FSC Fiber Optic System Communication: Ethernet and RS422 Configuration
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FIBER OPTIC SYSTEM COMMUNICATION (FSC)

Purpose:
These procedures are designed to explain the components of the Fiber Optic System Communication (FSC), and the procedures to be followed to configure an Ethernet and RS422 Sonet System. Both interfaces will be configured in a ring topology as to offer complete redundancy for Ethernet and Differential applications as shown in Figure 1. Furthermore, it will provide a port overview of a typical working setup. For a more in-depth understanding of the FSC system it is recommended that you read the FSC Installation, Operations and Maintenance Manual.

Figure 1
**Equipment Required:**
*Note: All components are labeled with Nortel Networks part numbers.*

- 2 x 1 86434-12 SERVICE Unit
- 4 x 1 86433-13 JMUX
- 4 x 1 86438-01 JIF-ETHER Unit
- 4 x 1 86485-11 JIF SHARE
- 2 x 1 86446-11 HS DATA
- 4 x 1 86431-13 110/125VDC POWER SUPPLY or 86431-12 48VDC POWER SUPPLY
- 2 x 1 86401-01 EQUIPMENT SHELF UNIT
- 4 x 1 9752/32 Power Supply Paddle Board
- 2 x 1 86434-91 Service Unit Paddle Board
- 2 x 1 087-86438-90 Jif-Ether Paddle Board
- 2 x 1 087-86485-90 Jif Share Paddle Board
- 2 x 1 087-86447-90 HS Data Paddle Board
- 2 x 1 035-86430-66(RH) Port Cables
- 2 x 1 035-86430-65(LH) Port Cables
- 1 x 1 JCI Software

**G.E. Order Code Cross Reference**

<table>
<thead>
<tr>
<th>Nortel Part #</th>
<th>G.E. Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>86434-12 SERVICE Unit</td>
<td>S1</td>
</tr>
<tr>
<td>86433-13 JMUX</td>
<td>M2</td>
</tr>
<tr>
<td>86438-01 JIF-ETHER Unit</td>
<td>F6</td>
</tr>
<tr>
<td>86485-11 JIF SHARE</td>
<td>F7</td>
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<tr>
<td>86446-11 HS DATA</td>
<td></td>
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<td>86431-13 110/125VDC POWER SUPPLY</td>
<td>12</td>
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<td>86431-12 48VDC POWER SUPPLY</td>
<td>04</td>
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<td>FSC1S</td>
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<td>087-86438-90 Jif-Ether Paddle Board</td>
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<td>087-86447-90 HS Data Paddle Board</td>
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<tr>
<td>035-86430-66(RH) Port Cables</td>
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<td></td>
</tr>
<tr>
<td>JCI Software</td>
<td></td>
</tr>
</tbody>
</table>

*Refer to G.E. Order Code*
EQUIPMENT DESCRIPTION
This section provides a brief description of the function of each Unit.

Equipment Shelf Unit (86401-01)
The 86401 FSC shelf provides 15 mounting spaces, power buses and JVT buses for common units and channel units. Paddle Board screw type connectors mount to the rear of the shelves and provide the user interface connections to the units. Various cables provide quick, efficient connections for all common units. The shelf layout for Ethernet and RS 422 connections is shown in Figure 2.

Figure 2

Shelf Layout

<table>
<thead>
<tr>
<th>Shelf Position</th>
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<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>POWER</td>
</tr>
<tr>
<td>JMUX</td>
</tr>
<tr>
<td>SERVICE</td>
</tr>
<tr>
<td>JIF-ETHER</td>
</tr>
<tr>
<td>JIF-SHARE</td>
</tr>
<tr>
<td>HS DATA</td>
</tr>
<tr>
<td>BLANKS</td>
</tr>
</tbody>
</table>

*Note: Both shelves should be configured the same.*
The connections to the rear shelf expansion slots should be as follows for the above layout:

<table>
<thead>
<tr>
<th>Paddle Board</th>
<th>Rear Shelf Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER 9752/32</td>
<td>P1 and/or P15</td>
</tr>
<tr>
<td>JMUX 035-86430-66(RH) Port Cables</td>
<td>P14A</td>
</tr>
<tr>
<td>035-86430-65(LH) Port Cables</td>
<td>P12A</td>
</tr>
<tr>
<td>SERVICE 86434-91</td>
<td>P13A</td>
</tr>
<tr>
<td>JIF-ETHER 087-86438-90</td>
<td>P10 and P11</td>
</tr>
<tr>
<td>JIF-SHARE 087-86485-90</td>
<td>P8 and P9</td>
</tr>
<tr>
<td>HS DATA 087-86447-90</td>
<td>P7</td>
</tr>
</tbody>
</table>

Prior to the installation of the Paddle Boards on the rear of the shelf JVT Bus (Bus Board), it should be noted that there is a Jumper Assembly (087-86430-90) that will have to be removed behind both JIF-Ether and JIF-Share units. When the Jumper Assembly is inserted, the JVT shelf bus is extended to the next shelf position. This allows the JVT shelf bus to be extended or discontinued along the entire shelf or to be continued to another shelf. Therefore, if these jumpers are in place both JIF-Share and JIF-Ether units will receive the same data. However, when they are removed the JIF-Share and JIF-Ether units function independently of the shelf bus by connecting port cables to the JIF-Share and JIF-Ether units.

Remove the Jumper Assembly at locations P35, P33, P31, P25, P23, P21, P19, and P17 if they are in place. It is important that the Jumper Assembly at locations P27 and P29 are left in place so that the HS DATA unit can receive timing from the bus.

The JVT Bus comes equipped with 8 port cables for the connection of four independent ports if required, each JIF unit requires two port cables. The cables are clearly marked by port number, 1, 2, 3 or 4, and orientation, RH (right hand) or LH (left hand). Port Cables must be connected to the JIF-Ether and JIF-Share Paddle Boards. The JIF-Ether Paddle Boards should be connected to the Port 1 Cables. The Paddle Boards are clearly marked Lin (left in) and Rin (right in). Also, the JIF-Share Paddle Boards should be connected to the Port 2 Cables observing the Lin and Rin orientation.

**POWER UNIT (86431-13 or 86431-12)**

The 86431 Power unit is one of the channel units in the GE FSC digital transport/access system designed specifically for the requirements of the utility industry using optical fiber transmission. The 86431 Power unit provides the interface between the customer supplied station battery and a JMUX node. Input power requirements can be 24, 48 or 125VDC depending on unit option. The Power unit can be paralleled with another unit to provide redundancy in case of a single unit failure.

The 86431 Power unit provides the regulated +5V required for the JMUX shelf. The unit can interface various station battery inputs depending on unit option. The Battery + and – terminals are clearly marked on the back of Paddle Board.
**JMUX UNIT (86433-13)**

The 86433-13, 51.84 Mbps Optical JMUX unit provides the interface between an incoming optical signal and a JMUX node. The JMUX unit can be configured for self-healing bi-directional rings, multiple rings and spurs or linear systems. In the ring configuration each node is equipped with two JMUX units, the left (east) JMUX unit and the right (west) JMUX unit.

Either a system (internal) clock, residing in a JMUX unit or an external reference clock provides the system synchronization. There can only be one system clock operating on a linear path. Since a ring configuration is two different linear paths, there must be two system clocks assigned. Therefore, one JMUX must be configured as the System or Headend clock, and the other as the Recovered or Normal clock. In a linear system a terminal site (end site) is configured with one JMUX unit, (in the right shelf slot position), and an add-drop site is configured with two JMUX units. For correct node synchronization in a linear system, at each node the right JMUX unit must be the one receiving the clock signal from the Headend node. For example, node one has two JMUX units, east and west; therefore, the east JMUX is configured as the System or Headend clock and the west JMUX is configured as the Recovered or Normal clock. Also, at node two the east JMUX must be configured as the System or Headend clock and the west JMUX as the Recovered or Normal clock.

All Virtual Tributaries (VT) assignments and Time Slot Interchange are performed by the JMUX and are assigned via the JCI software.

The JMUX unit occupies one slot position (12 or 14) slot in an 86401 common equipment shelf. In a ring system, the right JMUX is located in the slot 14 and the left JMUX is in the slot 12. The left JMUX unit is connected to the right JMUX unit at the previous site and the right JMUX unit is connected to the left JMUX at the next site. This left to right connection of JMUX units must be maintained through out the ring. The associated JIF units are then cabled to the JMUX units. The fiber optic storage area located above the shelf allows for excess fiber patch cord to be stored.

**SERVICE UNIT (86434-12)**

The 86434-12 Service unit has the capabilities to monitor FSC common units i.e. JMUX, JIF, Power, SYNC, JIF-Ether, and JIF-Share and provides both Form-C Major and Minor alarms. It also provides a Network Management interface allowing network configuration, monitoring and diagnostics of the entire network.
86438 JIF-ETHER UNIT

- Functions As an Ethernet Learning Bridge
- Provides a 10 Mb/s Ethernet Channel
- Provides Thick and Thin Wire Interfaces
- No Distance Limitation
- Provides Indicators for Channel Activity
  » Tx, Rx, collisions
- User Configuration to Allocate From 1 to 7 VT1.5s
  (1.5 To 11 Mb/s)

The JIF-ETHER unit is divided into two sub modules; a JIF module and an ETHER module. The JIF module provides the interface to the JMUX unit and the ETHER module provides the interface to the Ethernet LAN and is responsible for all aspects of the Ethernet bridging function.

JIF Sub-Module
The JMUX unit JIFport supplies a data stream of 7 VT1.5s with a total bandwidth of 12.96Mb/s or ¼ of the OC-1 signal of 51.84 Mb/s. The JIF module must be configured to process from 1 to 7 Virtual Tributaries (VTs) depending on the Ethernet traffic. The user must assign the VTs through the JCI software. The module ensures that byte synchronization and bit ordering is maintained in the active Ethernet transport channel.

ETHER Sub-Module
The ETHER module supplies a data stream at the rate requested by the JIF module. This data comprises either an idle code or packets of inter-bridged Ethernet data. The JIF module then passes this data from the ETHER module to the JMUX unit for transport onto the fiber ring.

The JMUX Ethernet Bridging unit is a single 10 Mb/s Ethernet interface that allows LAN connections between two JMUX nodes. When configured in a JMUX ring system, protected transport of Ethernet packets is achieved between all pairs of Ethernet nodes. This unit effectively connects together local LANs to form a single, large, Ethernet network.
Each packet from an Ethernet LAN is examined and the Ethernet bridging unit determines if the frame is targeted for a site on the local LAN or the remote LAN. If the frame is destined for a remote LAN, the frame is encapsulated in an envelope, and is bridged by the Ethernet unit. A unit is designated for bridging with a remote site if its path to the site requires fewer hops through intermediate Ethernet bridging units than its companion Ethernet unit to the same remote site. At each site, the Ethernet unit examines all envelopes on the JMUX ring. If the envelope is destined for the receiving Ethernet bridging unit, it is accepted and removed from the ring.

The Ethernet Bridge has learning ability, so no operator initialization is required to setup address tables in any of the units. The bridge provides 10BaseT connection via an RJ-45 connector and an AUI interface, which is accessible via a DB15 female connector. Through the AUI interface a variety of standard Ethernet electrical interfaces, including the BNC 10Base2 thin coax Ethernet cable, BNC 10Base5 thick Ethernet cable, and RJ-45 10BaseT twisted pair, can be supported.

**JIF-SHARE UNIT (087-86485-90)**

The 86485 JIF Share unit allows VTs to be shared between FSC nodes thus providing better utilization of DSO channels. The JIF Share unit provides the interface between a JMUX unit JIFport and four FSC Virtual Tributary (JVT) ports. JIF is a FSC Intermediate Format multiplex level that interfaces the seven available VTs from the JIFport and selects 4 individual VTs for DSO channel access.

The JIF Share unit consists of a main board assembly that houses the microprocessor, the Field Programmable Gate Array and performs the following functions:

- Interface to the 12.96Mb/s JIFport signal.
- Access to four of the seven VTs in a JIFport signal.
- Monitors the integrity of the received VT signals (Pointer values, VT Label, Far End Bit Error Rate, BIP-2 errors.)
- Access to DSO channels on a VT. DSO channels may be dropped or passed through.
- Monitors the integrity of the dropped DSO channels.

To ensure that cabling between JMUX units and JIF Share units is kept as short as possible, the preferred location for the first (pair) JIF Share unit(s) is slot 10 and slot 11 on the 86430-01 common equipment shelf. It is recommended that as more JIF Share units are required, they be installed on different JIFports. (First pair of JIF Share units on JIFport #1, second pair of units on JIFport #2, third pair on JIFport #3, and the fourth pair on JIFport #4). Additional JIF share units, on the same JIFport, should be kept as close together as possible.
Note: if any of the JVTs are to be installed in a shelf that already has a JVT connected, the JVT bus must be broken at the position where the new JVT is to be connected. The JVT bus may be broken by removing the 087-86430-90 sub assembly.

**HS DATA UNIT (86446-11)**

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**86446 HS DATA UNIT**

- RS-422, V.35
- 56Kb/s Synchronous or Asynchronous
- 64 Kb/s Synchronous
- One HS Control Lead on 56 Kb/s Option

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The 86446 HS DATA unit provides a single high-speed data channel and depending on unit option, one RS 422 or V.35 control signal over a single 64 kbit channel.

The HS DATA unit can be configured as a 56 kbit/s asynchronous channel with one control lead, a 56 kbit/s synchronous channel with one control lead or a 64 kbit/s synchronous channel with no control lead.

The HS DATA unit and associated Paddle Board can be inserted in channel slots 2 to 9 of a 86401-01 common equipment shelf. The remaining slots are reserved for common equipment units.

Each HS DATA unit requires one 86447-90 Paddle Board. The Paddle Board allows termination of RS 422 signals. Figure 3 details the Paddle Board Connections required for interconnection to an L90 RS-422 interface communications module.
Paddle Board Connections

**Figure 3**

<table>
<thead>
<tr>
<th>UR RS 422 CONNECTOR</th>
<th>HS DATA PADDLE BOARD CONNECTOR</th>
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</thead>
<tbody>
<tr>
<td>Tx +</td>
<td>TB3 Pin # 1 RD (B)</td>
</tr>
<tr>
<td>Tx -</td>
<td>TB3 Pin # 2 RD (A)</td>
</tr>
<tr>
<td>Rx +</td>
<td>TB1 Pin # 1 SD (B)</td>
</tr>
<tr>
<td>Rx -</td>
<td>TB1 Pin # 2 SD (A)</td>
</tr>
<tr>
<td>Shld.</td>
<td>TB1 Pin # 3 GND</td>
</tr>
<tr>
<td>Clock +</td>
<td>TB1 Pin # 4 ST (B)</td>
</tr>
<tr>
<td>Clock -</td>
<td>TB1 Pin # 5 ST (A)</td>
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HS DATA PADDLE BOARD
86447-90

RS-449 INTERFACE

<table>
<thead>
<tr>
<th>PIN</th>
<th>INTERCONNECT</th>
<th>ABRV</th>
<th>TERMINAL</th>
</tr>
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<tr>
<td>1</td>
<td>Shield</td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>Send Data (A)</td>
<td>SD</td>
<td>TB 1 PIN 2</td>
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<tr>
<td>5</td>
<td>Send Timing (A)</td>
<td>ST</td>
<td>TB 1 PIN 5</td>
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<tr>
<td>6</td>
<td>Receive Data (A)</td>
<td>RD</td>
<td>TB 3 PIN 2</td>
</tr>
<tr>
<td>7</td>
<td>Request to Send (A)</td>
<td>RS</td>
<td>TB 2 PIN 2</td>
</tr>
<tr>
<td>8</td>
<td>Receive Timing (A)</td>
<td>RT</td>
<td>TB 3 PIN 5</td>
</tr>
<tr>
<td>9</td>
<td>Clear to Send (A)</td>
<td>CS</td>
<td>TB 2 PIN 5</td>
</tr>
<tr>
<td>17</td>
<td>Terminal Timing (A)</td>
<td>TT</td>
<td>TB 4 PIN 2</td>
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<tr>
<td>19</td>
<td>Signal Ground</td>
<td>SG</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Send Data (B)</td>
<td>SD</td>
<td>TB 1 PIN 1</td>
</tr>
<tr>
<td>23</td>
<td>Send Timing (B)</td>
<td>ST</td>
<td>TB 1 PIN 4</td>
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<td>24</td>
<td>Receive Data (B)</td>
<td>RD</td>
<td>TB 3 PIN 1</td>
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<td>25</td>
<td>Request to Send (B)</td>
<td>RS</td>
<td>TB 2 PIN 1</td>
</tr>
<tr>
<td>26</td>
<td>Receive Timing (B)</td>
<td>RT</td>
<td>TB 3 PIN 4</td>
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<td>Clear to Send (B)</td>
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<td>TB 2 PIN 4</td>
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<td>35</td>
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V.35 INTERFACE

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<tr>
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<td>Shield</td>
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<tr>
<td>B</td>
<td>Signal Ground</td>
<td>SG</td>
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<tr>
<td>C</td>
<td>Request to Send</td>
<td>RS</td>
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<td>D</td>
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<td>TB 1 PIN 1</td>
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<td>Receive Data (B)</td>
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</tr>
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<td>U</td>
<td>Terminal Timing (A)</td>
<td>TT</td>
<td>TB 4 PIN 2</td>
</tr>
<tr>
<td>V</td>
<td>Receive Timing (A)</td>
<td>RT</td>
<td>TB 3 PIN 5</td>
</tr>
<tr>
<td>W</td>
<td>Terminal Timing (B)</td>
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<tr>
<td>Y</td>
<td>Send Timing (A)</td>
<td>ST</td>
<td>TB 1 PIN 5</td>
</tr>
<tr>
<td>AA</td>
<td>Send Timing (B)</td>
<td>ST</td>
<td>TB 1 PIN 4</td>
</tr>
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</table>

NOTES:
The bubbles on the signal leads denote the inverting signals of the differential interface.

The CONTROL IN and CONTROL OUT connections act as one way (simplex) virtual wires and may be used for purposes other than Request to Send/Clear to Send. Each pair of control leads represents a balanced input/output and therefore may not be used for more than one function at a time. When interfacing with V.35 the 'A' side of the control leads is left floating.

The 86447-90 paddle board services both high and low speed data units.

When used in synchronous mode the HS DATA unit supplies the necessary timing via the ST and RT leads. When used as asynchronous the unit accepts external timing via the TT leads.
PORT OVERVIEW

Using the FSC1S software package the following screens are available via the Craft Interface (C.I.) Jack located on the front of all FSC units. This is a serial RS232 9600 b/s port for connection to a 486 or better PC. This CI enables the user to configure and monitor the entire network from a local interface.

JMUX EAST  Node 1

Receive Level
Displays the optical input level as calibrated to a fixed reference by the factory. Actual level should be measured with an optical power meter. Should the levels differ by more than 1.5 dBm, and the connectors have been properly cleaned, the user can adjust the level on the screen to reflect the metered level by selecting and editing the PIN CALIBRATION.

Alarm
This is the receive optic level that will put the JMUX unit into minor alarm which is sent to the Service unit. Actual alarm level to be determined by the customer. Typical settings are 3 to 6 dB below the nominal receive level.

Fail
Factory set to –33.3 dBm (for maximum range) but field adjustable.

Laser Current (Not Adjustable)
Typically between 10 – 25 mA.

Temperature (Not Adjustable)
Current FOT (upper) module operating temperature.

Pin Calibration
Adjusts FOT module displayed receive level to exact receive input level. Ideally this should read “0” but may vary by +/- 5 if displayed level requires editing to reflect actual level.
**1300nm, -5dBm Laser (Not Adjustable)**
Denotes operating wavelength of FOT module and typical laser output power. Actual output may vary +/- 1.5 dB.

**Temperature (Not Adjustable)**
Current JMUX unit operating temperature.

**XMT PLL Voltage (Not Adjustable)**
Shows phase lock loop voltages for transmit VCXO. Voltage should be between 1.10V and 2.10V and stable to within .05V.

**Sync. Mode (Not Adjustable)**
Determined by JMUX unit shelf position and NODE TYPE configuration. May be INTERNAL, SHELF, or LINE TIMING.

For a ring system functioning normally:
INTERNAL is displayed on right JMUX unit at a Headend node.
SHELF is displayed on the left JMUX unit at a Headend Node.
SHELF is displayed on the right JMUX unit at a Normal node.
LINE is displayed on the left JMUX unit at a Normal node.
SHELF is displayed on both JMUX units at a SLAVE node.

**Node type**
May be HEADEND, NORMAL or SLAVE.

HEADEND is selected for the nodes that supplies the clock frequency for the entire FSC system.

SLAVE is selected for:
(a) Nodes with Sync Units.
(b) Nodes being synchronized from a co-located node on another ring (or linear) system.

NORMAL is selected for all other nodes in a system.

**SPE-Mode**
The SPEPORT-Y and SPEPORT-Z may be configured for:
- VT-THRU: For VTs not being dropped, uses TSI block.
- SPE-THRU: For VTs or DS3 not being dropped.
- VT-DROP: For VTs being dropped (by an SPE-JIF unit).
- SPE-DROP: For DS3 being dropped (by an SPE-DS3 unit).

**Line Loopback**
When ON, the 51.84 Mbps output is driven from the incoming 51.84 Mbps receive input. The line loopback kills the normal transmit traffic.
Local Loopback
When ON, the 51.84 Mbps receive input is driven by the outgoing 51.84 Mbps transmit signal. This kills the normal receive traffic.

Force AIS-XMT
When enabled, this field ensures that actual traffic is not carried on the transmitted 51.84 Mbps signal (for maintenance).

Force AIS-RCV
When enabled, this field ensures that actual traffic is not carried on the three SPE outputs (for maintenance).

JIFPORT VT ASSIGNMENTS

JIFport (Not Adjustable)
Denotes the four available JIFports each dropping a maximum number of seven VTs.

VT Assignment Slots
At each site 28 VTs may be dropped or inserted via the JMUX unit. These VTs are dropped through SPE-X. The 28 VTs assigned to the SPE-X in the TSI module can be assigned to the JIFports (for dropping at this node). Each VT is identified by a number (1 – 28) and the suffix ‘x’ (refers to a VT in SPE-X).

JMUX WEST  Node 1
**SERVICE UNIT Node 1**

**Ring #**
The Ring # identifies the ring in which this node is connected. The ring and node numbers comprise the address used for the Network Management System (NMS).

**Node #**
The Node # identifies the node # in this ring. The ring and node numbers comprise the address used for NMS communication.

**Max Hops**
Used to limit the lifetime of NMS packets in multi-ring systems. This is normally set to the total number of nodes in the system.

**Auto (Autonomous Broadcast Packet Byte Rate)**
The Autonomous Broadcast Packet Byte rate is used to adjust the delay of NMS packets in multi-ring systems. The Autonomous Broadcast frequency should be set equal to the number of nodes in a multi-ring system, with 16 being the lower limit.

**Sonet/SDH**
May be set to OC-3/STM-1 or OC-1/STM-0. This field is based on the JMUX units in the ring.

**JMUX Left/Right**
May be set to Equipped or Not Equipped. This field is set to enable correct alarm reporting.

**Sync Left/Right**
May be set to Equipped or Not Equipped. This field is set to enable correct alarm reporting.
NMS and Overhead Use
Maybe set to either TOH (Transport Overhead Bytes) or POH (Path Overhead Bytes). This field identifies the overhead bytes that are used to carry the orderwire, 4W VF Partyline and NMS information. The path Overhead byte allows the use of a foreign SONET/SDH system between FSC nodes.

Dropped Channels
This field identifies the channels (bytes) in either the Transport Overhead or Path Overhead that are dropped at this node. Seven channels are available and these channels may be assigned to orderwire units and/or 4W VF Partyline units.

NMS Byte
This field identifies the overhead byte in either the Transport Overhead or Path Overhead that is used by the NMS for inter node communication. The same byte must be assigned in all the service units. The Path Overhead byte allows the use of foreign SONET/SDH system between FSC nodes.

JIF-ETHER LEFT Node 1

Slot #
There are seven available slots (1 – 7) to a JIFport. Each slot can be either assigned or turned off(-). Once the slot has been chosen, the VT# that is assigned to that slot in the JMUX unit is displayed (in the next field) and is not adjustable here. The JIFport ID# in the bottom right corner of the screen displays which of the four JIFports the JIF-ETHER unit is connected to. In a ring system, both JIF-ETHER units must be configured the same.
Status (Not Adjustable)
An “OK” indicates normal operation.

XMT Test
This is a built in maintenance tool allowing the user to test the integrity of each VT by sending a predetermined pattern between nodes and viewing this pattern on the JCI screen. When this mode is selected, bytes 11, 22, … 77 are transmitted in slot # 1, 2, … 7 respectively (all 100 payload bytes of each VT are the same).

RCV Test (Not Adjustable)
Displays the far-end transmitted VT test pattern.

Local BER (Not Adjustable)
Displays the current BER rate. Uses the Path BIP-2 byte.

BER Threshold
Path BER threshold setting. An alarm condition is reported if the threshold setting is exceeded.

Far-End BER (Not Adjustable)
Displays the current BER rate of the remote JIF-ETHER unit.

Yellow (Not Adjustable)
Indicates the detection of a yellow path alarm that will also be displayed on the front of the unit. The remote JIF-ETHER unit generates this when it is receiving a bad VT.

JIF Site ID
Both JIF-ETHER units at a site must have the same site ID. No two sites should have the same number. Range is 1 to 230.

LAN ID
All JIF-ETHER units in the system using the same VTs should have the same LAN ID if in the same set of connected LANs. Bridging is only allowed between LANs that are in the same set. Multiple LAN Ids may be used to establish multiple sets of LANs. Bridging will occur between LANs that are members of the same set, but will not be allowed between LANs that are members of different sets. Range is 1 to 15.

Rack Number (use is optional)
Identifies rack or cabinet in which the unit is located. This information may be utilized on the NMS.

Rack Mount Position (use is optional)
Identifies location of shelf in which the unit is located. This information may be utilized on the NMS.

Shelf Slot Position (use is optional)
Identifies slot position within the shelf (1 through 15) in which the unit is located. This information may be utilized on the NMS.
JIF-ETHER RIGHT Node 1

JIF-SHARE LEFT Node 1

JVT Type
JVT-S, JVT-R, and JVT-Q may be set to one of the following:
- Standard VT
- Share VT
- Standard Tie VT
- Share Tie VT

JVT-P may be set to either Standard VT or Standard Tie VT
JVT Assignment
JIFport slot numbers range from 1 to 7. Once the slot has been chosen, the VT that is assigned to that slot in the JMUX unit is displayed. The JIFport ID# in the bottom right corner of the screen displays which of the four JIFports the JIF unit is connected to. In a ring system, both JIF Share units must be configured the same.

Note: Do not confuse JIFport slot numbers with VT assignments. Use the JMUX JCI screen in conjunction with the JIF screen to identify VT assignments.

Priority
In a ring system, the priority is usually set to the shortest distance between sites and may be either right or left regardless of the JIF/JMUX positions (both units must be set the same).

SOY
SOY (Switch On Yellow) may be selected as “SOY” or “-“ and used only in a ring system. If “SOY” is selected, the VT path is switched on “yellow” path alarm as well as a AIS (red). This feature, when enabled, ensures both transmit and receive paths (delays) are the same in the event of a fiber switch.

Test
This is a built in test feature that allows a predetermined pattern to be sent in the VT payload between nodes. The pattern should be observable at the remote JIF unit using the F( screen. Selected patterns are hexadecimal ‘11’ through ‘FF’. This pattern may be selected to appear on all four JVTs if desired. Note: this test will override any traffic currently in use on the selected VT.

Output (Not Adjustable)
Indicates which JIF unit is supplying received data to the JVT bus.

Received VT Status (Not Adjustable)
An “OK” indicates normal operation. Other messages displayed could be AIS, Bad Pointer.

Local BER (Not Adjustable)
Displays the current BER rate and CV (code violation) count. Uses the Path BIP-2 byte.

Threshold
Path BER threshold setting. An alarm condition is reported if threshold setting is exceeded.

Far-End BER (Not Adjustable)
Displays the current BER rate and CV (code violation) count of the remote JIF unit.

Yellow (Not Adjustable)
Indicates the detection of a yellow path alarm which will be displayed on the front of the unit.
**JVT In TIE Mode**
For a JVY in TIE mode the ring #, node # and VT # of the near end site and the far end site is displayed in the message.

**Rack Number**
Identifies rack or cabinet in which the unit is located. This information will be utilized on the NMS.

**Rack Mount Position**
Identifies location of shelf in which the unit is located for NMS.

**Shelf Slot Position**
Identifies which slot position within the shelf (1 through 15) the unit is located in.

**Ring #**
Displays the local ring number.

**Node #**
Displays the local node number.

**JIF-SHARE RIGHT Node 1**
**HS DATA Node 1**

### JMUX Channel
Channel numbers are selectable from 1 through 24. Each JMUX channel occupies its own time slot within a VT thereby making it mandatory that no two channels be allocated the same number on the same VT. The corresponding HS DATA unit (at the far end node) must be given the same channel number.

### Rack Number
Identifies rack or cabinet in which the unit is located. This information will be utilized on the NMS.

### Rack Mount Position
Identifies location of shelf in which the unit is located for NMS.

### Unit's Shelf Slot
Identifies which slot position within the shelf (1 through 15) that the unit is located in for NMS.

### Type
May be 56 kb/s SYNCHRONOUS / ASYNCHRONOUS or 64 kp/s SYNCHRONOUS only.

Note: The unit generates its own internal clock when in SYNCHRONOUS mode. In ASYNCHRONOUS mode the unit will accept an external clock at the terminal timing connections on the Paddle Board. Refer to associated Paddle Board drawing, Figure 3, for more information.

### Designation
May be configured as DTE or DCE. Although both options are available on the JCI screen, the unit itself cannot be considered to be a true DTE since the Send and Receive Timing signals are fixed in direction and support DCE applications only.
Send / Rcv Timing Polarity
The timing polarity may be set to trigger for rising edge or falling edge and is dependent on the communication equipment that is being used. The Send and Receive timing modes between local and far end units must be configured for the same polarity.

PRBS Generator
The Pseudo Random Bit Stream generator may be set to ENABLED (on) or DISABLED (off). When configured to ENABLE the unit will continuously generate PRBS 511 bit periods. This is an on-board maintenance tool used to test and monitor both units and path compatibility between nodes.

JMUX EAST Node 2

JMUX WEST Node 2
SERVICE UNIT Node 2

JIF-ETHER LEFT Node 2
JIF-ETHER RIGHT Node 2

JIF-SHARE LEFT Node 2
JIF-SHARE RIGHT Node 2

HS DATA Node 2