000 1B3                            2108+UCTTNKCT DS    CL1                   CURRENT NUM ASSIGNED
000 1B4                            2109+UCTBUFLM DS    CL1                   MAX NUM OF BUFFERS ASSIGNABLE TO DV
000 1B5                            2110+UCTBUFCT DS    CL1                   CURRENT NUM ASSIGNED
000 1A6                            2111+         ORG   $TCT4
                                   2112+*
                                   2113+*        STORAGE ALLOCATION AND INITIAL VALUES FOR TCT
                                   2114+*
000 1A6                            2115+         DS    0H
000 1A6 0000                       2116+         DC    Y($TCT5)
000 1A8 0001                       2117+         DC    AL2(1)
000 1AA 95                         2118+         DC    AL1(149)
000 1AB 08                         2119+         DC    AL1(TCT1442)
000 1AC 00B4                       2120+         DC    Y($UCOMM1)
                                   2121+*        NORMAL EXTENTION TO TOTAL CONTROL TABLE
000 1AE 0000                       2122+         DC    Y(0)
000 1B0 0000                       2123+         DC    Y(0)
000 1B2 01                         2124+         DC    AL1(1)
000 1B3 00                         2125+         DC    X'00'                 CURRENT NUMBER OF TANKS IN Q
000 1B4 02                         2126+         DC    AL1(2)
000 1B5 00                         2127+         DC    X'00'                 CURRENT NUMBER OF BUFFERS IN Q
                                   2128 &A       SETA  &A+1                                                   F4020000
                                   2129          AGO   .TCTPUNL                                               F4022000
                                   2130 .TCTPUNL AIF   (&A GT &NUMPUN).TCTPUN                                  F4012000
                                   2131 .TCTPUN  ANOP                                                         F4024000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        P'50CT70  11/21/72
                                   2133 $TCT&B   EQU   0                  LAST TCT POINTS TO ZERO          F4028000
000000                                  $TCT5    EQU   0                  LAST TCT POINTS TO ZERO
                                   2134         PRINT &GEN                                              F4030000
                                                PRINT NOGEN

                                   2136 .NOGTCTS ANOP                                                    F4034000
                                   2137 *                                                                F4036000
                                   2138 *            E R R O R  L O G  T A B L E                         F4038000
                                   2139 *                                                                F4040000
000186                             2140 LOGTABLE DS    0H                                                 F4042000
000248                             2141         ORG   *+X'92'            ORG OVER THE LOG TABLE          F4044000
0001A6                             2142 $ERRTAB  EQU   LOGTABLE-LOGEND+LOGDSECT ERROR LOG TABLE FOR CE   F4046000

                                   2144 *                                                                F4050000
                                   2145 *              BEGINNING OF QUEUE CHAINS                         F4052000
                                   2146 *                                                                F4054000

000248 0000                        2148 $TEMP    DC    H'0'               GLOBAL TEMPORARY WORK           F4058000
                                   2149 $BUFFPOOL $ACON $1STBUF           BUFFER POOL CHAIN CONTROL WORD  F4060000
                                   2151 $TANKPOL $ACON $1STTANK           TANK QUEUE CONTROL WORD         F4062000
                                   2153 $OUTBUF  $ACON 0                  XMISSION BUFFER CHAIN CTL WORD  F4066000
                                   2155 $CORESIZ $ACON 0                  SYSTEM MEMORY SIZE              F4068000
000252                             2157 $PCSOUT  DS    0H                 OUTGOING FUNCTION CONTROL SEQUENCE F4070000
000252 8FCF                        2158         DC    X'8FCF'            ALL FUNCTIONS PERMITTED         F4072000
000254 8FCF                        2159 $PCSIN   DC    X'8FCF'            INCOMING FCS FROM HASP          F4074000
                                   2160         AIF   (&MACHINE NE 20).N20CON                           F4076000
000256 00A0                        2161 $WAITCON DC    H'160'             DELAYING CONSTANT FOR MOD 20    F4078000
                                   2162         AGO   .N30CON                                           F4080000
                                   2163 .N30CON  ANOP                                                    F4086000
```

14112 G.B.

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                   2165 *                                                                  F4090000
                                   2166 *                                                                  F4092000
                                   2167 $CRTN1   NULL                                                      F4094000
000000A4                           2169 $CCOMM1  EQU   $CONTCOM                                            F4096000
000000                             2170 CFLAGS   EQU   0                 DUMMY CCW                         F4098000
000000                             2171 COPCODE  EQU   0                 DUMMY CCW                         F4100000
                                   2172 *                                                                  F4102000
                                   2173 $CONTROL NULL  *                 ENTRY POINT                       F4104000
000000                             2175         $LA    R13,$CTLTCT       GET CONTROL TCT                   F4106000
                                   2177          USING TCTDSECT,R13      *                                 F4108000
000026E 4770 027A          0027A   2178         $DCHAIN TCTTANK,R8,NOSSH  GET A TANK OF DATA                F4110000
000272 9200 00A5      000A5        2183          BNZ   MPROCESS           BR IF GOTTEN                      F4112000
000276 47F0 00A8          000A8    2184          MVI   $CONTCOM+1,0       NONE... CLOSE ENTRY               F4114000
                                   2185          B     $CONTCOM+4         AND EXIT                          F4116000
                                   2186 *                                                                  F4118000
                                   2187 *              PROCESS A CONTROL RECORD                            F4120000
                                   2188 *                                                                  F4122000

                                   2190 MPROCESS NULL  *                 *                                 F4126000
                                   2192         $TCTPOST T,R10           SHOW TANK GOTTEN                  F4128000
000000                             2198          DROP  R13               DONE FOR NOW                      F4130000
000028E F300 030F 8002 0030F 00002 2199          USING TANKDSEC,R8       *                                 F4132000
000294 9403 030F      0030F        2200          UNPK  MTEMP+1(1),TANKRCB(1) SWAP DIGITS                   F4134000
000298 48A0 030E          0030E    2201          NI    MTEMP+1,3         TURN OFF CTL BIT                  F4136000
00029C 1AAA                        2202          LH    R10,MTEMP         GET CTL FUNCTION TYPE             F4138000
                                   2203          AR    R10,R10           DOUBLE IT                         F4140000
0002A2 1A9A                        2204         $LA    R9,MCONTTAB-2     START OF CTL TYPE TABLE           F4142000
0002A4 4890 9000          00000    2206          AR    R9,R10            R9 = CORRECT TABLE ENTRY          F4144000
0002A8 4090 02AE          002AE    2207          LH    R9,0(0,R9)        R9 = CONTROL ADDRESS              F4146000
0002AC 47F0 0000          00000    2208          STH   R9,*+6            ENTER ROUTINE                     F4148000
                                   2209          B     *-*                                               F4150000
```

14112 G.R.

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                P150CT70  11/21/72
                                  2211 *                                                                F4154000
                                  2212 *          SUBROUTINE TO FIND TCT CORRESPONDING TO SRCB FUNCTION F4156000
                                  2213 *            R14=RETURN , CC NE 0 -R13 CONTAINS TCT,CC=0-NOT FOUND F4158000


                                  2215 MTCTFIND NULL  *                 ENTRY POINT                     F4162000
                                  2217          $LA   R13,$TCT1         FIRST TCT                       F4164000
000000                            2219          USING TCTDSECT,R13      ADDRESSABILITY                  F4166000
                                  2220 MNEXTTCT NULL  *                 *                               F4168000
0002B4 D500 D004 8003 00004 00003 2222          CLC   TCTRCB,TANKSRCB   IS THIS CORRECT TCT             F4170000
0002BA 4780 02CC            02CC  2223          BE    MTCTOK            BR IF YES                       F4172000
                                  2224          AIF   (&R(2) AND &R(3) AND &R(7)).MDUAL                 F4174000
                                  2225 .MDUAL   ANOP                                                    F4180000
                                  2226          $LOAD R13,TCTNEXT       NO... TO NEXT                   F4182000
                                  2228          $LTR  R13,R13           IS THIS ALL...                  F4184000
0002C6 4770 02B4            02B4  2230          BNZ   MNEXTTCT          BR IF MORE                      F4186000
0002CA 07FE                       2231          BR    R14               RETURN WITH COND. CODE = 0      F4188000
                                  2232 MTCTOK   $LTR  R14,R14           SET COND. CODE NON-ZERO         F4190000
0002D0 07FE                       2234          BR    R14               AND RETURN                      F4192000
```

```
                                    2237 *
                                    2238 *                SUBROUTINE TO $TPPUT AN ANSWERING CTL RECORD                F4198000
                                    2239 *                     R8 = TANKADDR                                          F4200000
                                                                                                                       F4202000

                                    2241 HPUT     NULL  *                        ENTRY POINT                           F4206000
                                    2243          BAS   R14,$TPPUT               GO PUT RECORD                         F4208000
0002D6 4770 02F4          002F4     2247          BNZ   HEXIT                    EXIT IF ACCEPTED                      F4210000
0002DA D201 00A6 0310 000A6 00310   2248          MVC   $CONTCOM+2(2),HREPUTA    SET COMUTATOR RE-ENTRY                F4212000
                                    2249        $STO    R8,HTANK                 SAVE TANK ADDR                        F4214000
0002E4 47F0 00A8          000A8     2251          B     $CONTCOM+4               EXIT TO COMUTATOR                     F4216000
                                    2252 HREPUT   NULL  *                        RETRY PUTTING RECORD                  F4218000
                                    2254        $LOAD   R8,HTANK                 RESTORE TANK ADDR                     F4220000
                                    2256          BAS   R14,$TPREPUT             TRY IT                                F4222000
0002F0 4780 00A8          000A8     2260          BZ    $CONTCOM+4               CYCLE IF STILL NOT ACCEPTED           F4224000
                                    2261 HEXIT    NULL  *                        ENTRY AT END OF PROCESSING            F4226000
                                    2263        $FREE   $TANKPOL,R8,NOENB        FREE TANK                             F4228000
000302 D201 00A6 0312 000A6 00312   2267          MVC   $CONTCOM+2(2),HCONTROL     RESET COMUTATOR                       F4230000
000308 47F0 0258          00258     2268          B     $CONTROL                 AND TRY NEXT TANK                     F4232000
                                    2269 HTANK    $ACON 0                        TANK REG STORAGE                      F4234000
00030E 0000                         2271 HTEMP    DC    H'0'                     TEMP STORAGE (HI-BYTE ALWAYS ZERO)    F4236000
000310 02E8                         2272 HREPUTA  DC    S(HREPUT)                COMMUTATOR ADJUSTMENT ADDR            F4238000
000312 0258                         2273 HCONTROL DC    S($CONTROL)              COMMUTATOR ADJUSTMENT ADDR            F4240000
                                    2274 HCONTTAB NULL  *                        CONTROL TYPE BRANCH TABLE             F4242000
                                    2276 *        DC    S(HC0)          000    RESERVED                              F4244000
000314 0322                         2277          DC    S(HC1)          001    START FUNCTION REQUEST                F4246000
000316 033C                         2278          DC    S(HC2)          010    START FUNCTION PERMISSION             F4248000
000318 02F4                         2279          DC    S(HC3)          011    RESERVED                              F4250000
00031A 02F4                         2280          DC    S(HC4)          100    RESERVED                              F4252000
00031C 02F4                         2281          DC    S(HC5)          101    RESERVED                              F4254000
00031E 02F4                         2282          DC    S(HC6)          110    RESERVED                              F4256000
000320 02F4                         2283          DC    S(HC7)          111    GENERAL CONTROL TYPE                  F4258000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F150CT70  11/21/72
                                  2286 *                                                              F4264000
                                  2287 * MC0          CONTROL RECORD , TYPE = 000 (RESERVED)         F4266000
                                  2288 *                                                              F4268000
                                  2290 *                                                              F4272000
                                  2291 *              RESERVED FOR FUTURE USE                         F4274000
                                  2292 *                                                              F4276000
0002F4                            2293 MC0      EQU   MEXIT               TO DEFINE SYMBOL          F4276000
                                  2295 *                                                              F4282000
                                  2296 * MC1          CONTROL RECORD , TYPE = 001(REQUEST TO START FUNCTION) F4284000
                                  2297 *                                                              F4286000
                                  2299 MC1      NULL  *                   *                         F4290000
                                  2301 *                                                              F4292000
                                  2302          BAS   R14,MTCTFIND        GO FIND TCT               F4294000
000326 4770 032E          0032E   2306          BNZ   MTCTSET             BR IF FOUND               F4296000
                                  2307         $TRACE SSM=YES                                       F4298000
00032A 47F0 02F4          002F4   2308          B     MEXIT               IGNORE REQUEST            F4300000
                                  2309 MTCTSET  NULL  *                   CORRECT TCT FOUND         F4302000
00032E 947F D005      00005       2311          NI    TCTSTAT,255-TCTOPEN SHOW USE                  F4306000
000332 D300 8002 1358 00002 01358 2312          MVZ   TANKRCB,=X'A0'      CHANGE REQUEST TO PERMISSION F4310000
000338 47F0 02D2          002D2   2313          B     MPUT                AND SEND IT               F4312000
                                  2315 *                                                              F4316000
                                  2316 * MC2          CONTROL RECORD , TYPE = 010(PERMISSION TO START FCN) F4318000
                                  2317 *                                                              F4320000
                                  2319 MC2      NULL  *                   ENTRY POINT               F4324000
                                  2321         $TRACE SSM=YES                                       F4326000
                                  2322          BAS   R14,MTCTFIND        GO LOOK-UP TCT            F4328000
000340 4780 02F4          002F4   2326          BZ    MEXIT               IGNORE IF NOT FOUND       F4330000
                                  2327         $LOAD  R14,TCTCOM          GET COMUTATOR ENTRY       F4332000
000348 92F0 E001      00001       2329          MVI   1(R14),X'F0'        OPEN IT                   F4334000
00034C 947F D005      00005       2330          NI    TCTSTAT,255-TCTOPEN SHOW OPEN                 F4336000
000350 47F0 02F4          002F4   2331          B     MEXIT               AND EXIT                  F4338000
                                  2333 *                                                              F4342000
                                  2334 * MC3          CONTROL RECORD , TYPE = 011 (RESERVED)         F4344000
```

14112 G.B.

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72
0002F4                            2336 MC3      EQU   MEXIT              NOT YET DEFINED                F4348000

                                  2338 *                                                                  F4352000
                                  2339 * MC4          CONTROL RECORD , TYP = 100 (RESERVED)               F4354000
                                  2340 *                                                                  F4356000

0002F4                            2342 MC4      EQU   MEXIT              NOT YET DEFINED                F4360000

                                  2344 *                                                                  F4364000
                                  2345 * MC5          CONTROL RECORD , TYPE = 101 (RESERVED)              F4366000
                                  2346 *                                                                  F4368000

0002F4                            2348 MC5      EQU   MEXIT              TO DEFINE SYMBOL               F4372000
                                  2349 *                                 FUNCTION IS NOT YET SUPPORTED  F4374000

                                  2351 *                                                                  F4378000
                                  2352 * MC6          CONTROL RECORD , TYPE = 110(RESERVED)               F4380000
                                  2353 *                                                                  F4382000

                                  2355 *                                                                  F4386000
                                  2356 *              THIS CONTROL TYPE IS CURRENTLY UNDEFINED BUT IS     F4388000
                                  2357 *              RESERVED FOR FUTURE USE.                            F4390000
                                  2358 *                                                                  F4392000
0002F4                            2359 MC6      EQU   MEXIT              TO DEFINE SYMBOL               F4394000

                                  2361 *                                                                  F4398000
                                  2362 * MC7          CONTROL RECORD , TYPE = YYY (GENERALIZED CONTROL)   F4400000
                                  2363 *                                  (TYPE INDICATED IN SRCB)        F4402000
                                  2364 *                                                                  F4404000

0002F4                            2366 MC7      EQU   MEXIT              ENTRY POINT                    F4408000
                                  2367 *                                                                  F4410000
                                  2368 *              CURRENTLY NO FUNCTIONS ARE IMPLEMENTED FOR THIS     F4412000
                                  2369 *              CONTROL FUNCTION. THE TYPE OF CONTROL RECORD, SUCH  F4414000
                                  2370 *              AS ACCOUNTING,SIGN-ON,INITIALIZATION,ETC, IS        F4416000
                                  2371 *              INDICATED IN THE SRCB.                              F4418000
                                  2372 *              THE SRCB IDENTIFICATION CHARACTERS 'A' THRU 'R'     F4420000
                                  2373 *              AND '0' THRU '9' ARE RESERVED FOR FUTURE HASP       F4422000
                                  2374 *              DEVELOPMENT. ALL OTHER EBCDIC CHARACTERS , WHICH    F4424000
```

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                 2375 *          ARE TRANSMISSION COMPATIBLE ARE AVAILABLE TO THE        F4426000
                                 2376 *          USER TO ADD ADDITIONAL CONTROL FUNCTIONS.               F4428000
                                 2377 *                                                                  F4430000


                                 2379            DROP  R8,R13                                            F4434000
                                 2380            PRINT &GEN                                              F4436000
                                                 PRINT NOGEN
                                 2381            AIF   (&NUMPRT EQ 0).PRTNSKP                            F4438000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                  2383 &A       SETA  0                                                F4442000
                                  2384 *                                                               F4444000
                                  2385 *        BASE REGISTER ASSIGNMENT                               F4446000
                                  2386 *                                                               F4448000
000000                            2387          USING TANKDSEC,R8                                      F4450000
                                  2388          AIF   (&NUMPRT EQ 1).PSK1                              F4452000
                                  2389 .PSK1    ANOP                                                   F4456000
                                  2390 $PRTN1   NULL                                                   F4458000
000354                            2392 PNEXT    EQU   *                 BASIC LOOP                     F4460000
                                  2393          $GETTNK P,R8,R9,EMPTY=WAIT GET NEXT TANK TO PRINT      F4462000
000388 9500 8005       00005      2406          CLI   TANKCNT+1,0       TEST FOR END OF JOB            F4464000
                                  2407          AIF   (&PRTCONS EQ 0).PSK5                             F4466000
                                  2408 .PSK5    ANOP                                                   F4502000
00038C 4780 0416             00416 2409          BE    PFREE             FREE THE TANK IF END OF JOB    F4504000
                                  2410 .PSK5A   ANOP                                                   F4506000
000390 958E 8003       00003      2411          CLI   TANKSRCB,X'8E'    LOOK FOR CHANGE IN FORMS       F4508000
                                  2412          AIF   (&CONSOLE EQ 0).PSK5B                            F4510000
000394 4770 039C             0039C 2413 .PSK5B   BNE   *+8               SKIP SRCB MODIFICATION IF NO   F4516000
000398 9291 8003       00003      2414          MVI   TANKSRCB,X'91'    INSERT PRINT AND EJECT SRCB    F4518000
                                  2415 .PSK5C   ANOP                                                   F4520000
00039C D200 03FF 8005 003FF 00005 2416          MVC   PCTCCWCT+1(1),TANKCNT+1 SET THE LINE IN CCW      F4522000
                                  2417 *                                                               F4524000
                                  2418 *        SET UP CARRIAGE CONTROL                                F4526000
                                  2419 *                                                               F4528000
                                  2420          AIF   (&MACHINE EQ 20).PSK2                            F4530000
                                  2421 .PSK2    ANOP                                                   F4562000
0003A2 D200 03E5 8003 003E5 00003 2422          MVC   PCIO+3(1),TANKSRCB  PICK UP CARRIAGE CONTROL INFO F4564000
0003A8 9244 03E3       003E3      2423          MVI   PCIO+1,X'44'      RESET CONTROL OPCODE           F4566000
0003AC 9120 03E5       003E5      2424          TM    PCIO+3,PSKIMM     CK FOR SKIP IMMEDIATE          F4568000
0003B0 4710 03B8             003B8 2425          BO    PSKIM             IF YES GO AROUND DELAY SETTING F4570000
0003B4 9602 03E3       003E3      2426          OI    PCIO+1,X'02'      SET SKIP AFTER PRINT 44=46     F4572000
0003B8 9110 03E5       003E5      2427 PSKIM    TM    PCIO+3,X'10'      CK FOR SKIP NOT SPACE          F4574000
0003BC 4780 03C4             003C4 2428          BZ    PSKLNS            IF OFF SPACE                   F4576000
0003C0 9601 03E3       003E3      2429          OI    PCIO+1,X'01'      SET SKIP 44=45, 46=47          F4578000
0003C4 4A80 1316             01316 2430 PSKLNS   AH    R8,=Y(TANKDATA-TANKDSEC) GET TO DATA ADDRESS   F4580000
0003C8 4080 03FC             003FC 2431          STH   R8,PCTCCW+2       SAVE ADDRESS IN XIO INST       F4582000
0003CC 9601 03FB       003FB      2432          OI    PCTCCW+1,X'01'    SPACE SUPPRESS BIT ON          F4584000
0003D0 913F 03E5       003E5      2433          TM    PCIO+3,X'3F'      DO WE SPACE SUPPRESS           F4586000
0003D4 4780 03F4             003F4 2434          BZ    PLINE             IF SO SKIP OVER CARRIAGE CONTROL F4588000
0003D8 94FE 03FB       003FB      2435          NI    PCTCCW+1,255-X'01' TURN SPACE SUPPRESS OFF     F4590000
                                  2436          $DELAY P,TYPE=SETUP     PREPARE FOR WAITING            F4592000
                                  2439 PCIO     CIO   *-*,*-*           PERFORM CARRIAGE CONTROL OPERATION F4594000
0003E6 4770 00B0             000B0 2444          BC    7,$PCOMM1+4       WAIT AND TRY LATER IF NO START F4596000
                                  2445          $CHECK P                WAIT FOR FINISH                F4598000
                                  2451 .PSK3    ANOP                                                   F4600000
                                  2452 PLINE    $WRITE P,S=PCTCCW       PRINT THE LINE                 F4602000
                                  2461          $CHECK P                CHECK FOR FINISHED             F4604000
                                  2467          $LOAD R8,PCTCCW+4-&L    PICK UP AREA FROM CCW          F4606000
000412 4B80 1316             01316 2469          SH    R8,=Y(TANKDATA-TANKDSEC) GET TO START OF TANK  F4608000
                                  2470 PFREE    $FREE $TANKPOL,R8,ENBL  RELEASE THE TANK ENABLED       F4610000
000424 47F0 0354             00354 2475          B     PNEXT             PRINT NEXT LINE                F4612000
                                  2476          AIF   (&NUMPRT EQ 1).PRTN1                             F4614000
                                  2477 .PRTN1   ANOP                                                   F4618000
                                  2478          $ENDPROC P              END OF PRINT PROCESSOR         F4620000
                                  2480 *                                                               F4622000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72

                                   2485 *        EQUATES FOR PRINT PROCESSOR                                F4624000
                                   2486 *                                                                   F4626000
000020                             2487 PSKIMM   EQU   X'20'              SRCB FLAG TO SKIP IMMEDIATE       F4628000
                                   2488          AIF   (&MACHINE EQ 20).PSK4                               F4630000
                                   2489 .PSK4    ANOP                                                      F4642000
000084                             2490 PCT      EQU   132                LINE LENGTH AS ASSEMBLED         F4644000
0003FE                             2491 PCTCCWCT EQU   PCTCCW+4           LOCATION OF COUNT FIELD           F4646000
0000B0                             2492 PCTRTN   EQU   $PCOMM1+4          LOCATION OF NEXT COMMUTATOR ENTRY F4648000
                                   2493 .PRTNSKP ANOP                                                      F4650000
                                   2494          AIF   (&NUMRDR EQ 0).RRTNSKP                              F4652000
```

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                   2496 &A       SETA  0                                                  F4656000
                                   2497 *                                                                 F4658000
                                   2498 *        INPUT SERVICE PROCESSOR                                  F4660000
                                   2499 *                                                                 F4662000
                                   2500 *        GENERATION LOGIC VARIBLE MEANINGS                        F4664000
                                   2501 *        &R(1) = 0 FOR 1442,2501,2520,2540,2560 READ DEVICES      F4666000
                                   2502 *        &R(2) = 0 FOR 2520 READ/PUNCH DEVICES                    F4668000
                                   2503 *        &R(3) = 0 FOR 1442 READ/PUNCH DEVICES                    F4670000
                                   2504 *        &R(6) = 0 FOR MOD 20                                     F4672000
                                   2505 *        &R(7) = 0 FOR 2560 READ/PUNCH DEVICE                     F4674000
                                   2506          AIF   (&NUMRDR EQ 1).RRTN1                1+2+3+6+7      F4676000
                                   2507 .RRTN1   AIF   (&R(7)).RRTN2                                      F4680000
                                   2508 .RRTN2   ANOP                                      1+2+3+6+7      F4684000
                                   2509 $RRTN1   NULL                      INITIAL ENTRY AT IPL TIME        F4686000
000432                             2511 RDSTART  DS    0H                  ENTRY AFTER EOF, LOOP FOR DUAL PUNCH F4688000
                                   2512          AIF   (&R(2) AND &R(3) OR NOT &R(6)).RRTN18            F4690000
                                   2513 .RRTN18  ANOP                                                     F4694000
                                   2514 READ1    $READ R,RCTTDTA1        PERFORM THE INITIAL READ         F4696000
                                   2522 RCK1     $CHECK R,RDERR1,RDEOF1  MAKE SURE IN OK                  F4698000
                                   2534          AIF   (&R(2) AND &R(3) OR &R(1)).RRTN3       (2+3)*1     F4700000
                                   2535 .RRTN3   AIF   (&R(2) AND &R(3)).RRTN4                   2+3      F4706000
                                   2536 .RRTN4   AIF   (&R(2) OR &R(3)).RRTN5                             F4712000
                                   2537 .RRTN5   AIF   (&R(2) OR NOT &R(6)).RRTN6                2**-6    F4718000
                                   2538 .RRTN6   ANOP                                      1+2+3+6+7      F4724000
                                   2539 ROPEN    $LA   R8,RCTTANK1       LOCATE TANK IN PARAMETER REG     F4726000
                                   2541          AIF   (&HOME EQ 1).RHOME                                 F4728000
                                   2542          BAS   R14,$TPOPEN       REQUEST HASP TO RECEIVE STREAM   F4730000
00045C 4780 0522          00522    2546          BZ    RREOPEN           IF NOT SENT TO HASP WAIT         F4732000
                                   2547          AIF   (&LOCCOM EQ 0).RRTN7A                            F4734000
                                   2548 .RRTN7A  AIF   (&MACHINE EQ 20).RRTN7                           F4738000
                                   2549 .RRTN7   ANOP                                      -(1+2+3)       F4748000
                                   2550          $DELAY R,TIME=LONG,TYPE=BRANCH WAIT FOR HASP TO RESPOND  F4750000
                                   2555 .RRTN8   AIF   (&LOCCOM EQ 0).RRTN8A                              F4752000
                                   2556 .RRTN8A  ANOP                                                     F4756000
                                   2557 *                  WE MUST GO BACK TO COMMUTATOR FOR GATE TO BE OPENED F4758000
                                   2558 .RHOME   ANOP                                                     F4760000
00046E                             2559 RDLOOP   DS    0H                  BASIC READ LOOP                  F4762000
                                   2560          $READ R,RCTTDTA2        READ A CARD                      F4764000
00047E D201 00F6 131A 000F6 0131A  2568          MVC   RCTTCT1,=H'80'    SET LENGTH INTO TANK COUNT       F4766000
                                   2569          $PUT  R,RCTTANK1        SEND PREVIOUS TANK DATA TO HASP  F4768000
                                   2581          $CHECK R,RDERR,RDEOF    CHECK FOR CARD IN OK             F4770000
                                   2593          $READ R,RCTTDTA1        READ A CARD                      F4772000
0004BC D201 0150 131A 00150 0131A  2601          MVC   RCTTCT2,=H'80'    SET LENGTH INTO TANK COUNT       F4774000
                                   2602          $PUT  R,RCTTANK2        SEND PREVIOUS TANK DATA TO HASP  F4776000
0004D8                             2614 RCHECK   DS    0H                  REENTRY AFTER ERRORS             F4778000
                                   2615          $CHECK R,RDERR,RDEOF    CHECK FOR CARD IN OK             F4780000
0004EA 47F0 046E          0046E    2627          B     RDLOOP            IF SO CONTINUE TO READ CARDS     F4782000
0004EE D201 00F6 1308 000F6 01308  2628 RDEOF    MVC   RCTTCT1,=F'0'     SET END OF FILE INDICATOR        F4784000
                                   2629          $DELAY R,TYPE=SETUP     PREPARE FOR REJECT ON SENDING    F4786000
                                   2632          $LA   R8,RCTTANK1       PUT TANK ADDR IN PARAMETER REG   F4788000
                                   2634          BAS   R14,$TPPUT        SEND TO HASP EOF SIGNAL          F4790000
000502 4780 00B4          00B4     2638          BZ    RCTRTN            IF NOT PREPARED FOR SEND WAIT RETRY F4792000
                                   2639          AIF   (&R(2) AND &R(3)).RRTN9                2+3       F4794000
                                   2640 .RRTN9   AIF   (&MACHINE EQ 20).RRTN10                -(6+7)      F4800000
                                   2641 .RRTN10  AIF   (&R(7)).RRTN14                            7        F4814000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F15OCT70  11/21/72
                                  2642 .RRTN14  ANOP                                                    -7        F4820000
000506 47F0 0432              00432 2643        B     RDSTART           GO BACK TO START OF PROCESSOR       F4822000
                                  2644 .RRTN15  ANOP                                                    1+2+3+6+7 F4824000
                                  2645 RDERR    $INTREQ R,RDR           PREPARE TO WAIT ON OPERATOR         F4826000
                                  2648          $READ   R,RCTTDTA1      READ AGAIN                          F4828000
00051E 47F0 04D8              004D8 2656        B     RCHECK            SEE IF IN PROPERLY                  F4830000
                                  2657 RREOPEN  $DELAY R,TIME=SHORT,TYPE=BRANCH,PREVLOC=ROPEN WAIT, TRY AGAIN F4832000
                                  2661 RDERR1   $INTREQ R,RDR,PREVLOC=READ1 PREPARE TO WAIT ON OPERATOR, READ F4834000
                                  2665          AIF   (&R(7)).RRTN12                                  7     F4836000
                                  2666 .RRTN12  AIF   (NOT &R(6)).RRTN12A                                   F4904000
                                  2667 .RRTN12A ANOP                                                        F4910000
000432                            2668 RDEOF1   EQU   RDSTART             IGNORE EOF                        F4912000
                                  2669 .RRTN13  AIF   (&R(2) AND &R(3)).RRTN16                        2+3   F4914000
                                  2670 .RRTN16  ANOP                                                        F4972000
                                  2671          AIF   (&NUMRDR EQ 1).RRTN17                               F4974000
                                  2672 .RRTN17  ANOP                                                        F4978000
                                  2673          $ENDPROC R              END OF READ PROCESSOR             F4980000
                                  2686          AIF   (&MACHINE NE 20).RRTNSKP                            F4982000
                                  2687 *                                                                    F4984000
                                  2688 *        INPUT PROCESSOR EQUATES                                     F4986000
                                  2689 *                                                                    F4988000
000050                            2690 RCT      EQU   80                LENGTH OF CARD                    F4990000
0000B4                            2691 RCTRTN   EQU   $RCOMM1+4         LOCATION OF NEXT COMMUTATOR ENTRY F4992000
                                  2692 .RRTNSKP ANOP                                                        F4994000
                                  2693          AIF   (&NUMPUN EQ 0).URTNSKP                              F4996000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F15OCT70  11/21/72
                                  2695 &A      SETA  0                                                                  P5000000
                                  2696 *                                                                                P5002000
                                  2697 *       PUNCH SERVICE PROCESSOR                                                  P5004000
                                  2698 *                                                                                P5006000
                                  2699 *       GENERATION LOGIC VARIABLE MEANINGS                                       P5008000
                                  2700 *       &R(2) = 0 FOR 2520 READ/PUNCH DEVICES                                    P5010000
                                  2701 *       &R(3) = 0 FOR 1442 READ/PUNCH DEVICES                                    P5012000
                                  2702 *       &R(4) = 0 FOR 2540 PUNCH DEVICES                                         P5014000
                                  2703 *       &R(5) = 0 FOR 2520,2560 PUNCH DEVICES                                    P5016000
                                  2704 *       &R(6) = 0 FOR MOD 20                                                     P5018000
                                  2705 *       &R(7) = 0 FOR 2560 READ/PUNCH DEVICE                                     P5020000
                                  2706 *       &R(8) = 0 FOR 1442 SINGLE POCKET PUNCH DEVICES                           P5022000
000000                            2707         USING TANKDSEC,R8                                                        P5024000
                                  2708         AIF   (&NUMPUN EQ 1).URTN1                                               P5026000
                                  2709 .URTN1  ANOP                                                                     P5030000
                                  2710 $URTN1  NULL                                  2+3+4+5+6+8                        P5032000
00054C                            2712 USTART  DS    0H                              INITIAL ENTRY AT IPL TIME,DUAL PUNCH P5034000
                                  2713         $GETTNK U,R8,R9,EMPTY=WAIT GET OUTPUT TANK WITH PUNCH RECORD             P5036000
000580 9500 8005       00005      2726         CLI   TANKCNT+1,0               TEST FOR END OF JOB                      P5038000
000584 4780 05BC             005BC 2727         BE    UFREE                     IF SO FREE TANK                          P5040000
000588                            2728 UOUTPUT DS    0H                        PUNCH THE CARD                           P5042000
                                  2729 UPUNCH  $WRITE U,TANKDATA,TANKDSEC,OP=(UCTALTOP,D),CTADDR=TANKCNT,             CP5044000
                                               S=UCTCCW                        PUNCH THE CARD                           P5046000
                                  2741         AIF   (&R(4) OR &R(2) AND &R(3) AND &R(5) AND &R(8)).URTN2               P5048000
                                  2742 .URTN2  AIF   (&R(4)).URTN3                                                      &  P5054000
                                  2743 .URTN3  AIF   (&R(2) AND &R(3) AND &R(5) AND &R(8)).URTN4                        P5096000
                                  2744 UCHECK  $CHECK U,UERR                     CHECK FOR IN OK                        P5098000
                                  2753         $LOAD R8,UCTCCW+4-&L              PICK UP DATA ADDRESS                   P5100000
0005B8 4B80 1316           01316  2755         SH    R8,=Y(TANKDATA-TANKDSEC)    GET TO START OF TANK                   P5102000
                                  2756 .URTN4  ANOP                                                                     P5104000
                                  2757 UFREE   $FREE $TANKPOL,R8,ENBL            RELEASE THE TANK                       P5106000
                                  2762         AIF   (&R(2) AND &R(3) OR &R(5) AND &R(8) AND &R(4)).URTN5               P5108000
                                  2763 .URTN5  AIF   (&R(2) AND &R(3)).URTN6                                            P5116000
                                  2764 .URTN6  AIF   (&R(4) OR &R(2) AND &R(3) AND &R(5) AND &R(8)).URTN7           2+3 P5120000
                                  2765 .URTN7  AIF   (&R(4)).URTN8                                                      &  P5126000
                                  2766 .URTN8  AIF   (NOT(&R(2) AND &R(3)) AND &R(4) AND &R(5) AND &R(8)).UR9           P5134000
0005CA 47F0 054C           0054C  2767         B     USTART                    GO BACK TO START OF PROCESSOR          P5136000
                                  2768 .UR9    AIF   (NOT(&R(8) AND &R(2) AND &R(3)) OR &R(5)).URTN10                 P5138000
                                  2769 .URTN10 AIF   (&R(2) AND &R(3) AND &R(8)).URTN11                          2+3+8  P5152000
0005CE                            2770 UERR    DS    0H                        PUNCH I/O ERROR ENTRY                  P5154000
                                  2771 .URTN11 AIF   (&R(2) AND &R(3) OR &R(5) OR &R(8)).URTN12      (2+3)*5*8          P5156000
                                  2772 .URTN12 AIF   (&R(2) AND &R(3) AND &R(5) OR &R(8)).URTN13     (2+3+5)*8          P5162000
                                  2773 .URTN13 AIF   (&R(8)).URTN17                                                     P5172000
                                  2774         $INTREQ U,PUN,PREVLOC=UPUNCH                                             P5174000
                                  2777 .URTN17 AIF   (&R(2) AND &R(3) OR &R(5) OR NOT &R(8)).URTN14                     P5176000
                                  2778 .URTN14 AIF   (&R(2) AND &R(3)).URTN15                                       2+3 P5182000
                                  2779 .URTN15 AIF   (&NUMPUN EQ 1).URTN16                                              P5224000
                                  2780 .URTN16 ANOP                                                                     P5228000
                                  2781         $ENDPROC U                        END OF PUNCH PROCESSOR                 P5230000
                                  2785         AIF   (&MACHINE NE 20).URTNSKP                                           P5232000
                                  2786 *                                                                                P5234000
                                  2787 *       PUNCH PROCESSOR EQUATES                                                  P5236000
                                  2788 *                                                                                P5238000
000050                            2789 UCT     EQU   80                        LENGTH OF CARD                         P5240000
0000B8                            2790 UCTRTN  EQU   $UCOMM1+4                 LOCATION OF NEXT COMMUTATOR ENTRY      P5242000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72
                                  2791 .UBTNSKP ANOP                                                  F5204000
                                  2792          AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).WRTNSKP    F5206000
                                  2793 .WRTNSKP ANOP                                                  F5624000
                                  2794          AIF   (&LOCCOM EQ 0).WXX1                           F5626000
                                  2795 .WXX1    ANOP                                                  F5780000
                                  2796          PRINT GEN                                           F5782000
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72
                                    2798 *                                                                F5786000
                                    2799 *        $PUT  ROUTINE          INTERFACE WITH $TPPUT            F5788000
                                    2800 *                                                                F5790000
                                    2801 &A       SETA  0                                                 F5792000
000000                              2802 OXDUM    DSECT                  SYMBOLIC AID FOR PUT ROUTINE     F5794000
                                    2803          AIF   (&MACHINE EQ 20).OXB                              F5796000
                                    2804 .OXB     ANOP                                                    F5802000
000000                              2805 OXTNK    DS    H                TANK ADDRESS                     F5804000
000002                              2806 OXTCT    DS    H                TCT ADDRESS                      F5806000
000004                              2807 OXBADRET DS    2H               WAIT RETURN                      F5808000
000008                              2808 OXGDRET  DS    2H               RETURN ADDR TO USER              F5810000
                                    2809 .OXAB    ANOP                                                    F5812000
000000                              2810 HASPRTP  CSECT                                                   F5814000
000000                              2811          USING OXDUM,R14                                         F5816000
000000                              2812          USING TANKDSEC,R8                                       F5818000
                                    2813          AIF   (&MACHINE EQ 20).OX1                              F5820000
                                    2814 .OX1     ANOP                                                    F5836000
                                    2815 *        R14 POINTS TO USER CALLING SEQ WITH TANK AND TCT ADDRESS F5838000
000000                              2816          USING TCTDSECT,R9                                       F5840000
                                    2817 $PUT     NULL                                                    F5842000
0005DC                              2818+$PUT     DS    0H
0005DC 4AE0 131C          0131C     2819          AH    R14,=H'4'        SKIP OVER INITIAL BAS INST       F5844000
0005E0 40E0 0600          00600     2820          STH   R14,OXSAV        SAVE RETURN ADDRESS (OFFSET)     F5846000
0005E4 4880 E000          00000     2821          LH    R8,OXTNK         PICK UP ADDRESS OF TANK          F5848000
0005E8 4890 E002          00002     2822          LH    R9,OXTCT         PICK UP ADDRESS OF TCT           F5850000
                                    2823 .OXA1    AIF   (&CONSOLE EQ 0).OX2                               F5852000
                                    2824 .OX2     ANOP                                                    F5906000
                                    2825 OXPUT    BAS   R14,$TPPUT       SUBMIT TANK FOR TRANSMISSION     F5908000
0005EC                              2826+OXPUT    DS    0H
0005EC 4D                           2827+         DC    X'4D'
0005ED E0                           2828+         DC    AL1(R14*16)
0005EE 064C                         2829+         DC    S($TPPUT)
                                    2830          $LOAD R14,OXSAV        RESTORE RETURN POINTER           F5910000
0005F0 48E0 0600          00600     2831+         LH    R14,OXSAV
                                    2832          AIF   (&MACHINE NE 20).OX7                              F5912000
0005F4 4890 E002          00002     2833          LH    R9,OXTCT         PICK UP TCT ADDR                 F5914000
                                    2834 .OX7     ANOP                                                    F5916000
0005F8 4770 E008          00008     2835          BNE   OXGDRET          IF TANK WENT OK THEN RETURN      F5918000
                                    2836          AIF   (&CONSOLE EQ 0).OX8                               F5920000
                                    2837 .OX8     AIF   (&MACHINE EQ 20).OX9                              F5932000
                                    2838 .OX9     ANOP                                                    F5946000
0005FC 47F0 E004          00004     2839          B     OXBADRET         WAIT ONE TIME AROUND COMMUTATOR   F5948000
000600 0000                         2840 OXSAV    DC    H'0'             SAVE AREA                        F5950000
000602 40E0 0600          00600     2841 $PUTA    STH   R14,OXSAV        REENTRY AFTER A WAIT             F5952000
000606 4880 E000          00000     2842          LH    R8,OXTNK         PICK UP TANK ADDR                F5954000
                                    2843          BAS   R14,$TPREPUT     RESUBMIT TANK FOR TRANSMISSION   F5956000
00060A 4D                           2844+         DC    X'4D'
00060B E0                           2845+         DC    AL1(R14*16)
00060C 086E                         2846+         DC    S($TPREPUT)
00060E 48E0 0600          00600     2847          LH    R14,OXSAV        PICK UP RETURN POINTER           F5958000
000612 4780 E004          00004     2848          BE    OXBADRET         IF IT DIDN'T GO WAIT AGAIN       F5960000
                                    2849 .OXA9    ANOP                                                    F5962000
000616 47F0 E008          00008     2850          B     OXGDRET          RETURN                           F5964000
                                    2851          DROP  R14,R8                                            F5966000
                                    2852          AIF   (&MACHINE NE 20).OXC                              F5968000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72
                                  2853          DROP  R9                                                F5970000
                                  2854 .OXC     ANOP                                                    F5972000
                                  2855          AIP   (&MACHINE EQ 20).OX50               F5974000
                                  2856 .OX50    ANOP                                      F6012000
                                  2857          $ENDPROC O          END OF PUT ROUTINE    F6014000
```

```
   LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F15OCT70  11/21/72
000000                           2859          USING LOGDSECT,R15                                                    F6018000
                                 2860 $LOG     NULL                                                                  F6020000
00061A                           2861+$LOG     DS    OH
                                 2862          $STO  R14,LOG14SAV       SAVE R14                                     F6022000
00061A 40E0 0648           00648 2863+         STH   R14,LOG14SAV
                                 2864          $STO  R15,LOGRTN         STORE RTN REG                                F6024000
00061E 40F0 064A           0064A 2865+         STH   R15,LOGRTN
000622 48F0 F000           00000 2866          LH    R15,0(0,R15)       PICK UP ERROR ENTRY OFFSET                   F6026000
                                 2867          $AA   R15,$ERRTAB        ADD ERROR TABLE ORIGIN                       F6028000
000626 4AF0 131E           0131E 2868+         AH    R15,=Y($ERRTAB)
00062A 48E0 F002           00002 2869          LH    R14,LOGCOUNT       LOAD ERROR COUNT                             F6030000
00062E 4AE0 1320           01320 2870          AH    R14,=H'1'          UP COUNT BY ONE                              F6032000
000632 40E0 F002           00002 2871          STH   R14,LOGCOUNT       STORE NEW COUNT                              F6034000
                                 2872          AIF   (&TRACE EQ 0).LNOTRC                                         F6036000
                                 2873 .LNOTRC  AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).LOGNOT                     F6056000
                                 2874 .LOGNOT  ANOP                                                               F6089000
                                 2875 LRTN     $LOAD R14,LOG14SAV       RESTORE R14                                  F6090000
000636 48E0 0648           00648 2876+LRTN     LH    R14,LOG14SAV
                                 2877          $LOAD R15,LOGRTN         PICK UP CALLER                               F6092000
00063A 48F0 064A           0064A 2878+         LH    R15,LOGRTN
00063E D203 00C4 1308 000C4 01308 2879          MVC   $LOGINFO,=F'0'     ZERO OUT LOG INFO FOR NEXT LOG               F6094000
000644 47F0 F002           00002 2880          B     2(0,R15)           RETURN                                       F6096000
                                 2881 LOG14SAV $ACON                                                              F6098000
000648 0000                      2882+LOG14SAV DC    Y(0)
                                 2883 LOGRTN   $ACON                                                              F6100000
00064A 0000                      2884+LOGRTN   DC    Y(0)
                                 2885 $LOGCLAS EQU   &LOGCLAS                                                     F6102000
000000                               $LOGCLAS EQU   0
                                 2886          DROP  R15                                                          F6104000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  P150CT70  11/21/72
                                  2888 *                                                                F6108000
                                  2889 *  ENTRY - STPPUT                                                F6110000
                                  2890 *                REGISTERS - R8=RECORD TANK 2(R8)=RCB,3(R8)=SRCB F6112000
                                  2891 *                            R14=RETURN ADDR ,CC=0 - RECORD NOT TAKEN F6114000
                                  2892 *                                                 CC.NE.0-RECORD ACCEPTED F6116000
                                  2893 *                            R15 IS CONSIDERED VOLITILE          F6118000
                                  2894 *                                                                F6120000
                                  2895 *                                                                F6122000
                                  2896 $TPPUT   NULL                                                    F6124000
000064C                           2897+$TPPUT   DS    0H
                                  2898          $TRACE SSM=YES                                          F6126000
                                  2899          $STO  R14,OSAVR14          SAVE RETURN                  F6128000
000064C 40E0 088E           0088E 2900+         STH   R14,OSAVR14
000650 40A0 088C            0088C 2901          STH   R10,OSAVR10                                       F6130000
000654 4090 088A            0088A 2902          STH   R9,OSAVR9                                         F6132000
                                  2903          $STO  R8,OINADD            SAVE INPUT TANK ADDR         F6134000
000658 4080 0890            00890 2904+         STH   R8,OINADD
00065C 48F0 1320            01320 2905          LH    R15,=H'1'            CONSTANT FOR SPEED           F6136000
                                  2906          $LOAD R10,OINADD           COMPRESSION WORK AREA        F6138000
000660 48A0 0890            00890 2907+         LH    R10,OINADD
000664 4AA0 1322            01322 2908          AH    R10,=Y(TANKRCB-TANKDSEC) SKIP TO CTL BYTES          F6140000
000000                            2909          USING TANKDSEC,R8          *                            F6142000
000668 4890 8004            00004 2910          LH    R9,TANKCNT           TANK DATA COUNT              F6144000
00066C 4990 1314            01314 2911          CH    R9,=H'0'             IS THIS A NULL RECORD        F6146000
000670 4780 0786            00786 2912          BE    OEOINPUT             BR IF YES TO ADD TO BUFFER   F6148000
                                  2913          AIF   (&CMPTYPE LE 1).ONOCOMP TEST NONE OR TRAILING COMP  F6150000
000674 1A98                       2914          AR    R9,R8                INCLUDE TANK ADDR            F6152000
                                  2915          $STO  R9,OINEND            TO SAFE STORAGE              F6154000
000676 4090 0892            00892 2916+         STH   R9,OINEND
00067A 9502 8006      00006       2917          CLI   OTS(R8),2            IS THIS A TEXT CARD          F6156000
00067E 4770 0694            00694 2918          BNE   OGOA                 BR IF NO                     F6158000
                                  2919 *                  SKIP ATTEMPTING TO COMPRESS A TEXT CARD       F6160000
000682 4890 8004            00004 2920          LH    R9,TANKCNT           INPUT COUNT                  F6162000
                                  2921          $LTR  R11,R8               INPUT ADDR                   F6164000
000686 1BEB                       2922+         SR    R11,R11
000688 1AB8                       2923+         AR    R11,B8
00068A 1A89                       2924          AR    R8,R9                END OF RECORD                F6166000
00068C 4A90 089A            0089A 2925          AH    R9,OD200             COUNT FORMAT                 F6168000
000690 47F0 06C8            006C8 2926          B     OSQUEEZE             GO PROCESS RECORD            F6170000
                                  2927 OGOA     NULL                                                    F6172000
000694                            2928+OGOA     DS    0H
000694 9200 9006      00006       2929          MVI   OTS(R9),0            SETUP ENDING CHARACTER       F6174000
                                  2930          AIF   (&CMPTYPE EQ 2).ONB8                            F6176000
000698 9500 9005      00005       2931          CLI   OTS-1(R9),0          DOES ENDING MATCH LAST DATA CHAR F6178000
00069C 4770 06A4            006A4 2932          BNE   *+8                  BR IF NOT                    F6180000
0006A0 92FF 9006      00006       2933          MVI   OTS(R9),255          YES...USE ANOTHER            F6182000
                                  2934 .ONB8    ANOP                                                    F6184000
                                  2935          MVC   OTS+1(&CCT-1,R9),OTS(R9) PROPAGATE FOR DUPLICATION F6186000
0006A4 D202 9007 9006 00007 00006           MVC   OTS+1(8-1,R9),OTS(R9) PROPAGATE FOR DUPLICATION
                                  2936 OGO      NULL                                                    F6188000
0006AA                            2937+OGO      DS    0H
                                  2938          $LA   R14,OGO1             LOAD FOR SPEED               F6190000
0006AA 48E0 1324            01324 2939+         LH    R14,=Y(OGO1)
                                  2940          $LA   R13,OSQUEEZE         LOAD FOR SPEED               F6192000
0006AE 48D0 1326            01326 2941+         LH    R13,=Y(OSQUEEZE)
```

F150CT70 11/21/72

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    F6194000
                                     2942         LH    R9,OD200          INITIAL COUNTER FOR HVC             F6196000
0006B2 4890 089A             0089A   2943        $LTR   R11,R8            INPUT AREA TO R11                   F6198000
0006B6 1BBB                          2944+        SR    R11,R11                                               F6200000
0006B8 1AB8                          2945+        AR    R11,R8                                                F6202000
                                     2946 OGO1    NULL                                                        F6204000
0006BA                               2947+OGO1    DS    0H                                                    F6206000
                                     2948         AIF   (&CMPTYPE NE 2).ONB1                                  F6208000
                                     2949 .ONB1   ANOP                                                        F6210000
                                     2950         CLC   OTS(&CCT-1,R8),OTS+1(R8) CHECK FOR COMPRESSABILITY    F6212000
0006BA D502 8006 8007 00006 00007    2951         CLC   OTS(4-1,R8),OTS+1(R8) CHECK FOR COMPRESSABILITY       F6214000
0006C0 078D                          2952         BCR   8,R13              BR IF COMPRESSABLE (TO OSQUEEZE)    F6216000
0006C2 1A8F                          2953         AR    R8,R15             UP DATA PTR                         F6218000
0006C4 1A9F                          2954         AR    R9,R15             AND CHAR COUNT                      F6220000
0006C6 07FE                          2955         BR    R14                CONTINUE (TO OGO1)                  F6222000
                                     2956 .ONB2   AIF   (&CMPTYPE NE 2).ONB2                                  F6224000
                                     2957 *                                                                   F6226000
                                     2958 * OSQUEEZE - &CCT IDENTICAL CHARACTERS FOUND                        F6228000
                                     2959 *                                                                   F6230000
                                     2960 *                                                                   F6232000
                                     2961 OSQUEEZE NULL                     *                                 F6234000
0006C8                               2962+OSQUEEZE DS    0H                                                   F6236000
0006C8 4990 089A             0089A   2963         CH    R9,OD200           IS A CHARACTER STRING ACTIVE        F6238000
0006CC 4780 06F4             006F4   2964         BE    OCOMPTST           BR IF NO TO COMPRESS                F6240000
0006D0 4990 089C             0089C   2965         CH    R9,OD263           DOES STRING EXCEED SCB              F6242000
0006D4 4720 076C             0076C   2966         BH    OBIGMOVE           BR IF YES                           F6244000
0006D8 4090 06DC             006DC   2967         STH   R9,*+4             SET MOVE AND COUNT                  F6246000
0006DC D200 A003 B006 00003 00006    2968         MVC   3(*-*,R10),OTS(R11) MOVE CHAR STRING (+1)               F6248000
0006E2 D200 A002 06DD 00002 006DD    2969         MVC   2(1,R10),*-5       SET SCB COUNT                       F6250000
0006E8 96C0 A002       00002         2970         OI    2(R10),X'C0'       SET SCB ID BITS                     F6252000
0006EC 4B90 089A             0089A   2971         SH    R9,OD200           REDUCE TO ACTUAL COUNT              F6254000
0006F0 1AA9                          2972         AR    R10,R9             FIX OUTPUT POINTER                  F6256000
0006F2 1AAF                          2973         AR    R10,R15            COUNT SCB                           F6258000
                                     2974 OCOMPTST NULL  *                  TEST FOR EOI                        F6260000
0006F4                               2975+OCOMPTST DS    0H                                                   F6262000
0006F4 4980 0892             00892   2976         CH    R8,OIBEND          ARE WE DONE...                      F6264000
0006F8 4730 0786             00786   2977         BNL   OEOINPUT           BR IF YES                           F6266000
                                     2978 OCOMP   NULL                                                        F6268000
0006FC                               2979+OCOMP   DS    0H                                                   F6270000
0006FC 48E0 1328             01328   2980        $LA    R14,OCOMP1         FOR LOOP SPEED                      F6272000
000700 48D0 132A             0132A   2981+        LH    R14,=Y(OCOMP1)                                         F6274000
000704 4890 132C             0132C   2982        $LA    R13,OCMPSTOP       FOR LOOP SPEED                      F6276000
                                     2983+        LH    R13,=Y(OCMPSTOP)                                       F6278000
000708                               2984         LH    R9,=Y(&CCT)        START COMPRESSION COUNTER           F6280000
                                     2985 OCOMP1  NULL  *                  CONTINUE COMPRESSION TESTING        F6282000
                                     2986+OCOMP1  DS    0H                                                   F6284000
                                     2987         AIF   (&CMPTYPE NE 2).ONB3                                  F6286000
                                     2988 .ONB3   ANOP                                                        F6288000
000708 D500 8009 800A 00009 0000A    2989         CLC   (&CCT+OTS-1)(1,R8),(&CCT+OTS)(R8) DOES MATCH CONTINUE F6290000
                                     2990 .ONB4   ANOP                                                        F6292000
00070E 077D                          2991         BCR   7,R13              BR IF NO (TO CMPSTOP)               F6294000
000710 1A9F                          2992         AR    R9,R15             ANOTHER MATCH... COUNT IT           F6296000
000712 1A8F                          2993         AR    R8,R15             UP TO NEXT CHAR                     F6298000
                                                                                                              F6300000
                                                                                                              F6302000
                                                                                                              F6304000
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
000714 07FE                          2994           BR    R14                 CONTINUE (TO OCOMP1)          F6306000
                                     2995 OCMPSTOP  NULL  *                   IDENTICAL STRING ENDED        F6308000
000716                               2996+OCMPSTOP  DS    0H
000716 4990 132E           0132E     2997           CH    R9,=H'31'           DOES IT EXCEED SCB...         F6310000
00071A 4720 074A           0074A     2998           BH    OBIGPROP            BR IF YES                     F6312000
00071E 4090 0248           00248     2999           STH   R9,STEMP            TO TEMPORARY STORAGE          F6314000
000722 9680 0249      00249          3000           OI    STEMP+1,X'80'       SET SCB ALWAYS BIT            F6316000
000726 D200 A002 0249 00002 00249    3001           MVC   2(1,R10),STEMP+1    SET SCB                       F6318000
                                     3002           AIF   (&CMPTYPE EQ 2).ONB5                              F6320000
                                     3003           CLI   (&CCT+OTS-1)(R8),C' ' ARE WE SQUEEZING BLANKS     F6322000
00072C 9540 8009      00009          CLI   (4+OTS-1)(R8),C' ' ARE WE SQUEEZING BLANKS
000730 4780 0740           00740     3004           BE    OBLANK              BR IF YES                     F6324000
                                     3005           MVC   3(1,R10),(&CCT+OTS-1)(R8) SET DUPLICATION CHAR  F6326000
000734 D200 A003 8009 00003 00009                   MVC   3(1,R10),(4+OTS-1)(R8) SET DUPLICATION CHAR
00073A 9620 A002      00002          3006           OI    2(R10),X'20'        SHOW NON-BLANK DUPLICATION    F6328000
00073E 1AAF                          3007           AR    R10,R15             SKIP SAMPLE CHAR              F6330000
                                     3008 .ONB5     ANOP                                                    F6332000
                                     3009 OBLANK    NULL                                                    F6334000
000740                               3010+OBLANK    DS    0H
000740 1AAF                          3011           AR    R10,R15             COUNT SCB                     F6336000
                                     3012           AH    R8,=Y(&CCT)         COUNT INPUT FIELD             F6338000
000742 4A80 132C           0132C                   AH    R8,=Y(4) COUNT INPUT FIELD
000746 47F0 06AA           006AA     3013           B     OGO                 AND CONTINUE RECORD           F6340000
                                     3014 OBIGPROP  NULL  *                   DUPLICATION COUNT EXCEEDS SCB F6342000
00074A                               3015+OBIGPROP  DS    0H
00074A 929F A002      00002          3016           MVI   2(R10),X'9F'        SHOW MAX SCB                  F6344000
                                     3017           AIF   (&CMPTYPE EQ 2).ONB6                              F6346000
                                     3018           CLI   (&CCT+OTS-1)(R8),C' ' IS THIS BLANKS            F6348000
00074E 9540 8009      00009          CLI   (4+OTS-1)(R8),C' ' IS THIS BLANKS
000752 4780 0762           00762     3019           BE    OBIGBLNK            BR IF YES                     F6350000
                                     3020           MVC   3(1,R10),(&CCT+OTS-1)(R8) SET SAMPLE CHAR       F6352000
000756 D200 A003 8009 00003 00009                   MVC   3(1,R10),(4+OTS-1)(R8) SET SAMPLE CHAR
00075C 9620 A002      00002          3021           OI    2(R10),X'20'        SHOW NON-BLANK                F6354000
000760 1AAF                          3022           AR    R10,R15             COUNT SAMPLE                  F6356000
                                     3023 .ONB6     ANOP                                                    F6358000
                                     3024 OBIGBLNK  NULL  *                   EXCESSIVE COUNT BLANKS        F6360000
000762                               3025+OBIGBLNK  DS    0H
000762 1AAF                          3026           AR    R10,R15             COUNT SCB                     F6362000
000764 4B90 132E           0132E     3027           SH    R9,=H'31'           ADJUST COUNT                  F6364000
000768 47F0 0716           00716     3028           B     OCMPSTOP            AND TRY AGAIN                 F6366000
                                     3029 OBIGMOVE  NULL  *                   STRING COUNT EXCEEDS SCB MAXIMUM F6368000
00076C                               3030+OBIGMOVE  DS    0H
00076C D23E A003 B006 00003 00006    3031           MVC   3(63,R10),OTS(R11)  MOVE MAX                     F6370000
000772 92FF A002      00002          3032           MVI   2(R10),X'FF'        SET MAX SCB                   F6372000
000776 4AA0 1330           01330     3033           AH    R10,=H'64'          COUNT STRING AND SCB          F6374000
00077A 4AB0 1332           01332     3034           AH    R11,=H'63'          UPDATE FROM POINTER           F6376000
00077E 4B90 1332           01332     3035           SH    R9,=H'63'           REDUCE COUNT                  F6378000
000782 47F0 06C8           006C8     3036           B     OSQUEEZE            AND TRY AGAIN                 F6380000
                                     3037           AGO   .OSKNCMP                                         F6382000
                                     3038 .OSKNCMP  ANOP                                                    F6450000
                                     3039 *                                                                 F6452000
                                     3040 *                   END OF INPUT RECORD - TERMINATE AND ADD TO BUFFER F6454000
                                     3041 *                                                                 F6456000
000786 9200 A002      00002          3042 OEOINPUT  MVI   2(R10),0            END-OF-RECORD SCB             F6458000
00078A 1AAF                          3043           AR    R10,R15             COUNT IT                      F6460000
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                     3044         $LOAD  R8,OINADD          STARTING ADDR OF COMPRESSED REC     F6462000
 000788 4880 0890                00890 3045+        LH    R8,OINADD
 00078C 1BA8                           3046         SR    R10,R8             REDUCE TO ACTUAL COUNT              F6464000
 00078E 4BA0 1334                01334 3047         SH    R10,=Y(L'TANKCHN-2) COMPENSATE FOR FULL CHAIN WORD     F6466000
 000792 40A0 8000                00000 3048         STH   R10,TANKCHN        SAVE COUNT IN TANK FOR $TPREPUT     F6468000
                                      3049 OREENT   NULL                     RE-ENTRY POINT FROM $TPREPUT        F6470000
 000796                               3050+OREENT   DS    0H
                                      3051         $LOAD  R9,OBUFPTR         GET ADDR OF ACTIVE BUFFER           F6472000
 000796 4890 0896                00896 3052+        LH    R9,OBUFPTR
 00079A 4990 1314                01314 3053         CH    R9,=H'0'           IS THERE ONE                        F6474000
 00079E 4780 07F4                007F4 3054         BE    OGETBUF            BR IF NO                            F6476000
                                      3055 OBUFOK   NULL  *                  VALID BUFFER                        F6478000
 0007A2                               3056+OBUFOK   DS    0H
 0007A2 49A0 0898                00898 3057         CH    R10,OBUFCNT        WILL THIS RECORD FIT...             F6480000
 0007A6 4720 0846                00846 3058         BH    OBUFFULL           BR IF NO                            F6482000
 0007AA 40A0 0248                00248 3059         STH   R10,$TEMP          FOR STC                             F6484000
 0007AE D200 07B9 0249 007B9 00249 3060         MVC   *+7(1),$TEMP+1     SET IN MOVE                             F6486000
 0007B4 D200 9000 8002 00000 00002 3061         MVC   0(*-*,R9),L'TANKCHN(R8) MOVE RECORD                        F6488000
 0007BA 1A9A                           3062         AR    R9,R10             UPDATE CURRENT PTR                  F6490000
                                      3063         $STO   R9,OBUFPTR         AND RESET                           F6492000
 0007BC 4090 0896                00896 3064+        STH   R9,OBUFPTR
 0007C0 4890 0898                00898 3065         LH    R9,OBUFCNT         REMAINING COUNT                     F6494000
 0007C4 1B9A                           3066         SR    R9,R10             REDUCE BY THIS RECORD               F6496000
 0007C6 4090 0898                00898 3067         STH   R9,OBUFCNT         AND RESET                           F6498000
 0007CA 49A0 1336                01336 3068         CH    R10,=H'3'          WAS THIS A NULL RECORD              F6500000
 0007CE 4780 0842                00842 3069         BE    OFLUSH             BR IF YES TO WRITE BUFFER           F6502000
                                      3070         CLI   TANKFCB,&ORCB(1)    IS THIS OPER CMD TO HASP            F6504000
 0007D2 9592 8002       00002          CLI   TANKRCB,146 IS THIS OPER CMD TO HASP
 0007D6 4780 0842                00842 3071         BE    OFLUSH             BR IF YES TO SEND BUFFER            F6506000
                                      3072 ORETOK   NULL  *                  POSITIVE RETURN ENTRY               F6508000
 0007DA                               3073+ORETOK   DS    0H
 0007DA 96F0 0867       00867          3074         OI    OFLSW+1,X'F0'      OPEN NORMAL GATE AND SET COND CODE  F6510000
                                      3075 ORETURN  NULL                     RETURN--COND. CODE ALREADY SET      F6512000
 0007DE                               3076+ORETURN  DS    0H
 0007DE 4880 0890                00890 3077         LH    R8,OINADD          RESTORE TANK ADDR                   F6514000
 0007E2 4890 088A                0088A 3078         LH    R9,OSAVR9          RESTORE                             F6516000
 0007E6 48A0 088C                0088C 3079         LH    R10,OSAVR10        RESTORE                             F6518000
                                      3080         $LOAD  R14,OSAVR14        GET RETURN                          F6520000
 0007EA 48E0 088E                0088E 3081+        LH    R14,OSAVR14
 0007EE 07FE                           3082         BR    R14                AND DO IT                           F6522000
                                      3083 OGETBUF  NULL  *                                                     F6524000
 0007F0                               3084+OGETBUF  DS    0H
 0007F0 1B99                           3085         SR    R9,R9              SET COND CODE                       F6526000
 0007F2 4700 07E2                007E2 3086 $TPPNONE NOP   ORETURN          SW SET BY CONSUP TO STOP BUFFERING  F6528000
                                      3087         $DCHAIN $BUFPOOL,R9       GET A BUFFER                        F6530000
 0007F6 000007FE                      3088+         DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
 0007FA                               3089+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
 0007FA 8100                          3090+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
 0007FE                               3091+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
 0007FE 00000802                      3092+         DC    AL4(*+4)
 000802 9500 024A       0024A          3093+         CLI   $BUFPOOL,0
 000806 4780 0814                00814 3094+         BE    *+14
 00080A 4890 024A                0024A 3095+         LH    R9,$BUFPOOL
 00080E D201 024A 9000 0024A 00000 3096+         MVC   $BUFPOOL(2),0(R9)
 000814 9231 0824       00824          3097+         MVI   *+16,X'31'
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F150CT70  11/21/72
000818 4770 0820             00820  3098+          BNZ   *+8
00081C 9201 0824       00824        3099+          MVI   *+8,X'01'
000820 00000824                     3100+          DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000820                              3101+          ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000820 8100                         3102+          DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000824                              3103+          ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000824 0100                         3104+          DC    AL2(X'0100')
000826 0828                         3105+          DC    Y(*+2)
000828 4780 07E2             007E2  3106           BZ    ORETURN          BR IF NONE (NOTE COND. CODE SET)   F6532000
                                    3107           $STO  R9,OACTBUF       SET BUFFER ADDR                    F6534000
00082C 4090 0894             00894  3108+          STH   R9,OACTBUF
000830 4A90 1338             01338  3109           AH    R9,=Y(BUFDATA-BUFDSECT)  TO USABLE AREA             F6536000
                                    3110           $STO  R9,OBUFPTR       SET CURRENT POINTER                F6538000
000834 4090 0896             00896  3111+          STH   R9,OBUFPTR
                                    3112           MVC   OBUFCNT,=Y(&TPBFSIZ-BUFDATA+BUFSTART-2) AND COUNT  F6540000
000838 D201 0898 133A 00898 0133A                  MVC   OBUFCNT,=Y(400-BUFDATA+BUFSTART-2) AND COUNT
00083E 47F0 07A6             007A6  3113           B     OBUFOK           AND GO PIT RECORD                  F6542000
                                    3114 *                                                                   F6544000
                                    3115 *         BUFFER IS FULL--SEND IT TO HASP                           F6546000
                                    3116 *                                                                   F6548000
                                    3117 OFLUSH    NULL  *                ENTRY TO WRITE A PARTIAL BUFFER    F6550000
000842                              3118+OFLUSH    DS    0H
000842 9200 0867       00867        3119           MVI   OFLSW+1,0        SET FLUSH SWITCH                   F6552000
                                    3120 ORUFFULL  NULL                                                      F6554000
000846                              3121+OBUFFULL  DS    0H
                                    3122           $LOAD R9,OBUFPTR       GET CURRENT BUFFER POINTER         F6556000
000846 4890 0896             00896  3123+          LH    R9,OBUFPTR
                                    3124           $LOAD R13,OACTBUF      FOR $EXTP                          F6558000
00084A 48D0 0894             00894  3125+          LH    R13,OACTBUF
000000                              3126           USING BUFDSECT,R13                                       F6560000
00084E 9200 9000       00000        3127           MVI   0(R9),0          SET EOB  (RC=00)                   F6562000
000852 1B9D                         3128           SR    R9,R13           SUBTRACT SOB                       F6564000
000854 4B90 133C             0133C  3129           SH    R9,=Y(BUFSTART-BUFDSECT-1) MAKE COUNT ACTUAL       F6566000
000858 4090 D002             00002  3130           STH   R9,BUFCOUNT      SET COUNT                          F6568000
00085C 1B99                         3131           SR    R9,R9            ZERO                             F6570000
                                    3132           $STO  R9,OBUFPTR       AND SHOW NO BUFFER                 F6572000
00085E 4090 0896             00896  3133+          STH   R9,OBUFPTR
                                    3134           BAS   R14,$EXTP        GO DO I/O                          F6574000
000862 4D                           3135+          DC    X'4D'
000863 E0                           3136+          DC    AL1(R14*16)
000864 0A56                         3137+          DC    S($EXTP)
000866 4700 07F4             007F4  3138 OFLSW     NOP   OGETBUF          FLUSH SWITCH                       F6576000
00086A 47F0 07DE             007DE  3139           B     ORETOK           JUST RETURN IF FLUSH               F6578000
                                    3140           DROP  R13                                                F6580000
                                    3141 *                                                                   F6582000
                                    3142 *         RE-ENTRY POINT IF ORIGINAL $TPPUT NOT ACCEPTED            F6584000
                                    3143 *           R8=ORIGINAL TANK , R14= RETURN                          F6586000
                                    3144 $TPREPUT  NULL                                                      F6588000
00086E                              3145+$TPREPUT  DS    0H
                                    3146           $STO  R8,OINADD        SET FOR RESTORE                    F6590000
00086E 4080 0890             00890  3147+          STH   R8,OINADD
                                    3148           $STO  R14,OSAVR14      RESET RETURN                       F6592000
000872 40E0 088E             0088E  3149+          STH   R14,OSAVR14
000876 40A0 088C             0088C  3150           STH   R10,OSAVR10      SAVE                               F6594000
00087A 4090 088A             0088A  3151           STH   R9,OSAVR9        SAVE                               F6596000
```

14112 G.B.

```
   LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
00087E 48F0 1320           01320  3152          LH    R15,=H'1'          CONSTANT                  F6598000
000882 48A0 8000           00000  3153          LH    R10,TANKCHN        COMPRESSED COUNT          F6600000
000886 47F0 079A           0079A  3154          B     OREENT             ENTER FLOW                F6602000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                   3156 *                                                              F6606000
                                   3157 *                                                              F6608000
                                   3158 *                                                              F6610000
                                   3159 *                                                              F6612000
                                   3160 OSAVR9    $ACON 0                REG SAVE                     F6614000
000088A 0000                       3161+OSAVR9    DC    Y(0)
                                   3162 OSAVR10   $ACON 0                REG SAVE                     F6616000
000088C 0000                       3163+OSAVR10   DC    Y(0)
                                   3164 OSAVR14   $ACON 0                RETURN ADDR SAVE             F6618000
000088E 0000                       3165+OSAVR14   DC    Y(0)
                                   3166 OINADD    $ACON 0                INPUT TANK ADDR              F6620000
000890 0000                        3167+OINADD    DC    Y(0)
                                   3168 OINEND    $ACON 0                LAST VALID DATA BYTE IN TANK F6622000
000892 0000                        3169+OINEND    DC    Y(0)
                                   3170 OACTBUF   $ACON 0                ACTIVE BUFFER ADDR           F6624000
000894 0000                        3171+OACTBUF   DC    Y(0)
                                   3172 OBUFPTR   $ACON 0                CURRENT POINTER IN BUFFER    F6626000
000896 0000                        3173+OBUFPTR   DC    Y(0)
000898 0000                        3174 OBUFCNT   DC    H'0'             REMAING SPACE COUNT IN BUFFER F6628000
00089A                             3175 OD200     DS    0H                                            F6630000
00089A D200                        3176           DC    X'D200'          CONSTANT FOR MVC COUNT       F6632000
00089C                             3177 OD263     DS    0H                                            F6634000
00089C D23F                        3178           DC    X'D23F'          MAX SCB CNT + MVC            F6636000
000006                             3179 OTS       EQU   TANKDATA-TANKDSEC                             F6638000
                                   3180           DROP  R8               DISCONTINUE TANK REG         F6640000
```

14112 G.B.

```
LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    F6644000
                                 3182 *                                                                     F6646000
                                 3183 *                                                                     F6648000
00089E                           3184 $TPGET   NULL  *                                                      F6650000
00089E 9200 00A9       00A9      3185+$TPGET   DS    0H          ENTERED FROM COMUTATOR                     F6676000
                                 3186          MVI   $TPGETCM+1,0  CLOSE COMMUTATOR                       F6678000
0008A2 48D0 1312             01312 3187        $LA   R13,$TCT1   BEGINNING OF TCT'S                       F6680000
000000                           3188+         LH    R13,=Y($TCT1)                                        F6682000
                                 3189          USING TCTDSECT,R13 **                                      F6684000
0008A6                           3190 GTEST    NULL  *           *                                        F6686000
0008A6 9140 D005       00005     3191+GTEST    DS    0H                                                   F6688000
                                 3192          TM    TCTSTAT,TCTACT  IS ACTION REQUESTED                  F6690000
0008AA 4710 08BE             008BE 3193        BO    GSERVICE    BR IF YES                                F6692000
0008AE                           3194 GNEXTTCT NULL                                                       F6694000
                                 3195+GNEXTTCT DS    0H                                                   F6696000
                                 3196          $LOAD R13,TCTNEXT TO NEXT TCT                            F6698000
0008AE 48D0 D000       00000     3197+         LH    R13,TCTNEXT                                          F6700000
                                 3198          $LTR  R13,R13     IS THIS END
0008B2 4AD0 1314             01314 3199+       AH    R13,=H'0'
0008B6 4770 08A6             008A6 3200        BNZ   GTEST       BR IF NO
                                 3201 *
                                 3202 *            ALL TCT'S HAVE BEEN SERVICED...
                                 3203 *
0008BA 47F0 00AC             00AC  3204 GWAIT    B     $TPGETCM+4  EXIT
```

```
                                    3206 *
                                    3207 *                SERVICE TCT WITH ACTION BIT ON                                F6704000
                                    3208 *                                                                              F6706000
                                    3209 GSERVICE NULL    *                                                             F6708000
0008BE                              3210+GSERVICE DS      0H                                                            F6710000
0008BE 9500 D00F       0000F        3211          CLI     TCTBUFCT,0          ARE ANY BUFFERS AVAILABLE                 F6712000
0008C2 4770 08CE              08CE  3212          BNE     GTTANK              BR IF YES                                 F6714000
0008C6 94BF D005       00005        3213 GNOACT   NI      TCTSTAT,255-TCTACT  NO... TURN OFF ACTION                     F6716000
0008CA 47F0 08AE              08AE  3214          B       GNEXTTCT            AND CONTINUE                              F6718000
                                    3215 GTTANK   NULL    *                   A BUFFER IS PRESENT                       F6720000
0008CE                              3216+GTTANK   DS      0H                                                            F6722000
0008CE D500 D00D D00C 0000D 0000C   3217          CLC     TCTTNKCT,TCTTNKLH   ARE SUFFICIENT TANKS QUEUED                F6724000
0008D4 47B0 08C6              08C6  3218          BNL     GNOACT              BR IF YES                                 F6726000
                                    3219 *                        A DECOMPRESSION IS REQUIRED                       F6728000
                                    3220          $DCHAIN $TANKPOL,R10,NOENB GET A TANK
0008D8 9500 024C       0024C        3221+         CLI     $TANKPOL,0
0008DC 4780 08EA              08EA  3222+         BE      *+14
0008E0 48A0 024C              024C  3223+         LH      R10,$TANKPOL
0008E4 D201 024C A000 0024C 00000   3224+         MVC     $TANKPOL(2),0(R10)
0008EA 4780 08BA              08BA  3225          BZ      GWAIT               BR IF NONE                                F6730000
000000                              3226          USING   TANKDSEC,R10        *                                         F6732000
                                    3227          $LOAD   R8,TCTBUFER         CURRENT BUFFER                            F6734000
0008EE 4880 D00A              0000A 3228+         LH      R8,TCTBUFER
0008F2 4A80 8002              00002 3229          AH      R8,(BUFCOUNT-BUFDSECT)(0,R8) TO DATA                          F6736000
                                    3230          $STO    R10,GTANK           SAVE TANK ADDR.                           F6738000
0008F6 40A0 0A28              00A28 3231+         STH     R10,GTANK
0008FA D201 A002 8000 00002 00000   3232          MVC     TANKRCB(2),0(R8)    MOVE RCB AND SRCB                         F6740000
000900 48F0 1320              01320 3233          LH      R15,=H'1'           CONSTANT FOR SPEED                        F6742000
                                    3234 GDECOMP  NULL    *                   PROCESS AN SCB                            F6744000
000904                              3235+GDECOMP  DS      0H
000904 D200 091F 8002 0091F 00002   3236          MVC     GSCB(1),2(R8)       SET SCB                                   F6746000
000908 947F 091F       0091F        3237          NI      GSCB,X'7F'          TURN OFF HIGH-BIT                         F6748000
00090E 4780 097E              097E  3238          BZ      GENDREC             END-OF-RECORD                             F6750000
000912 9140 091F       0091F        3239          TM      GSCB,X'40'          IS THIS A CHAR STRING...                  F6752000
000916 4780 0936              00936 3240          BZ      GPROP               BR IF NOT                                 F6754000
00091A 943F 091F       0091F        3241          NI      GSCB,X'3F'          TURN OFF STRING BIT                       F6756000
00091E D200 A006 8003 00006 00003   3242          MVC     TANKDATA(*-*),3(R8) MOVE STRING (+1)                          F6758000
00091F                              3243 GSCB     EQU     *-5                 SCB AND COUNT                             F6760000
000924 4890 091E              0091E 3244          LH      R9,GSCB-1           GET MOVE COUNT                            F6762000
000928 4B90 089A              0089A 3245          SH      R9,GD200            REMOVE MOVE                               F6764000
00092C 1A89                         3246          AR      R8,R9               COUNT INPUT STRING                        F6766000
00092E 1AA9                         3247 GCONT    AR      R10,R9              COUNT OUTPUT STRING                       F6768000
000930 1A8F                         3248          AR      R8,R15              COUNT SCB                                 F6770000
000932 47F0 0904              00904 3249          B       GDECOMP             CONTINUE WITH RECORD                      F6772000
                                    3250 GPROP    NULL    *                   PROPGATION REQUIRED                       F6774000
000936                              3251+GPROP    DS      0H
000936 9120 091F       0091F        3252          TM      GSCB,X'20'          IS THIS BLANKS...                         F6776000
00093A 4780 0962              00962 3253          BZ      GBLANKS             BR IF YES                                 F6778000
00093E 941F 091F       0091F        3254          NI      GSCB,X'1F'          NO .. REMOVE INDICATOR                    F6780000
000942 D200 A006 8003 00006 00003   3255          MVC     TANKDATA(1),3(R8)   SET SAMPLE CHARACTER                     F6782000
000948 D200 094F 091F 0094F 0091F   3256          MVC     GMOV+1(1),GSCB      SET COUNT                                 F6784000
00094E D200 A007 A006 00007 00006   3257 GMOV     MVC     TANKDATA+1(*-*),TANKDATA  PROPAGATE COUNT (+2)                F6786000
000954 4890 091E              0091E 3258          LH      R9,GSCB-1           PROPAGATION COUNT                         F6788000
000558 4B90 089A              0089A 3259          SH      R9,GD200            LESS MOVE                                 F6790000
00095C 1A8F                         3260          AR      R8,R15              COUNT SAMPLE CHAR                         F6792000
```

14112 G.B.

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

00095E 47F0 092E             0092E  3261          B     GCONT                AND ENTER FLOW                  F6794000
                                    3262 GBLANKS   NULL                       BLANK PROPAGATION REQUIRED      F6796000
000962                              3263+GBLANKS   DS    0H
000962 9240 A006       00006        3264          MVI   TANKDATA,C' '        SET BLANK SAMPLE                F6798000
000966 D200 0096D 091F 0096D 0091F  3265          MVC   *+7(1),GSCB          SET COUNT                       F6800000
00096C D200 A007 A006 00007 00006   3266          MVC   TANKDATA+1(*-*),TANKDATA PROPAGATE BLANKS            F6802000
000972 4890 091E             0091E  3267          LH    R9,GSCB-1            GET MOVE COUNT                  F6804000
000976 4B90 089A             0089A  3268          SH    R9,GD200             LESS MVC                        F6806000
00097A 47F0 092E             0092E  3269          B     GCONT                ENTER FLOW                      F6808000
                                    3270 GENDREC   NULL                       END OF LOGICAL RECORD           F6810000
00097E                              3271+GENDREC   DS    0H
                                    3272          $LOAD R9,GTANK             TANK ADDR                       F6812000
00097E 4890 0A28             00A28  3273+         LH    R9,GTANK
000982 1BA9                         3274          SR    R10,R9               FROM END PTR                X F6814000
                                    3275          DROP  R10                                                F6816000
000000                              3276          USING TANKDSEC,R9                                        F6818000
000984 40A0 9004             00004  3277          STH   R10,TANKCNT          SET COUNT IN TANK               F6820000
                                    3278          $LA   R10,TCTTANK-TCTDSECT TANK CHAIN DISPLACEMENT         F6822000
000988 48A0 133E             0133E  3279+         LH    R10,=Y(TCTTANK-TCTDSECT)
00098C 1AAD                         3280          AR    R10,R13              R10 = ABSOLUTE TANK CHAIN PTR   F6824000
                                    3281          $CHAIN (R10),R9,NOENB      ADD TO TANK QUEUE               F6826000
00098E 9500 A000       00000        3282+         CLI   0(R10),0
000992 4780 099E             0099E  3283+         BE    *+12
000996 48A0 A000             00000  3284+         LH    R10,0(0,R10)
00099A 47F0 098E             0098E  3285+         B     *-12
00099E 4090 A000             00000  3286+         STH   R9,0(0,R10)
0009A2 D201 9000 1314 00000 01314   3287+         MVC   0(2,R9),=H'0'
0009A8 4A80 1336             01336  3288          AH    R8,=H'3'             UPDATE TO NEXT RCB              F6828000
0009AC 48A0 D00C             0000C  3289          LH    R10,TCTTNKLM         LIMIT AND COUNT                 F6830000
0009B0 1AAF                         3290          AR    R10,R15              INCREMENT COUNT                 F6832000
0009B2 40A0 D00C             0000C  3291          STH   R10,TCTTNKLM         AND RESET                       F6834000
                                    3292          $LOAD R10,TCTCOM           GET COMMUTATOR ENTRY            F6836000
0009B6 48A0 D006             00006  3293+         LH    R10,TCTCOM
0009BA 92F0 A001       00001        3294          MVI   1(R10),X'F0'         OPEN PROCESSOR GATE             F6838000
                                    3295          $LOAD R9,TCTBUFER          CURRENT BUFFER ADDR             F6840000
0009BE 4890 D00A             0000A  3296+         LH    R9,TCTBUFER
0009C2 D500 D004 8000 00004 00000   3297          CLC   TCTRCB,0(R8)         IS NEXT RECORD SAME             F6842000
0009C8 4770 09D6             009D6  3298          BNE   GSWITCH              BR IF NO                        F6844000
0009CC 1B89                         3299          SR    R8,R9                REDUCE TO DATA DISPLACEMENT     F6846000
                                    3300          $STO  R8,BUFCOUNT-BUFDSECT(0,R9) AND SAVE                  F6848000
0009CE 4080 9002             00002  3301+         STH   R8,BUFCOUNT-BUFDSECT(0,R9)
0009D2 47F0 08CE             008CE  3302          B     GTTANK               AND CONTINUE                    F6850000
                                    3303 GSWITCH   NULL  *                    DIFFERENT RCB ENCOUNTERED       F6852000
0009D6                              3304+GSWITCH   DS    0H
                                    3305          $SSM  0                    DISABLE INTERRUPTS          V03.1 F6854000
0009D6 000009DA                     3306+         DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0009D6                              3307+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0009D6 8100                         3308+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0009DA                              3309+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0009DA 000009DE                     3310+         DC    AL4(*+4)
0009DE D201 D00A 9000 0000A 00000   3311          MVC   TCTBUFER,0(R9)       UPDATE CHAIN                    F6856000
                                    3312          $FREE $BUFPOOL,R9,NOENB    FREE THE BUFFER             V03.1 F6858000
0009E4 D201 9000 024A 00000 0024A   3313+         MVC   0(2,R9),$BUFPOOL
0009EA 4090 024A             0024A  3314+         STH   R9,$BUFPOOL
0009EE 4880 D00E             0000E  3315          LH    R8,TCTBUFLM          BUFFER LIMIT AND COUNT          F6860000
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72
                                    3316          $BCTR  R8,0                 REDUCE COUNT                  F6862000
0009F2 4A80 130E            0130E   3317+         AH     R8,=H'-1'
0009F6 4080 D00E            0000E   3318          STH    R8,TCTBUFLH          AND RESET                F6864000
0009FA D500 D00F D00E 0000F 0000E   3319          CLC    TCTBUFCT,TCTBUFLH    IS ANOTHER BUFFER REQUIRED F6866000
000A00 47B0 0A1C            00A1C   3320          BNL    GENABLE              ENABLE INTERRUPTS      V03.1 F6868000
                                    3321          $OC    $FCSOUT,TCTFCS       SHOW NEXT BUFFER PERMITTED F6870000
                                    3322+*        NOTE THAT THIS IS A VERY RESTRICTIVE
                                    3323+*        SIMULATION OF THE 'OC' INSTRUCTION FOR THE MODEL 20
000A04 D200 0A0B D002 00A0B 00002   3324+         MVC    *+7(1),TCTFCS
000A0A 9600 0252      00252         3325+         OI     $FCSOUT,*-*
000A0E D200 0A15 D003 00A15 00003   3326+         MVC    *+7(1),TCTFCS+1
000A14 9600 0253      00253         3327+         OI     $FCSOUT+1,*-*
000A18 92F0 0B5B      00B5B         3328          MVI    $FCSHOT+1,X'F0'      SHOW FCS CHANGE          F6872000
                                    3329 GENABLE  $SSM   FF                   ALLOW INTERRUPTS       V03.1 F6873000
000A1C                              3330+GENABLE  DS     0H
000A1C 00000A20                     3331+         DC     AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000A1C                              3332+         ORG    *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000A1C 8100                         3333+         DC     X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000A20                              3334+         ORG    *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000A20 0100                         3335+         DC     AL2(X'0100')
000A22 0A24                         3336+         DC     Y(*+2)
000A24 47F0 08BE            008BE   3337          B      GSERVICE             AND CONTINUE             F6874000
                                    3338 GTANK    $ACON  0                    TANK ADDR                F6970000
000A28 0000                         3339+GTANK    DC     Y(0)
00089A                              3340 GD200    EQU    0D200                SHARE CONSTANT           F6974000
                                    3341          DROP   R9                   DISCONTINUE TANK REG      F6976000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                  F15OCT70  11/21/72

                                   3343 $TPOPEN  NULL  *
000A2A                             3344+$TPOPEN  DS    0H                                                              F6980000
                                   3345          $TRACE SSM=YES
                                   3346          $STO   R14,TSAVA          SAVE CALLER'S                         F6982000
000A2A 40E0 0A50           00A50   3347+          STH   R14,TSAVA                                                   F6984000
                                   3348          $STO   R8,TSAVB           REGS
000A2E 4080 0A52           00A52   3349+          STH   R8,TSAVB                                                    F6986000
000A32 D200 0A4D 8002 00A4D 00002  3350          MVC   TTANK+TANKSRCB-TANKDSEC(1),TANKRCB-TANKDSEC(R8) SET FCN      F6988000
                                   3351          $LOAD  R8,TANKCON         FOR $TPPUT                            F6990000
000A38 4880 0A54           00A54   3352+          LH    R8,TANKCON
                                   3353          BAS   R14,$TPPUT          GO PUT RECORD                         F6992000
000A3C 4D                          3354+          DC    X'4D'
000A3D E0                          3355+          DC    AL1(R14*16)
000A3E 064C                        3356+          DC    S($TPPUT)
                                   3357          $LOAD  R8,TSAVB           CALLER'S                              F6994000
000A40 4880 0A52           00A52   3358+          LH    R8,TSAVB
                                   3359          $LOAD  R14,TSAVA          REGS                                  F6996000
000A44 48E0 0A50           00A50   3360+          LH    R14,TSAVA
000A48 07FE                        3361          BR    R14                 RETURN TO CALLER                      F6998000
                                   3362 *                                  DUMMY TANK                            F7000000
                                   3363 TTANK    $ACON  0                  CHAIN                                 F7002000
000A4A 0000                        3364+TTANK     DC    Y(0)
000A4C 90                          3365           DC    X'90'               RCB FOR FUNCTION CTL RECORD           F7004000
000A4D 00                          3366           DC    X'00'               USER'S SRCB (FUNCTION TYPE)           F7006000
000A4E 0000                        3367           DC    H'0'                TANK COUNT                            F7008000
                                   3368 TSAVA    $ACON  0                                                        F7010000
000A50 0000                        3369+TSAVA     DC    Y(0)
                                   3370 TSAVB    $ACON  0                                                        F7012000
000A52 0000                        3371+TSAVB     DC    Y(0)
                                   3372 TANKCON  $ACON  TTANK
000A54 0A4A                        3373+TANKCON   DC    Y(TTANK)                                                  F7014000
```

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT			P150CT70 11/21/72
				3375	*			
				3376	*$EXTP - R14 = RETURN , R13 = BUFFER ADDR			F7018000 F7020000
				3377	*			F7022000
				3379	$EXTP	NULL	*	WRITE ENTRY POINT F7026000
000A56				3380+	$EXTP	DS	0H	
000000				3381		USING	BUFDSECT,R13	BUFFER ADDR IS IN R13 F7028000
				3382		AIF	('&XPARENT' EQ 'YES').NONXP1	F7030000
				3383	.NONXP1	ANOP		F7056000
				3384		AIF	(&HOME EQ 0).EXTPOK	F7058000
				3385	.EXTPOK	ANOP		F7068000
				3386		$LA	R9,$OUTBUF	QUEUE CONTROL WORD F7070000
000A56	4890 1340		01340	3387+		LH	R9,=Y($OUTBUF)	
				3388	.EXTPFK	ANOP		F7072000
				3389		$CHAIN	(R9),R13	QUEUE FOR TRANSMISSION F7074000
000A5A	00000A5E			3390+		DC	AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A5A				3391+		ORG	*-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A5A	8100			3392+		DC	X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A5E				3393+		ORG	*+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A5E	00000A62			3394+		DC	AL4(*+4)	
000A62	9500 9000		00000	3395+		CLI	0(R9),0	
000A66	4780 0A72		00A72	3396+		BE	*+12	
000A6A	4890 9000		00000	3397+		LH	R9,0(0,R9)	
000A6E	47F0 0A62		00A62	3398+		B	*-12	
000A72	40D0 9000		00000	3399+		STH	R13,0(0,R9)	
000A76	D201 D000 1314	00000	01314	3400+		MVC	0(2,R13),=H'0'	
000A7C	00000A80			3401+		DC	AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A7C				3402+		ORG	*-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A7C	8100			3403+		DC	X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A80				3404+		ORG	*+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW	
000A80	0100			3405+		DC	AL2(X'0100')	
000A82	0A84			3406+		DC	Y(*+2)	
000A84	07FE			3407		BR	R14	RETURN TO CALLER F7076000
				3408		AIF	('&XPARENT' EQ 'YES').NONXP2	F7078000
				3409	.NONXP2	ANOP		F7084000
				3410		DROP	R13	KILL BUFFER ADDRESSABILITY F7086000

```
                                3413 *                          CONTROL CHARACTERS                                  F7092000
                                                                                                                    F7096000
000001                          3415 XSOH     EQU   X'01'       START OF HEADING                                    F7098000
000002                          3416 XSTX     EQU   X'02'       START OF TEXT                                       F7100000
000003                          3417 XETX     EQU   X'03'       END OF TEXT                                         F7102000
000010                          3418 XDLE     EQU   X'10'       DATA LINK ESCAPE                                    F7104000
000026                          3419 XETB     EQU   X'26'       END OF TEXT BLOCK                                   F7106000
00002D                          3420 XENQ     EQU   X'2D'       ENQUIRY                                             F7108000
000032                          3421 XSYN     EQU   X'32'       SYNCHRONIZATION                                     F7110000
000037                          3422 XEOT     EQU   X'37'       LOST BLOCK ALARM                                    F7112000
00003D                          3423 XNAK     EQU   X'3D'       NEGATIVE ACKNOWLEDGEMENT                            F7114000
000061                          3424 XACK1    EQU   X'61'       POSITIVE ACKNOWLEDGEMENT-CONDITIONAL                F7116000
000070                          3425 XACK0    EQU   X'70'       POSITIVE ACKNOWLEDGEMENT                            F7118000
                                3426          AIF   ('&XPARENT' EQ 'YES').XPARA                                   F7128000
                                3427 .XPARA   ANOP                                                                F7130000
000010                          3428 XLDR     EQU   XDLE        TRANSPARENT HEADER                                  F7132000
000010                          3429 XTRL     EQU   XDLE        TRANSPARENT TRAILER                                 F7134000
000060                          3430 XCHN     EQU   X'60'       TRANSPARENT CCW CHAINING BITS                       F7136000
                                3431 .XPARB   ANOP                                                                F7138000


                                3433          AIF   (&MACHINE NE 20).D1                                          F7140000


                                3435 *                          COMMUNICATIONS ADAPTER ADDRESSES                    F7144000

000C56                          3437 CAINTID  EQU   X'56'       BSCA INTERRUPT IDENTIFIER                           F7148000
000C55                          3438 CAREAD   EQU   X'54'+1     BSCA RECEIVE CODE                                   F7150000
000C59                          3439 CAWRITE  EQU   X'58'+1     BSCA TRANSMIT CODE                                  F7152000
000C57                          3440 CASENSE  EQU   X'57'       BSCA SENSE CODE                                     F7154000
000C50                          3441 CAERROR  EQU   X'50'       BSCA ERROR TEST CODE                                F7156000
000C56                          3442 CASCA    EQU   X'56'       BSCA STORE CURRENT ADDRESS                          F7158000
000052                          3443 CAENABLE EQU   X'52'       BSCA ENABLE CODE                                    F7160000
000052                          3444 CARECI   EQU   X'51'+1     BSCA RECEIVE INITIAL CODE                           F7162000
000051                          3445 CAWRTRD  EQU   X'50'+1     BSCA TRANSMIT-RECEIVE CODE                          F7164000
                                3446          AGO   .D2                                                           F7166000
                                3447 .D2      ANOP                                                                F7184000

                                3449 *                          BLOCK CONTROL BYTE INDICATORS                       F7188000

000010                          3451 BCBIGNRE EQU   X'10'       IGNORE BLOCK COUNT INDICATOR                        F7192000
000020                          3452 BCBRESET EQU   X'20'       RESET BLOCK COUNT INDICATOR                         F7194000
```

14112 G.B.

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                    3454 $IOINT   NULL  *                    ALL INTERRUPTS ENTER HERE          F7198000
000A86                              3455+$IOINT   DS    0H                                                      F7200000
                                    3456          AIF   (&MACHINE NE 20).X2                                    F7202000
000A86 9556 0091      00091         3457          CLI   145,CAINTID          IS THIS BSCA                       F7204000
000A8A 4770 0EEE            00EEE   3458          BNE   $NOTIP               BR IF NO                           F7206000
000A8E 47F0 0AB8            00AB8   3459 $COMBUSY B     CEXIT                RETURN IF NO ACTIVITY              F7208000
                                    3460          TIOB  CERROR,CAERROR       BR IF ANY ERROR                    F7210000
000A92 9A                           3461+         DC    X'9A'
000A93 50                           3462+         DC    AL1(CAERROR)
000A94 0290                         3463+         DC    S(CERROR)
000A96 47F0 0ABC            00ABC   3464 CREADREQ B     CENDREAD             BR IF READ ENDING                  F7212000
                                    3465 CRDRESP  XIO   *-*(CAREAD),&TPBPSIZ OTHERWISE START READ            F7214000
000A9A                              3466+CRDRESP  DS    0H
000A9A D254 0000 0190 00000 00190   3467+         MVC   *-*(CAREAD),400 XIOXIOXIOXIOXIOXIO
000A9A                              3468+         ORG   *-6 XIOXIOXIOXIOXIOXIO
000A9A D0                           3469+         DC    X'D0' XIOXIOXIOXIOXIOXIO
000AA0                              3470+         ORG   *+5 XIOXIOXIOXIOXIOXIO
000A9E                              3471 CREADCT  EQU   *-2                   READ COUNT FIELD          V03.1 F7216000
000AA0 4770 0A9A            00A9A   3472          BC    7,*-6                WAIT FOR READ TO TAKE              F7218000
000AA4 92F0 0A97      00A97         3473          MVI   CREADREQ+1,X'F0'     SHOW READ ACTIVE                   F7220000
                                    3474          SPSW  144                  AND EXIT                           F7222000
000AA8 00000090                     3475+         DC    AL4(144) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000AA8                              3476+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000AA8 8100                         3477+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000AAC                              3478+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
                                    3479 CREXIT   NULL                                                       F7224000
000AAC                              3480+CREXIT   DS    0H                                                     F7226000
                                    3481          AIF   (&TRACE EQ 0 OR &MACHINE NE 20).ITRA                   F7228000
                                    3482 .ITRA    ANOP                                                       F7230000
                                    3483          $RESTORE R13,R15,CREGS     RESTORE INTERRUPTED REGS
000AAC 48D0 0ED8            00ED8   3484+         LH    R13,CREGS+0
000AB0 48E0 0EDA            00EDA   3485+         LH    R14,CREGS+2
000AB4 48F0 0EDC            00EDC   3486+         LH    R15,CREGS+4
                                    3487 .ITRB    ANOP                                                       F7232000
                                    3488 CEXIT    NULL                                                       F7234000
000AB8                              3489+CEXIT    DS    0H
                                    3490          SPSW  144                  RETURN TO INTERRUPTED LOCATION     F7236000
000AB8 00000090                     3491+         DC    AL4(144) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000AB8                              3492+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000AB8 8100                         3493+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000ABC                              3494+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
                                    3495          AGO   .X3                                                   F7238000
                                    3496 .X3      ANOP                                                       F7262000
```

14112 G.B.

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72


                                   3499 $ENDREAD NULL  *                 EXTERNAL ENTRY POINT                F7268000
000ABC                             3500*$ENDREAD DS    0H
                                   3501 CENDREAD NULL  *                 EXAMINE CONTROL INFORMATION         F7270000
000ABC                             3502*CENDREAD DS    0H
                                   3503          AIF   (&MACHINE NE 20).X21                                F7272000
                                   3504          AIF   (&TRACE EQ 0 OR &MACHINE NE 20).ITRC                F7274000
                                   3505 .ITRC    ANOP                                                      F7282000
                                   3506          $SAVE R13,R15,CREGS   SAVE INTERRUPTED REGS             F7284000
000ABC 40D0 0ED8           00ED8   3507*          STH   R13,CREGS+0
000AC0 40E0 0EDA           00EDA   3508*          STH   R14,CREGS+2
000AC4 40F0 0EDC           00EDC   3509*          STH   R15,CREGS+4
                                   3510 .ITRD    ANOP                                                      F7286000
                                   3511          $LOAD R13,CBUFFER     GET ACTIVE BUFFER                   F7288000
000AC8 48D0 0EC6           00EC6   3512*          LH    R13,CBUFFER
                                   3513 .X21     ANOP                                                      F7290000
000C00                             3514          USING BUFDSECT,R13    *                                   F7292000


000ACC 47F0 0ADC           00ADC   3516          B     CNOLOGAL        AVOID LOG OVERHEAD                  F7296000


                                   3518 *                NOP THE ABOVE BRANCH TO LOG EVERY BLOCK RECEIVED    F7300000


000AD0 D202 00C4 D006 00C4 00006   3520          MVC   $LOGINFO(3),BUFSTART+1 RESPONSE LEADERS              F7304000
                                   3521          $LOG  XTPREAD         LOG RECEIVED DATA                   F7306000
000AD6 4D                          3522*         DC    X'4D'
000AD7 F0                          3523*         DC    AL1(R15*16)
000AD8 061A                        3524*         DC    S($LOG)
000ADA 0090                        3525*         DC    AL2(XTPREAD*(LOGEND-LOGDSECT))
                                   3526 CNOLOGAL NULL  *                 ENTRY TO SKIP LOGGING EVERYTHING    F7308000
000ADC                             3527*CNOLOGAL DS    0H
000ADC D200 0ED4 D005 00ED4 00005  3528          MVC   CRESP,BUFSTART    GET FIRST RESPONSE BYTE             F7310000
000AE2 9510 0ED4           00ED4   3529          CLI   CRESP,XDLE        IS IT DLE LEADER...                 F7312000
000AE6 4770 0AF0                   00AF0 3530    BNE   *+10              BR IF NO                            F7314000
000AEA D200 0ED4 D006 00ED4 00006  3531          MVC   CRESP,BUFSTART+1  YES... GET REAL RESPONSE            F7316000
000AF0 9501 0ED4           00ED4   3532          CLI   CRESP,XSOH        IS THIS NON-XPARENT LEADER...       F7318000
000AF4 4780 0B9A                   00B9A 3533    BE    CINBUF            BR IF YES TO PROCESS TEXT           F7320000
000AF8 9502 0ED4           00ED4   3534          CLI   CRESP,XSTX        IS THIS DATA                        F7322000
000AFC 4780 0B9A                   00B9A 3535    BE    CINBUF            BR IF YES TO PROCESS                F7324000
000B00 9570 0ED4           00ED4   3536          CLI   CRESP,XACK0       IS THIS WRITE ACKNOWLEDGEMENT       F7326000
000B04 4780 0B14                   00B14 3537    BE    CACKED            BR IF YES                           F7328000
000B08 953D 0ED4           00ED4   3538          CLI   CRESP,XNAK        WERE WE NAK'ED                      F7330000
000B0C 4780 0D54                   00D54 3539    BE    CNAKED            BR IF YES                           F7332000
000B10 47F0 0D8C                   00D8C 3540    B     CRESPBAD          UNKNOWN RESPONSE RECEIVED           F7334000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72

                                  3542 *                                                                F7338000
                                  3543 *          POSITIVE ACKNOWLEDGEMENT OF LAST WRITE RECEIVED       F7340000
                                  3544 *                                                                F7342000


                                  3546 CACKED   NULL  *                 ACKNOWLEDGEMENT WAS ACK         F7346000
000E14                            3547+CACKED   DS    0H
000B14 94BF 0254      00254       3548          NI    $FCSIN,255-X'40'  TURN OFF WAIT-A-BIT            F7348000
                                  3549 CWRTOK   NULL                                                    F7352000
000B18                            3550+CWRTOK   DS    0H
000B18 9101 D004      00004       3551          TM    BUFSTAT,BUFFAKE   IS THIS A DUMMY BUFFER         F7354000
000B1C 4710 0B2E            00B2E 3552          BO    CWRTNEXT          BR IF YES                       F7356000
000B20 9200 D004      00004       3553          MVI   BUFSTAT,0         RESET STATUS BYTE               F7358000
                                  3554        $FREE   $BUFPOOL,R13,NOENB RELEASE WRITTEN BUFFER         F7360000
000B24 D201 D000 024A 00000 0024A 3555+         MVC   0(2,R13),$BUFPOOL
000B2A 40D0 024A            0024A 3556+         STH   R13,$BUFPOOL
                                  3557 CWRTNEXT NULL  *                 ENTRY TO START NEXT WRITE       F7362000
000B2E                            3558+CWRTNEXT DS    0H
000B2E 48E0 0256            00256 3559          LH    R14,$WAITCON      LOAD DELAYING CONSTANT          F7374000
                                  3560          MVC   CREADCT(2),=Y(&TPBPSIZ) SET READ COUNT TO FULL  V03.1 F7375000
000B32 D201 0A9E 1342 00A9E 01342               MVC   CREADCT(2),=Y(400) SET READ COUNT TO FULL  V03.1
                                  3561 CYCLE    NULL  *                 COMMUTATOR CYCLE POINT          F7376000
000B38                            3562+CYCLE    DS    0H
000B38 9140 0254      00254       3563          TM    $FCSIN,X'40'      IS WAIT-A-BIT SET               F7378000
000B3C 4710 0B92            00B92 3564          BO    CWAITBIT          BR IF YES                       F7380000
000B40 9200 07F7      007F7       3565          MVI   $TPPHONE+1,0      RESET BUFFERING STOP            F7382000
                                  3566        $DCHAIN $OUTBUF,R13,NOENB OTHERWISE CHECK WRITE QUEUE     F7384000
000B44 9500 024E      0024E       3567+         CLI   $OUTBUF,0
000B48 4780 0B56            00B56 3568+         BE    *+14
000B4C 48D0 024E            0024E 3569+         LH    R13,$OUTBUF
000B50 D201 024E D000 0024E 00000 3570+         MVC   $OUTBUF(2),0(R13)
000B56 4770 0B6E            00B6E 3571          BNZ   CSTNDWRT          BR IF WRITE BUFFER GOTTEN       F7386000
000B5A 4700 0CF4            00CF4 3572 $FCSHOT  NOP   CRESPOND          SW TO FORCE FCS RESPONSE        F7388000
                                  3573          BAS   R15,CSETCOM       CYCLE COMMUTATOR AGAIN          F7390000
000B5E 4D                         3574+         DC    X'4D'
000B5F F0                         3575+         DC    AL1(R15*16)
000B60 0DAA                       3576+         DC    S(CSETCOM)
000B62 4AE0 130E            0130E 3577          AH    R14,=H'-1'        DECREMENT DELAY COUNT           F7392000
000B66 4720 0B38            00B38 3578          BP    CYCLE             BR IF NOT EXHAUSTED             F7394000
000B6A 47F0 0CF4            00CF4 3579          B     CRESPOND          DELAY TIME UP...SEND RESPONSE   F7396000
                                  3580 CSTNDWRT NULL  *                 ENTRY FOR BUFFER WRITE WITH BCB F7398000
000E6E                            3581+CSTNDWRT DS    0H
000B6E D201 D005 0E56 00005 00E56 3582          MVC   BUFSTART,XSTXSEQ  SET START OF TEXT HEADER        F7400000
000E74 9608 D004      00004       3583          OI    BUFSTAT,BUFTEXT   SHOW TEXT BUFFER               F7402000
000B78 D200 0E45 0ECF 00E45 00ECF 3584          MVC   CSETBCB+1(1),CBCBCNTO BCB FOR CURRENT BUFFER      F7404000
000E7E 48F0 0ECE            00ECE 3585          LH    R15,CBCBCNTO-1    GET CURRENT COUNT               F7406000
000B82 4AF0 1320            01320 3586          AH    R15,=H'1'         INCREMENT TO NEXT               F7408000
000B86 40F0 0ECE            00ECE 3587          STH   R15,CBCBCNTO-1    AND SAVE                        F7410000
000B8A 948F 0ECF      00ECF       3588          NI    CBCBCNTO,X'80'+15 MODULO 16                       F7412000
000B8E 47F0 0DF4            00DF4 3589          B     CWWRITE           GO WRITE BUFFER                 F7414000


                                  3591 *                                                                F7418000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72
                                  3592 *            WAIT-A-BIT SEQUENCE RECEIVED FROM HASP                  F7420000
                                  3593 *                                                                    F7422000
                                  3594 CWAITBIT NULL  *                 *                                   F7424000
000B92                            3595+CWAITBIT DS    0H
000B92 92F0 07F7      007F7       3596          MVI   $TPPNONE+1,X'F0'  STOP ALL BUFFERING                  F7426000
                                  3597        $TRACE SSM=NO                                                 F7428000
000B96 47F0 0B5A            0B5A  3598          B     $FCSHOT           GO IDLE                             F7430000
```

14112 G.B.

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72

                                  3601 CINBUF   NULL  *                  *                                P7436000
000B9A                            3602+CINBUF   DS    0H
                                  3603          AIF   (&MACHINE EQ 20).CCOM20                             P7438000
                                  3604 .CCOM20  ANOP                                                     P7446000
                                  3605          CIO   CALASTPO,CASCA     LAST ADDR USED +1               P7448000
000B9A 9B                         3606+         DC    X'9B'
000B9B 56                         3607+         DC    AL1(CASCA)
000B9C 0EE4                       3608+         DC    S(CALASTPO)
000B9E 48F0 02E4          00EE4   3609          LH    R15,CALASTPO       TO REG                          P7450000
000BA2 4AF0 130E          0130E   3610          AH    R15,=H'-1'         REDUCE TO LAST ADDR             P7452000
                                  3611 .CCOMN20 ANOP                                                     P7454000
000BA6 9526 F000    00000         3612          CLI   0(R15),XETB        WAS ENDING SEQUENCE CORRECT (ETB)  P7456000
000BAA 4770 0D8C          00D8C   3613          BNE   CRESPBAD           BR IF NO, LOG AND NAK           P7458000
000BAE D201 0254 D008 00254 00008 3614          MVC   $FCSIN,BUFFCS      SET NEW FUNCTION CONTROL        P7460000
                                  3615 *                VERIFY BLOCK CONTROL BYTE COUNT                  P7462000
000BB4 D200 0BBB D007 00BBB 00007 3616          MVC   CBCB(1),BUFBCB     GET BCB COUNT                   P7464000
000BB8                            3617 CBCB     EQU   *+1                COUNT BYTE                      P7466000
000BBA 9500 0ED1    00ED1         3618          CLI   CBCBCNTI,*-*       DOES RECEIVED MATCH EXPECTED    P7468000
000BBE 4770 0C7E          00C7E   3619          BNE   CBCBCHEK           BR IF NO                        P7470000
000BC2 48F0 03D0          00ED0   3620          LH    R15,CBCBCNTI-1     GET CURRENT COUNT               P7472000
000BC6 4AF0 1320          01320   3621          AH    R15,=H'1'          TO NEXT EXPECTED                P7474000
000BCA 40F0 0ED0          00ED0   3622          STH   R15,CBCBCNTI-1     AND RESET                       P7476000
000BCE 948F 0ED1    00ED1         3623          NI    CBCBCNTI,X'80'+15  MODULO 16                       P7478000
                                  3624 CBCBOK   NULL  *                  ENTRY FROM IGNORE               P7480000
000BD2                            3625+CBCBOK   DS    0H
000BD2 9101 D004    00004         3626          TM    BUFSTAT,BUFFAKE    IS THIS DUMMY BUFFER (SYNCHAR=11)  P7482000
000BD6 4710 0B18          00B18   3627          BO    CWRTOK             BR IF YES TO IGNORE             P7484000
                                  3628 CHOMASGN $LA   R14,$TCT1          POINT TO FIRST TCT          V03.1 P7484100
000BDA 48E0 1312          01312   3629+CHOMASGN LH    R14,=Y($TCT1)
000000                            3630          USING TCTDSECT,R14                                 V03.1 P7484200
000BDE D500 E004 D00A 00004 0000A 3631 COMPTCT  CLC   TCTRCB,BUFDATA     DOES BUFFER AND TCT RCBS MATCH V03.1 P7484300
000BE4 4780 0C08          00C08   3632          BE    CASSIGN            IF SO ASSIGN BUFFER         V03.1 P7484400
                                  3633          $LOAD R14,TCTNEXT        GO TO NEXT TCT            V03.1 P7484500
000BE8 48E0 E000          00000   3634+         LH    R14,TCTNEXT
                                  3635          $LTR  R14,R14            TEST FOR END              V03.1 P7484600
000BEC 4AE0 1314          01314   3636+         AH    R14,=H'0'
000BF0 4770 0BDE          00BDE   3637          BNZ   COMPTCT            COMPARE AGAINST TCT       V03.1 P7484700
                                  3638          AIF   (&HOME NE 0).HOMCTL                          V03.1 P7484750
000BF4 9500 D00A    0000A         3639          CLI   BUFDATA,0          ZERO RCB?                 V03.1 P7484800
000BF8 4780 0B18          00B18   3640          BE    CWRTOK             FREE BUFFER               V03.1 P7484900
000BFC 910F D00A    0000A         3641          TM    BUFDATA,15         IS IT A CONTROL RECORD    V03.1 P7485000
000C00 4770 0B18          00B18   3642          BNZ   CWRTOK             FREE BUFFER IF NOT        V03.1 P7485100
                                  3643 .HOMCTL  ANOP                                               V03.1 P7485150
                                  3644          $LA   R14,$CTLTCT        POINT TO CONTROL TCT      V03.1 P7485200
000C04 48E0 130C          0130C   3645+         LH    R14,=Y($CTLTCT)
                                  3646 CASSIGN  $LA   R15,TCTBUFER-TCTDSECT GET BUFFER POINTER OFFSET V03.1 P7485300
000C08 48F0 1344          01344   3647+CASSIGN  LH    R15,=Y(TCTBUFER-TCTDSECT)
000C0C 1AFE                       3648          AR    R15,R14            POINT TO TCT BUFFER CHAIN  V03.1 P7485400
000C0E 92F0 00A9    000A9         3649          MVI   $TPGETCH+1,X'F0'   OPEN TPGETS GATE                P7486000
000C12 9200 D004    00004         3650          MVI   BUFSTAT,0          RESET BUFFER STATUS BITS        P7488000
                                  3651          $CHAIN (R15),R13,NOENB   QUEUE FOR PROCESSING            P7492000
000C16 9500 F000    00000         3652+         CLI   0(R15),0
```

14112 G.B.

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72

000C1A 4780 0C26            00C26  3653+         BE    *+12
000C1E 48F0 F000            00000  3654+         LH    R15,0(0,R15)
000C22 47F0 0C16            00C16  3655+         B     *-12
000C26 40D0 F000            00000  3656+         STH   R13,0(0,R15)
000C2A D201 D000 1314 00000 01314  3657+         MVC   0(2,R13),=H'0'
                                   3658          $LA   R15,BUFDATA-BUFDSECT GET RCB OFFSET          V03.1 F7492100
000C30 48F0 1338            01338  3659+         LH    R15,=Y(BUFDATA-BUFDSECT)
000C34 40F0 D002            00002  3660          STH   R15,BUFCOUNT       SAVE OFFSET TO FIRST RCB  V03.1 F7492200
000C38 48F0 E00E            0000E  3661          LH    R15,TCTBUFLM       PICK LIMIT AND COUNT      V03.1 F7492300
                                   3662          $AA   R15,1              ADD 1 TO COUNT            V03.1 F7492400
000C3C 4AF0 1345            01346  3663+         AH    R15,=Y(1)
000C40 40F0 E00E            0000E  3664          STH   R15,TCTBUFLM       SAVE                      V03.1 F7492500
000C44 9640 E005      00005       3665          OI    TCTSTAT,TCTACT     SHOW ACTION REQUIRED ON TCT V03.1 F7492600
                                   3666          AIF   (&HOME EQ 0).HOMASGN                         V03.1 F7492620
                                   3667 .HOMASGN ANOP                                              V03.1 F7492680
000C48 D500 E00F E00E 0000F 0000E  3668          CLC   TCTBUFCT,TCTBUFLM  IS BUFFER MAXIMUM EXCEEDED V03.1 F7492700
000C4E 4740 0C76            00C76  3669          BL    CASMORE            IF NOT ALLOW MORE         V03.1 F7492800
                                   3670          $BITOFF $FCSOUT,TCTFCS,R15 TURN FCS BIT OFF       V03.1 F7492900
                                   3671+*        NOTE THAT THIS IS A VERY RESTRICTIVE
                                   3672+*        SIMULATION OF THE 'OC' INSTRUCTION FOR THE MODEL 20
000C52 D200 0C59 E002 00C59 00002  3673+         MVC   *+7(1),TCTFCS
000C58 9600 0252      00252       3674+         OI    $FCSOUT,*-*
000C5C D200 0C63 E003 00C63 00003  3675+         MVC   *+7(1),TCTFCS+1
000C62 9600 0253      00253       3676+         OI    $FCSOUT+1,*-*
000C66 48F0 0252            00252  3677+         LH    R15,$FCSOUT
000C6A 4BF0 E002            00002  3678+         SH    R15,TCTFCS
000C6E 40F0 0252            00252  3679+         STH   R15,$FCSOUT
                                   3680          DROP  R14                                         V03.1 F7493000
000C72 47F0 0B2E            00B2E  3681          B     CWRTNEXT           CONTINUE TRANSMISSION     V03.1 F7493100
000C76 92F0 0B5B      00B5B       3682 CASMORE  MVI   $FCSHOT+1,X'F0'     SHOW FCS ACTIVE           V03.1 F7493200
000C7A 47F0 0B2E            00B2E  3683          B     CWRTNEXT           AND CONTINUE XMISSION             F7494000
                                   3684 *                                                                  F7496000
                                   3685 *         RECEIVED BCB CHECK COUNT NOT CORRECT                     F7498000
                                   3686 *                                                                  F7500000
                                   3687 CBCBCHEK NULL  *                 DETERMINE DAMAGE                  F7502000
000C7E                             3688+CBCBCHEK DS    0H
000C7E 9110 0BBB      00BBB        3689          TM    CBCB,BCBIGNRE      IS THE IGNORE BIT ON              F7504000
000C82 4710 0BD2            00BD2  3690          BO    CBCBOK             BR IF YES                         F7506000
000C86 9120 0BBB      00BBB        3691          TM    CBCB,BCBRESET      IS THIS A RESET REQUEST           F7508000
000C8A 4780 0C98            00C98  3692          BZ    CBCBBAD            BR IF NO                          F7510000
000C8E D100 0ED1 0BBB 00ED1 00BBB  3693          MVN   CBCBCNTI(1),CBCB   YES... DO IT                      F7512000
000C94 47F0 0BD2            00BD2  3694          B     CBCBOK             AND PROCESS RECORD                F7514000
                                   3695 CBCBBAD  NULL  *                 BLOCK COUNTS DO NOT AGREE         F7516000
000C98                             3696+CBCBBAD  DS    0H
000C98 D100 00C4 0BBB 000C4 00BBB  3697          MVN   $LOGINFO(1),CBCB   SET FOR ERROR LOG                 F7518000
000C9E D100 00C5 0ED1 000C5 00ED1  3698          MVN   $LOGINFO+1(1),CBCBCNTI SET FOR LOG                   F7520000
                                   3699          $LOG  XBCBCHEK                                            F7522000
000CA4 4D                          3700+         DC    X'4D'
000CA5 F0                          3701+         DC    AL1(R15*16)
000CA6 061A                        3702+         DC    S($LOG)
000CA8 0010                        3703+         DC    AL2(XBCBCHEK*(LOGEND-LOGDSECT))
000CAA D200 0ECB 0BBB 00ECB 00BBB  3704          MVC   CTEMP+1(1),CBCB    ISOLATE RECEIVED CNT              F7524000
000CB0 48F0 0ED0            00ED0  3705          LH    R15,CBCBCNTI-1     GET EXPECTED CNT                  F7526000
000CB4 4BF0 0ECA            00ECA  3706          SH    R15,CTEMP          LESS RECEIVED                     F7528000
000CB8 4720 0CC0            00CC0  3707          BP    *+8                BR IF TOO LOW                     F7530000
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                P150CT70  11/21/72

000CBC 4AF0 1348              01348  3708          AH    R15,=H'16'          MAKE DIFFERENCE POSITIVE          F7532000
000CC0 49F0 0ECC              00ECC  3709          CH    R15,CMAXDUP+3       IS DIFFERENCE REASONABLE          F7534000
000CC4 4720 0CCC              00CCC  3710          BH    CBLKLOST            BR IF NO                          F7536000
000CC8 47F0 0B18              00B18  3711          B     CWRTOK              IGNORE BLOCK                      F7538000


                                     3713 CBLKLOST NULL  *                 ONE OR MORE BLOCKS ARE LOST       F7542000
000CCC                               3714+CBLKLOST DS    0H
000CCC D100 0CED 0BBB 00CED 00BBB    3715          MVN   CLOSTBCB,CBCB      SET RECEIVED BLOCK COUNT       F7544000
000CD2 D100 0CF1 0ED1 00CF1 00ED1    3716          MVN   CLSTSRCB,CBCBCNTI  SET EXPECTED BLOCK COUNT       F7546000
000CD8 D20B D002 0CE8 0000Z 00CE8    3717          MVC   BUFCOUNT(CLOSTEND-CLOSTBLK),CLOSTBLK  SET BAD BLOCK F7548000
000CDE D200 0E45 0CED 00E45 00CED    3718          MVC   CSETBCB+1(1),CLOSTBCB  SET RESTORE BCB INSTRUCTION V03.1 F7549000
000CE4 47F0 0DF4              00DF4  3719          B     CNWRITE             GO TELL HASP ABOUT BAD BCB        F7550000


                                     3721 *              PROTOTYPE CTL RECORD TO TELL HASP THAT BLOCKS ARE LOST F7554000


                                     3723 CLOSTBLK NULL  *                 START                             F7558000
000CE8                               3724+CLOSTBLK DS    0H
000CE8 0009                          3725          DC    AL2(CLOSTEND-CLOSTBS) BUFCOUNT                    F7560000
000CEA 08                            3726          DC    AL1(BUFTEXT)          BUFSTAT                     F7562000
000CEB 1002                          3727 CLOSTBS  DC    AL1(XLDR,XSTX)        BUFSTART                    F7564000
000CED 90                            3728 CLOSTBCB DC    AL1(X'80'+BCBIGNRE)   BUFBCB(RECEIVED BLOCK CT ADDED F7566000
000CEE 0000                          3729 CLOSTFCS DC    AL2(0)                FCS                         F7568000
000CF0 E0                            3730          DC    AL1(X'E0')            RCB (CTL REC,TYPE=LOST DATA)F7570000
000CF1 80                            3731 CLSTSRCB DC    AL1(X'80')            SRCB(EXPECTED BLK CT ADDED) F7572000
000CF2 00                            3732          DC    AL1(0)                SCB (NULL RECORD)           F7574000
000CF3 00                            3733          DC    AL1(0)                RCB (END OF BLOCK)          F7576000
000CF4                               3734 CLOSTEND EQU   *                 END OF PROTOTYPE                  F7578000
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70 11/21/72
                                    3737 CRESPOND NULL  *                 ENTRY TO RESPOND TO HASP          F7584000
000CF4                              3738+CRESPOND DS    0H
000CF4 9200 0B5B      00B5B         3739          MVI   $FCSHOT+1,0       RESET HOT SWITCH                  F7586000
                                    3740        $DCHAIN $BUFPOOL,R13,NOENB GET A BUFFER TO USE              F7588000
000CF8 9500 024A      0024A         3741+         CLI   $BUFPOOL,0
000CFC 4780 0D0A            00D0A   3742+         BE    *+14
000D00 48D0 024A            0024A   3743+         LH    R13,$BUFPOOL
000D04 D201 024A D000 0024A 00000   3744+         MVC   $BUFPOOL(2),0(R13)
000D0A 4770 0D24            00D24   3745          BNZ   CBUFGOTN            BR IF GOTTEN                      F7590000
                                    3746 CSTOPIN  NULL  *                 ENTRY TO STOP ALL INPUT           F7592000
000D0E                              3747+CSTOPIN  DS    0H
                                    3748        $LA   R13,CDUMMY          USE DUMMY BUFFER                  F7594000
000D0E 48D0 134A            0134A   3749+         LH    R13,=Y(CDUMMY)
000D12 9200 D00A      0000A         3750          MVI   BUFDATA,0           SET NULL BUFFER RCB               F7596000
000D16 9201 D004      00004         3751          MVI   BUFSTAT,BUFFAKE     FORCE STATUS TO DUMMY             F7598000
000D1A D201 0A9E 134C 00A9E 0134C   3752          MVC   CREADCT(2),=Y(CDUMCT) SET READ COUNT TO SHORT  V03.1 F7599000
000D20 47F0 0B6E            00B6E   3753          B     CSTNDWRT            GO DO NORMAL WRITE                F7600000
                                    3754 CBUFGOTN NULL  *                                                   F7602000
000D24                              3755+CBUFGOTN DS    0H
000D24 9200 D00A      0000A         3756          MVI   BUFDATA,0           SET NULL BUFFER RCB               F7604000
000D28 D201 D002 134E 00002 0134E   3757          MVC   BUFCOUNT,=AL2(CDUMEND-CDUMSTRT) SET WRITE COUNT   F7606000
000D2E D501 0EC8 0252 00EC8 00252   3758          CLC   CFCSOUT,$FCSOUT     HAS FCS BEEN CHANGED              F7608000
000D34 4770 0B6E            00B6E   3759          BNE   CSTNDWRT            BR IF YES TO DO NORMAL WRITE      F7610000
000D38 D201 D005 0EEA 00005 0EEA    3760          MVC   BUFSTART,XACKSEQ     SETUP STANDARD SEQUENCE           F7612000
                                    3761 CSENDRES NULL                    *                                 F7614000
000D3E                              3762+CSENDRES DS    0H
000D3E 9602 D004      00004         3763          OI    BUFSTAT,BUFRESP     SHOW RESPONSE BUFFER              F7616000
000D42 47F0 0DF4            00DF4   3764          B     CNWRITE             AND GO WRITE                      F7618000
                                    3765 CDUMMY   $ACON 0                   NO CHAIN                          F7620000
000D46 0000                         3766+CDUMMY   DC    Y(0)
000D48 0006                         3767          DC    AL2(CDUMEND-CDUMSTRT) COUNT                         F7622000
000D4A 01                           3768          DC    AL1(BUFFAKE)        BUFSTAT                       F7624000
000D4B 1002                         3769 CDUMSTRT DC    AL1(XLDR,XSTX)      BUFSTART                      F7626000
000D4D 90                           3770          DC    AL1(X'80'+BCBIGNRE) BUFBCB                        F7628000
000D4E 0000                         3771          DC    AL2(0)              FCS                           F7630000
000D50 00                           3772          DC    AL1(0)              RCB (EOB)                     F7632000
000D51                              3773 CDUMEND  EQU   *                     END OF DUMMY BUFFER           F7634000
                                    3774          AIF   (&MACHINE NE 20).CNOPAD                           F7636000
000D51 0000                         3775          DC    AL2(0)              SPACE FOR ENDING SEQUENCE     F7638000
                                    3776 .CNOPAD  ANOP                                                    F7640000
000008                              3777 CDUMCT   EQU   *-CDUMSTRT          MAXIMUM ACCEPTABLE COUNT  V03.1 F7641000
```

14112 G.B.

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72

                                   3779 *                                                              F7644000
                                   3780 *          A NEGATIVE RESPONSE RECEIVED FROM HASP              F7646000
                                   3781 *                                                              F7648000


                                   3783 CNAKED   NULL  *                PREPARE TO RETRANSMIT          F7652000
000D54                             3784+CNAKED   DS    0H
                                   3785          $LOG  XNAKREC          LOG NEGATIVE REPLY             F7654000
000D54 4D                          3786+         DC    X'4D'
000D55 F0                          3787+         DC    AL1(R15*16)
000D56 061A                        3788+         DC    S($LOG)
000D58 0020                        3789+         DC    AL2(XNAKREC*(LOGEND-LOGDSECT))
000D5A 9104 D004       00004       3790          TM    BUFSTAT,BUFNAK   WERE WE SENDING A NAK        F7656000
000D5E 4710 0D76             0D76  3791          BO    CNAKNAK          BR IF YES                     F7658000
000D62 9210 D005       00005       3792          MVI   BUFSTART,XLDR    RESET LEADER CHARACTER        F7660000
000D66 9108 D004       00004       3793          TM    BUFSTAT,BUFTEXT  WAS THIS A TEXT BUFFER       F7662000
000D6A 4710 0E30             0E30  3794          BO    CREWRITE         BR IF YES TO RETRY            F7664000
000D6E 9210 D005       00005       3795          MVI   BUFSTART,XDLE    SET RESPONSE LEADER           F7666000
000D72 47F0 0E5A             0E5A  3796          B     CWRTXIO          AND GO WRITE IT               F7668000
                                   3797 CNAKNAK  NULL                   OUR NAK WAS NAK'ED            F7670000
000D76                             3798+CNAKNAK  DS    0H
000D76 9108 D004       00004       3799          TM    BUFSTAT,BUFTEXT  WAS ORIGINAL BUFFER TEXT...  F7672000
000D7A 4780 0B18             0B18  3800          BZ    CWRTOK           NO...FORGET IT                F7674000
                                   3801 *                               YES...PREPARE TO RESEND       F7676000
000D7E D201 D005 0EE6 00005 00EE6  3802          MVC   BUFSTART,XSTXSEQ RESET TEXT LEADERS            F7678000
000D84 94F9 D004       00004       3803          NI    BUFSTAT,255-BUFNAK-BUFRESP RESET STATUS         F7680000
000D88 47F0 0DF4             0DF4  3804          B     CNWRITE          WRITE BUFFER AGAIN            F7682000


                                   3806 *                                                              F7686000
                                   3807 *          UNKNOWN RESPONSE FROM HASP... RESEND LAST DATA      F7688000
                                   3808 *                                                              F7690000
                                   3809 CRESPBAD NULL                                                  F7692000
000D8C                             3810+CRESPBAD DS    0H
000D8C D201 00C4 D005 000C4 00005  3811          MVC   $LOGINFO(2),BUFSTART SHOW BAD RESPONSE         F7694000
                                   3812          $LOG  XUNKRES          LOG ERROR                     F7696000
000D92 4D                          3813+         DC    X'4D'
000D93 F0                          3814+         DC    AL1(R15*16)
000D94 061A                        3815+         DC    S($LOG)
000D96 0030                        3816+         DC    AL2(XUNKRES*(LOGEND-LOGDSECT))
000D98 47F0 0D9C             0D9C  3817          B     CSENDNAK         GO REPLY NAK                  F7698000


                                   3819 *                                                              F7702000
                                   3820 *          SEND A NEGATIVE RESPONSE TO HASP                    F7704000
                                   3821 *                                                              F7706000
                                   3822 CSENDNAK NULL  *                ENTRY                         F7708000
000D9C                             3823+CSENDNAK DS    0H
000D9C D201 D005 0EEC 00005 00EEC  3824          MVC   BUFSTART,XNAKSEQ SET NAK SEQUENCE             F7710000
000DA2 9606 D004       00004       3825          OI    BUFSTAT,BUFRESP+BUFNAK SHOW NAK RESPONSE      F7712000
```

LOC	OBJECT CODE	ADDR1	ADDR2	STMT	SOURCE STATEMENT			F15OCT70 11/21/72
0001A6	47F0 0DF4		00DF4	3826	B	CNWRITE	AND GO WRITE IT	F7714000

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72
                                     3828 *                                                          F7718000
                                     3829 *          COMSUP IS EXITING WITHOUT I/O ACTIVE            F7720000
                                     3830 *          PREPARE FOR RE-ENTRY THROUGH COMUTATOR          F7722000
                                     3831 *                                                          F7724000


                                     3833 CSETCOM  NULL  *                   *                       F7728000
000DAA                               3834+CSETCOM  DS    0H
000DAA 92F0 00B9       000B9         3835          MVI   $COMCOM+1,X'F0'     OPEN GATE               F7730000
000DAE 92F0 0A8F       00A8F         3836          MVI   $COMBUSY+1,X'F0'    SHOW NO ACTIVITY        F7732000
                                     3837        $SAVE   R13,R15,CRETREGS    SAVE SOME REGISTERS     F7734000
000DB2 40D0 0DE8             00DE8   383R+         STH   R13,CRETREGS+0
000DB6 40E0 0DEA             00DEA   3839+         STH   R14,CRETREGS+2
000DBA 40F0 0DEC             00DEC   3840+         STH   R15,CRETREGS+4
000DBE 47F0 0AAC             00AAC   3841          B     CREXIT              AND RETURN TO INTERRUPTED LOC F7736000
                                     3842 $COMSUP  NULL                                            F7738000
000DC2                               3843+$COMSUP  DS    0H
                                     3844        $SSM    0                   DISABLE                 F7740000
000DC2 00000DC6                      3845+         DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000DC2                               3846+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000DC2 8100                          3847+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000DC6                               3848+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000DC6 00000DCA                      3849+         DC    AL4(*+4)
000DCA 9200 00B9       000B9         3850          MVI   $COMCOM+1,0         CLOSE COMUTATOR ENTRY   F7742000
                                     3851        $RESTORE R13,R15,CRETREGS   RESTORE                 F7744000
000DCE 48D0 0DE8             00DE8   3852+         LH    R13,CRETREGS+0
000DD2 48E0 0DEA             00DEA   3853+         LH    R14,CRETREGS+2
000DD6 48F0 0DEC             00DEC   3854+         LH    R15,CRETREGS+4
                                     3855          AIF   (&MACHINE NE 20).CA                       F7746000
000DDA D201 0092 1350 00092 01350    3856          MVC   146(2),=Y($COMCOM+4) SET EXIT TO COMUTATOR F7748000
                                     3857          AGO   .CB                                       F7750000
                                     3858 .CA      ANOP                                            F7756000
000DE0 9200 0A8F       00A8F         3859          MVI   $COMBUSY+1,0        ALLOW COMMUNICATIONS INTERRUPTS F7758000
000DE4 07FF                          3860          BR    R15                 RE-ENTER COMSUP         F7760000
                                     3861 CRETREGS $WCON (0,0,0)             REGISTER SAVE           F7762000
000DE6 0000
000DE8 000000000000000               3862+CRETREGS DC    A(0,0,0)
```

14112 G.B.

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                   3865 CNWRITE  NULL                                                  F7766000
000DF4                             3866+CNWRITE  DS    0H                                              F7768000
                                   3867          AIF   (&MACHINE NE 20).X4                             F7770000
000DF4 48F0 1352          01352    3868          LH    R15,=Y(BUFSTART-BUFDSECT) DATA DISPLACEMENT     F7772000
000DF8 1AFD                        3869          AR    R15,R13           R15 = BEGINNING OF DATA       F7774000
000DFA 40F0 0A9C          00A9C    3870          STH   R15,CRDRESP+2     SET RETURN READ               F7776000
000DFE 40F0 0E84          00E84    3871          STH   R15,CNWRITE+2     SET WRITE ADDR                F7778000
000E02 9102 D004    00004          3872          TM    BUFSTAT,BUFRESP   IS THIS A RESPONSE SEQUENCE... F7780000
000E06 4780 0E14          00E14    3873          BZ    CSETEND           BR IF NO                      F7782000
000E0A D201 0E86 1354 00E86 01354  3874          MVC   CNWRITE+4(2),=H'2' YES...SET RESPONSE COUNT       F7784000
000E10 47F0 0E5A          00E5A    3875          B     CWRTXIO           AND WRITE IT                  F7786000
                                   3876 CSETEND  NULL  *                 ADD BSC ENDING SEQUENCE       F7788000
000E14                             3877+CSETEND  DS    0H                                              F7790000
000E14 48F0 D002          00002    3878          LH    R15,BUFCOUNT      DATA COUNT                    F7792000
000E18 4AF0 1356          01356    3879          AH    R15,=H'11'        FIX FOR XPARENCY              F7794000
000E1C 40F0 0E86          00E86    3880          STH   R15,CNWRITE+4     SET COUNT                     F7796000
000E20 1AFD                        3881          AR    R15,R13           INCLUDE BUFFER                F7798000
000E22 4AF0 1352          01352    3882          AH    R15,=Y(BUFSTART-BUFDSECT) ADJUST FOR HEADING    F7800000
000E26 4BF0 1356          01356    3883          SH    R15,=H'11'        AVOIDS ASSEMBLER ERROR        F7802000
000E2A D201 F000 0EE8 00000 00EE8  3884          MVC   0(2,R15),XETBSEQ  SET ENDING                    F7804000
                                   3885 CREWRITE NULL  *                 RE-WRITE TEXT ENTRY           F7806000
000E30                             3886+CREWRITE DS    0H                                              F7808000
000E30 9102 D004    00004          3887          TM    BUFSTAT,BUFRESP   IS THIS A RESPONSE           F7810000
000E34 4710 0E5A          00E5A    3888          BO    CWRTXIO           BR IF YES TO SKIP FCS SET     F7812000
000E38 D201 D008 0252 00008 00252  3889          MVC   BUFFCS,$FCSOUT    SET CURRENT FCS               F7814000
000E3E D201 0EC8 0252 00EC8 00252  3890          MVC   CFCSOUT,$FCSOUT   SAVE LAST FCS SENT            F7816000
000E44 9200 D007    00007          3891 CSETBCB  MVI   BUFBCB,*-*        SET BCB INTO BUFFER           F7818000
000E48 D200 0EB7 D00A 00EB7 0000A  3892          MVC   COLDRCB+1(1),BUFDATA SAVE RCB                   V03.1 F7820000
000E4E 9101 D00A    00004          3893          TM    BUFSTAT,BUFFAKE   IS THIS A DUMMY BUFFER       F7822000
000E52 4780 0E5A          00E5A    3894          BZ    *+8               BR IF NO                      F7824000
000E56 9640 D008    00008          3895          OI    BUFFCS,X'40'      YES...SET WAIT-A-BIT          F7826000
                                   3896 CWRTXIO  NULL  *                 WRITE BUFFER                  F7828000
000E5A                             3897+CWRTXIO  DS    0H                                              F7830000
000E5A 9200 0A97    00A97          3898          MVI   CREADREQ+1,0      SHOW READ REQUIRED            F7832000
000E5E 40D0 0EC6          00EC6    3899          STH   R13,CBUFFER       SET BUFFER ADDR               F7834000
000E62 47F0 0E72          00E72    3900          B     CNWLOG            NOP THIS TO LOG EVERY WRITE   F7836000
000E66 D202 00C4 D006 000C4 00006  3901          MVC   $LOGINFO(3),BUFSTART+1 SET LOG INFO             F7838000
                                   3902          $LOG  XTPWRITE          AND DO IT                     F7840000
000E6C 4D                          3903+         DC    X'4D'                                           F7842000
000E6D F0                          3904+         DC    AL1(R15*16)                                     F7844000
000E6E 061A                        3905+         DC    S($LOG)                                         F7846000
000E70 0080                        3906+         DC    AL2(XTPWRITE*(LOGEND-LOGDSECT))                 F7848000
                                   3907 CNWLOG   NULL  *                 WRITE LOG BYPASS              F7850000
000E72                             3908+CNWLOG   DS    0H                                              F7852000
                                   3909          AIF   (&TRACE EQ 0 OR &MACHINE NE 20).TRX             F7854000
                                   3910 .TRX     ANOP                                                  F7856000
                                   3911          $RESTORE R13,R15,CREGS  RESTORE BEFORE I/O IN CASE 40KB F7858000
000E72 48D0 0ED8          00ED8    3912+         LH    R13,CREGS+0                                     F7860000
000E76 48E0 0EDA          00EDA    3913+         LH    R14,CREGS+2                                     F7862000
000E7A 48F0 0EDC          00EDC    3914+         LH    R15,CREGS+4                                     F7864000
                                   3915 .TRZ     ANOP                                                  F7866000
000E7E 9200 0A8F    00A8F          3916          MVI   $COMBUSY+1,0      SHOW ACTIVITY                 F7868000
```

14112 G.B.

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72

                                    3917          AIF   (&MACHINE NE 20 OR &LINESPD LT 19200).CL      V03.1 F7850000
                                    3918 .CL      ANOP                                                        F7854000
                                    3919 COMWRITE XIO   *-*(CAWRITE),0      ISSUE WRITE                     F7856000
000E82                              3920+COMWRITE DS    0H
000E82 D258 0000 0000 00000 00000   3921+         MVC   *-*(CAWRITE),0 XIOXIOXIOXIOXIOXIO
000E82                              3922+         ORG   *-6 XIOXIOXIOXIOXIOXIO
000E82 D0                           3923+         DC    X'D0' XIOXIOXIOXIOXIOXIO
000E88                              3924+         ORG   *+5 XIOXIOXIOXIOXIOXIO
000E88 4770 0E82            00E82   3925          BC    7,*-6               WAIT UNTIL ACCEPTED         F7858000
                                    3926          SPSW  144                 EXIT (QUICKLY)              F7860000
000E8C 00000090                     3927+         DC    AL4(144) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000E8C                              3928+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000E8C 8100                         3929+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000E90                              3930+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
                                    3931          AGO   .X5                                               F7862000
                                    3932 .X5      ANOP                                                    F7942000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72

                                  3934 *                                                              F7946000
                                  3935 *                                                              F7948000
                                  3936 *                                                              F7950000


                                  3938 CERROR   NULL  *                                               F7954000
000E90                            3939+CERROR   DS    0H
                                  3940          AIF   (&MACHINE NE 20).X10                           F7956000
                                  3941          AIF   (&TRACE EQ 0 OR &MACHINE NE 20).ITRE          F7958000
                                  3942 .ITRE    ANOP                                                F7966000
                                  3943          $SAVE R13,R15,CREGS       SAVE INTERRUPTED REGS     F7968000
000E90 40D0 0ED8          00ED8   3944+          STH   R13,CREGS+0
000E94 40E0 0EDA          00EDA   3945+          STH   R14,CREGS+2
000E98 40F0 0EDC          00EDC   3946+          STH   R15,CREGS+4
                                  3947 .ITRF    ANOP                                                F7970000
                                  3948          $LOAD R13,CBUFFER         GET CURRENT BUFFER        F7972000
000E9C 48D0 0EC6          00EC6   3949+          LH    R13,CBUFFER
                                  3950          CIO   CSNSE,CASENSE       STORE SENSE BYTES         F7974000
000EA0 9B                         3951+          DC    X'9B'
000EA1 57                         3952+          DC    AL1(CASENSE)
000EA2 0EA5                       3953+          DC    S(CSNSE)
000EA5                            3954 CSNSE    EQU   *+1                                           F7976000
000EA4 9200 00C4     000C4        3955          MVI   $LOGINFO,*-*        SET FOR LOG PROCESSING    F7978000
                                  3956          $LOG  XUNITCHK            LOG ERROR                 F7980000
000EA8 4D                         3957+          DC    X'4D'
000EA9 F0                         3958+          DC    AL1(R15*16)
000EAA 061A                       3959+          DC    S($LOG)
000EAC 0050                       3960+          DC    AL2(XUNITCHK*(LOGEND-LOGDSECT))
000EAE 957F 0EA5     00EA5        3961          CLI   CSNSE,X'7F'         TEST I/O TYPE (CLI FASTER)  F7982000
000EB2 47D0 0E30          00E30   3962          BNH   CREWRITE            BR IF WRITE TO RE-TRY       F7984000
                                  3963 *                                  PROCESS READ ERROR          F7986000
000EB6 9500 D00A     0000A        3964 COLDRCB  CLI   BUFDATA,*-*         CHECK VALIDITY OF DATA (RCB)  V03.1 F7986500
000EBA 4780 0D9C          00D9C   3965          BE    CSENDNAK            BR IF MATCH                   V03.1 F7987000
000EBE 94F7 D004     00004        3966          NI    BUFSTAT,255-BUFTEXT OTHERWISE FORGET TEXT         V03.1 F7987500
000EC2 47F0 0D9C          00D9C   3967          B     CSENDNAK            GO NAK HASP                 F7988000
                                  3968          AGO   .X12                                            F7990000
                                  3969 .X1Z     ANOP                                                  F8148000
```

```
                                3972 CBUFFER $ACON  0                 ACTIVE COMUNICATIONS BUFFER          F8154000
000EC6 0000                     3973+CBUFFER  DC    Y(0)
000EC6                          3974 $BUFFER  EQU   CBUFFER           EXTERNAL REFERENCE NAME              F8156000
000EC8 0000                     3975 CFCSOUT  DC    H'0'              LAST FCS TRANSMITTED TO HASP         F8158000
000ECA 0000                     3976 CTEMP    DC    H'0'              TEMPORARY STORAGE                    F8160000
000ECC 0003                     3977 CMAXDUP  DC    H'3'              MAX REPEATED BLOCKS                  F8162000
000ECE 00                       3978          DC    AL1(0)            FIRST BYTE OF HALF-WORD              F8164000
000ECF 80                       3979 CBCBCNTO DC    AL1(X'80')        BLOCK CHECK COUNT OUT                F8166000
000ED0 00                       3980          DC    AL1(0)            SPACER                               F8168000
000ED1 80                       3981 CBCBCNTI DC    AL1(X'80')        BLOCK COUNT CHARACTER EXPECTED       F8170000
000ED2 0000                     3982          DC    H'0'              *                                    F8172000
000ED3                          3983 $INQCNT  EQU   *-1               COUNT OF QUEUED INPUT BUFFERS        F8174000
000ED4 00                       3984 CRESP    DC    AL1(0)            RESPONSE CHARACTER RECEIVED          F8176000
                                3985          AIF   (&TRACE EQ 0 OR &MACHINE NE 20).TRG                    F8178000
                                3986 .TRG     ANOP                                                       F8184000
                                3987 CREGS    $WCON (0,0,0)           REGISTER SAVE AREA                   F8186000
000ED5 000000
000ED8 0000000000000000         3988+CREGS    DC    A(0,0,0)
                                3989 .TRH     ANOP                                                       F8188000
000EE4 0000                     3990 CALASTPO DC    H'0'              LAST ADDR STORAGE                    F8190000

                                3992 *                      CONTROL SEQUENCES                          F8194000
000EE6 1002                     3993 XSTXSEQ  DC    AL1(XLDR,XSTX)    START-OF-TEXT SEQUENCE               F8196000
000EE8 1026                     3994 XETBSEQ  DC    AL1(XTRL,XETB)    END-OF-TEXT-BLOCK SEQUENCE           F8198000
000EEA 1070                     3995 XACKSEQ  DC    AL1(XDLE,XACK0)   POSITIVE ACKNOWLEDGEMENT SEQUENCE    F8200000
000EEC 323D                     3996 XNAKSEQ  DC    AL1(XSYN,XNAK)    NEGATIVE ACKNOWLEDGEMENT SEQUENCE  F8202000
                                3997          AIF   (&MACHINE EQ 20).S1                                  F8204000
                                3998 .S1      ANOP                                                       F8240000
                                3999          DROP  R13               KILL BUFFER ADDRESSABILITY         F8242000
                                4000          AIF   (&MACHINE EQ 20).YOSKP1                              F8244000
                                4001 .YOSKP1  ANOP                                                       F8488000
```

14112 G.B.

```
  LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F150CT70  11/21/72
                                   4003          AIF   (&CONSOLE EQ 0).YOSKP2                                F8492000
                                   4004 .YOSKP2  ANOP                                                        F8508000
                                   4005 $NOTTP   NULL                                                        F8510000
000EEE                             4006+$NOTTP   DS    0H
                                   4007 YORET    SPSW  144              RETURN TO INTERRUPTED LOCATION       F8512000
000EEE                             4008+YORET    DS    0H
000EEE 00000090                    4009+         DC    AL4(144) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000EEE                             4010+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000EEE 8100                        4011+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
000EF2                             4012+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
                                   4013          AIF   (&R(2)).YOSKP3                                      F8514000
                                   4014 .YOSKP3  ANOP                                                      F8516000
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                    4016 $SVC     NULL  *                  SVC NEW ENTRY POINT          F8620000
000FF2                              4017+$SVC     DS    0H
                                    4018          AIF   (&TRACE EQ 0).TRASKIP                          F8622000
                                    4019 .TRASKIP ANOP                                               F8766000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72

                                   4021 $1STTANK $GENTANK                                              F8770000
000EF2 0F74                        4022+$TANK1   DC    Y($TANK2)
000EF4 00                          4023+         DC    AL1(0)              TANK RCB
000EF5 00                          4024+         DC    AL1(0)              TANK SRCB
000EF6 0000                        4025+         DC    AL2(0)              TANK COUNT
000EF8 4040404040404040            4026+         DC    120C' '             TANK DATA
000F70 40404040                    4027+         DC    (4)C' '             TANK WORK SPACE
000F74 0FF6                        4028+$TANK2   DC    Y($TANK3)
000F76 00                          4029+         DC    AL1(0)              TANK RCB
000F77 00                          4030+         DC    AL1(0)              TANK SRCB
000F78 0000                        4031+         DC    AL2(0)              TANK COUNT
000F7A 4040404040404040            4032+         DC    120C' '             TANK DATA
000FF2 40404040                    4033+         DC    (4)C' '             TANK WORK SPACE
000FF6 1078                        4034+$TANK3   DC    Y($TANK4)
000FF8 00                          4035+         DC    AL1(0)              TANK RCB
000FF9 00                          4036+         DC    AL1(0)              TANK SRCB
000FFA 0000                        4037+         DC    AL2(0)              TANK COUNT
000FFC 4040404040404040            4038+         DC    120C' '             TANK DATA
001C74 40404040                    4039+         DC    (4)C' '             TANK WORK SPACE
001C78 10FA                        4040+$TANK4   DC    Y($TANK5)
001C7A 00                          4041+         DC    AL1(0)              TANK RCB
001C7B 00                          4042+         DC    AL1(0)              TANK SRCB
001C7C 0000                        4043+         DC    AL2(0)              TANK COUNT
001C7E 4040404040404040            4044+         DC    120C' '             TANK DATA
0010F6 40404040                    4045+         DC    (4)C' '             TANK WORK SPACE
0010FA 117C                        4046+$TANK5   DC    Y($TANK6)
0010FC 00                          4047+         DC    AL1(0)              TANK RCB
001CFD 00                          4048+         DC    AL1(0)              TANK SRCB
0010FE 0000                        4049+         DC    AL2(0)              TANK COUNT
001100 4040404040404040            4050+         DC    120C' '             TANK DATA
001178 40404040                    4051+         DC    (4)C' '             TANK WORK SPACE
00117C 11FE                        4052+$TANK6   DC    Y($TANK7)
00117E 00                          4053+         DC    AL1(0)              TANK RCB
00117F 00                          4054+         DC    AL1(0)              TANK SRCB
001180 0000                        4055+         DC    AL2(0)              TANK COUNT
001182 4040404040404040            4056+         DC    120C' '             TANK DATA
0011FA 40404040                    4057+         DC    (4)C' '             TANK WORK SPACE
0011FE 1280                        4058+$TANK7   DC    Y($TANK8)
001200 00                          4059+         DC    AL1(0)              TANK RCB
001201 00                          4060+         DC    AL1(0)              TANK SRCB
001202 0000                        4061+         DC    AL2(0)              TANK COUNT
001204 4040404040404040            4062+         DC    120C' '             TANK DATA
00127C 40404040                    4063+         DC    (4)C' '             TANK WORK SPACE
001280 0000                        4064+$TANK8   DC    Y($TANK9)
001282 00                          4065+         DC    AL1(0)              TANK RCB
001283 00                          4066+         DC    AL1(0)              TANK SRCB
001284 0000                        4067+         DC    AL2(0)              TANK COUNT
001286 4040404040404040            4068+         DC    120C' '             TANK DATA
0012FE 40404040                    4069+         DC    (4)C' '             TANK WORK SPACE
000000                             4070+$TANK9   EQU   0                       END CHAIN
000EF2                             4071+$1STTANK EQU   $TANK1              EXTERNAL NAME
                                   4072          AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).TANKSKP     F8772000
                                   4073 .TANKSKP ANOP                                                F8782000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                    4075          LTORG                                                F8786000
001308 00000000                     4076          =F'0'
00130C 00CA                         4077          =Y($CTLTCT)
00130E FFFF                         4078          =H'-1'
001310 0312                         4079          =Y(HCONTTAB-2)
001312 00CA                         4080          =Y($TCT1)
001314 0000                         4081          =H'0'
001316 0006                         4082          =Y(TANKDATA-TANKDSEC)
001318 00F2                         4083          =Y(RCTTANK1)
00131A 0050                         4084          =H'80'
00131C 0004                         4085          =H'4'
00131E 01A6                         4086          =Y($ERRTAB)
001320 0001                         4087          =H'1'
001322 0002                         4088          =Y(TANKRCB-TANKDSEC)
001324 06BA                         4089          =Y(OGO1)
001326 06C8                         4090          =Y(OSQUEEZE)
001328 0708                         4091          =Y(OCOMP1)
00132A 0716                         4092          =Y(OCMPSTOP)
00132C 0004                         4093          =Y(4)
00132E 001F                         4094          =H'31'
001330 0040                         4095          =H'64'
001332 003F                         4096          =H'63'
001334 0000                         4097          =Y(L'TANKCHN-2)
001336 0003                         4098          =H'3'
001338 000A                         4099          =Y(BUFDATA-BUFDSECT)
00133A 0189                         4100          =Y(400-BUFDATA+BUFSTART-2)
00133C 0004                         4101          =Y(BUFSTART-BUFDSECT-1)
00133E 0008                         4102          =Y(TCTTANK-TCTDSECT)
001340 024E                         4103          =Y($OUTBUF)
001342 0190                         4104          =Y(400)
001344 000A                         4105          =Y(TCTBUFER-TCTDSECT)
001346 0001                         4106          =Y(1)
001348 0010                         4107          =H'16'
00134A 0D46                         4108          =Y(CDUMMY)
00134C 0008                         4109          =Y(CDUMCT)
00134E 0006                         4110          =AL2(CDUMEND-CDUMSTRT)
001350 00BC                         4111          =Y($COMCOM+4)
001352 0005                         4112          =Y(BUFSTART-BUFDSECT)
001354 0002                         4113          =H'2'
001356 000B                         4114          =H'11'
001358 A0                           4115          =X'A0'
00135A                              4116 $END     DS    0H                END OF PERMANENT CODE    F8788000
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72
00135C                           4118 $1STBUF  DS    OF                                              F8792000
                                 4119 *                                                              F8794000
                                 4120 *          THE FOLLOWING SECTION WILL DYNAMICALLY BUILD THE    F8796000
                                 4121 *          COMMUNICATIONS BUFFER POOL OVER THE INITIALIZATION  F8798000
                                 4122 *          INSTRUCTIONS.  BUFFERS WILL BE CONSTRUCTED TO THE   F8800000
                                 4123 *          EXTENT OF MEMORY OR UNTIL '&NUMBUFS' HAS BEEN BUILT.F8802000
                                 4124 *          THE LOCATION OF THE BUFFERS SO GENERATED WILL BE AS F8804000
                                 4125            GIVEN BELOW.                                        F8806000

00135C                           4127+$BUF1    EQU   $1STBUF+(1-1)*(BUFEND-BUFBEGIN)
0014F4                           4128+$BUF2    EQU   $1STBUF+(2-1)*(BUFEND-BUFBEGIN)
00168C                           4129+$BUF3    EQU   $1STBUF+(3-1)*(BUFEND-BUFBEGIN)
001824                           4130+$BUF4    EQU   $1STBUF+(4-1)*(BUFEND-BUFBEGIN)
0019BC                           4131+$BUF5    EQU   $1STBUF+(5-1)*(BUFEND-BUFBEGIN)
001B54                           4132+$BUF6    EQU   $1STBUF+(6-1)*(BUFEND-BUFBEGIN)
001CEC                           4133+$BUF7    EQU   $1STBUF+(7-1)*(BUFEND-BUFBEGIN)
001E84                           4134+$BUF8    EQU   $1STBUF+(8-1)*(BUFEND-BUFBEGIN)
```

```
  LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F15OCT70  11/21/72

001361                           4136          ORG   *+(BUFSTART-BUFBEGIN)  ORG AFTER BUF CNTRL INFO          F8808000
                                 4137 P$1STBUF $ACON $1STBUF                                                    F8810000
001361 00
001362 135C                      4138+P$1STBUF DC    Y($1STBUF)
001364 0178                      4139 BUFLN1   DC    OH'0',AL2(BUFEND-BUFBEGIN)                                 F8812000
001366 0330                      4140 BUFLN2   DC    OH'0',AL2(2*(BUFEND-BUFBEGIN))                             F8814000
001368 00000000                  4141 BUFZEROS DC    F'0'                                                       F8816000
                                 4142 BCOREND  DC    OH'0',AL2(1024*&HICORE-1)                                  F8818000
00136C 1FFF                          BCOREND  DC    OH'0',AL2(1024*8-1)
00136E 0001                      4143 BONE     DC    H'1'                                                       F8820000
                                 4144 BNUMBUFS DC    H'&NUMBUFS'                                                F8822000
001370 0008                          BNUMBUFS DC    H'8'
                                 4145 IBLDBUFS NULL                                                             F8824000
001372                           4146+IBLDBUFS DS    0H
                                 4147          $LOAD R11,P$1STBUF        LOAD ADDR OF 1ST BUFFER              F8826000
001372 48B0 1362          01362  4148+         LH    R11,P$1STBUF
001376 48A0 1362          01362  4149          LH    R10,P$1STBUF        LOAD ADDR OF 1ST BUFFER              F8828000
00137A 4890 1370          01370  4150          LH    R9,BNUMBUFS         LOAD MAX NUMBER OF BUFFERS           F8830000
                                 4151 BULDMORE NULL                                                             F8832000
00137E                           4152+BULDMORE DS    0H
00137E 4AA0 1366          01366  4153          AH    R10,BUFLN2          INCREASE R10 BY 2 BUFLENGTHS         F8834000
                                 4154          $CA   R10,BCOREND         IS THERE ROOM FOR 2 MORE BUFS        F8836000
001382 49A0 136C          0136C  4155+         CH    R10,BCOREND
001386 4720 13A8          013A8  4156          BH    BUFSDONE            BR IF NO                             F8838000
00138A 4B90 136E          0136E  4157          SH    R9,BONE             SUB ONE FROM BUFFER COUNT            F8840000
00138E 4780 13A8          013A8  4158          BZ    BUFSDONE            BR IF LAST BUBBER                    F8842000
001392 4BA0 1364          01364  4159          SH    R10,BUFLN1          BACK UP TO NEXT BUFF ADDR            F8844000
                                 4160          $STO  R10,0(0,R11)        STORE POINTER IN PREV BUF            F8846000
001396 40A0 B000          00000  4161+         STH   R10,0(0,R11)
00139A D202 B002 1368 00002 01368 4162          MVC   L'BUFCHAIN((BUFSTART-BUFCOUNT),R11),BUFZEROS  MOVE IN  F8848000
                                 4163 *                                  INITIAL VALUES                       F8850000
0013A0 48B0 B000          00000  4164          LH    R11,0(0,R11)        UPDATE R11 TO NEXT BUFFER            F8852000
0013A4 47F0 137E          0137E  4165          B     BULDMORE            BR TO BUILD ANOTHER BUFF             F8854000
                                 4166 BUFSDONE NULL                                                             F8856000
0013A8                           4167+BUFSDONE DS    0H
                                 4168          $LOAD R10,BUFZEROS        LOAD CHAIN TERMINATOR                F8858000
0013A8 48A0 1368          01368  4169+         LH    R10,BUFZEROS
                                 4170          $STO  R10,0(0,R11)        STORE IT IN THE LAST BUFFER          F8860000
0013AC 40A0 B000          00000  4171+         STH   R10,0(0,R11)
0013B0 D202 B002 1368 00002 01368 4172          MVC   L'BUFCHAIN((BUFSTART-BUFCOUNT),R11),BUFZEROS  MOVE IN  F8862000
                                 4173 *                                  INITIAL VALUES                       F8864000
                                 4174          AIF   (&HOME EQ 0).IHOMB                                       F8866000
                                 4175 .IHOMB   ANOP                                                           F8872000
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F150CT70  11/21/72
                                     4177          $DCHAIN $BUFPOOL,R13,NOENB GET A BUFFER                          F8876000
0013B6 9500 024A          0024A    4178+         CLI   $BUFPOOL,0
0013BA 4780 13C8               13C8 4179+         BE    *+14
0013BE 48D0 024A               0024A 4180+        LH    R13,$BUFPOOL
0013C2 D201 024A D000 0024A 00000  4181+         MVC   $BUFPOOL(2),0(R13)
000000                             4182          USING BUFDSECT,R13      *
0013C8 D25A D002 1414 00002 01414  4183          MVC   BUFCOUNT(ICTLE-ICTLS),ICTLS SETUP CONTROL REPLY          F8878000
                                   4184          $CHAIN $OUTBUF,R13,NOENB STAGE FOR WRITE                       F8880000
0013CE 4080 00C0               000C0 4185+        STH   R8,$CHNTEMP                                            F8882000
0013D2 4880 1470               01470 4186+        LH    R8,=Y($OUTBUF)
0013D6 9500 8000          00000    4187+         CLI   0(R8),0
0013DA 4780 13E6               13E6 4188+         BE    *+12
0013DE 4880 8000               00000 4189+        LH    R8,0(0,R8)
0013E2 47F0 13D6               13D6 4190+         B     *-12
0013E6 40D0 8000               00000 4191+        STH   R13,0(0,R8)
0013EA D201 D000 1472 00000 01472  4192+         MVC   0(2,R13),=H'0'
0013F0 4880 00C0               000C0 4193+        LH    R8,$CHNTEMP
                                   4194          $DCHAIN $BUFPOOL,R13,NOENB GET ANOTHER                         F8884000
0013F4 9500 024A          0024A    4195+         CLI   $BUFPOOL,0
0013F8 4780 1406               01406 4196+        BE    *+14
0013FC 48D0 024A               0024A 4197+        LH    R13,$BUFPOOL
001400 D201 024A D000 0024A 00000  4198+         MVC   $BUFPOOL(2),0(R13)
                                   4199          $STO  R13,$BUFFER       SET FOR I/O ROUTINES                   F8886000
001406 40D0 0EC6               00EC6 4200+        STH   R13,$BUFFER
00140A D201 D005 0EEA 00005 00EEA  4201          MVC   BUFSTART,XACKSEQ  FAKE AN ACK                            F8888000
001410 47F0 0ABC               00ABC 4202          B     $ENDREAD        FAKE AN INTERRUPT                      F8890000
001414                             4203 ICTLS    DS    0H              CONTROL INFO FOR BUFFER                  F8892000
001414 0058                        4204          DC    AL2(ICTLE-*-3)  BUFCOUNT                                 F8894000
001416 00                          4205          DC    X'00'           BUFSTAT                                  F8896000
001417 1002                        4206          DC    AL1(XLDR,XSTX)  BUFSTART                                 F8898000
001419 A0                          4207          DC    AL1(X'80'+BCBRESET) BUFBCB (RESETS EXPECTED BLOCK CT)    F8900000
00141A 0000                        4208          DC    AL2(0)          FCS                                      F8902000
00141C F0                          4209          DC    X'F0'           GENERAL CONTROL TYPE RCB                 F8904000
00141D C1                          4210          DC    C'A'            SIGN-ON ID                               F8906000
00141E                             4211 ICTXT    DS    0CL80                                                    F8908000
00141E 615CE2C9C7D5D6D5            4212          DC    CL21'/*SIGNON       REMOTE'                              F8910000
                                   4213          DC    CL59'&RMTID'        REMOTE IDENTIFICATION                F8912000
001433 F2404040404040404040                      DC    CL59'2' REMOTE IDENTIFICATION
00146E 00                          4214          DC    AL1(0)          EOR                                      F8914000
00146F                             4215 ICTLE    EQU   *                                                        F8916000
001470                             4216          LTORG                                                          F8918000
001470 024E                        4217                =Y($OUTBUF)
001472 0000                        4218                =H'0'
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72
                                    4220 $REPLOAD NULL                    The RTP
                                                                          ENTRY POINT                          F8922000
001474                              4221+$REPLOAD DS    0H
                                    4222 ZEP1     NULL  *                 READ REP CARD                        F8924000
001474                              4223+ZEP1     DS    0H
                                    4224          AIF   (&MACHINE EQ 20).REP20                               F8926000
                                    4225 .REP20   ANOP                                                       F8952000
                                    4226          XIO   ZEPCARD(ROPCODE+1),80 READ REP CARD                  F8954000
001474 D212 151D 0050 0151D 00050   4227+         MVC   ZEPCARD(ROPCODE+1),80 XIOXIOXIOXIOXIOXIO
001474                              4228+         ORG   *-6 XIOXIOXIOXIOXIOXIO
001474 D0                           4229+         DC    X'D0' XIOXIOXIOXIOXIOXIO
00147A                              4230+         ORG   *+5 XIOXIOXIOXIOXIOXIO
00147A 4770 1474            01474   4231          BC    7,*-6               *                              F8956000
                                    4232 ZEP2     NULL                                                     F8958000
00147E                              4233+ZEP2     DS    0H
                                    4234          TIOB  *,RBUSY             WAIT                           F8960000
00147E 9A                           4235+         DC    X'9A'
00147F 10                           4236+         DC    AL1(RBUSY)
001480 147E                         4237+         DC    S(*-2)
                                    4238 ZEP3     NULL                                                     F8962000
001482                              4239+ZEP3     DS    0H
                                    4240          TIOB  ZEP1,RERROR         ERROR                          F8964000
001482 9A                           4241+         DC    X'9A'
001483 11                           4242+         DC    AL1(RERROR)
001484 1474                         4243+         DC    S(ZEP1)
                                    4244 ZEP4     NULL                                                     F8966000
001486                              4245+ZEP4     DS    0H
                                    4246          TIOB  ZEPEND,REOF         EOF                            F8968000
001486 9A                           4247+         DC    X'9A'
001487 14                           4248+         DC    AL1(REOF)
001488 14F6                         4249+         DC    S(ZEPEND)
                                    4250          XIO   ZEPCARD(POPCODE+1),80 PRINT REP CARD               F8970000
00148A D240 151D 0050 0151D 00050   4251+         MVC   ZEPCARD(POPCODE+1),80 XIOXIOXIOXIOXIOXIO
00148A                              4252+         ORG   *-6 XIOXIOXIOXIOXIOXIO
00148A D0                           4253+         DC    X'D0' XIOXIOXIOXIOXIOXIO
001490                              4254+         ORG   *+5 XIOXIOXIOXIOXIOXIO
001490 4770 148A            0148A   4255          BC    7,*-6               WAIT UNTIL TA-EN               F8972000
                                    4256          AGO   .REP20A                                            F8974000
                                    4257 .REPZUA  ANOP                                                     F8990000
001494 D503 151D 1820 0151D 01820   4258          CLC   ZEPCARD(4),=C'    ' IS THIS BLANK                  F8992000
00149A 4780 14F6            014F6   4259          BE    ZEPEND              BR IF YES TO END OF REPS       F8994000
0014A0 D507 151D 141E 0151D 0141E   4260          CLC   ZEPCARD(8),ICTXT    IS THIS SIGNON CARD            F8996000
0014A4 4780 14F0            014F0   4261          BE    ZEPENDA             IF SO MOVE SIGNON              F8998000
0014A8 D502 151E 183C 0151E 0183C   4262          CLC   ZEPCARD+1(3),=C'REP'   IS THIS REP                 F9000000
0014AE 4770 1474            01474   4263          BNE   ZEP1                BR IF NO... TO READ AGAIN      F9002000
0014B2 D503 1525 1820 01525 01820   4264          CLC   ZEPCARD+8(4),=C'    ' IS LOC FIELD BLANK...        F9004000
0014B8 4880 1828            01828   4265          LH    R8,=Y(ZEPCARD+16)   LOAD ADDR OF DATA              F9006000
0014BC 4780 14D4            014D4   4266          BE    Z1                  BR IF BLANK TO CONT. OLD LOC   F9008000
0014C0 4680 182A            0182A   4267          LH    R9,=Y(ZEPCARD+8)    ADDR OF LOC FIELD              F9010000
                                    4268          BAS   R9,ZTRAN            GO DECODE                      F9012000
0014C4 4D                           4269+         DC    X'4D'
0014C5 90                           4270+         DC    AL1(R9*16)
0014C6 14FA                         4271+         DC    S(ZTRAN)
0014C8 40A0 151A            0151A   4272          STH   R10,ZWK+1           SIMULATE                       F9014000
0014CC 4880 151A            0151A   4273          LH    R11,ZWK+1           LR  11,10                      F9016000
0014D0 4880 1828            01828   4274          LH    R8,=Y(ZEPCARD+16)   FIRST DATA WORD               F9018000
```

14112 G.D.

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72

                                     4275 Z1       BAS   R9,ZTRAN          GO DECODE                    F9020000
0014D4                               4276+Z1       DS    0H
0014D4 4D                            4277+         DC    X'4D'
0014D5 90                            4278+         DC    AL1(P9*16)
0014D6 14FA                          4279+         DC    S(ZTRAN)
0014D8 40A0 B000           00000     4280          STH   R10,0(0,R11)    AND STORE                    F9022000
0014DC 4AB0 182C           0182C     4281          AH    R11,=H'2'       BUMP LOC CTR                 F9024000
0014E0 9568 8004     00004           4282          CLI   4(R8),C','      IS THERE MORE                F9026000
0014E4 4770 1474           01474     4283          BNE   ZEP1            BR IF NO TO NEXT CARD        F9028000
0014E8 4A80 182E           0182E     4284          AH    R8,=H'5'        UP CARD POINTER              F9030000
0014EC 47F0 14D4           014D4     4285          B     Z1              AND GO AGAIN                 F9032000
0014F0 D24F 141E 151D 0141E 0151D    4286 ZEPENDA  MVC   ICTXT,ZEPCARD   MOVE SIGNON INTO DEFAULT      F9034000
                                     4287 ZEPEND   NULL  *               END OF REP CARDS             F9036000
0014F6                               4288+ZEPEND   DS    0H
0014F6 47F0 15A6           015A6     4289          B     $INITI8         GO TO INITIALIZATION         F9038000
                                     4290 *                                                           F9040000
                                     4291 *   ZTRAN - CONVERT EBCDIC HEX TO BINARY                    F9042000
                                     4292 *           R8= START OF FIELD ,R9=LINK REG , R10 =BINARY RESULTS F9044000
                                     4293 *                                                           F9046000
                                     4294 ZTRAN    NULL                *                              F9048000
0014FA                               4295+ZTRAN    DS    0H
0014FA D203 1519 8000 01519 00000    4296          MVC   ZWK(4),0(R8)    MOVE DATA                    F9050000
001500 DC03 1519 14AC 01519 014AC    4297          TR    ZWK(4),ZTAB     TRANSLATE A LITTLE           F9052000
001506 F233 1519 1519 01519 01519    4298          PACK  ZWK(4),ZWK(4)   PACK IT UP                   F9054000
00150C F133 1519 1519 01519 01519    4299          MVO   ZWK(4),ZWK(4)   SHIFT IT                     F9056000
001512 48A0 151A           0151A     4300          LH    R10,ZWK+1       LOAD RESULT--- INTO REG      F9058000
001516 07F9                          4301          BR    R9              AND RETURN                   F9060000
001518                               4302          DS    0H                                           F9062000
001518 00                            4303          DC    X'00'                                        F9064000
001519 000000                        4304 ZWK      DC    AL3(0)                                       F9066000
00151C 00                            4305          DC    X'00'           SPACER                       F9068000
00151D                               4306 ZEPCARD  DS    80C                                          F9070000
0014AC                               4307 ZTAB     EQU   *-X'C1'                                      F9072000
00156D 0A0B0C0D0E0F                  4308          DC    X'0A0B0C0D0E0F'                              F9074000
001573 0000000000000000              4309          DC    (X'F0'-X'C6')X'00'                           F9076000
00159D 0102030405060708              4310          DC    X'0102030405060708'                          F9078000
                                     4311          AIF   (&MACHINE EQ 20).REP360C                     F9080000
                                     4312 .REP360C ANOP                                               F9086000
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        F150CT70  11/21/72
                                     4314 $INITI8  NULL  *                  ENTRY POINT                        F9090000
0015A6                               4315+$INITI8  DS    0H                                                    F9090000
                                     4316          AIF   (&CONSOLE EQ 0 AND &PRTCONS EQ 0).ISKPTNK              F9092000
                                     4317 .ISKPTNK ANOP                                                        F9108000
                                     4319 *                                                                    F9112000
                                     4320 *        HASP ENVIRONMENT RECORDING ERROR PRINTOUT (HEREP)            F9114000
                                     4321 *                                                                    F9116000
                                     4322 INIHEREP NULL                                                        F9118000
0015A6                               4323+INIHEREP DS    0H                                                    F9118000
0015A6 D50B 164A 01BA 0164A 001BA    4324          CLC   ILOGTABL+4(L'LOGTEXT),LOGTABLE+4 IS THE TABLE GOOD  F9120000
0015AC 4770 163C           0163C     4325          BNE   INEWTABL            BR NO TO INITIALIZE NEW TABLE     F9122000
                                     4326          AIF   (&MACHINE EQ 20).INI1                                 F9124000
                                     4327 .INI1    AIF   (&MACHINE NE 20).INI2                                 F9146000
                                     4328          SSSM  0                    DISABLE I/O INTERRUPTS            F9148000
0015B0 00001584                      4329+         DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0015B0                               4330+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0015B0 8100                          4331+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0015B4                               4332+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0015B4 00001588                      4333+         DC    AL4(*+4)
                                     4334          CIO   1,X'45'              SKIP TO CHANELL 1                 F9150000
0015B8 9B                            4335+         DC    X'9B'
0015B9 45                            4336+         DC    AL1(X'45')
0015BA 0001                          4337+         DC    S(1)
0015BC 4770 15B8           0015B8    4338          BC    7,*-4                BR UNTILL EXCEPTED                F9152000
                                     4339          XIO   INITITLE(POPCODE+1),90 PRINT TITLE                    F9154000
0015C0 D240 16D7 005A 016D7 0005A    4340+         MVC   INITITLE(POPCODE+1),90 XIOXIOXIOXIOXIOXIO
0015C0                               4341+         ORG   *-6 XIOXIOXIOXIOXIOXIO
0015C0 D0                            4342+         DC    X'D0' XIOXIOXIOXIOXIOXIO
0015C6                               4343+         ORG   *+5 XIOXIOXIOXIOXIOXIO
0015C6 4770 15C0           0015C0    4344          BC    7,*-6                BR UNTIL EXCEPTED                 F9156000
                                     4345          CIO   3,X'44'              SPACE 3                           F9158000
0015CA 9B                            4346+         DC    X'9B'
0015CB 44                            4347+         DC    AL1(X'44')
0015CC 0003                          4348+         DC    S(3)
0015CE 4770 15CA           0015CA    4349          BC    7,*-4                BR UNTIL EXECTPED                 F9160000
                                     4350          CIO   3,X'44'              SPACE 3                           F9162000
0015D2 9B                            4351+         DC    X'9B'
0015D3 44                            4352+         DC    AL1(X'44')
0015D4 0003                          4353+         DC    S(3)
0015D6 4770 15D2           0015D2    4354          BC    7,*-4                BR UNTIL EXCEPTED                 F9164000
                                     4355 .INI2    ANOP                                                      F9166000
000000                               4356          USING LOGDSECT,R9                                         F9168000
                                     4357          $LA   R9,LOGTABLE          R9 BASE FOR FIRST ENTRY           F9170000
0015DA 4890 1830           01830     4358+         LH    R9,=Y(LOGTABLE)
                                     4359 INPRTOUT NULL                                                      F9172000
0015DE                               4360+INPRTOUT DS    0H
0015DE 9500 9000      00000          4361          CLI   LOGID,X'00'          IS THIS THE END                   F9174000
0015E2 4780 163C           0163C     4362          BE    INEWTABL             BR YES INITIALIZE NEW TABLE       F9176000
0015E6 D20B 178E 9004 0178E 00004    4363          MVC   INILTEXT,LOGTEXT     MVC LOGTEXT TO PRINT BUFFER       F9178000
0015EC 48A0 9002           00002     4364          LH    R10,LOGCOUNT         LOAD ERROR COUNT INTO R10         F9180000
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F15OCT70  11/21/72
                                    4365          AIF   (&MACHINE EQ 20).INI3                          F9182000
                                    4366 .INI3    AIF   (&MACHINE NE 20).INI4                          F9186000
0015F0 D207 17B0 17B8 017B0 017B8   4367          MVC   INICVD,INIPZERO     MVC PACKED ZERO          F9188000
                                    4368 INCVDLOP NULL                                                F9190000
0015F6                              4369+INCVDLOP DS    0H                                            F9190000
0015F6 4BA0 1832          01832     4370          SH    R10,=H'1'           SUBTRACT ONE             F9192000
0015FA 4740 1608          01608     4371          BM    INCVDONE            BR NEGATIVE TO EDIT      F9194000
0015FE FA70 17B0 17C0 017B0 017C0   4372          AP    INICVD,INIPONE      ADD ONE TO THE CONVERT FIELD F9196000
001604 47F0 15F6          015F6     4373          B     INCVDLOP            LOOP                     F9198000
                                    4374 .INI4    ANOP                                              F9200000
                                    4375 INCVDONE NULL                                                F9202000
001608                              4376+INCVDONE DS    0H
001608 F367 17A4 17B0 017A4 017B0   4377          UNPK  INIERCNT,INICVD     CONVERT THE NUMBER TO EBCDIC F9204000
                                    4378          $LA   R10,INIERCNT        PICK UP START OF OUTPUT AREA F9206000
00160E 48A0 1834          01834     4379+         LH    R10,=Y(INIERCNT)
                                    4380 *                                  FOR LEADING ZERO SUPPRESSION F9208000
                                    4381 INIEDIT  NULL                                                F9210000
001612                              4382+INIEDIT  DS    0H
001612 95F0 A000      00000         4383          CLI   0(R10),C'0'         TERT FOR A LEADING ZERO  F9212000
001616 4770 1626          01626     4384          BNE   INIWRITE           BR  NO TO WRITE THE LINE F9214000
00161A 9240 A000      00000         4385          MVI   0(R10),C' '         REPLACE WIT A BLANK      F9216000
00161E 4AA0 1832          01832     4386          AH    R10,=H'1'           POINT TO NEXT CHARACTER  F9218000
001622 47F0 1612          01612     4387          B     INIEDIT             GO CHECK FOR ANOTHER BLANK F9220000
                                    4388 INIWRITE NULL                                                F9222000
001626                              4389+INIWRITE DS    0H
001626 96F0 17AA      017AA         4390          OI    INIERCNT+6,X'F0'    CORRECT LOW ORDER DIGIT ZONE F9224000
                                    4391          AIF   (&MACHINE EQ 20).INI5                         F9226000
                                    4392 .INI5    AIF   (&MACHINE NE 20).INI6                         F9232000
                                    4393          XIO   INIBUFF(POPCODE+1),L'LOGTEXT+37 PRINT THE LINE F9234000
00162A D240 177A 0031 0177A 00031   4394+         MVC   INIBUFF(POPCODE+1),L'LOGTEXT+37 XIOXIOXIOXIOXIOXIO
00162A                              4395+         ORG   *-6 XIOXIOXIOXIOXIOXIO
00162A D0                           4396+         DC    X'D0' XIOXIOXIOXIOXIOXIO
001630                              4397+         ORG   *+5 XIOXIOXIOXIOXIOXIO
001630 4770 162A          0162A     4398          BC    7,*-6               BR UNTIL EXCEPTED        F9236000
                                    4399 .INI6    ANOP                                              F9238000
001634 4A90 1836          01836     4400          AH    R9,=Y(LOGEND-LOGID) UPDATE R9 TO NEXT LOG ENTRY F9240000
001638 47F0 15DE          015DE     4401          B     INPRTOUT            BR TO PROCESS THE NEXT ENTRY F9242000


                                    4403 INEWTABL NULL                                                F9246000
00163C                              4404+INEWTABL DS    0H
00163C D291 01B6 1646 001B6 01646   4405          MVC   LOGTABLE(X'92'),ILOGTABL RECREATE THE LOG TABLE F9248000
001642 47F0 17C2          017C2     4406          B     INCONTIN            CONTINUE                 F9250000
001646                              4407 ILOGTABL DS    0H                                            F9252000
                                    4408          $LOGENT ID=XBCBCHEK,CLASS=1C,TEXT='BLOCK SEQ CK'  F9254000
000C01                              4409+XBCBCHEK EQU   1
001646                              4410+         DS    0H
001646 01                           4411+         DC    AL1(XBCBCHEK)
001647 0A                           4412+         DC    AL1(10)
001648 0000                         4413+         DC    H'0'
00164A C2D3D6C3D240E2C5             4414+         DC    CL(L'LOGTEXT)'BLOCK SEQ CK'
                                    4415          $LOGENT ID=XNAKREC,CLASS=7,TEXT='ERRON REPLY'     F9256000
000C02                              4416+XNAKREC  EQU   2
001656                              4417+         DS    0H
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F15OCT70  11/21/72
001656 02                          4418+          DC    AL1(XNAKREC)
001657 07                          4419+          DC    AL1(7)
001658 0000                        4420+          DC    H'0'
00165A C5D9D9D6D940D9C5            4421+          DC    CL(L'LOGTEXT)'ERROR REPLY'
                                   4422           $LOGENT ID=XUNKRES,CLASS=10,TEXT='INVALID RESP'          F9258000
000003                             4423+XUNKRES   EQU   3
001666                             4424+          DS    0H
001666 03                          4425+          DC    AL1(XUNKRES)
001667 0A                          4426+          DC    AL1(10)
001668 0000                        4427+          DC    H'0'
00166A C9D5E5C1D3C9C440            4428+          DC    CL(L'LOGTEXT)'INVALID RESP'
                                   4429           $LOGENT ID=XUNITEXP,CLASS=10,TEXT='UNIT EXCPTN'          F9260000
000004                             4430+XUNITEXP  EQU   4
001676                             4431+          DS    0H
001676 04                          4432+          DC    AL1(XUNITEXP)
001677 0A                          4433+          DC    AL1(10)
001678 0000                        4434+          DC    H'0'
00167A E4D5C9E340C5E7C3            4435+          DC    CL(L'LOGTEXT)'UNIT EXCPTN'
                                   4436           $LOGENT ID=XUNITCHK,CLASS=7,TEXT='UNIT CHECK'            F9262000
000005                             4437+XUNITCHK  EQU   5
001686                             4438+          DS    0H
001686 05                          4439+          DC    AL1(XUNITCHK)
001687 07                          4440+          DC    AL1(7)
001688 0000                        4441+          DC    H'0'
00168A E4D5C9E340C3C8C5            4442+          DC    CL(L'LOGTEXT)'UNIT CHECK'
                                   4443           $LOGENT ID=XUNSLERR,CLASS=15,TEXT='UNUSUAL END'          F9264000
000006                             4444+XUNSLERR  EQU   6
001696                             4445+          DS    0H
001696 06                          4446+          DC    AL1(XUNSLERR)
001697 0F                          4447+          DC    AL1(15)
001698 0000                        4448+          DC    H'0'
00169A E4D5E4E2E4C1D340            4449+          DC    CL(L'LOGTEXT)'UNUSUAL END'
                                   4450           $LOGENT ID=XSIOBAD,CLASS=12,TEXT='SIO FAILURE'           F9266000
000007                             4451+XSIOBAD   EQU   7
0016A6                             4452+          DS    0H
0016A6 07                          4453+          DC    AL1(XSIOBAD)
0016A7 0C                          4454+          DC    AL1(12)
0016A8 0000                        4455+          DC    H'0'
0016AA E2C9D640C6C1C9D3            4456+          DC    CL(L'LOGTEXT)'SIO FAILURE'
                                   4457           $LOGENT ID=XTPWRITE,CLASS=1,TEXT='W' LOG OF WRITES       F9268000
000008                             4458+XTPWRITE  EQU   8
0016B6                             4459+          DS    0H
0016B6 08                          4460+          DC    AL1(XTPWRITE)
0016B7 01                          4461+          DC    AL1(1)
0016B8 0000                        4462+          DC    H'0'
0016BA E6404040404040              4463+          DC    CL(L'LOGTEXT)'W'
                                   4464           $LOGENT ID=XTPREAD,CLASS=1,TEXT='R' LOG FOR ALL READS    F9270000
000009                             4465+XTPREAD   EQU   9
0016C6                             4466+          DS    0H
0016C6 09                          4467+          DC    AL1(XTPREAD)
0016C7 01                          4468+          DC    AL1(1)
0016C8 0000                        4469+          DC    H'0'
0016CA D9404040404040              4470+          DC    CL(L'LOGTEXT)'R'
0016D6 00                          4471           DC    X'00'                END OF LOG TABLE            F9272000
0016D7                             4472 ILTABEND  DS    0C                   END OF THE TABLE            F9274000
```

14112 G.B.

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72

                                  4473          AIF   (&MACHINE EQ 20).INI7                       F9276000
                                  4474 .INI7    ANOP                                              F9332000
0016D7 4040404040404040           4475 INITITLE DC  45C' ',C'HASP ENVIRONMENT RECORDING ERROR PRINTOUT'  F9334000
00172D 4040404040404040           4476 INIHEAD  DC    20C' ',C'ERROR ID',14C' '                    F9336000
001757 C3D6D4E4D3C1E3C9           4477          DC    C'CUMULATIVE COUNT SINCE THE LAST IPL'      F9338000
00177A                            4478 INIBUFF  DS    0CL(L'LOGTEXT+37)                           F9340000
00177A 4040404040404040           4479          DC    20C' '                                      F9342000
00178E 4040404040404040           4480 INILTEXT DC    CL(L'LOGTEXT)' '                            F9344000
00179A 4040404040404040           4481          DC    10C' '                                      F9346000
0017A4 F0F0F0F0F0F0F0F0           4482 INIERCNT DC    C'00000000'                                 F9348000
0017AB 0000000000
0017B0 000000000000000C           4483 INICVD   DC    0D'0',PL8'0'                                F9350000
0017B8 000000000000000C           4484 INIPZERO DC    PL8'0'                                      F9352000
0017C0 1C                         4485 INIPONE  DC    P'1'                                        F9354000
```

```
   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72
                                     4488 INCONTIN NULL
0017C2                               4489+INCONTIN DS    0H                                            F9360000
                                     4490          AIF   (&MACHINE EQ 20).IHOD20                       F9362000
                                     4491 .IHOD20  ANOP                                                  F9456000
                                     4492          CIO   1,X'45'          SKIP TO CHAN 1               F9458000
0017C2 9B                            4493+         DC    X'9B'
0017C3 45                            4494+         DC    AL1(X'45')
0017C4 0001                          4495+         DC    S(1)
0017C6 4770 17C2           017C2     4496          BC    7,*-4            WAIT UNTIL ACCEPTED         F9460000
                                     4497          $LOAD R12,=Y($SVC)     ESTABLISH TRACE ENTRY       F9462000
0017CA 48C0 1838           01838     4498+         LH    R12,=Y($SVC)
                                     4499          AIF   (&CONSOLE EQ 0).IHOD20A                       F9464000
                                     4500 .IHOD20A AIF   (&R(2)).IHOD20B                               F9470000
                                     4501 .IHOD20B ANOP                                                  F9482000
                                     4502          AIF   (&HOME EQ 0).IHOMIA                           F9484000
                                     4503 .IHOMIA  ANOP                                                  F9488000
                                     4504          CIO   1,CAENABLE       TURN ON BSCA                 F9490000
0017CE 9B                            4505+         DC    X'9B'
0017CF 52                            4506+         DC    AL1(CAENABLE)
0017D0 0001                          4507+         DC    S(1)
0017D2 D203 0094 1824 00094 01824    4508 IREDOIT  MVC   148(4),=AL4(INITINT) SET NEW PSW             F9492000
                                     4509 IAGAIN   NULL  *                  TRY AGAIN                    F9494000
0017D8                               4510+IAGAIN   DS    0H                                            F9496000
                                     4511          XIO   IWRDRES(CAWRTRD),4  SEND PRE-SIGNON, REC DLE ACK0
0017D8 D250 1816 0004 01816 00004    4512+         MVC   IWRDRES(CAWRTRD),4 XIOXIOXIOXIOXIOXIO
0017D8                               4513+         ORG   *-6 XIOXIOXIOXIOXIOXIO
0017D8 D0                            4514+         DC    X'D0' XIOXIOXIOXIOXIOXIO
0017DE                               4515+         ORG   *+5 XIOXIOXIOXIOXIOXIO
0017DE 4770 17D8           017D8     4516          BC    7,IAGAIN         TRY AGAIN IF NOT STARTED    F9498000
                                     4517          $SSM  FF               PREPARE FOR INTERRUPT       F9500000
0017E2 000017E6                      4518+         DC    AL4(*+4) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0017E2                               4519+         ORG   *-8 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0017E2 8100                          4520+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0017E6                               4521+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
0017E6 0100                          4522+         DC    AL2(X'0100')
0017E8 17EA                          4523+         DC    Y(*+2)
0017EA 47F0 17EA           017EA     4524          B     *                LOOP UNITL INTERRUPT        F9502000
0017EE 015600A400000A86              4525 INTFAKE  DC    X'01',AL1(CAINTID),Y($START),AL4($IOINT) FAKE AND REAL F9504000
                                     4526 INITINT  NULL  *                  INITIALIZATION INTERRUPT PROCESSOR. F9506000
0017F6                               4527+INITINT  DS    0H
0017F6 9556 0091           00091     4528          CLI   145,CAINTID        IS THIS BSCA                F9508000
0017FA 4770 181A           0181A     4529          BNE   IBACK             BR IF NO TO IGNORE          F9510000
                                     4530          TIOB  IAGAIN,CAERROR     RETRY IF ANY ERROR          F9512000
0017FE 9A                            4531+         DC    X'9A'
0017FF 50                            4532+         DC    AL1(CAERROR)
001800 17D8                          4533+         DC    S(IAGAIN)
001802 D501 1813 183A 01813 0183A    4534          CLC   IREADRES,=AL1(XDLE,XACK0) WAS ACK RECEIVED  F9514000
001808 4770 17D8           017D8     4535          BNE   IAGAIN             START OVER IF NOT           F9516000
00180C                               4536 IHOMSKP  DS    0H                                            F9518000
00180C D207 0090 17EE 00090 017EE    4537          MVC   144(8),INTFAKE     SETUP FAKE OLD AND GOOD NEW PSW F9520000
001812 47F0 1372           01372     4538          B     IBLDBUFS           GO BUILD BUFFERS AND SIGN-ON F9522000
001816 012D                          4539 IWRDRES  DC    AL1(XSOH,XENQ)     IDENTIFY AS CPU TERMINAL    F9524000
001818 0000                          4540 IREADRES DC    AL2(0)             RESPONSE CHARACTERS FROM HASP F9526000
                                     4541 IBACK    NULL  *                  NOT BSCA INTERRUPT          F9528000
00181A                               4542+IBACK    DS    0H
```

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F15OCT70  11/21/72

                                    4543          SPSW  144                RETURN                          F9530000
00181A 00000090                     4544+         DC    AL4(144) SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
00181A                              4545+         ORG   *-4 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
00181A 8100                         4546+         DC    X'8100' SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
00181E                              4547+         ORG   *+2 SPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSWSPSW
                                    4548 .IHODXX  ANOP                                            F9532000
```

14112 G.B.

```
   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
001820                           4550         LTORG
001820 40404040                  4551         =C'    '
001824 000017F6                  4552         =AL8(INITINT)
001828 152D                      4553         =Y(ZEPCARD+16)
00182A 1525                      4554         =Y(ZEPCARD+8)
00182C 0002                      4555         =H'2'
00182E 0005                      4556         =H'5'
001830 01B6                      4557         =Y(LOGTABLE)
001832 0001                      4558         =H'1'
001834 17A4                      4559         =Y(INIERCNT)
001836 0010                      4560         =Y(LOGEND-LOGID)
001838 0EF2                      4561         =Y($SVC)
00183A 1070                      4562         =AL1(XDLE,XACK0)
00183C D9C5D7                    4563         =C'REP'
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72

                                   4566 $L       EQU   *-HASPRJE+&HRTPORG                          V03.1 F9542000
00183F                                  $L       EQU   *-HASPRJE+128 V03.1
000000                             4567 $L1      EQU   $L/100000*100000                                  F9544000
000000                             4568 $L2      EQU   ($L-$L1)/10000*10000                             F9546000
001770                             4569 $L3      EQU   ($L-$L1-$L2)/1000*1000                           F9548000
0000C8                             4570 $L4      EQU   ($L-$L1-$L2-$L3)/100*100                         F9550000
000000                             4571 $L5      EQU   ($L-$L1-$L2-$L3-$L4)/10*10                       F9552000
000007                             4572 $L6      EQU   $L-$L1-$L2-$L3-$L4-$L5                           F9554000

                                   4574 *                                                               F9558000
                                   4575 *                THE FOLLOWING VALUE OF $DLENGTH INDICATES THE  F9560000
                                   4576 *                MINIMUM MEMORY SIZE TO CONTAIN THIS PROGRAM.   F9562000
                                   4577 *                THE VALUE REPRESENTS THE DECIMAL VALUE         F9564000
                                   4578 *                                                               F9566000
                                   4579 $DLENGTH EQU     $L1/100000*1048576+$L2/10000*65536+$L3/1000*4096+$L4/100CF9568000
006207                                                   *256+$L5/10*16+$L6                             F9570000
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F150CT70  11/21/72
                                  4581 ********************************************************************$ F9574000
                                  4583 *                        SIGNIFICANT LOCATION ADDRESSES                F9578000
000EC6                            4585 $01   EQU   CBUFFER          CURRENTLY ACTIVE COMMUNICATIONS BUFFER  $ F9582000
                                  4586         AIF   (&TRACE EQ 0).INFO1                                      F9584000
                                  4587 .INFO1  ANOP                                                          F9588000
000EF2                            4588 $03   EQU   $TANK1           START OF DECOMPRESSION TANKS            $ F9590000
00135C                            4589 $04   EQU   $1STBUF          BEGINNING OF COMMUNICATIONS BUFFER POOL $ F9592000
00024A                            4590 $05   EQU   $BUFPOOL        FREE BUFFER CHAIN START                 $ F9594000
00024C                            4591 $06   EQU   $TANKPOL        FREE DECOMPRESSION TANK CHAIN START     $ F9596000
00024E                            4592 $08   EQU   $OUTBUF         BUFFERS AWAITING TRANSMISSION           $ F9600000
000252                            4593 $09     EQU   $FCSOUT            FUNCTION-CONTROL-SEQUENCE           $ F9602000
000E82                            4594 $10   EQU   COMWRITE         LAST TP WRITE COMMAND                   $ F9604000
000000                            4595 $11   EQU   $LOGCLAS         ERROR LOG CLASS LEVEL                   $ F9606000
                                  4597 ********************************************************************$ F9610000

                                  4599 *                    M O D E L  2 0  -  BSCA SENSE BYTES           $ F9614000
                                  4601 *          00 = UNDEFINED                                                F9618000
                                  4602 *          01 = DATA OVER-RUN ON A WRITE                                 F9620000
                                  4603 *          02 = CPU-BSCA PARITY CHECK ON WRITE                           F9622000
                                  4604 *          04 = MAIN STORAGE EXCEEDED ON WRITE                           F9624000
                                  4605 *          08 = NO ENDING SEQUENCE FOUND ON WRITE                        F9626000
                                  4606 *          10 = NOT DEFINED                                              F9628000
                                  4607 *          20 = NOT DEFINED                                              F9630000
                                  4608 *          40 = EOT RECEIVED WHILE WRITING                               F9632000
                                  4609 *          80 = NOT DEFINED                                              F9634000
                                  4610 *          81 = DATA OVER-RUN ON READ                                    F9636000
                                  4611 *          82 = NOT DEFINED                                              F9638000
                                  4612 *          84 = MAIN STORAGE EXCEEDED ON READ                            F9640000
                                  4613 *          88 = LOST DATA ON READ                                        F9642000
                                  4614 *          90 = READ TIMEOUT                                             F9644000
                                  4615 *          A0 = DATA CHECK ON READ                                       F9646000
                                  4616 *          C0 = EOT RECEIVED ON READ                                     F9648000

                                  4618 *                    H A S P  E R R O R  L O G  C O D E S           F9652000
                                  4620 *          00 = TRACE ENTRY (NOT LOGGED)                                 F9656000
                                  4621 *          01 = BLOCK COUNT CHECK                                        F9658000
                                  4622 *          02 = NEGATIVE ACKNOWLEDGEMENT RECEIVED                        F9660000
                                  4623 *          03 = UNKNOWN RESPONSE RECEIVED                                F9662000
                                  4624 *          04 = EOT RECEIVED                                             F9664000
                                  4625 *          05 = UNIT CHECK                                               F9666000
                                  4626 *          06 = UNUSUAL CHANNEL END                                      F9668000
                                  4627 *          07 = SIO FAILURE (360 ONLY)                                   F9670000
                                  4628 *          08 = ADAPTER WRITE LOGGING ( 360 ONLY )                       F9672000
                                  4629 *          09 = ALL COMMUNICATIONS INTERRUPTS                            F9674000
```

LCC OBJECT CODE ADDR1 ADDR2 STMT SOURCE STATEMENT F15OCT70 11/21/72

```
                        4632 ********************************************************************************* F9680000
                        4633 *                                                                                   F9682000
                        4634 *          EIGHT CHARACTER ERROR MESSAGE CODES                                      F9684000
                        4635 *                                                                                   F9686000
                        4636 *               01 = BLOCK COUNT CHECK (DUPLICATE OR LOST RECORDS)                  F9688000
                        4637 *                    01IIEE00          II= INPUT BLOCK CHECK FROM HASP              F9690000
                        4638 *                                      EE= EXPECTED BLOCK CHECK                     F9692000
                        4639 *                                                                                   F9694000
                        4640 *               02 = NEGATIVE ACKNOWLEDGEMENT RECEIVED                              F9696000
                        4641 *                    02000000                                                       F9698000
                        4642 *                                                                                   F9700000
                        4643 *               03 = UNKNOWN RESPONSE RECEIVED                                      F9702000
                        4644 *                    03IIII00          IIII= DATA BYTES 1,2 OF INPUT.               F9704000
                        4645 *                                      ( IF CORRECT CONTROL SEQUENCE                F9706000
                        4646 *                                      ENDING SEQUENCE IS INVALID )                 F9708000
                        4647 *                                                                                   F9710000
                        4648 *               04 = UNIT EXCEPTION - EOT RECEIVED                                  F9712000
                        4649 *                    0400AAAA          AAAA= DEVICE ADDRESS. 0 FOR BSCA             F9714000
                        4650 *                                                                                   F9716000
                        4651 *               05 = UNIT CHECK                                                     F9718000
                        4652 *                    05SSAAAA           SS= SENSE BYTE                             F9720000
                        4653 *                                      AAAA= DEVICE ADDRESS. 0 FOR BSCA             F9722000
                        4654 *                                                                                   F9724000
                        4655 *               06 = UNUSUAL END                                                    F9726000
                        4656 *                    06CCAAAA           CC= CSW BYTE 5                             F9728000
                        4657 *                                      AAAA= DEVICE ADDRESS. 0 FOR BSCA             F9730000
                        4658 *                                                                                   F9732000
                        4659 *               07 = SIO FAILURE                                                    F9734000
                        4660 *                    07000000                                                       F9736000
                        4661 *                                                                                   F9738000
                        4662 *               08 = ADAPTER WRITE LOGGING                                          F9740000
                        4663 *                    08000000          000000= BYTES 2,3,4 OF OUTPUT DATA           F9742000
                        4664 *                                                                                   F9744000
                        4665 *               09 = ALL COMMUNICATION ADAPTER INTERRUPTS                           F9746000
                        4666 *                    09IIIIII          IIIIII= BYTES 2,3,4 OF INPUT DATA            F9748000
                        4667 *                                                                                   F9750000
                        4668 ********************************************************************************* F9752000
```

14112 u.o.

APPENDIX B

TERMINAL IMPLEMENTATION RECOMMENDATIONS

This appendix contains random notes which do not seem to fit elsewhere in the document, recommendations on features and problems to look at.

1. IBM logs all errors on the console, if the console exists, and in an environment table. When the terminal is loaded, the contents of the environment table, if it is still intact, are printed on the terminal.

2. IBM terminals can dynamically change core locations via cards read by the terminal at load time {before the SIGNON or blank card}.

3. If a NAK block is transmitted by the terminal as a response and a NAK block is received by the terminal, a problem can occur if the IBM implementation of the error procedure is implemented. The problem occurs if the terminal's NAK block is in response to an EOF block from the central processor. The EOF block will be lost. A better error procedure implementation is to keep track of the fact that a NAK block was transmitted by the terminal and if a NAK block is received from the central processor, to transmit a BCB error block.

4. The standard transmission buffer size {&MLBFSZ} is 400 bytes. The buffer size can be changed if both processors have the same length buffers. The buffer size must be established at assembly time. {HASPGEN parameter}

5. If multiple devices are to be defined on a terminal, the following HASPGEN parameters must be changed according to the configuration &NUMTPRD, &NUMTPPU, and &NUMTPPR. Also a DCT for each additional device must be generated for the central processor.

6. If the terminal is communicating with the central processor via a leased line, the central processor ignores the SIGN-ON card.

7. The number of buffers {&NUMBUF} must correspond to the number of remote device functions plus the number of local device functions. {Punch and print functions must have two buffers each to do double buffering.} {HASPGEN parameters.}

8. &NUMRJE and &NUMLNES must be equal to the largest teleprocessing line identification number or the largest remote terminal identification number {HASPGEN parameters}.

9. &NUMTPPR and &NUMTPPU must specify the maximum number of HASP Remote Terminal print-output and punch-output streams that can simultaneously be active. {HASPGEN parameters}

10. The RMTnn parameter must be defined for each HASP Remote Terminal. {HASPGEN parameter}

11. If ASCII code is going to be used, the &USASCII parameter must be set to YES. {HASPGEN parameter}

12. The type of character compression used should be an assembly option for the terminal. Types available are: trailing blank compression; leading, embedded and trailing blank compression; all duplicate character compression.

13. The minimum number of duplicate characters necessary to trigger compression should be an assembly option for the terminal.

14. Transparent or non-transparent communication code should be an assembly option for the terminal.

15. The SRCB {Section 4.2.4} for General Control Records that are defined but not in use are:

SSSSSSS = 1000010 - Final terminal SIGN-OFF
= 1000011 - Print initialization record
= 1000100 - Punch initialization record
= 1000101 - Input initialization record
= 1000110 - Data set transmission initialization
= 1000111 - System configuration status
= 1001001 - 1011001 - Reserved
= 1011010 - 1111111 - Available for local modification

APPENDIX C

EBCDIC CHARACTER ASSIGNMENTS

Bit Positions 4, 5, 6, 7		S/360 Main Storage Bit Positions 0, 1, 2, 3															
		0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
	Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0	NUL	DLE	DS		SP	&	-						{	}	\	0
0001	1	SOH	DC1	SOS						a	j	~		A	J		1
0010	2	STX	DC2	FS	SYN					b	k	s		B	K	S	2
0011	3	ETX	DC3							c	l	t		C	L	T	3
0100	4	PF	RES	BYP	PN					d	m	u		D	M	U	4
0101	5	HT	NL	LF	RS					e	n	v		E	N	V	5
0110	6	LC	BS	EOB / ETB	UC					f	o	w		F	O	W	6
0111	7	DEL	IL	PRE / ESC	EOT					g	p	x		G	P	X	7
1000	8		CAN							h	q	y		H	Q	Y	8
1001	9	RLF	EM						\	i	r	z		I	R	Z	9
1010	A	SMM	CC	SM		¢	!	¦	:								
1011	B	VT				.	$	,	#								
1100	C	FF	IFS		DC4	<	*	%	@								
1101	D	CR	IGS	ENQ	NAK	(	)	_	'								
1110	E	SO	IRS	ACK		+	;	>	=								
1111	F	SI	IUS	BEL	SUB	!	¬	?	"								

ACKD=X'70'

Duplicate Assignment

APPENDIX D

ASCII CHARACTER ASSIGNMENTS

		S/360 Main Storage Bit Positions 0, 1, 2, 3															
Bit Positions 4, 5, 6, 7		0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
	HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0	NUL	DLE	SP	0	@	P	`	p								
0001	1	SOH	DC1	!	1	A	Q	a	q								
0010	2	STX	DC2	"	2	B	R	b	r								
0011	3	ETX	DC3	#	3	C	S	c	s								
0100	4	EOT	DC4	$	4	D	T	d	t								
0101	5	ENQ	NAK	%	5	E	U	e	u								
0110	6	ACK	SYN	&	6	F	V	f	v								
0111	7	BEL	ETB	'	7	G	W	g	w								
1000	8	BS	CAN	(	8	H	X	h	x								
1001	9	HT	EM	)	9	I	Y	i	y								
1010	A	LF	SUB	*	:	J	Z	j	z								
1011	B	VT	ESC	+	;	K	[	k	{								
1100	C	FF	FS	,	<	L	\	l	|							
1101	D	CR	GS	-	=	M	]	m	}								
1110	E	SO	RS	.	>	N	¬	n	~								
1111	F	SI	US	/	?	O	_	o	DEL								

ACKD=X'30'