

Enginuity USS-3100 T1 Span Simulator Operation Guide

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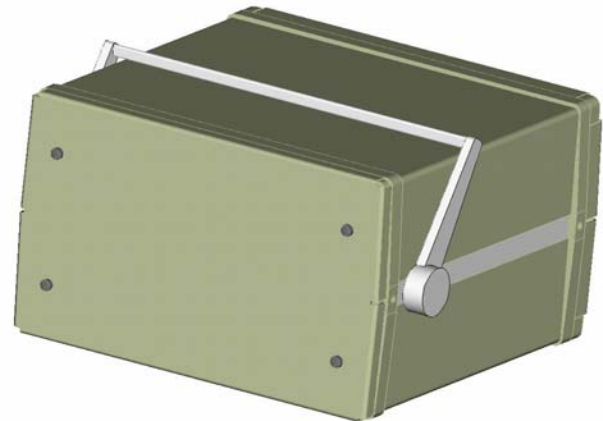
1. GENERAL

1.01 The Enginuity USS-3100 T1/HDSL Line Simulator is a compact and transportable test fixture, used to train installation and maintenance personnel in understanding C.O. to customer premises T1, HDSL, HDSL2 and HDSL4 network circuit design. It can also be used to verify DS1 circuit modules functionality in the garage before rolling a truck to troubleshoot and repair a DS1 circuit. The USS-3100 provides the capability to simulate various lengths of 24 AWG cable from 3Kft to 27Kft, and can facilitate various line conditions and faults.

1.02 Whenever this product or document is changed, it will be reflected in this paragraph.

1.03 The USS-3100 provides the following features and capabilities:

- **All in one case**, card slots for Office Repeater (ORB), Span Repeaters (239 type), Network Interface Unit (NIU)
- **Power** – Standard 120VAC grounded plug
- **Individual short, open and ground switches** for Tip and Ring on both pairs to identify any shorts, opens or failed insulation in the cable
- **Individual line condition switches** for bridge taps, excessive loop length and load coils for Tip and Ring on both pairs
- **Supports** multiple vendor plug-ins and technology for T1 and HDSL
- **Loop length selections** in 3Kft increments, for each segment up to a total circuit length of 27Kft
- **Span repeater slots** for up to (2) two 239 type repeaters or an HDSL doubler.
- **DSX Bantam Jack access** at ORB end, and DSX Bantam with RJ48C Jack access at NIU end
- **ORB slots** for DDM+, 220 and STS 3192 mechanic plug-ins
- **NIU slot supports T200** mechanic plug-ins
- **Two (2) 239 type span repeater slots** with individual by-bass switches
- **Individual line condition toggle switches** for bridge taps from 1 to 3 Kft, excessive loop length, and load coils
- **Individual line fault toggle switches** for Tip-Ring normal/shorted/reversed
- **Individual line fault toggle switches** for Tip normal/open/ground and Ring normal/open/ground
- **Both line condition and line fault toggle switches** provided for Tip and Ring pairs in both circuit directions



**Figure 1 Front View of USS-3100
(with cover)**

- **Three (3) individual cable length segments**, each settable to 0Kft, 3Kft, 6Kft, or 9Kft
- **Compatible with standard T1 and HDSL Test Equipment**
- **Rugged metal case** with adjustable handle

2. OPTIONS

Refer to Figure 2a “Rear Panel View” or the rear panel of the USS-3100 unit while reading this section.

The USS-3100 T1 Span Simulator contains switch options to simulate varying line lengths, line impairments and faults. Three line segments can each be selected for 0Kft, 3Kft, 6Kft, or 9Kft. Line impairments such as load coils and bridge taps for T1 and HDSL 1, 2, or 3 Kft may be selected for either or

both sides of transmission paths. Line faults such as Tip and/or Ring ground, open, or short may be selected for either or both sides of the transmission paths. Transmit & Receive pair reversal can be applied on 2 different line segments along the transmission path. All switches are located on the rear panel of the unit in proximity to the transmission paths and line segments they affect on the graphic screened onto the rear panel. All toggle switches (except NIU Local Power and Ground Selection) operate relays which switch in various impairments or bypass circuit elements. See Tables 1 through 5.

2.01 The cable span sections are simulated with passive discrete components modeling the characteristics of actual 24 AWG cable spans. Also, because the spans are simulated and not actual cable, it is possible that some sophisticated test equipment, such as a Dynatel 965, may not be fooled in all cases.

Table 1 Circuit Elements, Segment Lengths, Power and Ground

OPTION	SWITCH TYPE	FUNCTION	OPTIONS	FACTORY DEFAULT SETTING
Circuit Elements, Segment Lengths, Power and Ground				
ON or OFF	Rocker, 2-Position	Powers Simulator	ON, OFF	OFF
Intra-Office Cable Length	Rotary, 4-Position	Simulates Intra-Office Cable	0, 0 to 220, 220 to 440, or 400 to 655 ft	0 ft
Office Equipment Type or open span	Rotary, 4-Position	Selects slot for office equipment type	Open Span, WECO220, STS 3192, or DDM+	WECO220
Span 1 Length	Rotary, 4-Position	Selects line length to simulate	0, 3, 6, or 9 Kft	0 Kft
Repeater #1 Bypass	Toggle 3-Position	Line Repeater #1 in or out of circuit	Bypass, IN, or IN	BYPASS
Span 2 Length	Rotary, 4-Position	Selects line length to simulate	0, 3, 6, or 9 Kft	0 Kft
Repeater #2 Bypass	Toggle 3-Position	Line Repeater #2 in or out of circuit	Bypass, IN, or IN	BYPASS
Span 3 Length	Rotary, 4-Position	Selects line length to simulate	0, 3, 6, or 9 Kft	0 Kft
Power to NIU	Toggle, 3-Position	Applies power to NIU (if USS powered)	ON, OFF, OFF	OFF
Signal Ground Selection	Toggle 3-Position	Selects signal path ground or no ground	Battery Ground, No Ground, Frame Ground	Battery Ground

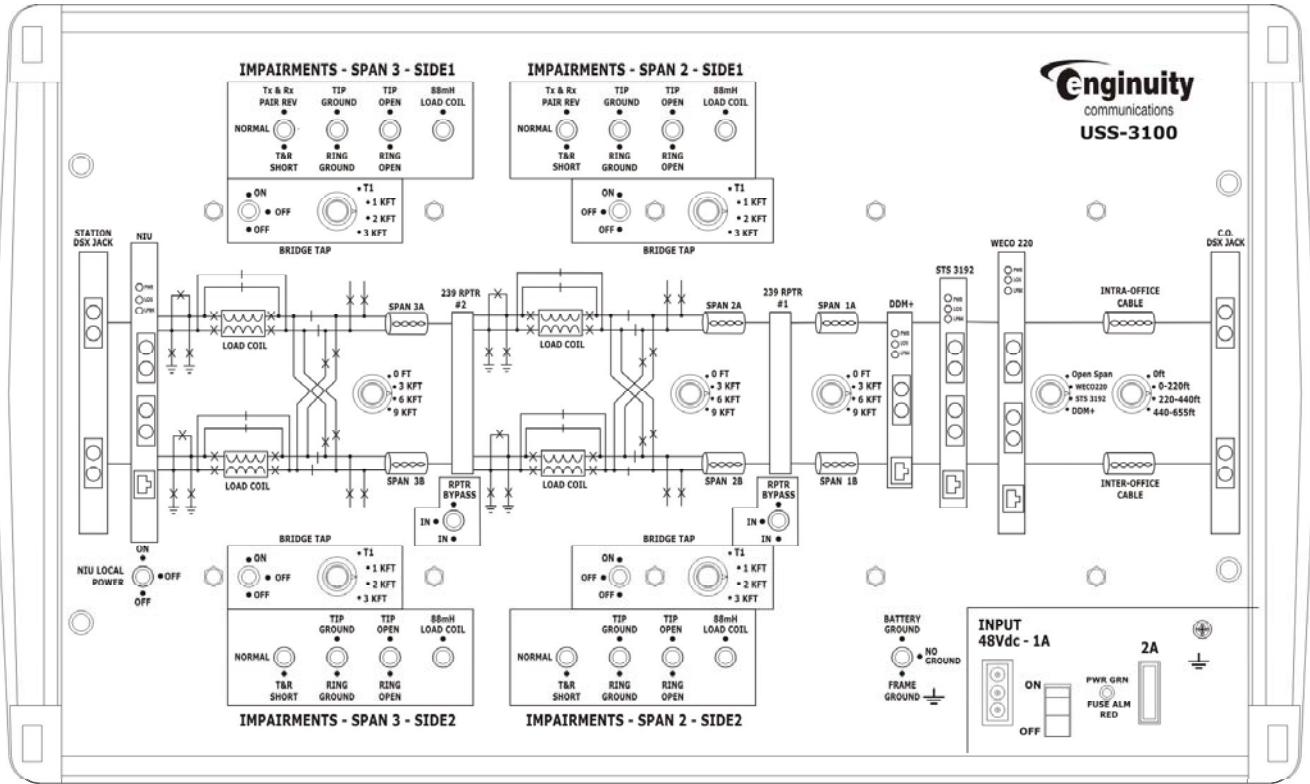


Figure 2a. Rear Panel View of USS3100

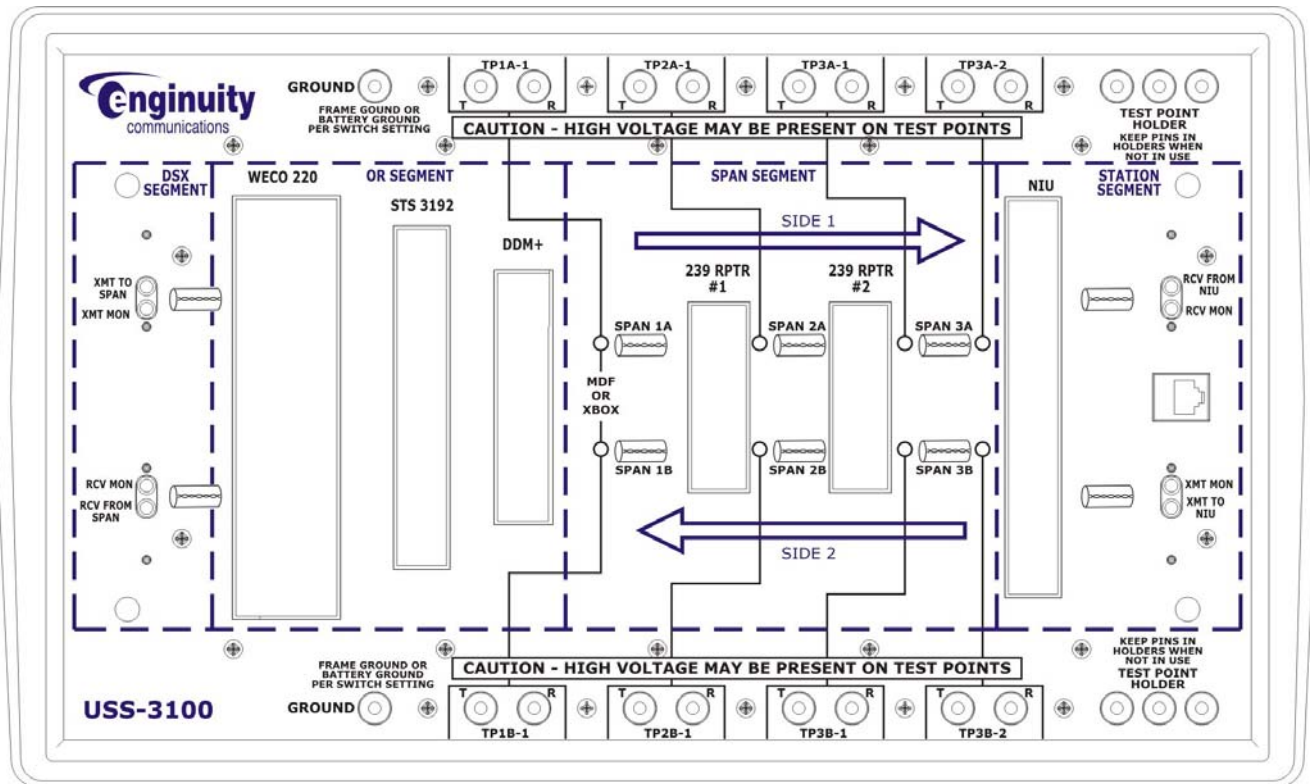


Figure 2b. Front Panel View of USS3100

2.02 Power to Unit

Power is provided to the USS-3100 Span Simulator through a cord supplied with the unit which converts 120 VAC to -48VDC to a connector on the lower right rear of the unit. Without power, the USS-3100 will not function to switch in impairments nor provide power (local power) to the inserted modules. There is an ON/OFF rocker switch near the power cord entry which is switched ON to provide power to the unit. See Figure 3.

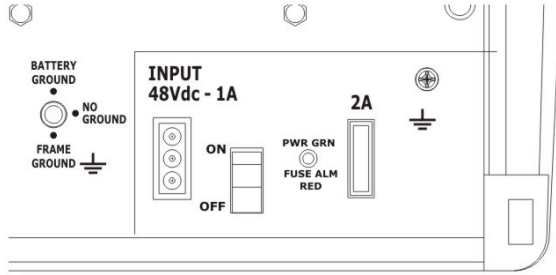


Figure 3. Power Input

2.03 Intra-Office Cable Length Selection

Intra-office cable length from the DSX panel to the ORB may be selected on a 4-position rotary switch on the rear of the unit. See Figure 4. Lengths of 0, 0 to 220, 220 to 440, or 440 to 655 ft may be selected.

2.04 Office Equipment Type Selection

Office equipment types in use of WECO220, STS 3192, DDM+, or Open Span may be selected by a 4-position rotary switch on the rear panel of the unit. See Figure 4. This switch actually selects to which slot in the USS-3100 that the signals are routed. The user plugs in the office equipment type into the card slot on the front of the simulator. All office equipment slots are continuously powered regardless of selection.

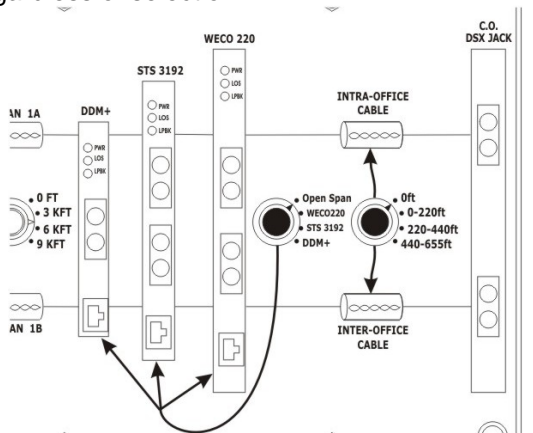


Figure 4.

Intra-Office Cable & ORB Module Selection

2.05 Span 1 Cable Length

0, 3, 6, or 9 Kft simulated cable length may be selected for span 1 on the 4-Position Rotary switch so designated on the rear panel of the unit. See Figure 5, which shows 3 Kft selected. All cable lengths are simulated as 24 gauge twisted pair cable.

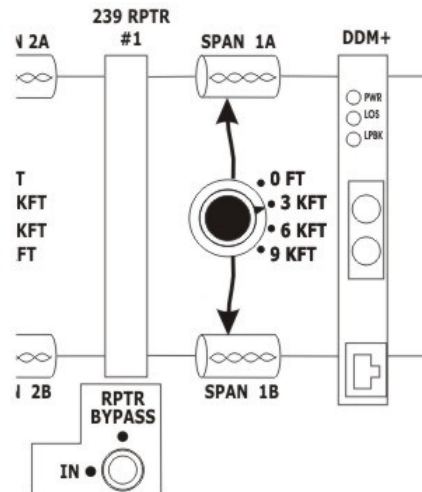


Figure 5. Cable Length, Span 1 & Repeater #1

2.06 Repeater #1 Bypass or In-Circuit

Repeater number 1 can be selected to be in the circuit, "IN", or bypassed, "BYPASS", by the toggle switch below graphic of the repeater on the rear panel of the unit. See Figure 5 which also shows Repeater #1 bypassed. If repeater #1 is selected "IN", the user must have inserted a 239 type line repeater (or 239 mechanics size HDSL doubler for HDSL circuits) in the #1 line repeater slot on the front panel of the unit. If repeater number 1 is selected to be bypassed "BYPASS", no repeater needs to be inserted in the repeater #1 slot, although it would not matter if one were inserted in this case.

2.07 Span 2 Cable Length

0, 3, 6, or 9 Kft simulated cable length may be selected for span 2 on the 4-Position Rotary switch so designated on the rear panel of the unit. All cable lengths are simulated as 24 gauge twisted pair cable.

2.08 Repeater #2 Bypass or In-Circuit

Repeater number 2 can be selected to be in the circuit, "IN", or bypassed, "BYPASS", by the toggle switch below graphic of the repeater on the rear panel of the unit. If repeater #2 is selected "IN", the user must have inserted a 239 type line repeater (or 239 mechanics size HDSL doubler for HDSL circuits) in the #2 line repeater slot on the front panel of the unit. If repeater number 2 is selected to be bypassed "BYPASS", no repeater needs to be inserted in the repeater #2 slot, although it would not matter if one were inserted in this case.

2.09 Power to NIU

Local power can be applied to the NIU by selecting "ON" on the toggle switch below the graphic of the NIU on the rear panel. See Figure 6. A 200 Mechanics NIU must be inserted in the NIU slot on the front panel of the unit for this switch to have any effect.

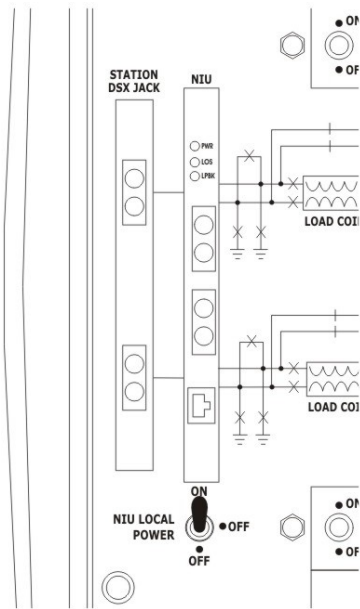


Figure 6. NIU Local Power Switch

Table 2 Span Impairments Span 2 Side 1

OPTION	SWITCH TYPE	FUNCTION	OPTIONS	FACTORY DEFAULT SETTING
Impairments Span 2 Side 1 (and Pair Reversal side 1 to 2)				
Load Coil	Toggle, 3-Position	Inserts 88mH Load Coil when selected	Normal, or 88mH LOAD COIL (down position = normal)	Normal
Tip or Ring Open	Toggle, 3-Position	Selects Open on Ring or Tip	Normal, Tip Open, or Ring Open	Normal
Tip or Ring Ground	Toggle, 3-Position	Selects Ground on Ring or Tip	Normal, Tip Ground, or Ring Ground	Normal
Pair Reversal or T&R short	Toggle, 3-Position	Reverses Tx & Rx pairs between Side 1 & Side 2 or Shorts Tip & Ring on Side 1	Normal, Transmit & Receive PAIR REVersal, or Tip & Ring Short	Normal
Bridge Tap (BT)	Toggle & Rotary, 4-Position	Selects Tap ON or OFF Selects Bridge Tap Length or T1	ON, OFF, OFF T1 or HDSL 1, 2, or 3 Kft	OFF T1

2.10 Load Coil Selection – Span 2 Side 1

This 3-position toggle selects insertion of 88mH load coils on Tip and Ring on Span 2 Side 1. When the toggle switch is in the up position, the load coils are inserted. See Figure 7. When the toggle switch is in the “NORMAL” position (the down position is the same as the NORMAL position), load coils are out of the circuit span.

2.11 Tip or Ring Open – Span 2 Side 1

This 3-position toggle switch selects, on Span 2 Side 1, Open on Tip lead when in the up position, Open on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Open) when in the middle, “NORMAL”, position. See Figures 8 & 9.

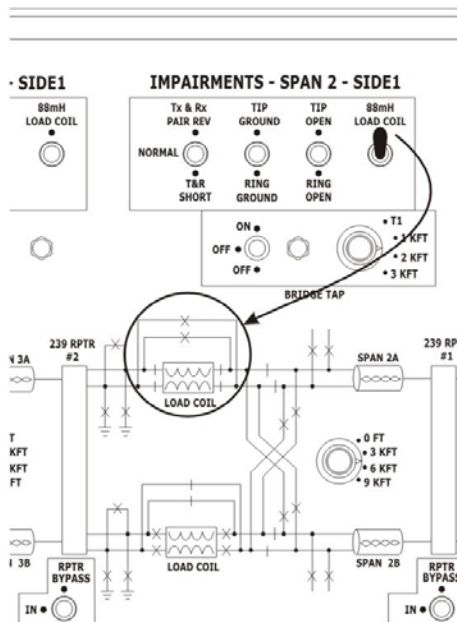


Figure 7. Load Coil Inserted Span 2 Side 1

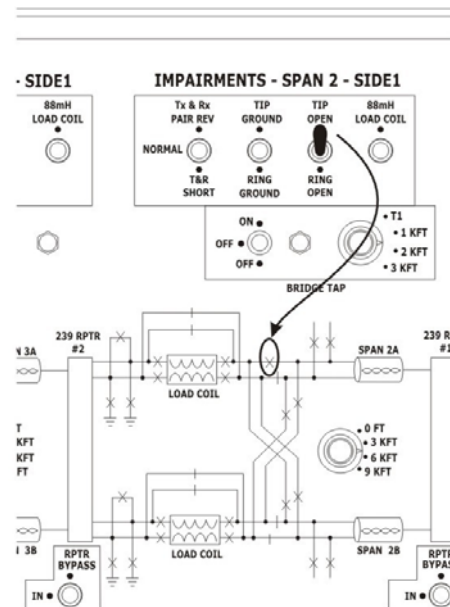


Figure 8. Tip Open Selected

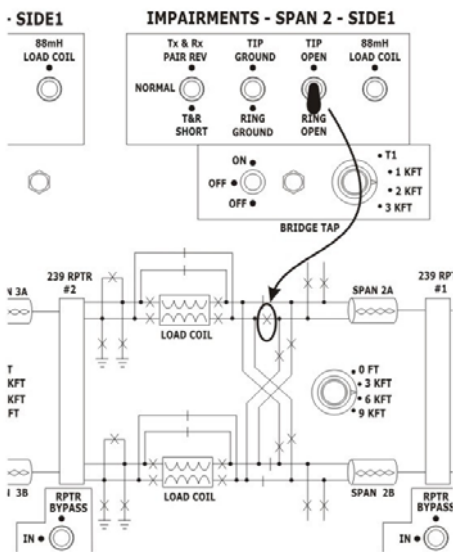


Figure 9. Ring Open Selected

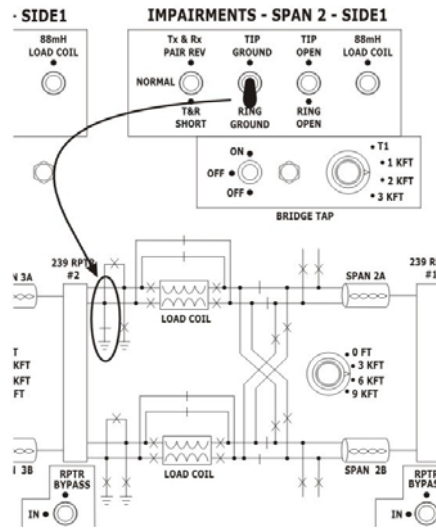


Figure 11. Ring Ground Selected

2.12 Tip or Ring Ground – Span 2 Side 1

This 3-position toggle switch selects, on Span 2 Side 1, Ground on Tip lead when in the up position (See Figure 10), Ground on the Ring lead when in the down position (See Figure 11), or Normal (neither Tip nor Ring lead Ground) when in the middle, “NORMAL”, position.

2.13 Pair Reversal or Tip & Ring Short

This 3-Position toggle switch selects Tip and Ring short on Span 2 Side 1 (See Figure 12), Transmit (Tx) & Receive (Rx) Pair Reversal between Side 1 and 2 on Span 2 (See Figure 13), or Normal operation, in middle neutral position.

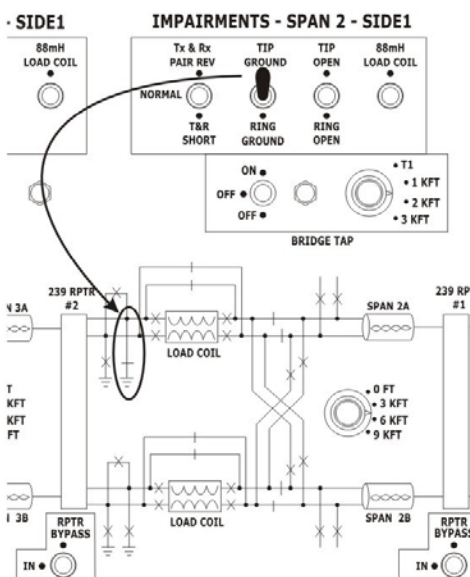


Figure 10. Tip Ground Selected

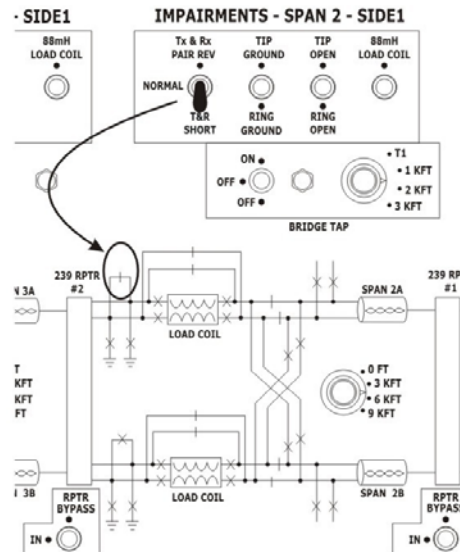


Figure 12. Tip & Ring Short

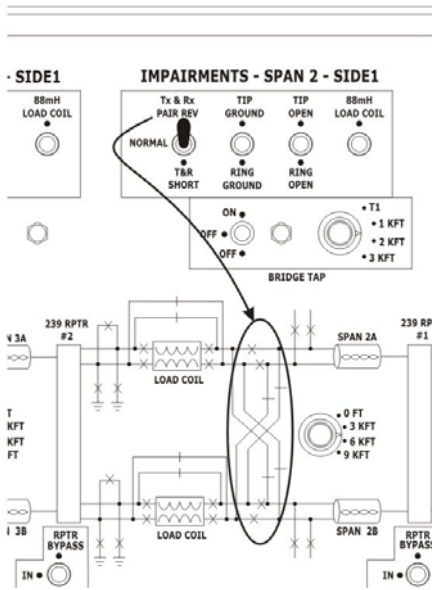


Figure 13. Tx & Rx Pair Reversal

“ON” or up position and is disabled in the “OFF” or the middle and down position.

The 4-position rotary switch allows the user to select T1 Bridge Tap or HDSL Bridge Tap of 1, 2 or 3 Kft in length. The T1 and HDSL Bridge Tap were specifically designed for T1 and HDSL service, respectively.

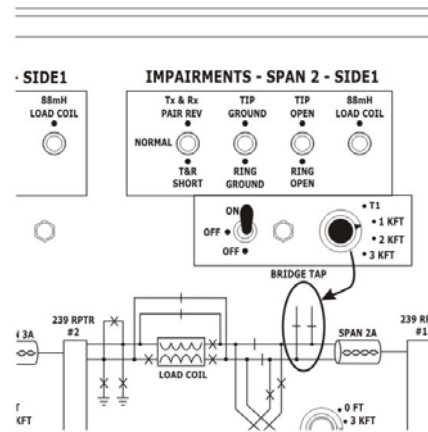


Figure 14. Bridge Tap Selection, Span 2 Side 1 (1 Kft shown selected)

2.14 Bridge Tap – Span 2 Side 1

Operation of the Bridge Tap impairments involves a 3-position toggle switch and a 4-Position rotary switch. See Figure 14. The 3-position toggle switch enables the Bridge Tap selected from the 4-position rotary switch. The Bridge Tap is enabled in the

Table 3 – Span Impairments Span 2 Side 2

OPTION	SWITCH TYPE	FUNCTION	OPTIONS	FACTORY DEFAULT SETTING
Impairments Span 2 Side 2				
Load Coil	Toggle, 3-Position	Inserts 88mH Load Coil when selected	Normal, or 88mH LOAD COIL (down position = normal)	Normal
Tip or Ring Open	Toggle, 3-Position	Selects Open on Ring or Tip	Normal, Tip Open, or Ring Open	Normal
Tip or Ring Ground	Toggle, 3-Position	Selects Ground on Ring or Tip	Normal, Tip Ground, or Ring Ground	Normal
T&R Short	Toggle, 3-Position	Shorts Tip and Ring on Side 2	Normal, Tip & Ring Short	Normal
Bridge Tap (BT)	Toggle & Rotary, 4-Position	Selects Tap ON or OFF Selects Bridge Tap Length or T1	ON, OFF, OFF T1, or 1, 2, or 3 Kft	OFF T1

2.15 Load Coil Selection – Span 2 Side 2

This 3-position toggle selects insertion of 88mH load coils on Tip and Ring on Span 2 Side 2. when the toggle switch is in the up position, the load coils are inserted. When the toggle switch is in the “NORMAL” position (the down position is the same as the NORMAL position), load coils are out of the circuit span.

2.16 Tip or Ring Open – Span 2 Side 2

This 3-position toggle switch selects, on Span 2 Side 2, Open on Tip lead when in the up position, Open on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Open) when in the middle, “NORMAL”, position.

2.17 Tip or Ring Ground – Span 2 Side 2

This 3-position toggle switch selects, on Span 2 Side 2, Ground on Tip lead when in the up position, Ground on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Ground) when in the middle, “NORMAL”, position.

2.18 Tip & Ring Short – Span 2 Side 2

This 3-Position toggle switch selects Tip and Ring short on Span 2 Side 2, or Normal operation. The up position is the same as the NORMAL position.

2.19 Bridge Tap – Span 2 Side 2

Operation of the Bridge Tap impairments involves a 3-position toggle switch and a 4-Position rotary switch. See Figure 15. The 3-position toggle switch enables the Bridge Tap selected from the 4-position rotary switch. The Bridge Tap is enabled in the “ON” or up position and is disabled in the “OFF” or the middle and down position.

The 4-position rotary switch allows the user to select T1 Bridge Tap or HDSL Bridge Tap of 1, 2, or 3 Kft in length.

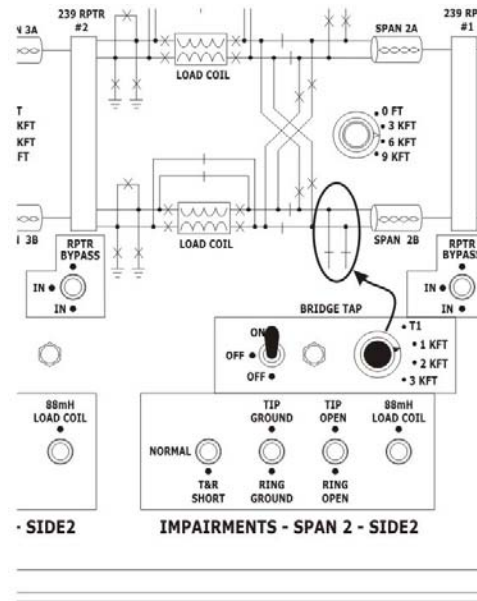


Figure 15. Bridge Tap Selection, Span 2 Side 2 (1 Kft shown selected)

Table 4 Span 3 Side 1 Impairments

OPTION	SWITCH TYPE	FUNCTION	OPTIONS	FACTORY DEFAULT SETTING
Impairments Span 2 Side 2				
Load Coil	Toggle, 3-Position	Inserts 88mH Load Coil when selected	Normal, or 88mH LOAD COIL (down position = normal)	Normal
Tip or Ring Open	Toggle, 3-Position	Selects Open on Ring or Tip	Normal, Tip Open, or Ring Open	Normal
Tip or Ring Ground	Toggle, 3-Position	Selects Ground on Ring or Tip	Normal, Tip Ground, or Ring Ground	Normal
T&R Short	Toggle, 3-Position	Shorts Tip and Ring on Side 2	Normal, Tip & Ring Short	Normal
Bridge Tap (BT)	Toggle & Rotary, 4-Position	Selects Tap ON or OFF Selects Bridge Tap Length or T1	ON, OFF, OFF T1, or 1, 2, or 3 Kft	OFF T1

2.20 Load Coil Selection – Span 3 Side 1

This 3-position toggle selects insertion of 88mH load coils on Tip and Ring on Span 3 Side 1. When the toggle switch is in the up position, the load coils are inserted. When the toggle switch is in the “NORMAL” position (the down position is the same as the NORMAL position), load coils are out of the circuit span.

2.21 Tip or Ring Open – Span 3 Side 1

This 3-position toggle switch selects, on Span 3 Side 1, Open on Tip lead when in the up position, Open on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Open) when in the middle, “NORMAL”, position.

2.22 Tip or Ring Ground – Span 3 Side 1

This 3-position toggle switch selects, on Span 3 Side 1, Ground on Tip lead when in the up position,

Ground on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Ground) when in the middle, “NORMAL”, position.

2.23 Pair Reversal or Tip & Ring Short

This 3-Position toggle switch selects Tip and Ring short on Span 3 Side 1, Transmit & Receive Pair Reversal between Side 1 and 2 on Span 3, or Normal operation.

2.24 Bridge Tap – Span 3 Side 1

Operation of the Bridge Tap impairments involves a 3-position toggle switch and a 4-Position rotary switch. See Figure 16. The 3-position toggle switch enables the Bridge Tap selected from the 4-position rotary switch. The Bridge Tap is enabled in the “ON” or up position and is disabled in the “OFF” or the middle and down position.

The 4-position rotary switch allows the user to select T1 Bridge Tap or HDSL Bridge Tap of 1, 2 or 3 Kft in length. The T1 and HDSL Bridge Tap were specifically designed for T1 and HDSL service, respectively. This bridge tap is electrically simulated to be within 500 ft of the NIU.

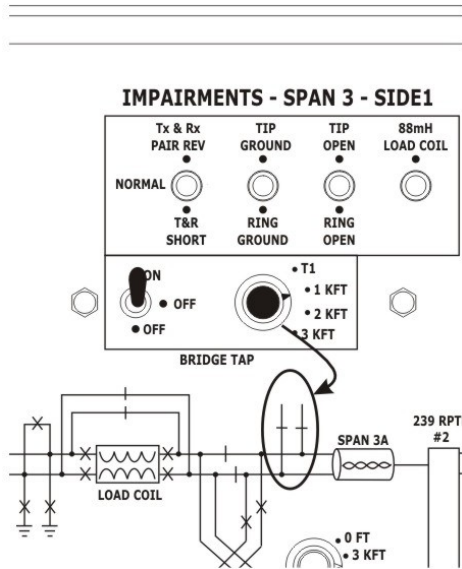


Figure 16. Bridge Tap Selection, Span 3 Side 1 (1 Kft shown selected)

Table 5 Span 3 Side 2 Impairments

OPTION	SWITCH TYPE	FUNCTION	OPTIONS	FACTORY DEFAULT SETTING
Impairments Span 3 Side 2 (except Pair Reversal)				
Load Coil	Toggle, 3-Position	Inserts 88mH Load Coil when selected	Normal, 88mH LOAD COIL (down position = normal)	Normal
Tip or Ring Open	Toggle, 3-Position	Selects Open on Ring or Tip	Normal, Tip Open, Ring Open	Normal
Tip or Ring Ground	Toggle, 3-Position	Selects Ground on Ring or Tip	Normal, Tip Ground, Ring Ground	Normal
T&R short	Toggle, 3-Position	Shorts Tip & Ring on Side 2	Normal, Tip & Ring Short	Normal
Bridge Tap (BT)	Toggle & Rotary, 4-Position	Selects Tap ON or OFF Selects Bridge Tap Length or T1	No Tap 1, 2, or 3 Kft	No Tap

2.25 Load Coil Selection – Span 3 Side 2

This 3-position toggle selects insertion of 88mH load coils on Tip and Ring on Span 3 Side 2. when the toggle switch is in the up position, the load coils are inserted. When the toggle switch is in the “NORMAL” position (the down position is the same as the NORMAL position), load coils are out of the circuit span.

2.26 Tip or Ring Open – Span 3 Side 2

This 3-position toggle switch selects, on Span 3 Side 2, Open on Tip lead when in the up position, Open on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Open) when in the middle, “NORMAL”, position.

2.27 Tip or Ring Ground – Span 3 Side 2

This 3-position toggle switch selects, on Span 3 Side 2, Ground on Tip lead when in the up position,

Ground on the Ring lead when in the down position, or Normal (neither Tip nor Ring lead Ground) when in the middle, “NORMAL”, position.

2.28 Tip & Ring Short – Span 3 Side 2

This 3-Position toggle switch selects Tip and Ring short on Span 3 Side 2, or Normal operation. The up position is the same as the NORMAL position.

2.29 Bridge Tap Span 3 Side 2

Operation of the Bridge Tap impairments involves a 3-position toggle switch and a 4-Position rotary switch. See Figure 17. The 3-position toggle switch enables the Bridge Tap selected from the 4-position rotary switch. The Bridge Tap is enabled in the “ON” or up position and is disabled in the “OFF” or the middle and down position.

The 4-position rotary switch allows the user to select T1 Bridge Tap or HDSL Bridge Tap of 1, 2 or 3 Kft in length. The T1 and HDSL Bridge Tap were specifically designed for T1 and HDSL service, respectively. This bridge tap is electrically simulated to be within 500 ft of the NIU

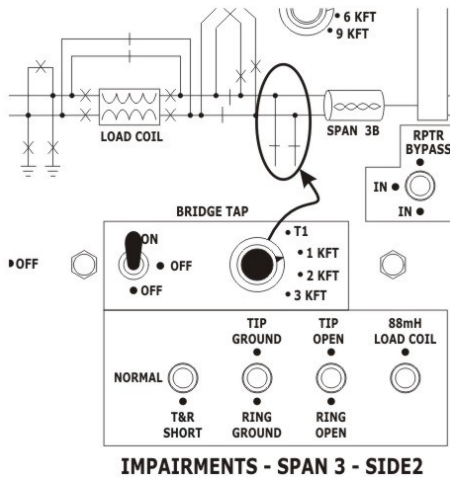


Figure 17. Bridge Tap Selection, Span 3 Side 2 (1 Kft shown selected)

2.30 Signal Path Ground Selection

The ground for the signal path may be selected to be Battery ground, Frame ground or no ground by the switch on the lower right rear panel to the left of the power input and power ON switch. When using T-1 technology, the Ground switch should be set to Battery Ground. When using HDSL technology, the Ground switch should be set to Frame Ground. See Figure 18.

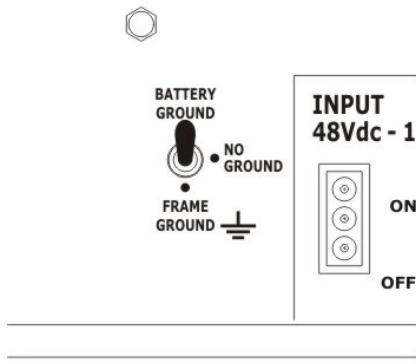


Figure 18. Ground Selection Switch

3. DS1 SIGNAL ACCESS

Refer to Figure 19 “Front Panel View” or the front panel of the unit while reading this section.

3.01 All signal access is done on the front panel of the USS-3100. This is for both insertion/extraction or for monitoring. Signals may be accessed at the office side of spans 1, 2, and 3 and also at the customer side of span 3 via test points, TPNX-1 (or 2)’s, (Where N is the span number from 1 to 3 and X is either the A or B signal path) and displayed on an oscilloscope or other test equipment. All TPNX-1 & 2’s are high impedance test points and suitable only for monitoring of signals. Test pins which plug into the TPNX-1 & 2’s banana jacks are supplied with the USS-3100.

- Caution -
High voltages may be present on test pins.
Use extreme caution.

In addition to the signal access points on the front panel of the USS-3100, one may be able to access, monitor, and insert/extract signals on the front panels of the modules inserted in the USS-3100, depending on the capabilities of the modules installed.

CPE Signal Access

3.02 The CPE DS1 Access Points can be via bantam jack interfaces or an RJ48C jack. The “STATION SEGMENT”-“RCV FROM NIU” jack is for access to CPE receive path from the network. The “STATION SEGMENT”-“XMT TO NIU” jack is for access to CPE Transmit to network. The signals can also be monitored via the associated bantam jacks, “RCV MON” and “XMT MON” at this point.

3.03 If the RJ48C jack is used instead of the STATION SEGMENT JACKs, both the ‘transmit to’ and ‘receive from’ the network are accessed via the single RJ48C connector. When the signals are sent via the RJ48C connector, be careful not to use the STATION SEGMENT JACKs at the same time or the circuit may be double terminated and yield erroneous results.

C.O. Signal Access

3.04 The C.O. signal access is via the DSX SEGMENT bantam JACKs, one for receive signal from the internal Central Office equipment, “RCV FROM SPAN”, and one for transmit to Central Office equipment, “XMT TO SPAN”. These signals can also be monitored via the associated bantam jacks, “RCV MON” and “XMT MON” at this point.

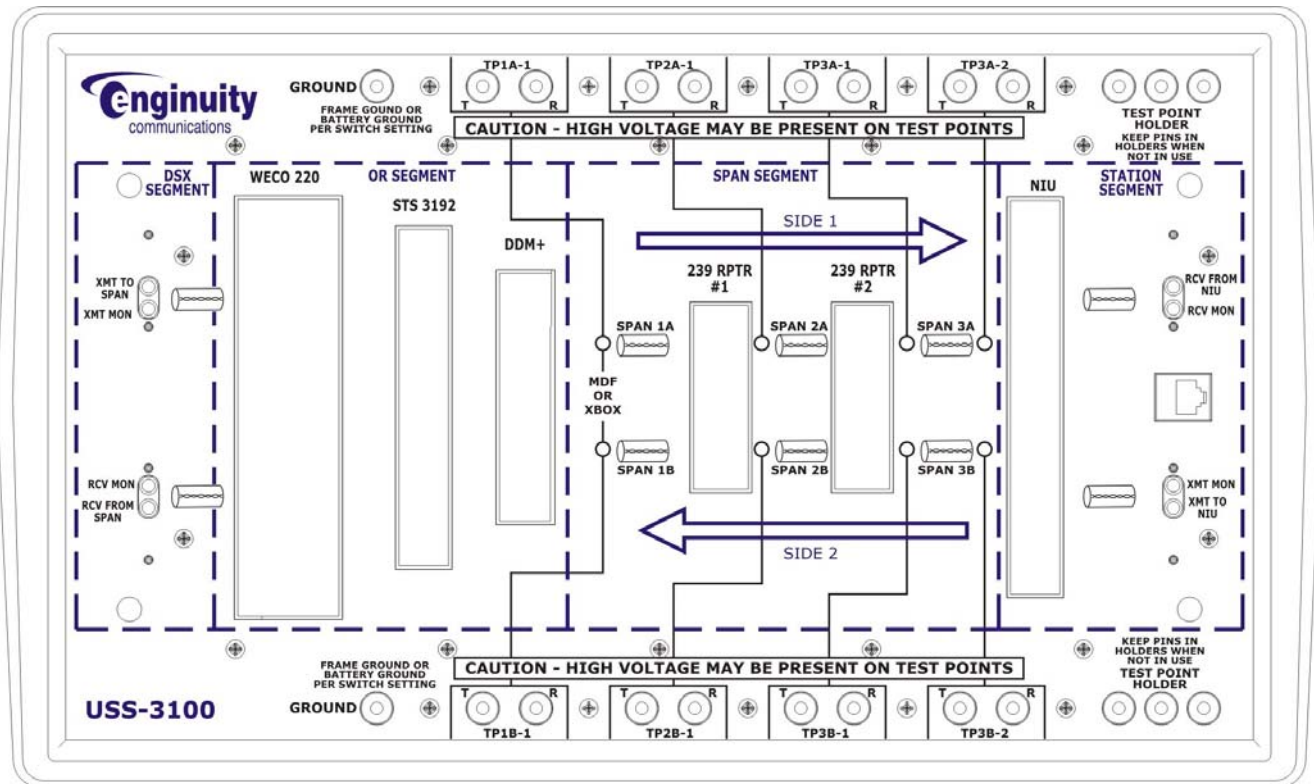


Figure 19. Front Panel View USS-3100

4. INSPECTION AND WARRANTY

Inspection

4.01 Upon receipt of the equipment, inspect the equipment thoroughly. If the equipment has been damaged during transit, please report the damage to the transportation company and to Engenuity.

Warranty

4.02 Engenuity warrants this product to be free of defects at the time of shipment. Engenuity also warrants this product to be fully functional for the time period specified by the terms and conditions governing the sale of the product.

4.03 This equipment should not be field repaired. Any attempt to repair or modify the equipment by anyone other than an authorized Engenuity representative will void the warranty. If the equipment is suspected of being faulty, please contact Engenuity Technical Support at one of the numbers listed in paragraph 4.07.

Repair and Return

4.04 Before returning equipment, a Return Material Authorization (RMA) number must first be requested from Engenuity. Once the RMA number is obtained, please include a brief description of the problem then return the equipment to:

Engenuity Communications, Inc.
3820 Ohio Avenue, Suite 12
St. Charles, IL 60174
ATTN: R.G.M. Department

4.05 Engenuity will repair or replace any defective Engenuity equipment without cost during the warranty period if the unit is found to be defective for any reason other than abuse, improper use or improper installation. If the equipment is found to be defective, please contact Engenuity regarding repair or exchange. If a replacement unit is required, it will be shipped in the fastest manner consistent with the urgency of the situation.

4.06 Engenuity will continue to repair or replace faulty equipment beyond the warranty period for a nominal charge. Contact Engenuity or your local Engenuity Sales Representative for details.

Technical Assistance

4.07 If technical assistance is required, contact the Engenuity Technical Service Department by contacting: Engenuity Communications, Inc. at:

1-(630) 587-1455 or
1-800-980-3266 (ECOM) or
FAX: (630) 587-1879 or
www.EngenuityCommunications.com

5. PLUG-IN MODULES

5.01 No plug-in modules are supplied with the USS-3100. It is presumed that the customer has the appropriate modules for the plug-in slots in the USS-3100 or he would not otherwise have a need for the USS-3100 Span Simulator test unit. Plug in modules must be inserted into the USS-3100 for it to have any utility. A minimum complement of plug-ins would include an NIU (or equivalent HRU), and an ORB (or equivalent HCU) unit for a WECO220, an STS 3192, or a DDM+ slot, since both line repeaters may be bypassed. It could be instructive, however, to show what happens to signals and circuits if either the ORB unit or the NIU module were missing in a real circuit.

5.02 There are plug-in slots for a C.O. ORB, an NIU and up to 2 - 239 type Line Repeaters or HDSL doublers. The ORB can be a WECO220, STS 3192, or a DDM+ type unit. The signals are only routed to and from one of these units based which is selected on the rear panel of the US-3100 unit. See Figure 2, paragraph 2.04.

6. POWER

6.01 The USS-3100 operates on commercial 120Vac. A 6 foot cord with an in-line converter which converts 120Vac to -48Vdc is included with the unit. Plug the cord first into the USS-3100 then plug it into the commercial 120Vac outlet.

6.02 After plugging in the power cord at both ends, switch the power rocker switch on the rear panel of the USS-3100 to "ON". The "PWR GRN" led should illuminate green. This indicates that power is being supplied to the USS-3100. If the led fails to illuminate, check that the AC commercial power outlet is live. If the led illuminates red, the 3A fuse on the rear panel of the unit is blown and needs to be replaced.

6.03 When the power is on to the USS-3100 any module, with a power LED indicator, inserted in the slots of the USS-3100 should illuminate its' POWER LED. If the POWER LED is not ON for any plug-in module, verify that the module is firmly and correctly inserted in its' slot. If the POWER LED still fails to illuminate, replace the module with a known working module.

7. TESTING

7.01 The USS-3100 is used to train field and office test and maintenance personnel on several types of tests and responses they will receive and see on their test equipment due to various line impairments, faults and network equipment malfunctions. Span power tests, Loopback tests, and Transmission Level tests are some of the tests that one may wish to run using the USS-3100. Each of these tests will require the use of whatever standard test sets deployed by the telephone operating company. The USS-3100 can also be used to verify functionality of DS1 circuit modules in the garage before rolling a truck.

7.02 Some tests that can be done with the USS-3100 include metallic voltage tests, loopback tests, and transmission level tests. There are virtually an infinite number of tests one could run using the USS-3100. Typical test equipment that is used with USS-3100 include a Multi-meter with test probes or a test set with voltage measurement capability, such as a Dynatel 965, and a T-Berd 209A Test set or equivalent. Also the user will need Bantam test cords.

7.03 Test points are accessible at the both end of each span of cable. These are via banana jacks shown on the front panel graphic and accessible on the front panel. For the users convenience 6 test pins to plug into these jacks are provided with the USS-3100. Test equipment probes or clips may be attached to these test pins. When the test pins are not in use, they should be stored in the 6 test point holders on the right front of the USS-3100; three (3) test point (pin) holders at the top and three (3) at the bottom. Since these test points are not connected internally, this reduces the risk of high voltages on these test pins.

- Caution -
High voltages may be present on test pins.
Use extreme caution.

8. SPECIFICATIONS

Electrical

Input Power: –42.6 to –56 volts DC
(provided via included 120Vac power
cord to -48Vdc, nominal, converter)

Mechanical

Desk or Table Top Design

Size – Approximately 12" D x 19" W x 9" H

Weight – Approximately 25 pounds.

Environmental

Operating Temperature: 0 to +50°C

Humidity: 5 to 95%, non-condensing

Plug-Ins (user provided)

Office Repeater slots accept 220, DDM+, or
STS 3192 mechanics plug-ins, user selectable

Line Repeater slots accept 239 mechanics
modules

NIU slot accepts any T200 Mechanics modules