Plug-in Four-wire T1 Carrier Card, 751329 & 751329A

Description and Installation

POSITRON
Positron Inc.

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CONFIDENTIALITY NOTICE

DISCLAIMER NOTICE

Although Positron Inc. has made every effort to ensure the accuracy of the information contained herein, this document is subject to change without notice.

TECHNICAL CUSTOMER SUPPORT

Should a problem arise, contact your customer support department. If the problem cannot be resolved by your support department or if you have any questions, contact Positron's Technical Customer Support department at 1-888-577-5254.

1. The Plug-in Four-wire T1 Carrier Card

The Plug-in Four-wire T1 Carrier Cards, models 751329 & 751329A, provide high voltage isolation between an incoming four-wire T1 carrier line and a data transmitting/receiving device located in the substation.

Its features include the following:

- The cards are suitable for transmission at frequencies up to 5 MHz provided the data line is conditioned for operation at this speed.
- The cards do not require power input from either the Central Office (CO) or the Teleline shelf.
- The cards permit the flow of CO simplex sealing current (from one pair to another). Simplex sealing current is not transmitted across the isolation gap to the Station side.

Note

These cards are not compatible with any old generation Three, Five or Eight-card Shelf (models 7501-27, 7501-09 and 7501-08, respectively).

Two versions of the Plug-in Four-wire T1 Carrier cards are available:

- The 751329 Plug-in Four-wire T1 Carrier Card features two 50/60 Hz filters. In cases of line imbalance, common mode 60 Hz (or 50 Hz) can become metallic and disturb the isolation transformer. The filters will permit normal functionality with up to 30 V of 60 Hz induction.
- The 751329A Plug-in Four-wire T1 Carrier Card has been modified. The 60 Hz filters have been removed to create a more cost efficient card for applications where 60/50 Hz induction is not a problem (dedicated lines).

For a view of the 751329 Plug-in Four-wire T1 Carrier Cards' component layout, refer to Figure 1.

For a view of the 751329A Plug-in Four-wire T1 Carrier Cards' component layout, refer to Figure 2.

Figure 1 Plug-in Four-wire T1 Carrier Card, Model 751329 Component Layout (Only Major Components Shown)

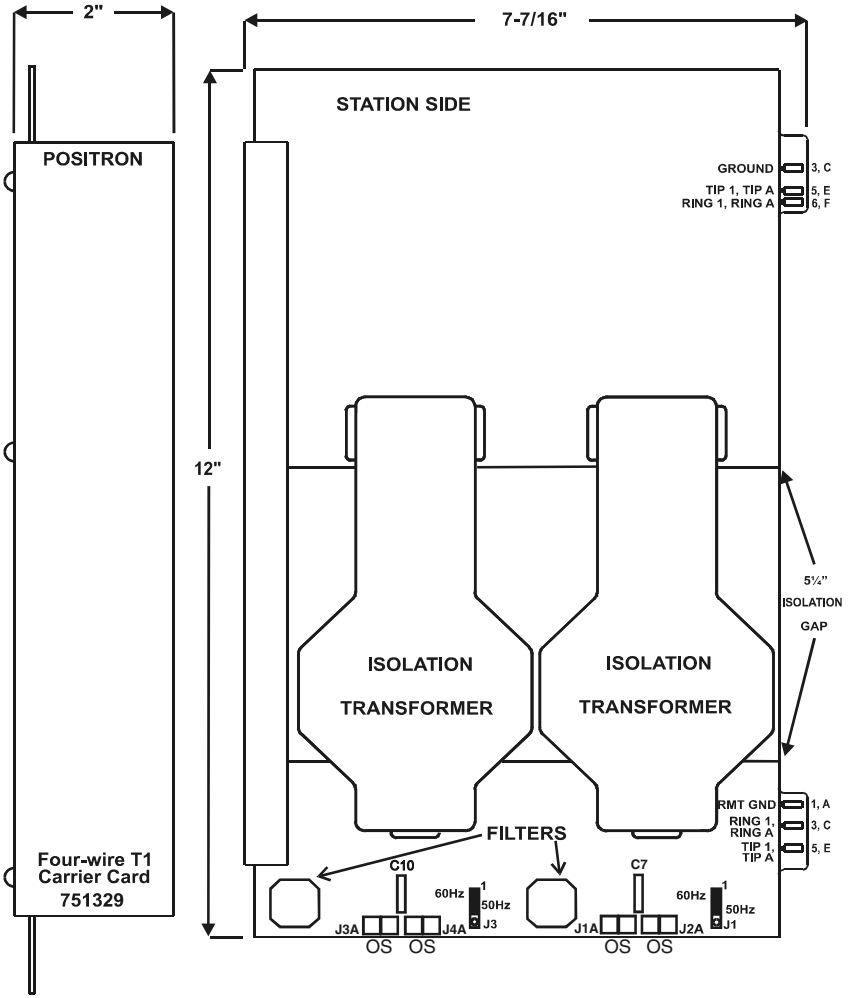
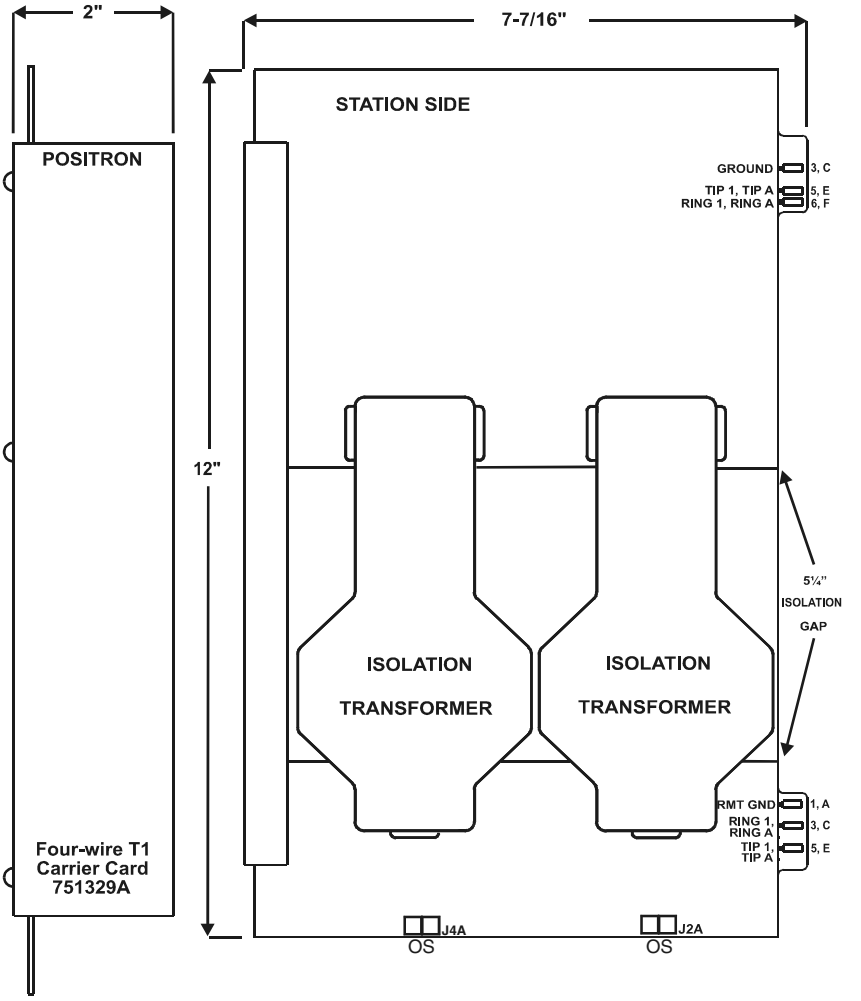


Figure 2 Plug-in Four-wire T1 Carrier Card, Model 751329A Component Layout (Only Major Components Shown)



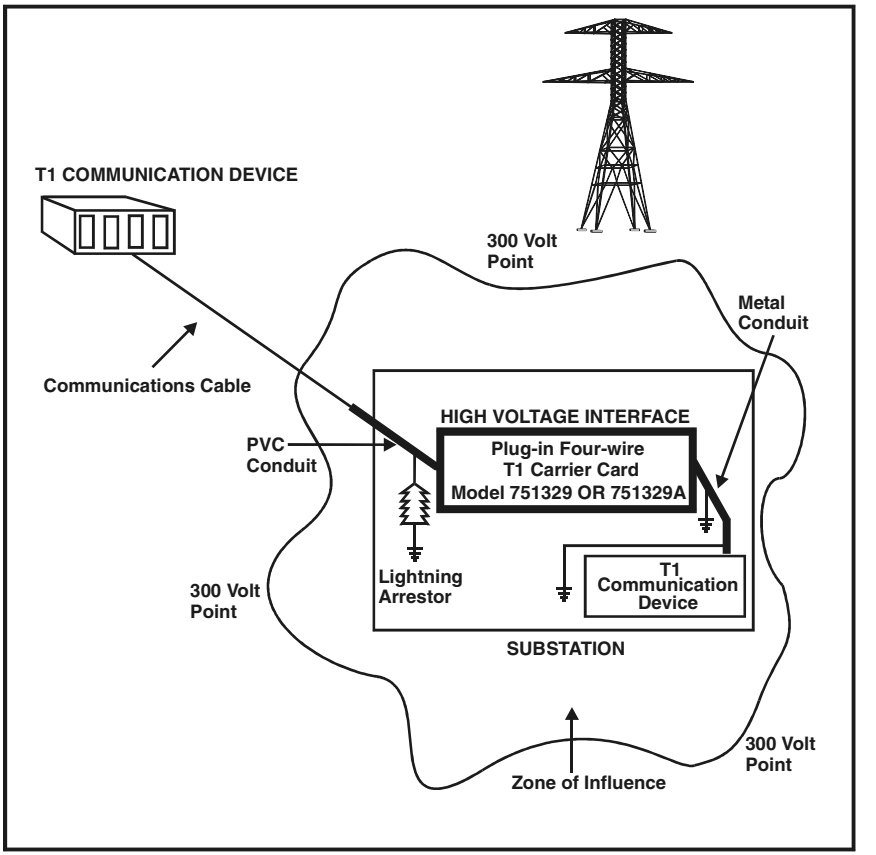
2. Applications

The applications of the Plug-in Four-wire T1 Carrier Card include the following:

- T1 Carrier (1.544 Mb/s)
- E1 Carrier (2.048 Mb/s)
- Analog carrier systems
- Digital data service
- Any other equipment using tone related signalling within the passband of the card.

For an illustration of the card's application, refer to Figure 3.

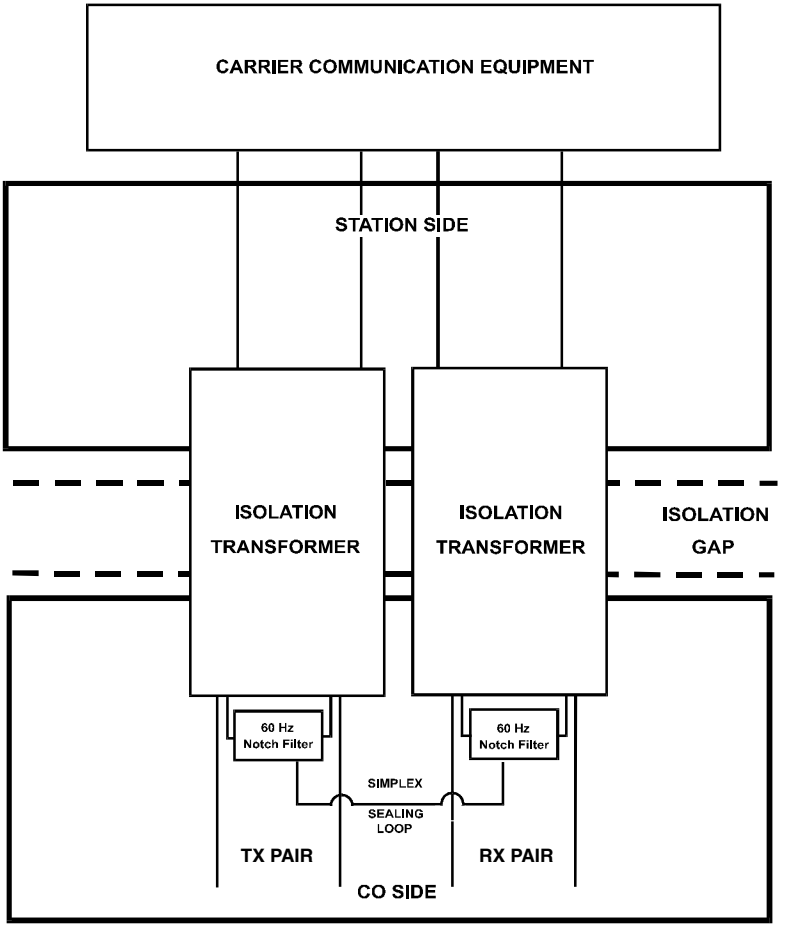
Figure 3 High Voltage Interface Application



3. Hardware Description for 751329

The Plug-in Four-wire T1 Carrier Card is comprised of two sides. The Station side is located on the upper portion of the card and the CO side is located on the lower portion of the card. The Station side is separated from the CO side by isolation transformers which create a 5¼ inch isolation gap. For the card's block diagram, refer to Figure 4.

Figure 4 Block Diagram for 751329 (With Filters)



The following is a description of the elements of the Plug-in Four-wire T1 Carrier Card block diagram.

Isolation Transformers

The Isolation Transformers provide the 5¼ inch isolation gap for the card.

Simplex Sealing Loop

The center taps of the two transformers are shorted together on the PCB to allow the Simplex Sealing Loop current to flow across the pairs.

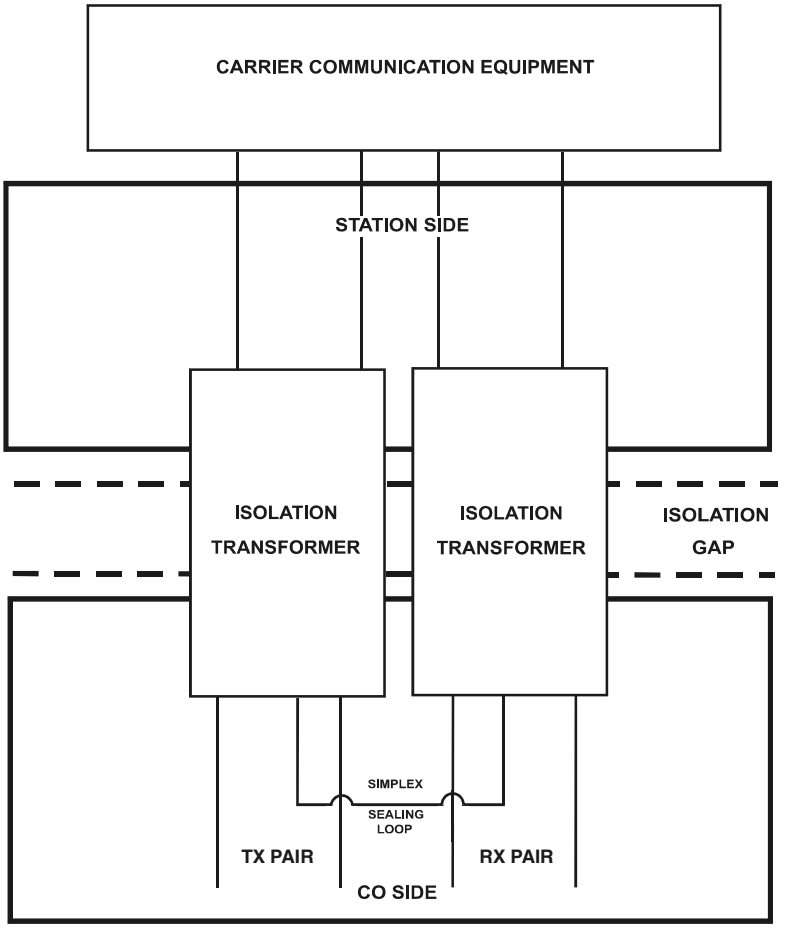
60 Hz Notch Filter

The 721329 (only) features a 60 Notch Filter. It is a parallel inductance capacitor (LC) filter that is tuned at 60 Hz (or 50 Hz), and looks like an open circuit at that frequency. The card can sustain high levels of metallic 60 Hz without degradation of the signal.

4. Hardware Description for 751329A

The Plug-in Four-wire T1 Carrier Card is comprised of two sides. The Station side is located on the upper portion of the card and the CO side is located on the lower portion of the card. The Station side is separated from the CO side by isolation transformers which create a 5¼ inch isolation gap. For the card's block diagram, refer to Figure 5.

Figure 5 Block Diagram for 751329A (No Filters)



The following is a description of the elements of the Plug-in Four-wire T1 Carrier Card block diagram.

Isolation Transformers

The Isolation Transformers provide the 5¼ inch isolation gap for the card.

Simplex Sealing Loop

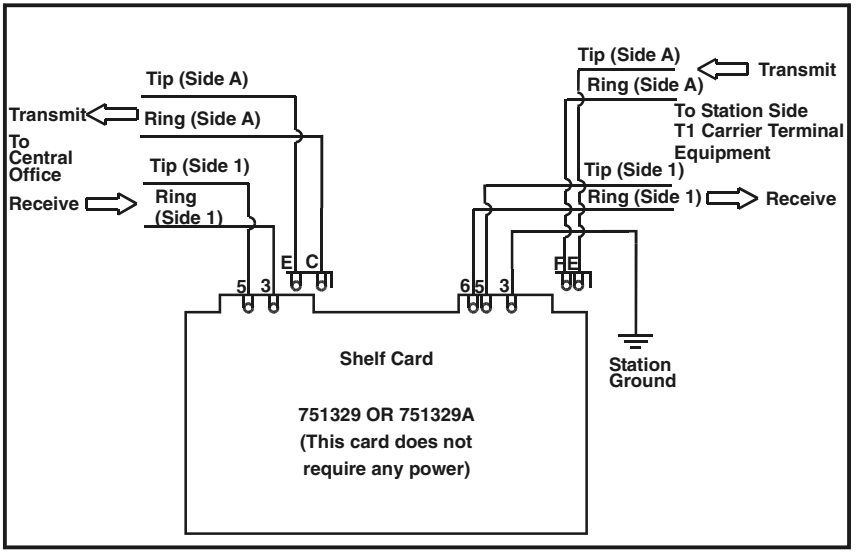
The center taps of the two transformers are shorted together on the PCB to allow the Simplex Sealing Loop current to flow across the pairs.

5. Installation

The Plug-in Four-wire T1 Carrier Cards plug into any slot of the new generation Teleline Three, Five or Eight-card Shelves. However, the card must be installed into the slot which has been pre-wired according to the installation diagram of the specific shelf.

To view the Four Wire T1 Carrier using a single 751329 Card or a single 751329A card, refer to Figure 6.

Figure 6 Four Wire T1 Carrier Using a Single 751329 card or a single 751329A Card



Note

1. Station end T1 carrier terminal equipment CANNOT be powered from the CO line side cable pairs using this type of card.
2. An internal connection on the board loops back the CO side CT of the TRANSMIT and RECEIVE cable pairs.
3. 'TRANSMIT' and 'RECEIVE' may be interchanged.

10 Plug-in Four-wire T1 Carrier Card

Caution

Stand on a thick rubber mat and wear rubber gloves during the installation procedure. It is preferable to perform these procedures on a clear dry day when a Ground Potential Rise (GPR) or transients are less likely to occur.

1. Unpack the Plug-in Four-wire T1 Carrier Card from its box. No unusual precautions need to be taken since the card does not have static-sensitive components.
2. Confirm that the isolation unit is a Plug-in Four-wire T1 Carrier Card by identifying the name and model number on the faceplate of the card.
3. The card must be inserted rightside up and may be plugged into the shelf with the power ON or OFF.
   - ► Slide the card into its designated pre-wired shelf slot until the two card-edge connectors lock into the Teleline shelf and the retaining clip snaps into place.
4. Set jumpers J1 and J3 to the local power frequency . It is factory set for 60Hz. To locate the jumpers, refer to Figure 1. **(For the 751329 card only)**
5. Set J1A to J4A at position “0” to activate the filters. **(For the 751329 card only)**
6. Verify the installation by applying a data signal across the isolator and check that it has been received correctly.

Note

In cases where DC simplex sealing current originates from within the substation, it can be routed through the Teleline shelf to the CO line. Consult Positron for more information.

6. Technical Specifications

For a listing of the card's electrical specifications, refer to Table 1. For a listing of the card's physical specifications, refer to Table 2.

Table 1 Electrical Specifications (measured at 77°F or 25°C, 50% R.H)

Parameter	Specifications
ISOLATION DATA:	
Isolation resistance	100 000 MΩ
Metallic surge	3 kV maximum
Insulation voltage	50 kVrms (70 kV peak)
INPUT VOLTAGE REQUIREMENT	None
POWER DISSIPATION	None
TRANSMISSION DATA:	
Crosstalk (between TX and RX pairs @ 750 kHz)	Better than -35 dB measured at + 10 dBm
Maximum signal level	Up to + 10 dBm with less than 2% harmonic distortion
NOISE	
2 to 100 Hz	-60 dBm
Voice band (C weighted message)	< 5 dBrnc
Phase jitter	< 0.5°, 300 to 3400 Hz
Impulse noise	Less than 1 count above 48 dBrnc in 30 minutes
SIGNAL	
Insertion loss (@ 100 kHz, 0 dBm)	< 1 dB
Insertion loss (@ 1.545 MHz, 0 dBm	< 1 dB
Bandwidth (-3 dB)	2 kHz to 5 MHz

Parameter	Specifications
MAXIMUM OPERATING VOLTAGE	
Across tip and ring	± 11.2 Vpk, 7.9 Vrms
Tip to GND or ring to GND	± 5.6 Vpk, 3.9 Vrms

Table 2 Physical Specifications

Parameter	Specifications
Operating temperature range	-4°F to +149°F (-20°C to +65°C)
Height	12” (30.5 cm)
Width	2” (5.08 cm)
Depth	7-7/16” (18.9 cm)
Weight	3.5 lbs (1.6 kg)

7. Service and Support

Technical Customer Support

Positron is committed to providing excellent ongoing technical support to its customers. A team of specialists is always available at our Technical Support Center in Montreal for either telephone consultations or on-site visits, to assist Field Technical personnel in the maintenance and troubleshooting of Positron equipment. During normal business hours, (8:30 a.m to 5:00 p.m. EST), any one of our Technical Customer Support (TCS) staff may be reached by dialing 1-888-577-5254 from anywhere in the continental United States or from Canada. Customers outside North America should dial 1-514-345-2200. Staff may also be contacted via fax at 514-345-2271 or e-mail at powerdivision@positron.qc.ca.

Positron TCS staff are available to provide technical assistance and/or to supervise the installation of Positron equipment. Assistance in the planning, configuration, and implementation of the installation will be provided as requested. Arrangements and pricing information regarding field assistance may be obtained by contacting the Technical Customer Support department. Please contact Positron for scheduling at least four weeks prior to the actual requested visit date.

Customer Training

Positron offers full customer training courses, as requested. Seminars are also available on High Voltage Interface (HVI). For more information, contact a customer representative by dialing 1-888-577-5254 or use our e-mail address, powerdivision@positron.qc.ca.

Warranty

Positron warrants that all equipment shall perform in accordance with Positron's specifications. The warranty remains valid for five (5) years from the date of shipment. The warranty will be honored provided that the equipment has not been abused and provided that the equipment has been installed and used in accordance with Positron's installation instructions and specifications. The warranty fully covers workmanship, materials and labor.

This warranty is in lieu of all other warranties, whether expressed or implied, including warranties of merchantability and fitness for a particular purpose. Positron guarantees that all equipment shall perform in accordance with Positron's specifications. Positron disclaims any warranty that Positron

equipment will meet customer requirements beyond the product specification. Positron disclaims any warranty that operations will be uninterrupted or error free.

Repair Service

Positron Inc. offers repair services by which customers can count on timely and quality repairs, regardless of customer location.

All warranty repairs are performed at no cost. Positron reserves the right to repair or replace any equipment which has been found to be defective.

For information about out-of-warranty repairs, contact Positron's Repair department at 1-800-661-4911 (from anywhere in the continental United States or from Canada) or dial 514-345-2228. Due to the varied nature of repairs, no one time frame for turnaround can be guaranteed. However, average turnaround time is two weeks from date of receipt. In emergency situations, special arrangements can be made by contacting our Repair department. All repaired items are warranted for a period of 90 days. Bulk repairs (more than five items) will require additional processing time, therefore, please take this into consideration when requesting a Return Material Authorization (RMA) number.

Before returning any items to Positron for repair, warranty repair or replacement, call the Repair department to obtain an RMA number. Parts returned without RMA numbers cannot be accepted. The RMA number must always be clearly marked on all boxes and crates and on all shipping documents.

Items under warranty are to be shipped prepaid to Positron and will be returned prepaid to the customer. Items that are not under warranty are to be shipped prepaid to Positron and will be returned prepaid with freight charges included on the invoice. Positron cannot accept items shipped collect. A purchase order number is required for all repairs.

To accelerate the repair process, whenever possible, customers should include a report detailing the reason for return with the unit(s) being returned. Also, please include the name and phone number of a person who can be contacted should our Repair department need further information.

When packing items being returned for repair, please ensure that the item(s) is properly packed to avoid further damage. Teleline Isolator cards should never be shipped while installed in a shelf; this will cause damage and will almost invariably extend the repair period.

Ordering Information

Positron's Teleline equipment can be ordered by telephone, facsimile, or by mail. All orders should be directed to the Positron Inside Sales department. Ordering by telephone, or facsimile will eliminate any delays arising from postal services. However, a hard copy purchase order is required as a confirmation. In addition to the model numbers of the items being ordered, the following information is required:

- Company name, contact name and telephone number
- Purchase order number
- "Ship To" address
- "Bill To" address
- Date required on site

All orders must be followed by a confirming order. Equipment will not be shipped until such confirmation is received.

For a list of our contact information, refer to Table 3.

Table 3 Positron Contact Information

Address	Positron Inc.
	5101 Buchan St.
	Montreal, Quebec, Canada
	H4P 2R9
Main telephone number	514-345-2200
Customer Service department telephone number	514-345-2200, 1-888-577-5254
General e-mail address	powerdivision@positron.qc.ca
Customer Service department fax number	514-345-2271
TCS department toll-free number	1-888-577-5254
TCS department fax number	514-345-2271
TCS department e-mail address	scarbonaro@positron.qc.ca
Repair department telephone numbers	514-345-2228 or 1-800-661-4911
Customer representative e-mail address	customerservicepower@positron.qc.ca