IBM

X.25 NCP Packet Switching Interface Reference Summary

Third Edition (March 1983)

PREFACE

This handbook provides the system programmer and the IBM program support representative with information about the X.25 NCP Packet Switching Interface Licensed Program (Program number 5668-981). It is designed to provide quick access to information often used in this program. For more detailed information on the subject, refer to the following publications:

* The X.25 Interface for Attaching IBM SNA Nodes to Packet-Switched Data Networks -- General Information (GA27-3345).

* X.25 NCP Packet Switching Interface General Information (GC30-3080).

* X.25 NCP Packet Switching Interface Installation and Operation (SC30-3163).

* X.25 NCP Packet Switching Interface Diagnosis Guide (SC30-3164).

* X.25 NCP Packet Switching Interface Diagnosis Reference (LY30-3054).

A handbook binder is available for this manual. This binder may be purchased through your IBM representative (form number S229-4124 or part number 453559).

Note: In this publication, generic terms are used for brevity. Network control program (or NCP) refers to ACF/NCP. Access method refers to the access method being used, when there is no need to distinguish between TCAM and VTAM. Where necessary, the text refers to VTAM -- meaning ACF/VTAM or VTAM -- and TCAM -- meaning ACF/TCAM or TCAM.

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Figure 1-1. X.25 NPSI General Data Flow

Figure 1-2.   X.25 NPSI Data Flow (Control Blocks and Modules)

```
                          ┌─────────────┐
      ┌───────────────────•│   A.V.T     │
      │                    └─────────────┘
 V MKBAT
      │ ┌──────────────┐
      │ │T/O│ MKB @•────────> MKB                    MKB
      │ │ . │ .... │                                ┌──────────────────┐      <══════• from MCH XUACB
      │ │T/O│ MKB @•────•─────────────────────────> │LKB    @ │•═══════════> to MCH LKB
      │ │ . │ .... │    │                           │RUACB  @ │•═══════════> to MCH RUACB
      │ │ . │ .... │    │                           │XUACB  @ │•═══════════> to MCH XUACB
      │ └──────────────┘    │                       │                  │        VCCPTIT
      │                     │                        │VCCPTIT @│•──────┐     ┌──────────────┐
      │                     │                        │OUFTIT  @│•───┐  └────>│VCCPT @│•──>VCCPT
      │                     │                        │                  │   │     │VCCPT @│•──>VCCPT
      │                     │              •─────────│VCGAT   @│        │   │     │ ....  │
      │             ┌───────────────┐      │         │                  │   └──────────────┘
      │             │    VCGAT      │      └─────────│VCBAT   @│•┐      │
      │             │ ┌─────────────┐                │                  │       OUFTIT
      │             │ │VCBAT  @ │•───────┐           └──────────────────┘    ┌──────────────┐
      │             │ │VCBAT  @ │•────┐  │                               └──>│OUFT  @│•──>OUFT
      │             │ │VCBAT  @ │•─┐  │  │                                   │     │OUFT  @│•──>OUFT
      │             │ │ ....... │  │  │  └──┐                                │     │ ....  │
      │             │ └─────────────┘  │     │                              └──────────────┘
      │                     │          │  ┌──│──>                  VCBAT
      │                     │          │  │  │   ┌────────────────────────────┐
      │                     │          │  │  └──>│i│ VCB │CUB @ │•═══════> VC-CUB
      │              VCB────│─│─────────────────>│.│ ... │ ...  │
      │              VCB────│─│──────────────────>│i│VCB@│CUB @ │•═══════> VC-CUB
      │                     │          │  │       │ └──│─────┘ └──│──>VCB
      │                     │          │  │       │ ###########│
      │             ┌───────────────────────────>│i│VCB@│CUB @ │•═══════>VC-CUB
      │             │       │          │  │       │ ───│──────┘
      │             │ ┌───────────────────────────>│ ###########│
      │             │ │     │          │  │       │i│VCB@│CUB @ │•═══════>VC-CUB
      │             │ │     │          │  │       │ ─│─
      │             │ │     │          │  │       │ .│ ... │ ...  │
      │             │ │     │          │  │       └────────────────────────────┘
      │             │ │     │   ┌──────────────┐
      │             │ │     │   │    VCB       │
      │             │ │     └──>│              │   <═══════════════════════════UACB
      │             │ │         │ • MKB @│•═══════════════════════════>LKB
      │  •<──│─│─────────────────│ LKB @│
      │      │ │    │         │ •VCBATe │
      │      │ │    │         └──────────────┘
      │      │ │    │   ┌──────────────┐
      │      │ │    │   │    VCB       │
      │      │ │    └──>│              │   <═══════════════════════════UACB
      │      │ │        │ • MKB @│•═══════════════════════════>LKB
      └──────────────────│ LKB @│
             │           │ •VCBATe │
             └───────────└──────────────┘
```
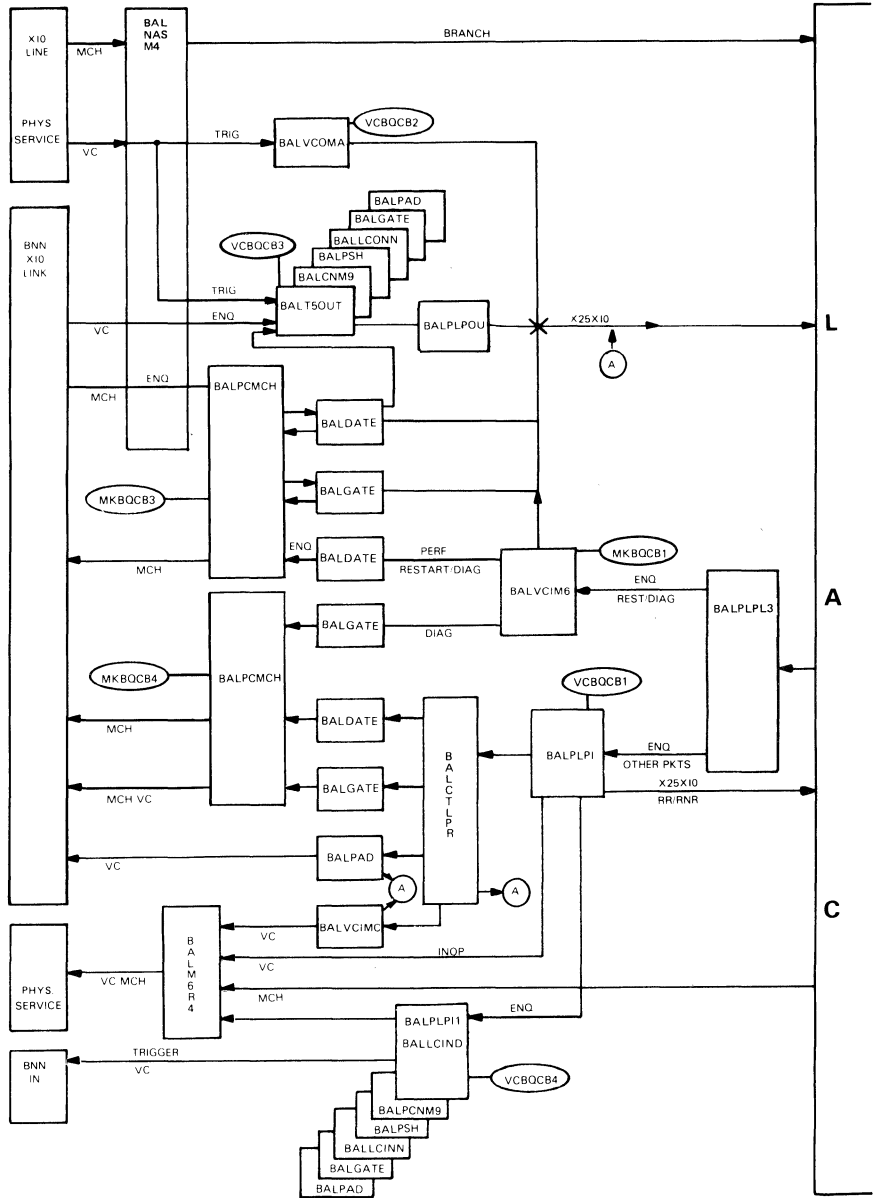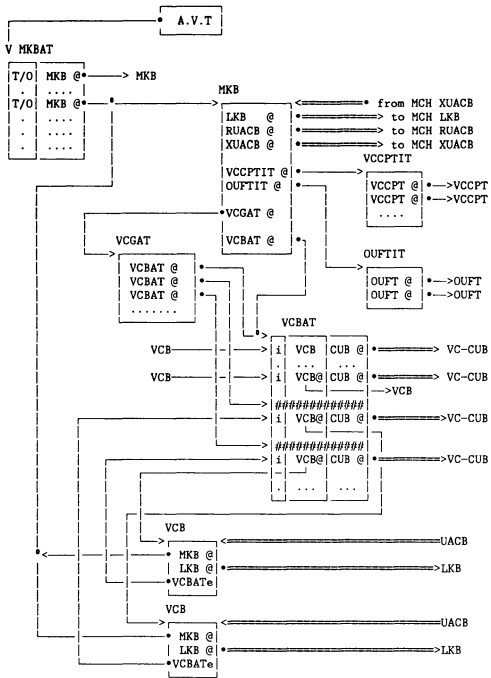
Figure 1·3. NCP and X.25 NPSI Control Block Relationship

```
        X25NPSI control blocks                    NCP control blocks
********************************************   ***************************
*  MKBAT          AVT               *     *                    #########
*  ,-------, <-----------------,        *     *                        #
*  |MKB @|--, |MKBAT @|         |        *     *                        #
*  |_____|  | |_____|         |        *     *       MCHLKB           #
*  ,--------'                   |        *     * ==>,----------,        #
*  |                       MCHRUACB      *     *    |RUACB @|           #
*  |        ,---------, <---+--------"--|RUACB @|          MCH
*      MKB           |XUACB @|--,  |  *     *    |_____|     LINK
*  ,-----, <----------+--| MKB @|  |  *     *    "                     #
*  |LKB    @|       | | LKB  @|======        *     "                    #
*  |RUACB @|        | |_____|       *     *    "                     #
*  |XUACB @|        |                 *     *    "                     #
*  |VCGAT @|--,     |  MCHXUACB       *     *    "                     #
*  |_____|  |     |,---------, <---,|    *     *    "                 #
*  |          |     ||RUACB @|----,  *     *    "                     #
*  |          '-----|| MKB  @|=====    *     *    "                     #
*  VCGAT            || LKB  @|          *     *    "                     #
*  ,-----,         ||_____|          *     *           #########
*  |VCBAT @|--,                        *     *           #########
*  |_____|  |                        *     *     CUB           #
*  |          |                        *     * "==>,---------, <------- #
*  |          |                        *     *  "  |LKB @|--,         #
*  ,----------'                        *     *  "  |_____|  |         #
*  VCBAT                               *     *  "           |   SVCs
*  ,-----,                             *     *  "          |       #
*  |CUB    @|=========================="  "  |   LKB          #
*  |SVCB @|--,     "==================    *     *  |       |       #
*  |........|  |   "          "  *     *    |PUV @|        #
*  ,-----,    |   "          "  *     *  |UACB@|        #
*  |CUB    @|========"  "  UACB  "  *    *    |_____|    #
*  |PVCB @|--, " "  ,-------, "  *    *       PUV       #
*  |........|  | " " |LKB @|=="  *    *    ,-------,    #
*  ,----------'  " " |SVCB@|   *    *    |CUB@|--'  #
*  |            " " |_____|   *     *                  #
*  ,------------+--"--"--,      *     *        ############
*  |           "========"   *     *     CUB           #
*  |         "       *     * <------ #
*  |         "          *     *  |LKB @|--,         #
*  SVCB      "          *     *  |_____|  |         #
*  ,-------,   "          *     *          |    PVCs
*  |LKB @|========"          *     *         |         #
*  |_____|  "          *     *      LKB         #
*  |  *------*  "          *     *  '->,-------,    #
*  |           "     "  *     *    |PUV @|        #
*  PVCB        "  ,------------------, "  *  |UACB@|        #
*  ,-----,     " '->,-------, "  *    |_____|    #
*  |LKB @|======" | UACB |LKB @|=="  *       PUV       #
*  |_____|    '->,-------, "  *    ,-------,    #
*  |------------------| PVCB @|   *    |CUB@|--'  #
********************************************   ***************************
```
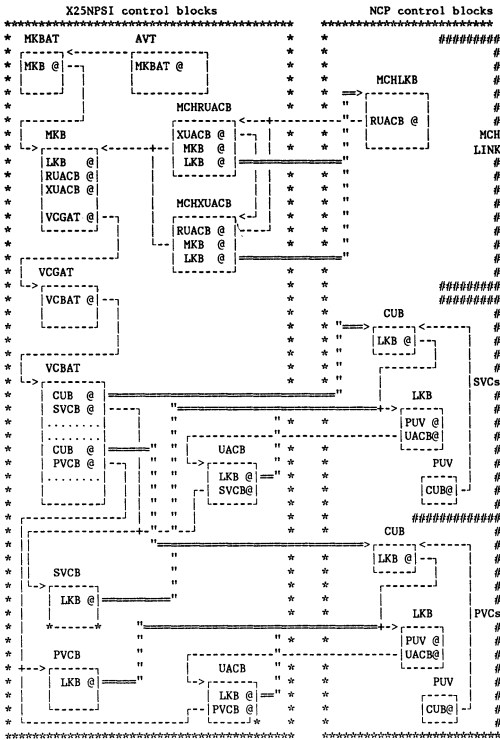
Note: The ====> between the X.25 and NCP control blocks are
established at INITIALIZATION time; the others are established at
sysgen time.

Figure 1-4. X.25 NPSI Control Block Relationship

CHAPTER 2. FRAME FORMATS

Structure of Frames

All transmissions (commands or responses) are contained in frames, which format
depends on whether they are Information (I), Supervisory (S) or Unnumbered (U)
frames.

The 'I' frames are used to perform an information transfer.

The 'S' frames are used to perform link supervisory control functions such as
acknowledge 'I' frames, request retransmission of 'I' frames or request a temporary
suspension of transmission of 'I' frames.

The 'U' frames are used to provide additional link control functions and contain no
sequence numbers.

Hereafter is a general description of these frames.

SUPERVISORY AND UNNUMBERED FRAMES
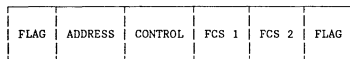
```
 _____ _____ _____ _____ _____ _____
|        |         |         |       |       |      |
|  FLAG  | ADDRESS | CONTROL | FCS 1 | FCS 2 | FLAG |
|        |         |         |       |       |      |
 ‾‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾ ‾‾‾‾‾‾
<-1B-> <--1B---> <--1B---> <--1B--> <--1B--> <--1B->
```

INFORMATION FRAMES AND FRMR FRAMES
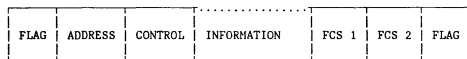
```
 _____ _____ _____ ................. _____ _____ _____
|        |         |         |               | |       |       |      |
|  FLAG  | ADDRESS | CONTROL | INFORMATION   | | FCS 1 | FCS 2 | FLAG |
|        |         |         |               | |       |       |      |
 ‾‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾‾‾ ................. ‾‾‾‾‾‾‾ ‾‾‾‾‾‾‾ ‾‾‾‾‾‾
<-1B-> <--1B---> <--1B---> <-n B for I----> <-1B--> <-1B--> <-1 B->
                          <-3 B for FRMR->
```

Flag

All frames start and end with a flag byte (X'7E'). The ending flag of a frame may
be the opening flag for the next frame. Any frame not properly bounded by flags is
invalid and is discarded by the LAC.

Address field

The address field consists of one byte, which value is the following:

*   X'01' for frames containing commands transferred from the DTE to the DCE and
    responses transferred from the DCE to the DTE.
*   X'03' for frames containing commands transferred from the DCE to the DTE and
    responses transferred from the DTE to the DCE.

Any frame received with an address other than X'01' or X'03' is invalid and is
discarded by the LAC.

Control field

The control field consists of one byte. This byte defines whether the frame is a command or a response. The following figure gives a general description of this field.

```
                                ||        BIT     DEFINITION          |
                                ||                                    |
                                || 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
                                ||___|___|___|___|___|___|___|___|
                                ||   |   |   |   |   |   |   |   |
   • INFORMATION FRAMES         ||   N ( R )  | P |  N ( S )  | 0 |
                                ||___|___|___|___|___|___|___|___|
                                ||   |   |   |   |   |   |   |   |
   • SUPERVISORY FRAMES         ||   N ( R )  |P/F| x    x  | 0 | 1 |
                                ||___|___|___|___|___|___|___|___|
                                ||   |   |   |   |   |   |   |   |
   • UNNUMBERED FRAMES          || x    x    x |P/F| x    x  | 1 | 1 |
                                ||___|___|___|___|___|___|___|___|
```

CONTROL FIELD PARAMETERS: Various parameters are associated with the control field and are described below.

Modulus: Each 'I' frame is sequentially numbered and may have the value 0 through modulus minus one. The modulus presently equals 8.

Send state variable V(S): This variable denotes the sequence number of the next in sequence 'I' frame to be transmitted. It can take on the values 0 through modulus minus one, and is incremented by one with each successive 'I' frame transmission.

Send sequence number N(S): Only 'I' frames contain this number which is the sequence number of the transmitted frame. The value of N(S) is the value of the send state variable V(S) at the time of the transmission.

Receive state variable V(R): This variable denotes the sequence of the next in sequence 'I' frame to be received. It can take on the values 0 through modulus minus one, and is incremented by the receipt of an error free, in sequence 'I' frame whose N(S) equals the V(R)

Receive sequence number N(R): All 'I' and 'S' frames contain N(R) which is the expected sequence of the next 'I' frame to be received. The value of N(R) is equal to the V(R) at the time of the transmission of an 'I' or 'S' frame.

N(R) indicates that all 'I' frames numbered up to and including N(R)-1 have been correctly received.

P/F bit: The P/F bit is used in both command and response frames. In command frames, it is referred to as the Poll bit. In response frames, it is referred to as the Final bit.

The DTE receiving a command with the Poll bit set to 1, will set the Final bit to 1 in the next response frame it transmits.

The DTE sending a command frame with the Poll bit set to 1, expects the Final bit set to 1 in the next response frame it receives. It ignores any response frame received without the Final bit set to 1 once it has polled the DCE.

Any response frame with the final bit set to 1 received by the DTE while it was not polling is:

- ignored in LAPB protocol

- rejected with 'FRMR' frame in LAP protocol

COMMANDS AND RESPONSES: The following figure gives a description of the Command and Response control fields used by the LAC.

	COMMAND	RESPONSE	BIT DEFINITION
• 'I' frames	I		N (R) P N (S) 0
• 'S' frames	RR	RR	N (R) P 0 0 0 1
	RNR	RNR	N (R) / 0 1 0 1
	REJ (*)	REJ	N (R) F 1 0 0 1
• 'U' frames	SABM		0 0 1 P 1 1 1 1
	SARM		0 0 0 P 1 1 1 1
	DISC		0 1 0 P 0 0 1 1
		UA	0 1 1 F 0 0 1 1
		DM	0 0 0 F 1 1 1 1
		FRMR	1 0 0 F 0 1 1 1

(*) The REJ command is never sent by the DTE but is processed when received from the DCE.

CHAPTER 3. PACKET FORMATS

The packet format is:

```
        bit:     0   1   2   3   4   5   6   7
                ┌───────────────────────────────┐
   byte   0     | General format | Logical channel |
                | Identifier     | Group number    |
                |───────────────────────────────|
          1     | Logical channel number          |
                |───────────────────────────────|
          2     | Packet type identifier          |
                |───────────────────────────────|
          3     | Packet type—dependent field     |
          .     |                                 |
          .     |                                 |
                └───────────────────────────────┘
```

Each packet is identified by a General Format Identifier (byte 0, bits 0 to 3) and by a Packet Type Identifier (byte 2).

The Virtual Circuit Number is composed of a Logical Channel Group Number (byte 0, bits 4 to 7) and a Logical Channel Number (byte 1).

The meaning of the fields starting from byte 3 depends on the type of the packet.

Figure 3-1 shows all the Packet Type Identifiers.

Figure 3-2 to Figure 3-13 show all the possible packet formats implemented in the X.25 NPSI.

```
+-------------------------------------------------+----------------+
|              PACKET TYPE                        |    Byte 2      |
|                                                 |    bits        |
+-------------------------------------------------+----------------+
|FROM DCE TO DTE        FROM DTE TO DCE           | 01234567       |
+-------------------------------------------------+----------------+
|              CALL ESTABLISHMENT                 |                |
|                                                 |                |
|Incoming Call          Call request             | 00001011       |
|Call-connected         Call accepted            | 00001111       |
|Clear-indication       Clear request            | 00010011       |
|DCE clear              DTE clear                 | 00010111       |
|confirmation           confirmation             |                |
|                                                 |                |
|              DATA AND INTERRUPT                 |                |
|                                                 |                |
|DCE data (modulo 8)    DTE data (modulo 8)      | RRRMSSS0       |
|DCE data (modulo 128) DTE data (modulo 128)|    | SSSSSSS0       |
|DCE interrupt          DTE interrupt            | 00100011       |
|DCE interrupt          DTE interrupt            |                |
|confirmation           confirmation             | 00100111       |
|                                                 |                |
|          FLOW CONTROL AND RESET                 |                |
|                                                 |                |
|DCE RR (modulo 8)      DTE RR (modulo 8)        | RRR00001       |
|DCE RNR (modulo 8)     DTE RNR (modulo 8)       | RRR00101       |
|DCE RR (modulo 128)    DTE RR (modulo 128)      | 00000001       |
|DCE RNR (modulo 128)   DTE RNR (modulo 128)     | 00000101       |
|Reset indication       Reset request            | 00011011       |
|DCE reset              DTE reset                 | 00011111       |
|confirmation           confirmation             |                |
|                                                 |                |
|              RESTART                            |                |
|                                                 |                |
|Restart indication     Restart request          | 11111011       |
|DCE restart            DTE restart               | 11111111       |
|confirmation           confirmation             |                |
+-------------------------------------------------+----------------+
```

Figure 3-1. Types of Packet

```
                0   1   2   3   4   5   6   7
              +---------------------------------+
     byte 0   | G   F   I   D |   VIRTUAL       |
              |     See Note  |                 |
              +---------------------------------+
         1    |        CHANNEL NUMBER           |
              +---------------------------------+
         2    | 0   0   0   0   1   0   1   1   |
              +---------------------------------+
         3    | Calling DTE address | Called DTE address |
              | length              | length             |
              +---------------------------------+
              |          DTE ADDRESS            |
              +---------------------------------+
              |               | 0   0   0   0   |
              +---------------------------------+
              | 0   0   |   FACILITY LENGTH     |
              +---------------------------------+
              |                                 |
              |          FACILITIES             |
              |                                 |
              +---------------------------------+
              |                                 |
              |        CALL USER DATA           |
              |                                 |
              +---------------------------------+
```

NOTE: Code 0X01 (modulo 8) or 0X10 (modulo 128)

Figure 3-2. Call Request and Incoming Call Packet Format

```
                0   1   2   3   4   5   6   7
              +---------------------------------+
     byte 0   | G   F   I   D |   VIRTUAL       |
              |     See Note  |                 |
              +---------------------------------+
         1    |        CIRCUIT NUMBER           |
              +---------------------------------+
         2    | 0   0   0   1   0   0   1   1   |
              +---------------------------------+
         3    |        CLEARING CAUSE           |
              +---------------------------------+
         4    |       DIAGNOSTIC CODE    *      |
              +---------------------------------+
```

NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

*Field not mandatory in CLEAR REQUEST packets.

Figure 3-3. Clear Request and Clear Indication Packet Format

```
                0   1   2   3   4   5   6   7
byte 0      |  G   F   I   D |     VIRTUAL    |
            |     See Note   |                |
            |----------------------------------|
     1      |         CIRCUIT NUMBER          |
            |----------------------------------|
     2      |  0   0   0   1   0   1   1   1  |
            |----------------------------------|
```
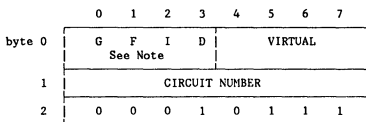
NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

Figure 3-4. DTE and DCE Clear Confirmation Packet Format

Modulo 8
```
                0   1   2   3   4   5   6   7
byte 0      |  Q   D   0   1 |     VIRTUAL    |
            |     See Note   |                |
            |----------------------------------|
     1      |         CIRCUIT NUMBER          |
            |----------------------------------|
     2      |    P(R)    | M |   P(S)    | 0  |
            |----------------------------------|
            |           USER DATA             /
            /                                 /
            |                                 |
            |----------------------------------|
```

Modulo 128
```
                0   1   2   3   4   5   6   7
byte 0      |  Q   D   1   0 |     VIRTUAL    |
            |     See Note   |                |
            |----------------------------------|
     1      |         CIRCUIT NUMBER          |
            |----------------------------------|
     2      |    P(S)                  | 0    |
            |----------------------------------|
     3      |    P(R)                  | M    |
            |----------------------------------|
            /           USER DATA             /
            /                                 /
            |                                 |
            |----------------------------------|
```
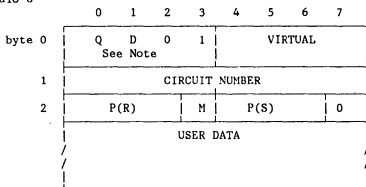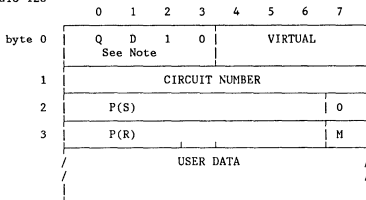
P(R) = Packet receive sequence number
P(S) = Packet send sequence number
M   = More Data Bit (MDB)
Q   = Qualified Data Bit (Q-bit)
D   = Delivery Confirmation Bit (D-bit)

Figure 3-5. DTE and DCE Data Packet Format

```
              0   1   2   3   4   5   6   7
           ┌─────────────────────────────────────┐
byte 0     │  G   F   I   D │    VIRTUAL          │
           │   See Note     │                     │
           ├─────────────────────────────────────┤
     1     │        CIRCUIT NUMBER                │
           ├─────────────────────────────────────┤
     2     │  0   0   1   0   0   0   1   1       │
           ├─────────────────────────────────────┤
     3     │          USER DATA                   │
           └─────────────────────────────────────┘
```
NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

Figure 3-6. DTE and DCE Interrupt Packet Format

```
              0   1   2   3   4   5   6   7
           ┌─────────────────────────────────────┐
byte 0     │  G   F   I   D │    VIRTUAL          │
           │   See Note     │                     │
           ├─────────────────────────────────────┤
     1     │        CIRCUIT NUMBER                │
           ├─────────────────────────────────────┤
     2     │  0   0   1   0   0   1   1   1       │
           └─────────────────────────────────────┘
```
NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

| Figure 3-7. DTE and DCE Interrupt Confirmation Packet Format

Modulo 8
```
              0   1   2   3   4   5   6   7
           ┌─────────────────────────────────────┐
byte 0     │  0   0   0   1 │    VIRTUAL          │
           ├─────────────────────────────────────┤
     1     │        CIRCUIT NUMBER                │
           ├─────────────────────────────────────┤
     2     │    P(R)        │ 0   0   0   0   1   │
           └─────────────────────────────────────┘
```

Modulo 128
```
              0   1   2   3   4   5   6   7
           ┌─────────────────────────────────────┐
| byte 0    │  0   0   1   0 │    VIRTUAL          │
           ├─────────────────────────────────────┤
     1     │        CIRCUIT NUMBER                │
           ├─────────────────────────────────────┤
     2     │  0   0   0   0   0   0   0 │ 1       │
           ├─────────────────────────────────────┤
     3     │    P(R)                    │ 0       │
           └─────────────────────────────────────┘
```

         P(R) = Packet receive sequence number

Figure 3-8. DTE and DCE RR Packet Format

Modulo 8

```
               0    1    2    3    4    5    6    7
   byte 0  | 0    0    0    1 |      VIRTUAL        |
         1 |          CIRCUIT NUMBER               |
         2 |    P(R)      |  0    0    1    0    1  |
```

Modulo 128

```
               0    1    2    3    4    5    6    7
   byte 0  | 0    0    1    0 |      VIRTUAL        |
         1 |          CIRCUIT NUMBER               |
         2 | 0    0    0    0    0    1    0    1  |
         3 |    P(R)                        | 0    |
```

P(R) = Packet receive sequence number

Figure 3-9. DCE RNR Packet Format

```
               0    1    2    3    4    5    6    7
   byte 0  | G    F    I    D |      VIRTUAL        |
           |   See Note       |                     |
         1 |          CIRCUIT NUMBER               |
         2 | 0    0    0    1    1    0    1    1  |
         3 |          RESETTING CAUSE              |
         4 |          DIAGNOSTIC CODE *            |
```

NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

* Field not mandatory in Reset Request packet.

Figure 3-10. Reset Request and Reset Indication Packet Format

```
               0    1    2    3    4    5    6    7
   byte 0  | G    F    I    D |      VIRTUAL        |
           |   See Note       |                     |
         1 |          CIRCUIT NUMBER               |
         2 | 0    0    0    1    1    1    1    1  |
```

NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

Figure 3-11. DTE and DCE Reset Confirmation Packet Format

```
              0   1   2   3   4   5   6   7
          +---------------------------------------+
 byte 0   | G   F   I   D | 0   0   0   0 |
          |     See Note  |                       |
          +---------------------------------------+
    1     | 0   0   0   0   0   0   0   0 |
          +---------------------------------------+
    2     | 1   1   1   1   1   0   1   1 |
          +---------------------------------------+
    3     |         RESTARTING CAUSE              |
          +---------------------------------------+
    4     |         DIAGNOSTIC CODE *             |
          +---------------------------------------+
```

NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

* Field not mandatory in Restart Request Packet

Figure 3-12. Restart Indication Packet Format

```
              0   1   2   3   4   5   6   7
          +---------------------------------------+
 byte 0   | G   F   I   D | 0   0   0   0 |
          |     See Note  |                       |
          +---------------------------------------+
    1     | 0   0   0   0   0   0   0   0 |
          +---------------------------------------+
    2     | 1   1   1   1   1   1   1   1 |
          +---------------------------------------+
```

NOTE: Code 0001 (modulo 8) or 0010 (modulo 128)

Figure 3-13. DTE Restart Confirmation Packet Format

CHAPTER 4. QLLC PACKET FORMATS

INTRODUCTION TO THE QLLC

The qualified logical link control (QLLC) is the logical link control supporting the NCP to a remote NCP over a Type 3 virtual circuit.

During the contact phase of a configuration station, the INN-LLC relays the physical services of ACF/NCP/VS to transmit XID-TYPE 2, SNRM, UA, DISC, TEST, DM to the adjacent LLC layer.

QLLC Packet Format

The format of the QLLC packet is the following:

```
            PACKET HEADER (WHERE Q-BIT IS ON)
                |
                |
      F A C  PH  QLLC  (INFO)  FCS F
                |
                |_____
                                            |
                                            |
```

SDLC COMMAND	QLLC PACKET NAME	QLLC BYTES		
		0	1	2 --> N
XID	QXID	FF	BF	XID TYPE 2
SNRM	QSNRM	FF	93	
UA	QUA	@@	73	
DISC	QDISC	FF	53	
TEST	QTEST	XX	F3	DATA
DM	QDM	FF	1F	
RD	QRD	@@	53	
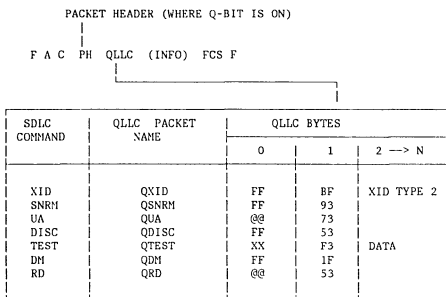
WHERE:
  BYTE 0:   ADDRESS BYTE   FF= BROADCAST ADDRESS
                                   @@= SECONDARY ADDRESS
                                   XX= FF OR @@
  BYTE 1:   CONTROL BYTE

CHAPTER 5. PHYSICAL SERVICES HEADER

INTRODUCTION TO THE PSH

The Physical Service Header (PSH) is used in the Logical Link Control supporting the NCP to remote NIA communication over a type 2 virtual circuit.

PSH Header Format

The format of the header is:

```
                    Packet Header
                       |
                       |
          F A C [ PH [ PSH   INFO ]] FCS F
                       |
                       |
                       Physical Services Header (FID-FOX)
                       |
                       V
         0    1    2    3    4    5    6    7
       +----+----+----+----+----+----+----+----+
   0   | 1  | 1  | 1  | 1  | 0  | SI | PSI| CPI|
       +----+----+----+----+----+----+----+----+
       |  DATA PACKET SEQ Nbr, CONTROL, or DATA |
       |                                        |
       +----------------------------------------+
       |          CONTROL   or   DATA           |
       +----------------------------------------+
   n   /                                        /
       |                                        |
       |                                        |

   SI       Segment Indicator
            B'1'    MORE SEGMENTS FOLLOW
            B'0'    LAST or ONLY SEGMENT

   PSI      Packet Sequence Indicator
            B'1'    BYTE 1 = 8-bit DPS Number
                    BYTE 2 = CONTROL or DATA
            B'0'    BYTE 1 = CONTROL or DATA

   CPI      Control Present Indicator
            B'1'    CONTROL PRESENT
            B'0'    DATA PRESENT
```

Commands Supported by the PSHC

These commands are:

	PSCONT	(CONTACT)	X'08'
	PSDISC	(DISCONTACT)	X'02'
	PSXID	(XID)	X'04'
	PSTEST	(TEST)	X'06'
Note:	PSFRMR	(FRAME REJ/INTERFACE CK)	X'0A' NOT IMPLEMENTED

PSH Options Used by the LLC

The valid formats for DATA LLUs are:

```
        0    1    2    3    4    5    6    7

    0 | 1  | 1  | 1  | 1  | 0  | SI | 1  | 0  |

    1 | <————————SEQUENCE NUMBER————————————>|

    2 |                DATA                   |

    n /                DATA                  /
```
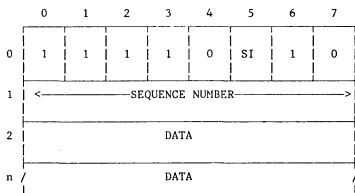
SI may be 1 or 0:

SI = 1 if this LLU is not last-in-chain.
SI = 0 if this LLU is the last-in-chain.

The valid formats for CONTROL LLUs are:

```
        0    1    2    3    4    5    6    7
      +----+----+----+----+----+----+----+----+
   0  | 1  | 1  | 1  | 1  | 0  | 0  | 0  | 1  |
      +----+----+----+----+----+----+----+----+
   1  |              COMMAND CODE              |
      +----------------------------------------+
   2  |                 DATA                   |
      +----------------------------------------+
   n  /                 DATA                   /
      |                                        |
```
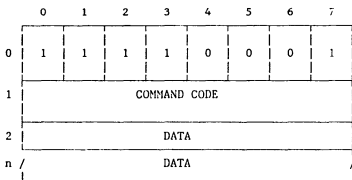
Data is valid only with the following commands:

```
     PSCONT    X'08'    NO DATA
     PSDISC    X'02'    NO DATA
     PSXID     X'04'    DATA ACCEPTED
     PSTEST    X'06'    DATA ACCEPTED
```

Note: PSFRMR   X'0A'   DATA ACCEPTED   NOT IMPLEMENTED

Notes:

1. The remote NIA does not accept data in the PSXID it receives from the NCP.

2. The remote NIA does not use the PSFRMR command.

CHAPTER 6. X.25 NPSI RELEASE 2 DATA AREAS

The data areas for Release 2 of the X.25 NPSI program product are as follows.

AVT

ADDRESS VECTOR TABLE (AVT)

Program: X.25 NPSI
Size in bytes: 28(1C)
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to AVT: Via a 'load address' instruction (BAL$AVT)
Function: Address vectors and general purpose flags

```
+----------------------------+-------------------+--------------------+
| 0(0)                       | 2(2)              | 3(3)               |
|            AVTBID          |      RESERVED     |     AVTFL5   *     |
|        Block identifier    |                   |                    |
|             'AV'           |                   |                    |
|            +---------------+-------------------+--------------------+
| 4(4)                                                               |
|                          AVTMKBAT                                  |
|                       Pointer to MKBAT                             |
|            +---------------+-------------------+--------------------+
| 8(8)                                                               |
|.................          AVTLLCTP                                 |
|    AVTSMK   *  |       Pointer to LLC table                        |
|               +-------------------+--------------------+           |
| 12(C)                                                              |
|                          AVTSARBP                                  |
|              Pointer to snap area first entry                      |
|            +---------------+-------------------+--------------------+
| 16(10)                                                             |
|                          AVTSARNP                                  |
|          Pointer to snap area next available entry                 |
|            +---------------+-------------------+--------------------+
| 20(14)                                                             |
|                          AVTSARLP                                  |
|              Pointer to snap area last entry                       |
|            +---------------+-------------------+--------------------+
| 24(18)                                                             |
|.................          AVTSARTR                                 |
|    AVTSARTM   |        Pointer to first MKB                        |
+----------------------------+-------------------+--------------------+
```

* Indicates a byte expansion follows

Byte Expansions

Offset/Name	Bit Pattern	Contents
8(8) AVTSMK		System options
	.1..	Snap facility available

LIQ

LINE INPUT QUEUE (LIQ)

Program: X.25 NPSI
Size in bytes: 16(10)
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to LIQ: MKBLIQEP and MUALIQPF
Function: MCH Input Queue

```
+-----------------+----------------+----------------+----------------+
| 0(0)            |                                                  |
|................ |                      LIQCHN                       |
| LIQFLAG    *    |          Pointer to next LIQ entry               |
| LIQ Event Flag  |                                                  |
+-----------------+----------------+----------------+----------------+
| 4(4)            |                                                  |
|................ |                      LIQHDBUF                     |
|   LIQFLAGE  *   |      Address of the first buffer of a block      |
| LIQ Error Flag  |                                                  |
+-----------------+----------------+----------------+----------------+
| 8(8)            | 9(9)           | 10(0A)                          |
|         LIQACFLD|                |                                 |
|   LIQAFLD       |   LIQCFLD      |              Reserved           |
| Event A-field   | Event C-field  |                                 |
+-----------------+----------------+----------------+----------------+
| 12(C)           |                                                  |
|                 |                                                  |
|                 |              Reserved                            |
|                 |                                                  |
+-----------------+----------------+----------------+----------------+
```

* Indicates a byte expansion follows

LIQ

Byte Expansions

Offset/Name	Bit Pattern	Contents
0(0) LIQFLAG		Interface flag from level 2 to level 3
	1...	Entry busy for level 3 event processing
	.1..	Event is on receive leg of the MCH
	..1.	Level 2 normal call
	...1	Level 2 error call
	.... 1...	Timeout event
	1	Permanent hardware failure
4(4) LIQFLAGE		LIQ error flag from level 2 to level 3
	1...	Error on receive
	.1..	DSR recovered after DCE modem test
	..1.	FCS error
	...1	Invalid frame length
	.... 1...	Modem check or DCE modem test
	.... .1..	Error during transmission
	.... ..1.	LEASE refused
	1	Buffer to be released at level 3

LLCT

LLC ADDRESS TABLE (LLCT)

Program: X.25 NPSI
Size in bytes: Variable depending upon the number of entries
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to LLCT: AVTLLCTP field in AVT
Function: Locate Input and Output LLC Routines in accordance to the
          type of the VC.

```
┌─────────────────┬──────────────────┬──────────────────┬───────────────┐
│ -8(-8)          │                  │                  │               │
│................ │      Block Service Order Table                      │
│ Level 5 flags   │                  │                  │               │
├─────────────────┼──────────────────┼──────────────────┼───────────────┤
│ -4(-4)          │                  │ -2(-2)           │               │
│       Block identifier             │         Number of Entries        │
│          'LC'                      │                  │               │
├─────────────────┼──────────────────┼──────────────────┼───────────────┤
│  0( 0)          │                  │                  │               │
│................ │              LLCTLLCI                               │
│ LLCTGFLG   *    │      Pointer to LLC-IN routine                      │
├─────────────────┼──────────────────┼──────────────────┼───────────────┤
│  4( 4)          │                  │                  │               │
│................ │              LLCTLLCO                               │
│ LLCTLCID   *    │      Pointer to LLC-OUT routine                     │
└─────────────────┴──────────────────┴──────────────────┴───────────────┘
```

* Indicates a byte expansion follows

LLCT

Byte Expansions

Offset/Name	Bit Pattern	Contents
0(0) LLCTGFLG		Generation flags
	1...	Last Entry
4(4) LLCTLCID		LLC identifier
	1...	LLC 0 enduser
	..1.	LLC 2 enduser
	...1	LLC 3 enduser
	.... 1...	LLC 4 enduser
	.... .1..	LLC 5 enduser

MULTICHANNEL LINK BLOCK (MKB)

Program: X.25 NPSI
Size in bytes: 212 (D4)
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to MKB: MKBATMKB and VCBMKBP
Function: Control block for a physical circuit (MCH)

```
+-----------------------------+-------------------+-------------------+
| 0(0)                        | 2(2)              | 3(3)              |
|           MKBBID            |     MKBVCMW1      |     MKBVCMW2      |
|       Block Identifier      |   VCM work area   |   VCM work area   |
|             'MK'            |                   |                   |
+--------------+--------------+-------------------+-------------------+
| 4(4)                        | 6(6)                                  |
|          MKBRMUAP           |            MKBXMUAP                    |
|    Pointer to receive MUACB |       Pointer to transmit MUACB       |
|                             |                                       |
+--------------+--------------+-------------------+-------------------+
| 8(8)                        |                                       |
|...............             |           MKBLKBP                      |
| MKBNETID   *  |           Pointer to LKB                           |
|   Network ID  |                                                     |
+--------------+--------------+-------------------+-------------------+
| 12(C)                       |                                       |
|...............             |           MKBCUBP                      |
|    MKBW       |           Pointer to CUB                           |
| LAPB Window   |                                                     |
+--------------+--------------+-------------------+-------------------+
| 16(10)                      |                                       |
|...............             |           MKBMKBTE                     |
|  MKBGENIF   * |           Pointer to MKBAT                         |
| Protocol type |                                                     |
+--------------+--------------+-------------------+-------------------+
| 20(14)                      |                                       |
|...............             |           MKBAVTP                      |
|   MKBTP       |           Pointer to AVT                           |
| TP Timer offset|                                                    |
+--------------+--------------+-------------------+-------------------+
| 24(18)                      |                                       |
|...............             |           MKBVCCPT                     |
|   MKBTD       |           Pointer to VCCPTIT                       |
| TD Timer offset|                                                    |
+--------------+--------------+-------------------+-------------------+
```

MKB

```
|-----------------------------------------------------------------------------|
| 28(1C)                                                                      |
|.................          MKBOUFTP                                          |
|  MKBMDREC  *  |        Pointer to OUFTIT                                     |
|  MDR code     |                                                             |
|-----------------------------------+-----------------+-----------------------|
| 32(20)                                                                      |
|.................          MKBVCGTP                                          |
|  MKBSTATC  *  |        Pointer to VCGAT                                      |
|  Status for VCM|                                                            |
|-----------------------------------+-----------------+-----------------------|
| 36(24)                                                                      |
|.................          MKBVCBTP                                          |
|  MKBGDPF   *  |        Pointer to VCBAT                                      |
|  GATE/DATE def.|                                                            |
|-----------------------------------+-----------------+-----------------------|
| 40(28)                                                                      |
|.................          MKBPLPOA                                          |
|  MKBGDW1   *  |      Address of PLP-OUT routine                             |
|  GATE/DATE work|                                                            |
|-----------------------------------+-----------------+-----------------------|
| 44(2C)                                                                      |
|.................          MKBXWAP                                           |
|  MKBXPFLG  *  |        Pointer to SLUB                                       |
|  Flag         |                                                             |
|-----------------------------------+-----------------+-----------------------|
| 48(30)                                                                      |
|.................          MKBLIQ                                            |
|  MKBOQCTR     |      Pointer to LIQ first entry                             |
|  Total OUTQ Cnt|                                                            |
|-----------------------------------+-----------------+-----------------------|
| 52(34)                                                                      |
|.................          MKBLIQEP                                          |
|  MKBXIOLC     |  Pointer to next LIQ to be processed by level 3             |
|  XIO LINK count|                                                            |
|-----------------------------------+-----------------+-----------------------|
| 56(38)                            | 58(3A)                                  |
|       MKBMAXFL                    |.......... MKBMAXN .............|         |
|  Maximum frame length             |  MKBMAXNP      |  MKBMAXND              |
|                                   |  NP retry count | ND retry count       |
|-----------------------------------+-----------------+-----------------------|
| 60(3C)                            | 62(3E)                                  |
|........... MKBADRSS .............|........... MKBLKST .............|        |
|  MKBA3705     |  MKBADCE          |  MKBLKST1  *  |  MKBLKST2  *          |
| X25 DTE address| X25 DCE address  | MCH state     | MCH substate          |
|-----------------------------------+-----------------+-----------------------|
| 64(40)                            | 66(42)                                  |
|........... MKBPSST .............|........... MKBXREQ .............|        |
|  MKBPST   *   |  MKBSST   *       |  MKBPREQ   *  |  MKBSREQ   *          |
| Primary state | Secondary state  | Primary request| Secondary req.       |
|-----------------------------------+-----------------+-----------------------|
```

```
+----------------+----------------+-------------------------------------+
| 68(44)         | 69(45)         | 70(46)                              |
|   MKBXRF   *   |                | ............. MKBN .............    |
| Xmit/Rcv flag  | Reserved       |   MKBNP        |   MKBND             |
|                |                |Current NP count|Current ND count    |
+----------------+----------------+----------------+--------------------+
| 72(48)         | 73(49)         | 74(4A)         | 75(4B)             |
|   MKBVS        |   MKBVR        |   MKBNR        |   MKBLPNR          |
| Current V(S)   | Current V(R)   | Received N(R)  | Last proc. N(R)    |
+----------------+----------------+----------------+--------------------+
| 76(4C)                                                                |
| ................       MKBWAQH                                        |
|   MKBWAQC       Head of waiting acknowledgment queue                  |
| WACK queue cnt  |                                                      |
+----------------+-----------------------------------+------------------+
| 80(50)                                                                |
| ................       MKBWAQT                                        |
|   MKBACKFC      Tail of waiting acknowledgment queue                  |
| ACK frame count |                                                     |
+----------------+-----------------------------------+------------------+
| 84(54)                            | 86(56)                            |
|          MKBEND1                  |                                   |
|    Save area for MUAEND1          |          Reserved                 |
|                                   |                                   |
+----------------+------------------+----------------+------------------+
| 88(58)                                                                |
|                           MKBQCB0                                     |
|                 LAP outbound queue control block                      |
|                                                                       |
+----------------+------------------+----------------+------------------+
| 104(68)                                                               |
|                           MKBQCB1                                     |
|                                                                       |
|                 VCM-IN queue control block                            |
|                                                                       |
|                                                                       |
+----------------+------------------+----------------+------------------+
| 128(80)                                                               |
|                           MKBECB1                                     |
|                 VCM-IN event control block                            |
+----------------+------------------+----------------+------------------+
| 140(8C)                                                               |
|                           MKBQCB2                                     |
|                                                                       |
|                 Statistic queue control block                        |
|                                                                       |
+----------------+------------------+----------------+------------------+
```

MKB

```
| 164(A4)                                                            |
|                            MKBQCB3                                 |
|                                                                    |
|                    LU-MCH OUT queue control block                  |
|                                                                    |
|                                                                    |
|                                                                    |
| 188(BC)                                                            |
|                            MKBQCB4                                  |
|                                                                    |
|                    LU-MCH IN queue control block                   |
|                                                                    |
|                                                                    |
```

* Indicates a byte expansion follows*

Byte Expansions

Offset/Name	Bit Pattern	Contents
8(8) MKBNETID		Network identifier
	0000 0000	Network type 1 — Transpac/Euronet
	0000 0010	Network type 2 — Datapac/Datex P/NRW
16(10) MKBGENIF		System generation parameters
	1...	LAPB protocol
	0...	LAP protocol
	.1..	MCH working as a DCE
	.0..	MCH working as a DTE
	..1.	DM supported
	..0.	DM not supported
	.... 1...	D-bit supported
	.... 0...	D-bit not supported
	.... .1..	LCN 0 supported as a VC
	.... .0..	LCN 0 not supported as a VC
	.... ..X.	Reserved
	1	Packet modulo 128
	0	Packet modulo 8
28 (1C) MKBMDREC		See Appendix B

Offset/Name	Bit Pattern	Contents
32(20) MKBSTATC		Interface with NCP terminators
	0001 0100	I-frame received (INN)
	0110 1011	Test-frame received (INN)
	1000 0000	MCH error (LAP) or timeout (INN)
	1000 0010	KO exit for Switched connect terminator
	1000 0101	Buffer pool depletion (INN)
	1001 0100	Link level 2 test termination
	1001 0110	Discont in ANS
	1001 1100	Enable termination
	1001 1110	Disable termination
	1010 0011	Invalid command (INN)
	1010 1001	Disc received (INN)
	1011 0000	LAP counter overflow
	1011 0011	SNRM received (INN)
	1011 0101	RD received (INN)
	1011 0111	DM received (INN)
	1011 1101	UA received (INN) — Cont/Disc OK (LAP)
	1011 1111	XID successful
	1110 0000	Permanent link error
36(24) MKBGDPF		Gate/Date definition flags
	1...	Subaddressing
	0...	No subaddressing
	.10.	Gate
	.00.	No Gate, No Date
	.01.	Date
	...1	Reserved
	.... 1...	Integrated Pad
	.... .1..	Transparent Pad
	.... ..1.	Odd translation (Pad)
	1	Even translation (Pad)
	00	No Translation
40(28) MKBGDW1		Gate/Date flag byte
	1...	Shutc pending on the MCH LU

MKB

Offset/Name	Bit Pattern	Contents
44(2C) MKBXPFLG		Miscellaneous flags
	1	Interlock bit for statistics
62(3E) MKBLKST1		MCH states
	0000 0000	Idle (M0)
	1...	Enable in progress (M1)
	.1..	Enabled (M2)
	..1.	Flag monitoring in progress (M3)
	...1	Contact in progress (M4)
	.... 1...	Contacted (M5)
	.... .1..	DSR off (M6)
	.... ..1.	Shutdown (M7)
63(3F) MKBLKST2		MCH substates
	0000 0000	S0 = No frame allowed
	1...	S1 = SABM sent
	.1..	S2 = SABM contention
	..1.	S3 = ABM (Information transfer)
	...1	S4 = FRMR sent
	.... 1...	S5 = DISC received

Offset/Name	Bit Pattern	Contents
64(40) MKBPST		Primary status
	1...	Polling
	.1..	Waiting ack
	..1.	Busy
	...1	In reject
	.... 1...	Reject not cleared
	.... .1..	Window closed
	.... ..1.	Timeout recovery (LAP)
	1	Set up or Disc OK (LAP)
65(41) MKBSST		Secondary status
	1...	Polling
	.1..	Busy
	..1.	In reject
	...1	Lease danger
	1	Set up or Disc OK (LAP)
66(42) MKBPREQ		Primary transmit request
	1...	SABM requested
	.1..	DISC requested
	..1.	I requested
	...1	RR command requested
67(43) MKBSREQ		Secondary transmit request
	1...	UA requested
	.1..	DM requested
	..1.	FRMR requested
	...1	RR response requested
	.... 1...	REJ response requested

MKB

Offset/Name	Bit Pattern	Contents
68(44)		Transmit and receive flags
MKBXRF		
	1...	Transmit side enabled
	.1..	Flags on transmit side
	..1.	Transmission in progress
	...1	Transmit request pending
	.... 1...	Receive side enabled
	.... .1..	Flags on receive side

MKB ADDRESS TABLE (MKBAT)

Program : X.25 NPSI
Size in bytes : 12
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to MKBAT : AVTMKBAT field in AVT.
Function : Table to address the multichannel link blocks

-8(-8) .... Level 5 flags	Block Service Order Table		
-4(-4) BLOCK ID 'MT'		-2(-2) Number of Entries	
0(0) .... MKBATGFG *	MKBATSOP Pointer to next VCBAT entry to be scanned		
4(4) .... MKBATNID * Network ID	MKBATMKB Pointer to MKB		
8(8) MKBATGNT Number of ticks	9(9) MKBATCRT Counter of ticks	10(A) MKBATGNN Scan entry nbr	11(B) MKBATCRN Scan entry cnt

* Indicates a byte expansion follows

MKBAT

Byte Expansions

Offset/Name	Bit Pattern	Contents
0(0) MKBATGFG		Sysgen and level 3 flags
	1...	Last entry in MKBAT
	.1..	Restart exchange in progress
	..1.	End of MCH re-initialization
	...1	Interlock bit for MCH contact
	.... 1...	Interlock bit for MCH discontact
	.... .1..	MCH operational (NAS scans the VCBs)
	.... ..1.	Link running (contacted)
	1	MCH re-initialization in progress
4(4) MKBATNID		Network identification
	0000 0000	Network type 1 - Transpac, EURONET
	0000 0010	Network type 2 - Datapac, DATEA-P, NRW

USER ADAPTER CONTROL BLOCK FOR A MCH LINK (MUACB)

Program: X.25 NPSI
Size in bytes: 124(7C)
Created by: X.25 NPSI generation
Located in: $SRCLO
Pointer to MUACB: LKBACBP and MKBXMUAP or MKBRMUAP
Function: ACB for a multichannel link

```
┌──────────────────┬─────────────────┬──────────────────────────────┐
│ 0(0)             │                 │                              │
│                            LXB compatibility                      │
│                                                                   │
│                                                                   │
├──────────────────┼─────────────────┼──────────────────────────────┤
│ 24(18)           │                 │                              │
│.................. │         MUALKBP                               │
│ LXB compatib.    │      Pointer to LKB                            │
├──────────────────┼─────────────────┼──────────────────────────────┤
│ 28(1C)           │                 │                              │
│                            LXB compatibility                      │
│                                                                   │
├──────────────────┴─────────────────┼──────────────────────────────┤
│ 36(24)           │ 38(26)                                         │
│       MUAGCBL2                     │        MUASTATE        *      │
│                                    │        (CCBSTATE)            │
│    Level 2 NAS entry point         │  Rcv/Xmit Status for line trace│
├────────────────────────────────────┼──────────────────────────────┤
│ 40(28)           │ 42(2A)                                         │
│       MUATACB                      │        MUATWORK              │
│       (CCBTACB)                    │        (CCBTWORK)           │
│ Ptr to next ACB in timer chain     │ Timer work entry for this ACB │
├────────────────────────────────────┼──────────────────────────────┤
│ 44(2C)           │ 46(2E)                                         │
│       MUALINK                      │        MUATIME              │
│       (CCBLINK)                    │        (CCBTIME),           │
│ Ptr to next ACB in L2/L3 chain     │      Timeout interface       │
└────────────────────────────────────┴──────────────────────────────┘
```

MUACB

```
+-----------------------------------------------------------------------+
| 48(30)                        | 50(32)                                |
|            MUABAR             |             MUABCC                     |
|           (CCBBAR)            |            (CCBBCC)                    |
|    Line interface address     |    Frame check sequence (CSB2)        |
+-------------------------------+---------------------------------------+
| 52(34)                        | 54(36)                                |
|            MUAEND1      *      |............ MUACNTS ............|     |
|       Interface level 2/3     |    MUACHAR    |    MUACUT             |
|                               | Character count| Cutoff value        |
+-------------------------------+---------------------------------------+
| 56(38)                                                                |
|.................              MUAMKBP                                  |
|   MUACHARS     |          Pointer to MKB                              |
| Buffer space   |                                                      |
+----------------+------------------------------------------------------+
| 60(3C)                                                                |
|.................              MUADATA                                  |
|   Reserved     |     Address of current sent or received byte        |
|                |                                                      |
+----------------+------------------------------------------------------+
| 64(40)                                                                |
|.................              MUASTART                                 |
|   MUAFLAGS     |            (CCBSTART)                                 |
|   (CCBFLAGS)   |        Current buffer address                        |
+----------------+------------------------------------------------------+
| 68(44)                                                                |
|.................              MUAXUABP                                 |
|   MUAERC       |         Pointer to UACB extension                    |
| Lvl2 retry cnt |                                                      |
+----------------+------------------------------------------------------+
| 72(48)                                                                |
|.................              MUAHDBUF                                 |
|   MUABUFCT     |      Address of first buffer of a block              |
| Cutoff value   |                                                      |
+----------------+------------------------------------------------------+
| 76(4C)                                                                |
|                            Reserved                                   |
|                                                                       |
|                                                                       |
+-------------------------------+---------------+-----------------------+
| 80(50)                        | 82(52)        | 83(53)                |
|            MUABID             |               |    MUATYPE   *        |
|       MUACB identifier        |   Reserved    |    (CCBTYPE)          |
|            'MU'               |               |  Scanner flags        |
+-------------------------------+---------------+-----------------------+
| 84(54)                                                                |
|                            Reserved                                   |
|                                                                       |
+-----------------------------------------------------------------------+
```

```
+-----------------------------------------------------------------------+
| 88(58)     MUAACFLD          | 90(5A)                                 |
|   MUAAFLD    |   MUACFLD     |                                        |
|   (CCBAFLD)  |   (CCBCFLD)   |              Reserved                  |
| Current A-field| Current C-field|                                      |
+-----------------------------------------------------------------------+
| 92(5C)                       | 94(5E)        | 95(5F)                 |
|           CCBLATO            |               |   MUAOFSET             |
|     Reserved for compatibility|   Reserved   |   (CCBOFSET)           |
|                              |               | Current offset         |
+-----------------------------------------------------------------------+
| 96(60)       MUAPOLL (CCBPOLL)  SOT entry being polled                |
|..............                |.......................................|
|   MUACPCMD   |               | 98(62)      MUARMUAP                   |
|   (CCBCPCMD) |               | Pointer to receive UACB (X side)       |
+-----------------------------------------------------------------------+
| 100(64)      MUASEL (CCBSEL)   SOT entry being selected               |
|..............                |.......................................|
|   MUACPOLL   |               | 102(66)     MUAXMUAP                   |
|   (CCBCPOLL) |               | Pointer to xmit UACB (R side)          |
+-----------------------------------------------------------------------+
| 104(68)     | 105(69)        | 106(6A)                                |
|   MUACODE   |   MUAUACB      |              MUAGCBP                   |
|   (CCBTYPEC)|   (CCBSETYP)   |                                        |
| NEO structure| Line trace comp| NEO structure : Pointer to GCB         |
+-----------------------------------------------------------------------+
| 108(6C)                                                               |
|                              Reserved                                 |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+
| 112(70)                                                               |
|                              Reserved                                 |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+
| 116(74)                                                               |
|                              Reserved                                 |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+
| 120(78)                                                               |
|                              Reserved                                 |
|                                                                       |
|                                                                       |
+-----------------------------------------------------------------------+
```

* Indicates a byte expansion follows

MUACB

Byte Expansions

Offset/Name	Bit Pattern	Contents
39(27) MUASTATE	Byte 1	Transmit and receive mask
	...1	Transmit
	...0	Receive
52(34) MUAEND1	Byte 0	Level 2/3 interface
	1...	Event on LIQ
	Byte 1	
	1...	Set mode phase
	.1..	Monitor DSR phase
	..1.	Bring-up RTS (CSB3)
	...1	Enabled
	.... 1...	Flag transmitted or received
	.... .1..	Modem check on transmit
83(53) MUATYPE		Flag byte for scanners
	1...	CSB3
	0...	CSB2
	.1..	Full duplex adapter (always 1)
	..1.	Transmit UACB
	..0.	Receive UACB
	.... 0.01	Primary SDLC link

OPTIONAL USER FACILITY TABLE (OUFT)

Program : X.25 NPSI
Size in bytes : Variable depending upon the facility and user
date field length.
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to OUFT: OUFTITP
Function: Contains the Optional User Facilities to be inserted
in an Outgoing Call Packet.

```
┌─────────────────────────────┬─────────────┬─────────────┐
│ 0(0)                        │ 2(2)        │ 3(3)        │
│           OUFBID            │ OUFINDX     │             │
│       Block identifier      │ Index       │ Reserved    │
│            'OT'             │             │             │
├─────────────────────────────┼─────────────┴─────────────┤
│ 4(4)                        │ 6(6)                      │
│           OUFFACL           │          OUFDATL          │
│   Length of User Facility Field │ Length of User Data Field │
├──────────────┬──────────────┼─────────────┬─────────────┤
│ 8(8)         │                                          │
│............. │              OUFUSRF                      │
│   OUFFACLF   │    User Facility and User Data            │
│Facility fld lg│                                          │
│into Call Packet│                                         │
└──────────────┴──────────────────────────────────────────┘
```

OUFTIT

OPTIONAL USER FACILITY TABLE INDEX TABLE (OUFTIT)

Program: X.25 NPSI
Size in bytes: Variable depending upon the number of 4 byte
entries defined at sysgen.
Created by: X.25 NPSI generation
Located in : $SRCHI
Pointer to OUFTIT : MKBOUFTP
Function : Index into OUFT

```
| -8(-8)          |                                           |
|.................          Block Service Order Table          |
|    Network      |                                           |
| Identification  |                                           |
|-----------------+-----------------+-------------------------|
| -4(-4)          | -2(-2)          |                         |
|        Block identifier          |          Number of Entries |
|            'OI'  |                 |                         |
|                 |                 |                         |
|-----------------+-----------------+-------------------------|
| 0(0)            |                                           |
|.................                  OUFTITP                    |
|   OUFTITF   *   |          Pointer to OUFT                   |
| Sysgen flags    |                                           |
```

* Indicates a byte expansion follows

Byte Expansions


```
| Offset/Name |Bit Pattern| Contents                |
|-------------+-----------+-------------------------|
| 0(0)        |           | Generation flags        |
| OUFTITF     |           |                         |
|             | 1... .... | Last entry              |
```

PKT

X25 PACKET (PKT)

Program : X.25 NPSI
Size in bytes : 3 or 4 bytes of header (according to the modulo),
               plus variable text length.
Function : Unit of transmission for X.25 PLP level.

```
| 0(0)            | 1(1)       | 2(2)            | 3(3)            |
|   PKTBYTE0  *   |  PKTBYTE1  |   PKTBYTE2   *  |   PKTBYTE3   *  |
| (PKTGFIGN)      |            |                 |                 |
|        |        |    LCN     |   Packet type   |  Control info   |
| GFID   |  LCGN  |            |    identifier   |     or data     |
|----------------+------------+-----------------+-----------------|
| 4(4)            |                                               |
|   PKTBYTE4  *   |                                               |
|                 |           Control information                 |
| Control info    |                                               |
|    or data      |                     or                        |
|-----------------+                                               |
|                               data                              |
|                                                                 |
|                                                                 |
|                                                                 |
|                                                                 |
```

* Indicates a byte expansion follows

Byte Expansions


```
| Offset/Name |Bit Pattern| Contents                               |
|-------------+-----------+----------------------------------------|
| 0(0)        |           | General format ID byte                 |
| PKTBYTE0    |           |                                        |
| PKTGFIGN    |           |                                        |
|             | 1... .... | Qualified packet (Q-bit)               |
|             | .1.. .... | Delivery bit (D-bit)                   |
|             | ..10 .... | Modulo 128                             |
|             | ..01 .... | Modulo 8                               |
|             | .... xxxx | Logical channel group number (LCGN)    |
```

PKT

Offset/Name	Bit Pattern	Contents
2(2) PKTBYTE2		Packet type identifier
	0	Data packet
	1	Control packet
		1) Data packets
		− Modulo 8
	xxx.	P(R)
	...1	More data bit (MDB)
	.... xxx.	P(S)
		− Modulo 128
	xxxx xxx.	P(S)
		2) Control packets
	X'0B'	Call request or incoming call
	X'0F'	Call accepted or call connected
	X'13'	Clear request or clear indication
	X'17'	DTE or DCE clear confirmation
	X'1B'	Reset request or reset indication
	X'1F'	DTE or DCE reset confirmation
	X'23'	DTE or DCE interrupt
	X'27'	DTE or DCE interrupt confirmation
	X'93'	Internal clear indication
	X'9B'	Internal reset indication
	X'F1'	DCE diagnostic packet
	X'FB'	Restart request or restart indication
	X'FF'	DTE or DCE restart confirmation
	0000 0001	RR modulo 8 (byte 2/2)
	0000 0101	RNR modulo 8 (byte 2/2)
	0000 0001	RR modulo 128 (byte 2/2)
	0000 0101	RNR modulo 128 (byte 2/2)

Offset/Name	Bit Pattern	Contents
3(3) PKTBYTE3		Cause byte (Control packets) First data byte (modulo 8) P(R) (data and rr/rnr pkts modulo 128)
		1) Data and RR/RNR packets
		- Modulo 128
	xxxx xxx.	P(R)
	1	More Data Bit
		- Modulo 8
		First data byte
		2) Control packets
		- Clear cause byte
	X'00'	DTE clearing
	X'01'	Call collision (busy)
	X'03'	Invalid call
	X'05'	Incident on the network
	X'09'	Out of order
	X'0B'	Access barred
	X'0D'	Unknown number
	X'11'	Remote procedure error
	X'13'	Local procedure error
	X'19'	Reverse charging refused by remote DTE
	X'21'	End of out of order condition
		- Reset cause byte
	X'00'	DTE resetting
	X'00'	End of out of order condition (TRANSPAC)
	X'01'	Out of order
	X'03'	Remote procedure error
	X'05'	Local procedure error
	X'07'	Incidents on the network
	X'09'	End of out of order condition
	X'0F'	End of incidents on the network
		- Restart cause byte
	X'00'	DTE restart
	X'01'	Local procedure error
	X'05'	End of out of order condition
	X'07'	End of incidents on the network

PKT

Offset/Name	Bit Pattern	Contents
4(4) PKTBYTE4		Diagnostic byte (control packets)
	X'FF'	– Internal clear or reset DCE restart
		– See Appendix B

LU SIMULATOR CONTROL BLOCK (SLUB)

Program : X.25 NPSI
Size in bytes : 38 for MCH-LU
              38 (26) for a VC-LU
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to SLUB: MKBXWAP or VCBEUWXP
Function: Control block for the SNA Logical Unit Type 1 Simulator
on a MCH-LU or a VC-LU working in LLC0, 4 or 5.

0(0)				
LSCUBAD Pointer to CUB				
4(4) LSSBID Block identifier 'SL'			6(6) LSSENSE Sense codes	
8(8) LSFMTH0 FMD TH byte 0	9(9) LSFMTH1 FMD TH byte 1	10(A) LSFMRH0 FMD RH byte 0	11(B) LSFMRH1 FMD RH byte 1	
12(C) LSFMRH2 FMD RH byte 2	13(D) LSFMRU0 FMD RU byte 0	14(E) LSSDTH0 SC/DFC TH byte 0	15(F) LSSDTH1 SC/DFC TH byte 1	
16(10) LSSDRH0 SC/DFC RH byte 0	17(11) LSSDRH1 SC/DFC RH byte 1	18(12) LSSDRH2 SC/DFC RH byte 2	19(13) LSSDRU0 SC/DFC RU byte 0	
20(14) LSERRU1 EXC REQ RU byte1	21(15) LSERRU2 EXC REQ RU byte2	22(16) LSERRU3 EXC REQ RU byte3	23(17) LSERRU4 EXC REQ RU byte4	

SLUB

24(18)	25(19)	26(1A)	27(1B)
LSRPQB0 *	LSRPQB1 *	LSMISF0 *	LSMISF1 *
PRPQ inter. 1/2	PRPQ inter. 2/2	Misc. flags 1/2	Misc. flags 2/2
28(1C)	29(1D)	30(1E)	31(1F)
LSACTU0 *	LSACTU1 *	LSTEMP0	LSTEMP1
Actual state 1/2	Actual state 2/2	Temp. state 1/2	Temp. state 2/2
32(20)	33(21)	34(22)	35(23)
	LSXIDBL	LSPKBYSA	Reserved
LSEXPUTY	ID block	Inter pkt s/a	
	LSXIDNU ID number		
PU type			
36(24)	37(25)	38(26)	
LSDATGFG	Reserved	LSGPLUNA	
DATE/MCH states		PLU name (GATE)	
		Restart buffer address s/a (DATE)	
		46(2C)	
		LSGSUBAT	
		Subaddressing table (GATE)	

* Indicates a byte expansion follows

Byte Expansions

Offset/Name	Bit Pattern	Contents
24(18)		Interface byte 0
LSRPQB0		
	1...	Response pending
	.1..	Negative response received
	..1.	Data rejected
	...1	Purge mode
	.... 1...	Cancel pending or requested
	.... .1..	Signal pending or requested
	.... ..1.	Shutc pending or requested
	1	Lustat pending or requested
25(19)		Interface byte 1
LSRPQB1		
	1...	Contention detected
	.1..	Logoff of PIU to be sent to SSCP
	..1.	Last segment to transmit
	...1	Last chain field to transmit
	.... 1...	DFC/SC request or response
	.... 0...	FMD request or response
	1111 1xxx	Internal error codes
		- for LUSRCV
	1	Error : Data response pending
	.... ..1.	Error : Control response pending
	11	Error : Unexpected response received
		- for LUSREQ
	1	No SSCP-SLU session
	.... ..1.	No PLU-SLU session
	11	SLU in receive or FME wait state
	.... .1..	Shutc entered state
	.... .1.1	Error : Wait for DFC response
	.... .11.	Error : No DFC request pending
	.... .111	Error : Begin bracket pending
		- for LUSRSP
	1	Response not pending

SLUB

Offset/Name	Bit Pattern	Contents
26(1A) LSMISF0		Miscellaneous byte 0
	1...	DFC response wait
	.1..	In segment state
	..1.	First segment transmitted
	...1	Shutc queued
	.... 1...	Bind parameter : No bracket allowed
	.... .1..	Bind parameter : EB from SLU allowed
	.... ..1.	Bind parameter : HDX-FF mode
	1	Bind parameter : Exception response mode
27(1B) LSMISF1		Miscellaneous byte 1
	1...	Data response pending
	.1..	Control response pending
	..1.	CD bit sent
	...1	PIU destined to SSCP (logon-logoff)
	.... 1...	End of send state
	.... .1..	End of FME WAIT state
	.... ..1.	Signal command received
	1	Last chain field transmitted
28(1C) LSACTU0		Actual state flags byte 0
	1...	In bracket state
	.1..	Shutc entered
	..1.	Begin bracket pending
	..1.	Unibracket terminal
	...1	EB received while in bracket
	.... 1...	BB received while between bracket
	.... .1..	Wait FME from terminal
	.... ..1.	Last chain field transmitted
	1	PLU-SLU session established

Offset/Name	Bit Pattern	Contents
29(1D) LSACTU1		Actual state flags byte 1
	1...	Wait SDT
	.1..	SSCP-SLU session established
	..1.	End of receive state
	xx	HDX states
	00	Stand-by State
	01	Receive State
	10	Send State
	11	FME Wait State (from Host)
36(24) LSDATGFG		DATE flag byte
	1...	Restart interlock on contact
	.1..	Restart buffer address saved in SLPLUNA

VCB

VIRTUAL CIRCUIT BLOCK (VCB)

Program: X.25 NPSI
Size in bytes: 204 (CC)
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to VCB: VCBATVCB
Function : Control block for a virtual circuit

0(0) VCBBID Block identifier 'VC'		2(2) VCBXIDDF Default XID for switched	
4(4) VCBVUAP Pointer to VUACB		6(6) .... VCBVCN .... VCBLCGN Channel group	7(7) VCBLCN Channel number
8(8) VCBEPST ☆ PLP status	9(9) VCBEEST ☆ LLC status	10(A) VCBEGST1 ☆	11(B) VCBLLCTY ☆ LLC mask
12(C) .... VCBRVCTO	VCBVCBTE Pointer to corresponding VCBAT entry		
16(10) .... VCBTYPE ☆ VC type	VCBLKBP Pointer to LKB		
20(14) .... VCBNETID Network Identif.	VCBMKBP Pointer to MKB		

VCB

24(18)			
....	VCBEUWXP		
VCBRVCCT	Pointer to SLUB for LLC 0, 4, 5		

28(1C)	29(1D)	30(1E)	31(1F)
VCBEUID ✮	VCBEUIX ✮	VCBDCPTI	VCBDUFTI
LLC identifier	LLCT index	VCCPT index	OUFT INDEX

32(20)			
....	VCBCPTP		
VCBCCPTI	Pointer to VCCPT (Sysgen)		
Current index			

32(20)	33(21)	34(22)	
VCBCCPTI	VCBWIND	VCBPKTSZ	
Current index	PLP window	Packet size	

36(24)	37(25)	38(26)	39(27)
VCBTHIUW	VCBPSXPT	VCBOTHLW	VCBPSXMT
Upper window	Expected P(S)	Upper window	Next xmit P(S)

40(28)	41(29)	42(2A)	43(3B)
VCBMMASK ✮	VCBIPSQC	VCBRECB0 ✮	VCBRECB1 ✮
Modulo mask	Input pkt count	Recms byte 0	Recms byte 1

44(2C)	45(2D)	46(2E)	47(2F)
VCBRECB2 ✮	VCBRECB3 ✮	VCBRECB4 ✮	VCBRECB5 ✮
Recms byte 2	Recms byte 3	Recms byte 4	Recms byte 5

48(30)		50(32)	
VCBISLUN		VCBISLDA	
Safe/unsafe threshold		Unsafe/danger threshold	

52(34)	53(35)	54(36)	55(37)
VCBVCM0 ✮	VCBVCM1 ✮	VCBSSCP	VCBEGST ✮
		Action byte	

56(38)		58(3A)	59(3B)
VCBGDRF		VCBGDW2	VCBGDW3
Reference for Call-out		Code of last	Code of last
		received pkt	sent pkt

```
┌─────────────────┬──────────────┬──────────────┬──────────────────┐
│ 60(3C)          │              VCBEUW0                            │
│                 │   Reserved for any LLC except PSH               │
│                 │              VCBPSWQH                            │
│                 │         PSH work queue head                     │
├─────────────────┼──────────────┼──────────────┼──────────────────┤
│ 64(40)          │ 65(41)   E/U │ 66(42)   E/U │ 67(43)      E/U  │
│                 │              │              │                  │
│   VCBEUW10   *  │  VCBEUW11  * │  VCBEUW12  * │  VCBEUW13   *    │
├─────────────────┴──────────────┴──────────────┴──────────────────┤
│ 68(44)                                                           │
│...............           VCBPSWQT                                │
│                       PSH work queue tail                        │
│   VCBEUW20      ├──────────────┬──────────────┬──────────────────┤
│                 │  VCBEUW21    │  VCBEUW22    │   VCBEUW23       │
├─────────────────┴──────────────┴──────────────┴──────────────────┤
│ 72(48)                                                           │
│                         VCBQCB1                                  │
│                         PLP-IN QCB                               │
├─────────────────────────────────────────────────────────────────┤
│ 96(60)                                                           │
│                         VCBECB1                                  │
│                         PLP timer                               │
├─────────────────────────────────────────────────────────────────┤
│ 108(6C)                                                          │
│                         VCBQCB2                                  │
│                         VCM-OUT QCB                              │
├─────────────────────────────────────────────────────────────────┤
│ 132(84)                                                          │
│                         VCBECB2                                  │
│                         VCM-OUT timer                            │
└─────────────────────────────────────────────────────────────────┘
```

VCB

```
┌─────────────┬──────────────┬──────────────┬──────────────┬───────────────┐
│ 144(90)     │              │              │              │               │
│             │              VCBQCB3        │              │               │
│             │              LLC-OUT QCB    │              │               │
├─────────────┼──────────────┼──────────────┼──────────────┼───────────────┤
│ 168(A8)     │              │              │              │               │
│             │              VCBECB3        │              │               │
│             │              LLC-OUT timer  │              │               │
├─────────────┼──────────────┼──────────────┼──────────────┼───────────────┤
│ 180(B4)     │              │              │              │               │
│             │              VCBQCB4        │              │               │
│             │          PLP-IN accumulation QCB           │               │
└─────────────┴──────────────┴──────────────┴──────────────┴───────────────┘
```

* Indicates a byte expansion follows

Byte Expansions

```
┌──────────────┬─────────────┬──────────────────────────────────────────────┐
│ Offset/Name  │ Bit Pattern │ Contents                                     │
├──────────────┼─────────────┼──────────────────────────────────────────────┤
│ 8(8)         │             │ PLP state of a virtual circuit               │
│ VCBEPST      │             │                                              │
│              │ 1... ....   │ DTE window closed                            │
│              │ .1.. ....   │ RNR received                                 │
│              │ ..1. ....   │ Inbound accumulation in progress             │
│              │ ...1 ....   │ PLP-IN locked for data packets (PCNE)        │
│              │ .... 1...   │ RR/RNR delayed due to D-bit                  │
│              │ .... .1..   │ Outbound segmenting in progress              │
│              │ .... ..1.   │ Outbound task waits for ack to D-bit pkt     │
└──────────────┴─────────────┴──────────────────────────────────────────────┘
```

Offset/Name	Bit Pattern	Contents
9(9) VCBEEST		LLC state of a virtual circuit
	1...	LLC timer running
	.1..	LLC-OUT waits for triggering
	..1.	LLC-IN timer elapsed
	...1	RR/RNR to be sent
	.... 1...	LLC-OUT must sysxit with 'trigger=yes'
	.... .1..	D-bit not allowed
10(A) VCBEGST1		GATE/DATE flags and status
	1...	PLP-IN locked between logon and SDT
11(B) VCBLLCTY		Types of LLCs allowed on this VC
	1...	LLC 0 i.e. PCNE
	..1.	LLC 2 i.e. PSH
	.... 1...	LLC-4 i.e. GATE
	.... .1..	LLC-5 i.e. PAD
16(10) VCBTYPE		Type of virtual circuit
	:	Switched virtual circuit
	:	Permanent virtual circuit
	: ...	INN line
	: ...	BNN line
	..1.	Module 128
	..0.	Module 8
	...1	Virtual call available for call-in
	...0	Virtual call not available for call-in
	.... 1...	Virtual call available for call-out
	.... 0...	Virtual call not available for call-out
28 (1C) VCBLLCID		LLC in use See VCBLLCTY 11(B) for bit definition
29(1D) VCBELIX		Index of end-user protocol in LLC table
	0000 0000	Index for LLC 0
	0001 0000	Index for LLC 2
	0001 1000	Index for LLC 3
	0010 0000	Index for LLC 4
	0010 1000	Index for LLC 5

VCB

Offset Name	Bit Pattern	Contents
(28) VCBNMASK	0111 1111 0000 0111	Module mask Mask for modulo 128 Mask for modulo 8
42 (2A) VCBRECB0		SEE APPENDIX B
43 (2B) VCBRECB1		SEE APPENDIX B
44 (2C) VCBRECB2		SEE APPENDIX B
45 (2D) VCBRECB3		SEE APPENDIX B
46 (2E) VCBRECB4		SEE APPENDIX B
47 (2F) VCBRECB5		SEE ADDENDIX B
52(34) VCBVCM0	.1.. .... 1000 .... 0100 .... 0010 0001	VCM state of a virtual circuit Inhibit transmit SARM P6 i.e. DTE clear request in progress P4 i.e. data transfer Call request in progress DTE reset request in progress
53(35) VCBVCM1	1... .... ..1. ....1	VCM flag byte VCB reserved Delayed processing Network error in progress

Offset/Name	Bit Pattern	Contents
55(37) VCBEGST		GATE/DATE flags and status (1/2)
	1...	First path in VCM for a call-in
	.1..	Second path in VCM for a call-in
	..1.	Call invalid (detected by VCM)
	...1	Clear/reset already send by the GATE
	.... 1...	VCB reserved by the GATE/DATE
	.... .1..	Invalid P(R) or P(S) (detected by PLPIN)
	.... ..1.	Logon gen'd and enqued by the GATE/DATE
	1	Contact pending after inhibit transmit
64 (40) VCBEUW10	....	PSH Command Retry Count

VCB

Offset/Name	Bit Pattern	Contents
65(41) VCBEUW11		LLC dependent flags
		- PCNE and PSH
	1...	Link level 2 test active
		- PCNE
	.1..	Shutc pending
	..1.	RR pending (D-bit)
	.... 1...	Inbound purge mode
		- PSH
	1...	Data transfer
	.1..	Wait for XID
	..1.	Wait for PSCONTACT
	...1	Wait for PSDISCONTACT
	.... 1...	Outbound segmenting in progress
	.... .1..	Inbound segmenting in progress
66(42) VCBEUW12		LLC dependent flags
		- PSH
	1...	Inbound sequence number
		- PAD
	1...	Invitation to clear pending
	.1..	Clear already sent
	..1.	Q-packet to send (Integrated PAD)
	...1	PIU re-enqued (Integrated PAD)
67 (43) VCBEUW13	....	PSH Outbound Sequence Number

VIRTUAL CIRCUIT BLOCK ADDRESS TABLE (VCBAT)

Program : X.25 NPSI
Size in bytes : Variable depending upon the number of entries,
each entry is 12 bytes long.
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to VCBAT : VCGVCBAT in VCGAT, VCBVCBTE field in VCB
Function : Correspondence table between a V.C. Number
          and its Control Blocks.

```
┌─────────────────┬─────────────┬─────────────┬───────────────────────┐
│ -8(-8)          │             │             │                       │
│..............   │        Block Service Order Table                  │
│   Reserved      │             │             │                       │
├─────────────────┼─────────────┴─────────────┴───────────────────────┤
│ -4(-4)          │ -2(-2)      │                                     │
│     Block identifier          │          Number of Entries          │
│          'VN'                 │                                     │
├─────────────────┬─────────────┬─────────────┬───────────────────────┤
│ 0(0)            │ 1(1)        │ 2(2)        │ 3(3)                  │
│   VCBATGFG  *   │  VCBATFLG  *│   VCBATUID * │    Reserved          │
│   Sysgen flags  │  PLP flags  │   User ID   │                       │
├─────────────────┼─────────────┴─────────────┴───────────────────────┤
│ 4(4)            │                                                   │
│..............   │              VCBATVCB                             │
│   VCBATDOF      │            Pointer to VCB                         │
│   Buffer Offset │                                                   │
├─────────────────┼─────────────┬─────────────┬───────────────────────┤
│ 8(8)            │             │             │                       │
│..............   │              VCBATCUB                             │
│   Reserved      │          Pointer to SCB/CUB                       │
│                 │             │             │                       │
└─────────────────┴─────────────┴─────────────┴───────────────────────┘
```

* Indicates a byte expansion follows

VCBAT

Byte Expansions

Offset/Name	Bit Pattern	Contents
0(0) VCBATGFG		Generation flags
	1...	Last entry for the MCH
	.1..	Last entry for the group
	..1.	PVC
	...1	SVC
	..00	No VCB generated at this entry
	.... 1...	INN
	.... .1..	VC active
	.... ..1.	SVC allocated by Contention Processor
1(1) VCBATFLG		PLP Flag Byte
	1...	Ack requested
	.1..	RNR to be sent
	..1.	Unsafe situation
	...1	Danger situation
2(2) VCBATUID		Enduser Protocol Identifier
	1...	LLC0
	..1.	LLC2
	.... 1...	LLC4
	.... .1..	LLC5

VIRTUAL CIRCUIT CONNECTION PARAMETER TABLE (VCCPT)

Program : X.25 NPSI
Size in bytes : Variable depending upon the number of entries, each entry
being 14 byte long
Created by: X.25 NPSI generation
Located in: $SRCHI
Pointer to VCCPT: VCCPTITP
Function: Contains parameters used for XVC management

0(0) VPTBID Block identifier 'PT'	2(2) VPTINDX Indx in VCCPTIT	3(3) RESERVED
4(4) VPTPKTSZ Packet Size to be used	6(6) RESERVED	7(7) VPTWIND Packet Window
8(8) RESERVED	10(A) VPTISLUN * Safe/Unsafe Threshold	
12(C) VPTISLDA * Unsafe/Danger Threshold		

* Set at sysgen time as a percentage of NCP slowdown threshold,
and reset at initialization time as a number of buffers

VCCPTIT

VCCPT INDEX TABLE (VCCPTIT)

Program : X.25 NPSI
Size in bytes : Variable depending upon the number of entries,
one entry being 4 bytes long
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to VCCPTIT : MKBVCCTP
Function : Correspondence table between an index and
            an entry into the VCCPT.

```
┌────────────────┬──────────────┬─────────────────┬───────────────────────────┐
│ -8(-8)         │              │                 │                           │
│................│  Block Service Order Table                                 │
│  Network ID    │              │                 │                           │
├────────────────┼──────────────┼─────────────────┼───────────────────────────┤
│ -4(-4)         │              │ -2(-2)          │                           │
│          Block identifier     │             Number of Entries               │
│              'PI'             │                 │                           │
├────────────────┼──────────────┼─────────────────┼───────────────────────────┤
│ 0(0)           │              │                 │                           │
│................│             VCCPTITP                                       │
│   VCCPTITF  *  │        Pointer to VCCPT entry                              │
└────────────────┴──────────────┴─────────────────┴───────────────────────────┘
```

* Indicates a byte expansion follows

Byte Expansions

```
┌──────────────────┬────────────┬────────────────────────────────────────────┐
│ Offset/Name      │Bit Pattern │ Contents                                    │
├──────────────────┼────────────┼────────────────────────────────────────────┤
│ 0(0)             │            │ Generation Flags                            │
│ VCCPTITF         │            │                                             │
│                  │ 1... ....  │ Last Entry                                  │
└──────────────────┴────────────┴────────────────────────────────────────────┘
```

VCCPTIT

VIRTUAL CIRCUIT GROUP ADDRESS TABLE (VCGAT)

```
Program : X.25 NPSI
Size in bytes : Variable depending upon the number of entries,
               one entry being 8 bytes long.
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to VCGAT : MKBVCGTP
Function : Correspondence table between a L.C. group and its
          dependent Logical channels.
```

```
┌──────────────────┬──────────────┬──────────────────┬──────────────────┐
│ -8(-8)           │              │                  │                  │
│ ................ │       Block Service Order Table                     │
│   RESERVED       │              │                  │                  │
│                  │              │                  │                  │
├──────────────────┼──────────────┼──────────────────┼──────────────────┤
│ -4(-4)           │              │ -2(-2)           │                  │
│        Block identifier         │           Number of Entries         │
│             'VG'                │               in VCGAT              │
│                  │              │                  │                  │
├──────────────────┼──────────────┼──────────────────┴──────────────────┤
│ 0(0)             │ 1(1)         │ 2(2)                                 │
│   VCGATGFG  *    │              │               VCGVCBTN               │
│  Sysgen Flags    │   Reserved   │     Number of entries in VCBAT       │
│                  │              │                  │                  │
├──────────────────┼──────────────┴──────────────────┴──────────────────┤
│ 4(4)             │                                                     │
│ ................ │                   VCGVCBAT                          │
│    Reserved      │               Pointer to VCBAT                     │
│                  │              │                  │                  │
└──────────────────┴──────────────┴──────────────────┴──────────────────┘
```

* Indicates a byte expansion follows

Byte Expansion

```
┌──────────────────┬──────────────┬─────────────────────────────────────┐
│ Offset/Name      │ Bit Pattern  │ Contents                            │
├──────────────────┼──────────────┼─────────────────────────────────────┤
│ 0(0)             │              │ Generation Flags                    │
│ VCGATGFG         │              │                                     │
│                  │ 1... ....    │ Last Entry                          │
└──────────────────┴──────────────┴─────────────────────────────────────┘
```

VCGAT

VIRTUAL CIRCUIT USER ADAPTER CONTROL BLOCK (VUACB)

Program : X.25 NPSI
Size in bytes : 108(6C)
Created by : X.25 NPSI generation
Located in: $SRCLO
Pointer to VUACB : LKBACBP and VCBVUAP
Function: UACB for Virtual Circuit

```
┌─────────────┬──────────────┬──────────────┬──────────────────┐
│  0(0)       │              │              │                  │
│             │                                                 │
│                        LXB compatibility                     │
│                                                              │
│                                                              │
├─────────────┼──────────────┼──────────────┼──────────────────┤
│ 24(18)      │              │              │                  │
│..............│              VUALKBP                          │
│ LXB compatib.│           Pointer to LKB                      │
├─────────────┼──────────────┼──────────────┼──────────────────┤
│ 28(1C)      │              │              │                  │
│                        LXB compatibility                     │
│                                                              │
│                                                              │
├─────────────┼──────────────┼──────────────┼──────────────────┤
│ 36(24)      │              │              │                  │
│                           Reserved                           │
│                                                              │
├─────────────┼──────────────┼──────────────┼──────────────────┤
│ 40(28)      │              │ 42(2A)       │                  │
│          VUATACB           │            VUATWORK             │
│ Chain of ACBs on timer queue│       Work field for timer     │
│      (CCB compatibility)   │       (CCB compatibility)       │
├─────────────┼──────────────┼──────────────┼──────────────────┤
│ 44(2C)      │              │ 46(2E)       │                  │
│          VUALINK           │            VUATIME              │
│  Pointer to chained UACB   │       Work field for timer      │
│      (CCB compatibility)   │       (CCB compatibility)       │
└─────────────┴──────────────┴──────────────┴──────────────────┘
```

VUACB

```
+----------------------------------+----------------------------------+
| 48(30)                           | 50(32)                           |
|              VUABAR              |             VUANAST              |
|     Physical interface address   |          NAS timer field         |
|        (CCB compatibility)       |                                  |
+----------------------------------+----------------------------------+
| 52(34)                           |                                  |
|..................|       VUAVCBP                                    |
|     VUAMDB       |          Pointer to VCB                          |
|                  |                                                  |
+------------------+-----------------+---------------+----------------+
| 56(38)                                                             |
|                        VUBUFCHN                                    |
|                     Buffer chaining                                |
|                                                                    |
+-----------------------------------+---------------+----------------+
| 60(3C)                            | 62(3E)        | 63(3F)         |
|                                   |   VUOFFSET    |   VUDATCNT     |
|             Reserved              |  Data offset  |  Data count    |
|                                   |               |                |
+-----------------------------------+---------------+----------------+
| 64(40)                                                             |
|                        VUAECHN                                     |
|                     Message chaining                               |
|                                                                    |
+------------------+----------------------------------+--------------+
| 68(44)           | 69(45)                                          |
|   VUACSTAT       |             Reserved                            |
|  Priority field  |                                                 |
|                  |                                                 |
+------------------+-------------------------------------------------+
```

72(48) VUAPKTH0 PH byte 0	73(49) VUAPKTH1 PH byte 1	74(4A) VUAPKTH2 PH byte 2	75(4B) VUAPKTH3 PH byte 3
76(4C) Reserved			
80(50) VUABID VUACB identifier 'VU'		82(52) Reserved	
84(54) Reserved			
(5C) CCB compatibility (CCBLATO)		94(5E) Reserved	
96(60) .... (CCBCPCMD)	CCB compatibility (CCBPOLL) SOT entry being polled		
100(64) .... (CCBCPOLL)	CCB compatibility (CCBSEL) SOT entry being selected		
104(68) VUACODE Flags for NEO compatibility	105(69) VUAUACB	106(6A) VUAGCBP NEO structure : Pointer to GCB	

VUACB

MCH USER ADAPTER CONTROL BLOCK EXTENSION (XUACB)

```
Program : X.25 NPSI
Size in bytes : 48
Created by : X.25 NPSI generation
Located in: $SRCHI
Pointer to XUA: MUAXUABP
Function: Extension to MUACB
```

0(0) Reserved	XUAPBUF Pseudo buffer for LAP level 2		
4(4) Reserved		6(6) XUAOFSET Offset to data	7(7) XUADTCNT Data count
8(8) XUADATA Packet byte 0	9(9) Packet byte 1	10(A) Packet byte 2	11(B) Packet byte 3
12(C) Packet byte 4	13(D) Packet byte 5	14(E) Packet byte 6	15(F) Packet byte 7
16(10) Packet byte 8	XUAL2 Address of level 2 user routine		
20(14) XUADATE ☆ DATE flags	XUALIQFP (X side) Pointer to first LIQ to be filled XUASVCGT (R side) Current address of VCGAT		

XUACB

24(18)		XUAVCGMP	
. . . .			
Reserved		Pointer to VCGAT -2 block	
28(1C) XUAADRSS		30(1E) XUABID	
XUAA3705	XUAADCE		
DTE address	DCE address	UACB extension identifier 'XU'	
32(20) XUAIN44		34(22) XUAIN45	
Save area for Input X'44'		Save area for Input X'45'	
36(24) XUAIN47		38(26) XUAIN48	
Save area for Input X'47'		Save area for Input X'48'	
40(28) XUAIN49		42(2A) XUAIN4E	
Save area for Input X'49'		Save area for Input X'4E'	
44(2C) XUAIN4F		46(2E) XUAIN4B	47(2F)
		Save area for	
Save area for Input X'4F'		Input X'4B'	Reserved

* indicates a byte expansion follows

Byte Expansion

Offset/Name	Bit Pattern	Contents
20(14)		Date Flags
XUADATE		
	1...	Link set-up flag

CHAPTER 7. X.25 NPSI RELEASE 3 DATA AREAS

Only those blocks which are changed in Release 3 are included in this section.

MUA is longer and has a new pointer at offset 108(6C): MUAAXBP

VCB has the same length and definition of fields is the same, only new flags definition is added for QLLC and VR hold in fields VCBEEST, VCBEUW12, VCBEUW13, VCBEUW23.

VCBAT is the same as in release 2, only a new flag is defined: VCBATFL2 at offset 3.

VUA is longer and has a new pointer at offset 108(6C): VUAAXBP

USER ADAPTER CONTROL BLOCK FOR A MCH LINK (MUACB)

Program : X.25 NPSI
Size in bytes : 128(80)
Created by : X.25 NPSI generation
Located in : $SRCLO
Pointer to MUACB : LKBACBP field in LKB and MKBXMUAP or MKBRMUAP
                   fields in MKB.
Function : ACB for a multichannel link

```
┌──────────────┬─────────────┬──────────────┬───────────────────┐
│ 0(0)                                                           │
│                         LXB compatibility                     │
│                                                               │
├──────────────┼─────────────┼──────────────┼───────────────────┤
│ 24(18)                                                         │
│................      MUALKBP                                   │
│ LXB compatib. │       Pointer to LKB                          │
├──────────────┴─────────────┴──────────────┴───────────────────┤
│ 28(1C)                                                         │
│                         LXB compatibility                     │
│                                                               │
├──────────────┬───────────────────────────────────────────────┤
│ 36(24)       │ 38(26)                                         │
│    MUAGCBL2  │                 MUASTATE        ☆              │
│              │                 (CCBSTATE)                     │
│  Level 2 NAS entry point │  Rcv/Xmit Status for line trace    │
├──────────────┼───────────────────────────────────────────────┤
│ 40(28)       │ 42(2A)                                         │
│    MUATACB   │                 MUATWORK                       │
│    (CCBTACB) │                 (CCBTWORK)                     │
│ Ptr to next ACB in timer chain │ Timer work entry for this ACB │
├──────────────┼───────────────────────────────────────────────┤
│ 44(2C)       │ 46(2E)                                         │
│    MUALINK   │                 MUATIME                        │
│    (CCBLINK) │                 (CCBTIME)                      │
│ Ptr to next ACB in L2/L3 chain │   Timeout interface          │
└──────────────┴───────────────────────────────────────────────┘
```

```
+-------------------------------+-----------------------------------------------+
| 48(30)          |             | 50(32)                                        |
|            MUABAR             |                  MUABCC                        |
|           (CCBBAR)            |                 (CCBBCC)                       |
|     Line interface address    |       Frame check sequence (CSB2)             |
+-------------------------------+-----------------------------------------------+
| 52(34)                        | 54(36)                                        |
|         MUAEND1       *        |.......... NUACNTS ...........                 |
|     Interface level 2/3       |    MUACHAR      |     MUACUT                   |
|                               | Character count | Cutoff value                |
+-------------------+-----------+-----------------+-----------------------------+
| 56(38)            |                                                           |
|................   |                   MUAMKBP                                 |
|   MUACHARS        |              Pointer to MKB                               |
| Buffer space      |                                                           |
+-------------------+-----------------------------------------------------------+
| 60(3C)            |                                                           |
|................   |                   MUADATA                                 |
|   Reserved        |      Address of current sent or received byte             |
+-------------------+-----------------------------------------------------------+
| 64(40)            |                                                           |
|................   |                   MUASTART                                |
|   MUAFLAGS        |                  (CCBSTART)                                |
|   (CCBFLAGS)      |            Current buffer address                          |
+-------------------+-----------------------------------------------------------+
| 68(44)            |                                                           |
|................   |                   MUAXUABP                                |
|   MUAERC          |           Pointer to UACB extension                       |
| Lvl2 retry cnt    |                                                           |
+-------------------+-----------------------------------------------------------+
| 72(48)            |                                                           |
|................   |                   MUAHDBUF                                |
|   MUABUFCT        |     Address of first buffer of a block                    |
| Cutoff value      |                                                           |
+-------------------+-----------------------------------------------------------+
| 76(4C)            |                                                           |
|                                   Reserved                                    |
|                                                                               |
+-------------------+-----------------------+-----------------------------------+
| 80(50)            |                       | 82(52)      | 83(53)              |
|            MUABID                         |             |   MUATYPE     *     |
|         MUACB identifier                  |  Reserved   |   (CCBTYPE)         |
|             'MU'                          |             |   Scanner flags     |
+-------------------+-----------------------+-------------+---------------------+
| 84(54)                                                                        |
|                                                                               |
|                                   Reserved                                    |
|                                                                               |
+-------------------------------+---------------+-------------------------------+
```

MUACB

88(58) MUAACFLD		90(5A)	
MUAAFLD (CCBAFLD) Current A-field	MUACFLD (CCBCFLD) Current C-field	Reserved	
92(5C) CCBLATO Reserved for compatibility		94(5E) Reserved	95(5F) MUAOFSET (CCBOFSET) Current offset
96(60) MUAPOLL (CCBPOLL) SOT entry being polled			
MUACPCMD (CCBCPCMD)		98(62) MUARMUAP Pointer to receive UACB (X side)	
100(64) MUASEL (CCBSEL) SOT entry being selected			
MUACPOLL (CCBCPOLL)		102(66) MUAXMUAP Pointer to xmit UACB (R side)	
104(68) MUACODE (CCBTYPEC) NEO structure	105(69) MUAUACB (CCBSETYP) Line trace comp	106(6A) MUAGCBP NEO structure : Pointer to GCB	
108(6C) MUAAXBP Pointer to ACB Extension (AXB)			
112(70) Reserved			
116(74) Reserved			
120(78) Reserved			
124(7C) Reserved			

* Indicates a byte expansion follows

Byte Expansions

Offset/Name	Bit Pattern	Contents
39(27) MUASTATE	Byte 1	Transmit and receive mask
	...1	Transmit
	...0	Receive
52(34) MUAEND1	Byte 0	Level 2/3 interface
	1...	Event on LIQ
	Byte 2	
	1...	Set mode phase
	.1..	Monitor DSR phase
	..1.	Bring-up RTS (CSB3)
	...1	Enabled
	.... 1...	Flag transmitted or received
	.... .1..	Modem check on transmit
83(53) MUATYPE		Flag byte for scanners
	1...	CSB3
	0...	CSB2
	.1..	Full duplex adapter (always 1)
	..1.	Transmit UACB
	..0.	Receive UACB
	01	Primary SDLC link

VCB

VIRTUAL CIRCUIT BLOCK (VCB)

Program : X.25 NPSI
Size in bytes : 204(CE)
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to VCB : VCBATVCB field in VCBAT
Function : Control block for a virtual circuit

0(0) VCBBID Block identifier 'VC'		2(2) VCBXIDDF Default XID for switched	
4(4) VCBVUAP Pointer to VUACB		6(6) .... VCBVCN .... VCBLCGN Channel group	7(7) VCBLCN Channel number
8(8) VCBEPST ☆ PLP status	9(9) VCBEEST ☆ LLC status	10(A) VCBEGST1 ☆	11(B) VCBLLCTY ☆ LLC mask
12(C) .... VCBRVCTO	VCBVCBTE Pointer to corresponding VCBAT entry		
16(10) .... VCBTYPE ☆ VC type	VCBLKBP Pointer to LKB		
20(14) .... VCBNETID Network Identif.	VCBMKBP Pointer to MKB		

VCB

24(18)			
. . . . VCBRVCCT	VCBEUWXP Pointer to SLUB for LLC 0, 4, 5		

28(1C) VCBEUID LLC identifier	29(1D) VCBEUIX ☆ LLCT index	30(1E) VCBDCPTI VCCPT index	31(1F) VCBDUFTI OUFT INDEX

32(20)			
. . . . VCBCCPTI Current index	VCBCPTP Pointer to VCCPT		

32(20) VCBCCPTI Current index	33(21) VCBWIND PLP window	34(22) VCBPKTSZ Packet size	

36(24) VCBTHIUW Upper window	37(25) VCBPSXPT Expected P(S)	38(26) VCBOTHLW Upper window	39(27) VCBPSXMT Next xmit P(S)

40(28) VCBMMASK ☆ Modulo mask	41(29) VCBIPSQC Input pkt count	42(2A) VCBRECB0 ☆ Recms byte 0	43(3B) VCBRECB1 ☆ Recms byte 1

44(2C) VCBRECB2 ☆ Recms byte 2	45(2D) VCBRECB3 ☆ Recms byte 3	46(2E) VCBRECB4 ☆ Recms byte 4	47(2F) VCBRECB5 ☆ Recms byte 5

48(30)		50(32)	
VCBISLUN Safe/unsafe threshold		VCBISLDA Unsafe/danger threshold	

52(34) VCBVCM0 ☆	53(35) VCBVCM1 ☆	54(36) VCBSSCP Action byte	55(37) VCBEGST ☆

56(38)		58(3A) VCBGDW2 Code of last received pkt	59(3B) VCBGDW3 Code of last sent pkt
VCBGDRF Reference for Call-out			

```
+------------------+---------------------------+-------------------+
| 60(3C)           |             VCBEUW0                           |
|................  |   Reserved for any LLC except PSH             |
|   VCBAGING       |             VCBPSWQH                           |
|                  |        PSH work queue head                    |
+------------------+-----------------+---------------+-------------+
| 64(40)           | 65(41)    E/U   | 66(42)   E/U  | 67(43)  E/U |
|                  |                 |               |             |
|   VCBEUW10       |   VCBEUW11  *   |  VCBEUW12  *  |  VCBEUW13 * |
|                  | VCBEUB1   PCNE  | VCBPAD   PAD  |             |
| VCBPSRC    PSH   | VCBPSS1    PSH  | VCBPSSI  PSH  | VCBPSSO PSH |
| VCBQCNTC  QLLC   |                 | VCBQSTA1 QLLC | VCBQSTA2 QLLC|
+------------------+-----------------+---------------+-------------+
| 68(44)           |             VCBPSWQT                          |
|................  |        PSH work queue tail                    |
|   VCBEUW20       |-----------------+---------------+-------------+
|                  | VCBEUW21  *     |   VCBEUW22    |  VCBEUW23 * |
| VCBQSAS   QLLC   |                 | VCBQSAF  QLLC | VCBQFL QLLC |
+------------------+-----------------+---------------+-------------+
| 72(48)           |             VCBQCB1                           |
|                  |             PLP-IN QCB                        |
+------------------+-----------------+---------------+-------------+
| 96(60)           |             VCBECB1                           |
|                  |             PLP timer                         |
+------------------+-----------------+---------------+-------------+
| 108(6C)          |             VCBQCB2                           |
|                  |             VCM-OUT QCB                       |
+------------------+-----------------+---------------+-------------+
| 132(84)          |             VCBECB2                           |
|                  |             VCM-OUT timer                     |
+------------------+-----------------+---------------+-------------+
```

VCB

```
┌─────────────┬───────────────┬───────────────┬───────────────┐
│ 144(90)     │               │               │               │
│                                                             │
│                        VCBQCB3                              │
│                       LLC-OUT QCB                           │'
│                                                             │
├─────────────┼───────────────┼───────────────┼───────────────┤
│ 168(A8)     │               │               │               │
│                                                             │
│                        VCBECB3                              │
│                      LLC-OUT timer                          │
│                                                             │
├─────────────┼───────────────┼───────────────┼───────────────┤
│ 180(B4)     │               │               │               │
│                                                             │
│                        VCBQCB4                              │
│                   PLP-IN accumulation QCB                   │
│                                                             │
└─────────────┴───────────────┴───────────────┴───────────────┘
```

* Indicates a byte expansion follows

Byte Expansions

Offset/Name	Bit Pattern	Contents
8(8)		PLP state of a virtual circuit
VCBEPST		
	1...	DTE window closed
	.1..	RNR received
	..1.	Inbound accumulation in progress
	...1	PLP-IN locked for data packets (PCNE)
	.... 1...	RR/RNR delayed due to D-bit
	.... .1..	Outbound segmenting in progress
	.... ..1.	Outbound task waits for ack to D-bit pkt

Offset/Name	Bit Pattern	Contents
9(9) VCBEEST		LLC state of a virtual circuit
	1...	LLC timer running
	.1..	LLC-OUT waits for triggering
	..1.	LLC-IN timer elapsed
	...1	RR/RNR to be sent
	.... 1...	LLC-OUT must sysxit with 'trigger=yes'
	.... .1..	D-bit not allowed
	.... ..1.	VR Hold on VC (CUB/CBB)
	1	VR Hold on MCH (CUB/CBB)
10(A) VCBEGST1		GATE/DATE flags and status (2/2)
	1...	PLP-IN locked between logon and SDT
11(B) VCBLLCTY		Types of LLCs allowed on this VC
	1...	LLC 0 i.e. PCNE
	..1.	LLC 2 i.e. PSH
	...1	LLC 3 i.e. QLLC
	.... 1...	LLC 4 i.e. GATE
	.... .1..	LLC 5 i.e. PAD
16(10) VCBTYPE		Type of virtual circuit
	1...	Switched virtual circuit
	0...	Permanent virtual circuit
	.1..	INN link
	.0..	BNN link
	..1.	Modulo 128
	..0.	Modulo 8
	...1	Virtual circuit available for call-in
	...0	Virtual circuit not avail. for call-in
	.... 1...	Virtual circuit available for call-out
	.... 0...	Virtual circuit not avail. for call-out

VCB

Offset/Name	Bit Pattern	Contents
29(1D) VCBEUIX		Index of enduser protocol in LLC table
	0000 0000	Index for LLC 0
	0001 0000	Index for LLC 2
	0001 1000	Index for LLC 3
	0010 0000	Index for LLC 4
	0010 1000	Index for LLC 5
40(28) VCBMMASK		Modulo mask
	0111 1111	Mask for modulo 128
	0000 0111	Mask for modulo 8
42 (2A) VCBRECB0		SEE APPENDIX B
43 (2B) VCBRECB1		SEE APPENDIX B
44 (2C) VCBRECB2		SEE APPENDIX B
45 (2D) VCBRECB3		SEE APPENDIX B
46 (2E) VCBRECB4		SEE APPENDIX B
47 (2F) VCBRECB5		SEE APPENDIX B
52 (34) VCBVCM0		VCM state of a virtual circuit
	1...	D2 state entered from P1
	.1..	Inhibit transmit SARM
	 1000	P6 i.e. DTE clear request in progress
	 0100	P4 i.e. data transfer
	 0010	Call request in progress
	 0001	DTE reset request in progress
53(35) VCBVCM1		VCM flag byte
	1...	VCB reserved
	..1.	Delayed processing
	...1	Network error in progress

Offset/Name	Bit Pattern	Contents
55(37) VCBEGST		GATE/DATE flags and status (1/2)
	1...	First path in VCM for a call-in
	.1..	Second path in VCM for a call-in
	..1.	Call invalid (detected by VCM)
	...1	Clear/reset already send by the GATE
	.... 1...	VCB reserved by the GATE/DATE
	.... .1..	Invalid P(R) or P(S) (detected by PLPIN)
	.... ..1.	Logon gen'd and enqued by the GATE/DATE
	1	Contact pending after inhibit transmit

VCB

Offset/Name	Bit Pattern	Contents
65(41) VCBEUW11		LLC dependent flags
		– PCNE and PSH
	1...	Link level 2 test active
		– PCNE
	1...	Interrupt in progress
	.1..	Shutc pending
	..1.	RR pending (D–bit)
	.... 1...	Inbound purge mode
		– PSH
	1...	Data transfer
	.1..	Wait for XID
	..1.	Wait for PSCONTACT
	...1	Wait for PSDISCONTACT
	.... 1...	Outbound segmenting in progress
	.... .1..	Inbound segmenting in progress
66(42) VCBEUW12		LLC dependent flags
		– PSH
	1...	Inbound sequence number
		– QLLC
	1...	Transmit QXID
	.1..	Transmit QSNRM
	..1.	Transmit QUA
	.... 1...	Receive QXID
	.... .1..	Receive QSNRM
	.... ..1.	Receive QUA
		– PAD
	1...	Invitation to clear pending
	.1..	Clear already sent
	..1.	Q-packet to send (Integrated PAD)
	...1	PIU re-enqued (Integrated PAD)
67(43) VCBEUW13		LLC dependent flags
		– QLLC
	1...	Transmit QDISC
	.1..	Transmit QRD
	..1.	Transmit QTEST Request
	...1	Transmit QTEST Response
	.... 1...	Receive QDISC/QRD
	.... ..1.	Receive QTEST RESP

Offset/Name	Bit Pattern	Contents
71(47) VCBEUW23		LLC dependent flags
		- QLLC
	1...	Retry Contact 1 time
	.... 1...	Contact/Discontact Timer elapsed

VCBAT

VIRTUAL CIRCUIT BLOCK ADDRESS TABLE (VCBAT)

Program : X.25 NPSI
Size in bytes : Variable depending upon the number of twelve-byte
entries.
Created by : X.25 NPSI generation
Located in : $SRCHI
Pointer to VCBAT : VCGVCBAT in VCGAT.
Function : Correspondence table between a V.C. Number
          and its Control Blocks.

-8(-8) .... Reserved	Block Service Order Table		
-4(-4) Block identifier 'VN'		-2(-2) Number of Entries	
0(0) VCBATGFG * Sysgen flags	1(1) VCBATFLG * PLP flags	2(2) VCBATUID * User ID	3(3) VCBATFL2 * Flag
4(4) .... VCBATDOF Buffer Offset	VCBATVCB Pointer to VCB		
8(8) .... Reserved	VCBATCUB Pointer to SCB/CUB		

* Indicates a byte expansion follows

VCBAT

Byte Expansions

Offset/Name	Bit Pattern	Contents
0(0) VCBATGFG		Generation flags
	1...	Last entry
	.1..	Last entry for the group
	..1.	PVC
	...1	SVC
	..00	No VCB generated at this entry
	.... 1...	INN
	.... .1..	VC active
	.... ..1.	SVC allocated by Contention Processor
1(1) VCBATFLG		PLP Flag Byte
	1...	Ack requested
	.1..	RNR to be sent
	..1.	Unsafe situation
	...1	Danger situation
2(2) VCBATUID		Enduser Protocol Identifier
	1...	LLC0
	..1.	LLC2
	...1	LLC3
	.... 1...	LLC4
	.... .1..	LLC5
3(3) VCBATFL2		Flag
	1...	XID to be transmitted (QLLC)

VIRTUAL CIRCUIT USER ADAPTER CONTROL BLOCK (VUACB)

```
Program : X.25 NPSI
Size in bytes : 124(7C)
Created by : X.25 NPSI generation
Located in : $SRCLO
Pointer to VUACB : LKBACBP field in LKB and VCBVUAP in VCB
Function : UACB for Virtual Circuit
```

0(0) LXB compatibility		
24(18) .... LXB compatib.	VUALKBP Pointer to LKB	
28(1C) LXB compatibility		
36(24) Reserved		
40(28) VUATACB Chain of ACBs on timer queue (CCB compatibility)	42(2A) VUATWORK Work field for timer (CCB compatibility)	
44(2C) VUALINK Pointer to chained UACB (CCB compatibility)	46(2E) VUATIME Work field for timer (CCB compatibility)	

VUACB

```
+-----------------------------+-----------------------------+
| 48(30)                      | 50(32)                      |
|          VUABAR             |          VUANAST            |
|    Physical interface address |       NAS timer field     |
|       (CCB compatibility)   |                             |
+-----------------------------+-----------------------------+
| 52(34)                                                    |
|................       VUAVCBP                             |
|   VUAMDB     |       Pointer to VCB                       |
|              |                                            |
+-----------------------------+-----------------------------+
| 56(38)                                                    |
|                     VUBUFCHN                              |
|                  Buffer chaining                          |
|                                                           |
+--------------+--------------+-------------+---------------+
| 60(3C)                      | 62(3E)      | 63(3F)        |
|                             | VUOFFSET    | VUDATCNT      |
|          Reserved           | Data offset | Data count    |
|                             |             |               |
+--------------+--------------+-------------+---------------+
| 64(40)                                                    |
|                     VUAECHN                               |
|                 Message chaining                          |
|                                                           |
+--------------+--------------+-------------+---------------+
| 68(44)       | 69(45)                                     |
|  VUACSTAT    |            Reserved                         |
| Priority field |                                          |
|              |                                            |
+--------------+--------------+-------------+---------------+
| 72(48)       | 73(49)       | 74(4A)      | 75(4B)        |
|  VUAPKTH0    |  VUAPKTH1    |  VUAPKTH2   |  VUAPKTH3     |
|  PH byte 0   |  PH byte 1   |  PH byte 2  |  PH byte 3    |
|              |              |             |               |
+--------------+--------------+-------------+---------------+
| 76(4C)                                                    |
|                     Reserved                              |
|                                                           |
|                                                           |
+--------------+--------------+-------------+---------------+
| 80(50)                      | 82(52)                      |
|         VUABID              |          Reserved           |
|     VUACB identifier        |                             |
|         'VU'                |                             |
+-----------------------------+-----------------------------+
```

```
+------------------------------------------------------------------+
| 84(54)                                                           |
|                           Reserved                               |
|                                                                  |
+------------------------------+-----------------------------------+
| 92(5C)                       | 94(5E)                            |
|        CCB compatibility     |            Reserved               |
|            (CCBLATO)         |                                   |
+------------------------------+-----------------------------------+
| 96(60)                                                           |
|................        CCB compatibility                         |
|  (CCBCPCMD)    |          (CCBPOLL)                              |
|                |       SOT entry being polled                    |
+------------------------------------------------------------------+
| 100(64)                                                          |
|................        CCB compatibility                         |
|  (CCBCPOLL)    |          (CCBSEL)                               |
|                |       SOT entry being selected                  |
+--------------+-------------+-------------------------------------+
| 104(68)      | 105(69)     | 106(6A)                             |
|   VUACODE    |  VUAUACB    |            VUAGCBP                   |
| Flags for NEO compatibility | NEO structure : Pointer to GCB     |
+--------------+-------------+-------------------------------------+
| 108(6C)                                                          |
|                           VUAAXBP                                |
|                                                                  |
|              Pointer to ACB extension (AXB)                      |
+------------------------------------------------------------------+
| 112(70)                                                          |
|                           Reserved                               |
|                                                                  |
|                                                                  |
+------------------------------------------------------------------+
| 116(74)                                                          |
|                           Reserved                               |
|                                                                  |
|                                                                  |
+------------------------------------------------------------------+
| 120(78)                                                          |
|                           Reserved                               |
|                                                                  |
|                                                                  |
+------------------------------------------------------------------+
```

CHAPTER 8. EXCEPTION RESPONSE

EXCEPTION RESPONSE

An SNA exception response is generated by the NCP when one of the following occurs:

* The NCP detects an invalid PIU request

* The PIU is valid but the NCP detects an abnormal condition.

To Identify an Exception Response

Exception responses are identified in the RH when the RH1B0 bit 5 is on. The RU is displaced four bytes to the left to make room for sense data. The first two bytes (bytes 0 and 1) of the sense data contain the exception response code. Bytes 2 and 3, which contain user-specified sense information, are not used by the X.25 NPSI.

The exception response code information, used by the X.25 NPSI, is described in the following table.

To Interpret the Exception Response

EXCEPTION RESPONSE CODE	MEANING
X'0001'	Component not available
X'0806'	VC ID received from CTCP is invalid (GATE/PAD)
X'080C'	Activate line trace on reject VC or invalid command from CTCP (GATE/PAD)
X'0813'	Bracket rejected, or BB request received from host on an OIC or LIC request with exception response
X'0817'	XIO unsuccessful (GATE/PAD) MCH inactive
X'081B'	Receiver in transmit
X'081C'	Link level 2 test rejected on a MCH
X'081C'	ACTLU rejected on a MCH
X'081C'	Command from CTCP is temporarily not executable (GATE)
X'0821'	Invalid session operand
X'0850'	Load/dump failed
X'08F3'	Invalid SC/DFC requests
X'08F4'	PCNE error
X'08F5'	Segmenting not supported
X'08F6'	Interrupt confirmation not received
X'08F7'	Interrupt request contention
X'08F8'	DFC request not supported
X'08F9'	SHUTD request not currently allowed
X'1003'	Function not supported
X'2002'	Chaining error
X'2003'	FMD without Begin Bracket or Exception Response requested on OIC during conditional bracket initialization
X'400C'	Bracket not supported
X'8007'	Segment error

CHAPTER 9. INOPERATIVE MESSAGE

Inoperative Message

When the NCP detects an abnormal condition not caused by a request PIU, the NCP generates an inoperative message followed by one or several RECMS.

The destination of an inoperative message is the SSCP. The destination of a RECMS is a data set that belongs to the operating system.

There are two types of inoperative messages for X.25 NPSI:

1. Inoperative Station Message (Inoperative Type = X'01'): reports that the SNA PU resource is no longer available. An explanation of the failure and statistics information (relating to the PU) is contained in the associated RECMS for SNA station errors.

2. Inoperative Link Message (Inoperative Type = X'02'): reports that the SNA link resource is no longer available. An explanation of the failure is contained in the associated RECMS for an SNA link error. Also, for each PU associated with this link, statistics information is sent to the host in a RECMS for SNA statistics.

There are three additional types of inoperative messages for Release 3 only, which apply to the X.25 INN link:

1. Inoperative type X'03': Disconnect (DISC)

2. Inoperative type X'04': Request Disconnect (RD)

3. Inoperative type X'05': Disconnect Mode (DM)

More detailed information about the failure is contained in the associated RECMS for SNA station errors.

To Identify an Inoperative Message

Inoperative messages are "Function Management Data" messages that belong to the "Physical Configuration Services." The format of an INOPERATIVE message is as follows:

```
      TH1     |      RH1      |           RU
              |              |0     1     2    3          5
   /--- /--------|-----|------|----|-----|-----|---------|---
   |  /  /  |     |     |      |    |     |     | Network |
   |  /  /  |     |     |      |X'01'|X'02'|X'81'|         |
   |  /  /  |     |     |      |    |     |     | Address |
   |--- /--/-------|     |      |    |     |     |         |
        |          |                |     |     |
   Byte 0         |          X'01'  Resource Failed
   Bits 1, 2 <----|          X'02'  Link Failed         <----
   B'00'                     X'03'  Disconnect
                             X'04'  Request Disconnect
                             X'05'  Disconnect Mode
```
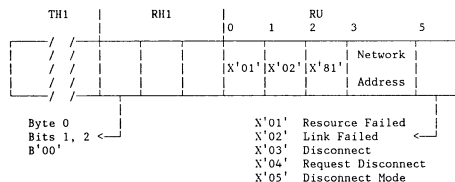
CHAPTER 10. RECORD MAINTENANCE STATISTICS

Record Maintenance Statistics Messages

RECMS messages are "Function Management Data" messages that belong to the "Physical Maintenance Services" and are identified by:

```
                |        RH1        |              RU
            ----|-------------------|------------------------
 ------/  /-----|-----|-----|-------|-----|-----|-----|-----/  /----
 |    / /       |     |     |       |     |     |     |     / /     |
 |    / /       |     |     |X'01'|X'03'|X'81'|     / /     |
 |    / /       |     |     |       |     |     |     |     / /     |
 ------/  /-----|-----|-----|-------|-----|-----|-----|-----/  /----
                |
     Byte 0     |
     Bits 1, 2 <---
     B'00'
```
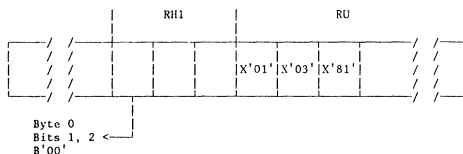
There are three types of Record Maintenance Statistics message for the X.25 NPSI:

1. The RECMS for SNA link errors: Recording mode = X'72'
2. The RECMS for SNA station errors: Recording mode = X'73'
3. The RECMS for SNA statistics: Recording mode = X'76'

The recording mode bytes X'72', X'73', and X'76' are located in the seventh byte of the RU.

Note: If you have not installed one of the following PTFs then the recording mode byte X'82' is used instead of X'72' and the record looks like an SDLC record. Refer only to the hexadecimal portion of the record.

- For ACF/NCP Release 2.1
    - UR03062 (OS Systems)
    - UR03064 (DOS Systems)
- For ACF/NCP Release 3
    - UR03063 (OS Systems)
    - UR03065 (DOS Systems)

```
    TH1    |    RH1    |                      RU
           |           | 0     1     2     3           5
 ┌─/ /──┬─/ /──────────┬─────┬─────┬─────┬─────────────┬──────────┐
 │ / /  │              │     │     │     │Network Addr │ Line     │
 │ / /  │              │X'01'│X'03'│X'81'│of failing   │ Interface├──┐
 │ / /  │              │     │     │     │unit         │ Address  │  │
 └─/ /──┴─/ /──────────┴─────┴─────┴─────┴─────────────┴──────────┘  │
                                                                     │
                         |     7     8     9                         │
                         | ┌─────┬─────────┬─/ /──┐                  │
                         | │     │         │ / /  │                  │
                         └>│     │ X'05'   │ / /  │<─────────────────┘
                         | │     │         │ / /  │
                           └──┬──┴─────────┴─/ /──┘
                              |
                              | Recording Mode byte
                              └>  X'72' = RECMS for SNA link errors
                                  X'73' = RECMS for SNA station errors
                                  X'76' = RECMS for SNA statistics
```
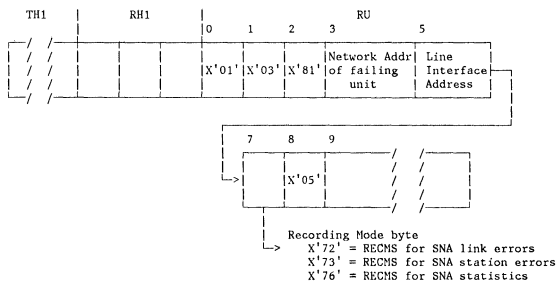
To Interpret RECMS Messages

RU FORMAT OF RECMS FOR SNA LINK ERRORS RELATED TO A PHYSICAL CIRCUIT (MCH)

The purpose of the RECMS for SNA link errors is to explain in detail the cause of a
failure.

```
                                                          ┌─────────┐
                                                          │0(0)     │
                                                          │Network  │
                                                          │Services │
                                                          │X'01'    │
┌────────┬────────┬───────────┬───────────────┬─────────┼─────────┤
│1(1)    │2(2)    │3(3)       │5(5)           │7(7)     │8(8)     │
│        │        │SNA Address│Line Interface │Record   │Record   │
│        │        │           │Address        │Mode     │ID       │
│ X'03'  │ X'81'  │           │  CCBBAR       │ X'72'   │ X'05'   │
├────────┼────────┴───────────┴───────────────┴─────────┴─────────┤
│9(9)    │                                                        │
│Level   │                                                        │
│Inform- │                    Hex Zeros                           │
│ation   │                                                        │
├────────┼──────────┬─────────┬───────────┬─────────┬────────────┤
│17(11)  │18(12)    │20(14)   │21(15)     │23(17)   │24(18)      │
│        │          │         │           │         │            │
│LXBCMAND│ LXBCMODS │LXBINCT  │ LXBSTAT   │LXBEXTST │ X'C0'      │
├────────┴──────────┴─────────┴───────────┴─────────┴────────────┤
│25(19)                                                          │
│                                                                │
│ (*)                                                            │
│MKBMDREC│                                                       │
├────────┘                                             ┌─────────┤
│                                                      │40(28)   │
│                                                      │         │
│                    Hex Zeros                         │ CCBTYPE │
│                                                      └─────────┤
│                                                                │
│                                                                │
└────────────────────────────────────────────────────────────────┘
```

* This byte is particular to X.25 NPSI.
  Refer to Appendix B for the byte expansion for MKBMDREC.

Figure 10-1. RU Format of RECMS for SNA Link Errors Related to a Physical Circuit

RU FORMAT OF RECMS FOR SNA STATION ERRORS RELATED TO A PHYSICAL CIRCUIT (MCH)

The purpose of a RECMS for SNA station errors is to:

* Explain in detail the cause of the failure
* Send to the host processor the information concerning the activity of the corresponding station

A RECMS for SNA station errors contains the information provided in:

* A RECMS for SNA link errors
* A RECMS for SNA statistics

The NCP maintains 8 counters to give information about the traffic concerning this station. The X.25 NPSI uses the same fields located in the SCB to maintain its own statistics.

					0(0)
					Network
					Services
					X'01'

1(1)	2(2)	3(3) SNA Station Address	5(5) Line Interface Address CCBBAR	7(7) Record Node X'73'	8(8) Record ID X'05'
X'03'	X'81'				

9(9) Level Info.	10(A) Reserved	13(D) SCBSSCF	15(F) SCBOCF	16(10) Reserved

17(11) LXBCMAND	18(12) LXBCMODS	20(14) LXBIMCT	21(15) LXBSTAT	23(17) LXBESTST	24(18) X'C0'

25(19) (*) MKBMDREC	26(1A) X'00'	27(1B) (*) SCBTCNT	29(1D) Reserved	31(1F) (*) SCBTRTCT

33(21) SCBTYPE	34(22) Reserved	36(24) SCBPCNT	37(25) Reserved	40(28) CCBTYPE

41(29) X'00'	42(2A) CCBCFLD	43(2B) Reserved	45(2D) (*) SCBRECNT	47(2F) (*) SCBTPCNT

49(31) (*) SCBRCNT	51(33) (*) SCBRPCNT	53(35) (*) SCBTIACT	55(37) (*) SCBTINCT

Reserved

* This field is particular to X.25 NPSI.
  Refer to Appendix B for the byte expansion for MKBMDREC.
  Refer to the following table for meaning of the counters.

Figure 10-2. RU Format of RECMS for SNA Station Errors Related to a Physical Circuit

Location	Length in Bytes	Meaning
SCBTCNT	2	Number (count) of I frames transmitted
SCBTRTCT	2	Number of I frames received
SCBRECNT	2	Number of RRs transmitted
SCBTPCNT	2	Number of RRs received
SCBRCNT	2	1st byte: Number of RNRs transmitted 2nd byte: Number of RNRs received
SCBRPCNT	2	1st byte: Number of REJs transmitted 2nd byte: Number of REJs received
SCBTIACT	2	1st byte: Number of retries on transmission 2nd byte: Number of frames received with FCS error
SCBTINCT	2	1st byte: Number of all errors on receive except FCS 2nd byte: Number of all modem errors

RU FORMAT OF RECMS FOR SNA STATISTICS RELATED TO A PHYSICAL CIRCUIT (MCH)

The purpose of the a RECMS for SNA statistics is to send the host processor
information concerning the activity of the corresponding station. Note that for an
INOP LINK message, a RECMS for SNA statistics is generated for each station
depending on the line.

The NCP maintains 8 counters to give information about the traffic concerning this
station.

The X.25 NPSI uses the same fields located in the SCB to maintain its own
statistics.

					0(0) Network Services X'01'
1(1) X'03'	2(2) X'81'	3(3) SNA Station Address	5(5) Line Interface Address CCBBAR	7(7) Record Mode X'76'	8(8) Record ID X'05'
9(9) Level Info.	10(A) Reserved				
17(11) Hex Zeros					
25(19)	27(1B) (*) SCBTCNT	29(1D) Reserved	31(1F) (*) SCBTRTCT		
33(21) SCBTYPE	Hex Zeros				
41(29)			45(2D) (*) SCBRECNT	47(2F) (*) SCBTPCNT	
49(31) (*) SCBRCNT	51(33) (*) SCBRPCNT	53(35) (*) SCBTIACT	55(37) (*) SCBTINCT		

* This field is particular to X.25 NPSI.
  Refer to the following table for meaning of the counters.

Figure 10-3. RU Format of RECMS for SNA Statistics Related to a Physical Circuit

Location	Length in Bytes	Meaning
SCBTCNT	2	Number (count) of I frames transmitted
SCBTRTCT	2	Number of I frames received
SCBRECNT	2	Number of RRs transmitted
SCBTPCNT	2	Number of RRs received
SCBRCNT	2	1st byte: Number of RNRs transmitted 2nd byte: Number of RNRs received
SCBRPCNT	2	1st byte: Number of REJs transmitted 2nd byte: Number of REJs received
SCBTIACT	2	1st byte: Number of retries on transmission 2nd byte: Number of frames received with FCS error
SCBTINCT	2	1st byte: Number of all errors on receive except FCS 2nd byte: Number of all modem errors

RU FORMAT OF RECMS FOR SNA LINK ERRORS RELATED TO A VIRTUAL CIRCUIT

The purpose of the a RECMS for SNA link errors is to explain in detail the cause of a failure.

					0(0) Network Services X'01'
1(1) X'03'	2(2) X'81'	3(3) SNA Address	5(5) Line Interface Address CCBBAR	7(7) Record Mode X'72'	8(8) Record ID X'05'
9(9) Level Info.	Hex Zeros				
17(11) LXBCMAND	18(12) LXBCMODS	20(14) LXBIMCT	21(15) LXBSTAT	23(17) LXBEXTST	24(18) (*) VCBRECB0
25(19) (*) VCBRECB1	26(1A) (*) VCBRECB2	Hex Zeros			

* This field is particular to X.25 NPSI.
  Refer to Appendix B for the byte expansion for VCBRECB0, VCBRECB1,
  and VCBRECB2.

Figure 10-4. RU Format of RECMS for SNA Link Errors Related to a Virtual Circuit

RU FORMAT OF RECMS FOR SNA STATION ERRORS RELATED TO A VIRTUAL CIRCUIT

The purpose of the a RECMS for SNA station errors is to:

* Explain in detail the cause of the failure
* Send to the host processor the information concerning the activity of the corresponding station

A RECMS for SNA station errors must contain the information provided in:

* A RECMS for SNA link errors
* A RECMS for SNA statistics

The NCP maintains 8 counters to give information about the traffic concerning this station. The X.25 NPSI uses the same fields located in the SCB to maintain its own statistics.

1(1) X'03'	2(2) X'81'	3(3) SNA Station Address		5(5) Line Interface Address CCBBAR		7(7) Record Mode X'73'	8(8) Record ID X'05'
9(9) Level Info.	10(A) Reserved			13(D) SCBSSCF	15(F) SCBOCF	16(10) Reserved	
17(11) LXBCMAND	18(12) LXBCMODS		20(14) LXBIMCT	21(15) LXBSTAT		23(17) LXBESTST	24(18) (*) VCBRECB0
25(19) (*) VCBRECB1	26(1A) (*) VCBRECB2	27(1B) (*) SCBTCNT		29(1D) Reserved		31(1F) (*) SCBTRTCT	
33(21) SCBTYPE	34(22)	35(23)	36(24) (*) VCBRECB3	37(25) (*) VCBRECB4	38(26) (*) VCBRECB5	40(28) CCBTYPE	
41(29) Hex Zeros				45(2D) (*) SCBRECNT		47(2F) (*) SCBTPCNT	
49(31) (*) SCBRCNT		51(33) (*) SCBRPCNT		53(35) (*) SCBTIACT		55(37) (*) SCBTINCT	
Reserved							

* This field is particular to X.25 NPSI.
  Refer to Appendix B for the byte expansion for VCBRECB0, VCBRECB1,
  VCBRECB2, VCBRECB3, VCBRECB4, and VCBRECB5.
  Refer to the following table for meaning of the counters.

Figure 10-5. RU Format of RECMS for SNA Station Errors Related to a Virtual Circuit

Location	Length in bytes	Meaning
SCBTCNT	2	Number of I packets transmitted
SCBTRTCT	2	Number of I packets received
SCBRECNT	2	Number of RR packets transmitted
SCBTPCNT	2	Number of RR packets received
SCBRCNT	2	1st byte: Number of RNR packets transmitted 2nd byte: Number of RNR packets received
SCBRPCNT	2	Reserved
SCBTIACT	2	Reserved
SCBTINCT	2	Reserved

RU FORMAT OF RECMS FOR SNA STATISTICS RELATED TO A VIRTUAL CIRCUIT

The purpose of the a RECMS for SNA statistics is to send the host processor information concerning the activity of the corresponding station. Note that for an INOP LINK message, a RECMS for SNA statistics is generated for each station depending on the line.

The NCP maintains 8 counters to give information about the traffic concerning this station.

The X.25 NPSI uses the same fields located in the SCB to maintain its own statistics.

```
                                                    +-----------+
                                                    |0(0)       |
                                                    |Network    |
                                                    |Services   |
                                                    | X'01'     |
+--------+--------+-------------+----------------+----------+-----------+
|1(1)    |2(2)    |3(3)         |5(5)            |7(7)      |8(8)       |
|        |        |SNA Station  |Line Interface  |Record    |Record     |
|        |        |Address      |Address         |Mode      |ID         |
| X'03'  | X'81'  |             | CCBBAR         | X'76'    | X'05'     |
+--------+--------+-------------+----------------+----------+-----------+
|9(9)    |10(A)                                                        |
|Level   |   Reserved                                                  |
|Info.   |                                                             |
+---------------------------------+-----------------------------------+
|17(11)                                                               |
|                                                                     |
|                       Hex Zeros                                     |
|                                                                     |
+--------+-------------+----------------+-----------------------------+
|25(19)  |27(1B)       |29(1D)          |31(1F)                       |
|        |             |                |                             |
|        |   (*)       |   Reserved     |    (*)                      |
|        |  SCBTCNT    |                |   SCBTRTCT                  |
+--------+-------------+----------------+-----------------------------+
|33(21)  |                                                            |
|        |                                                            |
|SCBTYPE |    Hex Zeros                                               |
+--------+------------------------+--------------+--------------------+
|41(29)                           |45(2D)        |47(2F)              |
|                                 |              |                    |
|                                 |   (*)        |    (*)             |
|                                 |  SCBRECNT    |   SCBTPCNT         |
+---------------+-----------------+--------------+--------------------+
|49(31)         |51(33)           |53(35)        |55(37)              |
|               |                 |              |                    |
|    (*)        |    (*)          |    (*)       |    (*)             |
|  SCBRCNT      |  SCBRPCNT       |  SCBTIACT    |  SCBTINCT          |
+---------------+-----------------+--------------+--------------------+
```

* This field is particular to X.25 NPSI.
  Refer to the following table for meaning of the counters.

Figure 10-6. RECMS RU Format for SNA Statistics Related to a Virtual Circuit

Location	Length in bytes	Meaning
SCBTCNT	2	Number of I packets transmitted
SCBTRTCT	2	Number of I packets received
SCBRECNT	2	Number of RR packets transmitted
SCBTPCNT	2	Number of RR packets received
SCBRCNT	2	1st byte: Number of RNR packets transmitted 2nd byte: Number of RNR packets received
SCBRPCNT	2	Reserved
SCBTIACT	2	Reserved
SCBTINCT	2	Reserved

APPENDIX A. ABEND CODES

ABEND CODES

ABEND CODE	COMMENTS	
0A00	NO ECB ON TIMEOUT	(BALVCOMA)
0A01	INVALID VCM STATE ON AN ACTIVATE LINK FOR A PVC	(BALVCOMA)
0A02	WRONG INTERFACE AT BALMAR1 ENTRY	(BALVCOMA)
0A03	INVALID VCM STATE ON A TIMEOUT FOR AN SVC	(BALVCOMA)
0A10	DISCREPANCY BETWEEN THE NCP AND X.25 SYSGEN	(BALINIMD)
	NUMBER OF ERRORS THAT CAN BE FOUND IN THE DUMP. THEY ARE SAVED IN THE MODULE AFTER THE LABELS: ER1= MORE THAN ONE UACB FOR ONE LKB ER2= UACB NOT IDENTIFIED AS X.25 (MU OR VU) ER3= NCP/X.25 DISCREPANCY ABOUT SWITCHED/PERMANENT ER4= PU TYPE INVALID FOR LLC0 (PU TYPE 1 ONLY) OR FOR LLC3 ON PVC (PU TYPE 4 ONLY)	
0A20	INVALID VALUE IN MKBSTATC	(BALVCIM6)
0A21	NO ELEMENT ON QCB DURING RESTART PHASE	(BALVCIM6)
0A22	NO ELEMENT ON QCB WHEN MCH OPERATIONAL	(BALVCIM6)
0A23	INVALID VALUE IN LXBSTATC	(BALVCIM6)
0A24	INVALID VALUE IN CUBSSCP	(BALVCIM6)
0A40	NO MORE LIQ AVAILABLE	(BAL2BM)
0A41	CSB3: TRANSMIT ERROR ENTRY WITHOUT REASON	(BAL2B3)
0A42	CSB3: TRANSMIT, NO BUFFER WHILE BUFFER SERVICE	(BAL2B3)
0A43	DISCREPANCY IN WACK Q AND WACK Q COUNT	(BAL3LAPS)
0A55	NO BUFFER RECEIVED FROM BALPLI	(BALCTLPR)
0A56	PAD MODE NOT IDENTIFIED (INTEGRATED OR TRANSPARENT)	(BALCTLPR)
0A60	ERROR DURING SEGMENTING IN PACKETS, VCBQCB3 EMPTY	(BALT5OUT)

ABEND CODE	COMMENTS	
0A70	INVALID BUFFER OR PSEUDO-BUFFER ON X25XIO	(BALNASM4)
0A71	INVALID PACKET LENGTH: LT.3 OR GT.FRMLGTH	(BALNASM4)
0A72	LINE TIMER LEVEL 3 FOR A VC	(BALNASM4)
0A73	DEQUEUE INVALID DURING RESET SYSTEM TIMER	(BALNASM4)
0A74	X25XIO INTERFACE ERROR	(BALNASM4)
0A75	THE X.25 NPSI ISSUED XIO LINK INSTEAD OF X25XIO	(BALNASM4)
0A76	LINK TEST LEVEL 2 REQUEST ON AN INN VC WITHOUT EMPTY LOQ	(BALNASM4)
0A77	X25EXTRA INTERFACE ERROR	(BALNASM4)
0A7E	LEVEL 3 INTERRUPT FOR A VC	(BALNASME)
0A7F	LEVEL 2 INTERRUPT FOR A VC	(BALNASME)
0A80	PHYSICAL SERVICES REQUEST INVALID	(BALLCONN)
0A81	LOGIC ERROR DETECTED IN TIMER ROUTINE	(BALLCONN)
0A82	PHYSICAL SERVICES ELEMENT (TCB/XID) QUEUED ON LOBQ	(BALLCONN)
0A83	QSTATE ERROR DETECTED IN DATA PROCESSOR OUT	(BALLCONN)
0A84	QSTATE ERROR DETECTED IN LL2 TEST	(BALLCONN)
0A85	QSTATE ERROR DETECTED IN QXID PROCESSOR	(BALLCONN)
0A86	QSTATE ERROR DETECTED IN QSNRM/QUA PROCESSOR	(BALLCONN)
0A87	LOBQ EMPTY OF FIRST ELEMENT OR LOBQ NOT AN XID	(BALLCONN)
0A8A	QSTATE ERROR DETECTED IN QRD PROCESSOR	(BALLCONN)
0A8D	NO TCB TO BUILD THE QTEST REQUEST, LL2 TEST FRAME BUILDER OUT	(BALLCONN)
0A90	QSTATE ERROR DETECTED IN MAIN ROUTINE	(BALLCINN)
0A91	PHYSICAL SERVICES PACKET LENGTH INVALID	(BALLCINN)
0A93	DATA PIU LENGTH INVALID	(BALLCINN)
0A94	QSTATE ERROR DETECTED IN DATA PROCESSOR	(BALLCINN)
0A95	QTEST RESPONSE RECEIVED INSTEAD OF QTEST REQUEST	(BALLCINN)
0A96	QSTATE ERROR DETECTED IN LL2 TEST ECHOER	(BALLCINN)
0A9F	ERROR DURING XPC-OUT VERIFICATION —FID TYPE INVALID, NOT FID0/1/4, —PIU LENGTH TOO SHORT, —PIU'S TH LENGTH WRONG —SUB-AREA ADDRESS IN PIU'S TH=0	(BALLCINN)
0AA1	DISPATCH-OUT FUNCTION NOT RECOGNIZED	(BALPCNM9)
0AA2	PHYSICAL SERVICES ERROR	(BALPCNM9)
0AA3	UNKNOWN SESSION CONTROL COMMAND	(BALPCNM9)
0AA4	INVALID ENTRY IN THE TIMER ROUTINE	(BALPCNM9)
0AA5	DISPATCH-IN FUNCTION NOT RECOGNIZED	(BALPCNM9)
0AA6	NO PIU QUEUED IN TRANSPARENT MODE	(BALPCNM9)
0AB0	VC NUMBER DISCREPANCY IN VCB AND PKT	(BALVCIMC)
0AB2	OTHER THAN CONTROL PACKET RECEIVED	(BALVCIMC)
0AB3	INVALID PVC STATUS, PROGRAMMING ERROR	(BALVCIMC)
0AB4	INVALID SVC STATUS, PROGRAMMING ERROR	(BALVCIMC)
0AD0	LINK TEST LEVEL 2 WITHOUT TCB QUEUED	(BALL2TMB)

APPENDIX B. RECMS BYTE EXPANSIONS

MKBMDREC

If a failure occurs on a physical circuit, the X.25 NPSI maintains one byte in the
MKBMDREC to explain the failure.

The format of the byte is:

MKBMDREC	FAILURE EXPLANATION ACTION
	ERROR CODES ASSOCIATED WITH AN INOP MCH LINK (RECMS LINK)
	X'01' Enable on a busy line
	X'02' SET MODE error on the send side of link
	X'03' SET MODE error on receive side of link
	X'04' MONITOR DSR error on send side of link
	X'05' MONITOR DSR error on receive side of link
	X'06' RTS error on send side of link (CSB3)
	X'07' Timeout on Enable phase
	X'08' Flag transmission error during contact
	X'09' Flag monitoring error during contact
	X'0A' Timeout on flag monitoring during contact
	X'0B' DEACTIVATE PU for MCH already disabled
	X'0C' DEACTIVATE PU for MCH in enable phase
	X'0D' DEACTIVATE PU for MCH during modem check recovery
	X'0E' Transmit error during shutdown
	X'0F' Receive error during shutdown
	X'10' Timeout on transmit during shutdown
	X'11' Timeout on transmit during information transfer
	X'12' Permanent hardware failure
	X'13' Modem check
	ERROR CODES ASSOCIATED WITH AN INOP STATION (RECMS STATION)
	X'20' Limit reached in LAP outgoing queue
	X'21' DEACTIVATE PU for MCH already deactivated or
	for MCH in flag monitoring phase
	X'22' Timeout on receive after retries during shutdown
	X'23' Timeout on receive after retries during contact
	X'24' Timeout on receive after retries during ABM phase
	X'25' DM received during contact
	X'26' DM received during reinitialization phase
	X'27' DCE does not Send DISC (LAP only)
	X'28' DCE does not Send SARM (LAP only)
	X'FF' Restart Request Timeout
	ERROR CODES USED FOR A MCH LINK REINITIALIZATION (RECMS LINK)
	X'30' Reinitialize after sending FRMR on receiving DISConnect
	X'31' Reinitialize after receiving UA in information transfer
	X'32' Reinitialize after receiving FRMR for invalid N(R)
	X'33' Reinitialize after receiving FRMR for length error
	in I frame
	X'34' Reinitialize after receiving FRMR for short frame
	length error
	X'35' Reinitialize after receiving FRMR for invalid C field
	X'36' Reinitialize after receiving DM during information
	transfer or during timer recovery
	X'37' Reinitialize after receiving SABM during information
	transfer or during timer recovery

| **VCBRECB0, VCBRECB1, VCBRECB2, VCBRECB3, VCBRECB4, AND VCBRECB5**

If an abnormal condition occurs on a virtual circuit, the X.25 NPSI maintains six
bytes in the virtual circuit block (VCB) to explain this condition.

The format of these six bytes is:

```
┌─────────────┬──────────────────────────────────────────────────────────────┐
│ VCBRECB0    │                                                              │
│             ├──────────────────────────────────────────────────────────────│
│             │ bit 0 = 0    Indicates that the RECMS applies to a VC         │
│             │                                                              │
│ VCBROX25    │ bit 1 = 1    Indicates that the RECMS is generated by         │
│             │                the X.25 NPSI                                  │
│             │                                                              │
│             │ bits 2,3:                                                    │
│ VCBROMCH    │    00  MCH failure                                           │
│ VCBROVCM    │    01  VCM failure                                           │
│ VCBROPLP    │    10  PLP failure                                           │
│ VCBROLLC    │    11  LLC failure                                           │
│             │                                                              │
│             │ bits 4-7:  indicate the category of the failure.             │
│             │              Valid in case of VCM or LLC failure:            │
│             │                                                              │
│             │              In the case of VCM failure:                     │
│             │                                                              │
│ VCBROTO     │ 0001  Timeout                                                │
│ VCBROOCR    │ 0010  Outgoing call refused                                  │
│ VCBROCLE    │ 0011  Clear indication received                              │
│ VCBRORET    │ 0100  Reset indication received                              │
│ VCBRORAT    │ 0101  Restart indication received                            │
│ VCBROICP    │ 0110  Invalid or unexpected control packet                   │
│             │         received                                             │
│ VCBROICR    │ 0111  Incoming call refused                                  │
│             │                                                              │
│             │              In the case of LLC failure:                     │
│             │                                                              │
│ VCBROPSH    │ 0001  PSH failure                                            │
│ VCBROPCO    │ 0010  Non-SNA LLC failure (PCNE/GATE/PAD)                     │
│ VCBROQLC    │ 0011  QLLC (INN)                                             │
│ VCBROLLD    │ 0100  LLC-OUT dispatcher failure                             │
│ VCBROLLI    │ 0101  LLC-IN dispatcher failure                              │
│             │                                                              │
│             │                                                              │
└─────────────┴──────────────────────────────────────────────────────────────┘
```

VCBRECB1	
VCBR1MC0	In case of MCH failure (VCBRECB0 bits 2,3=00): = X'00'

VCBR1A01	In case of VCM failure (VCBRECB0 bits 2-3=01)
	
	*For the "Type of failure": Timeout
	    X'01' Timeout on CALL REQUEST
	    X'00' Other types of timeouts

VCBR1B01
VCBR1B02
VCBR1B03
VCBR1B04
VCBR1B05
VCBR1B06
VCBR1B07
VCBR1B08
VCBR1B09
VCBR1B0B
VCBR1B0D
	*For the "Type of failure": Outgoing call refused
	    X'01' LLC type invalid
	    X'02' LLC type not supported
	    X'03' Invalid VCCPT index
	    X'04' Invalid QUFT index
	    X'05' Slowdown during Connect-out
	    X'06' Command refused due to MCH failure
	    X'07' SVC not defined for CALL=OUT
	    X'08' Calling or Called DTE address length invalid
	    X'09' Invalid Dial Digits length
	    X'0B' SVC already reserved by GATE
	    X'0D' CALL-OUT not allowed in DATE

	*For the "Type of failure": Clear indication received
	  The value of this byte is equal to the CAUSE byte
	  received in the CLEAR indication packet (See note 1)

	*For the "Type of failure": Reset indication received
	  The value of this byte is equal to the CAUSE byte
	  received in the RESET indication packet (See note 2)

	*For the "Type of failure": Restart indication received
	  The value of this byte is equal to the CAUSE byte
	  received in the RESTART indication packet (See note 3)

	*For the "Type of failure": Invalid or unexpected
	  control packet received
	  The value of this byte is equal to byte 0 of the packet
	  header received

VCBR1C01
VCBR1C02
VCBR1C03
VCBR1C04
VCBR1C05
VCBR1C06
	*For the "Type of failure": Incoming call refused
	    X'01' LLC type invalid
	    X'02' LLC type not supported
	    X'03' VC not in answer mode
	    X'04' VC defined with CALL=OUT only
	    X'05' Contention with an outgoing call
	    X'06' Invalid facility field

VCBRECB1	(Continued)
	In case of PLP failure (VCBRECB0 bits 2,3=10)
VCBR1PL1	X'01' Invalid P(S) received
VCBR1PL2	X'02' Q bit received, not supported
VCBR1PL3	X'03' Invalid P(R) received (BALPLPI)
VCBR1PL4	X'04' D-Bit not supported (BALPLPI)
	In case of LLC failure (VCBRECB0 bits 2,3=11)
	*For an LLC-OUT dispatcher failure:
VCBR1LL1	X'01' LLU to be sent on an X.25 LVL3 state
	different from "Information Transfer"
	(P4)
VCBR1LL2	
	*For an LLC-IN dispatcher failure:
	X'02' Invalid input from End-User
	*For a PSH failure:
VCBR1PS2	X'02' Invalid PU type in XID
VCBR1PS3	X'03' XID-LLU to send on a PVC or on a state
	different from XMIT-XID
VCBR1PS4	X'04' Timeout and retries exhausted
VCBR1PS5	X'05' Invalid NS-LLU received
VCBR1PS6	X'06' CMDR Received
VCBR1PS7	X'07' Invalid N(S) received in an I-LLU
VCBR1PS8	X'08' I-LLU to be sent on state different from
	PSH Data Transfer
VCBR1PS9	X'09' I-LLU received on state different from
	PSH Data Transfer
VCBR1PSA	X'0A' Contact request out of valid PSH state
VCBR1PSB	X'0B' Discontact request out of valid PSH state
	*For a Non-SNA LLC failure:
	The LUSREQ macro cannot send the designated SNA RU
	to the host because:
VCBR1PC1	X'01' No SSCP-SLU session
VCBR1PC2	X'02' No PLU-SLU session
VCBR1PC3	X'03' SLU in RCV or FME-WAIT state
VCBR1PC4	X'04' SHUTC state entered
VCBR1PC5	X'05' Wait for DFC response
VCBR1PC6	X'06' No DFC request pending
VCBR1PC7	X'07' Begin bracket pending
VCBR1PC8	X'08' Discontact processing on a PVC due to
	an ANS condition
VCBR1PC9	X'09' Exception Response received from the host
	while D-bit is used
	*For a QLLC failure:
	X'00'

VCBRECB2	
VCBR2MC0	In case of MCH failure (VCBRECB0 bits 2,3=00) = X'00'

VCBR2VC0	In case of VCM failure (VCBRECB0 bits 2,3=01)
	
	*For the "Type of failures": Timeout
	                                           Outgoing call refused
	                                           Incoming call refused
	   = X'00'
	
	*For the "Type of failure": Clear indication received
	   the value of this byte is equal to the DIAGNOSTIC
	   byte received in the Clear indication packet (Note 5)
	
	*For the "Type of failure": Reset indication received
	   the value of this byte is equal to the DIAGNOSTIC
	   byte received in the Reset indication packet (Note 5)
	
	*For the "Type of failure": Restart indication received
	   the value of this byte is equal to the DIAGNOSTIC
	   byte received in the Restart indication packet
	
	*For the "Type of failure": Invalid or not supported
	   control packet received, the value of this byte is
	   equal to byte 2 of the packet header received

VCBR2PL0	In case of PLP failure (VCBRECB0 bits 2,3=10) = X'00'
VCBR2LL0	In case of LLC failure, (VCBRECB0 bits 2,3=11) =X'00'

	In case of QLLC failure, (VCBRECB0 bits 4-7=0011)
	=VCBQSTA1 (LLC status byte 1)
	        X'00' Reset Status (configurable)
	        X'80' QXID sent (configurable)
	        X'88' QXID exchange in progress (configurable)
	        X'C8' QSNRM in progress (primary)
	        X'8C' QSNRM received (secondary)
	        X'AC' QUA in progress (secondary)
	        X'CA' Data transfer (primary)
	        X'AE' Data transfer (secondary)

VCBRECB3	This byte contains a copy of the VCM state at the time of the failure: VCBVCM0
	X'40' Inhibit transmit SARM
	X'08' P6 - DTE CLEAR REQUEST in progress
	X'04' P4 - Data transfer
	X'02' P2 - CALL REQUEST in progress
	X'01' D2 - DTE RESET REQUEST in progress
VCBRECB4	This byte contains a copy of the PLP state at the time of the failure: VCBEPST
	X'80' DTE window closed
	X'40' RNR received
	X'20' Incoming packet accumulation in progress
	X'10' PLP-IN locked for PCNE
VCBRECB5	This byte contains a copy of the end user state taken at the time of the failure
	*LLC dispatcher state = VCBEEST
	X'80' LLC timer running
	X'40' LLC-OUT waits for triggering
	X'20' LLC-IN timer elapsed
	X'10' Send RR/RNR
	X'08' LLC-OUT SYSXIT with trigger
	X'04' D-bit not allowed
	*PSH state = VCBPSS1
	X'80' Information transfer
	X'40' Waiting XID
	X'20' Waiting PSCONT
	X'10' Waiting PSDISC
	X'08' Outgoing segmenting
	X'04' Incoming segmenting
	*PCNE state = VCBEUS1
	X'40' SHUTC pending
	X'20' D-Bit RR pending
	X'08' Incoming purge mode
	In case of QLLC failure, (VCBRECB0 bits 4-7=0011) =VCBQSTA2 (LLC Status Byte 2)
	X'08' QRD or QDISC received (primary)
	X'80' QDISC in progress (primary)
	X'88' QDISC in progress (primary)
	X'40' QRD in progress (secondary)
	X'20' QTEST request in progress (requestor)
	X'22' QTEST request in progress (requestor)
	X'10' QTEST response in progress (echoer)

Notes:

1. CAUSE byte in a CLEAR INDICATION packet:

X'00'	DTE clearing
X'01'	Number busy (or CALL COLLISION)
X'03'	Invalid facility request
	or invalid call (for Network Type 1)
X'05'	Network congestion or
	incidents on the network (for Network Type 1)
X'09'	Out-of-order
X'0B'	Access barred
X'0D'	Unknown number
X'11'	Remote procedure error
X'13'	Local procedure error
X'15'	RPOA out-of-order
X'19'	Remote DTE refuses reverse charging
X'21'	Incompatible destination or
	End of out-of-order condition (for Network Type 1)
X'29'	Fast select acceptance not subscribed

   Refer to Note 4.

2. CAUSE byte in a RESET INDICATION Packet:

X'00'	DTE resetting (for Network Type 1)
X'00'	End of out-of-order (for Network Type 2)
X'01'	Out-of-order
X'03'	Remote procedure error
X'05'	Local procedure error
X'07'	Network congestion
X'09'	Remote DTE operational
X'0F'	Network operational
X'11'	Incompatible destination

   Refer to Note 4.

3. CAUSE byte in RESTART INDICATION Packet:

X'00'	DTE restart
X'01'	Local procedure error
X'03'	Network congestion
X'05'	End of out-of-order condition (for Network Type 1)
X'07'	Network operational

   Refer to Note 4.

4. Defining Network Type:

   Network Type 1 is defined by coding NETTYPE=1 in the X25NET macro.
   Network Type 2 is defined by coding NETTYPE=2 in the X25NET macro.
   If the network type is not indicated in the preceding notes, then the cause byte
   is as specified in the CCITT Recommendation X.25 (1980).

5. Interpretation of the Diagnostic Byte in a CLEAR/RESET INDICATION Packet:

   The diagnostic byte is meaningful only for Type 1 networks. For Type 2
   networks, there is no diagnostic byte in a CLEAR INDICATION packet and it is
   equal to X'00' in a RESET INDICATION packet.

   When the cause byte indicates DTE clearing or resetting, the associated
   diagnostic byte should be interpreted according to the type of remote DTE:

a. If the remote DTE is a remote NIA, refer to the <u>IBM 5973-L02 Product</u>
    <u>Description Manual</u>, GA11-8643 (SC 7043)

b. If the remote DTE is the X.25 NPSI program product, refer to Appendix C for
    the meaning of the diagnostic byte in the CLEAR REQUEST and RESET REQUEST
    packet.

For cause values other than DTE clearing or resetting, see the X.25 network
specifications corresponding to the PSDN you are using for an interpretation of
the diagnostic byte.

APPENDIX C. DIAGNOSTIC BYTES SPECIFIED BY X.25 NPSI

DIAGNOSTIC BYTE IN THE CLEAR REQUEST PACKET

For Type 1 Networks, when the X.25 NPSI sends a CLEAR REQUEST packet, the "Clearing Cause" byte is set to X'00' and the diagnostic field byte is set to the following values:

HEXADECIMAL VALUE	EXPLANATION
00	Disconnection upon request for the host or an ANS situation has occurred
14	Data packet received in P1 state
15	Received something other than Clear Indication or Incoming Call in state P2
45	Incoming call received and link not owned by SSCP or SVC disabled during ANS
84	PLP or LLC error
A2	Invalid or unexpected control packet received
AB	Invalid P(S) received
AC	Invalid P(R) received
B1	LU-MCH session not active
E0	Reset indication received while in VCM inoperative status (switched virtual circuit)
E3	Incoming call received and VC not in ANSWER mode
E5	Incoming call received and LLC type invalid
E6	Incoming call received and LLC type not supported or facility field invalid
E8	Timeout on call request
E9	Incoming call received for a callout only VC
EA	Incoming call received during NCP slowdown
EB	Reset indication while in VCM data transfer status
EC	Incoming call received and Switched Connection Terminator (CXDDSCT) not present

For Network Type 2, there is no diagnostic field in the CLEAR REQUEST packet.

DIAGNOSTIC BYTE IN THE RESET REQUEST PACKET

For Type 1 Networks, when the X.25 NPSI sends a RESET REQUEST packet, the "Resetting Cause" byte is set to X'00' and the diagnostic byte is set to the following values:

HEXADECIMAL VALUE	EXPLANATION
14	Data packet received on an inactive VC link
82	Invalid or unexpected control packet received
83	Disconnection upon request from the SSCP, or because an ANS situation has occurred
84	PLP or LLC error

For Type 2 Networks, the diagnostic byte is always equal to X'00'.

X.25 NCP Packet
Switching Interface
Reference Summary

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