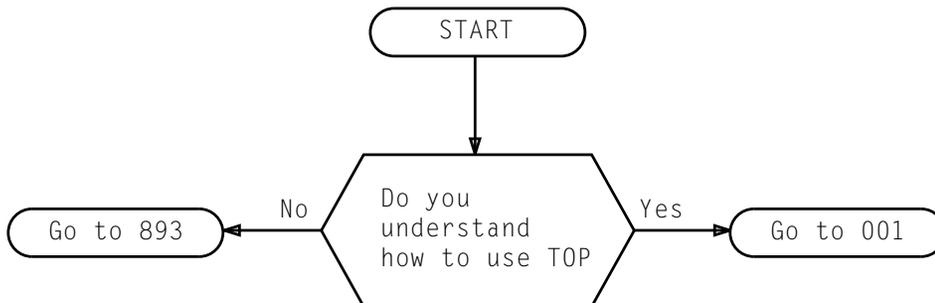




Task Oriented Practice (TOP)

# 4ESS™ Switch Common Network Interface Trouble Clearing



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Call: 1-800-334-0404  
Or FAX to: 1-910-727-3043

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# How Are We Doing?

Document Title: **4ESS™** Switch Common Network Interface

Document No.: 234-351-120AC

Issue: 2

Date: March 1998

Lucent Technologies welcomes your feedback on this document. Your comments can be of great value in helping us improve our documentation.

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| <input type="checkbox"/> Improve the overview/introduction | <input type="checkbox"/> Make it more concise/brief                 |
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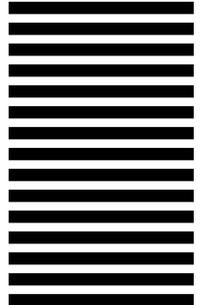
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Acceptance . . . . .	NTP-002
Analog Signaling Link; To Service – Add . . . . .	NTP-007
Analog Signaling Link; From Service – Remove . . . . .	NTP-005
Analog Signaling Link Cross-Office, End-to-End, and Loopback Tests – Perform . . . . .	NTP-009
Configuration Data; Signaling Link – Change . . . . .	NTP-008
Cross-Office, End-to-End, and Loopback Tests; Analog Signaling Link – Perform . . . . .	NTP-009
Diagnostic Failure – ATP Node (ATPN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-113
Diagnostic Failure – Aborted – Clear . . . . .	TAP-106
Diagnostic Failure – International Link Node (ILN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear. . . . .	TAP-103
Diagnostic Failure – Common Channel Signaling 7 (CCS7) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-102
Diagnostic Failure – IMS User Node (IUN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-105
Diagnostic Failure – Customer Premise Equipment (CPE) Node – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-104
Diagnostic Failure – DLNE/DLN30 – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-101
Diagnostic Failure – Ethernet Interface Node (EIN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-116
Diagnostic Failure – Ring Peripheral Controller Node (RPCN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-100
Diagnostic Failure – Small Computer Systems Interface Node (SIN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-114
Diagnostic Failure – Universal Link Node (ULN) – By Analyzing Raw Data and Replacing Suspect Packs – Clear . . . . .	TAP-115
Diagnostics; Node – Perform . . . . .	DLP-524

**TASK INDEX LIST**

**FIND YOUR JOB IN THE LIST BELOW . . . . . THEN GO TO**

Digital Service Unit End-To-End Testing – Perform . . . . . NTP-006

Digital Signaling Link; To Service – Add . . . . . NTP-003

Digital Signaling Link; From Service – Remove . . . . . NTP-005

Digital Signaling Link Hardware (DSU, CSU, or DSA) – Change . . . . . NTP-004

End-to-End Testing; Digital Service Unit – Perform . . . . . NTP-006

Fan Filter Assembly – Inspect and Clean . . . . . DLP-506

Fan Unit Assembly – Ring Node Cabinet – Replace . . . . . DLP-537

Fault; Isolated Node (LN, DLNE/DLN30, or RPCN) – Clear . . . . . TAP-108

Fuse; Blown – Analog Facility Access (AFA) Cabinet – Replace . . . . . DLP-510

Fuse; Blown – Digital Facility Access (DFA) Cabinet (J3F010A) – Replace . . . . . DLP-511

Fuse; Blown – Power Distribution Frame (J86334-B/C) – Replace . . . . . DLP-513

Fuse; Blown – Ring Node Cabinet – Replace . . . . . DLP-509

Node Data – For All Growth Nodes – Determine . . . . . DLP-578

Node Diagnostics – Perform . . . . . DLP-524

Node (LN, DLNE/DLN30, or RPCN) Hardware Fault – Clear . . . . . TAP-107

Node; on Ring – Include . . . . . DLP-508

Node; From Ring – Isolate . . . . . DLP-507

Node; From Service – Remove . . . . . DLP-540

Node; To Service – Restore . . . . . DLP-541

Power Converter; FA – Replace . . . . . DLP-514

**TASK INDEX LIST**

**FIND YOUR JOB IN THE LIST BELOW . . . . . THEN GO TO**

Ring Transport Error – Analyze . . . . .	TAP-112
Security Tape; On Encrypted Circuit Pack for Alterations – Inspect . . . . .	DLP-553
Signaling Link Configuration Data – Change . . . . .	NTP-008
Signaling Link Failure – Clear . . . . .	TAP-109
Signaling Link "No Flags" Fault – Clear . . . . .	TAP-110
Signaling Link State – Change . . . . .	DLP-525
Signaling Link TIFA Hardware Fault – Clear. . . . .	TAP-111

**TASK INDEX LIST**

No acceptance test procedures are required for this volume.  
The readiness of the CNI equipment to become a part of the  
operating system was established by the successful  
completion of the CNI installation test procedures.

## ACCEPTANCE

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**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure All Digital Signaling Link Hardware Has Been Installed And Accepted	-
2	Ensure All Link Interface Equipment Configuration Data (ECD) Has Been Loaded	-
3	Ensure Recent Change Activity Specifying Link Configuration Data For Link Node Has Been Completed	-
4	Ensure Both Near-End And Far-End Has Completed Facility Assignment As Specified On Facility Assignment Card	-
5	At MCRT, Verify Associated Link Node Is In ACTIVE State (OP:RING,LNa b! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-515
6	At MCRT, Verify Signaling Link Is In UNEQUIPPED or UNAVAILABLE-GROW State (OP:SLK(a,b)! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-516
7	Ensure Signaling Link Cabling Connections Exist Between Ring Node Cabinet and Digital Facility Access Cabinet	-
8	At Ring Node Cabinet, Verify Correct Link Interface Is Installed for Signaling Link Being Added	DLP-517
9	At Digital Facility Access (DFA) Cabinet, Perform The Following:	-
	1. Verify Correct Digital Service Unit (DSU), Channel Service Unit (CSU), and Digital Service Adapter (DSA) Is Installed for Signaling Link Being Added	DLP-518
	2. Perform One Of The Following To Verify DSU Options Are Properly Set:	-
	A. Verify 500B/502B DSU Options	DLP-519
	B. Verify DATATEL DCP3189 DSU Options	DLP-520
	C. Verify AT&T 2556 DSU Options	DLP-521
	3. Verify DSU Is Not In Self-Looped Mode By Ensuring Self-Loop Switch On Faceplate Is In Middle (Unmarked) Position	-
	4. Verify CSU Options Are Properly Set	DLP-522
5. Verify DSA Options Are Properly Set	DLP-523	

**ADD DIGITAL SIGNALING LINK TO SERVICE**

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**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

10	Perform One of The Following Per Office Classification:	-
	A. For Collocated Offices, Verify Connectivity Between Near-End And Far-End Offices	-
	B. For Non-Collocated Offices, Verify Cabling From Digital Facility Access (DFA) Cabinet To The Carrier Facility And The Carrier End-to-End Lineup Is Complete	-
11	Perform Link Node Diagnostics (DGN:LNa b:TLP! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-524
12	At MCRT, Enter MON:SLK(a,b);ON! To Activate Link Monitor (a = Ring Node Group Number(00-63); b = Node Member Number (1-15))	-
13	Change Signaling Link State To UNAVAILABLE-TEST (CHG:SLK(a,b);TEST! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-525
14	Verify Signaling Link Is In SYNC And PROVED-IN	DLP-526
15	At MCRT, Enter MON:SLK(a,b);OFF! To Turn Off Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
16	Request Recent Change Activity Be Completed To Change Link Configuration Data Table And Signaling Link State To AVAILABLE-IS	-

**ADD DIGITAL SIGNALING LINK TO SERVICE**

**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure Replacement Hardware (DSU, CSU, Or DSA) Is Available	-
2	Notify Far-End Office Of Intent To Replace Signaling Link Hardware	-
3	Change Signaling Link State To AVAILABLE-MOOS (CHG:SLK(a,b);MOOS! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-525
4	At MCRT, Enter MON:SLK(a,b);ON! To Activate Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
5	Perform One Of The Following To Replace Applicable Signaling Link Hardware:	-
	A. Replace Digital Service Unit (DSU)	DLP-527
	B. Replace Channel Service Unit (CSU)	DLP-528
	C. Replace Digital Service Adapter (DSA)	DLP-529
6	If All Applicable Signal Link Hardware Has Not Been Replaced, Repeat From Item 5	-
7	Perform the Following To Verify Replacement Of Signaling Link Hardware:	-
	1. Verify Correct DSU, CSU, And DSA Is Installed For Associated Signaling Link	DLP-518
	2. Verify DSU Is Not In Self-Looped Mode by Ensuring Self-Loop Switch on Faceplate Is In Middle (Unmarked) Position	-
	3. If DSU Was Replaced, Perform One Of The Following To Verify DSU Options Are Properly Set:	-
	A. Verify AT&T 500B/AT&T 502B DSU Options	DLP-519
	B. Verify DATATEL DCP3080/3189 DSU Options	DLP-520
	C. Verify AT&T 2556 DSU Options	DLP-521
	4. If CSU Was Replaced, Verify CSU Options Are Properly Set	DLP-522
	5. If DSA Was Replaced, Verify DSA Options Are Properly Set	DLP-523
8	Verify Signaling Link Is In SYNC and PROVED-IN	DLP-526
9	At MCRT, Enter MON:SLK(a,b);OFF! To Turn Off Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
10	Request Recent Change Activity Be Completed To Change Link Configuration Data Table and Signaling Link State To AVAILABLE-IS	-

**CHANGE DIGITAL SIGNALING LINK HARDWARE (DSU, CSU, OR DSA)**

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**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure Recent Change Activity For Removing Signaling Link Has Been Completed	-
2	Ensure Both Near-End and Far-End Has Completed Work as Specified on Facility Assignment Card	-
3	Verify That No Active Traffic Is Present On Signaling Link (DUMP:SMEAS(a,b);HIST LDAY;SLK(c,d)! a,b = Measurement Names; c = Ring Node Group Number (00-63); d = Node Member Number (1-15))	DLP-530
4	Change Signaling Link State To AVAILABLE-MOOS (CHG:SLK(a,b);MOOS! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-525
5	Request Recent Change Activity To Be Completed To Change Link Configuration Data Table And Signaling Link State To UNEQUIPPED	-

**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Establish Communication Between Near-End And Far-End Office	-
2	Identify DSU Type Being Used At Near-End And Far-End For Associated Signaling Link	-
3	Perform One Of The Following To Complete DSU End-to-End Testing (Near-End to Far-End) for Identified Configurations:	-
	<i>NOTE:</i> No End-To-End Tests Are Possible When A AT&T 500B DSU Is Used At Near-End. This Is Due To The AT&T 500B DSU Being Unable To Generate An Internal Test Pattern To Be Sent Through The Loop. However, Tests Can Be Completed With The AT&T 500B DSU At Far-End. This Is Due To The AT&T 500B DSU's Ability To Be Placed In The Remote Loopback Mode.	-
	A. Near-End DATATEL DCP3189 DSU To Far-End AT&T 2556 DSU	DLP-531
	B. Near-End DATATEL DCP3189 DSU To Far-End DATATEL DCP3189 DSU	DLP-532
	C. Near-End DATATEL DCP3189 DSU To Far-End AT&T 500B DSU	DLP-533
	D. Near-End AT&T 2556 DSU To Far-End AT&T 2556 DSU	DLP-534
	E. Near-End AT&T 2556 DSU To Far-End DATATEL DCP3189 DSU	DLP-535
	F. Near-End AT&T 2556 DSU To Far-End AT&T 500B DSU	DLP-536

**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure All Analog Signaling Link Hardware Has Been Installed And Accepted	-
2	Ensure Link Interface Equipment Configuration Data (ECD) Has Been Set To CNI And MV Data Has Been Set to 0x0	-
3	Ensure Recent Change Activity Specifying Link Configuration Data For Link Node And Logical-To-Physical Signaling Link Assignment Has Been Completed	-
4	Ensure Both Near-End And Far-End Has Completed Facility Assignment As Specified On Facility Assignment Card	-
5	At MCRT, Verify Associated Link Node Is In ACTIVE State (OP:RING, LN a b! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-515
6	At MCRT, Verify Signaling Link Is In UNAVAILABLE-GROW State (OP:SLK(a,b)! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-516
7	Ensure Signaling Link Cabling Connections Exist Between Ring Node Cabinet And Analog Facility Access Cabinet	-
8	Request Recent Change Be Performed To Change Link Configuration Data To Place Signaling Link In Self-Looped Condition	-
9	At Ring Node Cabinet, Verify Correct Link Interface Is Installed For Signaling Link Being Added	DLP-517
10	At Analog Facility Access (AFA) Cabinet, Verify Correct Data Set Is Installed For Signaling Link Being Added	DLP-542
11	Verify 2024A/2048A Data Set Options Are Properly Set	DLP-543
12	Verify Cabling From Analog Facility Access (AFA) Cabinet To The Carrier Facility And The Carrier End-to-End Lineup Is Complete	-
13	Perform Node Diagnostics (DGN:LNa b:TLP! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-524
14	At MCRT, Enter MON:SLK(a,b);ON! To Activate Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
15	Request Recent Changes Be Performed To Change Link Configuration Data To Take Signaling Link Out of Self-Looped Condition	-

**ADD ANALOG SIGNALING LINK TO SERVICE**

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**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

16	Change Signaling Link State To UNAVAILABLE-TEST (CHG:SLK(a,b);TEST! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-525
17	Verify Signaling Link Is In SYNC and PROVED-IN	DLP-526
18	At MCRT, Enter MON:SLK(a,b);OFF! To Turn Off Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
19	Request Recent Change Activity Be Completed To Change Link Configuration Data Table And Signaling Link State To AVAILABLE-IS	-

**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure All Affected Offices Have Completed Facility Assignment As Specified On Facility Assignment Card	-
2	Verify Correct Link Interface Is Available For Signaling Link Configuration	DLP-517
3	Change Signaling Link State To AVAILABLE-MOOS (CHG:SLK(a,b);MOOS! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-525
4	Remove Link Node From Service (RMV:LNa b! a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	DLP-540
5	Request Recent Change Activity Be Completed To Perform The Following:	-
	1. Change Signaling Link State To UNAVAILABLE-TEST	-
	2. Change Applicable Link Configuration Data Table Entries	-
6	At MCRT, Enter MON:SLK(a,b);ON! To Activate Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
7	Verify Signaling Link Is In SYNC And PROVED-IN	DLP-526
8	At MCRT, Enter MON:SLK(a,b);OFF! To Turn Off Link Monitor (a = Ring Node Group Number (00-63); b = Node Member Number (1-15))	-
9	Restore Link Node To Service	DLP-541
10	Request Recent Changes Be Completed To Change Link Configuration Data Table And Signaling Link State To AVAILABLE-IS	-

**CHANGE SIGNALING LINK CONFIGURATION DATA**

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**DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO**

1	Ensure Both Near-End and Far-End Has The Following Equipment: <ul style="list-style-type: none"> <li>• Transmission Impairment Measuring Set (TIMS)</li> <li>• Transmission Measuring Set (TMS)</li> <li>• Two Patch Cords Equipped With WE-type 310 Plugs</li> </ul>	-
2	Perform One Of The Following To Complete Desired Signaling Link Test:	-
	A. Cross-Office Test	DLP-544
	B. 1004 Hz Net Loss Test	DLP-545
	C. C-Notched Noise And Noise-To-Noise Test	DLP-546
	D. Single Frequency Interference Test	DLP-547
	E. Peak-To-Average Ratio Test	DLP-548
	F. Impulse Noise, Phase Hits, And Gain Hits Test	DLP-549
	G. Frequency Response Test	DLP-550
	H. Envelope Delay Distortion Test	DLP-551
3	If All Desired Tests Have Not Been Performed, Repeat From Item 2	-

**PERFORM ANALOG SIGNALING LINK CROSS-OFFICE, END-TO-END, AND LOOPBACK TESTS**

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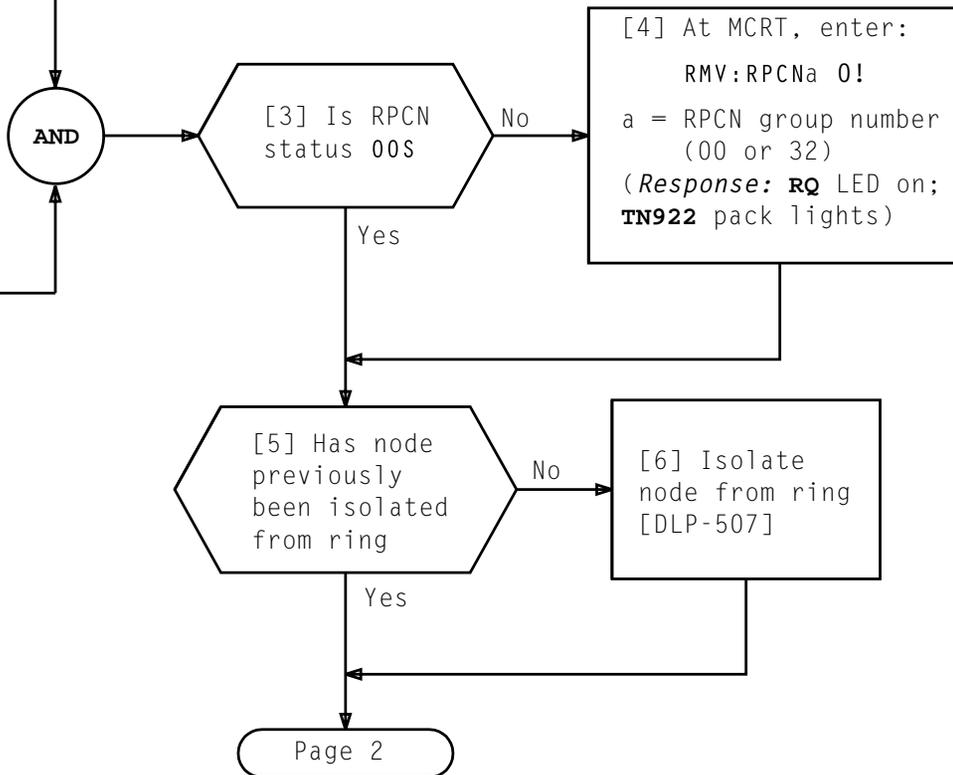
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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

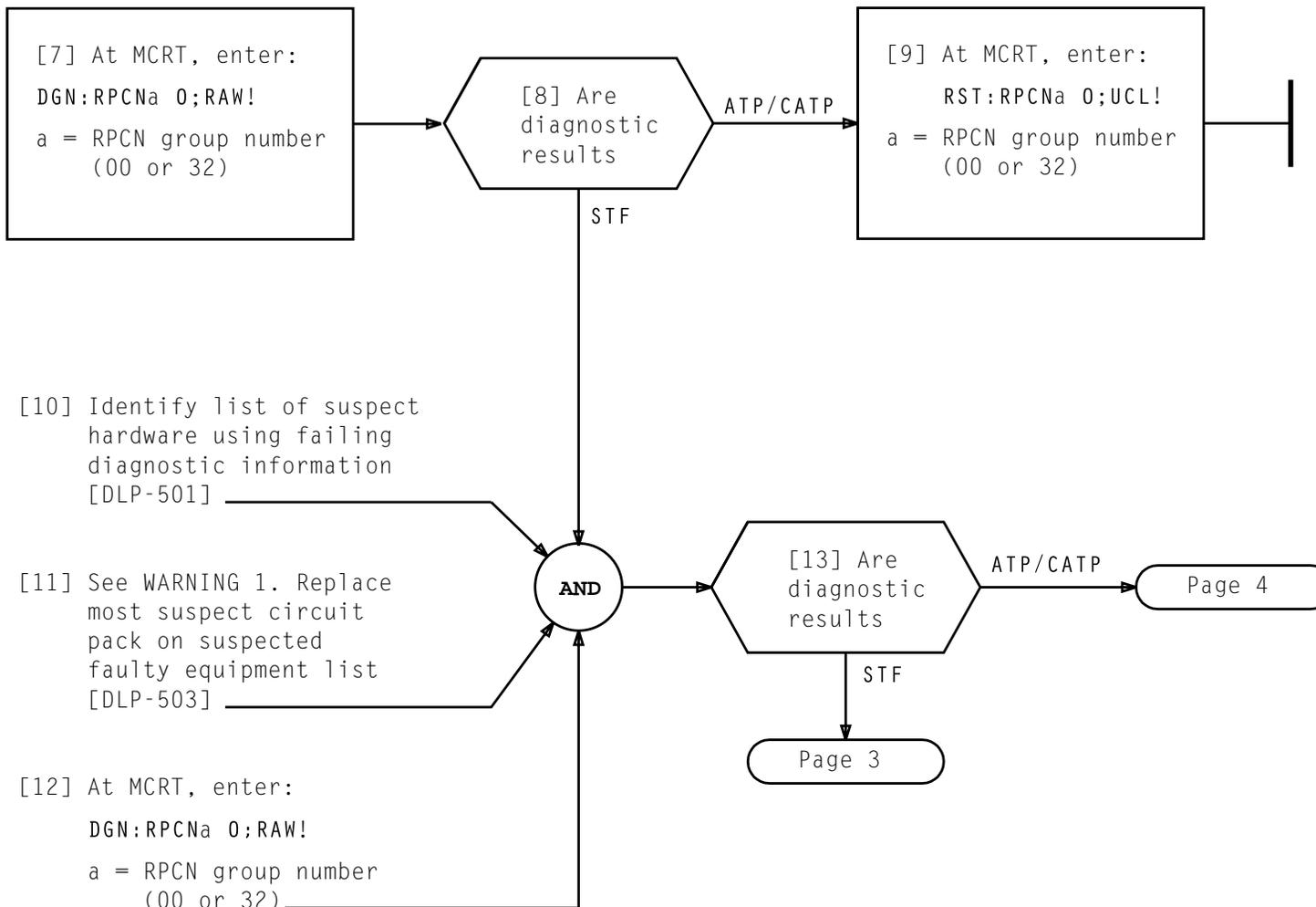
Alarms Silence

[2] Determine status of RPCN failing diagnostic [DLP-500]



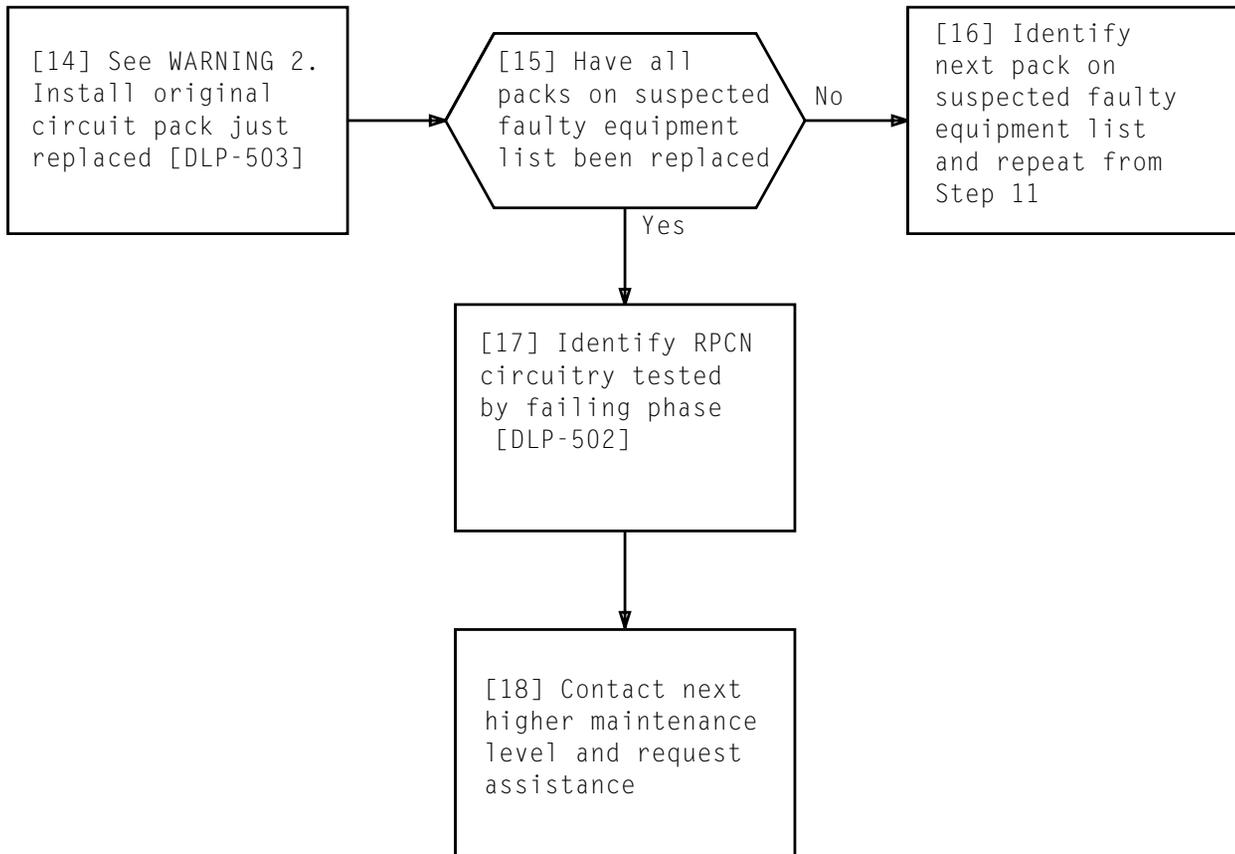
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – RING PERIPHERAL CONTROLLER NODE (RPCN)**

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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – RING PERIPHERAL CONTROLLER NODE (RPCN)**



*WARNING 2  
Due to circuit  
pack damage  
caused by  
electrostatic  
discharge,  
precautions must  
be taken when  
handling circuit  
packs and working  
in backplane  
area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING  
SUSPECT PACKS – RING PERIPHERAL CONTROLLER NODE (RPCN)**

[19] At MCRT, enter:

RST:RPCNa 0;UCL!

a = RPCN group number  
(00 or 32)

[20] Include node on  
ring [DLP-508]

[22] Copy incore equipment  
configuration data base  
(ECD) to disk [DLP-554]

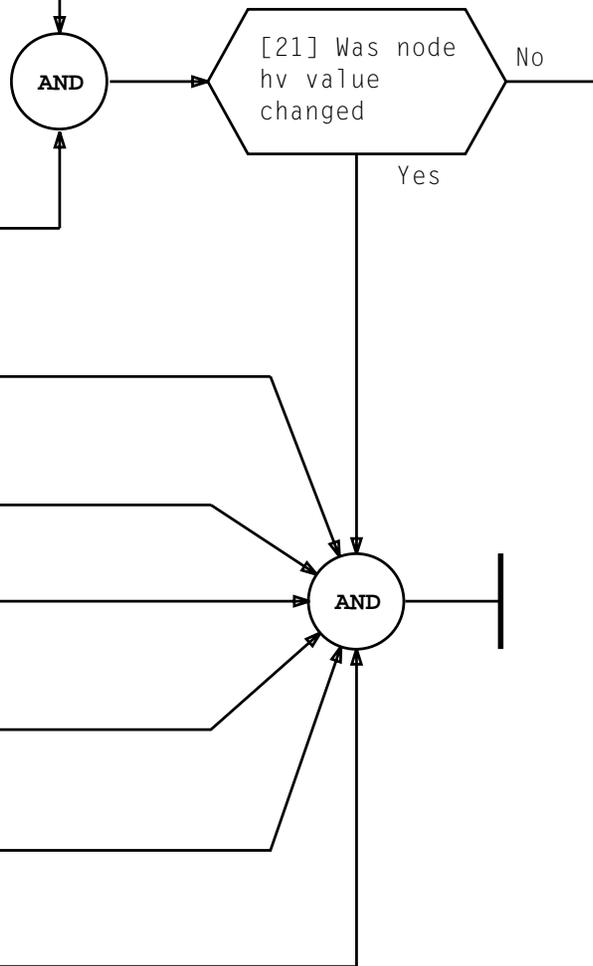
[23] Run file system audits on running file system  
to ensure no file system errors [DLP-555]

[24] Update backup data base [DLP-556]

[25] Run file system audits on backup file system  
to ensure no file system errors [DLP-569]

[26] Write 3B Computer backup RT0  
and DB tapes [DLP-557]

[27] Verify backup  
tapes [DLP-560]



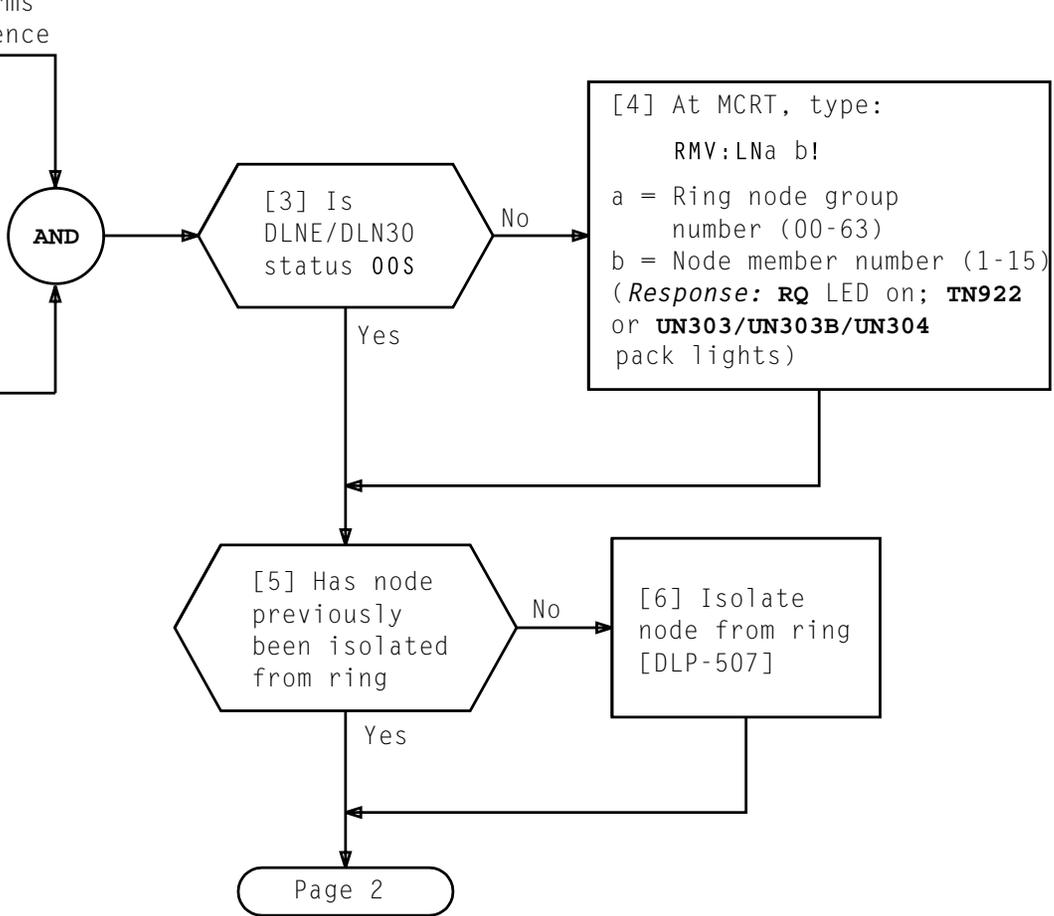
## CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS — RING PERIPHERAL CONTROLLER NODE (RPCN)

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

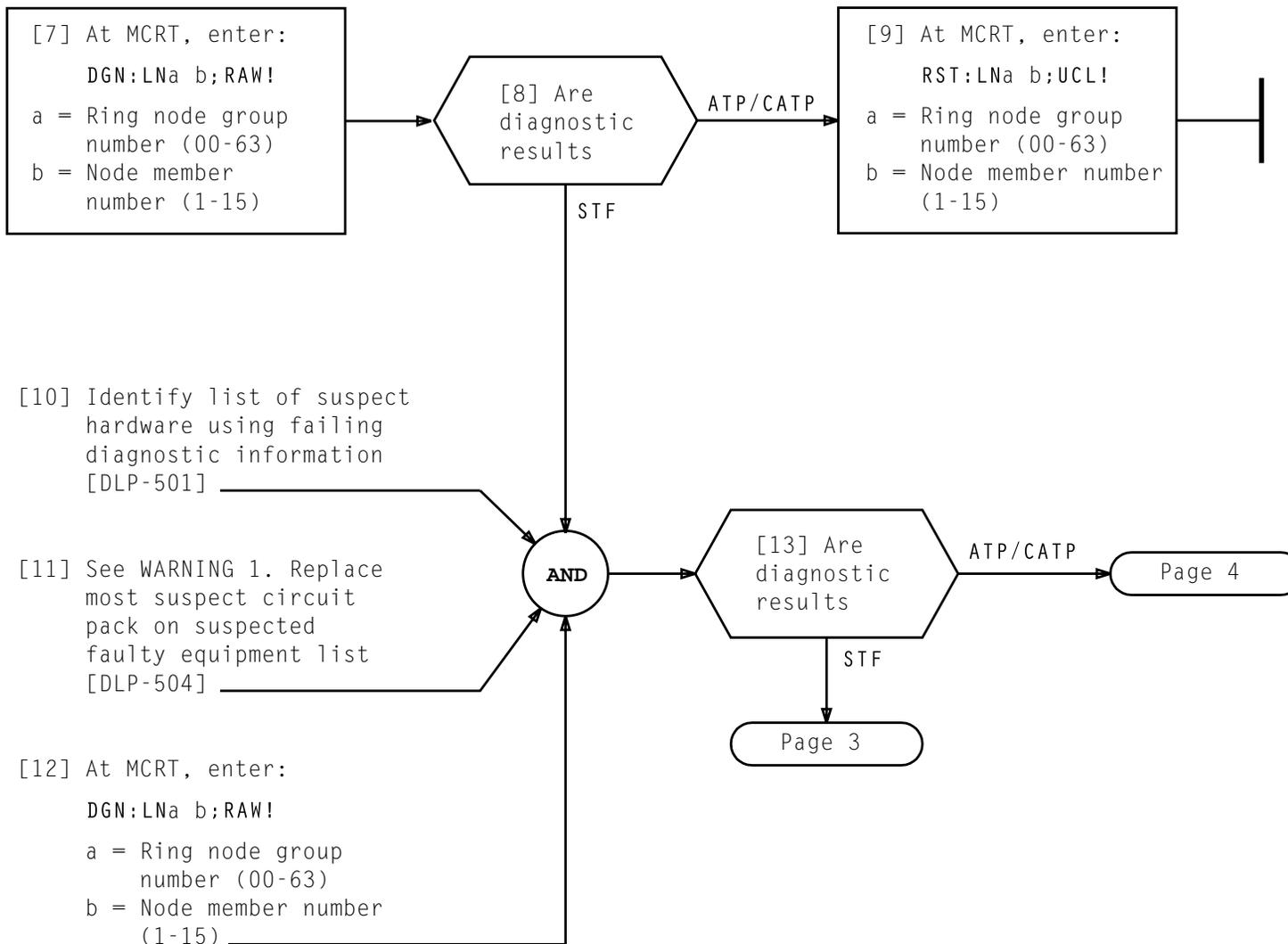
Alarms Silence

[2] Determine status of DLNE/DLN30 failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – DLNE/DLN30**

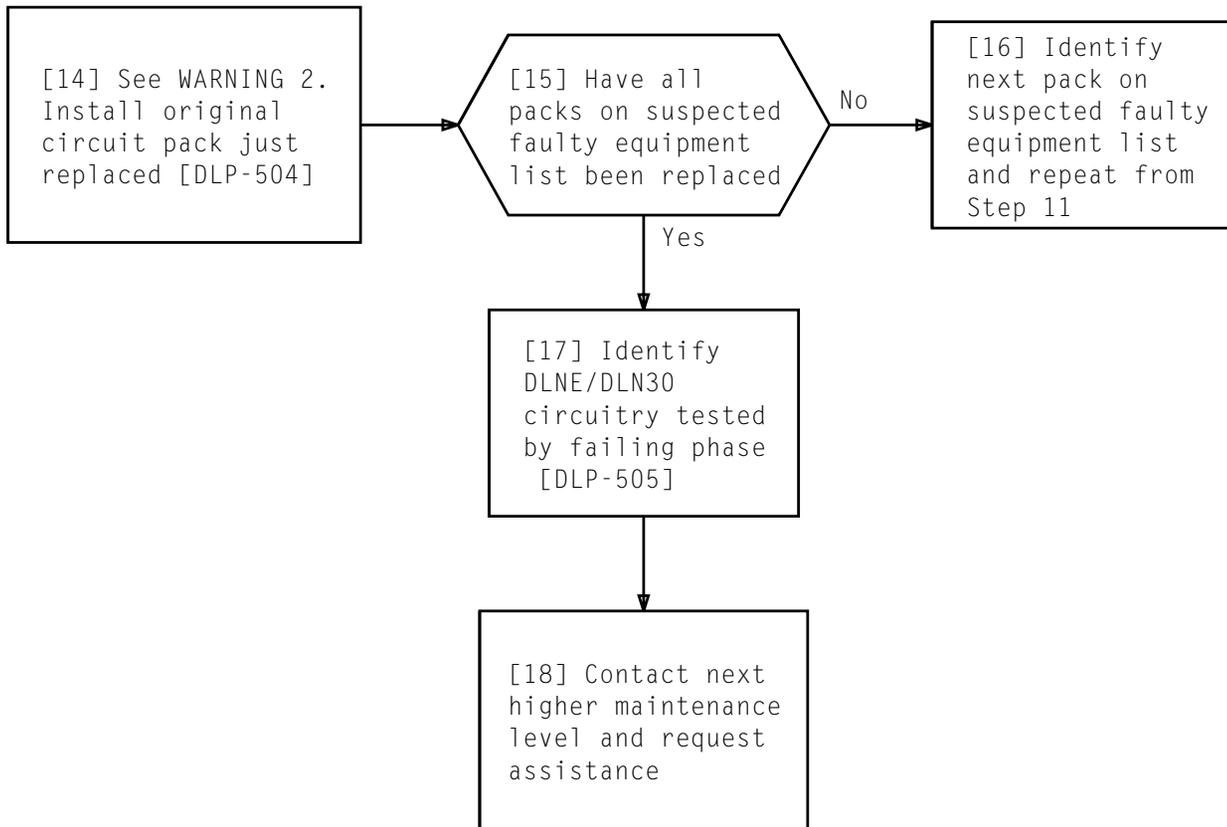
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – DLNE/DLN30**

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*WARNING 2  
Due to circuit  
pack damage  
caused by  
electrostatic  
discharge,  
precautions must  
be taken when  
handling circuit  
packs and working  
in backplane  
area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS — DLNE/DLN30**

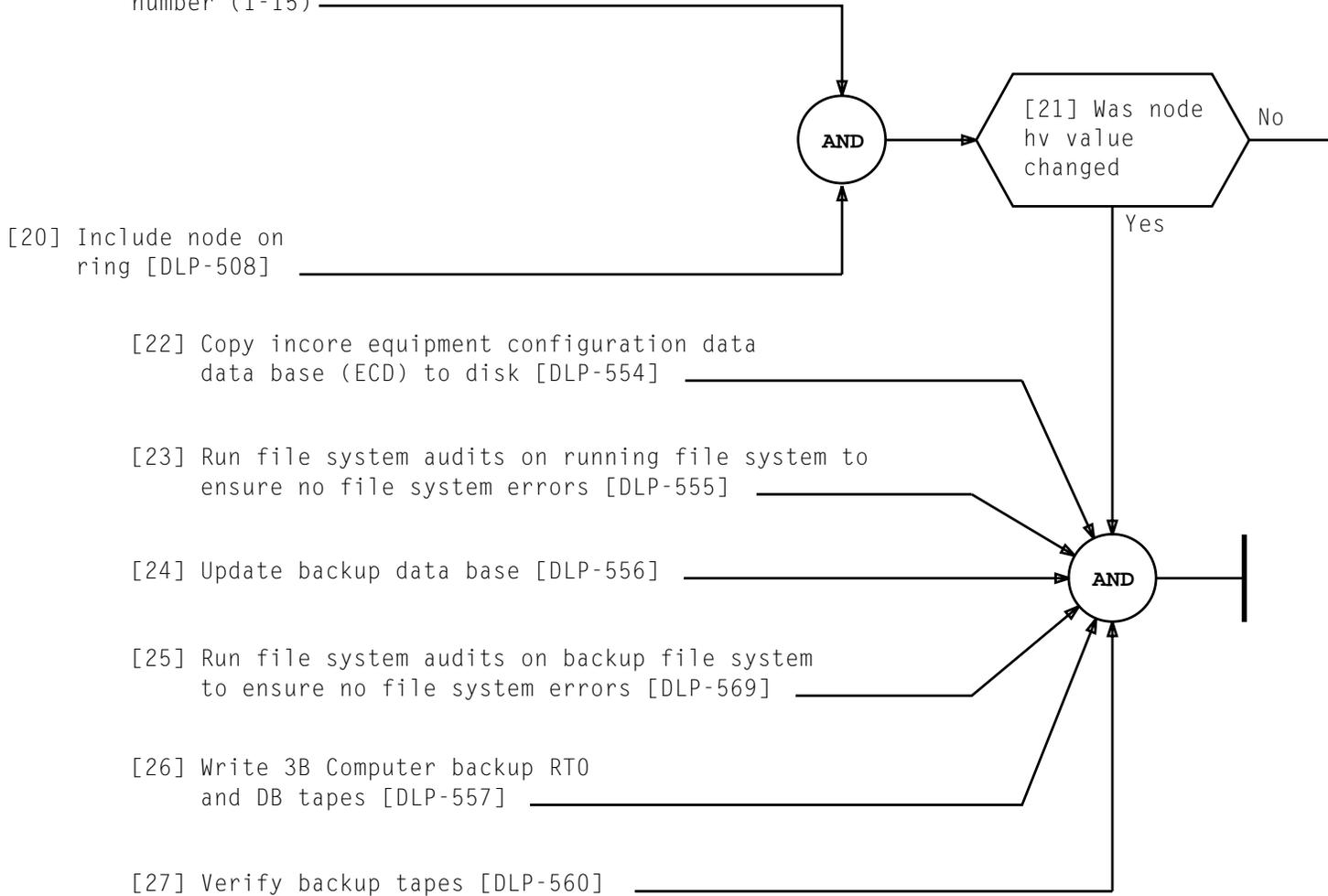
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[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



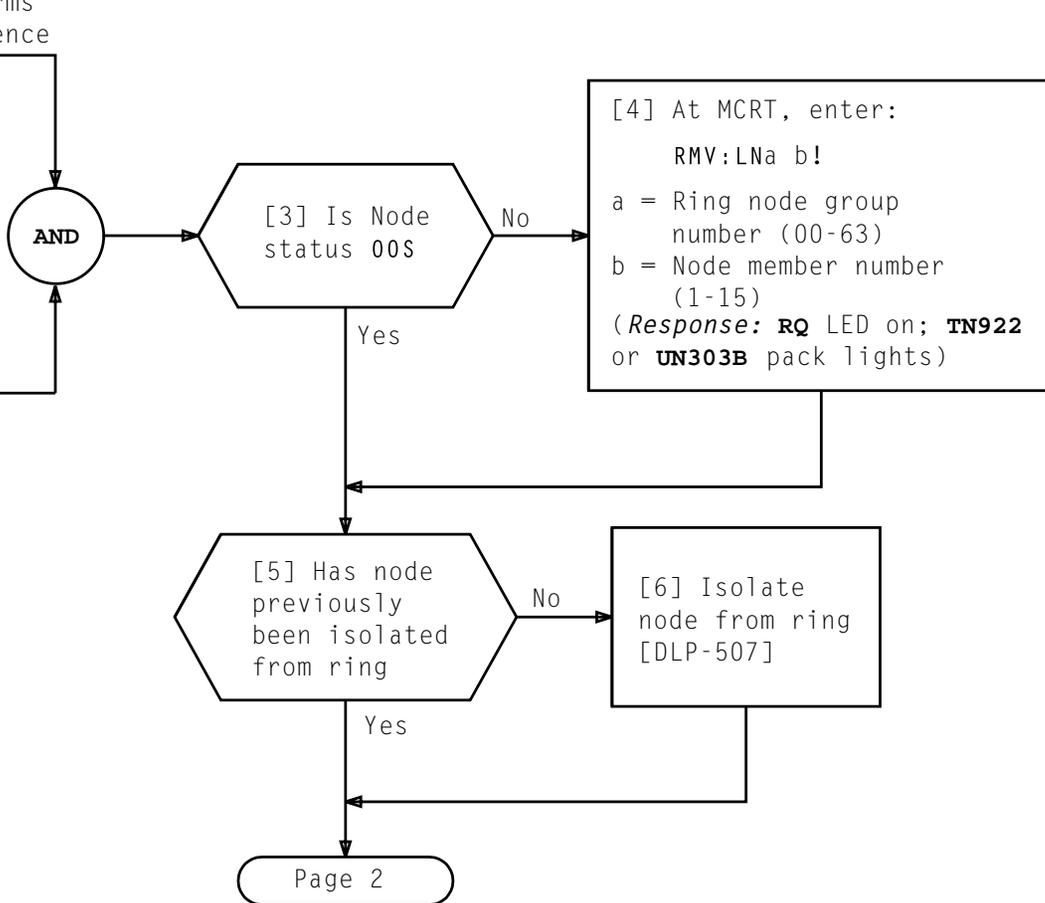
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS — DLNE/DLN30**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

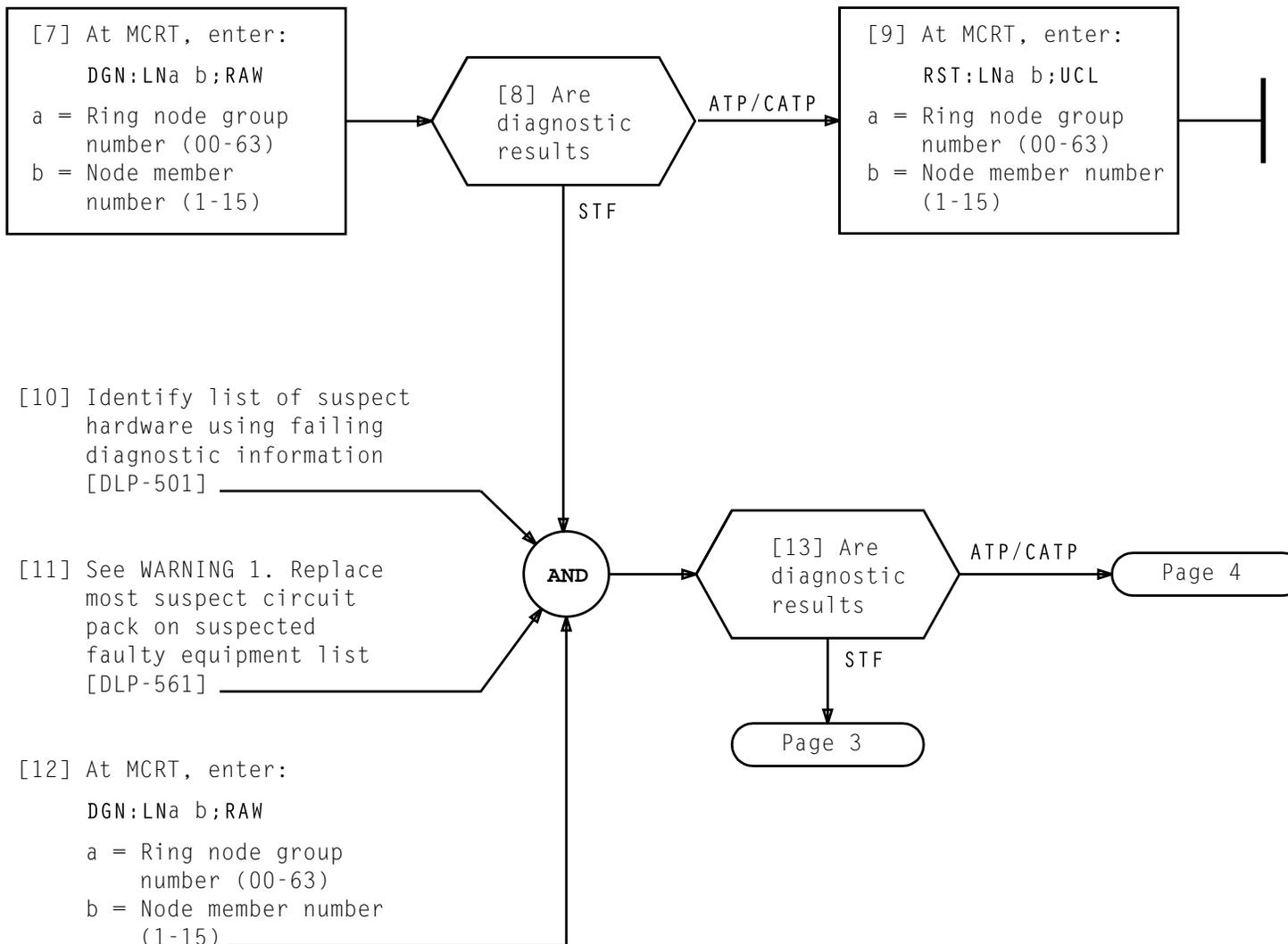
Alarms Silence

[2] Determine status of node failing diagnostics [DLP-500]



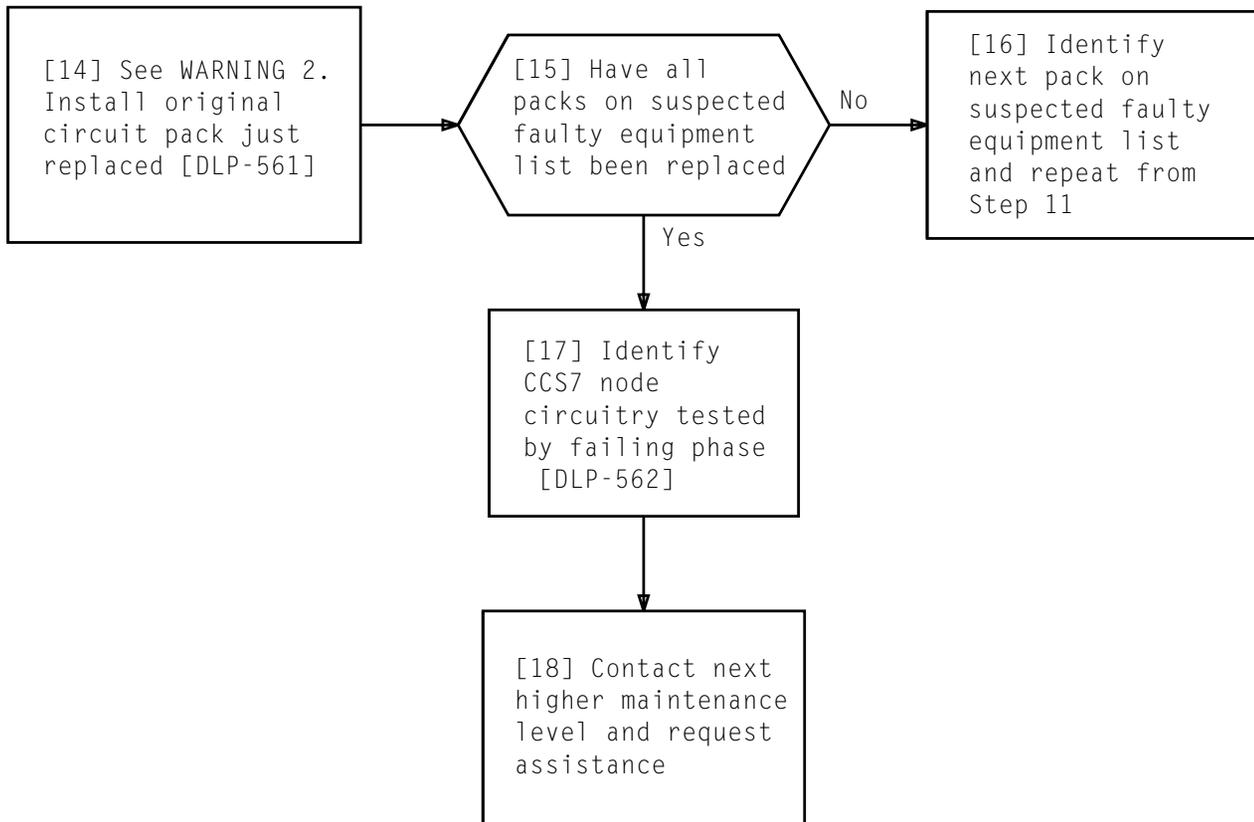
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – COMMON CHANNEL SIGNALING 7 (CCS7) NODE**

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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – COMMON CHANNEL SIGNALING 7 (CCS7) NODE**



*WARNING 2  
Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

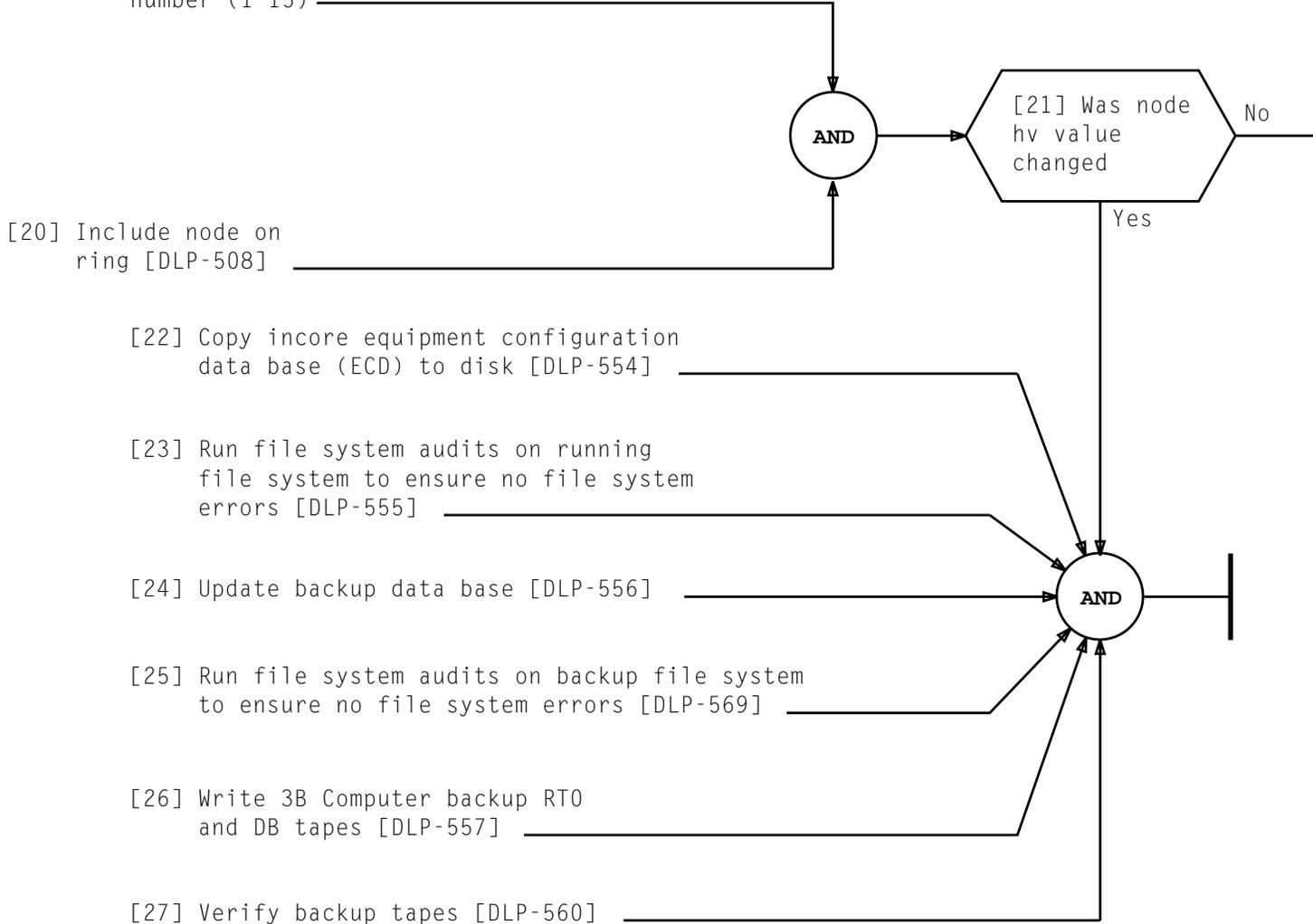
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – COMMON CHANNEL SIGNALING 7 (CCS7) NODE**

[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



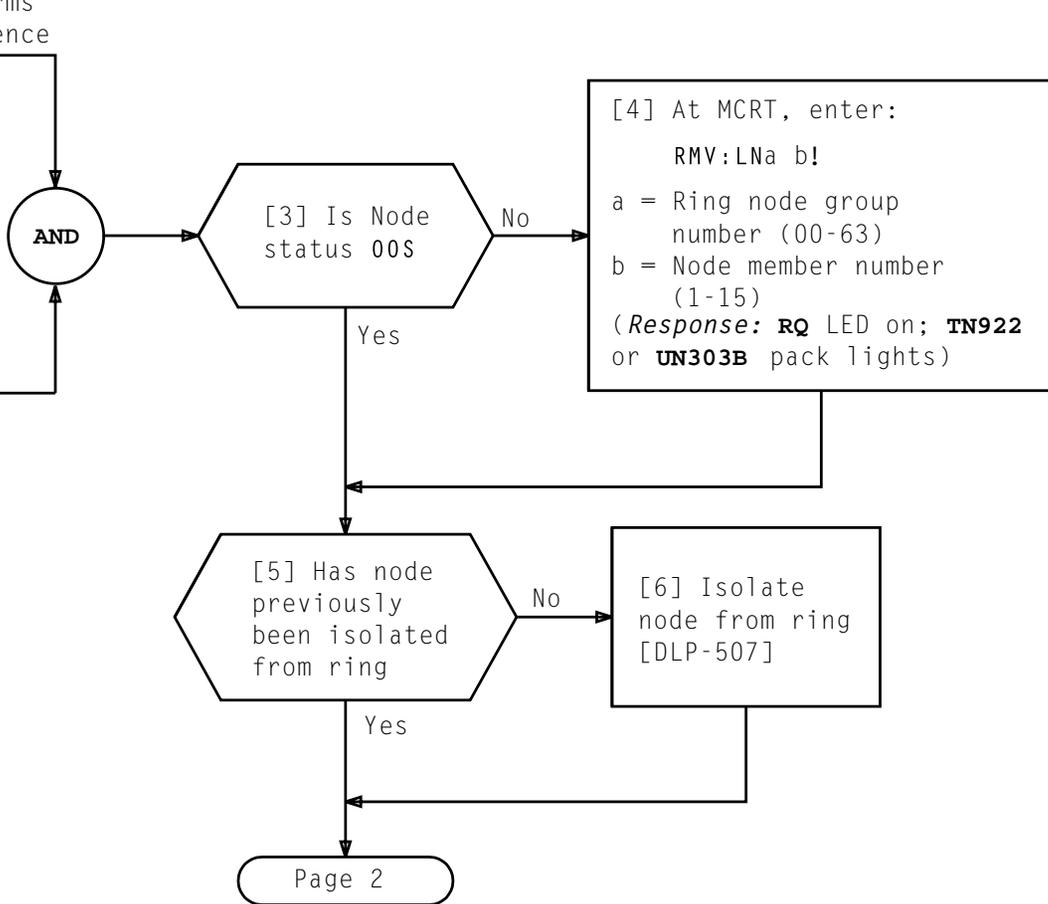
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – COMMON CHANNEL SIGNALING 7 (CCS7) NODE**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

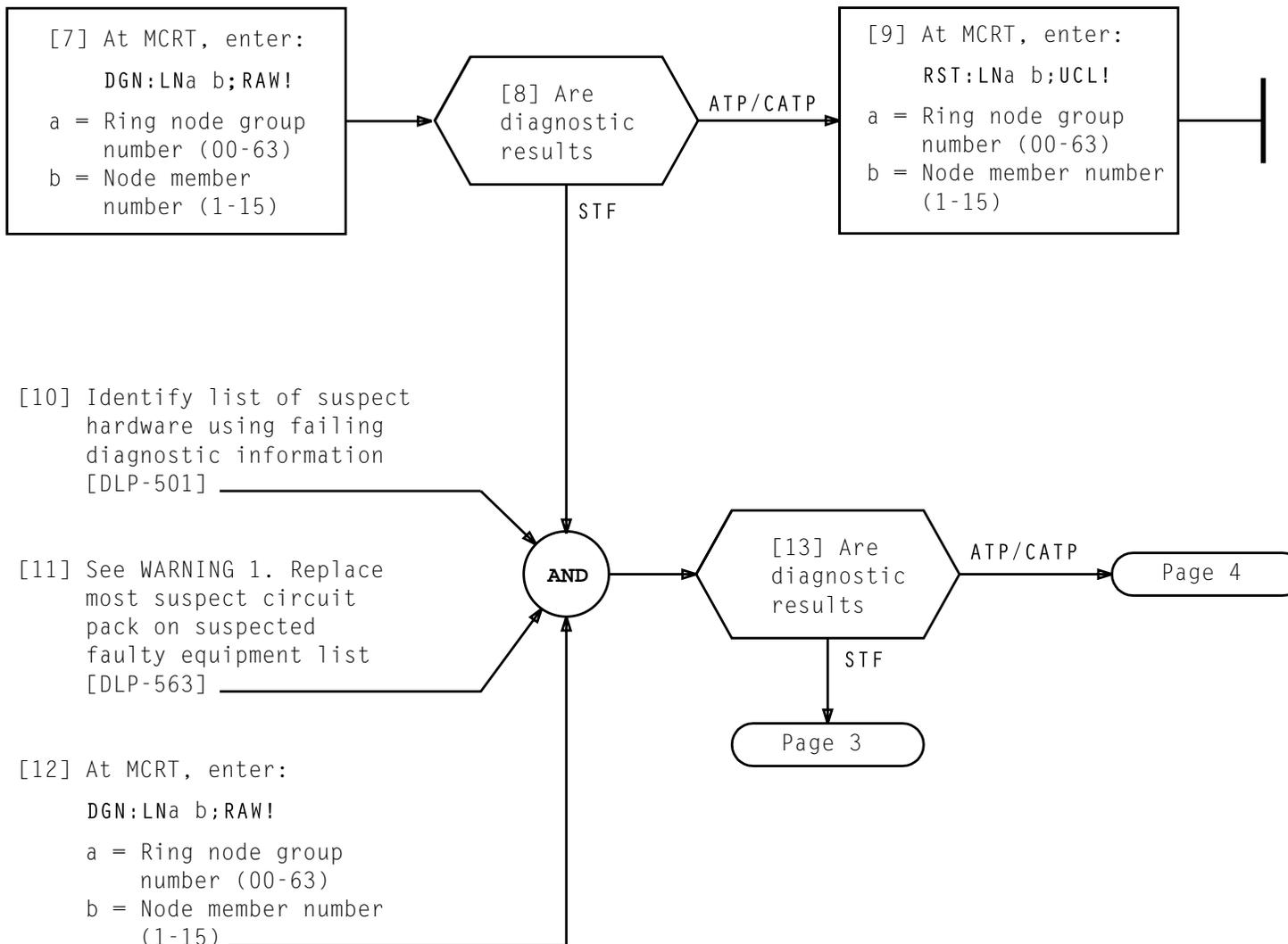
Alarms Silence

[2] Determine status of node failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – INTERNATIONAL LINK NODE (ILN)**

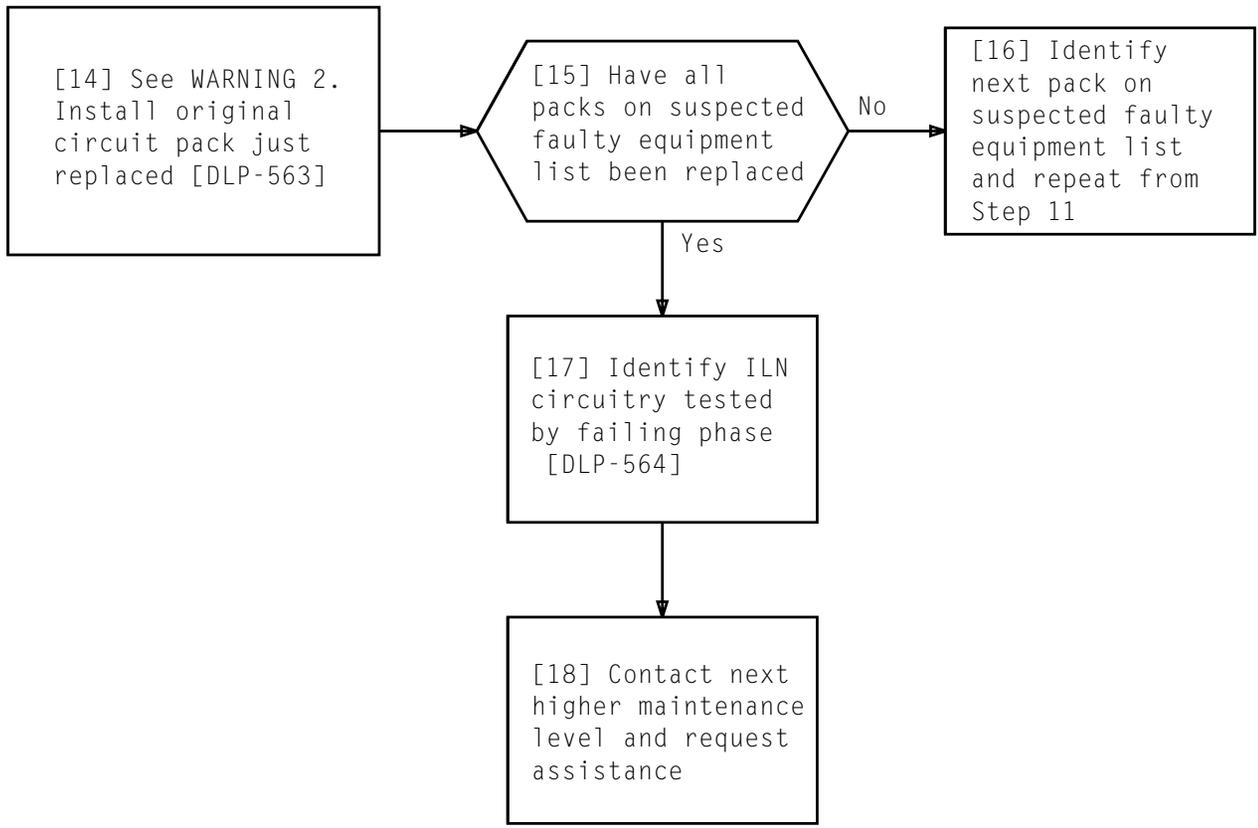
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – INTERNATIONAL LINK NODE (ILN)**

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*WARNING 2  
Due to circuit  
pack damage  
caused by  
electrostatic  
discharge,  
precautions must  
be taken when  
handling circuit  
packs and working  
in backplane area*

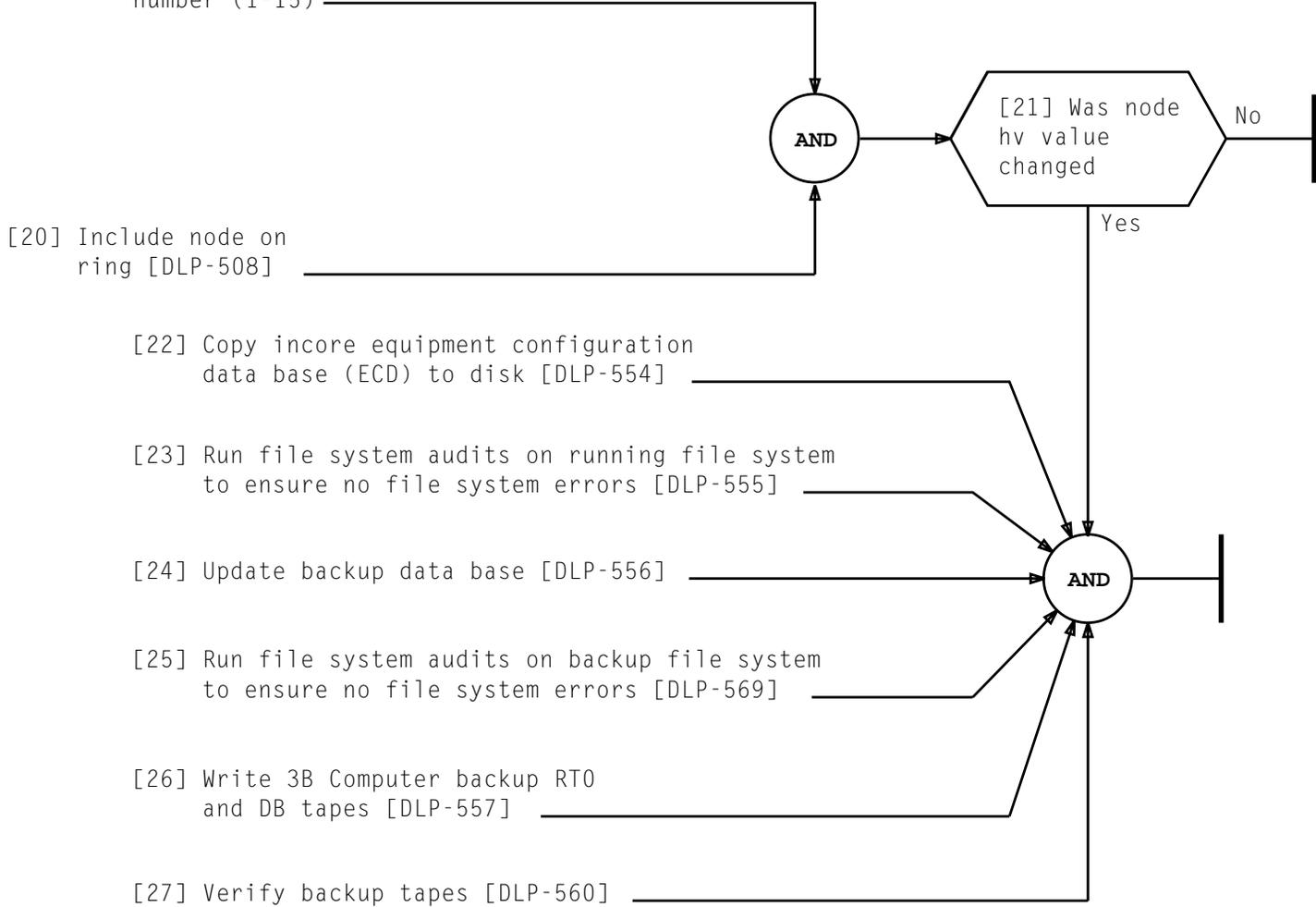
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS –INTERNATIONAL LINK NODE (ILN)**

[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



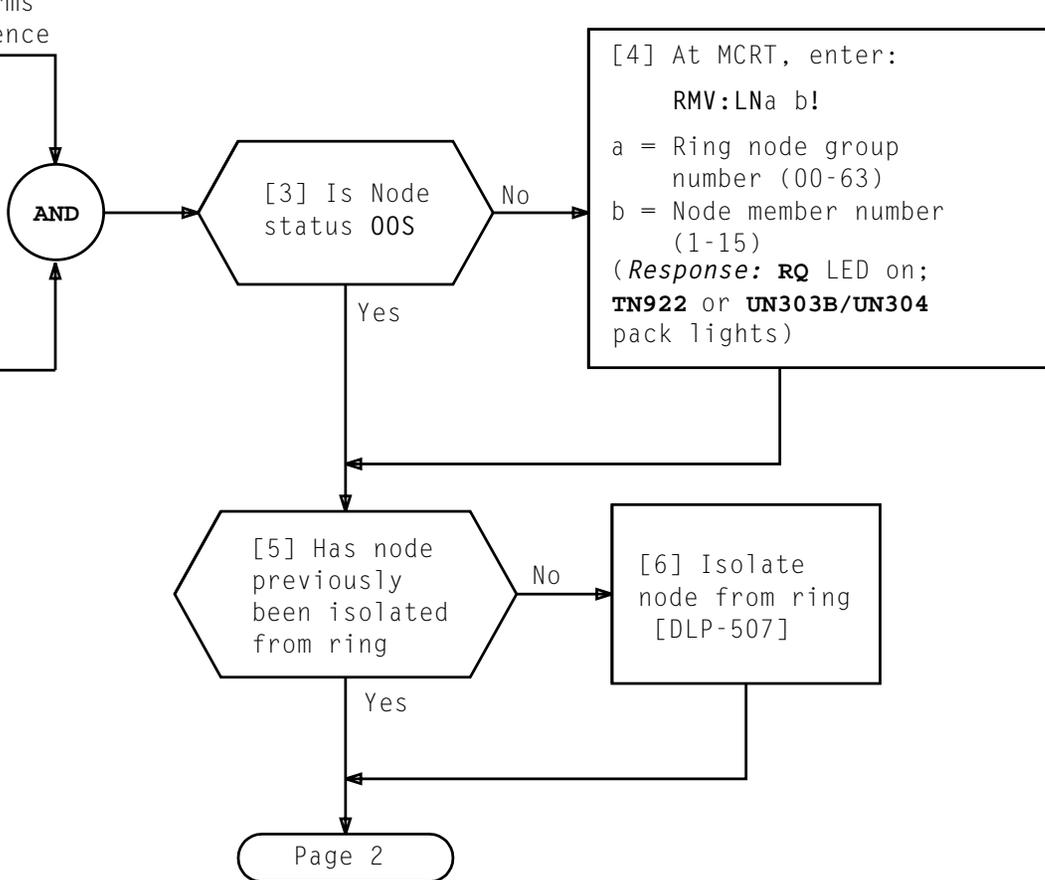
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – INTERNATIONAL LINK NODE (ILN)**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

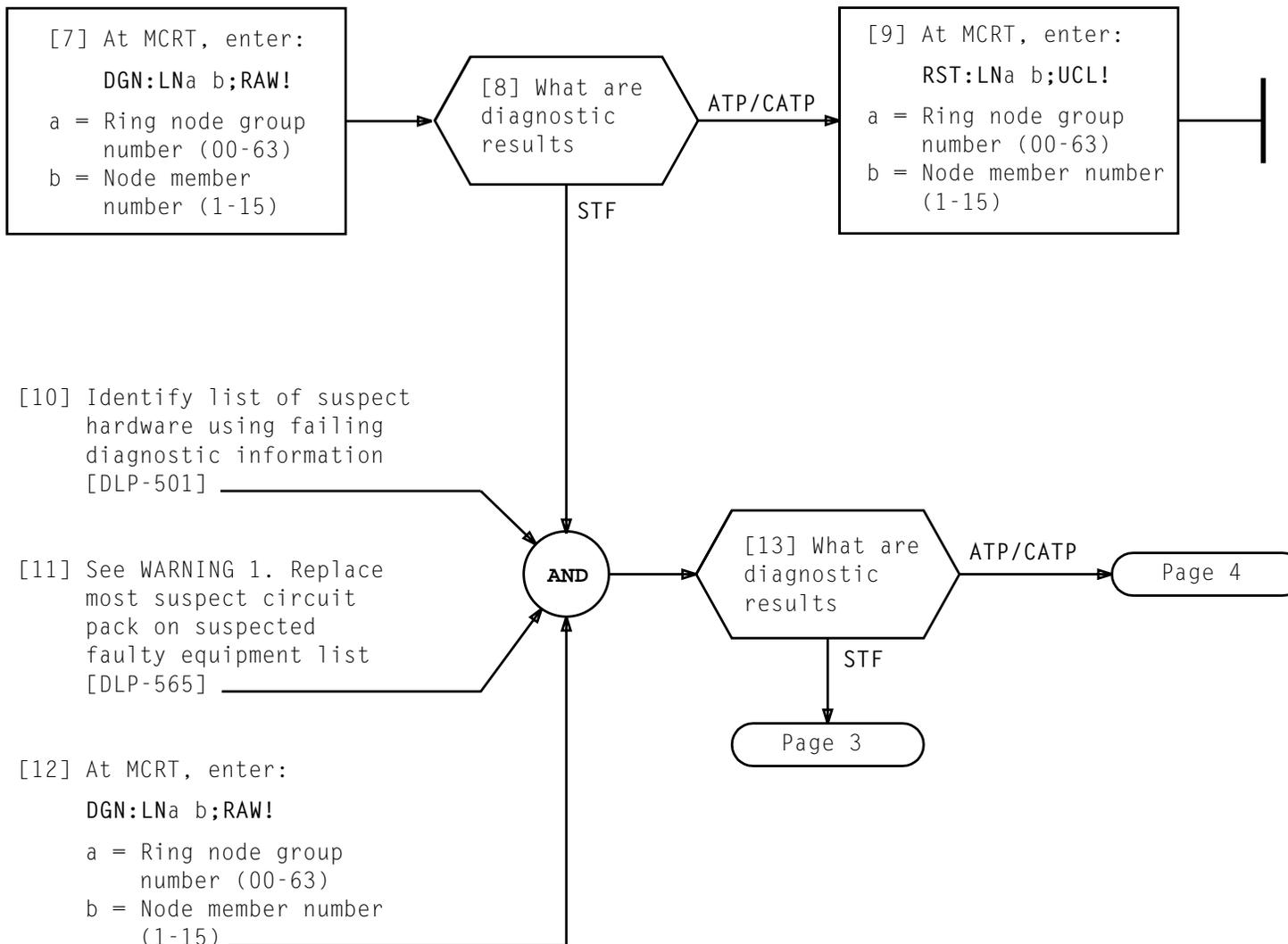
Alarms Silence

[2] Determine status of node failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – CUSTOMER PREMISE EQUIPMENT (CPE) NODE**

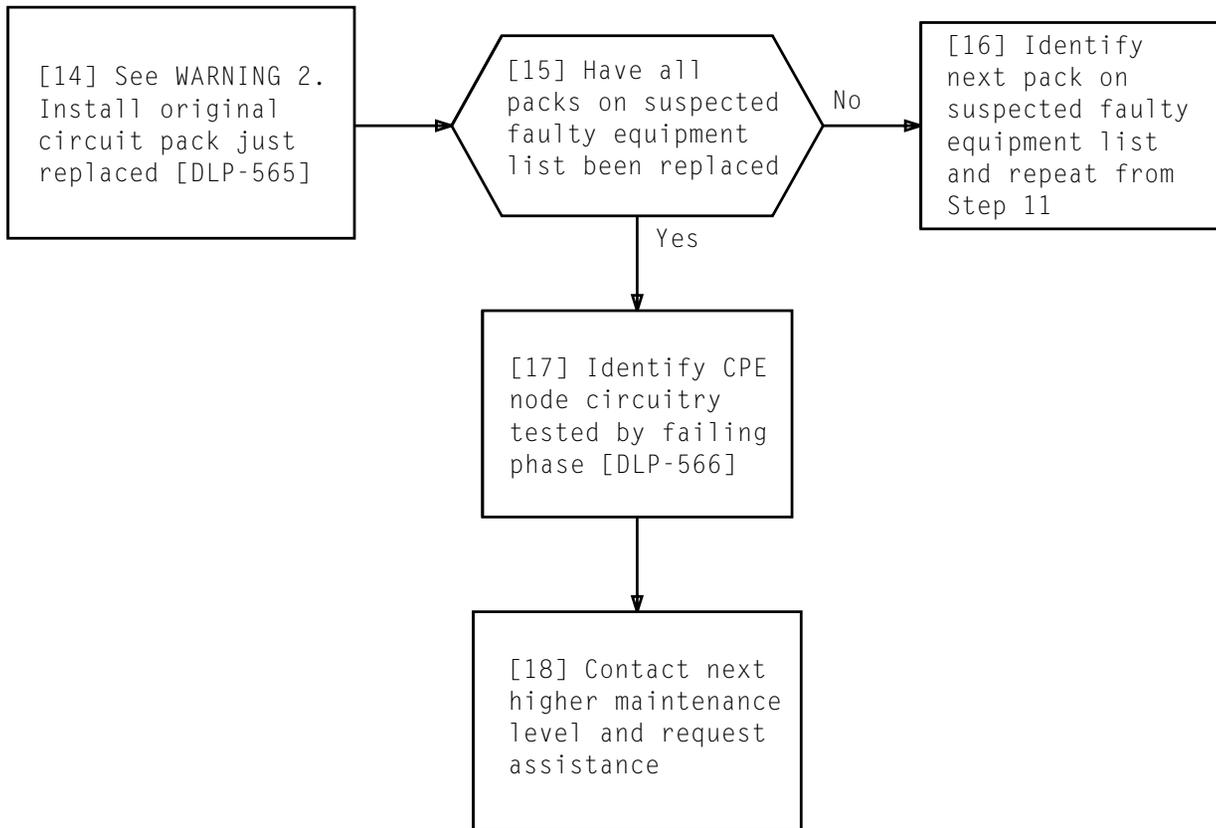
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**WARNING 1**  
 Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – CUSTOMER PREMISE EQUIPMENT (CPE) NODE**

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*WARNING 2  
Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

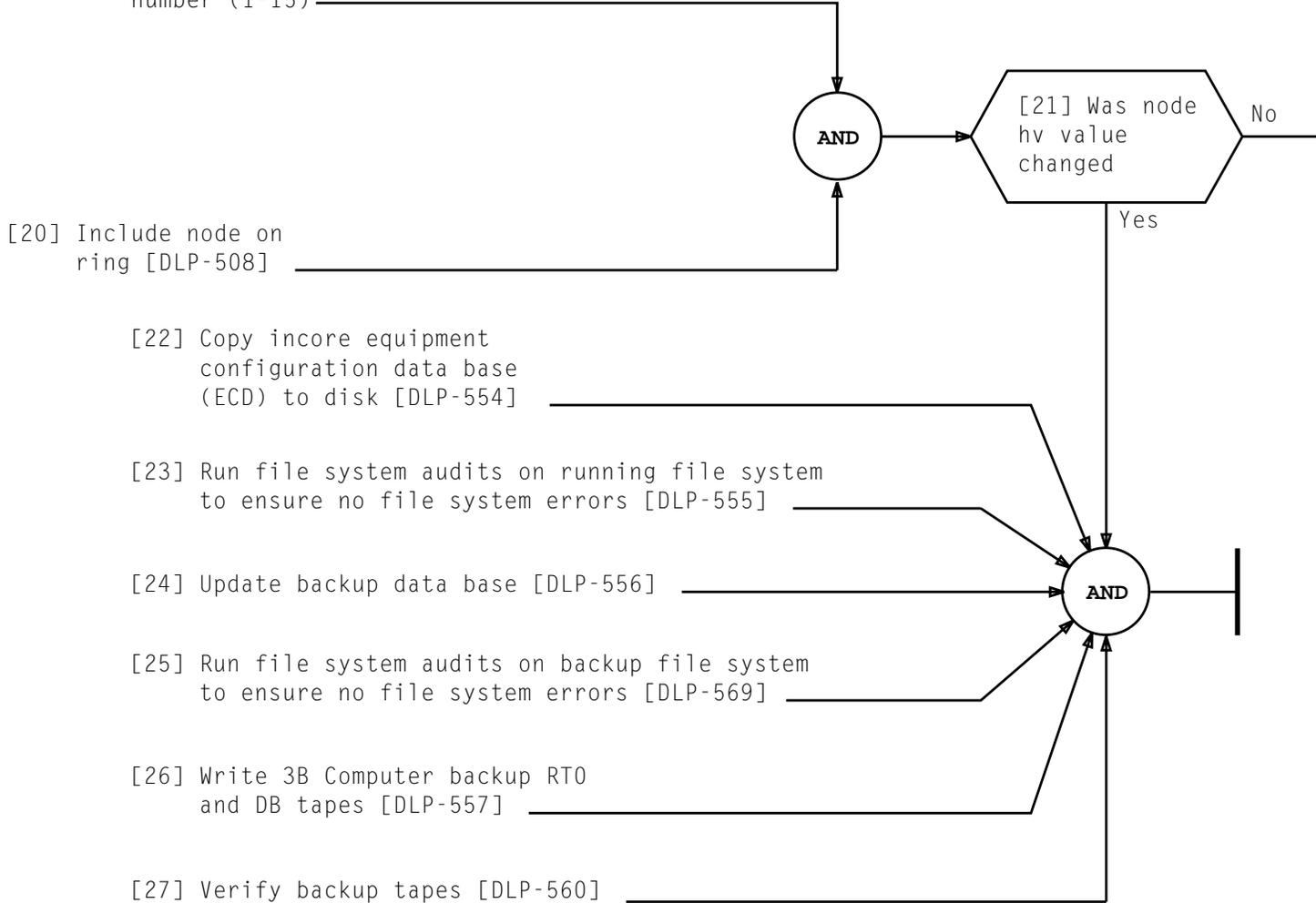
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – CUSTOMER PREMISE EQUIPMENT (CPE) NODE**

[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

B = NODE MEMBER  
number (1-15)



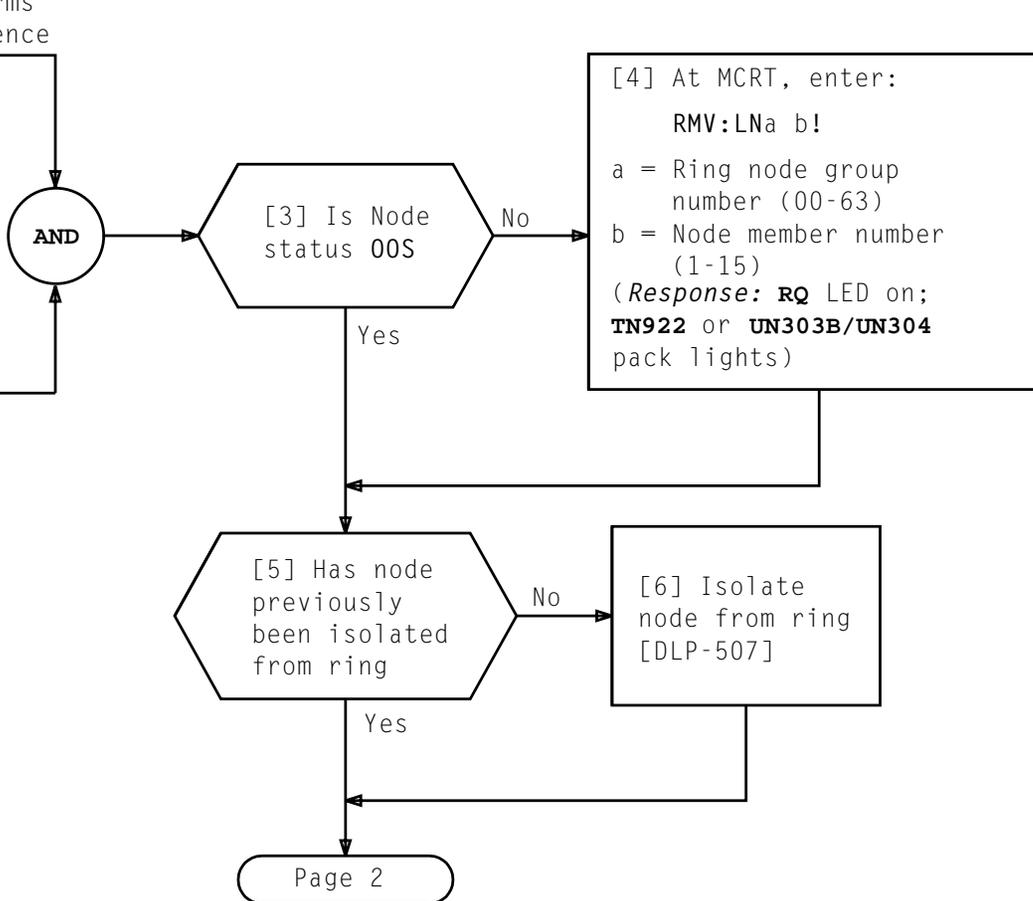
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – CUSTOMER PREMISE EQUIPMENT (CPE) NODE**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

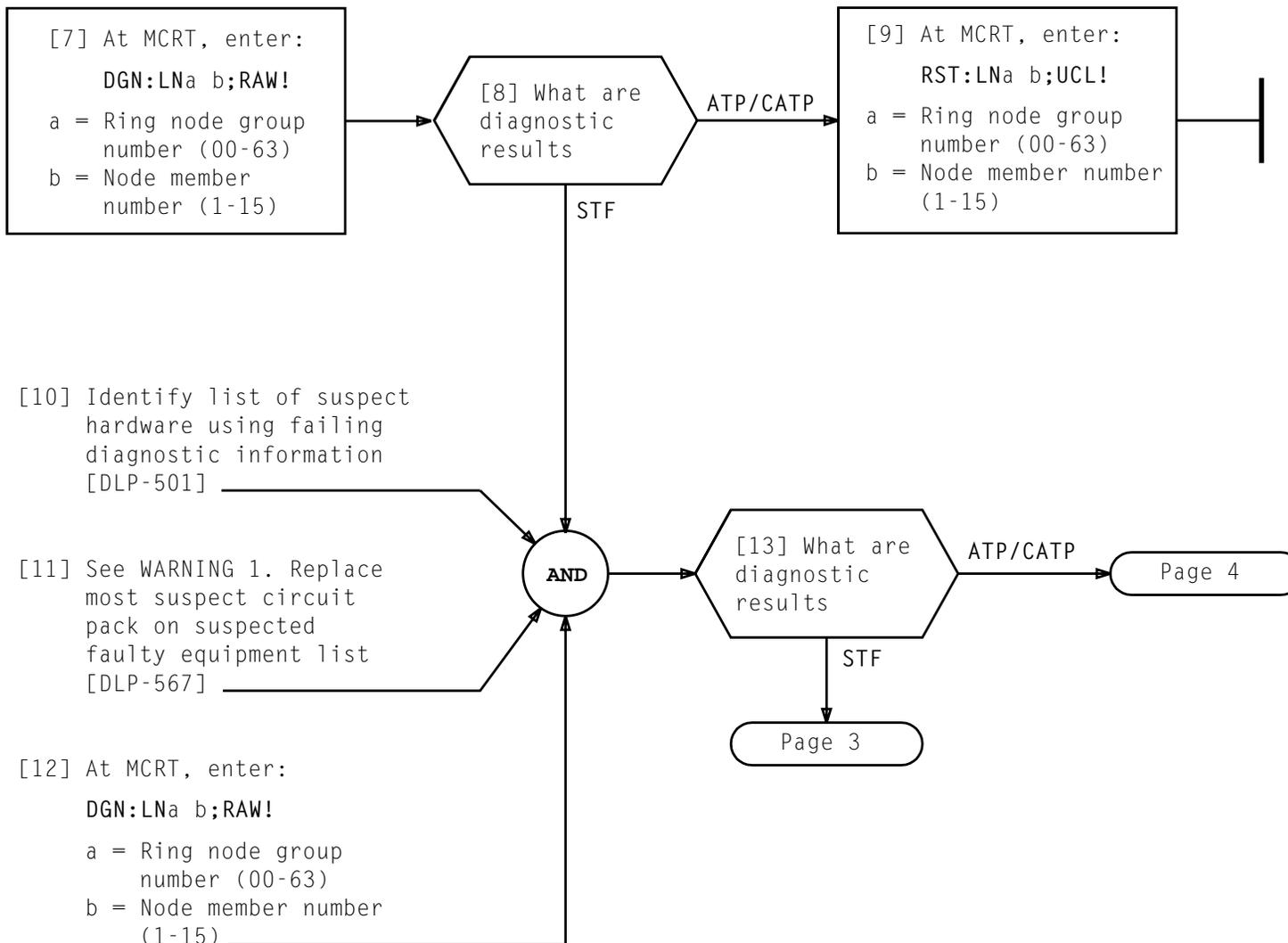
Alarms Silence

[2] Determine status of node failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – IMS USER NODE (IUN)**

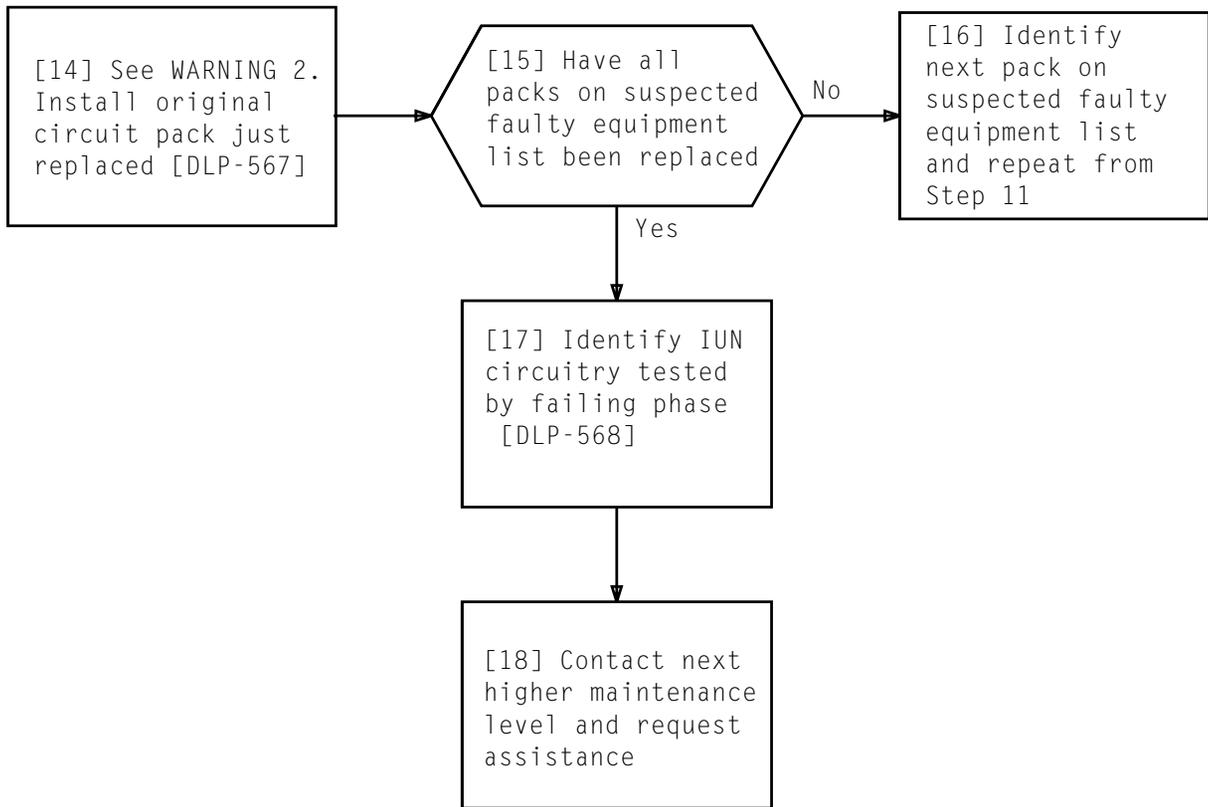
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – IMS USER NODE (IUN)**

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*WARNING 2*  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

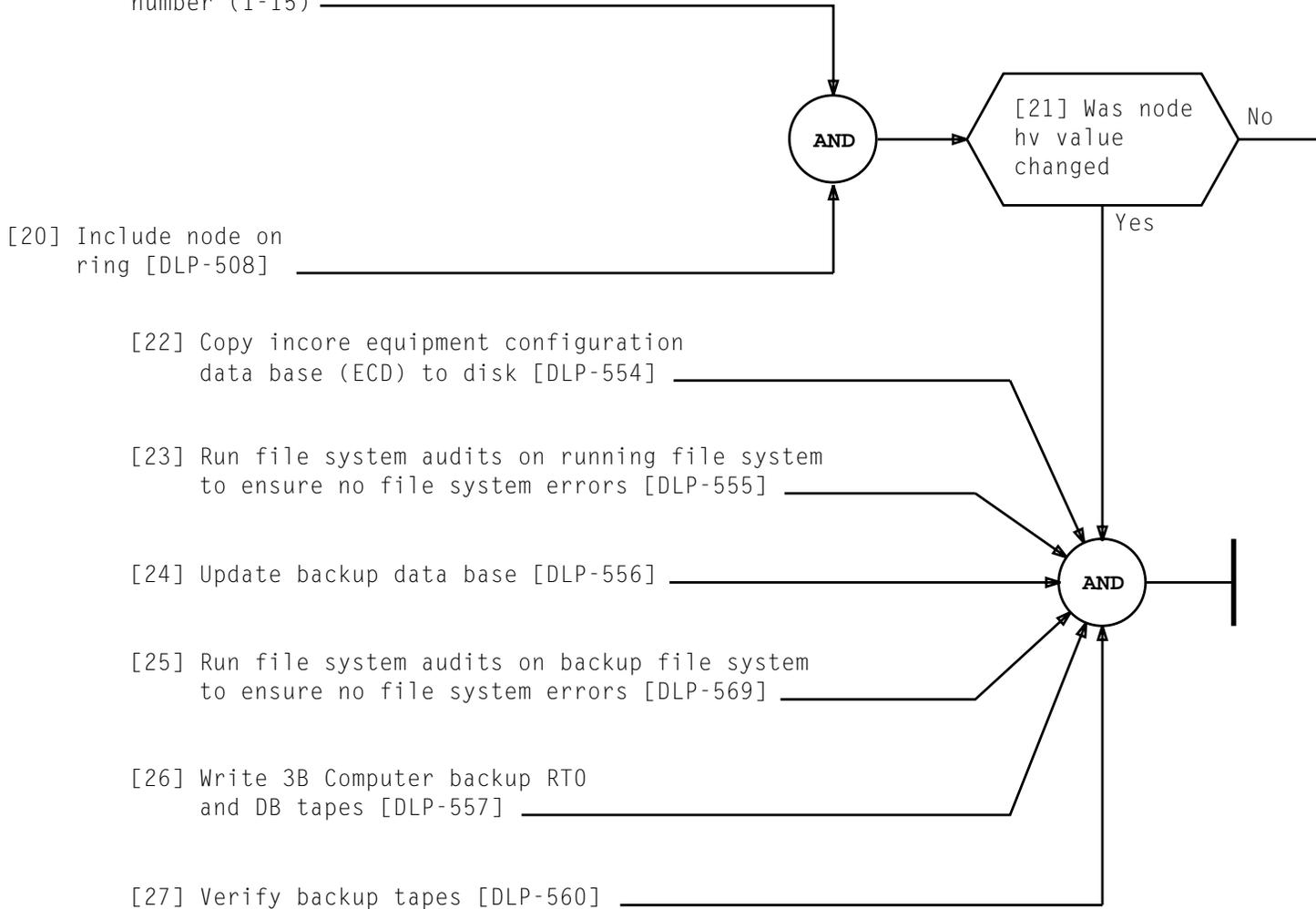
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – IMS USER NODE (IUN)**

[19] At MCRT, enter:

RST:LNa b;UCL!

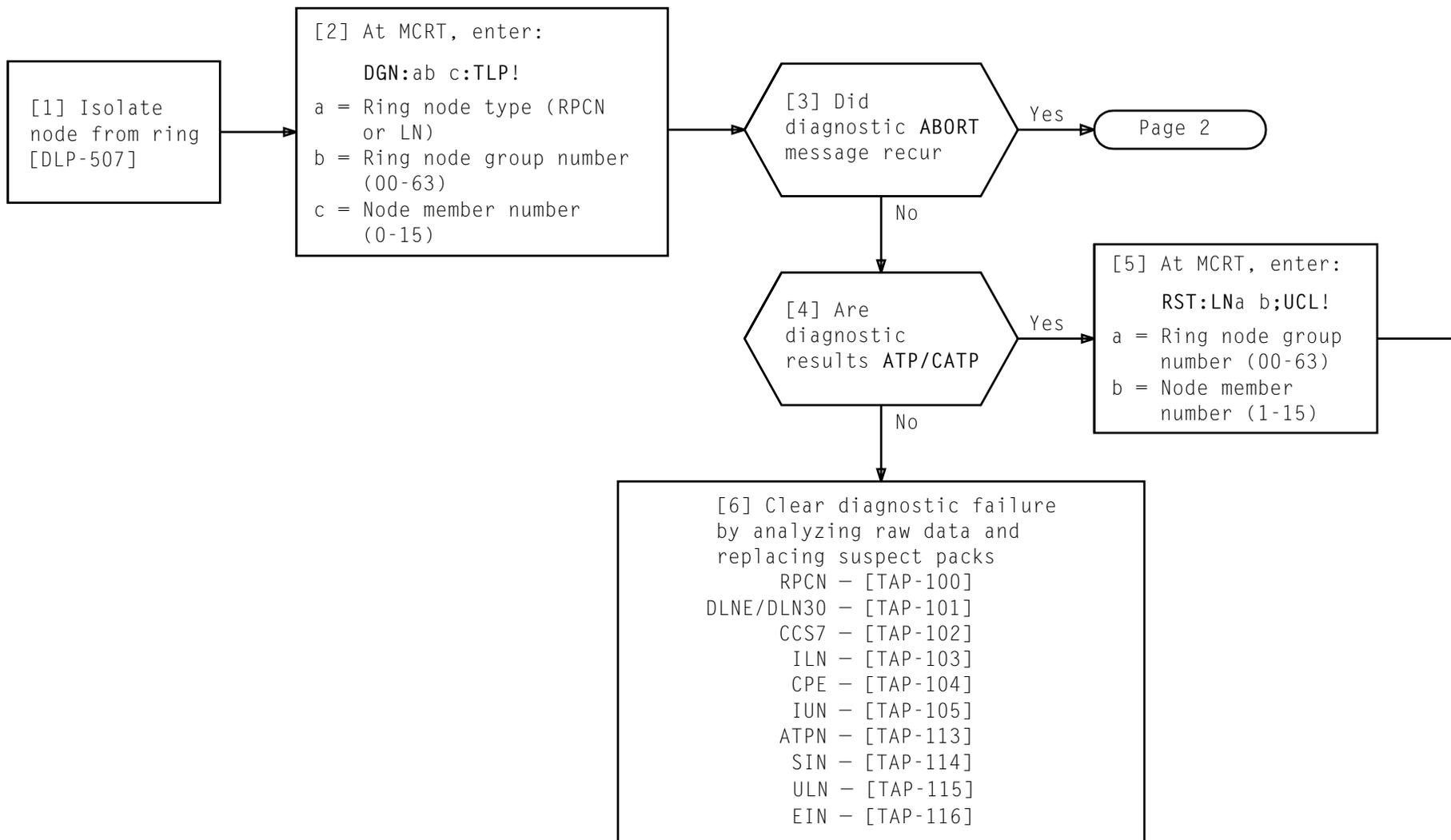
a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – IMS USER NODE (IUN)**

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**CLEAR DIAGNOSTIC ABORTED FAILURE**

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[7] Using diagnostic abort message printout [Figure 1], identify and note abort code

[8] Identify and note DATA TABLE PHASE NUMBER and LAST TEST EXECUTED [Figure 1]

[9] Using TABLE A, Page 3, locate identified abort code and note REASON FOR ABORT and any SYSTEM/DRIVER SUPPLEMENTAL DATA provided

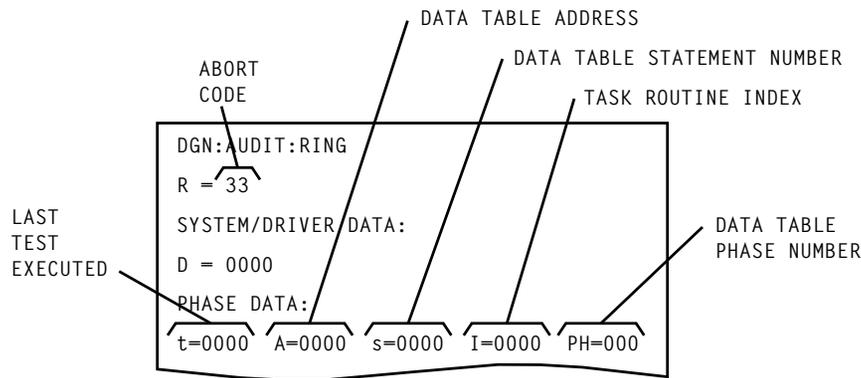
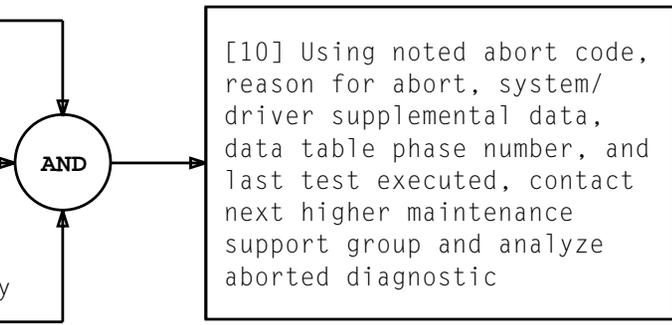


Figure 1 - Example Printout of Diagnostic Abort Message

## CLEAR DIAGNOSTIC ABORTED FAILURE

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TABLE A		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
30	Node under test is not isolated	Has no significance
31	Function call to _rgcntl() failed	Return code from _rgcntl()
32	File handling failed in writeifb()	3 - call to creat() failed 4 - call to write() failed 5 - call to close() failed
33	Ring is down. (Not possible to diagnose LN in this state)	Has no significance
34	After write of rac control message, received message from node not being controlled	The NODE_ID of source node in received message
35	_nplreset function call failed	Return code from _nplreset
36	Received message of imm_type IM_NPDAT that was not control type _ONLY	Control code in reply message to read NP memory request
37	Received abort from ring.chng indicating ring is being configured	Has no significance
38	RAC control was not effective	The following specify which RAC control failed: 1 - set inhibit input 2 - clear inhibit input 3 - set force read 4 - clear force read 5 - set force propagate 6 - clear force propagate 7 - program rac reset 8 - clear blockage 9 - disable error interrupt 10 - enable error interrupt
39	Function call to _rgrelay() failed	Return code from _rgrelay()

## CLEAR DIAGNOSTIC ABORTED FAILURE

TABLE A (Contd)		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
41	Open special device file failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
42	SETIO failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
43	Makeseg failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
44	Sendpw failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
45	Execute diagnostic failed	Return code from _nplexec
46	IMS driver operation failed in msgtoport() function call	See IMSDRV Diagnostic Error Codes [TABLE C, Page 12]
48	Msgenab failure	See SYSTEM ERROR CODES [TABLE B, Page 9]
49	Msgdisab failure	See SYSTEM ERROR CODES [TABLE B, Page 9]
4A	_nplread function call failed	Return code from _nplread
4B	_npltest function call failed	Return code from _npltest
4C	Excofl timed out	See SYSTEM ERROR CODES [TABLE B, Page 9]
4D	Open ECD manager failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
4E	Function "ugucbn" failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
4F	PIC microstore size not in ucb	See SYSTEM ERROR CODES [TABLE B, Page 9]
50	Receive wait failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
51	LEXEC function failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
52	E_host of ucb not initialized	See SYSTEM ERROR CODES [TABLE B, Page 9]
53	Lseek function failure	See SYSTEM ERROR CODES [TABLE B, Page 9]
54	Call to _rglcont failed	Return code from _rglcont
55	Write hardware command to BISO or EISO denied because of illegal hardware command	Has no significance. This is a data table problem
56	Write/read segment too small	See SYSTEM ERROR CODES [TABLE B, Page 9]

## CLEAR DIAGNOSTIC ABORTED FAILURE

TABLE A (Contd)		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
57	Function ugetucb failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
58	Received maintenance message of unexpected type	imm_type in received message
59	NP insane after NP reset	Return code from driver
61	Time-out awaiting reply to recvw() function call	No significance
64	Cannot open data table file	See SYSTEM ERROR CODES [TABLE B, Page 9]
65	Cannot share DCB from DIAMON	See SYSTEM ERROR CODES [TABLE B, Page 9]
66	Error in data table	See SYSTEM ERROR CODES [TABLE B, Page 9]
67	Invalid number of parameters from DIAMON	See SYSTEM ERROR CODES [TABLE B, Page 9]
68	Open spooler failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
6A	Invalid interactive mode command	See SYSTEM ERROR CODES [TABLE B, Page 9]
6C	Open tlpfile failed	See SYSTEM ERROR CODES [TABLE B, Page 9]
6D	Signal: illegal instruction	See SYSTEM ERROR CODES [TABLE B, Page 9]
6E	Signal: bus error	See SYSTEM ERROR CODES [TABLE B, Page 9]
6F	Signal: segment violation	See SYSTEM ERROR CODES [TABLE B, Page 9]
70	Signal: software termination	See SYSTEM ERROR CODES [TABLE B, Page 9]
71	Open message switch failed	Return code from _ims_open
72	ims_ioctl message switch failed	Return code from _ims_ioctl
73	ims_write message switch failed	Return code from _ims_write
74	ims_hdr message switch failed	Return code from _ims_hdr
75	get_mbuf message switch failed	Return code from _get_mbuf
76	ims_read message switch did not return _SUCCESS	Return code from _ims_read

## CLEAR DIAGNOSTIC ABORTED FAILURE

TABLE A (Contd)		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
77	Time-out occurred. No reply message from message switch in event mode	Has no significance
78	ucb name to node id translation failed or data returned from ring_cnfg indicates more than DB_MAXNODE nodes in isolated segment	0 - bad node name to node id translation 1 - ring.cnfg indicates too many ring nodes
79	Open driver for rpc diagnostics failed	Return code from driver
7A	Lock process in memory from dgndmawt() left insufficient memory for swapping	Has no significance
7B	Least significant byte in ucb HV field is out of range, ie, at least one nibble >= DBIFBMAX. (see db_arrays.h)	NODE_ID corresponding to ucb containing data is out of range
7C	Imsdiag timed out while awaiting a GO event from DIAMON	Has no significance
7D	Node being diagnosed is an iun type and is neither isolated nor does it have an RI minor state of USBL	The nodes RI minor state: 0 = UNTSTD            2 = USBL 1 = FLTY              3 = QUSBL
7E	An excessive number of messages were queued for _DIAGC channel immediately after channel was opened	Has no significance
80	Reply messages to rg_query() were received out of sequence	Next expected sequence number
81	Argument passed to qktst_qu() was out of range. Allowable are 1(BISO) and 2(EISO)	Argument actually passed
82	Request to update RI minor state was not successful	Node id where update was not successful

## CLEAR DIAGNOSTIC ABORTED FAILURE

TABLE A (Contd)		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
83	An 8-byte message relayed from imsdiaq to itself via a double relay through isolated segment was received from proper relay node, but message was not proper length	Number of bytes in received message
84	Imsdiag received an unexpected node type from driver in response to a node-type query message	Node type received: 128 - RPCN 0 - UNEQP node or unknown type
85	The driver rejected the diagnostic test job of the DLN dma	The "result" field in the message returned from the driver: 4 - error found in request message 8 - software which handles the test DLN dma is busy
86	The message sequence number of the message for which the 2 bits pattern is going to be built exceeds the allowed limit	Message sequence number of the message for which the 2 bits pattern is going to be built
87	The home RPCN id for the home RPCN of the relay node is not valid	The home RPCN id for the home RPCN of the relay node
88	The capacity test is aborted by the home RPCN of the relay node	The why_abt code in the reply message from the home RPCN of the relay node for the diagnostic capacity test

## CLEAR DIAGNOSTIC ABORTED FAILURE

TABLE A (Contd)		
ABORT CODE	REASON FOR ABORT	SYSTEM/DRIVER SUPPLEMENTAL DATA
89	The dg_rcont function was passed an invalid 'cntlcode' argument	The actual 'cntlcode' argument passed to the dg_rcont() function
90	The dg_rcont function was passed an invalid 'racrst' argument	The actual 'racrst' argument passed to the dg_rcont() function
91	The dg_rcont function was passed an invalid 'ring' argument	The actual 'ring' argument passed to the dg_rcont() function

**TABLE B  
SYSTEM ERROR CODES**

CODE	CODE DEFINITION	CODE	CODE DEFINITION
1	Not super-user	24	Too many open files
2	No such file or directory	25	Not a typewriter
3	No such process	26	Test file busy
4	Interrupted system call	27	File too large
5	I/O error	28	No space left on device
6	No such device or address	29	Illegal seek
7	Argument list too long	30	Read-only file system
8	Exec format error	31	Too many links
9	Bad file number	32	Broken pipe
10	No children	33	File is "temped"
11	No more processes	34	Trap to lower execution level kernel process
12	Not enough core	35	No message
13	Permission denied	36	Not allocated
14	Bad address	37	Mount audit failure
15	Block device required	38	Mount umount failed due to current audit
16	Mount device busy	39	First access of logical block
17	File exists	40	Fmove failed
18	Cross-device link	41	No extents
19	No such device	42	Pathname too long
20	Not a directory	43	No entries left
21	Is a directory	44	Invalid operation
22	Invalid argument	45	Failure as a result of an audit
23	File table overflow	46	Disk limp mode indication

**CLEAR DIAGNOSTIC ABORTED FAILURE**

**TABLE B (Contd)  
SYSTEM ERROR CODES**

CODE	CODE DEFINITION	CODE	CODE DEFINITION
47-50	Not used	68*	FLTRCV: Bad search level entry PMGR: Pfile (LDP output) doesn't exist
51	Message type not recognized	69*	FLTRCV: Could not find eqid unit
52	Cannot find process in process tables	70*	FLTRCV: Unit not out of service PMGR: Can't open dump file
53	Library file does not exist	71*	FLTRCV: Unit already reserved
54	All process slots in use (pstart fail)	72*	FLTRCV: No idle MDCT entry PMGR: Can't get capability of working directory
55	Insufficient memory for kernel	73*	FLTRCV: Backup not available PMGR: Unable to close a file
56	All sides are allocated or there is no swap space left	74*	FLTRCV: UCB type incorrect
57	Unable to read a pfile or library file	75*	FLTRCV: Not a "cu" ucb
58	Segment too big for virtual address space available	76*	FLTRCV: Invalid MCH order PMGR: Message from unauthorized process
59	Cannot add a shared segment to a process	77*	FLTRCV: Pcpmd driver busy. Try again later PMGR: Created process has segment index overlay
60*	FLTRCV: Invalid emt value for this driver PMGR: Incarnation count too big for one process	78*	FLTRCV: Micro-assist code in offline slave failed PMGR: Unable to lock shared library in memory
61*	FLTRCV: Iomap error	79*	FLTRCV: Pointer not pointing to a ucb PMGR: Shared library already locked in memory
62*	FLTRCV: Hardware not oos or reserved PMGR: Can't acquire PCB of terminating process	80*	FLTRCV: Invalid pcpmd driver command PMGR: The term has already taken place (by proad)
63*	FLTRCV: Not a pseudo unit PMGR: PMGR faulted, entered fault routine	81*	FLTRCV: Can't fault the driver PMGR: Pfile calls for PAS, no PAS in system
64*	FLTRCV: Pointer not valid PMGR: NUB faulted, entered fault routine		
65*	FLTRCV: No mate unit		
66*	FLTRCV: Not a legitimate start UCB		
67*	FLTRCV: Bad eqid entry PMGR: Bad ACK resulting from copyseg OST		

\* System error codes 60-87 may be generated by either the process manager or fault recovery software

**CLEAR DIAGNOSTIC ABORTED FAILURE**

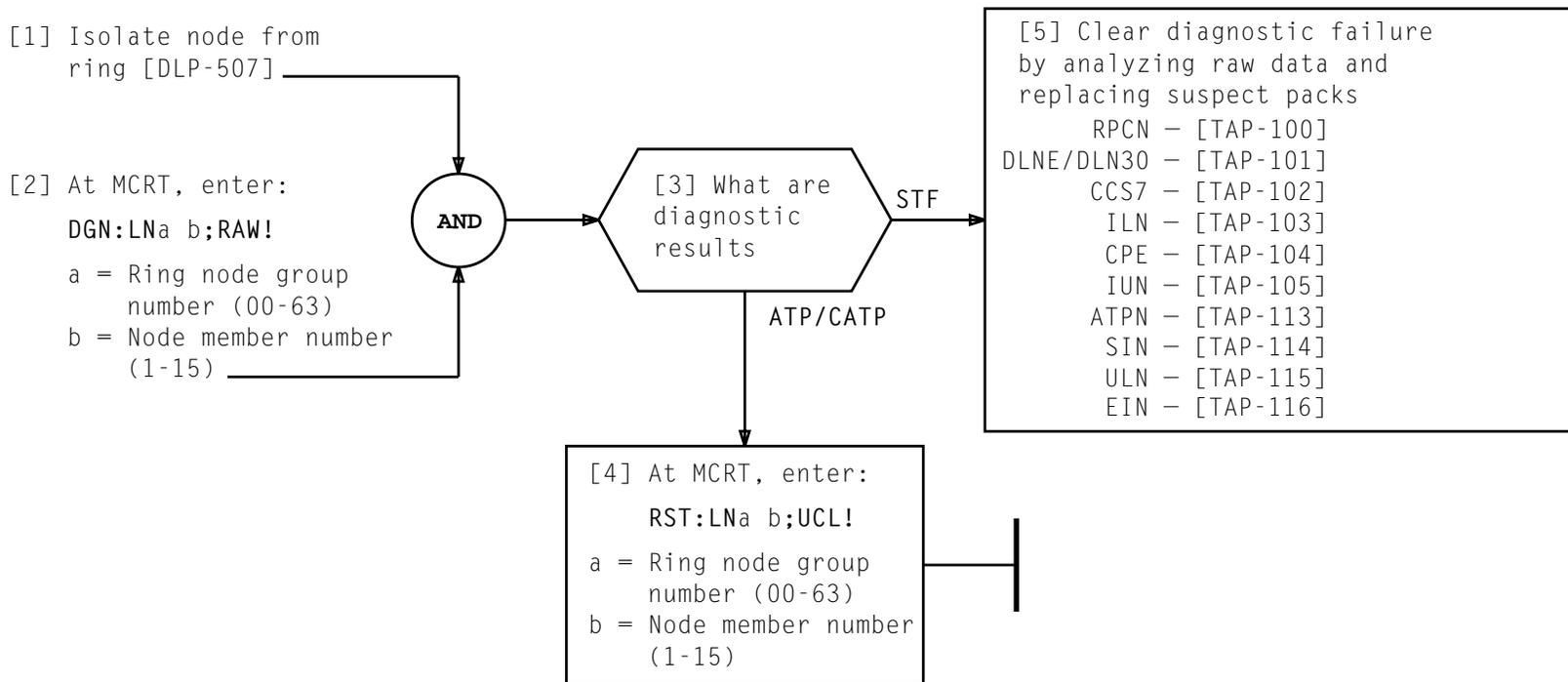
**TABLE B (Contd)  
SYSTEM ERROR CODES**

CODE	CODE DEFINITION	CODE	CODE DEFINITION
82*	FLTRCV: CONFIG fail return PMGR: The fork request failed pcreate - super	96	Unequipped Unit Control Block specified or accessed
		97	Not a top Unit Control Block
83*	FLTRCV: Processor not duplexed PMGR: Can't create because in disk limp mode	98	No match found
		99	Bad tag value
84*	FLTRCV: Mate processor not active PMGR: Segid and index do not specify same module	100	Offline CU MRFed
85*	FLTRCV: Invalid argument PMGR: Bad pcb index - when EMM index must be less than partition boundary	101-119	Not used
		120	"lla_nsqid" function failed
		121	"lla_rdget" function failed
86*	FLTRCV: MCH hardware error PMGR: Pfile does not specify pcb segment	122	"lla_uprid" function failed
		123	"lla_opnsq" function failed
87*	FLTRCV: Execmch function didn't process expected number of bytes PMGR: An ack message was lost or delayed	124	"lla_attrid" function failed
		125	"lla_delete" function failed
88	Kernel function returned failed	126	"lla_sinfo" function failed
89	Read of off-line CU timed out	127	"lla_get" function failed
90	Parity error in on-line processor	128	"lla_gtrid" function failed
91	Parity failure in off-line processor	129	Update bit not set
92	Data is not same in both processors	130	Online CU RID not provided for update
93	The on-line processor was specified when off-line was expected	131	No DMA RIDs under CU
94	Stop DMA routine failed	132	Online parity error detected by cpblkp instruction
95	Start DMA routine failed	133	Other store time-out during update

\* System error codes 60-87 may be generated by either the process manager or fault recovery software

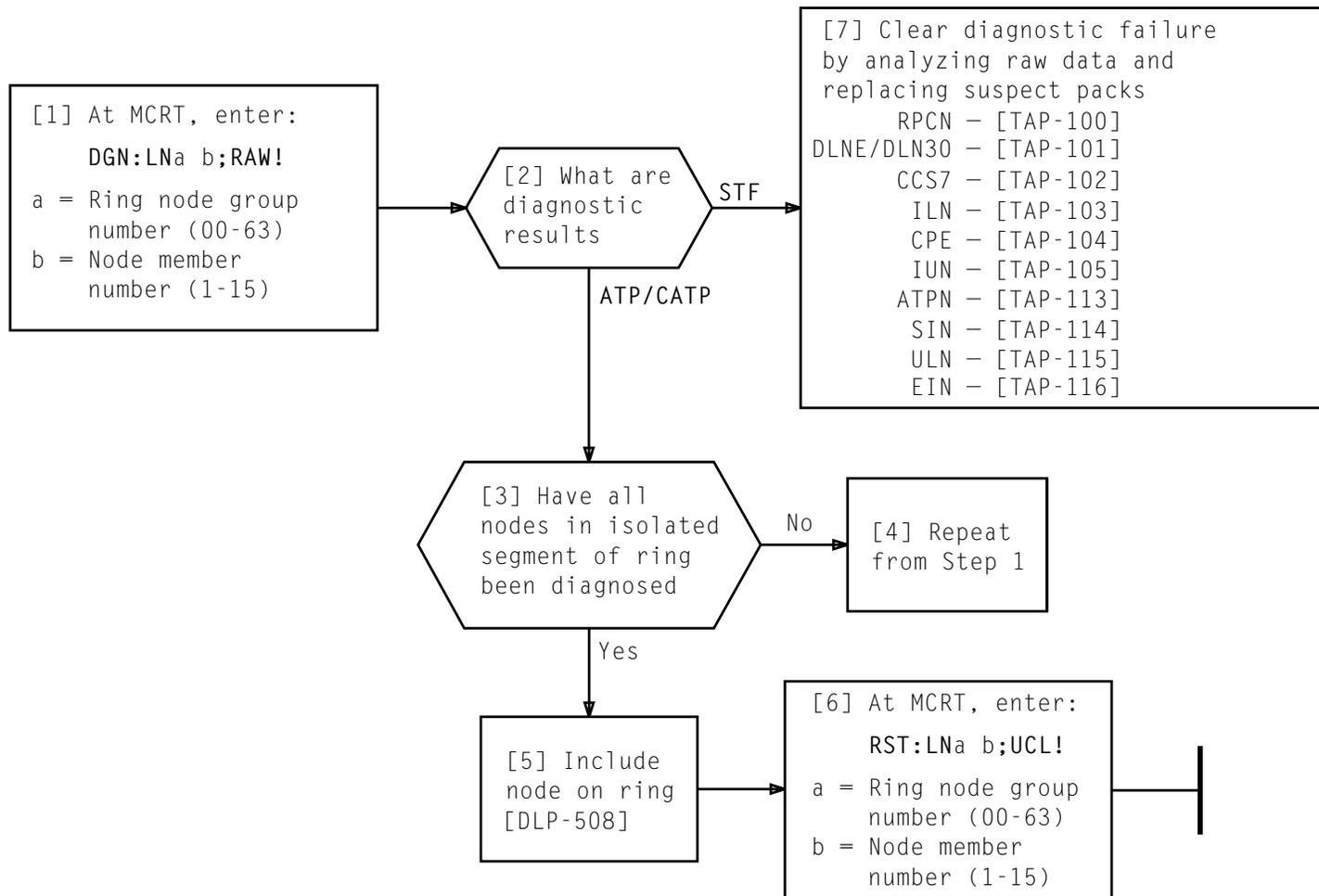
**CLEAR DIAGNOSTIC ABORTED FAILURE**

TABLE C	
IMSDRV DIAGNOSTIC ERROR CODES	
CODE	CODE DEFINITION
1	Failed to attach interrupt
2	Failed to detach interrupt
3	Failed to get dma address (getdma failed)
4	Wrong sequence
5	Wrong opcode
6	Wrong node address
7	Driver not open for diagnostics
8	Failed to open since init is in progress
9	Failed to lock segment
A	Failed diagnostics due to other reasons
B	Failed due to time-out
C	Fault code received



**CLEAR NODE (LN, DLNE/DLN30, OR RPCN) HARDWARE FAULT**

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## CLEAR ISOLATED NODE (LN, DLNE/DLN30, OR RPCN) FAULT

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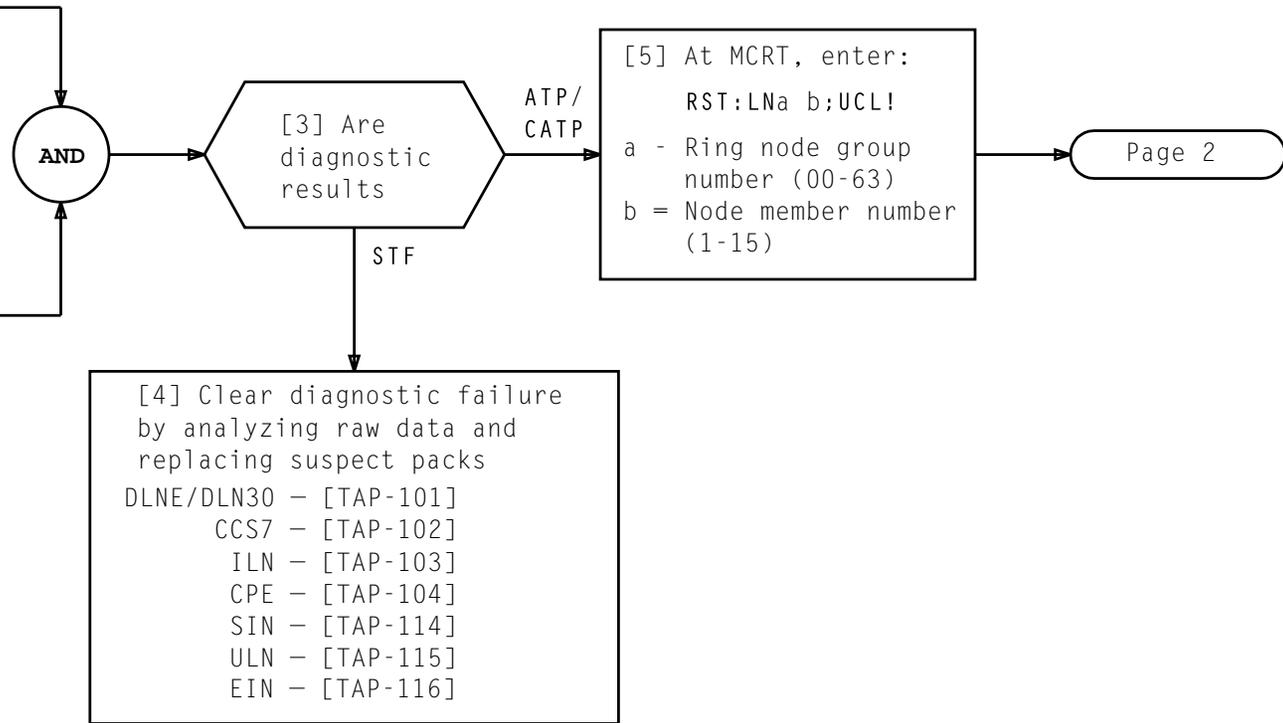
[1] Isolate node associated  
with faulty signaling  
link [DLP-507]

[2] At MCRT, enter:

DGN:LNa b;RAW!

a = Ring node group  
number (00-63)

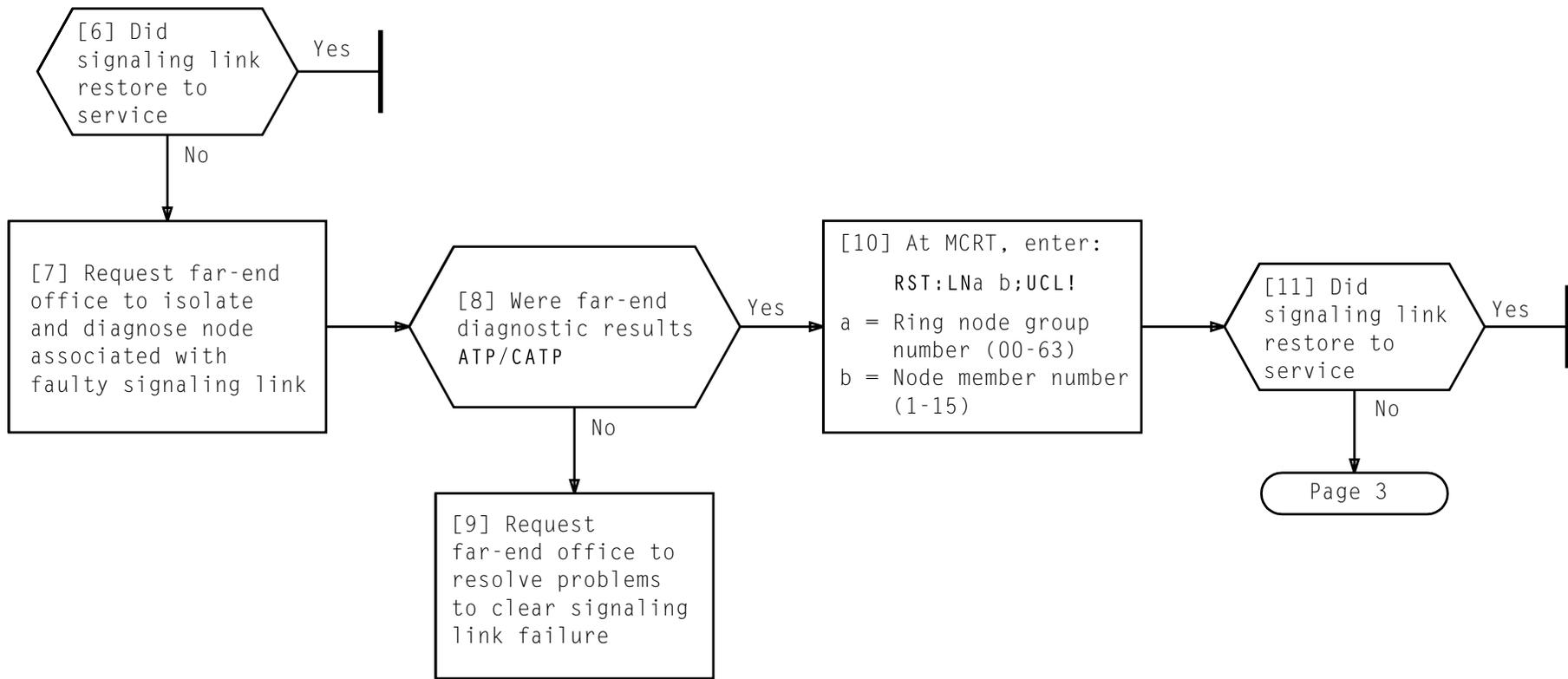
b = Node member number  
(1-15)



## CLEAR SIGNALING LINK FAILURE

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## CLEAR SIGNALING LINK FAILURE

[12] Ensure signaling link cabling connections exist between associated link node and digital service unit (DSU)

[13] Verify correct link interface pack is installed [DLP-517]

[14] Verify correct digital service unit (DSU), channel service unit (CSU), and digital service adapter (DSA) are installed [DLP-518]

[15] Verify DSU options are properly set [TABLE A]

[16] Verify DSU is not in local loop (LL) mode

[17] Verify CSU options are properly set [DLP-522]

[18] Verify DSA options are properly set [DLP-523]

AND

Page 4

**TABLE A**

DSU TYPE	OPTION SETTING PROCEDURE
AT&T 500B/ AT&T 502B	[DLP-519]
DATATEL DCP3189	[DLP-520]
AT&T 2556	[DLP-521]

**CLEAR SIGNALING LINK FAILURE**

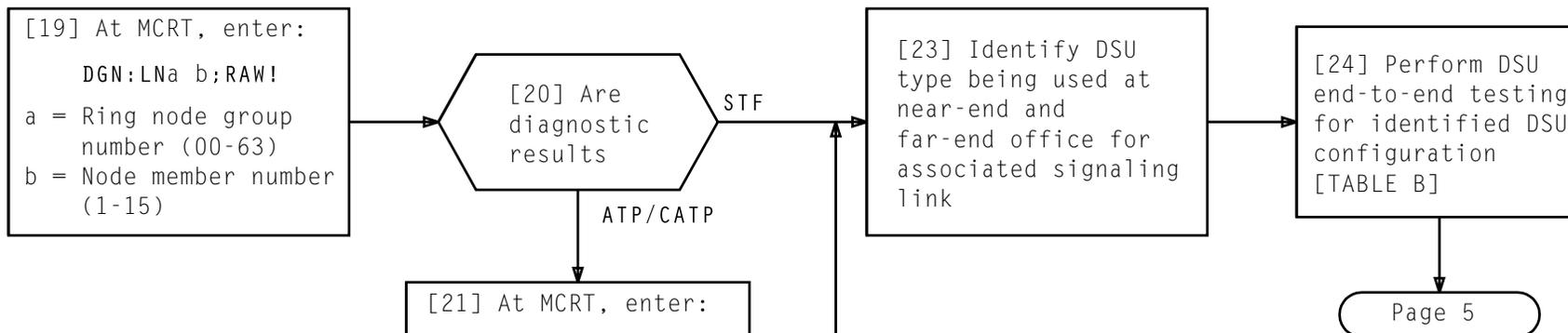
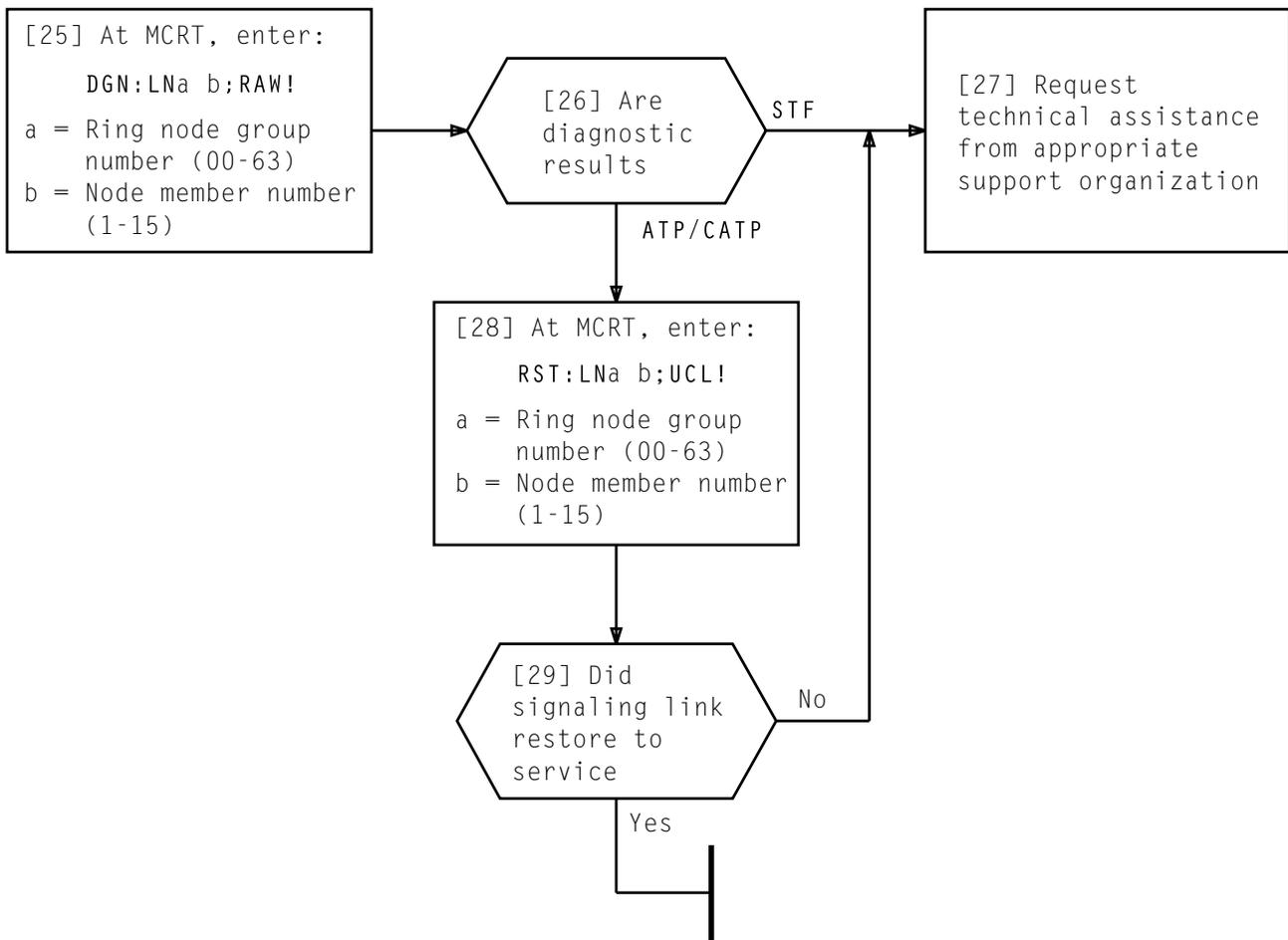


TABLE B DSU CONFIGURATION		
NEAR-END DSU (NOTE)	FAR-END DSU	DSU END-TO-END TEST PROCEDURE
DATATEL DCP3189	AT&T 2556	[DLP-531]
	DATATEL DCP3189	[DLP-532]
	AT&T 500B	[DLP-533]
AT&T 2556	AT&T 2556	[DLP-534]
	DATATEL DCP3189	[DLP-535]
	AT&T 500B	[DLP-536]

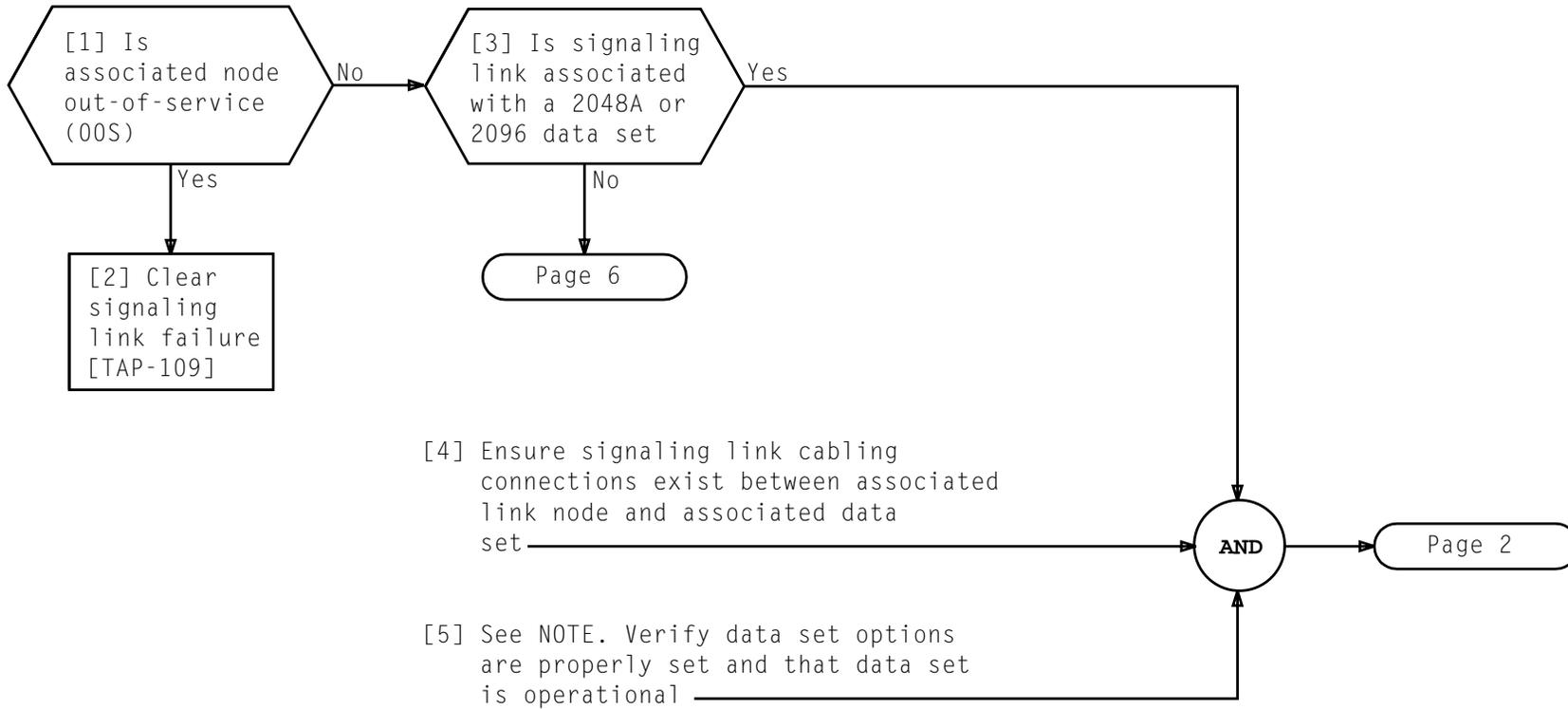
NOTE: No end-to-end tests possible when AT&T 500B DSU is used at near-end. This is due to AT&T 500B DSU being unable to generate internal test pattern to be sent through loop. Tests can be completed with AT&T 500B DSU at far-end. This is due to AT&T 500B DSU's ability to be placed in remote loopback mode.

## CLEAR SIGNALING LINK FAILURE



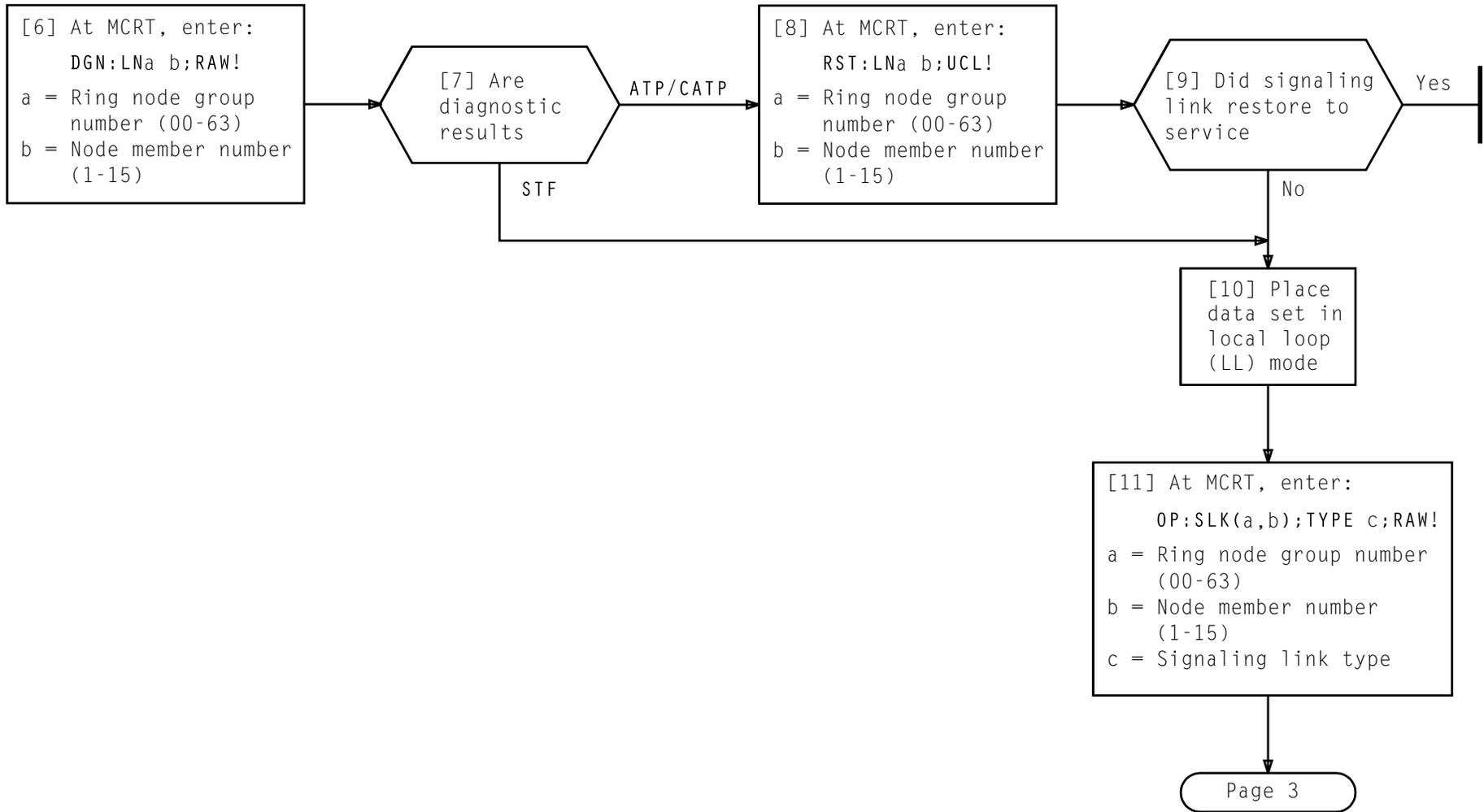
**CLEAR SIGNALING LINK FAILURE**

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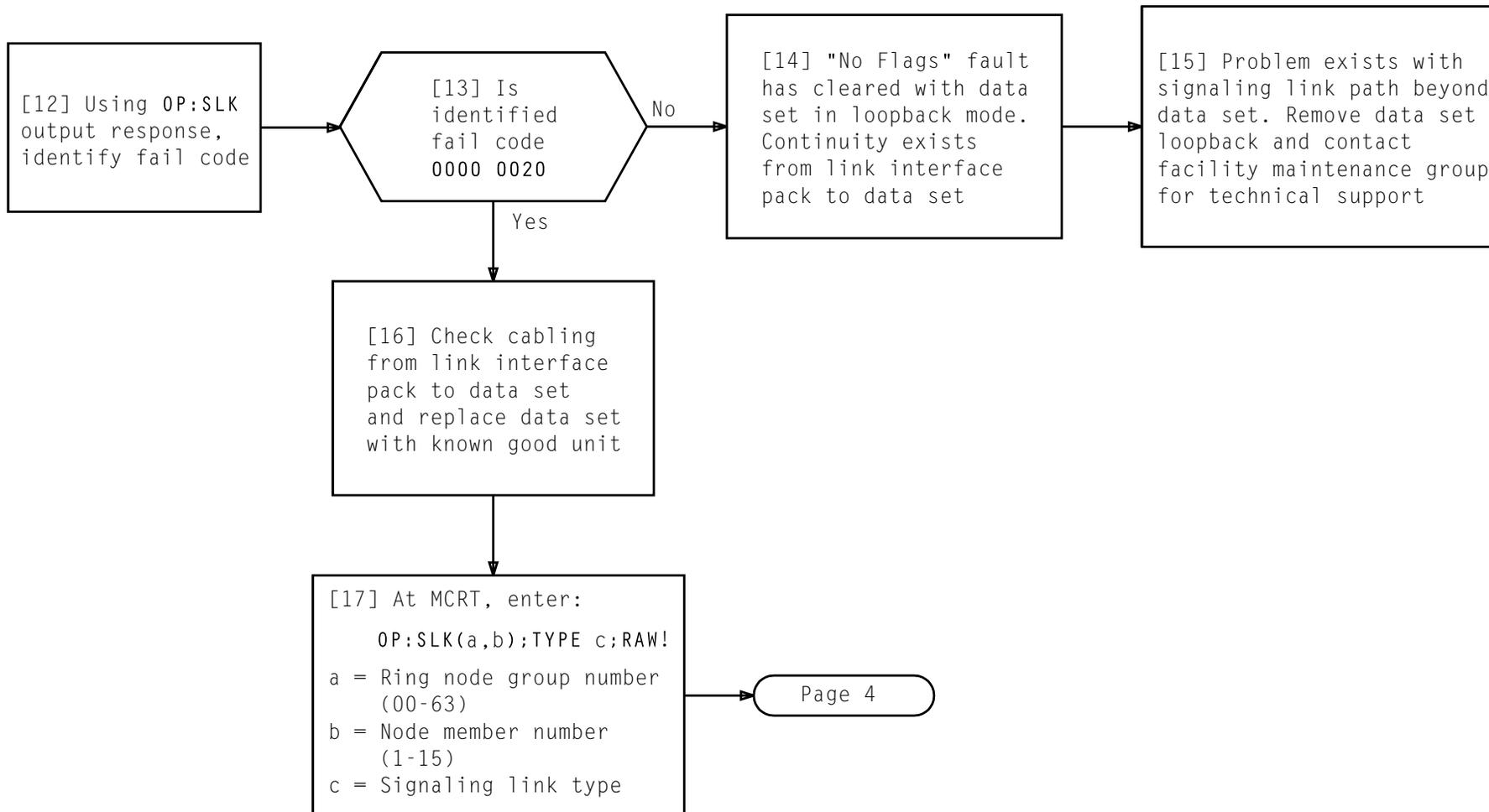
NOTE	
AT&T practices 592-040-120 and 592-040-520 provides information for checking data set operations and verifying applicable option settings	
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**CLEAR SIGNALING LINK NO FLAGS FAULT**



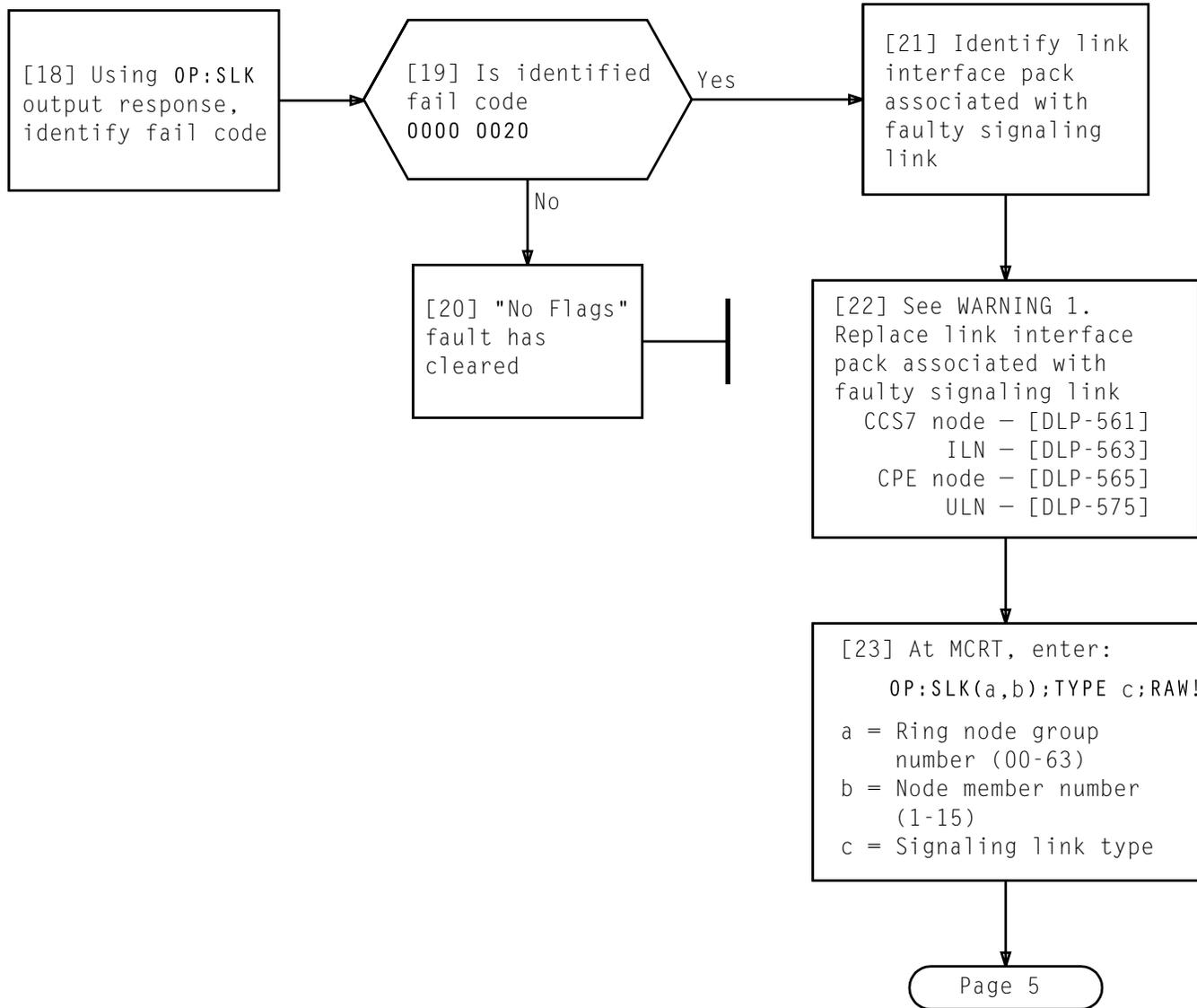
**CLEAR SIGNALING LINK NO FLAGS FAULT**

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**CLEAR SIGNALING LINK NO FLAGS FAULT**

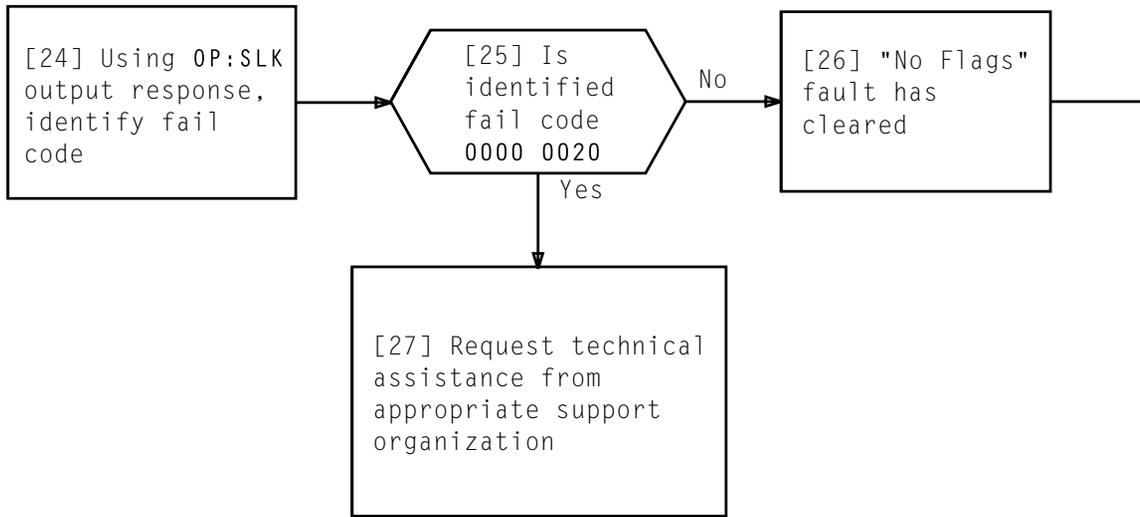
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*WARNING 1  
 Replacement of link interface pack causes service interruption to all signaling links associated with link interface.  
 Determine best time to introduce service outage in order to minimize service disruption*

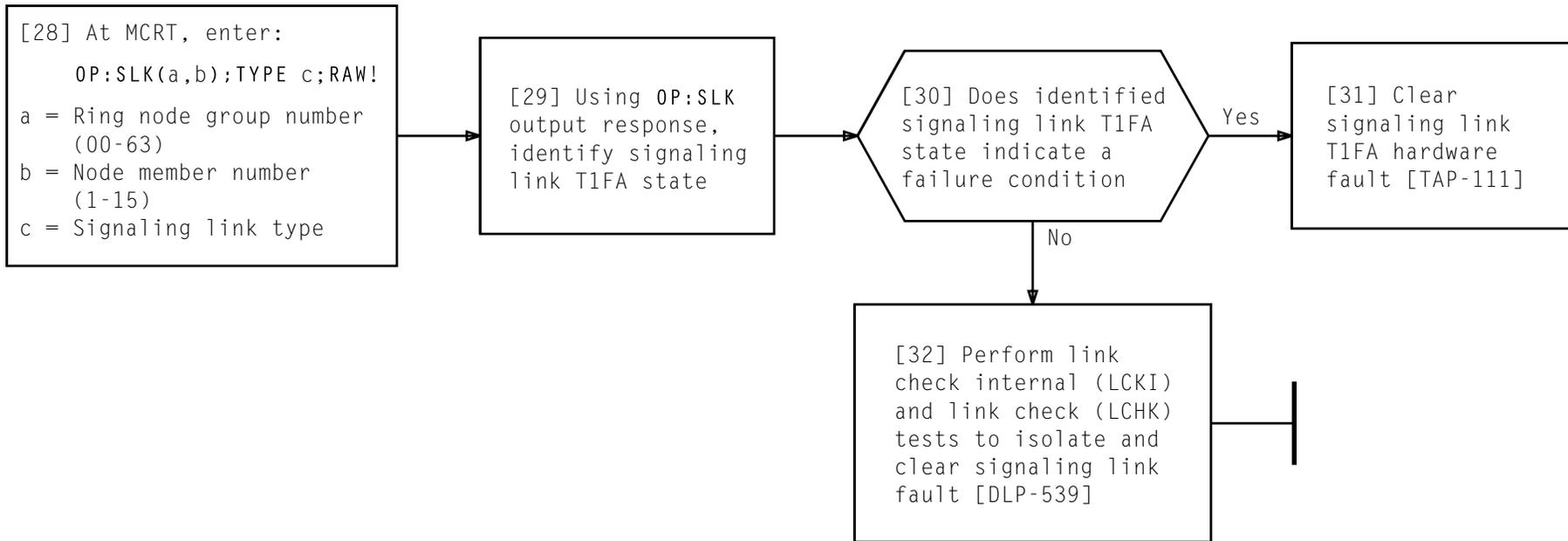
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**CLEAR SIGNALING LINK NO FLAGS FAULT**



**CLEAR SIGNALING LINK NO FLAGS FAULT**

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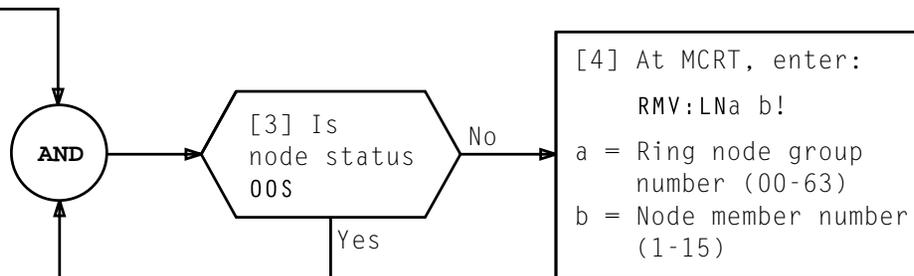


**CLEAR SIGNALING LINK NO FLAGS FAULT**

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[1] Identify link nodes associated with T1FA hardware fault

[2] Ensure all associated link nodes status is out-of-service [DLP-500]



[5] See WARNING 1. Replace **T1FA** circuit pack  
ILN - [DLP-563]  
CPE node - [DLP-565]

[6] Momentarily press **Reset** pushbutton on **T1FA** circuit pack

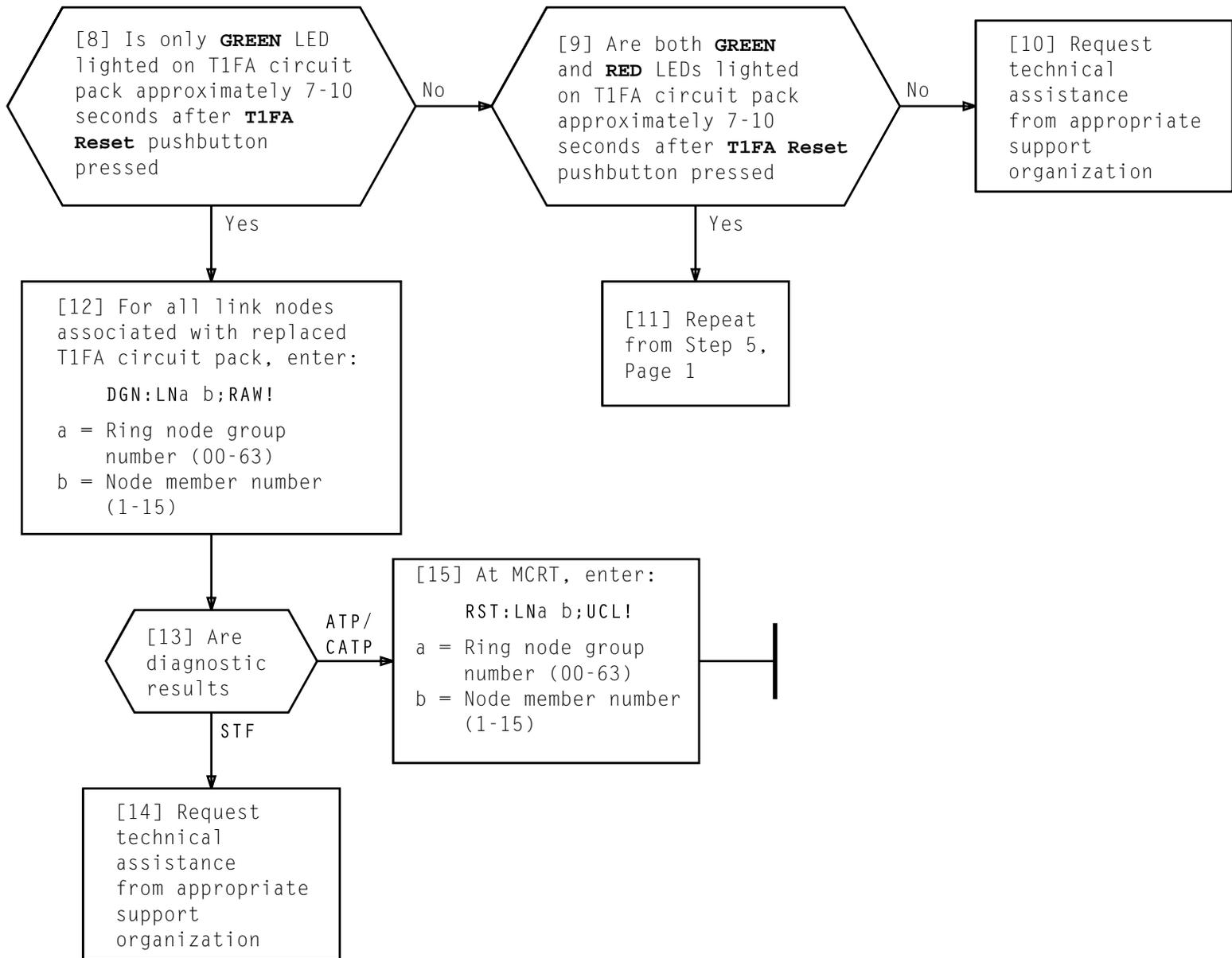
[7] Observe **T1FA** circuit pack LEDs

Page 2

**WARNING 1**  
Replacement of T1FA pack causes service interruption to all signaling links associated with T1FA. Determine best time to introduce service outage in order to minimize service disruption

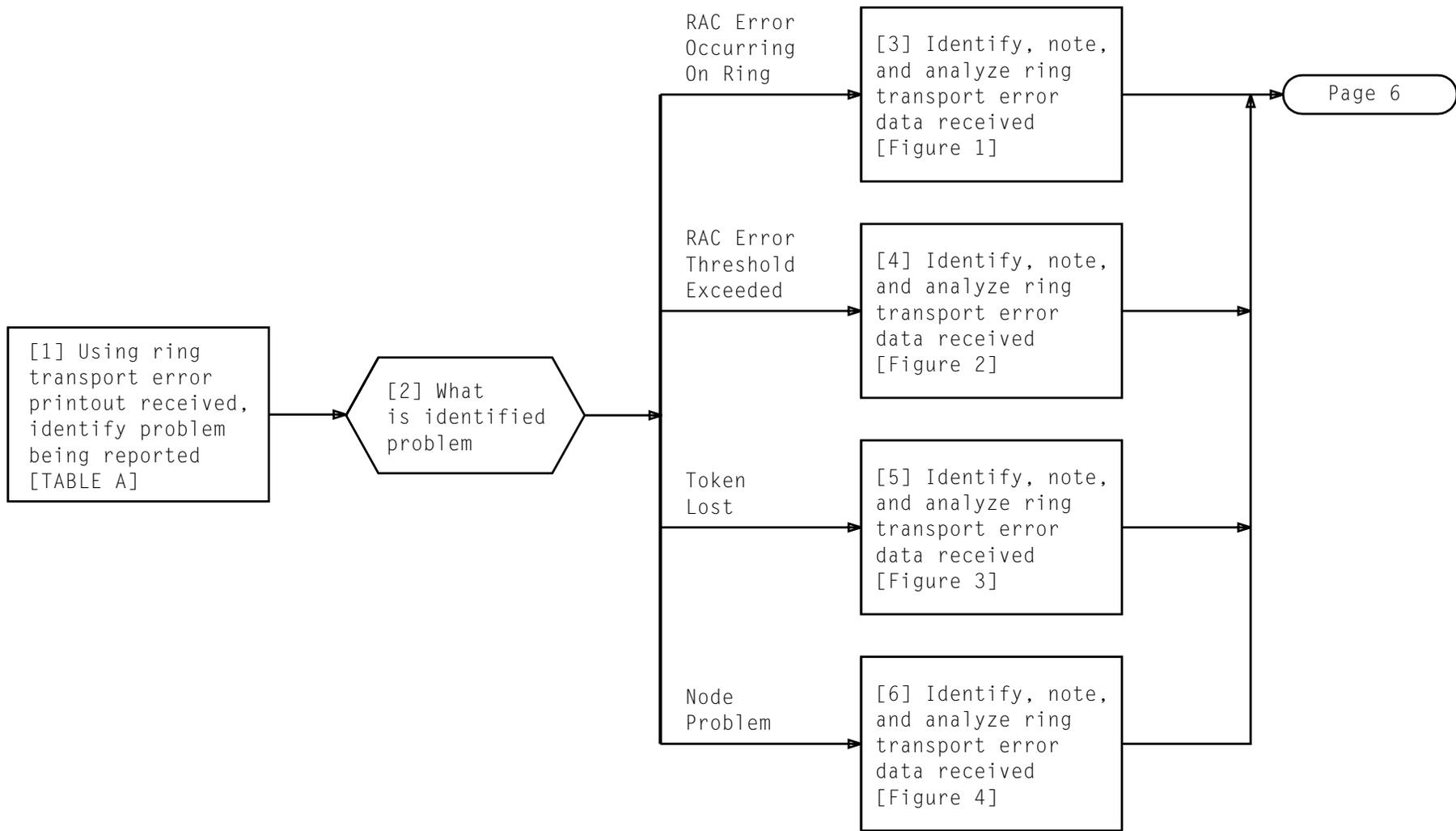
## CLEAR SIGNALING LINK T1FA HARDWARE FAULT

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**CLEAR SIGNALING LINK T1FA HARDWARE FAULT**

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**ANALYZE RING TRANSPORT ERROR**

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TABLE A	
RING TRANSPORT ERROR FORMAT	PROBLEM BEING REPORTED
FORMAT 1 (Figure 1)	Ring Access Circuit (RAC) errors occurring on ring
FORMAT 2 (Figure 2)	Threshold has been exceeded for types of Ring Access Circuit (RAC) errors being reported
FORMAT 3 (Figure 3)	Token lost due to non-specified reason
FORMAT 4 (Figure 4)	Node problem

## ANALYZE RING TRANSPORT ERROR

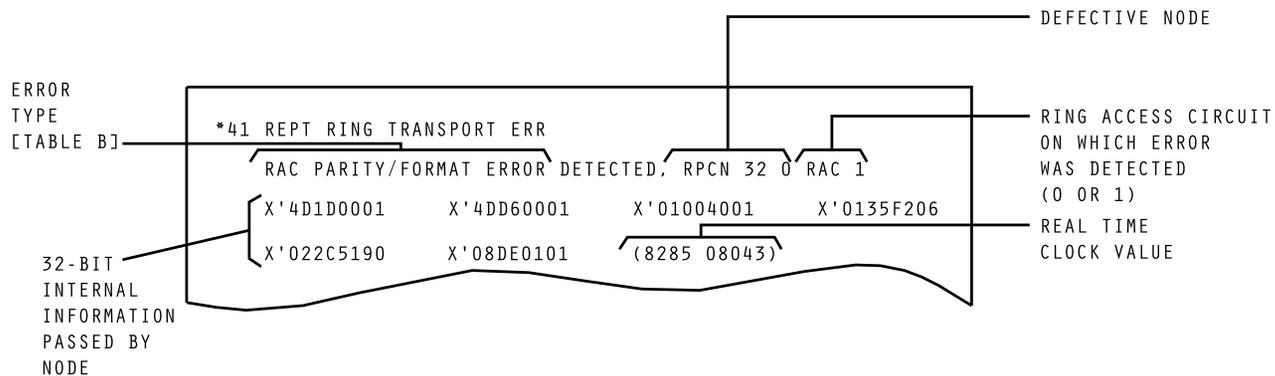


Figure 1 - Sample Printout of Ring Transport Error (Format 1)

TABLE B RING TRANSPORT ERROR TYPES (FORMAT 1)
BLOCKAGE
RAC PARITY/FORMAT ERROR
TRANSIENT RAC ERROR
INTERFAME BUFFER PARITY ERROR
RAC OUTPUT PARITY ERROR
WRITE FORMAT ERROR
READ FORMAT ERROR
READ TOO SHORT ERROR
READ INHIBIT ERROR
SOURCE MATCH
GENERAL RAC ERROR
DEQUEUED TOKEN

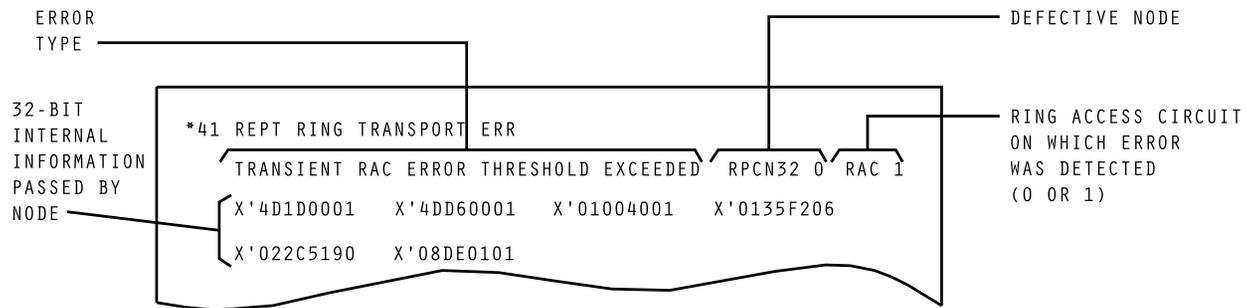


Figure 2 - Sample Printout of Ring Transport Error (Format 2)



Figure 3 - Sample Printout of Ring Transport Error (Format 3)

# ANALYZE RING TRANSPORT ERROR

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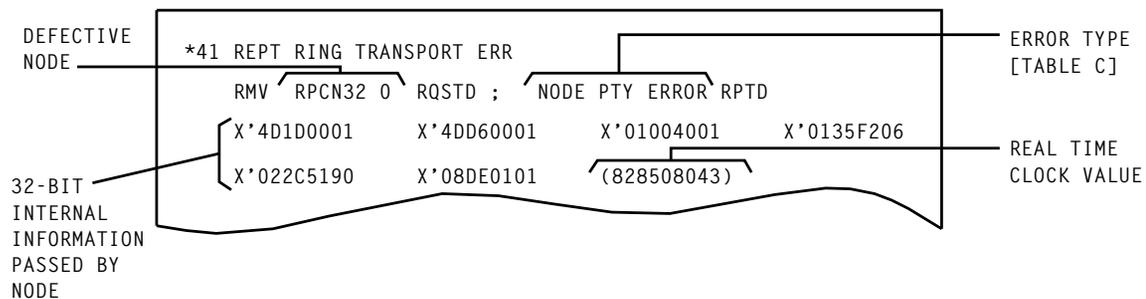
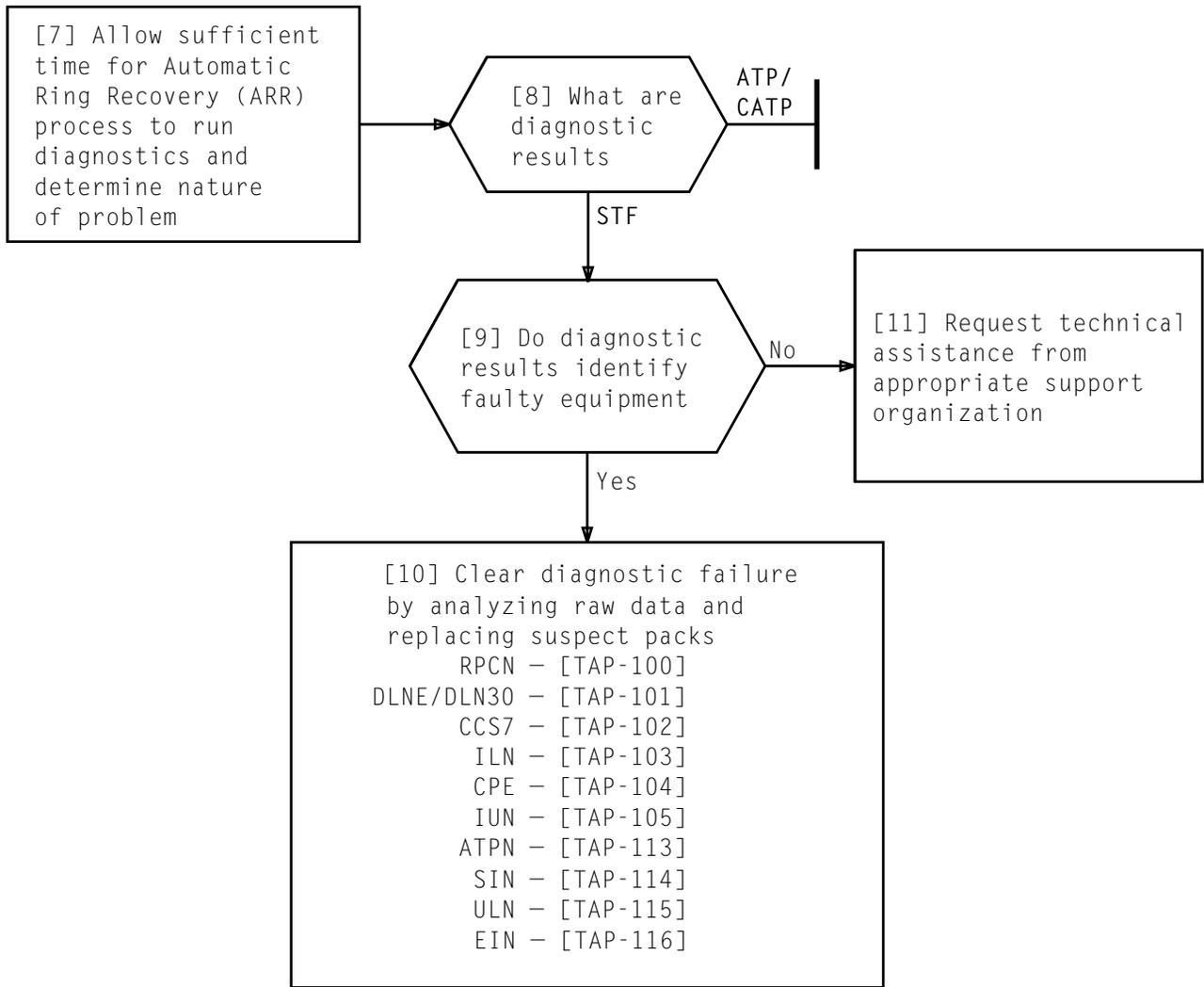


Figure 4 - Sample Printout of Ring Transport Error (Format 4)

TABLE C	
RING TRANSPORT ERROR TYPES (FORMAT 4)	
SRC MATCH	
NAUD FAILURE	
NODE PTY ERROR	
NODE CKSUM ERROR	
RING WRITE FAILURE	
RING READ FAILURE	
RPC PANIC	
UNXPCTD SET QUAR	
RAC CONTROL FAILURE	
MSG RELAY FAILURE	
RING INTERFACE FAILURE	
PIO FAILURE	
RPC STATE CHANGE FAILURE	
RPC ISOLATION	
UNXPCTD STATE CHNG MSG	



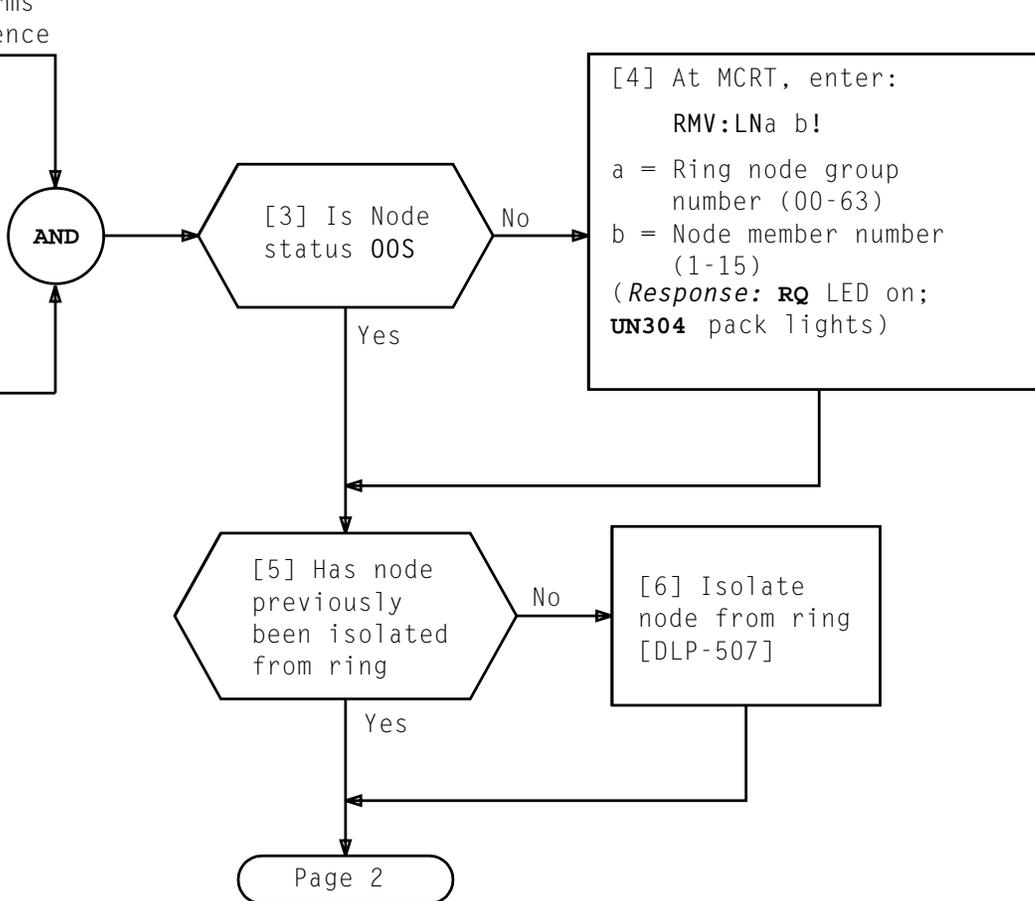
**ANALYZE RING TRANSPORT ERROR**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

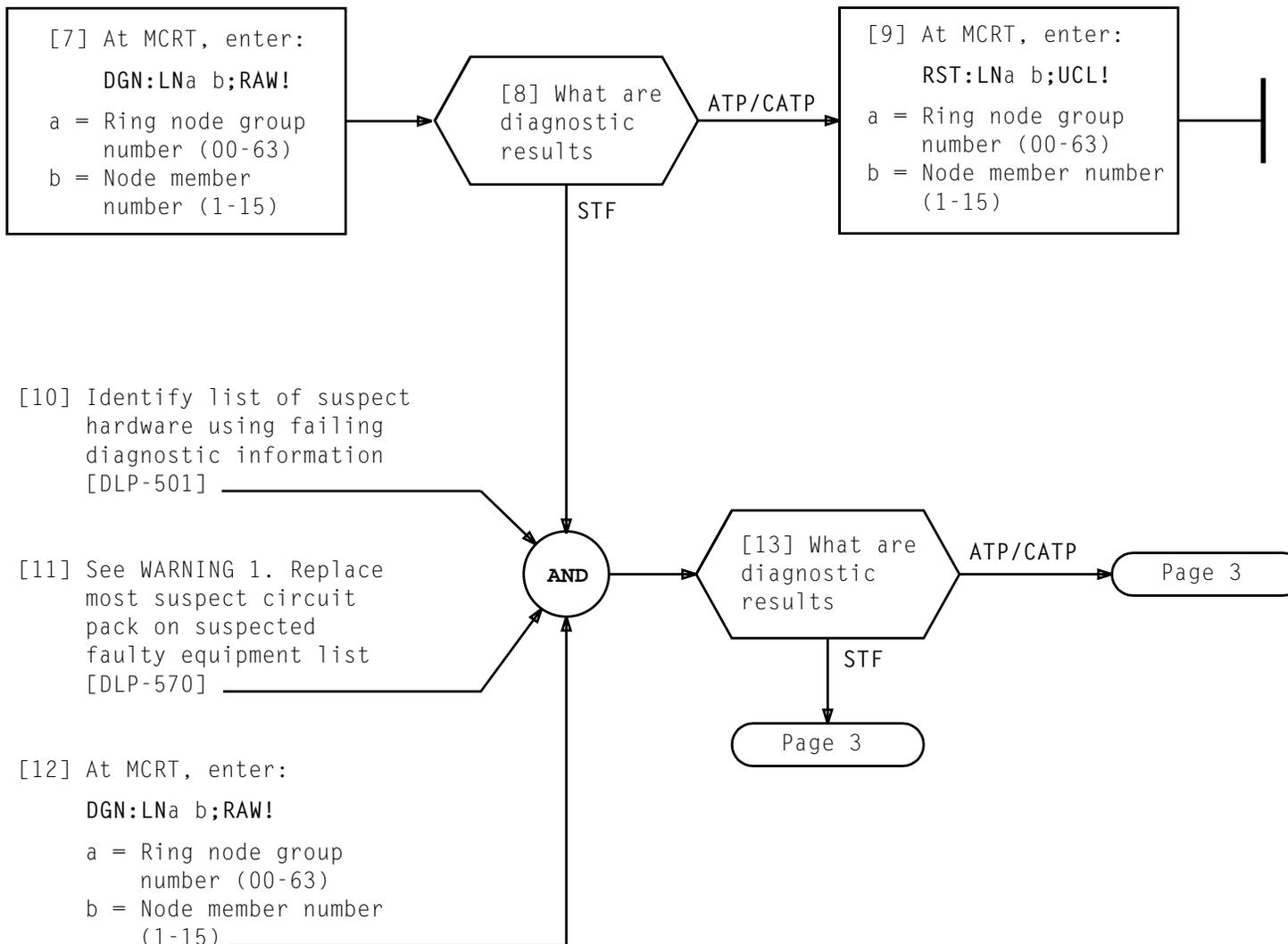
Alarms Silence

[2] Determine status of node failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – ATP NODE (ATPN)**

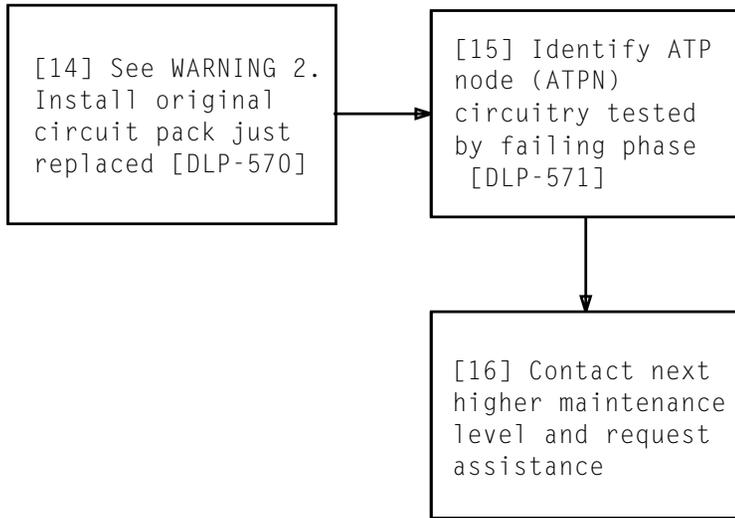
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – ATP NODE (ATPN)**

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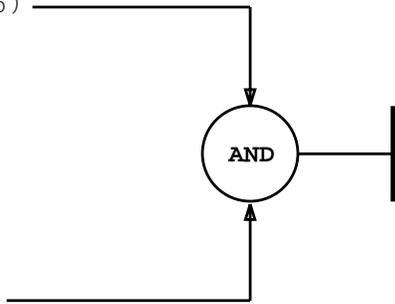


[17] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group number (00-63)

b = Node member number (1-15)



[18] Include node on ring [DLP-508]

*WARNING 2*  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

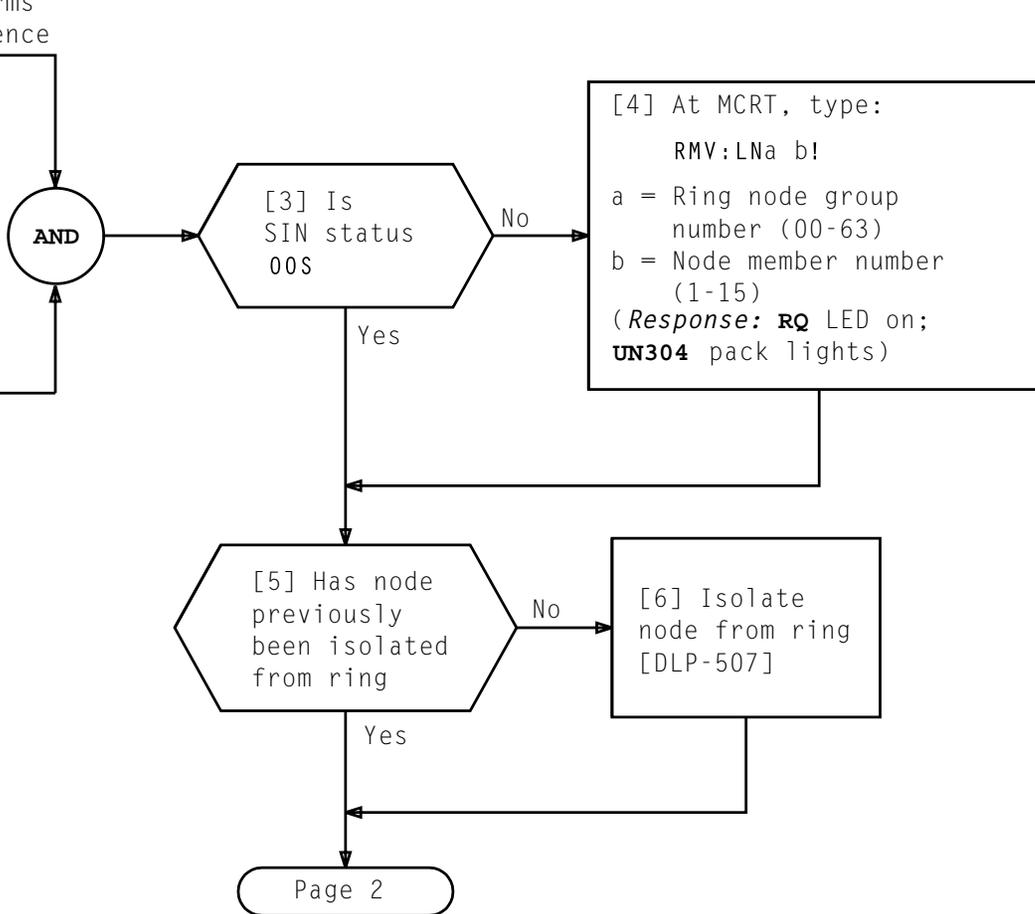
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – ATP NODE (ATPN)**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

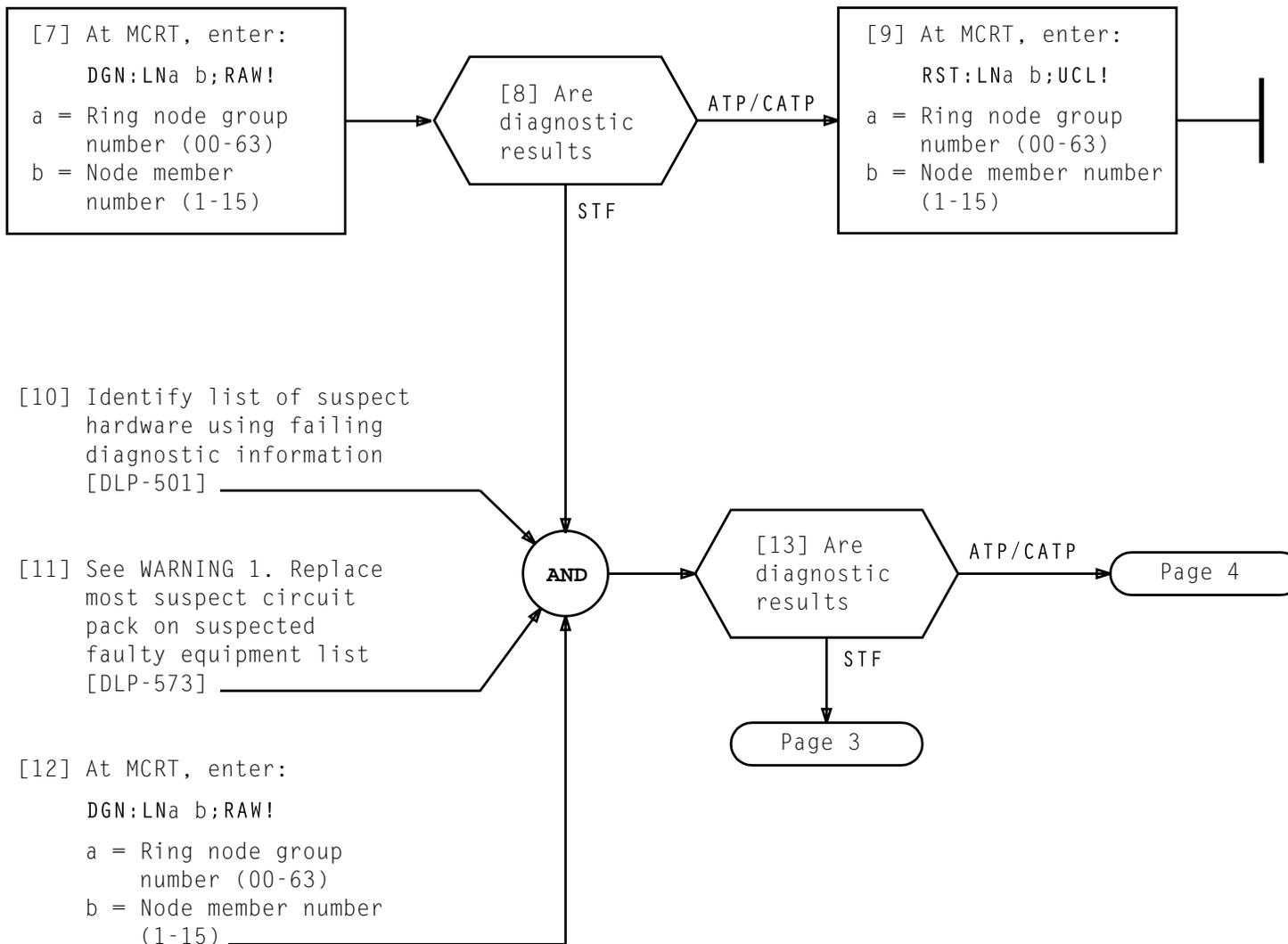
Alarms Silence

[2] Determine status of SIN failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)**

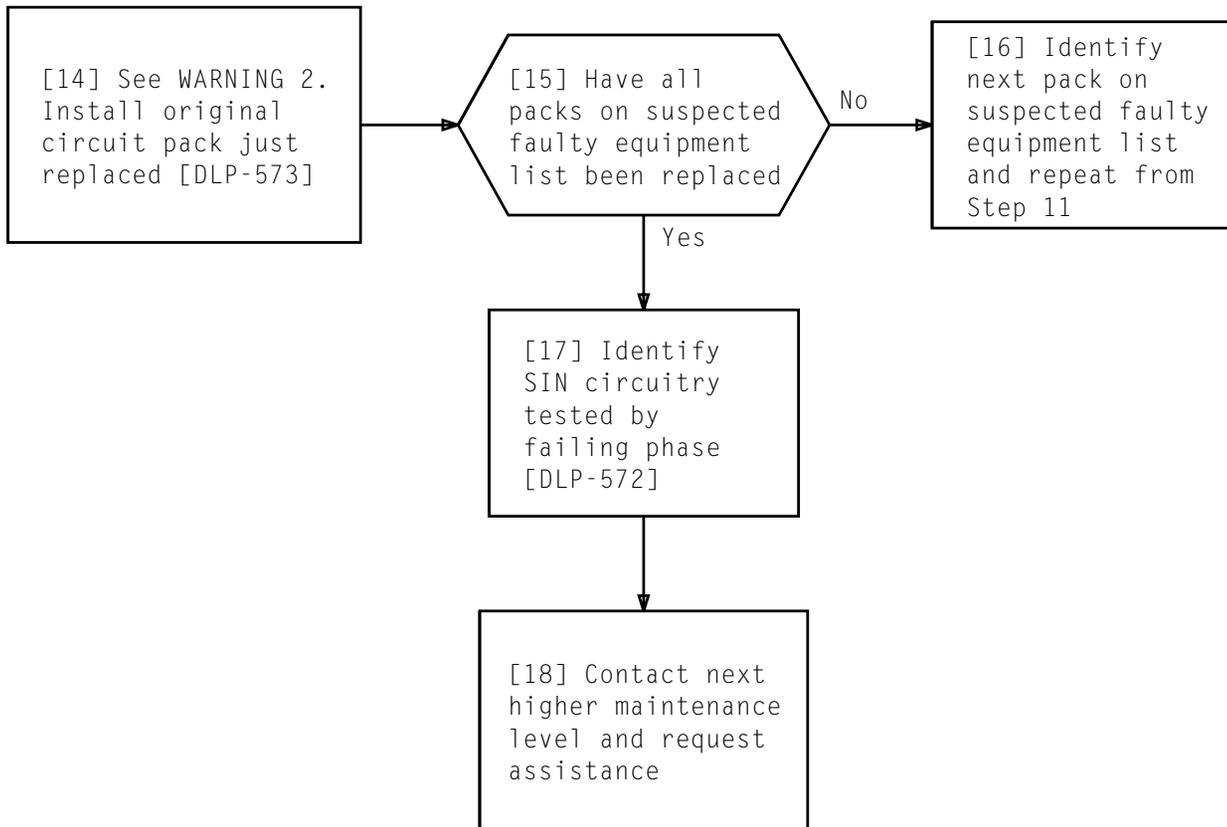
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)**

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*WARNING 2*  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)**

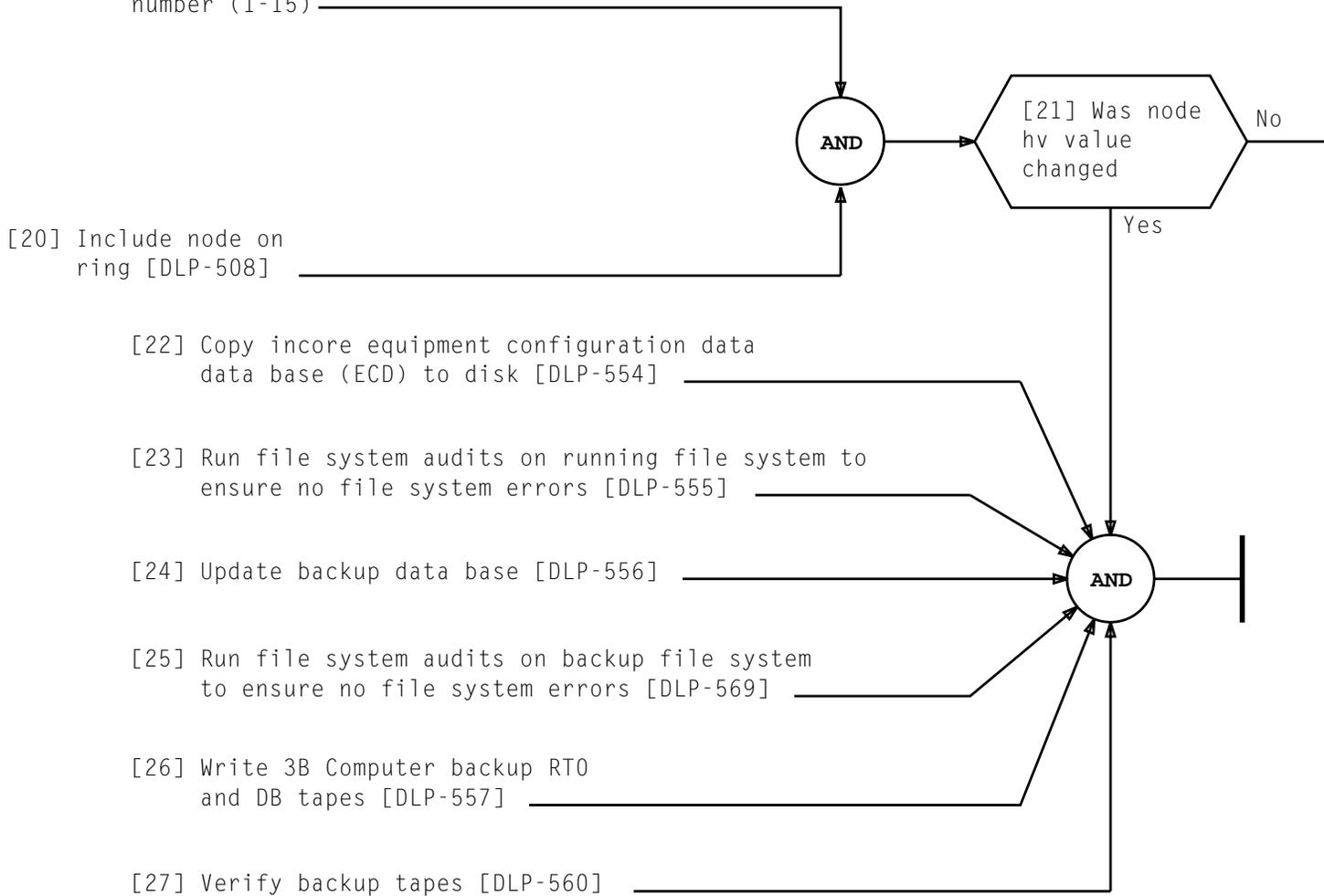
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[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



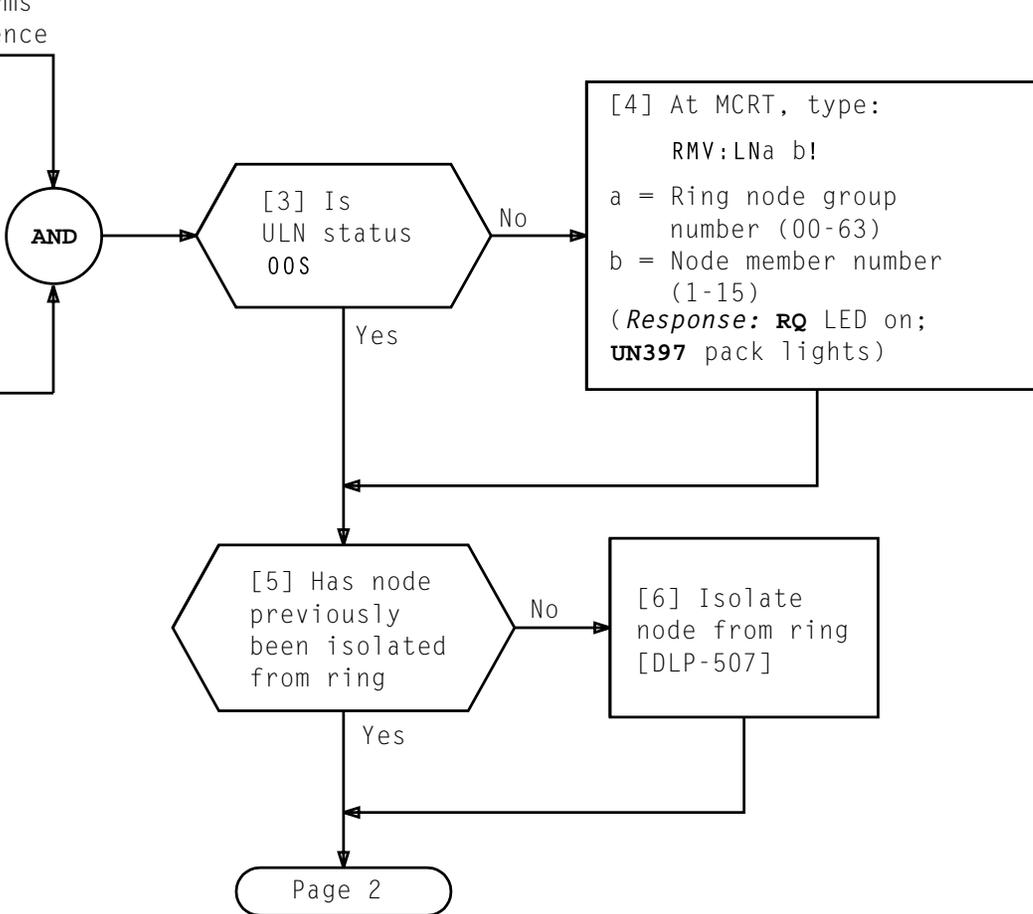
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

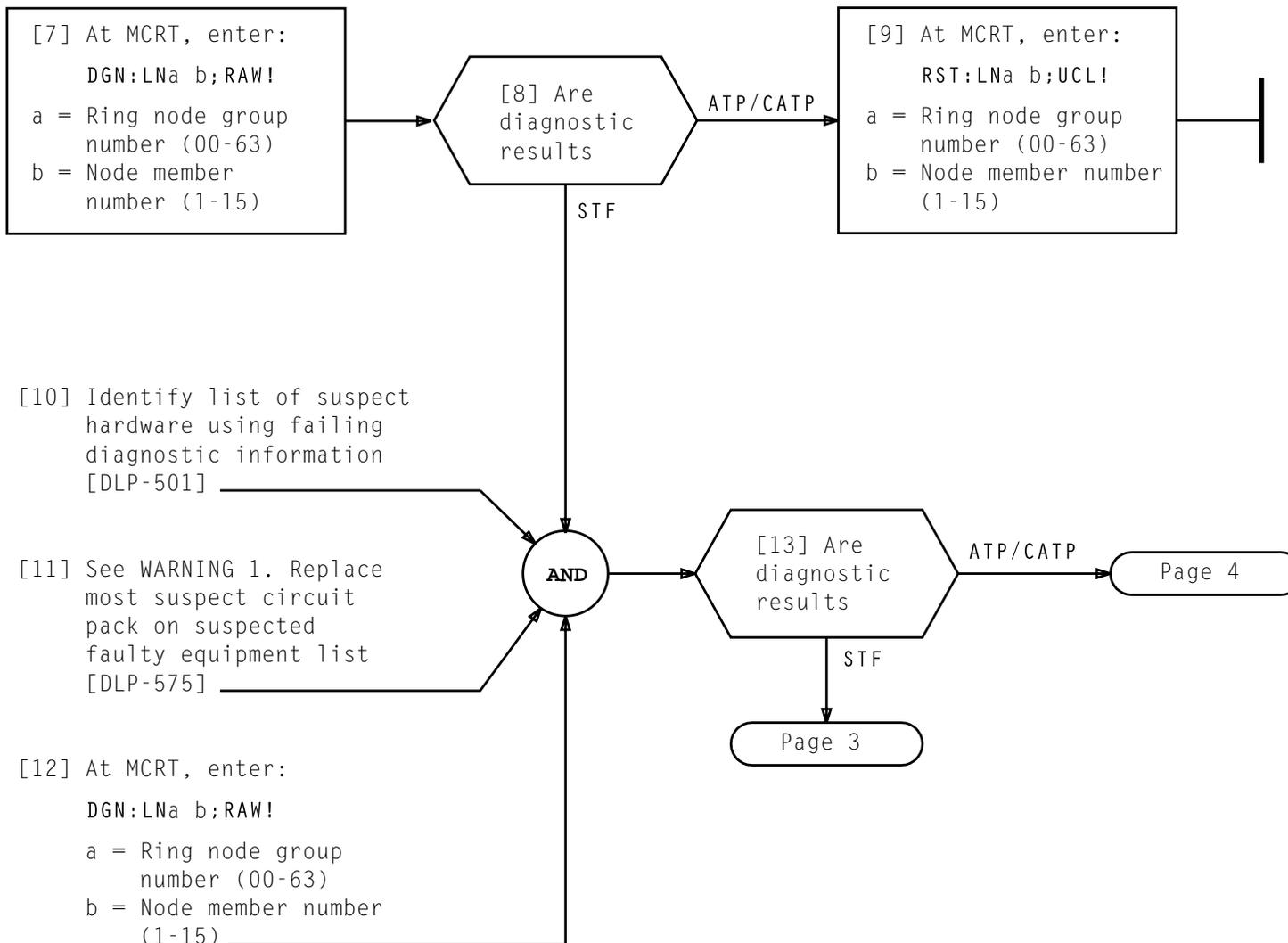
Alarms Silence

[2] Determine status of ULN failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – UNIVERSAL LINK NODE (ULN)**

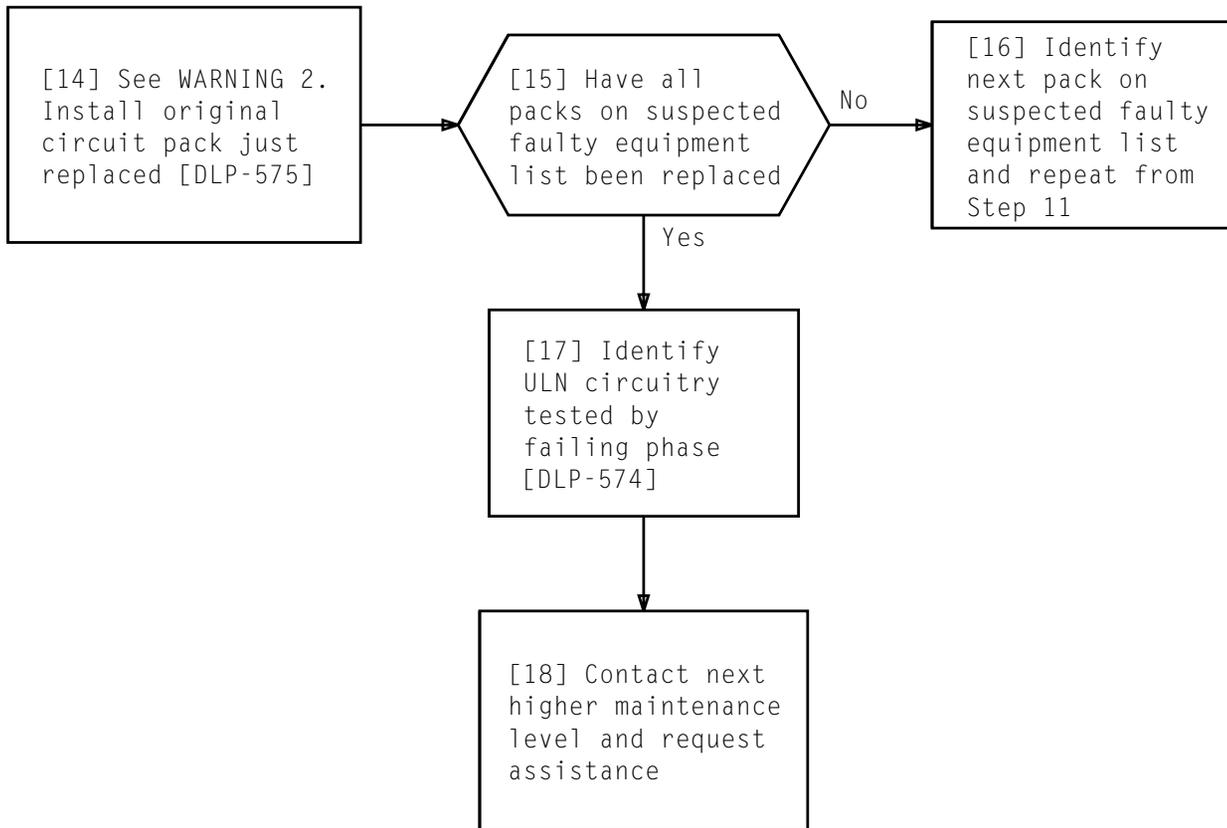
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – UNIVERSAL LINK NODE (ULN)**

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*WARNING 2  
Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – UNIVERSAL LINK NODE (ULN)**

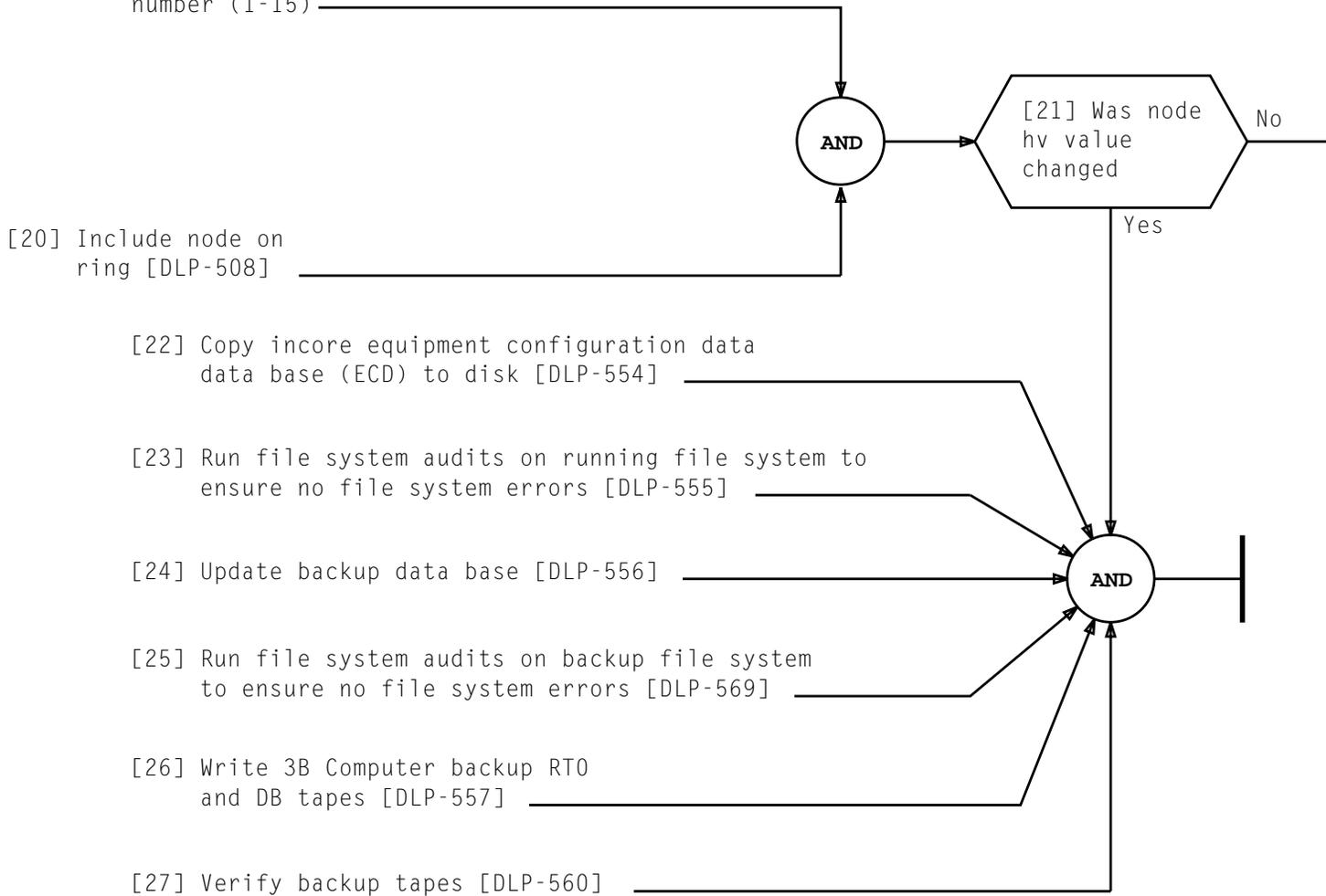
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[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



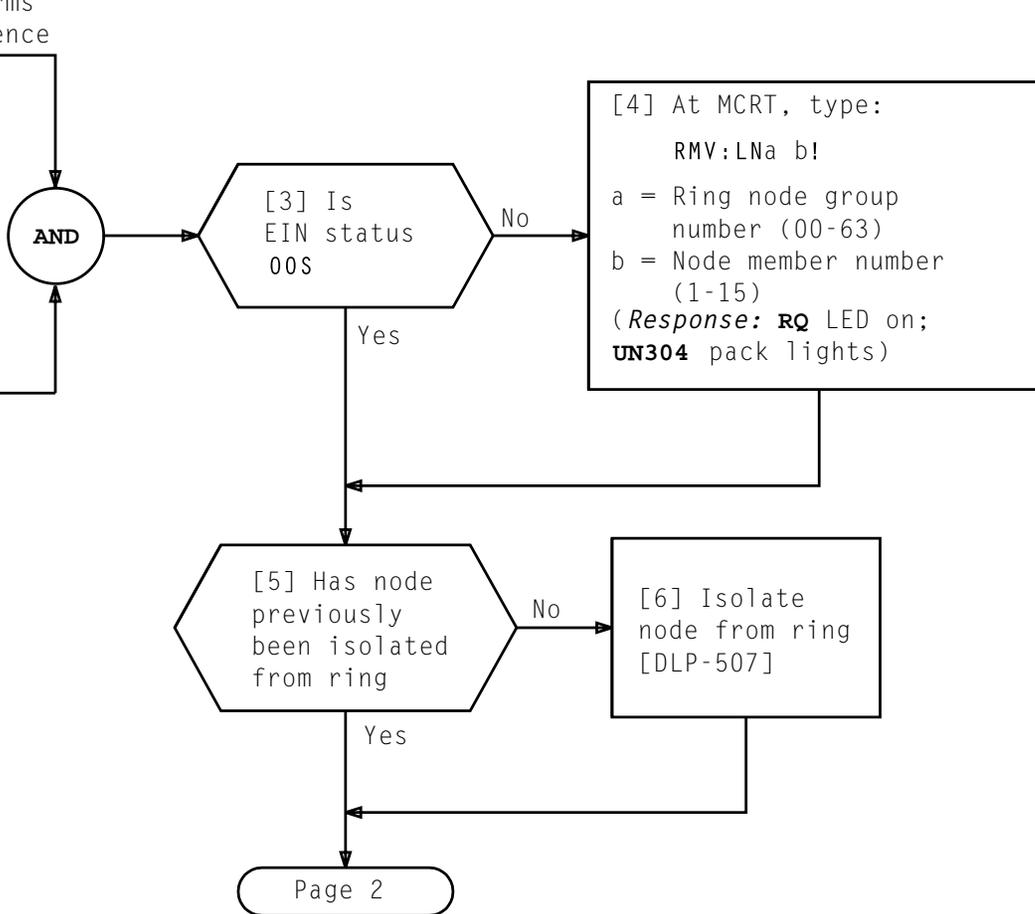
**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – UNIVERSAL LINK NODE (ULN)**

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[1] At frame fuse panel and alarm control unit, depress **ALM-RLS** pushbutton

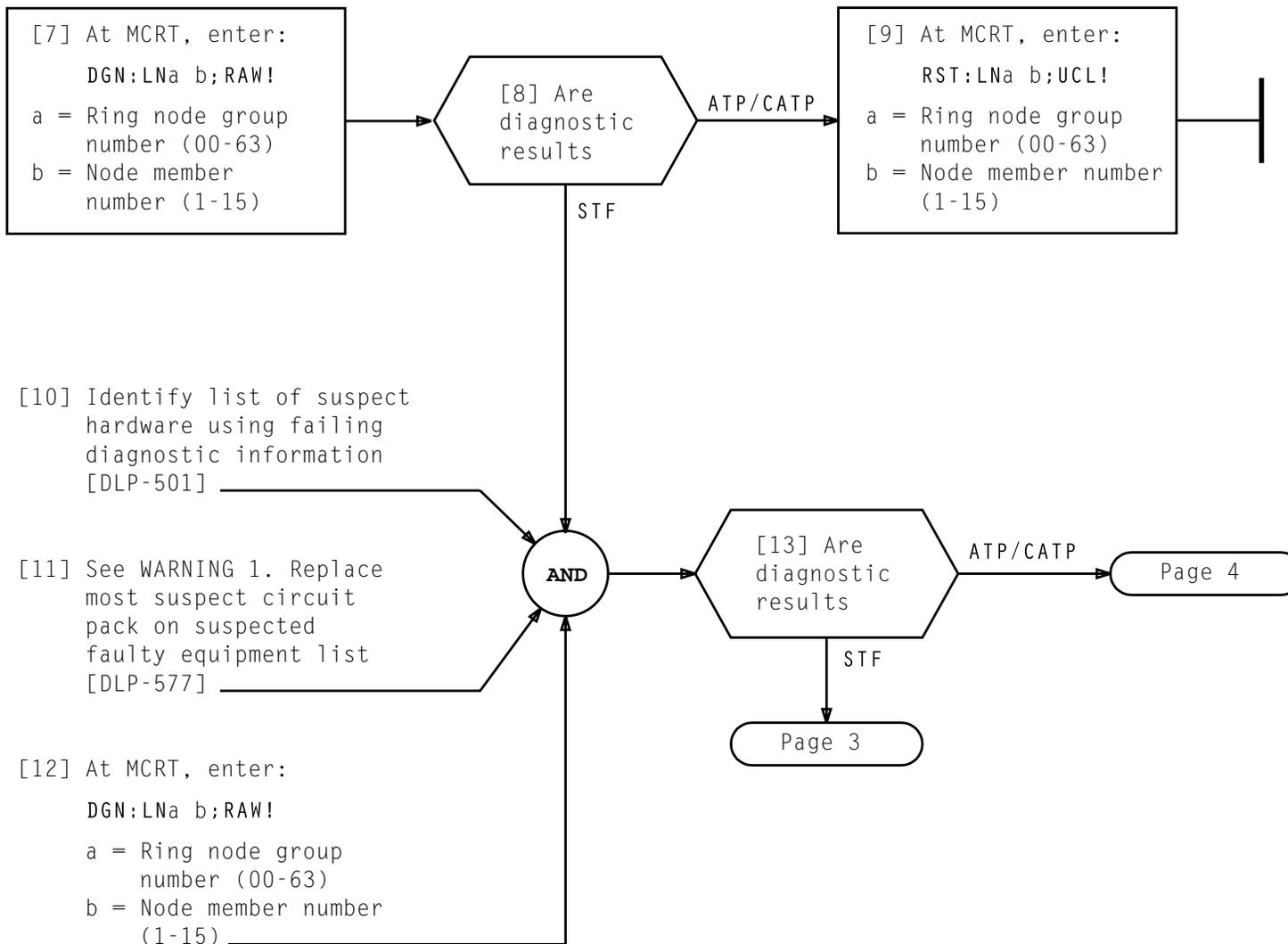
Alarms Silence

[2] Determine status of EIN failing diagnostics [DLP-500]



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS — ETHERNET INTERFACE NODE (EIN)**

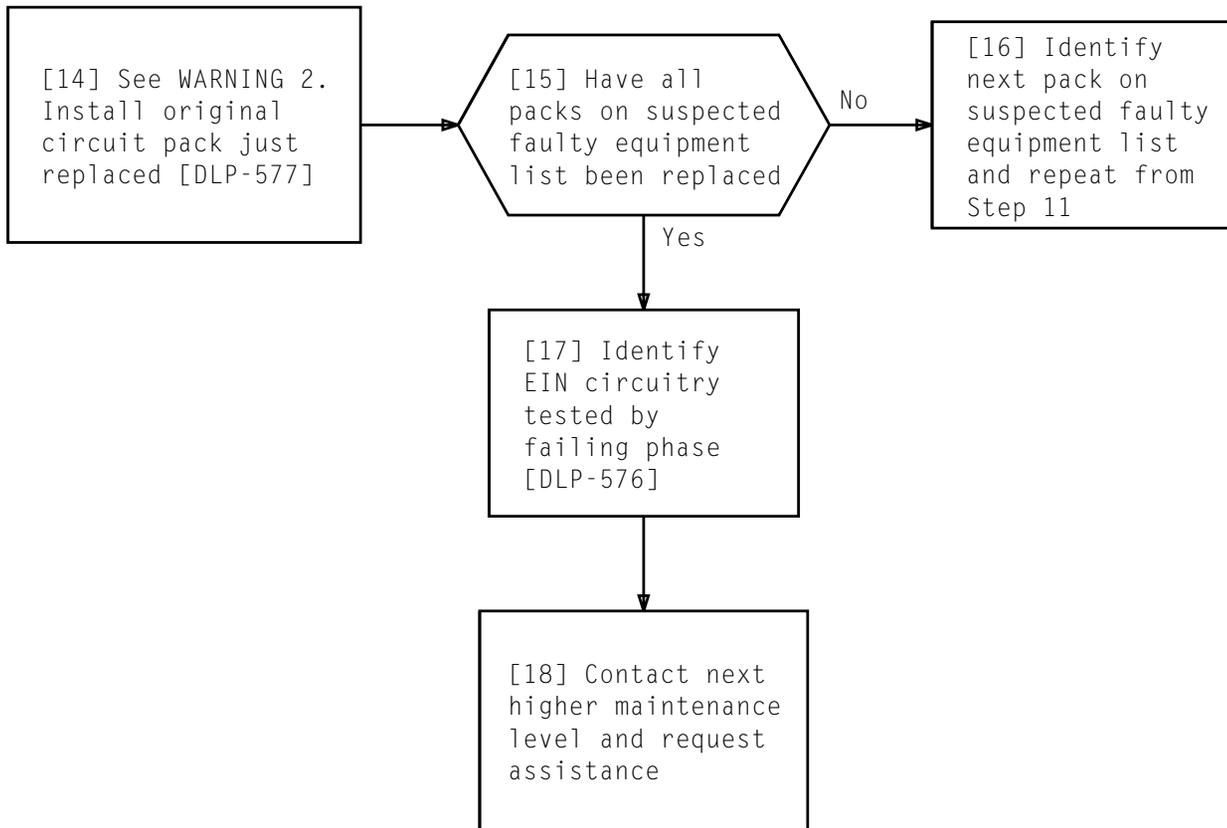
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**WARNING 1**  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – ETHERNET INTERFACE NODE (EIN)**

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*WARNING 2*  
*Due to circuit pack damage caused by electrostatic discharge, precautions must be taken when handling circuit packs and working in backplane area*

**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS – ETHERNET INTERFACE NODE (EIN)**

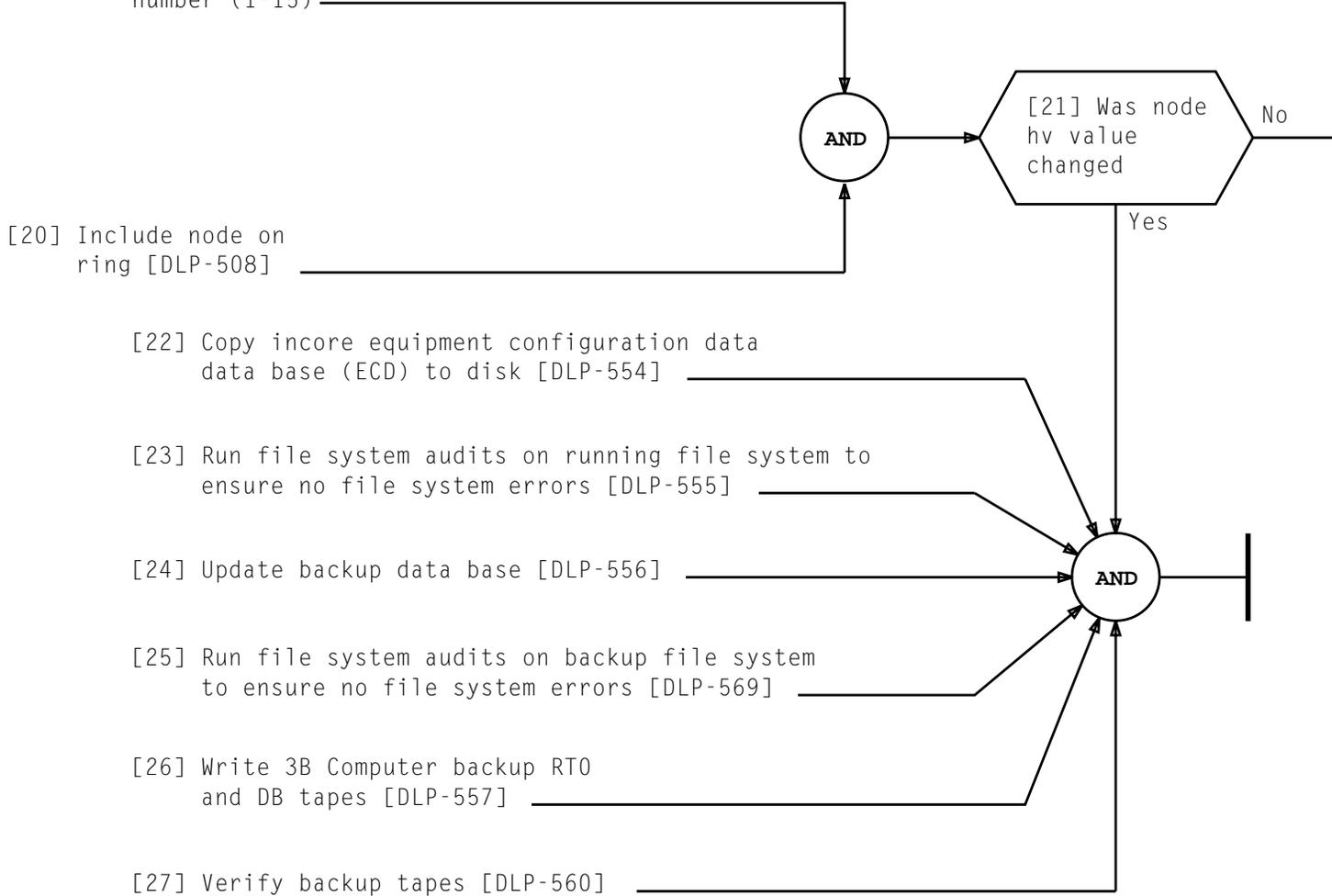
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[19] At MCRT, enter:

RST:LNa b;UCL!

a = Ring node group  
number (00-63)

b = Node member  
number (1-15)



**CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS — ETHERNET INTERFACE NODE (EIN)**

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[1] At MCRT, enter:  
OP:RING;DETD!

System prints status of  
all equipped ring nodes

AND

[2] On ring node status printout  
[Figure 1], identify desired  
node status

NODE STATUS  
A = ACTIVE  
I = ISOLATED  
U = UNAVAILABLE  
O = OUT-OF-SERVICE  
. = UNEQUIPPED

CNI  
GROUP  
NUMBER

```

M37 OP:RING;DETD! PF
10/04/88 08:37:25 #000689

M37 OP RING COMPL
RING ACTIVE, ISO SEG BISO = LN002 EISO = LN00 4

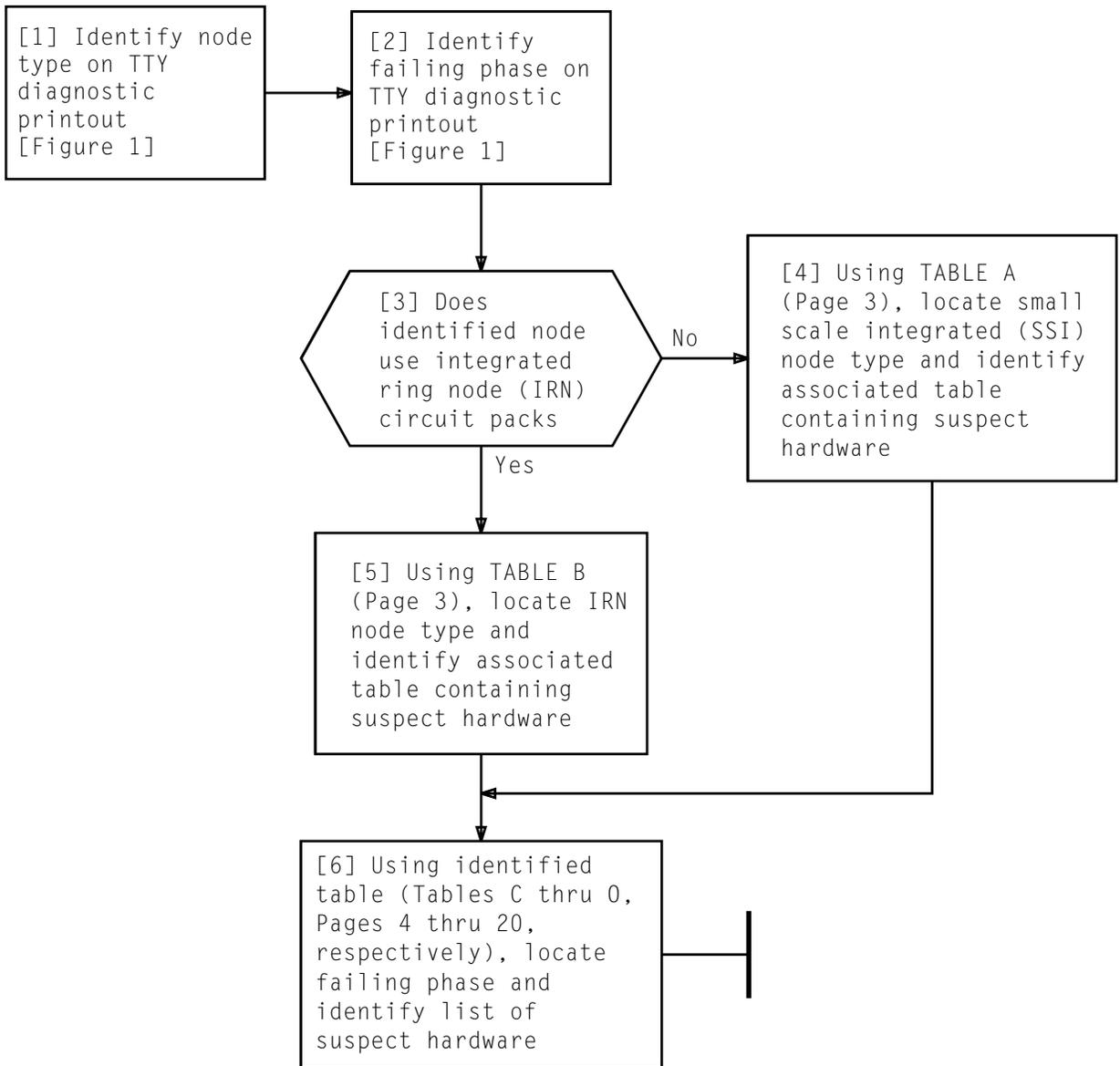
GRP
00 AAAiAAAAAAAAA 01 ..... 02 .....
06 .AAAAAAAAUUUUUUU 07 AAAAAAA.UUUUUUUU 08 .....
28 .AAAAAAAAUUUUUUU 29 AAAAAAA.UUUUUUUU 30 .....
31 ..... 32 AAAAAAAAAAAAAA 33 .....
37 ..... 38 .AAAAAAAAUUUUUUU 39 AAAAAAA.UUUUUUUU
58 ..... 59 ..... 60 .AAAAAAAAUUUUUUU
61 AAAAAAA.UUUUUUUU 62 ..... 63 .....

```

Figure 1 - Sample Printout of Ring Node Status

**DETERMINE NODE STATUS**

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**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

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```

30 DGN:RPCN32 0:PH 10-31. PF
M 30 DGN: RPCN32 0 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRSR ERROR 3 3
M 31 DGN: RPCN32 0 PH 10 STF ( 2 00000000 00000000 ) MSG IP
TEST MISMATCH
3 00000009
4 00000009
M 31: RPCN32 0 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: RPCN32 0 SUMMARY DATA MSG STARTED
TLP: RPCN32 0 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
TLPFILE COMPLETED
M 31 DGN: RPCN32 0 COMPLETED STF ( 2 00000000 00000000 ) MSG 1P
M 31 DGN: RPCN32 0 STF ( 2 00000000 00000000 ) MSG COMPL

```

Figure 1 - Sample Printout of Failing Diagnostic Phase

TABLE A	
NODE TYPE (NOTE)	ASSOCIATED TABLE CONTAINING SUSPECT HARDWARE
SSI RPCN	TABLE C (Pages 4-5)
SSI CCS7	TABLE D (Pages 6-7)
SSI CPE	TABLE E (Pages 8-9)
SSI IUN	TABLE F (Page 10)
<p><b>NOTE:</b> Node types using small scale integrated (SSI) circuitry use individual circuit packs for the node processor, ring interface 0, and ring interface 1 circuitry.</p>	

TABLE B	
NODE TYPE (NOTE)	ASSOCIATED TABLE CONTAINING SUSPECT HARDWARE
IRN ILN	TABLE G (Page 11)
IRN/IRN2 IUN	TABLE H (Page 12)
IRN CCS7	TABLE I (Page 13)
IRN/IRN2 CPE	TABLE J (Page 14)
IRN/IRN2 DLNE/DLN30	TABLE K (Page 16)
IRN2 ATPN	TABLE L (Page 17)
IRN2 SIN	TABLE M (Page 18)
ULN	TABLE N (Page 19)
IRN2 EIN	TABLE O (Page 20)
<p><b>NOTE:</b> Node types using integrated ring node (IRN) circuitry combines the node processor, ring interface 0, and ring interface 1 circuitry onto one circuit pack.</p>	

## IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION

TABLE C SSI RPCN SUSPECT HARDWARE							
FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918 TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	—	—	—
02	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918 TN1506, TN1508 TN1509, TN1803	RING BUS CABLE	—	—	—
10	TN69B	UN9, UN9B	—	—	—	—	—
11	TN914	TN69B	—	—	—	—	—
12	TN914	TN922	—	—	—	—	—
13	TN914	TN922	—	—	—	—	—
14	TN69B	UN9, UN9B	—	—	—	—	—
20	TN922	—	—	—	—	—	—
23	TN922	—	—	—	—	—	—
24	TN922	—	—	—	—	—	—
26	TN922	—	—	—	—	—	—
27	TN922	—	—	—	—	—	—
30	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—
31	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

TABLE C (Contd) SSI RPCN SUSPECT HARDWARE							
FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
32	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918 TN1506, TN1508, TN1509, TN1803	—	—	—	—
33	UN123 UN123B	UN122 UN122B UN122C	TN915, TN918, TN1506, TN1508, TN1509, TN1803	—	—	—	—
39	UN122 UN122B UN122C	UN123 UN123B	—	—	—	—	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE D**  
**SSI CCS7 SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLING	—	—	—
02	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918 TN1506, TN1508, TN1509, TN1803	RING BUS CABLING	—	—	—
10	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—
11	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—
12	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	—	—	—	—
13	UN123 UN123B	UN122 UN122B UN122C	TN915, TN918, TN1506, TN1508, TN1509, TN1803	—	—	—	—
20	TN922	—	—	—	—	—	—
23	TN922	—	—	—	—	—	—
24	TN922	—	—	—	—	—	—
26	TN922	—	—	—	—	—	—
27	TN922	—	—	—	—	—	—
39	UN122 UN122B UN122C	UN123 UN123B	—	—	—	—	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE D (Contd)**  
**SSI CCS7 SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
40	TN916	TN917, TN917B	TN922	—	—	—	—
41	TN916	TN917, TN917B	TN922	—	—	—	—
47	TN916	TN917, TN917B	TN919	DATA SET	TN922	LINK CABLING	—
48	TF9	DATA SET	TN916	TN917, TN917B	TN922	LINK CABLING	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE E**  
**SSI CPE SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1059, TN1803	RING BUS CABLE	—	—	—
02	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	—	—	—
10	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—
11	UN122 UN122B UN122C	UN123 UN123B	TN922	—	—	—	—
12	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	—	—	—	—
13	UN122 UN122B UN122C	UN122 UN122B UN122C	TN915, TN918, TN1506, TN1508, TN1509, TN1803	—	—	—	—
20	TN922	—	—	—	—	—	—
23	TN922	—	—	—	—	—	—
24	TN922	—	—	—	—	—	—
26	TN922	—	—	—	—	—	—
27	TN922	—	—	—	—	—	—
29	UN291	—	—	—	—	—	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

LUCENT TECHNOLOGIES PROPRIETARY - Use Pursuant to Company Instructions

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**TABLE E (Contd)  
SSI CPE SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
50	TN922	TN1315, TN1316	-	-	-	-	-
51	TN922	TN1315, TN1316	-	-	-	-	-
52 *	TN1315, TN1316	-	-	-	-	-	-
53 *	TN1315, TN1316	-	-	-	-	-	-
54 *	TN1315, TN1316	-	-	-	-	-	-
55 *	TN1315, TN1316	-	-	-	-	-	-
56	TN1316	DATA SET	APPLIQUE 12A	-	-	-	-
60	TN922	TN1315, TN1316	-	-	-	-	-
61	TN922	TN1315, TN1316	-	-	-	-	-
62 †	TN1315, TN1316	-	-	-	-	-	-
63 †	TN1315, TN1316	-	-	-	-	-	-
64 †	TN1315, TN1316	-	-	-	-	-	-
65 †	TN1315, TN1316	-	-	-	-	-	-
66	TN1316	DATA SET	APPLIQUE 12A	-	-	-	-
* Phases 52 through 55 test link interface 0 † Phases 62 through 65 test link interface 1							

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE F**  
**SSI IUN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-
02	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-
10	UN122 UN122B UN122C	UN123 UN123B	TN922	-	-	-	-
11	UN122 UN122B UN122C	UN123 UN123B	TN922	-	-	-	-
12	UN122 UN122B UN122C	UN123 UN123B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-
13	UN123 UN123B	UN122 UN122B UN122C	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-
20	TN922	-	-	-	-	-	-
23	TN922	-	-	-	-	-	-
24	TN922	-	-	-	-	-	-
26	TN922	-	-	-	-	-	-
27	TN922	-	-	-	-	-	-
39	UN122 UN122B UN122C	UN123 UN123B	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE G  
IRN ILN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN303B	TN915, TN918, TN1506, TN1508 TN1509, TN1803	RING BUS CABLE	-	-	-	-
02	UN303B	TN915, TN918, TN1506, TN1508 TN1509, TN1803	RING BUS CABLE	-	-	-	-
10	UN303B	-	-	-	-	-	-
12	UN303B	TN915, TN918, TN1506, TN1508 TN1509, TN1803	-	-	-	-	-
13	UN303B	TN915, TN918, TN1506, TN1508 TN1509, TN1803	-	-	-	-	-
20	UN303B	-	-	-	-	-	-
21	UN303B	-	-	-	-	-	-
29	UN291	-	-	-	-	-	-
39	UN303B	-	-	-	-	-	-
50	UN303B	TN1315	-	-	-	-	-
51	UN303B	TN1315	-	-	-	-	-
52	TN1315	-	-	-	-	-	-
53	TN1315	-	-	-	-	-	-
54	TN1315	-	-	-	-	-	-
55	TN1315	-	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE H**  
**IRN/IRN2 IUN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN303B UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
02	UN303B UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
10	UN303B UN304	-	-	-	-	-	-
12	UN303B UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
13	UN303B UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
20	UN303B UN304	-	-	-	-	-	-
21	UN303B UN304	-	-	-	-	-	-
39	UN303B UN304	-	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE I  
IRN CCS7 SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN303 UN303B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
02	UN303 UN303B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
10	UN303, UN303B	-	-	-	-	-	-
12	UN303 UN303B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
13	UN303 UN303B	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
20	UN303, UN303B	-	-	-	-	-	-
21	UN303, UN303B	-	-	-	-	-	-
39	UN303, UN303B	-	-	-	-	-	-
40	TN916, TN917, TN917B	UN303 UN303B	-	-	-	-	-
41	TN916, TN917, TN917B	UN303 UN303B	-	-	-	-	-
47	TN916, TN917, TN917B	TN719	DATA SET	TN922	LINK CABLING	-	-
48	TF9	DATA SET	TN916, TN917, TN917B	TN922	LINK CABLING	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE J  
IRN/IRN2 CPE SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN303B,UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
02	UN303B,UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	RING BUS CABLE	-	-	-	-
10	UN303B,UN304	-	-	-	-	-	-
12	UN303B,UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
13	UN303B,UN304	TN915, TN918, TN1506, TN1508, TN1509, TN1803	-	-	-	-	-
20	UN303B,UN304	-	-	-	-	-	-
21	UN303B,UN304	-	-	-	-	-	-
29	TN69B	UN9, UN9B	-	-	-	-	-
39	TN914	TN69B	-	-	-	-	-
50	UN303B,UN304	TN1315 TN1316	-	-	-	-	-
51	UN303B,UN304	TN1315 TN1316	-	-	-	-	-
52	TN1315, TN1316	-	-	-	-	-	-
53	TN1315, TN1316	-	-	-	-	-	-
54	TN1315, TN1316	-	-	-	-	-	-
55	TN1315, TN1316	-	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE J (Contd)**  
**IRN/IRN2 CPE SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
56	TN1316	DATA SET	APPLIQUE 12A	—	—	—	—
60	UN303B, UN304	TN1315, TN1316	—	—	—	—	—
61	UN303B, UN304	TN1315, TN1316	—	—	—	—	—
62	TN1315, TN1316	—	—	—	—	—	—
63	TN1315, TN1316	—	—	—	—	—	—
64	TN1315, TN1316	—	—	—	—	—	—
65	TN1315, TN1316	—	—	—	—	—	—
66	TN1316	DATA SET	APPLIQUE 12A	—	—	—	—

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE K  
IRN/IRN2 DLNE/DLN30 SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN303B/ UN304	TN915, TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
02	UN303B/ UN304	TN915, TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
10	UN303B/UN304	-	-	-	-	-	-
12	UN303B/ UN304	TN915*, TN918, TN1508, TN1803	-	-	-	-	-
13	UN303B/ UN304	TN915*, TN918, TN1508, TN1803	-	-	-	-	-
20	UN303B/UN304	-	-	-	-	-	-
21*	UN303B	-	-	-	-	-	-
30	TN69B	UN9, UN9B	-	-	-	-	-
31	TN914	TN69B	-	-	-	-	-
32	TN914	UN303B/UN304	-	-	-	-	-
33	TN914	UN303B/UN304	-	-	-	-	-
34	TN69B	UN9, UN9B	-	-	-	-	-
35	TN914	UN303B/UN304	-	-	-	-	-
40	TN1630B	-	-	-	-	-	-
41	TN1630*/TN1630B**	-	-	-	-	-	-
42	TN1630*/TN1630B**	-	-	-	-	-	-
43	TN1630B	-	-	-	-	-	-

\* Applicable for DLNE only

\*\* Applicable for DLN30 only

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE L  
IRN2 ATPN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN304	RING BUS CABLE		—	—	—	—
02	UN304	RING BUS CABLE		—	—	—	—
10	UN304	—	—	—	—	—	—
12	UN304	—	—	—	—	—	—
13	UN304	—	—	—	—	—	—
20	UN304	—	—	—	—	—	—
21	UN304	—	—	—	—	—	—
39	UN304	—	—	—	—	—	—

**TABLE M**  
**IRN2 SIN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN304	TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
02	UN304	TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
10	UN304	-	-	-	-	-	-
12	UN304	TN918, TN1508, TN1803	-	-	-	-	-
13	UN304	TN918, TN1508, TN1803	-	-	-	-	-
20	UN304	-	-	-	-	-	-
30	TN69B	UN9, UN9B	-	-	-	-	-
31	TN914	TN69B	-	-	-	-	-
32	TN914	UN304	-	-	-	-	-
33	TN914	UN304	-	-	-	-	-
34	TN69B	UN9, UN9B	-	-	-	-	-
35	TN914	UN304	-	-	-	-	-
40	TN1804	-	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

**TABLE N  
ULN SUSPECT HARDWARE**

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN397	TN1803, TN1508, TN918		RING BUS CABLE	—	—	—
02	UN397	TN1803, TN1508, TN918		RING BUS CABLE	—	—	—
10	UN397	—	—	—	—	—	—
12	UN397	TN1803, TN1508, TN918		—	—	—	—
13	UN397	TN1803, TN1508, TN918		—	—	—	—
20	UN397	—	—	—	—	—	—
40	TN2520	UN397	—	—	—	—	—
41	TN2520	UN397	—	—	—	—	—
43	TN2520	UN397	—	—	—	—	—
50	TN2520	LINK CABLING	TRANSMISSION FACILITIES	UN397	—	—	—

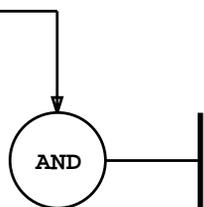
**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

TABLE O  
IRN2 EIN SUSPECT HARDWARE

FAILING PHASE	SUSPECT HARDWARE						
	FIRST	SECOND	THIRD	FOURTH	FIFTH	SIXTH	SEVENTH
01	UN304	TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
02	UN304	TN918, TN1508, TN1803	RING BUS CABLE	-	-	-	-
10	UN304	-	-	-	-	-	-
12	UN304	TN918, TN1508, TN1803	-	-	-	-	-
13	UN304	TN918, TN1508, TN1803	-	-	-	-	-
20	UN304	-	-	-	-	-	-
30	TN69B	UN9, UN9B	-	-	-	-	-
31	TN914	TN69B	-	-	-	-	-
32	TN914	UN304	-	-	-	-	-
33	TN914	UN304	-	-	-	-	-
34	TN69B	UN9, UN9B	-	-	-	-	-
35	TN914	UN304	-	-	-	-	-
40	TN4016	-	-	-	-	-	-

**IDENTIFY SUSPECT HARDWARE USING DIAGNOSTIC INFORMATION**

[1] Identify failing phases on diagnostic printout [Figure 1]



[2] Locate failing phase and identify circuitry tested [TABLE A, Page 2]

```
                                FAILING PHASE
30 DGN: RPCN32 0:PH 10-31. PF
M 30 DGN: RPCN32 0 SLOT 1 MSG STARTED
M 30 REPT IMSRMVST ERROR 3 3
M 31 DGN: RPCN32 0 PH 10 STF ( 2 00000000 00000000 ) MSG IP
TEST MISMATCH
3 00000009
4 00000009
M 31: RPCN32 0 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: RPCN32 0 SUMMARY DATA MSG STARTED
TLP: RPCN32 0 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
TLPFILE COMPLETED
M 31 DGN: RPCN32 0 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: RPCN32 0 STF ( 2 00000000 00000000 ) MSG COMPL
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

## IDENTIFY RPCN CIRCUITRY TESTED BY FAILING PHASE

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<b>TABLE A</b>	
<b>RPCN DIAGNOSTIC PHASES</b>	
<b>FALLING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that a message can be relayed from the BISO node to the EISO node via the isolated segment over ring 0/. Phase 1 also tests that any interframe buffers and all SSI boards (or IRN boards) in the isolated segment are equipped in accordance with ECD data, and that any interframe buffers in the isolated segment exhibit the proper data storage capacity.
02	Tests that a message can be relayed from the EISO node to the BISO node via the isolated segment over ring 1. Phase 2 also tests that any interframe buffers and all SSI boards (or IRN boards) in the isolated segment are equipped in accordance with ECD data, and that any interframe buffers in the isolated segment exhibit the proper data storage capacity.
10	Tests interface between DSCH and DDSBS
11	Tests interface between DDSBS and 3BI
12	Verifies that RAC 0 can detect bad parity in ring message
13	Verifies that RAC 1 can detect bad parity in ring message
14	Performs off-line CU to DDSBS tests (demand phase only)
20	Tests NP RAM memory, NP parity checker and generator circuitry
21	Performs diagnostics on RP of IRN circuit packs
23	Tests NP parity checker and generator circuitry
24	Tests NP programmable master and slave interrupt controllers and associated circuitry
26	Tests NP programmable Direct Memory Access Controller and associated circuitry
27	Tests NP programmable interval timer circuitry

**IDENTIFY RPCN CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE A (Contd)</b>	
<b>RPCN DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
30	Tests part of both RAC circuits, and RAC to NP interface. Partially tests interface between both RACs and ring bus.
31	Makes additional tests of interface between both RACs and ring bus
32	Verifies that RAC0/ can detect bad parity in a ring message
33	Verifies that RAC1 can detect bad parity in a ring message
39*	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load)
* SSI Cabinet only	

**IDENTIFY RPCN CIRCUITRY TESTED BY FAILING PHASE**

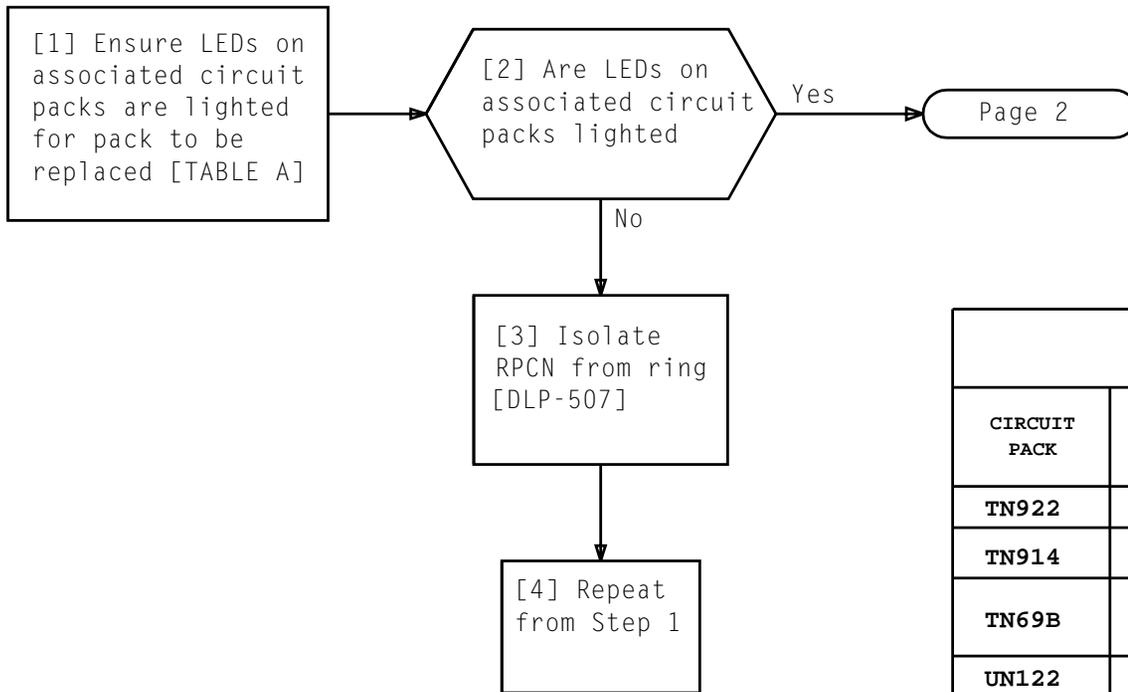


TABLE A CIRCUIT PACKS		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
<b>TN922</b>	Node Processor (NP)	<b>RQ</b> LED on;
<b>TN914</b>	3B Interface (3BI)	<b>TN922</b> or
<b>TN69B</b>	Duplex Dual Serial Bus Selector (DDSBS)	<b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> lighted
<b>UN122</b>	Ring Interface 0/ (RI0/)	<b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> lighted
<b>UN122B</b>		
<b>UN122C</b>		
<b>UN123</b>	Ring Interface 1 (RI1)	
<b>UN123B</b>		
<b>TN915</b> <b>TN918</b> <b>TN1506</b> <b>TN1508</b> <b>TN1509</b> <b>TN1803</b>	Interface Buffer (IFB)	<b>NT</b> LED on; associated <b>UN123</b> , <b>UN123B</b> or <b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> of neighbor node in adjacent frame lighted

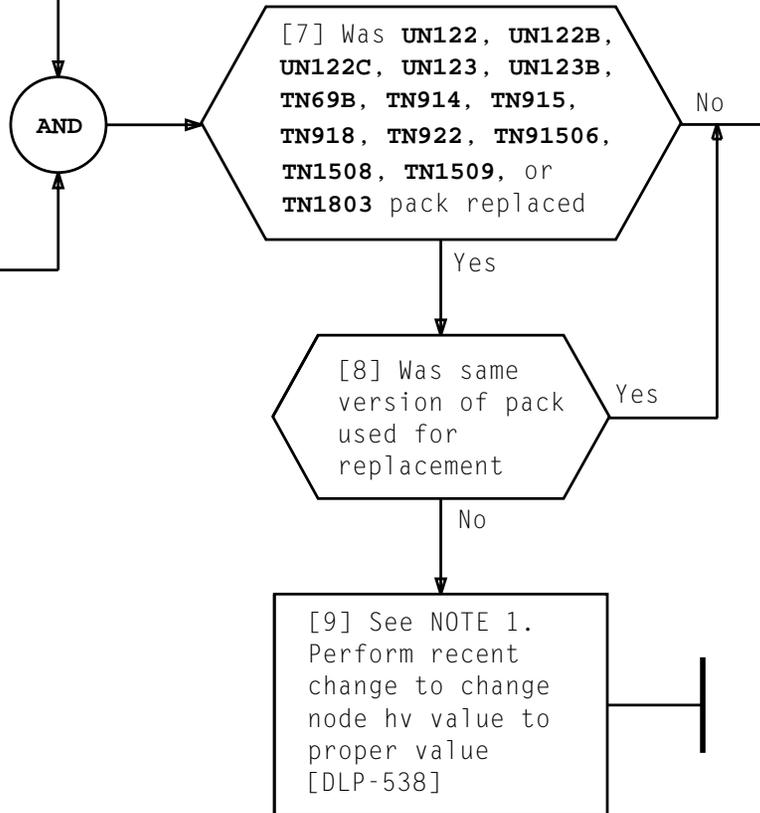
## REPLACE CIRCUIT PACK, RING PERIPHERAL CONTROLLER NODE (RPCN)

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[5] See WARNING 1. Remove circuit pack to be replaced

[6] See WARNING 1. Insert and properly seat replacement pack



**NOTE 1**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE CIRCUIT PACK, RING PERIPHERAL CONTROLLER NODE (RPCN)**

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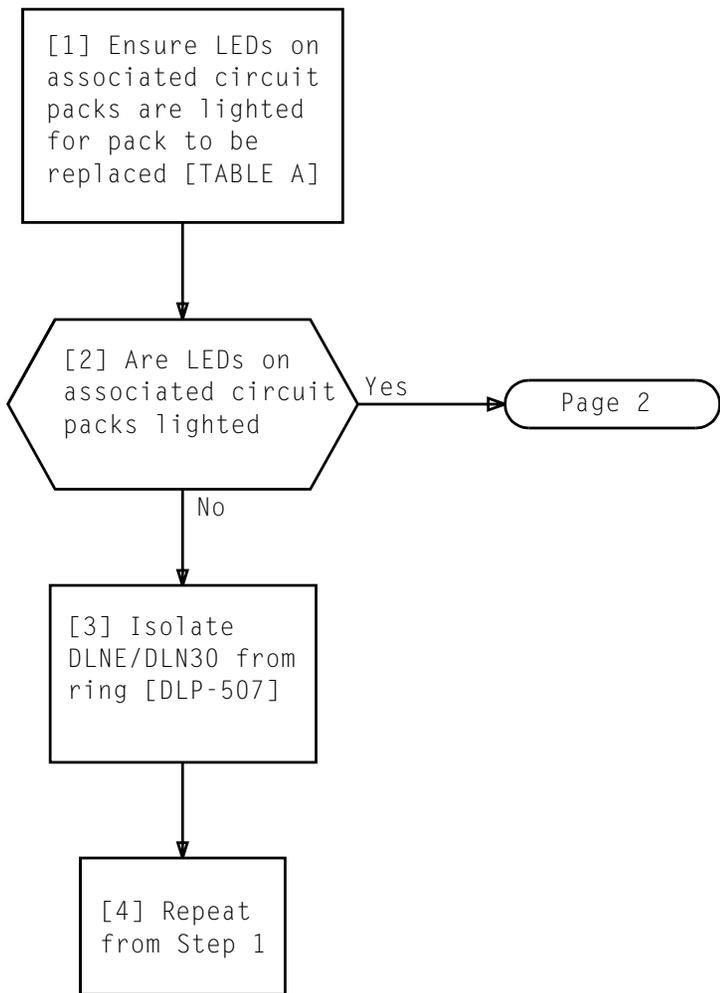
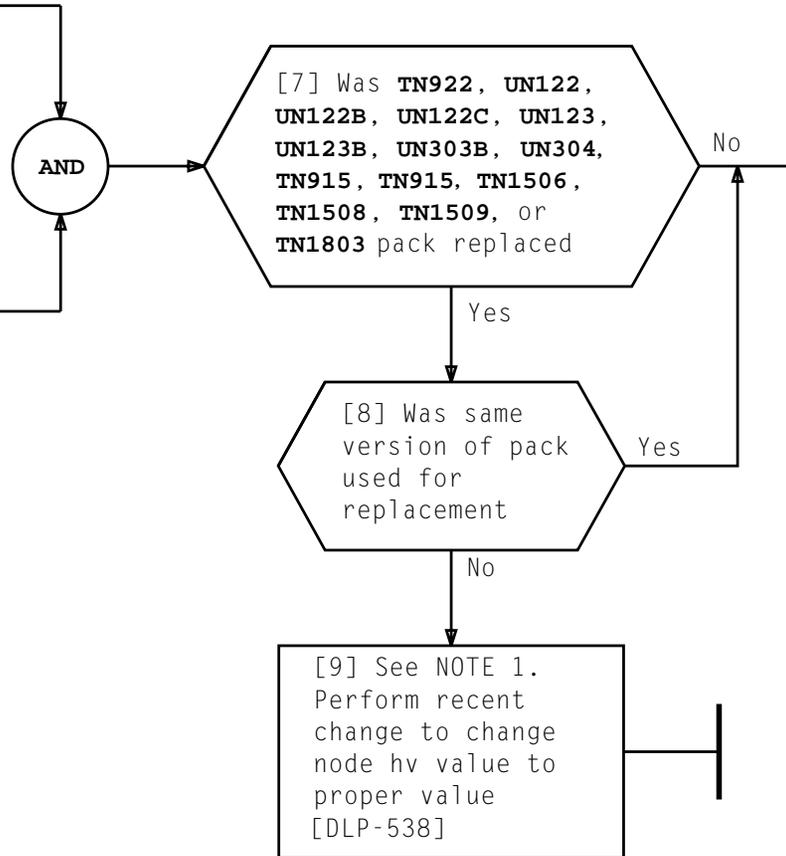


TABLE A CIRCUIT PACKS		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
TN922	Node Processor (NP)	NT LED on; UN123 or UN123B lighted
UN303B/ UN304	Integrated Ring Node (IRN)	-
UN122	Ring Interface 0/ (RI0/)	NT LED on; UN123 or UN123B lighted
UN122B		
UN122C		
UN123	Ring Interface 1 (RI1)	
UN123B		
TN915 TN918 TN1506 TN1508 TN1509 TN1803	Interface Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 or UN123B of neighbor node in adjacent frame lighted

**REPLACE CIRCUIT PACK, DLNE/DLN30**

[5] See WARNING 1. Remove circuit pack to be replaced

[6] See WARNING 1. Insert and properly seat replacement pack



**NOTE 1**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) MUST be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE CIRCUIT PACK, DLNE/DLN30**

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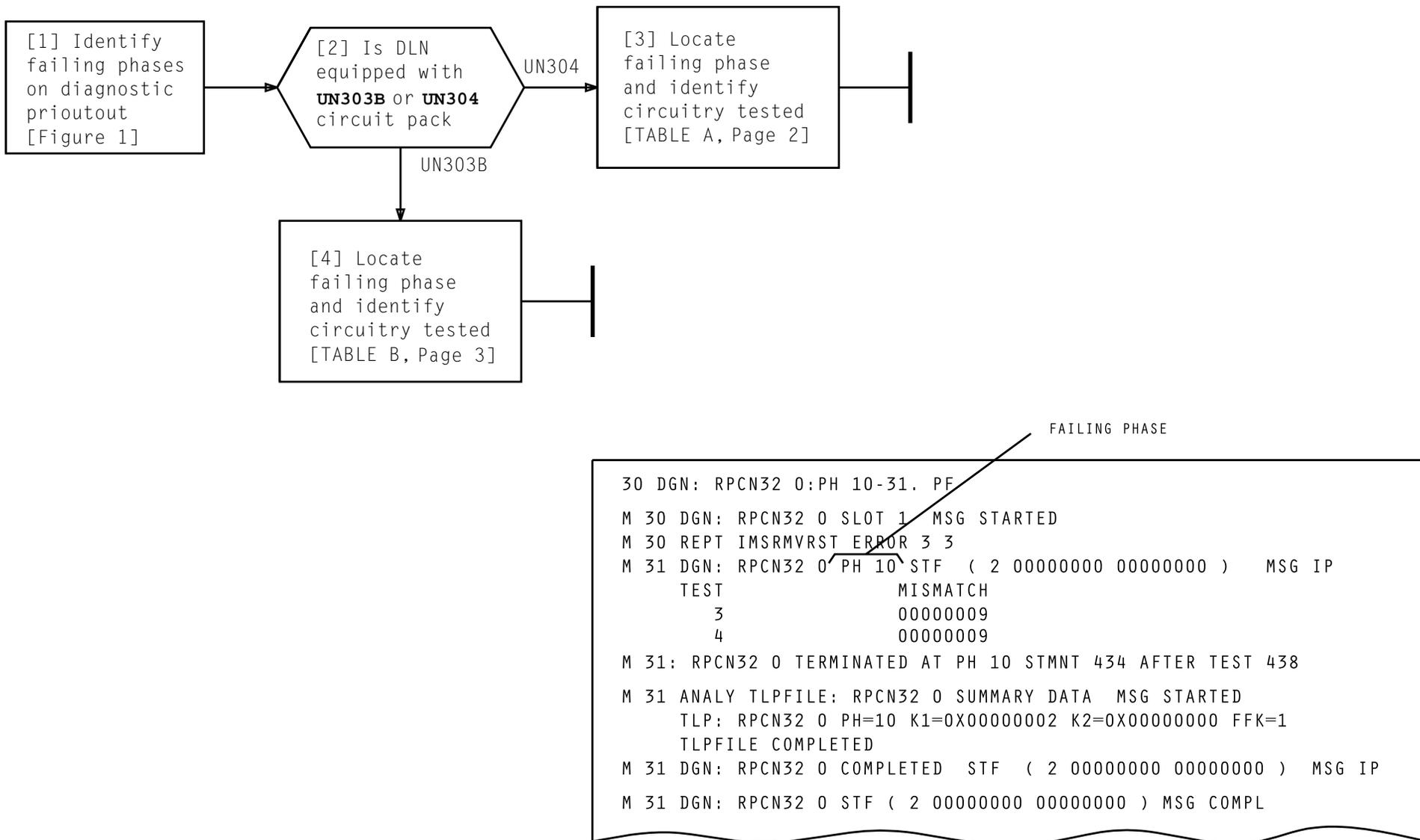


Figure 1 - Sample Printout of Failing Diagnostic Phase

**IDENTIFY DIRECT LINK NODE DLNE/DLN30 CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE A  
UN304 DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0/. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0/, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests the ring interface (RI) circuitry of the integrated ring node (IRN2) circuit pack.
12	Verifies that RAC0/ can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory.
30	Tests interface between DSCH and DDSBS.
31	Tests interface between DDSBS and 3B1.
32	Tests ability of NP to go "insane" and set "Interrupt Request Flag" when 3BI has an error.
33	Tests interface between 3B1 and NP.
34	Performs off-line CU to DDSBS tests (demand phase only).
35	Cooperates with 3B20D driver to test DMA capability via 3B1.
40	Tests the share static memory in the AP30 from the IRN2.
41	Tests the shared static memory form the AP30 side.
42	Tests interface between DMA and 3B1.
43	Tests the four D-Channel data links on the AP30

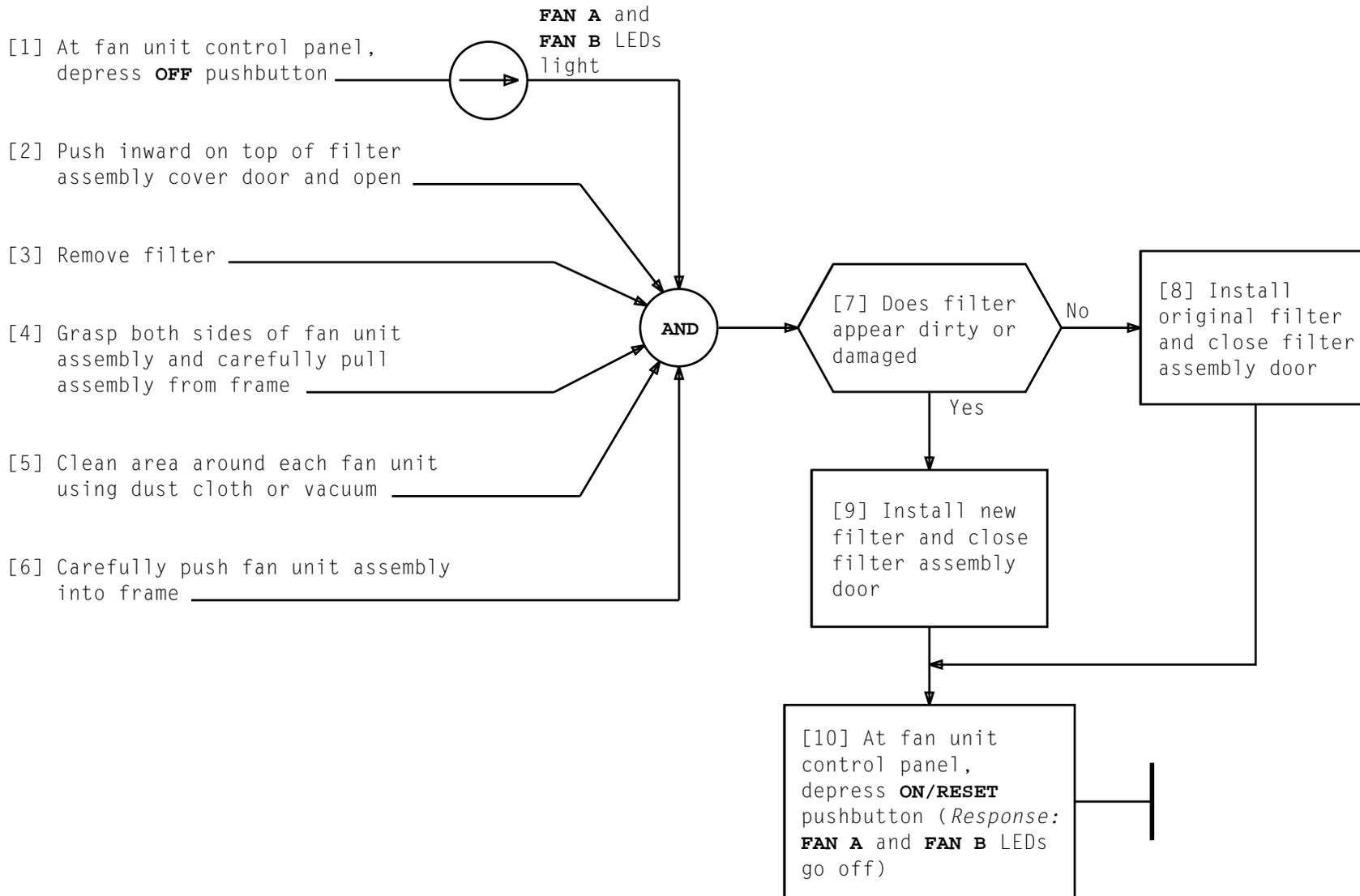
**IDENTIFY DIRECT LINK NODE DLNE/DLN30 CIRCUITRY TESTED BY FAILING PHASE**

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<b>TABLE B UN303B DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0/. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0/, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests the ring interface (RI) circuitry of the integrated ring node (IRN2) circuit pack.
12	Verifies that RAC0/ can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory.
21	Tests the NP programmable master and slave interrupt controllers and associated circuitry. Also tests the NP programmable interval timer circuitry.
30	Tests interface between DSCH and DDSBS.
31	Tests interface between DDSBS and 3BI.
32	Tests ability of NP to go "insane" and set "Interrupt Request Flag" when 3BI has an error.
33	Tests interface between 3BI and NP.
34	Performs off-line CU to DDSBS tests (demand phase only).
35	Cooperates with 3B20D driver to test DMA capability via 3BI.
40	Tests the share static memory in the AP30 form the IRN2.
41	Tests the sanity of microprocessor and ROM.
42	Tests interface between DMA and 3BI.
43	Tests the four D-Channel data links on the AP30

**IDENTIFY DIRECT LINK NODE DLNE/DLN30 CIRCUITRY TESTED BY  
FAILING PHASE**

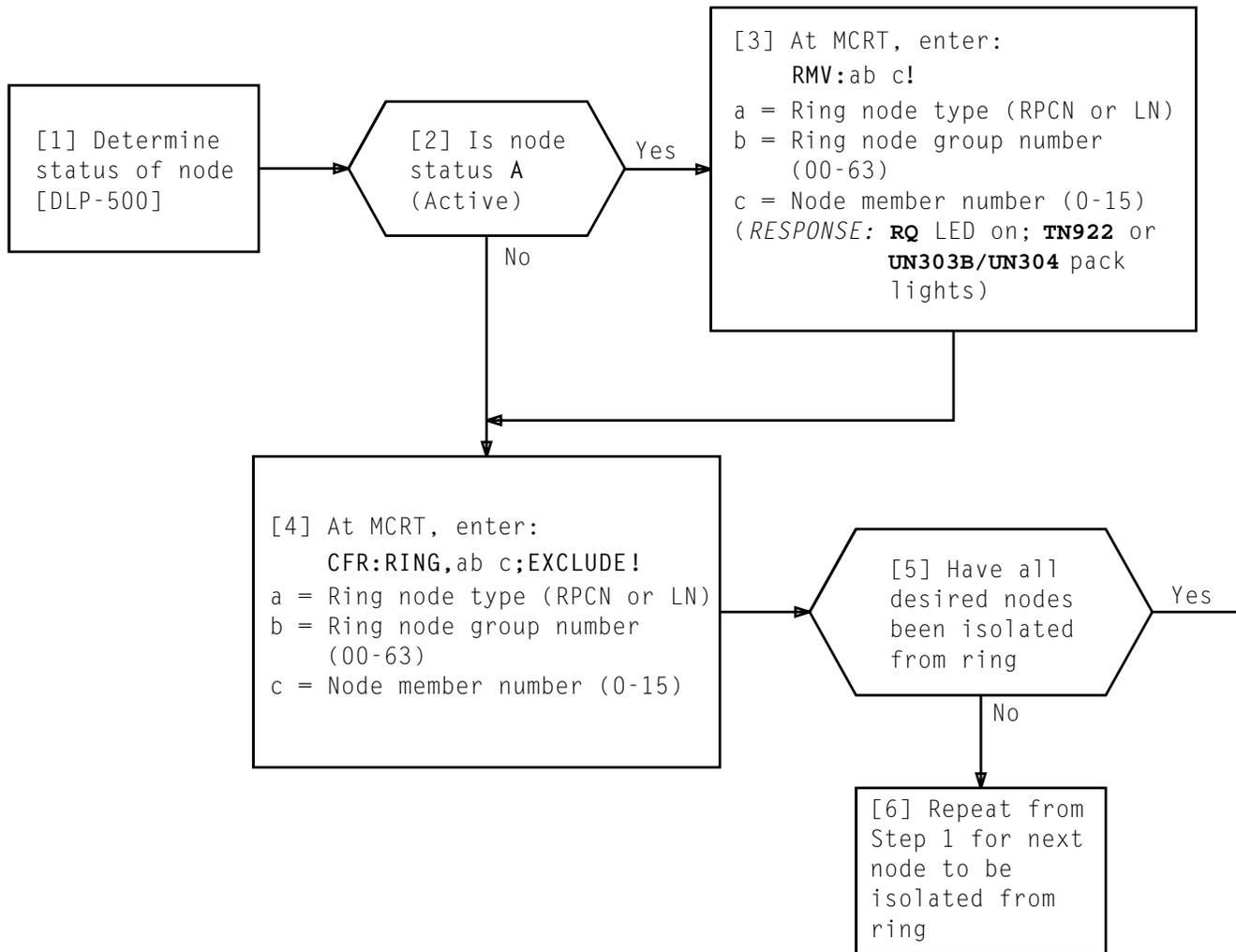
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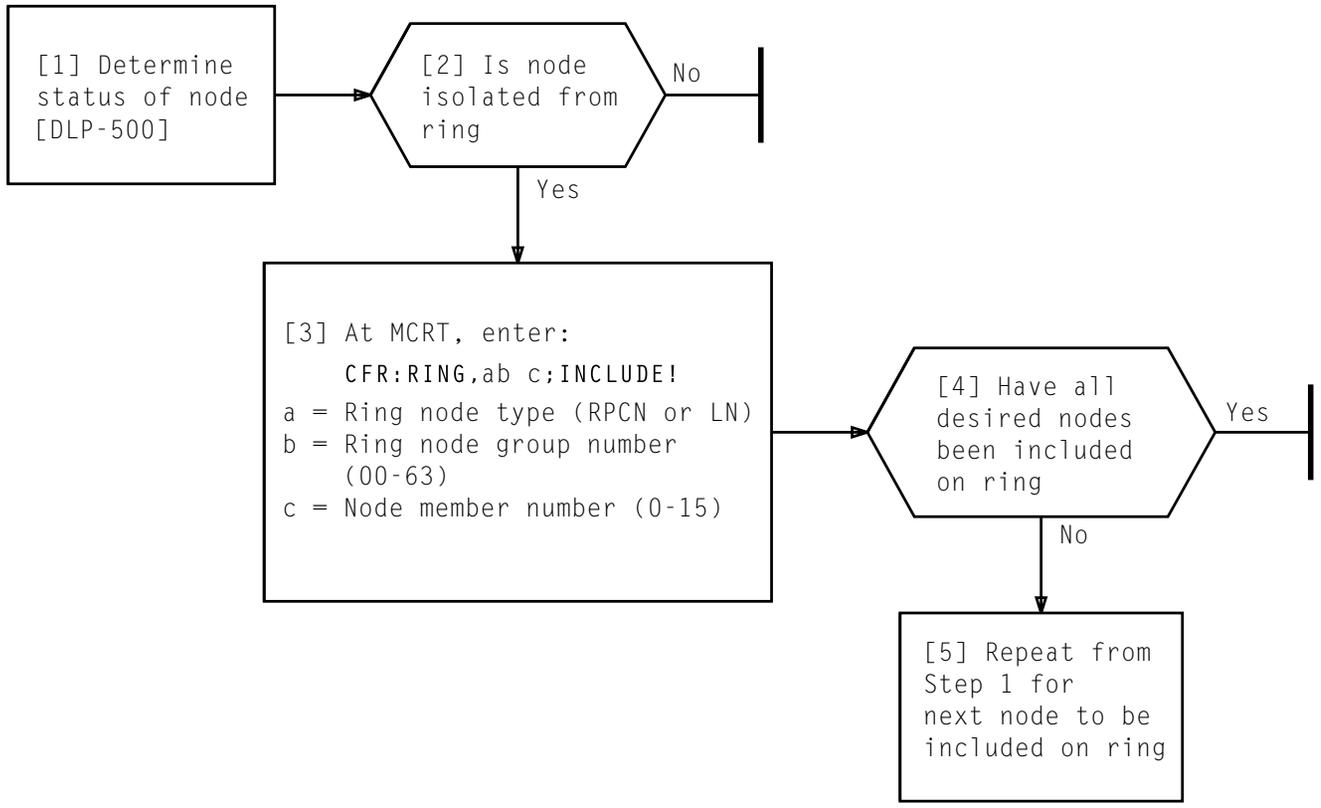
## INSPECT AND CLEAN FAN FILTER ASSEMBLY

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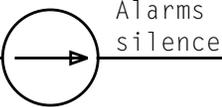
## ISOLATE NODE FROM RING



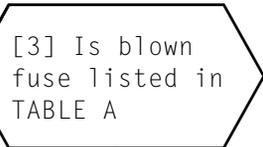
**INCLUDE NODE ON RING**

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[1] At fuse panel and alarm control unit, depress **ALM-RLS** pushbutton



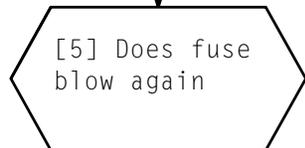
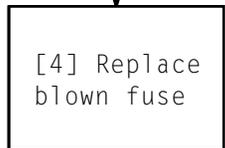
[2] Determine location of blown fuse



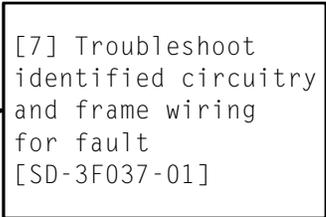
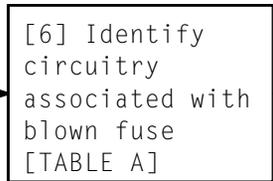
No



Yes



Yes



No

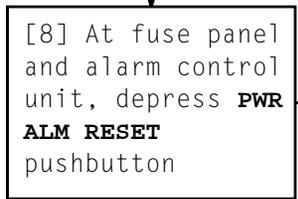


TABLE A		
BLOWN FUSE	FUSE TYPE	ASSOCIATED CIRCUITRY
FC1	70G	FAN CONTROLLER 1
FC2	70G	FAN CONTROLLER 2
AF1	70A	FAN UNIT 1
BF2	70A	FAN UNIT 2
CF3	70A	FAN UNIT 3
DF4	70A	FAN UNIT 4
ALP	70G	BUS A LAMP
BLP	70G	BUS B LAMP

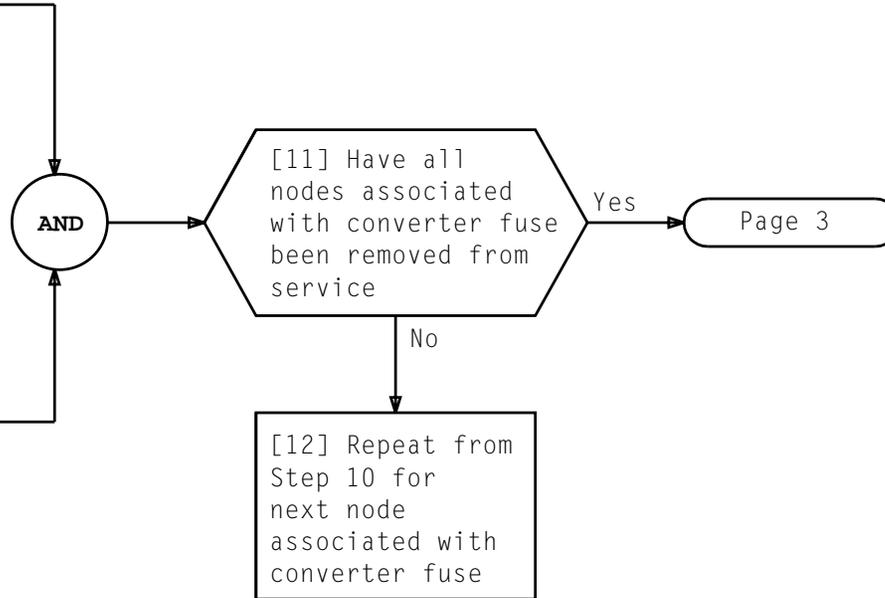
## REPLACE BLOWN FUSE — RING NODE CABINET

[9] See NOTE 1. Identify nodes associated with FA power converter fuse

[10] For nodes associated with FA power converter fuse— at MCRT, enter:

RMV:ab c!

a = Ring node type (RPCN or LN)  
b = Ring node group number (00-63)  
c = Node member number (0-15)

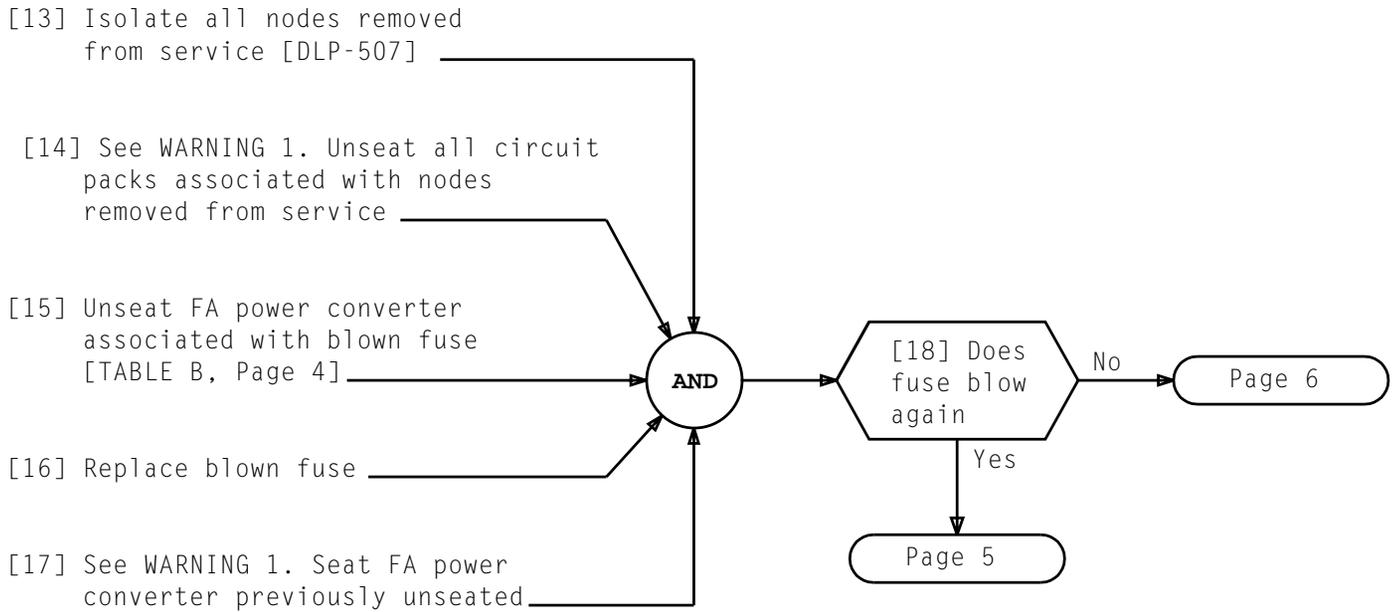


NOTE 1

Two FA power converters supply power to each LN shelf unit. One converter supplies power for one-half the shelf unit and the other converter supplies power to other half. With this arrangement, it is possible that some LNs are powered by both converters

**REPLACE BLOWN FUSE — RING NODE CABINET**

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**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE BLOWN FUSE — RING NODE CABINET**

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TABLE B FA POWER CONVERTER FUSE LOCATIONS					
BLOWN FUSE	FUSE TYPE	LINK NODE SHELF	RN CABINET 00 OR 32 CONVERTER HORIZONTAL LOCATION	ILN OR HDB CABINET CONVERTER HORIZONTAL LOCATION	FUSE FUNCTION
M00	70G	0	010	015	PILOT
M01	70G	0	170	032	
A00	74D	0	010	015	LOAD
A01	74D	0	170	032	
M10	70G	1	010	015	PILOT
M11	70G	1	170	032	
B10	74D	1	010	015	LOAD
B11	74D	1	170	032	
M20	70G	2	010	015	PILOT
M21	70G	2	170	032	
C20	74D	2	010	015	LOAD
C21	74D	2	170	032	
M30	70G	3	010	015	PILOT
M31	70G	3	170	032	
D30	74D	3	010	015	LOAD
D31	74D	3	170	032	
M40	70G	4	010	015	PILOT
M41	70G	4	170	032	
E40	74D	4	010	015	LOAD
E41	74D	4	170	032	
M50	70G	5	010	015	PILOT
M51	70G	5	170	032	
F50	74D	5	010	015	LOAD
F51	74D	5	170	032	

**REPLACE BLOWN FUSE — RING NODE CABINET**

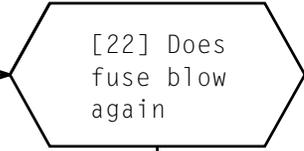
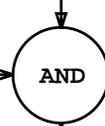
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[19] Remove load fuse and pilot fuse associated with defective converter

[20] Replace defective converter with known good converter

[21] Replace load fuse and pilot fuse

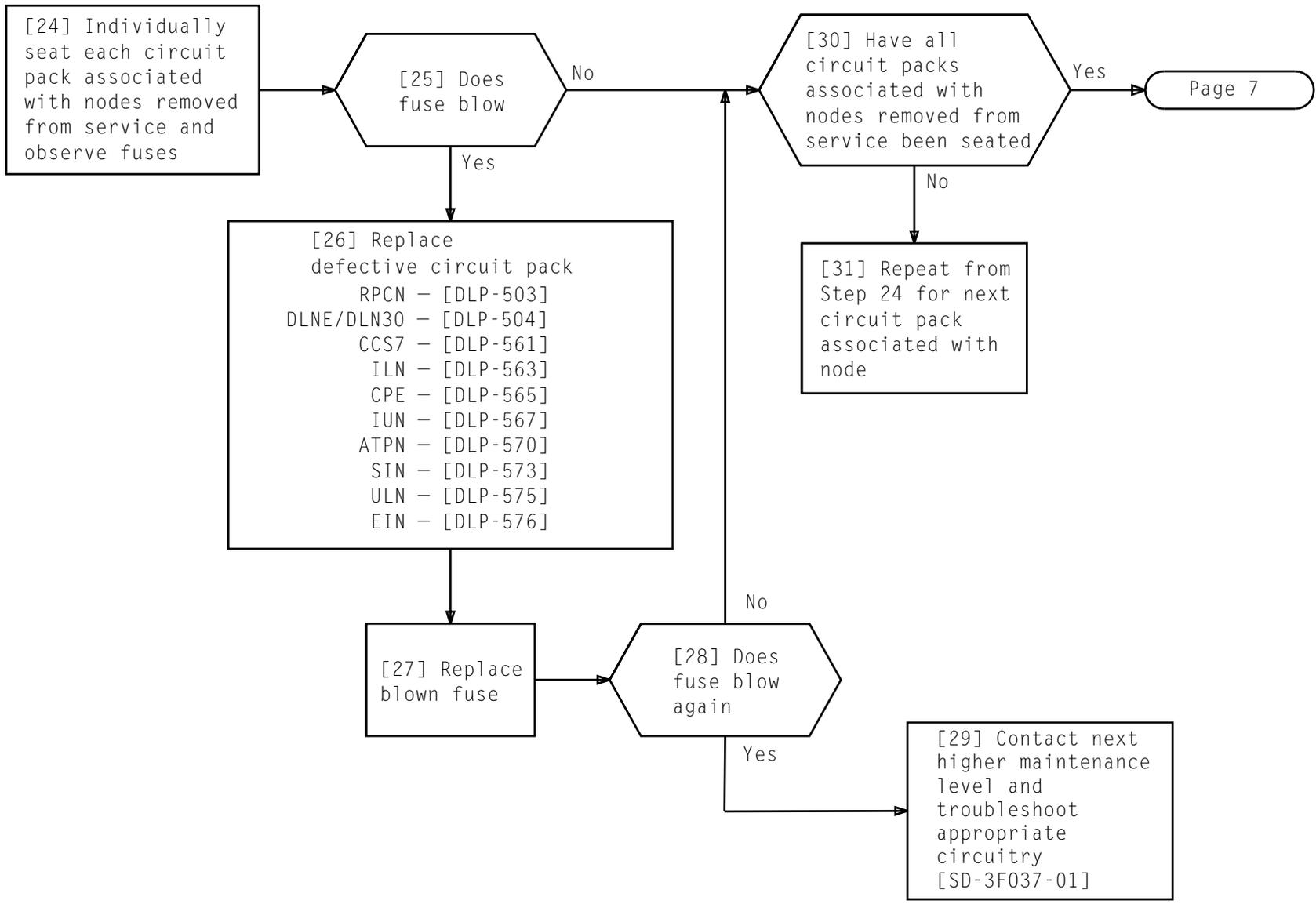


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[23] Troubleshoot frame wiring for possible short to ground  
[SD-3F037-01]

## REPLACE BLOWN FUSE — RING NODE CABINET

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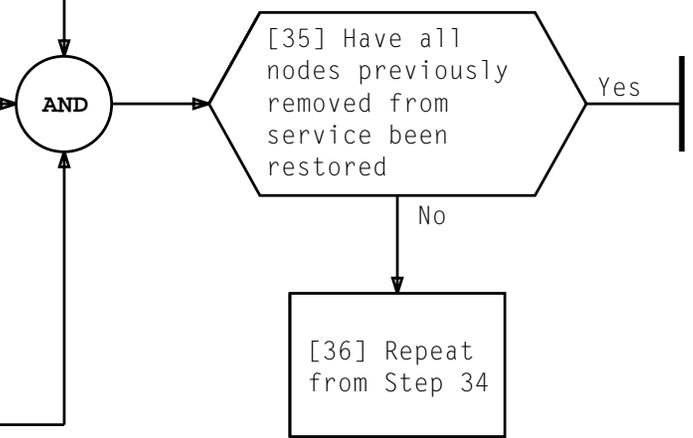
**REPLACE BLOWN FUSE – RING NODE CABINET**

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[32] At fuse panel and alarm control unit, depress **PWR ALM RESET** pushbutton

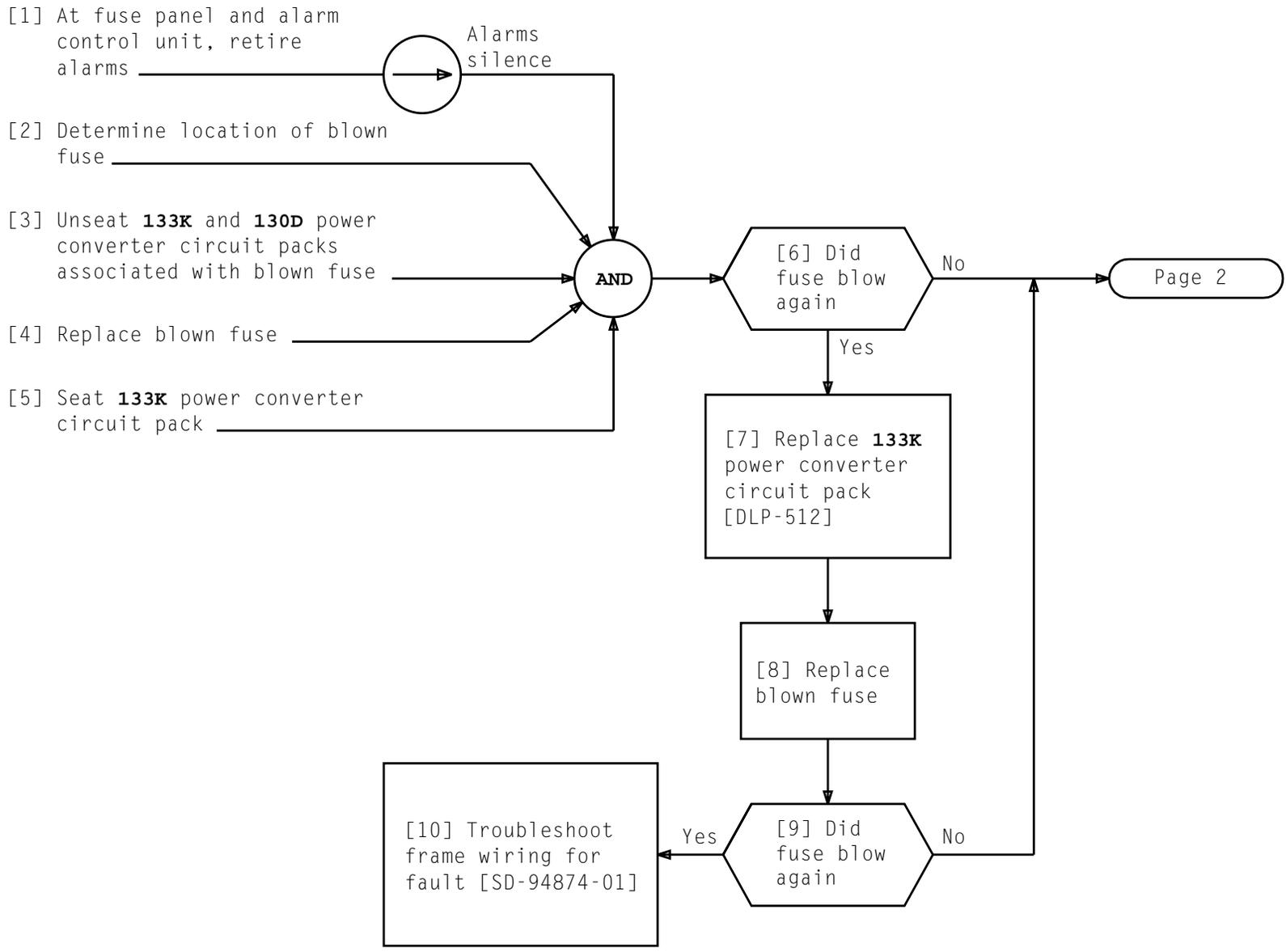
[33] Include previously isolated nodes on ring [DLP-508]

[34] At MCRT, enter:  
RST:a;UCL!  
for nodes previously removed from service  
a = RPCNxx 0  
LNxx y  
xx = Ring node group number (00-63)  
y = Node member number (1-15)



## REPLACE BLOWN FUSE — RING NODE CABINET

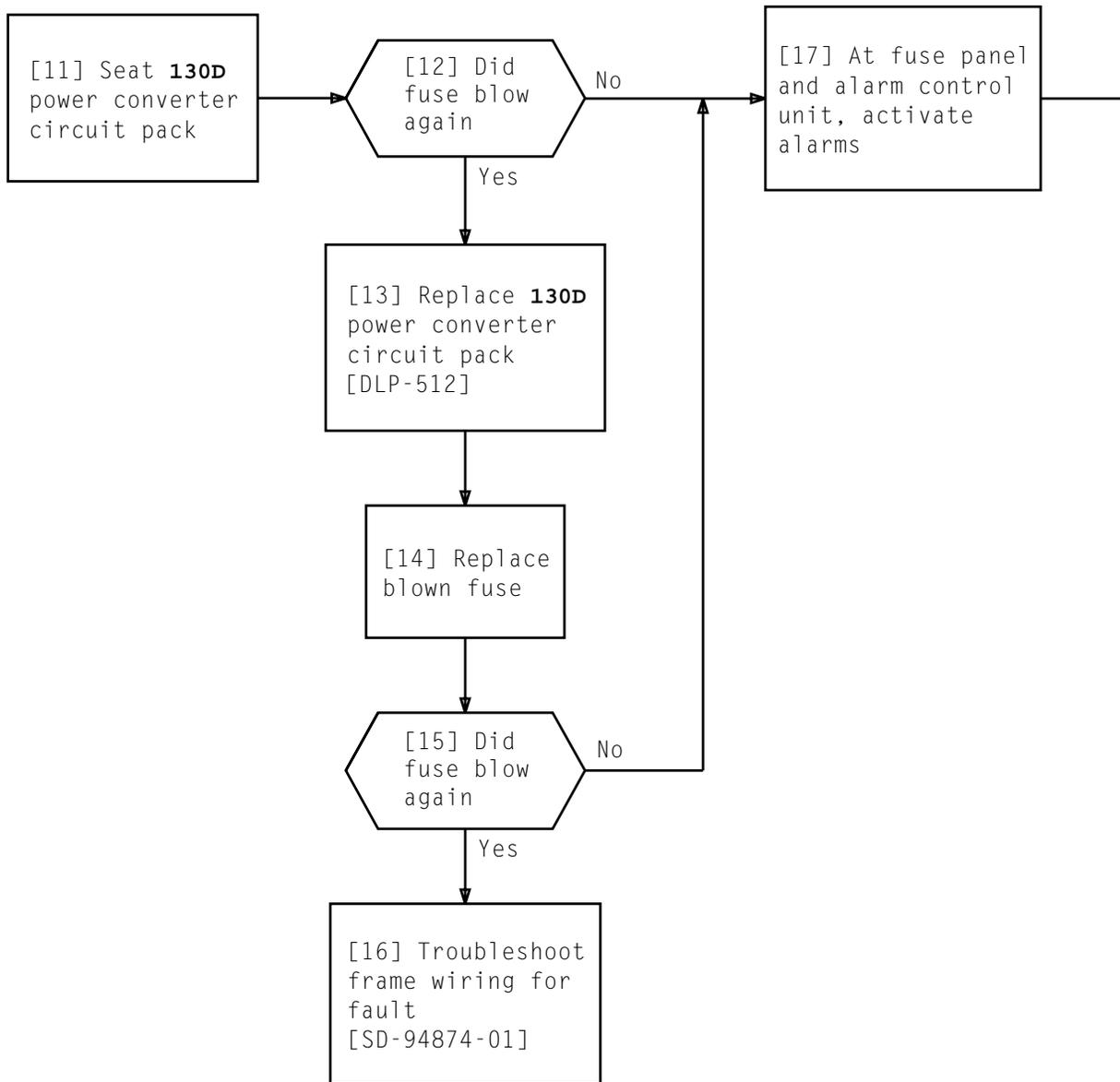
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**REPLACE BLOWN FUSE – ANALOG FACILITY ACCESS (AFA) CABINET**

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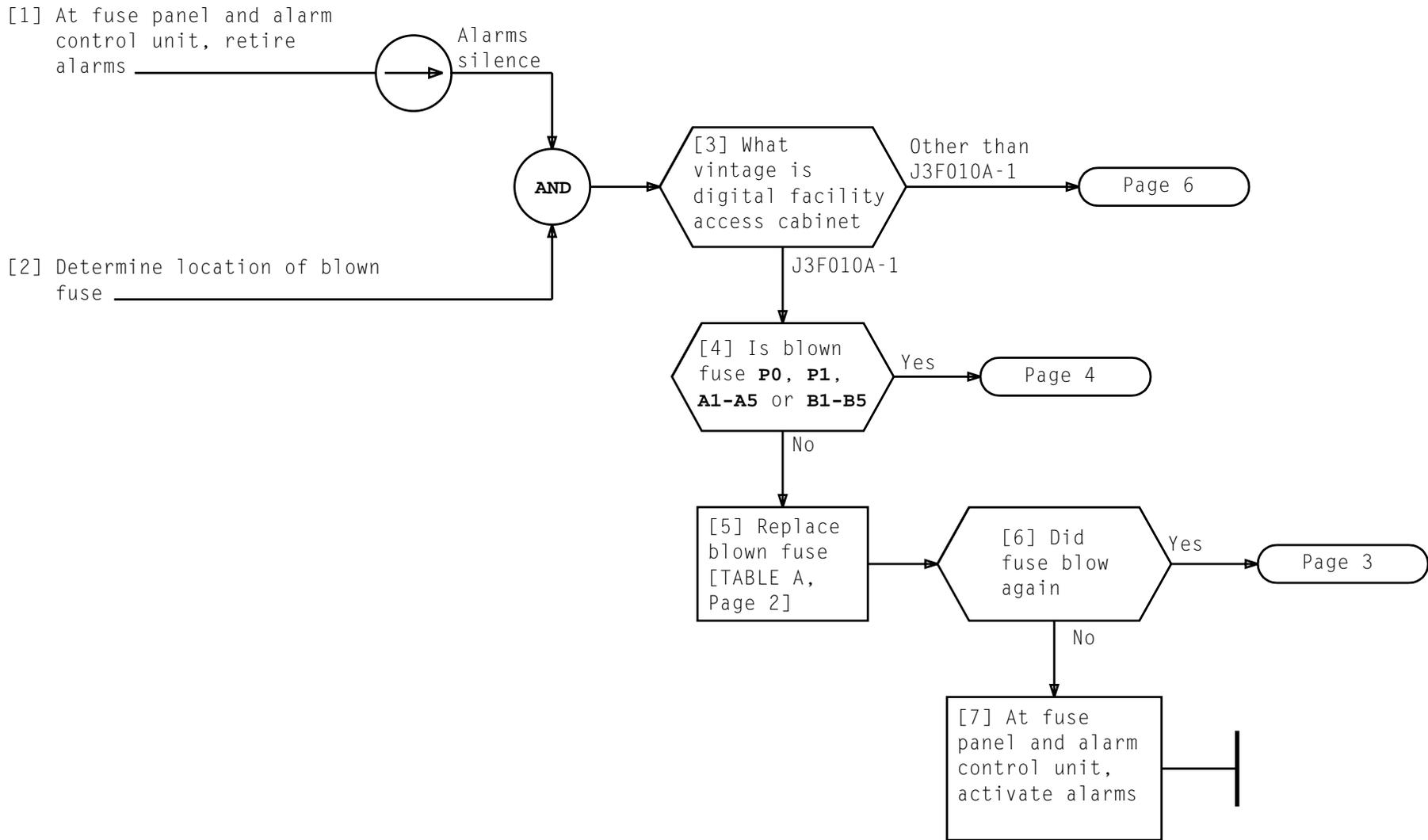
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**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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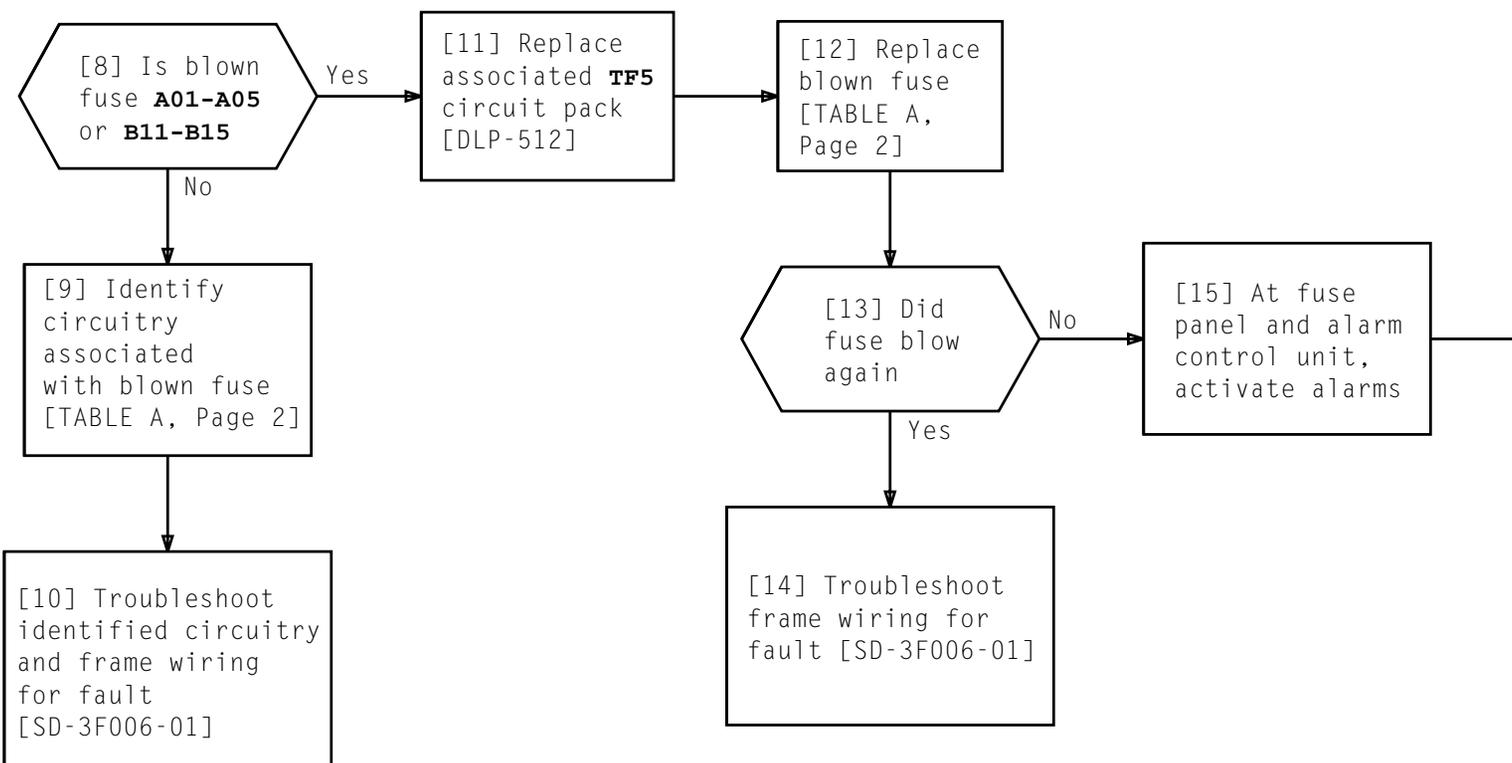
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TABLE A					
BLOWN FUSE	AMPERAGE	ASSOCIATED CIRCUITRY	BLOWN FUSE	AMPERAGE	ASSOCIATED CIRCUITRY
A01	1/2	DSA01 -48 V (TF5 Pack)	BL	1/2	Circuit 1 ALM Circuitry
A02	1/2	DSA02 -48 V (TF5 Pack)	M1	1/2	Circuit 1 PWR Converter Pilot Fuse
A03	1/2	DSA03 -48 V (TF5 Pack)	P1	10	Circuit 1 PWR Converter Load Fuse
A04	1/2	DSA04 -48 V (TF5 Pack)	A1	1/2	Data Link 01 120 V AC
A05	1/2	DSA05 -48 V (TF5 Pack)	A2	1/2	Data Link 02 120 V AC
AL	1/2	Circuit 0 ALM Circuitry	A3	1/2	Data Link 03 120 V AC
MO	1/2	Circuit 0 PWR Converter Pilot Fuse	A4	1/2	Data Link 04 120 V AC
PO	10	Circuit 0 PWR Converter Load Fuse	A5	1/2	Data Link 05 120 V AC
B11	1/2	DSA11 -48 V (TF5 Pack)	B1	1/2	Data Link 11 120 V AC
B12	1/2	DSA12 -48 V (TF5 Pack)	B2	1/2	Data Link 12 120 V AC
B13	1/2	DSA13 -48 V (TF5 Pack)	B3	1/2	Data Link 13 120 V AC
B14	1/2	DSA14 -48 V (TF5 Pack)	B4	1/2	Data Link 14 120 V AC
B15	1/2	DSA15 -48 V (TF5 Pack)	B5	1/2	Data Link 15 120 V AC

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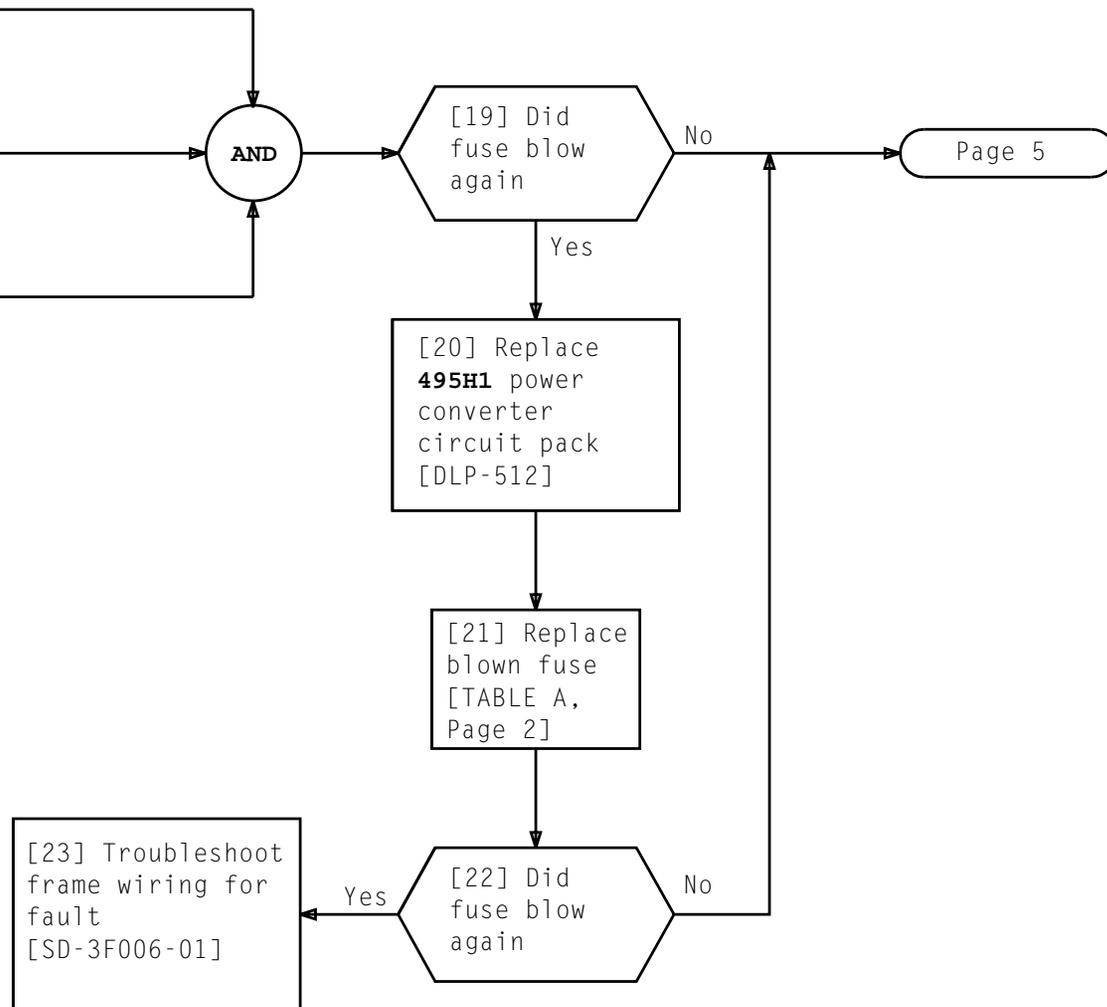
**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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[16] Unseat **495H1** and **393A** power converter circuit packs associated with blown fuse [TABLE A, Page 2]

[17] Replace blown fuse

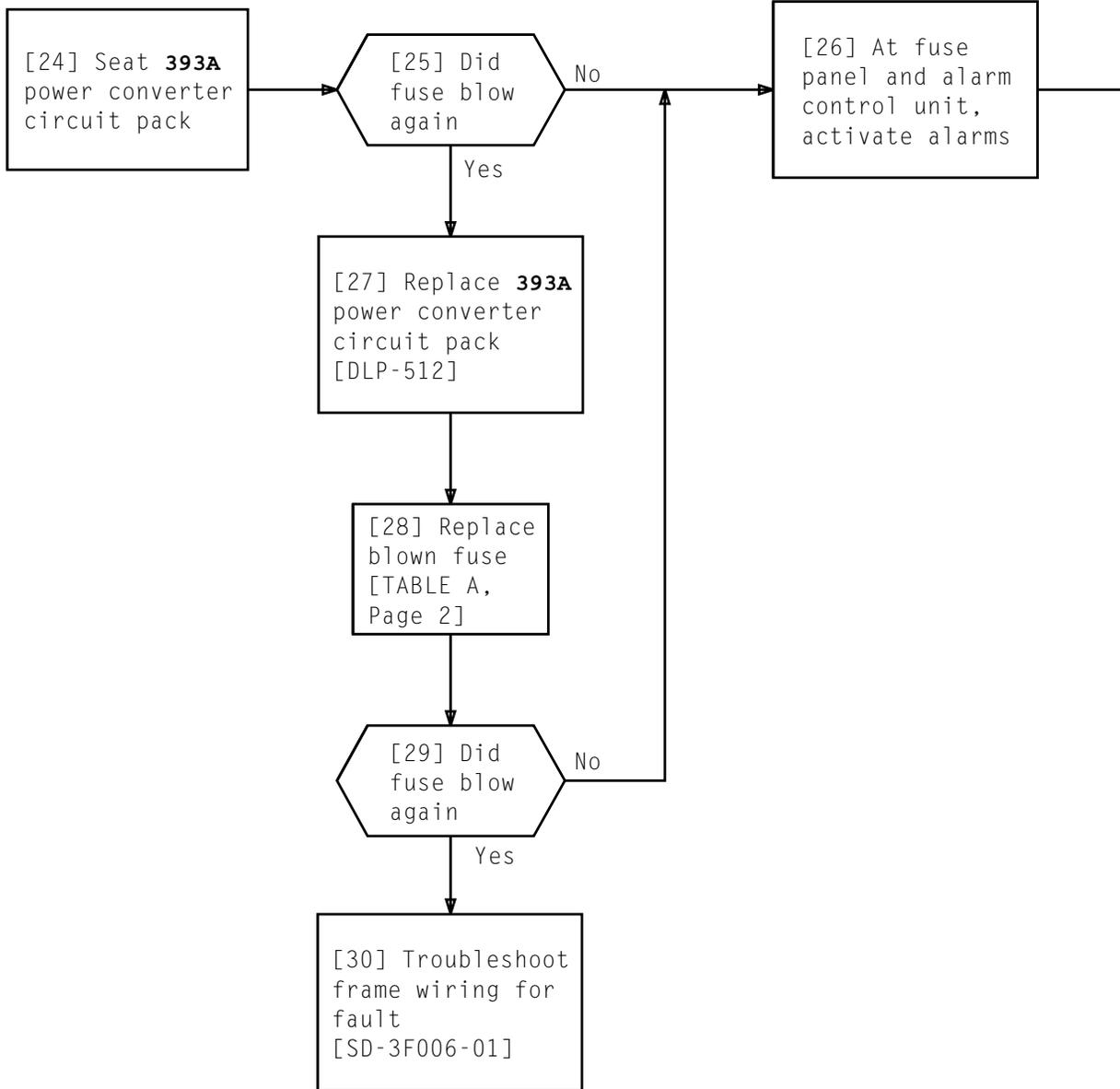
[18] Seat **495H1** power converter circuit pack



## REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET

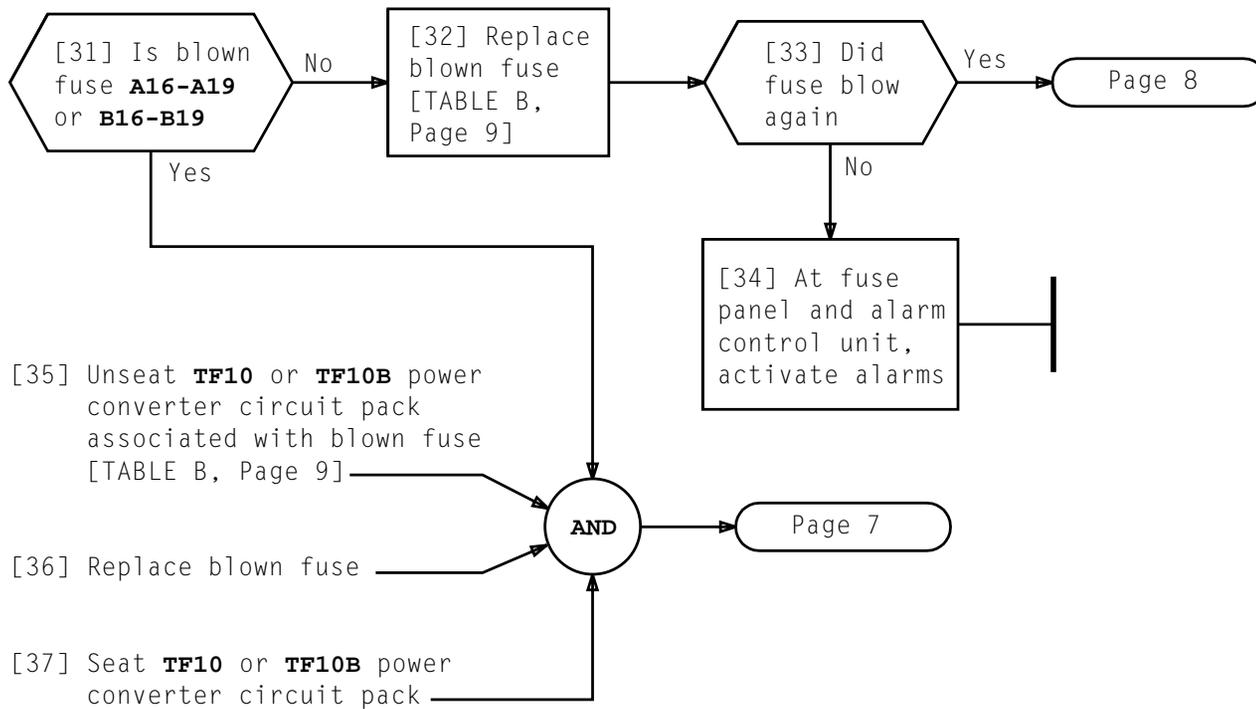
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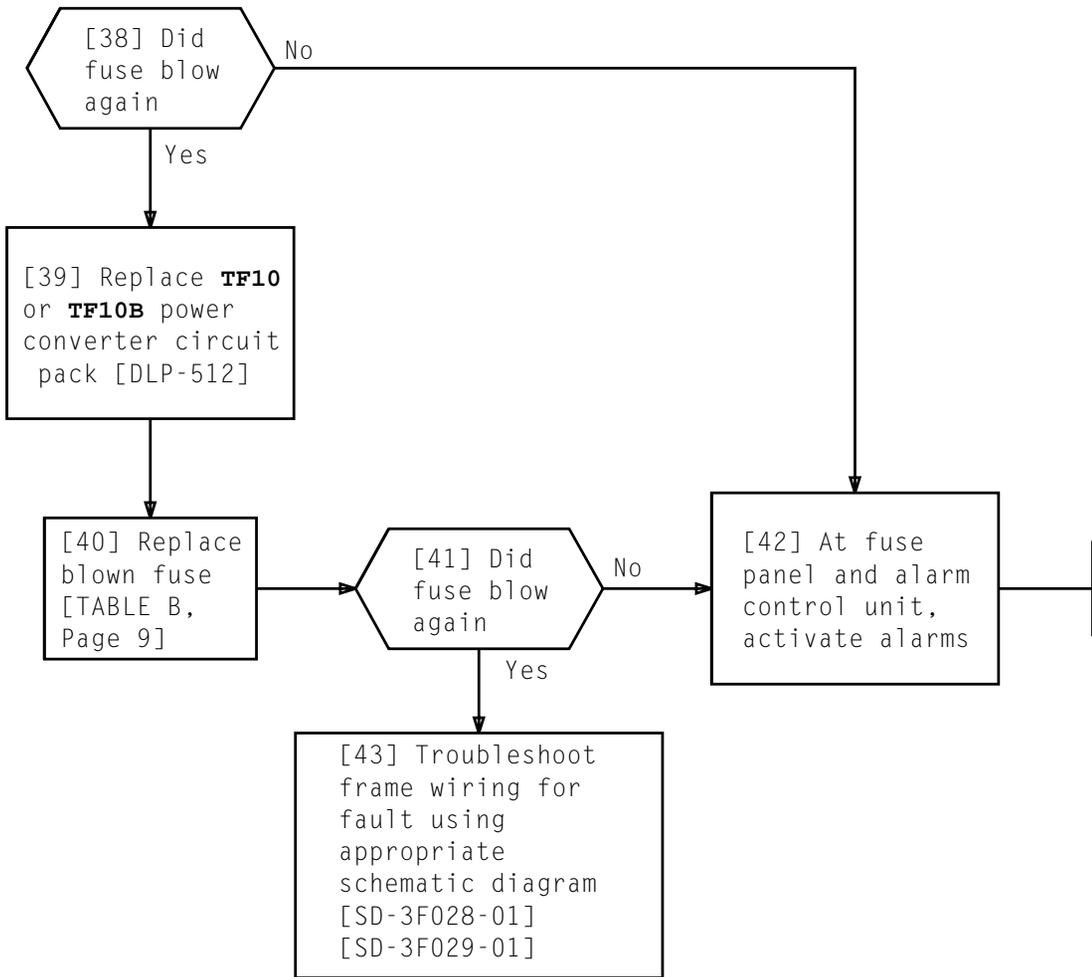
**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

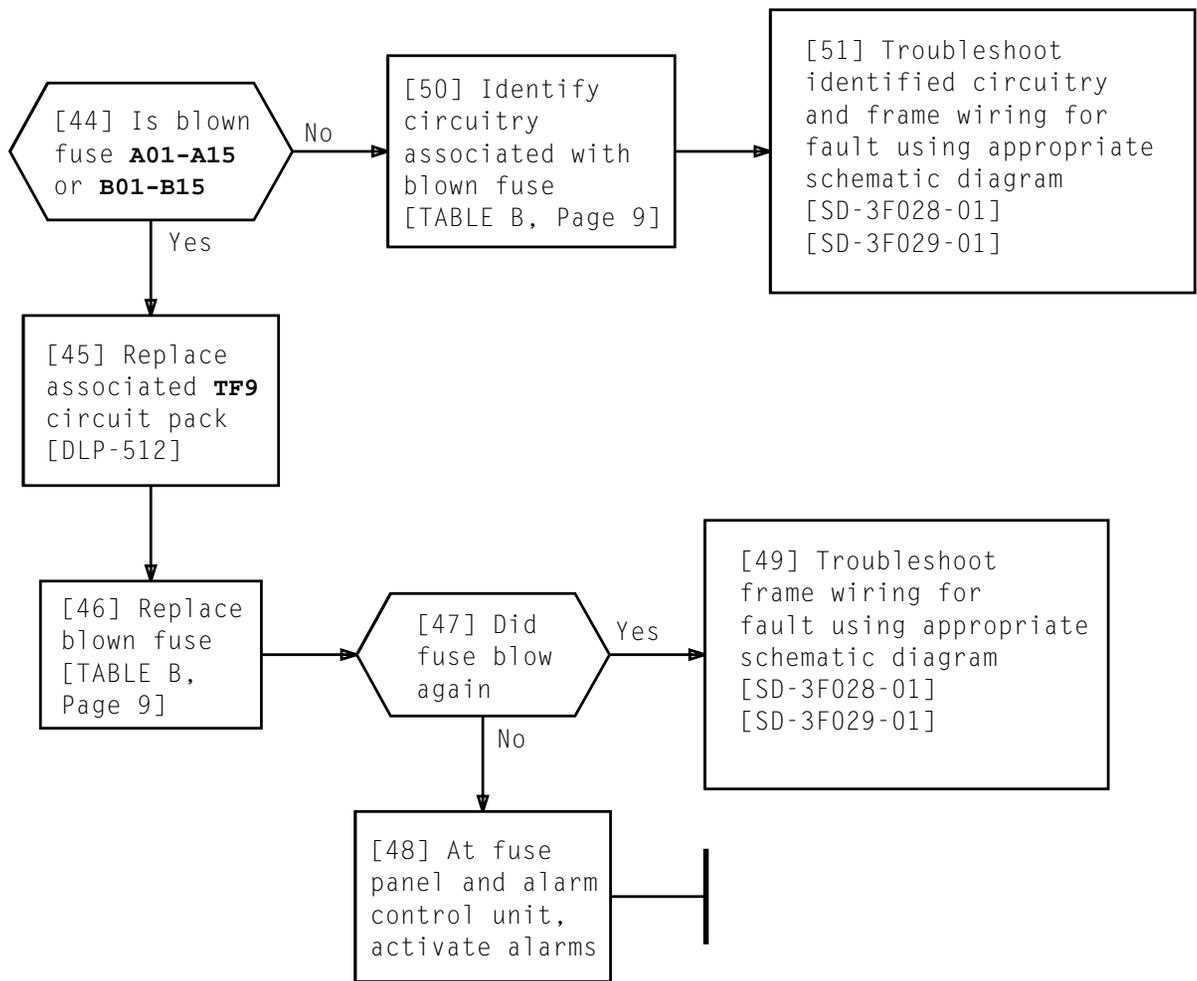
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**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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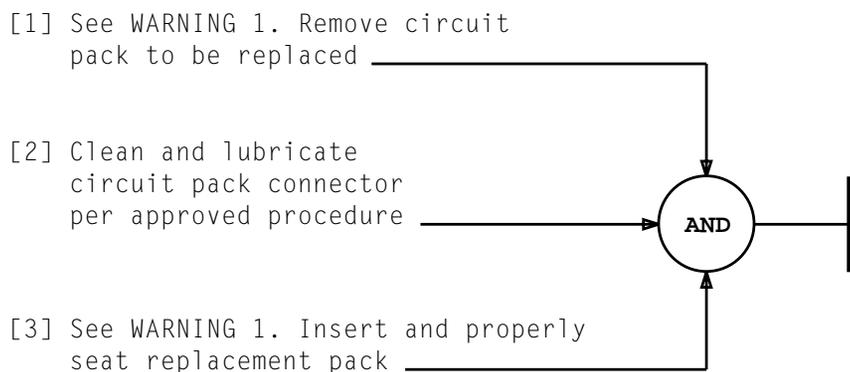
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TABLE B					
BLOWN FUSE	AMPERAGE	ASSOCIATED CIRCUITRY (CIRCUIT A)	BLOWN FUSE	AMPERAGE	ASSOCIATED CIRCUITRY (CIRCUIT B)
A01	1/2	DSA01 -48V (TF9 Pack)	B01	1/2	DSA01 -48V (TF9 Pack)
A02	1/2	DSA02 -48V (TF9 Pack)	B02	1/2	DSA02 -48V (TF9 Pack)
A03	1/2	DSA03 -48V (TF9 Pack)	B03	1/2	DSA03 -48V (TF9 Pack)
A04	1/2	DSA04 -48V (TF9 Pack)	B04	1/2	DSA04 -48V (TF9 Pack)
A05	1/2	DSA05 -48V (TF9 Pack)	B05	1/2	DSA05 -48V (TF9 Pack)
A06	1/2	DSA06 -48V (TF9 Pack)	B06	1/2	DSA06 -48V (TF9 Pack)
A07	1/2	DSA07 -48V (TF9 Pack)	B07	1/2	DSA07 -48V (TF9 Pack)
A08	1/2	DSA08 -48V (TF9 Pack)	B08	1/2	DSA08 -48V (TF9 Pack)
A09	1/2	DSA09 -48V (TF9 Pack)	B09	1/2	DSA09 -48V (TF9 Pack)
A10	1/2	DSA10 -48V (TF9 Pack)	B10	1/2	DSA10 -48V (TF9 Pack)
A11	1/2	DSA11 -48V (TF9 Pack)	B11	1/2	DSA11 -48V (TF9 Pack)
A12	1/2	DSA12 -48V (TF9 Pack)	B12	1/2	DSA12 -48V (TF9 Pack)
A13	1/2	DSA13 -48V (TF9 Pack)	B13	1/2	DSA13 -48V (TF9 Pack)
A14	1/2	DSA14 -48V (TF9 Pack)	B14	1/2	DSA14 -48V (TF9 Pack)
A15	1/2	DSA15 -48V (TF9 Pack)	B15	1/2	DSA15 -48V (TF9 Pack)
A16	1/2	Power Converter -48V (TF10 or TF10B Pack)	B16	1/2	Power Converter -48V (TF10 or TF10B Pack)
A17	1/2	Power Converter -48V (TF10 or TF10B Pack)	B17	1/2	Power Converter -48V (TF10 or TF10B Pack)
A18	1/2	Power Converter -48V (TF10 or TF10B Pack)	B18	1/2	Power Converter -48V (TF10 or TF10B Pack)
A19	1/2	Power Converter -48V (TF10 or TF10B Pack)	B19	1/2	Power Converter -48V (TF10 or TF10B Pack)
AL	1/2	CIRCUIT A ALM CIRCUITRY	BL	1/2	CIRCUIT B ALM CIRCUITRY

**REPLACE BLOWN FUSE – DIGITAL FACILITY ACCESS (DFA) CABINET**

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**WARNING 1**

*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE CIRCUIT PACK — ANALOG FACILITY ACCESS (AFA) OR DIGITAL FACILITY ACCESS (DFA) CABINET**

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[1] At power distribution frame,  
locate blown fuse and  
identify affected ring  
node cabinet

[2] At affected ring node  
cabinet, depress  
**ALM-RLS** pushbutton

[3] At MCRT, enter:

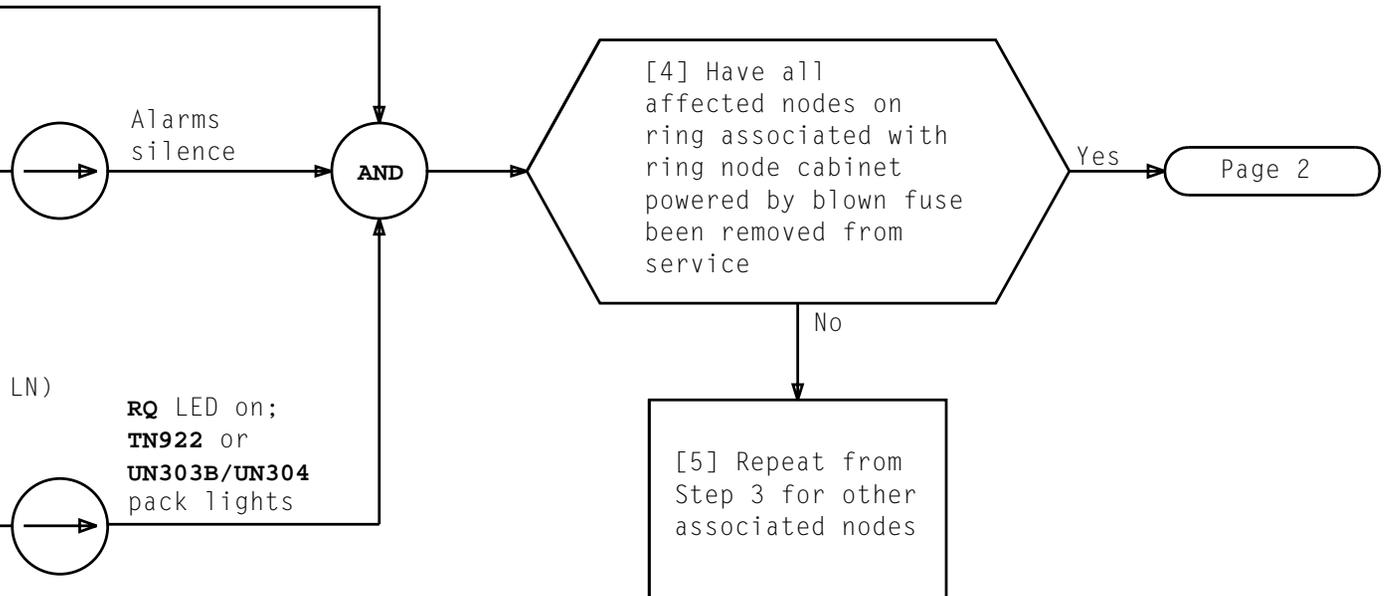
**RMV:ab c!**

a = Ring node type (RPCN or LN)

b = Ring node group  
number (00-63)

c = Node member number  
(0-15)

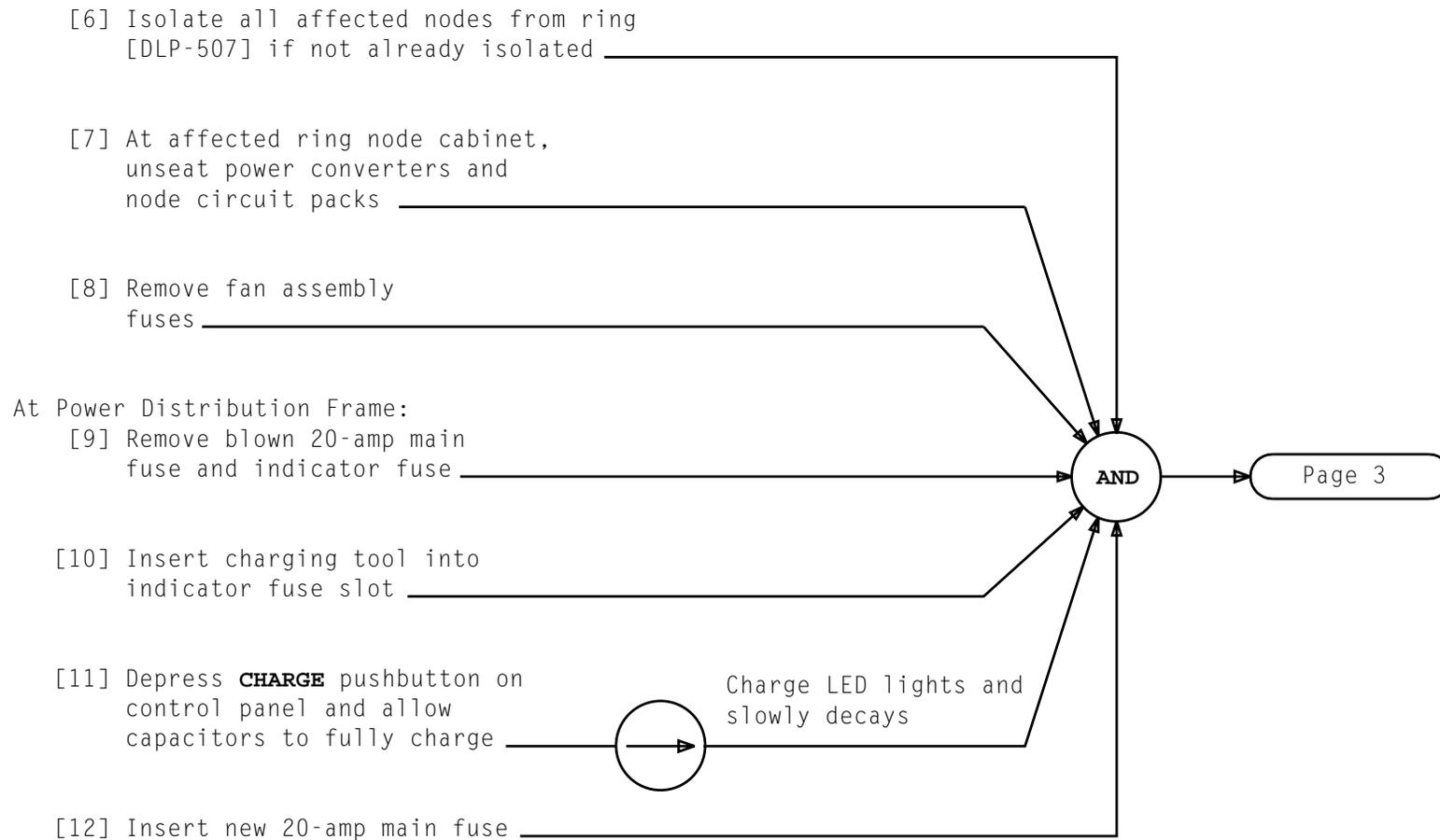
**RQ** LED on;  
**TN922** or  
**UN303B/UN304**  
pack lights



## REPLACE BLOWN FUSE — POWER DISTRIBUTION FRAME (J86334-B/C)

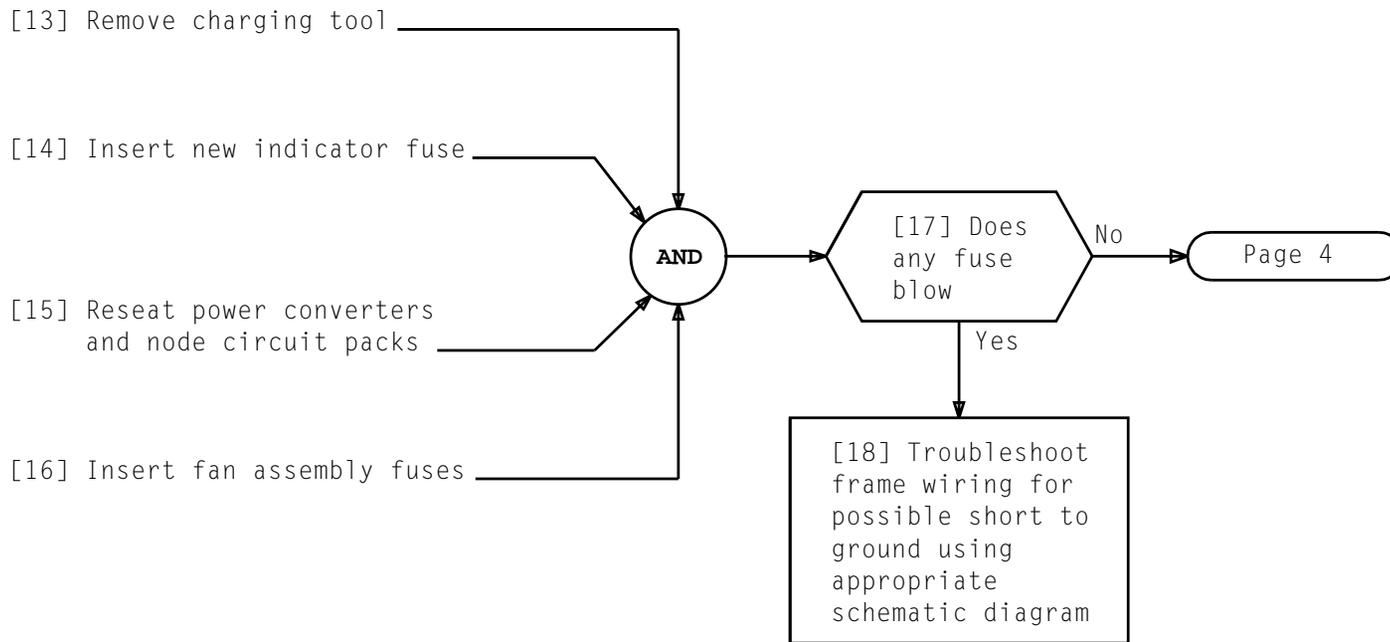
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**REPLACE BLOWN FUSE — POWER DISTRIBUTION FRAME (J86334-B/C)**

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**REPLACE BLOWN FUSE — POWER DISTRIBUTION FRAME (J86334-B/C)**

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[19] At ring node cabinet,  
depress **PWR ALM RESET**  
pushbutton

[20] Include all affected nodes  
on ring [DLP-508]

[21] At MCRT, enter:

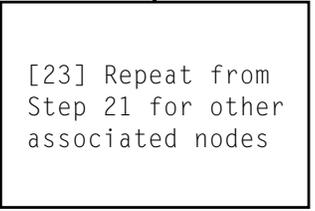
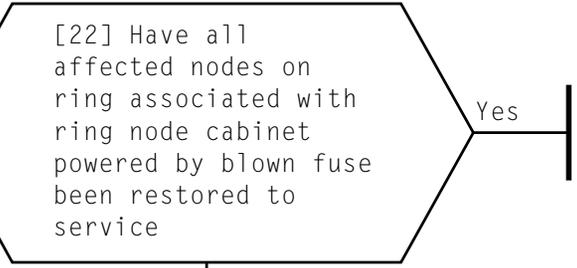
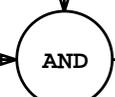
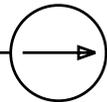
**RST:ab c;UCL!**

a = Ring node type (RPCN or LN)

b = Ring node group  
number (00-63)

c = Node member number  
(0-15)

**RQ** LED on;  
**TN922** or  
**UN303B/UN304**  
pack lights

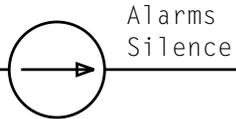


# REPLACE BLOWN FUSE – POWER DISTRIBUTION FRAME (J86334-B/C)

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[1] At fuse panel and alarm control unit, depress **ALM-RLS** pushbutton



[2] See NOTE 1. Identify nodes associated with FA power converter to be replaced



[3] At MCRT, enter:

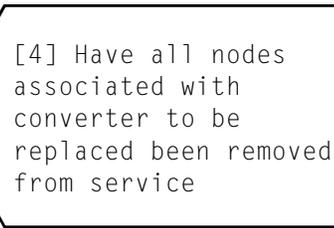
RMV:ab c!

for nodes associated with FA power converter

a = Ring node type (RPCN or LN)

b = Ring node group number (00-63)

c = Node member number (0-15)



Yes

Page 2

No

[5] Repeat from Step 3 for next node associated with converter

**NOTE 1**

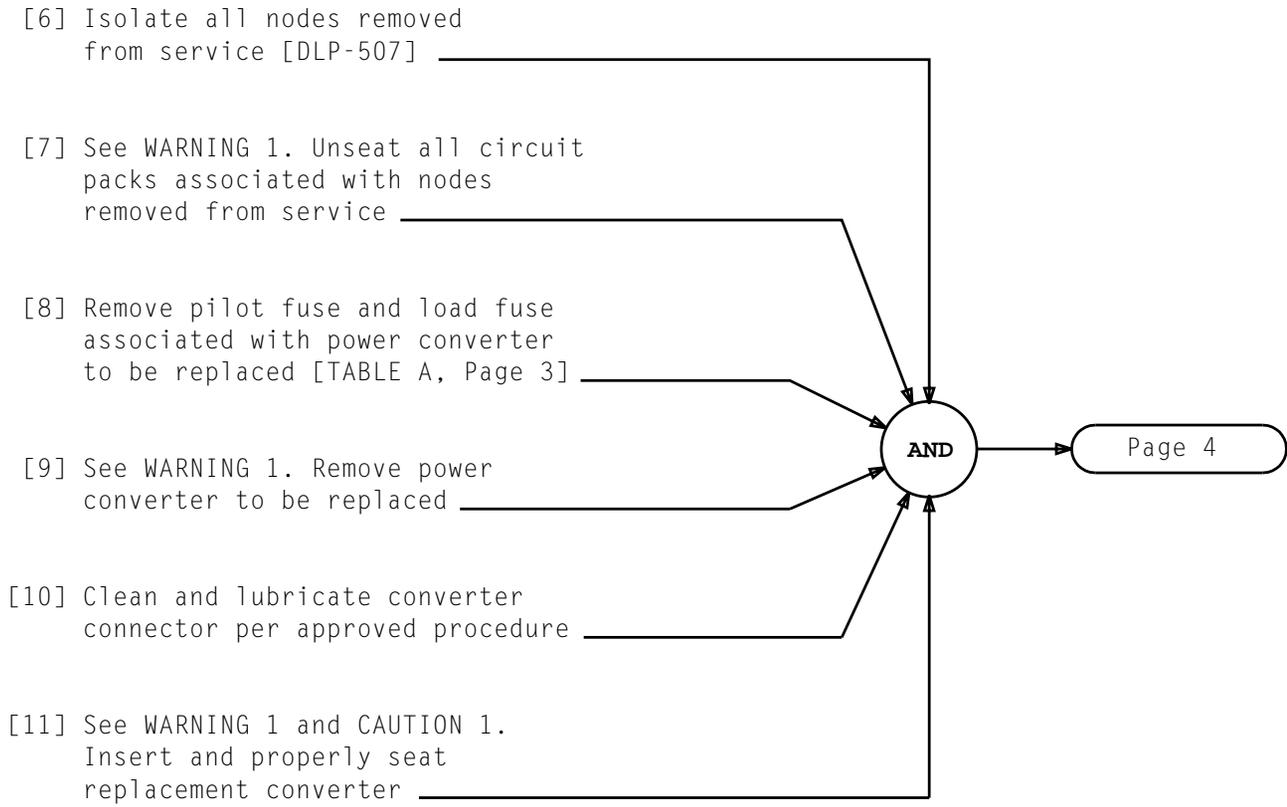
Two FA power converters supply power to each LN shelf unit. One converter supplies power for one-half the shelf unit and the other converter supplies power to other half. With this arrangement, it is possible that some LNs are powered by both converters

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**REPLACE FA POWER CONVERTER**



**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**CAUTION 1**  
*When replacing the 495FA Power Unit, series number 1:10, 1:11, 1:12, or 1:13 should NOT be used*

**REPLACE FA POWER CONVERTER**

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TABLE A FA POWER CONVERTER FUSES				
LINK NODE SHELF UNIT	FA POWER CONVERTER HORIZONTAL LOCATION		ASSOCIATED FUSES	
	RN CABINET	ILN OR HDB CABINET	PILOT	LOAD
0	10	15	M00	A00
	170	32	M01	A01
1	10	15	M10	B10
	170	32	M11	B11
2	10	15	M20	C20
	170	32	M21	C21
3	10	15	M30	D30
	170	32	M31	D31
4	10	15	M40	E40
	170	32	M41	E41
5	10	15	M50	F50
	170	32	M51	F51

**REPLACE FA POWER CONVERTER**

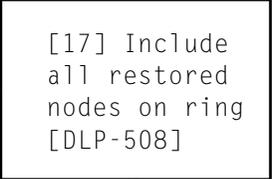
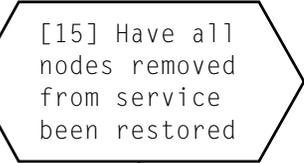
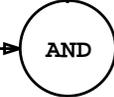
[12] Replace load fuse and pilot fuse previously removed

[13] See WARNING 1. Seat all circuit packs associated with nodes removed from service

[14] At MCRT, enter:

RST:ab c;UCL!

for nodes removed from service  
a = Ring node type (RPCN or LN)  
b = Ring node group number (00-63)  
c = Node member number (0-15)



**WARNING 1**  
It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins

# REPLACE FA POWER CONVERTER

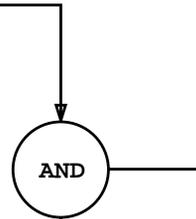
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[1] At MCRT, enter:

OP:RING,LNa b!

a = Ring node group number (00-63)

b = Node member number (1-15)



[2] Using system response [Figure 1],  
identify LN major state

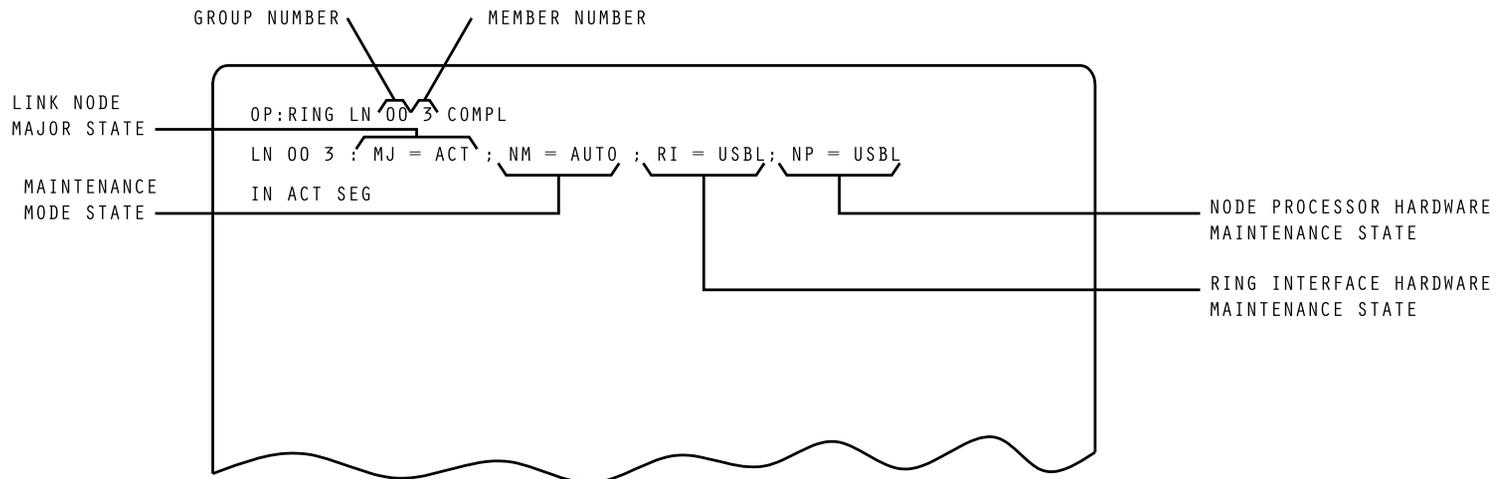


Figure 1 - Sample Printout of Link Node (LN) State

## VERIFY LINK NODE (LN) STATE

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[1] At MCRT, enter:

OP:SLK(a,b)!

a = Ring node group number (00-63)

b = Node member number (1-15)

[2] Using system response  
[Figure 1], identify  
signaling link state

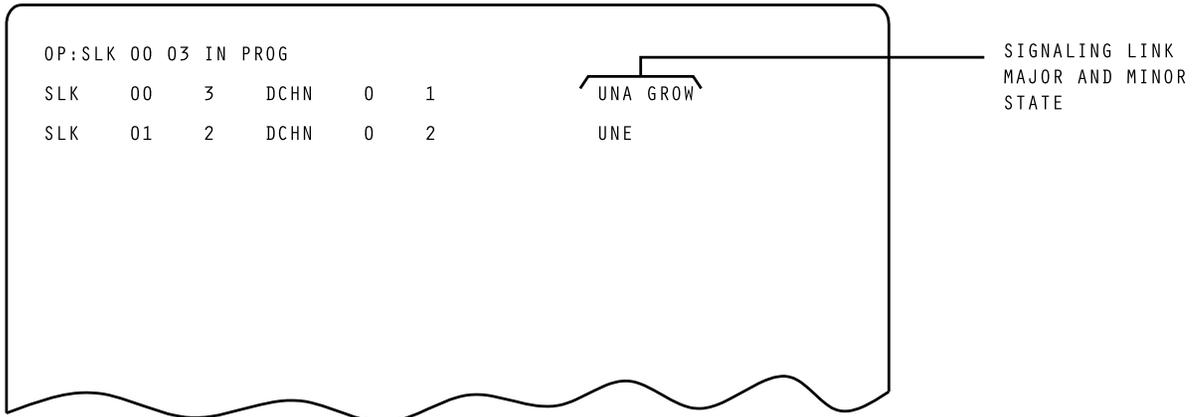
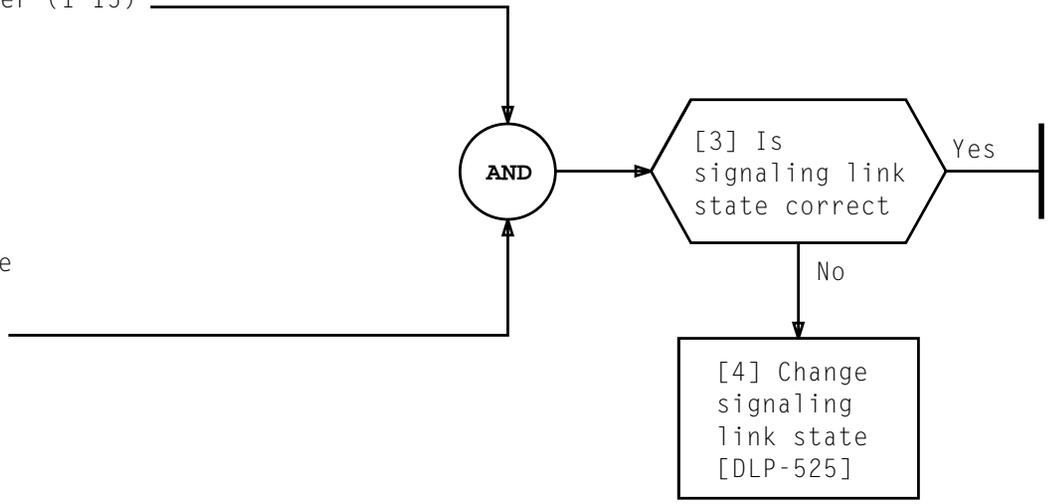


Figure 1 - Sample Printout of Signaling Link (SLK) State

## VERIFY SIGNALING LINK (SLK) STATE

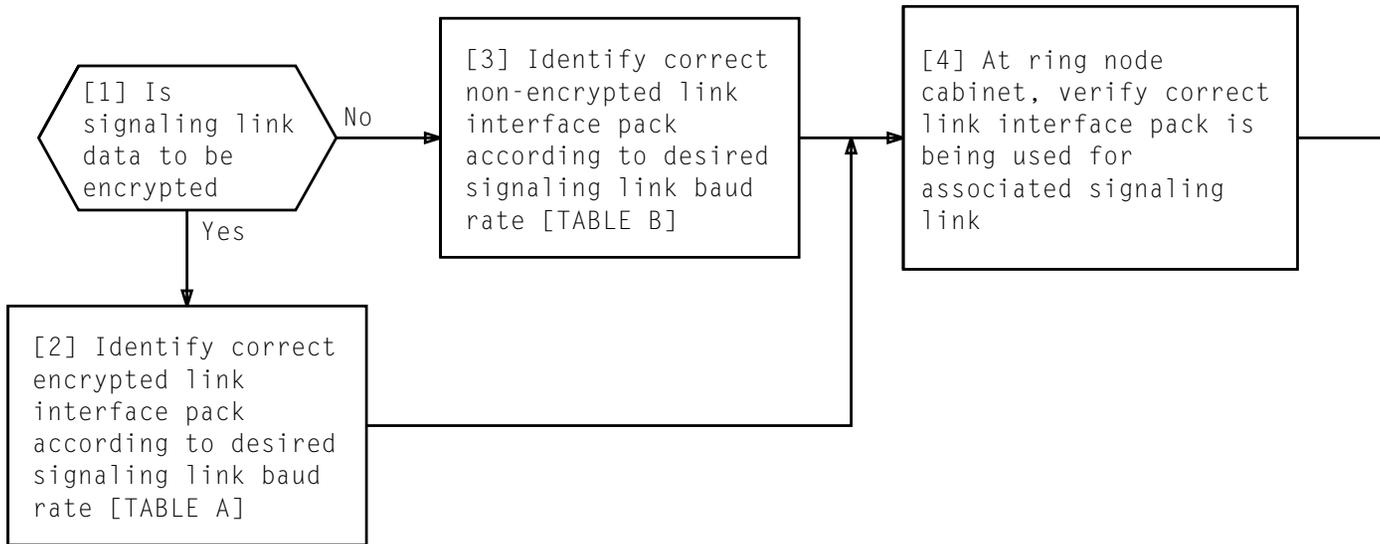


TABLE A ENCRYPTED LINK INTERFACE PACKS	
BAUD RATE	PACK IDENTIFICATION
2.4K	TN917 (MC3F004A1)
4.8K	
56K	TN917B (MC3F022A1)

TABLE B NON-ENCRYPTED LINK INTERFACE PACKS	
BAUD RATE	PACK IDENTIFICATION
2.4K	TN916 (MC3F001A1)
4.8K	
56K	TN916 (MC3F003A1)
1.544M	TN2520

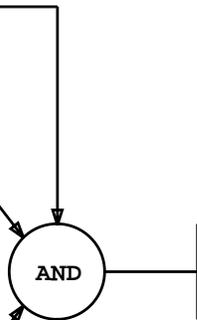
## VERIFY SIGNALING LINK'S LINK INTERFACE (LI)

[1] Identify correct DSU and CSU configuration associated with signaling link length and office designation [TABLE A]

[2] At DFA cabinet, verify correct DSU and CSU configurations are being used for associated signaling link

[3] Identify correct DSA associated with signaling link DSU [TABLE B]

[4] At DFA cabinet, verify correct DSA is being used for associated signaling link



## VERIFY SIGNALING LINK DIGITAL SERVICE UNIT (DSU), CHANNEL SERVICE UNIT (CSU), AND DIGITAL SERVICE ADAPTER (DSA)

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<b>TABLE A</b>			
<b>DIGITAL SERVICE UNIT AND CHANNEL SERVICE UNIT CONFIGURATION</b>			
<b>SIGNALING LINK LENGTH</b>	<b>DSU AND CSU CONFIGURATION</b>		<b>CONDITIONS</b>
	<b>NEAR-END OFFICE</b>	<b>FAR-END OFFICE</b>	
1000 FEET OR LESS	AT&T 500B/AT&T 502B DSU with No CSU	AT&T 500B/AT&T 502B DSU with No CSU	With this configuration, neither a CSU or transmission facility is used. The designated control office must use the AT&T 502B DSU
GREATER THAN 1000 FEET BUT LESS THAN OR EQUAL TO 9 MILES	AT&T 502B DSU and AT&T 550A CSU	AT&T 502B DSU and AT&T 550A CSU	With this configuration, a CSU is used but no transmission facility is required. The near-end office must use the AT&T 502B DSU to provide internal timing. Repeaters are required every three miles.
	AT&T 2556/DATATEL DSU-CSU combination	AT&T 2556/DATATEL DSU-CSU combination	With this configuration, no transmission facility is required. One office must modify its DSU/CSU to provide internal timing by enabling position 5 of option switch 1 on the DATATEL DSU/CSU or by enabling position 6 and disabling position 7 of option switch 1 on the AT&T 2556 DSU/CSU. Repeaters are required every three miles.
GREATER THAN 9 MILES	AT&T 500B DSU and AT&T 550A CSU	AT&T 500B DSU and AT&T 550A CSU	With this configuration, both a CSU and transmission facility is required. A AT&T 500B DSU is used at both the near-end and far-end offices
	AT&T 2556/DATATEL DSU-CSU combination	AT&T 2556/DATATEL DSU-CSU combination	A transmission facility is required with this configuration.

**VERIFY SIGNALING LINK DIGITAL SERVICE UNIT (DSU), CHANNEL SERVICE UNIT (CSU), AND DIGITAL SERVICE ADAPTER (DSA)**

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TABLE B DIGITAL SERVICE ADAPTERS	
SIGNALING LINK DSU TYPE	ASSOCIATED DSA TYPE
AT&T 500B DSU or Unmodified AT&T 2556 DSU-CSU Combination	<b>TF5</b>
AT&T 502B DSU; DATATEL DSU-CSU Combination, or Modified AT&T 2556 (2556 L-1A/2) DSU-CSU Combination	<b>TF9</b>

**VERIFY SIGNALING LINK DIGITAL SERVICE UNIT (DSU), CHANNEL  
SERVICE UNIT (CSU), AND DIGITAL SERVICE ADAPTER (DSA)**

[1] On AT&T 500B/AT&T 502B DSU, remove front and rear faceplates by depressing two tabs on bottom edge and simultaneously pulling outward

[2] At front of DSU, locate ground option switch (**S1**) [Figure 1]

[3] At rear of DSU, locate ten position option header (**H1**) and associated shunts [Figure 1]

[4] See NOTE 1. Ensure correct DSU options are set [TABLE A]

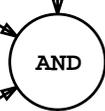


TABLE A AT&T 500B/AT&T 502B DSU OPTIONS	
OPTION	SETTING
Switch and LED assembly installed in front	—
LL spring clip installed	—
Ground option switch ( <b>S1</b> ) connected to frame ground (Switch IN) or disconnected from frame ground (Switch OUT)	<b>S1</b> switch either IN or OUT depending on what provides the best SLK performance
"Continuous request to send" feature enabled	<b>H1</b> header position 2 shunted
"Circuit assurance removed" feature enabled	<b>H1</b> header position 5 shunted
"System status removed" feature enabled	<b>H1</b> header position 8 shunted

NOTE 1  
**H1** header options are set by slipping shunts over the two pins that make up a position. Four shunts are provided. One is a spare and should be stored on position 10

**VERIFY AT&T 500B/AT&T 502B DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

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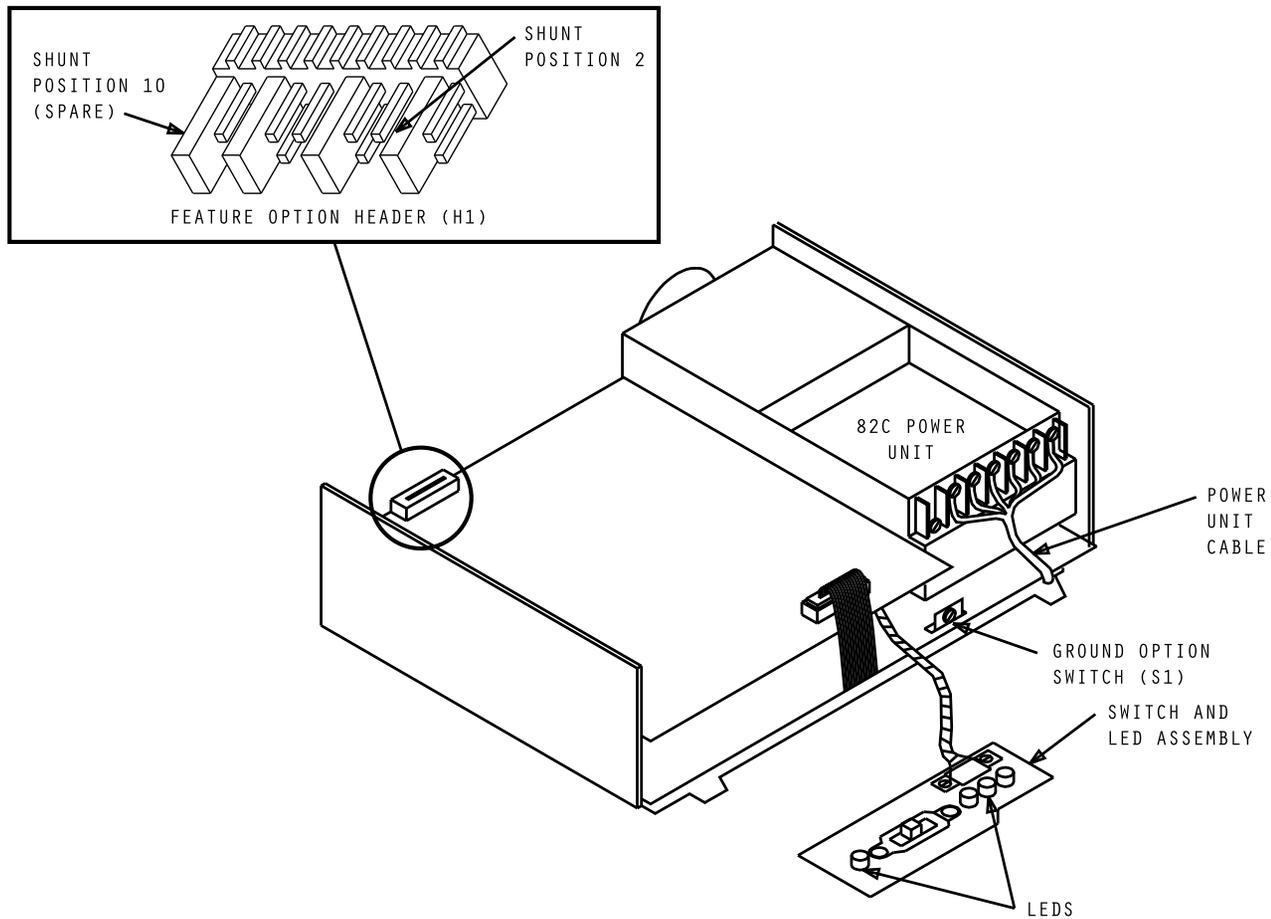
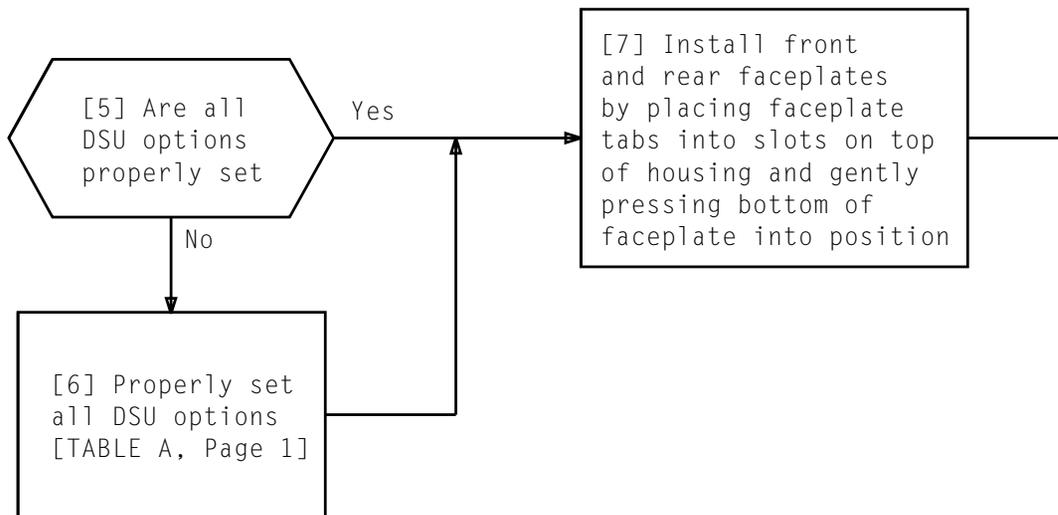


Figure 1 - AT&T 500B/AT&T 502B TYPE DATA UNIT SELECTOR (INTERNAL VIEW)

**VERIFY AT&T 500B/AT&T 502B DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

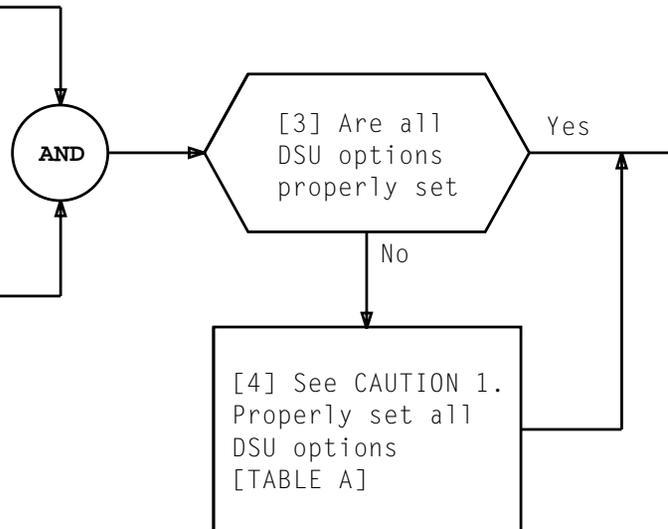


**VERIFY AT&T 500B/AT&T 502B DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

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[1] On DATATEL DCP3189 DSU,  
locate option switch **s1**  
and switch **s2**

[2] See CAUTION 1. Ensure  
correct DSU options are  
set [TABLE A, Page 2]



## VERIFY DATATEL DCP3189 DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET

<i>CAUTION 1</i> <i>Option switch (s1 or s2) position settings should not be changed while DSU power is ON</i>	
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TABLE A DATATEL DCP3189 DSU OPTIONS		
OPTION SWITCH		
DESIGNATION	POSITION	SETTING
S1	1	OFF
	2	OFF
	3	ON
	4	ON
	5	SEE NOTE
	6	OFF
	7	ON
	8	ON
S2	1	OFF
	2	ON
	3	OFF
	4	ON
	5	ON
	6	ON
	7	ON
	8	ON
NOTE: Set switch to OFF for applications where internal timing is not required or to ON for applications where internal timing is required		

**VERIFY DATATEL DCP3189 DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

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[1] On AT&T 2556 DSU, locate 12 position option DIP switch [Figure 1]

[2] Ensure correct DSU options are set [TABLE A]

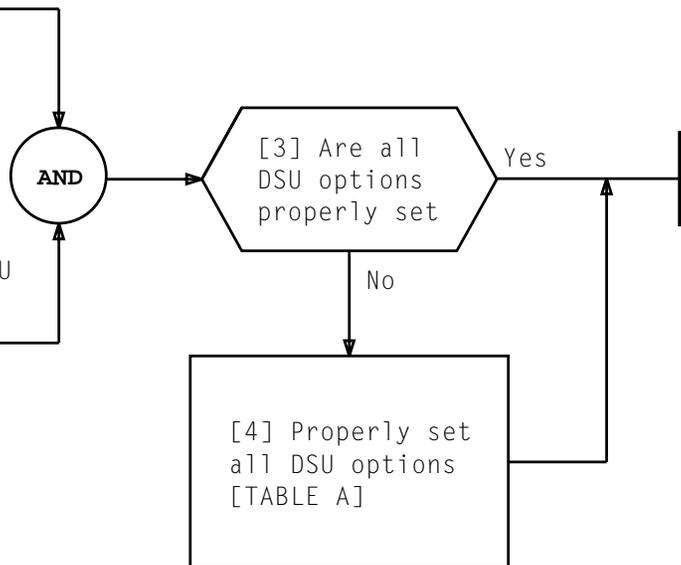


TABLE A AT&T 2556 DSU OPTIONS	
OPTION SWITCH	
POSITION	SETTING
1	ENABLE
2	DISABLE
3	ENABLE
4	DISABLE
5	DISABLE
6	DISABLE (SEE NOTE)
7	DISABLE
8	DISABLE
9	ENABLE
10	ENABLE
11	ENABLE
12	ENABLE

NOTE: This switch position should be enabled when the DSU is modified to be a AT&T 502B (metallic facility).

**VERIFY AT&T 2556 DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

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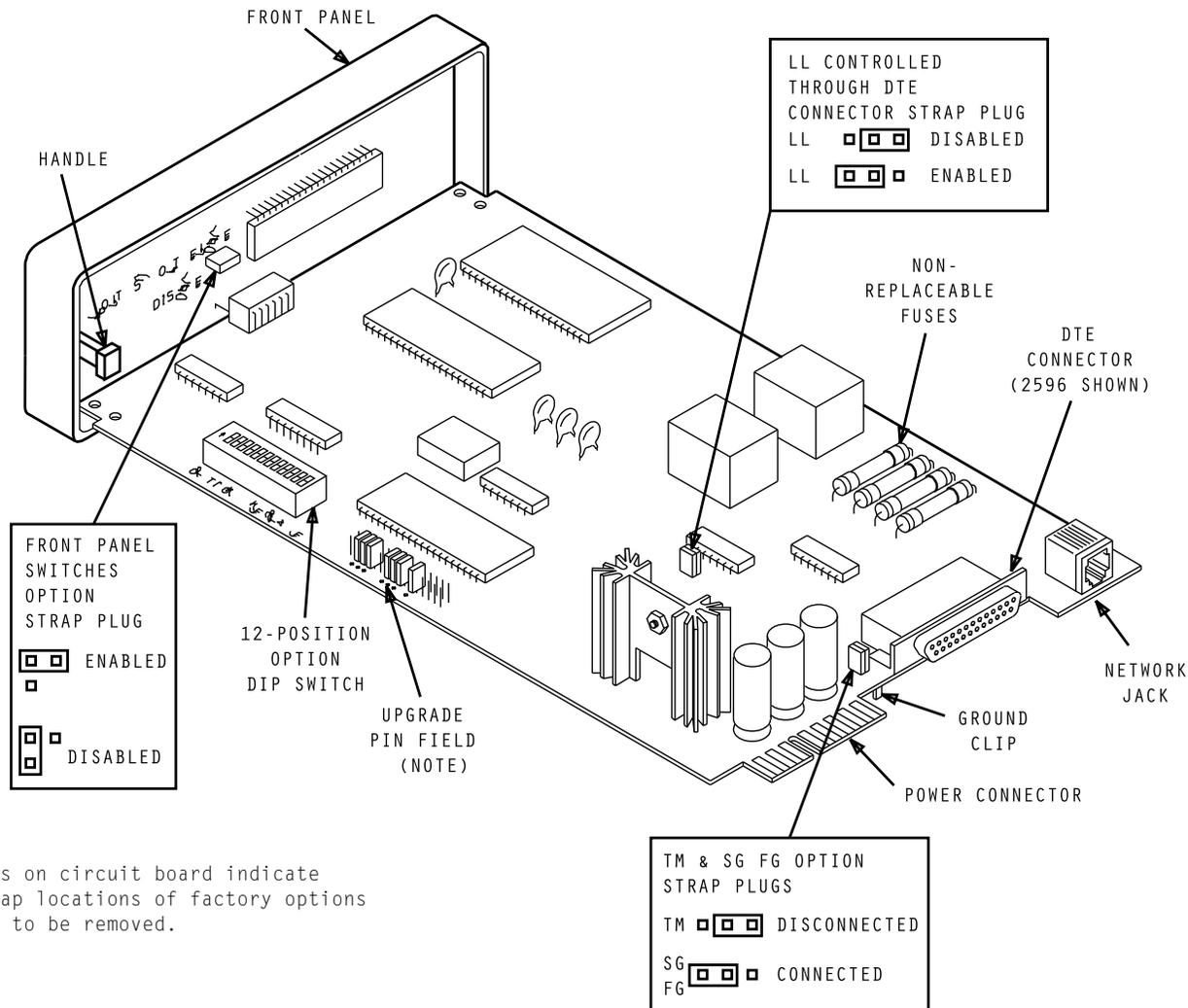


Figure 1 - AT&T 2556 TYPE DATA UNIT SELECTOR (INTERNAL VIEW)

**VERIFY AT&T 2556 DATA SERVICE UNIT (DSU) OPTIONS ARE PROPERLY SET**

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[1] At DFA cabinet, identify AT&T 550A CSU associated with signaling link

[2] On AT&T 550A CSU, place tip of small screwdriver under cover and gently lift to flex basepan and release holding tabs

[3] At rear of CSU, locate ground option switch (**s1**) [Figure 1]

[4] At rear of CSU, locate ten position option header (**H1**) and associated shunts [Figure 1]

[5] See NOTE 1. Ensure correct CSU options are set [TABLE A]

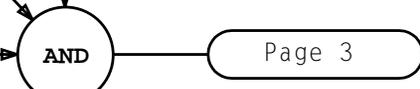


TABLE A AT&T 550A CSU OPTIONS	
OPTION	SETTING
Ground option switch ( <b>s1</b> ) connected to frame ground (Switch IN) or disconnected from frame ground (Switch OUT)	<b>s1</b> switch either IN or OUT depending on what provides the best SLK performance
"Fixed line build-out network installed" feature enabled	<b>H1</b> header positions 3, 5, and 9 shunted

NOTE 1 <b>H1</b> header options are set by slipping shunts over the two pins that make up a position. Four shunts are provided. One is a spare and should be stored on position 10	
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**VERIFY AT&T 550A CHANNEL SERVICE UNIT (CSU) OPTIONS ARE PROPERLY SET**

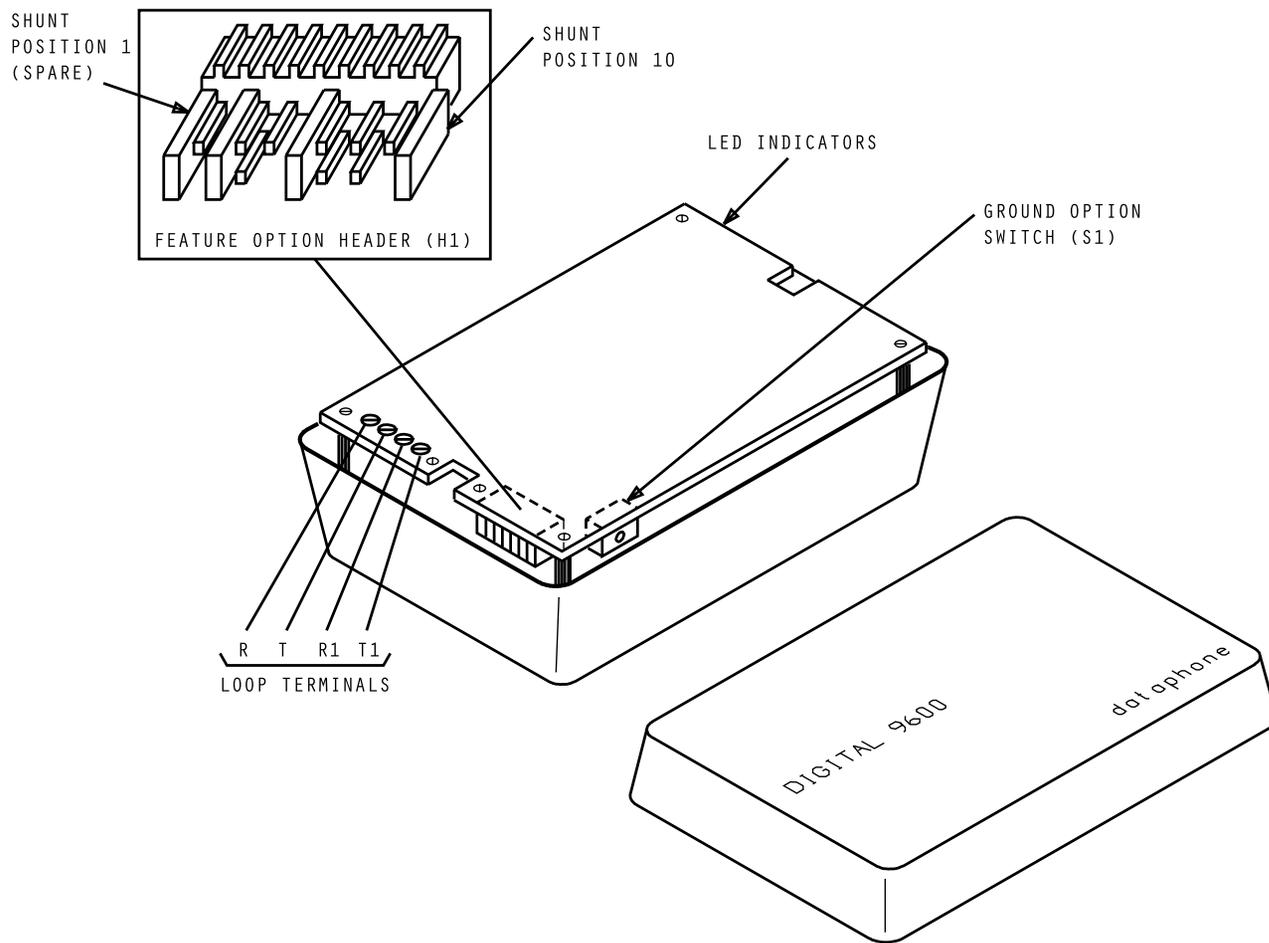
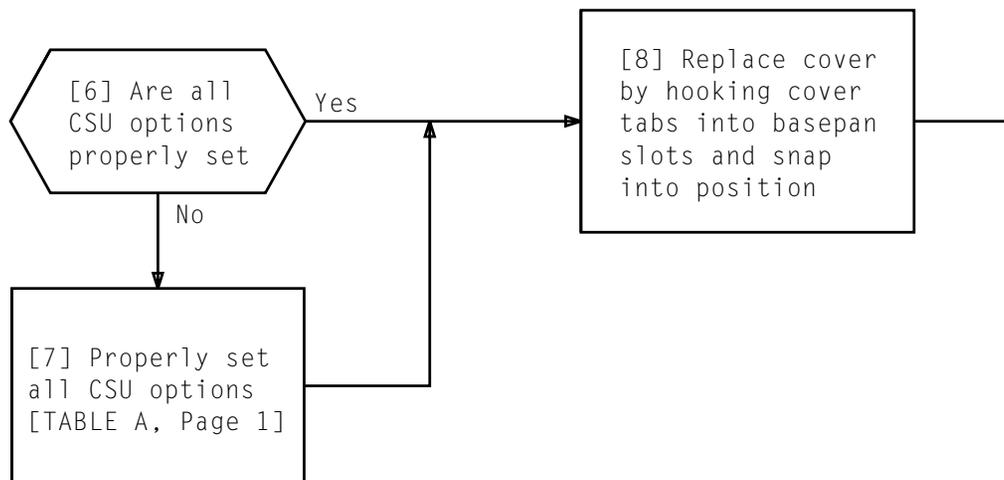


Figure 1 - AT&T 550A TYPE CHANNEL SELECTOR UNIT - COVER REMOVED

**VERIFY AT&T 550A CHANNEL SERVICE UNIT (CSU) OPTIONS ARE PROPERLY SET**

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**VERIFY AT&T 550A CHANNEL SERVICE UNIT (CSU) OPTIONS ARE PROPERLY SET**

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[1] At DFA cabinet, identify DSA type (TF5 or TF9) associated with signaling link

[2] What is identified DSA type

TF9

[3] DSA type TF9 has no changeable options

TABLE A TF5 DSA OPTIONS	
OPTION SWITCH	SETTING
S1A	ON
S1B	OFF

TF5

[4] On TF5 DSA, locate S1A and S1B option switches

AND

[6] Are all DSA options properly set

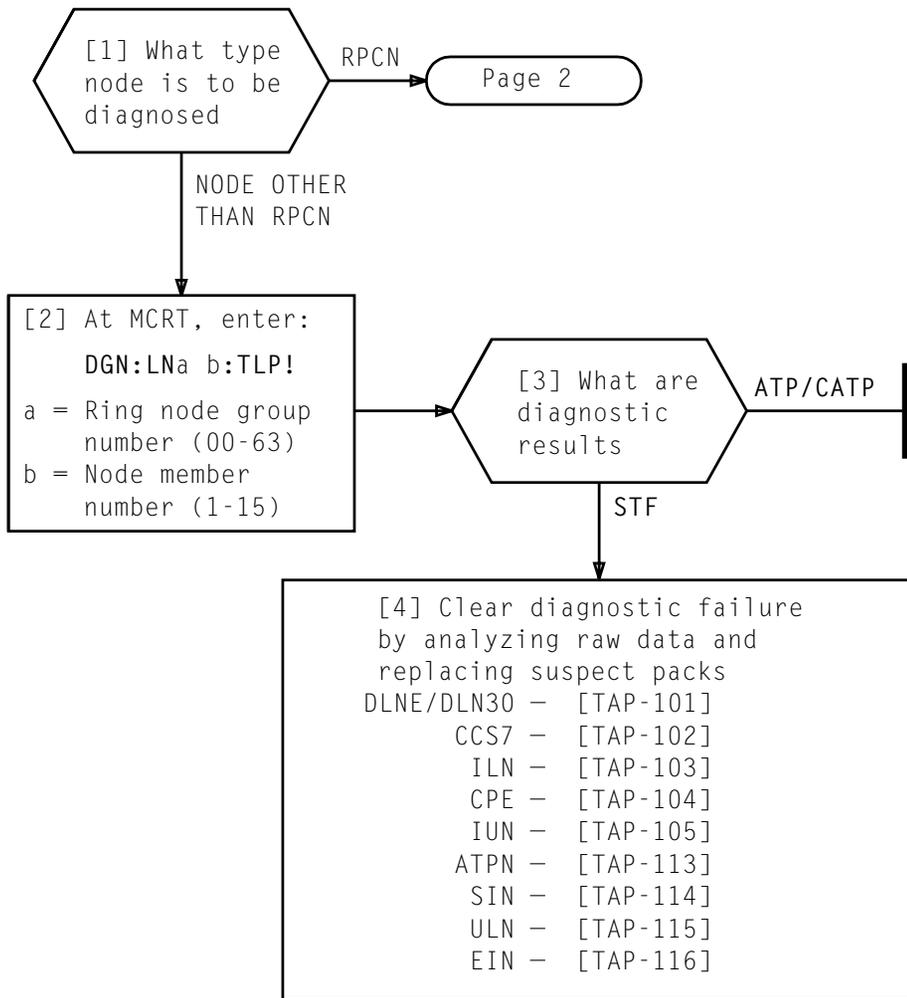
Yes

[5] Ensure correct DSA options are set [TABLE A]

No

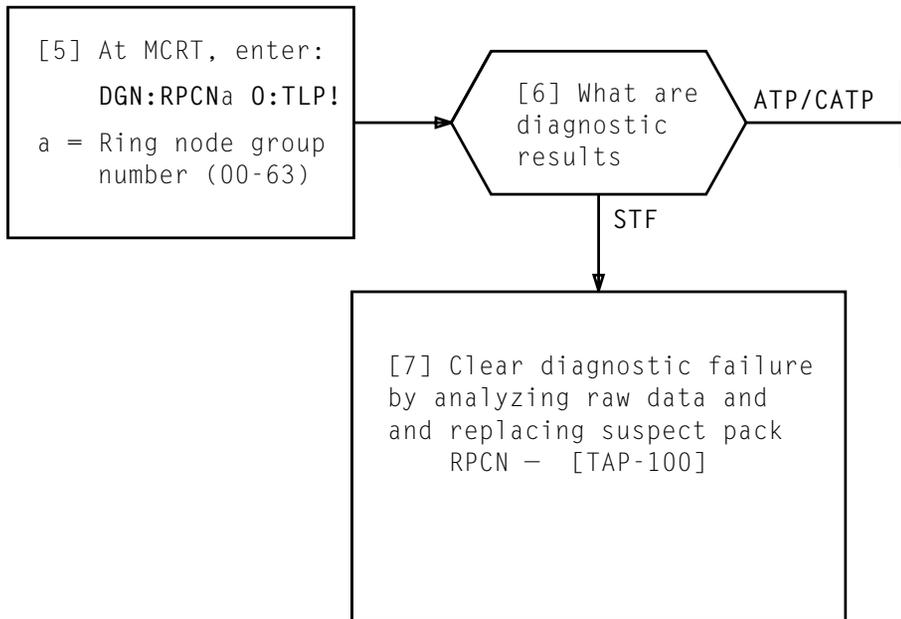
[7] Properly set all DSA options [TABLE A]

**VERIFY DIGITAL SERVICE ADAPTER (DSA) OPTIONS ARE PROPERLY SET**



**PERFORM NODE DIAGNOSTICS**

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**PERFORM NODE DIAGNOSTICS**

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[1] At MCRT, enter:

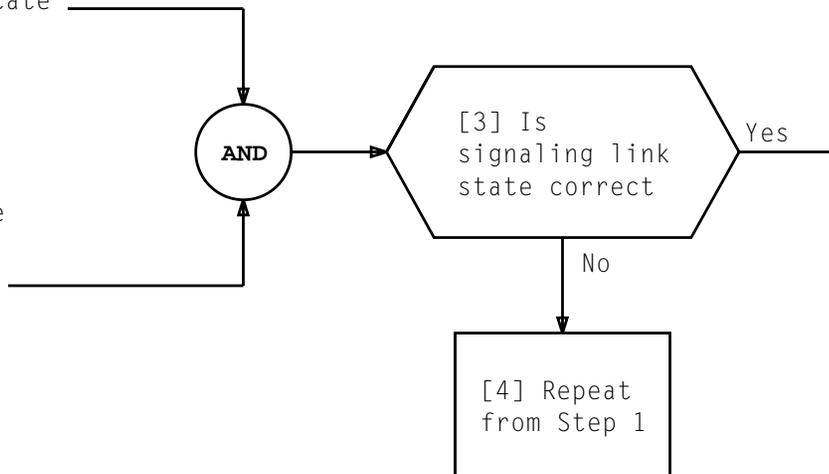
CHG:SLK(a,b);c!

a = Ring node group  
number (00-63)

b = Node member number (1-15)

c = Signaling link state

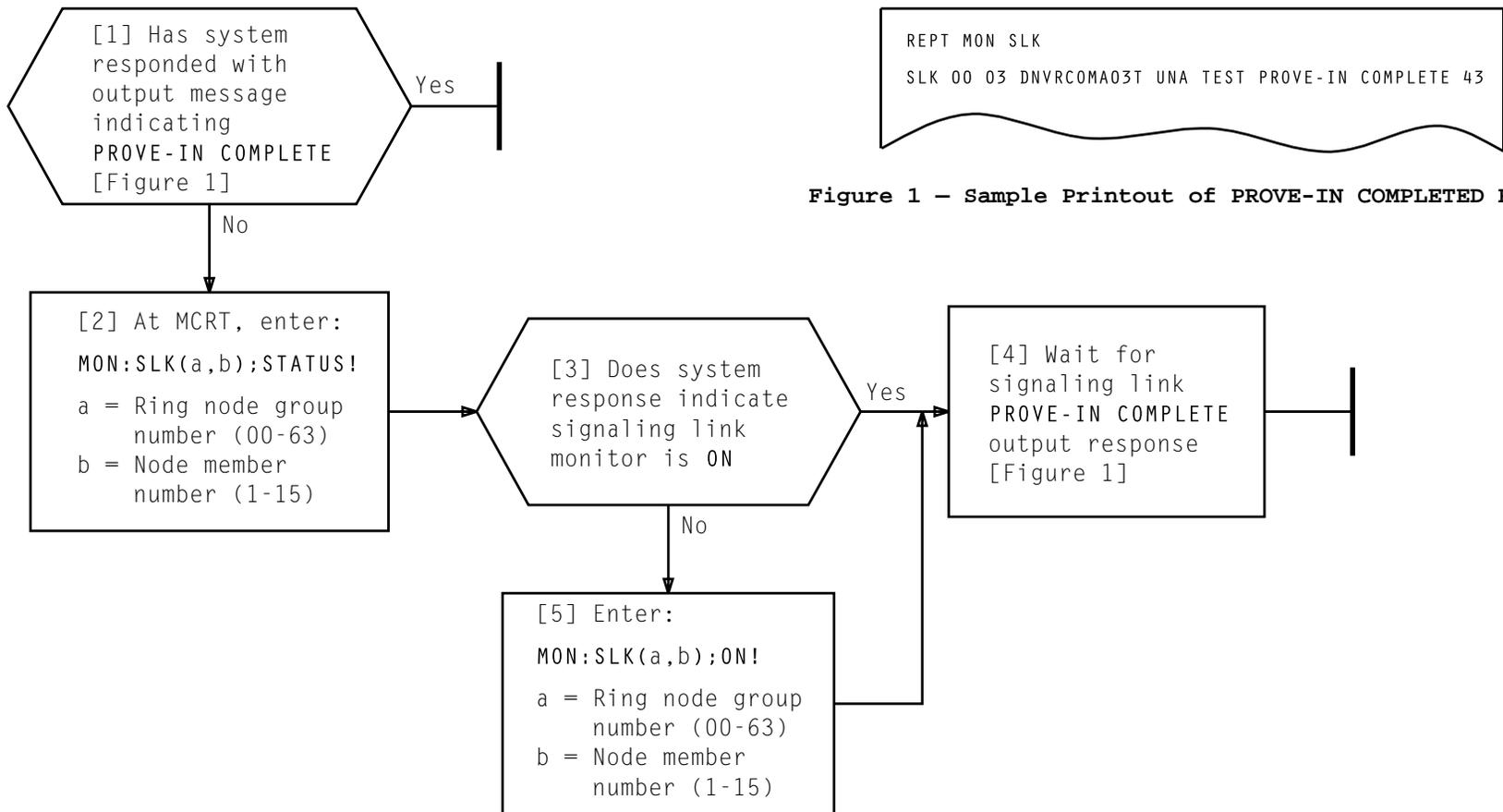
[2] Using system response  
[Figure 1], identify  
signaling link state



SLK STATE

```
CHG: SLK (00,03)
SLK 00 03 CHANGE ACCEPTED, NEW MINOR STATE = TEST
```

Figure 1 - Sample Printout of Output Response  
To Signaling Link State Change



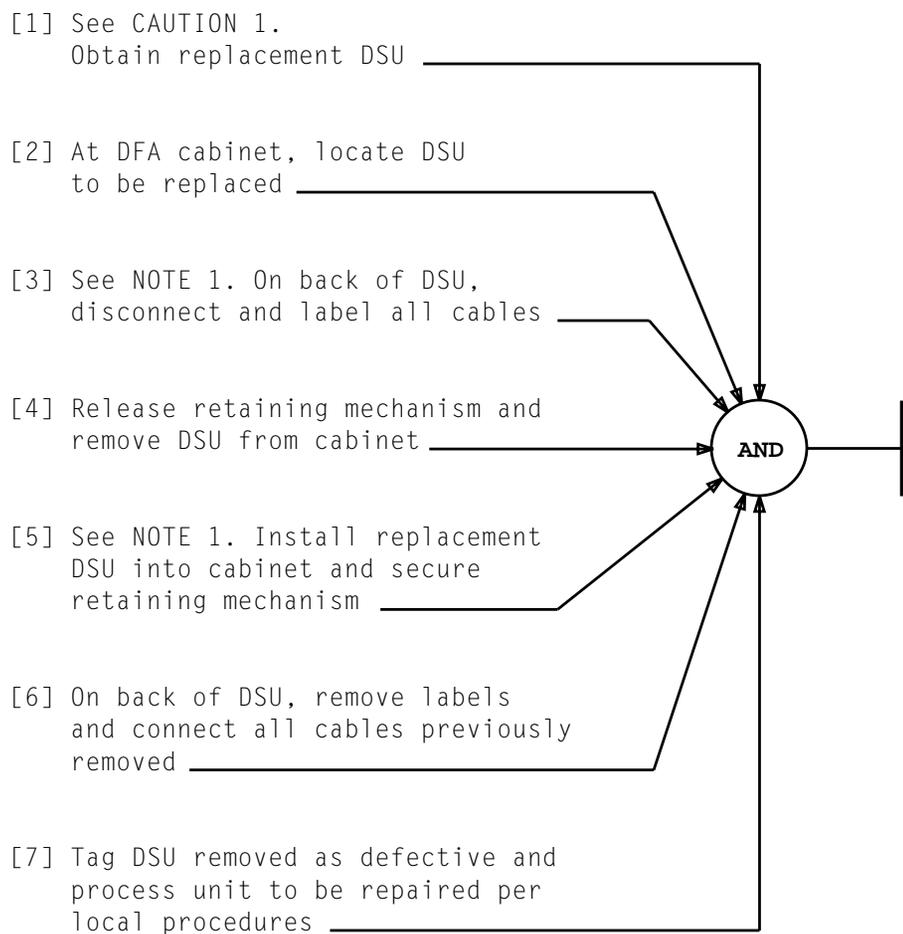
```

REPT MON SLK
SLK 00 03 DNVRCOMAO3T UNA TEST PROVE-IN COMPLETE 43
  
```

Figure 1 - Sample Printout of PROVE-IN COMPLETED Response

**VERIFY SIGNALING LINK IS IN SYNC AND PROVED-IN**

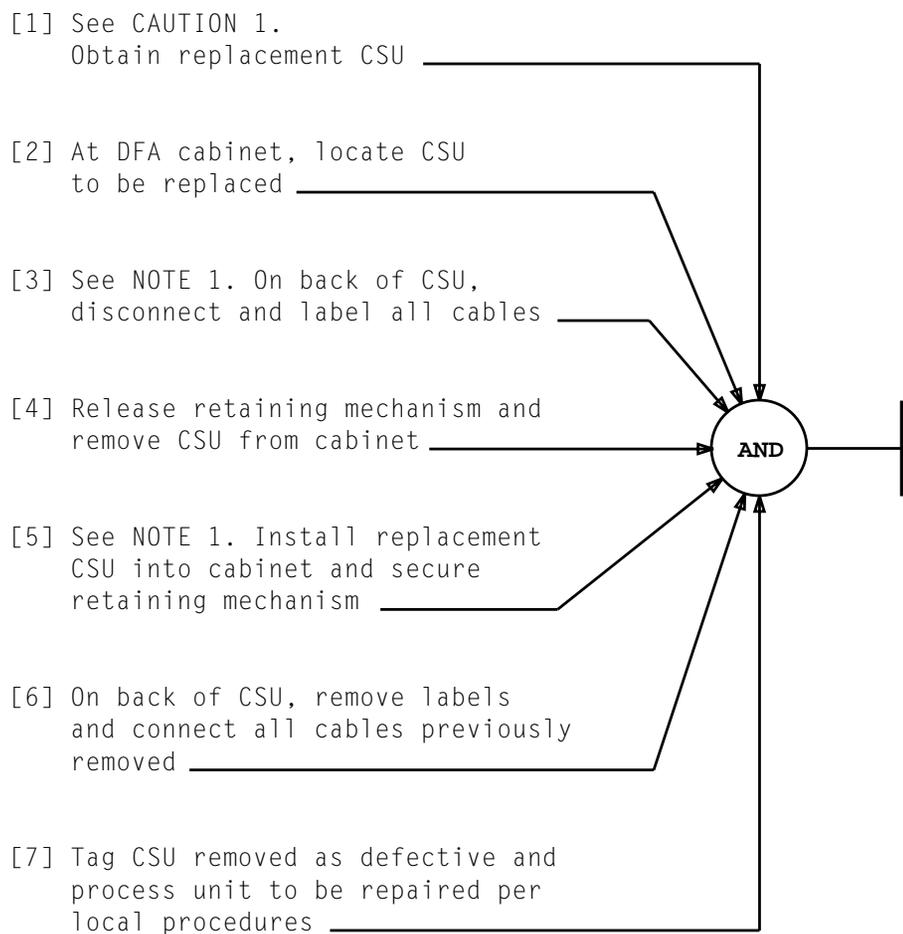
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**NOTE 1**  
When handling any equipment or working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to common ground. When appropriate wrist strap is not available, grounded (exposed) metal should always be touched before handling equipment. Unprotected equipment should never be passed to an ungrounded person nor touch components, leads nor connector pins

**CAUTION 1**  
*Keep DSU in protective package until it is ready to be installed in cabinet*

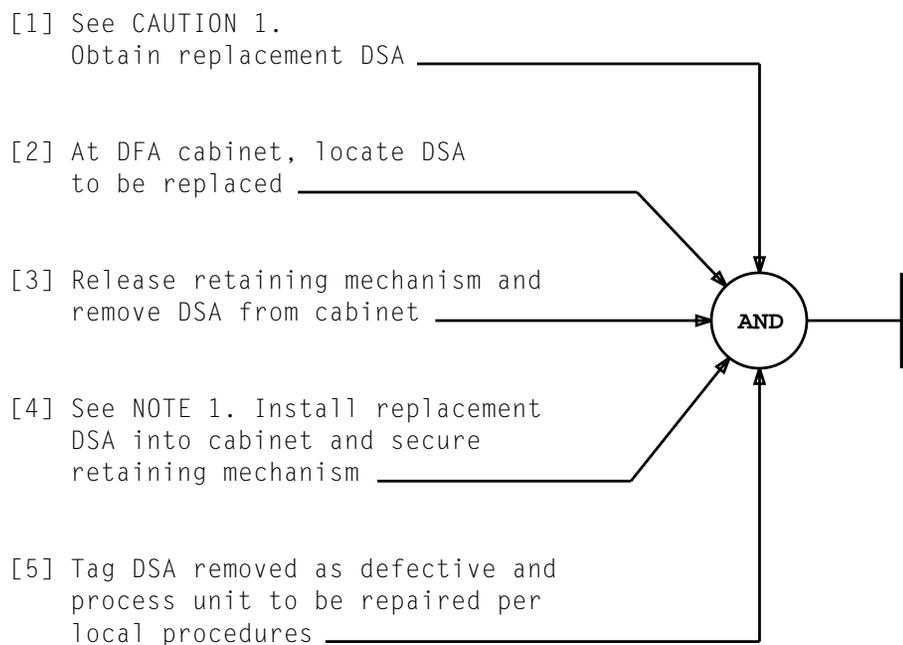
## REPLACE DIGITAL SERVICE UNIT (DSU)



**NOTE 1**  
When handling any equipment or working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to common ground. When appropriate wrist strap is not available, grounded (exposed) metal should always be touched before handling equipment. Unprotected equipment should never be passed to an ungrounded person nor touch components, leads nor connector pins

**CAUTION 1**  
*Keep CSU in protective package until it is ready to be installed in cabinet*

## REPLACE CHANNEL SERVICE UNIT (CSU)

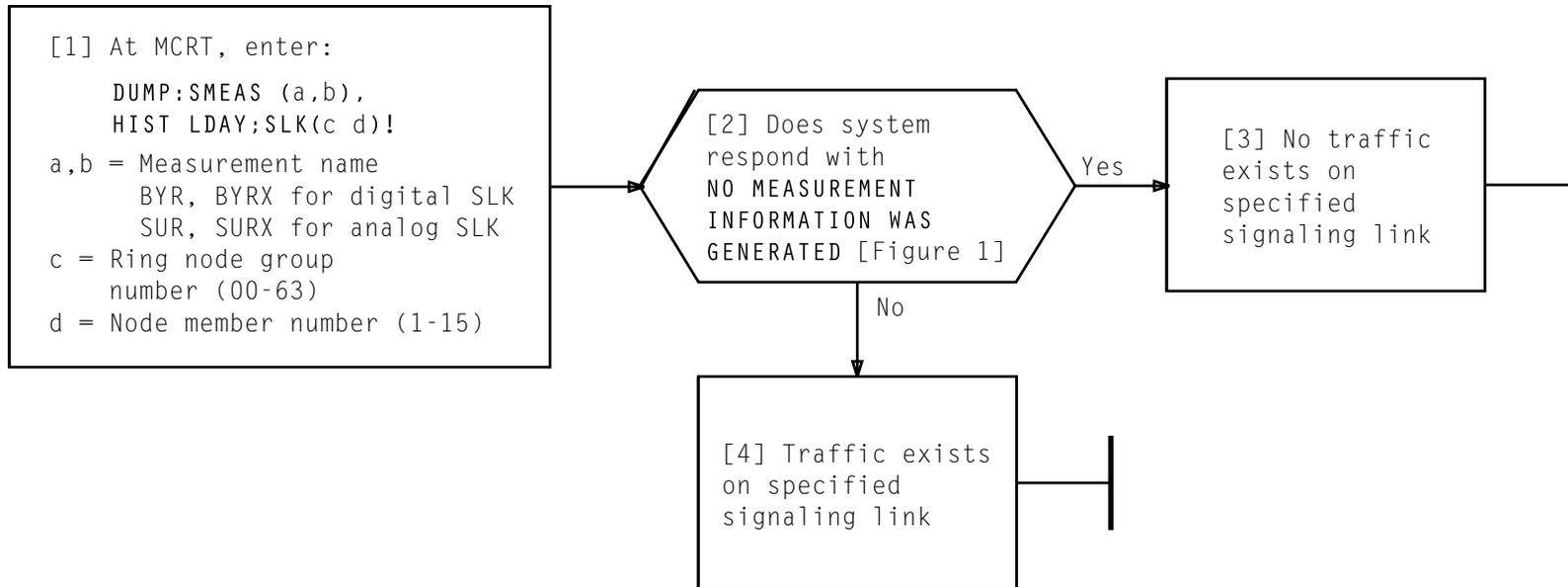


**NOTE 1**  
When handling any equipment or working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to common ground. When appropriate wrist strap is not available, grounded (exposed) metal should always be touched before handling equipment. Unprotected equipment should never be passed to an ungrounded person nor touch components, leads nor connector pins

**CAUTION 1**  
*Keep DSA in protective package until it is ready to be installed in cabinet*

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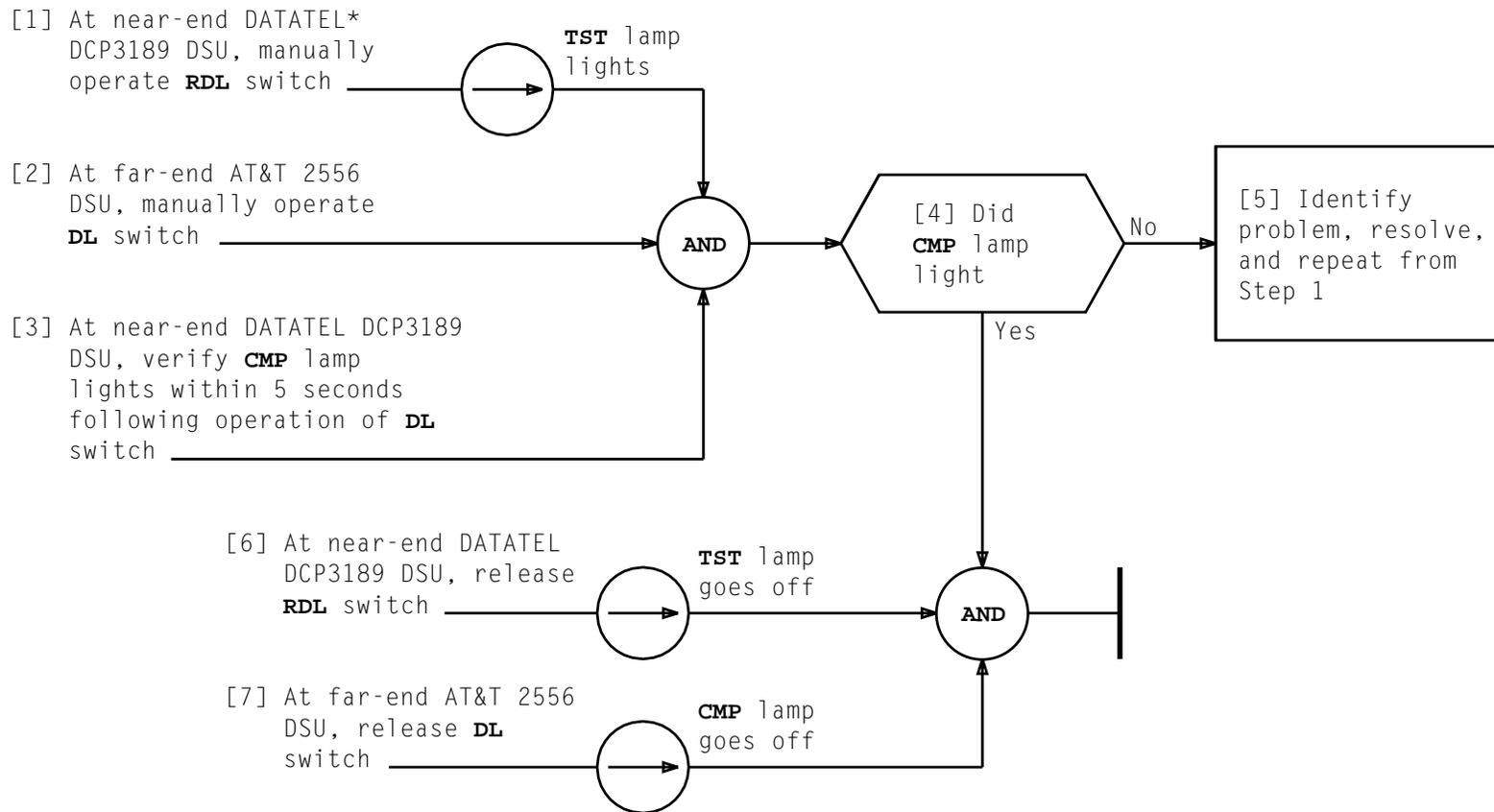
## REPLACE DIGITAL SERVICE ADAPTER (DSA)



```

DUMP SMEAS COMPL
NO MEASUREMENT INFORMATION WAS GENERATED
  
```

Figure 1 - Sample Printout Indicating No Signaling Link Measurement Data



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**PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST  
(DATATEL DCP3189 DSU TO AT&T 2556 DSU)**

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[1] Request far-end to enable DSU digital loop option by setting option switch **S2** position **5** to **ON**

[2] Set near-end DSU option switch **S2** position **5** to **OFF**

[3] At near-end DSU, manually operate **RDL** switch

**TST** lamp lights at both near-end and far-end DSU

[4] At far-end DSU, verify **CMP** lamp lights within 5 seconds following operation of **RDL** switch

[5] At near-end DSU, verify **CMP** lamp lights within 10 seconds following operation of **RDL** switch

AND

[6] Did **CMP** lamp light at both near-end and far-end DSU

No

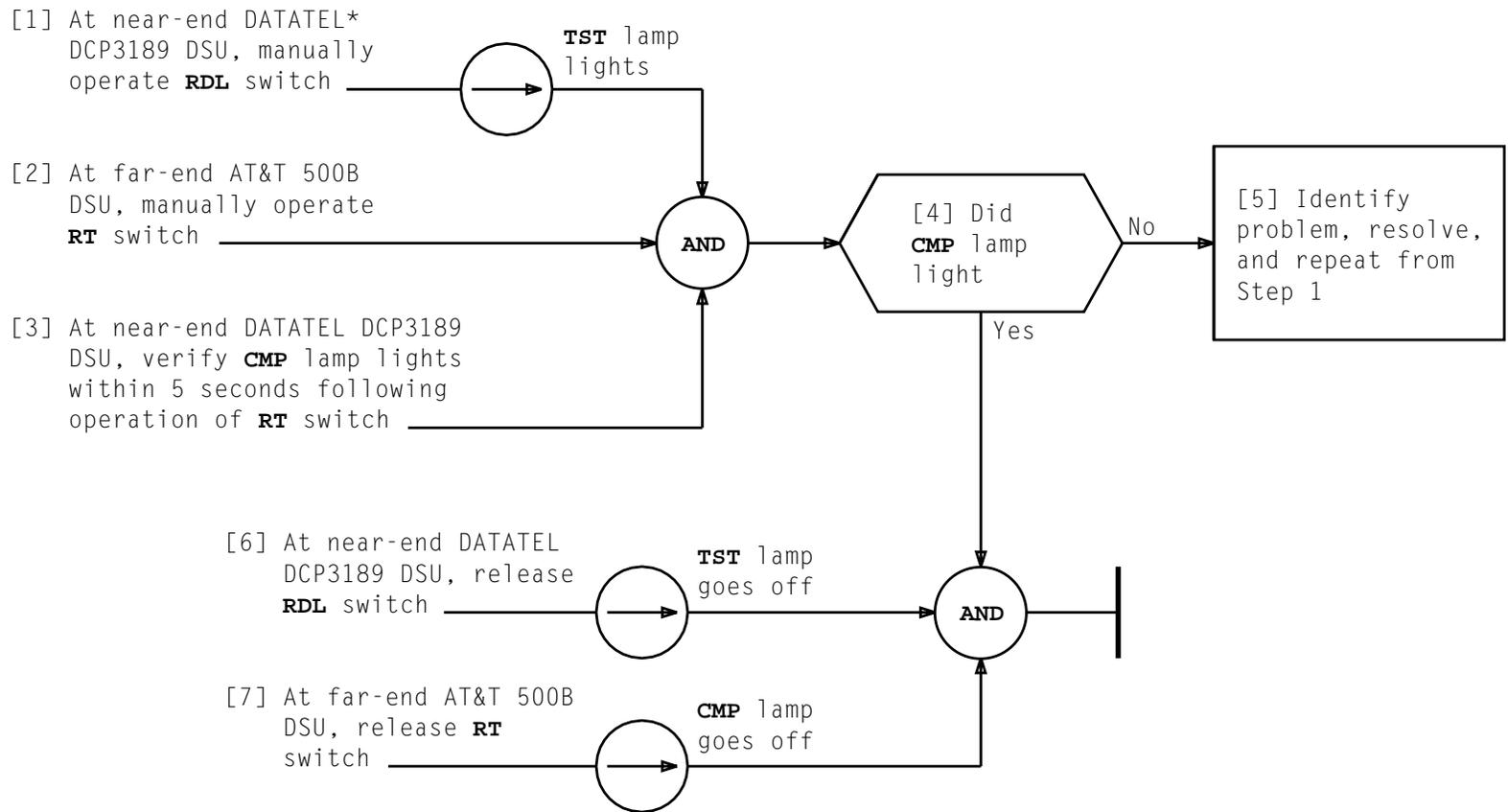
[7] Identify problem, resolve, and repeat from Step 1

Yes

[8] At near-end DSU, release **RDL** switch  
*Response: TEST and CMP lamps go off at both DSUs*

[9] At both DSUs, return option switch **S2** position **5** to original settings

**PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST  
(DATATEL DCP3189 DSU TO DATATEL DCP3189 DSU)**



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**PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST  
(DATATEL DCP3189 DSU TO AT&T 500B DSU)**

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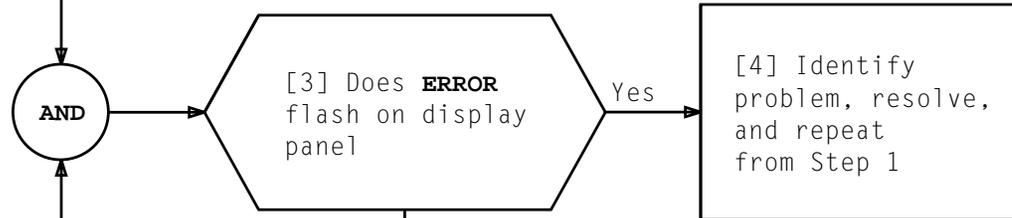
At near-end AT&T 2556 DSU:

[1] Manually operate

**RL** switch

[2] Manually operate

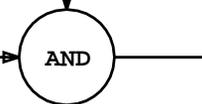
**TP** switch



At near-end AT&T 2556 DSU:

[5] Release **TP** switch

[6] Release **RL** switch



# PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST (AT&T 2556 DSU TO AT&T 2556 DSU)

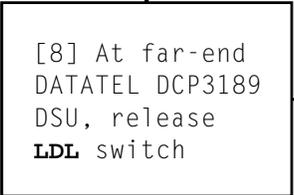
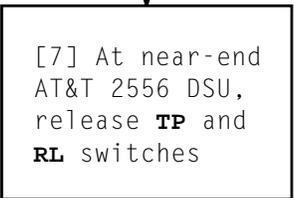
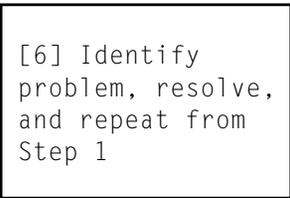
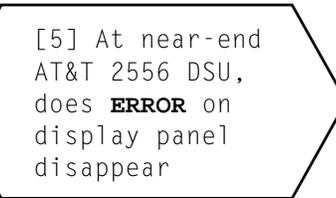
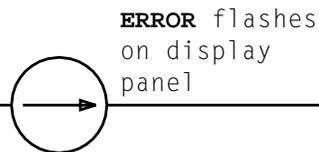
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[1] At near-end AT&T 2556 DSU, manually operate **RL** switch

[2] At near-end AT&T 2556 DSU, manually operate **TP** switch

[3] At far-end DATATEL\* DCP3189 DSU, verify **CMP** lamp lights within 5 seconds following operation of **TP** switch

[4] At far-end DATATEL DCP3189 DSU, manually operate **LDL** switch



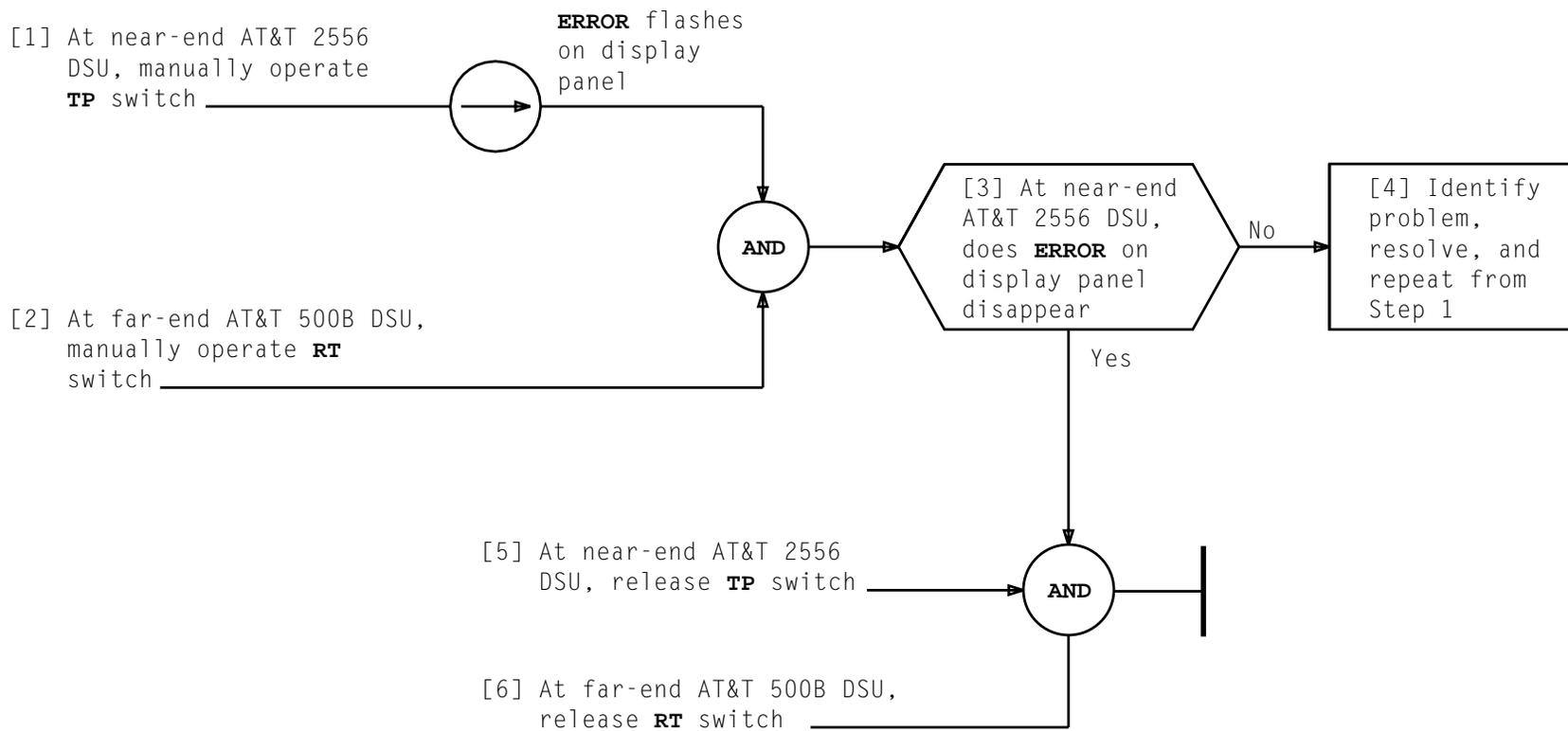
No

Yes

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**PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST  
(AT&T 2556 DSU TO DATATEL DCP3189 DSU)**

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**PERFORM DIGITAL SERVICE UNIT (DSU) END-TO-END TEST  
(AT&T 2556 DSU TO AT&T 500B DSU)**

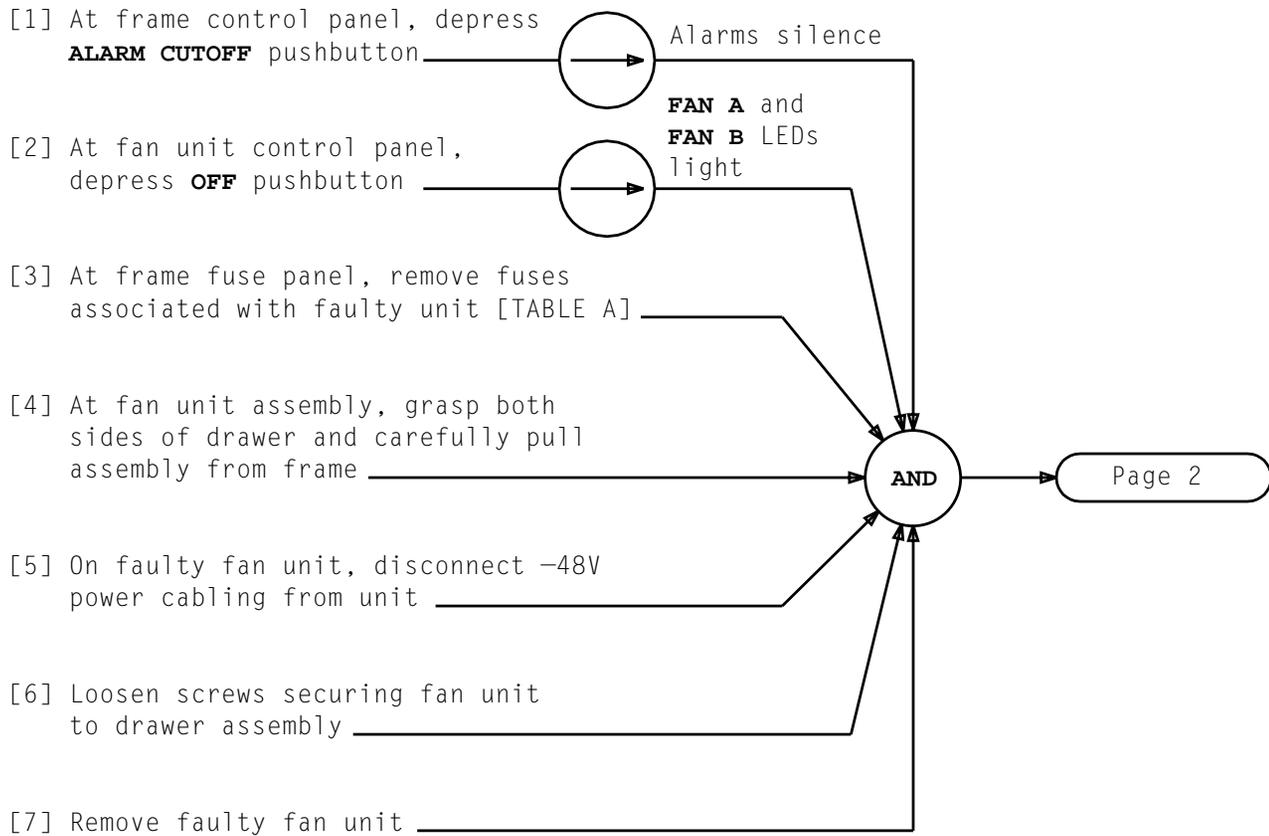
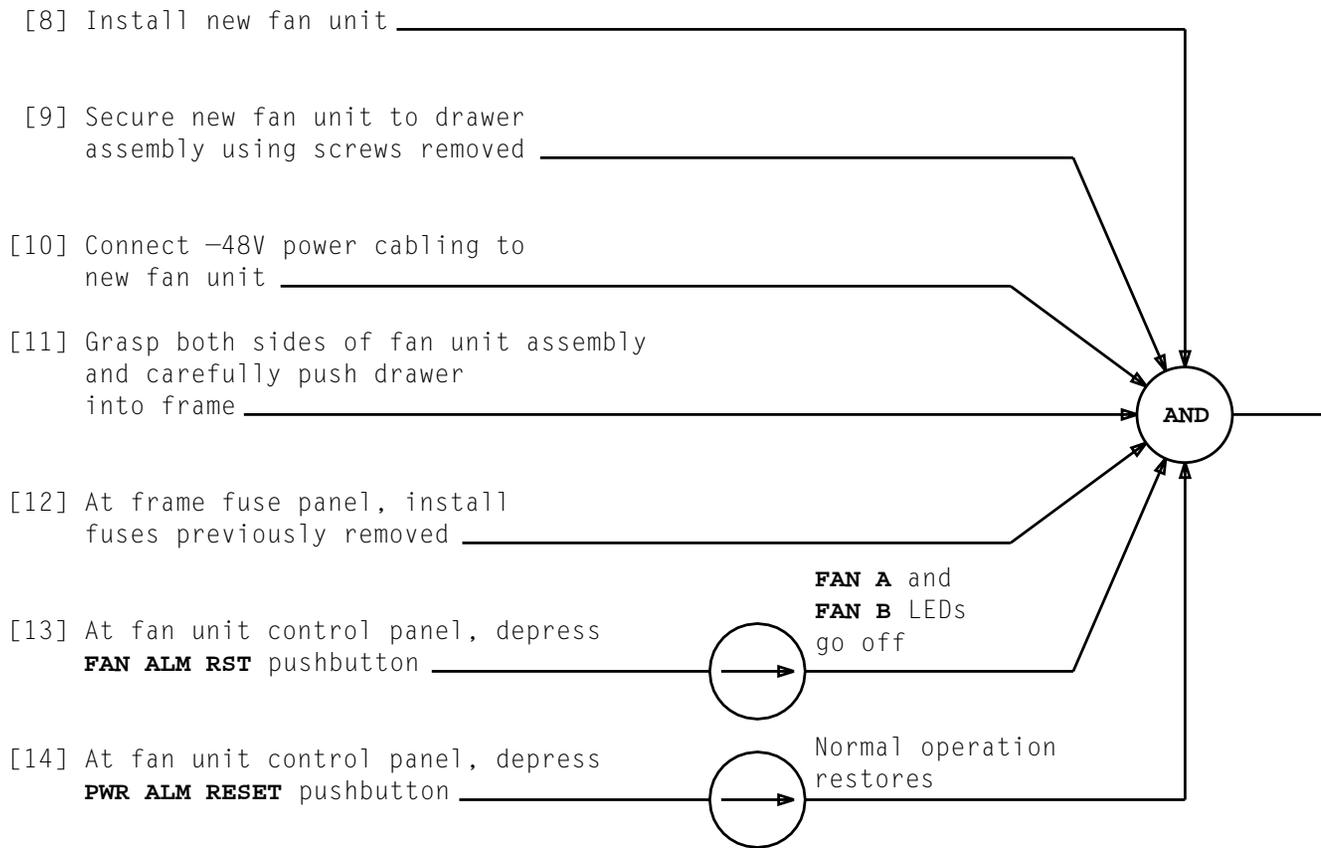


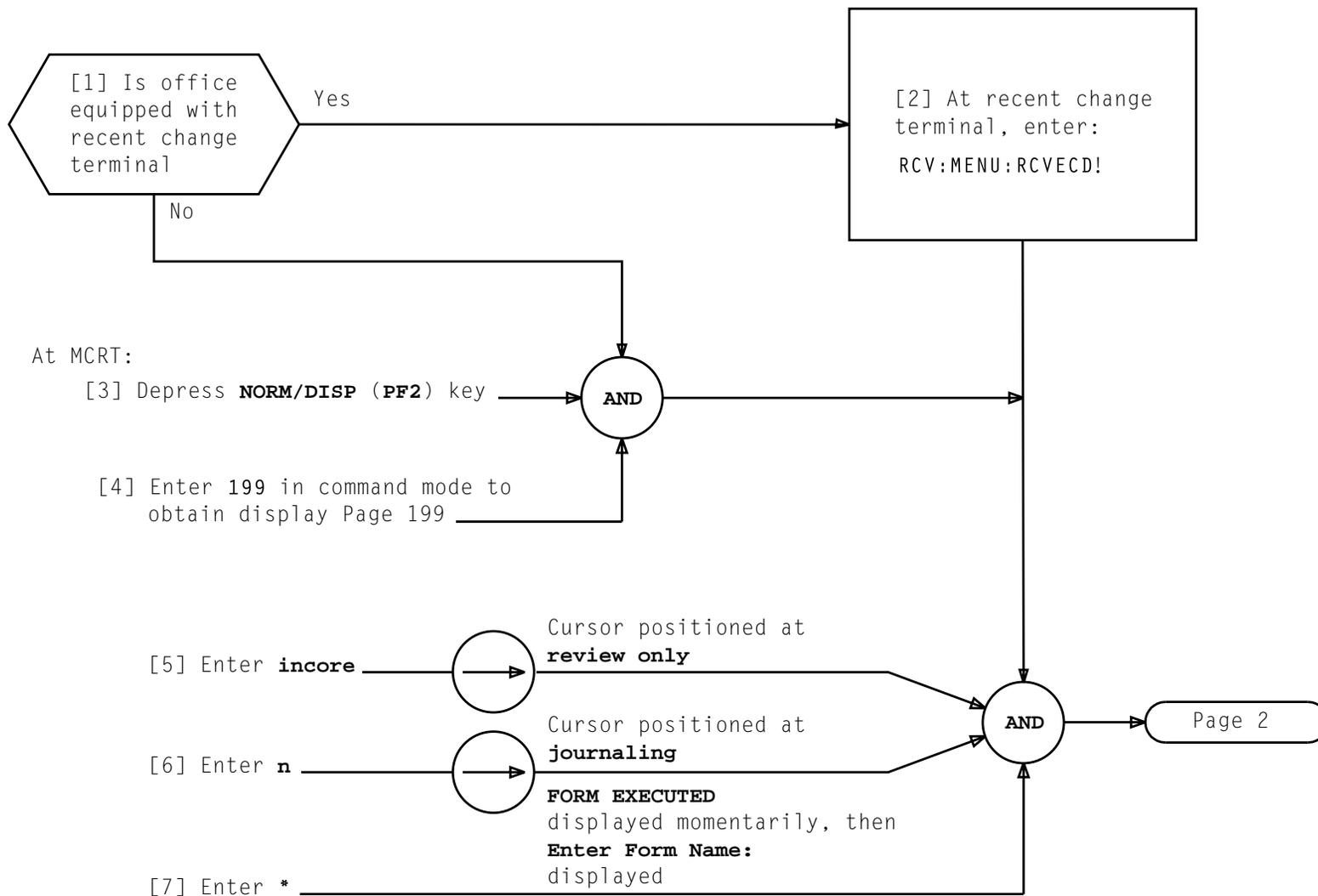
TABLE A FAN UNIT FUSES		
BLOWN FUSE	FUSE TYPE	ASSOCIATED CIRCUITRY
FC1	70G	FAN CONTROLLER 1
FC2	70G	FAN CONTROLLER 2
AF1	70A	FAN UNIT 1
BF2	70A	FAN UNIT 2
CF3	70A	FAN UNIT 3
DF4	70A	FAN UNIT 4
ALP	70G	BUS A LAMP
BLP	70G	BUS B LAMP

**REPLACE CABINET FAN UNIT ASSEMBLY**



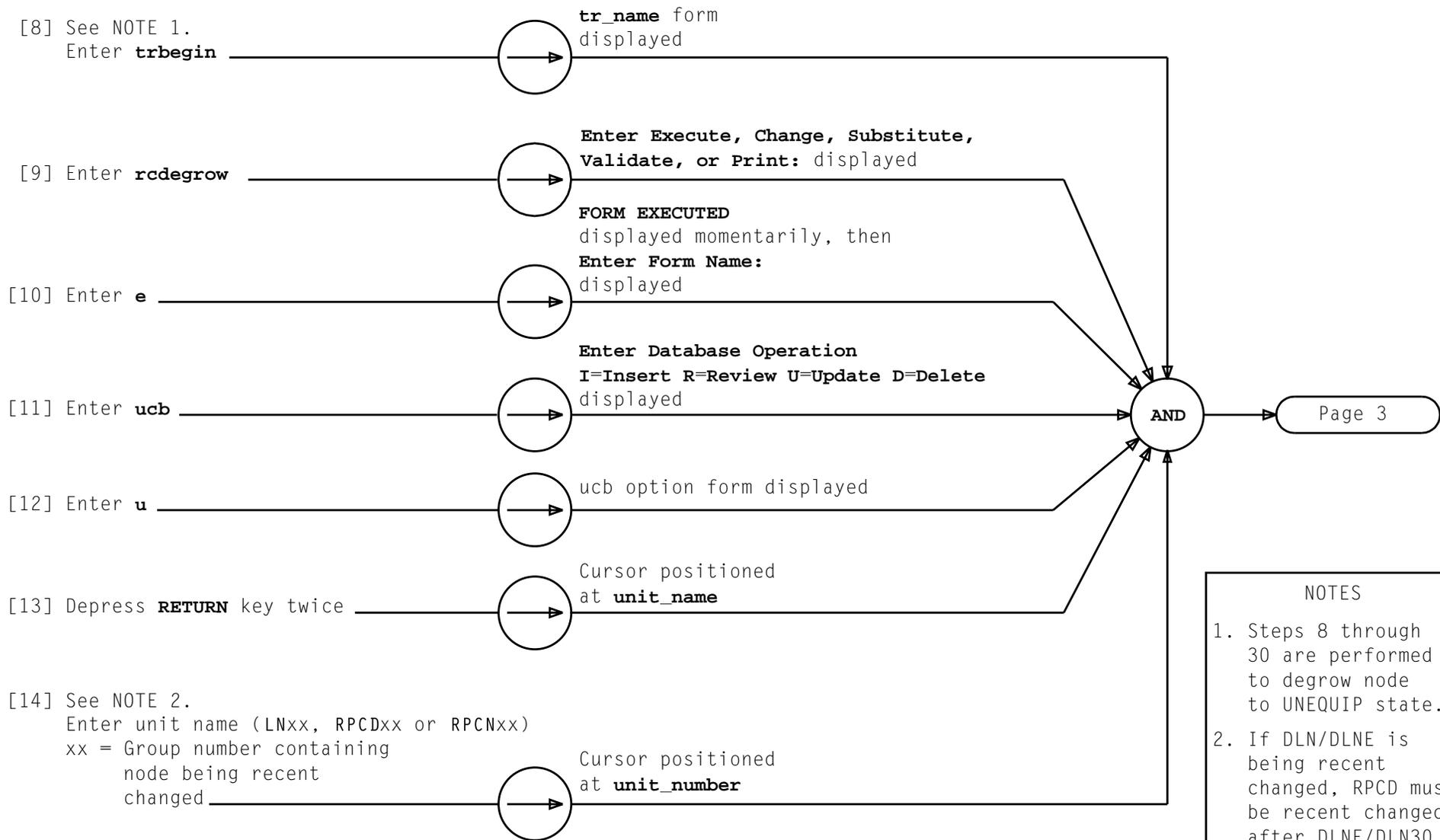
## REPLACE CABINET FAN UNIT ASSEMBLY

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**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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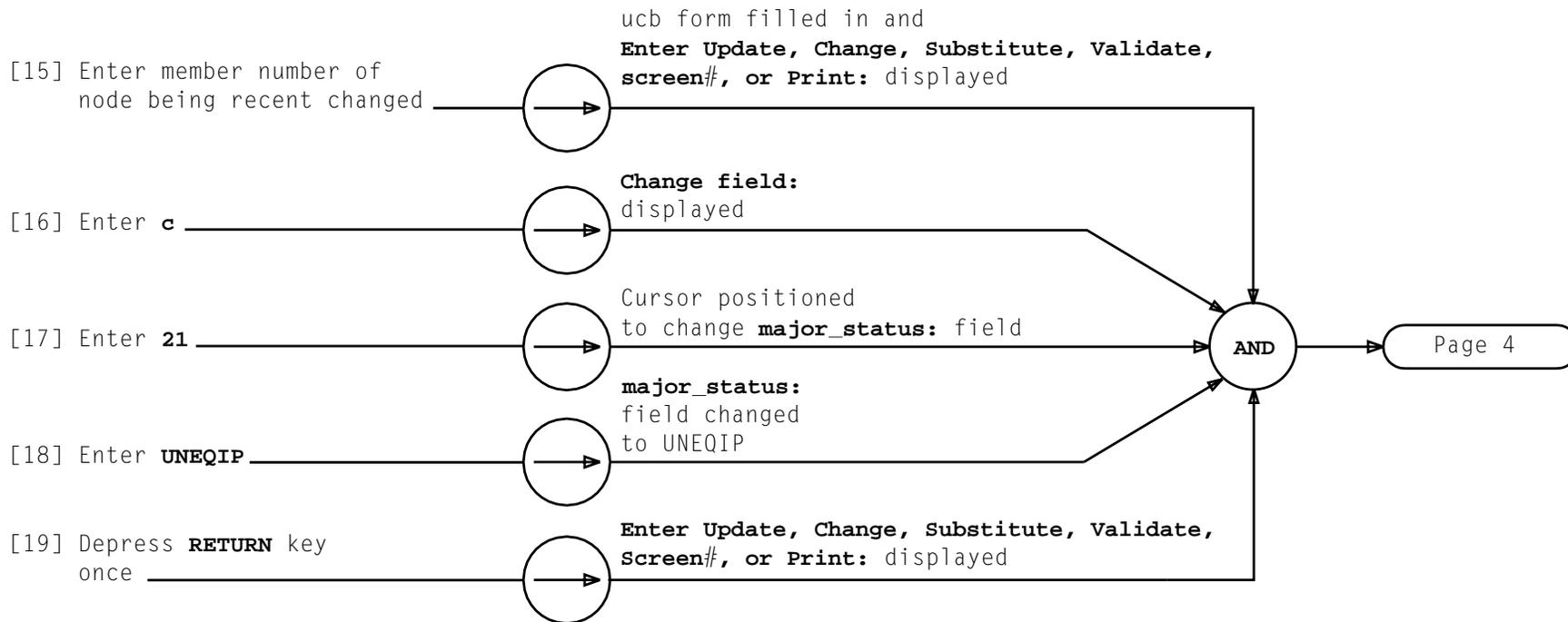


NOTES

- Steps 8 through 30 are performed to degrow node to UNEQUIP state.
- If DLN/DLNE is being recent changed, RPCD must be recent changed after DLNE/DLN30. A **trend** is required between recent changes

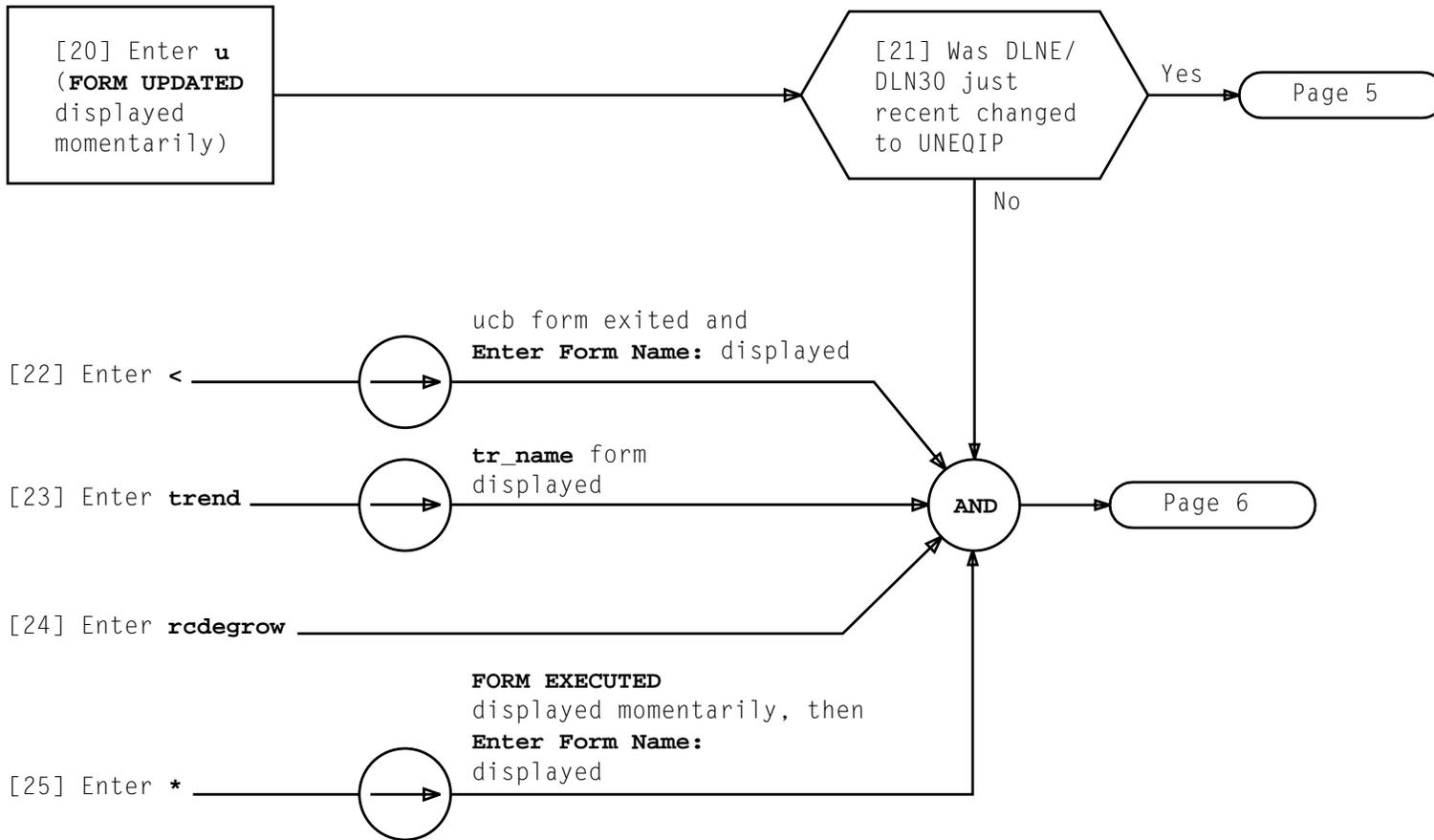
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**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**



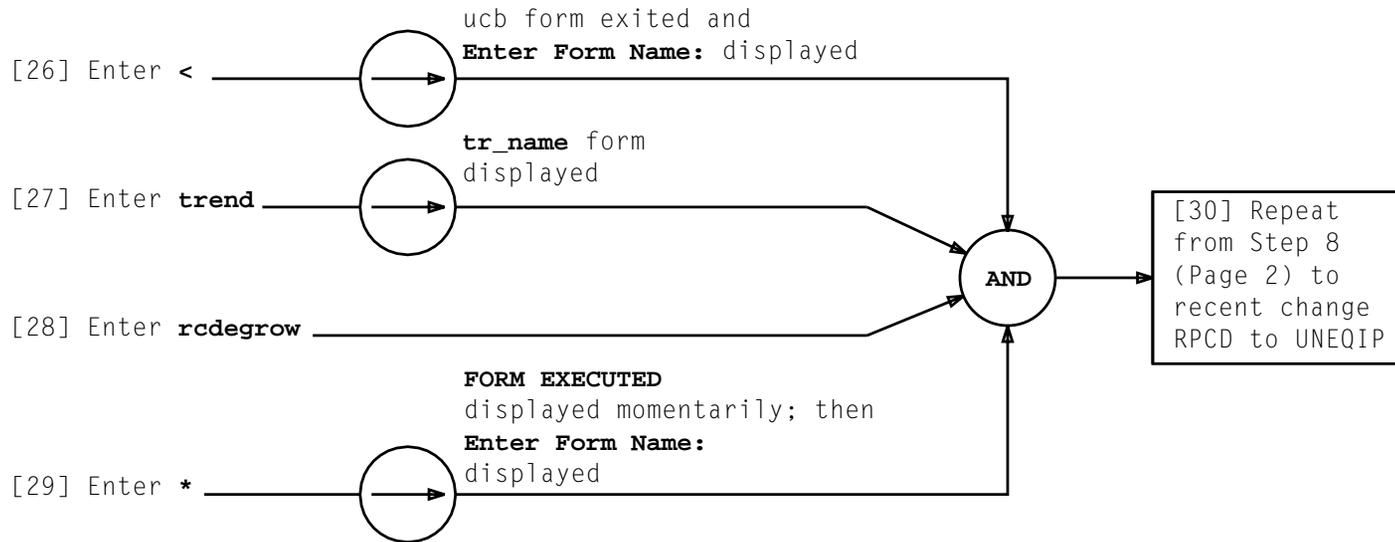
**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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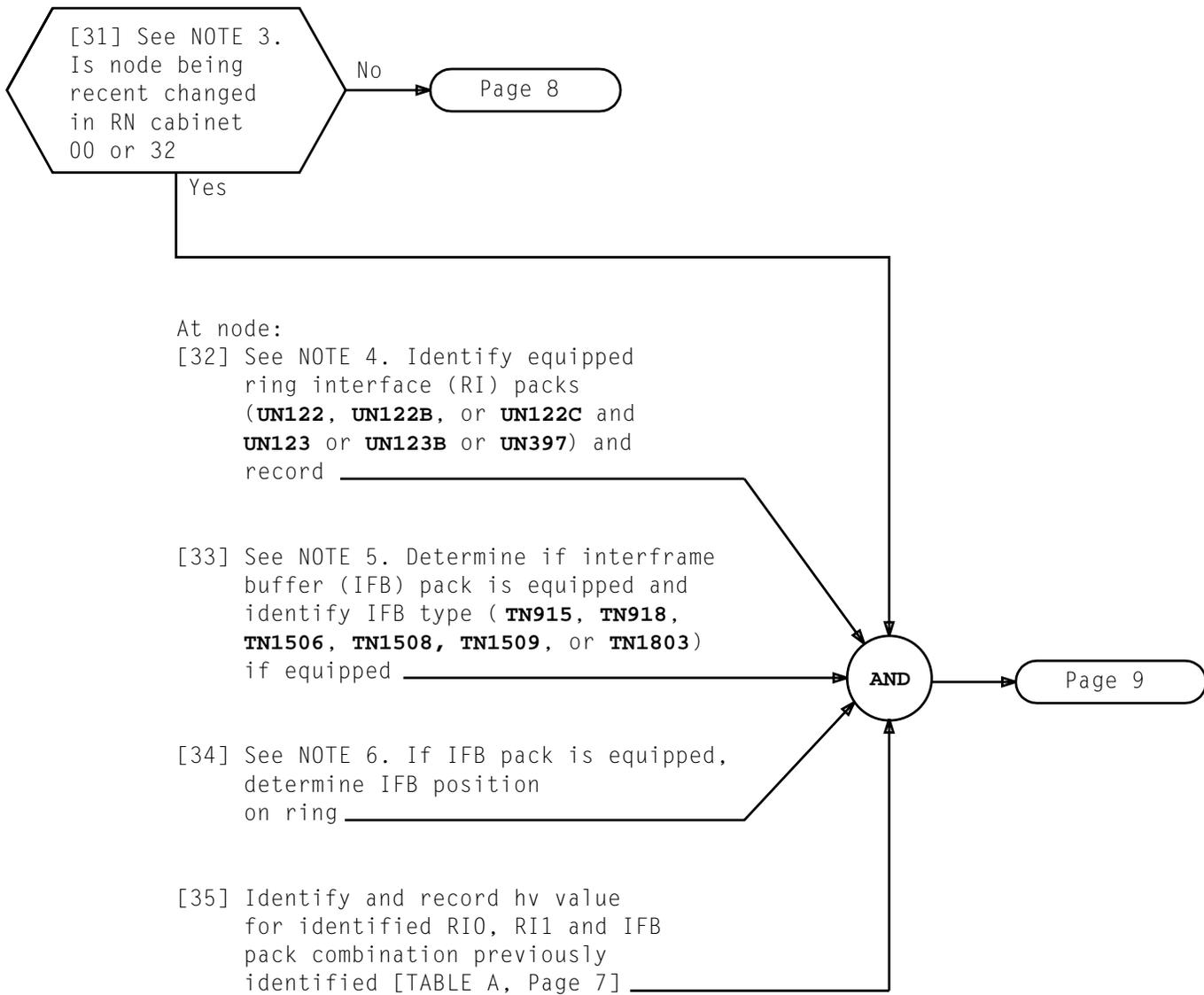
**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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**NOTES**

3. Steps 31 through 64 are performed to change node hv value.
4. If RPCD is being recent changed, hv value is same value as hv value for DLN
5. If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version.
6. IFB is considered lower if IFB is located in lowest node position in cabinet. IFB is considered higher if IFB is located in highest node position in cabinet.

**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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TABLE A SSI NODE hv VALUES							
RIO & RI1 TYPE	IFB POSITION IN RNC	hv VALUES FOR IFB TYPE					
		NO IFB	TN918	TN915	TN1506	TN1508	TN1509/ TN1803
UN122	Lowest	0x0100	0x0101	0x0102	0x0104	0x0105	0x0106
UN123	Highest	0x0100	0x0110	0x0120	0x0140	0x0150	0x0160
UN122B	Lowest	0x0900	0x0901	0x0902	0x0904	0x0905	0x0906
UN123B	Highest	0x0900	0x0910	0x0920	0x0940	0x0950	0x0960
UN122C	Lowest	0x1900	0x1901	0x1902	0x1904	0x1905	0x1906
UN123B	Highest	0x1900	0x1910	0x1920	0x1940	0x1950	0x1960
UN397	Lowest	0x4000	0x4001	*	*	0x4005	0x4006
	Highest	0x4000	0x4010			0x4050	0x4060

\* Not Applicable

**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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At node:

[36] Identify equipped integrated ring node (IRN) pack (UN303B, UN304) and record

[37] See NOTE 7. Determine if interframe buffer (IFB) pack is equipped, and identify IFB type (TN915, TN918, TN1506, TN1508, TN1509, or TN1803) if equipped

[38] See NOTE 8. If IFB pack is equipped, determine IFB position on ring (lower or higher)

[39] Identify and record hv value for identified IRN and IFB pack combination previously identified [TABLE B]

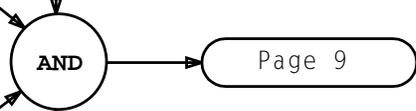
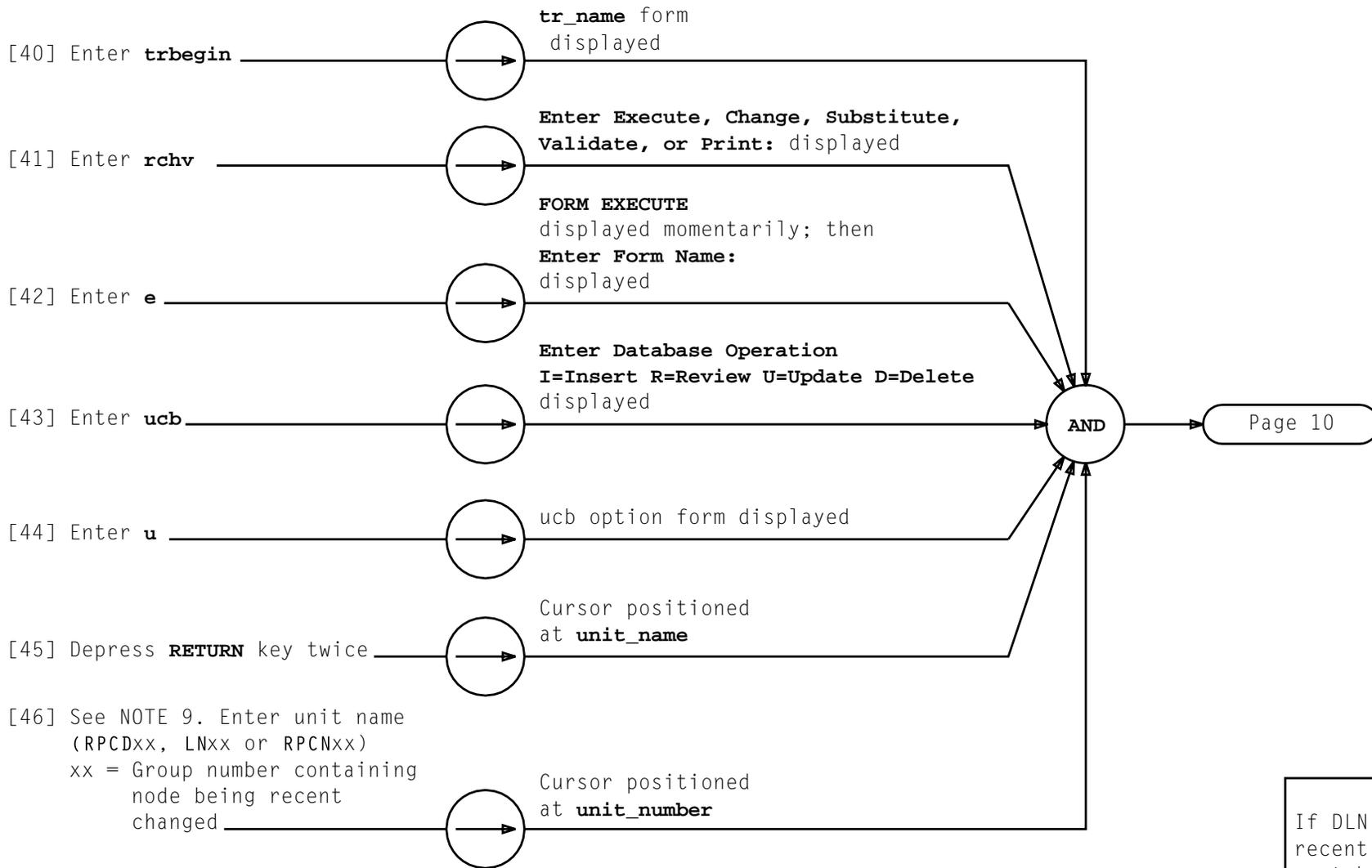


TABLE B HDB NODE hv VALUES							
IRN TYPE	IFB POSITION IN RNC	hv VALUES FOR IFB TYPE					
		NO IFB	TN918	TN915	TN1506	TN1508	TN1509/ TN1803
UN303B	Lowest	0x9000	0x9001	0x9002	0x9004	0x9005	0x9006
	Highest	0x9000	0x9010	0x9020	0x9040	0x9050	0x9060
UN304	Lowest	0xc000	0xc001	0xc002	0xc004	0xc005	0xc006
	Highest	0xc000	0xc010	0xc020	0xc040	0xc050	0xc060

NOTES	
7. If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version.	
8. IFB is considered lower if IFB is located in lowest node position in cabinet. IFB is considered higher if IFB is located in highest node position in cabinet.	
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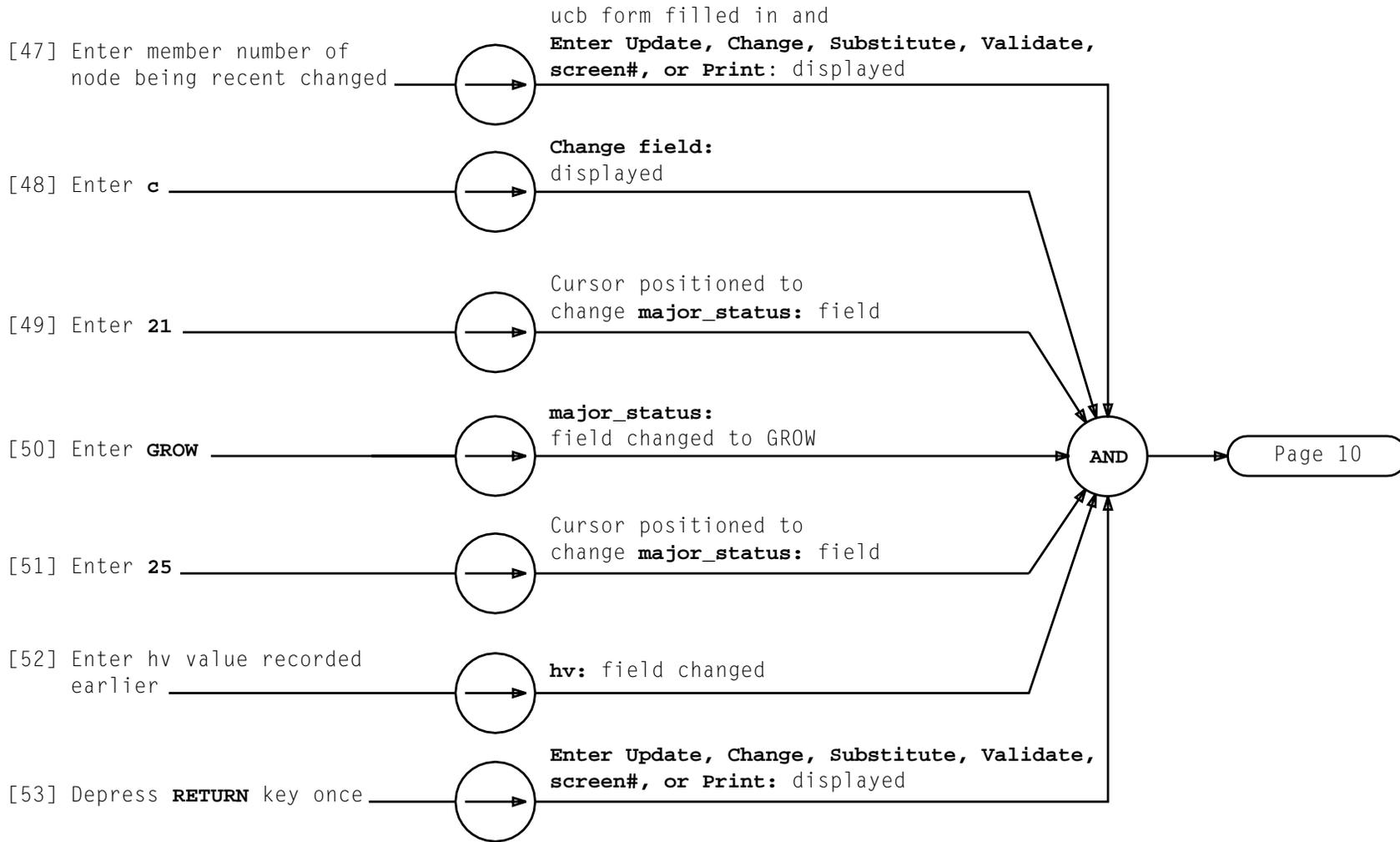
**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**



NOTE 9  
If DLN is being recent changed, RPCD must be recent changed before DLN. A **trend** is required between recent changes

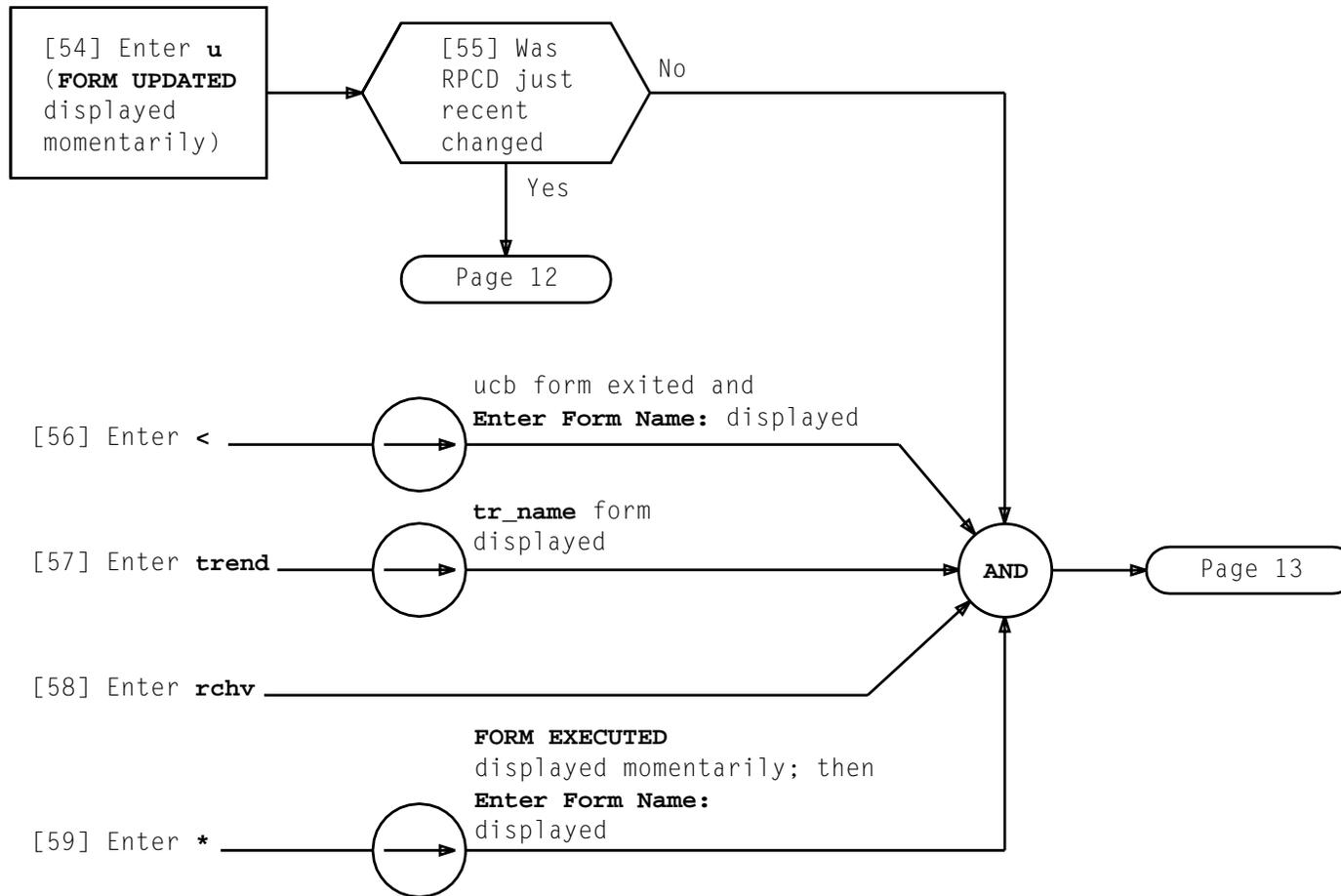
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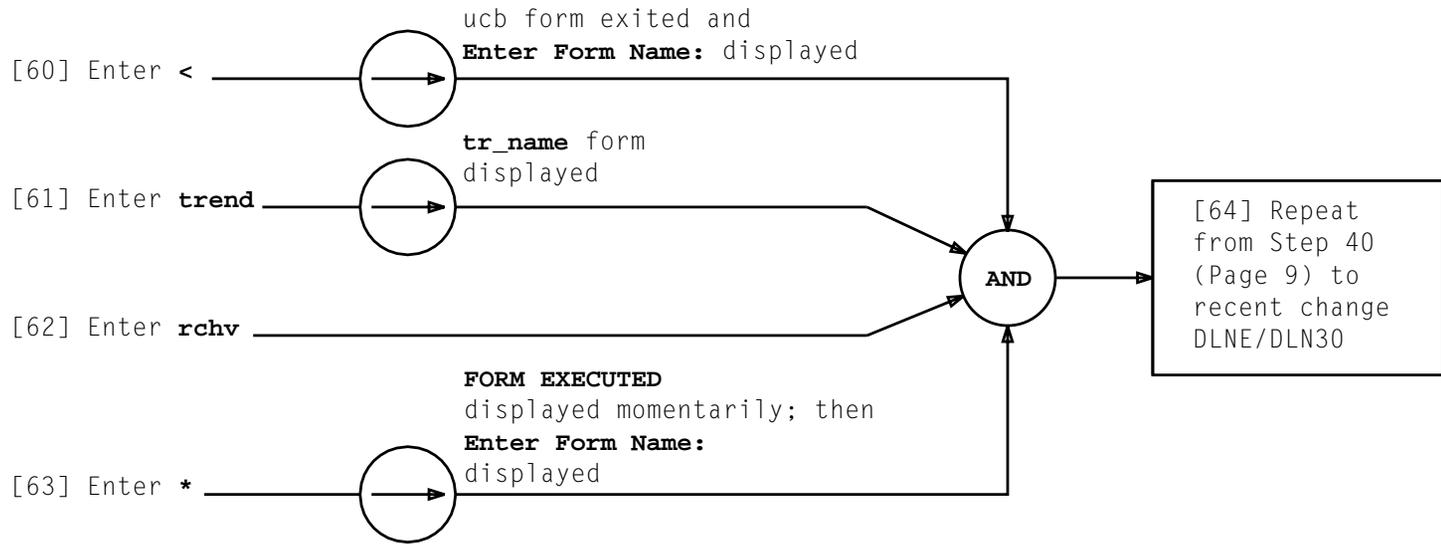
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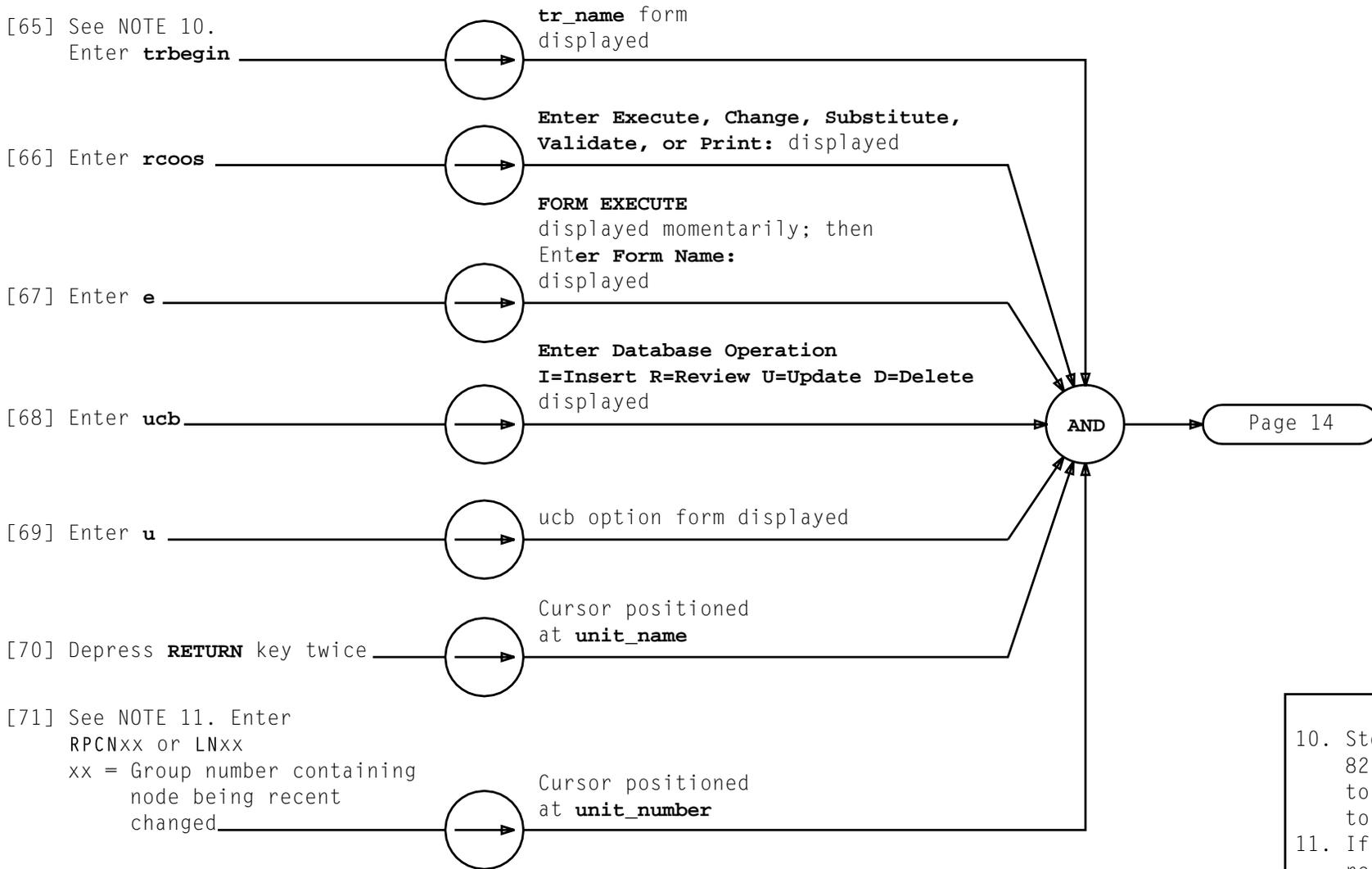
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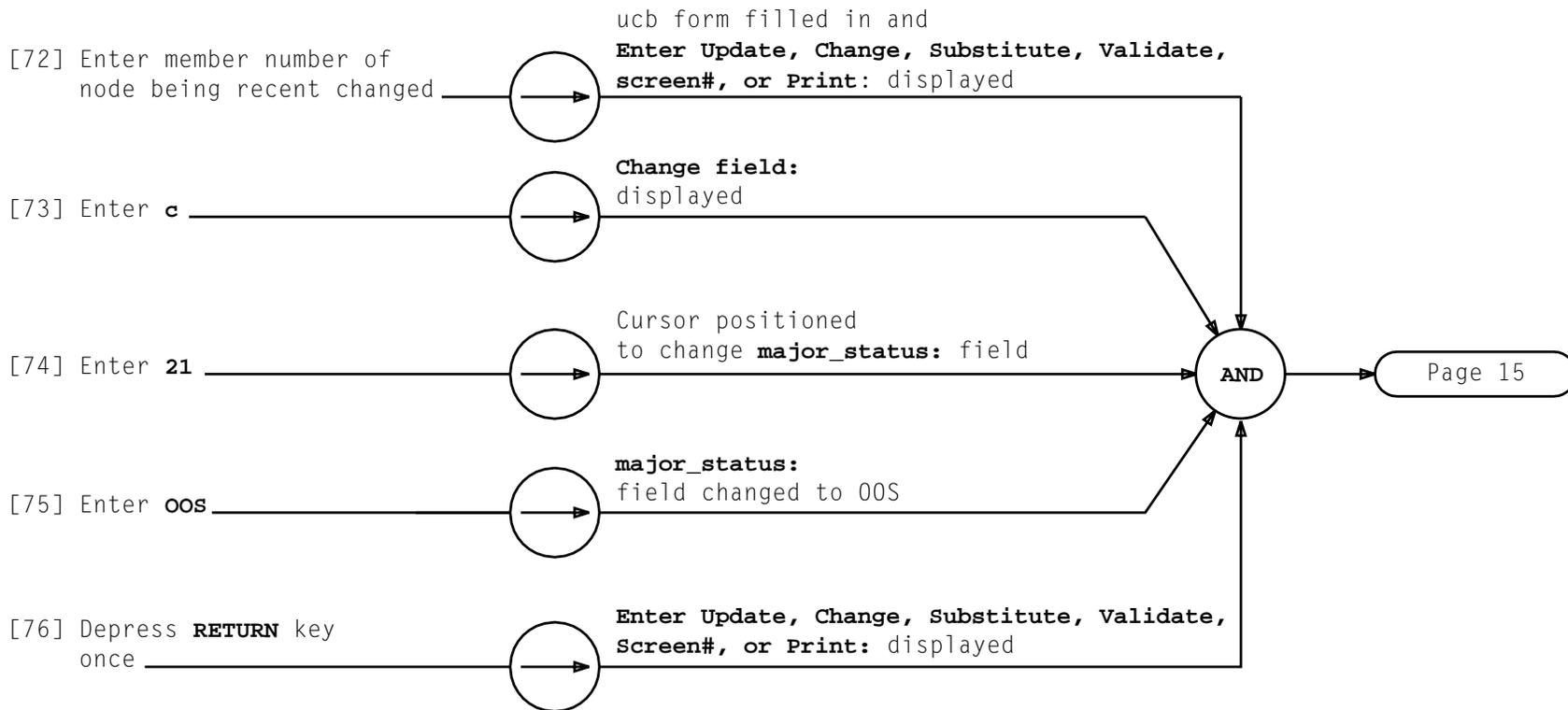
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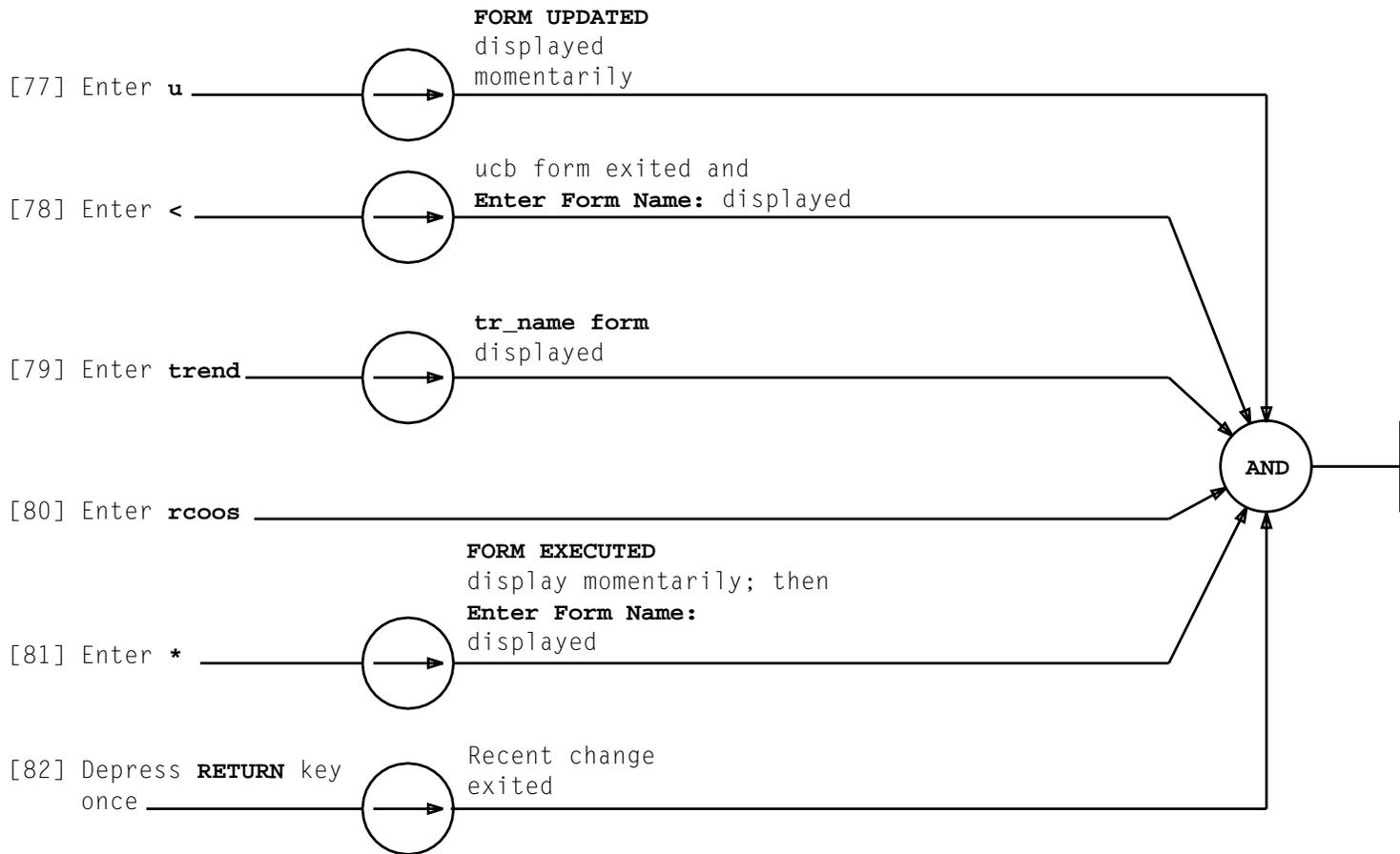
NOTES	
10. Steps 65 through 82 are performed to grow node to OOS state.	
11. If DLN is being recent changed, RPCD is not required to be recent changed to OOS	
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**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**



**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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**PERFORM RECENT CHANGE TO CHANGE NODE HV VALUE**

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[1] At MCRT, enter:

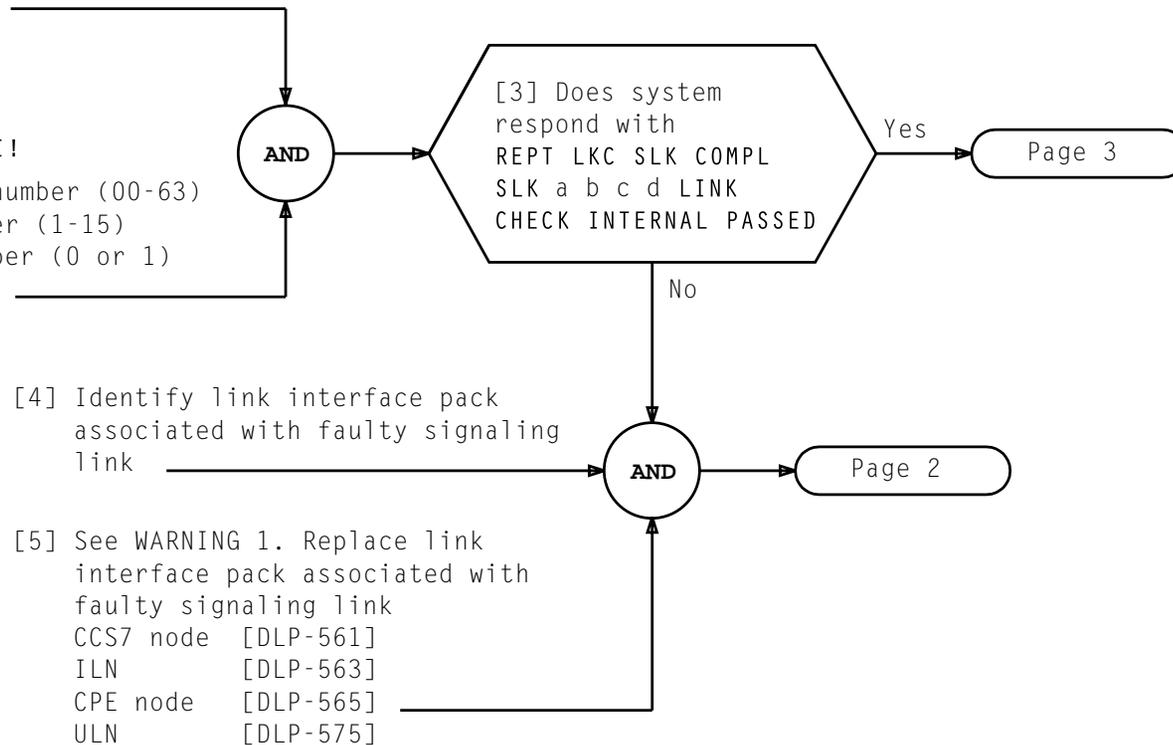
CHG:SLK(a,b,c,d);MOOS!

- a = Ring node group number (00-63)
- b = Node member number (1-15)
- c = Circuit pack number (0 or 1)
- d = Port number (0-3)

[2] Enter:

LKC:SLK(a,b,c,d);LCKI!

- a = Ring node group number (00-63)
- b = Node member number (1-15)
- c = Circuit pack number (0 or 1)
- d = Port number (0-3)

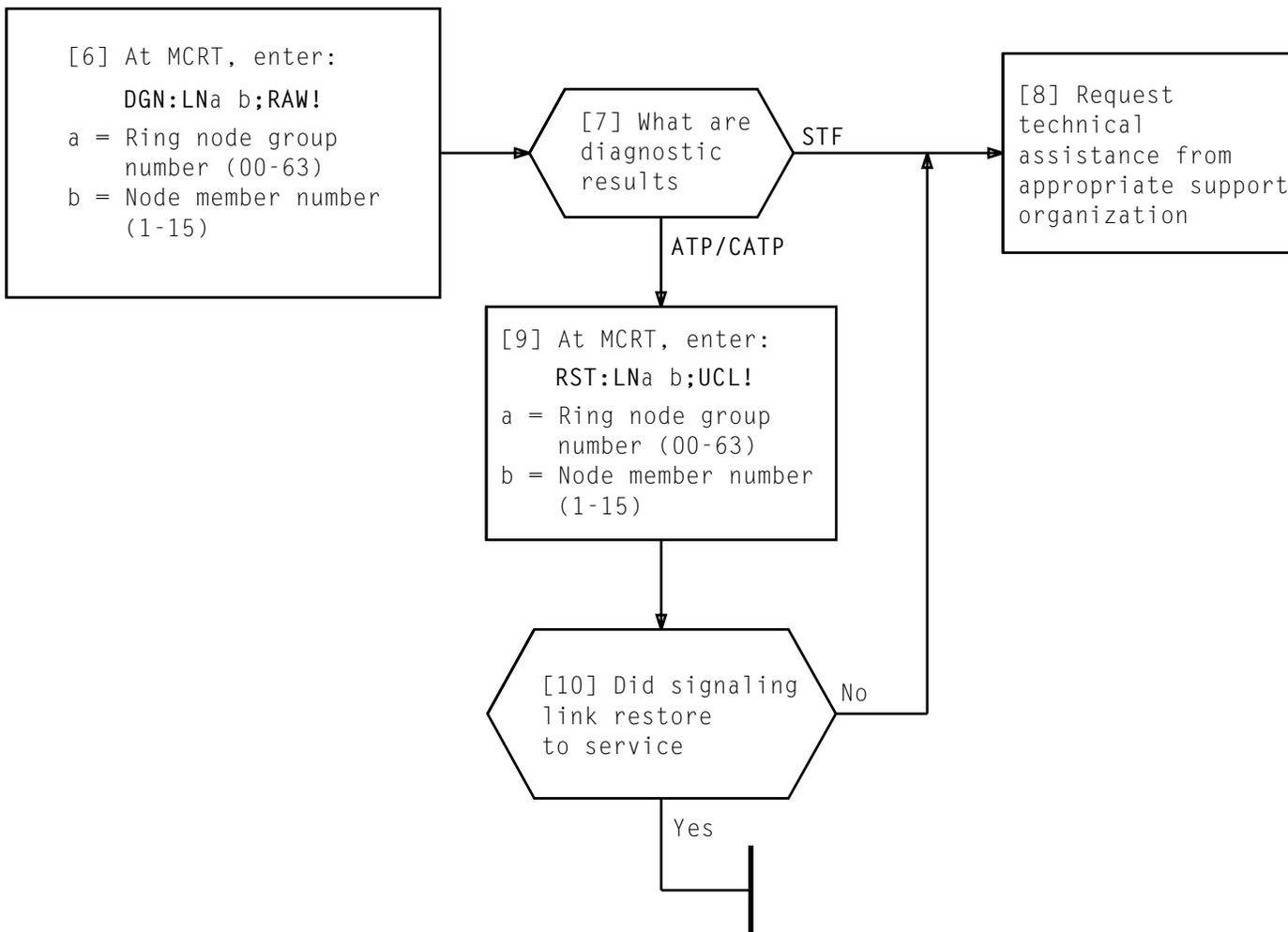


**WARNING 1**  
Replacement of link interface pack causes service interruption to all signaling links associated with link interface. Determine best time to introduce service outage in order to minimize service disruption

## PERFORM LINK CHECK INTERNAL (LCKI) AND LINK CHECK (LCHK) TESTS TO ISOLATE AND CLEAR SIGNALING LINK FAULT

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**PERFORM LINK CHECK INTERNAL (LCKI) AND LINK CHECK (LCHK)  
TESTS TO ISOLATE AND CLEAR SIGNALING LINK FAULT**

[11] Notify far-end of intent  
to perform link check test

[12] At MCRT, enter:

LKC:SLK(a,b,c,d);SETL!

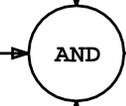
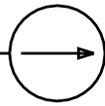
a = Ring node group number (00-63)

b = Node member number (1-15)

c = Circuit pack number (0-1)

d = Port number (0-3)

System responds with  
REPT LKC SLK COMPL  
SLK a b c d LOOPBACK  
ESTABLISHED



Page 4

[13] Enter:

LKC:SLK(a,b,c,d);LCHK!

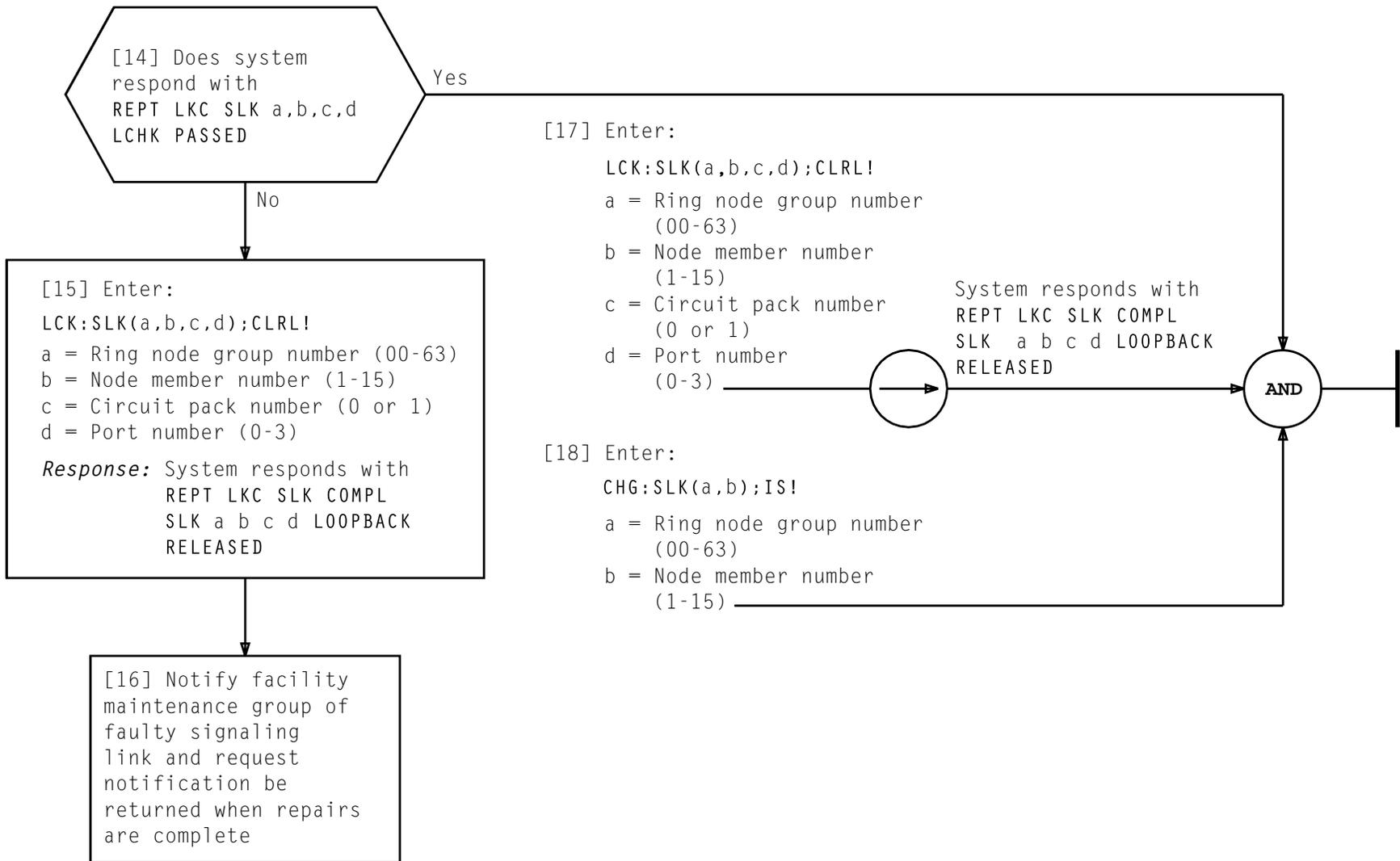
a = Ring node group number (00-63)

b = Node member number (1-15)

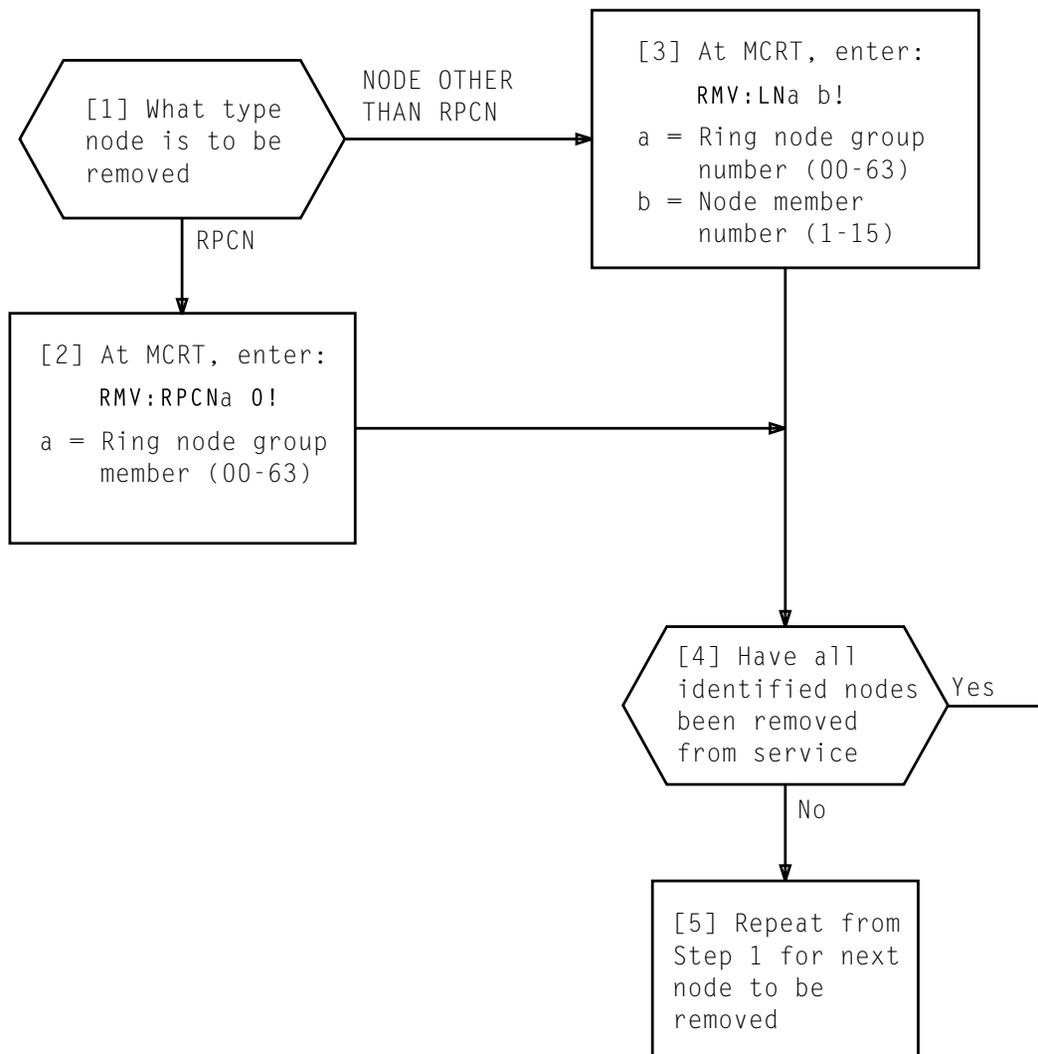
c = Circuit pack number (0-1)

d = Port number (0-3)

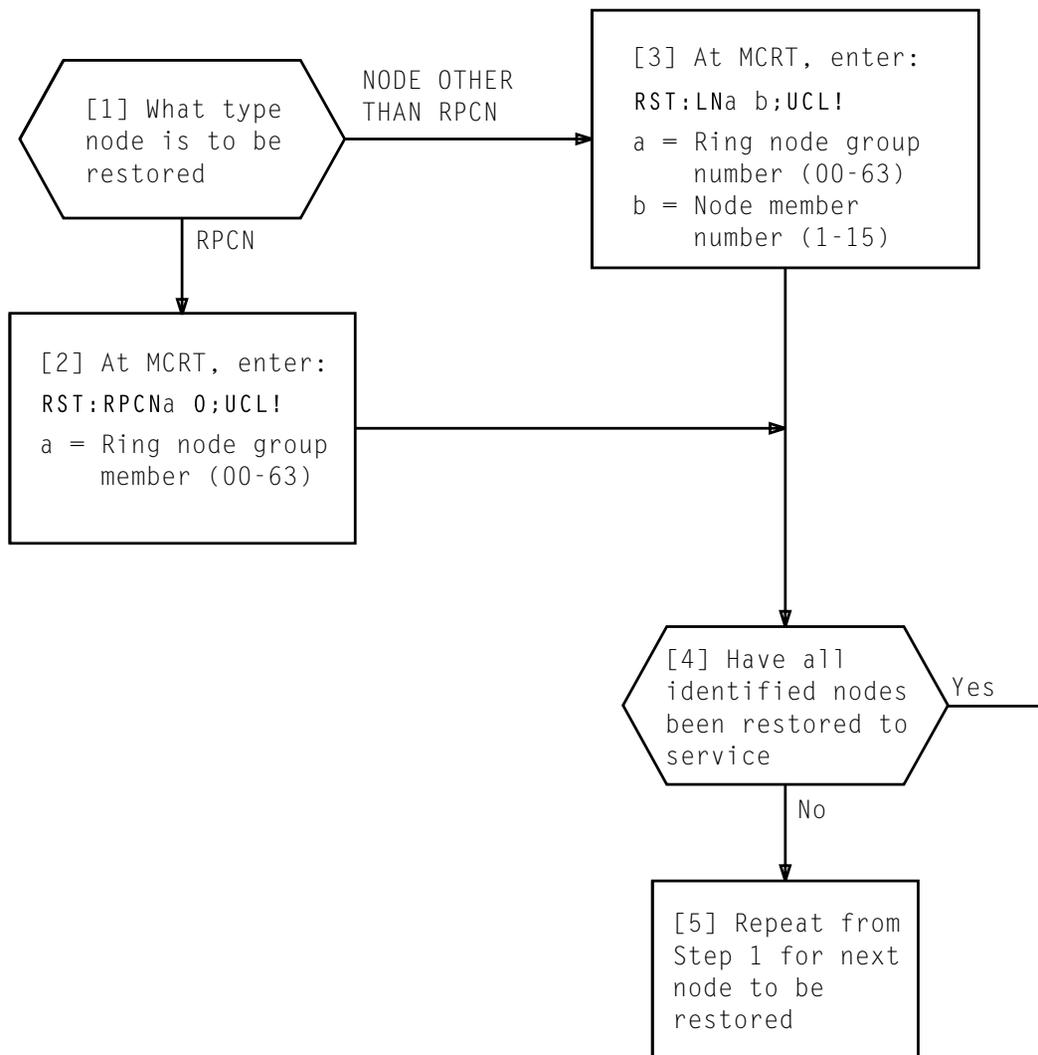
## PERFORM LINK CHECK INTERNAL (LCKI) AND LINK CHECK (LCHK) TESTS TO ISOLATE AND CLEAR SIGNALING LINK FAULT



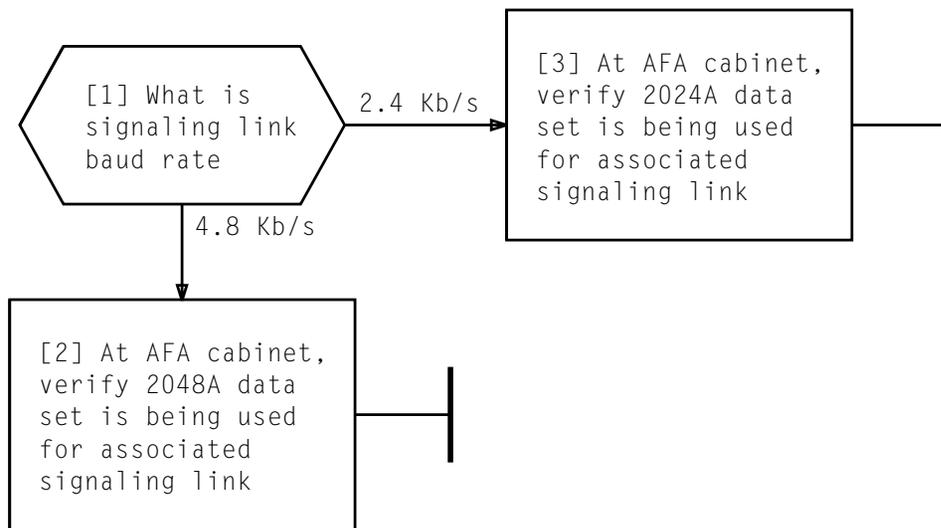
**PERFORM LINK CHECK INTERNAL (LCKI) AND LINK CHECK (LCHK)  
TESTS TO ISOLATE AND CLEAR SIGNALING LINK FAULT**



**REMOVE NODE FROM SERVICE**

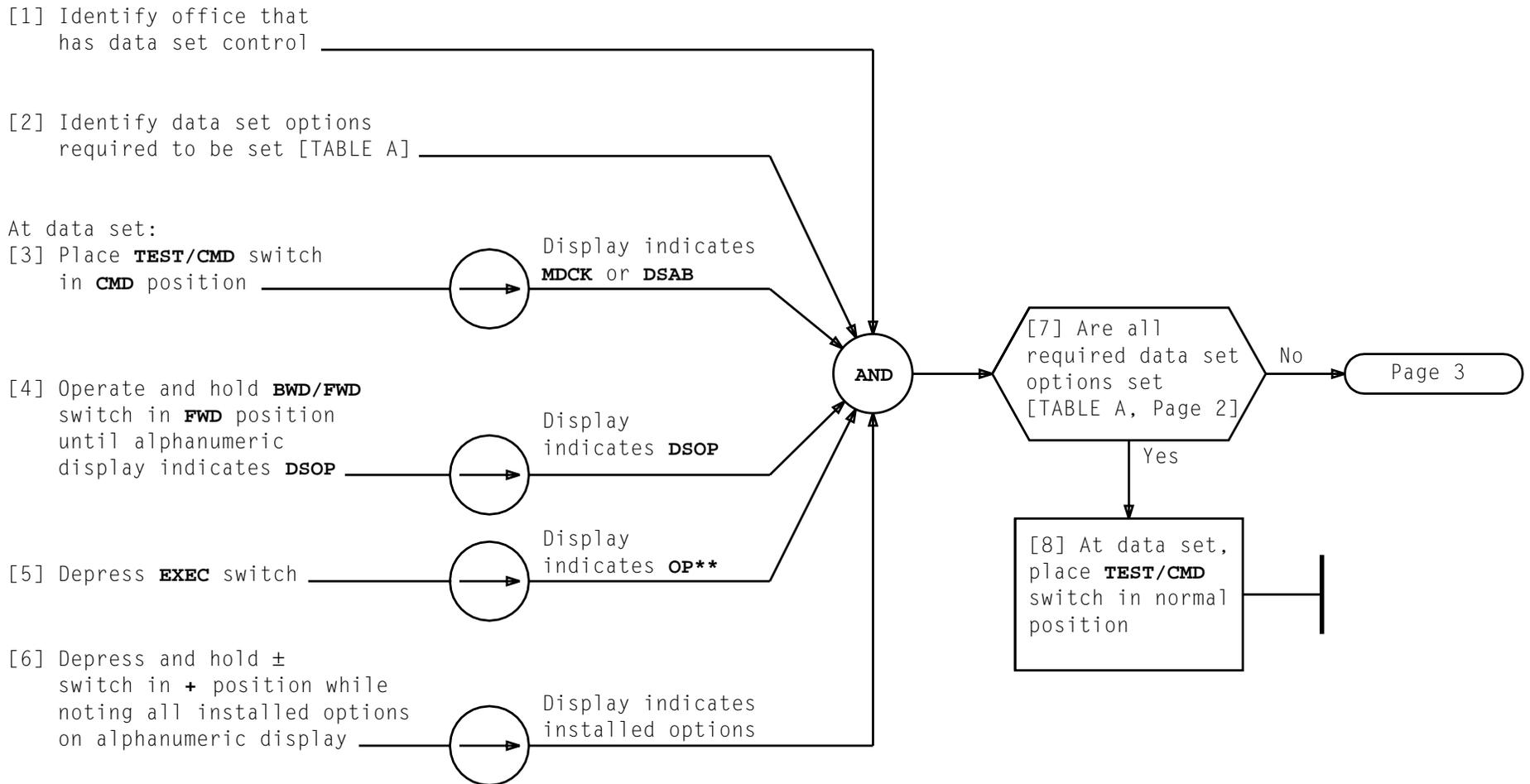


## RESTORE NODE TO SERVICE



**VERIFY ANALOG SIGNALING LINK DATA SET**

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**VERIFY AT&T 2024A/2048A DATA SET OPTIONS ARE PROPERLY SET**

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TABLE A AT&T 2024A/2048A DATA SET OPTION SETTINGS			
OPTION DESIGNATION	OPTION NAME	OPTION SETTINGS (NOTE 1)	
		OFFICE WITH DATA SET CONTROL	OFFICE WITHOUT DATA SET CONTROL
A1	Point-to-point control	ON	OFF
A2	Point-to-point tributary	OFF	ON
B1	Internal timing	ON	ON
C5	Continuous carrier, continuous request-to-send	ON	ON
D7	Data auxiliary set or line status indicator (TEK) leads not used	ON	ON
E5	Maximum address - 16	ON	ON
E7 (NOTE 2)	Disable secondary channel	ON	ON
NA01	Network address 01	OFF	ON
NA30	Network address 30	ON	OFF
PL01	Poll list contains network address 01	ON	OFF
NOTES: 1. Office designated as having data set control is not necessarily the same as designated control office. 2. Applicable to AT&T 2024A data set only.			

**VERIFY AT&T 2024A/2048A DATA SET OPTIONS ARE PROPERLY SET**

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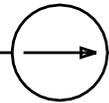
At data set:

[9] Operate and hold **BWD/FWD** switch in **FWD** position until alphanumeric display indicates **MTCE**



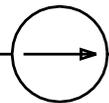
Display indicates **MTCE**

[10] Depress **EXEC** switch



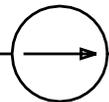
Display indicates **MC/O**

[11] Depress **EXEC** switch



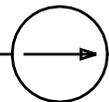
Display indicates **MC/I**

[12] Operate and hold **BWD/FWD** switch in **FWD** position until alphanumeric display indicates **CHOP**



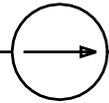
Display indicates **CHOP**

[13] Depress **EXEC** switch



Display indicates **CH\*\***

[14] Depress and release hold± switch in **+** position while noting all installed options on alphanumeric display

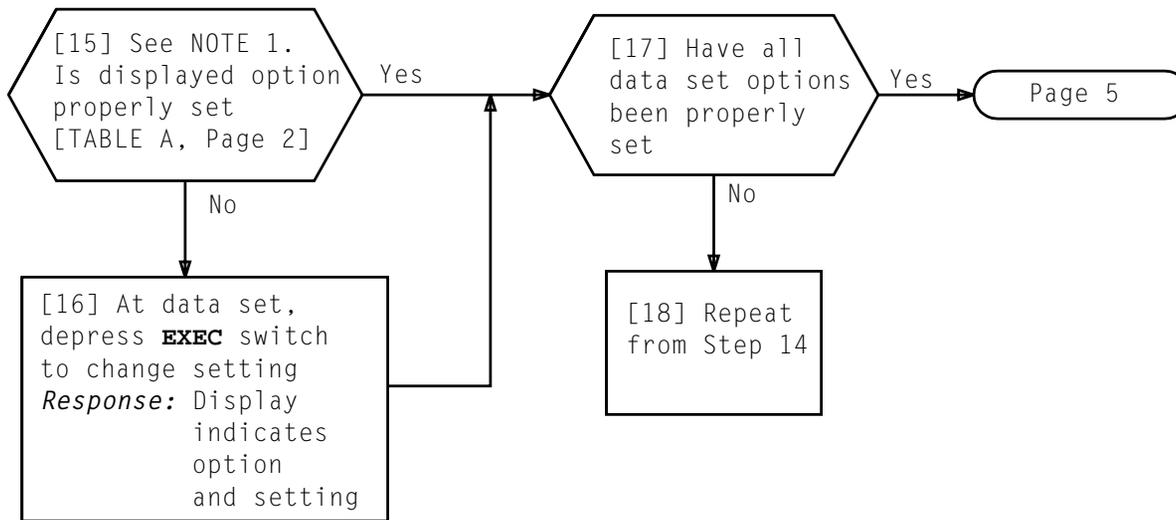


Display indicates option available for change



## VERIFY 2024A/2048A DATA SET OPTIONS ARE PROPERLY SET

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NOTE 1	
Options activity set will appear in alphanumeric display with a checkmark as the first character (√bA1)	
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**VERIFY 2024A/2048A DATA SET OPTIONS ARE PROPERLY SET**

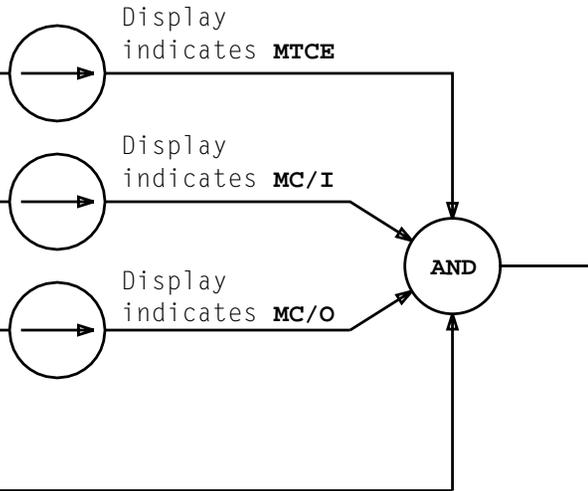
At data set:

[19] Operate and hold **BWD/FWD** switch in **FWD** position until alphanumeric display indicates **MTCE**

[20] Depress **EXEC** switch

[21] Depress **EXEC** switch

[22] Place **TEST/CMD** switch in normal position

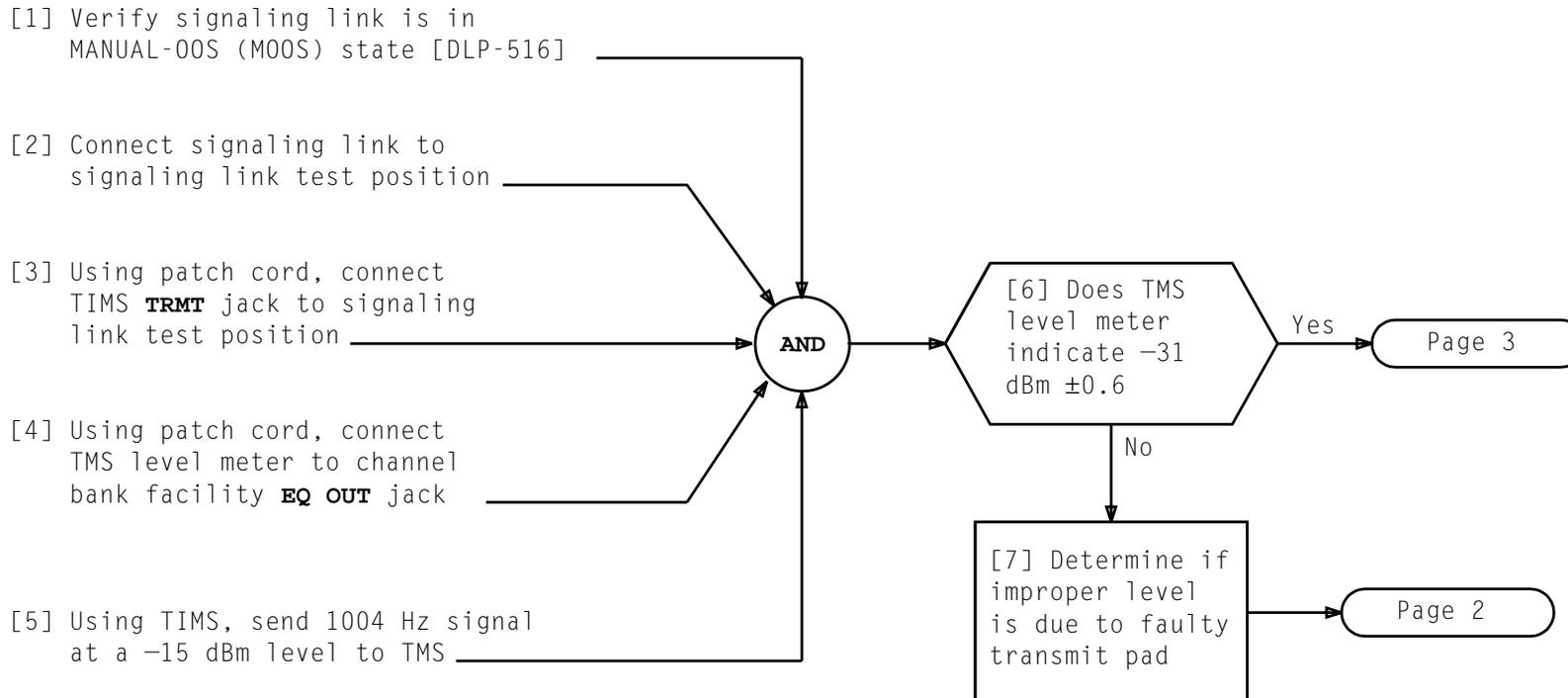


**VERIFY 2024A/2048A DATA SET OPTIONS ARE PROPERLY SET**

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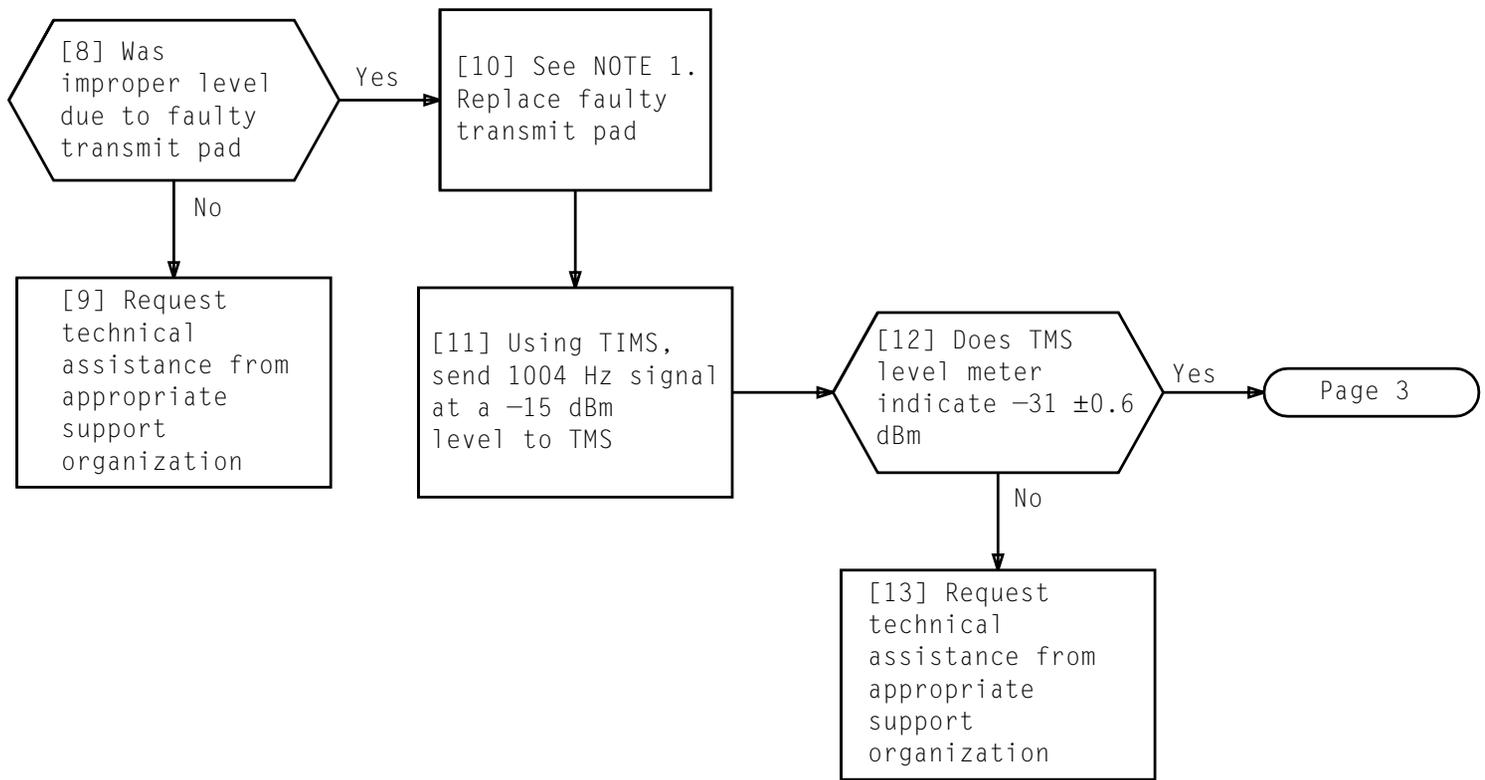
SUMMARY

The cross-office test verifies that the proper -31 dBm transmit pad level and -17 dBm receive pad level exist.



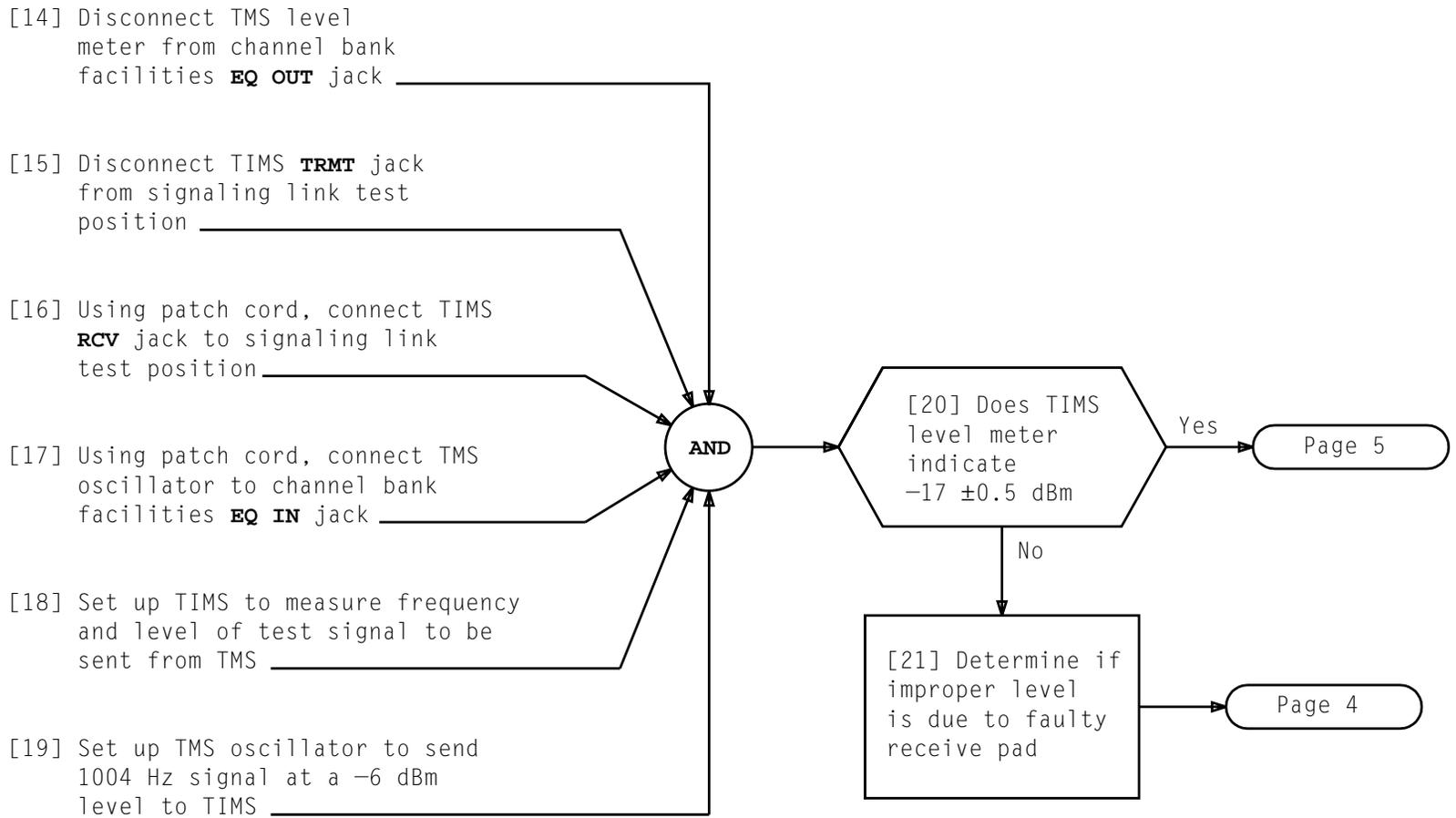
**PERFORM ANALOG SIGNALING LINK CROSS-OFFICE TEST**

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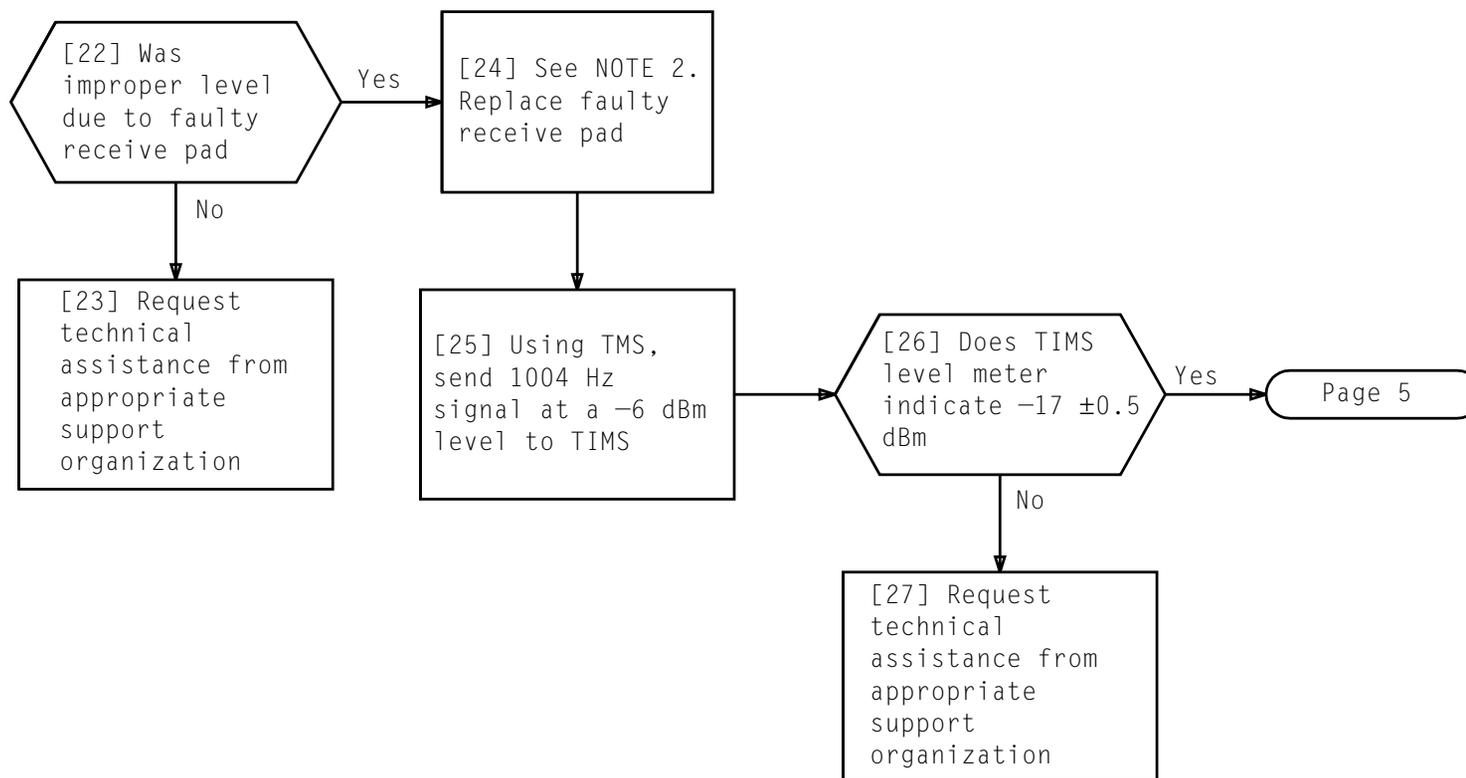
NOTE 1	
Transmit pads with values less than 12 dB and greater than 14 dB cannot be used. If correct meter level cannot be obtained within this tolerance, other problems exist	
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**PERFORM ANALOG SIGNALING LINK CROSS-OFFICE TEST**



**PERFORM ANALOG SIGNALING LINK CROSS-OFFICE TEST**

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NOTE 2	
Receive pads with values less than 5 dB and greater than 7 dB cannot be used. If correct meter level cannot be obtained within this tolerance, other problems exist	
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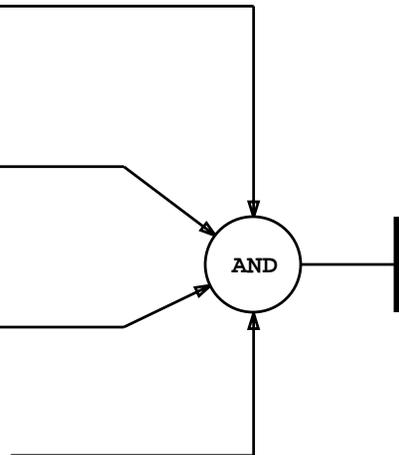
**PERFORM ANALOG SIGNALING LINK CROSS-OFFICE TEST**

[28] Disconnect TMS **RCV** jack  
from signaling link  
test position

[29] Disconnect TMS oscillator  
from channel bank facility  
**EQ IN** jack

[30] Disconnect signaling link  
from signaling link test  
position

[31] Change signaling link state  
to AVAILABLE - IS [DLP-525]



## PERFORM ANALOG SIGNALING LINK CROSS-OFFICE TEST

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SUMMARY

The 1004 Hz net loss test verifies that end-to-end or loopback net loss on a signaling link does not exceed the Expected Measured Loss (EML)

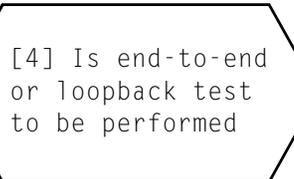
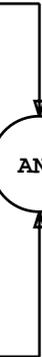
[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in MANUAL-00S (MOOS) state [DLP-516]

[3] At near-end and far-end office, connect signaling link to signaling link test position

[5] At far-end office, connect TIMS unit to signaling link test position using patch cord, and set TIMS unit up to measure signal frequency and level

[6] At near-end office, connect TIMS unit to signaling link test position using patch cord, and set TIMS unit up to send 1004 Hz signal



LOOPBACK

Page 3

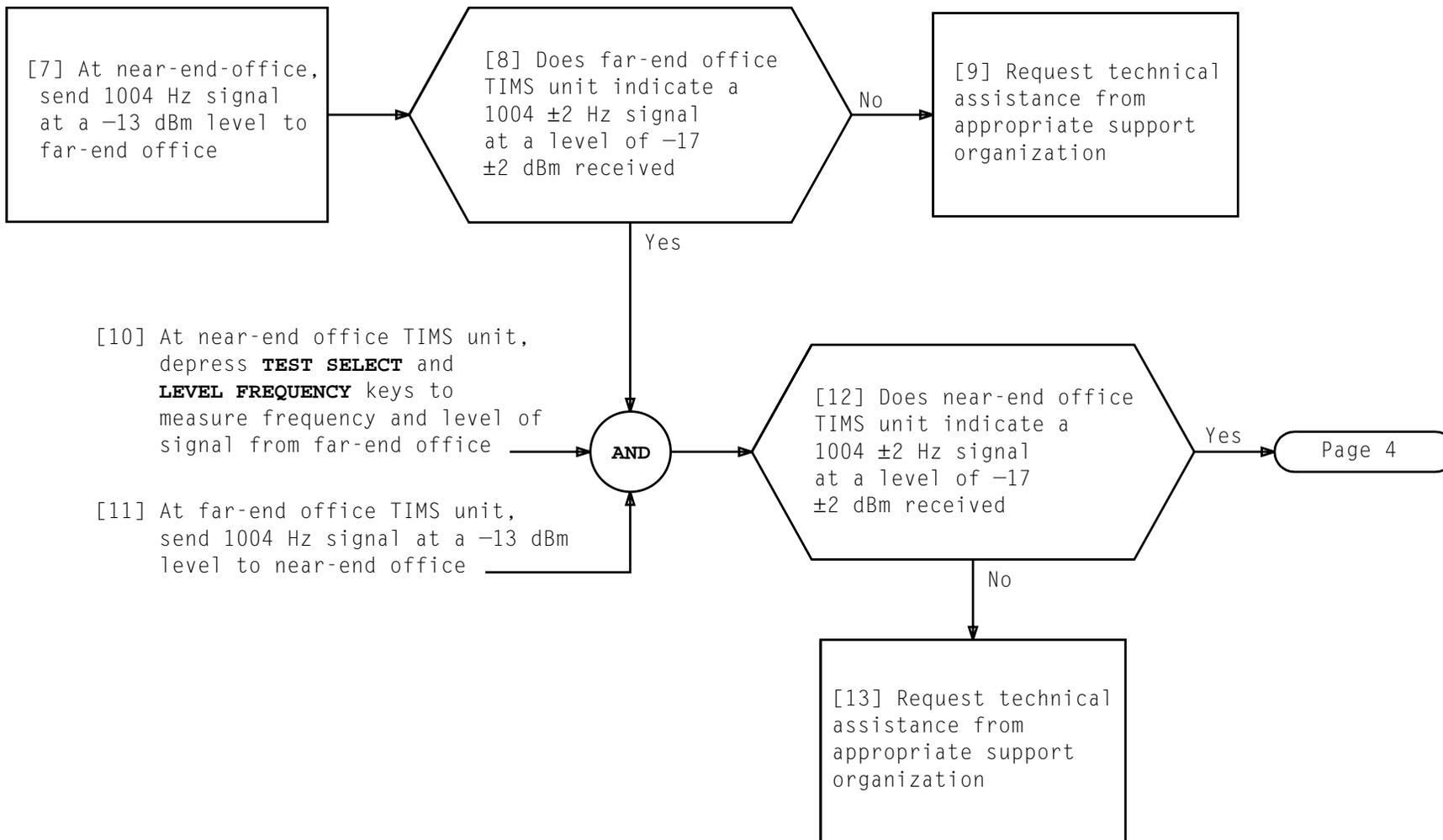
END-TO-END



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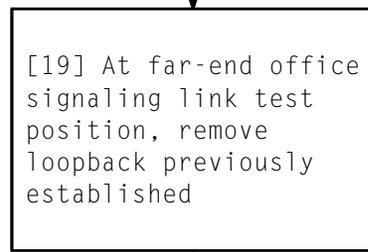
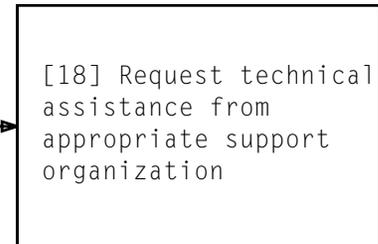
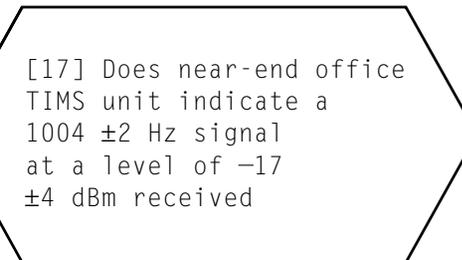
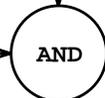
**PERFORM ANALOG SIGNALING LINK 1004 HZ NET LOSS TEST**

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[14] At far-end office signaling link test position, establish loopback for signaling link being tested

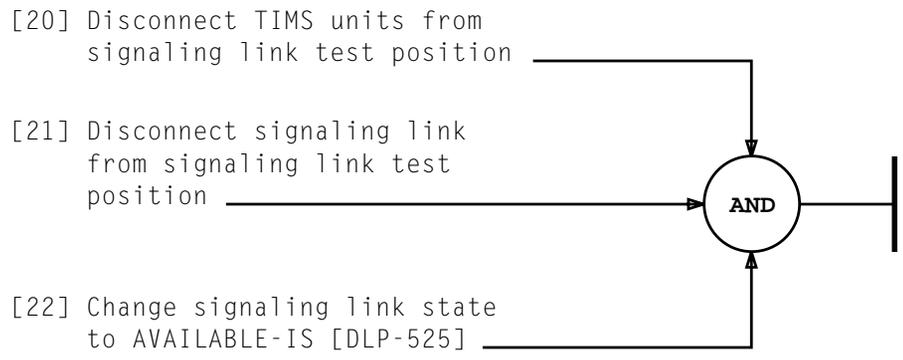
[15] At near-end office, connect TIMS unit to signaling link test position using patch cord, and set TIMS unit to send and receive 1004 Hz signal

[16] At near-end office, send 1004 Hz signal at a -13 dBm level to far-end office



# PERFORM ANALOG SIGNALING LINK 1004 Hz NET LOSS TEST

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**PERFORM ANALOG SIGNALING LINK 1004 Hz NET LOSS TEST**

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SUMMARY

The C-notched noise and signal-to-noise test measures the noise level on a signaling link

[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in the MANUAL-OOS (MOOS) state [DLP-516]

[3] At near-end and far-end office, connect signaling link to signaling link test position

[4] At far-end office, connect TIMS unit to signaling link test position using patch cord

At far-end office TIMS unit:

[5] Set **MEASUREMENT** switch to **NOISE WITH TONE** position

[6] Set **DISPLAY CONNECTED TO** switch to **RCV** position

[7] Depress **C-MSG NOISE FILTER** pushbutton

AND

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**PERFORM ANALOG SIGNALING LINK C-NOTCHED NOISE AND SIGNAL-TO-NOISE TEST**

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[8] At near-end office, connect TIMS unit to signaling link test position using patch cord and set TIMS unit to send 1004 Hz signal

[9] At near-end office, send 1004 Hz signal at a -13 dBm level to far-end office

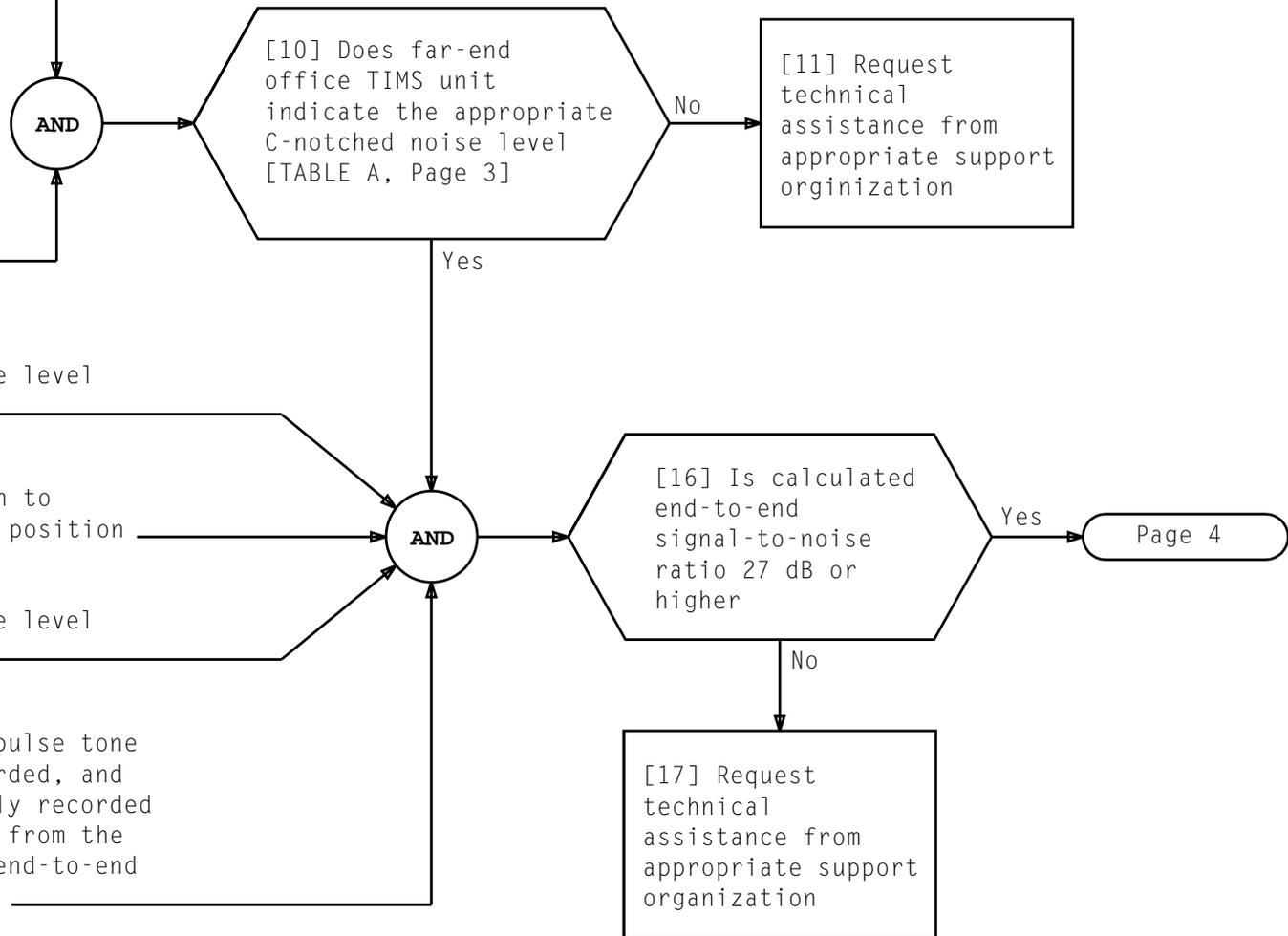
At far-end TIMS unit:

[12] Record C-notched noise level indicated

[13] Set **MEASUREMENT** switch to **MESSAGE CIRCUIT NOISE** position

[14] Record noise plus tone level (in dBm) indicated

[15] Add +90 to the noise pulse tone level value just recorded, and subtract the previously recorded C-notched noise level from the sum to calculate the end-to-end signal-to-noise ratio



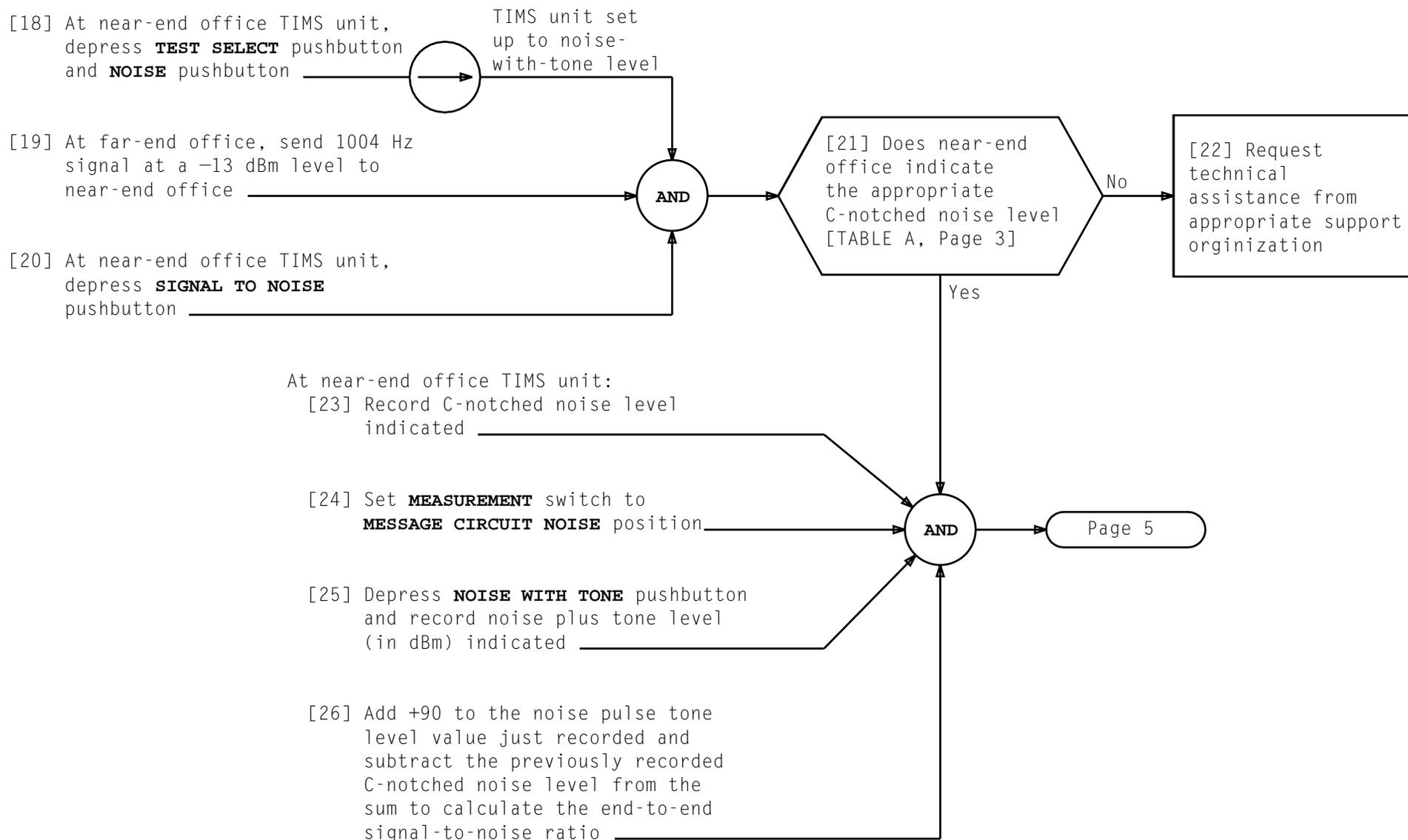
**PERFORM ANALOG SIGNALING LINK C-NOTCHED NOISE AND SIGNAL-TO-NOISE TEST**

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TABLE A C-NOTCHED NOISE REQUIREMENTS				
END-TO-END CIRCUIT LENGTH IN MILES (NOTE 1)	FACILITY TYPE (NOTE 2)			
	NONCOMPANDORED FACILITY	ANALOG AND N- CARRIER FACILITY (N1, N2, N3, ON)	ANALOG AND T- CARRIER FACILITY (D1A, D1B)	ANALOG AND T- CARRIER FACILITY (D1D, D2, D3, D4)
0 to 50	28	38	47	40
51 to 100	30	40	47	41
101 to 400	33	43	47	41
401 to 1000	37	42	48	42
1001 to 1500	39	43	48	43
1501 to 2500	41	43	48	44
2501 to 4000	43	45	49	45

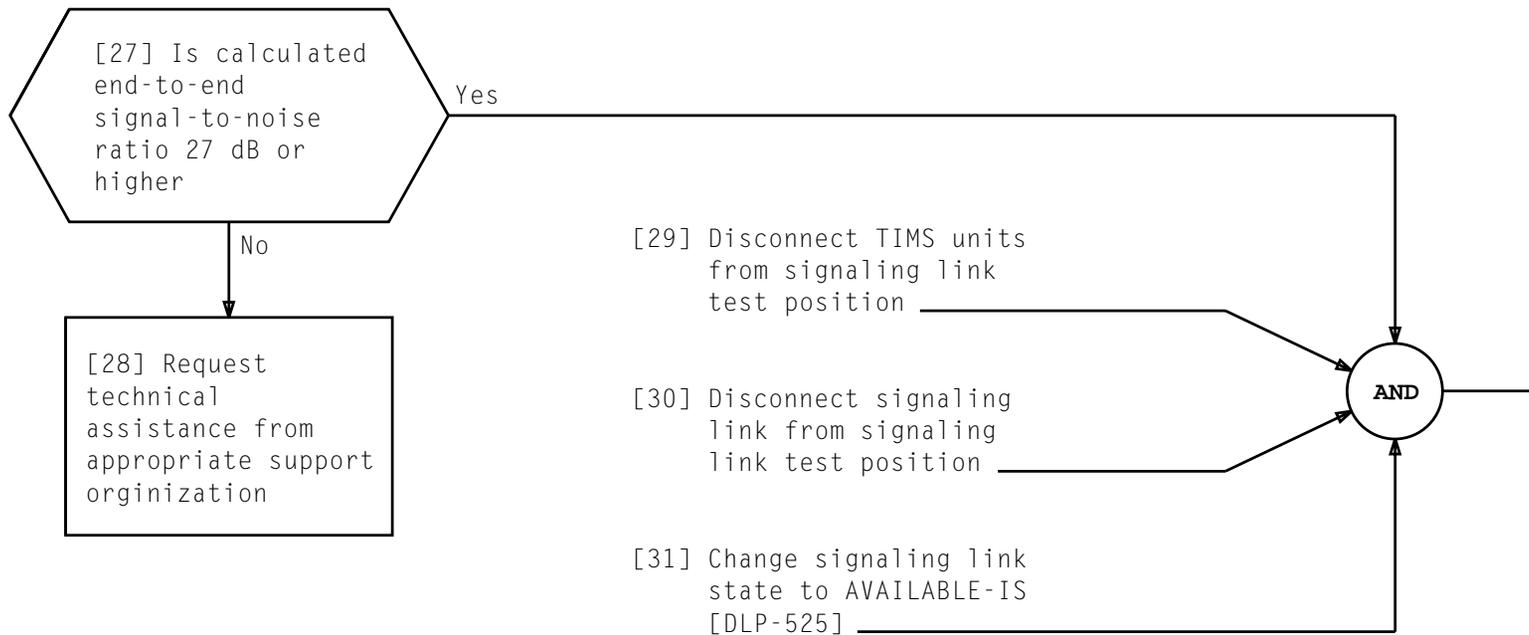
NOTES:

1. For mixed compandored/noncompandored signaling links greater than 200 miles, the compandored section is assumed to be 51 to 100 miles in length.
2. Values listed are in dBrc at -4 TLP for end-to-end noise measurement. For loopback testing, the values given must be increased by 3 dB.



**PERFORM ANALOG SIGNALING LINK C-NOTCHED NOISE AND SIGNAL-TO-NOISE TEST**

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**PERFORM ANALOG SIGNALING LINK C-NOTCHED NOISE AND SIGNAL-TO-NOISE TEST**

SUMMARY

The single frequency interference test checks a signaling link for spurious tones that can interfere with data signals

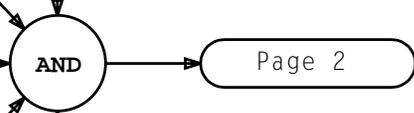
[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in MANUAL-00S (MOOS) state [DLP-516]

[3] At near-end and far-end office, connect signaling link to signaling link test position

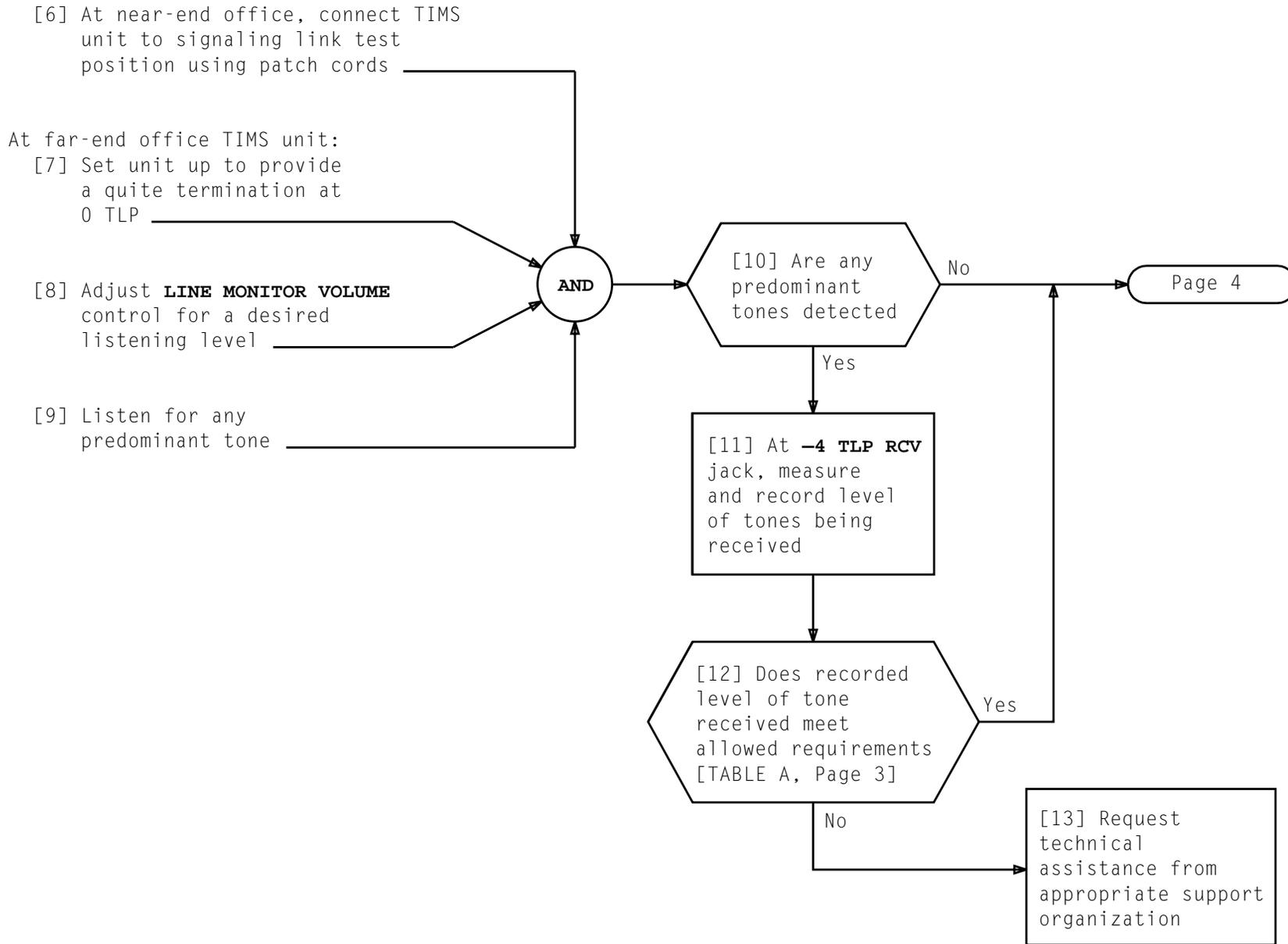
[4] At near-end office, connect TIMS unit to signaling link test position using patch cord

[5] At near-end office TIMS unit, depress **TEST SELECT** and **NOISE** pushbuttons



**PERFORM ANALOG SIGNALING LINK SINGLE FREQUENCY INTERFERENCE TEST**

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**PERFORM ANALOG SIGNALING LINK SINGLE FREQUENCY INTERFERENCE TEST**

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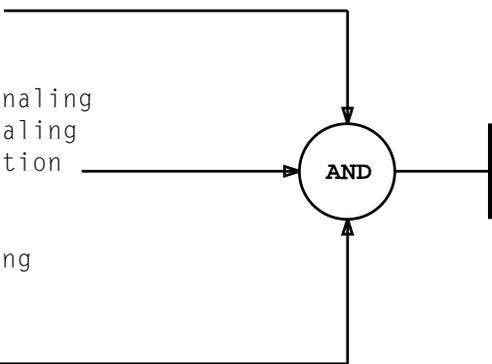
TABLE A SINGLE FREQUENCY INTERFERENCE TEST REQUIREMENTS	
CIRCUIT LENGTH IN MILES	ACCEPTABLE TONE LEVEL AT -4 TLP
0 to 50	24 dBrc
51 to 100	27 dBrc
101 to 400	30 dBrc
401 to 1000	34 dBrc
1001 to 1500	36 dBrc
1501 to 2500	38 dBrc
2501 to 4000	40 dBrc
4001 to 8000	43 dBrc
8001 to 16000	46 dBrc
Satellite channel	37 dBrc



[22] Disconnect TMS units  
from signaling link  
test position

[23] Disconnect signaling  
link from signaling  
link test position

[24] Change signaling  
link state to  
AVAILABLE-IS  
[DLP-525]

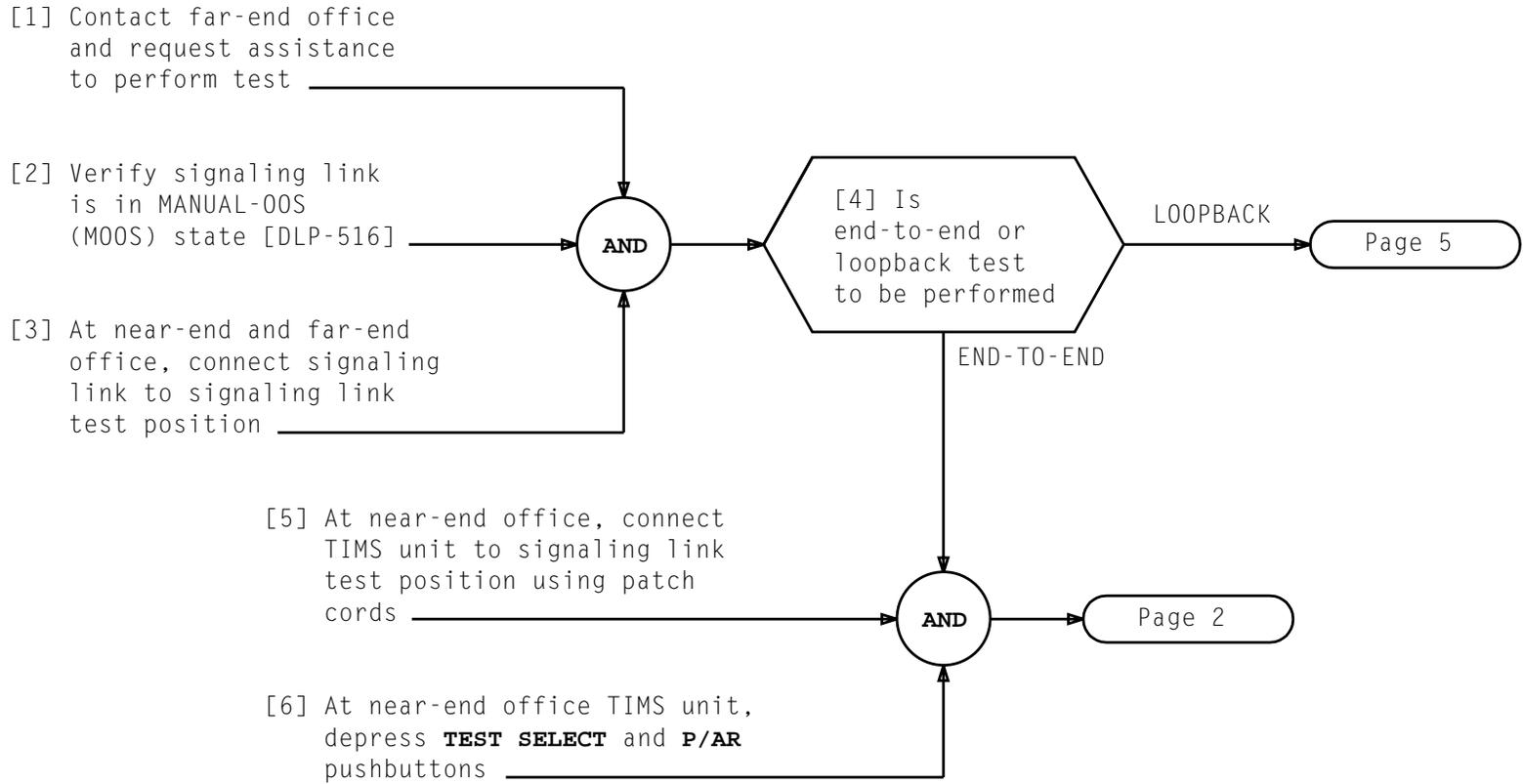


**PERFORM ANALOG SIGNALING LINK SINGLE FREQUENCY INTERFERENCE TEST**

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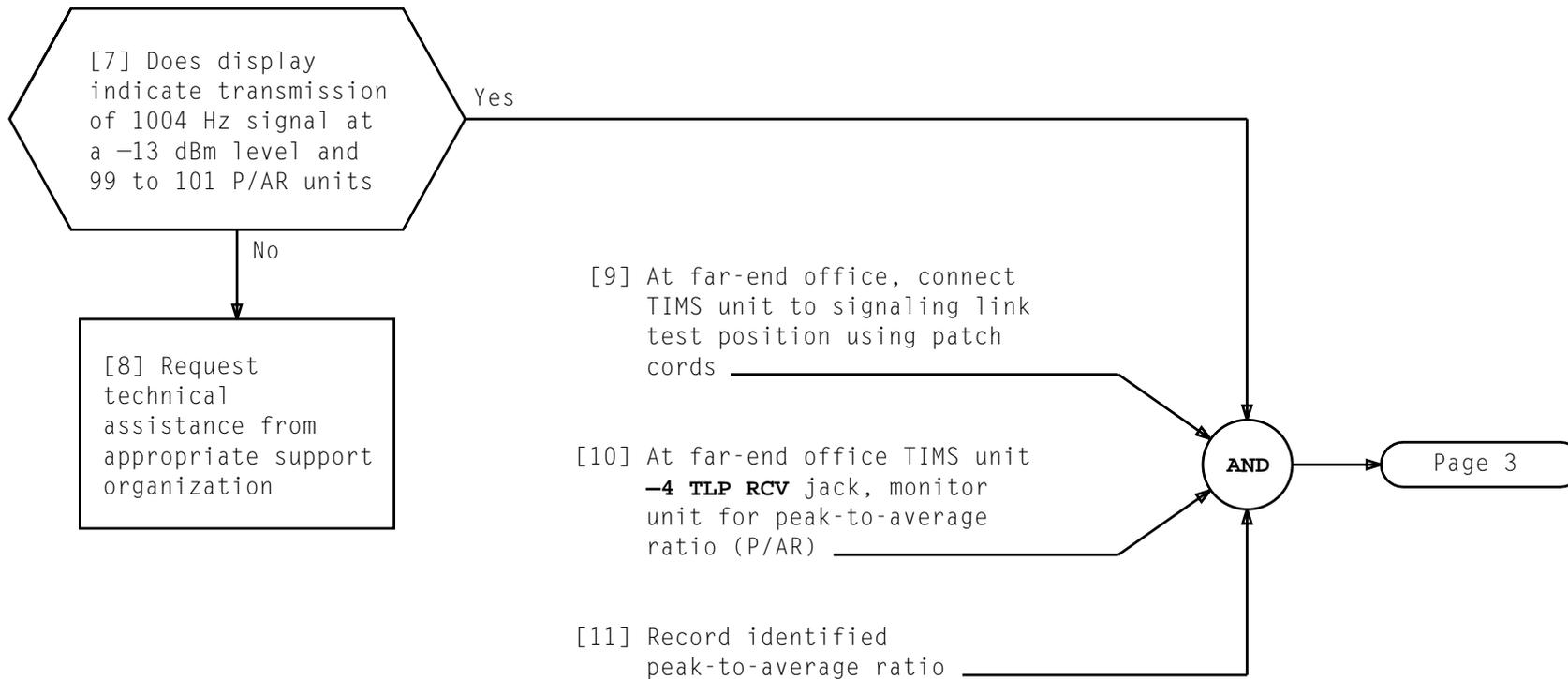
<p>SUMMARY</p> <p>The peak-to-average test checks the ratio of peak and full-wave rectified average values of a low duty cycle test</p>	<p>pulse relative to the undistorted test signal on a signaling link</p>
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**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**

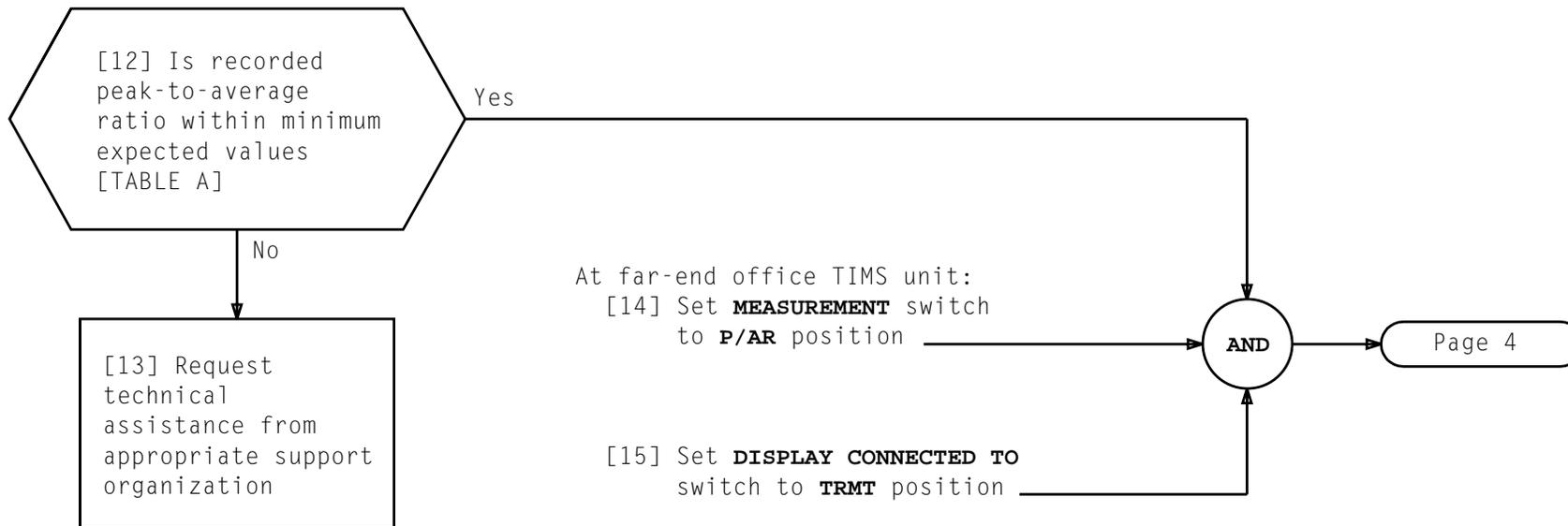
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**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**

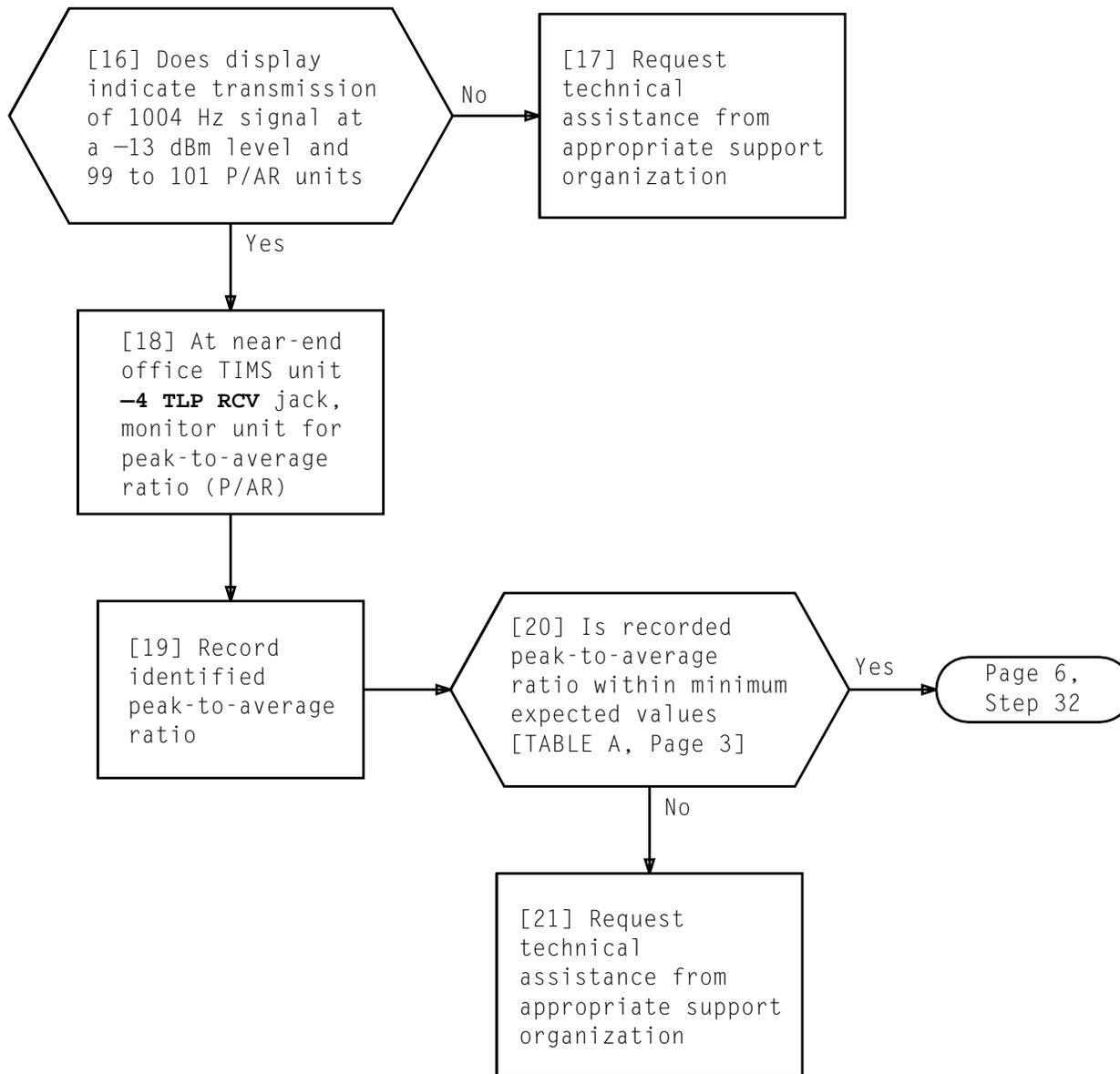
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**TABLE A**  
**MINIMUM PEAK-TO-AVERAGE RATIO VALUES**

FACILITY TYPE	MINIMUM PEAK-TO-AVERAGE RATIO
T	92
N1, N3, ON	86
N2	90
L or Radio	85

**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**



**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**

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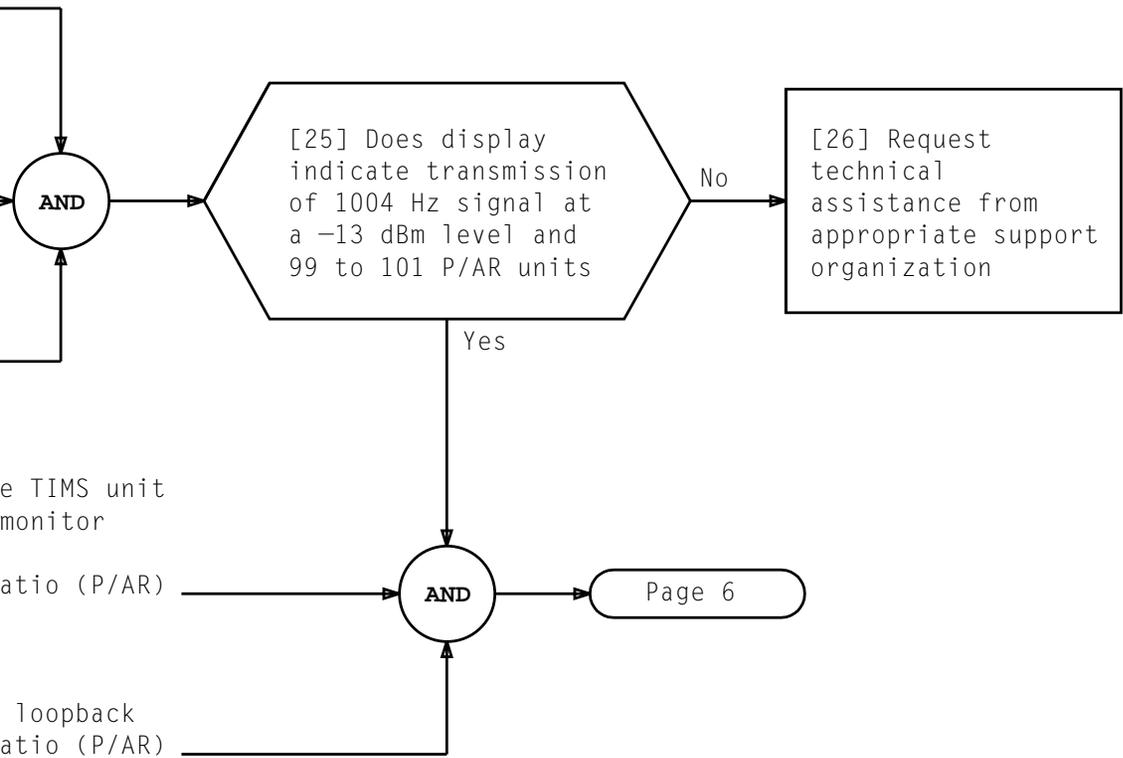
[22] At far-end office signaling link test position, establish loopback for signaling link being tested

[23] At near-end office, connect TIMS unit to signaling link test position using patch cords

[24] At near-end office TIMS unit, depress **TEST SELECT** and **P/AR** pushbuttons

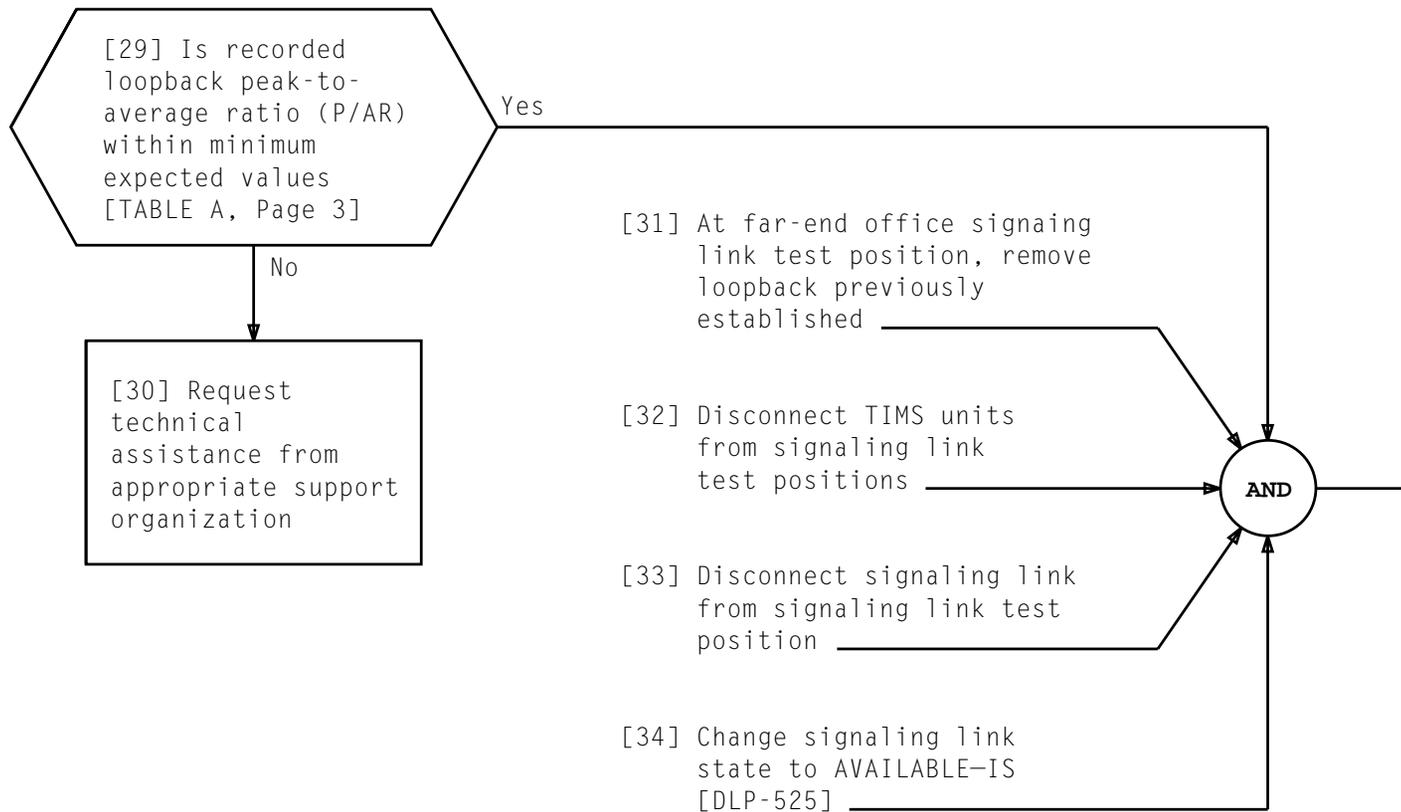
[27] At near-end office TIMS unit -4 **TLP RCV** jack, monitor unit for loopback peak-to-average ratio (P/AR)

[28] Record identified loopback peak-to-average ratio (P/AR)



**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**

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**PERFORM ANALOG SIGNALING LINK PEAK-TO-AVERAGE RATIO TEST**

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SUMMARY

The impulse noise, phase hits, and gain hits test checks for these conditions on a signaling link.

[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in MANUAL-00S (MOOS) state [DLP-516]

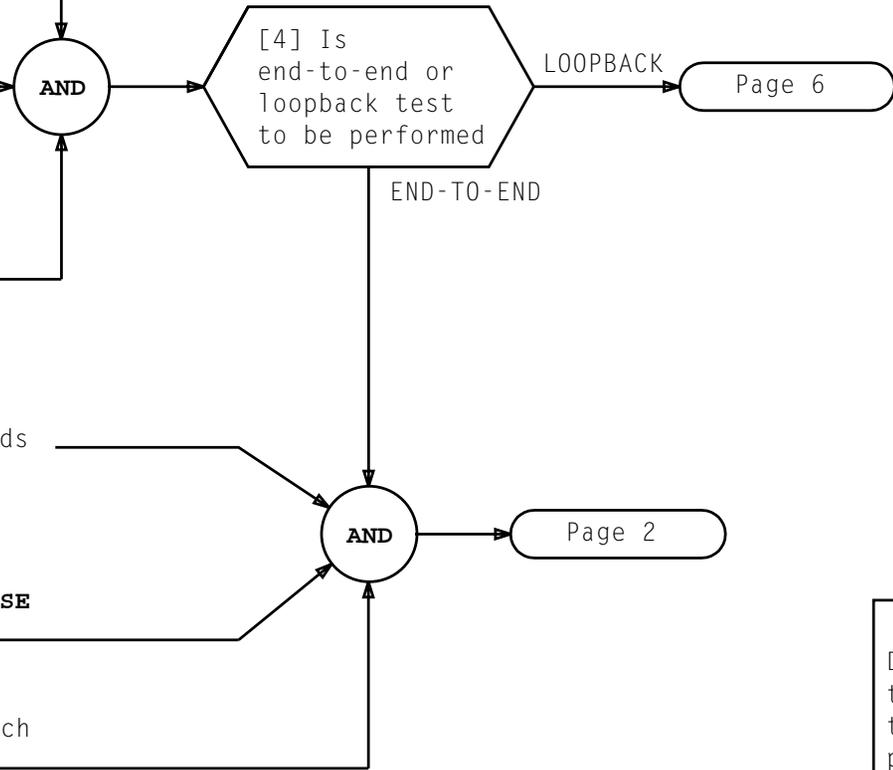
[3] At near-end and far-end office, connect signaling link to signaling link test position

[5] At far-end office, connect TIMS unit to signaling link test position using patch cords

At far-end office TIMS unit:

[6] See NOTE 1. Set **MEASUREMENT** switch to **3-LEVEL IMPULSE NOISE HITS & DROPOUTS** position

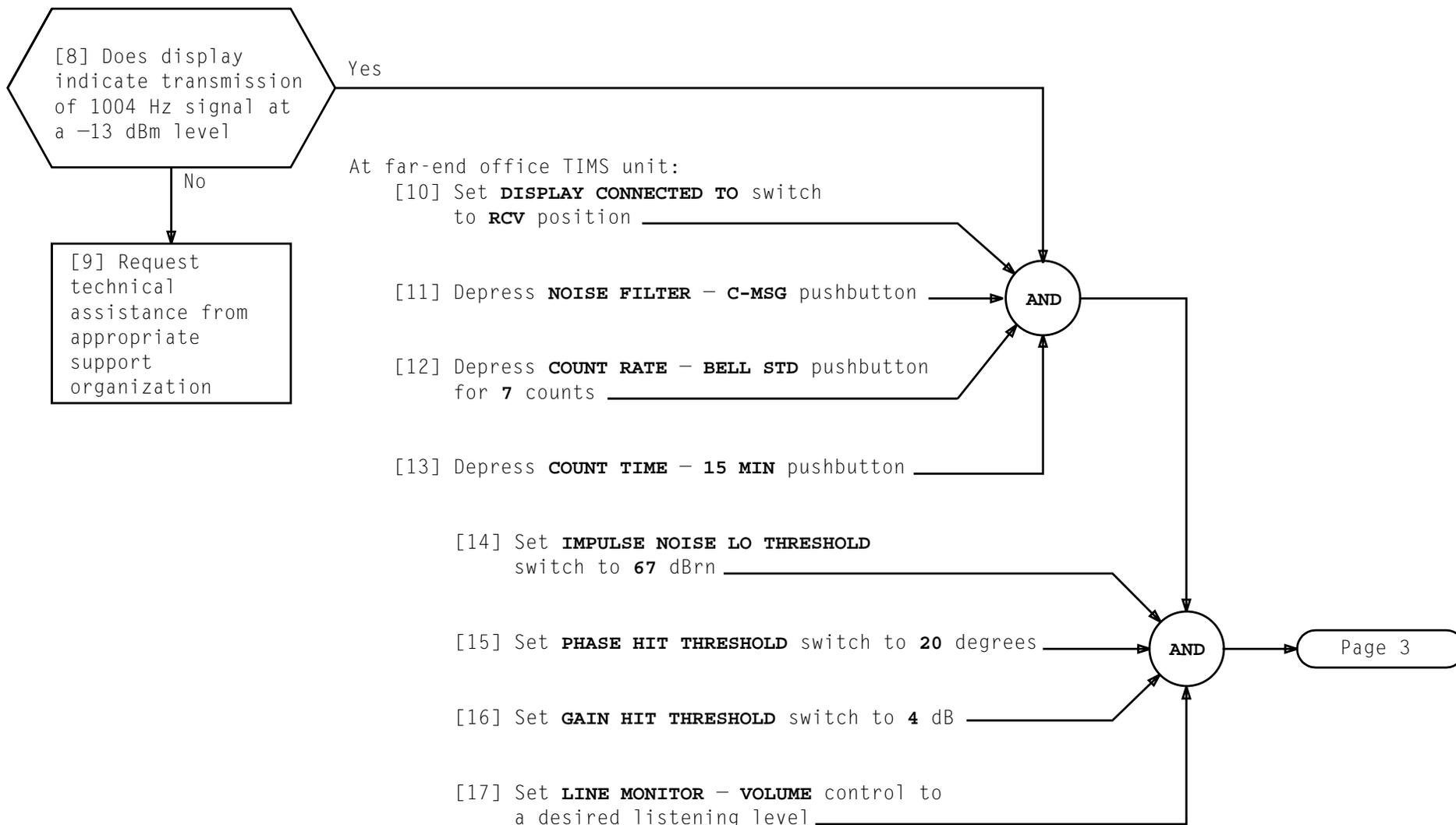
[7] Set **DISPLAY CONNECTED TO** switch to **TRMT** position



NOTE 1  
Due to time required to perform this test, it should be performed simultaneously at both offices

**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

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**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

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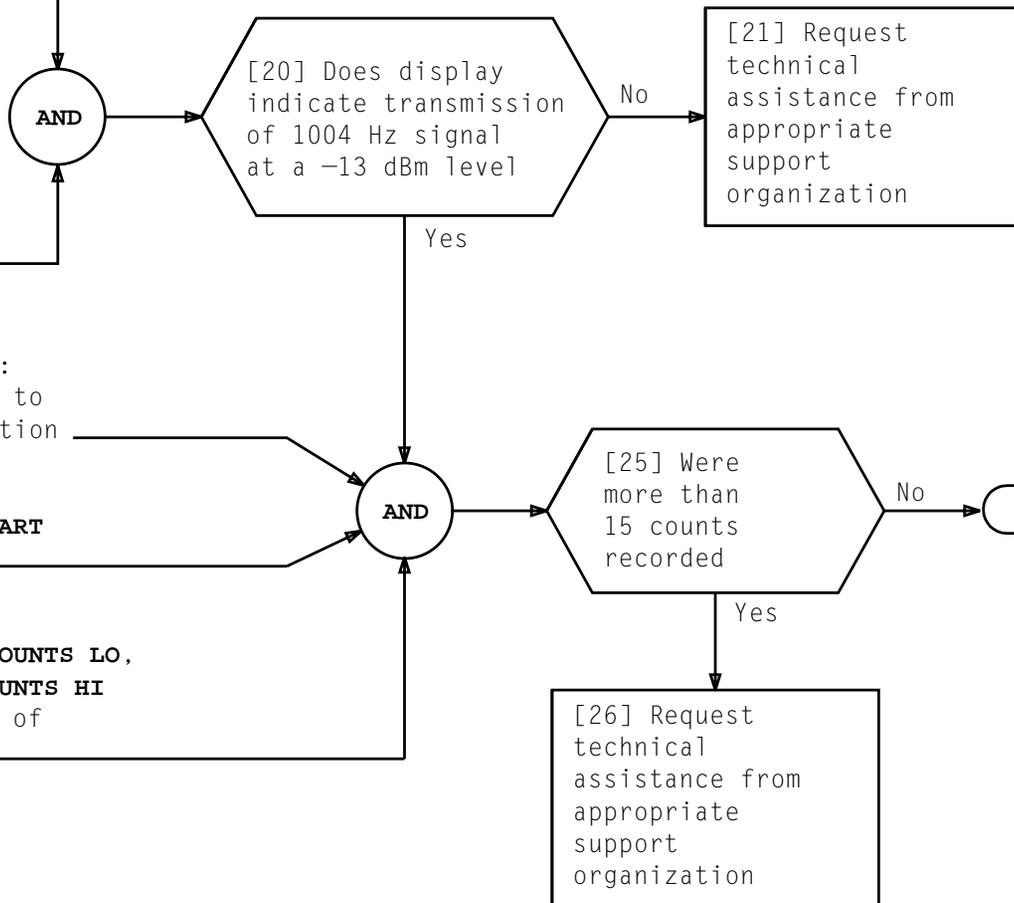
[18] At near-end office, connect TIMS unit to signaling link test position using patch cord

[19] At near-end office TIMS unit, set unit up to transmit a 1004 Hz signal at a -13 dBm level

At far-end office TIMS unit:  
[22] Set **DISPLAY** switch to **IMPULSE NOISE** position

[23] Depress **PUSH TO START** pushbutton

[24] Record number of **COUNTS LO**, **COUNTS MID**, and **COUNTS HI** received after end of count period



**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

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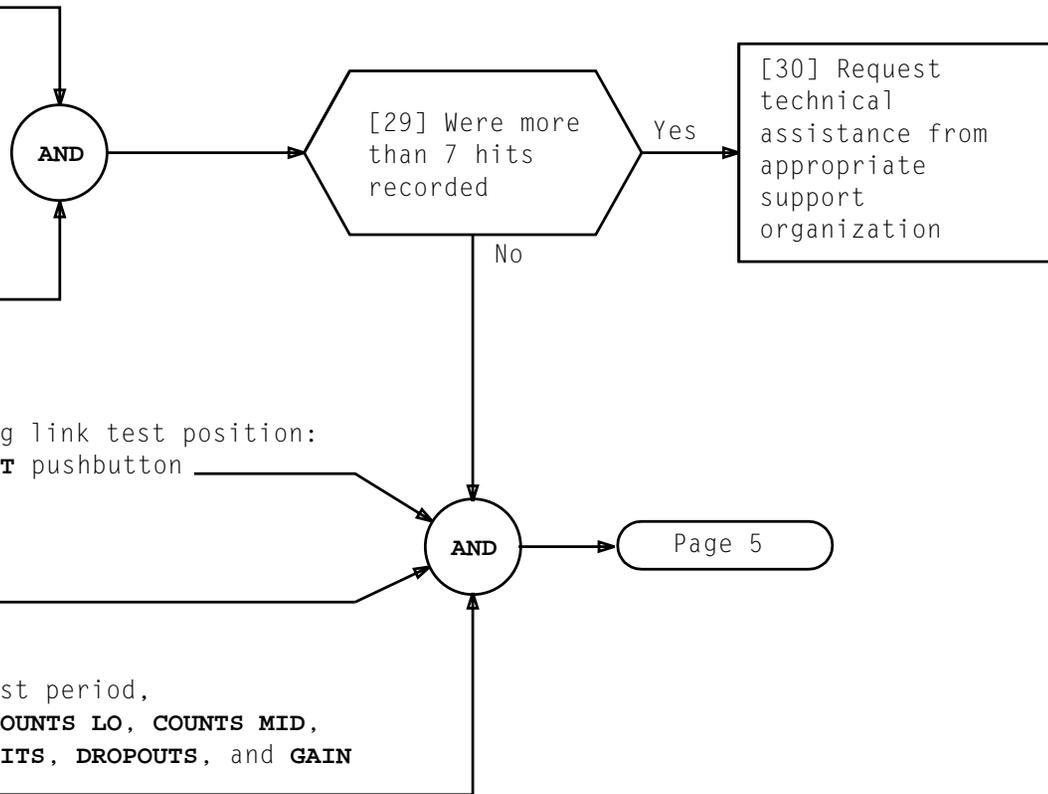
[27] At far-end office TIMS unit,  
set **DISPLAY** switch to  
**HITS & DROP** position

[28] Record number of **PHASE  
HITS, DROPOUTS,** and **GAIN  
HITS** received

At near-end office signaling link test position:  
[31] Depress **TEST SELECT** pushbutton

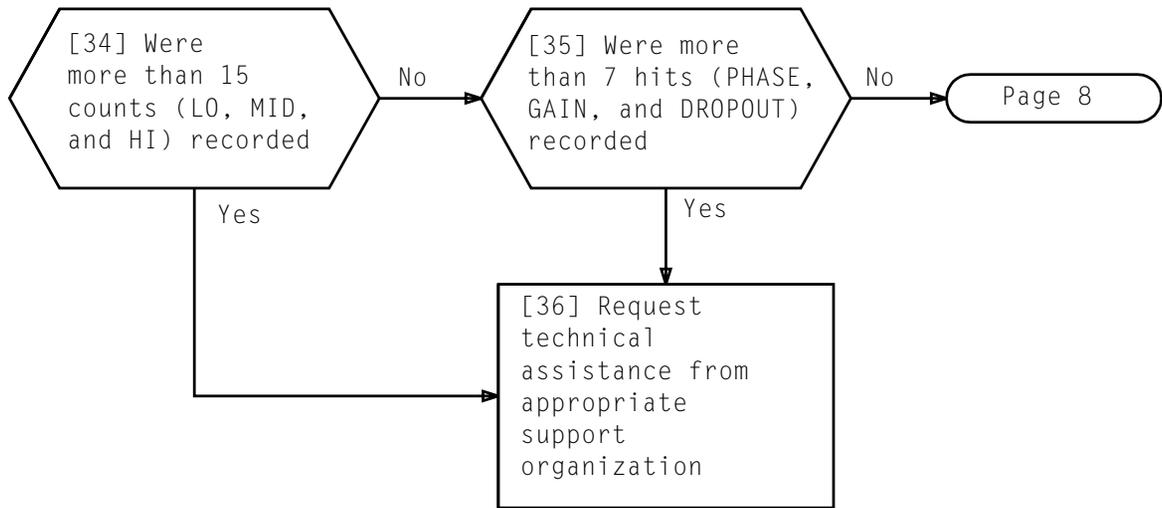
[32] Depress **TRANSIENT**  
pushbutton

[33] After 15 minute test period,  
record number of **COUNTS LO, COUNTS MID,  
COUNTS HI, PHASE HITS, DROPOUTS,** and **GAIN  
HITS** received



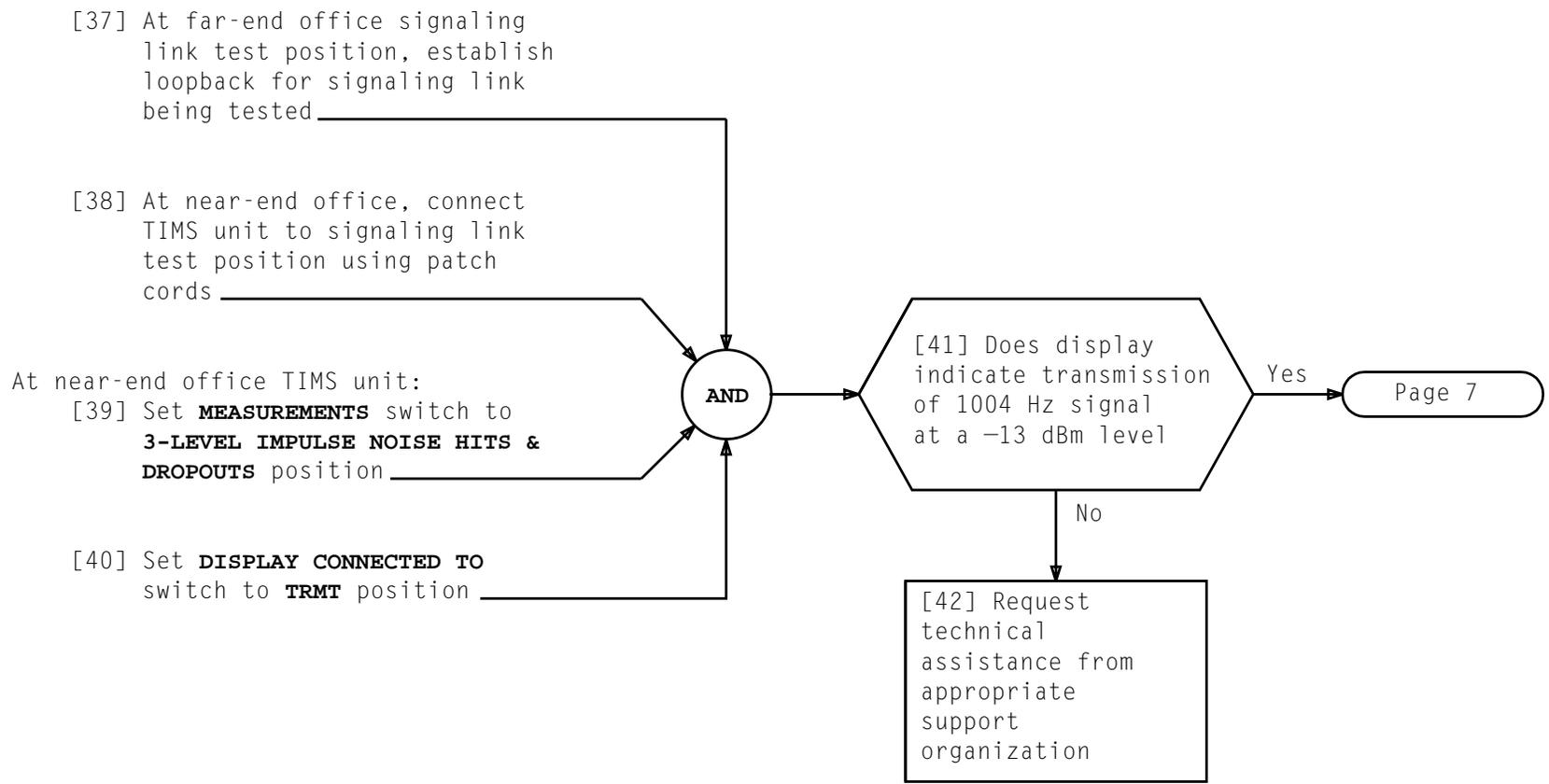
**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND  
GAIN HITS TEST**

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**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

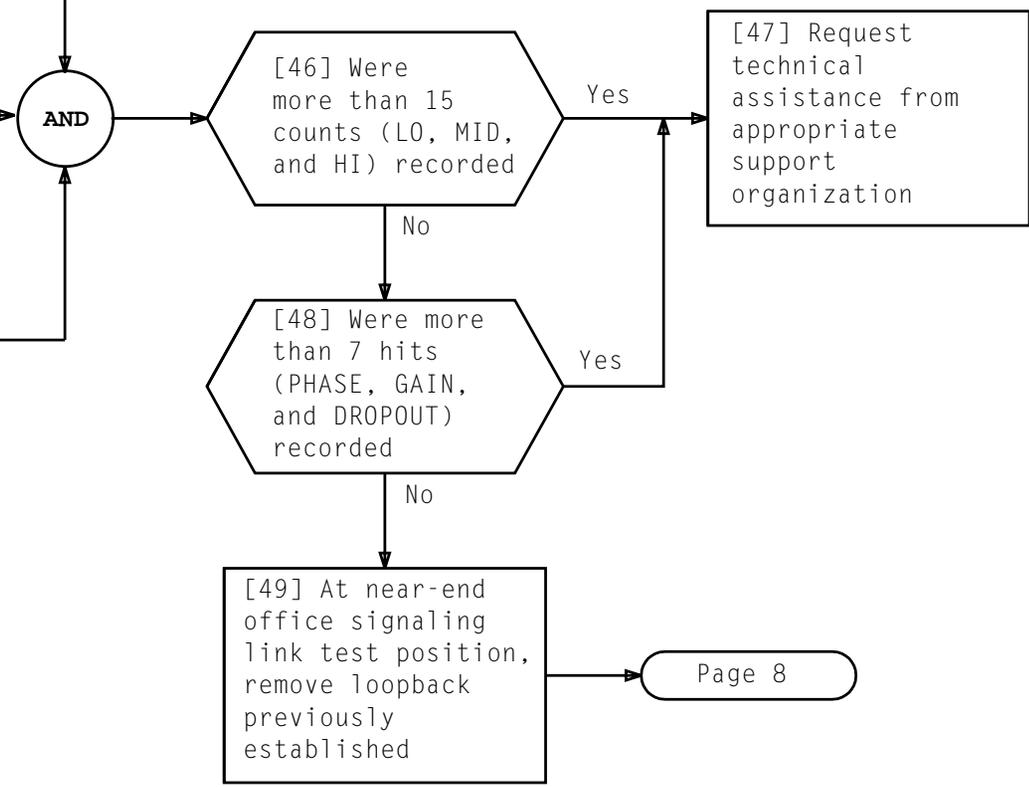
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At near-end office signaling link test position:

[43] Depress **TEST SELECT**  
pushbutton

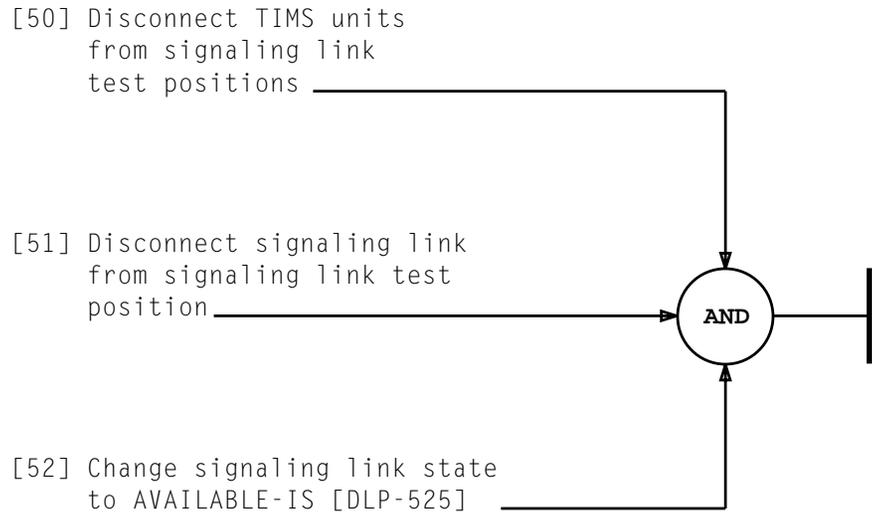
[44] Depress **TRANSIENT**  
pushbutton

[45] After 15 minute test period,  
record number of **COUNTS LO**,  
**COUNT MID**, **COUNTS HI**, **PHASE**  
**HITS**, **DROPOUTS**, and **GAIN**  
**HITS** received



**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

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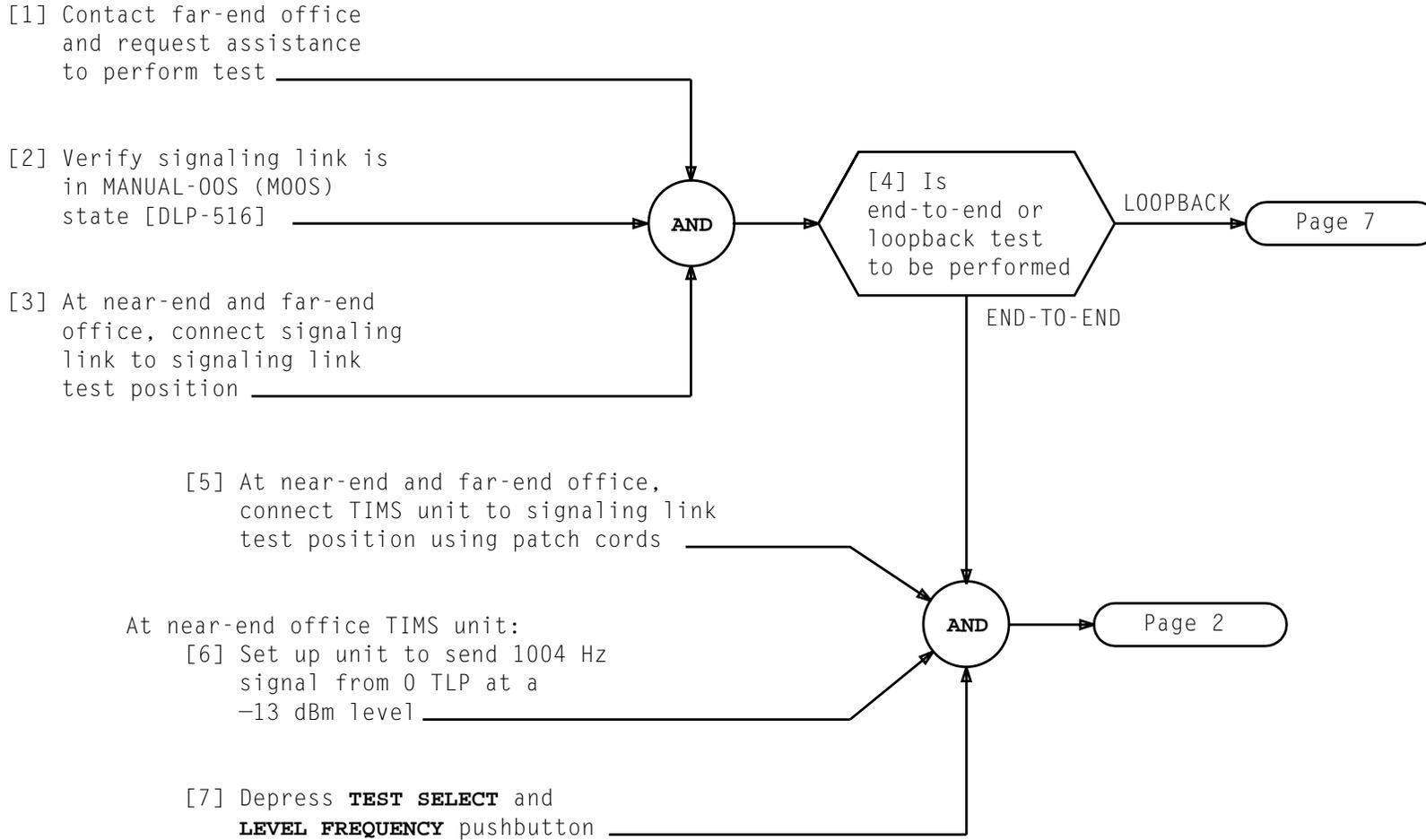


**PERFORM ANALOG SIGNALING LINK IMPULSE NOISE, PHASE HITS, AND GAIN HITS TEST**

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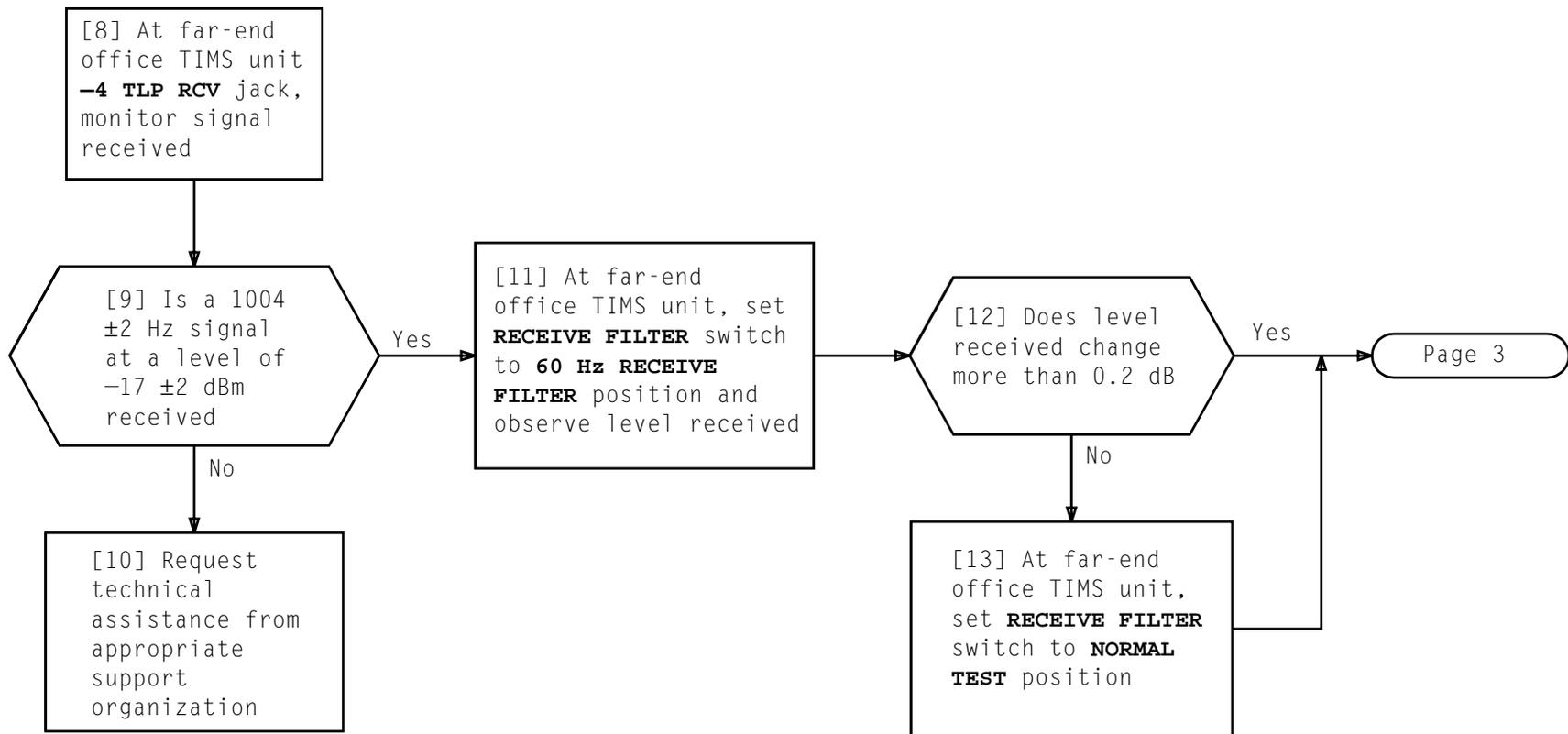
SUMMARY

The frequency response test checks the amplitude versus frequency characteristics of the signaling link and transmission media



**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

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**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

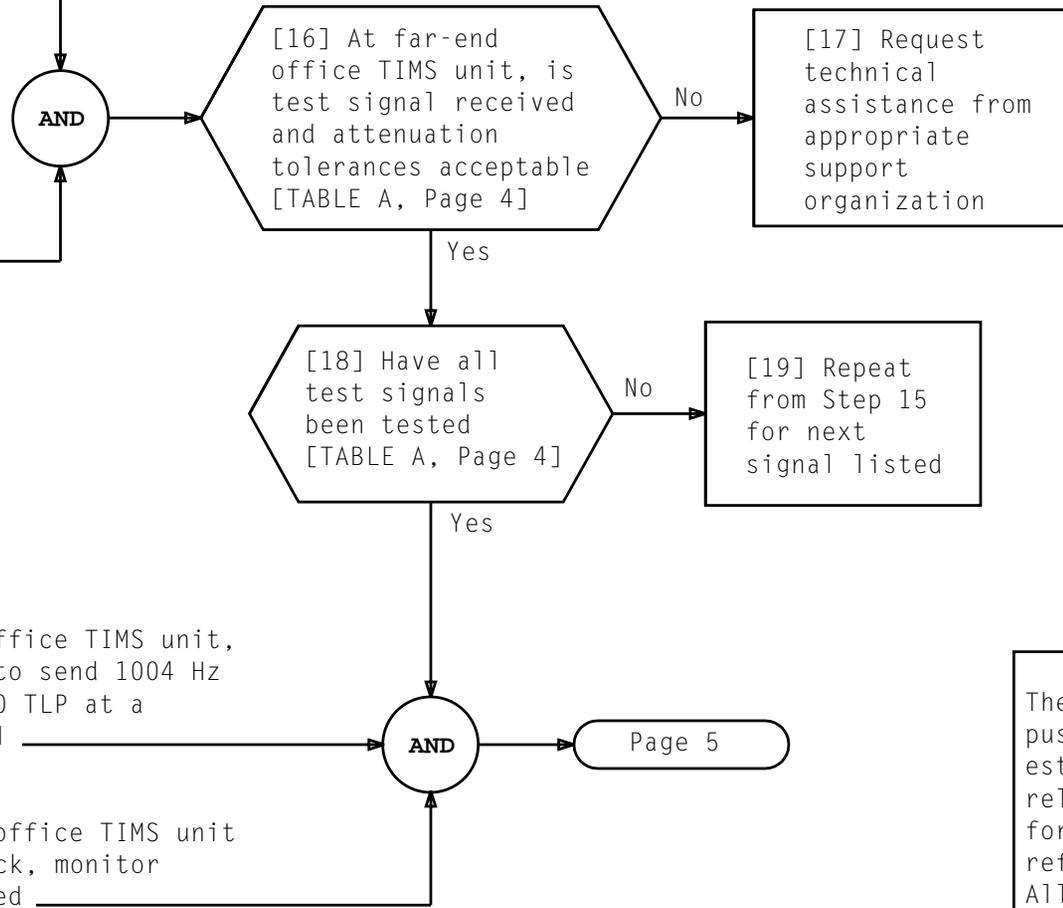
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[14] See NOTE 1. At far-end office TIMS unit, depress **LEVEL ZERO** pushbutton

[15] At near-end office TIMS unit, set up unit to transmit test signal from 0 TLP at a -13 dBm level [TABLE A, Page 4]

[20] At far-end office TIMS unit, set up unit to send 1004 Hz signal from 0 TLP at a -13 dBm level

[21] At near-end office TIMS unit -4 TLP RCV jack, monitor signal received



NOTE 1  
The **LEVEL ZERO** pushbutton establishes a 0 dB relative loss value for the received reference frequency. All subsequent level measurements are made in dB relative to the reference frequency dBm

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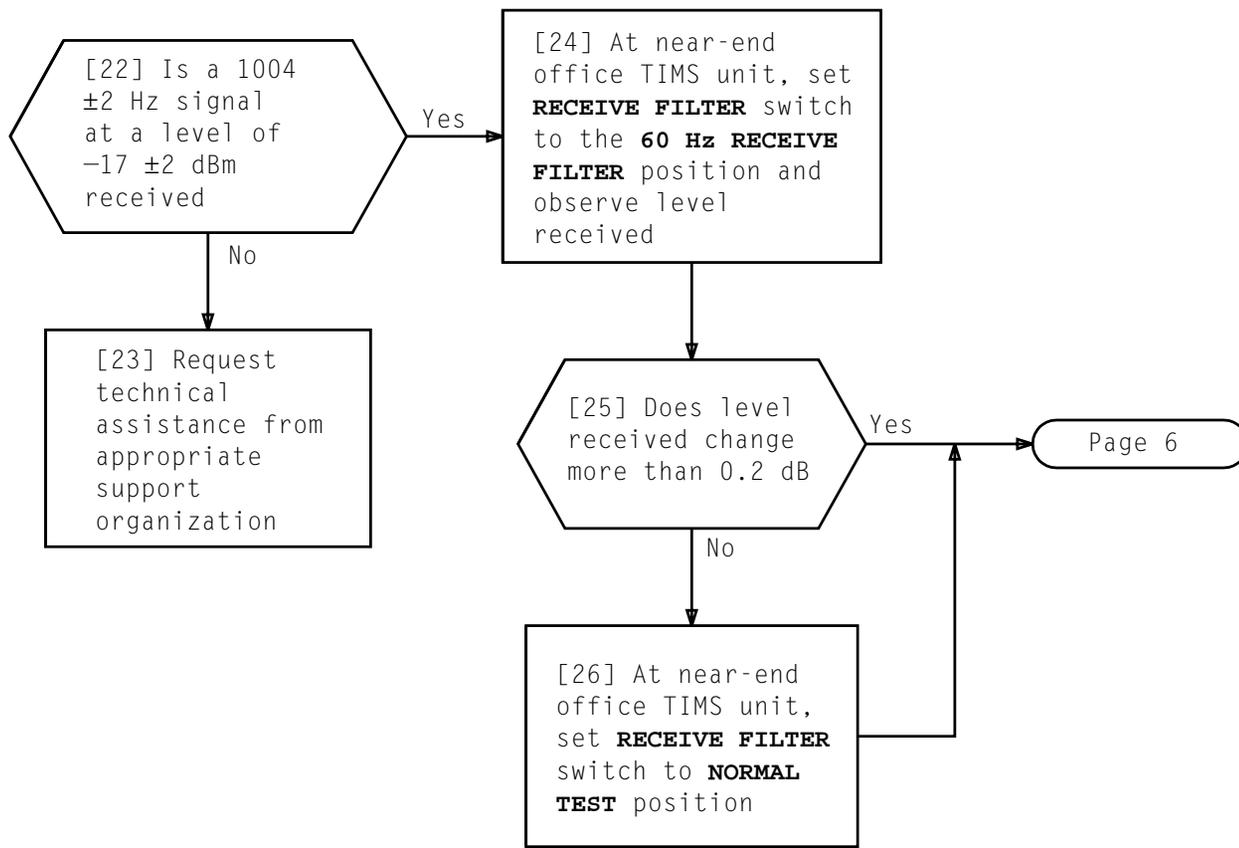
**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

TABLE A FREQUENCY RESPONSE REQUIREMENTS		
SIGNAL FREQUENCY AND LEVEL AT 0 TLP	SIGNAL FREQUENCY RECEIVED AT -4 TLP	ATTENUATION TOLERANCE (NOTE)
304 Hz at -13 dBm	304 Hz $\pm$ 2 Hz	-3 to +12 dB
404 Hz at -13 dBm	404 Hz $\pm$ 2 Hz	-2 to +6 dB
504 Hz at -13 dBm	504 Hz $\pm$ 2 Hz	-1 to +3 dB
604 Hz at -13 dBm	604 Hz $\pm$ 2 Hz	-1 to +3 dB
804 Hz at -13 dBm	804 Hz $\pm$ 2 Hz	-1 to +3 dB
1004 Hz at -13 dBm	1004 Hz $\pm$ 2 Hz	0 dB
1404 Hz at -13 dBm	1404 Hz $\pm$ 2 Hz	-1 to +3 dB
1804 Hz at -13 dBm	1804 Hz $\pm$ 2 Hz	-1 to +3 dB
2204 Hz at -13 dBm	2204 Hz $\pm$ 2 Hz	-1 to +3 dB
2504 Hz at -13 dBm	2504 Hz $\pm$ 2 Hz	-1 to +3 dB
2604 Hz at -13 dBm	2604 Hz $\pm$ 2 Hz	-2 to +6 dB
2804 Hz at -13 dBm	2804 Hz $\pm$ 2 Hz	-2 to +6 dB
3004 Hz at -13 dBm	3004 Hz $\pm$ 2 Hz	-3 to +12 dB
NOTE - Variance is relative to reference levels (dB)		

**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

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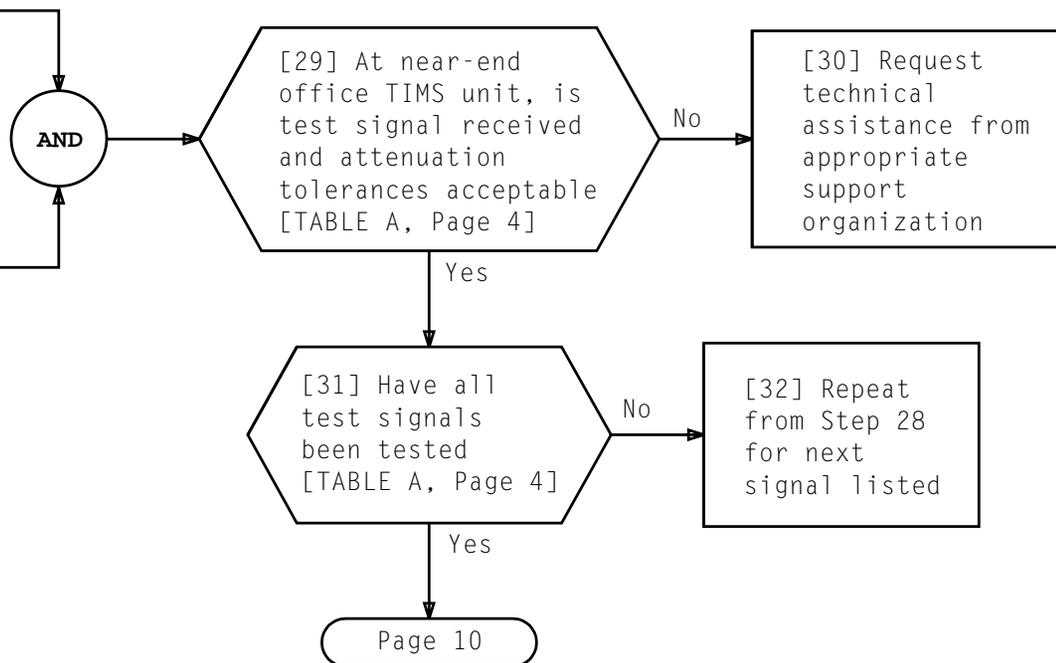


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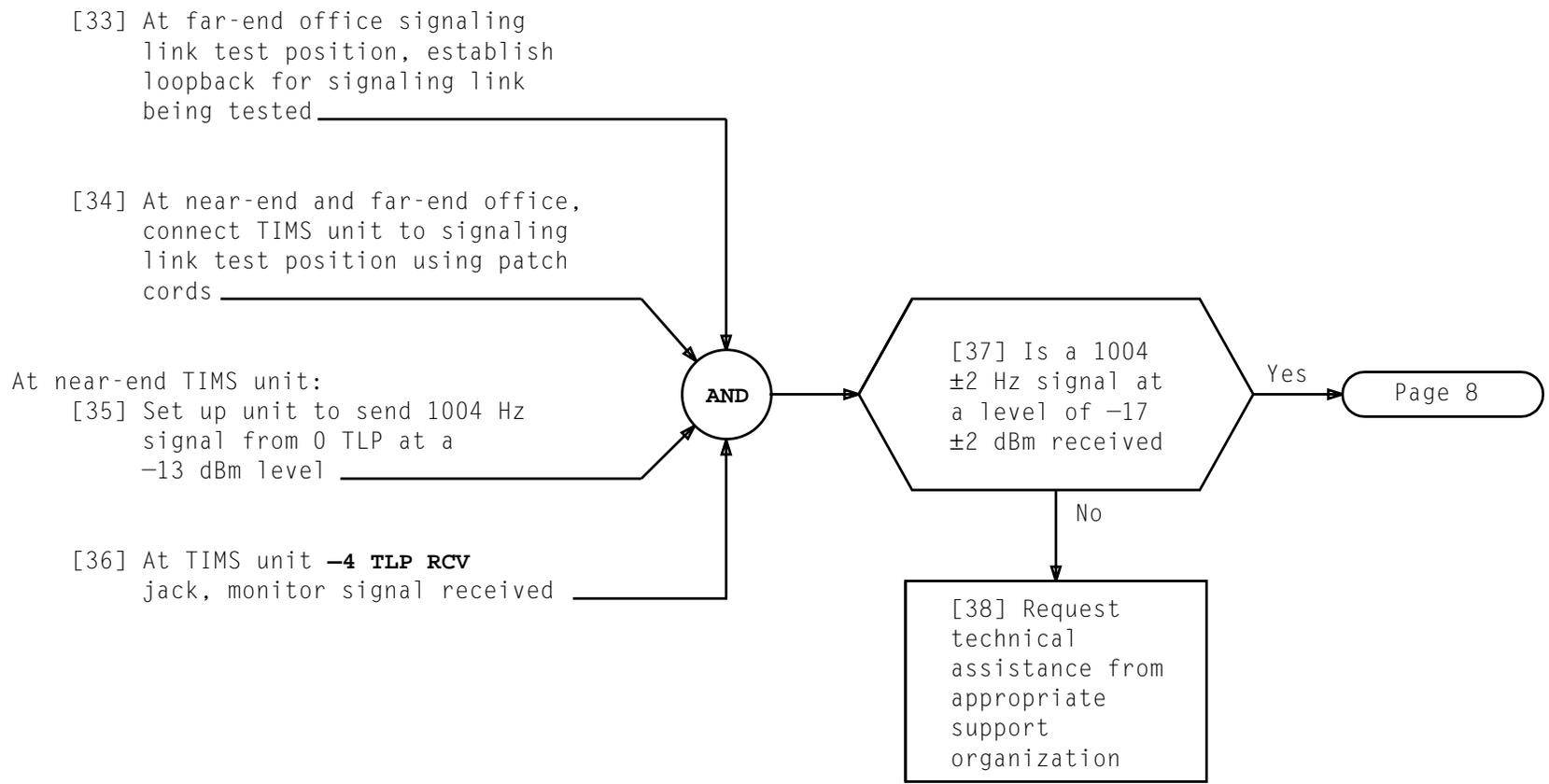
[27] See NOTE 2. At near-end office TIMS unit, depress **LEVEL ZERO** pushbutton

[28] At far-end office TIMS unit, set up unit to transmit test signal from 0 TLP at a -13 dBm level [TABLE A, Page 4]



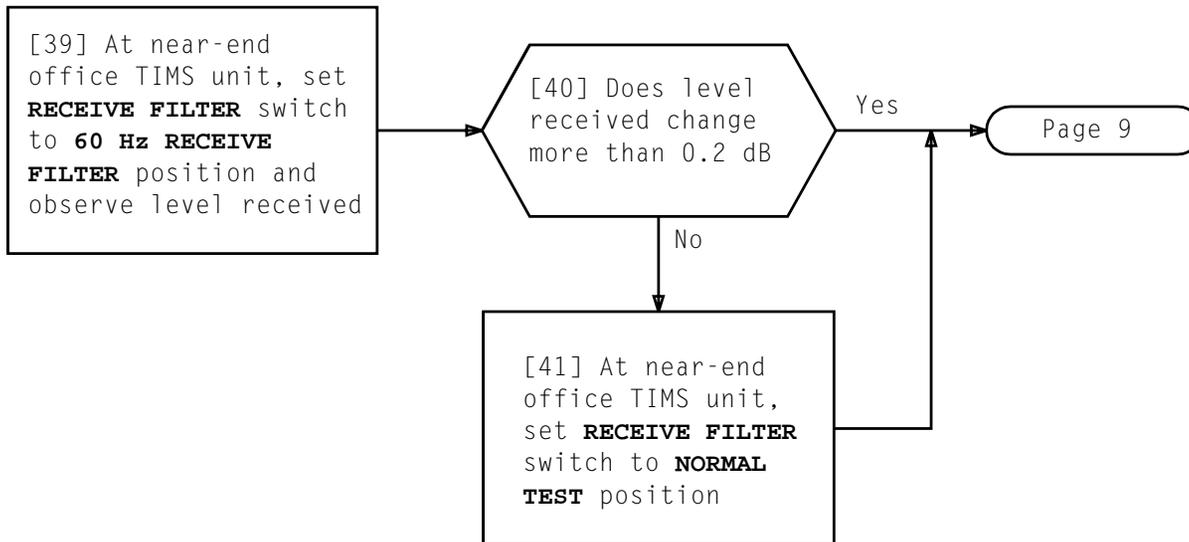
NOTE 2	
The <b>LEVEL ZERO</b> pushbutton establishes a 0 dB relative loss value for the reference frequency. All subsequent level measurements are made in dB relative to the reference frequency dBm	
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**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**



**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

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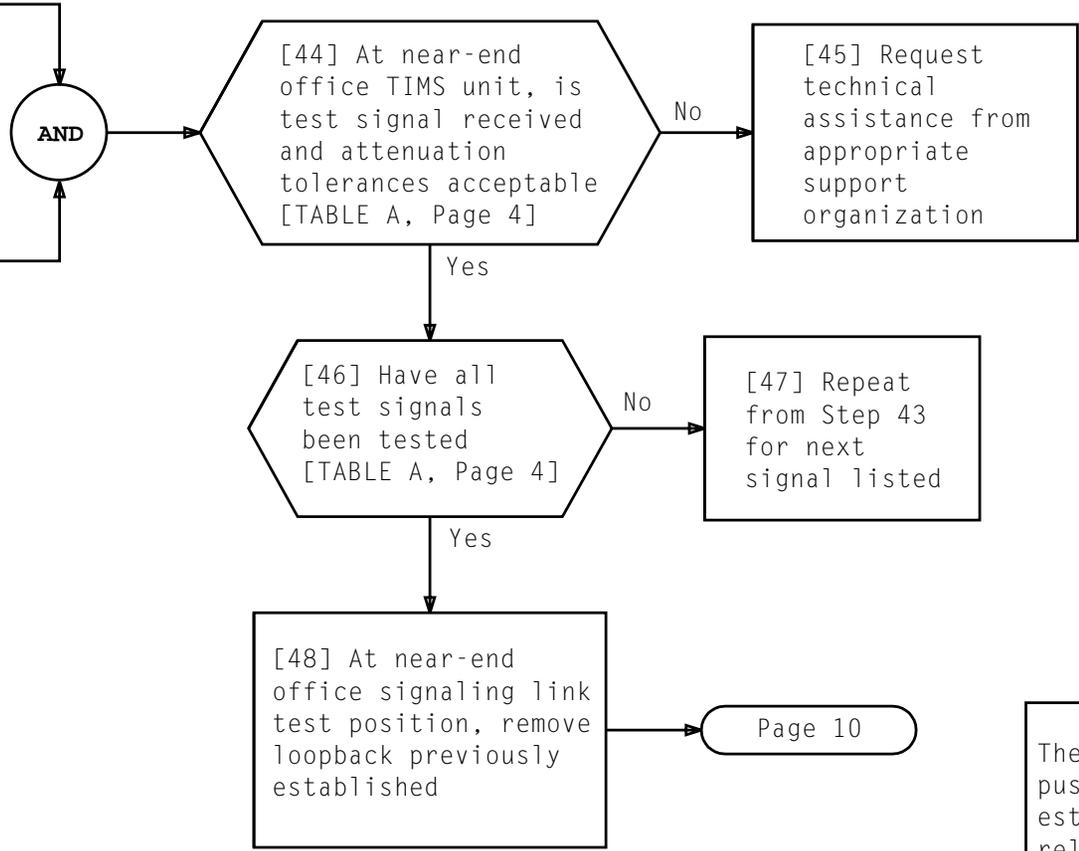


**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

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[42] See NOTE 3. At near-end office TIMS unit, depress **LEVEL ZERO** pushbutton

[43] At near-end office TIMS unit, set up unit to transmit test signal from 0 TLP at a -13 dBm level [TABLE A, Page 4]



NOTE 3  
The **LEVEL ZERO** pushbutton establishes a 0 dB relative loss value for the reference frequency. All subsequent level measurements are made in dB relative to the reference frequency dBm

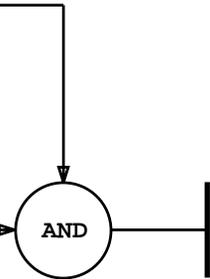
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**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

[49] Disconnect TIMS units  
from signaling link  
test positions

[50] Disconnect signaling link  
from signaling link test  
position

[51] Change signaling link state  
to AVAILABLE-IS [DLP-525]



**PERFORM ANALOG SIGNALING LINK FREQUENCY RESPONSE TEST**

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SUMMARY

The envelope delay distortion test checks the envelope delay distortion of a signaling link by transmitting specific test frequencies and measuring the delay.

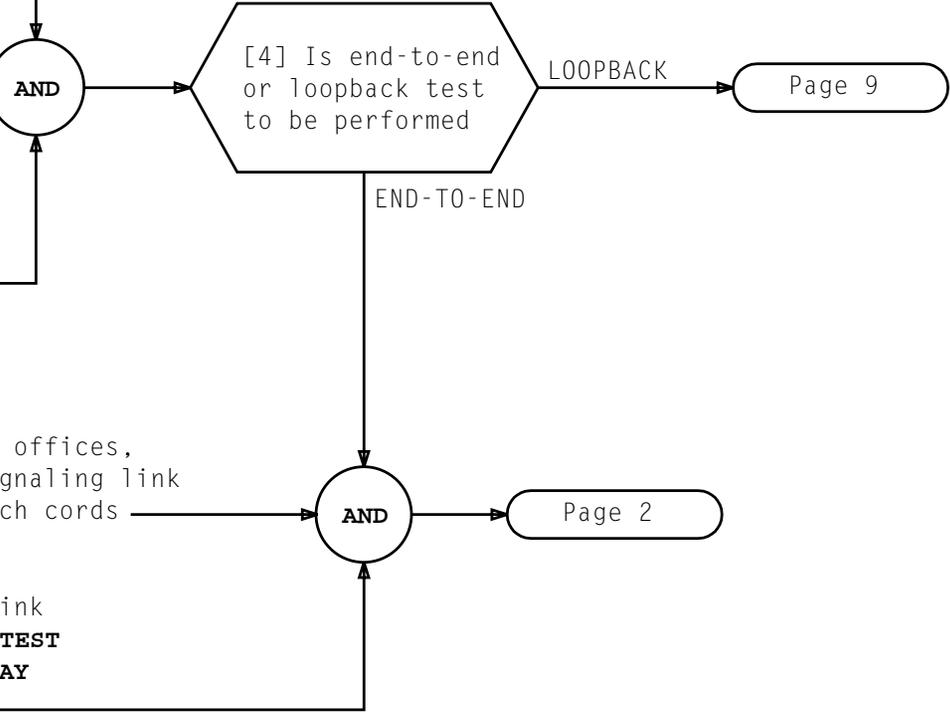
[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in MANUAL-00S (MOOS) state [DLP-516]

[3] At near-end and far-end office, connect signaling link to signaling link test position

[5] At near-end and far-end offices, connect TIMS unit to signaling link test position using patch cords

[6] At near-end signaling link test position, depress **TEST SELECT** and **ENVELOPE DELAY** pushbutton



**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

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At near-end office TIMS unit:

[7] Depress **NORMAL/REPT** pushbutton to set up unit as a normal test set

[8] Adjust **OUTPUT LEVEL** control to obtain a -13 dBm reference level

At far-end office TIMS unit:

[9] Set **MEASUREMENT** switch to **ENVELOPE DELAY** position

[10] Set **DISPLAY CONNECTED TO** switch to **TRMT** position

[11] Depress **ENVELOPE DELAY-REPEAT** pushbutton

[12] Set up TIMS unit to send 1804 Hz reference signal from 0 TLP at a -13 dBm level

[13] At near-end office TIMS unit, adjust reference signal frequency to 1804 Hz

AND

[14] Does near-end office TIMS unit display indicate a -40 dBm or higher envelope delay measurement

Yes

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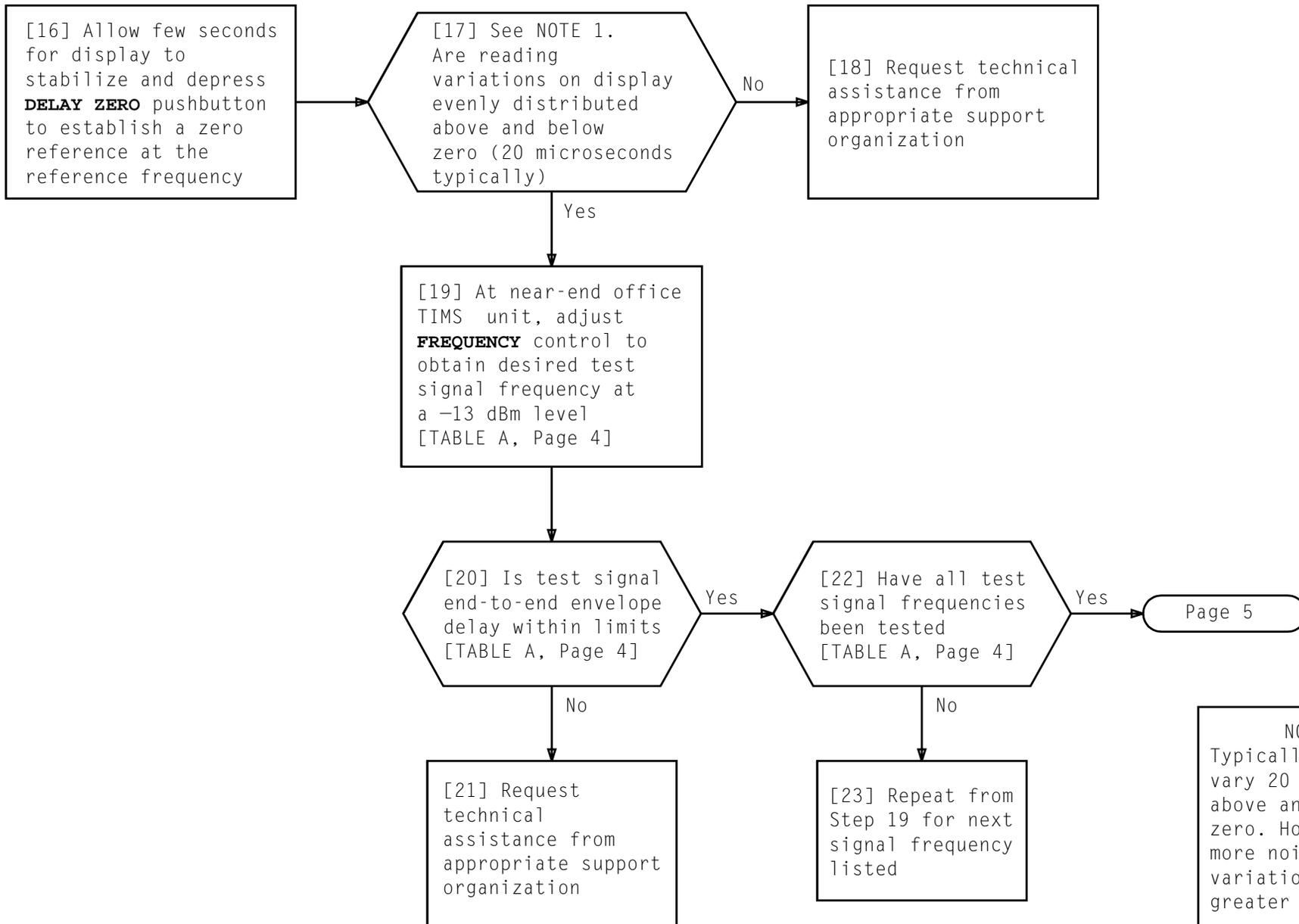
No

[15] Request technical assistance from appropriate support organization

## PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST

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NOTE 1  
Typically, readings vary 20 microseconds above and below zero. However, on more noisy circuits, variations may be greater

**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

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TABLE A ENVELOPE DELAY DISTORTION REQUIREMENTS		
SIGNAL FREQUENCY AND LEVEL AT 0 TLP	MAXIMUM END-TO-END ENVELOPE DELAY (MICROSECONDS)	MAXIMUM LOOPED BACK ENVELOPE DELAY (MICROSECONDS)
804 Hz at -13 dBm	1750	3500
1004 Hz at -13 dBm	1750	3500
1404 Hz at -13 dBm	1750	3500
1804 Hz at -13 dBm	1750	3500
2204 Hz at -13 dBm	1750	3500
2504 Hz at -13 dBm	1750	3500
2604 Hz at -13 dBm	1750	3500

**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

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At far-end office TIMS unit:

[24] Set **MEASUREMENT** switch  
to **ENVELOPE DELAY** position

[25] Set **DISPLAY CONNECTED TO**  
switch to **TRMT** position

[26] Depress **ENVELOPE DELAY - NORM**  
pushbutton

[27] Adjust **OUTPUT LEVEL** control to  
obtain a -13 dBm reference level

At near-end office TIMS unit:

[28] Depress **NORMAL/REPT** pushbutton to  
set up unit as a repeat test set

[29] Set up TIMS unit to send  
1804 Hz reference signal from  
0 TLP at a -13 dBm level

AND

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## PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST

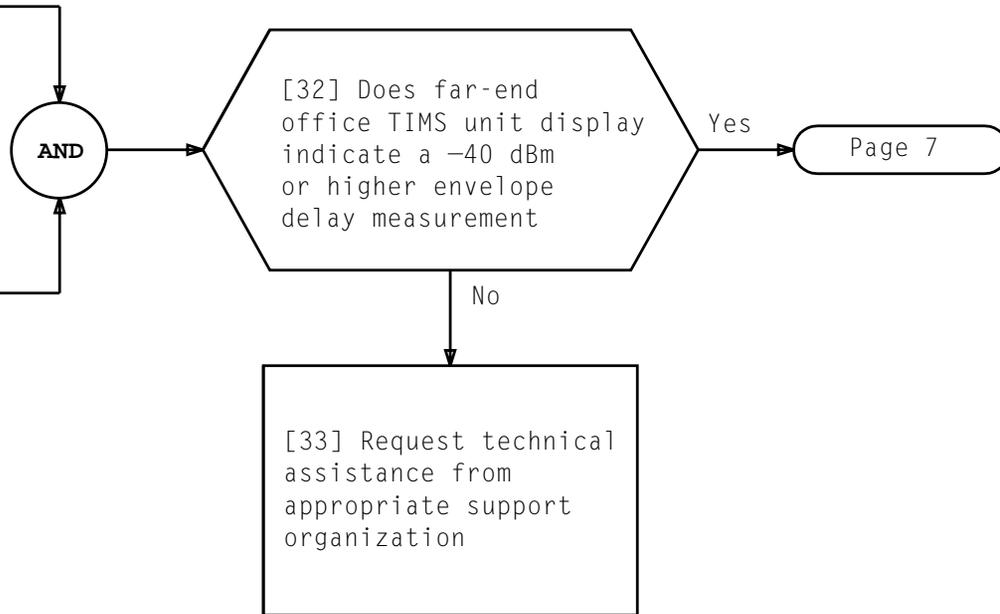
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At far-end office TIMS unit:

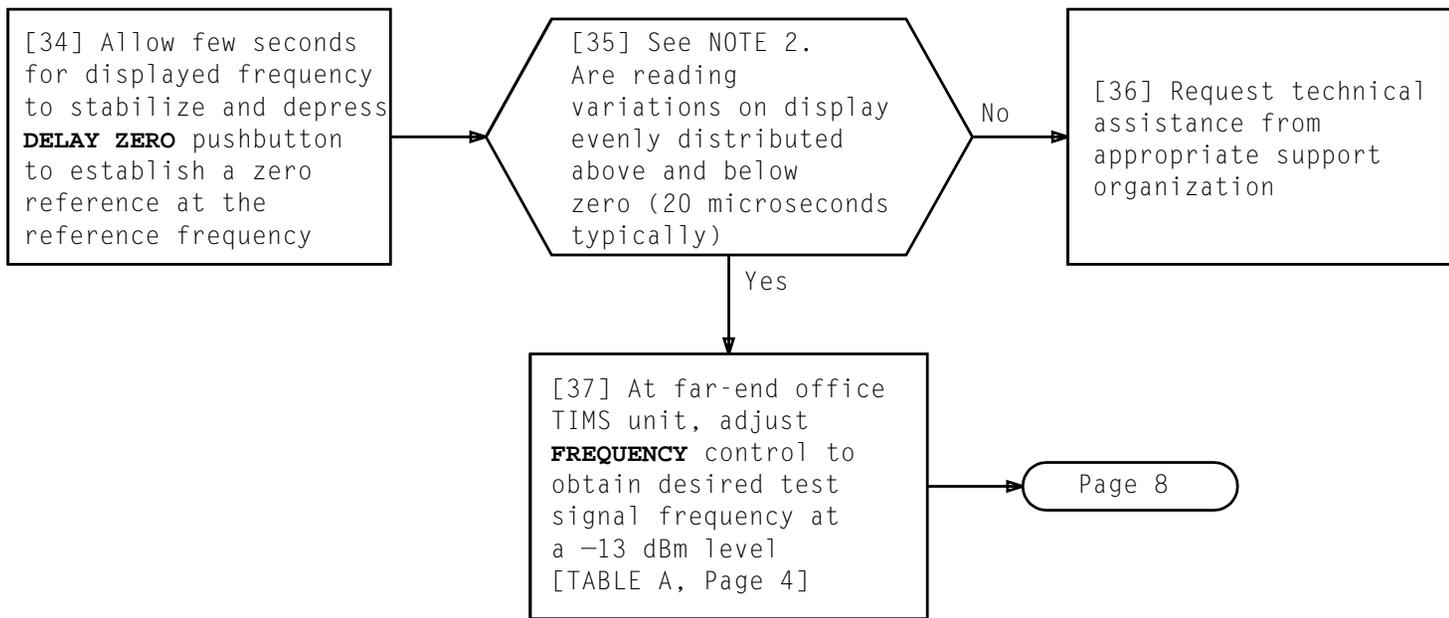
[30] Set **DISPLAY CONNECTED TO**  
switch to **RVC** position

[31] Adjust reference signal  
frequency to 1804 Hz



**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

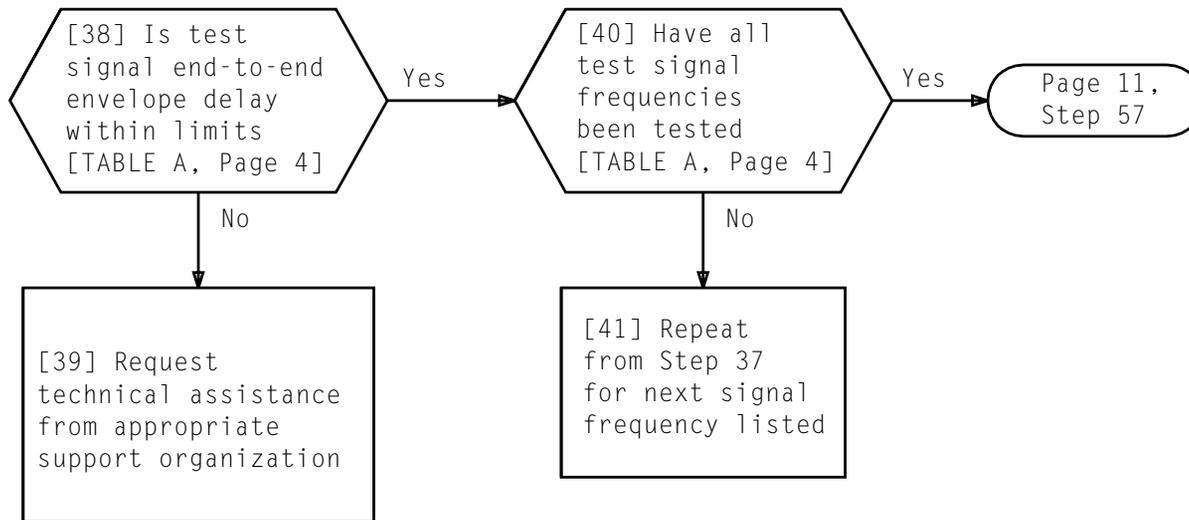
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NOTE 2  
Typically, readings vary 20 microseconds above and below zero. However, on more noisy circuits, variations may be greater

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**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

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[42] At far-end office signaling link test position, establish loopback for signaling link being tested

[43] At near-end and far-end offices, connect TIMS unit to signaling link test position using patch cords

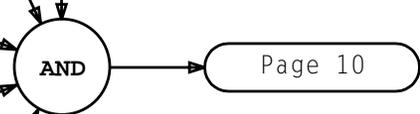
At near-end office TIMS unit:

[44] Depress **NORMAL/REPT** pushbutton to set up unit as a normal test set

[45] Adjust **OUTPUT LEVEL** control to obtain a -13 dBm reference level

[46] Set up TIMS unit to send 1804 Hz reference signal from 0 TLP at a -13 dBm level

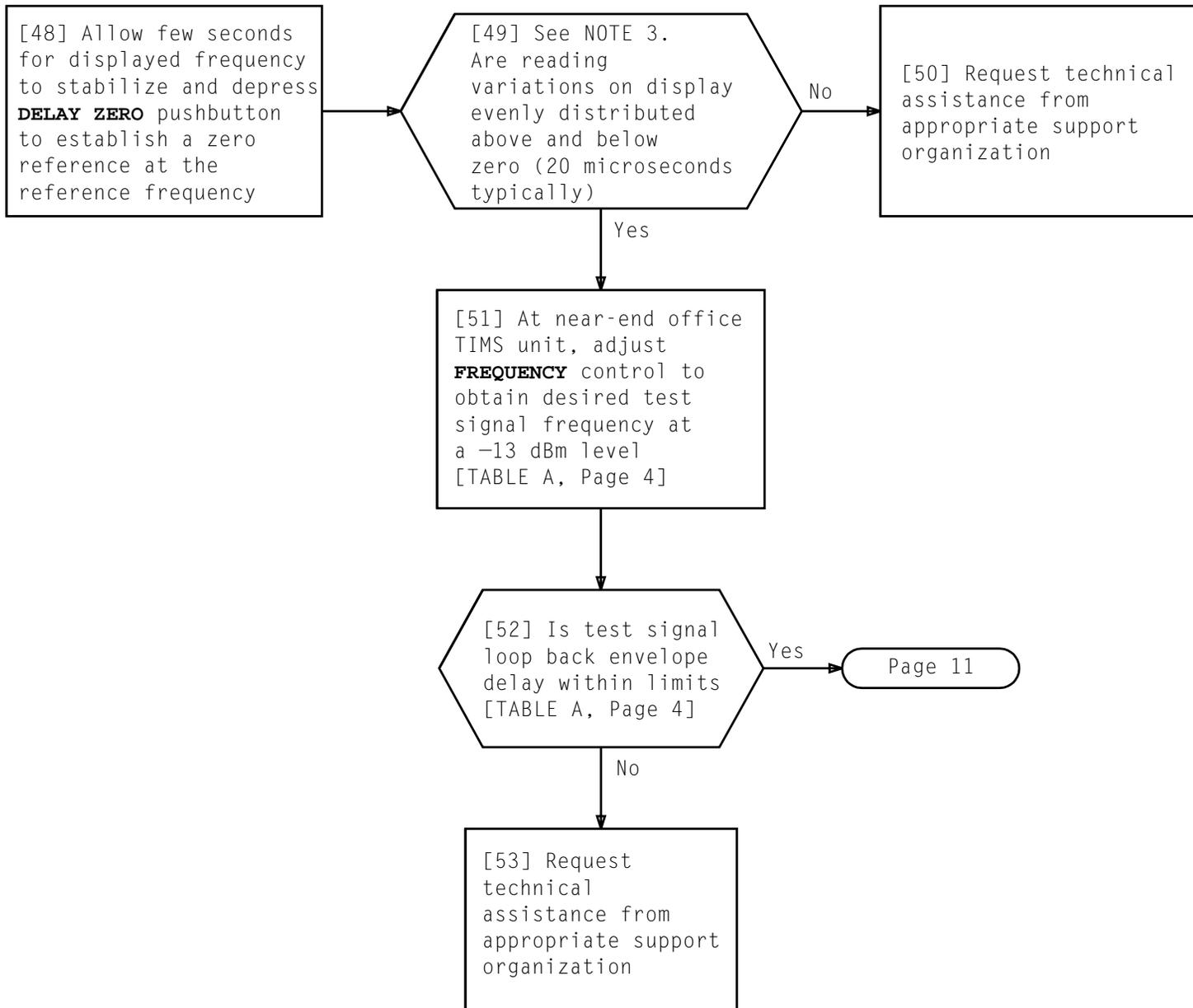
[47] Adjust **FREQUENCY** control to obtain 1804 Hz reference frequency



# PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST

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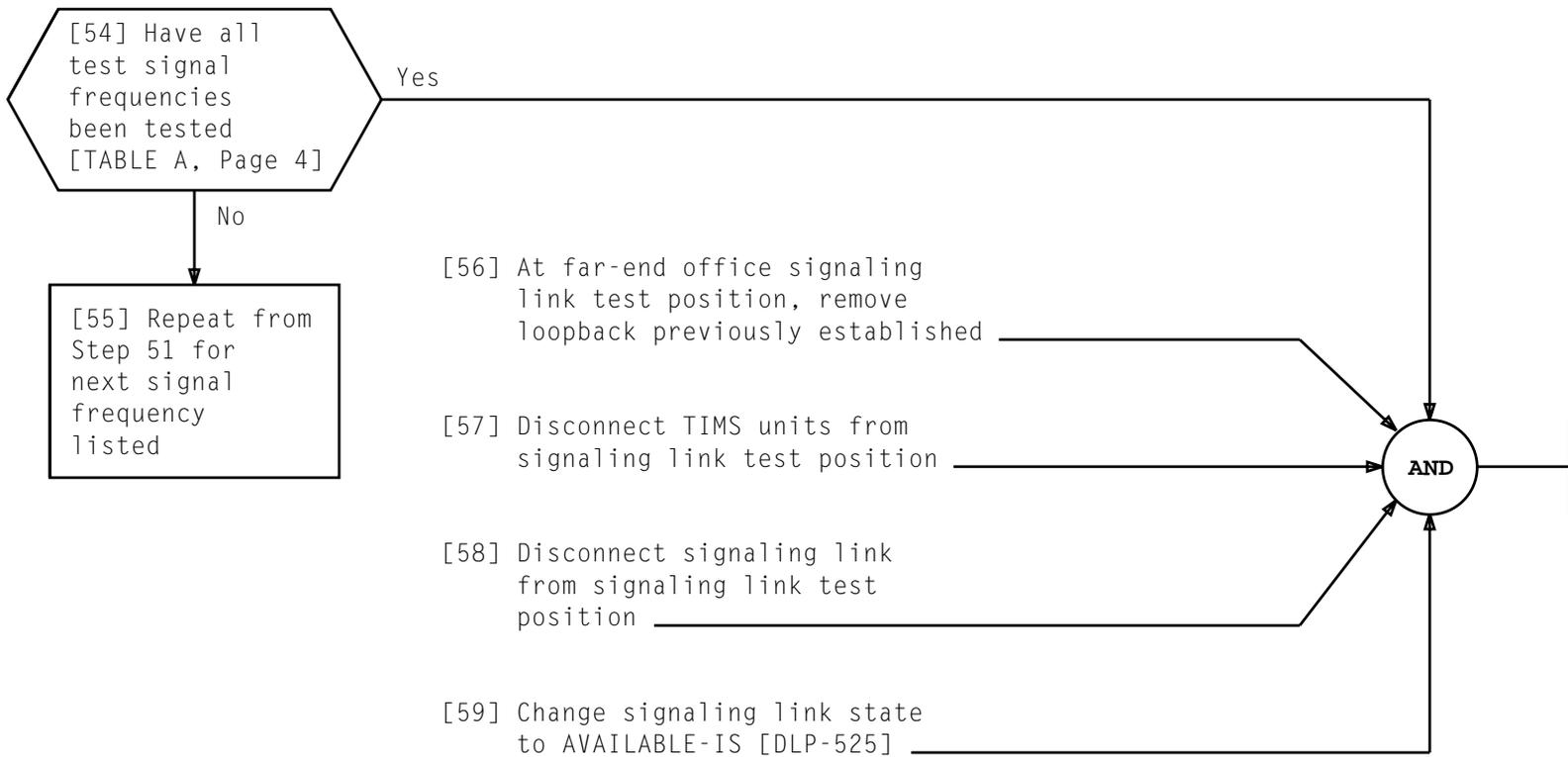
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NOTE 3  
Typically, readings vary 20 microseconds above and below zero. However, on more noisy circuits, variations may be greater

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**PERFORM ANALOG SIGNALING LINK ENVELOPE DELAY DISTORTION TEST**

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SUMMARY

The non-linear distortion test checks the second and third order distortions such as compression and clipping.

[1] Contact far-end office and request assistance to perform test

[2] Verify signaling link is in MANUAL-00S (MOOS) state [DLP-516]

[3] At near-end and far-end office, connect signaling link to signaling link test position

[5] At near-end and far-end offices, connect TIMS unit to signaling link test position using patch cords

[6] At near-end signaling link test position, depress **TEST SELECT** pushbutton

AND

[4] Is end-to-end or loopback test to be performed

AND

LOOPBACK

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END-TO-END

Page 2

**PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST**

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[7] At near-end office TIMS unit,  
set up unit to send 1004 Hz  
signal from 0 TLP at a  
-13 dBm level

At far-end office TIMS unit:

[8] Set **MEASUREMENT** switch to  
**NONLINEAR DISTORTION** position

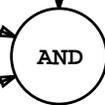
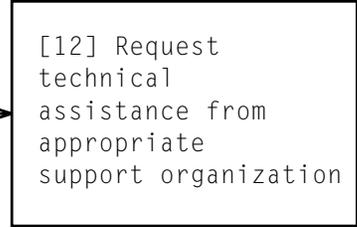
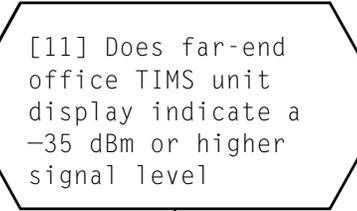
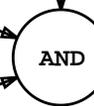
[9] Set **DISPLAY CONNECTED TO** switch  
to **RCV** position

[10] Depress **SIGNAL LEVEL** pushbutton

At far-end office TIMS unit:  
[13] Allow few seconds for display  
to stabilize and depress  
**LEVEL ZERO** pushbutton to  
establish a zero reference

[14] Depress **2ND ORDER** pushbutton

[15] Record "normal test signal level"  
indicated on unit display



No

Yes

[12] Request  
technical  
assistance from  
appropriate  
support organization

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**PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST**

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[16] At near-end signaling link test position, depress **CHECK SIGNAL** pushbutton and request far-end to record "check signal level" indicated on unit display

[17] Subtract recorded "check signal level" from recorded "normal signal level" and record difference value

[18] Identify "correction factor" associated with recorded difference value [TABLE A, Page 4]

[19] Calculate second order nonlinear distortion using the following formula:  
 $(\text{Correction Factor}) + (\text{Normal Test Signal Level}) = \text{Nonlinear Distortion}$

AND

[20] Is second order nonlinear distortion greater than 27 dB

Yes

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No

[21] Request technical assistance from appropriate support organization

**PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST**

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TABLE A	
NONLINEAR DISTORTION NOISE CORRECTION FACTORS	
DIFFERENCE VALUE	CORRECTION FACTOR
0	NOTE
1	7
2	4
3	3
4-5	2
6-8	1
Over 8	0
NOTE: Zero difference indicates the distortion level is buried in noise. This can mean extremely low distortion or extremely high noise.	

At far-end office TMS unit:

[22] Depress **3RD ORDER** pushbutton

[23] Record "normal test signal level" indicated on unit display

[24] At near-end signaling link test position, depress **CHECK SIGNAL** pushbutton and request far-end to record "check signal level" indicated on unit display

[25] Subtract recorded "check signal level" from recorded "normal signal level" and record difference value

[26] Identify "correction factor" associated with recorded difference value [TABLE A, Page 4]

[27] Calculate third order nonlinear distortion using the following formula:  
 $(\text{Correction Factor}) + (\text{Normal Test Signal Level}) = \text{Nonlinear Distortion}$

AND

[28] Is third order nonlinear distortion greater than 32 dB

Yes

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No

[29] Request technical assistance from appropriate support organization

## PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST

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At far-end office TIMS unit:

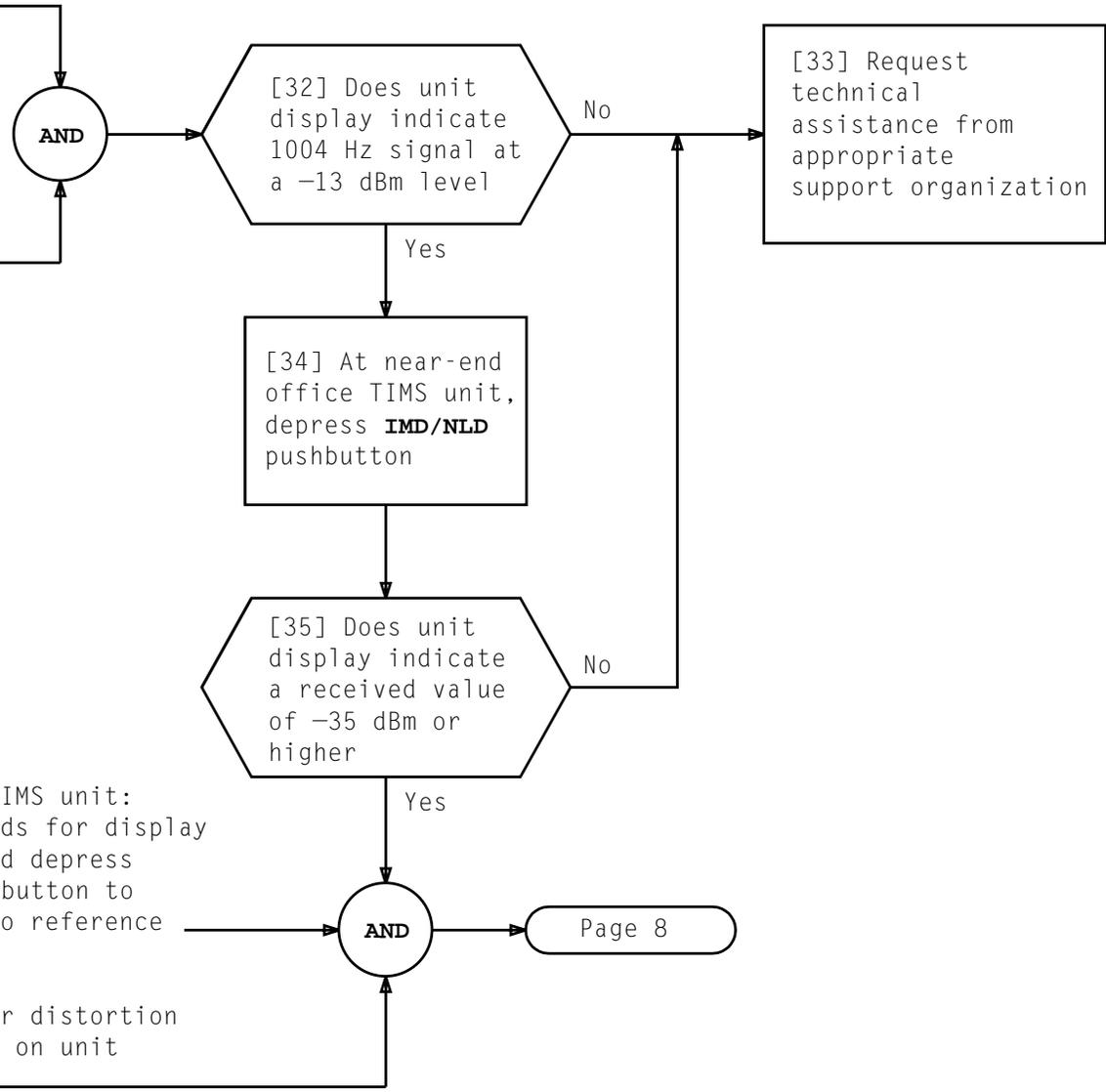
[30] Set **MEASUREMENT** switch to **NONLINEAR DISTORTION** position

[31] Set **DISPLAY CONNECTED TO** switch to **TRMT** position

At near-end office TIMS unit:

[36] Allow few seconds for display to stabilize and depress **LEVEL ZERO** pushbutton to establish a zero reference

[37] Record nonlinear distortion level indicated on unit display



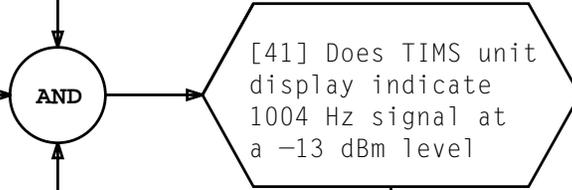
# PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST

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[38] At far-end office signaling link test position, establish loopback for signaling link being tested

[39] At near-end and far-end offices, connect TIMS unit to signaling link test position using patch cords

[40] At near-end office TIMS unit, set up unit to send 1004 Hz signal from 0 TLP at a -13 dBm level



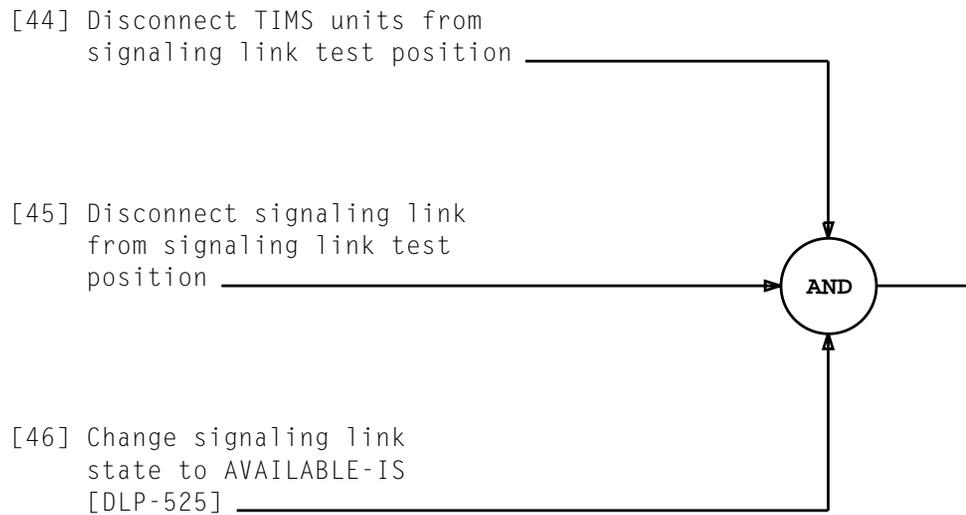
[42] Request technical assistance from appropriate support organization

[43] At far-end office signaling link test position, remove loopback previously established

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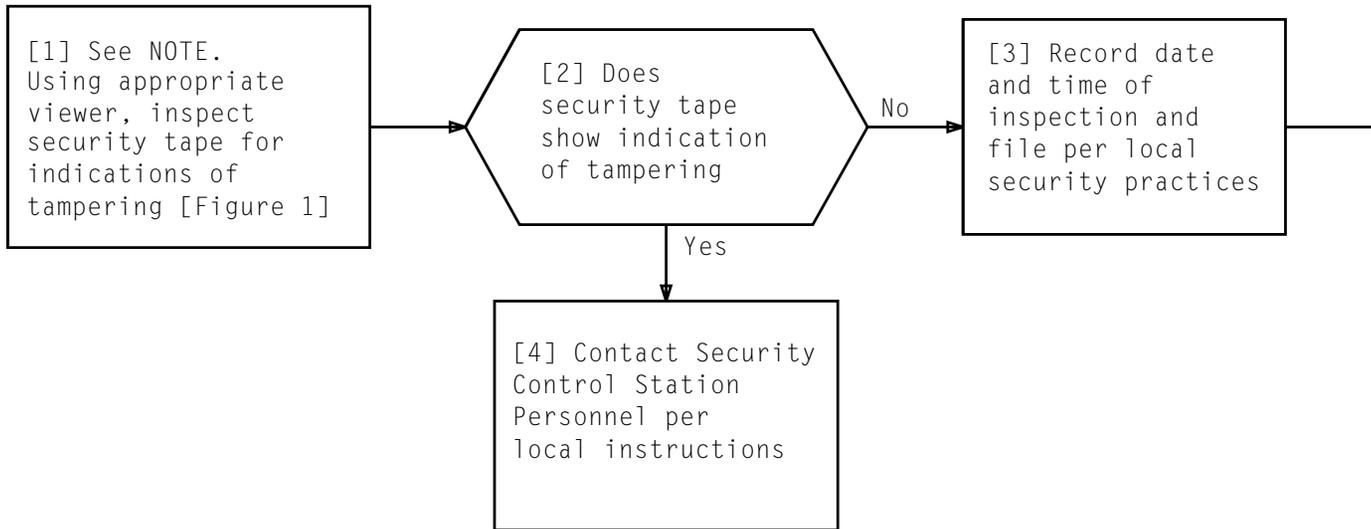
# PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST

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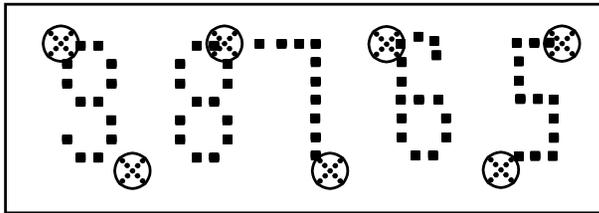
**PERFORM ANALOG SIGNALING LINK NONLINEAR DISTORTION TEST**

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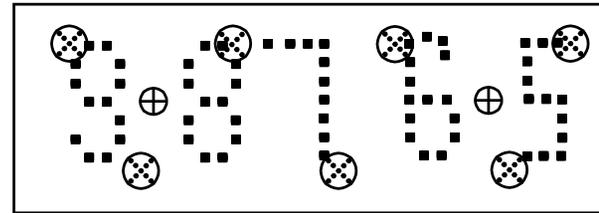


NOTE	
Patterns on security tape are made to change if tampering occurs. Inspectors should be familiar with actual patterns as they appear on unaltered and altered tapes.	
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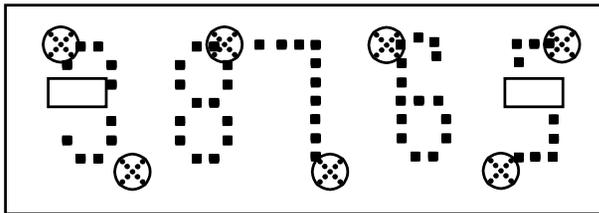
**INSPECT SECURITY TAPE ON ENCRYPTED CIRCUIT  
PACKS FOR ALTERATIONS**



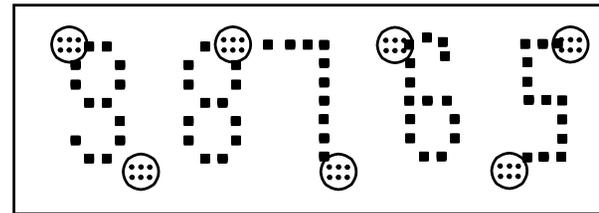
Tape Unaltered  
 (Some Tapes Have Perforated Numbers;  
 Some do Not)



Tape Altered  
 (Screws Removed and Reinstalled)



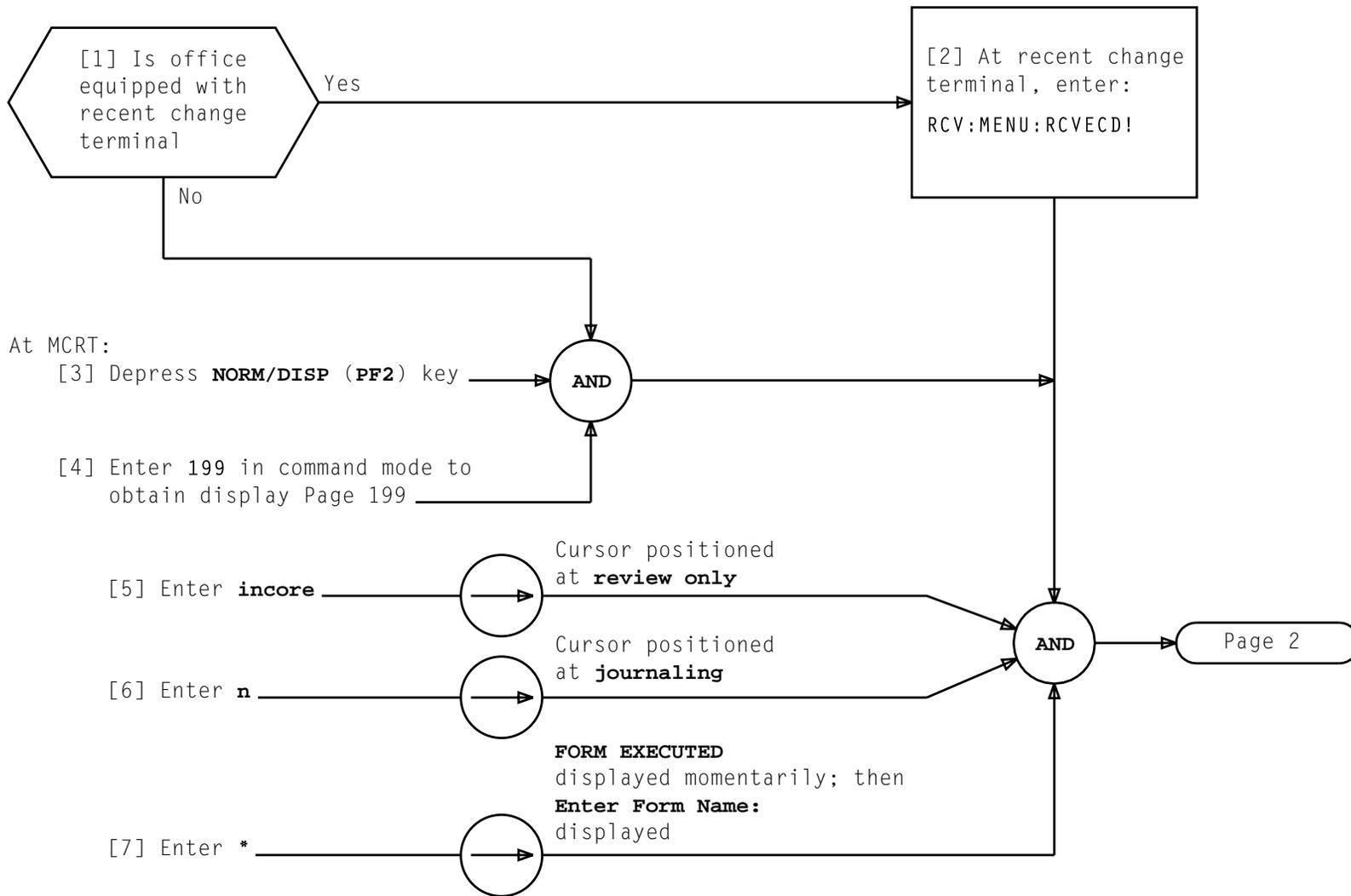
Tape Altered  
 (Replaced Tape on Screwheads)



Tape Removed and Replaced  
 (Different Pattern)

Figure 1 - Examples of Unaltered and Altered Security Tapes

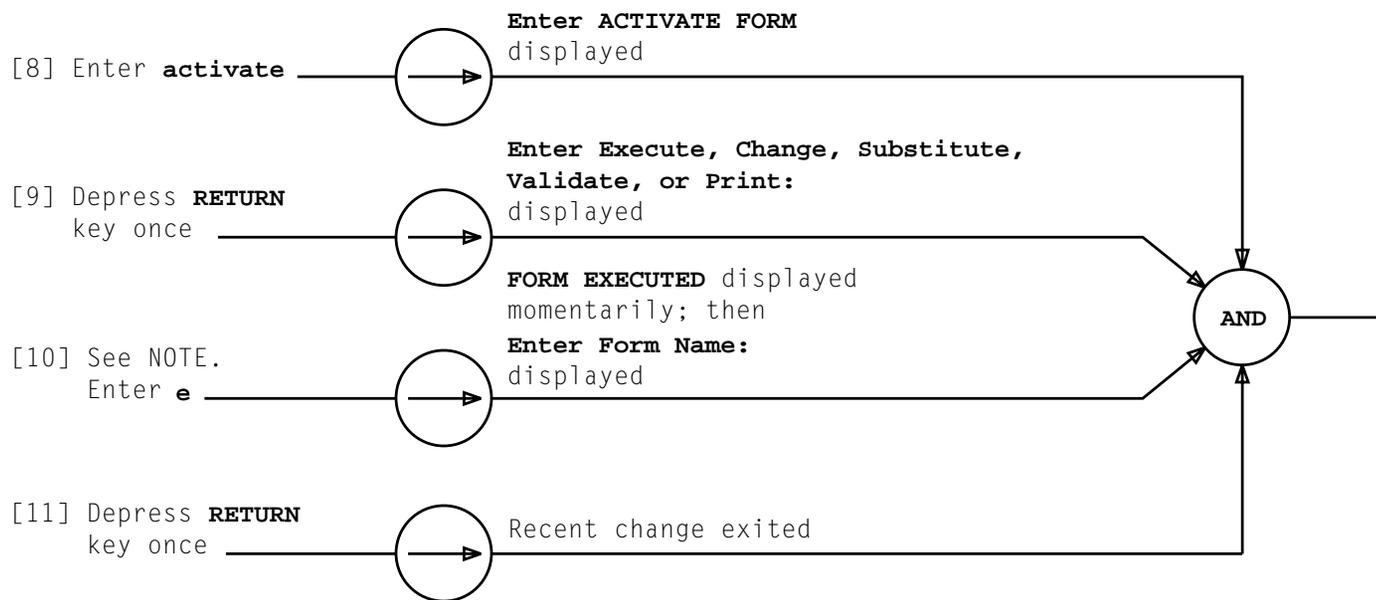
**INSPECT SECURITY TAPE ON ENCRYPTED CIRCUIT  
 PACKS FOR ALTERATIONS**



## COPY INCORE EQUIPMENT CONFIGURATION DATA BASE (ECD) TO DISK

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NOTE	
It may take several minutes before <b>FORM EXECUTED</b> response is displayed	
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[1] At MCRT, enter:

OP:STATUS:FILESYS!

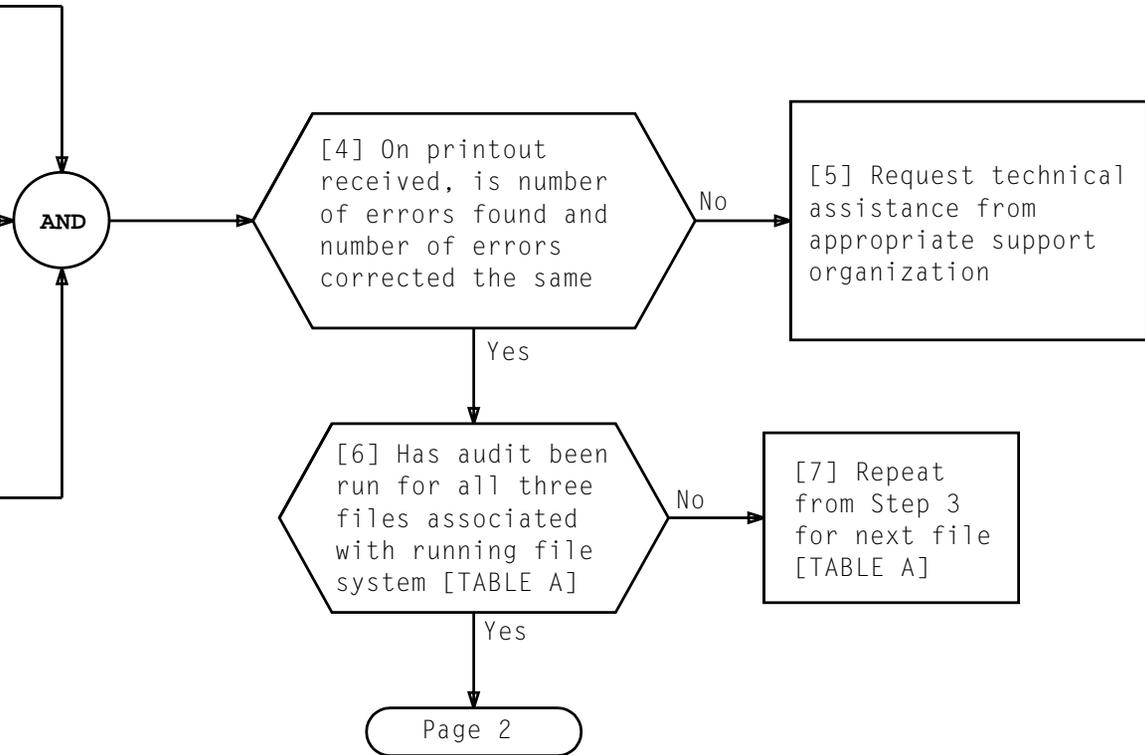
[2] Using ROP printout, determine if system is running on root (/dev/root) or broot (/dev/broot) and record

[3] At MCRT, enter:

AUD:FSBLK 1,INS"a"!

a = file name listed in TABLE A associated with running file system as determined in Step 2

TABLE A	
SYSTEM RUNNING ON	
ROOT	BROOT
/dev/root	/dev/broot
/dev/db	/dev/bdb
/dev/etc	/dev/betc



## RUN FILE SYSTEM AUDITS ON RUNNING FILE SYSTEM TO ENSURE NO FILE SYSTEM ERRORS

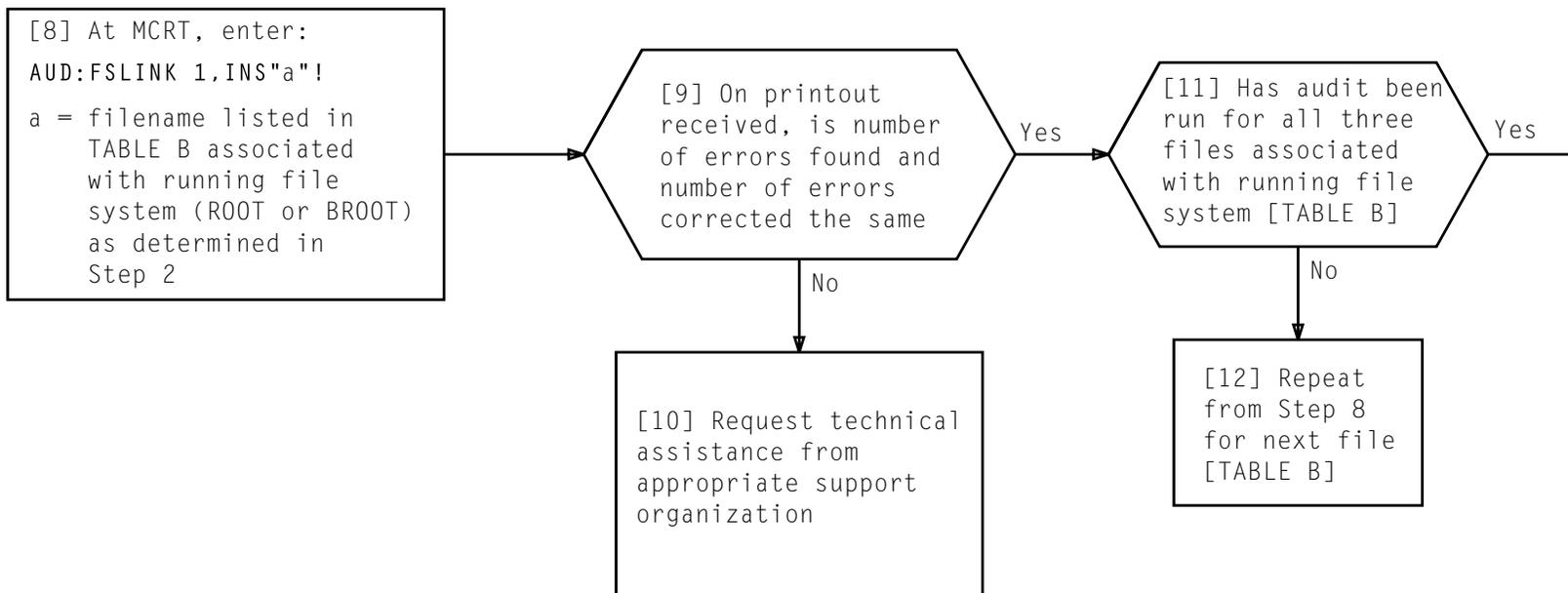
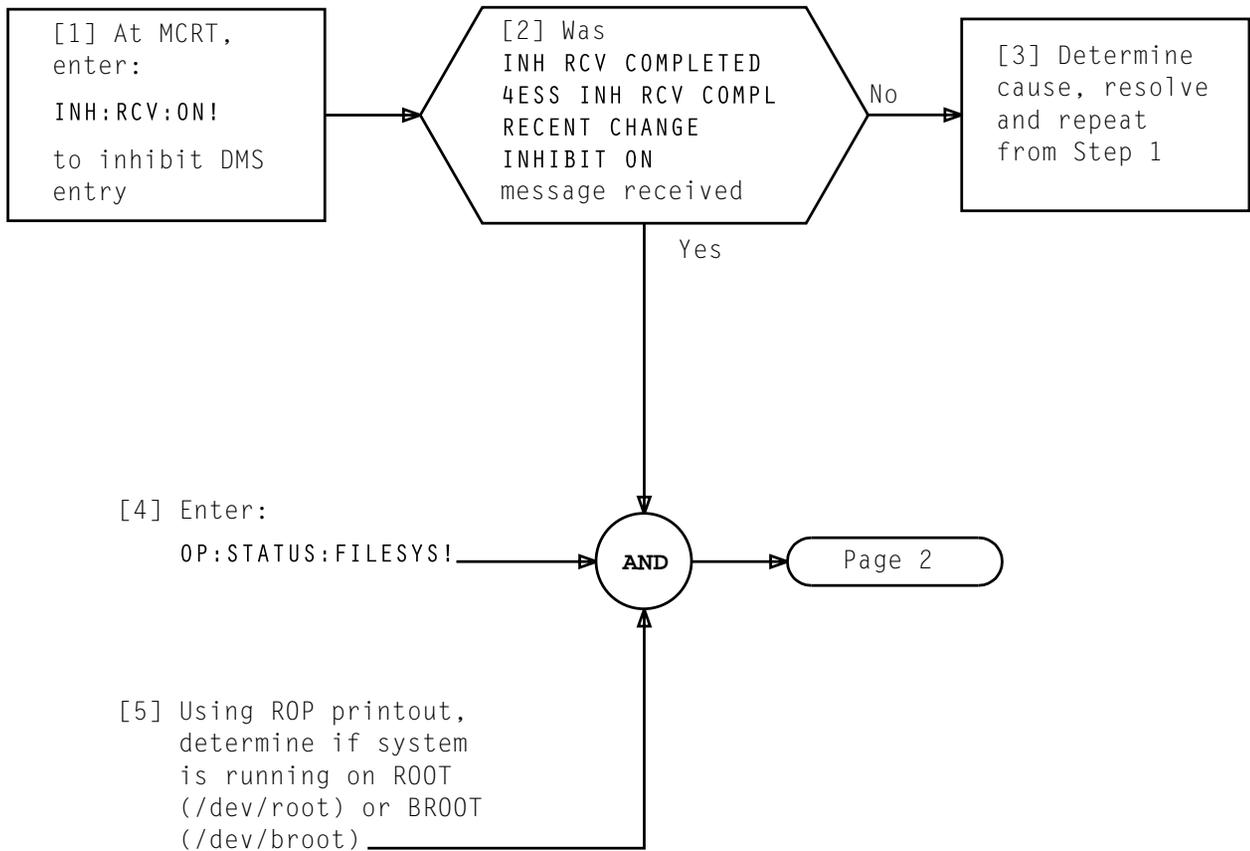
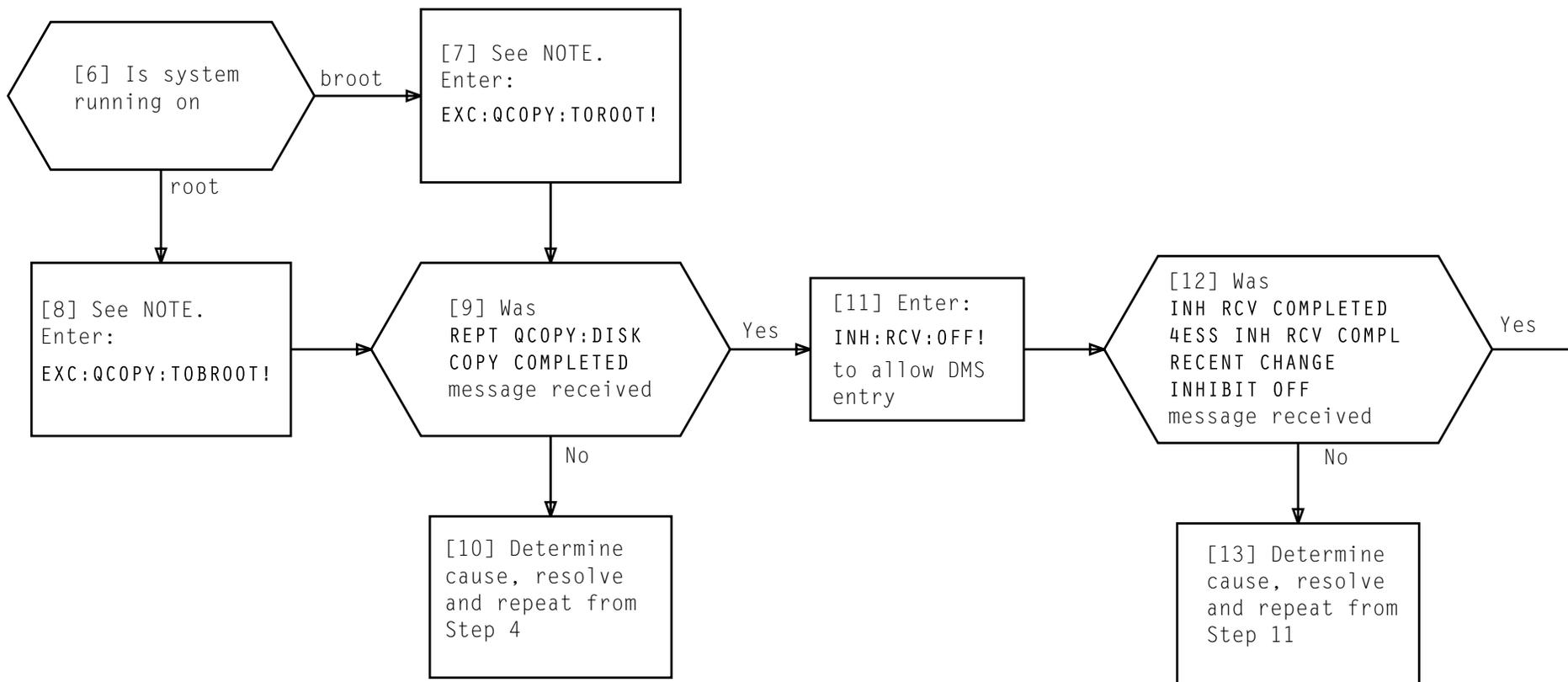


TABLE B	
SYSTEM RUNNING ON	
ROOT	BROOT
/dev/root	/dev/broot
/dev/db	/dev/bdb
/dev/etc	/dev/betc

**RUN FILE SYSTEM AUDITS ON RUNNING FILE SYSTEM TO ENSURE NO FILE SYSTEM ERRORS**





NOTE	
This command requires several minutes to complete	
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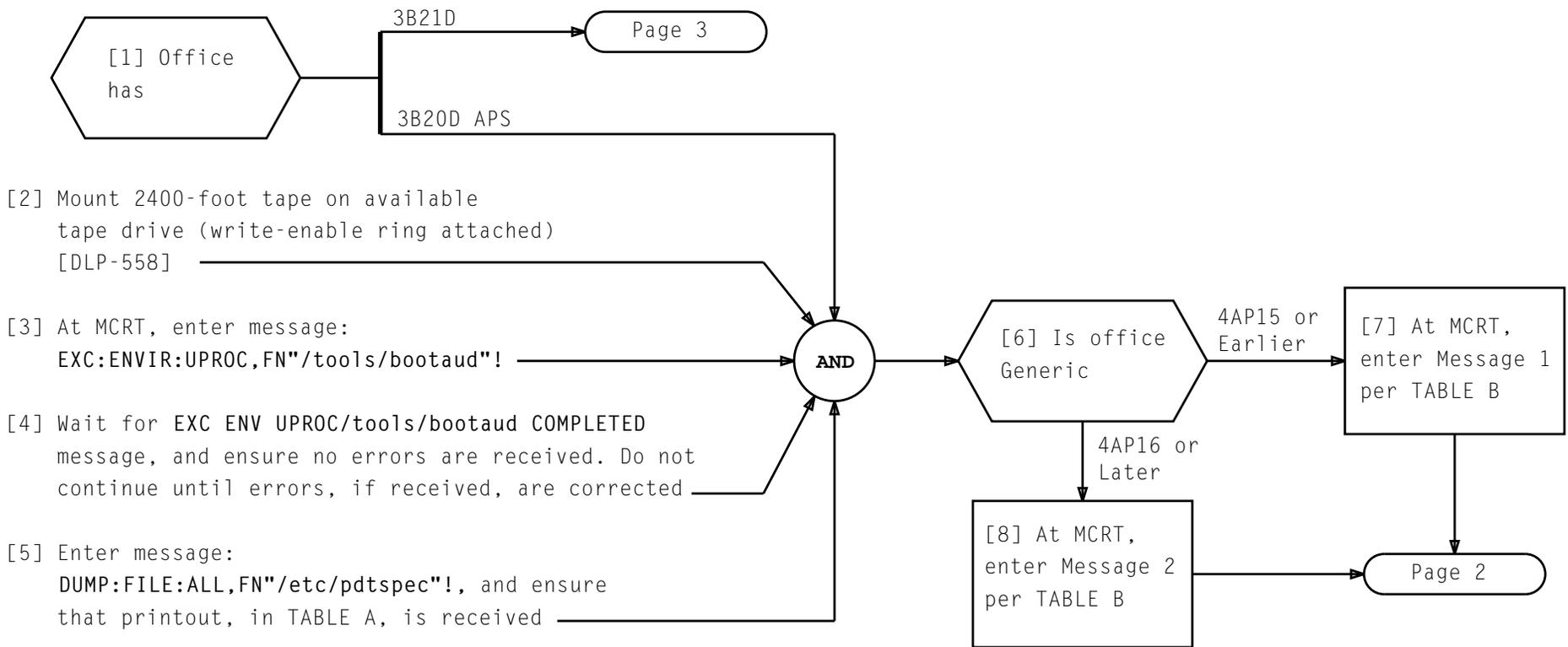


TABLE A	
MESSAGE NUMBER	OUTPUT MESSAGE
1	DUMP FILE ALL COMPLETED /dev/lboot /dev/vtoc /dev/boot /dev/bboot /dev/root /dev/etc /dev/db /dev/amabfiles /dev/amabfiles

TABLE B	
MESSAGE NUMBER	INPUT MESSAGES
1	COPY:BKDISK;START:SRC"/dev/vtoc",TD"/dev/mtX8",TPSIZE 2200!
2	COPY:BKDISK;START:SRC"/devv/toc",TD"/dev/mtX8",TPSIZE 2200,COM!
X = tape drive number used in Step 2	

## WRITE BACKUP TAPES

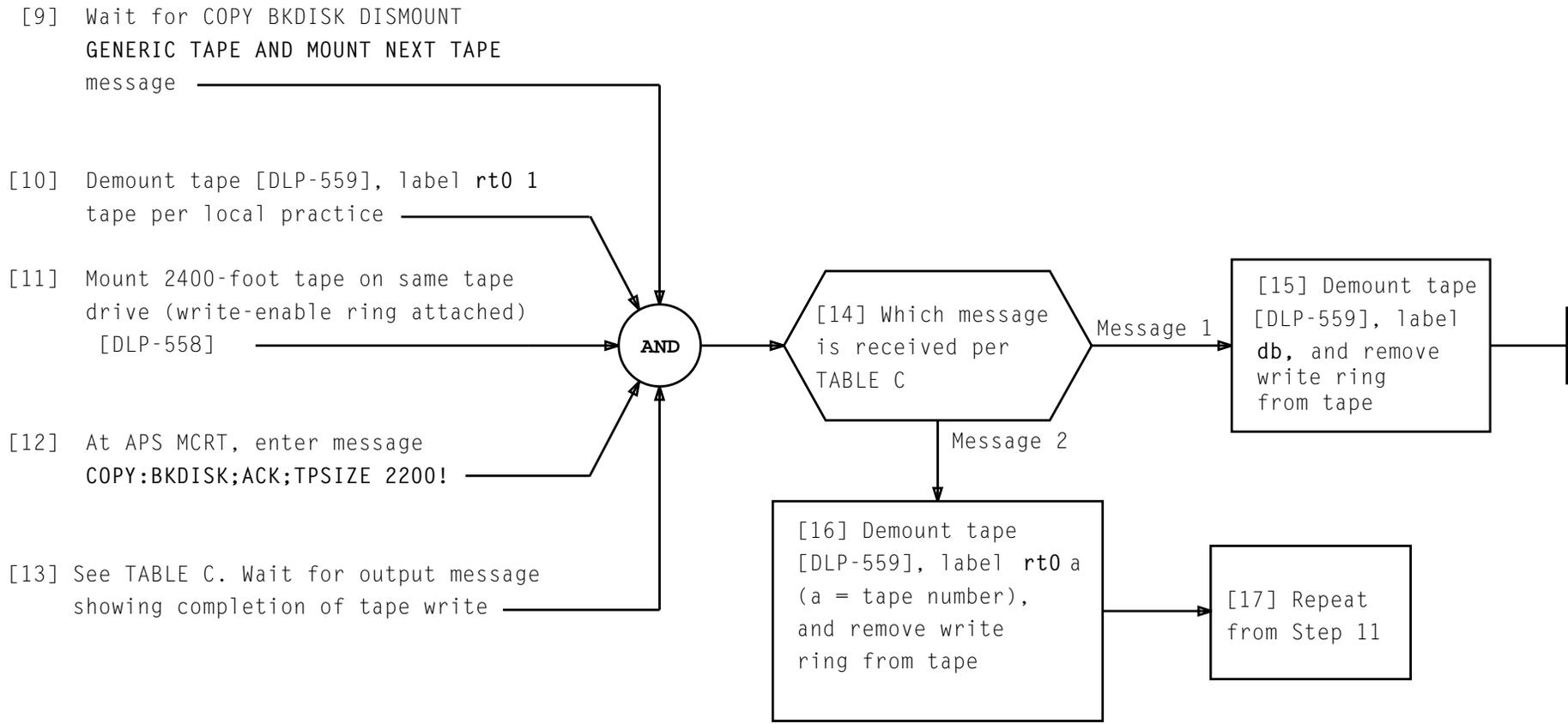


TABLE C	
MESSAGE NUMBER	OUTPUT MESSAGE
1	COPY BKDISK COMPLETED DISMOUNT DATABASE TAPE AND LABEL
2	COPY DISMOUNT GENERIC TAPE LABEL AND MOUNT NEXT TAPE

- [18] Insert blank or erasable 4-mm tape, with write-protect tab in up (unlocked) position, into available 3B21 APS DAT unit [DLP-558]
- [19] At 3B21 APS MCRT, enter message `DUMP:FILE:ALL, FN"/etc/pdtspec"` to dump the `/etc/pdtspec` file
- [20] Wait for `DUMP FILE ALL COMPLETED` message, and ensure that printout in TABLE D is received
- [21] At 3B21 APS MCRT, enter message `COPY:DKDISK;START;START;SRC"/dev/vtoc",TD"/dev/mtX0",TPSIZE 90,COM!` [Where X = DAT unit number with backup tape inserted (0 or 1)]
- [22] Wait for `COPY DKDISK DISMOUNT GENERIC TAPE LABEL AND MOUNT NEXT TAPE` message
- [23] Remove tape from DAT unit [DLP-559], label the tape `rt0 1`, and put write-protect tab in down (locked) position

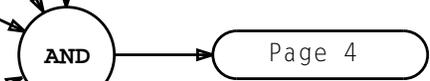


TABLE D	
MESSAGE NUMBER	OUTPUT MESSAGE
1	DUMP FILE ALL COMPLETED /dev/lboot /dev/lboot21 /dev/vtoc /dev/boot /dev/bboot /dev/root /dev/etc /dev/db /dev/amafiles /dev/amabfiles

[24] Insert blank or erasable 4-mm tape,  
with write-protect tab in up (unlocked)  
position into same available 3B21 APS  
DAT unit [DLP-558]

[25] At APS MCRT, enter message  
COPY:BKDISK;ACK;TPSIZE 90,COM!

[26] See TABLE E. Wait for output  
message showing completion  
of tape write

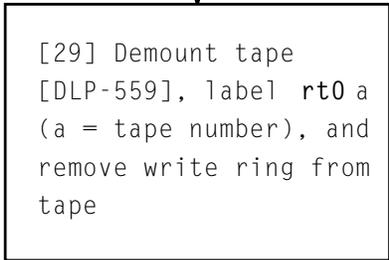
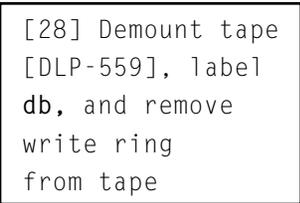
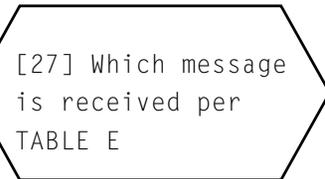
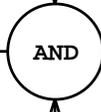
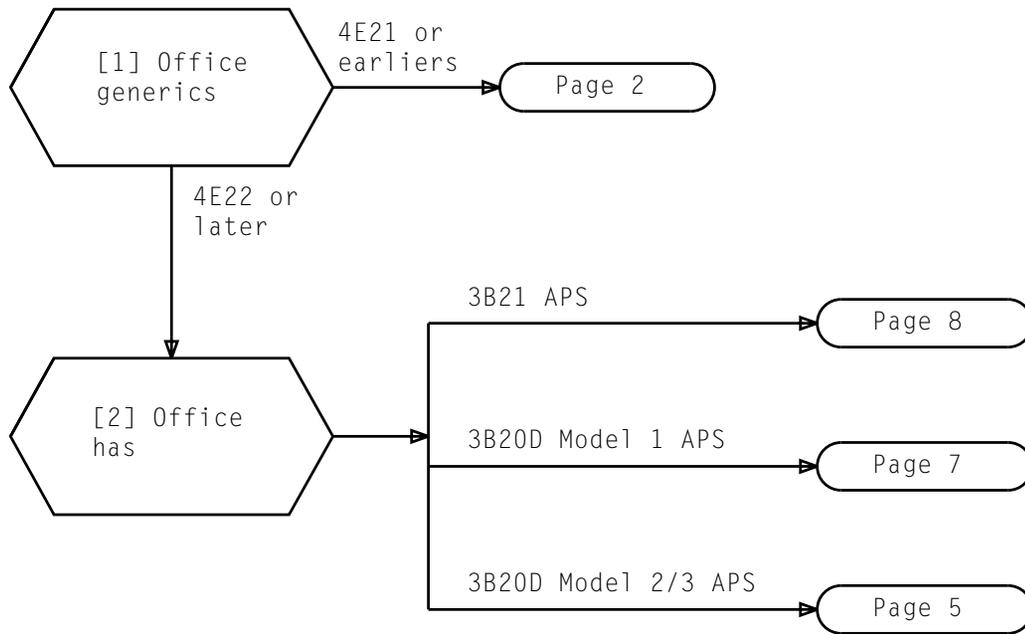


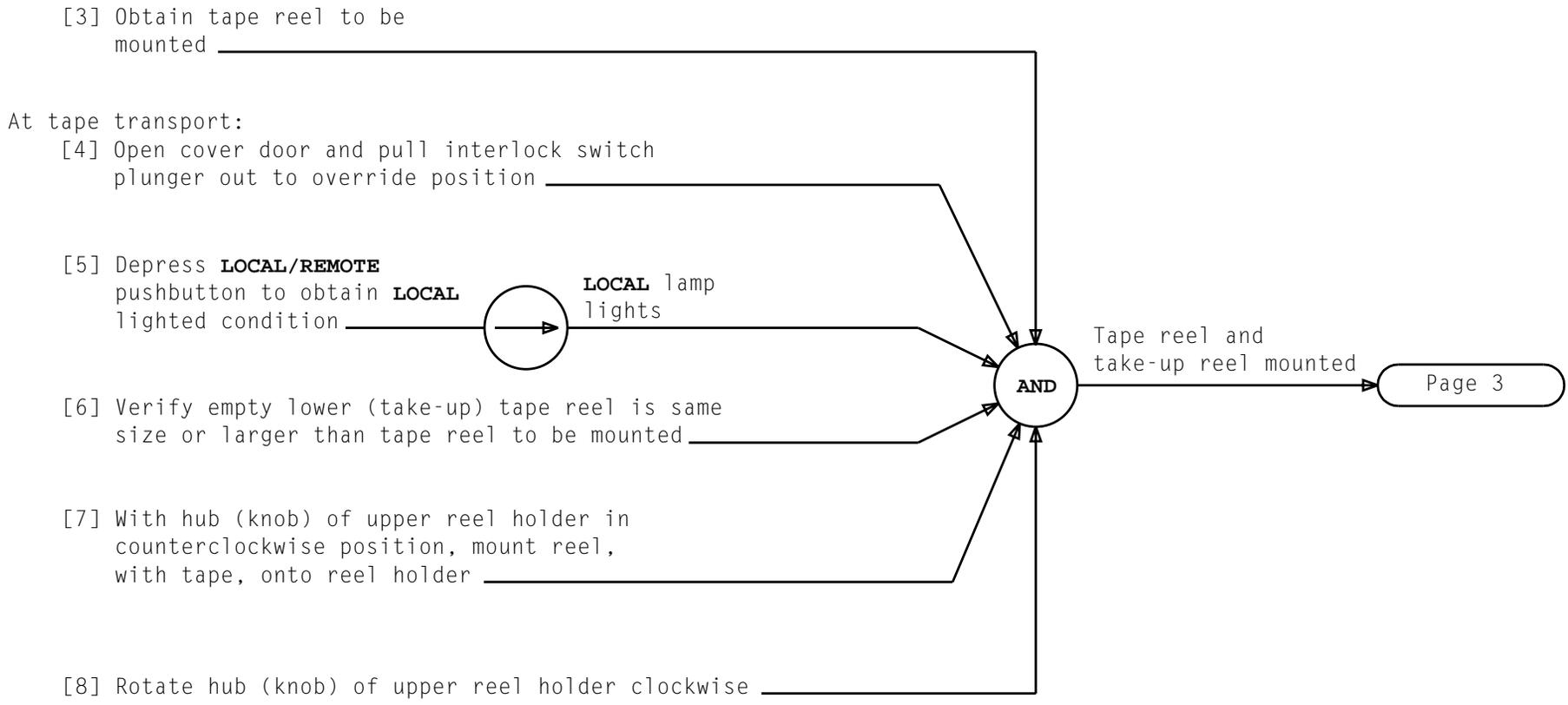
TABLE E	
MESSAGE NUMBER	OUTPUT MESSAGE
1	COPY BKDISK COMPLETED DISMOUNT DATABASE TAPE AND LABEL
2	COPY DISMOUNT GENERIC TAPE LABEL AND MOUNT NEXT TAPE



**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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[9] See WARNING 1. While depressing **BRAKE RELEASE** pushbutton, manually unwind approximately 5 feet of tape, and release **BRAKE RELEASE** pushbutton

[10] See WARNING 2. Thread tape through tape path indicated on tape transport

[11] See NOTE 1. Start tape end on lower (take-up) reel making sure tape is not twisted

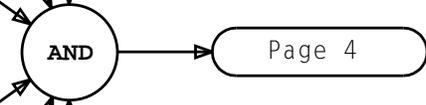
[12] See WARNING 3. While depressing **BRAKE RELEASE** pushbutton, manually wind lower (take-up) reel, three or four turns, and release **BRAKE RELEASE** pushbutton

[13] Depress **ARMS NORMAL** pushbutton

**ARMS NORMAL** lamp lights until arms apply tension to tape

[14] Depress **FORWARD** pushbutton

**FORWARD** lamp lights; tape winds forward to BOT marker and stops



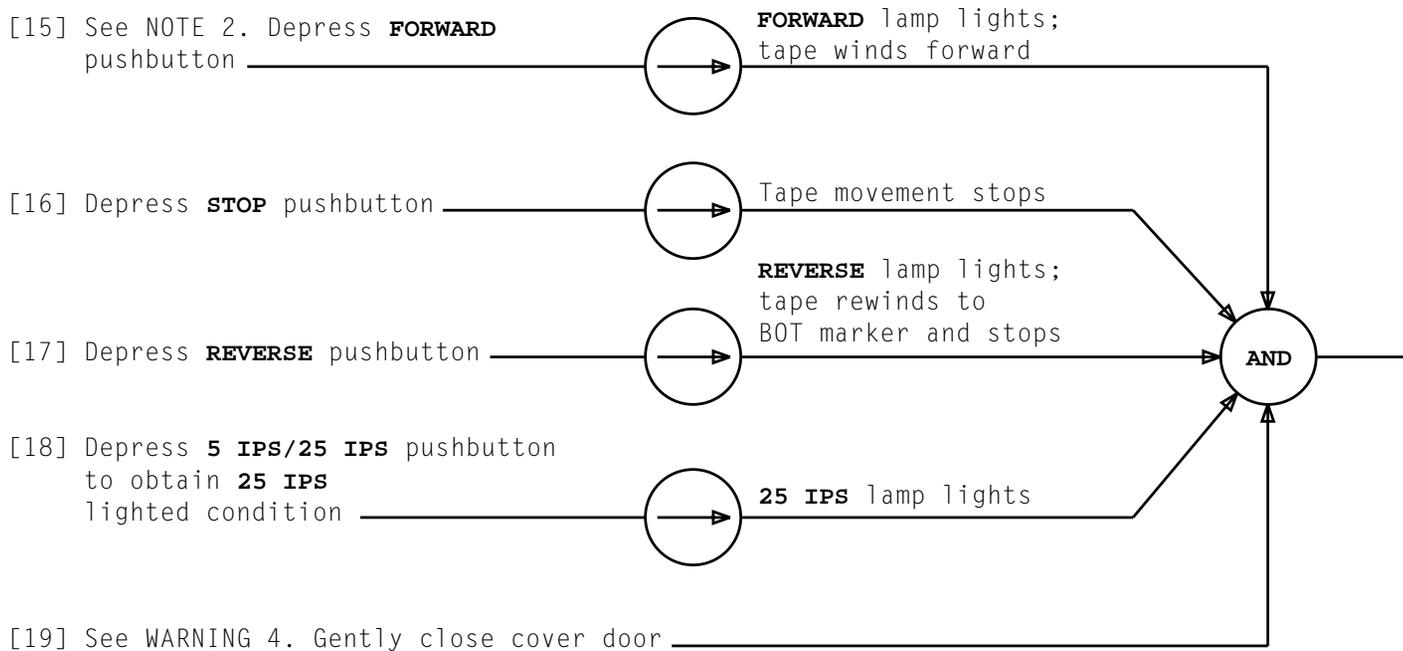
**NOTE 1**  
To start tape on take-up reel, tape end should be moistened (moistened fingers) and tape should be stuck to reel axle

**WARNINGS**

1. Contamination of tape by contact with floor damages tape heads
2. Tape head surfaces should not be touched; body oil contaminates tape
3. If tape is not properly aligned along rollers and guides or is too loose, tape may be damaged

**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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NOTE 2	
Steps 13, 14, and 15 cause BOT marker to be approached from recorded area of tape	
<i>WARNING 4</i>	
<i>Closing tape transport cover door in harsh manner may upset alignment</i>	
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**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

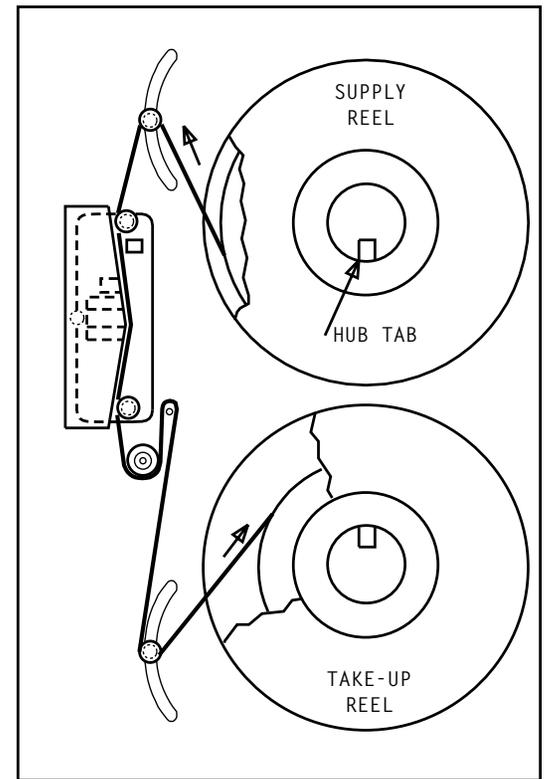
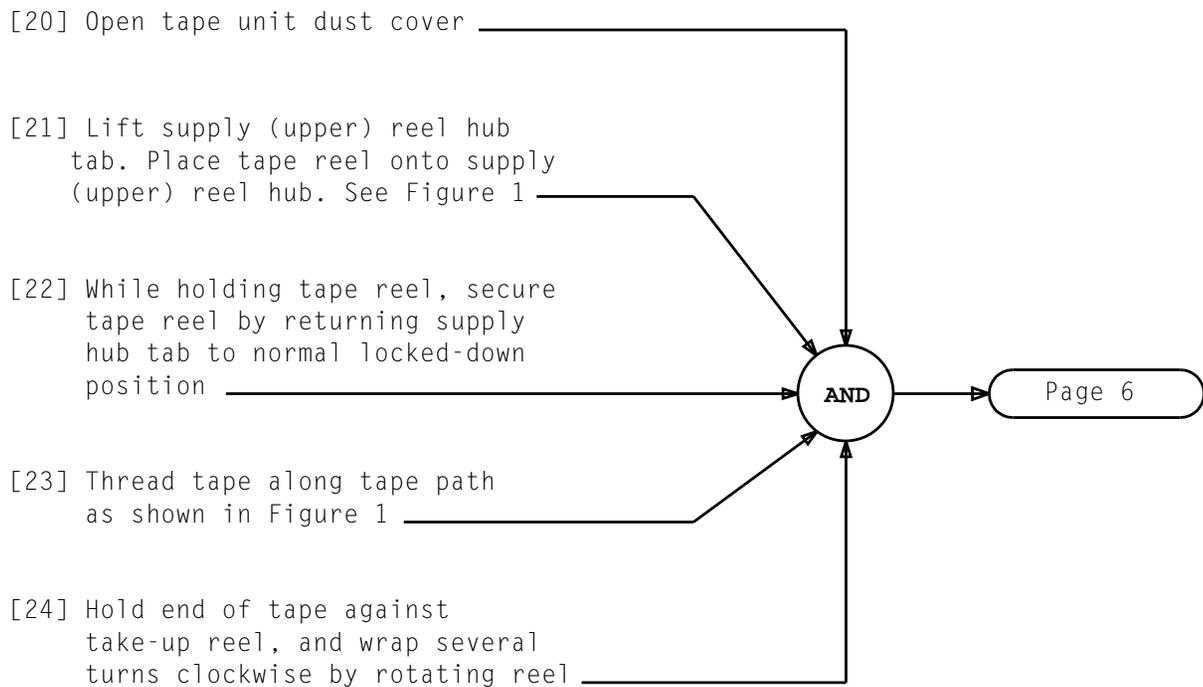
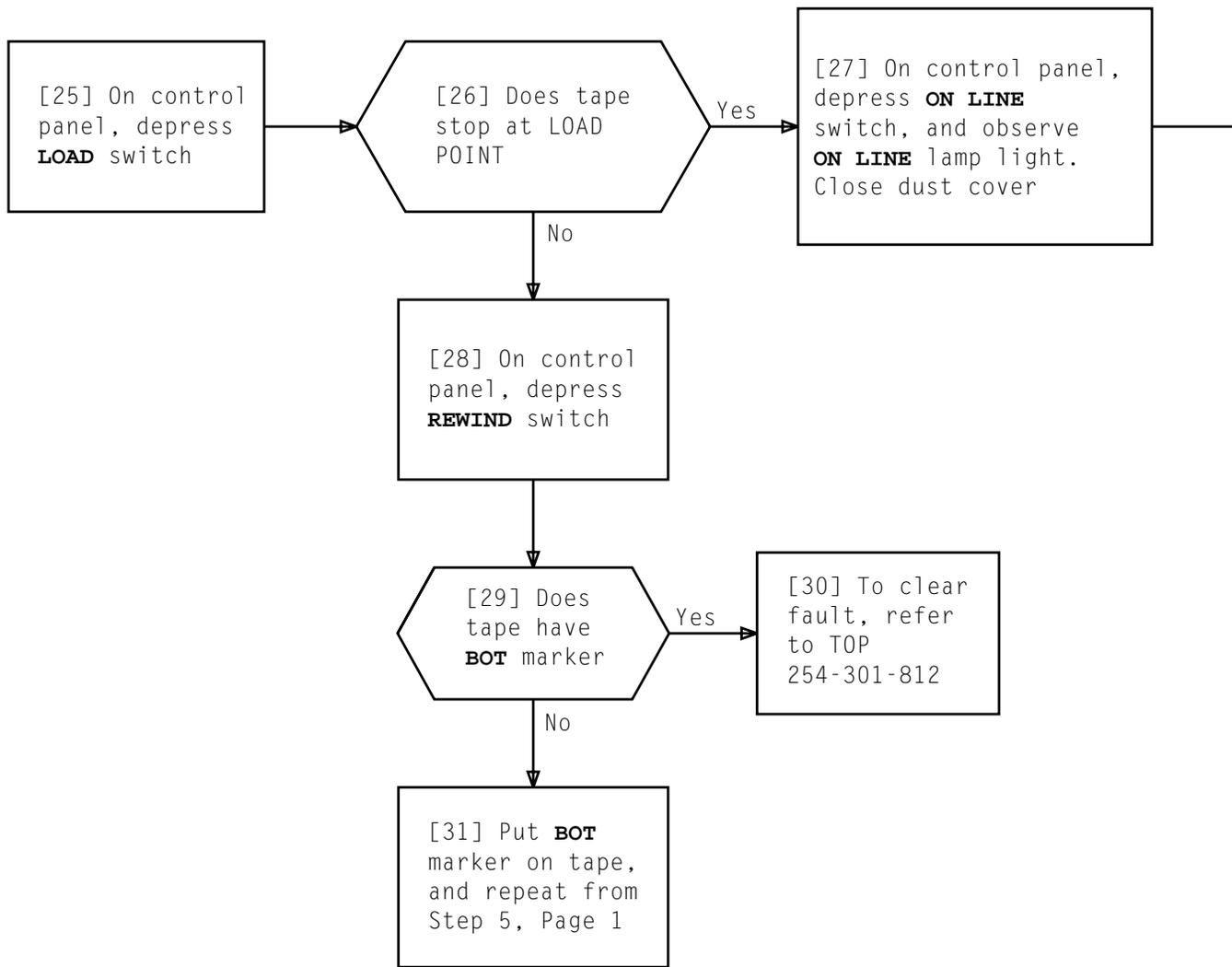


Figure 1

**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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[32] If tape is to be written, attach write-enable ring on supply reel

[33] If **LOGIC OFF** LED lighted, touch **LOGIC ON** switch

[34] Open dust cover and verify circuit breaker at side 1

[35] See Figure 2. Place supply reel on hub and depress hub latch

[36] Thread tape from bottom of supply reel along path as shown in Figure 2

[37] Hold end of tape against take-up reel; wrap several turns clockwise by rotating reel; then close dust cover

[38] At control panel, touch **LOAD/REWIND** switch

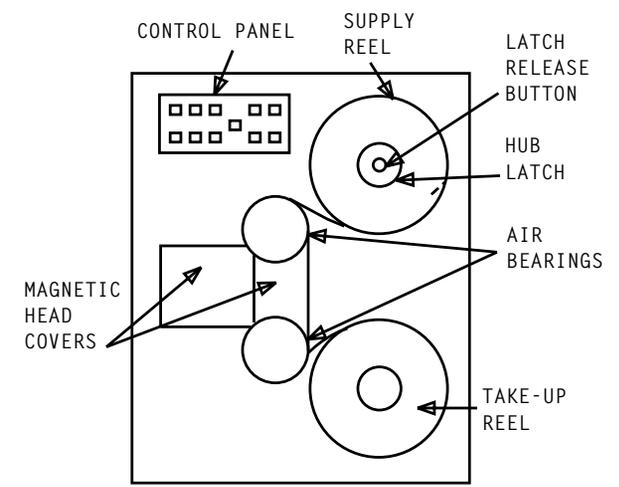
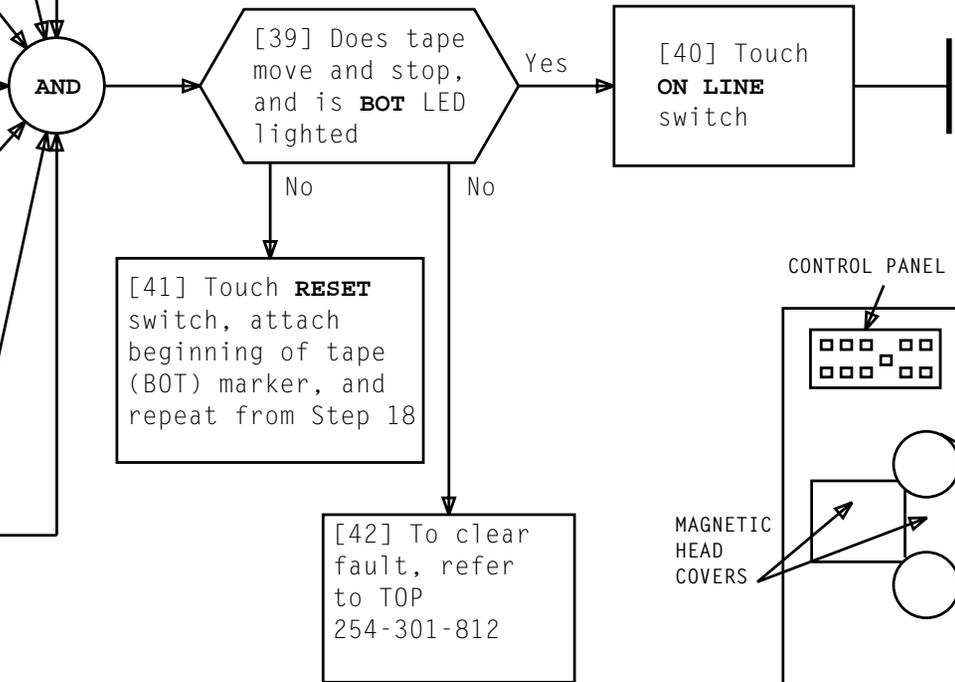


Figure 2

**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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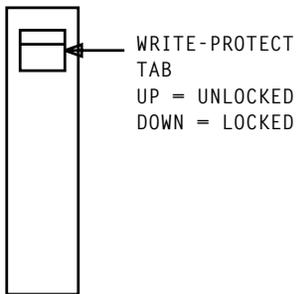
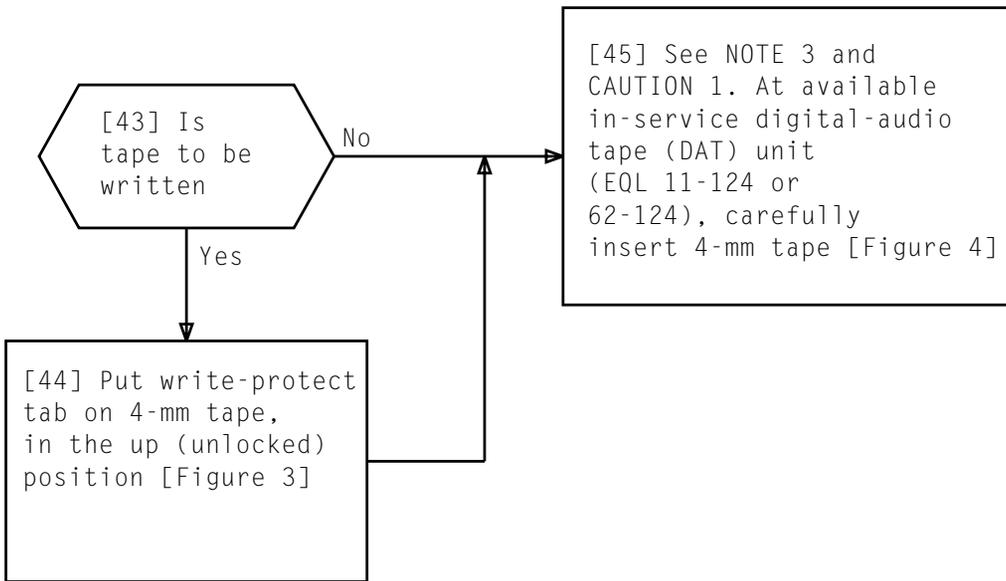


Figure 3 - 4-mm Tape

[45] See NOTE 3 and CAUTION 1. At available in-service digital-audio tape (DAT) unit (EQL 11-124 or 62-124), carefully insert 4-mm tape [Figure 4]

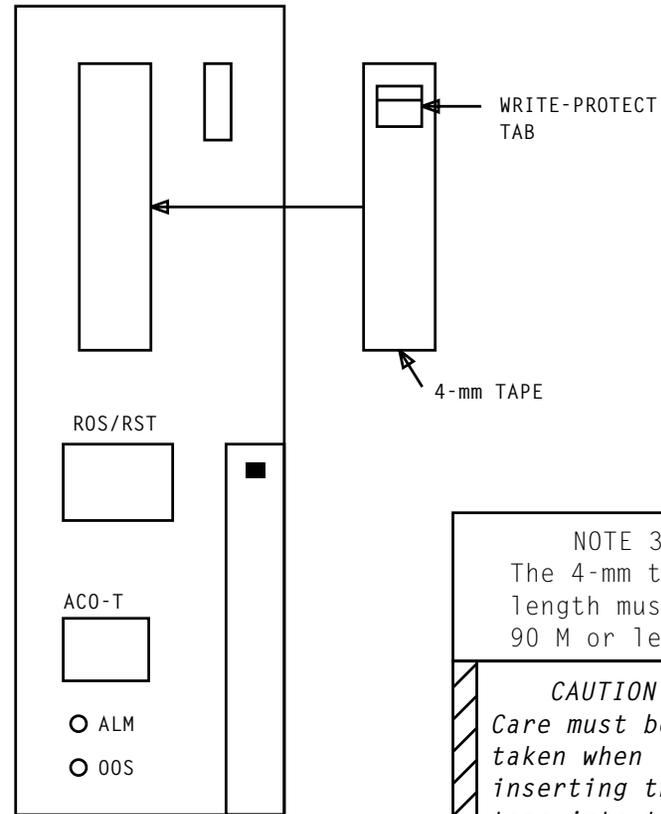


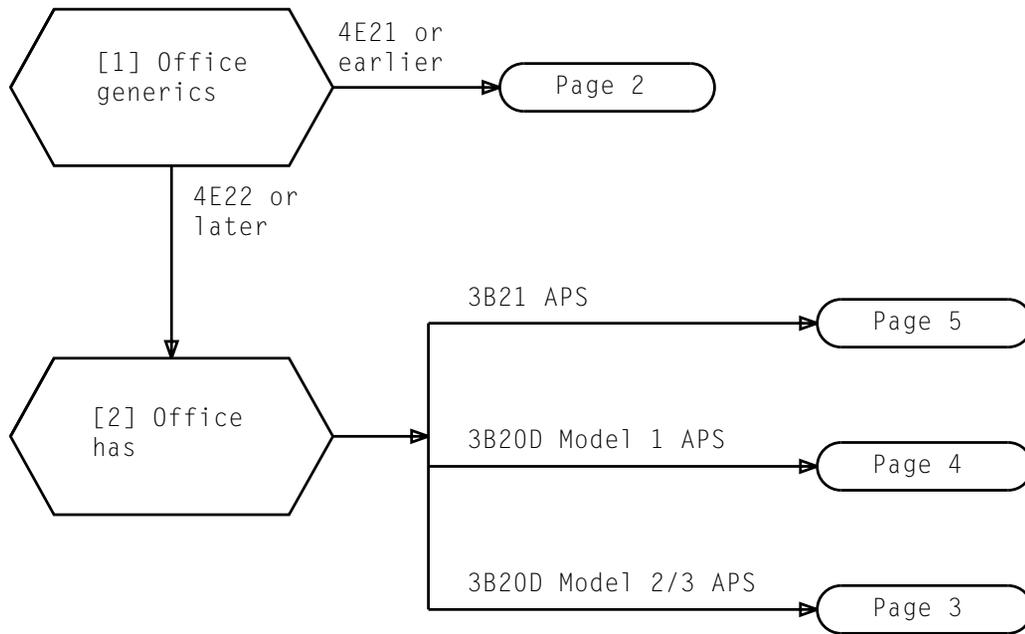
Figure 4 - DAT Unit

NOTE 3  
The 4-mm tape length must be 90 M or less

**CAUTION 1**  
Care must be taken when inserting the tape into the DAT unit. Tape must not be forced

**MOUNT TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

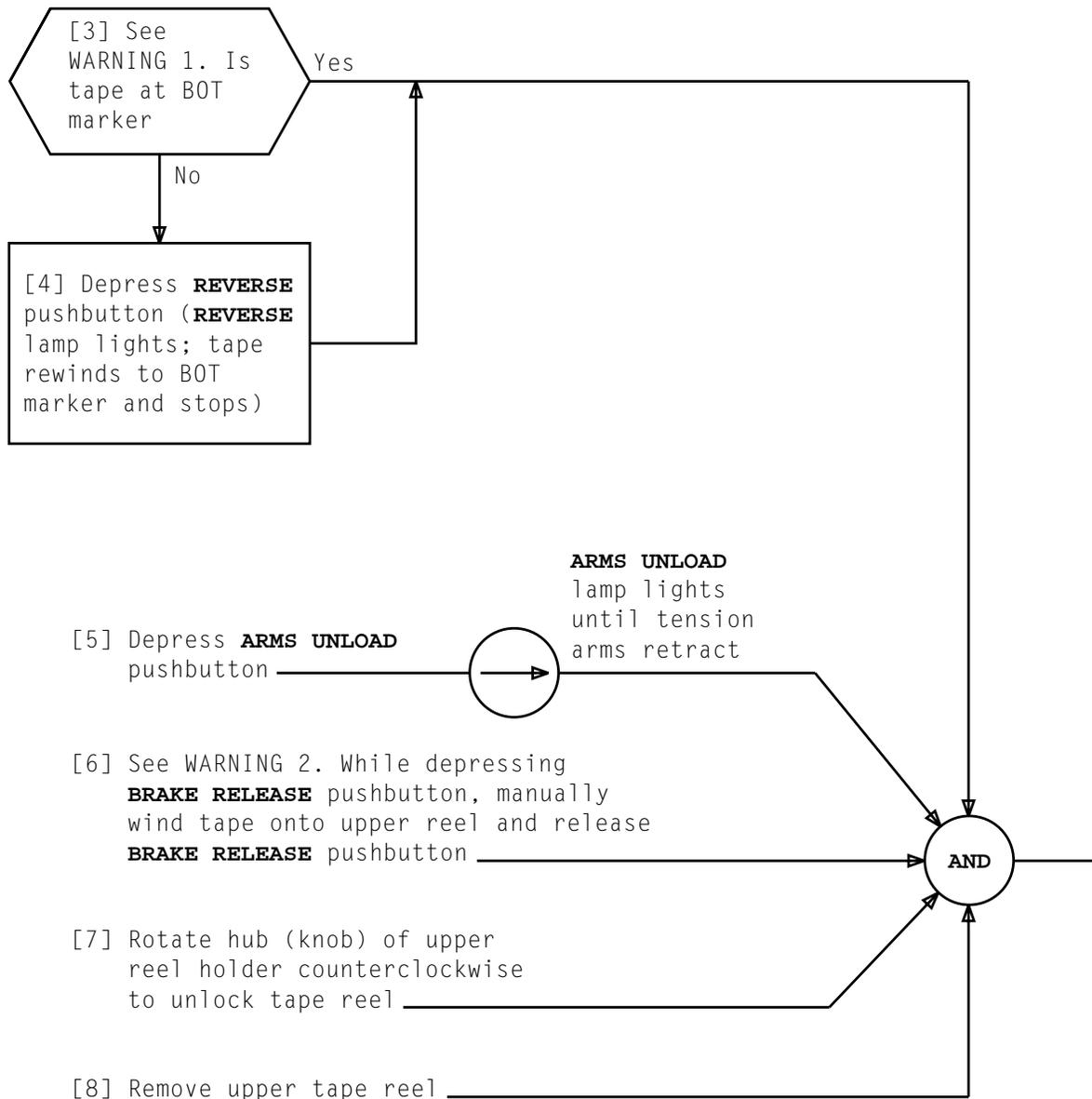
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**REMOVE TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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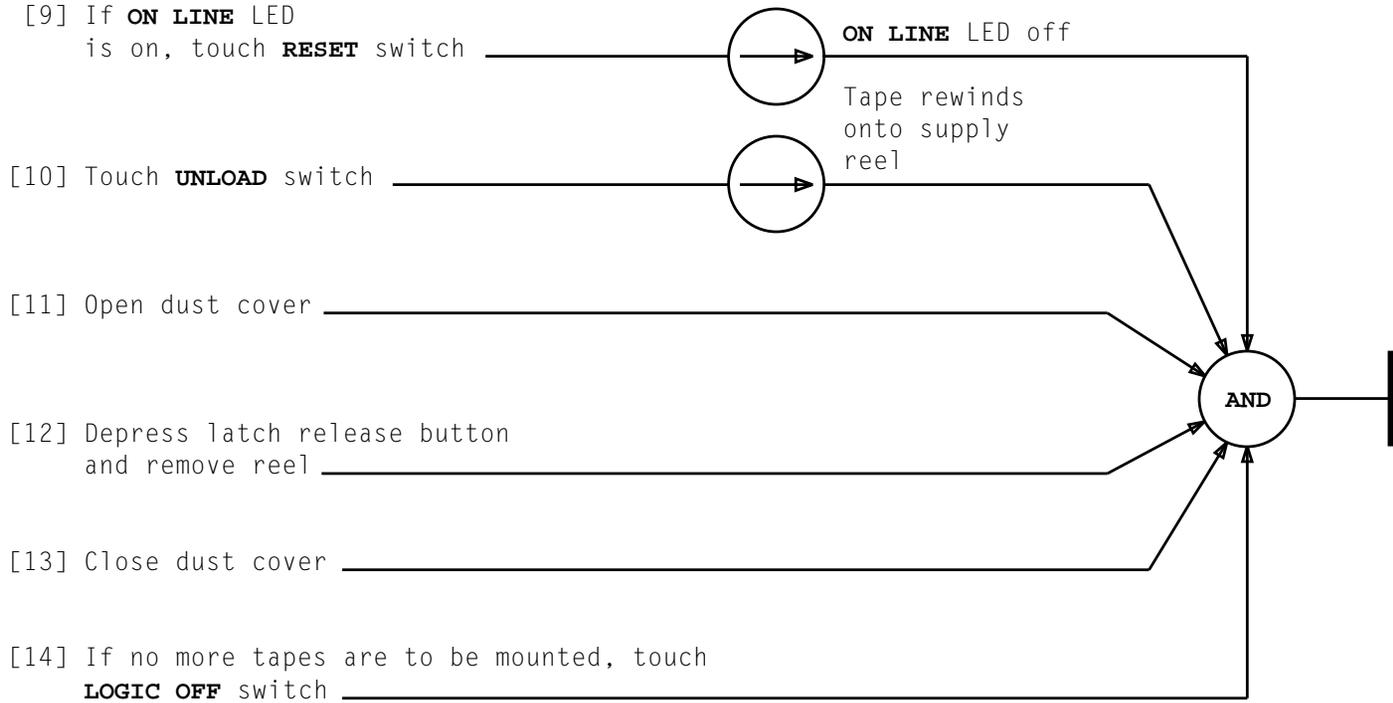
**WARNINGS**

1. If tape is being demounted due to an obvious faulty tape unit, the proper tape unit maintenance documentation should be referenced
2. Pulling or dragging last 5 feet of tape across heads may contaminate heads

## REMOVE TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT

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At control panel:



## REMOVE TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT

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At control panel:

[15] If **ON LINE** lamp  
is on, depress **ON**  
**LINE** switch

[16] If tape is not at BOT,  
depress **REWIND** switch

**LOAD POINT**  
LED lights

[17] Depress **REWIND** switch

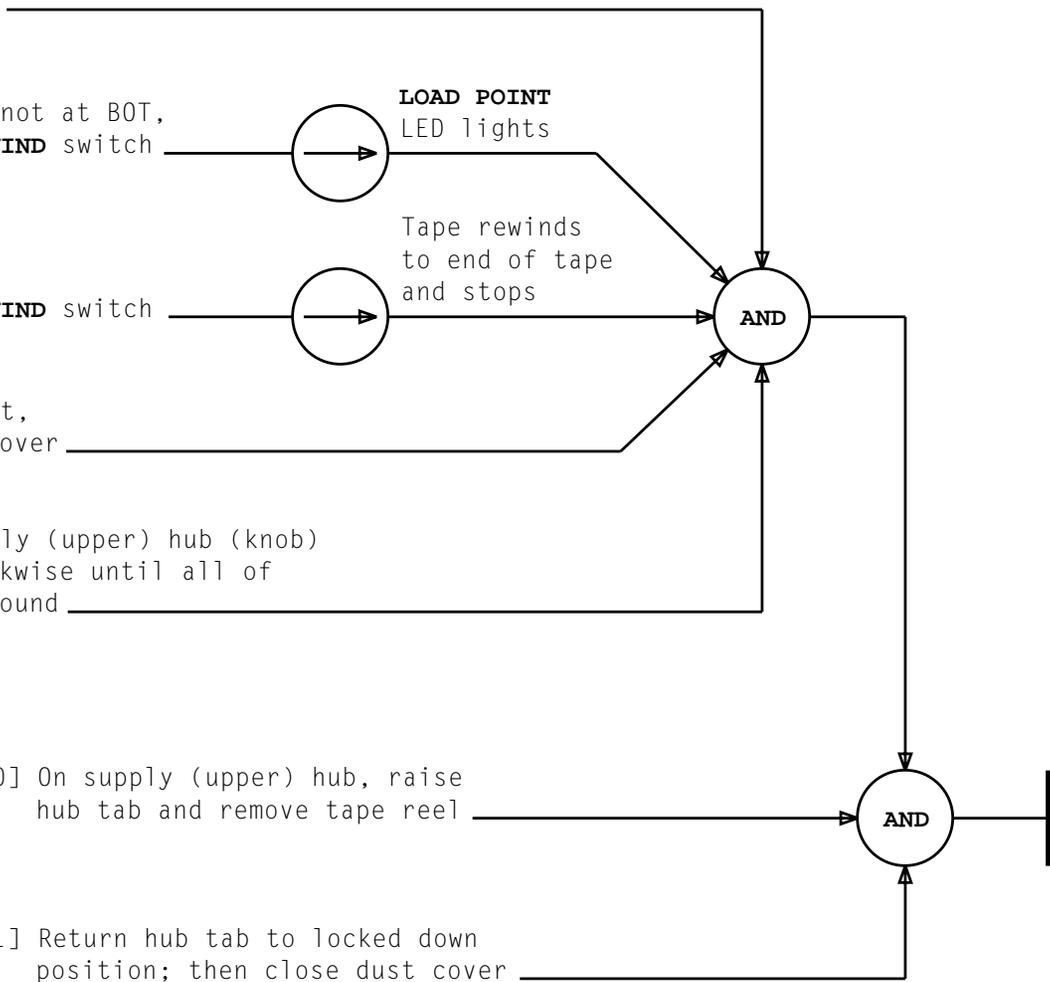
Tape rewinds  
to end of tape  
and stops

[18] On tape unit,  
open dust cover

[19] Rotate supply (upper) hub (knob)  
counterclockwise until all of  
tape is rewound

[20] On supply (upper) hub, raise  
hub tab and remove tape reel

[21] Return hub tab to locked down  
position; then close dust cover



## REMOVE TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT

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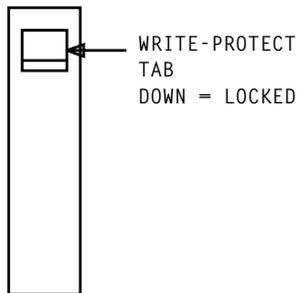
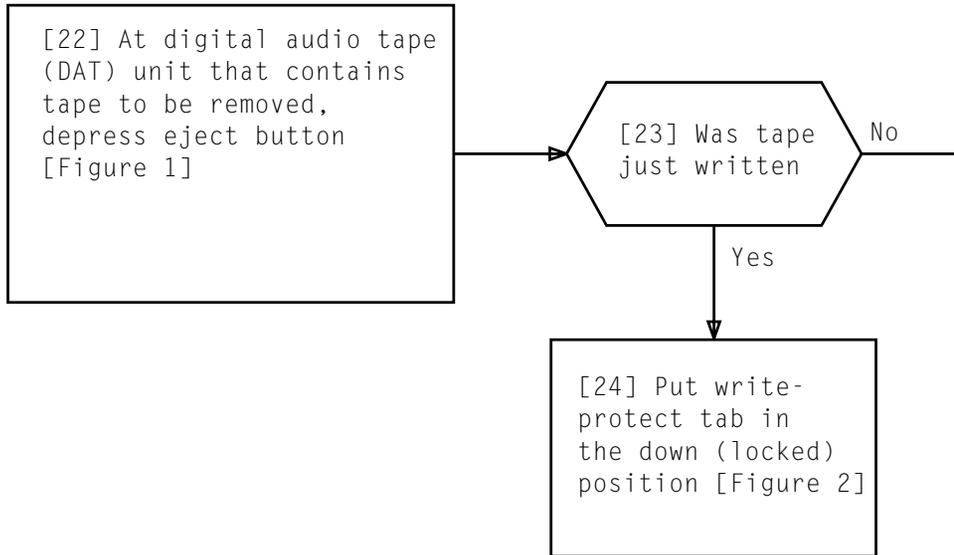


Figure 2 - 4-mm Tape

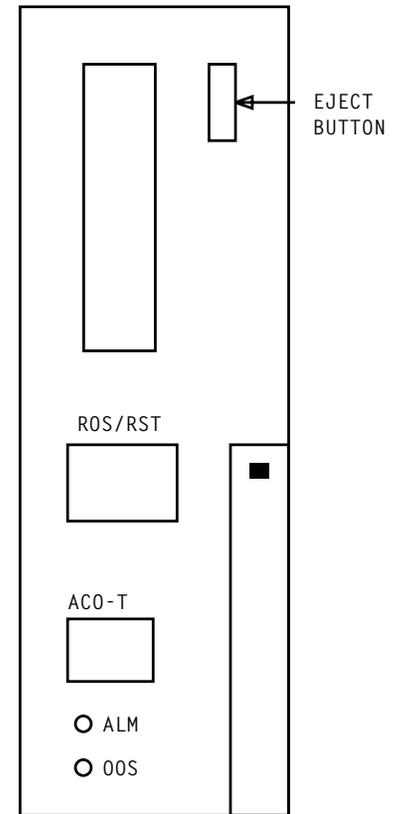


Figure 1 - DAT Unit

**REMOVE TAPE ON 3B TAPE UNIT OR DIGITAL AUDIO TAPE (DAT) UNIT**

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[1] Mount first RT0 backup  
tape (4AP<x> RT0 1)  
on available tape unit  
[DLP-558]

[2] At MCRT, enter:

VFY:TAPE,TD"/dev/mtX8",RETRY 3!

X = Tape unit member  
number

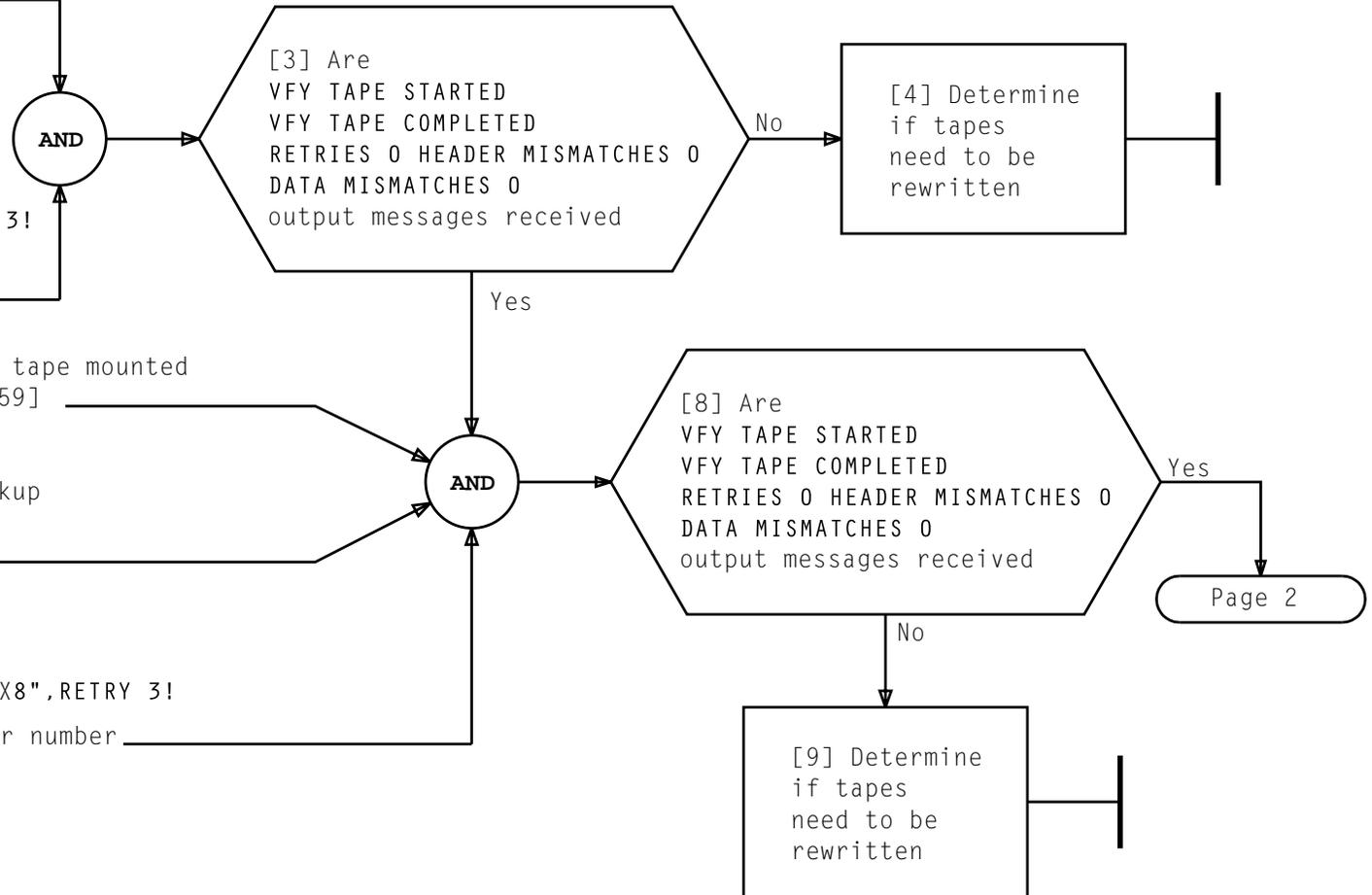
[5] Demount RT0/ backup tape mounted  
on tape unit [DLP-559]

[6] Mount next RT0/ backup  
tape on tape unit  
[DLP-558]

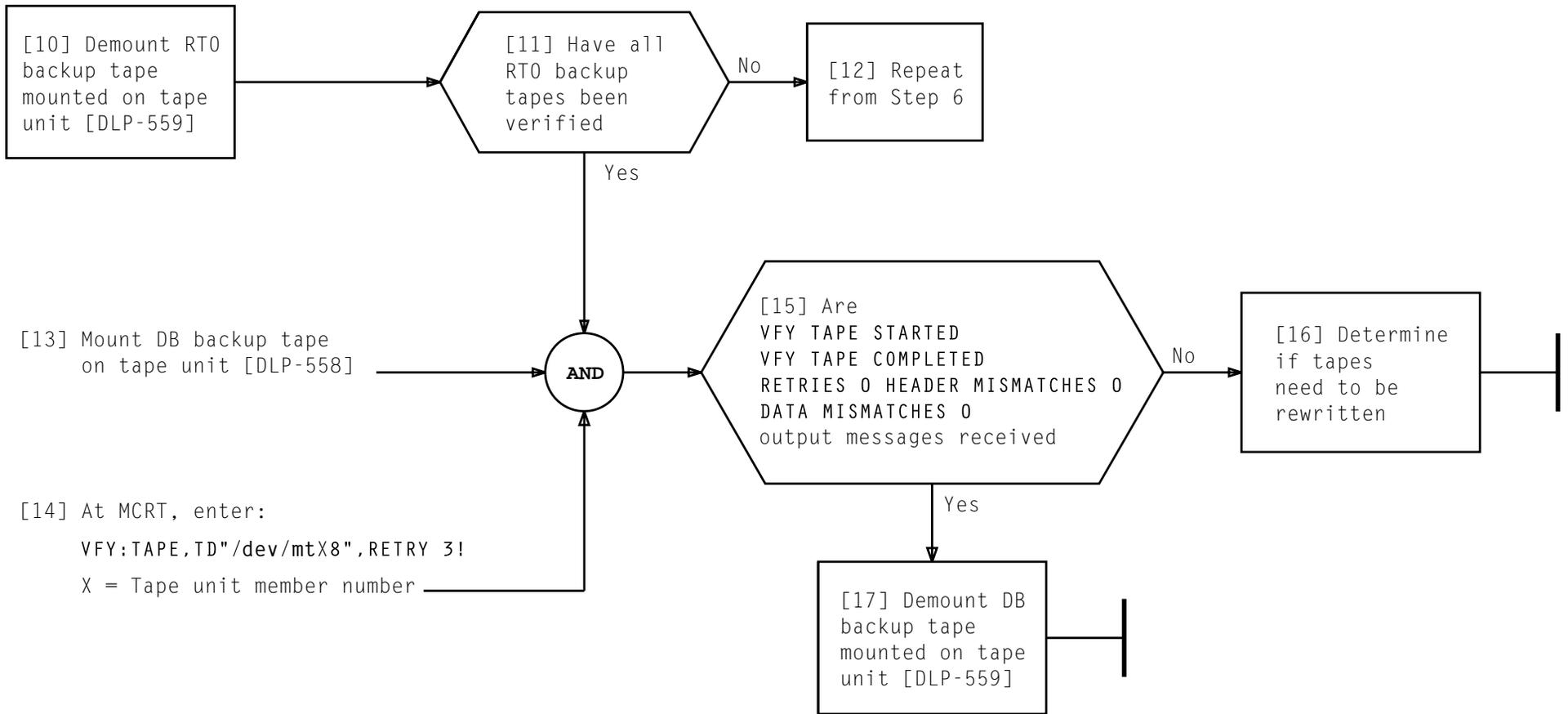
[7] At MCRT, enter:

VFY:TAPE,TD"/dev/mtX8",RETRY 3!

X = Tape unit member number



## VERIFY 3B COMPUTER BACKUP TAPES



**VERIFY 3B COMPUTER BACKUP TAPES**

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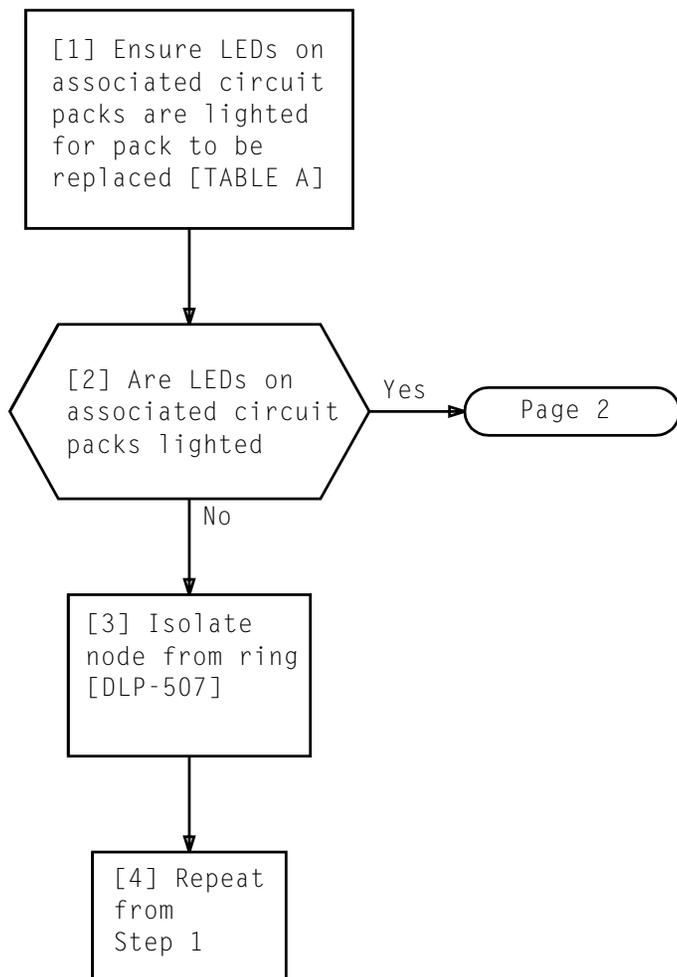
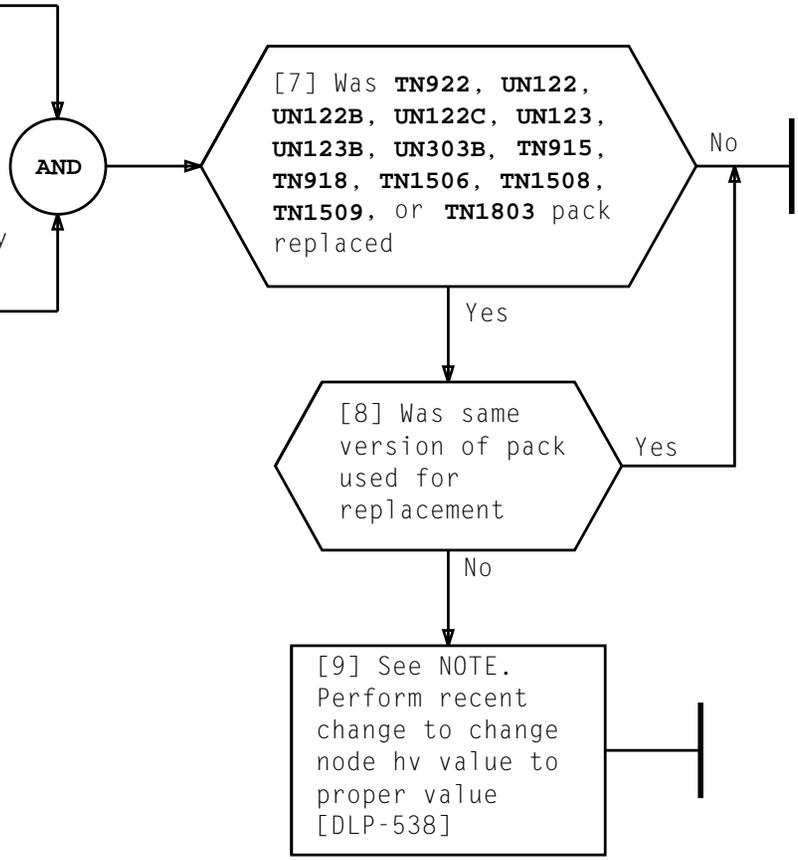


TABLE A CCS7 Circuit Packs		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
TN922	Node Processor (NP)	NT LED on; UN123 or UN123B lighted
TN916 TN917 TN917B	Link Interface (LI)	RQ LED on; TN916, TN917, or TN917B and NT LED on; UN123 or UN123B lighted
UN122 UN122B UN122C	Ring Interface 0 (RIO)	RQ LED on; TN916, TN917, or TN917B and NT LED on; UN123 or UN123B lighted
UN123 UN123B	Ring Interface 1 (RI1)	
TN915 TN918 TN1506 TN1508 TN1509 TN1803	Interframe Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 or UN123B of neighbor node in adjacent frame lighted
UN303B	Integrated Ring Node (IRN)	—

**REPLACE CIRCUIT PACK, COMMON CHANNEL SIGNALING 7 (CCS7) NODE**

[5] See WARNING.  
Remove Circuit

[6] See WARNING.  
Insert and properly  
seat replacement  
pack



**NOTE**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads nor connector pins*

**REPLACE CIRCUIT PACK, COMMON CHANNEL SIGNALING 7 (CCS7) NODE**

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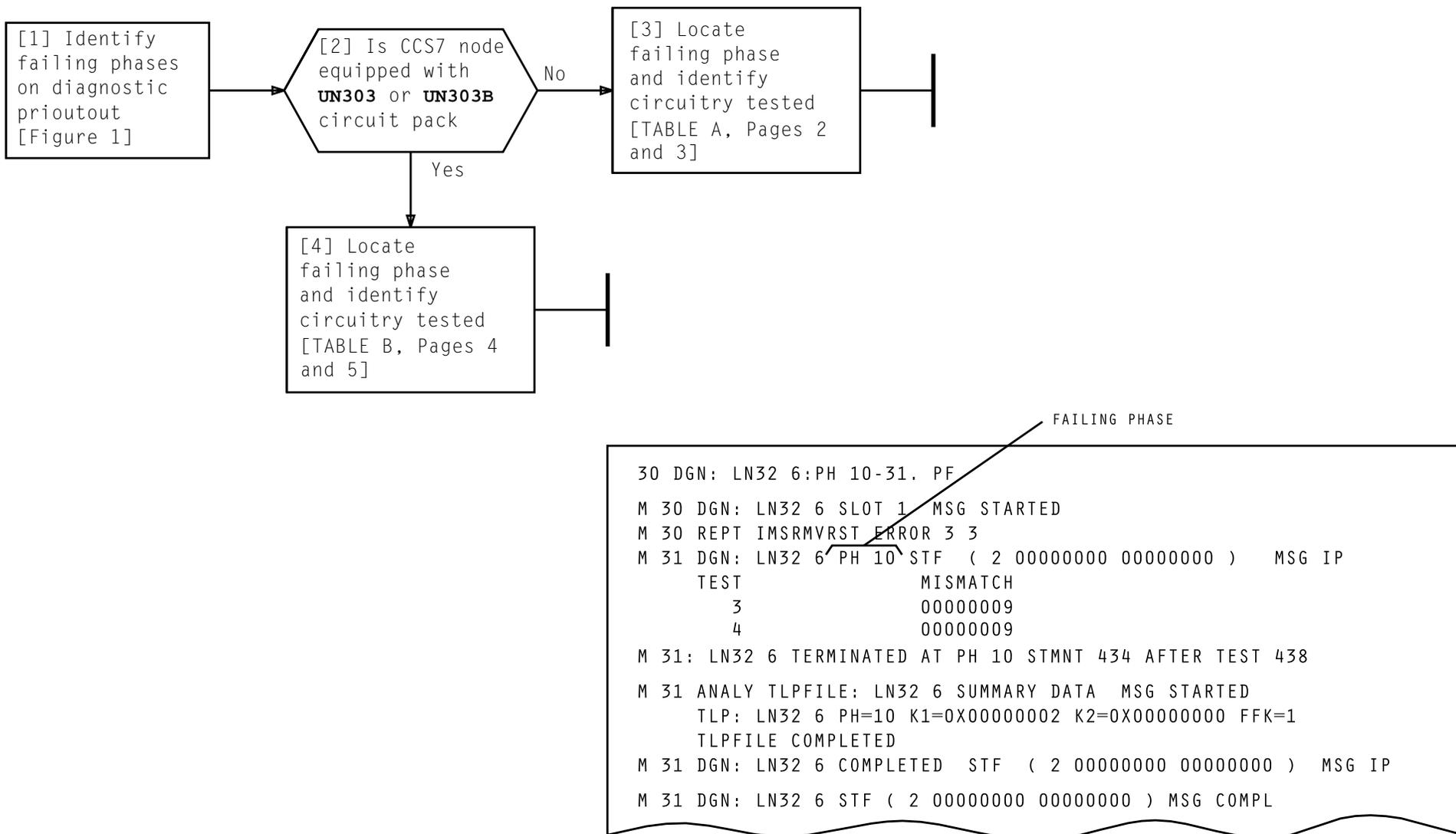


Figure 1 - Sample Printout of Failing Diagnostic Phase

## IDENTIFY CCS7 NODE CIRCUITRY TESTED BY FAILING PHASE

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**TABLE A**  
**SSI CCS7 NODE DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests part of both RAC circuit packs, and RAC to NP interface. It also partially tests interface between both RACs and ring bus.
11	Makes additional tests of interface between both RACs and ring bus. Checks capacity of interframe buffers associated with node under test.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory.

**IDENTIFY CCS7 NODE CIRCUITRY TESTED BY FAILING PHASE**

**TABLE A (contd)**  
**SSI CCS7 NODE DIAGNOSTIC PHASES**

FAILING PHASE	DESCRIPTION OF CIRCUITRY TESTED
23	Tests NP parity checker and generator circuitry.
24	Tests NP programmable master and slave interrupt controllers and associated circuitry.
26	Tests NP programmable direct memory access controllers and associated circuitry.
27	Tests NP programmable interval timer circuitry.
39	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load).
40	Tests hardware in LI board or LI to NP interface.
41	Tests sanity of microprocessor and read-only memory (ROM) on LI board.
47	Tests 2.4-, 4.8-, and 56-kb/s data service units, along with their respective VFLA or DSA units. CCS7 will ATP by default.
48	Ensures that firmware and hardware in LI board functions as a whole.

**IDENTIFY CCS7 NODE CIRCUITRY TESTED BY FAILING PHASE**

**TABLE B**  
**IRN CCS7 NODE DIAGNOSTIC PHASES**

FAILING PHASE	DESCRIPTION OF CIRCUITRY TESTED
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests ring interface (RI) circuitry of the integrated ring node (IRN) circuit pack.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests RAM memory of the integrated ring node (IRN) circuit pack.
21	Tests the ring processor circuitry of the integrated ring node (IRN) circuit pack.

**IDENTIFY CCS7 NODE CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE B (contd)</b> <b>IRN CCS7 NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
39	Verifies ability of node to read, write, and propagate a maximum length long message (demand only phase for transition load).
40	Tests hardware in LI board or LI to NP interface.
41	Tests sanity of microprocessor and read-only memory (ROM)
47	Tests 2.4-, 4.8-, and 56-kb/s data service units, along with their respective VFLA or DSA units. CCS7 is ATP by default.
48	Ensures that firmware and hardware on LI board functions as a whole.

**IDENTIFY CCS7 NODE CIRCUITRY TESTED BY FAILING PHASE**

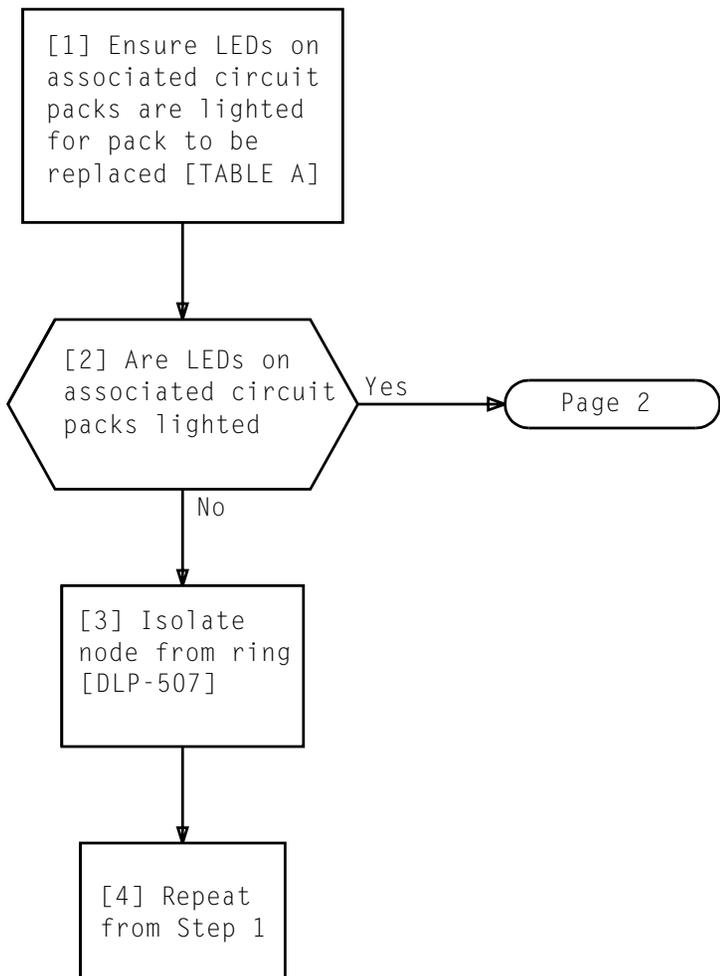
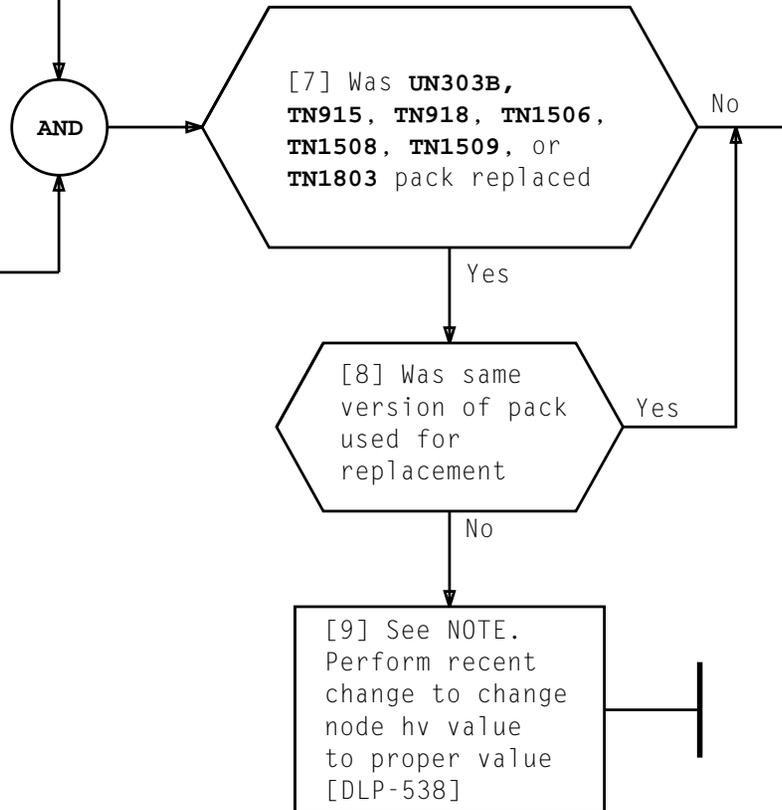


TABLE A		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
UN303B	Integrated Ring Node (IRN)	RQ LED and NT LED on; UN303B and RQ LED on; TN1315 lighted
TN1315	Link Interface (LI)	RQ LED on; TN1315, RQ LED and NT LED on; UN303B lighted
TN915 TN918 TN1506 TN1508  TN1509 TN1803	Interframe Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 UN123B of neighbor node in adjacent frame lighted
T1FA	T1 Facility Access	—

**REPLACE CIRCUIT PACK, INTERNATIONAL LINK NODE (ILN)**

[5] See WARNING. Remove circuit pack to be replaced

[6] See WARNING. Insert and properly seat replacement pack



NOTE

If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

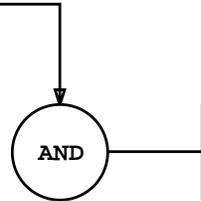
**WARNING**

*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should always be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads nor connector pins*

**REPLACE CIRCUIT PACK, INTERNATIONAL LINK NODE (ILN)**

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[1] Identify failing phases  
on diagnostic printout  
[Figure 1]



[2] Locate failing phase and  
identify circuitry  
tested [TABLE A, Page 2]

```
30 DGN: LN28 3:PH 10-31, PF
M 30 DGN: LN28 3 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRSST ERROR 3 3
M 31 DGN: LN28 3 PH 10 STF ( 2 00000000 00000000 ) MSG IP
TEST MISMATCH
3 00000009
4 00000009
M 31: LN28 3 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: LN28 3 SUMMARY DATA MSG STARTED
TLP: LN28 3 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
TLPFILE COMPLETED
M 31 DGN: LN28 3 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: LN28 3 STF ( 2 00000000 00000000 ) MSG COMPL
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

# IDENTIFY INTERNATIONAL LINK NODE (ILN) CIRCUITRY TESTED BY FAILING PHASE

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**TABLE A**  
**IRN ILN DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests the ring interface circuitry of the integrated ring node (IRN) circuit pack.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Test RAM memory of the integrated ring node (IRN) circuit pack.
21	Tests the ring processor circuitry of the integrated ring node (IRN) circuit pack.

**IDENTIFY INTERNATIONAL LINK NODE (ILN) CIRCUITRY TESTED  
BY FAILING PHASE**

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<b>TABLE A (Contd)</b> <b>IRN ILN DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
29	Tests T1FA 8032 processor and its internal RAM, T1FA/NP Dual Port RAM, T1FA maintenance buffer, T1FA - T1 Chip Set (Framer, Transmitter/Formatter, Receiver/Synchronizer), and verifies EPROM based code by running "check-sum" test. It also verifies remaining DPRAM and ensures T1FA is not insane.
39	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load).
50	Tests LI4 0 local RAM and Dual Port RAM from Node Processor. The LI4 is held reset.
51	Tests NP-LI4 0 interface and DPRAM from NP view, while microprocessor on Link Interface board is running. This phase is downloaded to LI4 0 via NP.
52	Tests 8086 microprocessor on LI4 0 board. A subset of 8086 instruction set is exercised to verify that microprocessor operates properly. This phase is downloaded to LI4 0 via NP.
53	Tests DPRAM and parity check circuit. This phase is downloaded to LI4 0 RAM via NP.
54	Tests Programmable Interrupt Controllers and Programmable Interval Timers. This phase is downloaded to LI4 0 RAM via NP.
55	Tests DMA, Serial Communications Chip (SCC), part of Programmable Interrupt Controller, timers, and formatting chips of LI4 0 when LI4D is tested (TN1315).

**IDENTIFY INTERNATIONAL LINK NODE (ILN) CIRCUITRY  
TESTED BY FAILING PHASE**

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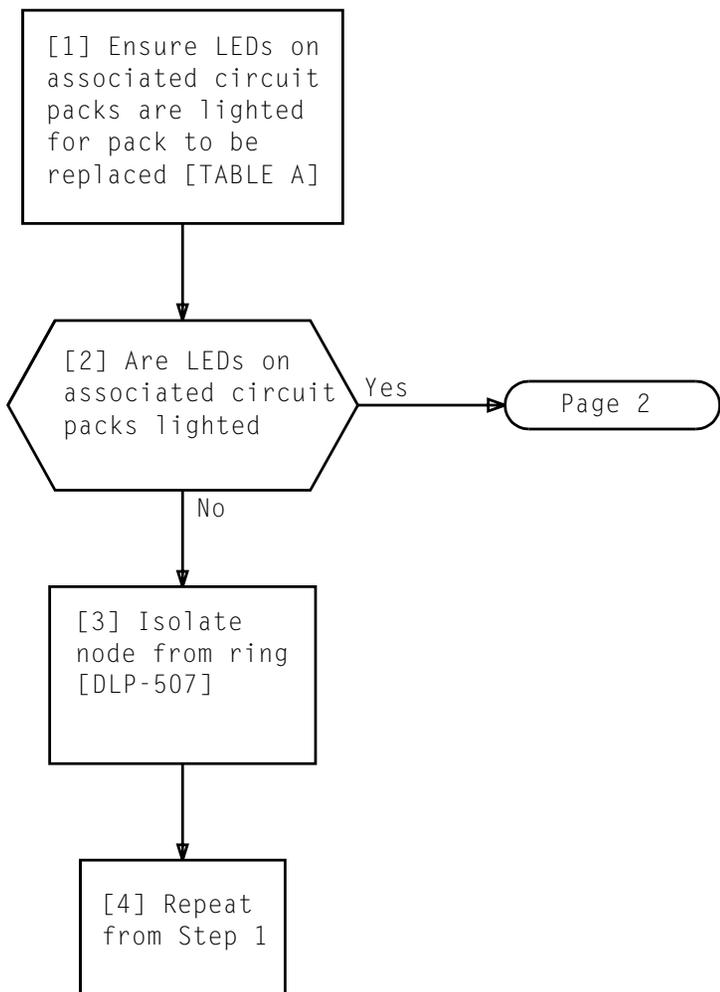


TABLE A Replacement Circuit Packs		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
<b>TN922</b>	Node Processor (NP)	<b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> lighted
<b>TN1315</b> <b>TN1316</b>	Link Interface (LI)	<b>RQ</b> LED on; <b>TN916</b> , <b>TN917</b> , or <b>TN917B</b> and <b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> lighted
<b>UN122</b> <b>UN122B</b> <b>UN122C</b>	Ring Interface 0 (RI0)	<b>RQ</b> LED on; <b>TN916</b> , <b>TN917</b> or <b>TN917B</b> and <b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> lighted
<b>UN123</b> <b>UN123B</b>	Ring Interface 1 (RI1)	
<b>TN915</b> <b>TN918</b> <b>TN1506</b> <b>TN1508</b> <b>TN1509</b> <b>TN1803</b>	Interframe Buffer (IFB)	<b>NT</b> LED on; associated <b>UN123</b> , <b>UN123B</b> or <b>NT</b> LED on; <b>UN123</b> or <b>UN123B</b> of neighbor node in adjacent frame lighted
<b>UN303B</b>	Integrated Ring Node (IRN)	—
<b>UN304</b>	Integrated Ring Node 2 (IRN2)	—
<b>T1FA</b>	T1 Facility Access	—

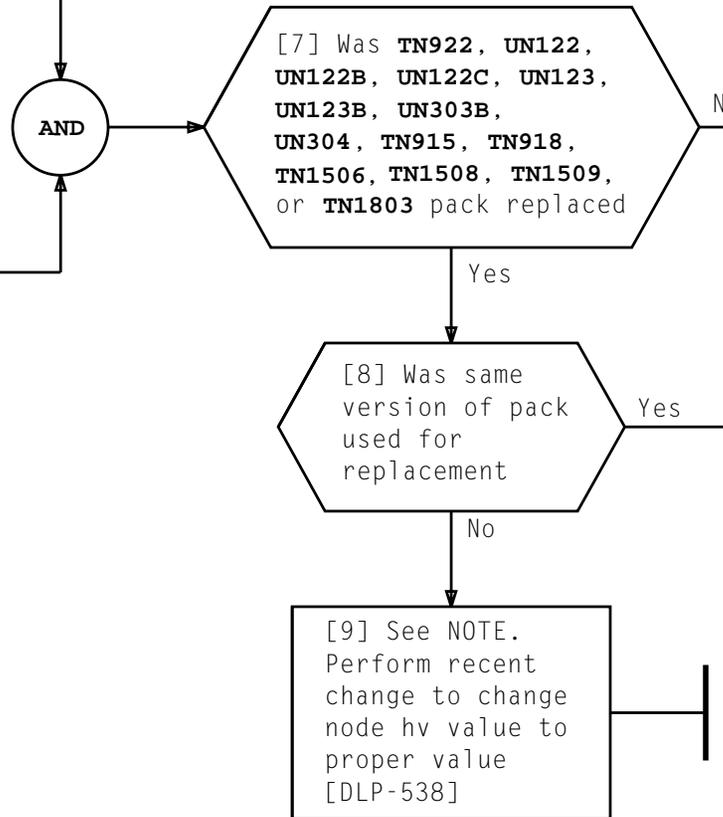
## REPLACE CIRCUIT PACK, CUSTOMER PREMISE EQUIPMENT (CPE) NODE

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[5] See WARNING. Remove circuit pack to be replaced

[6] See WARNING. Insert and properly seat replacement pack



**NOTE**

If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

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**WARNING**

*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should always be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads nor connector pins*

**REPLACE CIRCUIT PACK, CUSTOMER PREMISE EQUIPMENT (CPE) NODE**

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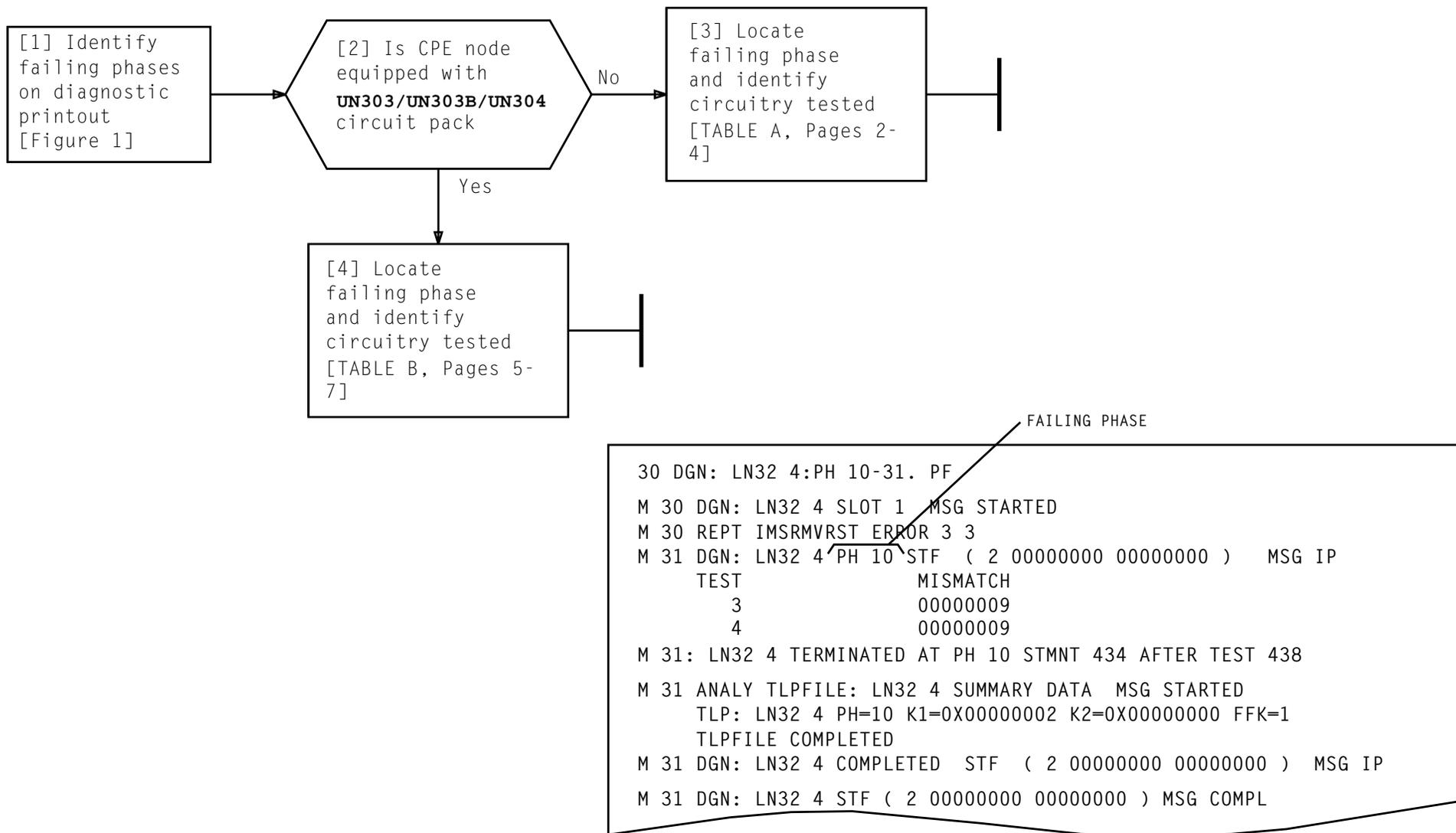


Figure 1 - Sample Printout of Failing Diagnostic Phase

## IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY TESTED BY FAILING PHASE

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<b>TABLE A</b> <b>SSI CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests part of both RAC circuit packs, and RAC to NP interface. It also partially tests interface between both RACs and ring bus.
11	Makes additional tests of interface between both RACs and ring bus. Checks capacity of interframe buffers associated with node under test.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY  
TESTED BY FAILING PHASE**

<b>TABLE A (Contd)</b> <b>SSI CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
23	Tests NP parity checker and generator circuitry.
24	Tests NP programmable master and slave interrupt controllers and associated circuitry.
26	Tests NP programmable Direct Memory Access Controllers and associated circuitry.
27	Tests NP programmable interval timer circuitry.
29	Tests T1FA 8032 processor and its internal RAM, T1FA/NP Dual Port RAM, T1FA maintenance buffer, T1FA – T1 Chip Set (Framer, Transmitter/Formatter, Receiver/Synchronizer), and verifies EPROM based code by running "check-sum" test. It also verifies remaining DPRAM and ensures T1FA is not insane.
50	Tests LI4 0 local RAM and Dual Port RAM from Node Processor. The LI4 is held reset.
51	Tests NP-LI4 0 interface and DPRAM from NP view, while microprocessor on Link Interface board is running. This phase is downloaded to LI4 0 via NP.
52	Tests 8086 microprocessor on LI4 0 board. A subset of 8086 instruction set is exercised to verify that microprocessor operates properly. This phase is downloaded to LI4 0 via NP.
53	Tests DPRAM and parity check circuit. This phase is downloaded to LI4 0 RAM via NP.
54	Tests Programmable Interrupt Controllers and Programmable Interval Timers. This phase is downloaded to LI4 0 RAM via NP.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE A (Contd)</b> <b>SSI CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
55	Tests DMA, Serial Communications Chip (SCC) part of Programmable Interrupt Controller, timers, and formatting chips of LI4 0 when LI4D is tested (TN1315).
56	Tests 12A Applique and 2048 data set. This phase is downloaded to LI4 0 via NP. This only applies to LI-4S.
60	Tests LI4 1 local RAM and Dual Port RAM from Node Processor.
61	Tests NP-LI4 1 interface and DPRAM from NP view, while microprocessor on Link Interface board is running. This phase is downloaded to LI4 1 via NP1.
62	Tests 8086 microprocessor on LI4 1 board. A subset of 8086 instruction set is exercised to verify that microprocessor operates properly. This phase is downloaded to LI4 1 via NP.
63	Tests DPRAM and parity check circuit. This phase is downloaded to LI4 1 RAM via NP.
64	Tests Programmable Interrupt Controllers and Programmable Interval Timers. This phase is downloaded to LI4 1 RAM via NP.
65	Tests DMA, Serial Communications Chip (SCC), part of Programmable Interrupt Controller, timers, and formatting chips of LI4 1 when LI4D is tested (TN1315).
66	Tests 12A Applique and 2048 data set. This phase is downloaded to LI4 1 RAM via NP. This only applies to LI-4S.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE B</b> <b>IRN/IRN2 CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests the ring interface (RI) circuitry of the integrated ring node (IRN) circuit pack.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Test RAM memory of the integrated ring node (IRN) circuit pack.
21	Tests the ring processor circuitry of the integrated ring node (IRN) circuit pack.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY  
TESTED BY FAILING PHASE**

<b>TABLE B (Contd)</b> <b>IRN/IRN2 CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
29	Tests T1FA 8032 processor and its internal RAM, T1FA/NP Dual Port RAM, T1FA maintenance buffer, T1FA - T1 Chip Set (Framer, Transmitter/Formatter, Receiver/Synchronizer), and verifies EPROM based code by running "check-sum" test. It also verifies remaining DPRAM and ensures T1FA is not insane.
50	Tests LI4 0 local RAM and Dual Port RAM from Node Processor. The LI4 is held reset.
51	Tests NP-LI4 0 interface and DPRAM from NP view, while microprocessor on Link Interface board is running. This phase is downloaded to LI4 0 via NP.
52	Tests 8086 microprocessor on LI4 0 board. A subset of 8086 instruction set is exercised to verify that microprocessor operates properly. This phase is downloaded to LI4 0 via NP.
53	Tests DPRAM and parity check circuit. This phase is downloaded to LI4 0 RAM via NP.
54	Tests Programmable Interrupt Controllers and Programmable Interval Timers. This phase is downloaded to LI4 0 RAM via NP.
55	Tests DMA, Serial Communications Chip (SCC), part of Programmable Interrupt Controller, timers, and formatting chips of LI4 0 when LI4D is tested (TN1315).
56	Tests 12A Applique and 2048 data set. This phase is downloaded to LI4 0 via NP. This only applies to LI-4S.
60	Tests LI4 1 local RAM and Dual Port RAM from Node Processor.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE B (Contd)</b> <b>IRN/IRN2 CPE NODE DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
61	Tests NP-LI4 1 interface and DPRAM from NP view, while microprocessor on Link Interface board is running. This phase is downloaded to LI4 1 via NP1.
62	Tests 8086 microprocessor on LI4 1 board. A subset of 8086 instruction set is exercised to verify that microprocessor operates properly. This phase is downloaded to LI4 1 via NP.
63	Tests DPRAM and parity check circuit. This phase is downloaded to LI4 1 RAM via NP.
64	Tests Programmable Interrupt Controllers and Programmable Interval Timers. This phase is downloaded to LI4 1 RAM via NP.
65	Tests DMA, Serial Communications Chip (SCC), part of Programmable Interrupt Controller, timers, and formatting chips of LI4 1 when LI4D is tested (TN1315).
66	Tests 12A Applique and 2048 data set. This phase is downloaded to LI4 1 RAM via NP. This only applies to LI-4S.

**IDENTIFY CUSTOMER PREMISE EQUIPMENT (CPE) NODE CIRCUITRY TESTED BY FAILING PHASE**

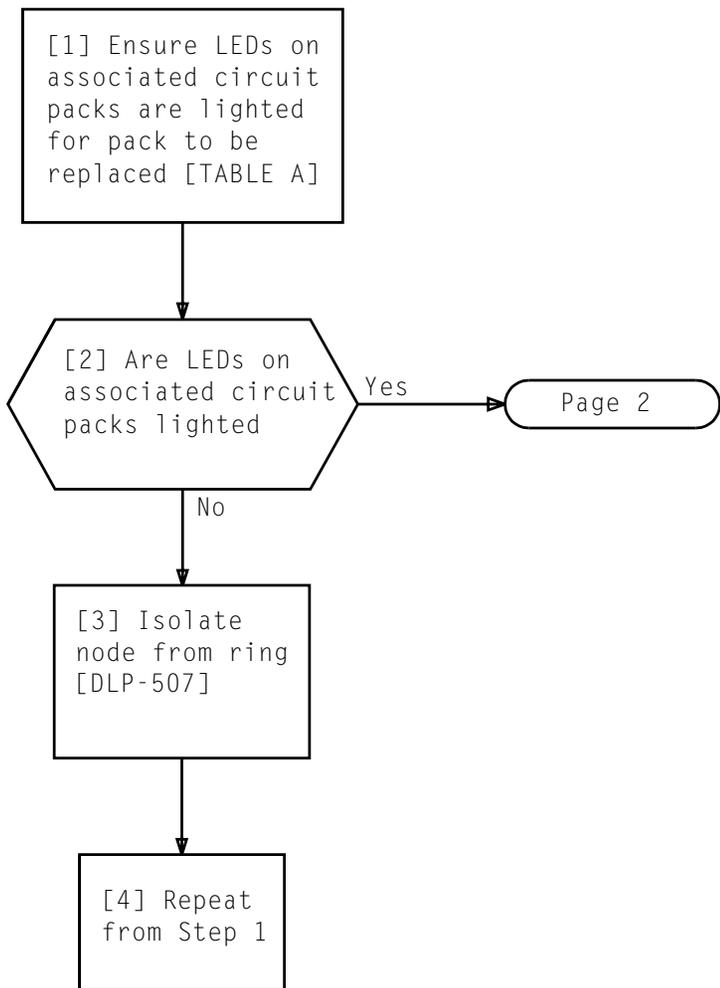
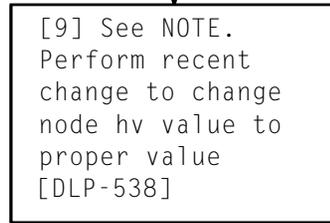
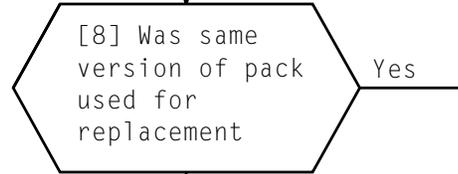
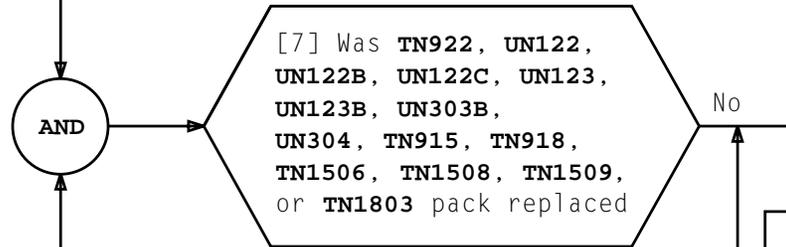


TABLE A Replacement Circuit Pack		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
TN922	Node Processor (NP)	NT LED on; UN123 or UN123B lighted
TN916 TN917 TN917B	Link Interface (LI)	RQ LED on; TN916, TN917, or TN917B and NT LED on; UN123 or UN123B lighted
UN122 UN122B UN122C	Ring Interface 0 (RIO)	RQ LED on; TN916, TN917 or TN917B and NT LED on; UN123 or UN123B lighted
UN123 UN123B	Ring Interface 1 (RI1)	
TN915 TN918 TN1506 TN1508 TN1509 TN1803	Interframe Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 or UN123B of neighbor node in adjacent frame lighted
UN303B	Integrated Ring Node (IRN)	—
UN304	Integrated Ring Node 2 (IRN2)	—

**REPLACE CIRCUIT PACK, IMS USER NODE (IUN)**

[5] See WARNING. Remove circuit pack to be replaced

[6] See WARNING. Insert and properly seat replacement pack



**NOTE**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) MUST be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads nor connector pins*

**REPLACE CIRCUIT PACK, IMS USER NODE (IUN)**

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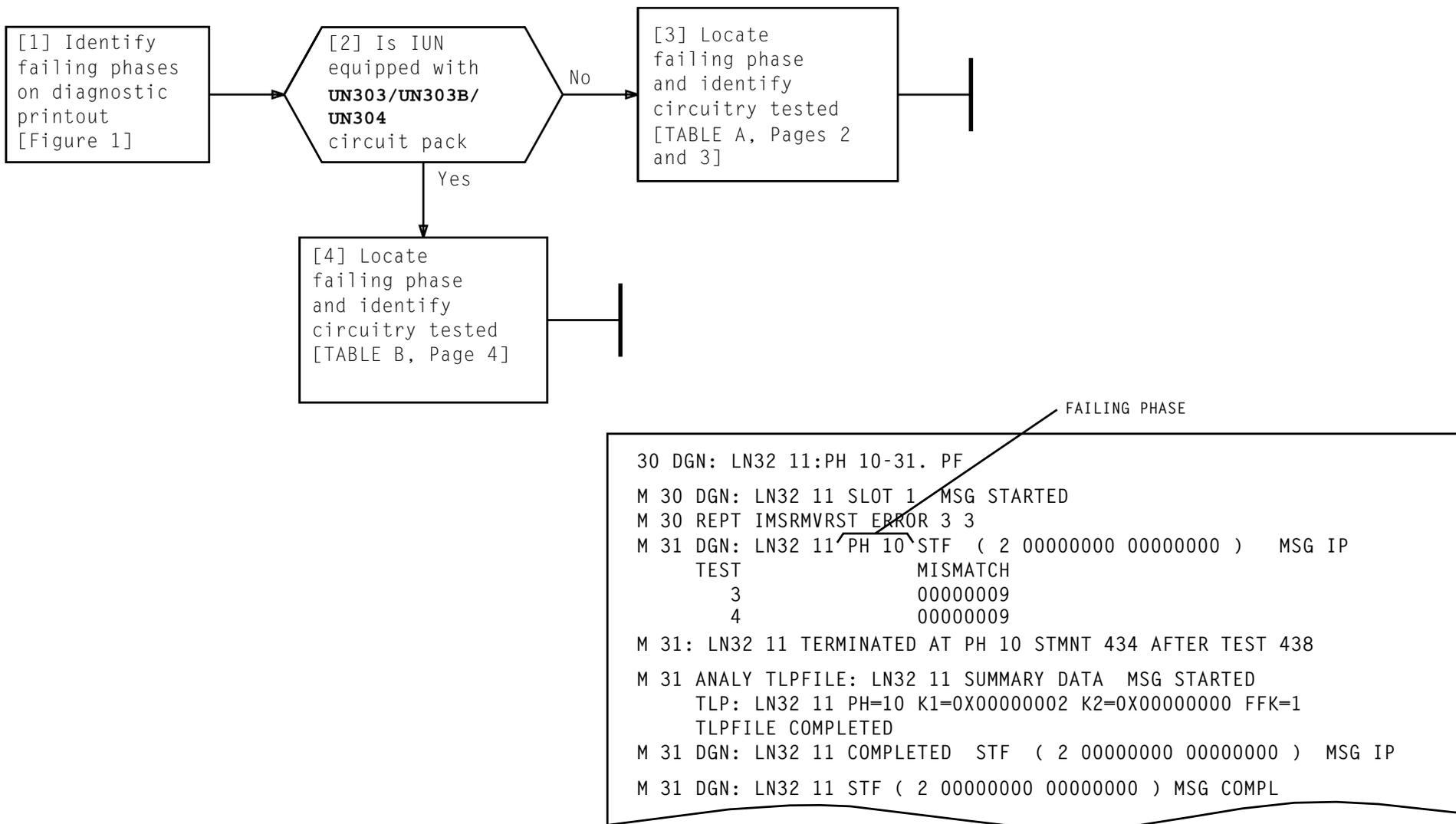


Figure 1 - Sample Printout of Failing Diagnostic Phase

**IDENTIFY IMS USER NODE (IUN) CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE A**  
**SSI IUN DIAGNOSTIC PHASES**

FAILING PHASE	DESCRIPTION OF CIRCUITRY TESTED
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests part of both RAC circuit packs, and RAC to NP interface. It also partially tests interface between both RACs and ring bus.
11	Makes additional tests of interface between both RACs and ring bus. Checks capacity of interframe buffers associated with node under test.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory.

**IDENTIFY IMS USER NODE (IUN) CIRCUITRY TESTED BY FAILING PHASE**

<b>TABLE A (Contd)</b> <b>SSI IUN DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
23	Tests NP parity checker and generator circuitry.
24	Tests NP programmable master and slave interrupt controllers and associated circuitry.
26	Tests NP programmable direct memory access controllers and associated circuitry.
27	Tests NP programmable interval timer circuitry.
39	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load).

**IDENTIFY IMS USER NODE (IUN) CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE B**  
**IRN/IRN2 IUN DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0/. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0/, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests ring interface (RI) circuitry of the integrated ring node (IRN) circuit pack.
12	Verifies that RAC0/ can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests RAM memory of the integrated ring node (IRN) circuit pack.
21	Tests the ring processor circuitry of the integrated ring node (IRN) circuit pack.
39	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load).

**IDENTIFY IMS USER NODE (IUN) CIRCUITRY TESTED BY FAILING PHASE**

[1] At MCRT, enter:

OP:STATUS:FILESYS!

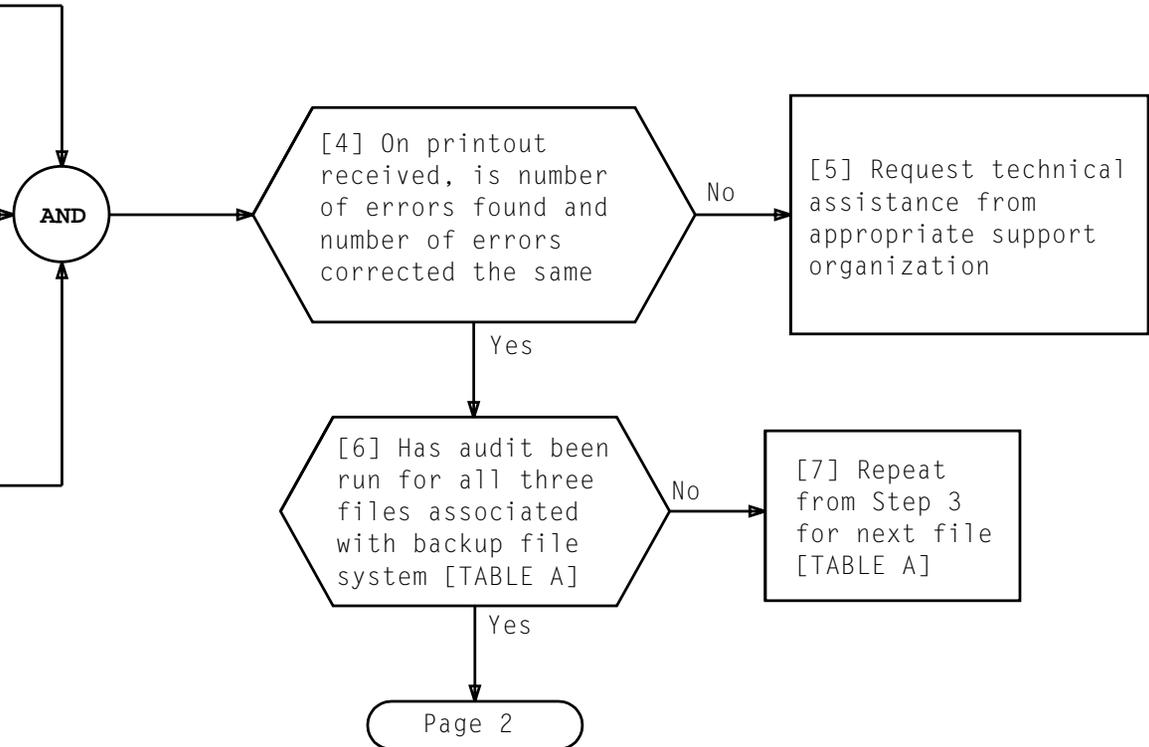
[2] Using ROP printout, determine if system is running on root (/dev/root) or broot (/dev/broot) and record

[3] At MCRT, enter:

AUD:FSBLK 1,INS"a"!

a = file name listed in TABLE A associated with backup file system as determined in Step 2

TABLE A	
SYSTEM RUNNING ON	
ROOT	BROOT
/dev/root	/dev/broot
/dev/db	/dev/bdb
/dev/etc	/dev/betc



# RUN FILE SYSTEM AUDITS ON BACKUP FILE SYSTEM TO ENSURE NO FILE SYSTEM ERRORS

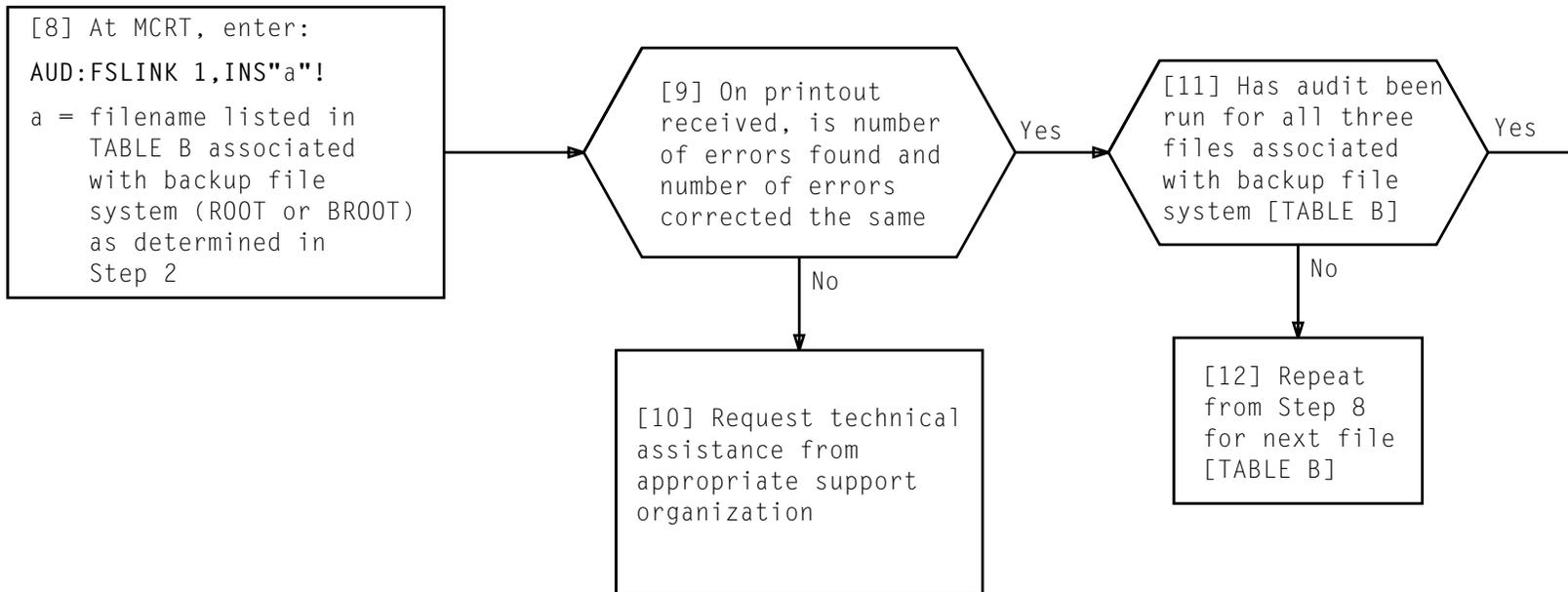


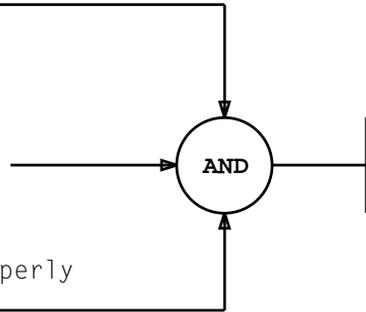
TABLE B	
SYSTEM RUNNING ON	
ROOT	BROOT
/dev/root	/dev/broot
/dev/db	/dev/bdb
/dev/etc	/dev/betc

**RUN FILE SYSTEM AUDITS ON BACKUP FILE SYSTEM TO ENSURE NO FILE SYSTEM ERRORS**

[1] Isolate node from ring [DLP-507]

[2] See WARNING. Remove **UN304B** circuit pack to be replaced

[3] See WARNING. Insert and properly seat replacement pack

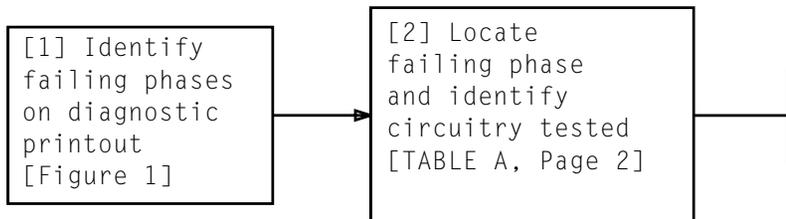


**WARNING**

*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) must be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads nor connector pins*

**REPLACE CIRCUIT PACK, ATP NODE (ATPN)**

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                                FAILING PHASE
30 DGN: LN38 8:PH 10-31. PF
M 30 DGN: LN38 8 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRST ERROR 3 3
M 31 DGN: LN38 8/PH 10 STF ( 2 00000000 00000000 ) MSG IP
      TEST                MISMATCH
          3                00000009
          4                00000009
M 31: LN38 8 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: LN38 8 SUMMARY DATA MSG STARTED
      TLP: LN38 8 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
      TLPFILE COMPLETED
M 31 DGN: LN38 8 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: LN38 8 STF ( 2 00000000 00000000 ) MSG COMPL
  
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

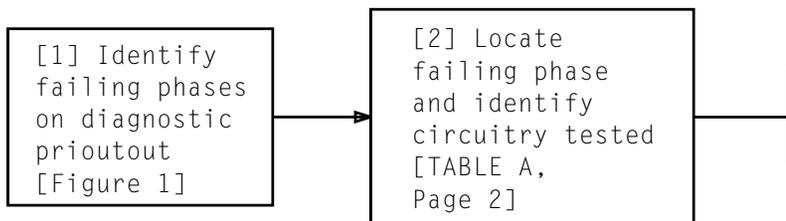
**IDENTIFY ATP NODE (ATPN) CIRCUITRY TESTED BY FAILING PHASE**

LUCENT TECHNOLOGIES PROPRIETARY - Use Pursuant to Company Instructions

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<b>TABLE A</b> <b>IRN2 ATPN DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0/. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0/, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests ring interface (RI) circuitry of the integrated ring node (IRN) circuit pack.
12	Verifies that RAC0/ can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests RAM memory of the integrated ring node (IRN) circuit pack.
21	Tests the ring processor circuitry of the integrated ring node (IRN) circuit pack.
39	Verifies ability of node to read, write, and propagate a maximum length message (demand only phase for transition load).

**IDENTIFY ATP NODE (ATPN) CIRCUITRY TESTED BY FAILING PHASE**



```

30 DGN: LN41 3:PH 10-31. PF
M 30 DGN: LN41 3 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRST ERROR 3 3
M 31 DGN: LN41 3 PH 10 STF ( 2 00000000 00000000 ) MSG IP
      TEST                MISMATCH
          3                00000009
          4                00000009
M 31: LN41 3 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: LN41 3 SUMMARY DATA MSG STARTED
      TLP: LN41 3 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
      TLPFILE COMPLETED
M 31 DGN: LN41 3 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: LN41 3 STF ( 2 00000000 00000000 ) MSG COMPL
  
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

**IDENTIFY SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN) CIRCUITRY  
CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE A**  
**SIN DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests part of both RACs, the RAC to the NP interface, and the interface between both RACs and the ring bus. Checks the capacity of the interframe buffers associated with node under test.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests NP RAM memory, NP parity checker and generator circuitry.
30	Tests interface between DSCH and DDSBS.
31	Tests interface between DDSBS and 3BI.
32	Tests ability of NP to go "insane" and set "Interrupt Request Flag" when 3BI has an error.
33	Tests interface between 3BI and NP.
34	Performs off-line CU to DDSBS tests (demand phase only).
35	Cooperates with 3B20D driver to test DMA capability via 3BI.
40	Tests the SCSI interface hardware.

**IDENTIFY SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN) CIRCUITRY  
TESTED BY FAILING PHASE**

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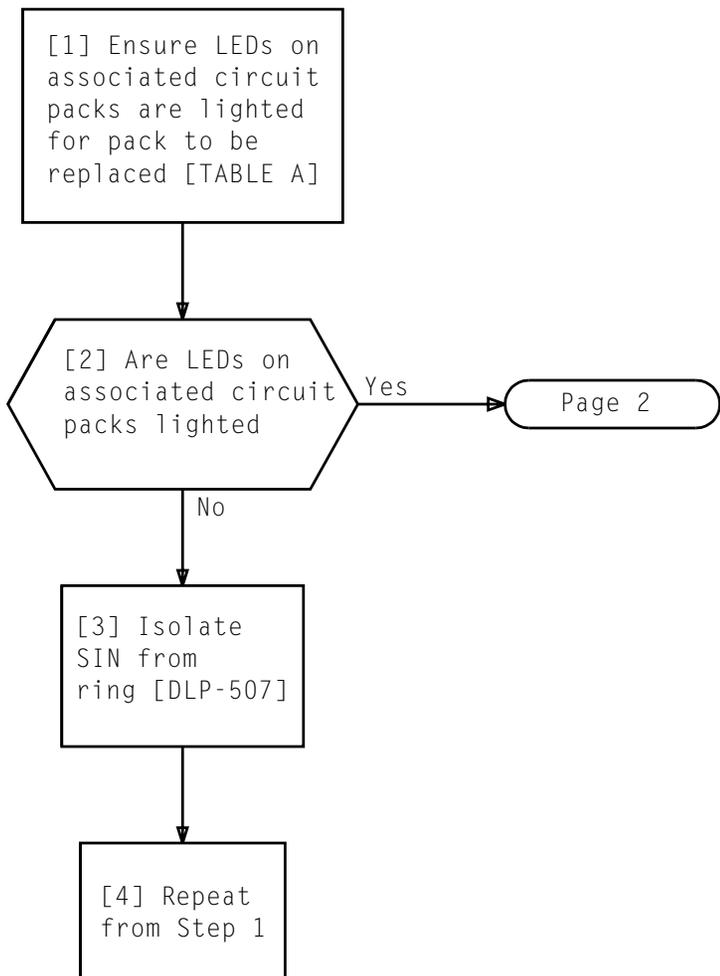


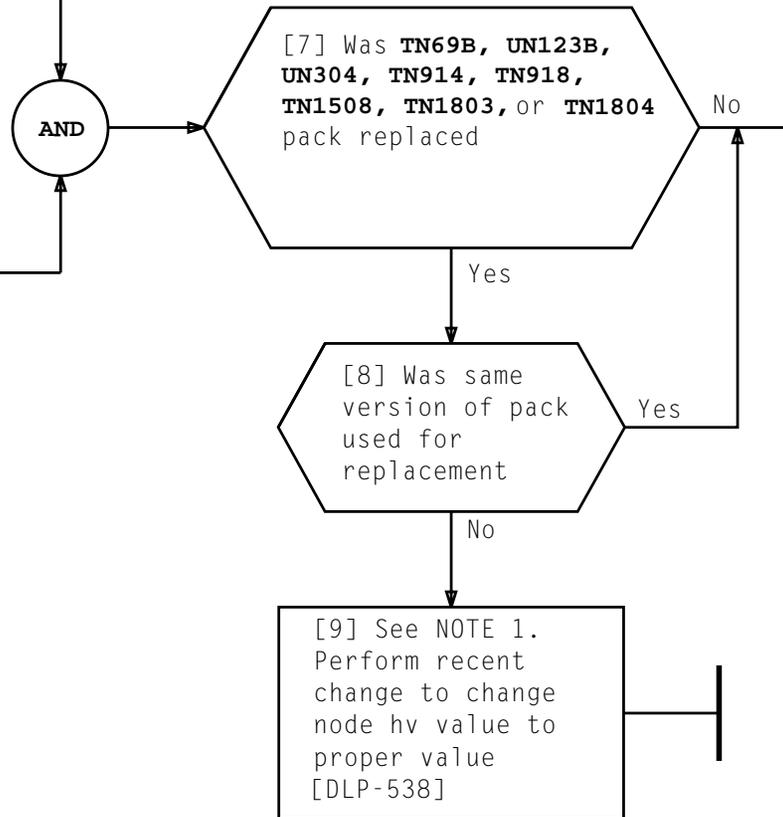
TABLE A CIRCUIT PACKS		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
UN304	Integrated Ring Node (IRN)	-
TN918 TN1508 TN1803	Interface Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 or UN123B of neighbor node in adjacent frame lighted
TN1804	Small Computer Systems Interface (SCSI)	-
TN914	3B Interface (3BI)	-
TN69B	Duplex Dual Serial Bus Selector (DDSBS)	-

**REPLACE CIRCUIT PACK, SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)**

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[5] See WARNING 1. Remove circuit pack to be replaced

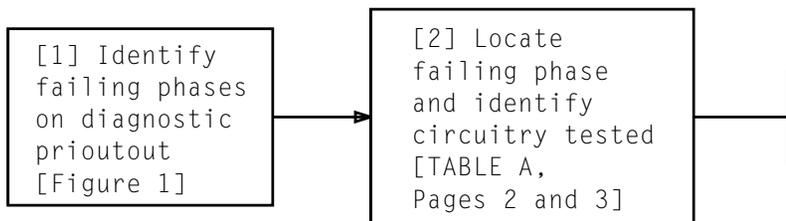
[6] See WARNING 1. Insert and properly seat replacement pack



**NOTE 1**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) MUST be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

## REPLACE CIRCUIT PACK, SMALL COMPUTER SYSTEMS INTERFACE NODE (SIN)



```

30 DGN: LN32 0:PH 10-31. PF
M 30 DGN: LN32 0 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRSST ERROR 3 3
M 31 DGN: LN32 0 PH 10 STF ( 2 00000000 00000000 ) MSG IP
      TEST          MISMATCH
          3          00000009
          4          00000009
M 31: LN32 0 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: LN32 0 SUMMARY DATA MSG STARTED
      TLP: LN32 0 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
      TLPFILE COMPLETED
M 31 DGN: LN32 0 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: LN32 0 STF ( 2 00000000 00000000 ) MSG COMPL
  
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

**IDENTIFY UNIVERSAL LINK NODE (ULN) CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE A**  
**SSI ULN DIAGNOSTIC PHASES**

FAILING PHASE	DESCRIPTION OF CIRCUITRY TESTED
01	<p>Runs the isolated segment diagnostics from the BISO end. It verifies that the data selector can be set and cleared at each isolated node and that all interframe buffers within the isolated segment are sized to agree with the ECD. This is accomplished by first setting the data selector at the isolated node closest to the BISO, verifying that the ring storage capacity from the BISO to the node having its data selector set agrees with the calculated capacity for that particular ring segment and then clearing the data selector that was just set. This process is then repeated at the next adjacent isolated node, etc., until the entire isolated segment is tested by adding one additional node to the test segment for each iteration.</p> <p>It also verifies that a message can be relayed from the 3B, via the BISO node, thru the isolated segment, and relayed back to the 3B via the EISO node.</p>
02	<p>Runs the isolated segment diagnostics from the EISO end. It verifies that the data selector can be set and cleared at each isolated node and that all interframe buffers within the isolated segment are sized to agree with the ECD. This is accomplished by first setting the data selector at the isolated node closest to the EISO, verifying that the ring storage capacity from the EISO to the node having its data selector set agrees with the calculated capacity for that particular ring segment and then clearing the data selector that was just set. This process is then repeated at the next adjacent isolated node, etc., until the entire isolated segment is tested by adding one additional node to the test segment for each iteration.</p> <p>It also verifies that a message can be relayed from the 3B, via the EISO node, thru the isolated segment, and relayed back to the 3B via the BISO node.</p>
10	<p>Requests download of the ulnph10.lv diagnostic code to run diagnostics on the ring interface. If Phases 01 and 02 are not run before this phase, other nodes in the isolated segment may affect the results.</p>

**IDENTIFY UNIVERSAL LINK NODE (ULN) CIRCUITRY TESTED BY  
FAILING PHASE**

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<b>TABLE A (Contd)</b> <b>SSI ULN DIAGNOSTIC PHASES</b>	
<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
12	Requests the relay module to write a message with bad parity from a BISO node into the isolated segment. The write is expected to block when the RAC at the node being diagnosed detects bad parity. The actual sequence is to first write the message with good parity, then with bad parity, then with good parity again.
13	Requests the relay module to write a message with bad parity from a EISO node into the isolated segment. The write is expected to block when the RAC at the node being diagnosed detects bad parity. The actual sequence is to first write the message with good parity, then with bad parity, then with good parity again.
20	Tests the ULN (RAM memory) on an RIB with code that is ROM resident.
40	Tests the ULN RIB-LIB inter-communications capability.
41	Tests the ULN (RAM memory) at an IUN with code that is ROM resident.
43	Tests the ULN T1 link option module
50	Tests the ULN T1 link connection. (Demand only phase.)

**IDENTIFY UNIVERSAL LINK NODE (ULN) CIRCUITRY TESTED BY FAILING PHASE**

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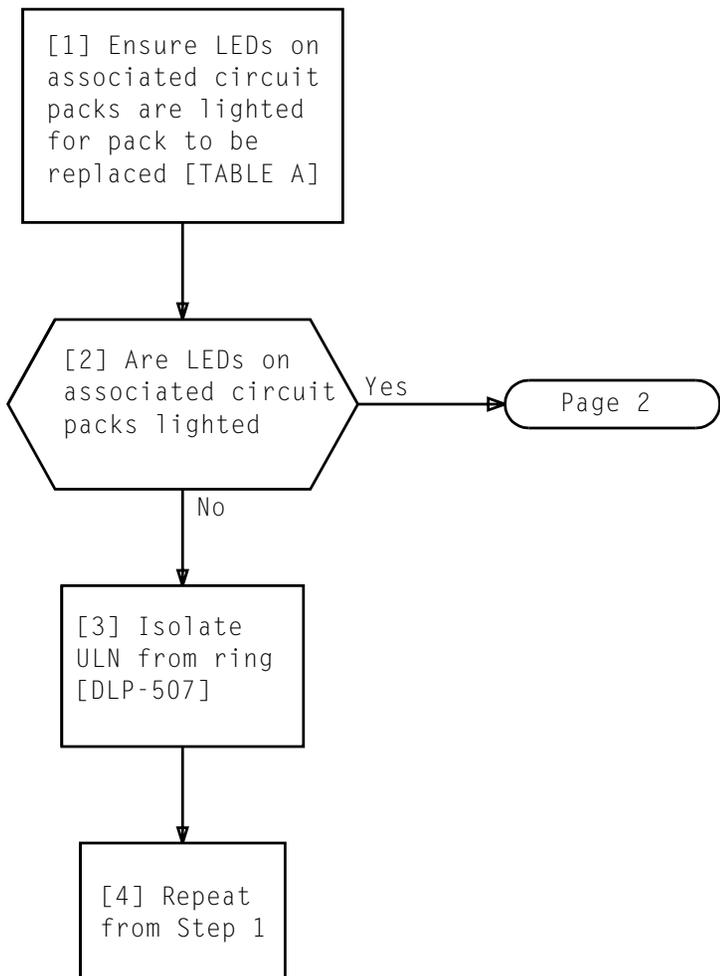
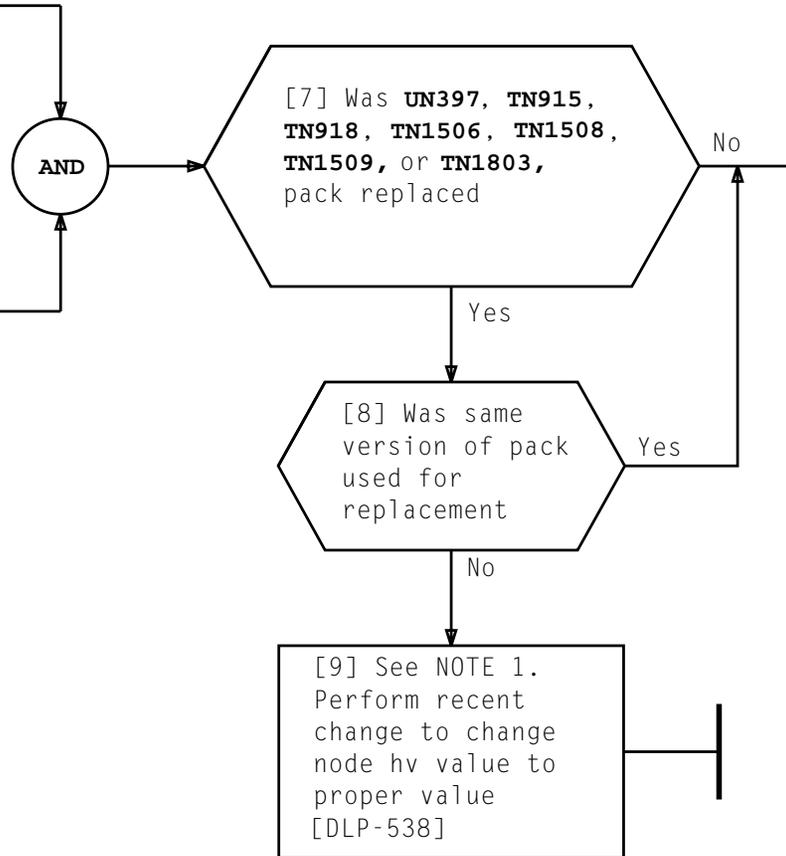


TABLE A CIRCUIT PACKS		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
UN397	Ring Interface Board	NT LED on; UN397 lighted
TN915 TN918 TN1506 TN1508 TN1509 TN1803	Interface Buffer (IFB)	NT LED on; associated UN397, or NT LED on; UN397 of neighbor node in adjacent frame lighted
TN2520	Link Interface Board	RQ LED on; TN2520 lighted and NT LED on

**REPLACE CIRCUIT PACK, UNIVERSAL LINK NODE (ULN)**

[5] See WARNING 1. Remove circuit pack to be replaced

[6] See WARNING 1. Insert and properly seat replacement pack

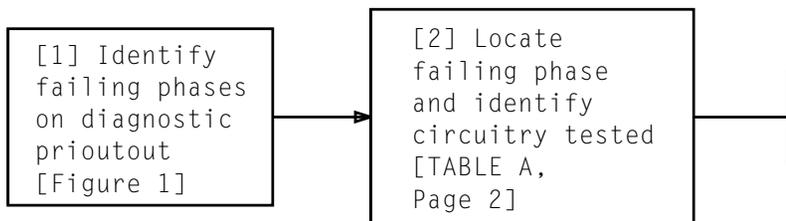


**NOTE 1**  
 If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) MUST be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE CIRCUIT PACK, UNIVERSAL LINK NODE (ULN)**

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```

30 DGN: LN41 3:PH 10-31. PF
M 30 DGN: LN41 3 SLOT 1 MSG STARTED
M 30 REPT IMSRMVRST ERROR 3 3
M 31 DGN: LN41 3 PH 10 STF ( 2 00000000 00000000 ) MSG IP
      TEST                MISMATCH
          3                00000009
          4                00000009
M 31: LN41 3 TERMINATED AT PH 10 STMNT 434 AFTER TEST 438
M 31 ANALY TLPFILE: LN41 3 SUMMARY DATA MSG STARTED
      TLP: LN41 3 PH=10 K1=0X00000002 K2=0X00000000 FFK=1
      TLPFILE COMPLETED
M 31 DGN: LN41 3 COMPLETED STF ( 2 00000000 00000000 ) MSG IP
M 31 DGN: LN41 3 STF ( 2 00000000 00000000 ) MSG COMPL
  
```

Figure 1 - Sample Printout of Failing Diagnostic Phase

**IDENTIFY ETHERNET INTERFACE NODE (EIN) CIRCUITRY TESTED BY FAILING PHASE**

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**TABLE A  
EIN DIAGNOSTIC PHASES**

<b>FAILING PHASE</b>	<b>DESCRIPTION OF CIRCUITRY TESTED</b>
01	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC0. Phase 1 also tests that a message can be relayed from BISO node to EISO node via isolated segment over ring 0, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
02	Tests that each node in isolated segment is able to set and clear its data selector via hardware commands at RAC1. Phase 2 also tests that a message can be relayed from EISO node to BISO node via isolated segment over ring 1, and that any interframe buffers in isolated segment are equipped in accordance with ECD data and exhibits proper data storage capacity.
10	Tests part of both RACs, the RAC to the IRN2 interface, and the interface between both RACs and the ring bus.
12	Verifies that RAC0 can detect bad parity in a ring message.
13	Verifies that RAC1 can detect bad parity in a ring message.
20	Tests IRN2 RAM memory, IRN2 parity checker and generator circuitry.
30	Tests interface between DSCH and DDSBS.
31	Tests interface between DDSBS and 3BI.
32	Tests ability of NP to go "insane" and set "Interrupt Request Flag" when 3BI has an error.
33	Tests interface between 3BI and NP.
34	Performs off-line CU to DDSBS tests (demand phase only).
35	Cooperates with 3B20D driver to test DMA capability via 3BI.
40	Requests download of diagnostic driver code to the IRN2 and initiates its execution to diagnose the Ethernet interface hardware. Testing ends at the loopback relay on the ELI circuit pack.

**IDENTIFY ETHERNET INTERFACE NODE (EIN) CIRCUITRY TESTED BY  
FAILING PHASE**

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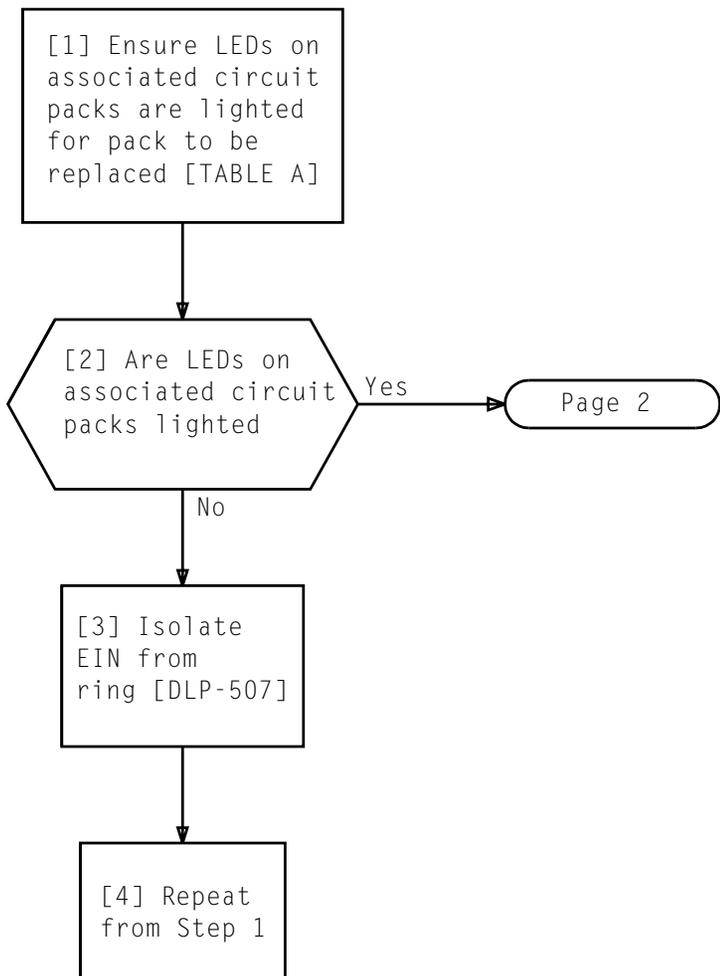
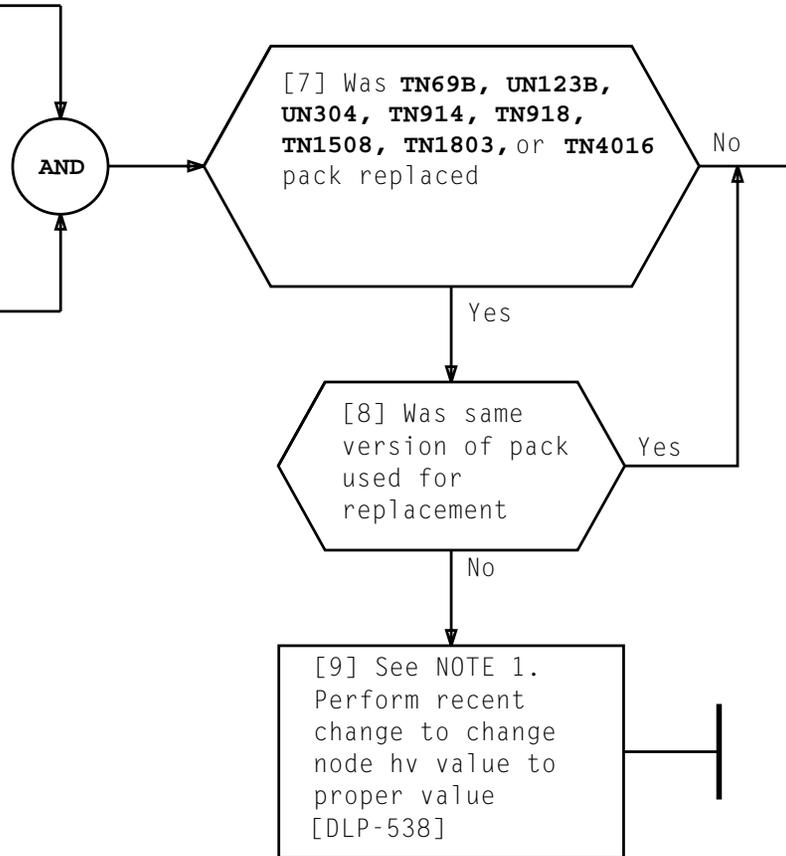


TABLE A CIRCUIT PACKS		
CIRCUIT PACK	FUNCTION	LED STATUS ON ASSOCIATED CIRCUIT PACKS
UN304	Integrated Ring Node (IRN)	-
TN918 TN1508 TN1803	Interface Buffer (IFB)	NT LED on; associated UN123, UN123B or NT LED on; UN123 or UN123B of neighbor node in adjacent frame lighted
TN4016	Ethernet Link Interface (ELI)	-
TN914	3B Interface (3BI)	-
TN69B	Duplex Dual Serial Bus Selector (DDSBS)	-

**REPLACE CIRCUIT PACK, ETHERNET INTERFACE NODE (EIN)**

[5] See WARNING 1. Remove circuit pack to be replaced

[6] See WARNING 1. Insert and properly seat replacement pack



**NOTE 1**  
If IFB pack is being replaced, the two IFB packs that make up a pair must be of the same version

**WARNING 1**  
*It should be assumed that all circuit packs containing solid-state electronic components can be damaged by electrostatic discharge. When handling circuit packs and working in the backplane area, a grounded antistatic wrist strap (R-4987 or equivalent) MUST be worn. The strap should be connected to ground common to circuit pack ground. When appropriate wrist strap is not available, grounded (exposed) metal should be touched before handling circuit pack. An unprotected circuit pack should never be passed to an ungrounded person nor touch components, leads, nor connector pins*

**REPLACE CIRCUIT PACK, ETHERNET INTERFACE NODE (EIN)**

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[1] Determine location of interface buffer (IFB) packs within frames 00 and 32

[2] Determine status (higher or lower) of IFB packs within CNI ring (following local procedure)

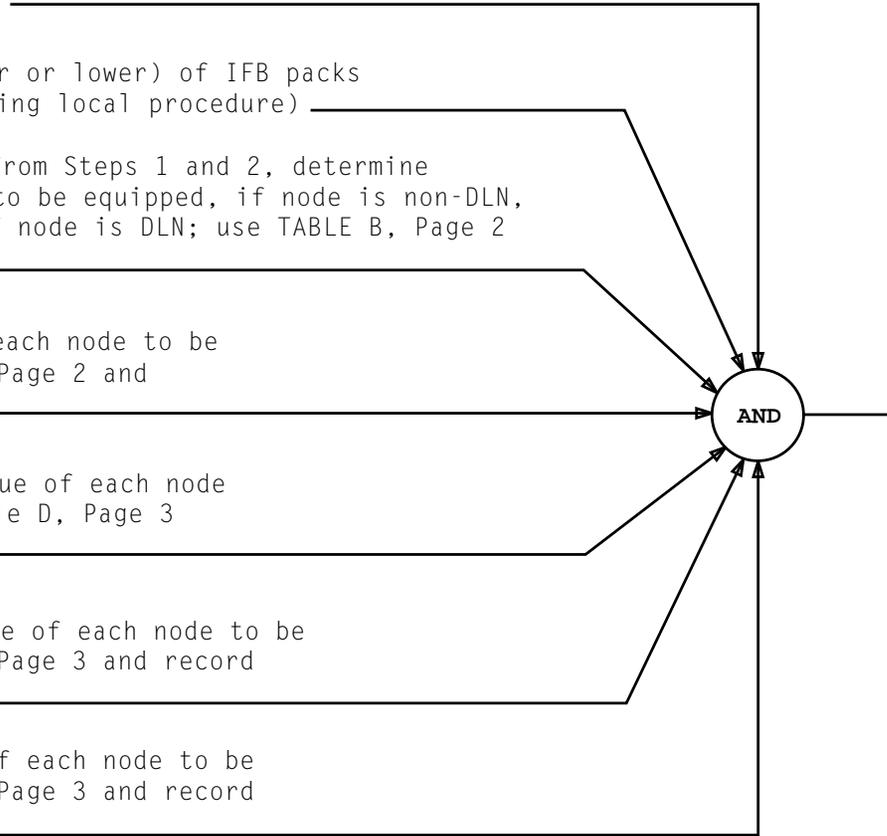
[3] Using the information from Steps 1 and 2, determine **hv** value of each node to be equipped, if node is non-DLN, use TABLE A, Page 2; if node is DLN; use TABLE B, Page 2 and record on DLP-579

[4] Determine **mv** value of each node to be equipped from TABLE C, Page 2 and record on DLP-579

[5] Determine **pack code** value of each node to be equipped from Table D, Page 3 and record on DLP-579

[6] Determine **pathname** value of each node to be equipped from Table E, Page 3 and record on DLP-579

[7] Determine **issue** value of each node to be equipped from Table F, Page 3 and record on DLP-579



## DETERMINE NODE DATA FOR ALL GROWTH NODES

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TABLE A							
Ring Interface Pack(s)	IFB Type	IFB Position	HV Value	Ring Interface Pack(s)	IFB Type	IFB Position	HV Value
UN122/UN123	None	N/A	0x0100	UN303	None	N/A	0x8000
UN122/UN123	TN918	Higher	0x0110	UN303	TN918	Higher	0x8010
UN122/UN123	TN1508	Higher	0x0150	UN303	TN1508	Higher	0x8050
UN122/UN123	TN1803	Higher	0x0160	UN303	TN1803	Higher	0x8060
UN122/UN123	TN918	Lower	0x0101	UN303	TN918	Lower	0x8001
UN122/UN123	TN1508	Lower	0x0105	UN303	TN1508	Lower	0x8005
UN122/UN123	TN1803	Lower	0x0106	UN303	TN1803	Lower	0x8006
UN122B/UN123B	None	N/A	0x0900	UN303B	None	N/A	0x9000
UN122B/UN123B	TN918	Higher	0x0910	UN303B	TN918	Higher	0x9010
UN122B/UN123B	TN1508	Higher	0x0950	UN303B	TN1508	Higher	0x9050
UN122B/UN123B	TN1803	Higher	0x0960	UN303B	TN1803	Higher	0x9060
UN122B/UN123B	TN918	Lower	0x0901	UN303B	TN918	Lower	0x9001
UN122B/UN123B	TN1508	Lower	0x0905	UN303B	TN1508	Lower	0x9005
UN122B/UN123B	TN1803	Lower	0x0906	UN303B	TN1803	Lower	0x9006
UN122C/UN123B	None	N/A	0x1900	UN304	None	N/A	0xc000
UN122C/UN123B	TN918	Higher	0x1910	UN304	TN918	Higher	0xc010
UN122C/UN123B	TN1508	Higher	0x1950	UN304	TN1508	Higher	0xc050
UN122C/UN123B	TN1803	Higher	0x1960	UN304	TN1803	Higher	0xc060
UN122C/UN123B	TN918	Lower	0x1901	UN304	TN918	Lower	0xc001
UN122C/UN123B	TN1508	Lower	0x1905	UN304	TN1508	Lower	0xc005
UN122C/UN123B	TN1803	Lower	0x1906	UN304	TN1803	Lower	0xc006
				UN397	None	N/A	0x4000
				UN397	TN918	Higher	0x4010
				UN397	TN1508	Higher	0x4050
				UN397	TN1803	Higher	0x4060
				UN397	TN918	Lower	0x4001
				UN397	TN1508	Lower	0x4005
				UN397	TN1803	Lower	0x4006

TABLE B			
Ring Interface Pack(s)	IFB Type	IFB Position	HV Value*
UN303B	None	N/A	0x200 9000
UN303B	TN918	Higher	0x200 9010
UN303B	TN1508	Higher	0x200 9050
UN303B	TN1803	Higher	0x200 9060
UN303B	TN918	Lower	0x200 9001
UN303B	TN1508	Lower	0x200 9005
UN303B	TN1803	Lower	0x200 9006
UN304	None	N/A	0x200 c000
UN304	TN918	Higher	0x200 c010
UN304	TN1508	Higher	0x200 c050
UN304	TN1803	Higher	0x200 c060
UN304	TN918	Lower	0x200 c001
UN304	TN1508	Lower	0x200 c005
UN304	TN1803	Lower	0x200 c006

\* HV Value for DLN's is used on both LN and RPCD UCB forms

**DETERMINE NODE DATA FOR ALL GROWTH NODES**

TABLE C				
Node Type	MV Value LI Equipage			
	LI 0 Only	LI 1 Only	Both LIs	No LIs
ATP				0x3
CCITT7 (without TIFA)	0x3a			
CCITT7 (with TIFA)	0x40			
CCS7 (without IRNs)	Blank*			
CCS7 (with IRNs)	0x43			
CCS7 (HSAL with ULN)	0x05			
DCHAN (without T1FA)†	0x3a	0x3b	0x3c	
DCHAN (with T1FA)†	0x40	0x41	0x42	
DLN30 16 mbytes				0x23
IUN (without IRNs)				0x1
IUN (with IRNs, IRN-B or IRN2)				0x3
DLNE (RPCD)				0x23
RPCN				Blank*
SADC (without IRN)	0x33	0x34	0x35	
SADC (with IRN or IRN-B)†	0x3d	0x3e	0x3f	
SIN (LN)				0x1a
SIN (RPCD)				0x23
EIN (LN and RPCD)				0x20

\* Blank field is obtained by entering an apostrophe.  
† HDRNC can only be equipped with LI 0.

TABLE E	
Node Type	Path Name
DLN30 16 mbytes	pu/iun
DLNE (RPCD)	pu/DLNI_NA
RPCN	pu/rpc
SIN (RPCD)	pu/SINI_NA
SIN (LN)	pu/irAZ
EIN (RPCD)	pu/EINI_NA
EIN (LN)	pu/irn2
ULN Packs (HSAL)	pu/uln
All Other Nodes (without IRN2)	pu/iun
All Other Nodes (with IRN2)	pu/irn2

TABLE D	
Node Type	Pack Code (Note)
ATP	ATP
CCITT7 (without TIFA)	IIDP
CCITT7 (with TIFA)	IITP
CCS7 (without IRNs)	CNI7
CCS7 (HSAL with ULN)	HSA7
CCS7 (with IRNs)	C7I
DCHAN (without T1FA)	PBXD
DCHAN (with T1FA)	PBXT
DLN30 16 mbytes	DLNE
IUN (without IRNs)	IUN
IUN (with IRNs or IRN-B)	IRN
IUN (with IRN2)	IRN2
DLNE (RPCD)	Blank *
RPCN	RPC
SADC	PBXS
SIN	SIN
EIN	EIN

**Note:** Pack codes must be entered in capital letters.  
\* Blank field is obtained by entering an apostrophe.

TABLE F	
Node Type	Issue
ATP	2
CCS7 (TN13126)	1
CCS7 (HSAL with ULN)	1
DLN30 (16 mbytes)	1
DLNE (RPCD)	1
SIN	1
EIN	1
DCHAN (with IRN2)	3
SADC	4
RPCN	Blank*
IUN (UN303, UN303B, UN304)	1
All Other Nodes	Blank*

\* Blank field is obtained by entering an apostrophe.

## DETERMINE NODE DATA FOR ALL GROWTH NODES

Node-Specific Variable Record-Frames 00 & 32											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
RPCN00 0		Blank *	RPC	N/A	pu/rpc	RPCN32 0		Blank *	RPC	N/A	pu/rpc
LN00 1						LN32 1					
LN00 2						LN32 2					
LN00 3						LN32 3					
LN00 4						LN32 4					
RPCD00 5	0x2009000	0x23	N/A	1	pu/DLNI_NA	RPCD32 5	0x2009000	0x23	N/A	1	pu/DLNI_NA
LN00 5	0x2009000	0x23	DLNE	1	pu/iun	LN32 5	0x2009000	0x23	DLNE	1	pu/iun
LN00 6						LN32 6					
LN00 7						LN32 7					
LN00 8						LN32 8					
LN00 9						LN32 9					
RPCD00 10	0x2009000	0x23	N/A	1	pu/DLNI_NA	RPCD32 10	0x2009000	0x23	N/A	1	pu/DLNI_NA
LN00 10	0x2009000	0x23	DLNE	1	pu/iun	LN32 10	0x2009000	0x23	DLNE	1	pu/iun
LN00 11						LN32 11					
LN00 12						LN32 12					
LN00 13						LN32 13					
LN00 14						LN32 14					
* Blank field is obtained by entering an apostrophe											

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 06											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN06 2						LN09 1					
LN06 3						LN09 2					
LN06 4						LN09 3					
LN06 5						LN09 4					
LN06 6						LN09 5					
LN06 7											
LN06 8											
LN07 1											
LN07 2						LN10 1					
LN07 3						LN10 2					
						LN10 3					
LN07 5						LN10 4					
LN07 6						LN10 5					
LN07 7						LN10 6					
LN07 8						LN10 7					
LN08 1						LN10 8					
LN08 2						LN11 1					
LN08 3						LN11 2					
LN08 4						LN11 3					
LN08 5						LN11 4					
LN08 6						LN11 5					
LN08 7						LN11 6					
LN08 8						LN11 7					
* Blank field is obtained by entering an apostrophe											

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 12 & 13											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN12 1						LN13 1					
LN12 2						LN13 2					
LN12 3						LN13 3					
LN12 4						LN13 4					
LN12 5						LN13 5					
LN12 6						LN13 6					
LN12 7						LN13 7					
LN12 8						LN13 8					
LN12 9						LN13 9					
LN12 10						LN13 10					
LN12 11						LN13 11					
LN12 12						LN13 12					
LN12 13						LN13 13					
LN12 14						LN13 14					
LN12 15						LN13 15					

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 14 & 15											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN14 1						LN15 1					
LN14 2						LN15 2					
LN14 3						LN15 3					
LN14 4						LN15 4					
LN14 5						LN15 5					
LN14 6						LN15 6					
LN14 7						LN15 7					
LN14 8						LN15 8					
LN14 9						LN15 9					
LN14 10						LN15 10					
LN14 11						LN15 11					
LN14 12						LN15 12					
LN14 13						LN15 13					
LN14 14						LN15 14					
LN14 15						LN15 15					

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 28 & 60											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN28 2						LN60 2					
LN28 3						LN60 3					
LN28 4						LN60 4					
LN28 5						LN60 5					
LN28 6						LN60 6					
LN28 7						LN60 7					
LN28 8						LN60 8					
LN28 9						LN60 9					
LN28 60						LN60 10					
LN28 11						LN60 11					
LN28 12						LN60 12					
LN28 13						LN60 13					
LN28 14						LN60 14					
* Blank field is obtained by entering an apostrophe											

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 38											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
						LN41 1					
LN38 2						LN41 2					
LN38 3						LN41 3					
LN38 4						LN41 4					
LN38 5						LN41 5					
LN38 6											
LN38 7											
LN38 8											
LN39 1						LN42 1					
LN39 2						LN42 2					
LN39 3						LN42 3					
						LN42 4					
LN39 5						LN42 5					
LN39 6						LN42 6					
LN39 7						LN42 7					
LN39 8						LN42 8					
LN40 1						LN43 1					
LN40 2						LN43 2					
LN40 3						LN43 3					
LN40 4						LN43 4					
LN40 5						LN43 5					
LN40 6						LN43 6					
LN40 7						LN43 7					
LN40 8											
* Blank field is obtained by entering an apostrophe											

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 44 & 45											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN44 1						LN45 1					
LN44 2						LN45 2					
LN44 3						LN45 3					
LN44 4						LN45 4					
LN44 5						LN45 5					
LN44 6						LN45 6					
LN44 7						LN45 7					
LN44 8						LN45 8					
LN44 9						LN45 9					
LN44 10						LN45 10					
LN44 11						LN45 11					
LN44 12						LN45 12					
LN44 13						LN45 13					
LN44 14						LN45 14					
LN44 15						LN45 15					

**RECORD NODE DATA RESULTS**

Node-Specific Variable Record-Frames 46 & 47											
Node	HV	MV	Pack Code	Issue	Pathname	Node	HV	MV	Pack Code	Issue	Pathname
LN46 1						LN47 1					
LN46 2						LN47 2					
LN46 3						LN47 3					
LN46 4						LN47 4					
LN46 5						LN47 5					
LN46 6						LN47 6					
LN46 7						LN47 7					
LN46 8						LN47 8					
LN46 9						LN47 9					
LN46 10						LN47 10					
LN46 11						LN47 11					
LN46 12						LN47 12					
LN46 13						LN47 13					
LN46 14						LN47 14					
LN46 15						LN47 15					

**RECORD NODE DATA RESULTS**

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
• TPG-000		DLP-508		DLP-543		• DLP-578					
• IXL-001		DLP-509		DLP-544		• DLP-579					
NTP-002		DLP-510		DLP-545		• CKL-891					
NTP-003		DLP-511		DLP-546		TNG-893					
NTP-004		DLP-512		DLP-547							
NTP-005		• DLP-513		DLP-548							
NTP-006		• DLP-514		DLP-549							
NTP-007		DLP-515		DLP-550							
NTP-008		DLP-516		DLP-551							
NTP-009		DLP-517		DLP-552							
TAP-100		DLP-518		• DLP-553							
• TAP-101		DLP-519		DLP-554							
TAP-102		DLP-520		DLP-555							
TAP-103		DLP-521		DLP-556							
• TAP-104		DLP-522		• DLP-557							
• TAP-105		DLP-523		• DLP-558							
TAP-106		DLP-524		• DLP-559							
TAP-107		DLP-525		DLP-560							
TAP-108		DLP-526		DLP-561							
TAP-109		DLP-527		DLP-562							
TAP-110		DLP-528		DLP-563							
TAP-111		DLP-529		DLP-564							
• TAP-112		DLP-530		• DLP-565							
• TAP-113		DLP-531		• DLP-566							
• TAP-114		DLP-532		• DLP-567							
TAP-115		DLP-533		• DLP-568							
• TAP-116		DLP-534		DLP-569							
DLP-500		DLP-535		DLP-570							
• DLP-501		DLP-536		DLP-571							
• DLP-502		DLP-537		DLP-572							
DLP-503		• DLP-538		• DLP-573							
• DLP-504		DLP-539		DLP-574							
• DLP-505		DLP-540		• DLP-575							
DLP-506		DLP-541		DLP-576							
• DLP-507		DLP-542		• DLP-577							

• REVISED OR ADDED ITEM

CANCELED ITEM

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234-351-120AC CKL

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**CHECKLIST**

This book is called a Task Oriented Practice or "TOP." It is a programmed document that gives step-by-step instructions to enable you to do a job (or task). If used correctly, TOP can be a very useful aid when completing everyday tasks.

A TOP is a programmed document giving step-by-step instructions to do a task. Since the instructions are given in the order that they must be done, you cannot enter a procedure except at the beginning. You *must* do the step-by-step instructions in the order given. Failure to follow the instructions in the proper order may cause service interruptions.

Remember, a TOP contains all the instructions needed to do a task. If you are doing the job for the first time, you are given step-by-step instructions with all detail that enables you to complete the job. Remember, TOP can provide you the information you need regardless of your experience in doing a job.

The work that you do can be classified into two broad job categories – *Trouble Clearing* and *Non-Trouble Clearing*. The following are the TOP definitions for these two job categories:

#### *Trouble Clearing*

Trouble clearing may be done in answering a customer complaint or in responding to an office alarm, a trouble report, or an abnormal TTY printout, etc.

#### *Non-Trouble Clearing*

Non-trouble clearing is not connected with trouble clearing. These are procedures performed to accept a system after a system has been installed, turn up a system for service, maintain a system according to a controlled maintenance plan, etc.

Now glance briefly at the front cover. In the upper right corner is a 9-digit number which identifies the volume. Near the center is the title of the volume which tells you something about the contents, such as the system (or subsystem) name and perhaps what kind of jobs are included in the volume. Next is the decision-action-logic diagram which directs you either to this training package or to 001 depending on your ability to use TOP.

Now turn to Figure 1 which shows a typical page of 001. In the lower left is the title, "TASK INDEX LIST" which tells you something about this list, such as it is a listing of tasks arranged in alphabetical order. This list is actually a listing of the tasks included in the volume. The tasks are listed in alphabetical order and permuted on key words to simplify locating a task. On the right side of the page is a column of reference numbers under the heading "THEN GO TO." To use this list, locate the job to be done and turn to the reference number in the "THEN GO TO" column.

Now assume that you have been assigned the task of performing a system test on a system covered by a TOP. On 001 in Figure 1, locate the job "System Test." Notice that this entry tells you to go to NTP-016 (Non-Trouble Procedure) under the "THEN GO TO" column. Next you locate the procedure, NTP-016. All procedures in a TOP are arranged in numerical sequence. In actual use of TOP, you would simply turn to the procedure.

<b>FIND YOUR JOB IN THE LIST BELOW . . . . . THEN GO TO</b>	
Alert; External – Horn, Ringer, Etc. – Remove . . . . .	NTP-028
Amplifiers; Channel – Recorded Announcement Frame – Test . . . . .	NTP-009
AR03 PWR ALM RA bb – bb = 16-30 . . . . .	TAP-105
<b>BRDG</b> LED – Does Not Light – Correct . . . . .	TAP-117
Bridging Controller; Trunk – J1C015MB – Replace . . . . .	DLP-572
Channel Amplifiers – Recorded Announcement Frame – Test . . . . .	NTP-009
Drum Wiper – Common Systems Recorded Announcement Frame – Inspect . . . . .	NTP-010
Extended Station Capability – Nonkey Set Only – Reported Failure . . . . .	TAP-123
External Alert – Horn, Ringer, Etc. – Remove . . . . .	NTP-028
Interchange Two Working Station Numbers . . . . .	NTP-081
LED; <b>BRDG</b> – Does Not Light – Correct . . . . .	TAP-117
Loudspeaker Paging – Add . . . . .	NTP-059
Loudspeaker; – Remove . . . . .	NTP-006
Station Capability; Extended – Nonkey Set Only – Reported Failure . . . . .	TAP-123
System Test – Perform . . . . .	NTP-016
Trunk Bridging Controller – J1C015MB – Replace . . . . .	DLP-572
TTY Printout – AR03 PWR ALM RA bb – bb = 16-30 . . . . .	TAP-105
Wiper; Drum – Common Systems Recorded Announcement Frame – Inspect . . . . .	NTP-010
<b>TASK INDEX LIST (Contd)</b>	<b>Issue 1</b> <b>DEC 1980</b>
	<b>123-456-789</b> <b>IXL</b>
	<b>PAGE 2 of 2</b> <b>001</b>

Figure 1

Look over the following example which shows a typical page of NTP-016. Note that the items are numbered in the left column. They *must* be completed in that order. In item 2 there are some lettered (A, B, C) items. These lettered items are optional ways to do an item; that is, you only have to do one of the lettered items.

Remember that this procedure gives all the items that must be done and the order in which they must be done to complete the job. If you know how to do a task, you should proceed without going to the referenced details

in the "FOR DETAILS, GO TO" column. If, on the other hand, you need additional details on how to do the task, turn to the procedure listed in the "FOR DETAILS, GO TO" column. In either case, after completing a task continue with the next task.

A TOP is designed so that you have to read only what is necessary to get your job done. If you know how to do a task, look no further for the "how to" information – just do the task and go on to the next task. This idea is called "bypassing" in TOP. In addition to not having to

<b>DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO</b>								
1	Obtain Support Apparatus Listed Below: <ul style="list-style-type: none"> <li>• Hewlett-Packard 3531A Transmission Measuring Set</li> <li>• 2P4C Patching Cord</li> </ul>	–						
2	Place SEC/SEB in Off-Line Mode	–						
	A. If in On-Line Mode, Change System From On-Line to Off-Line	DLP-509						
	B. If Powered Down, Condition System for Off-Line Operation as Follows:	–						
	1. Power up Minicomputer	DLP-503						
	2. Power up Line Printer	DLP-528						
	3. Power up Maintenance Terminal	DLP-510						
7	Run Computer Display Terminal Test for All Positions	DLP-513						
8	Mount Tape	DLP-500						
<b>PERFORM SYSTEM TEST</b>		<table border="1"> <tr> <td>Issue 1</td> <td>DEC 1980</td> </tr> <tr> <td>123-456-789</td> <td>NTP</td> </tr> <tr> <td>PAGE 1 of 4</td> <td><b>016</b></td> </tr> </table>	Issue 1	DEC 1980	123-456-789	NTP	PAGE 1 of 4	<b>016</b>
Issue 1	DEC 1980							
123-456-789	NTP							
PAGE 1 of 4	<b>016</b>							

**HOW TO USE TOP**

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look further for details, three other ways of "bypassing" are provided in TOP to help you bypass information you already know (see Figure 2):

*Summary Statement*

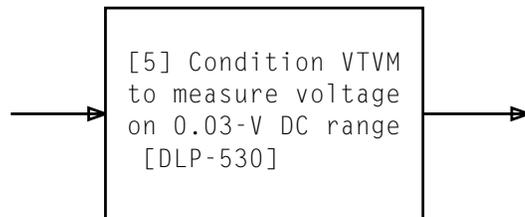
A summary statement is used with a procedure to tell you briefly how to do the procedure and what type measurement or result can be observed. If you can do the procedure after reading the summary, perform the procedure without reading any further. Simple procedures may not have summaries.

*Result Statement*

A result statement may be used in a flow-charted procedure along with the AND symbol. If, after reading the results statement, you know how to do the action indicated, perform the procedure without reading the steps associated with the AND symbol.

*Support Procedures*

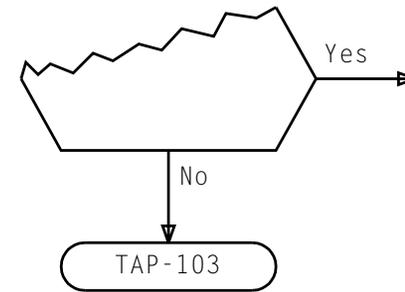
The following reference in TOP refers to a support procedure:  
 The support procedure [DLP-530] (Detailed Level Procedure) provides the information on how to



operate the VTVM. Here again, if you already know how to operate the VTVM, perform the procedure without looking up any further information.

Assume that you are doing a system test on a system covered by a TOP. In the process of doing this test, you are instructed to mount a tape. For the purposes of this example, assume that you do not know how to mount the tape and must look up additional details. Figure 2 on Page 5 shows you examples of bypassing that can be used. Take a few moments to examine this figure and make sure you understand the techniques of bypassing.

While using a TOP, you will probably run across a reference similar to the following:



This reference to TAP-103 (Trouble Analysis Procedure) indicates that the equipment is not operating correctly, and that you should refer to TAP-103 and clear this trouble condition. After clearing the trouble, you should re-enter the flowchart at the beginning (Step 1).

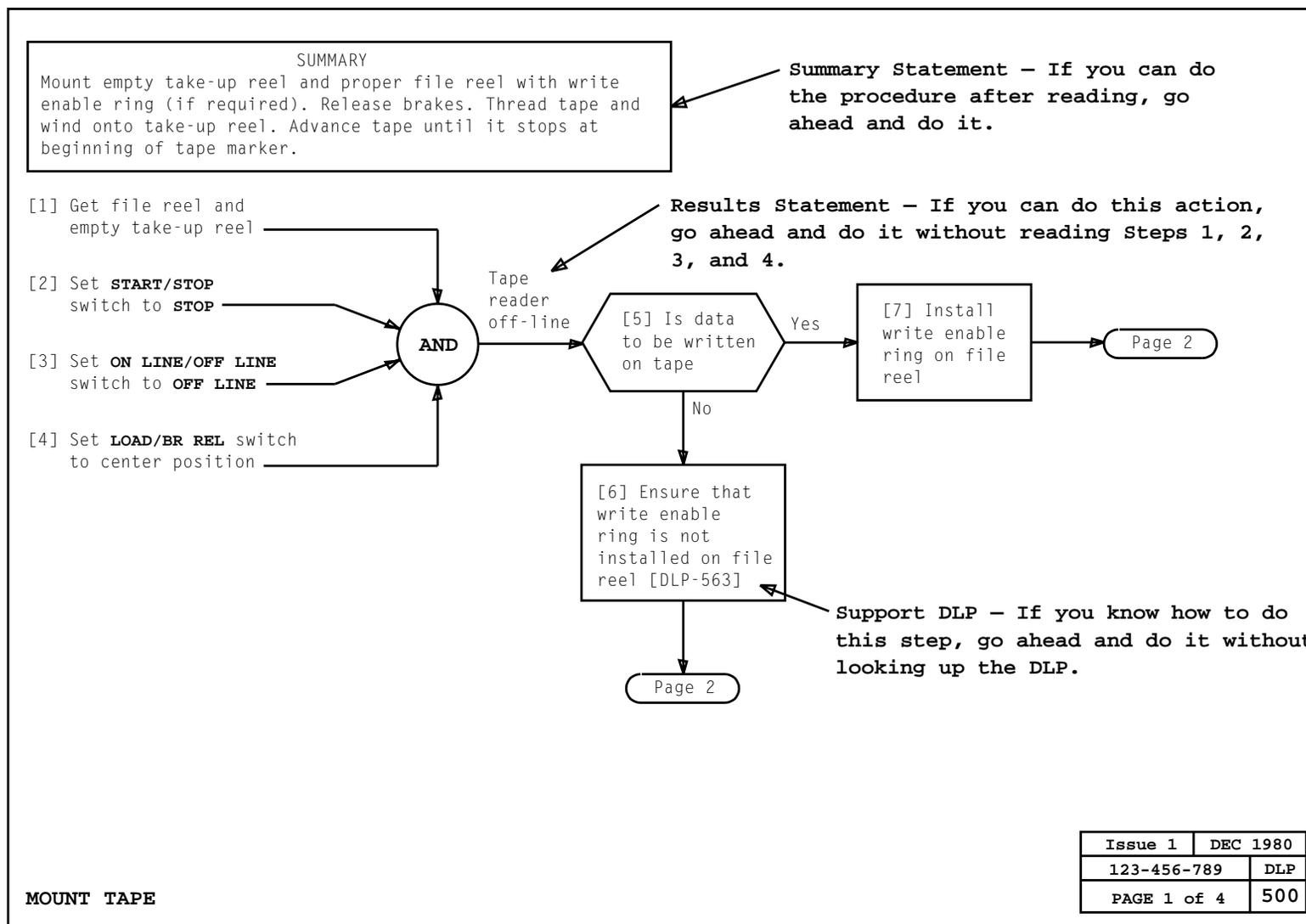
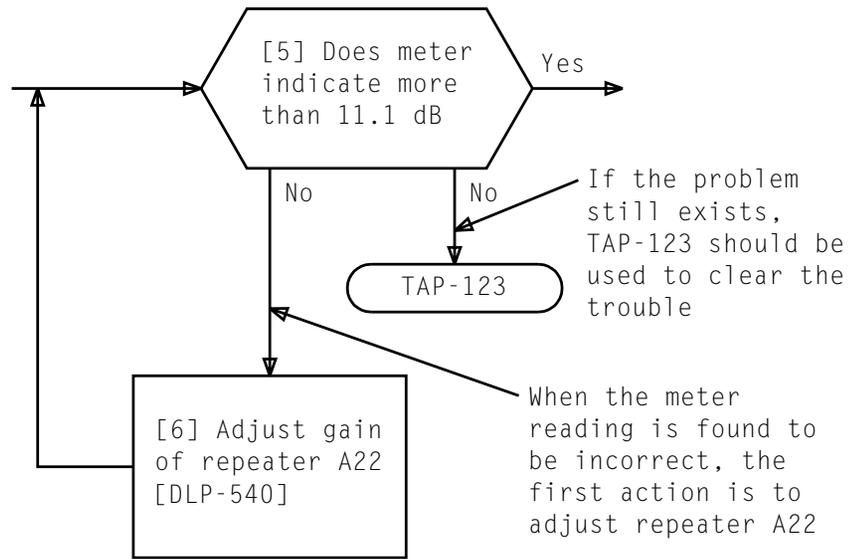


Figure 2

This idea can be carried further. In some cases, a decision block may have more than one abnormal output. This means that you should try more than one solution to the problem. See the following example.

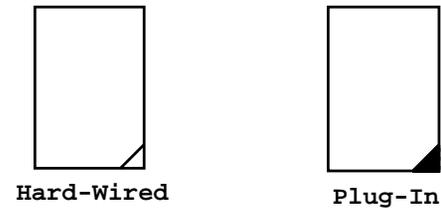


Trouble-clearing information in TOP is used basically the same way as non-trouble-clearing information. When an alarm or trouble report requires you to troubleshoot a system covered by a TOP, the TASK INDEX LIST (IXL-001) is the place to start. After locating your task on IXL-001, you are referenced to a Trouble Analysis Procedure (TAP) to find the information to aid in the location of the trouble. The TAP may reference to other information, such as Trouble Analysis Data (TAD) or Isolation Diagram (ISD) as an aid in the trouble-clearing process.

Now assume that you have to clear a major alarm on a terminal in a system covered by a TOP. Figure 3 on Page 7 shows how to access and how to use trouble-clearing information.

## HOW TO USE TOP

A TOP shows hard-wired and plug-in units on Isolation Diagrams (ISD) in the following manner:



Always do a job safely. Below are three things you should heed in TOP:

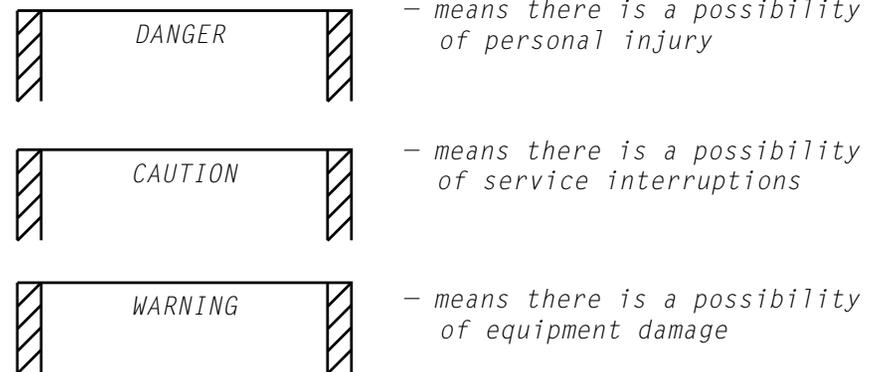


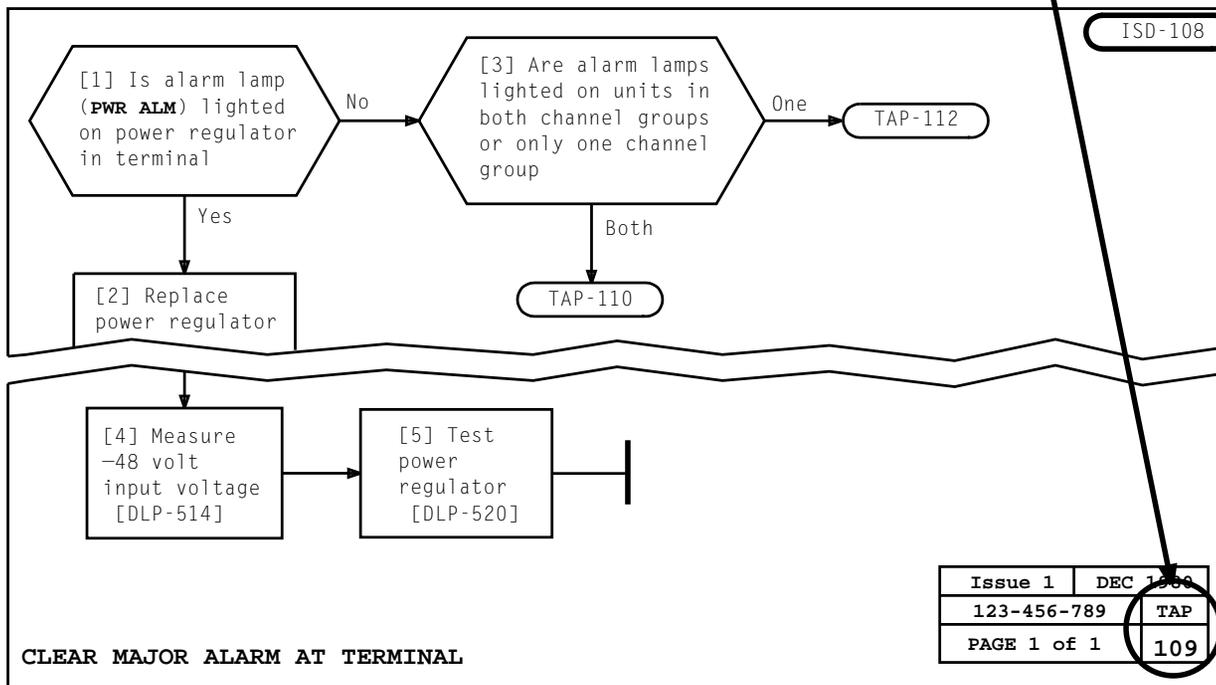
TABLE A on Page 8 shows some of the more important symbols and definitions.

While using TOP, if you find errors, or if a procedure is inadequate or missing, call the TOP HOTLINE number shown on the front cover and title page. Your comments are greatly needed to help prepare better documentation. Comments may also be forwarded using the form provided in the front of this TOP.

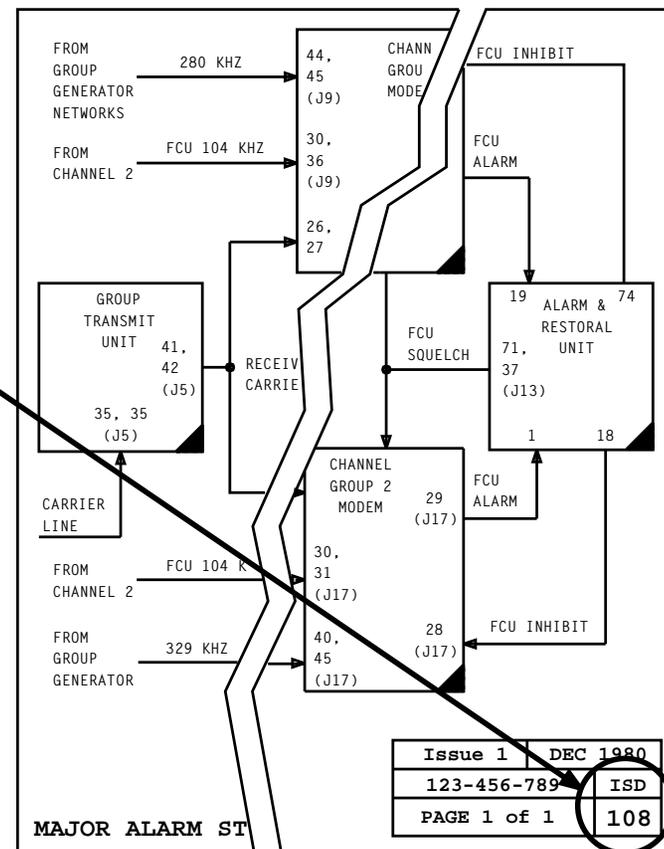
Now that you know how to use TOP, return to IXL-001 and find the task you need to do.

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<b>FIND YOUR JOB IN THE LIST BELOW . . . . .</b>	<b>. . . . . THEN GO TO</b>
Alert; External - Horn, Ringer, Etc. - Remove . . . . .	NTP-028
Alarm - Major - Clear . . . . .	TAP-109
TTY Printout - AR03 PWR ALM RA bb - bb = 16-30 . . . . .	TAP-05
Wiper; Drum - Common Systems Recorded Announcement Frame . . . . .	NTP-010
	Issue 1   DEC 1980
	123-456-789   IXL
<b>TASK INDEX LIST (Contd)</b>	PAGE 2 of 2   001



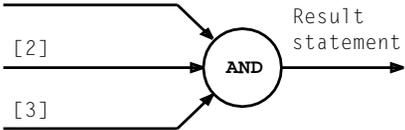
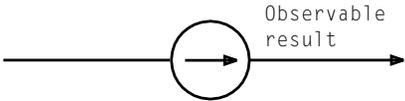
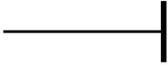
Issue 1	DEC 1980
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Issue 1	DEC 1980
123-456-789	ISD
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Figure 3

**TABLE A  
IMPORTANT TOP SYMBOLS AND DEFINITIONS**

SYMBOL	DEFINITION
	<p>The AND operation symbol is used where the successful completion of a group of instructions accomplishes a meaningful result that can be defined. The symbol indicates that each input instruction must be performed in the order given to accomplish the output (result statement). In instances where results cannot be defined, results statements are not provided.</p>
	<p>The flow-through symbol relates graphically a single instruction to the expected observable result(s).</p>
	<p>The end-of-procedure symbol denotes that the procedure has been completed.</p>
	<p>The reference bubble symbol indicates an exit from a page (either to a continuation page or to trouble-clearing data) or indicates the starting point of a procedure.</p>
<p>Acceptance (NTP-002)</p>	<p>Acceptance gives an overview of the acceptance techniques and facilities.</p>
<p>Maintenance Philosophy (TAD-100)</p>	<p>The maintenance philosophy, when provided, gives an overview of the considerations designed into the trouble-clearing procedures.</p>
<p>Checklist (CKL-891)</p>	<p>The checklist reflects the volume content (inventory) at any given time, the issue identifier of each data element therein, those data elements revised and/or added, and those data elements deleted from a previous issue.</p>