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**DIGITAL DATA SYSTEM**  
**BAY CLOCK, POWER, AND ALARMS CIRCUIT**  
**TESTS**

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This section provides the procedures for replacing faulty circuit packs during clearing of alarms caused by malfunctions within the bay clock, power, and alarms (BCPA) circuit. A general knowledge of the Digital Data System (DDS) is required for a full understanding of this section.

The DDS requires no routine maintenance. Troubles are corrected by the replacement of an entire circuit pack, rather than individual components, on a go/no go basis.

This section, with Section 314-916-300, provides efficient procedures for isolating and eliminating failures in the BCPA circuit.

The HL49 circuit pack (LT) has been rated Manufacture Discontinued (MFR DISC), and has been replaced by the HL49B. Both circuit packs are indicated throughout this section, since the HL49 remains in use in some early DDS installations.

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<b>CHART</b>	<b>PAGE</b>
1—Replacement of the HL49 or HL49B Circuit Pack (LT) . . . . .	<b>2</b>
2—Replacement of the HL50 Circuit Pack (ALR) . . . . .	<b>2</b>
3—Replacement of the HL51 Circuit Pack (ALL) . . . . .	<b>4</b>
4—Replacement of the HL52 Circuit Pack (CLD) . . . . .	<b>4</b>

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**APPARATUS:**

Replacement Circuit Packs HL49 or HL49B through HL51

1—Circuit Pack HL52 (may be required, though not immediately, since there should be a spare in shelf position 37 at the BCPA shelf)

1—KS-14510, Volt-Ohm-Milliammeter (VOM), or equivalent (Chart 2)

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## CHART 1

## REPLACEMENT OF THE HL49 OR HL49B CIRCUIT PACK (LT)

STEP	PROCEDURE
1	Select the appropriate option (Q or R) for the installation (see Table A).
2	Install the option chosen in Step 1 on the replacement HL49 or HL49B (see Table B).  <i>Caution: When two HL49 or HL49B circuit packs are provided in the BCPA circuit, DO NOT remove both circuit packs at the same time, since timing will be lost to the entire bay. For the HL49B, timing will also be lost to subsequent equipment bays served by the regenerated timing signal output.</i>
3	Remove the HL49 or HL49B to be replaced from its shelf position (02 or 05).  <i>Note: Removal of the HL49B used to provide timing to successive equipment bays causes a minor alarm in these bays. When a new HL49B is inserted, the alarm will be silenced.</i>
4	Install the new HL49 or HL49B in the proper shelf position.  <i>Note: Ensure that the circuit pack is inserted far enough into the 940A edge connector.</i>  <i>Requirement: The faceplate of the newly installed circuit pack is flush with the adjacent circuit pack faceplates.</i>

## CHART 2

## REPLACEMENT OF THE HL50 CIRCUIT PACK (ALR)

STEP	PROCEDURE
1	Select the appropriate options (S or T and Y or Z) for the installation (see Table A).  <i>Caution: Do not remove the present circuit pack to determine the proper options, since severe disruption will result in the entire bay (see Step 6).</i>
2	Install the options chosen in Step 1 on the replacement HL50 (see Table B).
3	Check the fuse in position FA24 on the BCPA circuit.  <i>Requirement: The fuse is good.</i>  <i>Note: If this requirement is not met, consult Section 314-916-300, Fig. 1. This requirement must be met before proceeding.</i>

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**CHART 2 (Cont)**


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STEP	PROCEDURE
4	<p>Measure the voltage with respect to ground on terminals 38 (A5A) and 40 (A5B) on terminal board (TB) 4.</p> <p><b>Requirement:</b> 5.0 <math>\pm</math>0.5 volts</p> <p><b>Note:</b> If this requirement is not met, consult the section on the bay power converter. This requirement must be met before proceeding.</p>
5	<p>Check the ALM indicator on the HL49 or HL49B in shelf position 02.</p> <p><b>Requirement:</b> The indicator is <i>not</i> illuminated.</p> <p><b>Note:</b> If this requirement is not met, consult Section 314-916-300, Fig. 2. This requirement must be met before proceeding.</p>
6	<p>Activate the bypass (BYP) key in the lower right quadrant of the BCPA shelf (power and service module). The indicator lamp next to it should come on.</p> <p><b>Note 1:</b> The lamp will not light if fuse FA23 has blown.</p> <p><b>Note 2:</b> Operation of the BYP key introduces errors into the DDS transmission for several milliseconds. These errors may be sufficient to cause an office channel unit (OCU) to go out of the OCU, data service unit (DSU), or channel loopback mode if it had previously been placed in one of these modes.</p> <p><b>Caution:</b> <i>Removing HL50 when the BYP key is not operated results in loss of circuit power to the BCPA circuit and of timing to the entire bay and to subsequent bays in a BCPA circuit chain. If the HL49 or HL49B in shelf position 02 is not functioning properly (its ALM indicator is illuminated), operation of the BYP key or removal of HL50 results in loss of timing to the entire bay and to subsequent bays in a BCPA circuit chain. If the bay circuit power (primary +5 volts) on lead 38 of TB 4 has failed, operation of the BYP key or removal of HL50 results in the loss of shelf circuit power, of bay timing, and of subsequent bay timing in a BCPA circuit chain. Notice the warning sticker on the faceplate of HL50.</i></p>
7	<p>Remove the previously working HL50 and install a new circuit pack in its place (shelf position 17). Ensure that the proper options are provided in the replacement circuit pack.</p> <p><b>Note:</b> Ensure that the new circuit pack is inserted far enough into the 940A edge connector.</p> <p><b>Requirement:</b> The faceplate of the newly installed circuit pack is flush with the adjacent circuit pack faceplates.</p>
8	<p>Deactivate the BYP key by returning it to its original position. The indicator lamp next to the key should be extinguished.</p>

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## CHART 3

## REPLACEMENT OF THE HL51 CIRCUIT PACK (ALL)

STEP	PROCEDURE
1	Select the appropriate options (K, V, W, or X; and Y or Z) for the installation (see Table A).
2	Install the options chosen in Step 1 on the replacement HL51 (see Table B).
3	Remove the previously working HL51 from shelf position 11 [a minor (MN) alarm will be generated] and fill the vacant position with the new circuit pack. Ensure that the proper options are provided in the replacement circuit pack.
	<b>Note:</b> Ensure that the new circuit pack is inserted far enough into the 940A edge connector.
	<b>Requirement:</b> The faceplate of the newly installed circuit pack is flush with the adjacent circuit pack faceplates.

## CHART 4

## REPLACEMENT OF THE HL52 CIRCUIT PACK (CLD)

STEP	PROCEDURE
1	Remove the spare HL52 from its storage position in shelf position 37.
2	Consult Table C to determine which shelf position is in parallel with the HL52 to be removed. One of these positions will be vacant.
3	Place the spare HL52 in the vacant shelf position (information obtained in Step 2) in the same group as the HL52 to be replaced.
	<b>Note:</b> Ensure that the new circuit pack is inserted far enough into the 940A edge connector.
	<b>Requirement:</b> The faceplate of the newly installed circuit pack is flush with the adjacent circuit pack faceplates.
	<b>Caution:</b> <i>Failure to install the spare HL52 in the vacant connector before removing the defective circuit pack results in loss of timing to all equipment served by that circuit pack.</i>
4	Remove the previously working HL52 from its shelf position.

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**CHART 4 (Cont)**


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STEP	PROCEDURE
5	When a replacement HL52 is available, place it in the working position vacated in Step 4 by the same paralleling procedure. Then return the spare HL52 to its storage position (shelf position 37).
<b>Caution:</b> <i>When the spare HL52 is replaced with a working HL52, the parallel operation of the two circuit packs must be followed (as in Step 3).</i>	

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**REFERENCES:**

- 314-916-300\*      Digital Data System—Bay Clock, Power, and Alarms Circuit—Maintenance and Troubleshooting
- CD- & SD-73082-01 Digital Data System—Central Office—Bay Clock, Power, and Alarms Circuit

\*This section may not have been issued yet; check the applicable index to determine whether it is available.

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**TABLE A**  
**OPTION FUNCTIONS WITHIN THE BCPA CIRCUIT**

OPTION	FUNCTION
K	With or without T1DM-PM—Red alarm generates a major alarm—Yellow alarm generates no alarms
Q	Redundant line terminators (HL49 or HL49B) in the BCPA circuit (shelf positions 02 and 05 are equipped)—Enables line terminator failure alarm in the redundant system to function normally
R	Nonredundant line terminators in the BCPA circuit (shelf position 05 vacant)—Prevents alarm indication due to absence of normally redundant equipment
S	T1DM-PM provided—Power supply minor (PSMN) generates a minor alarm
T	T1DM-PM <i>not</i> provided—PSMN generates a major alarm—Power supply major (PSMJ) generates a major alarm
V	T1DM-PM <i>not</i> provided—T1 line failure generates no alarms
W	T1DM-PM <i>not</i> provided—Red alarm generates a major alarm—Yellow alarm generates a major alarm
X	T1DM-PM <i>not</i> provided—Yellow alarm generates a minor alarm—Red alarm generates a major alarm
Y	—24 volt office battery supplied
Z	—48 volt office battery supplied

**TABLE B**  
**OPTION SELECTION SCREW SWITCHES**

OPTION DESIG*	CIRCUIT PACK CODE	SCREW SWITCH DESIG	SCREW SWITCH POSITION	
			OPEN (TURN CCW)	CLOSED (TURN CW)
K	HL51	S2, S3A	✓	
		S3B		✓
Q	HL49 or HL49B	S1	✓	
R		S1		✓
S	HL50	S2	✓	
T		S2		✓
V	HL51	S2, S3A, S3B	✓	
W	HL51	S3A	✓	
		S2, S3B		✓
X	HL51	S2	✓	
		S3A, S3B		✓
Y	HL50	S1		✓
	HL51	S1, S4, S5		✓
Z	HL50	S1	✓	
	HL51	S1, S4, S5	✓	

\* Table A contains option description

**TABLE C**  
**HL52 SHELF POSITIONS**

GROUP	SHELF POSITION NO.	
	WORKING	PARALLEL
1	20	18
2	24	22
3	28	26
4	32	30
5	35	34