Telecommunications Group

Fourth Printing, March 2006

360-22 D4 Digital Carrier Terminal Turn-Up and Acceptance Test Procedure for Common Equipment

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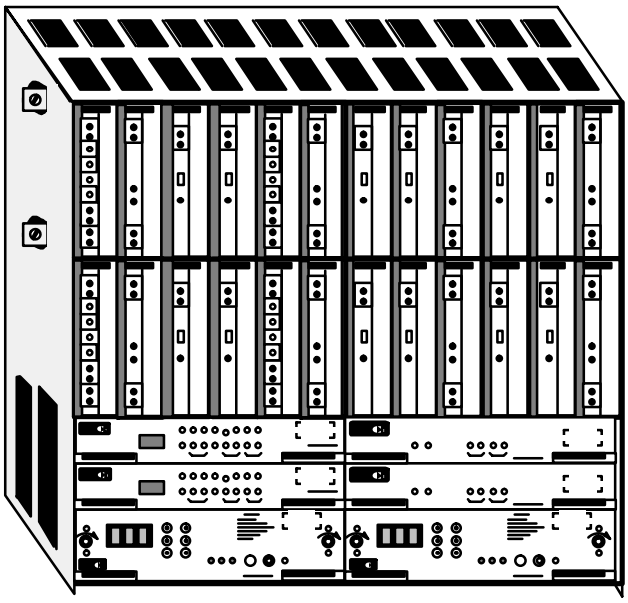

Figure 1. Charles Industries 360-22 D4 Digital Carrier Terminal

1. GENERAL

1.1 Document Purpose

This document provides turn-up and acceptance test procedures for the Charles Industries 360-22 D4 Digital Carrier Terminal (DCT) common equipment, which includes the units described below.

Table 1. 360-22 Digital Carrier Terminal (DCT) required common equipment plug-in units

Quantity	Description
2	3603-02 LIU-3E (Line Interface Unit, Mode 3 ESF)
2	3608-04 DIU-R (Digroup Interface Unit-Redundant)
2	3609-04 PSU-R (Power Supply Unit-Redundant)

1.2 Document Status

This document is reprinted to provide a general editorial update.

1.3 Equipment Function

360-22 D4 DCTs are usually supplied as part of a rack assembly that may contain up to 4 terminals and an 8481-08 power distribution panel at the top of the rack.

1.4 Static Concerns

Each module is shipped in static-protective packaging to prevent electrostatic charges from damaging static-sensitive devices. Use approved static-preventive measures, such as static-conductive wrist straps and a static-dissipative mat, when handling modules outside of their protective packaging. A module intended for future use should be tested as soon as possible and returned to its original protective packaging for storage.

Do not ship or store modules near strong electrostatic, electromagnetic, or magnetic fields. Also, make sure to use the original static-protective packaging for shipping or storage.

2. VERIFYING ELECTRICAL CONNECTIONS

Note: At various times in the following procedures you will be asked to "insert" and "remove" plug-in units into and from the 360-22 D4 DCT. "Insert" means to fully engage the plug-in unit into the terminal's edge connector, using the insertion/ejector latches on the plug-in unit, thus making an electrical connection. "Remove" means to disengage the plug-in unit from the edge connector. It is not necessary to completely remove a unit from a slot since subsequent steps will usually require re-installation. Following this procedure will eliminate unnecessary handling of the plug-in units. When a plug-in unit is to be disengaged from its edge connector, but not removed from the slot, simply open or pull the ejector latches, gently but firmly pull the unit out a convenient working distance, then close the latches. The unit can then be pushed back toward the DCT, but the closed latches will prevent engagement of the edge connector.

2.1 8481-08 Fuse And Alarm Panel

Verify the electrical connections to the 8481-08 Fuse and Alarm Panel by performing the following test procedure. If the 8481-08 Fuse and Alarm Panel is not used, proceed to **360-22 Power Connections**.

Step	Action
1.	**Go to Power Connections if a 8481-08 is not used**; that is, a non-Charles Industries fuse panel is being used.
2.	**Go to Power Connections if this is an addition**; that is, your DCT has just been connected to a previously verified 8481-08 which is presently powering one to four other DCTs.

Step	Action
3.	Insure that no plug-in units are installed in any of the 360-22 D4 digital carrier terminals in the bay.
4.	Apply power to the 8481-08.
5.	Install all fuses. For details, refer to Section 848-108-201.
6.	If any of the fuses in the 8481-08 blow, refer to the test procedure in Section 848-108-201. The BAY ALARM light on the 8481-08 should be extinguished. If office alarms are used, only the MAJOR alarm should be on (denotes that the DIU-R is not installed yet).
7.	Obtain one blown GMT-type fuse.
8.	Replace the GMT 1 amp ALM fuse in the PWR FEEDER A section on the 8481-08 with the blown fuse. The BAY ALARM light should illuminate and any office alarms, if used, should go on. Then replace the blown fuse with the original fuse, The BAY ALARM light should go out and any office alarms, if used, should go off.
9.	Repeat Step 6 for the ALM fuse in the PWR FEEDER B section.
10.	Replace each -48V DIST fuse in POWER FEEDER sections A and B (F7 through F14 on 8481-08) one at a time with the blown fuse. Each time the blown fuse is inserted, the BAY ALARM light should illuminate and any office alarms, if used, should go on. Each time the blown fuse is replaced with the original fuse, The BAY ALARM light should go out and any office alarms, if used, should go off.
11.	Proceed to **Power Connections.**

2.2 360-22 Power Connections

Verify the electrical connections to the 360-22 D4 Digital Carrier Terminal by performing the following test procedure.

Step	Action
1.	Locate Terminal Block TB4 at the rear of the 360-22 DCT. Set a voltmeter (Simpson 260 or equivalent) to the 250Vdc scale and connect the positive test lead to TB4 terminal 8. With the negative test lead, measure the voltage at TB4 terminal 7 and then terminal 5. The voltage should be between 44 and 56Vdc at both test points. If voltages are not correct, inspect wiring for proper polarity, and/or check power source for proper output and correct as required. Refer to Figure 1 for TB4 terminal locations.
2.	If the terminal is wired for ring generator, set a voltmeter (Simpson 260 or equivalent) to the 250Vdc scale and connect the positive test lead to TB4 terminal 2. With the negative test lead, measure the voltage at TB4 terminal 1 and then terminal 3. The voltage should be at least 44Vdc (bias voltage) at both test points. Reset the voltmeter to the 250Vac scale and connect one of the test leads to TB4 terminal 4. With the other lead, measure the voltage at TB4 terminal 1 and then terminal 3. The voltage should be at least 85Vac (ringing voltage) at both test points. If AC and DC voltages are not correct, check the ringing generator for proper connections and operation; correct as required.
3.	Set the options on the 3609-04 PSU-R (refer to Section 360-904-201 for optioning information), verify that its front-panel fuses are in place, and then insert it into the position for the Set A PSU-R (J27). Verify that no fuses blow, that the PSU-R green PWR ON LED lights, and that the major alarm is activated. Refer to Figure 2 for mounting location of the PSU-R.
4.	Remove the PSU-R and repeat Step 3 for the second PSU-R, if a redundant configuration is being used.
5.	This completes the verification of the 360-22 power connections. Remove the PSU-R from J27. Go to Part 3.

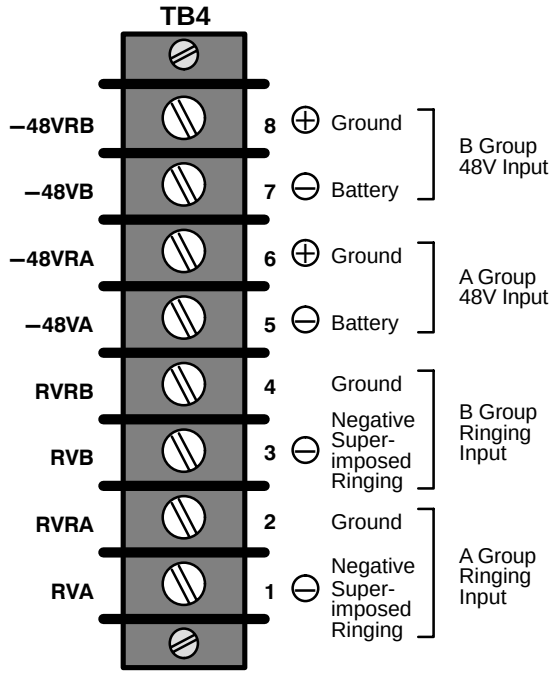

Figure 1. 360-22 Terminal Block 1 (TB4)

3. SYSTEM TURN-UP

In this procedure you will install and turn-up the common equipment. The common equipment is divided into two sets, A and B. The equipment will be installed into the locations as shown in Figure 2.

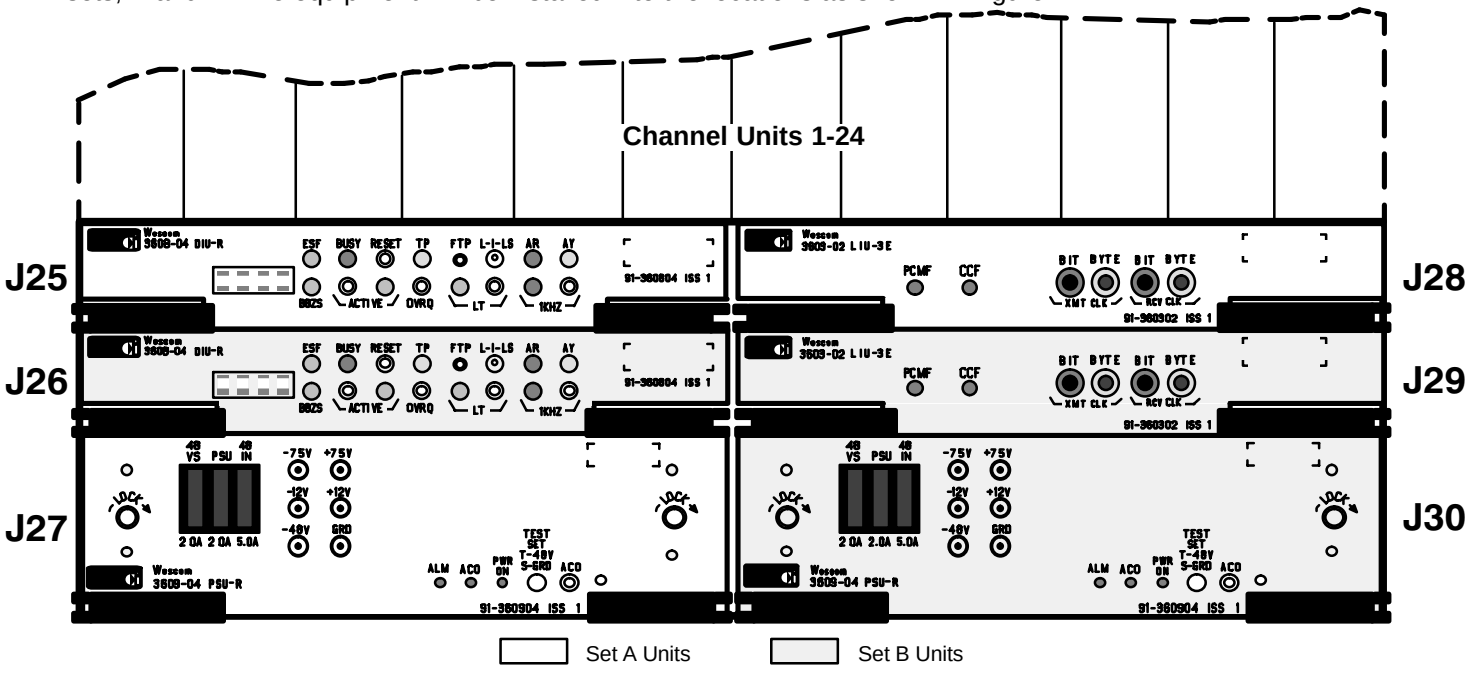

Figure 2. Front View 360-22 D4 Digital Carrier Terminal Common Equipment Locations

3.1 360-22 Common Equipment System Turn-Up Procedure

The common equipment sets will be turned up and checked out individually. First complete all the following steps for common equipment Set A, remove the Set A units, and repeat the steps for common equipment Set B.

While testing the common equipment sets, if actions or indications are in error, either replace the unit in question or refer to Practice Section 360-022-700, Troubleshooting Procedures.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1.</td><td>Connect the DS1 line from TB3-1 to TB3-4, and the DS1 line from TB3-2 to TB3-5.</td></tr>
<tr><td>2.</td><td>Option the common equipment, as required, per Sections 360-804-201 (DIU-R), 360-302-201 (LIU-3E), and 360-904-201 (PSU-R).</td></tr>
<tr><td>3.</td><td>Install the plug-in units one at a time in the order shown below:
<u>Sequence</u> <u>Unit</u> <u>Name</u>
1 3609-04 PSU-R
2 3603-02 LIU-3E
3 3608-04 DIU-R

Note: Table results are dependent on DIU-R S7-5.</td></tr>
<tr><td>4.</td><td>Verify that no fuses in the PSU-R blow. If a fuse blows when a common equipment unit is installed, remove the faulty unit and replace the fuse. Install a new common equipment unit in the slot. If the fuse blows again, discontinue this procedure and refer to the Power Alarm Troubleshooting in Section 360-022-700.</td></tr>
<tr><td>5.</td><td>Check the common equipment units for correct indicator status:
<table>
<tr><th>Unit</th><th>Display Reads</th><th>LED Indicator</th><th>LED Status</th></tr>
<tr><td>3609-04 (PSU-R)</td><td></td><td>PWR ON
ALARM, ACO</td><td>ON
OFF</td></tr>
<tr><td>3603-02 (LIU-3E)</td><td></td><td>PCMF, CCF</td><td>OFF</td></tr>
<tr><td>3608-04 (DIU-R)</td><td>ACTV</td><td>ACTIVE
AR, TP, AY, 1kHz, LT, BUSY
ESF, B8ZS</td><td>ON
OFF

*</td></tr>
<tr><td>Alarms</td><td></td><td>AUD, VIS
MAJ, OVRD</td><td>ON
OFF</td></tr>
</table>
* These LEDs will be ON or OFF depending on DIU-R options.</td></tr>
<tr><td>6.</td><td>Set the voltmeter to the following DC setting and at the PSU-R front-panel test points verify the following voltages:
<table>
<tr><th>Voltmeter Settings</th><th>- (Common) Voltmeter Lead on PSU-R Test Point</th><th>+ Voltmeter Lead on PSU-R Test Point</th><th>Voltmeter Readings</th></tr>
<tr><td>+250VDC -D.C.
+50VDC -D.C.
-10VDC -D.C.
+10VDC +D.C.
+50VDC +D.C.</td><td>GRD
GRD
GRD
GRD
GRD</td><td>-48V
-12V
-7.5V
+7.5V
+12V</td><td>44 to 56VDC
12.8 to 16.5VDC
7.4 to 8.4VDC
7.4 to 8.4VDC
12.8 to 16.5VDC</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>7.</td><td>On the front panel of the DIU-R, enable Forced Trunk Processing (FTP) by inserting a pin-plug into the FTP jack. Verify the following:
1. The DIU-R AR LED illuminates after 2-3 seconds (time dependent on DIU-R S7-5 optioning)
2. The DIU-R AY LED illuminates (dependent on DIU-R S7-5 optioning)
3. The DIU-R displays FTPR and TP=1
4. The DIU-R TP LED illuminates after 4-6 seconds (time dependent on DIU-R S7-5 optioning)
<table>
<tr><th>Unit</th><th>Display Reads</th><th>LED Indicator</th><th>LED Status</th></tr>
<tr><td>3609-04 (PSU-R)</td><td></td><td>PWR ON,
ACO, ALM</td><td>ON
OFF</td></tr>
<tr><td>3603-02 (LIU-3E)</td><td></td><td>PCMF, CCF</td><td>OFF</td></tr>
<tr><td>3608-04 (DIU-R)</td><td>FTPR,TP=1</td><td>ACTIVE, AR, TP, AY
1KHz, BUSY, LT
ESF, B8ZS</td><td>ON
OFF
*</td></tr>
<tr><td>Alarms</td><td></td><td>MAJ, AUD, VIS
OVRD</td><td>ON
OFF</td></tr>
<tr><td colspan="4">Note: AY LED dependent on DIU-R S7-5 optioning.
* These LEDs will be ON or OFF depending on DIU-R options.</td></tr>
</table></td></tr>
<tr><td>8.</td><td>Loop the 360-22 D4 Terminal as follows:
1. Press the ACO button on front panel of the PSU-R
2. Press the LT button on front panel of the DIU-R.
3. If the proper indicator status does not display, refer to Troubleshooting Procedures in Section 360-022-700.
<table>
<tr><th>Unit</th><th>Display Reads</th><th>LED Indicator</th><th>LED Status</th></tr>
<tr><td>3609-04 (PSU-R)</td><td></td><td>PWR ON, ACO,
PWR ALM</td><td>ON
OFF</td></tr>
<tr><td>3603-02 (LIU-3E)</td><td></td><td>PCMF, CCF</td><td>OFF</td></tr>
<tr><td>3608-04 (DIU-R)</td><td>TEST</td><td>LT, TP, ACTIVE, AR,
AY, 1KHz, BUSY</td><td>ON
OFF</td></tr>
<tr><td>Alarms</td><td></td><td>MAJ, VIS,
OVRD
AUD</td><td>ON **
OFF</td></tr>
<tr><td colspan="4">Note: AY LED dependent on DIU-R S7-5 optioning.
** MAJ and VIS alarms depend on the options on the PSU-R.</td></tr>
</table></td></tr>
<tr><td>9.</td><td>Bring the 360-22 D4 Terminal out of the looped condition by pressing the LT button on front panel of the DIU-R.</td></tr>
</table>

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>10.</td><td>On the DIU-R, remove the pin plug from the FTP jack and verify the following:
The DIU-R AR LED extinguishes immediately
The DIU-R AY LED extinguishes after 15 seconds (time dependent on DIU-R S7-5 optioning)
The DIU-R TP LED extinguishes after 15 seconds (time dependent on DIU-R S7-5 optioning)
<table>
<tr><th>Unit</th><th>Display Reads</th><th>LED Indicator</th><th>LED Status</th></tr>
<tr><td>3609-04 (PSU-R)</td><td></td><td>PWR ON, ACO,
PWR ALM</td><td>ON
OFF</td></tr>
<tr><td>3603-02 (LIU-3E)</td><td></td><td>PCMF, CCF</td><td>OFF</td></tr>
<tr><td>3608-04 (DIU-R)</td><td>ACTV (and)
TP=1</td><td>ACTIVE
LT, AR, TP,
AY, 1KHz, BUSY
ESF, B8ZS</td><td>ON
OFF
OFF
*</td></tr>
<tr><td>Terminal Block Alarms</td><td></td><td>VIS
MAJ, OVRD
AUD</td><td>ON * * *
OFF</td></tr>
</table>
Note: AY LED dependent on DIU-R S7-5 optioning.
* These LEDs will be ON or OFF depending on DIU-R options.
* * * VIS alarm depends on the option position on the PSU-R</td></tr>
<tr><td>11.</td><td>Remove the front-panel-mounted 2A fuse labelled 48 VS. From the PSU-R, obtain a blown GMT-type fuse and place it in the empty fuse holder. Press the ACO button on the PSU-R and verify the following:
1. The PSU-R ACO LED illuminates
2. The PSU-R PWR ALM LED illuminates
3. The DIU-R AY LED illuminates (dependent on DIU-R S7-5 optioning)
4. The DIU-R AR LED illuminates
5. The DIU-R TP LED illuminates
6. The DIU-R displays PSU-R FAIL and TP=2
Remove the blown fuse
Install the original (good) fuse and after 15-20 seconds (time dependent on DIU-R S7-5 optioning):
1. The DIU-R AY and TP LEDs extinguish (dependent on DIU-R S7-5 optioning)
2. The DIU-R displays ACTV and TP=2</td></tr>
<tr><td>12.</td><td>On the PSU-R, remove the front-panel-mounted 5.0A fuse 48 IN. Verify immediate office alarms, except for OVRD. Then press the ACO switch on the PSU-R and verify that the PSU-R ACO LED illuminates and the office AUD alarm turns off. VIS and MAJ depend on PSU-R options. Also, verify that the PSU-R PWR ALM LED lights and the PSU-R PWR ON LED extinguishes.</td></tr>
<tr><td>13.</td><td>Remove the PSU-R from its mounting slot and reinsert the 5.0A fuse. Reinsert the PSU-R into its mounting slot and verify the following:
1. PWR ON LED on the PSU-R illuminates within one second.
2. All common equipment LEDs, except the PSU-R PWR ON LED, should extinguish. ESF and B8ZS LEDs depend on DIU-R options. DUI-R active LED is ON.</td></tr>
<tr><td>14.</td><td>On the PSU-R, remove the front-panel-mounted 2.0A fuse PSU. Verify immediate office alarms. Then press the ACO switch on the PSU-R and verify that the PSU-R ACO LED illuminates and the office alarms turn off. (If the PSU-R screw option WW is CLOSED (down), only the office audible alarms will turn off. If the PSU-R screw option WW is OPEN (up), both audible and visual alarms will turn off.) Also verify that the PSU-R PWR ALM LED lights and the PSU-R PWR ON LED extinguishes.</td></tr>
</table>

Step	Action
15.	Remove the PSU-R from its mounting slot and reinsert the 2.0A fuse. Reinsert the PSU-R into its mounting slot and verify the following: 1. PWR ON LED on the PSU-R illuminates within one second. ESF and B8ZS LEDs depend on DIU-R options. DUI-R active LED is ON. 2. All common equipment LEDs, except the PSU-R PWR ON LED, should extinguish.
16.	If you have just completed the turn-up steps of common equipment Set A, remove all three Set A units and return to Step 2 of 3.1 and perform the steps for common equipment Set B. If you have completed both Set A and B at this point, proceed to the next step.
17.	This completes the verification of the system alarms. This also completes the Charles Industries 360-22 D4 Digital Carrier Terminal Turn-Up Acceptance Procedure For Common Equipment on an individual set basis. Proceed with Part 4.

4. 1:1 PROTECTION SWITCHING TEST

Use the following steps to perform the Set A and Set B common equipment 1:1 Protection Switching Test.

Step	Action		
1.	Before performing the Protection Switching Test, the Set A and Set B common equipment must have been tested and verified as explained in Part 3.		
2.	Reinstall the Set A common equipment and verify the following: 1. The Set A DIU-R displays STBY. 2. The Set B DIU-R displays ACTV.		
3.	Remove the Set B PSU-R and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set B 3608-04	PSU-R Fail	OFF
	Set A 3608-04	ACTV	ON
	Alarm Terminal Block	AUD, VIS MAJ, OVRD	ON OFF
4.	Reinstall the Set B PSU-R, and after 15 seconds (time dependent on DIU-R S7-5 optioning) verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set B 3608-04	STBY	OFF
	Set A 3608-04	ACTV	ON
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF
5.	Press the ACTIVE switch on the DIU-R in Set B and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	STBY	OFF
	Set B 3608-04	ACTV	ON
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF
6.	Press the ACTIVE switch on the DIU-R in Set A and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	ACTV	ON
	Set B 3608-04	STBY	OFF
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF

Step	Action		
7.	Press the OVRD switch on the DIU-R in Set B and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	STBY	OFF
	Set B 3608-04	OVRD	ON
	Alarm Terminal Block	OVRD AUD, VIS, MAJ	ON OFF
8.	Press the OVRD and/or the ACTIVE switch on the DIU-R in Set A and verify that this causes no change in the status.		
9.	Press the OVRD switch on the DIU-R in Set B and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	STBY	OFF
	Set B 3608-04	ACTV	ON
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF
10.	Press the OVRD switch on the DIU-R in Set A and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	OVRD	ON
	Set B 3608-04	STBY	OFF
	Alarm Terminal Block	OVRD AUD, VIS, MAJ	ON OFF
11.	Press the OVRD and/or the ACTIVE switch on the DIU-R in Set B and verify that this causes no change in the status.		
12.	Press the OVRD switch on the DIU-R in Set A and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	ACTV	ON
	Set B 3608-04	STBY	OFF
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF
13.	Connect a jumper wire between terminal 7 (REMB) of TB3 to terminal 6 (-48VRA, ground) of TB4 and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	STBY	OFF
	Set B 3608-04	OVRD	ON
	Alarm Terminal Block	OVRD AUD, VIS, MAJ	ON OFF
14.	Press the OVRD and/or the ACTIVE switch on the DIU-R in Set A and verify that this causes no change in the status.		
15.	Remove the jumper wire between terminal 7 (REMB) of TB3 to terminal 6 (-48VRA, ground) of TB4 and verify the following:		
	Unit	**DIU-R Display Reads**	**Active LED Status**
	Set A 3608-04	STBY	OFF
	Set B 3608-04	ACTV	ON
	Alarm Terminal Block	AUD, VIS, MAJ, OVRD	OFF

<table>
<tr><th>Step</th><th colspan="3">Action</th></tr>
<tr><td>16.</td><td colspan="3">Connect a jumper wire between terminal 8 (REMA) of TB3 to terminal 6 (-48VRA, ground) of TB4 and verify the following:</td></tr>
<tr><td></td><td>Unit</td><td>DIU-R Display Reads</td><td>Active LED Status</td></tr>
<tr><td></td><td>Set A 3608-04</td><td>OVRD</td><td>ON</td></tr>
<tr><td></td><td>Set B 3608-04</td><td>STBY</td><td>OFF</td></tr>
<tr><td></td><td>Alarm Terminal Block</td><td>OVRD
AUD, VIS, MAJ</td><td>ON
OFF</td></tr>
<tr><td>17.</td><td colspan="3">Press the OVRD and/or the ACTIVE switch on the DIU-R in Set B and verify that this causes no change in the status.</td></tr>
<tr><td>18.</td><td colspan="3">Remove the jumper wire between terminal 8 (REMA) of TB3 to terminal 6 (-48VRA, ground) of TB4 and verify the following:</td></tr>
<tr><td></td><td>Unit</td><td>DIU-R Display Reads</td><td>Active LED Status</td></tr>
<tr><td></td><td>Set A 3608-04</td><td>ACTV</td><td>ON</td></tr>
<tr><td></td><td>Set B 3608-04</td><td>STBY</td><td>OFF</td></tr>
<tr><td></td><td>Alarm Terminal Block</td><td>ALL</td><td>OFF</td></tr>
<tr><td>19.</td><td colspan="3">This completes the 1:1 Protection Switching Test.</td></tr>
<tr><td>20.</td><td colspan="3">This completes the Turn-Up and Acceptance Test of the 360-22 D4 Digital Carrier Terminal. The terminal is now ready for the channel unit installations.</td></tr>
</table>

5. TECHNICAL ASSISTANCE

5.1 Technical Assistance — U.S.

If technical assistance is required, contact Charles Industries' Technical Services Center at:

847-806-8500
847-806-8556 (FAX)
800-607-8500
techserv@charlesindustries.com (e-mail)

6. WARRANTY & CUSTOMER SERVICE

6.1 Warranty

Charles Industries, Ltd. offers an industry-leading, 5-year warranty on products manufactured by Charles Industries. Contact your local Sales Representative at the address or telephone numbers below for warranty details. The warranty provisions are subject to change without notice. The terms and conditions applicable to any specific sale of product shall be defined in the resulting sales contract.

Charles Industries, Ltd.
5600 Apollo Drive
Rolling Meadows, Illinois 60008-4049
847-806-6300 (Main Office)
847-806-6231 (FAX)

6.2 Field Repairs (In-Warranty Units)

Field repairs involving the replacement of components within a unit are not recommended and may void the warranty and compatibility with any applicable regulatory or agency requirements. If a unit needs repair, contact Charles Industries, Ltd. for replacement or repair instructions, or follow the *Repair Service Procedure* below.

6.3 Advanced Replacement Service (In-Warranty Units)

Charles Industries, Ltd. offers an “advanced replacement” service if a replacement unit is required as soon as possible. With this service, the unit will be shipped in the fastest manner consistent with the urgency of the situation. In most cases, there are no charges for in-warranty repairs, except for the transportation charges of the unit and for a testing and handling charge for units returned with no trouble found. Upon receipt of the advanced replacement unit, return the out-of-service unit in the carton in which the replacement was shipped, using the preaddressed shipping label provided. Call your customer service representative at the telephone number above for more details.

6.4 Standard Repair and Replacement Service (Both In-Warranty and Out-Of-Warranty Units)

Charles Industries, Ltd. offers a standard repair or exchange service for units either in- or out-of-warranty. With this service, units may be shipped to Charles Industries for either repair and quality testing or exchanged for a replacement unit, as determined by Charles Industries. Follow the *Repair Service Procedure* below to return units and to secure a repair or replacement. A handling charge applies for equipment returned with no trouble found. To obtain more details of this service and a schedule of prices, contact the CI Service Center at 217-932-5288 (FAX 217-932-2943).

Repair Service Procedure

1. Prepare, complete, and enclose a purchase order in the box with the equipment to be returned.

2. Include the following information:

   - Company name and address
   - Contact name and phone number
   - Inventory of equipment being shipped
   - Particulars as to the nature of the failure
   - Return shipping address

3. Ship the equipment, purchase order, and above-listed information, transportation prepaid, to the service center address shown below.

   CI Service Center
   Route 40 East
   Casey, IL 62420-2054

4. Most repaired or replaced units will be returned within 30 or 45 days, depending on the product type and availability of repair parts. Repaired units are warranted for either 90 days from the date of repair or for the remaining unexpired portion of the original warranty, whichever is longer.