

AT&T PRACTICE

Task Oriented Practice
(TOP)

*4ESS*TM SWITCH

PERIPHERAL UNIT BUS SYSTEM

Issue 5	NOV 1995
234-151-015	TPG
TITLE PAGE	000

**Copyright© 1995 AT&T
All Rights Reserved**

This material is protected by the copyright and trade secret laws of the United States and other countries. It may not be reproduced, distributed, or altered in any fashion by any entity including other AT&T business units or divisions without the expressed written consent of the Customer Education and Training Organization.

For permission to reproduce or distribute, please contact:

4ESS™ Switch Customer Information Development Manager
(in North Carolina, call 1-910-727-6681; outside North Carolina, call
1-800-334-0404)

Notice

Every effort is made to ensure that the document information is complete and accurate at the time of printing. However, information is subject to change.

Trademarks

4ESS is a trademark of AT&T.

Ordering Information

To order this document and all associated documentation, use one of the following methods:

- a. **AT&T Employees:** Mail or fax Form IND 1-80.80, available from the AT&T Customer Information Center, by using the following address or fax number.

AT&T Customer Information Center
Attention: Order Entry Department
2855 North Franklin Road
P.O. Box 19901
Indianapolis, Indiana 46219-1999

or

Call: 1-800-432-6600 Fax: 1-317-322-6484

Note: AT&T Business Unit/Division and all required billing information must be provided.

- b. **Local Exchange Carriers (LEC):** Process orders through your Technical Information Resource Management (TIRM) coordinator. If you are unsure who your TIRM coordinator is, call 1-800-432-6600.
- c. **Federal Government** orders must be faxed to the AT&T Customer Information Center using the following number:
Call: 1-317-322-6484
- d. **All Others:** Call: 1-800-432-6600

Developed by AT&T Network Systems Customer Education & Training.

Issue 5	NOV 1995
234-151-015	LPG
LEGAL PAGE	000

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Acceptance NTP-002

Add Half 1 Plug-in Units to PUB Branching and Loop Around Unit (Support to Installer) NTP-006

Add PUB Branching and Loop-Around Unit(s) to PUBB Frame (Support to Installer) NTP-005

Blown Fuse Trouble – DC-to-DC Converter (J87407A) – Clear TAP-113

Blown Fuse Trouble – PUBB and Loop-Around Unit (J4A005AA-1)– Clear TAP-112

Buses; Peripheral Unit – Scope NTP-003

Bus; PU – Equipment Trouble – Clear TAD-111

CC Register Analysis – F-Level Interrupt – Analyze TAP-117

Circuit Pack – PUBB Frame – Replace DLP-502

Converter (J87407A); DC-to-DC – Blown Fuse Trouble – Clear TAP-113

Converter (J87407A); DC-to-DC – LED Lighted Trouble – Clear TAP-114

Converter (J87407A); DC-to-DC – PUBB Frame – Replace NTP-004

DC-to-DC Converter (J87407A) Blown Fuse Trouble – Clear TAP-113

DC-to-DC Converter (J87407A) LED Lighted Trouble – Clear TAP-114

DC-to-DC Converter (J87407A) – PUBB Frame – Replace NTP-004

Diagnostic Failure – Analyzing Raw Data – Clear TAP-103

Diagnostic Failure – Looping Over First Failing Test and Signal Tracing – Clear TAP-104

Diagnostic Failure – TLP Suspect Equipment List Generated – Clear TAP-102

Diagnostic Failure – TLP Inhibit – Clear TAP-106

Diagnostic Failure – TLP Tape Acquisition Error – Clear TAP-118

Diagnostic Failure – TLP Abort – Clear TAP-108

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

Diagnostic Failure – TLP Disk Queue Full – Clear TAP-107

Diagnostic Failure – TLPQUEUE Blockage – Clear TAP-105

Diagnostic Failure – TLP Search Inhibited – Clear TAP-115

Diagnostic Failure – TLP Tape Not Mounted – Clear TAP-110

Diagnostic Failure – TLP Tape Version X Does Not Match Version Y – Clear TAP-109

Equipment Trouble – PU Bus – Clear TAD-111

Extend PUB Branch From PUBB Frame to Growth Frame(s) (Support to Installer) NTP-007

Extend PUB Branch From Operational Frame to Growth Frame(s) (Support to Installer) NTP-008

F-Level Interrupt – PUBB Frame – Clear Using SMCC Generated Pack List TAP-119

F-Level Interrupt – CC Register Analysis – Analyze TAP-117

F-Level Interrupt; PBFR – Analyze TAP-116

Half 1 Plug-in Units to PUB Branching and Loop Around Unit – Add (Support to Installer) NTP-006

Insert Growth Frame(s) Into PUB Branch Between Two Operational Frames (Support to Installer) NTP-009

Lamps; Power Switch – Test DLP-500

LED Lighted Trouble – DC-to-DC Converter (J87407A) – Clear TAP-114

Maintenance Philosophy TAD-100

PBFR F-Level Interrupt – Analyze TAP-116

Peripheral Unit Buses – Scope NTP-003

Power Switch Lamps – Test DLP-500

Power Switch – PUBB Frame – Replace DLP-501

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

PUB Branch From PUBB Frame to Growth Frame(s) – Extend (Support to Installer) NTP-007

PUB Branch From Operational Frame to Growth Frame(s) – Extend (Support to Installer) NTP-008

PUB Branch Between Two Operational Frames – Insert Growth Frame(s) Into (Support to Installer) NTP-009

PUB Branching and Loop-Around Unit(s) to PUBB Frame – Add (Support to Installer) NTP-005

PUBB And Loop-Around Unit (J4A005AA-1) Blown Fuse Trouble – Clear TAP-112

PUBB Frame Circuit Pack – Replace DLP-502

PUBB Frame Power Switch – Replace DLP-501

Signal Tracing; Looping Over First Failing Test And – Diagnostic Failure – Clear TAP-104

TLP Abort – Diagnostic Failure – Clear TAP-108

TLP Disk Queue Full – Diagnostic Failure – Clear TAP-107

TLP Inhibit;PUB – Diagnostic Failure – Clear TAP-106

TLP QUEUE Blockage – Diagnostic Failure – Clear TAP-105

TLP Search Inhibited – Diagnostic Failure – Clear TAP-115

TLP Suspect Equipment List Generated – Diagnostic Failure – Clear TAP-102

TLP Tape Acquisition Error – Diagnostic Failure – Clear TAP-118

TLP Tape Not Mounted – Diagnostic Failure – Clear TAP-110

TLP Tape Version X Does Not Match Version Y – Diagnostic Failure – Clear TAP-109

TTY Printout – ANALY:TLPFILE a, b, c SUSPECTED FAULTY EQUIPMENT
 NOTE Column Contains NOTE 2
 Fuse Blown See Blown Fuse Entries

TTY Printout – ANALY:TLPFILE a, b, c SUSPECTED FAULTY EQUIPMENT
 NOTE Column Contains NOTE 2
 No Fuses Blown TAP-103

FIND YOUR JOB IN THE LIST BELOW THEN GO TO

TTY Printout - ANALY:TLPFILE a, b, c SUSPECTED FAULTY EQUIPMENT
NOTE Column Does Not Contain NOTE 2 TAP-102

TTY Printout - ANALY:TLPFILE:PUB a, b, c NULL PACK TEST GENERATED TAP-103

TTY Printout - ANALY:TLPFILE:PUB a, b, c SUMMARY DATA
ALL PENDING TLP SEARCHES INHIBITED TAP-115

TTY Printout - ANALY:TLPFILE:PUB a, b, c SUMMARY DATA
QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0001 TAP-107

TTY Printout - ANALY:TLPFILE:PUB a, b, c SUMMARY DATA
QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0002 TAP-105

TTY Printout - ANALY:TLPFILE:PUB a, b, c SUMMARY DATA
QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0004 TAP-106

TTY Printout - ANALY:TLPFILE:PUB a, b, c ABORTED TAP-108

TTY Printout - ANALY:TLPFILE:PUB a, b, c
TLP PROGRAM ABORTED TAP-108

TTY Printout - ANALY:TLPFILE:PUB a, b, c TLP
CURRENT TLP SEARCH ABORTED TAP-108

TTY Printout - ANALY:TLPFILE:PUB a, b, c TLP
WARNING:VERSION X DOES NOT MATCH VERSION Y TAP-109

TTY Printout - ANALY:TLPFILE:PUB a, b, c
TLP TAPE ACQUISITION ERROR
MOUNT TAPE WITH FILE ID = f TAP-118

No acceptance test procedures are required for this frame.
Readiness of frame to become part of working system was
established by successful completion of Installation
Handbook test procedures.

ACCEPTANCE

Issue 5	NOV 1995
234-151-015	NTP
PAGE 1 of 1	002

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

1	At TTY, Type OP:MACLI,CLASS MTCE! To Verify That No Diagnostic Is Being Run on PUB, SP, TSI, TMS, NC, SC, CCIS, EST, DT, DIF, PUC, MAS, or VIF Frames	-
2	Perform PUB Looping Test to Scope Bus Branch at Bus Terminating Resistors (BTRs) for PUB 0 As Follows:	-
	NOTE: The interactive diagnostic loop used while scoping the buses will block the use of SP, TSI, TMS, NC, SC, CCIS, EST, DT, DIF, PUC, MAS, and VIF diagnostics	-
	1. Locate Bus Branch BTRs at PUBB Frame or Determine Location of Last Frame on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	-
	2. If VIF Frame Was Determined in Item 2-1, Determine Location of Frame Where PU Write and Enable Address Buses Terminate Per Office Record Drawing T-nnnn-Hn-3840	-
	3. At TTY, Type RMV:PUB 0!	-
	4. Store Input Messages on TTY for PUB Looping Test	DLP-504
	5. Advance Program to Bus Branch To Be Scoped	DLP-524
	6. Set Up Loop To Observe PU Write Bus Bit 0 and PU Reply Bus Bit 0	DLP-507
	7. Scope PU Write Bus Bit 0 At Last Frame Where Bus Terminates	DLP-510
	8. Scope PU Reply Bus Bit 0 At Last Frame Where Bus Terminates	DLP-511
	9. At TTY, Type EX:PUB 0!	-
	10. Advance Program to Bus Branch To Be Scoped	DLP-524
	11. Set Up Loop To Observe PU Write Bus Bits 1 Through 35, PU Enable Address Bus Bits 0 Through 11, and PU Reply Bus Bits 1 Through 23	DLP-507
	12. Scope PU Write Bus Bits 1 Through 35 at Last Frame Where Bus Terminates	DLP-512
	13. Scope PU Enable Address Bus Bits 0 Through 11 at Last Frame Where Bus Terminates	DLP-513
	14. Scope PU Reply Bus Bits 1 Through 23 at Last Frame Where Bus Terminates	DLP-514
	15. At TTY, Type EX:PUB 0!	-
	16. Advance Program to Bus Branch To Be Scoped	DLP-524
17. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	DLP-515	
18. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Where Buses Terminate	DLP-516	

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

2 (Contd)	19. If Last Frame Determined in Item 2-1 Was a VIF Frame, Scope Remaining PU Miscellaneous Bus Bits at Last Frame Where Bus Bits Terminate	DLP-518
	20. At TTY, Type EX:PUB 0!	—
	21. Stop Maintenance Control Program Client	DLP-508
	22. At TTY, Type RST:PUB 0!	—
3	Perform PUB Looping Test to Scope Bus Branch at Bus Terminating Resistors (BTRs) for PUB 1 As Follows:	—
	1. Locate Bus Branch BTRs at PUBB Frame or Determine Location of Last Frame on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3480	—
	2. If VIF Frame Was Determined in Item 3-1, Determine Location of Frame Where PU Write and Enable Address Buses Terminate Per Office Record Drawing T-nnnn-Hn-3480	—
	3. At TTY, Type RMV:PUB 1!	—
	4. Store Input Messages on TTY for PUB Looping Test	DLP-504
	5. Advance Program to Bus Branch To Be Scoped	DLP-524
	6. Set Up Loop To Observe PU Write Bus Bit 0 and PU Reply Bus Bit 0	DLP-507
	7. Scope PU Write Bus Bit 0 at Identified Frame Where Bus Terminates	DLP-510
	8. Scope PU Reply Bus Bit 0 at Last Frame Where Bus Terminates	DLP-511
	9. At TTY, Type EX:PUB 1!	—
	10. Advance Program to Bus Branch To Be Scoped	DLP-524
	11. Set Up Loop to Observe PU Write Bus Bits 1 Through 35, PU Enable Address Bus Bits 0 Through 11, and PU Reply Bus Bits 1 Through 23	DLP-507
	12. Scope PU Write Bus Bits 1 Through 35 at Last Frame Where Bus Terminates	DLP-512
	13. Scope PU Enable Address Bus Bits 0 Through 11 at Last Frame Where Bus Terminates	DLP-513
	14. Scope PU Reply Bus Bits 1 Through 23 at Last Frame Where Bus Terminates	DLP-514
	15. At TTY, Type EX:PUB 1!	—
	16. Advance Program to Bus Branch To Be Scoped	DLP-524
17. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	DLP-515	

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

3 (Contd)	18. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Where Buses Terminate	DLP-516
	19. If Last Frame Determined in Item 3-1 Was a VIF Frame, Scope Remaining PU Miscellaneous Bus Bits at Last Frame Where Bus Bits Terminate	DLP-518
	20. At TTY, Type EX:PUB 1!	-
	21. Stop Maintenance Control Program Client	DLP-508
	22. At TTY, Type RST:PUB 1!	-

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

1	At TTY, Type RMV:PUB a! Where a = Bus To Be Removed (0 or 1)	-
2	At 1A Power Switch, Rotate ROS/OFF Switch Clockwise to ROS (OFF NORM and OS Lamps Light)	-
3	At 1A Power Switch, Depress ROS/OFF Switch (PWR OFF Lamp Lights)	-
4	Replace DC-to-DC Converter (J87407A)	DLP-503
5	At 1A Power Switch, Rotate ROS/OFF Switch Counterclockwise to Normal Position (OFF NORM and OS Lamps Go Off)	-
6	At TTY, Type RST:PUB a! Where a = Bus To Be Restored (0 or 1)	-

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

		RESPONSIBILITY	
	NOTE: Associated Installation Handbook – 264A, Volume II, Section 125		
1	Verify PUBB Frame Unit Type (UT) Translator and Compare Translation Data Against Wiring Records:	TELCO/INST	–
	1. Verify Unit Data of PUBB UT Translator (VER:UTYPE:PUBB 0!)	TELCO/INST	DLP-529
	2. Compare Translation Data Against Wiring Records (for SME and Version Status)	INST	–
	3. Enter INH:MACLI,CLASS MTCE;REX! And STOP:TEST:PUSYSTEM!	TELCO	–
2	Run Peripheral Unit Bus 0 Diagnostic Using Restore Message (RST:PUB 0!)	TELCO	DLP-532
3	Run Peripheral Unit Bus 1 Diagnostic Using Restore Message (RST:PUB 1!)	TELCO	DLP-532
4	Recent Change and Verify Submember Equipage UNEQ to GROW (Half 0)	TELCO	DLP-533
5	Recent Change and Verify Submember Equipage GROW to SGRO (Half 0)	TELCO	DLP-533
6	Remove Peripheral Unit Bus 0 From Service (RMV:PUB 0!)	TELCO	DLP-534
7	Remove Power With Power Switch (PUB0 – Bay 0 Growth Associated PUBB Frame)	TELCO	–
8	Mount and Cable Half 0 PUBB 0 and Loop Around Unit (Bay 0)	INST	–
9	Insert PUBB Frame Power Converters and Fuses (Bay 0)	INST	–
10	Restore PUBB Frame Power With Power Switch Leaving OFF Switch in ROS (PUB0)	TELCO	–
11	Verify Power for Added Unit (Bay 0)	INST	
12	Enter Message To Diagnose Growth PUBB Equipment (Bay 0) (DGN:PUB 0:GROWTH!) ATP Required; Installer Clear Equipment Trouble	TELCO/INST	–
13	Restore PUBB Frame Power Switch to Normal (Bay 0)	TELCO/INST	DLP-535
14	Restore Peripheral Unit Bus 0 to Service (RST:PUB 0!)	TELCO/INST	DLP-532
15	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)		
	NOTE: SAFE STOP POINT. A Soak of New PUBB 0 Cables is Required Before PUBB 1 Changes Begin	TELCO	–
16	Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE: REX!) And Stop Peripheral System (STOP:TEST:PUSYS!)	TELCO	DLP-547

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

17	Remove Peripheral Unit Bus 1 From Service (RMV:PUB 1!)	TELCO	DLP-534
18	Remove Power With Power Switch (PUB1 – Bay 1 Growth Associated PUBB Frame)	TELCO	–
19	Mount and Cable Half 0 PUBB 0 and Loop Around Unit (Bay 1)	INST	–
20	Insert PUBB Frame Power Converters and Fuses (Bay 1)	INST	–
21	Restore PUBB Frame Power With Power Switch Leaving OFF Switch in ROS (PUB1)	TELCO	–
22	Verify Power for Added Unit (Bay 1)	INST	–
23	Enter Message To Diagnose Growth PUBB Equipment (Bay 1) (DGN:PUB 1:GROWTH!) ATP Required; Installer Clear Equipment Troubles	TELCO/INST	–
24	Restore PUBB Frame Power Switch to Normal (Bay 1)	TELCO/INST	DLP-535
25	Restore Peripheral Unit Bus 1 to Service (RST:PUB 1!)	TELCO/INST	DLP-532
26	Recent Change and Verify Submember Equipage SGRO to OPER (Half 0)	TELCO	DLP-533
25	Run Peripheral Unit Bus 0 Diagnostic Using Restore Message (RST:PUB 0!)	TELCO/INST	DLP-532
28	Run Peripheral Unit Bus 1 Diagnostic Using Restore Message (RST:PUB 1!)	TELCO/INST	DLP-532
29	Enter Message To Run Peripheral Unit Status Audit (AUD:PUSTAT!); Wait for Message Complete (MSG COMPL)	TELCO	–
30	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	–
	NOTE: End of Procedure. Safe Stop Point		

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

		RESPONSIBILITY	
	NOTE: Associated Installation Handbook – 264A, Volume II, Section 125		
1	Verify UNEQ Status of Peripheral Unit Bus Branching (PUBB) Unit Half 1 To Be Added (VER:UTYPE:PUBB 0,SME a!). Enter INH:MACLI,CLASS MTCE;REX! And STOP:TEST:PUSYSTEM!	TELCO	DLP-536
2	Run Peripheral Unit Bus 0 Diagnostic Using Restore Message (RST:PUB 0!)	TELCO	DLP-532
3	Run Peripheral Unit Bus 1 Diagnostic Using Restore Message (RST:PUB 1!)	TELCO	DLP-532
4	Recent Change and Verify Submember Equipage UNEQ to GROW	TELCO	DLP-533
5	Recent Change and Verify Submember Equipage GROW to SGRO	TELCO	DLP-533
6	Remove Peripheral Unit Bus 0 From Service (RMV:PUB 0!)	TELCO	DLP-537
7	Remove Power With Power Switch (PUB0 – Bay 0 PUBB Frame)	TELCO	–
8	Install New PUBB Unit Half 1 Plug-in Equipment (Bay 0)	INST	–
9	Restore Frame Power With Power Switch (PUB0 – Bay 0 PUBB Frame)	TELCO/INST	DLP-539
10	Enter Message To Diagnose Growth PUBB Equipment (Bay 0) (DGN:PUB 0:GROWTH!) ATP Required; Installer Clear Equipment Troubles	TELCO/INST	–
11	Restore Peripheral Unit Bus 0 to Service (RST:PUB 0!)	TELCO/INST	DLP-532
12	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	–
	NOTE: SAFE STOP POINT. A Soak of New PUBB 0 Cables is Required Before PUBB 1 Changes Begin	TELCO	–
13	Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE: REX!) And Stop Peripheral System (STOP:TEST:PUSYS!)	TELCO	DLP-547
14	Remove Peripheral Unit Bus 1 From Service (RMV:PUB 1!)	TELCO	DLP-537
15	Remove Power With Power Switch (PUB1 – Bay 1 PUBB Frame)	TELCO	–
16	Install New PUBB Unit Half 1 Plug-in Equipment (Bay 1)	INST	–
17	Restore Frame Power With Power Switch (PUB1 – Bay 1 PUBB Frame)	TELCO/INST	DLP-539
18	Enter Message To Diagnose Growth PUBB Equipment (Bay 1) (DGN:PUB 1:GROWTH!) ATP Required; Installer Clear Equipment Troubles	TELCO/INST	–

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

19	Restore Peripheral Unit Bus 1 to Service (RST:PUB 1!)	TELCO/INST	DLP-532
20	Recent Change and Verify Submember Equipage SGR0 to OPER	TELCO	DLP-533
21	Run Peripheral Unit Bus 0 Diagnostic Using Restore Message (RST:PUB 0!)	TELCO/INST	DLP-532
22	Run Peripheral Unit Bus 1 Diagnostic Using Restore Message (RST:PUB 1!)	TELCO/INST	DLP-532
23	Enter Message To Run Peripheral Unit Status Audit (AUD:PUSTAT!); Wait for Message Complete (MSG COMPL)	TELCO	-
24	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	-
	NOTE: End of Procedure. Safe Stop Point		

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

		RESPONSIBILITY	
	NOTE: Ensure that office preconditioning for PUB system growth or degrowth is completed		
	<i>CAUTION: If any trouble conditions cannot be resolved during work shift, cables to growth frame should be disconnected from PUBB frame and Bus Terminating Resistors (BTRs) reinstalled so that PUB can be returned to duplex operation prior to busy hour traffic conditions</i>		
1	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 0)		
	1. Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	—
	2. Locate Growth Bus Branch Terminating Resistors at PUBB Frame, or Determine Location of Last Frame on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	—
	3. If VIF Frame Was Determined in Item 1.2, Determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	—
	4. Store Input Messages on TTY for PUB 0 Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 0 Is in Service, Remove PUB 0 From Service (RMV:PUB 0!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 1.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Advance Program to Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-512

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) — SUPPORT TO INSTALLER (INST)**

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

1 (Contd)	13. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus as Last Frame Determined in Item 1.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.3	TELCO	DLP-513
	16. Scope Bits 1 to 23 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 1.2	TELCO	DLP-516
	20. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 1.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 1.2 Is a PUBB Frame. If PUBB, Set Up Loop To Observe and Scope PU Control Bus Expanded Pollable Bits	TELCO	DLP-550
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO	DLP-532
26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter: ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	—	
2	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 1)		
	1. If Procedure Was Temporarily Stopped, Enter INH:MACLI,CLASS MTCE:REX! and STOP:TEST:PUSYSTEM!	TELCO	—
	2. Locate Growth Bus Branch Terminating Resistors at PUBB Frame, or Determine Location of Last Frame Where PUB 1 Is Terminated on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	—

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) — SUPPORT TO INSTALLER (INST)**

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

2 (Contd)	3. If VIF Frame Was Determined in Item 2.2, determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	-
	4. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 1 Is in Service, Remove PUB 1 From Service (RMV:PUB 1!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 2.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	11. Advance Program to Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-512
	13. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.3	TELCO	DLP-513
	16. Scope Bits 1 to 23 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 2.2	TELCO	DLP-516

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) - SUPPORT TO INSTALLER (INST)**

Issue 5 NOV 1995

234-151-015 NTP

PAGE 3 of 7 007

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

2 (Contd)	20. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 2.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 2.2 Is a PUBB Frame. If PUBB, Set Up Loop To Observe and Scope PU Control Bus Expanded Pollable Bits	TELCO	DLP-550
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 1) (RST:PUB 1!)	TELCO	DLP-532
	26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	—
3	Verify That Power Is Removed at Growth Frame(s) to Which Bus Is Being Extended (IPUB 0 and 1 Only)	INST	—
4	If Procedure Was Temporarily Stopped, Enter INH:MACLI,CLASS MTCE:REX! and STOP:TEST:PUSYS!	TELCO	—
5	Ensure That PUB 0 and 1 Extension Cables Are Connected to Growth Frame(s). (Do Not Connect to Any In-Service Frame)	INST	—
6	Verify OPER Status of PUB Branch Being Extended (VER:UTYPE:PUBB 0,SME a!)	TELCO/INST	DLP-541
7	Run Peripheral Unit Bus Diagnostic Using Restore Message (PUB 0) (RST:PUB 0!)	TELCO	DLP-532
8	Run Peripheral Unit Bus Diagnostic Using Restore Message (PUB 1) (RST:PUB 1!)	TELCO	DLP-532
9	Remove Peripheral Unit Bus From Service (PUB 0) (RMV:PUB 0!)	TELCO	DLP-534
10	Remove Power With Power Switch (PUB0 – Bay 0 PUBB Frame)	TELCO	—
11	Remove and Relocate Bus Terminating Resistor (BTR) Assemblies From PUB Frame and Connect Bus Extension Cables (PUB 0)	INST	—
12	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (PUB0 – Bay 0 PUBB Frame)	TELCO/INST	DLP-542

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) – SUPPORT TO INSTALLER (INST)**

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

13	Execute PUB Looping Test To Verify Extended Bus Branch at BTRs (PUB 0)		
	1. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—
	4. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	6. Scope Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus at BTRs	INST	—
	7. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-524
	9. Scope PU Control Bus and Miscellaneous Bus Bits at BTRs	INST	—
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Stop Maintenance Control Program Client	TELCO	DLP-540
	12. Determine if Last Frame in Item 1.2 is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549
	13. Scope Expanded Pollable Bits	INST	—
	14. Stop the Maintenance Control Client	TELCO	DLP-540
15. Set OFF Switch to Normal Position (Bay 0 of PUBB Frame)	TELCO	—	
14	Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO/INST	DLP-534
15	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	—

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

	NOTE: This is a safe point to temporarily stop this procedure. To provide a required soak period for PUB 0, growth activities for PUB 1 should be performed on the next installation shift	TELCO/INST	—
16	Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	DLP-547
	1. Diagnose: Restore PUB 0 to Service (RST:PUB 0!)	TELCO	DLP-543
	2. Diagnose: Restore PUB 1 to Service (RST:PUB 1!)	TELCO	DLP-543
17	Remove Peripheral Unit Bus From Service (PUB 1) (RMV:PUB 1!)	TELCO	DLP-534
18	Remove Power With Power Switch (PUB1 – Bay 1 of PUBB Frame)	TELCO	—
19	Remove and Relocate BTR Assemblies and Connect Bus Extension Cables (PUB 1)	INST	—
20	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (PUB1 – Bay 1 of PUBB Frame)	TELCO/INST	DLP-542
21	Execute PUB Looping Test To Verify Extended Bus Branch at BTRs (PUB 1)		
	1. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—
	4. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	6. Scope Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus at BTRs		
	7. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	9. Scope PU Control Bus and Miscellaneous Bus Bits at BTRs	INST	—
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	11. Stop Maintenance Control Program Client	TELCO	DLP-540

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) – SUPPORT TO INSTALLER (INST)**

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

21 (Contd)	12. Determine if Last Frame in Item 21 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFF (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549
	13. Scope Expanded Pollable Bits	INST	-
	14. Stop the Maintenance Control Client	TELCO	DLP-540
	15. Set OFF Switch to Normal Position (Bay 1 of PUBB Frame)	TELCO	-
22	Restore Peripheral Unit Bus to Service (PUB 1) (RST:PUB 1!)	TELCO/INST	DLP-532
23	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	-
	NOTE: End of procedure. Safe stop point. To provide a required soak period for PUB 1, growth activities should be performed on the next installation shift		

**EXTEND PUB BRANCH FROM PUBB FRAME TO GROWTH
FRAME(S) - SUPPORT TO INSTALLER (INST)**

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

		RESPONSIBILITY	
	NOTE: Ensure that office preconditioning for PUB system growth or degrowth is complete		
	<i>CAUTION: If any trouble conditions cannot be resolved during work shift, cables to growth first growth frame should be disconnected from operational frame or PUBB and BTRs reinstalled so that PUB can be returned to duplex operation prior to busy hour traffic conditions</i>		
1	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 0)		
	1. Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	—
	2. Determine Location of Last Frame Where PUB 0 Is Terminated on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	—
	3. If VIF Frame Was Determined in Item 1.2, Determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	—
	4. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 0 Is in Service, Remove PUB 0 From Service (RMV:PUB 0!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 1.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Advance Program to Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-512

EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO GROWTH FRAME(S) — SUPPORT TO INSTALLER (INST)

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

1 (Contd)	13. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 1.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.3	TELCO	DLP-513
	16. Scope Bits 1 to 23 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 1.2	TELCO	DLP-516
	20. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 1.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 1.2 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe and Scope Expanded Pollable Bits	TELCO	DLP-549
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO	DLP-532
	26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	—
2	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 1)		
	1. If Procedure Was Stopped Temporarily, Enter INH:MACLI,CLASS MTCE;REX! and STOP:TEST:PUSYS!	TELCO	—
	2. Determine Location of Last Frame Where PUB 1 Is Terminated on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	—

**EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO
GROWTH FRAME(S) — SUPPORT TO INSTALLER (INST)**

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

2 (Contd)	3. If VIF Frame Was Determined in Item 2.2, determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	-
	4. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 1 Is in Service, Remove PUB 1 From Service (RMV:PUB 1!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 2.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	11. Advance Program to Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-512
	13. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.3	TELCO	DLP-513
	16. Scope Bits 1 or 23 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 2.2	TELCO	DLP-516

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

2 (Contd)	20. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 2.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 2.2 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe and Scope Expanded Pollable Bits	TELCO	DLP-549
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 1) (RST:PUB 1!)	TELCO	DLP-532
	26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	—
3	Verify That Power Is Removed at Growth Frame(s) to Which Bus Is Being Extended (IPUB 0 and 1 Only)	INST	—
4	If Procedure Was Temporarily Stopped, Enter INH:MACLI,CLASS MTCE;REX! and STOP:TEST:PUSYS!	TELCO	—
5	Determine Frame(s) From Which PU Buses 0 and 1 Are To Be Extended and Verify PU Bus Cables Are Connected to Growth Frame(s)	INST	—
6	Verify OPER Status of Frame(s) Related to PUB Growth (VER:UTYPE: a b,ME!)	TELCO/INST	DLP-544
7	Run Peripheral Unit Bus Diagnostic Using Restore Message (PUB 0) (RST:PUB 0!)	TELCO	DLP-532
8	Run Peripheral Unit Bus Diagnostic Using Restore Message (PUB 1) (RST:PUB 1!)	TELCO	DLP-532
9	Diagnose Controllers of Frame(s) From Which Bus Is Being Extended (Using Restore Message) (RST: a b,CONTR c!)	TELCO	DLP-545
10	Remove Peripheral Unit Bus From Service (PUB 0) (RMV:PUB 0!)	TELCO	DLP-534
11	Remove Power With Power Switch (IPUB 0 of Frame Determined in Item 5)	TELCO	—
12	If Additional Frame(s) Is Involved in This Bus Extension as Determined in Item 5, Remove Power With Power Switch (IPUB 0 of Second Frame Determined in Item 5)	TELCO	—

EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO GROWTH FRAME(S) — SUPPORT TO INSTALLER (INST)

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

13	Remove and Relocate Bus Terminating Resistor (BTR) Assemblies From Frame Determined in Item 5. Connect Bus Extension Cables (PUB 0)	INST	—
14	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 0 of Frame With Power Removed in Item 11)	TELCO/INST	DLP-542
15	If Additional Frame(s) Is Involved in This Bus Extension, Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 0 of Frame With Power Removed in Item 12)	TELCO/INST	DLP-542
16	Execute PUB Looping Test To Verify Extended Bus Branch at BTRs on Growth Frame (PUB 0)		
	1. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—
	4. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	6. Scope Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus at BTRs	INST	—
	7. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	9. Scope PU Control Bus and Miscellaneous Bus Bits at BTRs	INST	—
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Stop Maintenance Control Program Client	TELCO	DLP-540
	12. Determine if Last Frame in Item 16 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549
	13. Scope Expanded Pollable Bits	INST	—
14. Stop the Maintenance Control Client	TELCO	DLP-540	

EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO GROWTH FRAME(S) — SUPPORT TO INSTALLER (INST)

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

16 (Contd)	15. Set OFF Switch to Normal Position at Power Switch (PUB 0 of Frame With Power Removed in Item 11)	TELCO	-
17	If Additional Frame(s) Is Involved in This Bus Extension, Set OFF Switch to Normal Position at Power Switch (IPUB 0 of Frame With Power Removed in Item 15)	TELCO	-
18	Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO/INST	DLP-532
19	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	-
	NOTE: This is a safe point to temporarily stop this procedure. To provide a required soak period for PUB 1, growth activities should be performed on the next installation shift	TELCO/INST	-
20	Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	DLP-547
	1. Diagnose: Restore PUB 0 to Service (RST:PUB 0!)	TELCO	DLP-543
	2. Diagnose: Restore PUB 1 to Service (RST:PUB 1!)	TELCO	DLP-543
21	Remove Peripheral Unit Bus From Service (PUB 1) (RMV:PUB 1!)	TELCO	DLP-534
22	Remove Power With Power Switch (IPUB 1 of Frame Determined in Item 5)	TELCO	-
23	If Additional Frame(s) Is Involved in This Bus Extension as Determined in Item 5, Remove Power With Power Switch (IPUB 1 of Second Frame Determined in Item 5)	TELCO	-
24	Remove and Relocate BTR Assemblies and Connect Bus Extension Cables (PUB 1)	INST	-
25	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 1 of Frame With Power Removed in Item 22)	TELCO/INST	DLP-542
26	If Additional Frame(s) Is Involved in This Bus Extension, Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 1 of Frame With Power Removed in Item 23)	TELCO/INST	DLP-542
27	Execute PUB Looping Test To Verify Extended Bus Branch at BTRs on Growth Frame (PUB 1)		
	1. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539

EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO GROWTH FRAME(S) - SUPPORT TO INSTALLER (INST)

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

27	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—	
	4. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539	
	6. Scope Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus at BTRs	INST	—	
	7. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-524	
	9. Scope PU Control Bus and Miscellaneous Bus Bits at BTRs	INST	—	
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	11. Stop Maintenance Control Program Client	TELCO	DLP-540	
	12. Determine if Last Frame in Item 27 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549	
	13. Scope Expanded Pollable Bits	INST	—	
	14. Stop the Maintenance Control Client	TELCO	DLP-540	
	15. Set OFF Switch to Normal Position at Power Switch (PUB 1 of Frame With Power Removed in Item 22)	TELCO	—	
	28	If Additional Frame(s) Is Involved in This Bus Extension, Set OFF Switch to Normal Position at Power Switch (IPUB 1 of Frame With Power Restored in Item 26)	TELCO	—
	29	Restore Peripheral Unit Bus to Service (PUB 1)(RST:PUB 1!)	TELCO	DLP-532
30	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	—	
	NOTE: End of procedure. Safe stop point. To provide a required soak period for PUB 1, growth activities should be performed on the next installation shift			

EXTEND PUB BRANCH FROM OPERATIONAL FRAME TO GROWTH FRAME(S) — SUPPORT TO INSTALLER (INST)

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

		RESPONSIBILITY	
	NOTE: Ensure that office preconditioning for PUB system growth or degrowth is completed		
	<i>CAUTION: If any trouble conditions cannot be resolved during work shift, the new bus interface should be disconnected and original cables reconnected at operational frames so that duplex PUB operational status is restored prior to busy hour traffic conditions</i>		
1	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 0)	TELCO	—
	1. Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	—
	2. Determine Location of Last Frame Where PUB 0 Is Terminated on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	—
	3. If VIF Frame Was Determined in Item 1.2, Determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	—
	4. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 0 Is in Service, Remove PUB 0 From Service (RMV:PUB 0!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 1.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 1.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Advance Program to Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 1.2	TELCO	DLP-512

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES — SUPPORT TO INSTALLER (INST)**

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

1 (Contd)	13. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 1.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 1.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 1.3	TELCO	DLP-513
	16. Scope Bits 1 to 23 on PU Reply Bus at Last Frame Determined in Item 1.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	-
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 1.2	TELCO	DLP-516
	20. If Last Frame Determined in Item 1.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 1.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	-
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 1.2 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe and Scope Expanded Pollable Bits	TELCO	DLP-549
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO	DLP-532
	26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	-
2	Execute PUB Looping Test To Verify Growth Bus Branch at BTRs (PUB 1)		
	1. If Procedure Was Temporarily Stopped, Enter INH:MACLI, CLASS MTCE:REX! and STOP:TEST:PUSYS!	TELCO	-
	2. Determine Location of Last Frame Where PUB 1 Is Terminated on Bus Branch To Be Scoped Per Office Record Drawing T-nnnn-Hn-3840	TELCO	-

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES – SUPPORT TO INSTALLER (INST)**

Issue 5 **NOV 1995**

234-151-015 **NTP**

PAGE 2 of 7 **009**

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

2 (Contd)	3. If VIF Frame Was Determined in Item 2.2, determine From Office Record Drawing T-nnnn-Hn-3840 Frame Where PU Write and Enable Buses Are Terminated	TELCO	-
	4. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	5. If Peripheral Unit Bus 1 Is in Service, Remove PUB 1 From Service (RMV:PUB 1!)	TELCO	DLP-534
	6. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 0 on PU Write and Reply Buses	TELCO	DLP-539
	7. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-510
	8. If Last Frame Determined in Item 2.2 Is VIF Frame, Set Up Oscilloscope	TELCO	DLP-548
	1. Scope Bit 0 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-510
	9. Scope Bit 0 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-511
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	11. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	12. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.2	TELCO	DLP-512
	13. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 1 to 35 on PU Write Bus at Last Frame Determined in Item 2.3	TELCO	DLP-512
	14. If Last Frame Determined in Item 2.2 Is Not VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.2	TELCO	DLP-513
	15. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Bits 0 to 11 on PU Enable Address Bus at Last Frame Determined in Item 2.3	TELCO	DLP-513
	16. Scope Bits 1 to 23 on PU Reply Bus at Last Frame Determined in Item 2.2	TELCO	DLP-514
	17. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	-
	18. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES – SUPPORT TO INSTALLER (INST)**

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

2 (Contd)	19. Scope PU Control Bus and Miscellaneous Bus Bits at Last Frame Determined in Item 2.2	TELCO	DLP-516
	20. If Last Frame Determined in Item 2.2 Is VIF Frame, Scope Remaining Miscellaneous Bus Bits at Last Frame Determined in Item 2.3	TELCO	DLP-518
	21. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—
	22. Stop Maintenance Control Program Client	TELCO	DLP-540
	23. Determine if Last Frame in Item 2.2 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe and Scope Expanded Pollable Bits	TELCO	DLP-549
	24. Stop the Maintenance Control Client	TELCO	DLP-540
	25. Restore Peripheral Unit Bus to Service (PUB 1) (RST:PUB 1!)	TELCO	DLP-532
	26. This Is a Safe Point To Temporarily Stop This Procedure. If Stopping, Enter ALW:MACLI,CLASS MTCE! and TEST:PUSYS!	TELCO	—
3	Verify That Power Is Removed at Growth Frame to Which Bus Is To Be Connected	INST	—
4	If Procedure Was Temporarily Stopped, Enter INH:MACLI,CLASS MTCE:REX! and STOP:TEST:PUSYS!	TELCO	—
5	Determine Frame(s) From Which PU Buses 0 and 1 Are To Be Extended and Verify PU Bus Cables Are Connected to Growth Frame(s)	INST	—
6	Diagnose (Specifying Phase 99) and Restore Peripheral Bus Interface 0 and 1 for Operational Frame With Full PUB Access Nearest Insertion Point and Toward PUBB Frame, if any	TELCO	DLP-546
7	Diagnose (Specifying Phase 99) and Restore Peripheral Bus Interface 0 and 1 for Operational Frame With Full PUB Access Nearest Insertion Point and Away From PUBB Frame, if any	TELCO	DLP-546
8	Remove Peripheral Unit Bus From Service (PUB 0) (RMV:PUB 0!)	TELCO	DLP-534
9	Remove Power With Power Switch (IPUB 0 of Operational Frames; Could Include PUBB) (Determined in Item 5)	TELCO	—
	<i>CAUTION: Care should be taken to avoid momentarily disabling frame power while pulling PUB cabling across +24V and +140V power feeders</i>		

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES — SUPPORT TO INSTALLER (INST)**

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

10	Connect Peripheral Unit Bus Cables Per Equipment Spec 384 (PUB 0)	INST	—
11	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 0 of Operational Frame(s) Toward PUBB Frame With Power Removed in Item 9)	TELCO/INST	DLP-542
12	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 0 of Operational Frame Away From Insertion Point With Power Removed in Item 9)	TELCO/INST	DLP-542
13	Execute PUB Looping Test To Verify Inserted Bus Branch at BTRs (PUB 0)		
	1. Store Input Messages on TTY for PUB Looping Test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—
	4. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539
	6. Scope Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus at BTRs	INST	—
	7. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515
	9. Scope PU Control Bus and Miscellaneous Bus Bits at BTRs	INST	—
	10. At TTY, Enter Stop Looping Message (EX:PUB 0!)	TELCO	—
	11. Stop Maintenance Control Program Client	TELCO	DLP-540
	12. Determine if Last Frame in Item 13 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549
	13. Scope Expanded Pollable Bits	INST	—
	14. Stop the Maintenance Control Client	TELCO	DLP-540
	15. Set OFF Switch to Normal Position Switch (IPUB 0 of Operational Frame(s) Toward PUBB Frame With Power Removed in Item 9)	TELCO	—

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES — SUPPORT TO INSTALLER (INST)**

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

14	Set OFF Switch to Normal Position at Power Switch (IPUB 0 of Operational Frame Away From Insertion Point With Power Removed in Item 9)	TELCO	—
15	Restore Peripheral Unit Bus to Service (PUB 0) (RST:PUB 0!)	TELCO/INST	DLP-532
16	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	—
	NOTE: This is a safe point to temporarily stop this procedure. To provide a required soak period for PUB 0, growth activities for PUB 1 should be performed on the next installation shift	TELCO/INST	—
17	Inhibit Peripheral Automatic Exerciser Diagnostics (INH:MACLI,CLASS MTCE; REX!) and Stop Peripheral System (STOP:TEST;PUSYS!)	TELCO	DLP-547
	1. Diagnose: Restore PUB 0 to Service (RST:PUB 0!)	TELCO	DLP-543
	2. Diagnose: Restore PUB 1 to Service (RST:PUB 1!)	TELCO	DLP-543
	3. Remove Peripheral Unit Bus From Service (PUB 1) (RMV:PUB 1!)	TELCO	DLP-534
18	Remove Power With Power Switch (IPUB 1 of Operational Frames; Could Include PUBB) (Determined in Item 5)	TELCO	—
	<i>CAUTION: Care should be taken to avoid momentarily disabling frame power while pulling PUB cabling across +24V and +140V power feeders</i>		
19	Connect Peripheral Unit Bus Cables Per Equipment Spec 384 (PUB 1)	INST	—
20	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 1 of Operational Frame(s) Toward PUBB Frame With Power Removed in Item 18)	TELCO/INST	DLP-542
21	Restore Bus Power With Power Switch (Leave OFF Switch in ROS Position) (IPUB 1 of Operational Frame Away From Insertion Point Removed in Item 18)	TELCO/INST	DLP-542
22	Execute PUB Looping Test To Verify Inserted Bus Branch at BTRs (PUB 1)		
	1. Store Input Messages on TTY for PUB Looping test	TELCO	DLP-538
	2. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bit 0 on PU Write and Reply Buses	TELCO	DLP-539
	3. Scope Bit 0 on PU Write and Reply Buses at BTRs	INST	—

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES — SUPPORT TO INSTALLER (INST)**

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

22 (Contd)	4. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	5. Advance Program to Bus Branch To Be Scoped and Set Up Loop To Observe Bits 1 to 35 on PU Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus	TELCO	DLP-539	
	6. Scope Bits 1 to 35 on Pu Write Bus, Bits 0 to 11 on PU Enable Address Bus, and Bits 1 to 23 on PU Reply Bus of BTRs	INST	—	
	7. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	8. Set Up Loop To Observe PU Control Bus and Miscellaneous Bus Bits	TELCO	DLP-515	
	9. Scope PU Control Bus and Miscellaneous Bus Bits and BTRs	INST	—	
	10. At TTY, Enter Stop Looping Message (EX:PUB 1!)	TELCO	—	
	11. Stop Maintenance Control Program Client	TELCO	DLP-540	
	12. Determine if Last Frame in Item 22 Is an SCS or DIFE (Member Numbers 24-31) Frame. If SCS or DIFE (Member Numbers 24-31), Set Up Loop To Observe Expanded Pollable Bits	TELCO	DLP-549	
	13. Scope Expanded Pollable Bits	INST	—	
	14. Stop the Maintenance Control Client	TELCO	DLP-540	
	15. Set OFF Switch to Normal Position at Power Switch (PUB 1 of Operational Frame(s) Toward PUBB Frame With Power Removed in Item 18)	TELCO	—	
	23	Set OFF Switch to Normal Position at Power Switch (PUB 1 of Operational Frame Away From Insertion Point With Power Removed in Item 18)	TELCO	—
	24	Restore Peripheral Unit Bus to Service (PUB 1) (RST:PUB 1!)	TELCO/INST	DLP-532
	25	Allow Peripheral Routine Exerciser Diagnostics (ALW:MACLI,CLASS MTCE!) and Peripheral System (TEST:PUSYS!)	TELCO	—
	NOTE: End of Procedure. Safe Stop Point. To provide a required soak period for PUB 1, growth activities should be performed on the next installation shift			

**INSERT GROWTH FRAME(S) INTO PUB BRANCH BETWEEN
TWO OPERATIONAL FRAMES — SUPPORT TO INSTALLER (INST)**

GENERAL

The maintenance philosophy contained in this volume is based upon the design of equipment (hardware), diagnostic software, and test equipment employed. Procedures are intended to aid personnel in performing trouble-clearing tasks. The degree to which these procedures accomplish this depends upon input and feedback from the user. Additions, corrections, and improvements to the data are encouraged. Manufacturer, engineering, and software documentation such as input/output (I/O) manuals, SDs, PKs, PRs, etc., are referred to where applicable rather than duplicating that information in TOP. Some portions of those documents may be utilized in procedures but only as examples for the purpose of explanation. Test equipment (oscilloscopes, voltmeters, etc.) and the parameters involved in the circuits being tested, adjusted, or checked are usually prescribed. However, setup and method of operation is not described unless it is unusual or unique in some manner.

IXL PHILOSOPHY [IXL-001]

The IXL is an alphabetized permuted index structured to provide fast access to trouble analysis procedures (TAPs), non-trouble procedures (NTPs), and detailed level procedures (DLPs) pertinent to identified symptoms. Procedures unique to a particular modification of frame are identified by that frame's SD number. If not so identified, the procedure will apply to all modifications.

Power problems are sensed by scan points which generate an alarm. It is assumed that the user following the aisle pilot lights can locate the frame with the power fault which is automatically powered down (PWR OFF lamp lighted and OFF NORM lamp off), or by reading REPT:PA

printout which would identify the frame with power fault. The precise structure of the message is given in input/output (I/O) message manuals. Symptoms described in the IXL reflect the assumptions above, and indicate further conditions that are observable at the frame that would enable the user to access the proper trouble-clearing procedure. These conditions are blown fuses, and lighted LEDs on converters or power function circuit packs.

TAP PHILOSOPHY

When documenting a procedural approach to trouble clearing, certain assumptions are made. It is assumed that one fault is being cleared at a time. When directing the user to perform an action, it is assumed that the user performs that action correctly. Similarly, when directed to make replacements, the replacement part is always assumed to be good. Equipment used for testing both built-in (hardware and software) and commercial, is assumed to be good. Only consistent fault signatures are covered.

Trouble-clearing TAPs provided for diagnostic failures are provided on three levels. Level one (TAP-102) is referenced when a software TLP SUSPECTED FAULTY EQUIPMENT list is generated. This level provides a step-by-step procedure for replacing circuit packs one at a time, and analyzing the results. It is straightforward and only requires some familiarity with the equipment (descriptive and theory practices), TTY techniques, and diagnostic printouts.

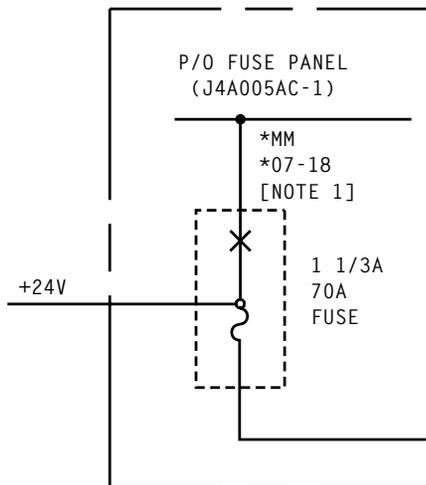
The second level of trouble clearing (TAP-103) is accessed from the first level TAP when the software generated TLP SUSPECTED FAULTY EQUIPMENT list has been exhausted without clearing the problem, or it can be accessed directly from the IXL. This level is known as raw data analysis and describes what to do with the summary and supplemental data printed either with or instead of the

TLP SUSPECTED FAULTY EQUIPMENT list. It is expected that this will lead to an identification of faulty circuits within the SD and possibly additional suspect circuit packs not previously identified. This level of trouble clearing is more complex and requires knowledge of the equipment, TTY techniques, and SDs, PKs, PRs, etc.

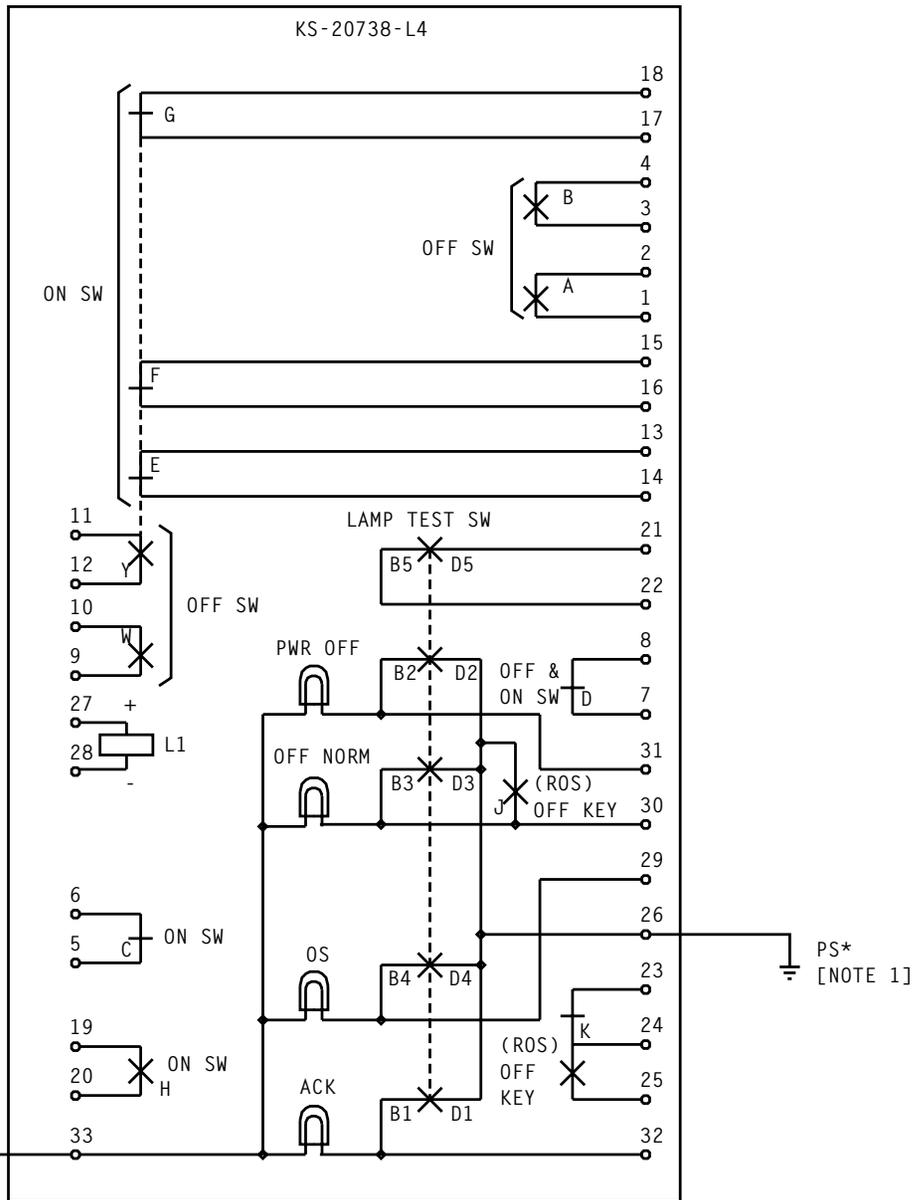
The third level of trouble clearing is signal tracing using interactive diagnostics (TAP-104). This procedure is accessible only from the previous level (TAP-103) and uses information derived from performance of that procedure. This level of trouble clearing requires an increase in the capabilities cited in the first two levels but with additional knowledge and skill in the setup and use of test equipment (oscilloscopes, voltmeters, etc).

ALTERNATE METHODS

The more knowledgeable and experienced personnel may access TOP documents at a point in trouble clearing where analyzation is completed (the faulty component determined) and only repair or replacement is required. Most DLPs are built to support TAPs and NTPs with preconditioning and system restoration steps covered in those procedures. Therefore, access to data (DLPs) on a hunt-and-find basis is a threat to equipment operation and may compound trouble-clearing problems.



+24*MM
[NOTE 1]



NOTE 1	
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)	
Issue 5	NOV 1995
234-151-015	TAD
PAGE 1 of 1	101

POWER SWITCH LAMP CIRCUIT

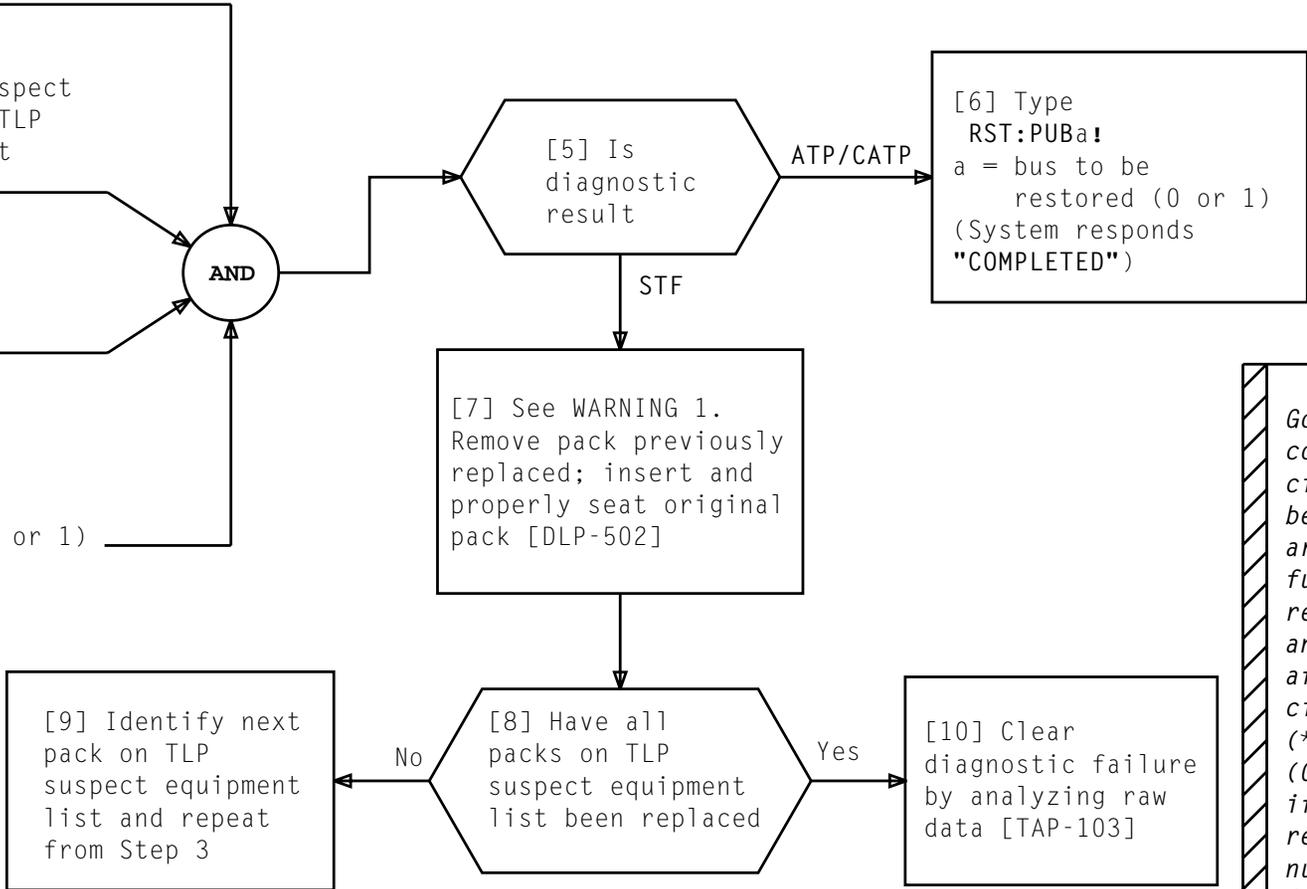
<p>SUMMARY</p> <p>At PUBB bay or repeater frame (if utilized), replace all circuit packs beginning with most suspect pack listed on TLP suspect equipment list. After each pack replacement,</p>	<p>check diagnostic results to determine if trouble was cleared. If trouble is not cleared after replacing each pack on TLP list, clear diagnostic failure by analyzing raw data [TAP-103]</p>
--	--

[1] At TTY, type
RMV:PUB a!
a = bus to be removed
(0 or 1)

[2] Identify most suspect circuit pack on TLP suspect equipment list

[3] See WARNING 1. Replace circuit pack [DLP-502]

[4] Type
DGN:PUB a:TLP!
a = bus to be diagnosed (0 or 1)



WARNING 1
*Gold-plated contacts on FB152 circuit pack may be damaged by arcing if *ML fuse is not removed before and replaced after replacing circuit pack (* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4))*

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	102

CLEAR DIAGNOSTIC FAILURE, TLP SUSPECT EQUIPMENT LIST GENERATED

SUMMARY

Read first failing phase prologue. Determine if subroutines were used and identify their location and function. Locate first failing test and determine test function. Determine if doloops were used and identify their location and function. Note PK information for failing bits in first

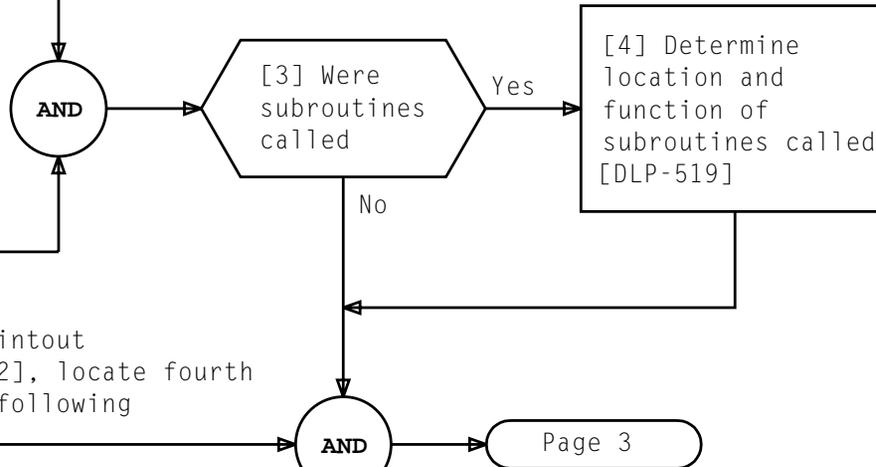
failing test. Use PK information and knowledge of first failing test function to identify and replace any suspect packs other than those previously replaced. If trouble is not cleared, clear diagnostic failure by looping over first failing test and signal tracing [TAP-104]

[1] See NOTE 1. Obtain diagnostic PIDENT for first failing phase and read prologue

[2] Determine if subroutines were called [DLP-527]

[5] On raw data printout [FIG. 1, Page 2], locate fourth raw data word following mismatch data

[6] See NOTE 2. Use this address to locate first failing test expected results (EXPR) in last subroutine called or in PHASE PIDENT if no subroutines were called [FIG. 2, Page 2]



NOTES

- PR number = 4A510 + phase number. PIDENT is PUDGPBxx (xx = phase number), except for six IPUB phase 99s:
 TMS - PUDGTG99 - 4A705
 TSI - PUDGTI99 - 4A706
 SCLK - PUDGSC99 - 4A697
 SP - PUDGSP99 - 4A703
 EST - PUDGEC99 - 4A692
 TGR - PUDGTA99 - 4A704
- Phase PIDENT may consist of more than one strip with address appearing in more than one strip. Be sure address located has EXPR data for your test

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 5	103

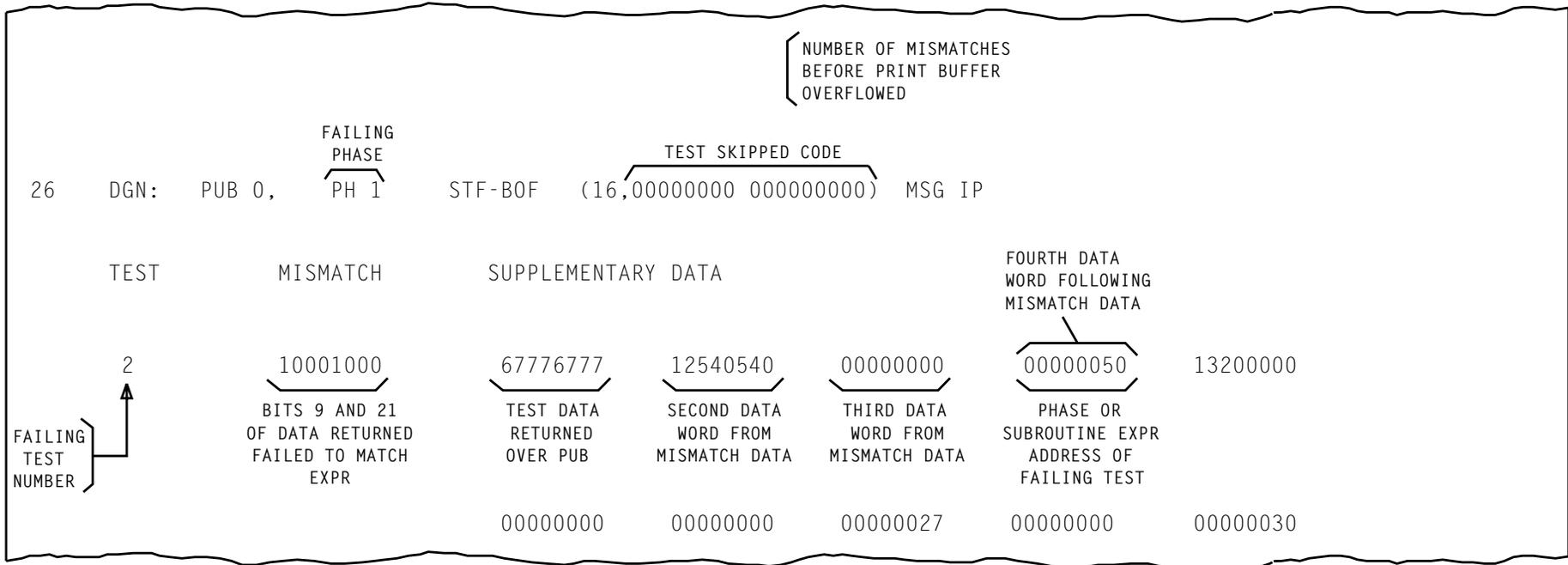


FIG. 1 - Example of PUBB Frame Raw Data Printout

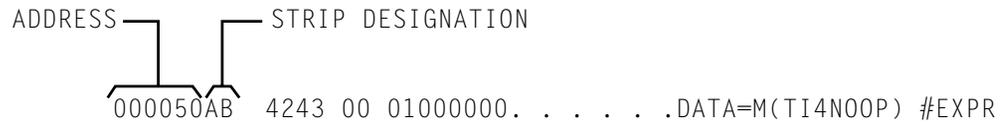
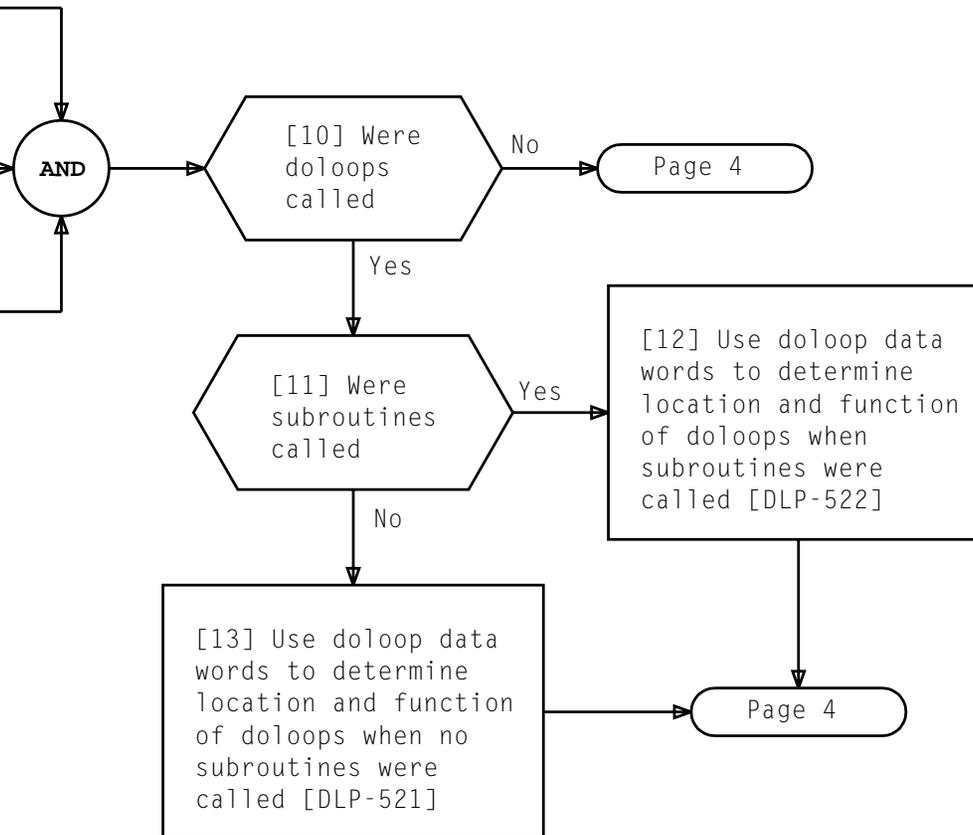


FIG. 2 - Example of EXPR Data in Listing

[7] See NOTE 3. Read prologue of program unit containing first failing test

[8] Analyze failing test data to determine test function [DLP-520]

[9] Determine if doloops were called [DLP-528]



NOTE 3	
Program unit name is indicated in upper left of each listing page	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 3 of 5	103

[14] Using summary data printout and Issue 2 or later Test Access PK 4A019, attempt to identify SD lead in path of failing bit [DLP-523]

[15] Was TLP list of packs printed

No

Yes

[16] See NOTE 4. Using PR prologue data, knowledge of failing test function, failing bits indicated by mismatch data, lead information, and appropriate SDs, identify any suspect packs

[17] See NOTE 4. Using PR prologue data, knowledge of failing test function, failing bits indicated by mismatch data, lead information, and appropriate SDs, identify any suspect packs not previously replaced

[18] Have any packs been identified that were not previously replaced

Yes

No

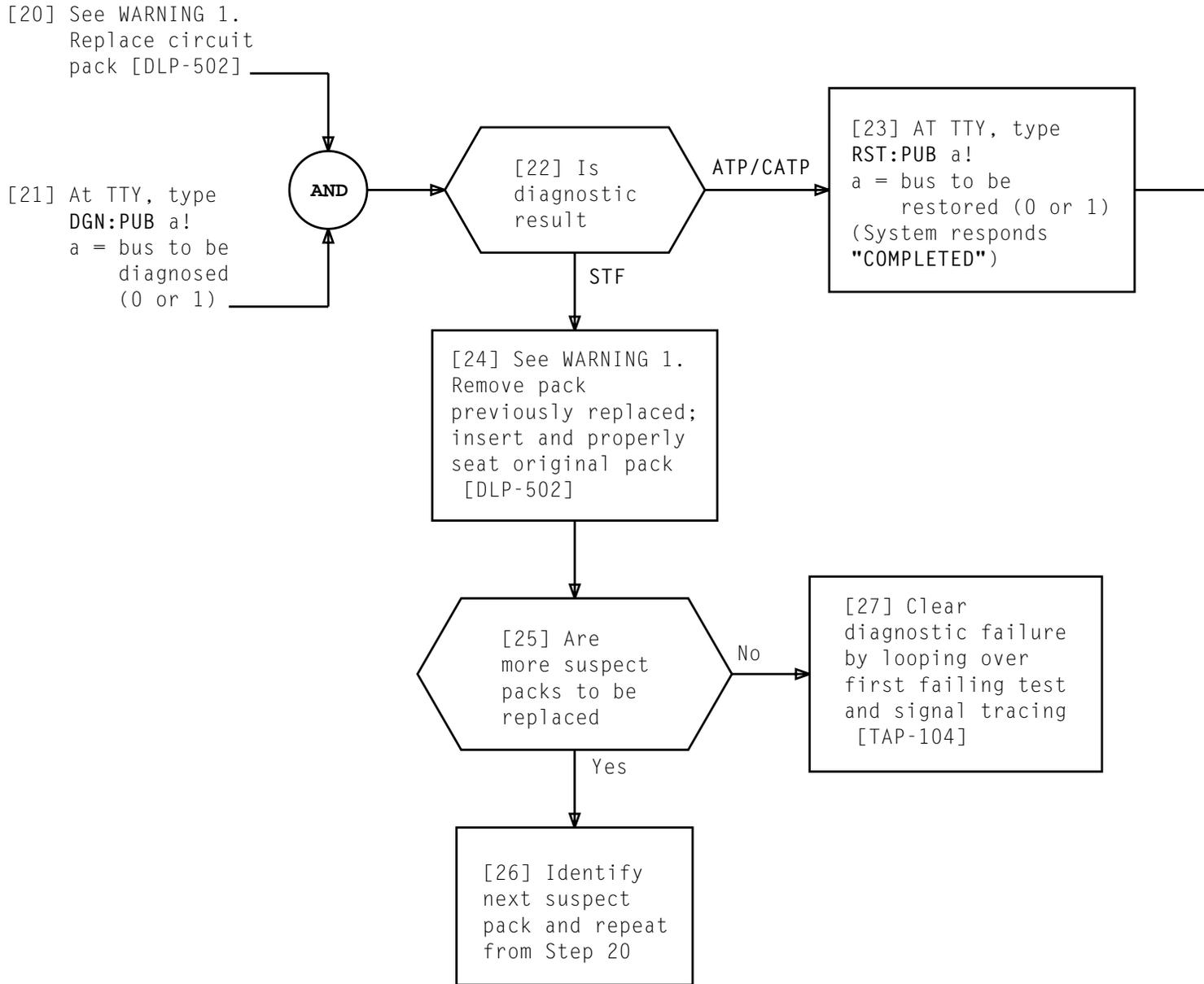
Page 5

[19] Clear diagnostic failure by looping over first failing test and signal tracing [TAP-104]

NOTE 4
PK information indicates where failing test data was read

Issue 5	NOV 1995
234-151-015	TAP
PAGE 4 of 5	103

CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA



WARNING 1
*Gold-plated contacts on FB152 circuit pack may be damaged by arcing if *ML fuse is not removed before and replaced after replacing circuit pack (* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4))*

Issue 5	NOV 1995
234-151-015	TAP
PAGE 5 of 5	103

SUMMARY

Set up loop over first failing test, requesting two diagnostic runs. Verify failing test raw data prints twice. Set up infinite loop over first failing test (RPT 2 option deleted). Set up scope. If SYNC option is used, attach external sweep trigger to terminal *80-10-015 [NOTE 1].

Using raw data analysis information obtained, SDs/CDs, and circuit pack SDs, signal trace path of failing bits to isolate and clear fault. If F-level interrupt is associated with diagnostic failure, analyze PBFR F-level interrupt [TAP-116]

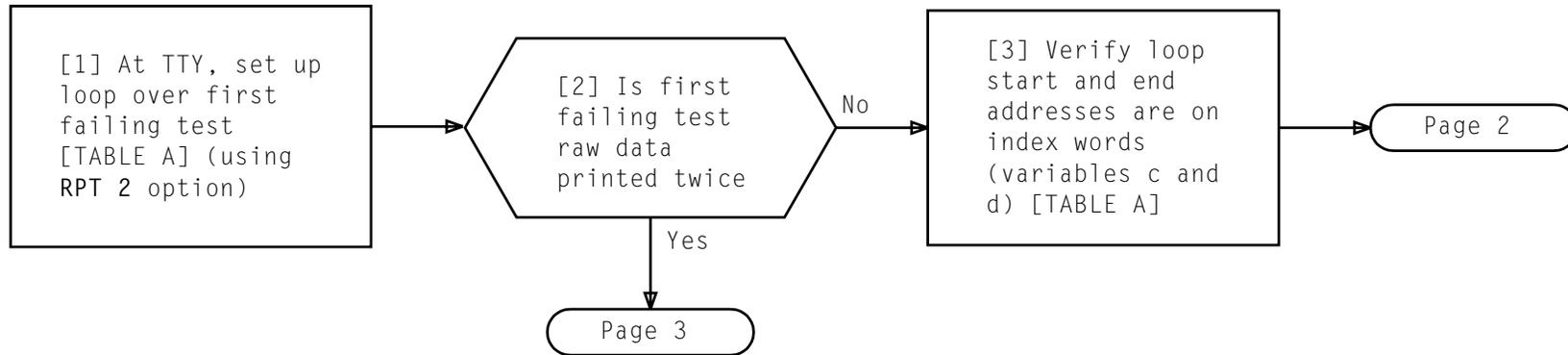


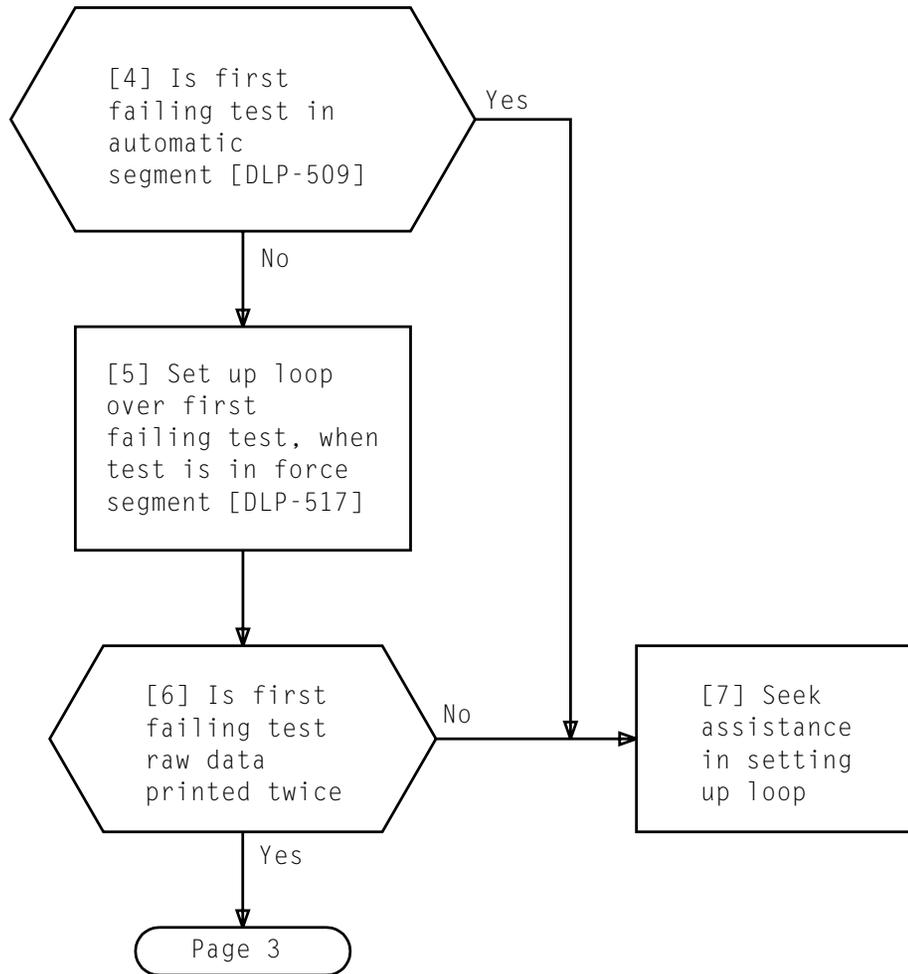
TABLE A
MESSAGES TO ESTABLISH LOOP

EX:PUB a;START!	RESPONSE:SUSPENDED
EX:PUB a:SYNC c,ENABLE e! (SYNC optional)	RESPONSE:SUSPENDED
EX:PUB a;RPT 2:PH b,ADR c-d!	RESPONSE:(RAW DATA)
a = failing PUB (0 or 1) b = first failing phase number c = address of first failing test statement index word d = address of next index word following first failing test index word e = first failing test number	

NOTE 1
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)

CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 5	104



CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

Issue 5	NOV 1995
234-151-015	TAP
PAGE 2 of 5	104

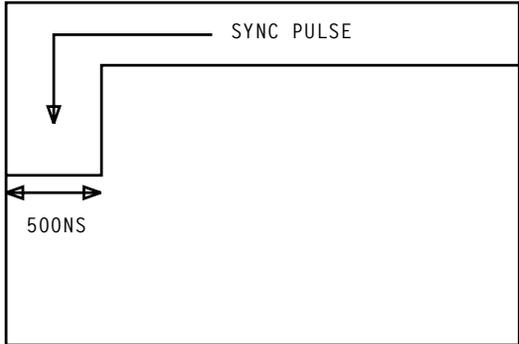
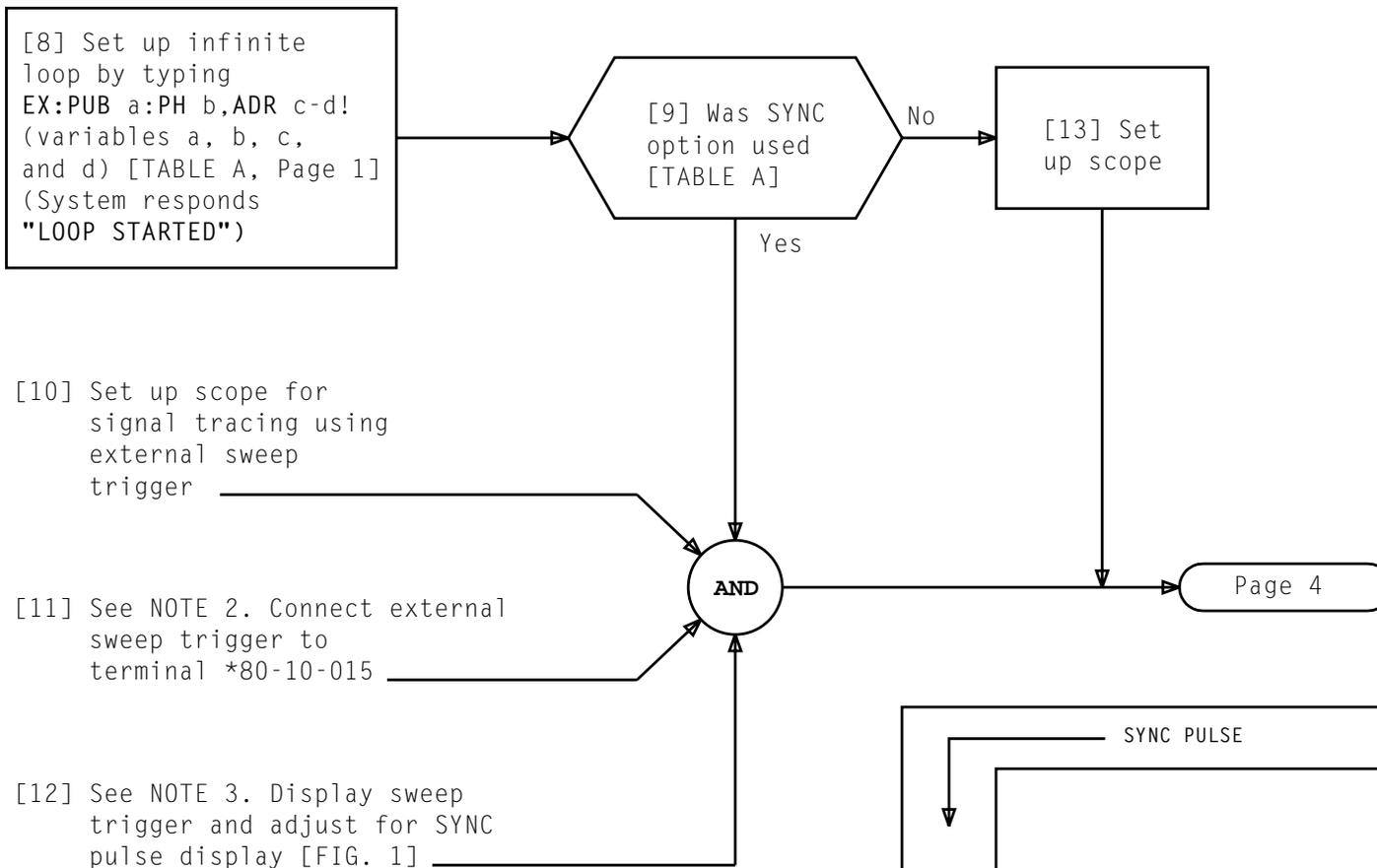
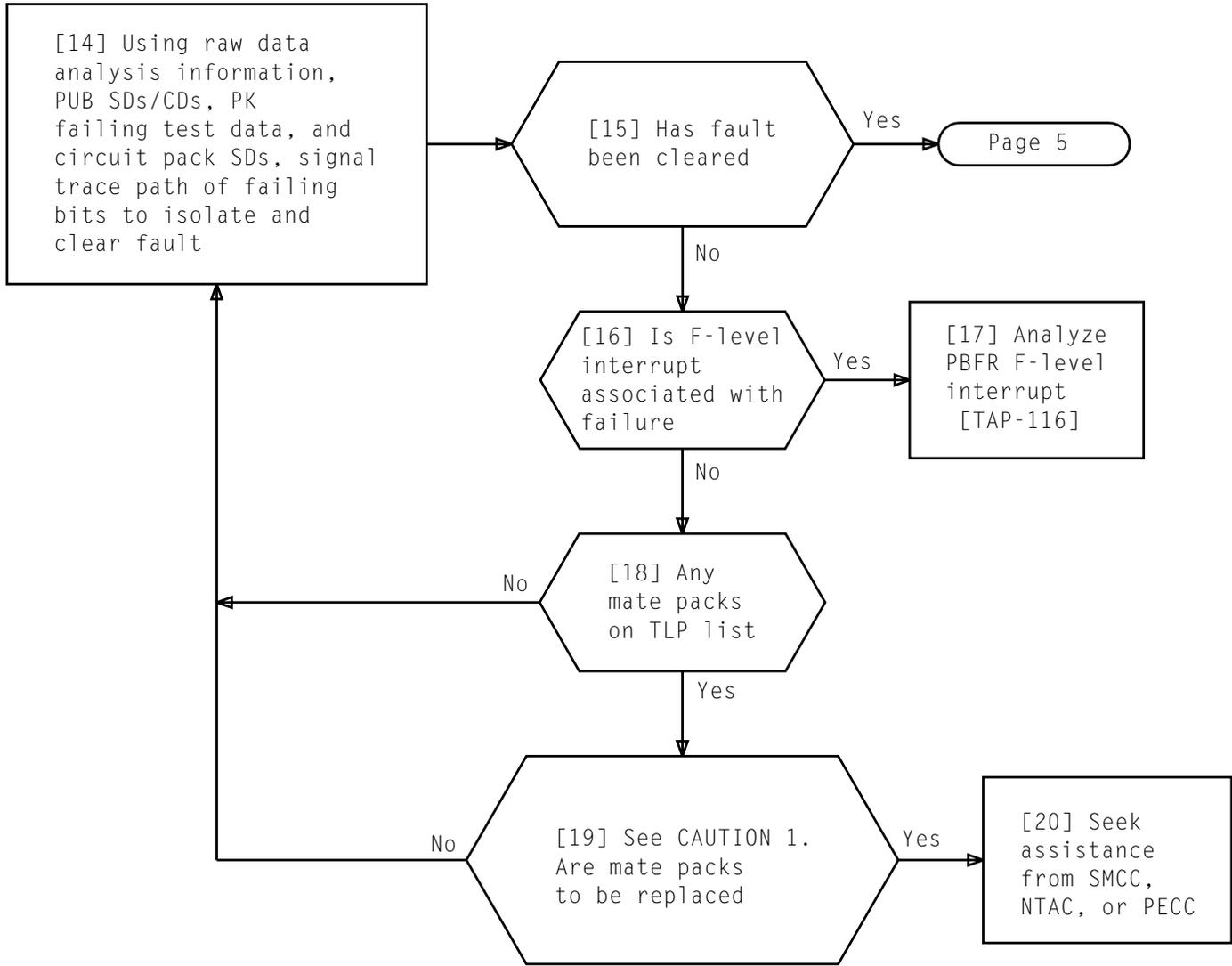


FIG. 1 - SYNC Pulse Display

- NOTES
2. * = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)
 3. SYNC pulse arrives over PUWB bit 36 which is not tested by PUB diagnostics

CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

Issue 5	NOV 1995
234-151-015	TAP
PAGE 3 of 5	104



CAUTION 1
Mate pack replacement may cause service degrading condition

CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

Issue 5	NOV 1995
234-151-015	TAP
PAGE 4 of 5	104

At TTY:

[21] Type

OP:MACLI,CLASS MTCE!

[22] Type

STOP:MACLI,CLASS MTCE,SUBCLASS a!
a = subclass assigned faulty PUB

[23] Type

DGN:PUB a:TLP!
a = bus to be
diagnosed (0 or 1)

AND

[24] Is
diagnostic
result

ATP/CATP

[25] Type

RST:PUBa!
a = bus to be
restored (0 or 1)
(System responds
"COMPLETED")

STF

[26] Is first
failing test in
automatic segment
[DLP-509]

No

[28] Set up loop
over first failing
test, when test is
in force segment
[DLP-517]

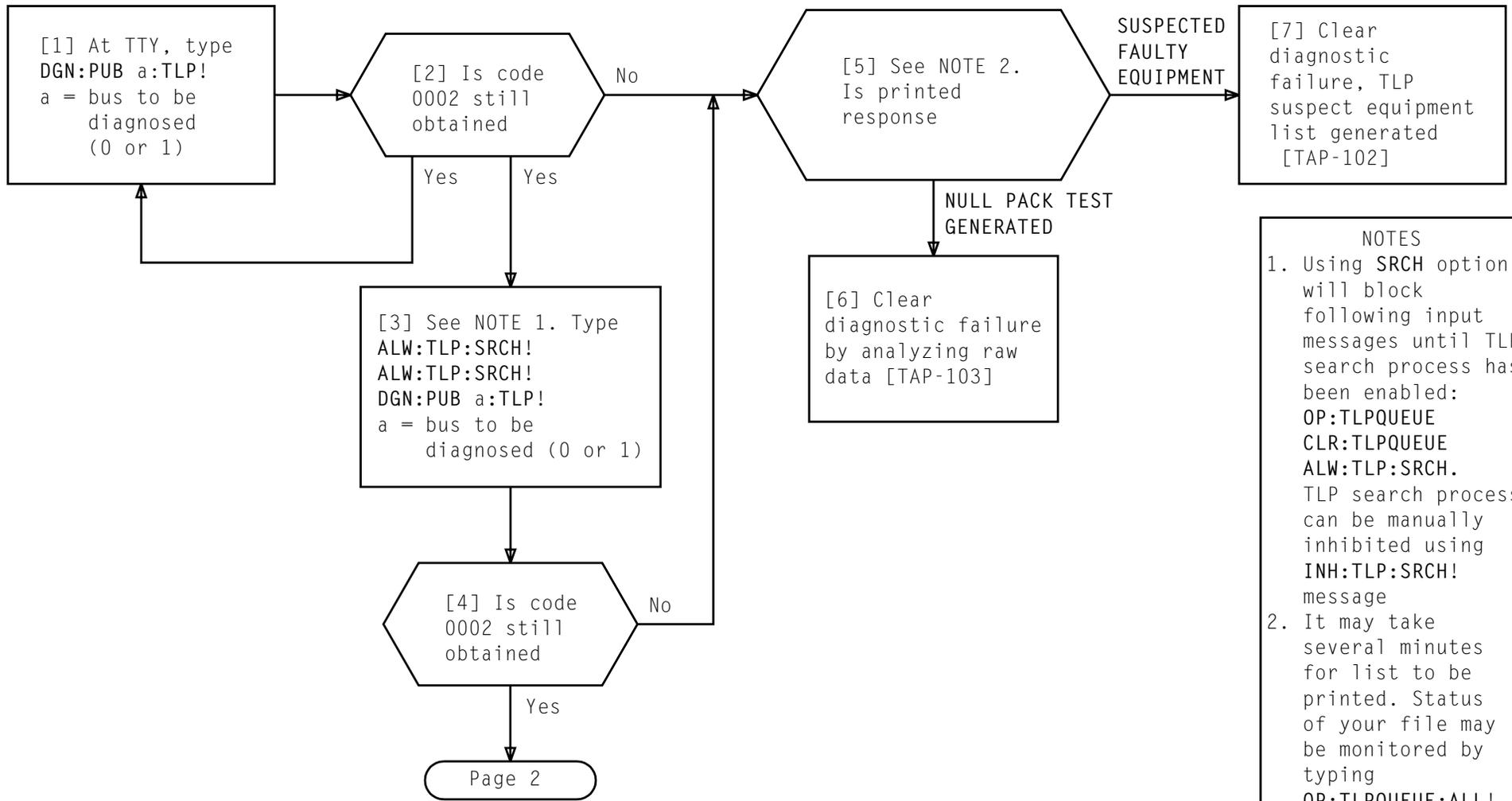
Yes

[27] At TTY, set
up loop over first
failing test
[TABLE A, Page 1]
(omitting
RPT 2 option)

[29] Repeat
from Step 14,
Page 4

CLEAR DIAGNOSTIC FAILURE BY LOOPING OVER FIRST FAILING TEST AND SIGNAL TRACING

Issue 5	NOV 1995
234-151-015	TAP
PAGE 5 of 5	104



NOTES

- Using SRCH option will block following input messages until TLP search process has been enabled:
 OP:TLPQUEUE
 CLR:TLPQUEUE
 ALW:TLP:SRCH.
 TLP search process can be manually inhibited using
 INH:TLP:SRCH! message
- It may take several minutes for list to be printed. Status of your file may be monitored by typing
 OP:TLPQUEUE;ALL!.
 TLP file currently being processed is indicated by asterisk in priority column

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 2	105

At TTY:

[8] Type

INIT:TLP!

[9] Type

ALW:TLP:SRCH,PUB!

[10] Type

DGN:PUB a:TLP!

a = bus to be
diagnosed (0 or 1)

AND

[11] See NOTE 2.
Is printed
response

SUSPECTED
FAULTY
EQUIPMENT

[13] Clear
diagnostic failure,
TLP suspect
equipment list
generated [TAP-102]

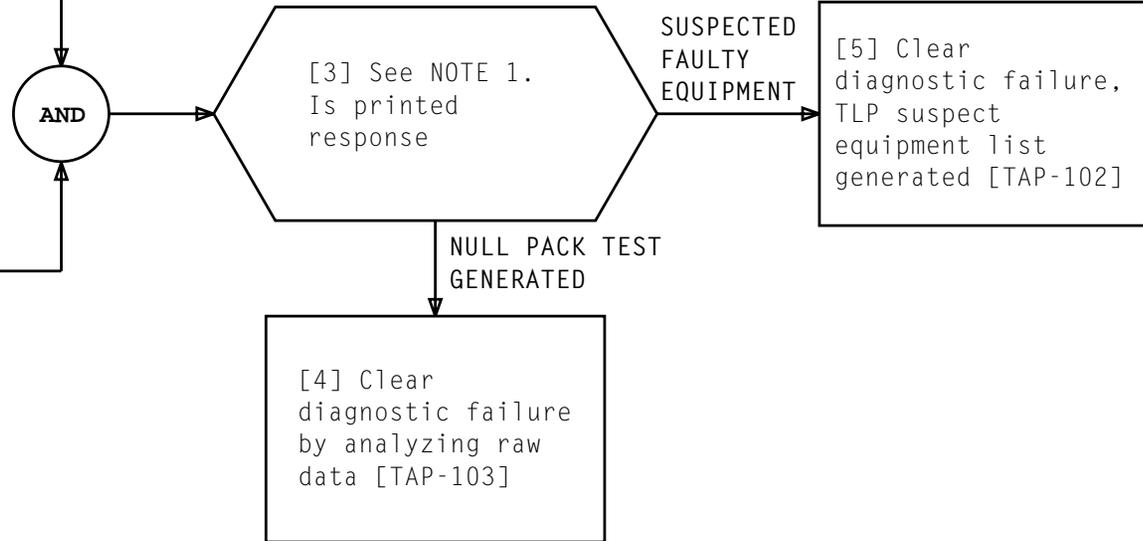
NULL PACK TEST
GENERATED

[12] Clear
diagnostic failure
by analyzing raw
data [TAP-103]

At TTY:

[1] Type
ALW:TLP:SRCH,PUB!

[2] Type
DGN:PUB a:TLP!
a = bus to be
diagnosed (0 or 1)



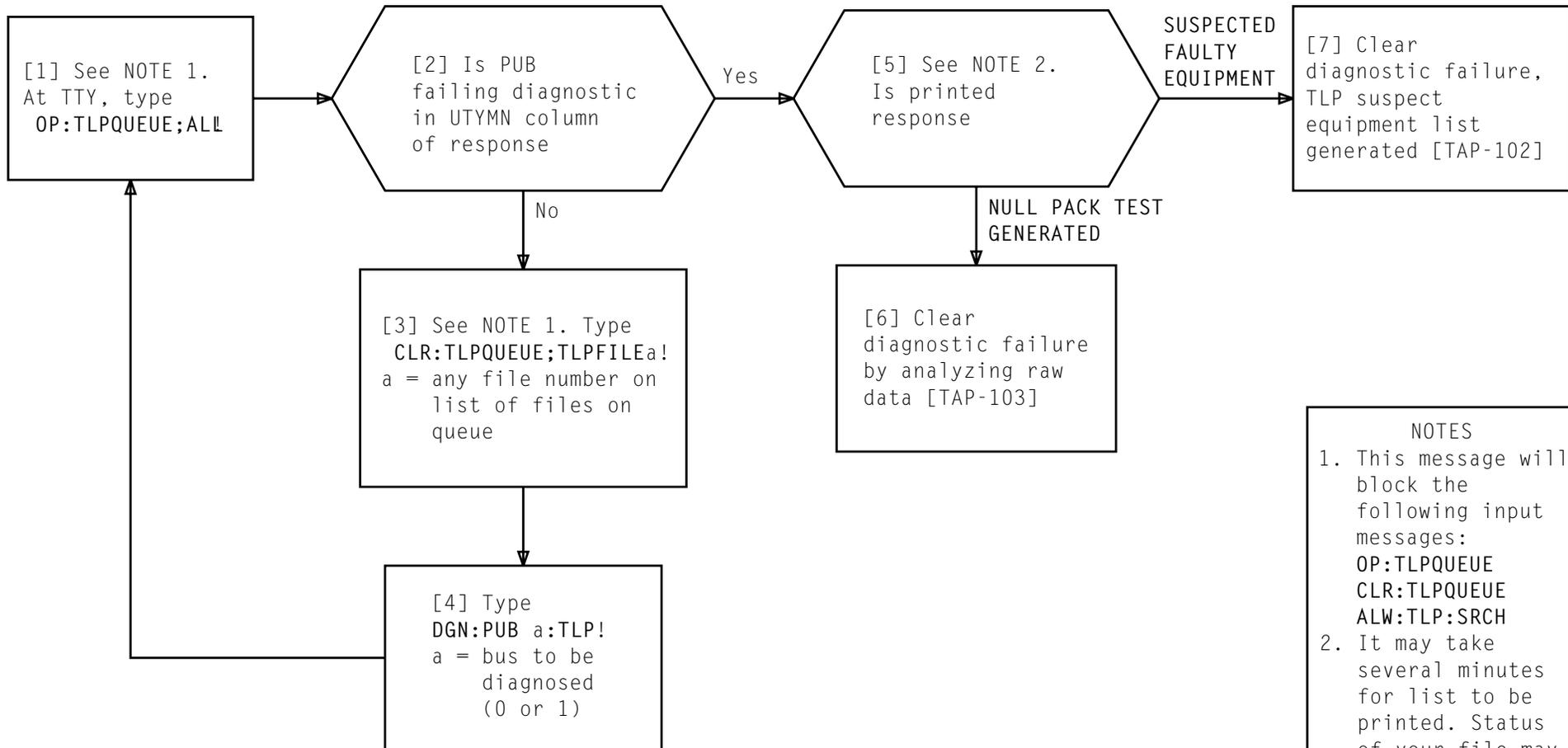
NOTE 1

It may take several minutes for list to be printed. Status of your file may be monitored by typing
OP:TLPQUEUE;ALL.
TLP file currently being processed is indicated by asterisk in priority column

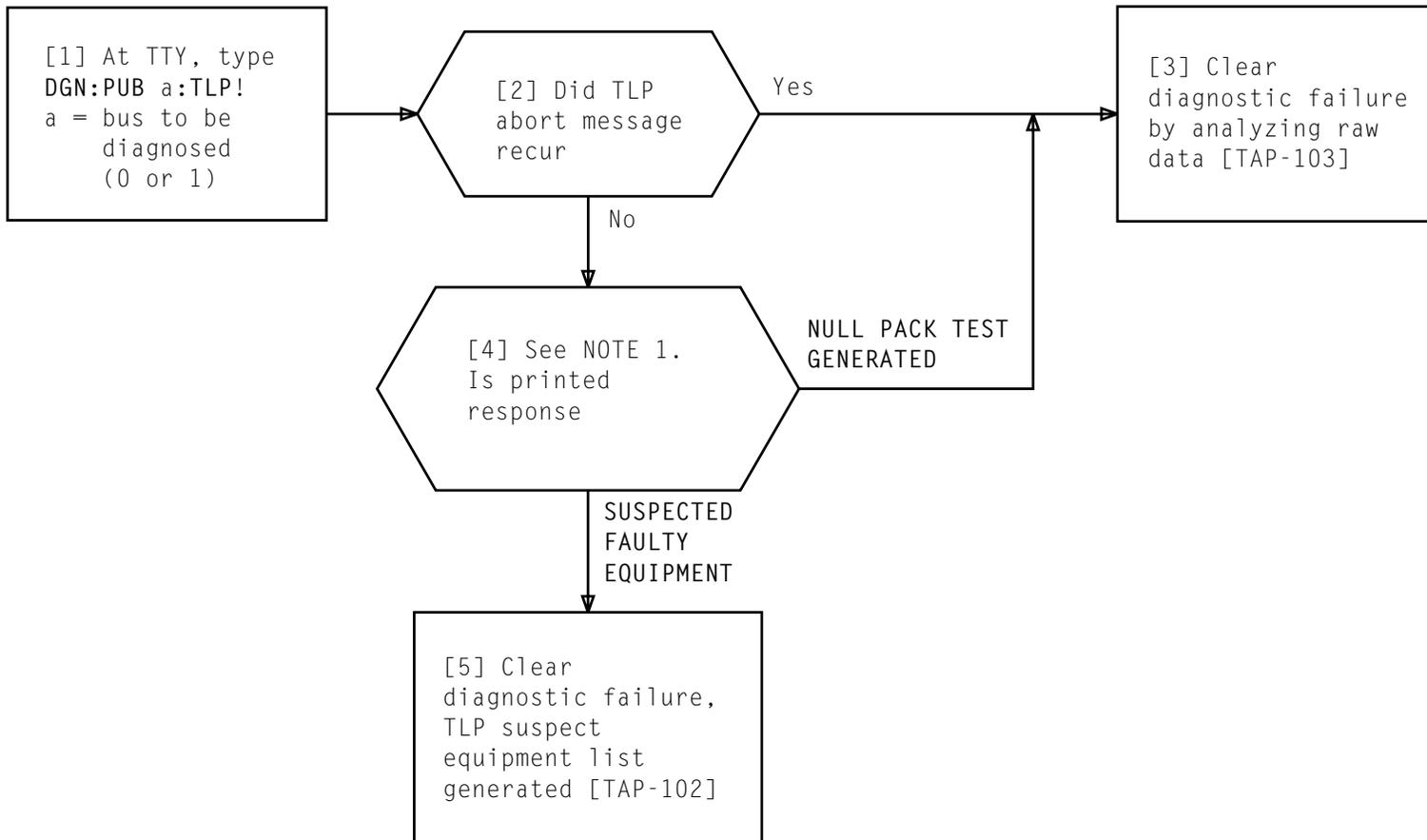
Issue 5	NOV 1995
---------	----------

234-151-015	TAP
-------------	-----

PAGE 1 of 1	106
-------------	-----

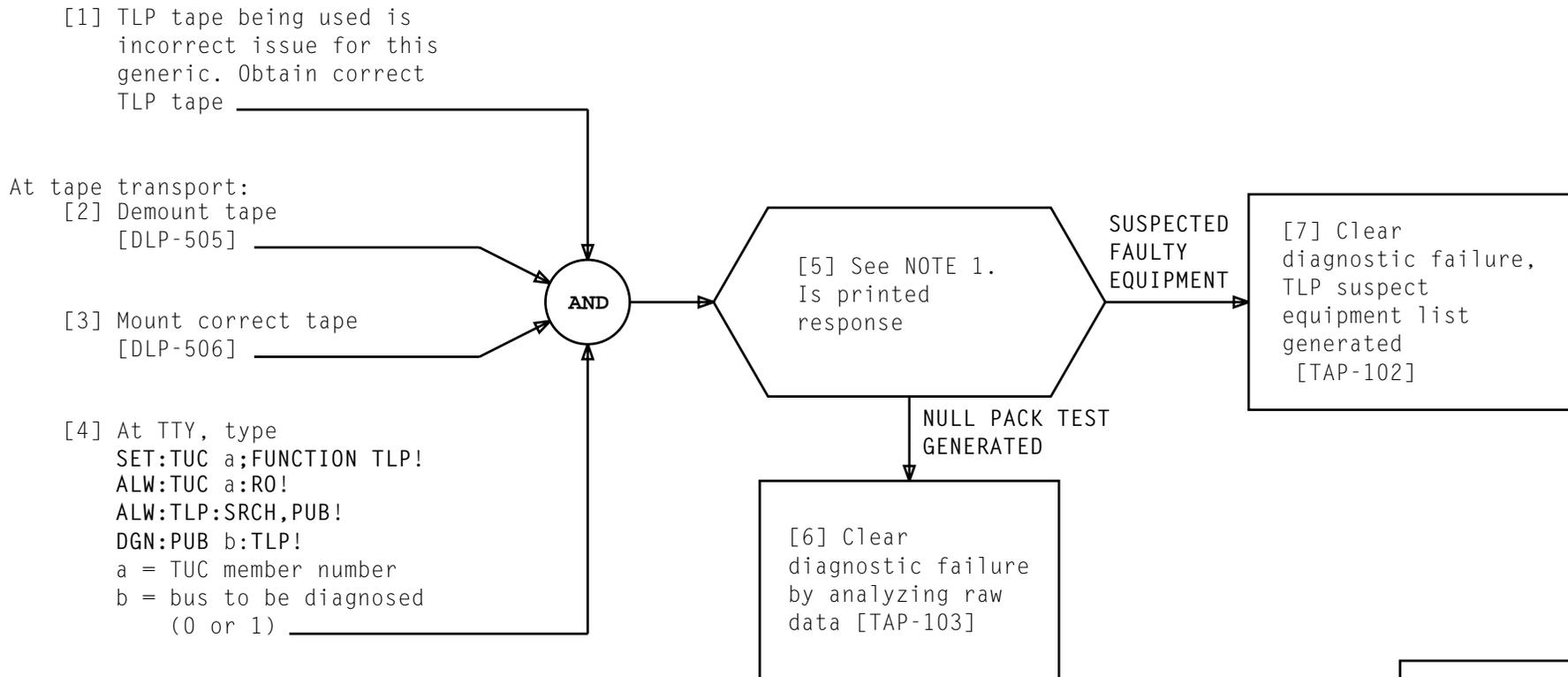


NOTES	
1. This message will block the following input messages: OP:TLPQUEUE CLR:TLPQUEUE ALW:TLP:SRCH	
2. It may take several minutes for list to be printed. Status of your file may be monitored by typing OP:TLPQUEUE;ALL!. TLP file currently being processed is indicated by asterisk in priority column	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	107



NOTE 1
 It may take several minutes for list to be printed. Status of your file may be monitored by typing
 OP:TLPQUEUE;ALL.
 TLP file currently being processed is indicated by asterisk in priority column

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	108



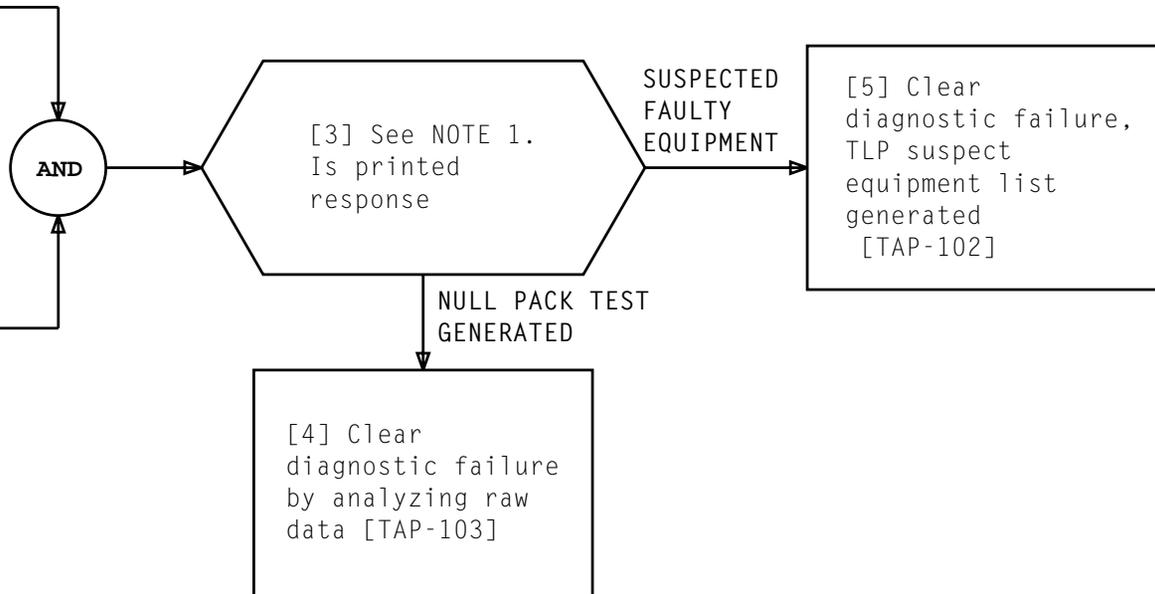
NOTE 1
 It may take several minutes for list to be printed. Status of your file may be monitored by typing
 OP:TLPQUEUE;ALL.
 TLP file currently being processed is indicated by asterisk in priority column

CLEAR DIAGNOSTIC FAILURE, TLP TAPE VERSION X DOES NOT MATCH VERSION Y

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	109

[1] Obtain and mount proper
TLP tape [DLP-506]

[2] At TTY, type
SET:TUCa;FUNCTION TLP!
ALW:TUCa:RO!
ALW:TLP:SRCH,PUB!
DGN:PUB b:TLP!
a = TUC member number
b = bus to be diagnosed
(0 or 1)



NOTE 1

It may take several minutes for list to be printed. Status of your file may be monitored by typing
OP:TLPQUEUE;ALL.
TLP file currently being processed is indicated by asterisk in priority column

Issue 5	NOV 1995
---------	----------

234-151-015	TAP
-------------	-----

PAGE 1 of 1	110
-------------	-----

CLEAR DIAGNOSTIC FAILURE, TLP TAPE NOT MOUNTED

1. Set scope **A** and **B TIME/DIV** settings to 0.5 μ sec and note bus bit being scoped
2. Locate waveform that most closely resembles scope pattern [FIG. 1, Page 2]
3. On TABLE A, Page 3 locate waveform chosen (A, B, C, etc); determine probable cause of trouble and perform suggested troubleshooting procedure

End of procedure

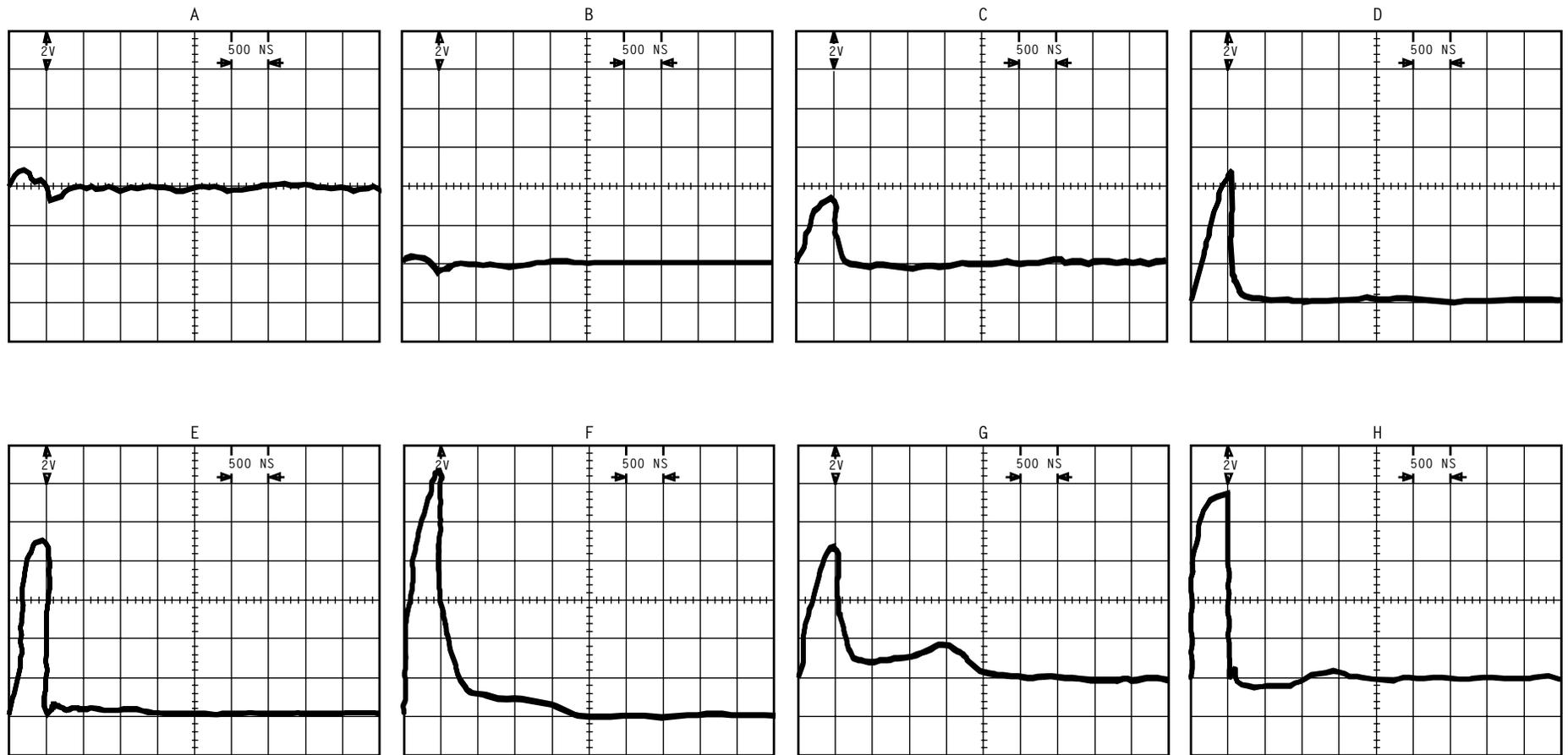
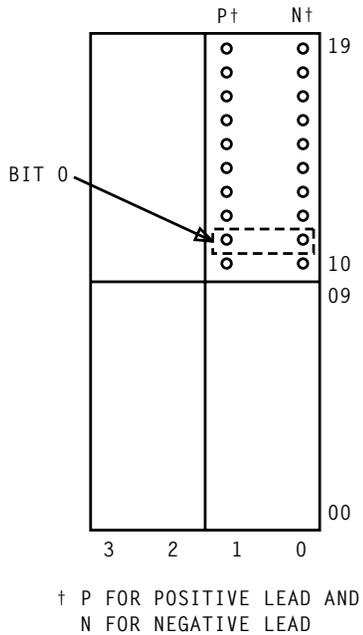


FIG. 1 - BUS Waveforms

TABLE A		
WAVEFORM	SCOPE PATTERN INDICATES PROBABLE CAUSE OF TROUBLE TO BE:	GENERAL TROUBLESHOOTING NOTES
A	Open P or N wire	If branch is not terminated at PUBB frame, use office record drawing T-nnnn-Hn-3840 to determine what frame is approximately halfway along branch; terminate same bus bit with BTR and scope at that point for normal pulse.* In this manner, narrow location of open between two adjacent frames†
B	Short across bus cable pair – very near scope probes	Use same procedure used for Waveform A
C	Possible high series resistance on bus pair between PUBB frame and BTR	Scope for normal pulse on same bus pair at PUBB frame. If normal, use same procedure used for Waveform A
D	Normal pulse (500 feet from driver)	If this pattern is obtained at PUBB frame, it is not normal. Output is too low, or marginal. Output should be between +8.9 and +9.7 volts
E	Normal pulse (pattern at driver)	If this pattern is obtained at 300 to 500 feet at BTR, then BTR could be partially open
F	Open at BTR (500 feet from driver)	Replace BTR assembly with known good assembly and scope same bus bit to verify
G	One side of bus grounded at or near driver (pattern at 500 feet from driver)	Start at PUBB frame and isolate using same procedure used for Waveform A
H	Short P wire to P wire of bit pair/or P wire to N wire of another	Use same procedure used for Waveform A
<p>* Using appropriate figure [FIG. 2 through 32], locate terminal connections for frame being terminated in BTR and bus bit being scoped</p> <p>† At each frame location where bus pair is scoped, that bus pair should be temporarily terminated in BTR at that point if not normally terminated in BTR</p>		

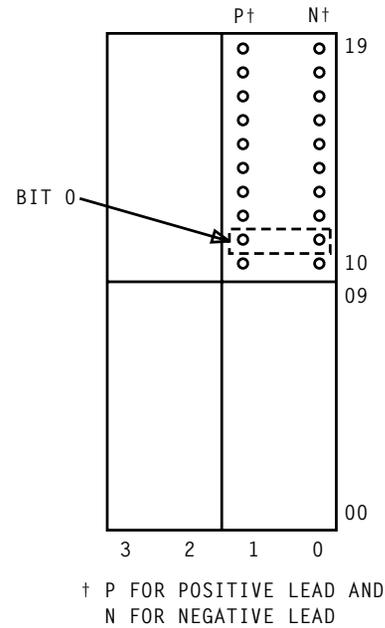
Issue 5	NOV 1995
234-151-015	TAD
PAGE 3 of 25	111



FRAME	BIT 0
CCIS	*80-25
EST	
BUS 0	080-17
BUS 1	080-38
IO	
BUS 0	080-03
BUS 1	080-27
IOP	
BUS 0	080-31
BUS 1	076-31
NCLK	*60-40
SP 1 (W/O COMBINED MATRIX FR)	
BUS 0	380-14
BUS 1	480-14
SP 1 (WITH COMBINED MATRIX FR)	
BUS 0	280-32
BUS 1	380-32
SP 2	
BUS 0	180-28
BUS 1	280-28
TMS A-1,2	*80-14
TMS B	
BUS 0	‡76-32
BUS 1	‡80-32
TSI A-1	*80-46
TSI A-2	*80-51
TSI B	*80-55

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR 1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 2 - Terminal Connections for Write Bus Bit 0 - CCIS, EST, IO, IOP, NCLK, SP, TMS, and TSI Frames



PUBB FRAME	BIT 0
BRANCH A	*76-03
BRANCH B	*72-06
BRANCH C	*76-05
BRANCH D	*72-07
BRANCH E	*64-03
BRANCH F	*60-06
BRANCH G	*64-05
BRANCH H	*60-07
BRANCH K	*48-03
BRANCH L	*44-06
BRANCH M	*48-05
BRANCH R	*44-07
BRANCH T	*36-03
BRANCH V	*32-06
BRANCH W	*36-05
BRANCH X	*32-07

* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 3 - Terminal Connections for Write Bus Bit 0 - PUBB Frame

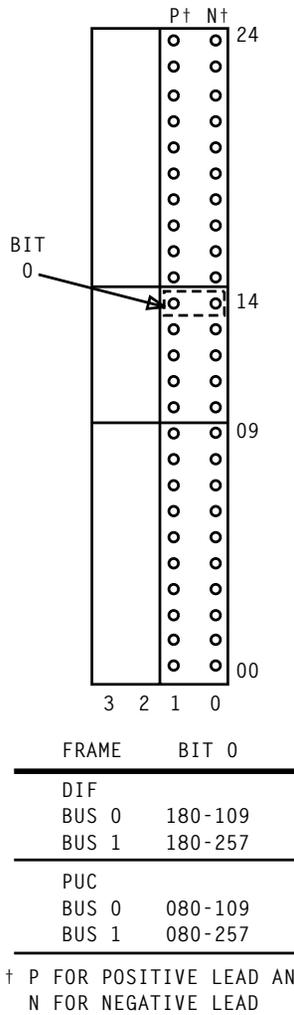


FIG. 4 - Terminal Connections for Write Bus Bit 0 - DIF and PUC Frames

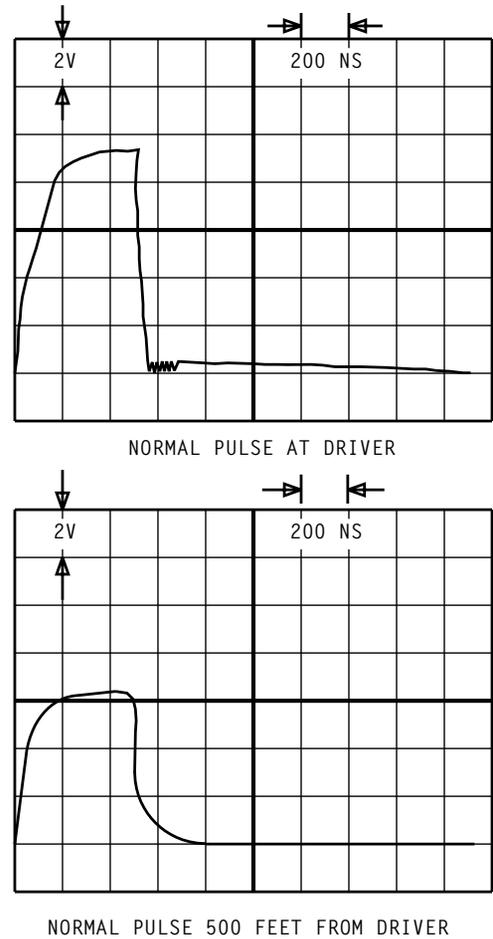
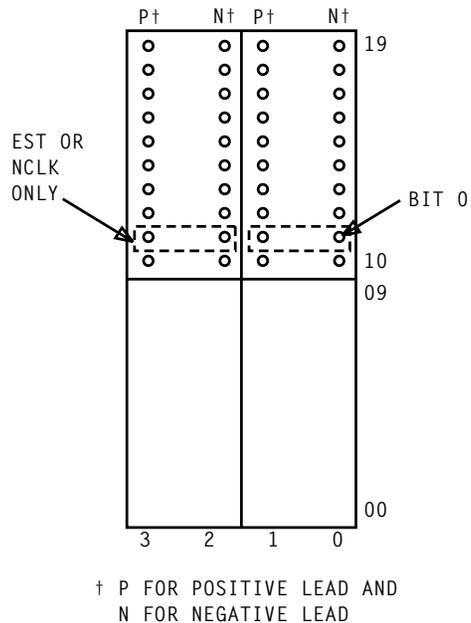


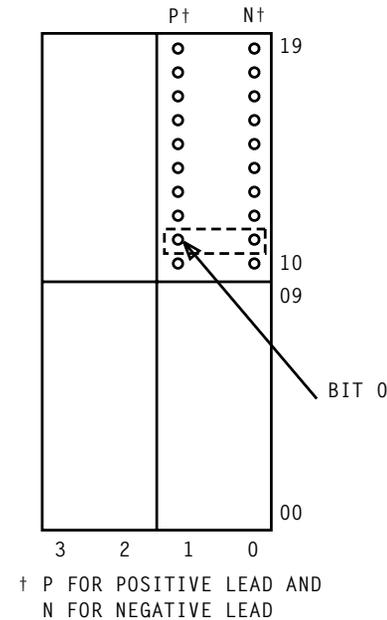
FIG. 5 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver for Write Bus Bit 0



FRAME	BIT 0
CCIS	*80-33
EST	
BUS 0	080-02
BUS 1	080-23
IO	
BUS 0	080-11
BUS 1	080-36
IOP	
BUS 0	080-40
BUS 1	076-40
NCLK	*60-48
SP 1 (W/O COMBINED MATRIX FR)	
BUS 0	380-04
BUS 1	480-04
SP 1 (WITH COMBINED MATRIX FR)	
BUS 0	280-20
BUS 1	380-20
SP 2	
BUS 0	180-18
BUS 1	280-18
TMS A-1,2	*80-04
TMS B	
BUS 0	‡76-20
BUS 1	‡80-20
TSI A-1	*80-36
TSI A-2	*80-39
TSI B	*80-43
VIF	
BUS 0	152-15
BUS 1	152-25

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS
BAY 0 OR 1 FOR BUS TERMINATING
AT TMS BAY 1

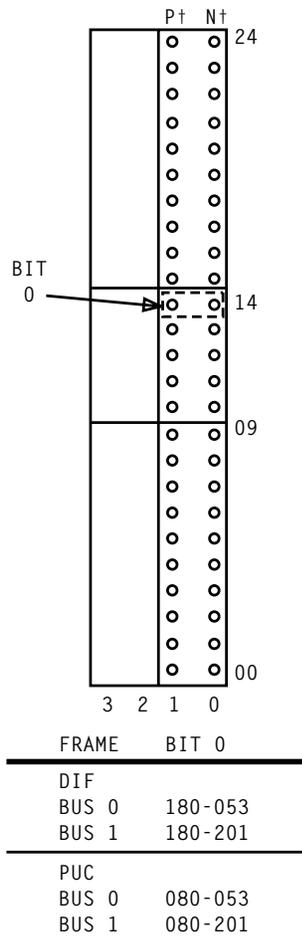
FIG. 6 - Terminal Connections for Reply Bus Bit 0 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI, and VIF Frames



PUBB FRAME	BIT 0
BRANCH A	*76-19
BRANCH B	*72-17
BRANCH C	*76-20
BRANCH D	*72-18
BRANCH E	*64-19
BRANCH F	*60-17
BRANCH G	*64-20
BRANCH H	*60-18
BRANCH K	*48-19
BRANCH L	*44-17
BRANCH M	*48-20
BRANCH R	*44-18
BRANCH T	*36-19
BRANCH V	*32-17
BRANCH W	*36-20
BRANCH X	*32-18

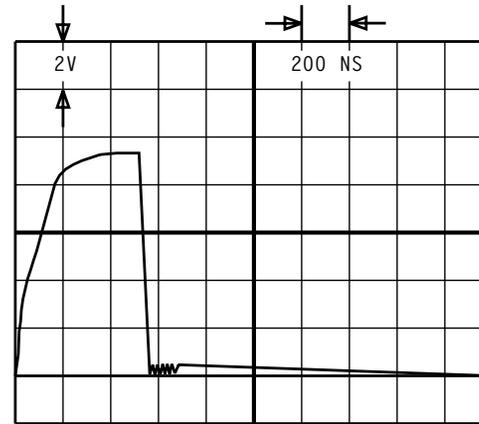
* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 7 - Terminal Connections for Reply Bus Bit 0 - PUBB Frame

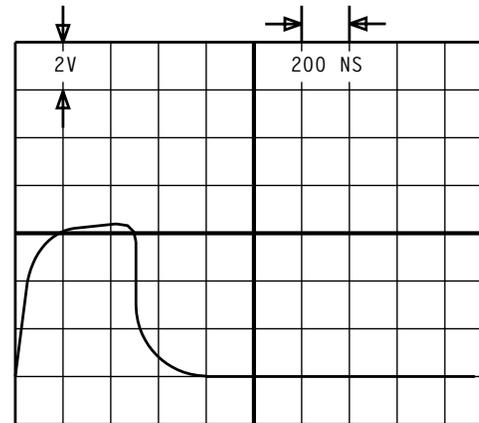


†P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FIG. 8 - Terminal Connections for Reply Bus
Bit 0 - DIF and PUC Frames

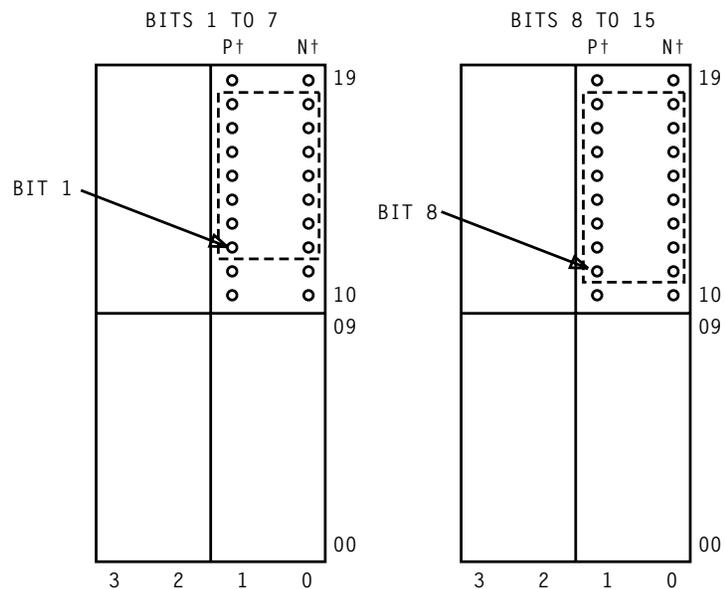


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 9 - Example Waveforms of Normal Pulse
at Driver and 500 Feet From Driver for
Reply Bus Bit 0

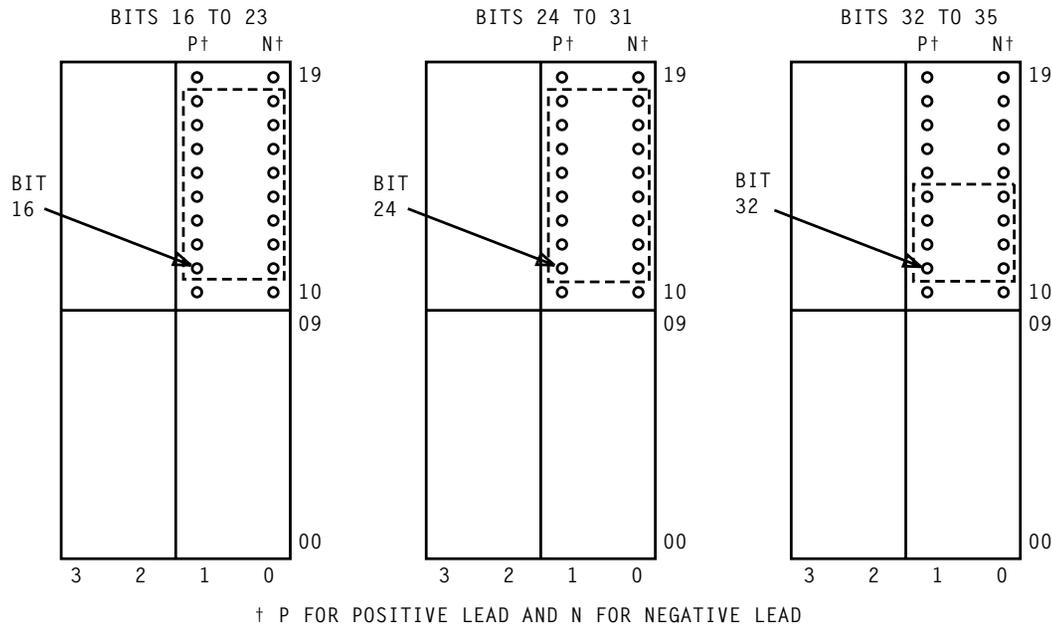


† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FRAME	BITS 1 TO 7	BITS 8 TO 15
CCIS	*80-25	*80-23
EST		
BUS 0	080-17	080-16
BUS 1	080-38	080-37
IO		
BUS 0	080-03	080-04
BUS 1	080-27	080-28
IOP		
BUS 0	080-31	080-33
BUS 1	076-31	076-33
NCLK	*60-40	*60-39
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-14	380-13
BUS 1	480-14	480-13
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-32	280-30
BUS 1	380-32	380-30
SP 2		
BUS 0	180-28	180-27
BUS 1	280-28	280-27
TMS A-1,2	*80-14	*80-13
TMS B		
BUS 0	‡76-32	‡76-30
BUS 1	‡80-32	‡80-30
TSI A-1	*80-46	*80-45
TSI A-2	*80-51	*80-49
TSI B	*80-55	*80-53

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS
 BAY 0 OR 1 FOR PUB TERMINATING
 AT TMS BAY 1

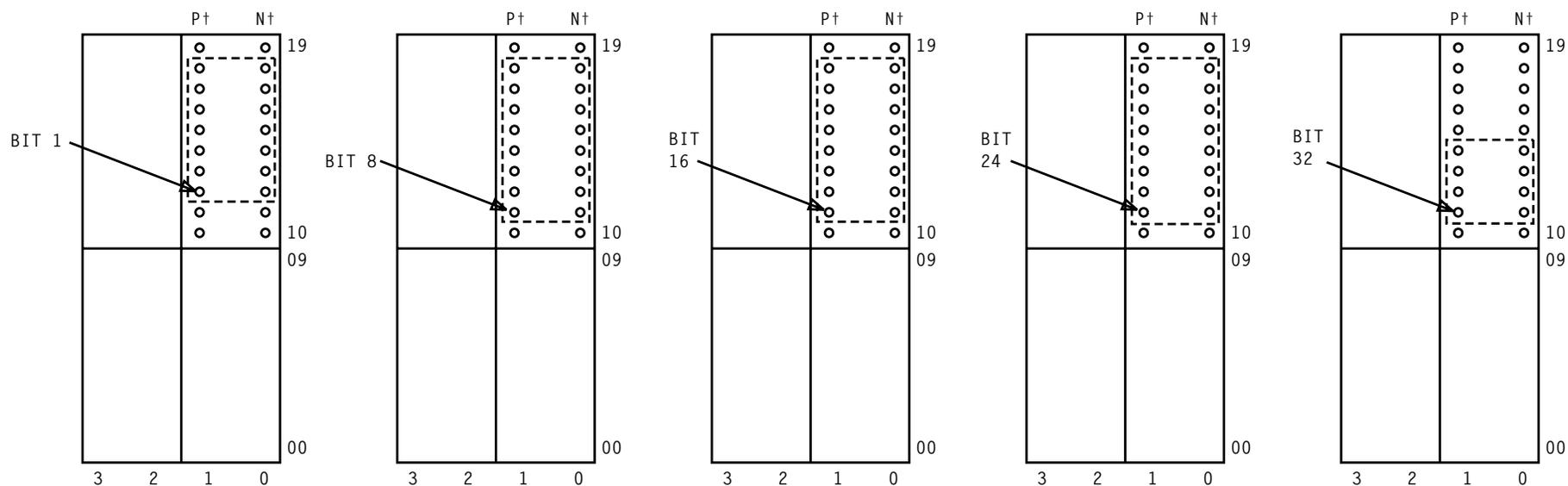
FIG. 10 - Terminal Connections for Write Bus Bits 1 Through 15 - CCIS, EST, IO, IOP, NCLK, SP, TMS, and TSI Frames



FRAME	BITS 16 TO 23	BITS 24 TO 31	BITS 32 TO 35
CCIS	*80-21	*80-19	*80-18
EST			
BUS 0	080-15	080-14	080-13
BUS 1	080-36	080-35	080-34
IO			
BUS 0	080-05	080-06	080-07
BUS 1	080-29	080-31	080-32
IOP			
BUS 0	080-34	080-36	080-37
BUS 1	076-34	076-36	076-37
NCLK	*60-38	*60-37	*60-36
SP 1 (W/O COMBINED MATRIX FR)			
BUS 0	380-12	380-11	380-10
BUS 1	480-12	480-11	480-10
SP 1 (WITH COMBINED MATRIX FR)			
BUS 0	280-29	280-27	280-26
BUS 1	380-29	380-27	380-26
SP 2			
BUS 0	180-26	180-25	180-24
BUS 1	280-26	280-25	280-24
TMS A-1,2	*80-12	*80-11	*80-10
TMS B			
BUS 0	‡76-29	‡76-27	‡76-26
BUS 1	‡80-29	‡80-27	‡80-26
TSI A-1	*80-44	*80-43	*80-42
TSI A-2	*80-48	*80-46	*80-45
TSI B	*80-52	*80-50	*80-49

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR
1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 11 - Terminal Connections for Write Bus Bits 16 Through 35 - CCIS, EST, IO, IOP, NCLK, SP, TMS, and TSI Frames



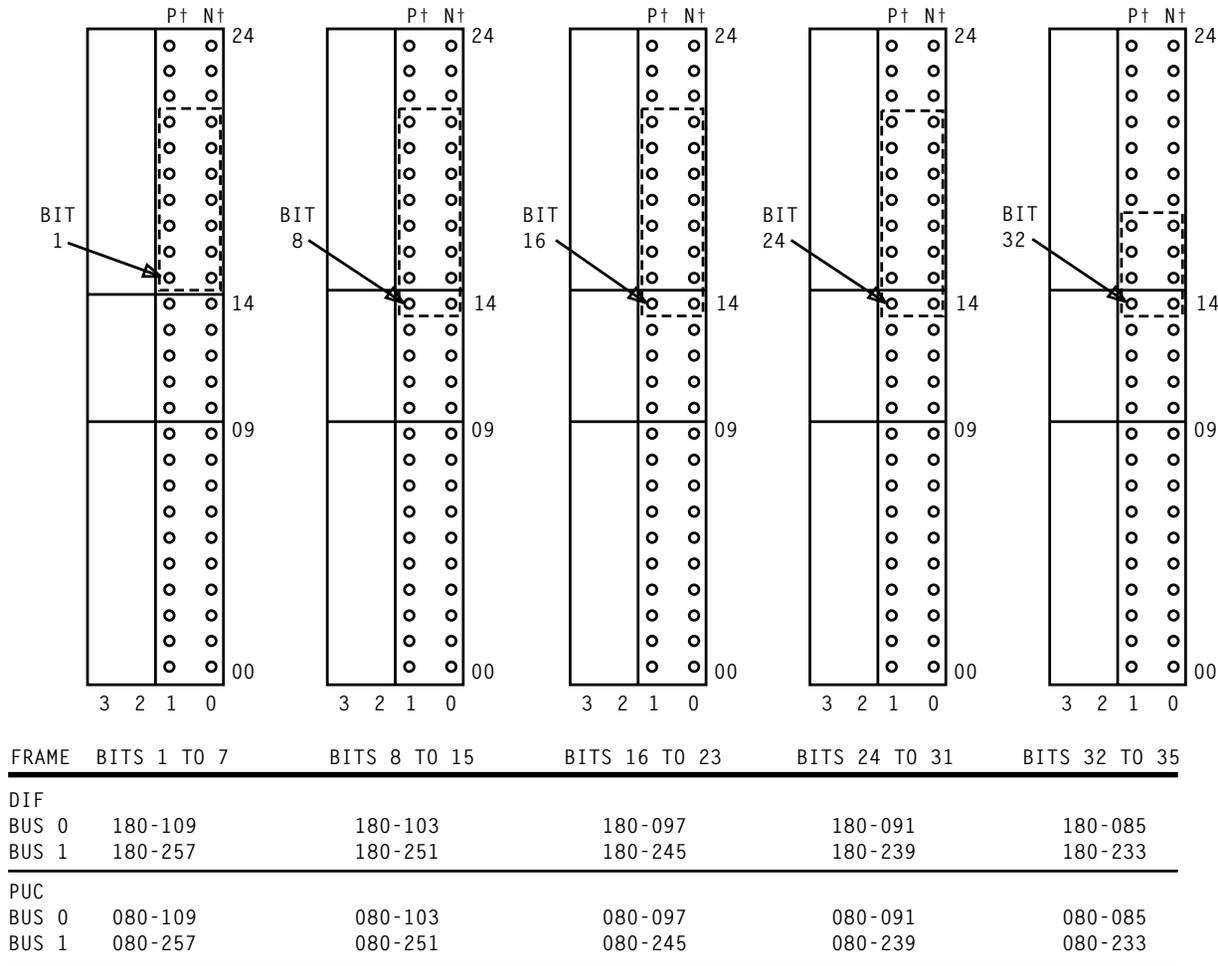
PUBB FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23	BITS 24 TO 31	BITS 32 TO 35
BRANCH A	*76-03	*76-12	*76-34	*76-06	*76-09
BRANCH B	*72-06	*72-12	*72-34	*72-08	*72-10
BRANCH C	*76-05	*76-14	*76-36	*76-08	*76-11
BRANCH D	*72-07	*72-13	*72-35	*72-09	*72-11
BRANCH E	*64-03	*64-12	*64-34	*64-06	*64-09
BRANCH F	*60-06	*60-12	*60-34	*60-08	*60-10
BRANCH G	*64-05	*64-14	*64-36	*64-08	*64-11
BRANCH H	*60-07	*60-13	*60-35	*60-09	*60-11
BRANCH K	*48-03	*48-12	*48-34	*48-06	*48-09
BRANCH L	*44-06	*44-12	*44-34	*44-08	*44-10
BRANCH M	*48-05	*48-14	*48-36	*48-08	*48-11
BRANCH R	*44-07	*44-13	*44-35	*44-09	*44-11
BRANCH T	*36-05	*36-12	*36-34	*36-06	*36-09
BRANCH V	*32-06	*32-12	*32-34	*32-08	*32-10
BRANCH W	*36-05	*36-14	*36-36	*36-08	*36-11
BRANCH X	*32-07	*32-13	*32-35	*32-09	*32-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

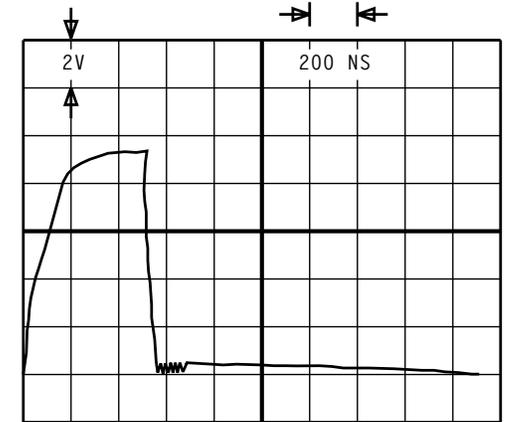
FIG. 12 - Terminal Connections for Write Bus Bits 1 Through 35 - PUBB Frame

Issue 5	NOV 1995
234-151-015	TAD
PAGE 10 of 25	111

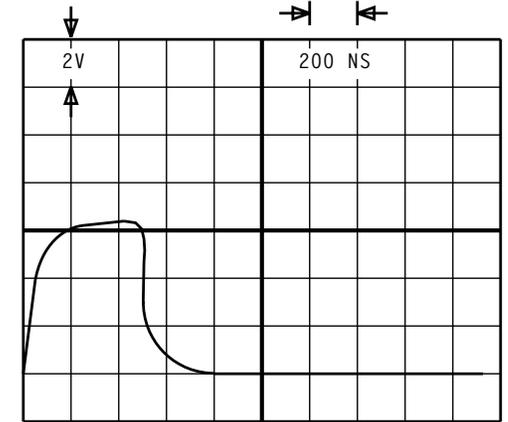


† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 13 - Terminal Connections for Write Bus Bits 1 Through 35 - DIF and PUC Frames

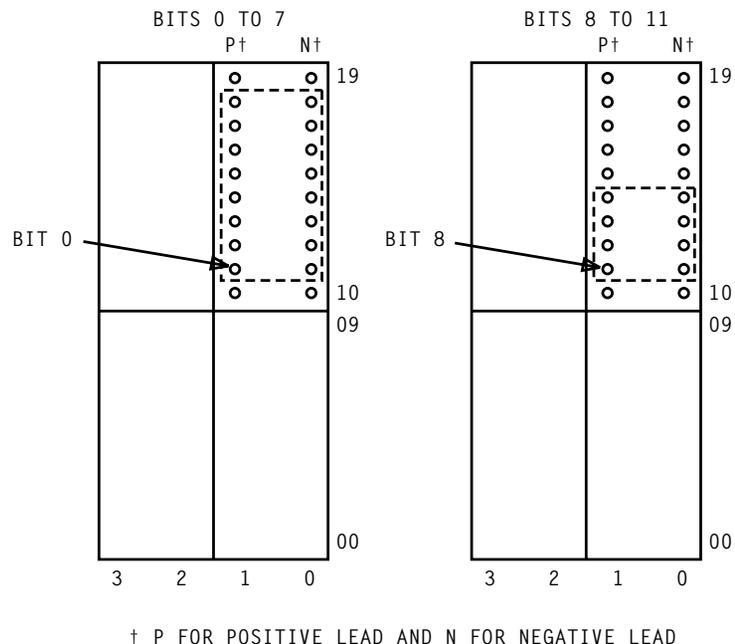


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

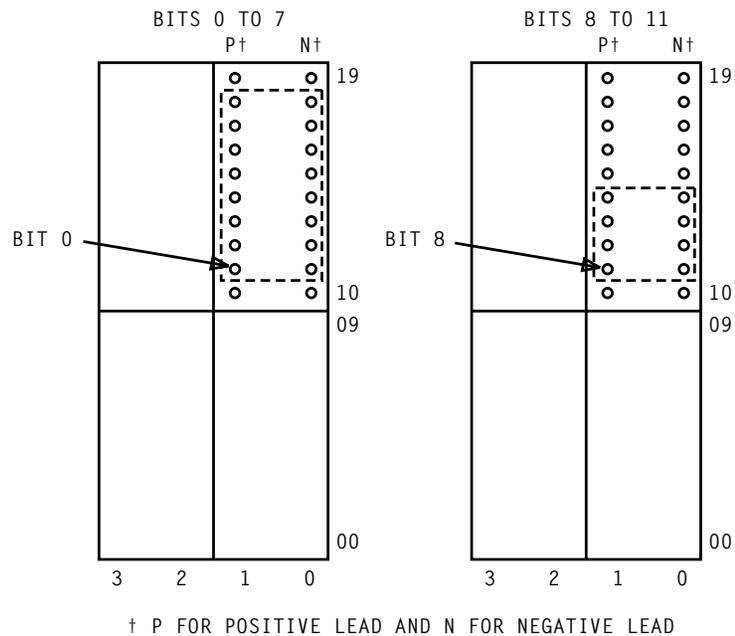
FIG. 14 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver for Write Bus Bits 1 Through 35



FRAME	BITS 0 TO 7	BITS 8 TO 11
CCIS	*80-16	*80-15
EST		
BUS 0	080-12	080-11
BUS 1	080-33	080-32
IO		
BUS 0	080-08	080-09
BUS 1	080-33	080-34
IOP		
BUS 0	080-24	080-27
BUS 1	076-24	076-27
NCLK	*60-35	*60-34
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-09	380-08
BUS 1	480-09	480-08
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-24	280-23
BUS 1	380-24	380-23
SP 2		
BUS 0	180-23	180-22
BUS 1	280-23	280-22
TMS A-1,2	*80-09	*80-08
TMS B		
BUS 0	‡76-24	‡76-23
BUS 1	‡80-24	‡80-23
TSI A-1	*80-41	*80-40
TSI A-2	*80-43	*80-42
TSI B	*80-47	*80-46

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR
 1 FOR PUB TERMINATING AT TMS BAY 1

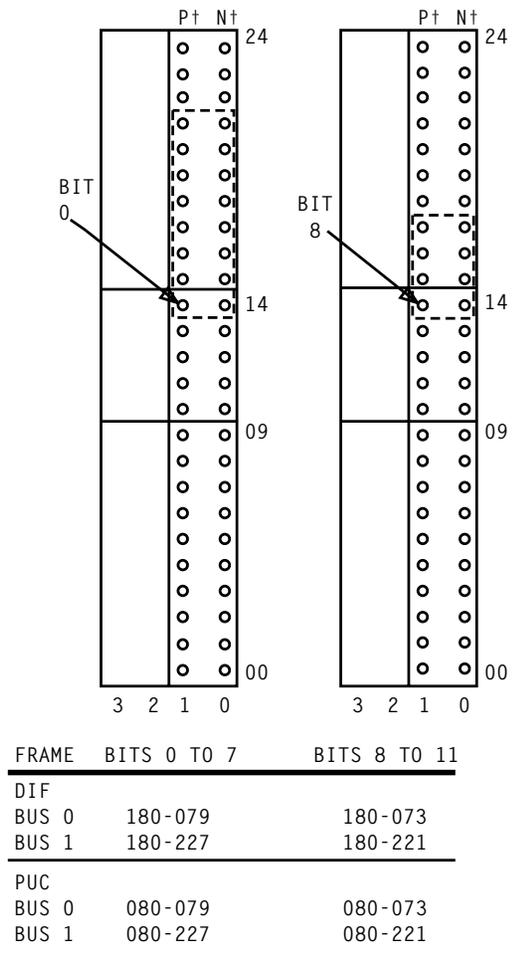
FIG. 15 - Terminal Connections for Enable Address Bus Bits 0 Through 11 -
 CCIS, EST, IO, IOP, NCLK, SP, TMS, and TSI Frames



PUBB FRAME	BITS 0 TO 7	BITS 8 TO 11
BRANCH A	*76-37	*76-40
BRANCH B	*72-36	*72-38
BRANCH C	*76-39	*76-42
BRANCH D	*72-37	*72-39
BRANCH E	*64-37	*64-40
BRANCH F	*60-36	*60-38
BRANCH G	*64-39	*64-42
BRANCH H	*60-37	*60-39
BRANCH K	*48-37	*48-40
BRANCH L	*44-36	*44-38
BRANCH M	*48-39	*48-42
BRANCH R	*44-37	*44-39
BRANCH T	*36-37	*36-40
BRANCH V	*32-36	*32-38
BRANCH W	*36-39	*36-42
BRANCH X	*32-37	*32-39

* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 16 - Terminal Connections for Enable Address Bus Bits 0 Through 11 - PUBB Frame



† P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FIG. 17 - Terminal Connections for Enable Address Bus Bits 0 Through 11 - DIF and PUC Frames

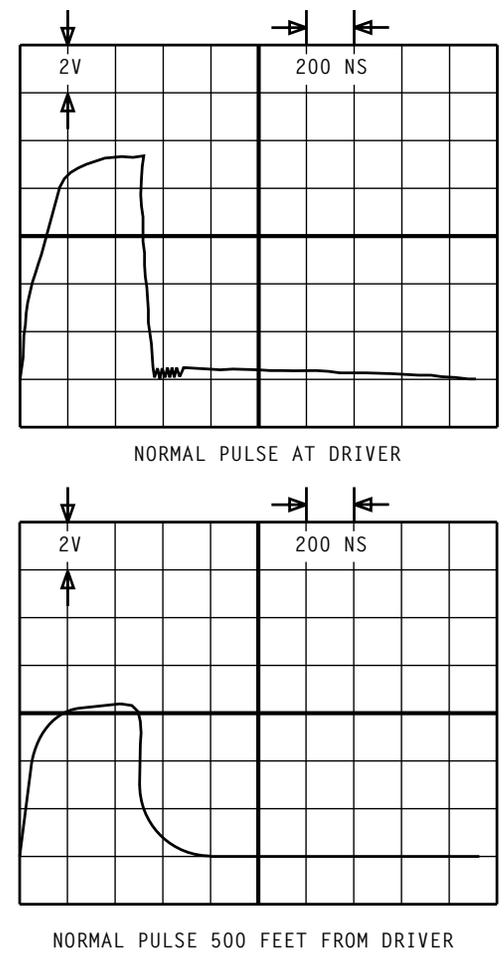
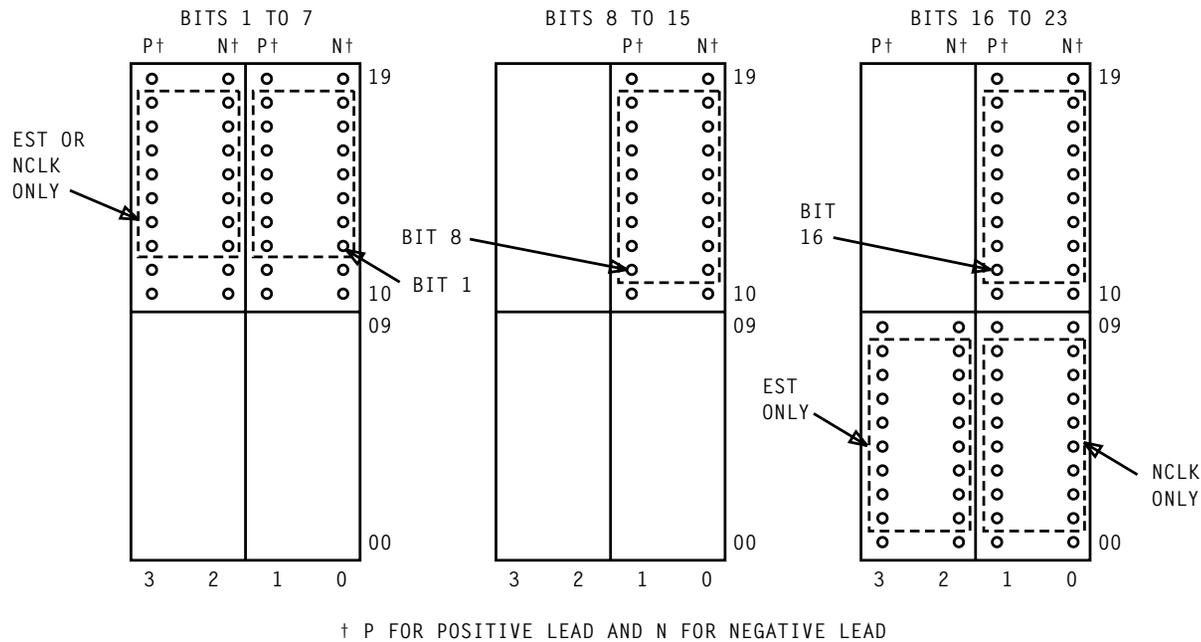


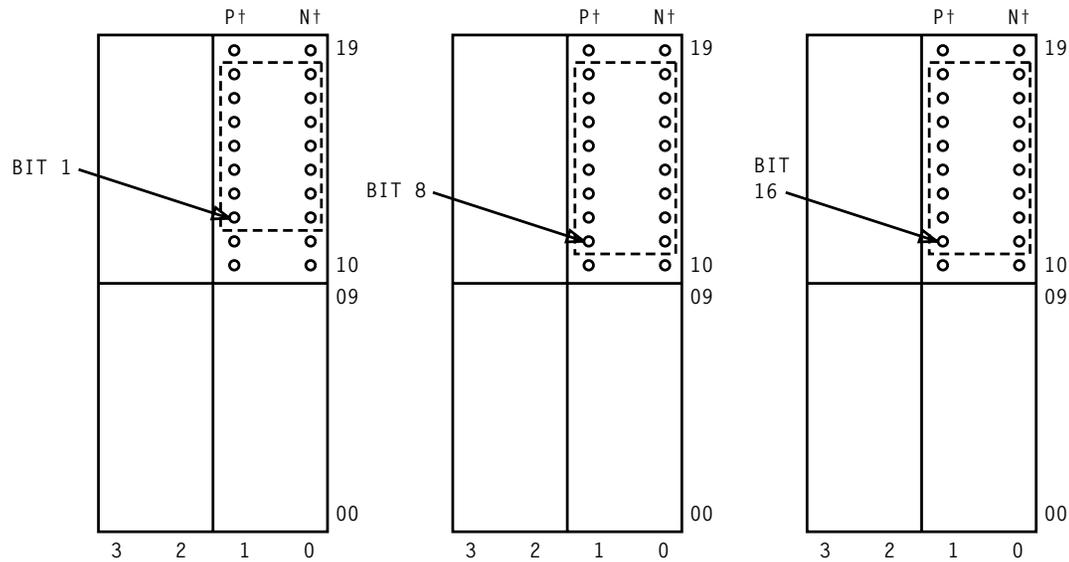
FIG. 18 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver For Enable Address Bus Bits 0 Through 11



FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
CCIS	*80-33	*80-32	*80-31
EST			
BUS 0	080-02	080-02	080-02
BUS 1	080-23	080-23	080-23
IO			
BUS 0	080-11	080-12	080-13
BUS 1	080-36	080-37	080-38
IOP			
BUS 0	080-40	080-41	080-42
BUS 1	076-40	076-41	076-42
NCLK	*60-48	*60-48	*60-48
SP 1 (W/O COMBINED MATRIX FR)			
BUS 0	380-04	380-03	380-02
BUS 1	480-04	480-03	480-02
SP 1 (WITH COMBINED MATRIX FR)			
BUS 0	280-20	280-18	280-16
BUS 1	380-20	380-18	380-16
SP 2			
BUS 0	180-18	180-17	180-16
BUS 1	280-18	280-17	280-16
TMS A-1,2	*80-04	*80-03	*80-02
TMS B			
BUS 0	†76-20	†76-18	†76-16
BUS 1	†80-20	†80-18	†80-16
TSI A-1	*80-36	*80-35	*80-34
TSI A-2	*80-39	*80-37	*80-35
TSI B	*80-43	*80-41	*80-39
VIF			
BUS 0	152-15	152-14	152-13
BUS 1	152-25	152-24	152-23

* 0 FOR BUS 0 OR 1 FOR BUS 1
 † 0 FOR PUB TERMINATING AT TMS BAY 0 OR 1 FOR
 PUB TERMINATING AT TMS BAY 1

FIG. 19 - Terminal Connections for Reply Bus Bits 1 Through 23 -
 CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI, and VIF Frames

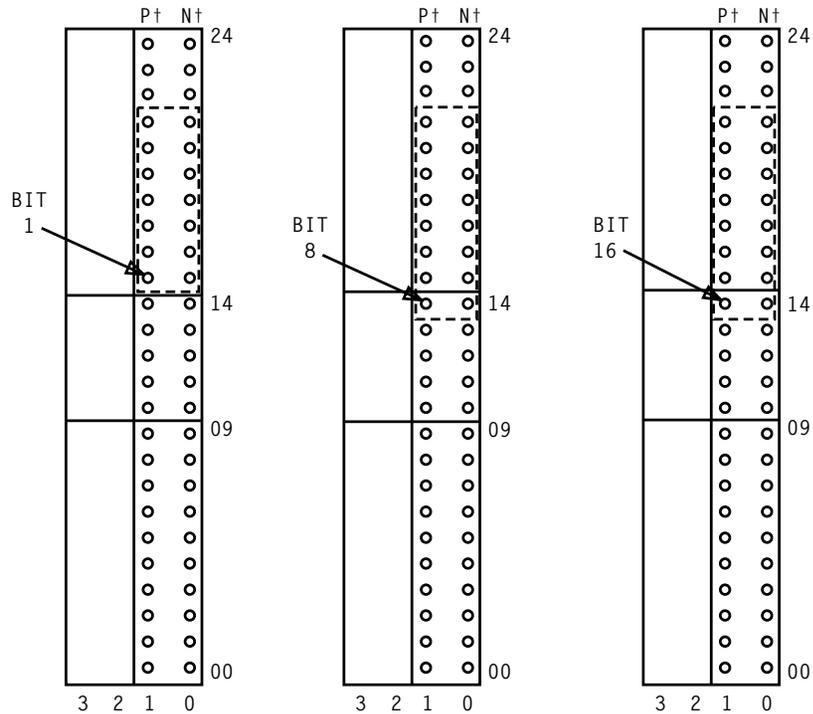


PUBB FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
BRANCH A	*76-19	*76-21	*76-23
BRANCH B	*72-17	*72-19	*72-25
BRANCH C	*76-20	*76-22	*76-24
BRANCH D	*72-18	*72-20	*72-26
BRANCH E	*64-19	*64-21	*64-23
BRANCH F	*60-17	*60-19	*60-25
BRANCH G	*64-20	*64-22	*64-24
BRANCH H	*60-18	*60-20	*60-26
BRANCH K	*48-19	*48-21	*48-23
BRANCH L	*44-17	*44-19	*44-25
BRANCH M	*48-20	*48-22	*48-24
BRANCH R	*44-18	*44-20	*44-26
BRANCH T	*36-19	*36-21	*36-23
BRANCH V	*32-17	*32-19	*32-25
BRANCH W	*36-20	*36-22	*36-24
BRANCH X	*32-18	*32-20	*32-26

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

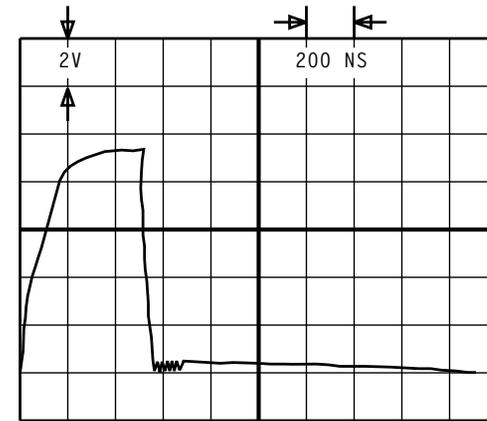
FIG. 20 - Terminal Connections for Reply Bus Bits 1 Through 23 - PUBB Frame



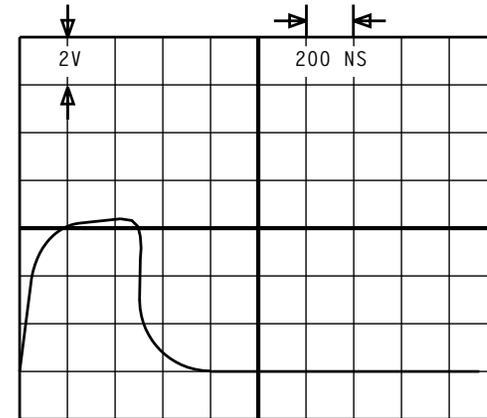
FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
DIF			
BUS 0	180-053	180-041	180-035
BUS 1	180-201	180-189	180-183
PUC			
BUS 0	080-053	080-041	080-035
BUS 1	080-201	080-189	080-183

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 21 - Terminal Connections for Reply Bus Bits 1 Through 23 - DIF and PUC Frames

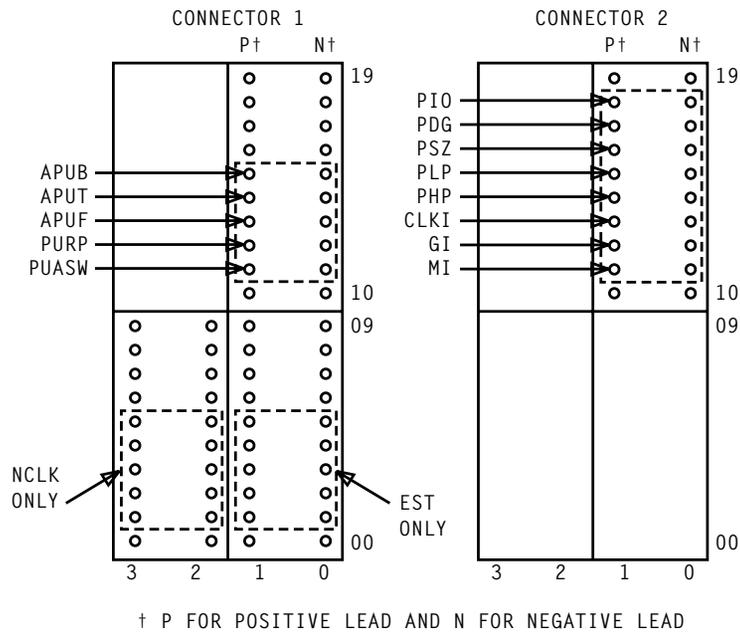


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

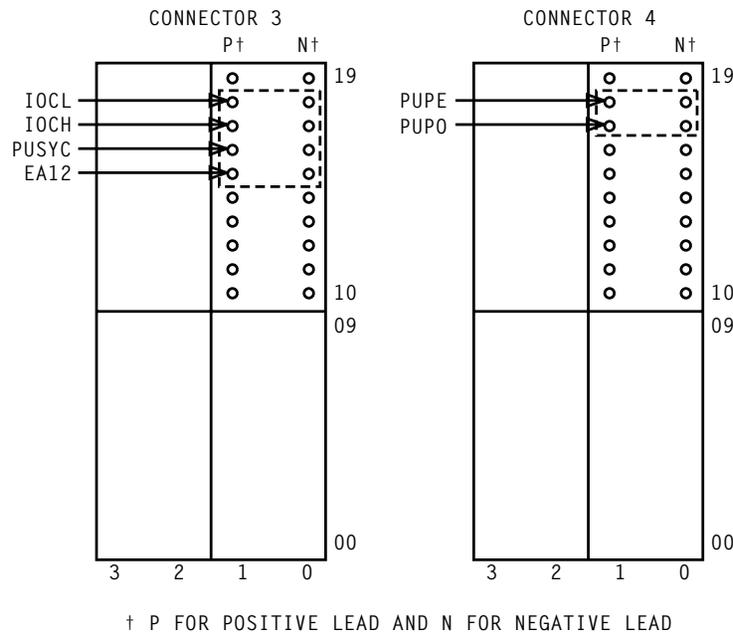
FIG. 22 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver For Reply Bus Bits 1 Through 23



FRAME	CONNECTOR 1	CONNECTOR 2
CCIS	*80-30	*80-13
EST		
BUS 0	080-02	080-10
BUS 1	080-23	080-31
IO		
BUS 0	080-14	080-10
BUS 1	080-39	080-35
IOP		
BUS 0	080-39	080-29
BUS 1	076-39	076-29
NCLK	*60-48	*60-47
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-01	380-07
BUS 1	480-01	480-07
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-14	280-21
BUS 1	380-14	380-21
SP 2		
BUS 0	180-15	180-21
BUS 1	280-15	280-21
TMS A-1,2	*80-01	*80-07
TMS B		
BUS 0	‡76-14	‡76-21
BUS 1	‡80-14	‡80-21
TSI A-1	*80-33	*80-39
TSI A-2	*80-33	*80-40
TSI B	*80-37	*80-44
VIF		
BUS 0	152-12	152-09
BUS 1	152-22	152-27

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0
OR 1 FOR PUB TERMINATING AT TMS BAY 1

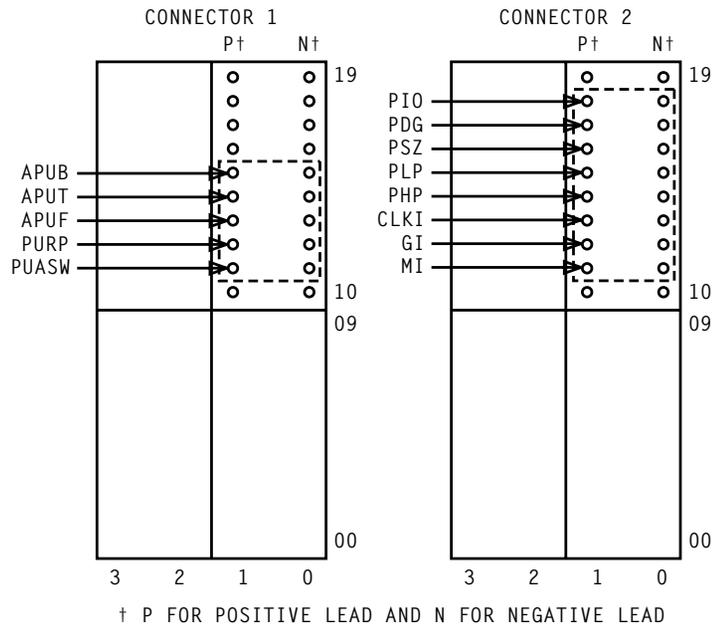
FIG. 23 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1 and 2 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI, and VIF Frames



FRAME	CONNECTOR 3	CONNECTOR 4
CCIS	*80-15	*80-18
EST		
BUS 0	080-11	080-13
BUS 1	080-32	080-34
IO		
BUS 0	080-09	080-07
BUS 1	080-34	080-32
IOP		
BUS 0	080-27	080-37
BUS 1	076-27	076-37
NCLK	*60-34	*60-36
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-08	380-10
BUS 1	480-08	480-10
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-23	280-26
BUS 1	380-23	380-26
SP 2		
BUS 0	180-22	180-24
BUS 1	280-22	280-24
TMS A-1,2	*80-08	*80-10
TMS B		
BUS 0	‡76-23	‡76-26
BUS 1	‡80-23	‡80-26
TSI A-1	*80-40	*80-42
TSI A-2	*80-42	*80-45
TSI B	*80-46	*80-49
VIF		
BUS 0	NONE	NONE
BUS 1	NONE	NONE

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS BAY 0
 OR 1 FOR PUB TERMINATING AT TMS BAY 1

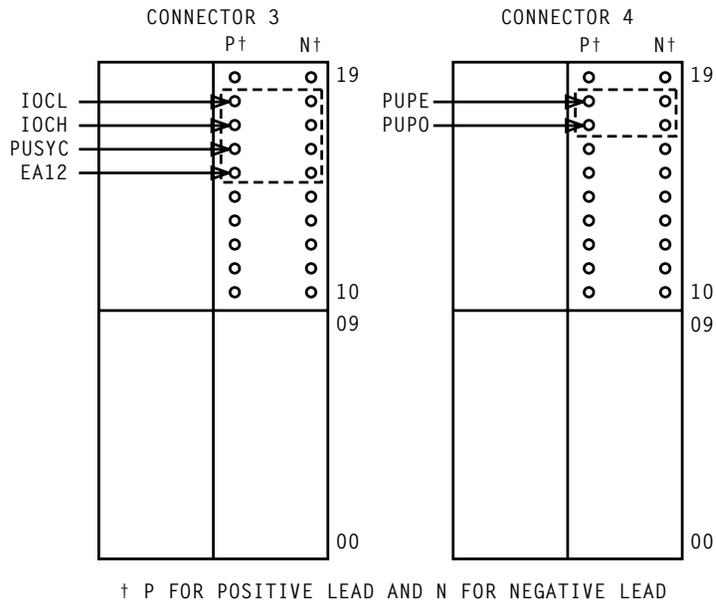
FIG. 24 - Terminal Connections for Control Bus and Miscellaneous Bus Bits,
 Connectors 3 and 4 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI, and VIF Frames



PUBB FRAME	CONNECTOR 1	CONNECTOR 2
BRANCH A	*76-25	*76-31
BRANCH B	*72-27	*72-32
BRANCH C	*76-26	*76-33
BRANCH D	*72-28	*72-33
BRANCH E	*64-25	*64-31
BRANCH F	*60-27	*60-32
BRANCH G	*64-26	*64-33
BRANCH H	*60-28	*60-33
BRANCH K	*48-25	*48-31
BRANCH L	*44-27	*44-32
BRANCH M	*48-26	*48-33
BRANCH R	*44-28	*44-33
BRANCH T	*36-25	*36-31
BRANCH V	*32-27	*32-32
BRANCH W	*36-26	*36-33
BRANCH X	*32-28	*32-33

* 0 FOR BUS 0 OR 1 FOR BUS 1

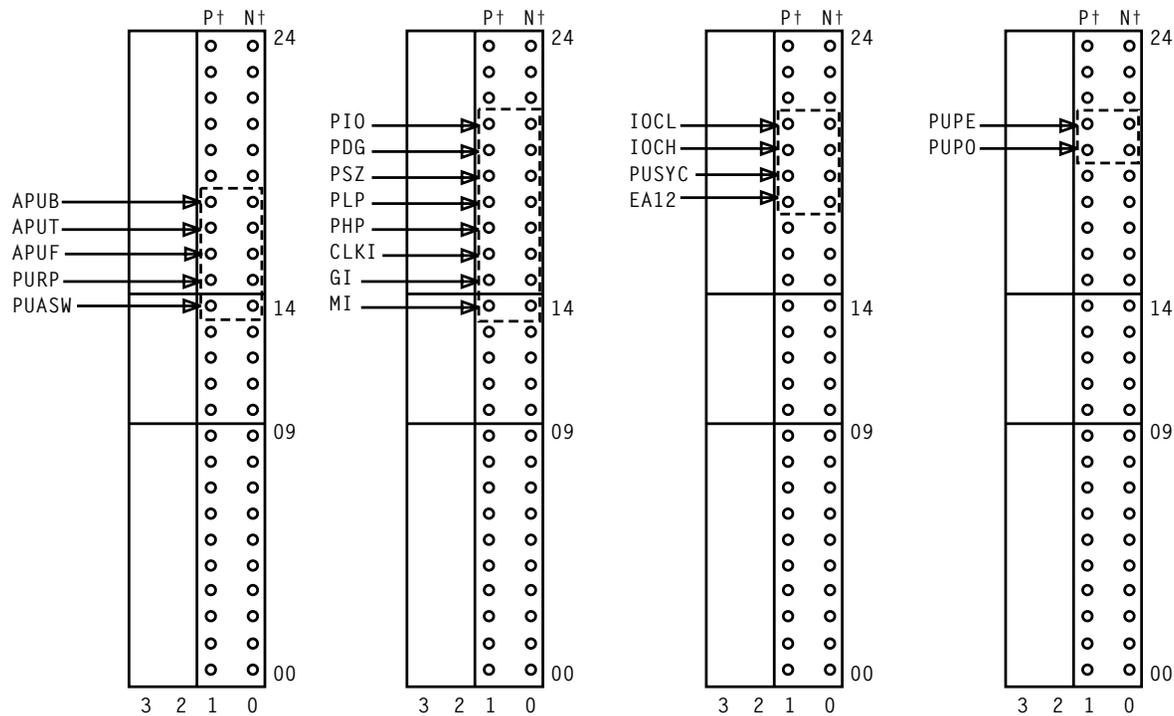
FIG. 25 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1 and 2 - PUBB Frame



PUBB FRAME	CONNECTOR 3	CONNECTOR 4
BRANCH A	*76-40	*76-09
BRANCH B	*72-38	*72-10
BRANCH C	*76-42	*76-11
BRANCH D	*72-39	*72-11
BRANCH E	*64-40	*64-09
BRANCH F	*60-38	*60-10
BRANCH G	*64-42	*64-11
BRANCH H	*60-39	*60-11
BRANCH K	*48-40	*48-09
BRANCH L	*44-38	*44-10
BRANCH M	*48-42	*48-11
BRANCH R	*44-39	*44-11
BRANCH T	*36-40	*36-09
BRANCH V	*32-38	*32-10
BRANCH W	*36-42	*36-11
BRANCH X	*32-39	*32-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

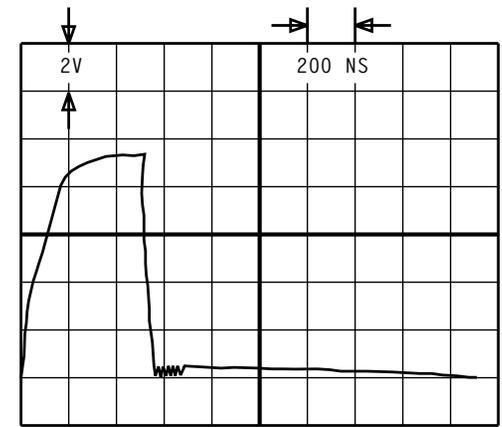
FIG. 26 - Terminal Connection for Control Bus and Miscellaneous Bus Bits, Connectors 3 and 4 - PUBB Frame



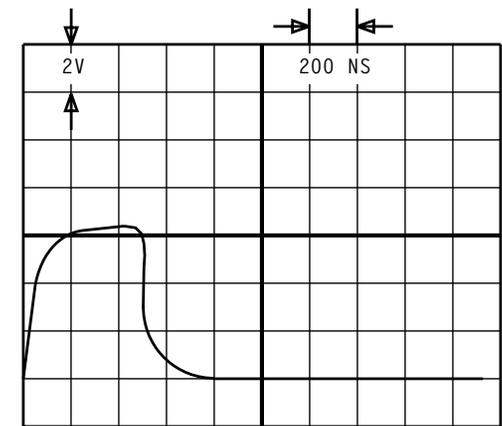
FRAME	CONNECTOR 1	CONNECTOR 2	CONNECTOR 3	CONNECTOR 4
DIF				
BUS 0	180-023	180-067	180-073	180-085
BUS 1	180-171	180-215	180-221	180-233
PUC				
BUS 0	080-023	080-067	080-073	080-085
BUS 1	080-171	080-215	080-221	080-233

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 27 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1, 2, 3, and 4 - DIF and PUC Frames

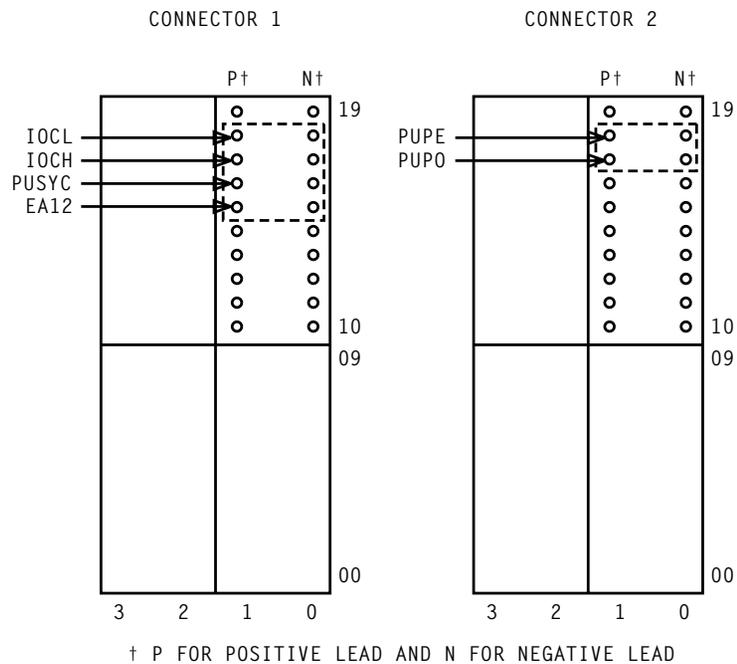


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

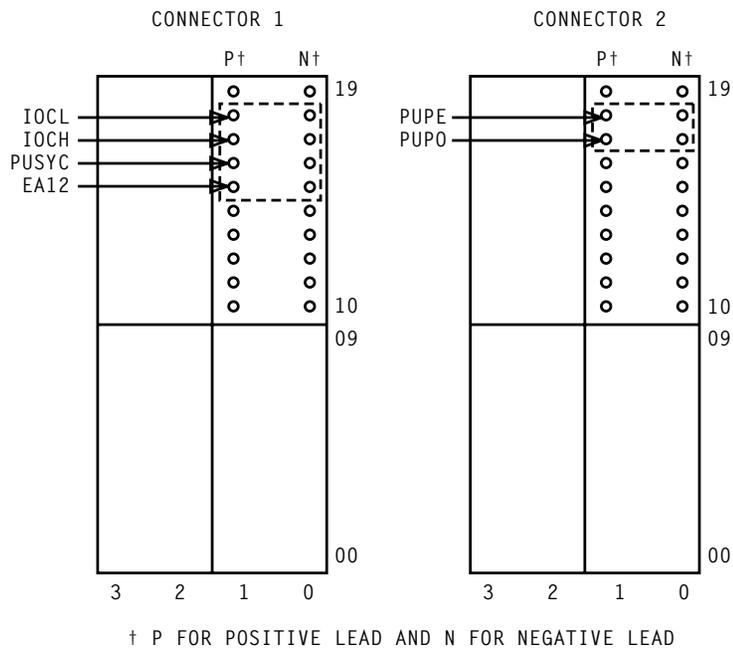
FIG. 28 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver for Control and Miscellaneous Bus Bits - Connectors 1, 2, 3, and 4



FRAME	CONNECTOR 1	CONNECTOR 2
CCIS	*80-16	*80-15
EST		
BUS 0	080-11	080-13
BUS 1	080-32	080-34
IO		
BUS 0	080-09	080-07
BUS 1	080-34	080-32
IOP		
BUS 0	080-27	080-37
BUS 1	076-27	076-37
NCLK	*60-34	*60-36
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-08	380-10
BUS 1	480-08	480-10
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-23	280-26
BUS 1	380-23	380-26
SP 2		
BUS 0	180-22	180-24
BUS 1	280-22	280-24
TMS A-1,2	*80-08	*80-10
TMS B		
BUS 0	‡76-23	‡76-26
BUS 1	‡80-23	‡80-26
TSI A-1	*80-40	*80-42
TSI A-2	*80-42	*80-45
TSI B	*80-46	*80-49

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR 1 FOR
PUB TERMINATING AT TMS BAY 1

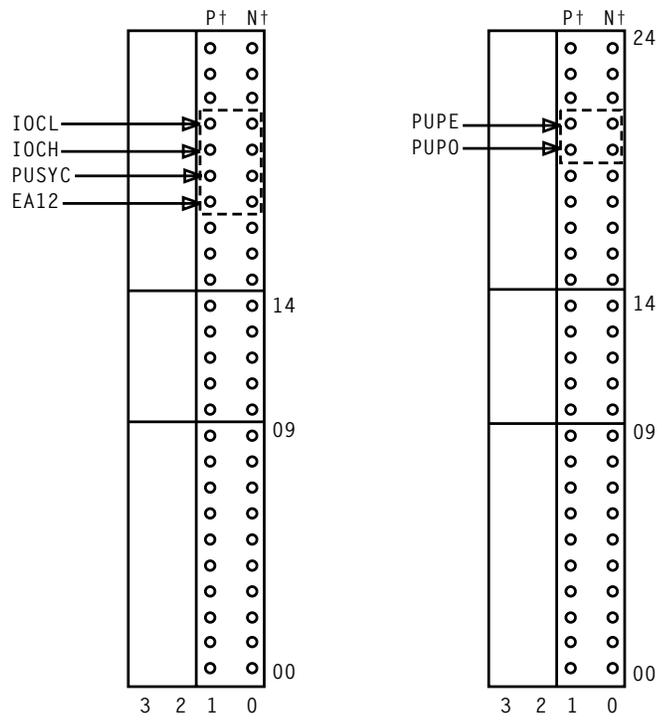
FIG. 29 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - CCIS, EST, IO, IOP, NCLK, SP, TMS, and TSI Frames



PUBB FRAME	CONNECTOR 1	CONNECTOR 2
BRANCH A	*76-40	*76-09
BRANCH B	*72-38	*72-10
BRANCH C	*76-42	*76-11
BRANCH D	*72-39	*72-11
BRANCH E	*64-40	*64-09
BRANCH F	*60-38	*60-10
BRANCH G	*64-42	*64-11
BRANCH H	*60-39	*60-11
BRANCH K	*48-40	*48-09
BRANCH L	*44-38	*44-10
BRANCH M	*48-42	*48-11
BRANCH R	*44-39	*44-11
BRANCH T	*36-40	*36-09
BRANCH V	*32-38	*32-10
BRANCH W	*36-42	*36-11
BRANCH X	*32-39	*32-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

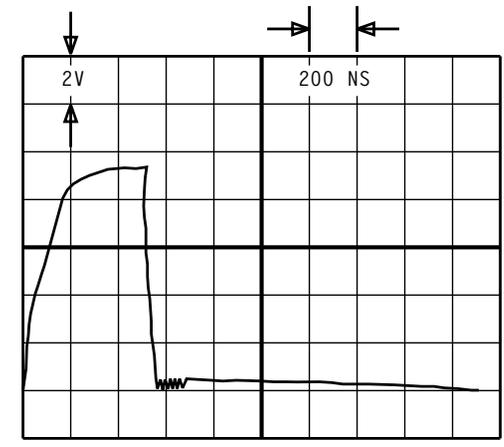
FIG. 30 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - PUBB Frame



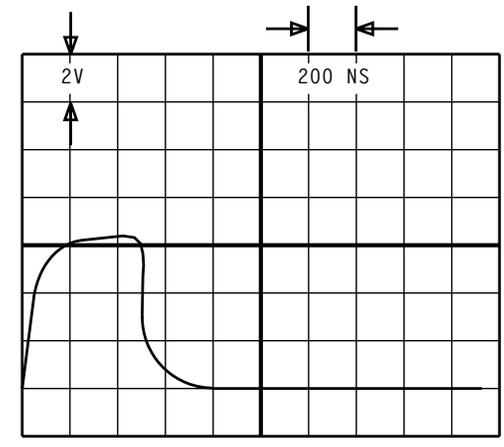
FRAME	CONNECTOR 1	CONNECTOR 2
DIF		
BUS 0	180-073	180-085
BUS 1	180-221	180-233
PUC		
BUS 0	080-073	080-085
BUS 1	080-221	080-233

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 31 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - DIF and PUC Frames



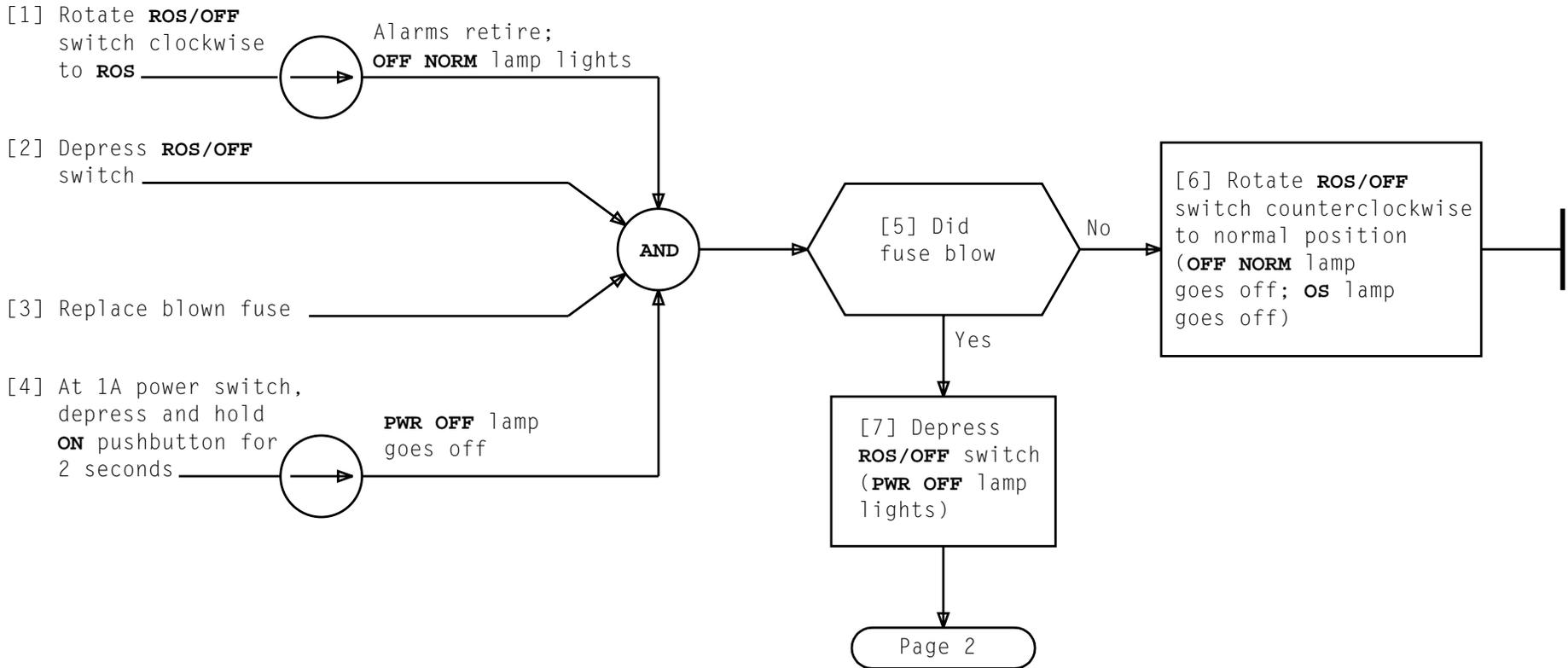
NORMAL PULSE AT DRIVER



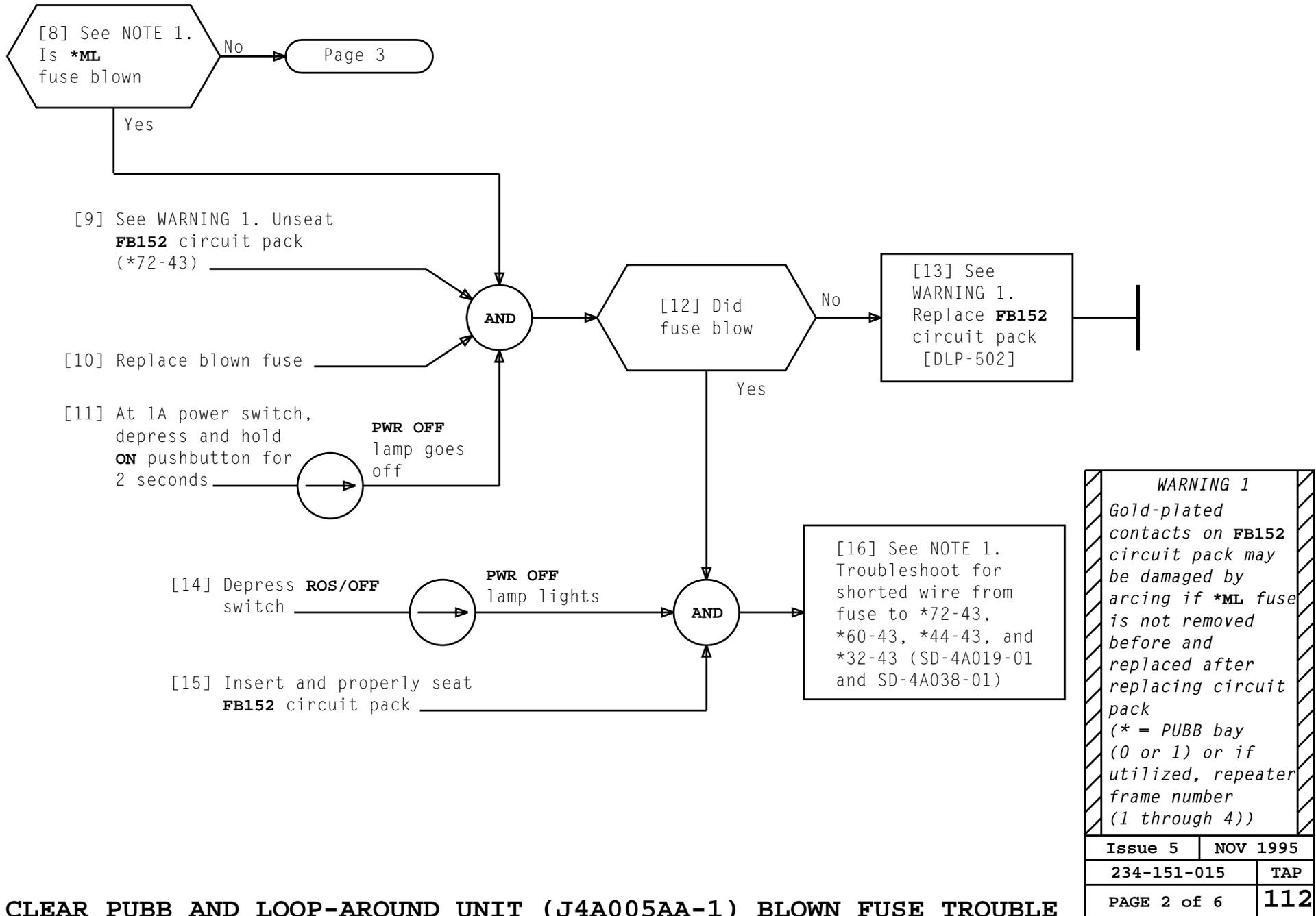
NORMAL PULSE 500 FEET FROM DRIVER

FIG. 32 - Example Waveforms of Normal Pulse at Driver and 500 Feet from Driver for Miscellaneous Bus Bits Not Terminated At VIF Frame

At 1A power switch (*56-41) [NOTE 1]:



NOTE 1	
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 6	112



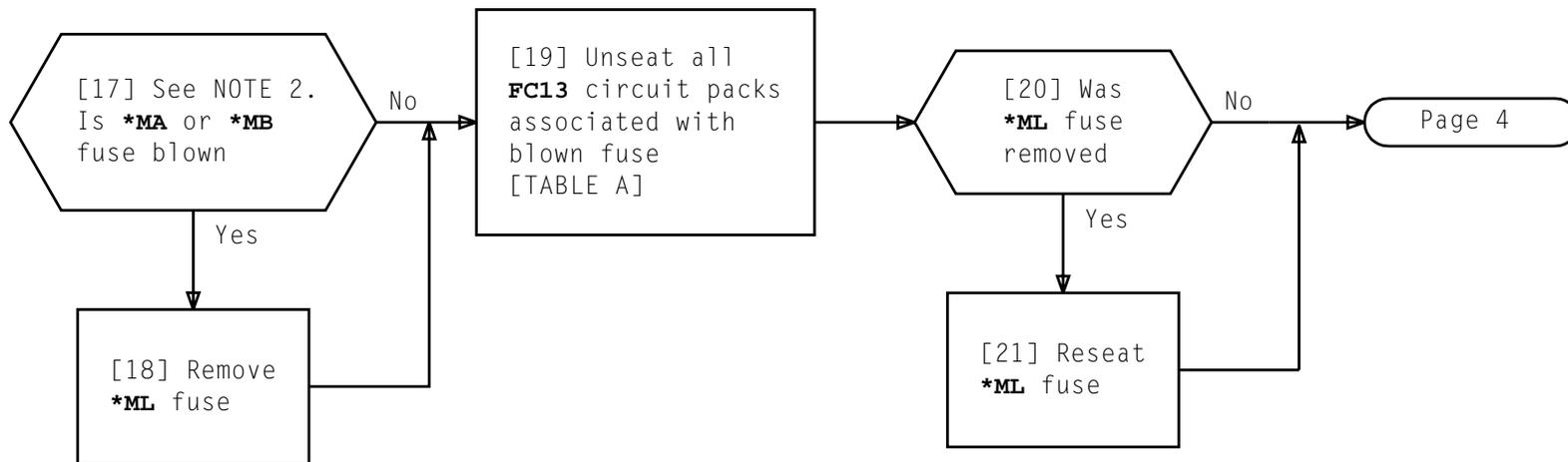
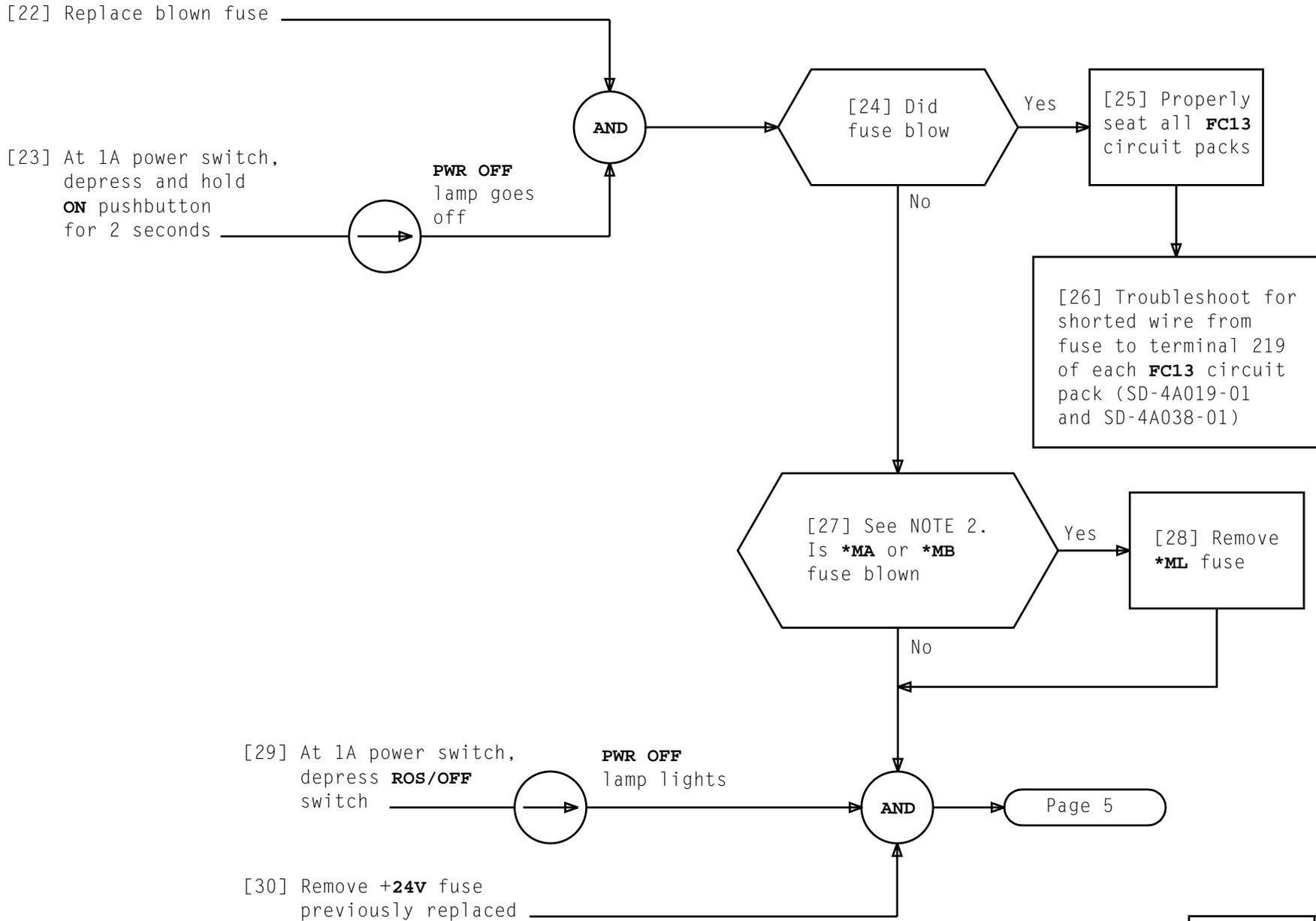


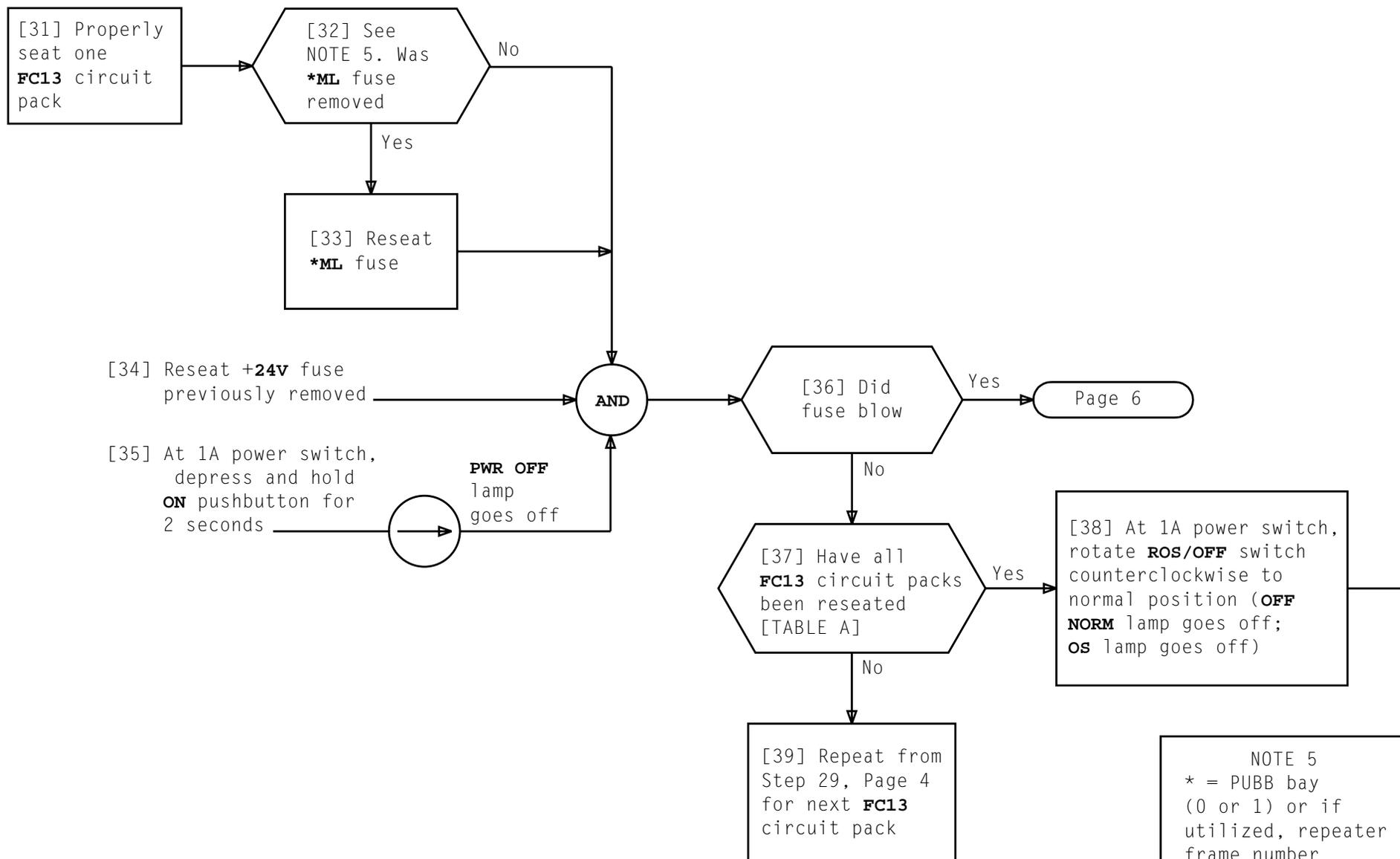
TABLE A LOCATION OF FC13		
BLOWN FUSE	VERTICAL POSITION [NOTES 2 AND 3]	HORIZONTAL POSITION [NOTE 4]
*MA, *MC, *ME, or *MG	*80, *68, *52, *40	25 and 26
	*76, *64, *48, *36	31, (33), 34, (36), 37, (39), 40, (42)
	*72, *60, *44, *32	25, (26), 27, (28)
*MB, *MD, *MF, or *MH	*80, *68, *52, *40	20 and 21
	*76, *64, *48, *36	03, (05), 06, (08), 09, (11), 12, (14)
	*72, *60, *44, *32	17, (18), 19, (20)

NOTES	
2. * = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)	
3. PUBB frame may be equipped with two, four, six, or eight peripheral unit bus branching and loop-around units	
4. Circled horizontal positions of FC13 circuit packs are optional bus branches	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 3 of 6	112

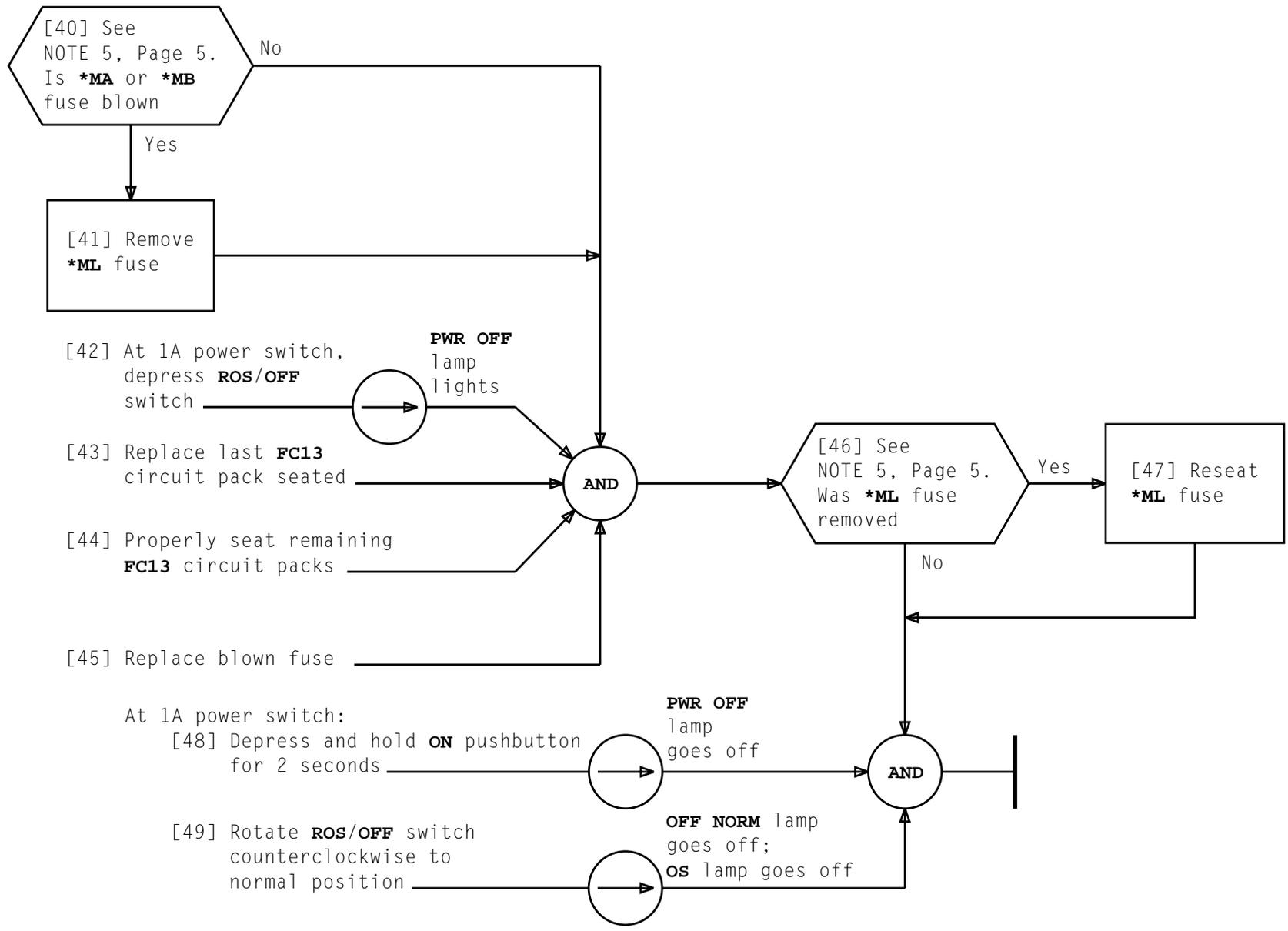


CLEAR PUBB AND LOOP-AROUND UNIT (J4A005AA-1) BLOWN FUSE TROUBLE

Issue 5	NOV 1995
234-151-015	TAP
PAGE 4 of 6	112

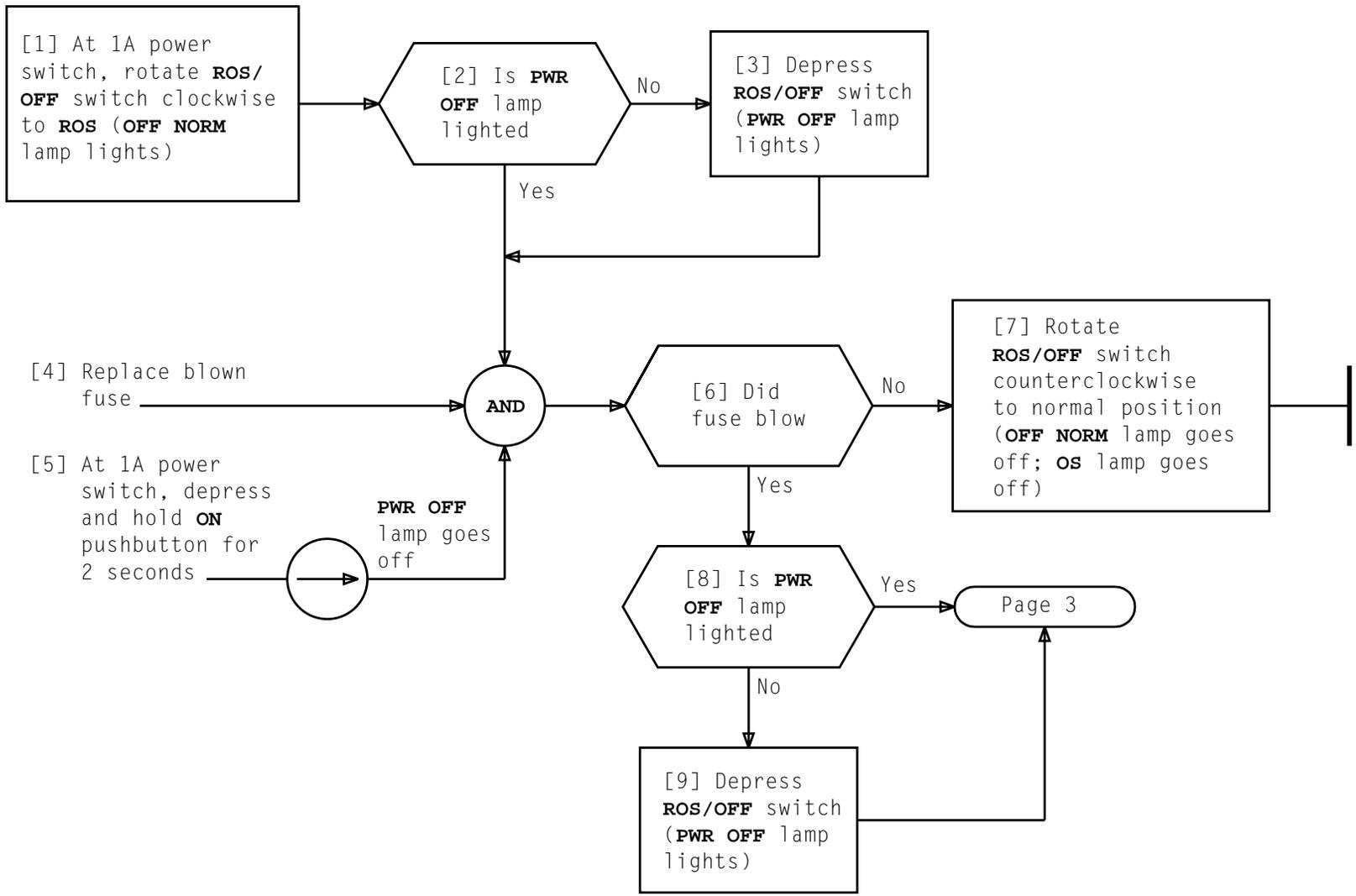


NOTE 5	
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 5 of 6	112



CLEAR PUBB AND LOOP-AROUND UNIT (J4A005AA-1) BLOWN FUSE TROUBLE

Issue 5	NOV 1995
234-151-015	TAP
PAGE 6 of 6	112



CLEAR DC-TO-DC CONVERTER (J87407A) BLOWN FUSE TROUBLE

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 5	113

TABLE A				
FUSES			CONVERTER	
+24V DESIGN/LOC	+24V DESIGN/LOC	+140V DESIGN/LOC	LOCATION	DESIGN
*CA *07-25 (3/4 AMP)	*BA *07-25 (1-1/3 AMP)	*AA *07-04 (1-1/3 AMP)	*17-00	CV*00
			*17-03	CV*01
			*17-06	CV*02
	*BB *07-25 (1-1/3 AMP)	*AB *07-04 (1-1/3 AMP)	*12-00	CV*03
			*12-03	CV*04
			*12-06	CV*05
			*17-12	CV*06
	*BB *07-25 (1-1/3 AMP)	*AC *07-04 (1-1/3 AMP)	*17-15	CV*07
			*17-18	CV*08
			*12-12	CV*09
			*12-15	CV*10
*BB *07-25 (1-1/3 AMP)	*AD *07-04 (1-1/3 AMP)	*12-18	CV*11	
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)				

CLEAR DC-TO-DC CONVERTER (J87407A) BLOWN FUSE TROUBLE

Issue 5	NOV 1995
234-151-015	TAP
PAGE 2 of 5	113

[10] See NOTE 1. Unseat converters associated with blown fuse [TABLE A, Page 2]

[11] Replace blown fuse

[12] At 1A power switch, depress and hold ON pushbutton for 2 seconds

PWR OFF lamp goes off

[13] Did fuse blow

Yes

No

[14] At 1A power switch, depress ROS/OFF switch

PWR OFF lamp lights

[15] See NOTE 2. Reseat all converters and associated fuses [TABLE A]

[17] Depress ROS/OFF switch

PWR OFF lamp lights

[18] Remove fuse previously replaced

AND

Page 4

[19] See NOTE 2. Reseat one converter and associated fuses [TABLE A]

[20] Depress and hold ON pushbutton for 2 seconds

PWR OFF lamp goes off

[16] Troubleshoot for shorted wire from fuse to converter [TABLE A] (SD-4A019-01)

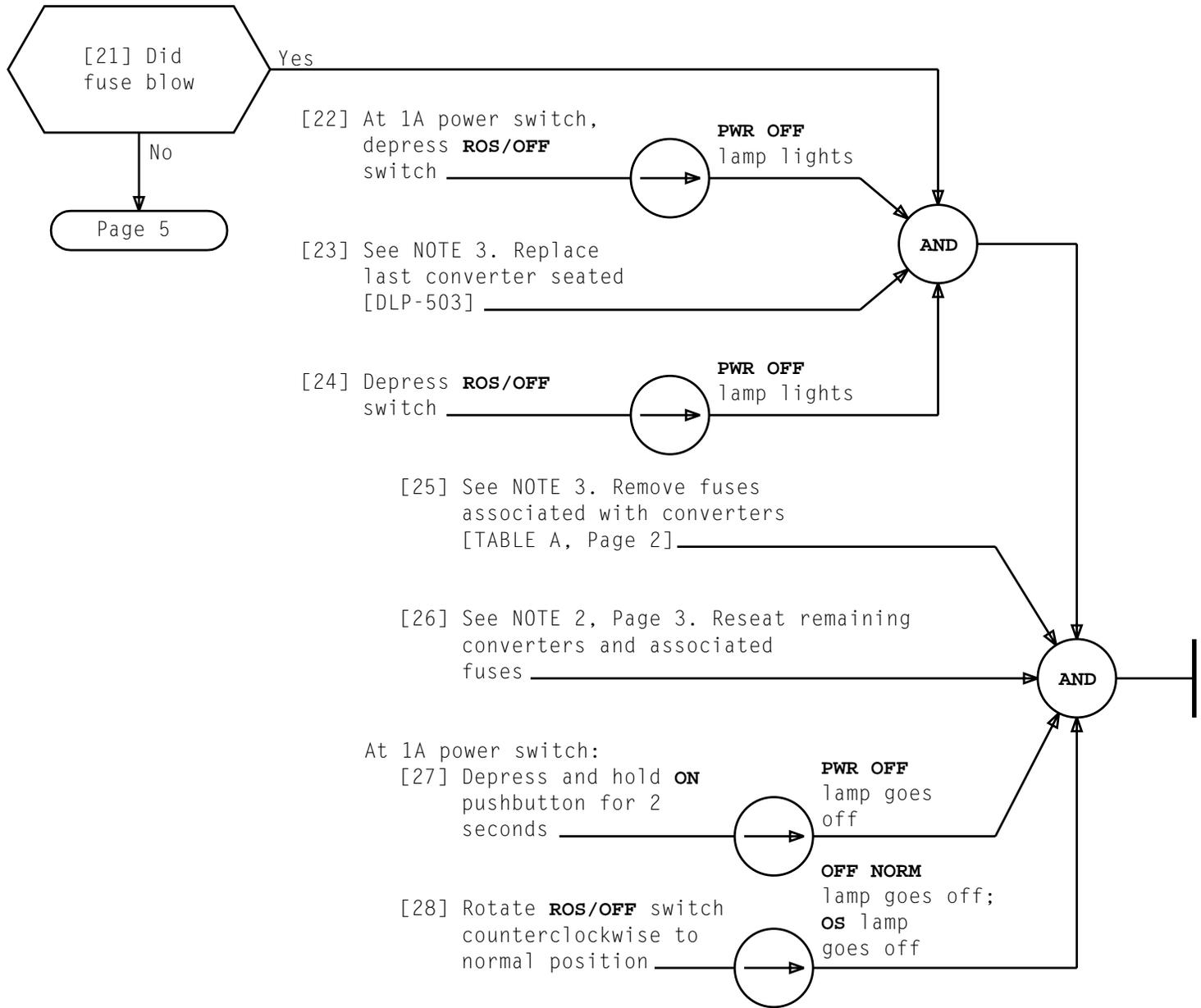
NOTES

1. Before unseating J87407A converters, remove all associated fuses, but remove 140V fuse first
2. After seating J87407A converters, reseat all associated fuses, but reseat 140V fuses last

Issue 5 | NOV 1995

234-151-015 | TAP

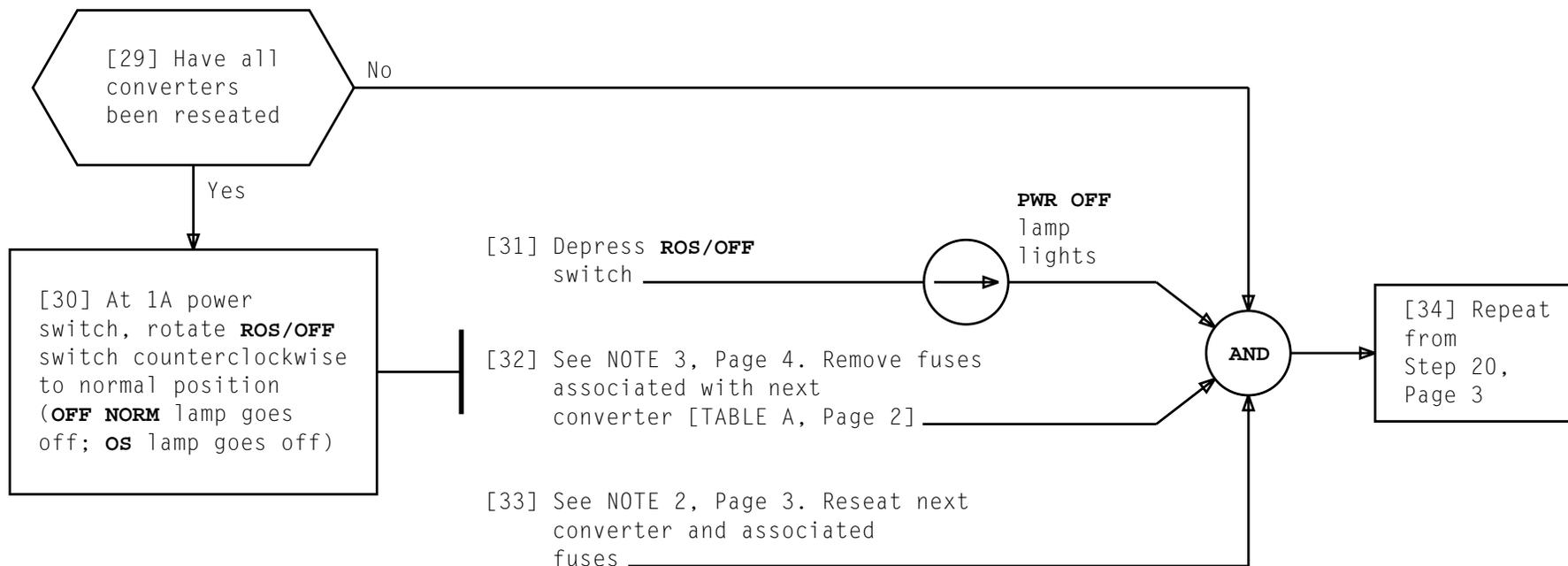
PAGE 3 of 5 | 113

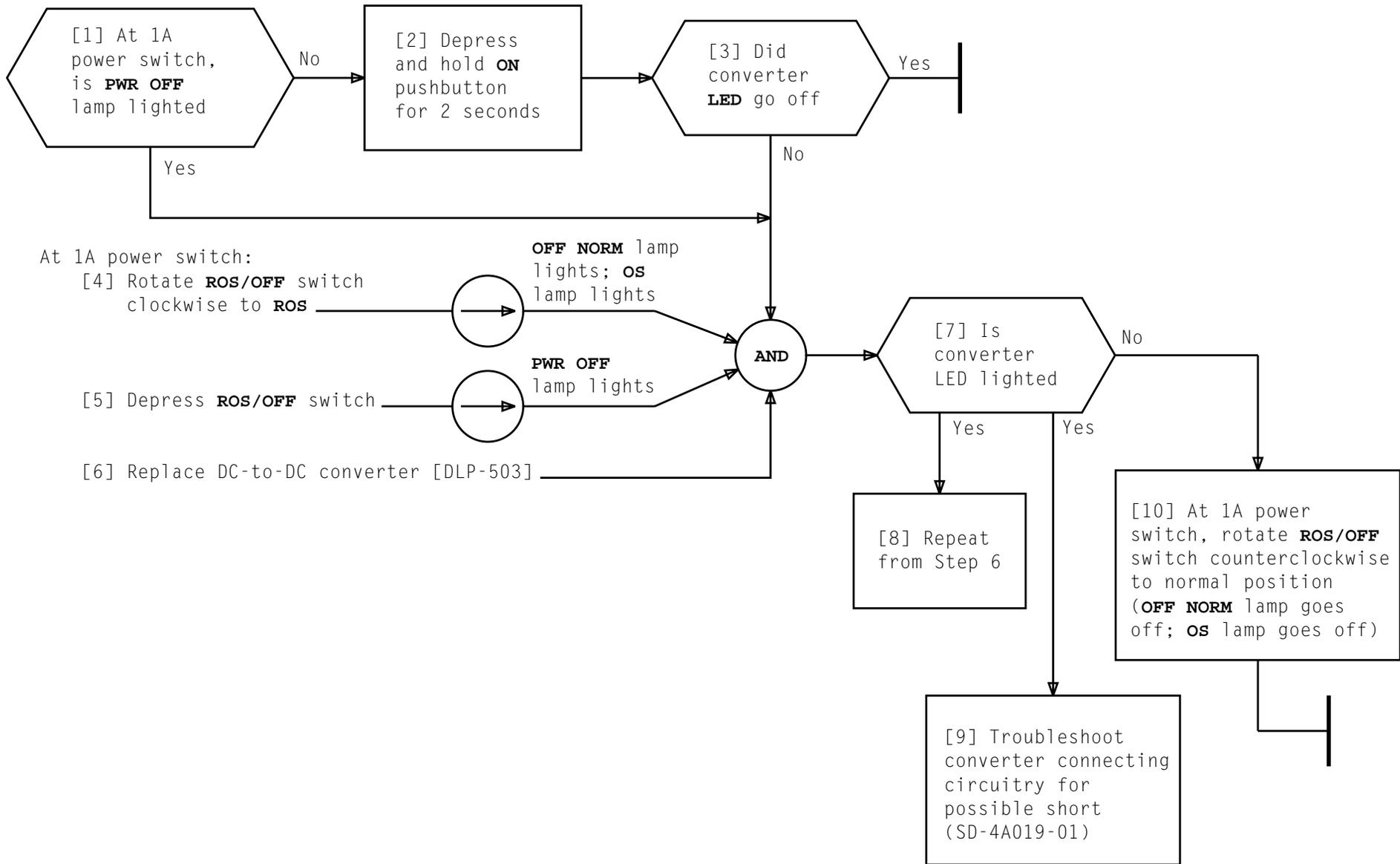


NOTE 3
 When removing and reseating fuses associated with J87407A converters, remove 140V fuse first, and reseal 140V fuse last

Issue 5	NOV 1995
234-151-015	TAP
PAGE 4 of 5	113

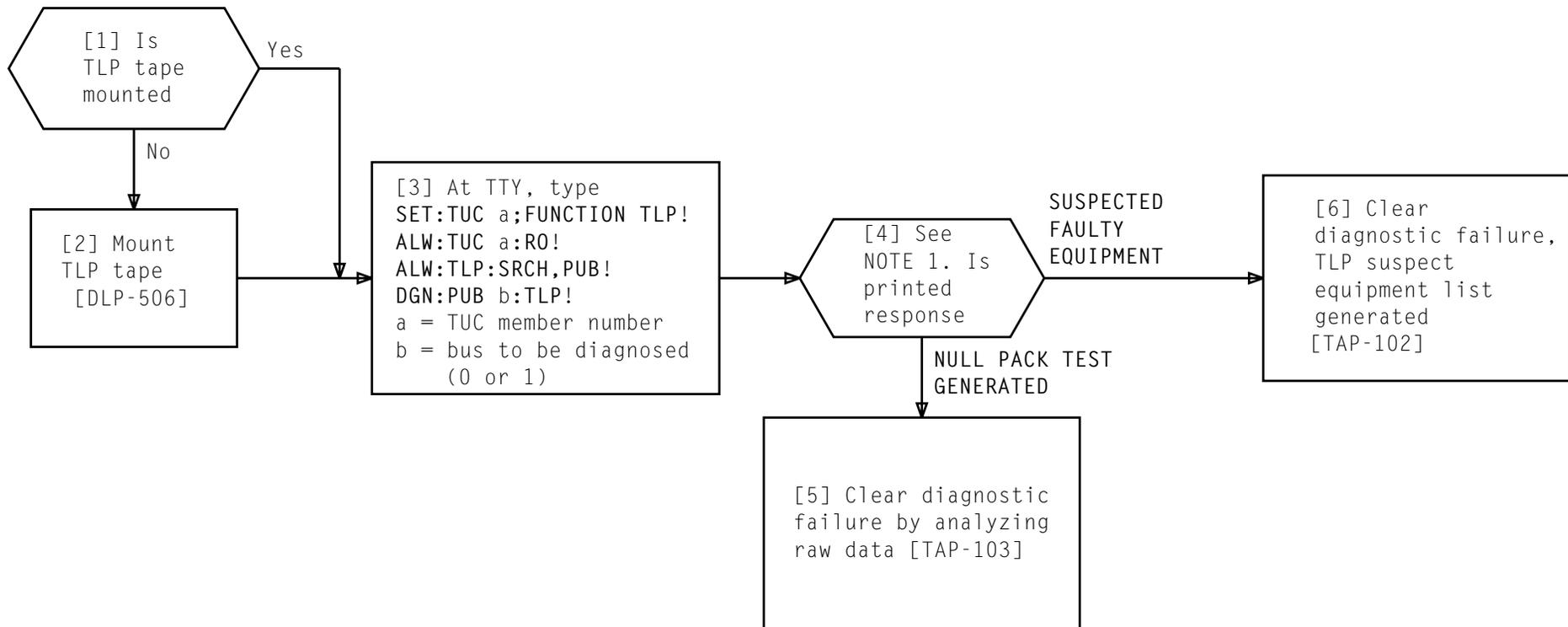
CLEAR DC-TO-DC CONVERTER (J87407A) BLOWN FUSE TROUBLE





CLEAR DC-TO-DC CONVERTER (J87407A) LED LIGHTED TROUBLE

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	114

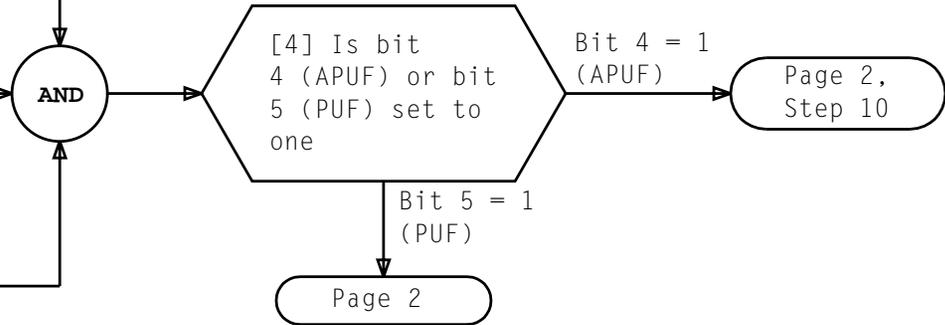


NOTE 1	
It may take several minutes for list to be printed. Status of your file may be monitored by typing OP:TLPQUEU;ALL! . TLP file currently being processed is indicated by asterisk in priority column	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	115

[1] Identify Point of Maximum Definition (PMD) from RCNT REG 29 [FIG. 1]

[2] Reference PMD DICTIONARY PBFR for description of identified PMD [DLP-525]

[3] Locate F-level Word 15 and determine if bit 4 (APUF) or bit 5 (PUF) is set to one [FIG. 2]



ERROR ANALYSIS RECENT HISTORY TABLE									
00241030	10401630	00000000	00000000	00000000	00000000	/	/	/	/
00000003	00000001	00010000	77777776	00000000	00000001	/	/	/	/
30602040	00000000	40001604	00000002	00000003	00000000	/	/	/	/
00000000	00000044	00000052	00000004	00000012	00241030	/	/	/	/
00402040	00000000	00000000	00000000	00076010	20000001	/	/	/	/
00025673	00025673	00000000	00000000	00000000	00000000	/	/	/	/
00000000	00000000	00000000	00000000	00000000	00000000	/	/	/	/
00100001	00011702	00000101	00000000	00000000	00000000	/	/	/	/
00000000	00000000	03471371	00000000	00000001	00000000	/	/	/	/
04000151	00000000	10000252	00000000	00000000	00000000	/	/	/	/
00000000	00000000	00000000	00000000	00000000	00000000	/	/	/	/
12/30/76	02:02:33	/	/	/	/	/	/	/	/
#247									

FIG. 1 - RCNT Register Printout

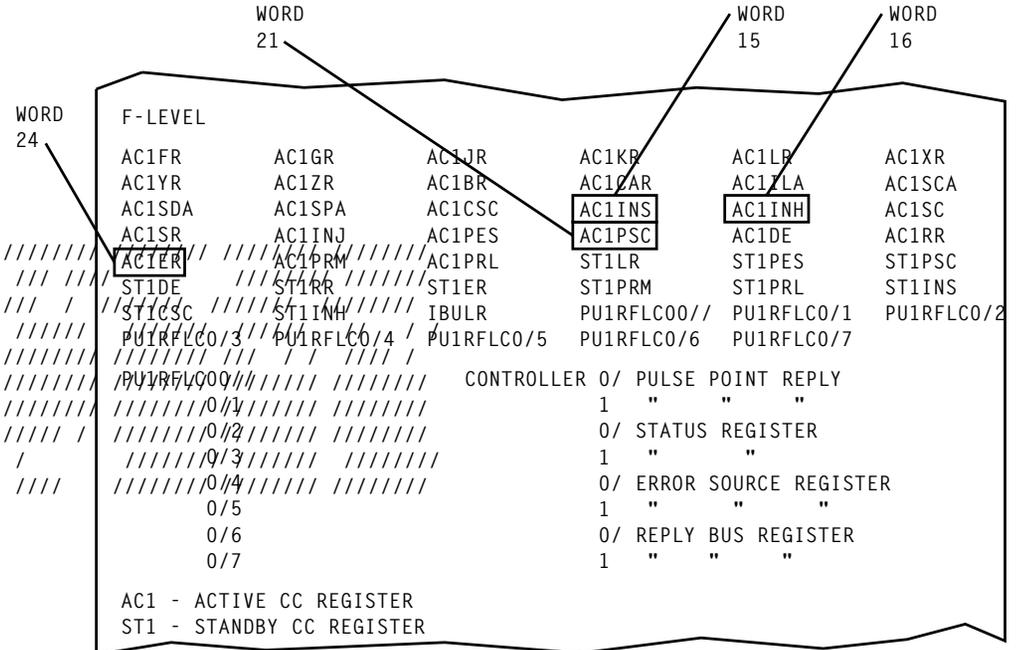
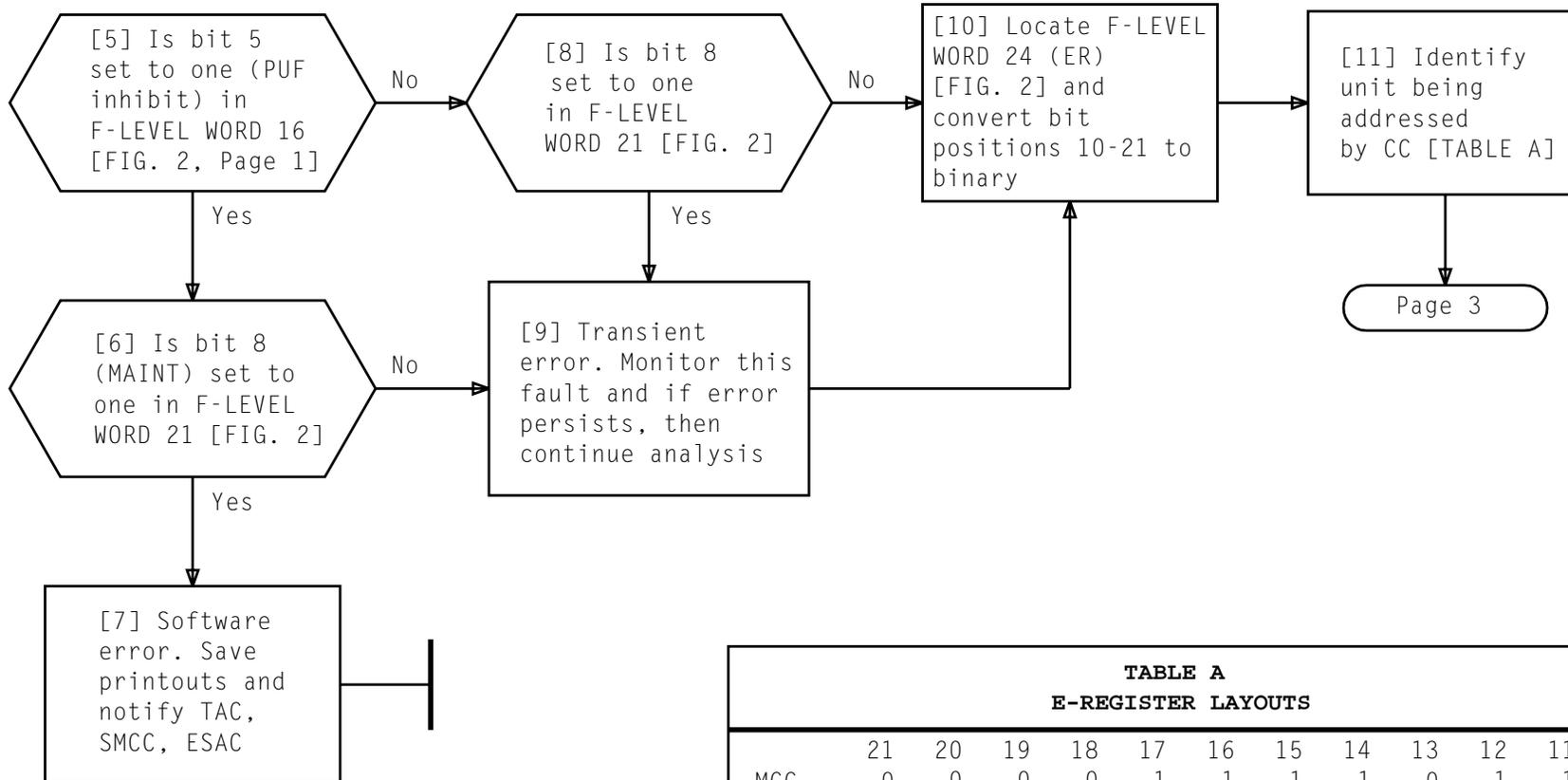


FIG. 2 - CC Register Layout

ANALYZE PBFR F-LEVEL INTERRUPT



**TABLE A
E-REGISTER LAYOUTS**

	21	20	19	18	17	16	15	14	13	12	11	10
MCC	0	0	0	0	1	1	1	1	0	1	1	0
SP/DIF	0	0	0	1	0	Member number						MTX
SCLK	0	0	0	1	1	Member number						
TMS	0	0	1	0	0	MEM NO						
TSI	0	0	1	0	1	Member number						SPC
TGR	0	0	1	1	0	Member number						
IOUS	0	0	1	1	1	Member number			IOUC			
EST	0	1	0	0	1	Member number						
PUC	0	1	0	1	0	Member number						

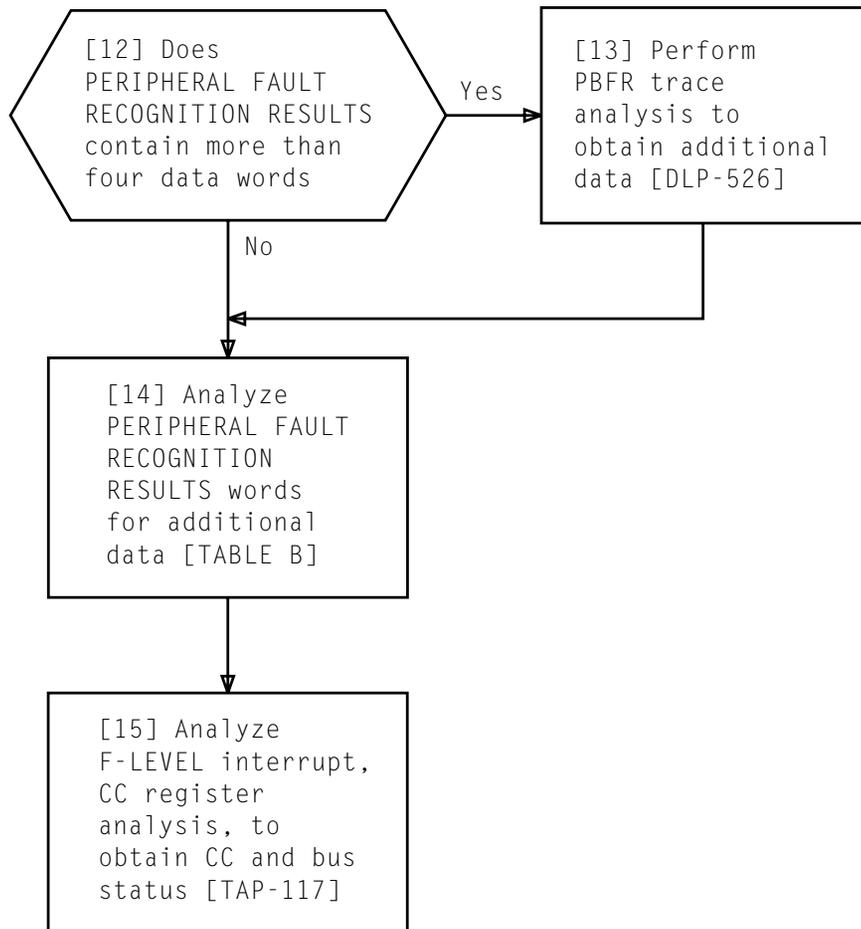


TABLE B PERIPHERAL FAULT RECOGNITION RESULTS			
IDENTIFICATION OF REGISTERS IN RESULTS			
TABLE OF F-LEVEL MESSAGES			
PU4RESULT	PU4UTMNO	PU4FRPMD	PU4FRJRG
PU4RESULT	-----NMLKJIHGFEDCBA		
BIT	0	A = CC0 found faulty	
	1	B = CC1 found faulty	
	2	C = Controller 0 found faulty	
	3	D = Controller 1 found faulty	
	4	E = PU bus 0 found faulty	
	5	F = PU bus 1 found faulty	
	6	G = PU bus 0 at unit found faulty	
	7	H = PU bus 1 at unit found faulty	
	8	I = Faulty unit or subunit to be removed and diagnosed	
	9	J = Faulty unit or subunit to be removed	
	10	K = Fault recognition was unable to find the fault	
	11	L = Fault recognition found that a software error caused the F-level	
	12	M = Fault recognition found that a transient caused the F-level	
	13	N = Signal processor matrix found faulty	
PU4UTMNO	DDDDDDCCCCCBBAAAAAA--		
BIT	2-8	A = Submember found faulty (if any)	
	9	B = Set if submember found faulty	
	10-16	C = Member number found faulty	
	17-23	D = Unit type found faulty	
PU4FRPMD	--CCCCCBBBBBBBAAAAAA		
BIT	0-7	A = Point of Maximum Definition MACRO number relative to an FR program	
	8-14	B = Fault recognition decision code	
	15-21	C = Error analysis action code	
PU4FRJRG = FR program address where error was located			

ANALYZE PBFR F-LEVEL INTERRUPT

[1] Locate AC1CSC and ST1CSC register
(WORDS 14 and 36) [FIG. 1] and determine
state of bit positions 6 and 9 through 12

[2] Determine ACTIVE CC from state of
bit 6 (if zero, CC 0 is active;
if one, CC 1 is active)

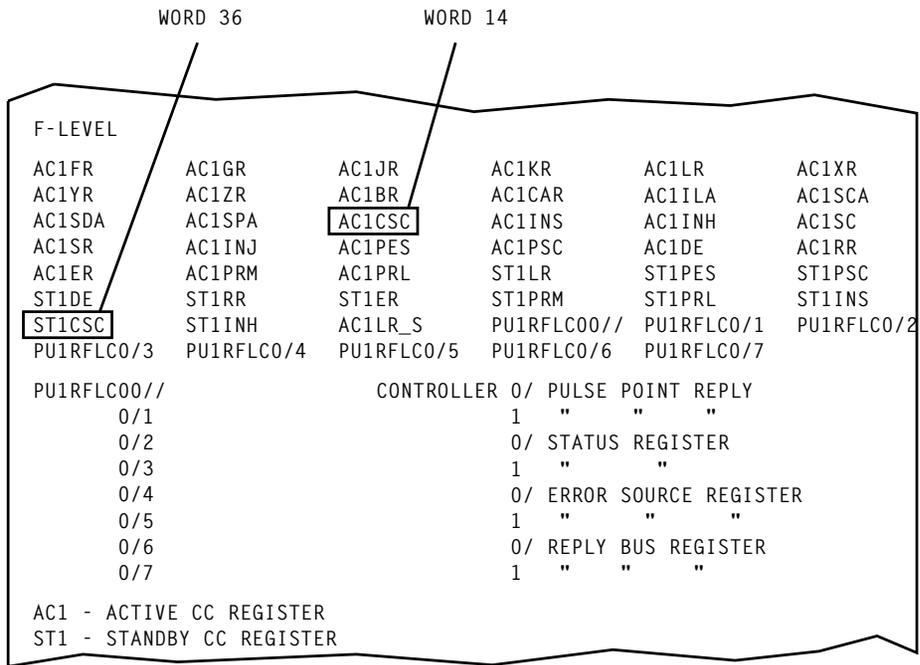
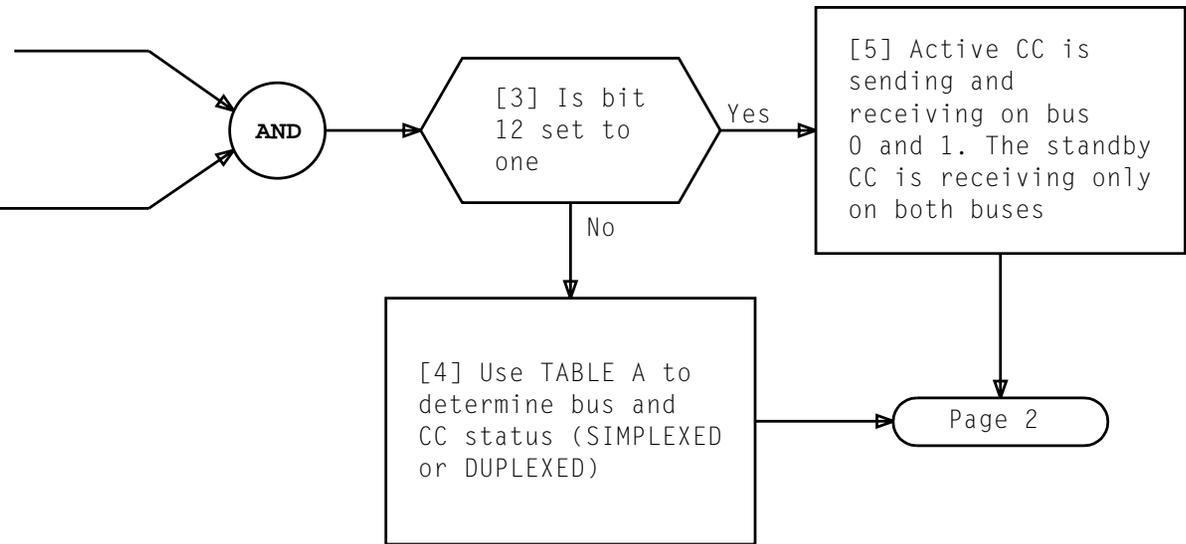


FIG. 1 - CC Register Layout

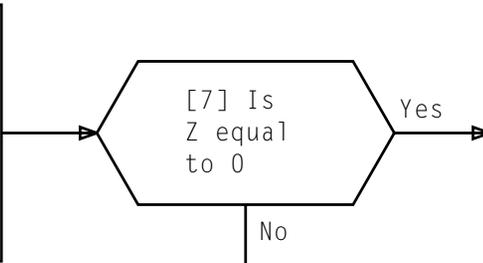
BIT VALUE			ACTIVE CC		STANDBY CC	
PUBT 11	PUBA 10	PUBO 09	ENABLE/ WRITE	REPLY (RECEIVE)	ENABLE/ WRITE	REPLY (RECEIVE)
0	0	0	0	0	1	1
0	1	0	1	1	0	0
1	0	0	0	0	X	0
1	1	0	1	1	X	1
0	0	1	0&1	0	X	1
0	1	1	0&1	1	X	0
1	0	1	0&1	0	X	0
1	1	1	0&1	1	X	1

X = Idle, bus receives only

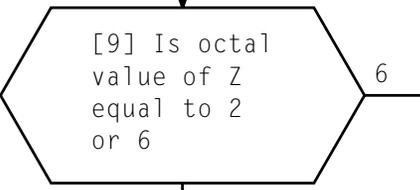
ANALYZE F-LEVEL INTERRUPT, CC REGISTER ANALYSIS

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 6	117

[6] See EXAMPLE 1. Using FIG. 2, locate F-LEVEL PSC register for both CCs (WORDS 21 and 29) and determine octal value of Z (bits 0, 1, 2)



[8] Error is in REPLY section of BUS, RECEIVER section of CC, or UNIT CONTROLLER (identified in Step 4 or 5)



[12] This is an input order to CC error. Parity and ASW is checked

Page 3

[10] CC was performing polling operation. Use program to identify unit type being polled

[11] If SP was being polled, use mismatched bit positions to obtain SP member number of suspect unit

			WORD 21		WORD 29
AC1FR	AC1GR	AC1JR	AC1KR	AC1LR	AC1XR
AC1YR	AC1ZR	AC1BR	AC1CAR	AC1ILA	AC1SCA
AC1SDA	AC1SPA	AC1CSC	AC1INS	AC1INH	AC1SC
AC1SR	AC1INJ	AC1PES	AC1PSC	AC1DE	AC1RR
AC1ER	AC1PRM	AC1PRL	ST1LR	ST1PES	ST1PSC
ST1DE	ST1RR	ST1ER	ST1PRM	ST1PRL	ST1INS
ST1CSC	ST1INH	AC1LR_S	PU1RFLC00//	PU1RFLC0/1	PU1RFLC0/2
PU1RFLC0/3	PU1RFLC0/4	PU1RFLC0/5	PU1RFLC0/6/	PU1RFLC0/7	

FIG. 2 - CC Register Layout

PSC = 00000000 // // // // //
 LAYOUT = -----Z
 Z VALUE IS EQUAL TO 0/
 EXAMPLE 1

[13] Using FIG. 3, locate F-LEVEL PES register for both CCs (WORDS 20 and 28) and determine if bit 6 or 7 is set to one

[14] Is bit 6 or bit 7 set to one in PES register

[16] Using TABLE B, compare state of bit 7 for both CCs and note indication given in table for future use

[15] Suspect software error or audit activity. Use TABLE C, Page 4 for isolation considerations. If interrupt occurs and repeats often, save printout and notify support organization

[17] Are bits other than 2, 3, 7, or 17 set to one in PES register

TABLE B PES BIT 7		
C C 0	C C 1	INDICATION
0	0	No error detected by CC. Peripheral unit reply problem. Use configuration to resolve error (CC, BUS, CONTR) and other indications (prior interrupts, growth activity, power sequencing, etc)
0 1	1 0	Bus related problem
1	1	A simplex controller is suspected to contain error. Request technical assistance, if necessary

[18] Check if power sequencing was being performed on unit at time of interrupt

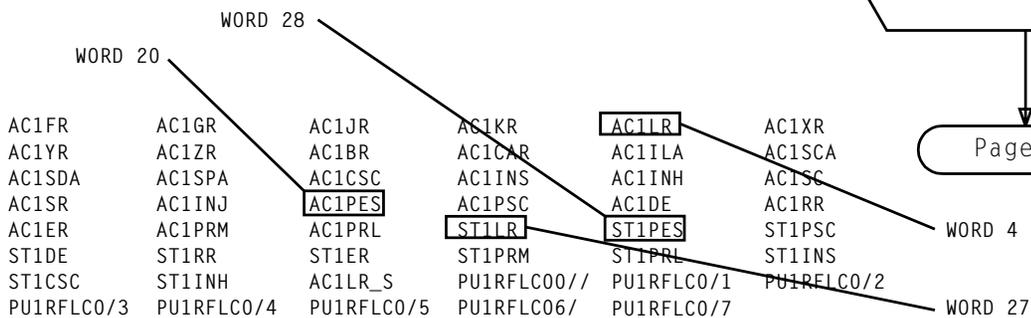


FIG. 3 - CC Register Layout

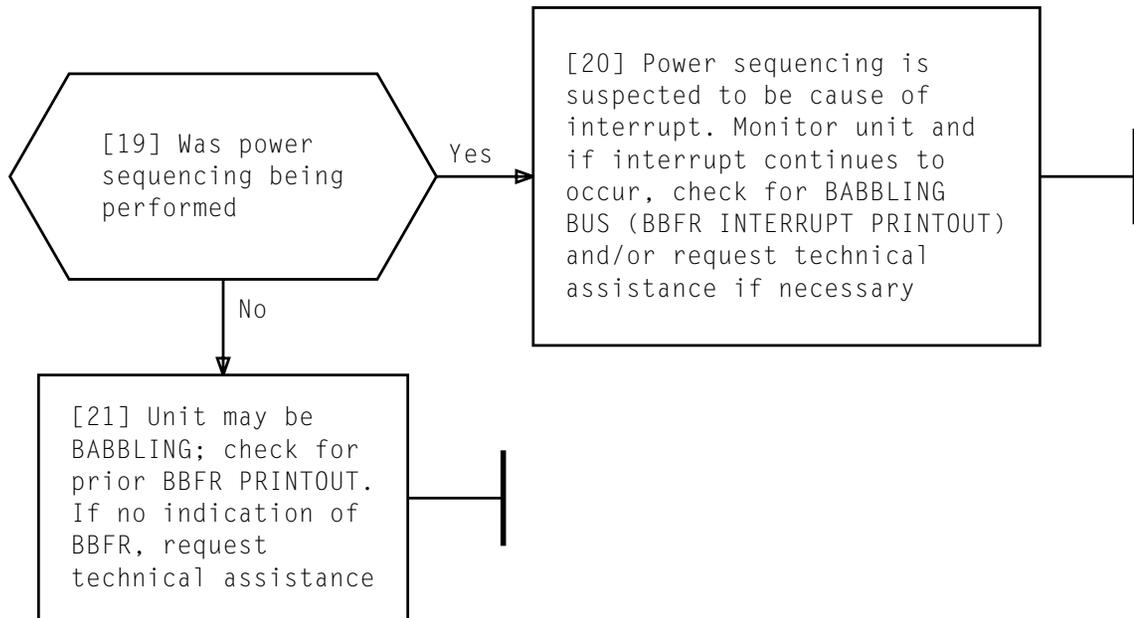
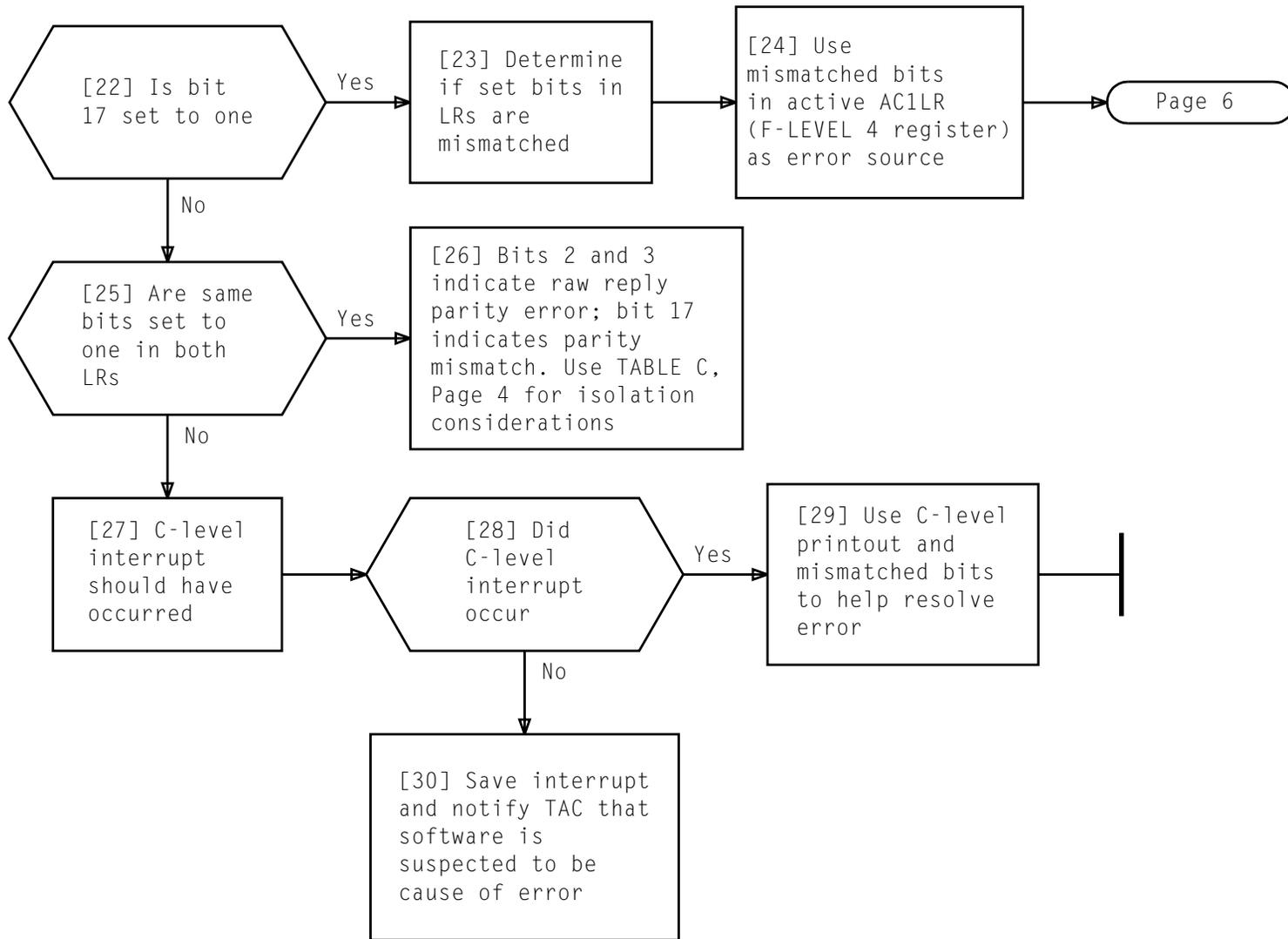
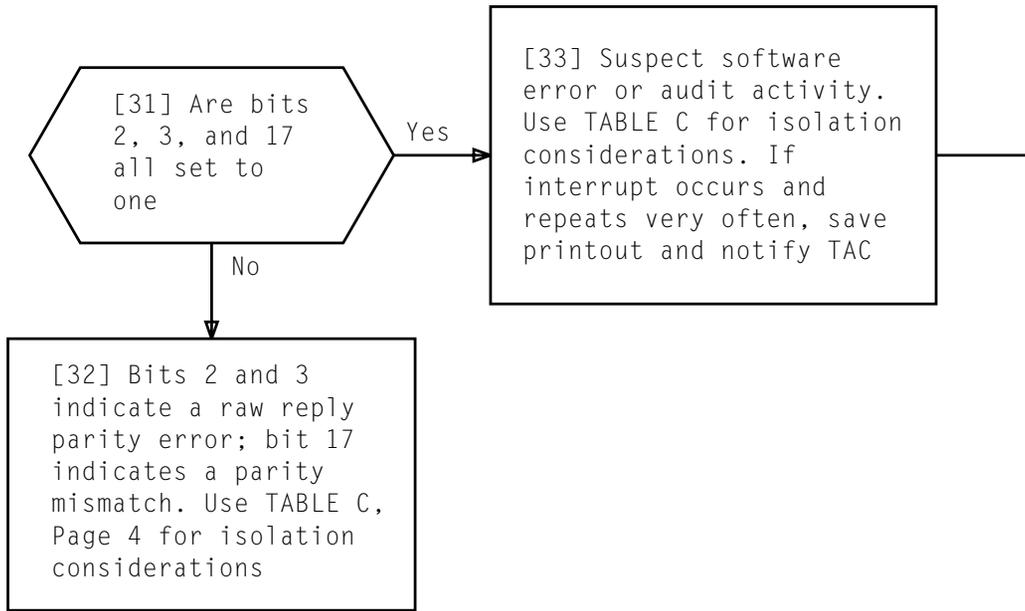
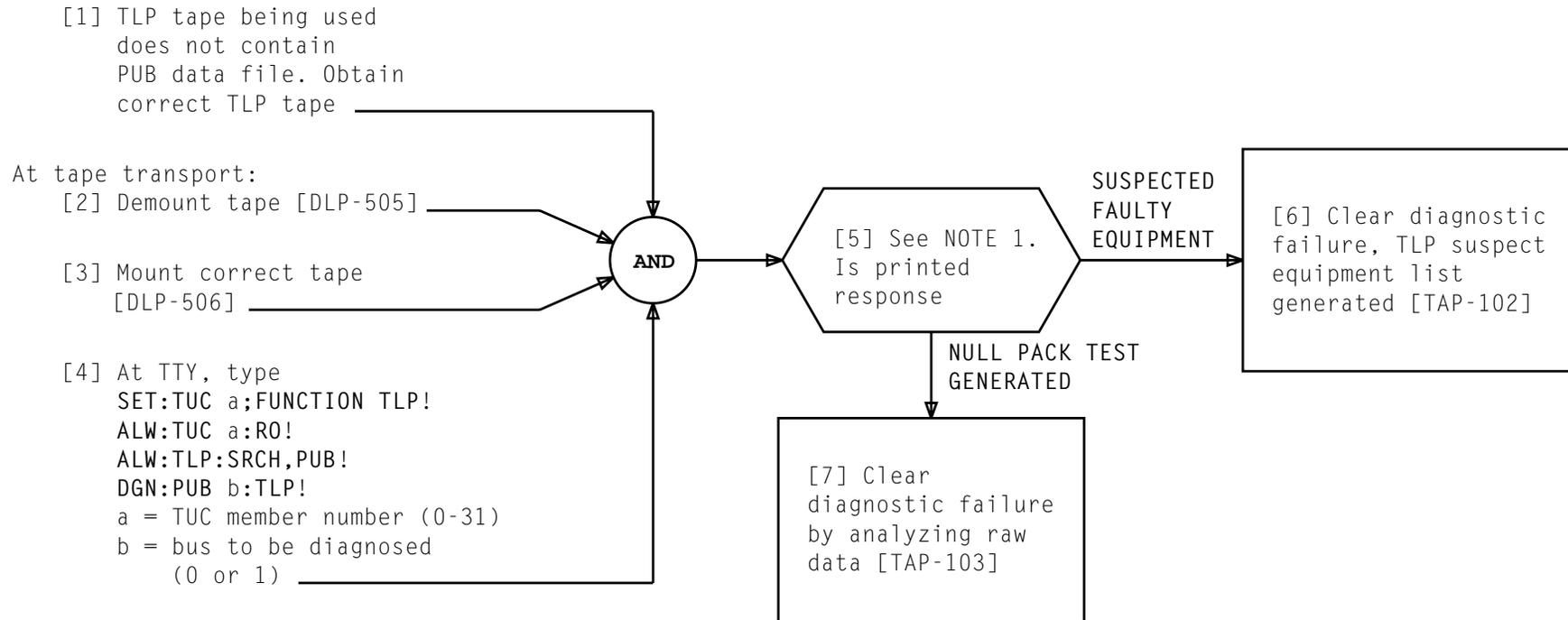


TABLE C	
CONSIDERATIONS FOR ISOLATION	
If only one unit is involved	
If multiple bits are set rather than same bits	
Does error occur on same branch pair of PUB	
After several days, is CC independent or dependent of error	
The integration of change versus no change (ie, after a period of time, does the error follow a pattern with different bus, controller, and/or CC configurations; or does it occur only with certain configurations)	







NOTE 1	
It may take several minutes for list to be printed. Status of file may be monitored by typing OP:TLPQUEUE;ALL! . TLP file currently being processed is indicated by asterisk in priority column	
Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 1	118

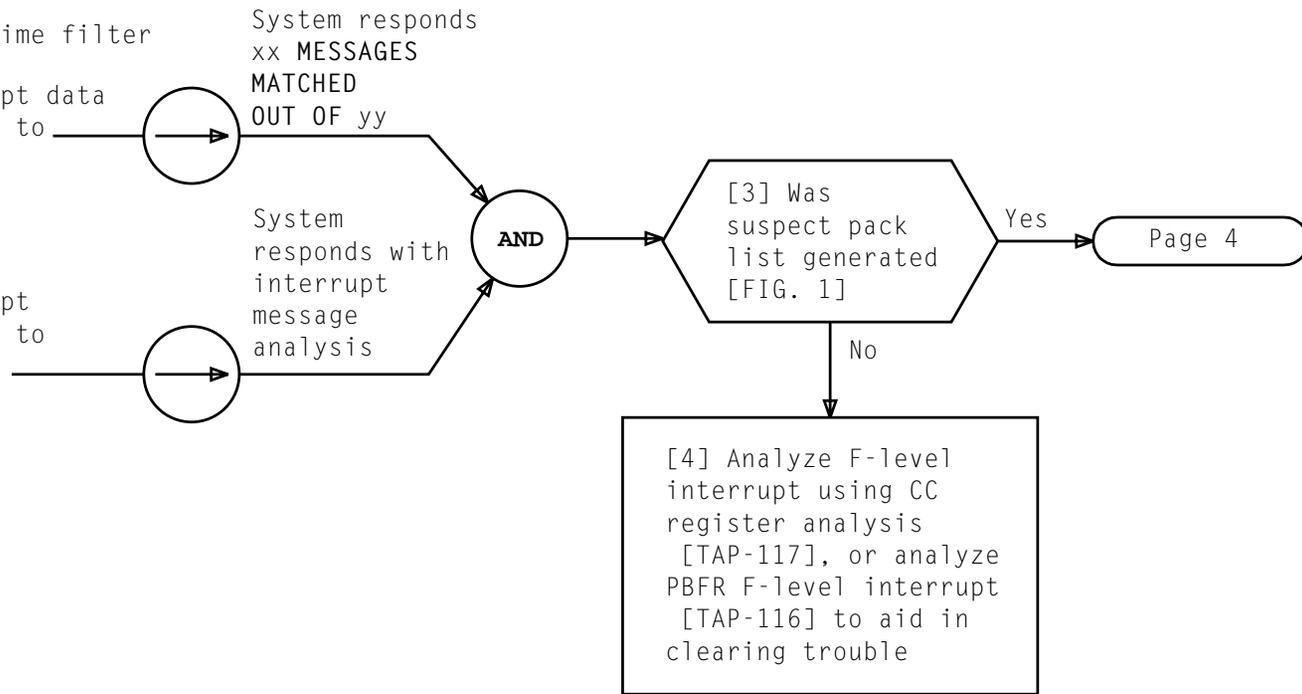
At SMCC terminal:

[1] Type F: a;PAT b,{FROM c, TO d,}RDT e!

- a = office code
- b = desired interrupt pattern
- c = month, day, and time filter
is to begin
- d = month, day, and time filter
is to end
- e = file name interrupt data
is to be directed to

[2] Type

- NEWANAL:INTR a;b;c!
- a = office code
 - b = file name interrupt
data was directed to
 - c = type of interrupt



**CLEAR PERIPHERAL UNIT CONTROL F-LEVEL INTERRUPT USING
SMCC GENERATED PACK LIST**

Issue 5	NOV 1995
234-151-015	TAP
PAGE 1 of 3	119

SUSPECT
CIRCUIT
PACKS

```

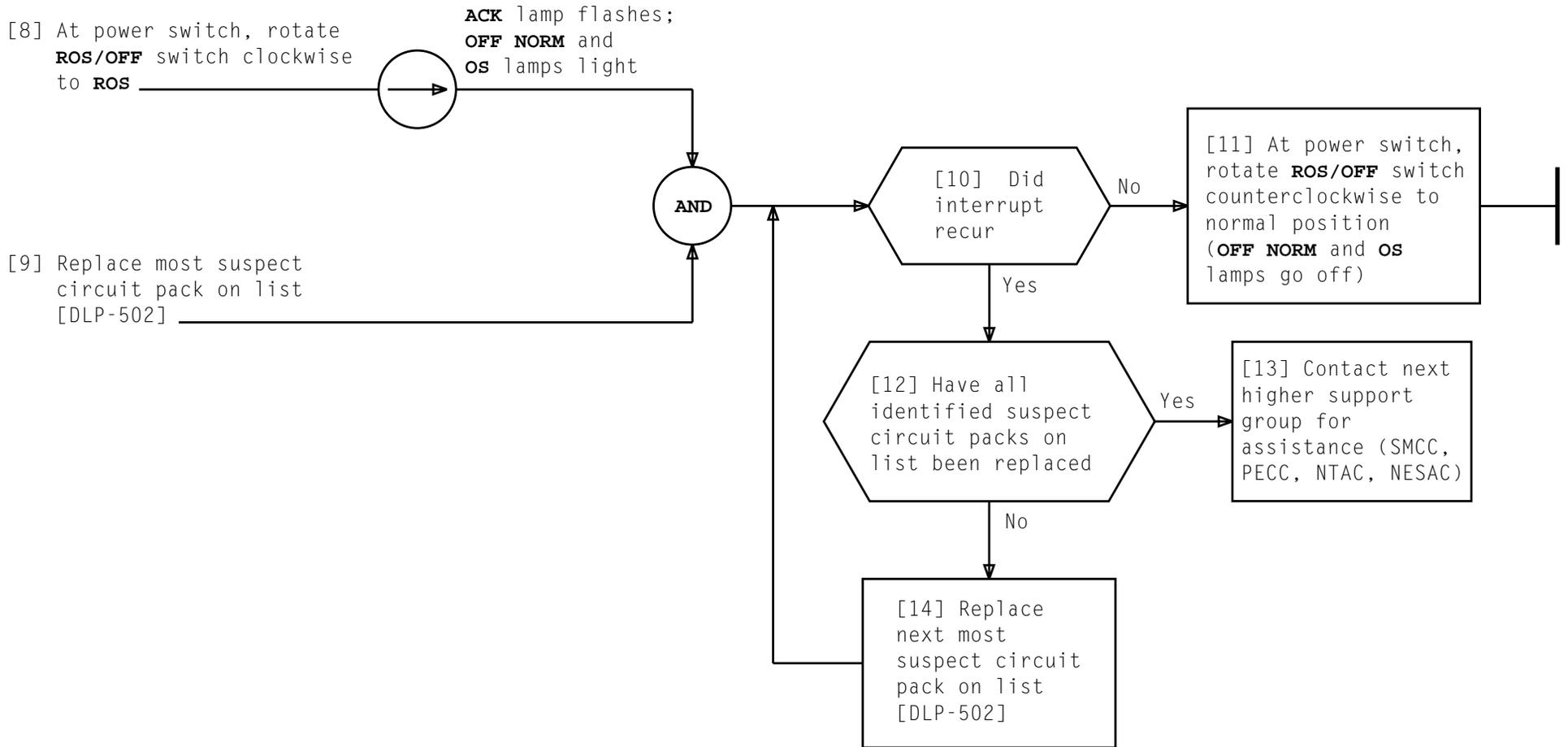
-----
: PATH TRACE :
-----
: TTSI :TMS ST2 ST1 : RTS1 : :
-----
: F C S L P C : F C S A B : S A B : F C S D P C :
: R T P O O H : R T W L L : W L L : R T P S O H :
: A R C D R A : A R T E E : T E E : A R C R R A :
: M L T N : M L V V : V V : M L T N :
-----
: 0/0/-1 2 7 0/ 0/17 : 0/-0/ 0/2 0/0/ 14 : 14 0/0/ 0/2 : 0/2-0/ 2 0/ 4 0/18 :
-----
: CIRCUIT PACKS IN THE PATH :
-----
: TTSI : TMS ST2 : TMS ST1 :RTSI :
-----
: FA1781 0/52-0/4 : FA533 0/28-23 : FA522 0/64-33 : FA1780/ 0/52-58 :
: FA1784 0/52-0/7 : FA521 0/28-31 : FA523 0/64-34*: FA545 0/52-47 :
: FA1785 0/52-14 : FA521 0/28-32*: FA524 0/64-21 : FA533B 0/76-0/7 :
: FA180/8 0/76-10/ : : :
-----
(* OPTIONAL)

```

FIG. 1 - Sample Interrupt Message Analysis (Partial)

CLEAR PERIPHERAL UNIT CONTROL F-LEVEL INTERRUPT USING
SMCC GENERATED PACK LIST

Issue 5	NOV 1995
234-151-015	TAP
PAGE 2 of 3	119



CLEAR PERIPHERAL UNIT CONTROL F-LEVEL INTERRUPT USING SMCC GENERATED PACK LIST

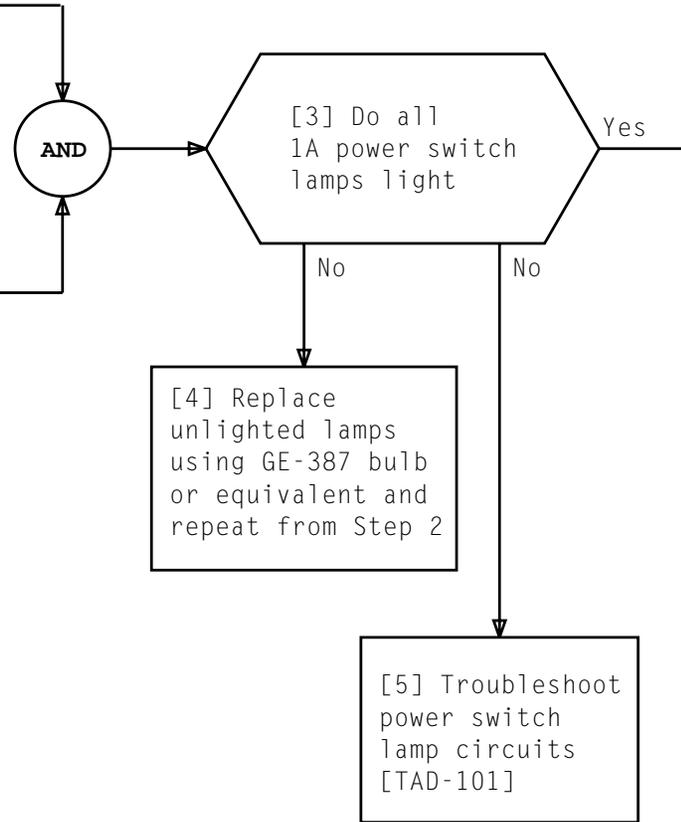
Reissued

Issue 4	SEP 1984
234-151-015	TAP
PAGE 3 of 3	119

At 1A power switch:

[1] Ensure **ROS/OFF** switch is rotated counterclockwise to normal position

[2] Depress and hold **TEST** pushbutton momentarily and observe 1A power switch lamps



TEST 1A POWER SWITCH LAMPS

Revised

Issue 4	SEP 1996
234-151-015	DLP
PAGE 1 of 1	500

[1] At TTY, type
RMV:PUB a!
 a = bus to be
 removed (0 or 1)

At 1A power switch:

[2] Rotate **ROS/OFF** switch
 clockwise to **ROS**

[3] Depress **ROS/OFF**
 switch

[4] Remove power switch
 fuses [TABLE A]

[5] Cover apparatus below
 switch with clean drop
 cloth

[6] See NOTE 1. Tag and
 remove frame wiring
 on rear of power
 switch

[7] Remove four mounting screws
 and withdraw switch from
 front of frame

System responds
RMV:PUB a COMPLETED

OFF NORM
 lamp lights;
OS lamp lights

PWR OFF
 lamp lights

AND

Switch
 removed

Page 2

TABLE A

FUSE DESIGNATION	FUSE LOCATION	RATED AMPERES	FUSE CODE
*MJ	*07-18	3/4A	70H
*MK	*07-25	1 1/3A	70A
*MM	*07-18	1 1/3A	70A

* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)

NOTE 1

Do not remove surface wiring on switch terminals. It will be used as guide to surface wire replacement switch

Issue 5 | **NOV 1995**

234-151-015 | **DLP**

PAGE 1 of 2 | **501**

[8] Install surface wire on replacement switch in same manner as on defective switch

[9] At front of frame, install replacement switch using screws from defective switch

[10] Reconnect frame leads to switch terminals and install pigtail components as required

[11] Reseat power switch fuses [TABLE A, Page 1]

At 1A power switch:

[12] Depress and hold **ON** pushbutton for 2 seconds

[13] Rotate **ROS/OFF** switch counterclockwise to normal position

[14] At TTY, type **RST:PUB a!**
a = bus to be restored
(0 or 1)

New switch installed

AND

PWR OFF lamp goes off

OFF NORM lamp goes off;
OS lamp goes off

System responds
RST:PUB a COMPLETED

AND

REPLACE POWER SWITCH, PUBB FRAME

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	501

At 1A power switch:

[1] Rotate **ROS/OFF** switch clockwise to **ROS**

OFF NORM lamp lights;
OS lamp lights

[2] Depress **ROS/OFF** switch

PWR OFF lamp lights

[5] Remove circuit pack to be replaced

[6] Clean and lubricate pack terminals and connector per approved method

[7] Insert and properly seat replacement pack

[8] See WARNING 1. Reseat ***ML** fuse if removed

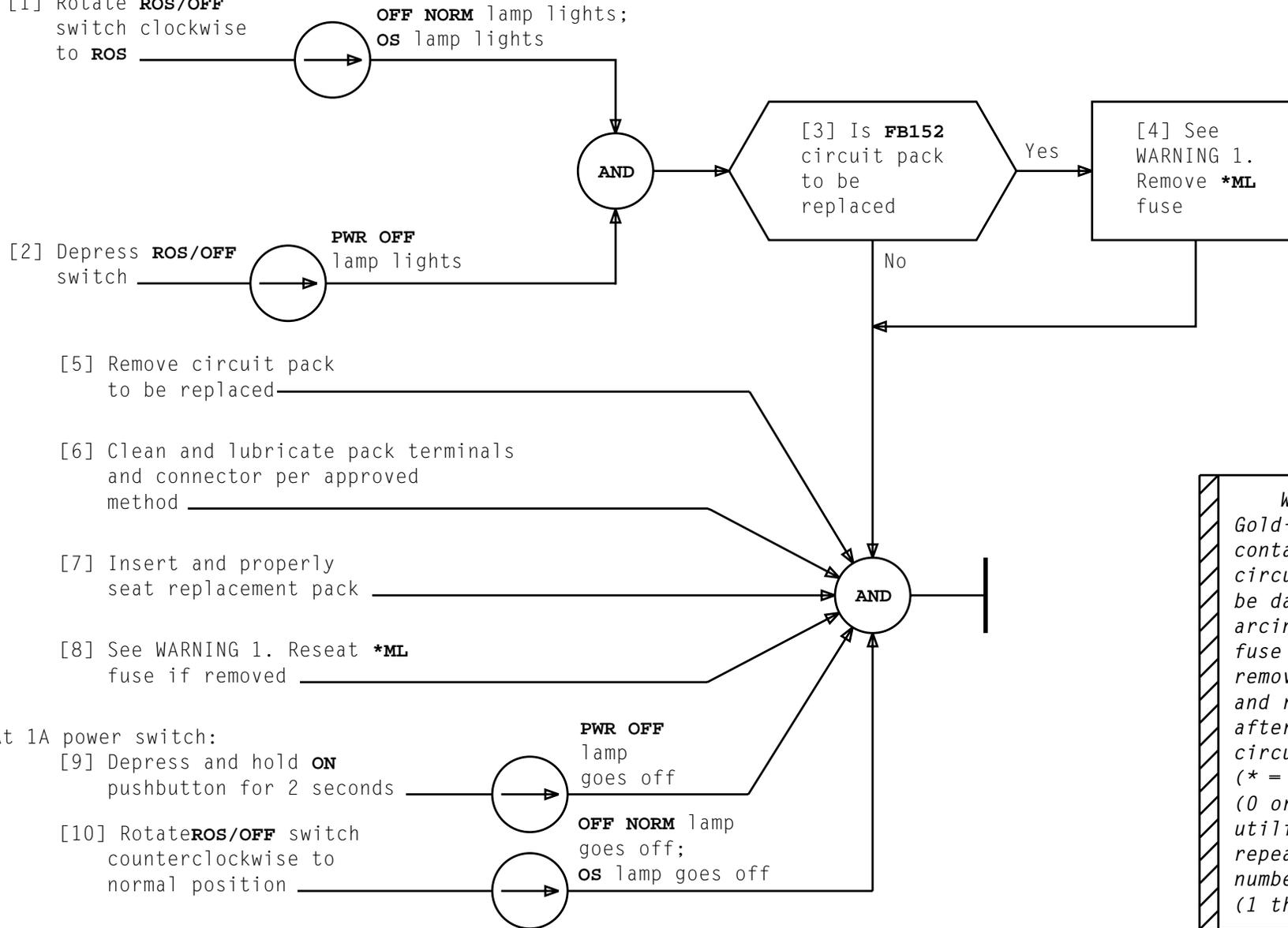
At 1A power switch:

[9] Depress and hold **ON** pushbutton for 2 seconds

PWR OFF lamp goes off

[10] Rotate **ROS/OFF** switch counterclockwise to normal position

OFF NORM lamp goes off;
OS lamp goes off



WARNING 1
Gold-plated contacts on FB152 circuit pack may be damaged by arcing if ***ML** fuse is not removed before and replaced after replacing circuit pack (* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4))

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	502

[1] See NOTE 1. Identify and remove three input fuses associated with converter [TABLE A, Page 2]

[2] Remove DC-to-DC converter

[3] Inspect connector for bent, broken, or shorted pins

[4] Insert and properly seat replacement DC-to-DC converter

DC-to-DC converter replaced

AND

[5] See NOTE 1. Reseat converter fuses

At 1A power switch:

[6] Depress and hold **ON** pushbutton for 2 seconds

PWR OFF lamp goes off

[7] Depress and hold **TEST** pushbutton for 2 seconds

Converter **LED** lights

[8] Depress and hold **ON** pushbutton for 2 seconds

Converter **LED** goes off

AND

NOTE 1

When removing and reseating fuses associated with J87407A converters, remove 140V fuse first, and reseal 140V fuse last

Issue 5 | NOV 1995

234-151-015 | DLP

PAGE 1 of 2 | 503

TABLE A				
CONVERTER		FUSES		
LOCATION	DESIGN	140V DESIGN/LOC	+24V DESIGN/LOC	+24V DESIGN/LOC
*17-00	CV*00	*AA *07-04 (1 1/3 AMP)	*BA *07-25 (1 1/3 AMP)	*CA *07-25 (3/4 AMP)
*17-03	CV*01			
*17-06	CV*02			
*12-00	CV*03	*AB *07-04 (1 1/3 AMP)		
*12-03	CV*04			
*12-06	CV*05			
*17-12	CV*06	*AC *07-04 (1 1/3 AMP)	*BB *07-25 (1 1/3 AMP)	
*17-15	CV*07			
*17-18	CV*08			
*12-12	CV*09	*AD *07-04 (1 1/3 AMP)		
*12-15	CV*10			
*12-18	CV*11			
* = PUBB bay (0 or 1) or if utilized, repeater frame number (1 through 4)				

REPLACE DC-TO-DC CONVERTER (J87407A)

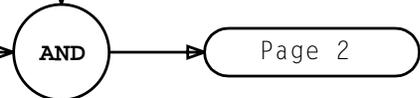
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	503

[1] Obtain program listing PUDGPBGR (PR-4A510) and PUDGPB02 (PR-4A512)

[2] Using PUDGPB02 (PR-4A512) [FIG. 1], identify and record address of ITEM 1 [TABLE A]

[3] Using PUDGPBGR (PR-4A510), identify and record addresses of ITEMS 2 through 6 [TABLE A]

TABLE A		
ITEM	STATEMENT LABELS	ADDRESS
1	STM10600	
2	PBTS2600	
3	PBTS2900	
4	PBTS3600	
5	PBTS4400	
6	PBTS13800	



USE FIRST ADDRESS
(DOWN FROM STM10600)

STM10600

```

000542AB 4643 00 00010135      4370.      38 STM10500 SEGMENT FORCE(AUTO)
                                -002-      39      DATA 9 = 1DG_UNUSED,9 = 0(101),6 = INDEX(4DGSEGMENT)

                                4376.      41 #
                                4378.      42 #
                                4380.      43 #
                                4382.      44 #
                                4384.      45 # SET UP MASK TO CHECK BTC EQUIPAGE
                                4386.      46 (STM10600) MOVEDATA_ITEM(PB4BTCEQMSK),CONST(=0(3)),
                                4388.      47 #
                                4390.      48 # CALCULATE AMOUNT OF SHIFT. SHIFT=(BTCOUNT*2)
                                        /
                                        /
                                        /

                                4420.      17 # SHIFT EQUIPAGE BITS BACK TO DO COMPARE.
000543AB 4643 00 00070136      4422.      18      ME      ITEM(PB4TEST),LOC(PB4TEST),SHIFT(DG4PULTAB+22)
                                -003-      19      DATA 9 = 1DG_UNUSED,9 = 0(701),6 = INDEX(4DGMovedata)

                                -003-      21
                                000544AB 4643 00 00000003      -003-      22      DATA 24 = 0(00000003) #LITERAL CONSTANT
                                000545AB 4643 00 40200323      -003-      23      DATA 2 = 2,5 = 0(0),5 = 0(20),12 = 0(0323) #TO ITEM
                                000546AB 4643 00 00000000      -003-      24      DATA 2 = 1DG_UNUSED,5 = 0(0),5 = 0(0),12 = 0(0000) #INDEX
                                000547AB 4643 00 00300000      -003-      25      DATA 2 = 0,5 = 0(0),5 = 0(30),9 = 1DG_UNUSED,3 = 0 #MASK,FLAGS
                                000550AB 4643 00 00000000      -003-      26      DATA 24 = 0(00000000) #NO OPERATION

```

FIG. 1 - Location of STM10600 and Address to Use

STORE INPUT MESSAGES ON TTY FOR PUB LOOPING TEST

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	504

At TTY:

[4] See CAUTION 1. Depress **FORM ENTER** pushbutton to **ON**

[5] Type input messages [TABLE B]

[6] Depress **FORM ENTER** pushbutton to **OFF**

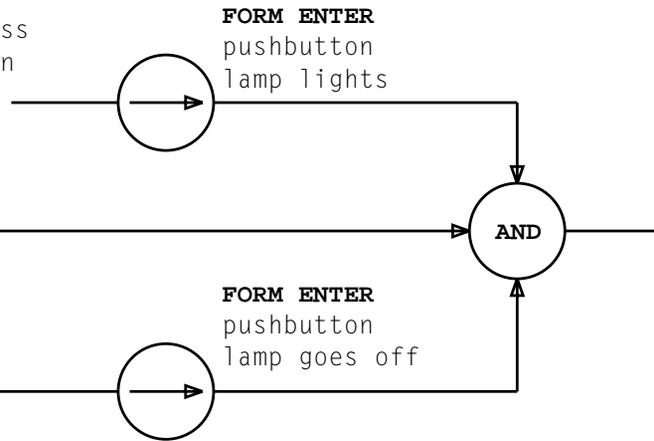


TABLE B			
NUMBER	INPUT MESSAGES	NUMBER	INPUT MESSAGES
1	EX:PUBa;START! a = Bus 0 or 1	7	EX:PUB a:ADR b-c! a = Bus 0 or 1 b = address of statement label PBTS4400 c = address of statement label PBTS13800
2	EX:PUB a:PH 2,ADR b! a = Bus 0 or 1 b = address of statement label STM10600	8	EX:PUB a:ADR b! a = Bus 0 or 1 b = address of statement label STM10600
3	EX:PUB a;STEP! a = Bus 0 or 1	9	OP:MACLI,CLASS MTCE!
4	EX:PUB a:ADR b-c! a = Bus 0 or 1 b = address of statement label PBTS2600 c = address of statement label PBTS2900	10	STOP:MACLI,CLASS MTCE,SUBCLASS a! a = CLASS MTCE SUBCLASS number from output message assigned to PUB diagnostic*
5	EX:PUB a! a = Bus 0 or 1	* To obtain CLASS MTCE SUBCLASS number, type OP:MACLI,CLASS MTCE!. From system response, determine which maintenance subclass number is associated with PUB	
6	EX:PUB a:ADR b-c! a = Bus 0 or 1 b = address of statement label PBTS2900 c = address of statement label PBTS3600		

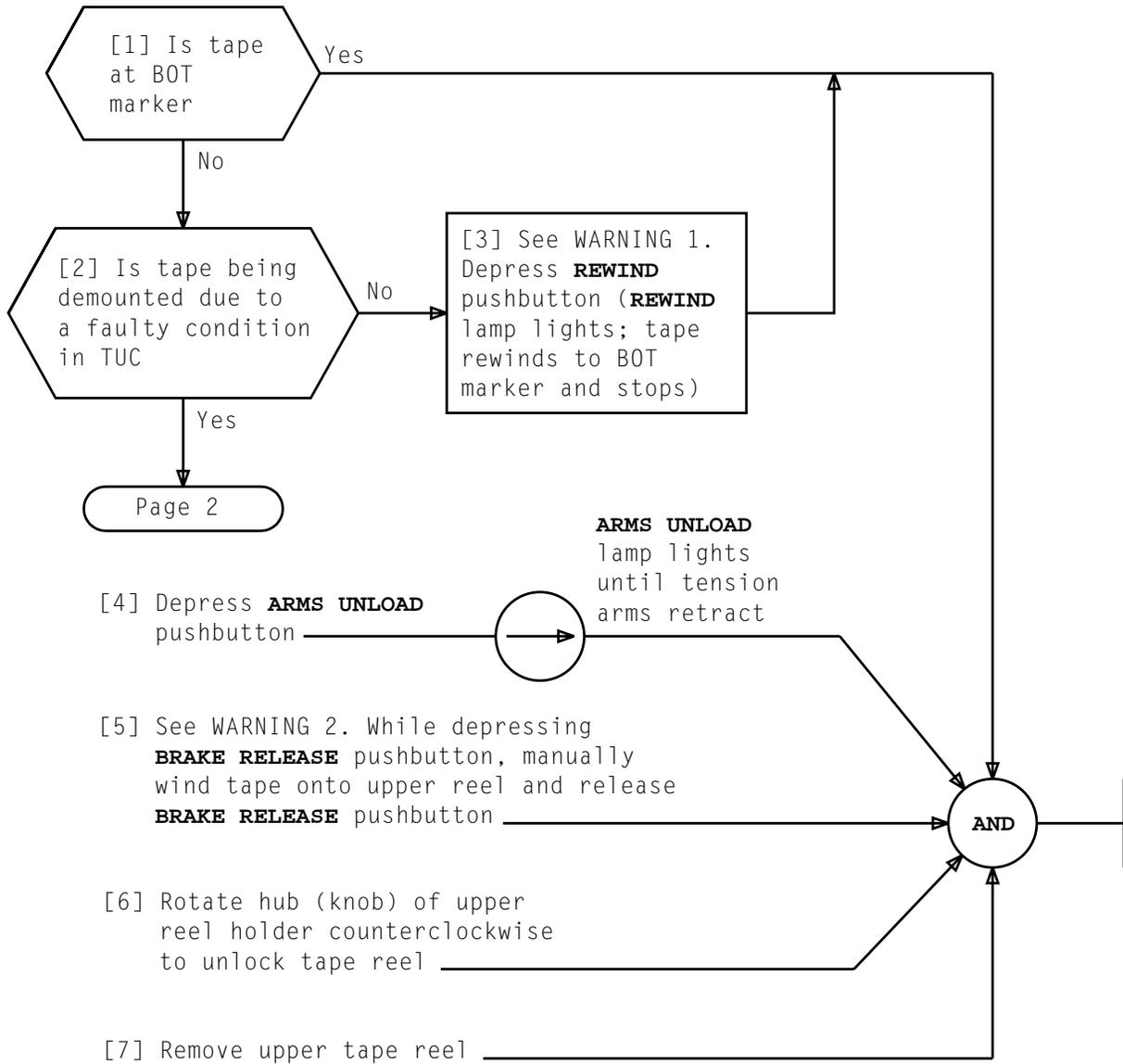
*CAUTION 1
Input messages
must not be
entered into
system at this
time*

Issue 5 NOV 1995

234-151-015 DLP

PAGE 2 of 2 **504**

STORE INPUT MESSAGES ON TTY FOR PUB LOOPING TEST

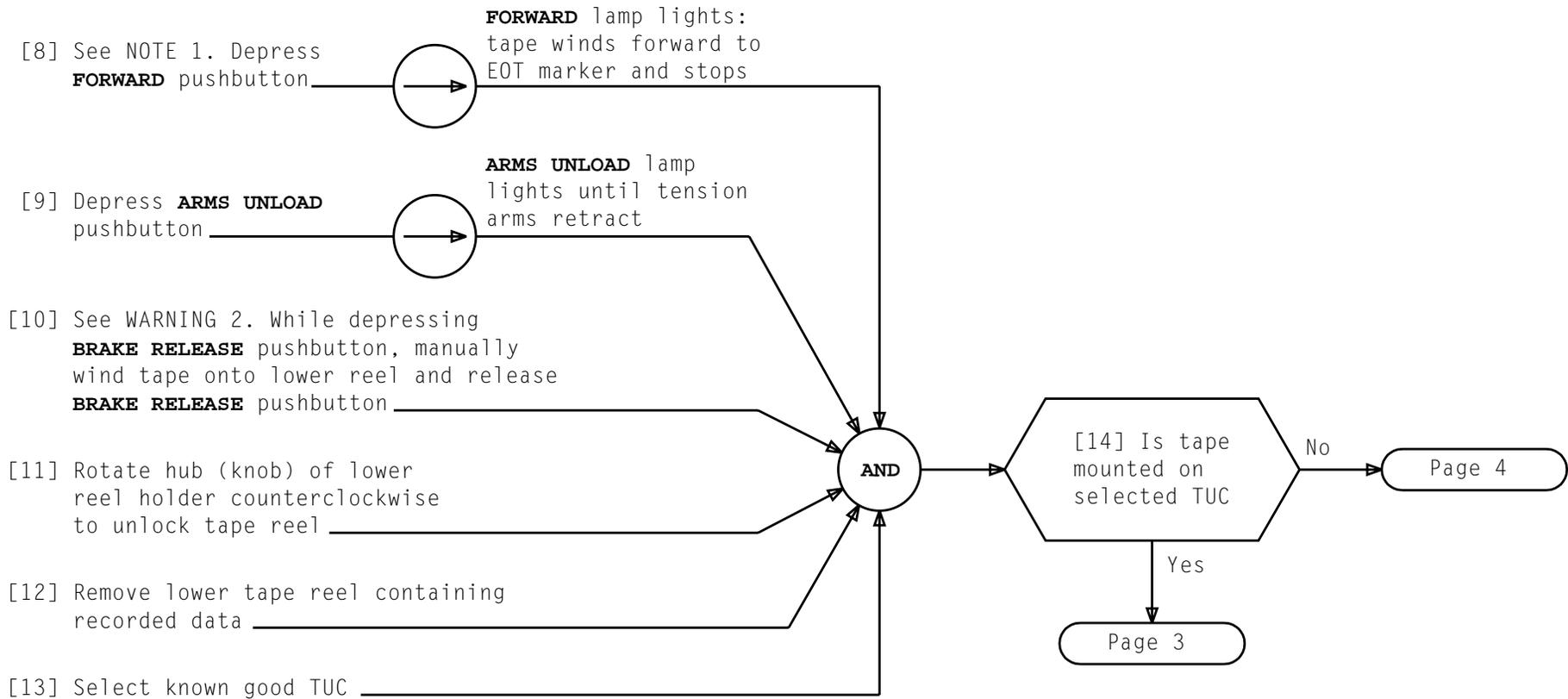


WARNINGS

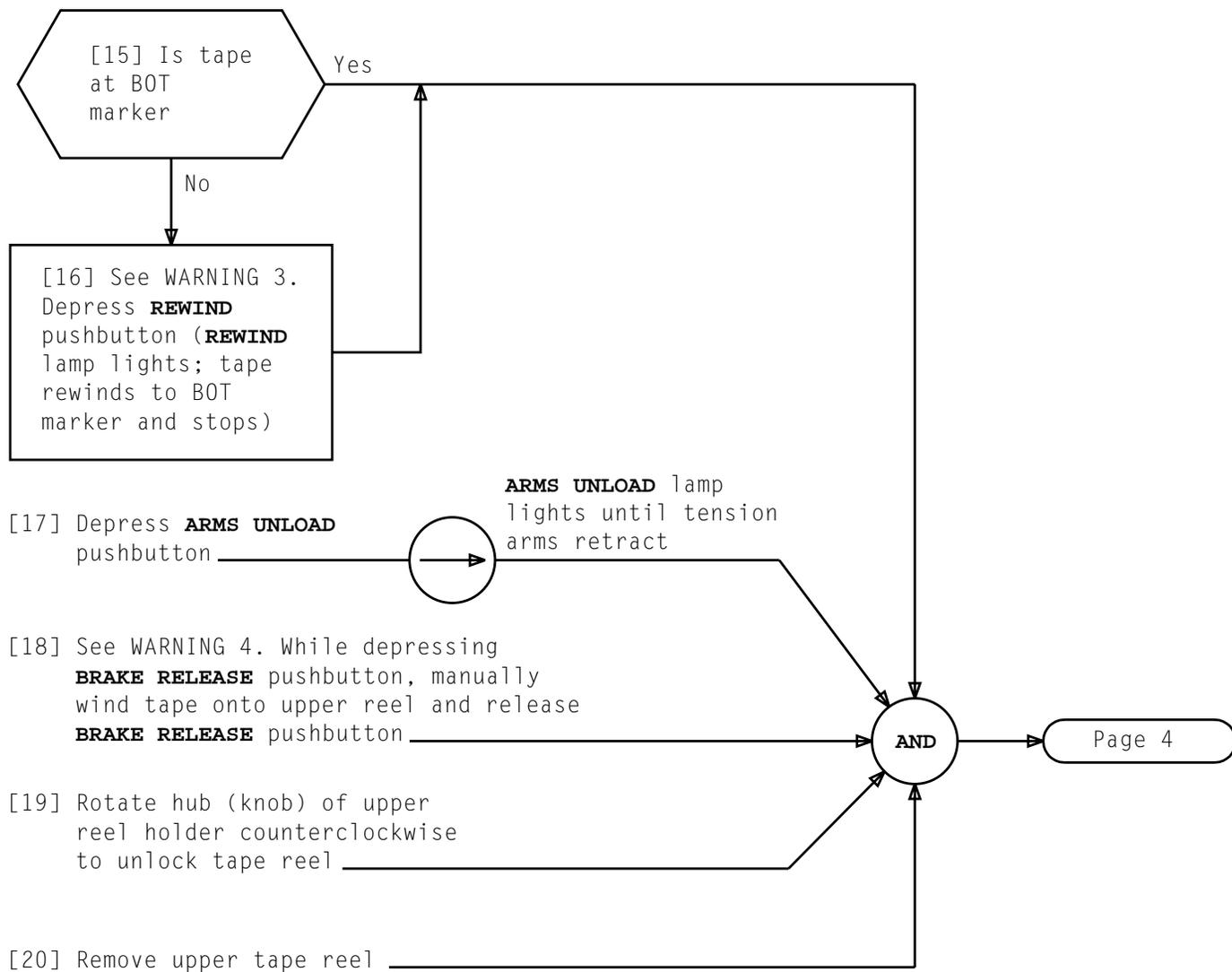
1. If alignment tape is mounted, use **REVERSE** pushbutton to rewind tape
2. Pulling or dragging last 5 feet of tape across heads may contaminate heads

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	505

DEMOUNT TAPE ON TAPE TRANSPORT



NOTE 1	
Steps 8 through 37 are being performed to prevent possible loss of recorded data	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 5	505



WARNINGS

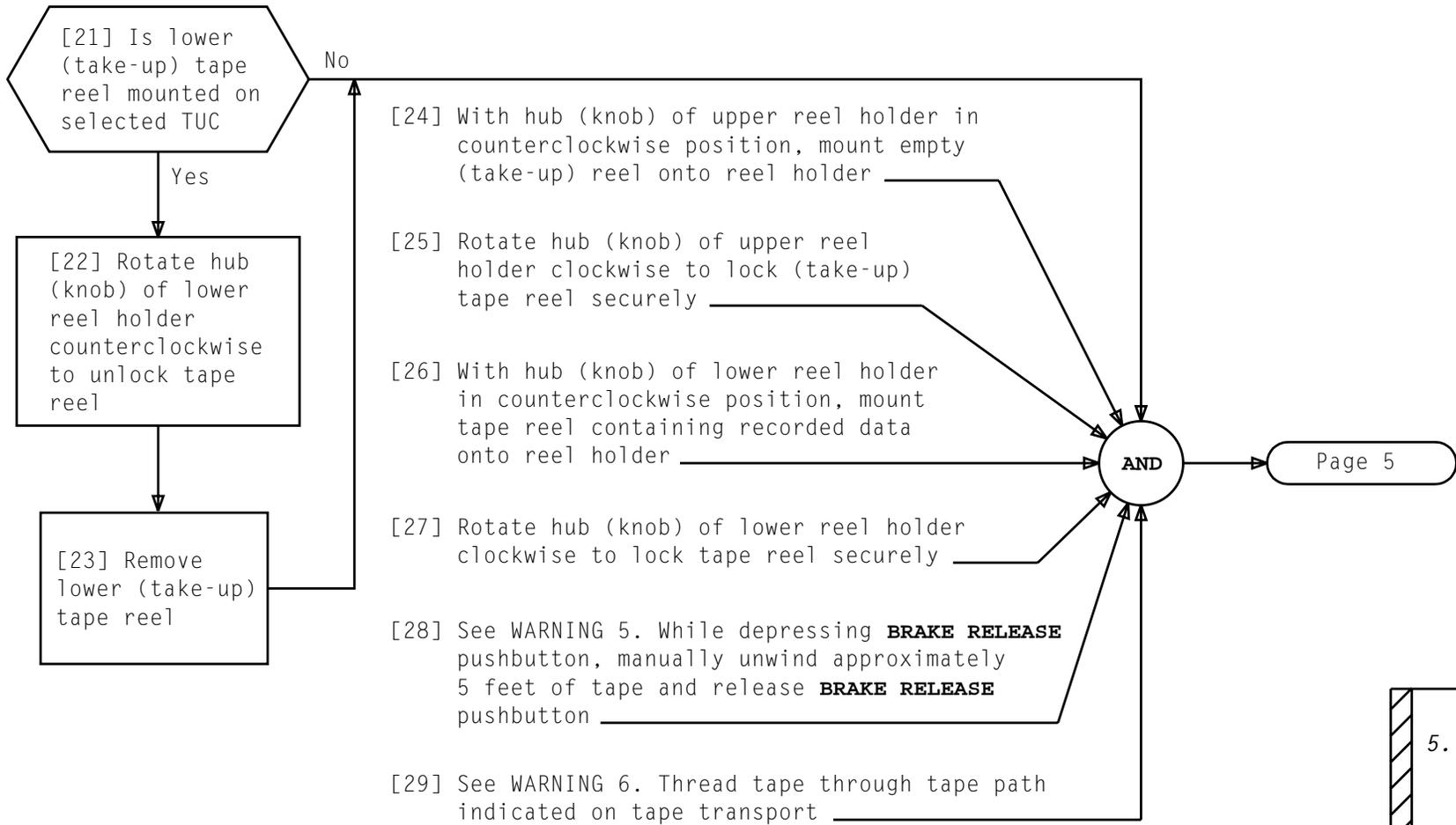
3. If alignment tape is mounted, use **REVERSE** pushbutton to rewind tape

4. Pulling or dragging last 5 feet of tape across heads may contaminate heads

Issue 5 | NOV 1995

234-151-015 | DLP

PAGE 3 of 5 | **505**



WARNINGS

5. Contamination of tape by contact with floor will damage tape heads

6. Do not touch tape head surfaces; body oil will contaminate tape

Issue 5	NOV 1995
234-151-015	DLP
PAGE 4 of 5	505

[30] See NOTE 2. Start tape on upper (take-up) reel making sure tape is not twisted

[31] See WARNING 7. While depressing **BRAKE RELEASE** pushbutton, manually wind upper (take-up) reel three or four turns and release **BRAKE RELEASE** pushbutton

[32] Depress **ARMS NORMAL** pushbutton

ARMS NORMAL lamp lights until arms apply tension to tape

[33] Depress **REWIND** pushbutton

REWIND lamp lights; tape rewinds to BOT marker and stops

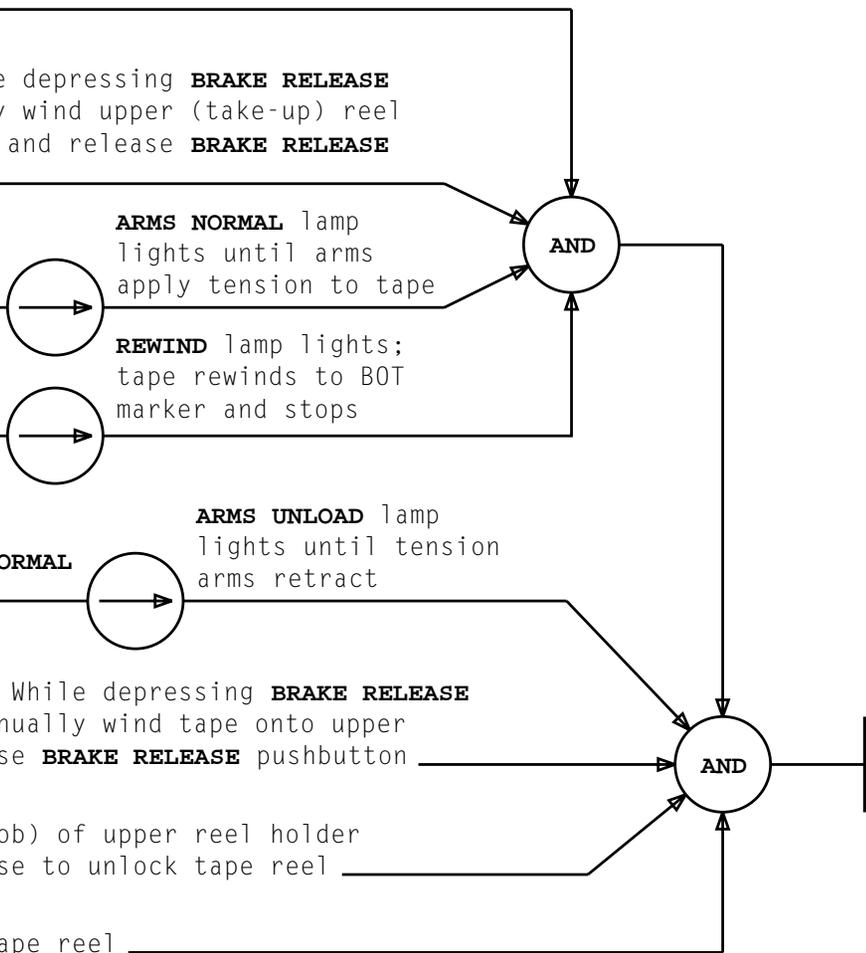
[34] Depress **ARMS NORMAL** pushbutton

ARMS UNLOAD lamp lights until tension arms retract

[35] See WARNING 8. While depressing **BRAKE RELEASE** pushbutton, manually wind tape onto upper reel and release **BRAKE RELEASE** pushbutton

[36] Rotate hub (knob) of upper reel holder counterclockwise to unlock tape reel

[37] Remove upper tape reel



NOTE 2

To start tape on take-up reel, it may help to moisten tape end (moistened fingers) and stick tape to reel axle

WARNINGS

- 7. If tape is not properly aligned along rollers and guides or is too loose, it may be damaged
- 8. Pulling or dragging last 5 feet of tape across heads may contaminate heads

Issue 5 NOV 1995

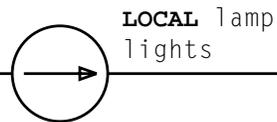
234-151-015 DLP

PAGE 5 of 5 505

At tape transport:

[1] Open interlocked cover door and at upper right, pull interlock switch plunger outward

[2] Depress **LOCAL/REMOTE** pushbutton to obtain **LOCAL** lighted condition



[3] Verify empty lower (take-up) tape reel is same size or larger than tape reel to be mounted

[4] With hub (knob) of upper reel in counterclockwise position, mount reel with tape on reel holder

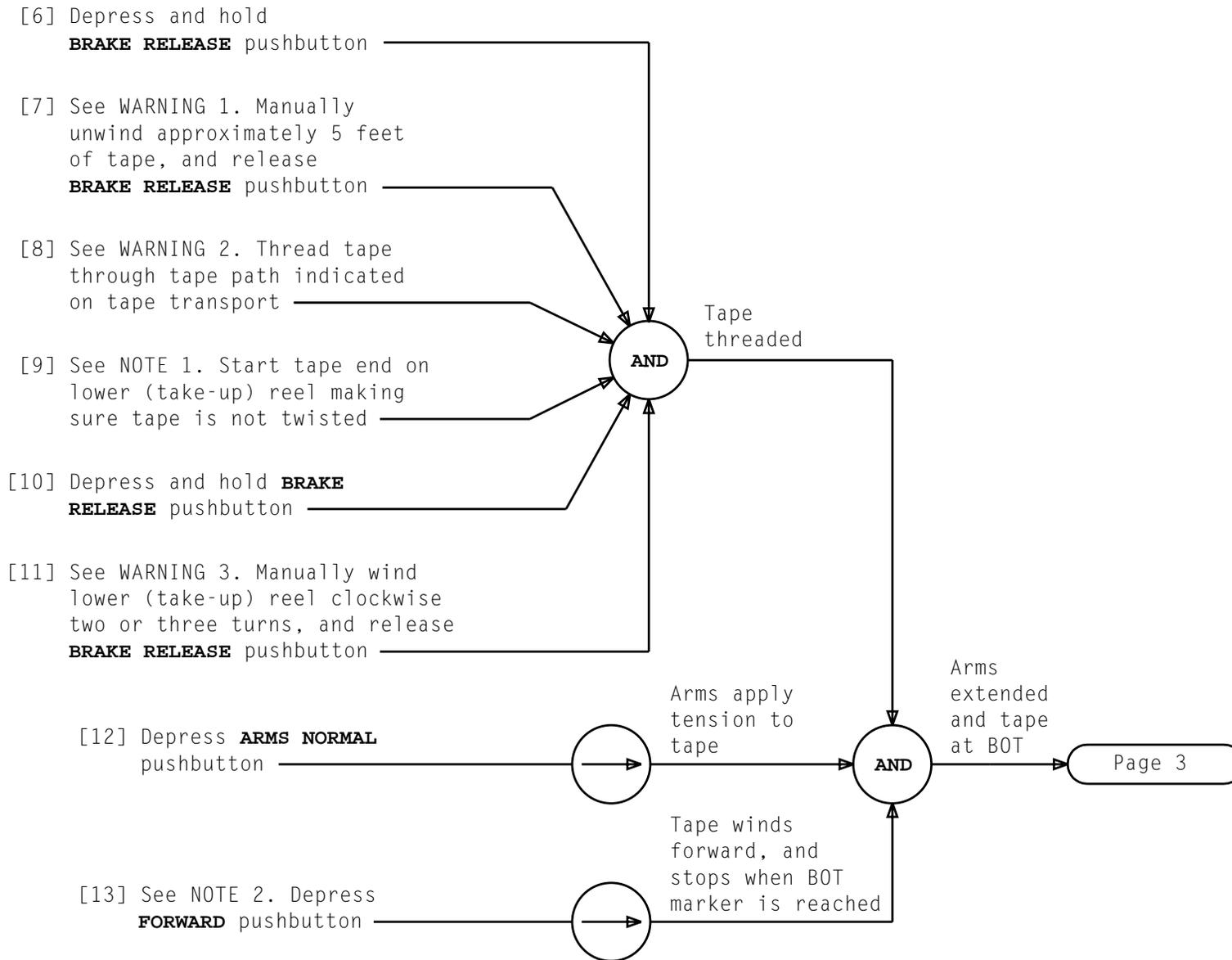
[5] Rotate hub (knob) of upper reel clockwise to detent to lock tape reel securely

Tape reel and take-up reel mounted

Page 2

MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 3	506



NOTES

1. To start tape on take-up reel, it may help to moisten tape end (moistened fingers) and stick tape to reel axle
2. Tape may not stop at BOT marker if **FAST FORWARD** is depressed

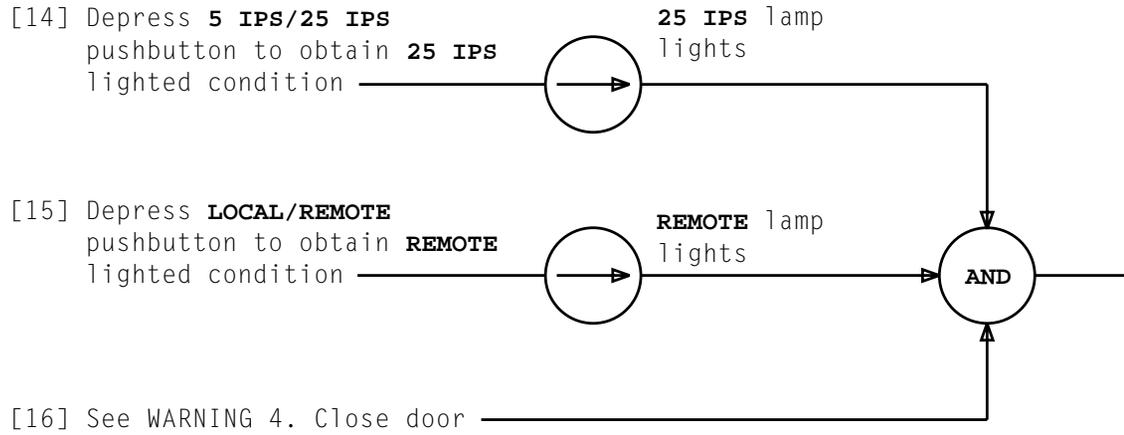
WARNINGS

1. Contamination of tape by touching floor will damage tape heads
2. Do not touch tape head surfaces; body oils will contaminate tape
3. If tape is not properly aligned along rollers and guides, or is too loose, it may be damaged

Issue 5 | NOV 1995

234-151-015 | DLP

PAGE 2 of 3 | 506

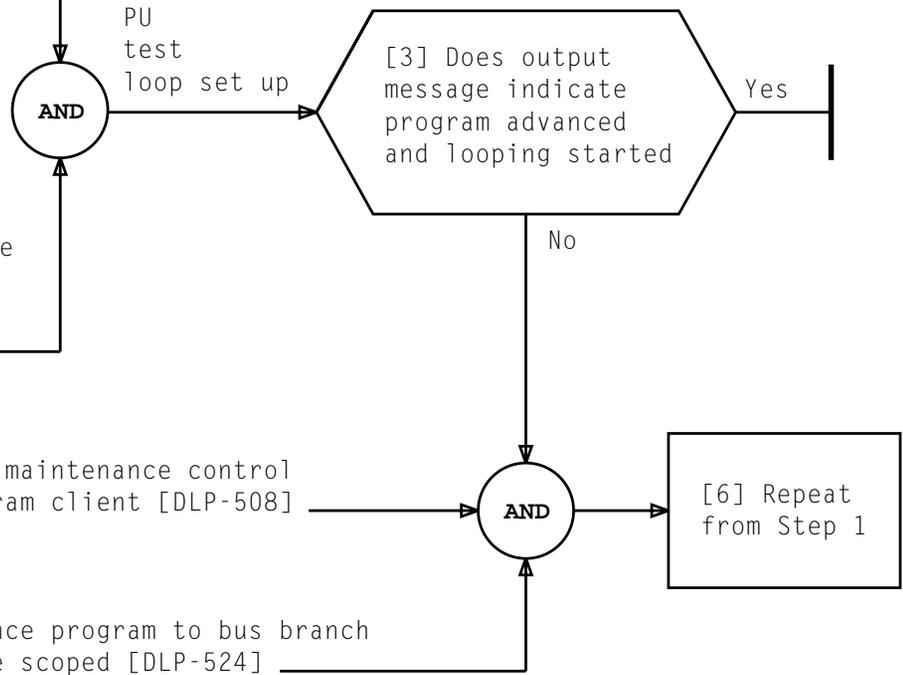


<i>WARNING 4 Closing tape transport door in harsh manner may upset alignment</i>	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 3	506

MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

[1] At TTY, type
 EX:PUB a;STEP!
 a = Bus 0 or 1

[2] Type
 EX:PUB a:ADR b-c!
 a = Bus 0 or 1
 b = address of statement
 label PBTS2600 for PU
 write bus bit 0 or
 PBTS2900 for PU write
 bus bits 1 thru 35
 c = address of statement
 label PBTS2900 for PU write
 bus bit 0 or PBTS3600 for
 PU write bus bits
 1 thru 35



SET UP LOOP TO OBSERVE PU WRITE AND REPLY BUS BITS OR PU WRITE, ENABLE ADDRESS, AND REPLY BUS BITS

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	507

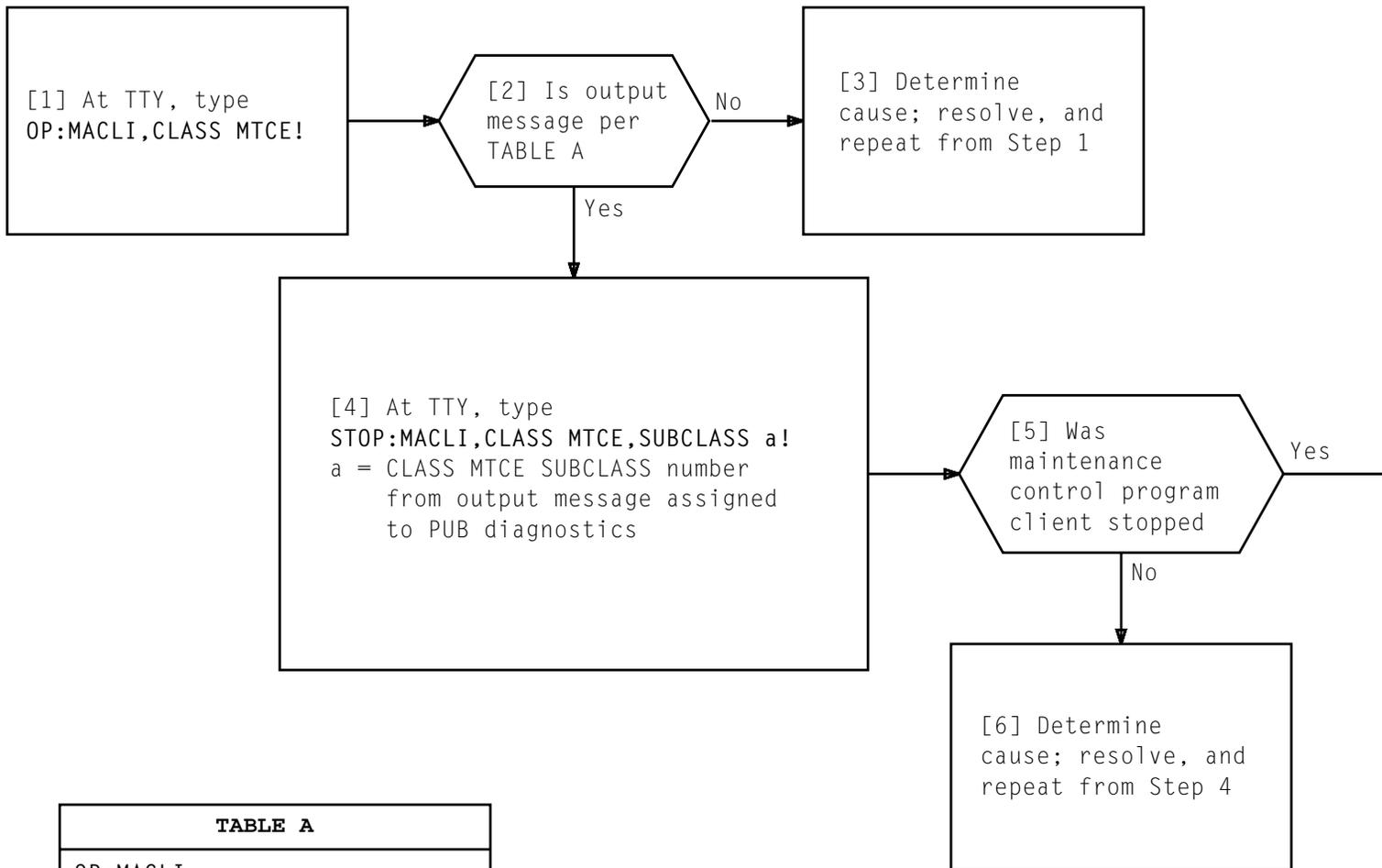


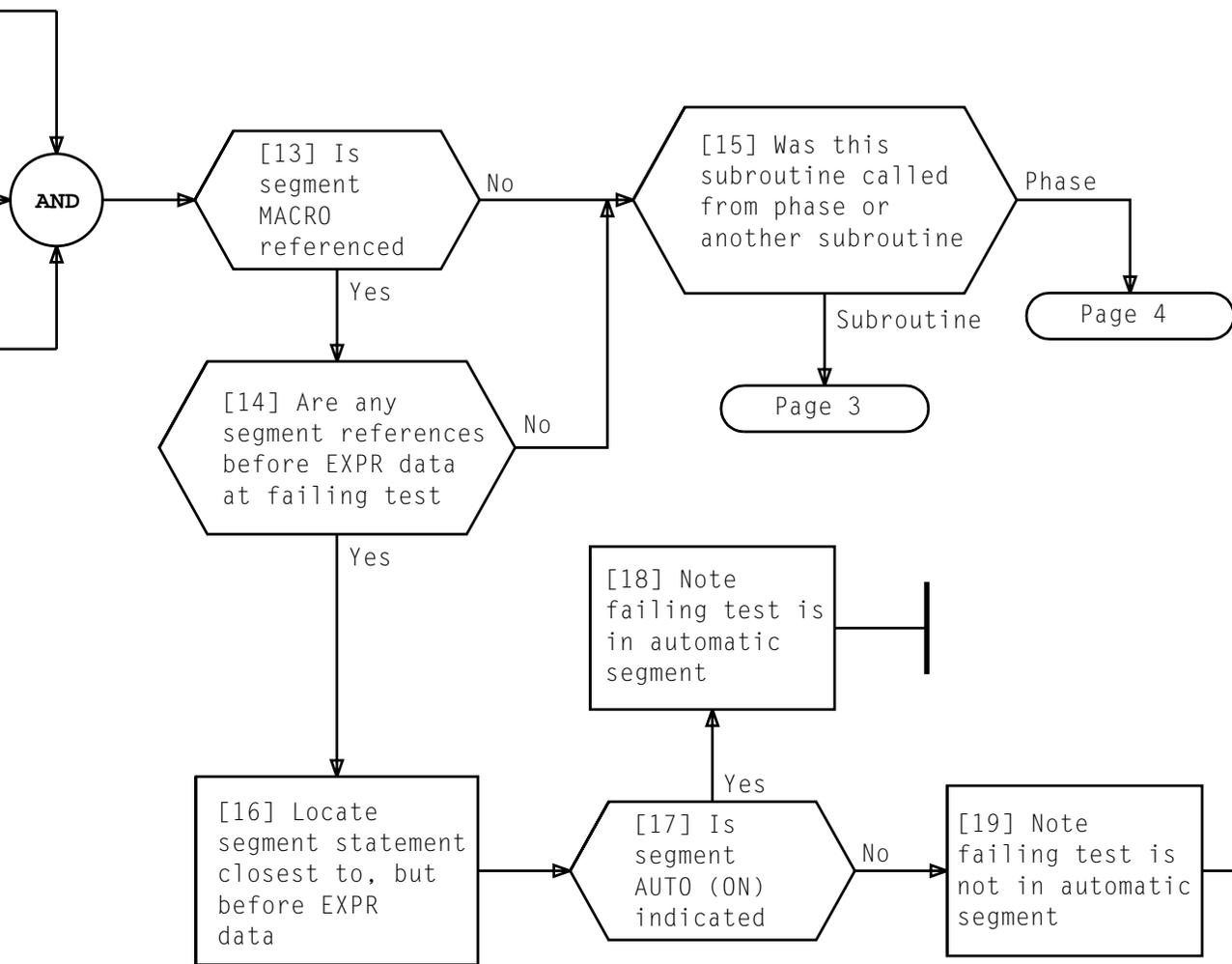
TABLE A	
OP:MACLI	
CLASS MTCE SUBCLASS 0	a-d e f
CLASS MTCE SUBCLASS 1	a-d e f
CLASS MTCE SUBCLASS 2	a-d e f
a-d = NONE or variable data	
e = unit type	
f = member number	

In subroutine where first failing test is located:

[10] Locate and note page and line number of first address in subroutine (000000)

[11] Locate and note page and line number of first failing test EXPR data

[12] Locate PIDENT reference section



DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

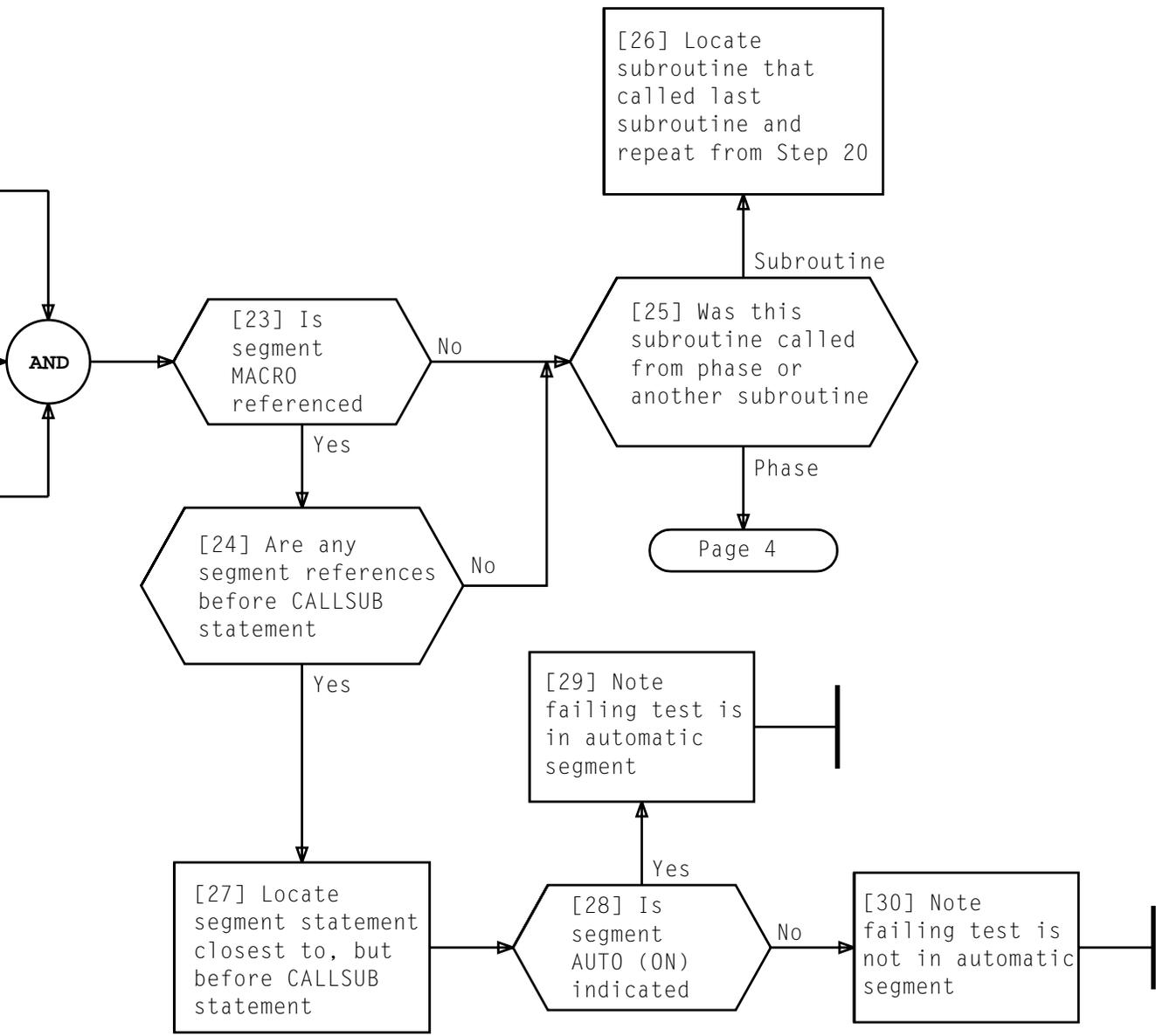
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 4	509

In subroutine that called
last subroutine checked
for segment statement:

[20] Locate and note page
and line number of
first address in
subroutine (000000)

[21] Locate and note page
and line number of
CALLSUB statement that
called last subroutine

[22] Locate PIDENT
reference section



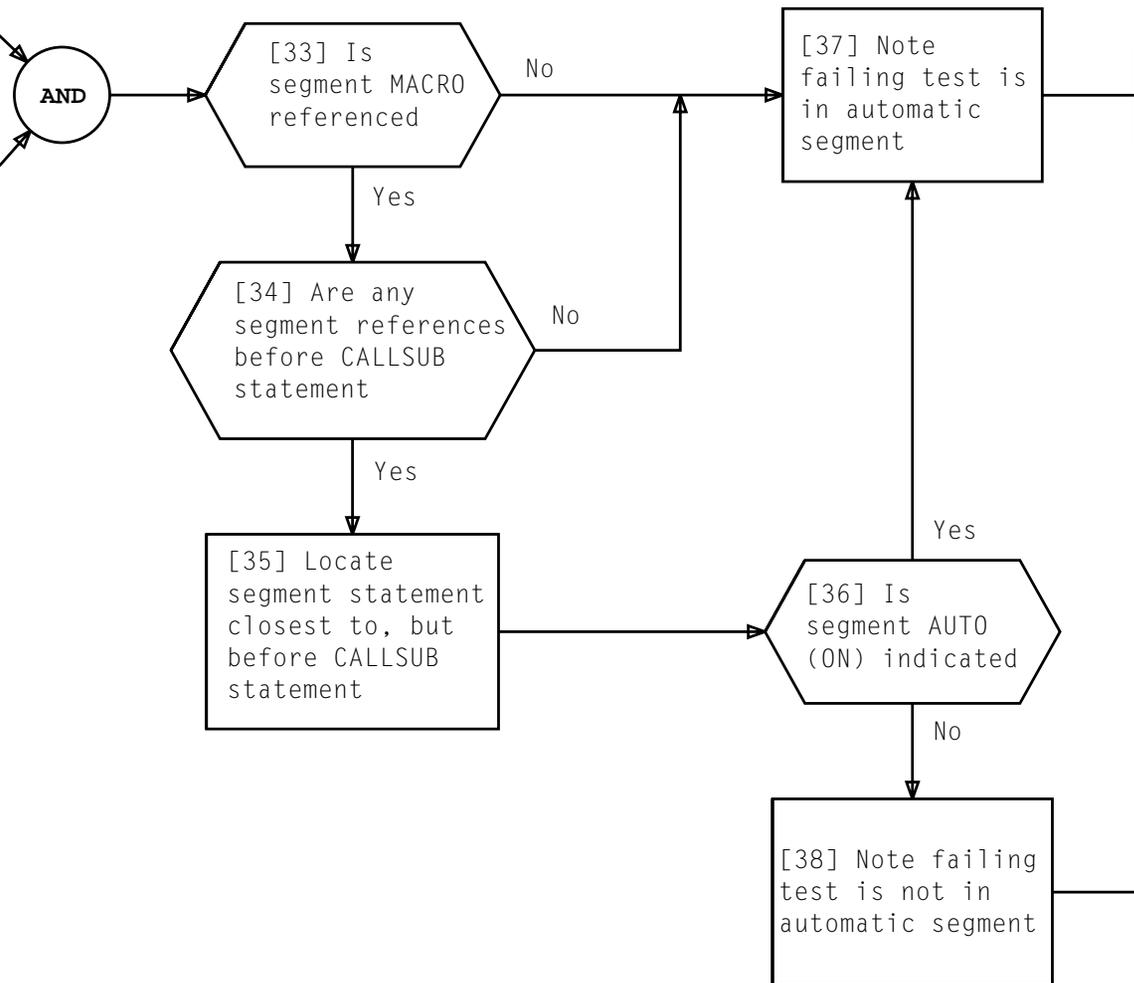
DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 4	509

In first failing phase PIDENT:

[31] Locate and note page and line number of CALLSUB statement that called last subroutine checked for segment statement

[32] Locate reference section



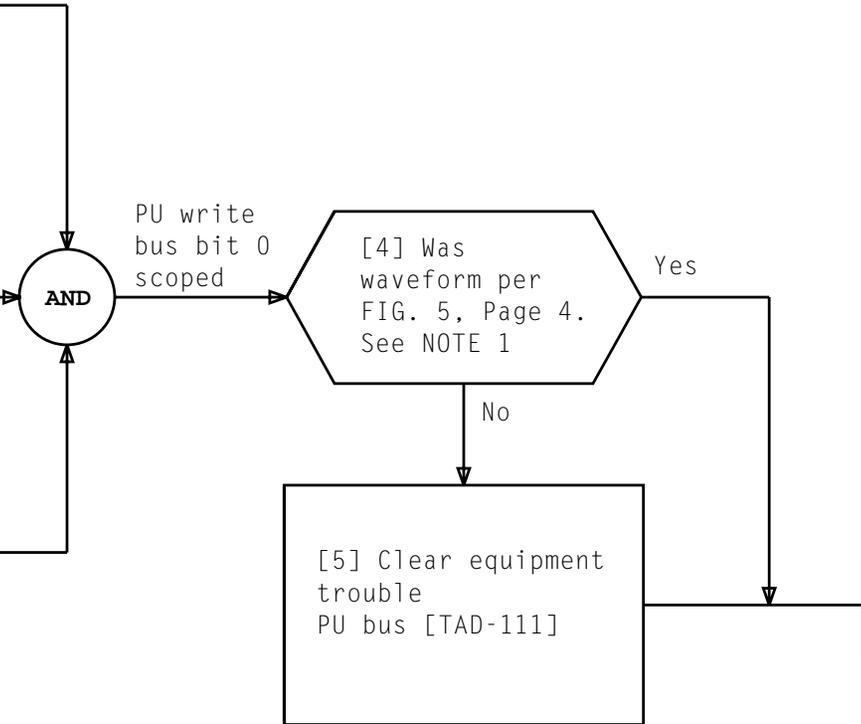
Issue 4	NOV 1995
234-151-015	DLP
PAGE 4 of 4	509

DETERMINE IF FAILING TEST IS IN AUTOMATIC SEGMENT

[1] Locate line in FIG. 1, 2, 3, 4 or 6, Pages 2 through 5, respectively, that contains last frame where PU write bus is terminated on bus branch to be scoped _____

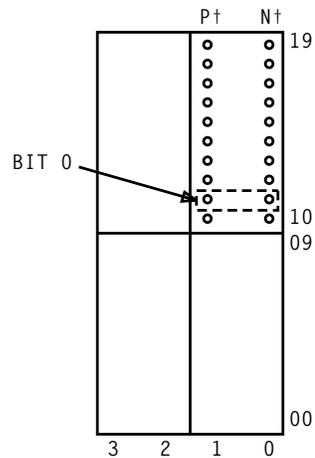
[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together _____

[3] Scope P- and N-pins in dash line box, per FIG. 1, 2, 3, 4 or 6, Pages 2 through 5, respectively, at connector location on line in Step 1. Observe oscilloscope for FIG. 5, Page 4, waveform. See NOTE 1 _____



NOTE 1
 Pulse waveform will vary depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 5, Page 4

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	510

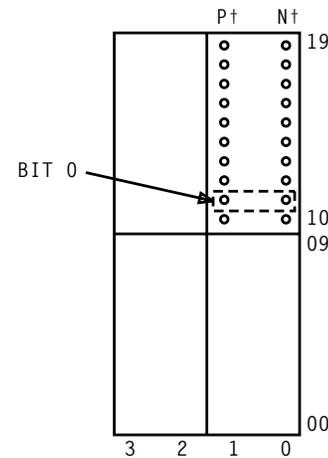


† P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FRAME	BIT 0
CCIS	*80-25
EST	
BUS 0	080-17
BUS 1	080-38
IO	
BUS 0	080-03
BUS 1	080-27
IOP	
BUS 0	080-31
BUS 1	076-31
NCLK	*60-40
SP 1 (W/O COMBINED MATRIX FR)	
BUS 0	380-14
BUS 1	480-14
SP 1 (WITH COMBINED MATRIX FR)	
BUS 0	280-32
BUS 1	380-32
SP 2	
BUS 0	180-28
BUS 1	280-28
TMS A-1,2	*80-14
TMS B	
BUS 0	†76-32
BUS 1	†80-32
TSI A-1	*80-46
TSI A-2	*80-51
TSI B	*80-55

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS
 BAY 0 OR 1 FOR PUB
 TERMINATING AT TMS BAY 1

FIG. 1 - Terminal Connections for Write Bus
 Bit 0 - CCIS, EST, IO, IOP, NCLK,
 SP, TMS and TSI Frames

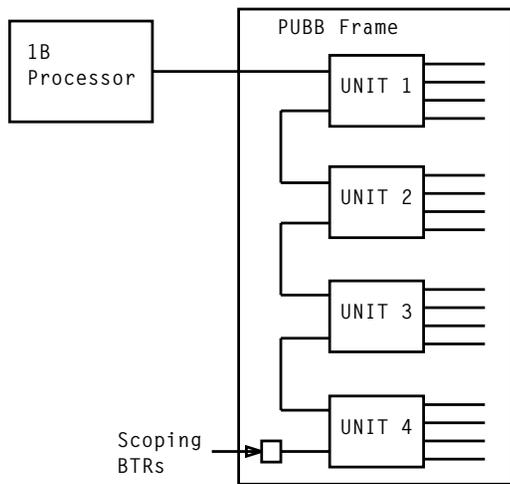


† P FOR POSITIVE LEAD AND
 N FOR NEGATIVE LEAD

PUBB FRAME	BIT 0
BRANCH A	*76-03
BRANCH B	*72-06
BRANCH C	*76-05
BRANCH D	*72-07
BRANCH E	*64-03
BRANCH F	*60-06
BRANCH G	*64-05
BRANCH H	*60-07
BRANCH K	*48-03
BRANCH L	*44-06
BRANCH M	*48-05
BRANCH R	*44-07
BRANCH T	*36-03
BRANCH V	*32-06
BRANCH W	*36-05
BRANCH X	*32-07

* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 2 - Terminal Connections for Write
 Bus Bit 0 - PUBB Frame



PUBB FRAME (PRE-PCO Scoping)	Branches	
UNIT 1	A-D	*76-04
UNIT 2	E-H	*64-04
UNIT 3	K-R	*48-04
UNIT 4	T-X	*36-04

* 0 FOR BUS 0 OR 1 FOR BUS 1

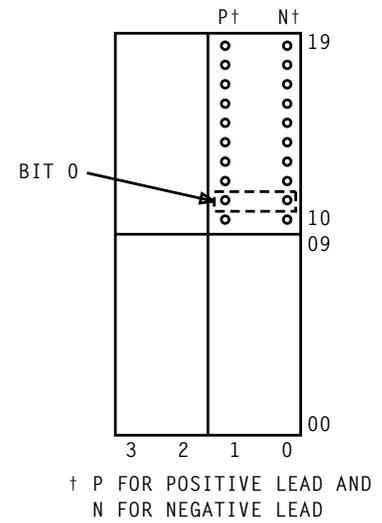
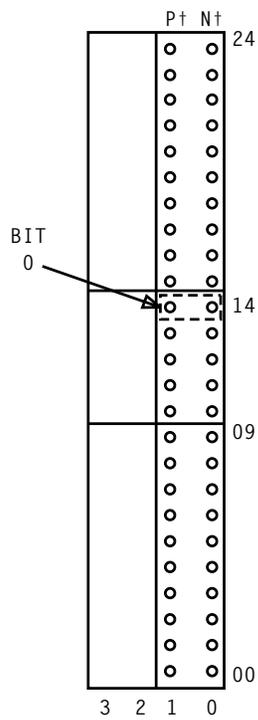


FIG. 3 - Terminal Connection For Write Bus Bit 0
PUBB FRAME (1B Processor During Pre-PCO)



FRAME	BIT 0
DIF	
BUS 0	180-109
BUS 1	180-257
PUC	
BUS 0	080-109
BUS 1	080-257

† P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FIG. 4 - Terminal Connections for Write Bus Bit 0 - DIF and PUC Frames

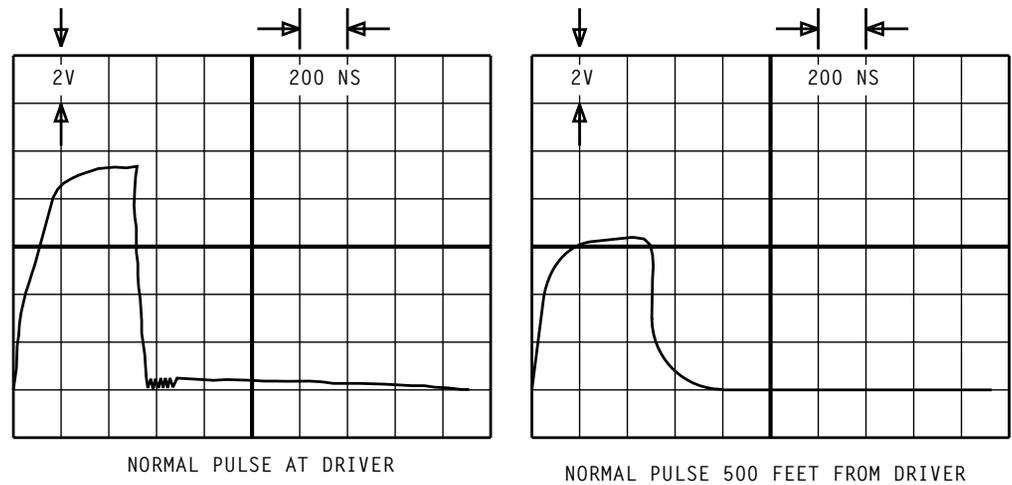


FIG. 5 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver

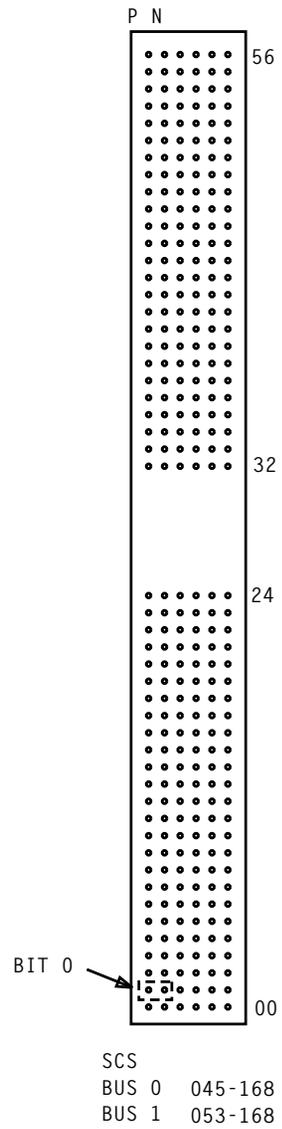


FIG. 6

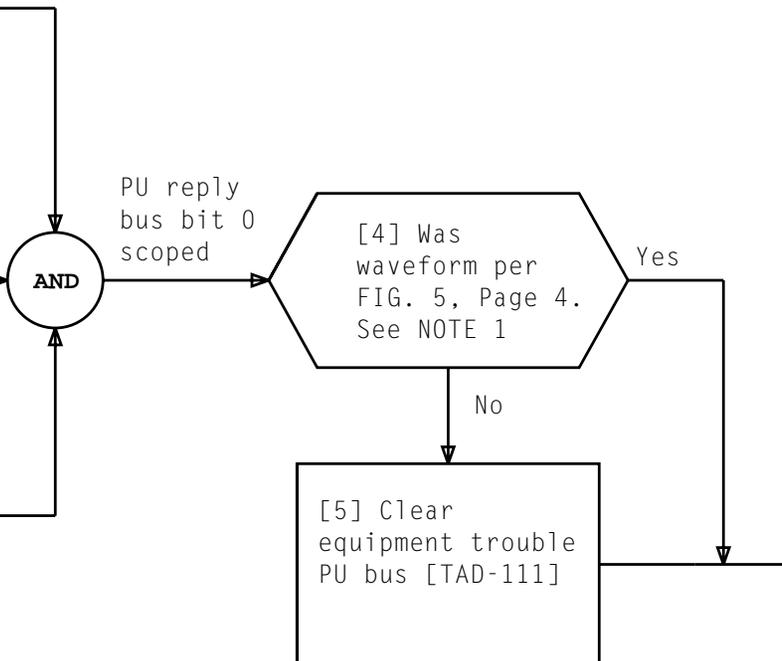
SCOPE PU WRITE BUS BIT 0

Issue 5	NOV 1995
234-151-015	DLP
PAGE 5 of 5	510

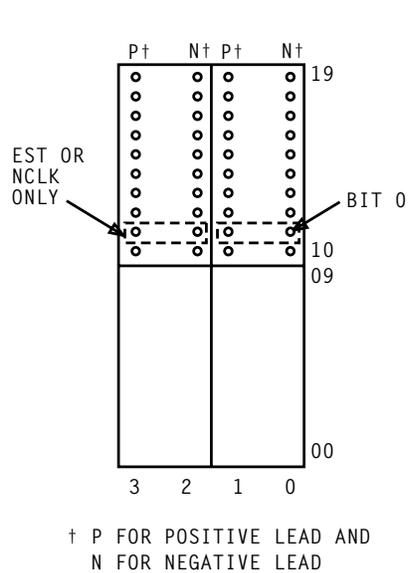
[1] Locate line in FIG. 1, 2, 3, 4 or 5, Pages 2 through 5, respectively, that contains last frame where PU reply bus is terminated on bus branch to be scoped

[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in dashed line box, per FIG. 1, 2, 3, 4 or 6, Pages 2 through 5, respectively, at connector location on line in Step 1. Observe oscilloscope for FIG. 5, Page 4, waveform. See NOTE 1



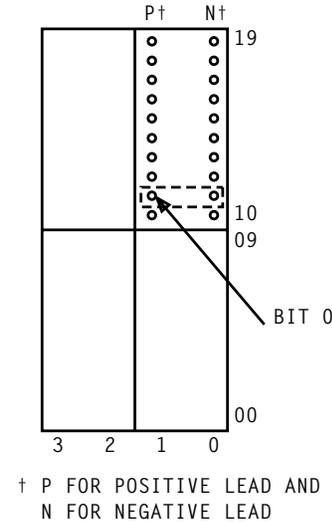
NOTE 1	
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 5, Page 4	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	511



FRAME	BIT 0
CCIS	*80-33
EST	
BUS 0	080-02
BUS 1	080-23
IO	
BUS 0	080-11
BUS 1	080-36
IOP	
BUS 0	080-40
BUS 1	076-40
NCLK	*60-48
SP 1 (WITH COMBINED MATRIX FR)	
BUS 0	280-20
BUS 1	380-20
SP 1 (W/O COMBINED MATRIX FR)	
BUS 0	380-04
BUS 1	480-04
SP 2	
BUS 0	180-18
BUS 1	280-18
TMS A-1,2	*80-04
TMS B	
BUS 0	‡76-20
BUS 1	‡80-20
TSI A-1	*80-36
TSI A-2	*80-39
TSI B	*80-43
VIF	
BUS 0	152-15
BUS 1	152-25

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT
 TMS BAY 0 OR 1 FOR PUB
 TERMINATING AT TMS BAY 1

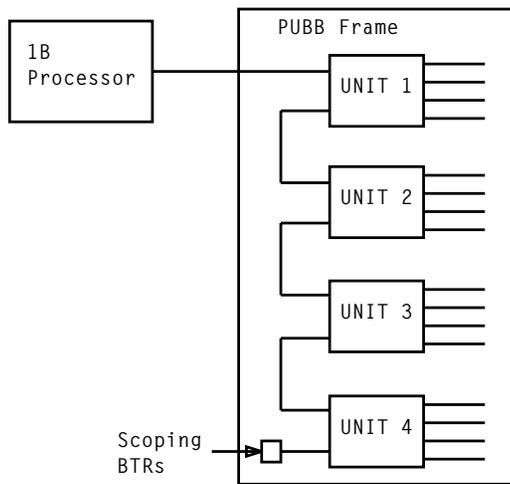
**FIG. 1 - Terminal Connections for Reply Bus
 Bit 0 - CCIS, EST, IO, IOP, NCLK, SP,
 TMS, TSI and VIF Frames**



PUBB FRAME	BIT 0
BRANCH A	*76-19
BRANCH B	*72-17
BRANCH C	*76-20
BRANCH D	*72-18
BRANCH E	*64-19
BRANCH F	*60-17
BRANCH G	*64-20
BRANCH H	*60-18
BRANCH K	*48-19
BRANCH L	*44-17
BRANCH M	*48-20
BRANCH R	*44-18
BRANCH T	*36-19
BRANCH V	*32-17
BRANCH W	*36-20
BRANCH X	*32-18

* 0 FOR BUS 0 OR 1 FOR BUS 1

**FIG. 2 - Terminal Connections for Reply
 Bus Bit 0 - PUBB Frame**



PUBB FRAME (PRE-PCO Scoping)	Branches	
UNIT 1	A-D	*76-20
UNIT 2	E-H	*64-20
UNIT 3	K-R	*48-20
UNIT 4	T-X	*36-20

* 0 FOR BUS 0 OR 1 FOR BUS 1

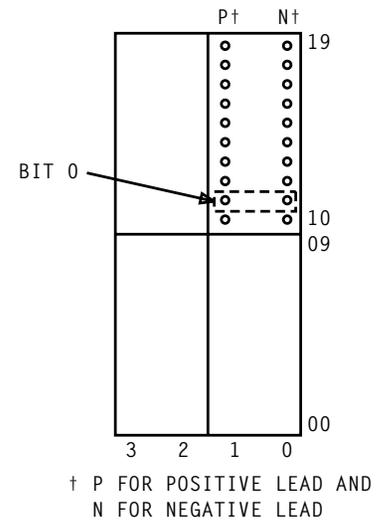
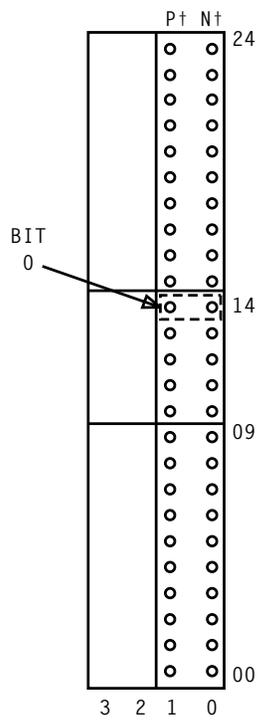


FIG. 3 - Terminal Connection For Reply Bus Bit 0
PUBB FRAME (1B Processor During Pre-PCO)



FRAME	BIT 0
DIF	
BUS 0	180-053
BUS 1	180-201
PUC	
BUS 0	080-053
BUS 1	080-201

† P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FIG. 4 - Terminal Connections
for Reply Bus Bit 0 - DIF
and PUC Frames

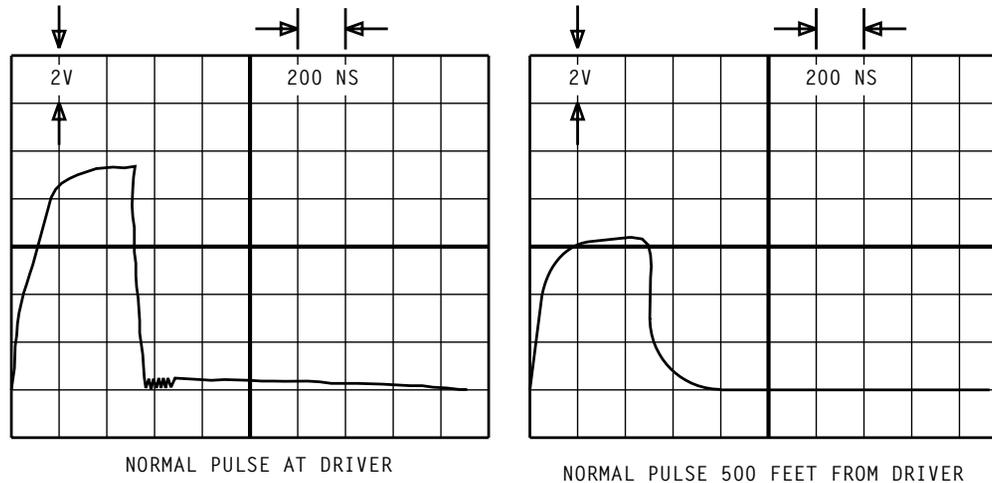


FIG. 5 - Example Waveforms of Normal Pulse
at Driver and 500 Feet From Driver

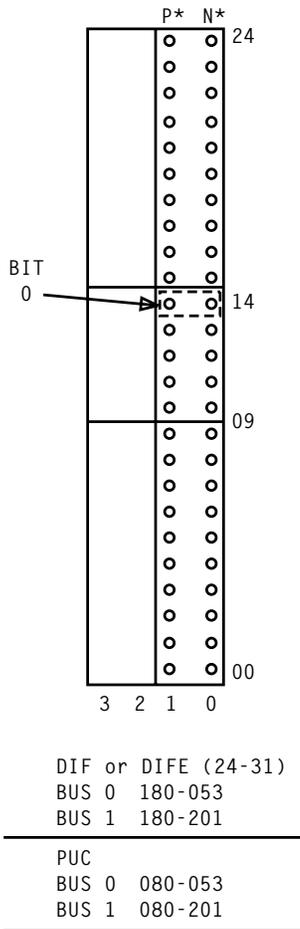
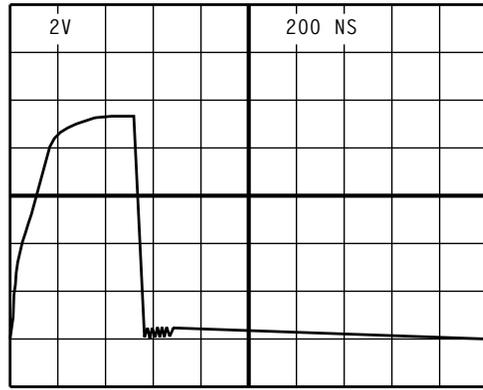
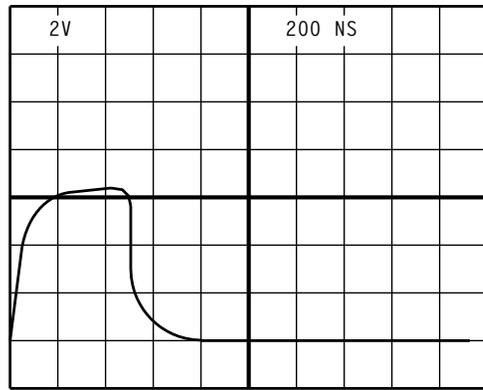


FIG. 3

*P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

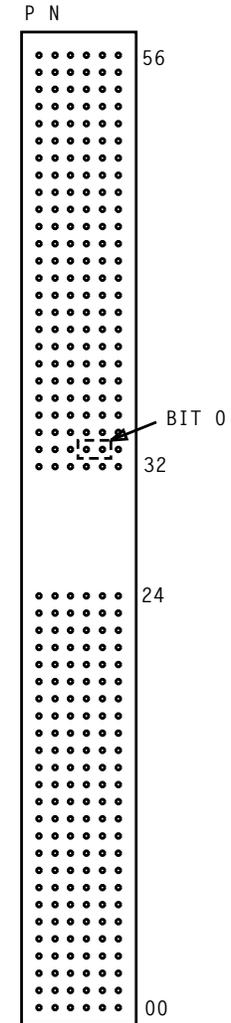


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 4



SCS		XTSI	
BUS 0	045-168	BUS 0	052-170
BUS 1	053-168	BUS 1	061-170

FIG. 5

[1] Locate line in FIG. 1, 2, 3, 4, 5 or 7, Pages 2, 3, 4, 5, 6 and 7, respectively, that contains last frame where PU write bus is terminated on bus branch to be scoped

[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in each dashed line box, per FIG. 1, 2, 3, 4, 5 or 7, Pages 2, 3, 4, 5, 6 and 7, respectively, at connector locations on line in Step 1. Observe oscilloscope for FIG. 6, Page 6, waveform. See NOTE 1

PU write bus bits 1 to 35 scoped

AND

[4] Were all observations per waveform in FIG. 6, Page 6. See NOTE 1

Yes

No

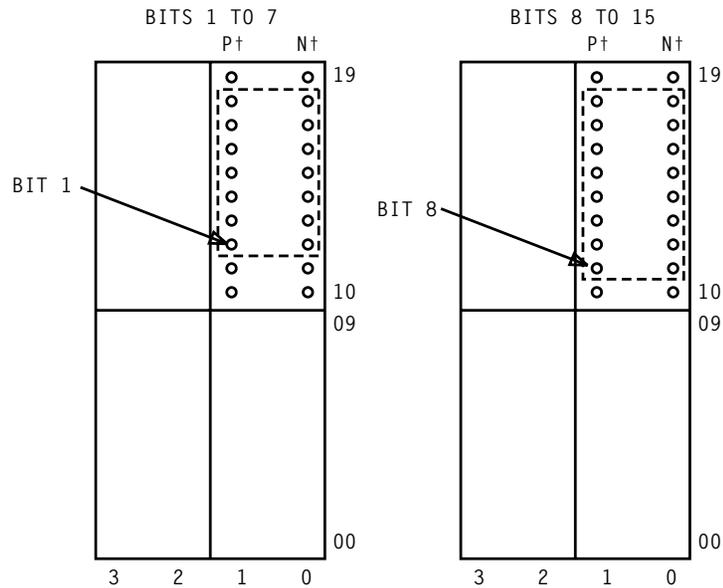
[5] Clear equipment trouble PU bus [TAD-111]

NOTE 1
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 6, Page 6

Issue 5 | NOV 1995

234-151-015 | DLP

PAGE 1 of 7 | 512

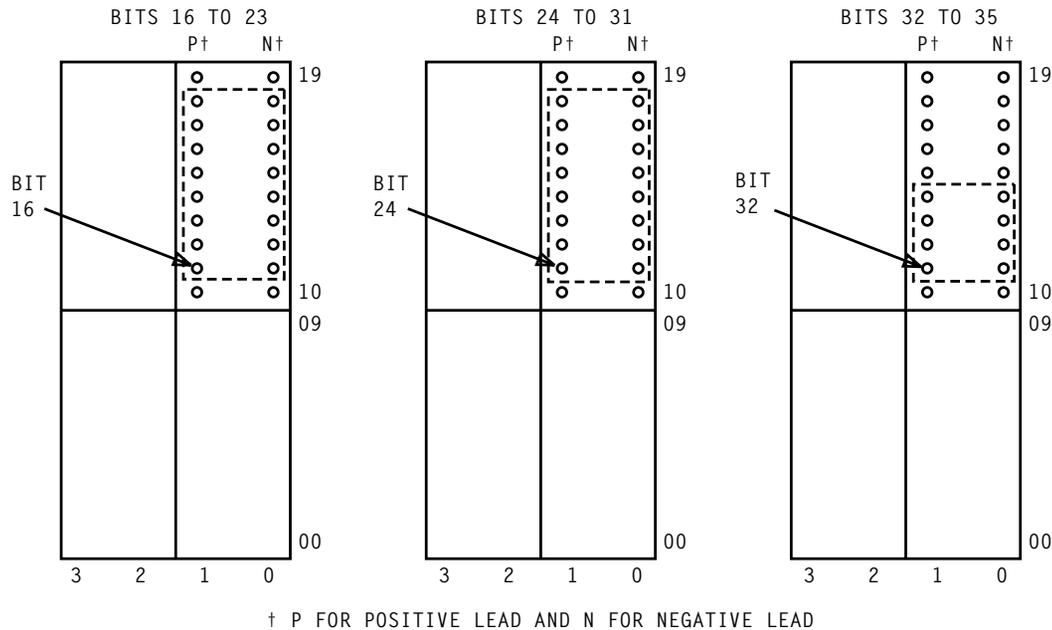


† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FRAME	BITS 1 TO 7	BITS 8 TO 15
CCIS	*80-25	*80-23
EST		
BUS 0	080-17	080-16
BUS 1	080-38	080-37
IO		
BUS 0	080-03	080-04
BUS 1	080-27	080-28
IOP		
BUS 0	080-31	080-33
BUS 1	076-31	076-33
NCLK	*60-40	*60-39
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-14	380-13
BUS 1	480-14	480-13
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-32	280-30
BUS 1	380-32	380-30
SP 2		
BUS 0	180-28	180-27
BUS 1	280-28	280-27
TMS A-1,2	*80-14	*80-13
TMS B		
BUS 0	‡76-32	‡76-30
BUS 1	‡80-32	‡80-30
TSI A-1	*80-46	*80-45
TSI A-2	*80-51	*80-49
TSI B	*80-55	*80-53

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS
 BAY 0 OR 1 FOR PUB TERMINATING
 AT TMS BAY 1

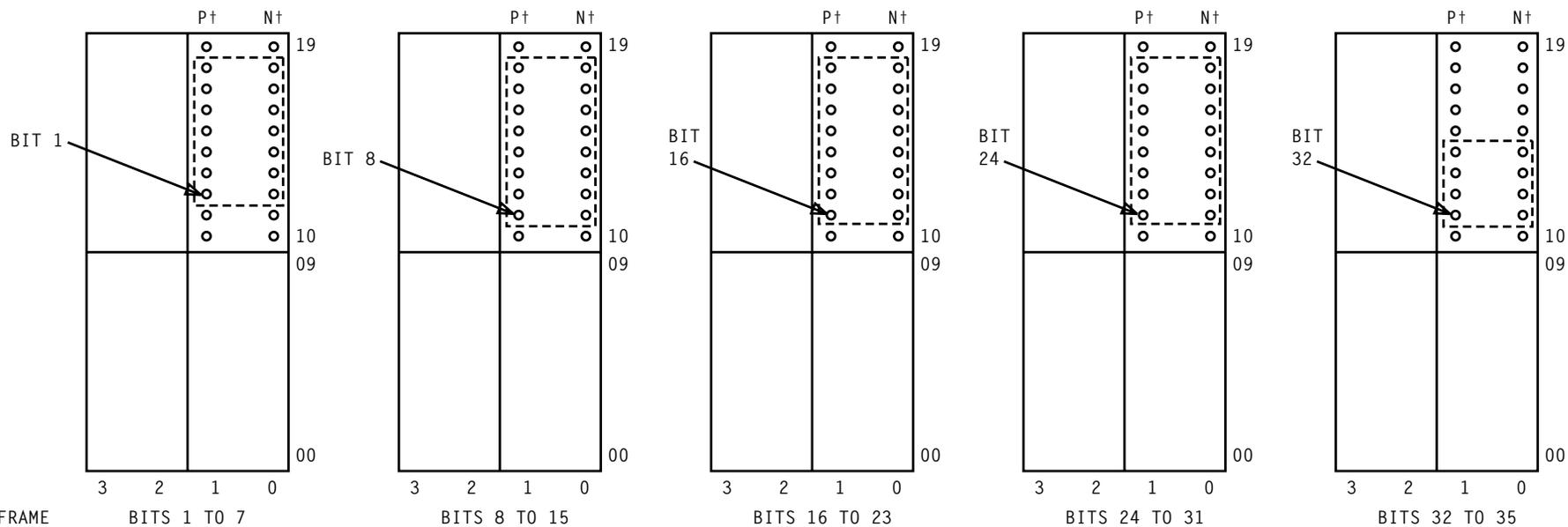
FIG. 1 - Terminal Connections for Write Bus Bits 1 Through 15 - CCIS, EST, IO, IOP, NCLK, SP, TMS and TSI Frames



FRAME	BITS 16 TO 23	BITS 24 TO 31	BITS 32 TO 35
CCIS	*80-21	*80-19	*80-18
EST			
BUS 0	080-15	080-14	080-13
BUS 1	080-36	080-35	080-34
IO			
BUS 0	080-05	080-06	080-07
BUS 1	080-29	080-31	080-32
IOP			
BUS 0	080-34	080-36	080-37
BUS 1	076-34	076-36	076-37
NCLK	*60-38	*60-37	*60-36
SP 1 (W/O COMBINED MATRIX FR)			
BUS 0	380-12	380-11	380-10
BUS 1	480-12	480-11	480-10
SP 1 (WITH COMBINED MATRIX FR)			
BUS 0	280-29	280-27	280-26
BUS 1	380-29	380-27	380-26
SP 2			
BUS 0	180-26	180-25	180-24
BUS 1	280-26	280-25	280-24
TMS A-1,2	*80-12	*80-11	*80-10
TMS B			
BUS 0	†76-29	†76-27	†76-26
BUS 1	†80-29	†80-27	†80-26
TSI A-1	*80-44	*80-43	*80-42
TSI A-2	*80-48	*80-46	*80-45
TSI B	*80-52	*80-50	*80-49

* 0 FOR BUS 0 OR 1 FOR BUS 1
 † 0 FOR PUB TERMINATING AT TMS BAY 0 OR
 1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 2 - Terminal Connections for Write Bus Bits 16 Through 35 - CCIS, EST, IO, IOP, NCLK, SP, TMS and TSI Frames

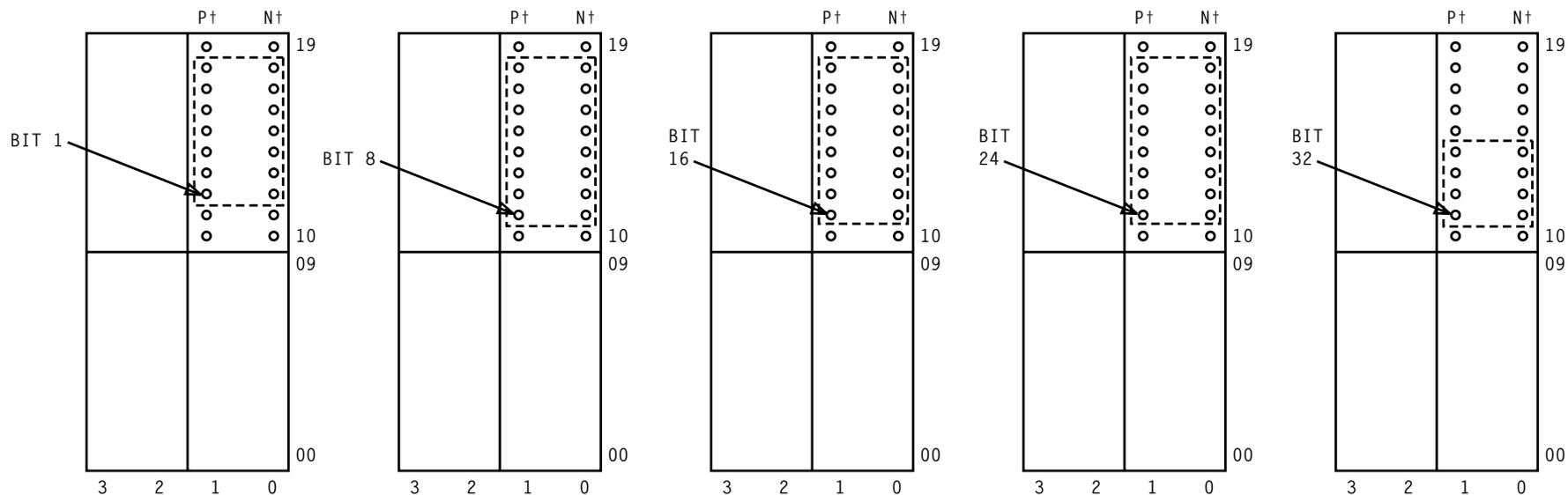


PUBB FRAME	BITS 1 TO 7		BITS 8 TO 15		BITS 16 TO 23		BITS 24 TO 31		BITS 32 TO 35	
BRANCH A	*76-03		*76-12		*76-34		*76-06		*76-09	
BRANCH B	*72-06		*72-12		*72-34		*72-08		*72-10	
BRANCH C	*76-05		*76-14		*76-36		*76-08		*76-11	
BRANCH D	*72-07		*72-13		*72-35		*72-09		*72-11	
BRANCH E	*64-03		*64-12		*64-34		*64-06		*64-09	
BRANCH F	*60-06		*60-12		*60-34		*60-08		*60-10	
BRANCH G	*64-05		*64-14		*64-36		*64-08		*64-11	
BRANCH H	*60-07		*60-13		*60-35		*60-09		*60-11	
BRANCH K	*48-03		*48-12		*48-34		*48-06		*48-09	
BRANCH L	*44-06		*44-12		*44-34		*44-08		*44-10	
BRANCH M	*48-05		*48-14		*48-36		*48-08		*48-11	
BRANCH R	*44-07		*44-13		*44-35		*44-09		*44-11	
BRANCH T	*36-03		*36-12		*36-34		*36-06		*36-09	
BRANCH V	*32-06		*32-12		*32-34		*32-08		*32-10	
BRANCH W	*36-05		*36-14		*36-36		*36-08		*36-11	
BRANCH X	*32-07		*32-13		*32-35		*32-09		*32-11	

* 0 FOR BUS 0 OR 1 FOR BUS 1
† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 3 - Terminal Connections for Write Bus Bits 1 Through 35 - PUBB Frame

Issue 4	NOV 1995
234-151-015	DLP
PAGE 4 of 7	512

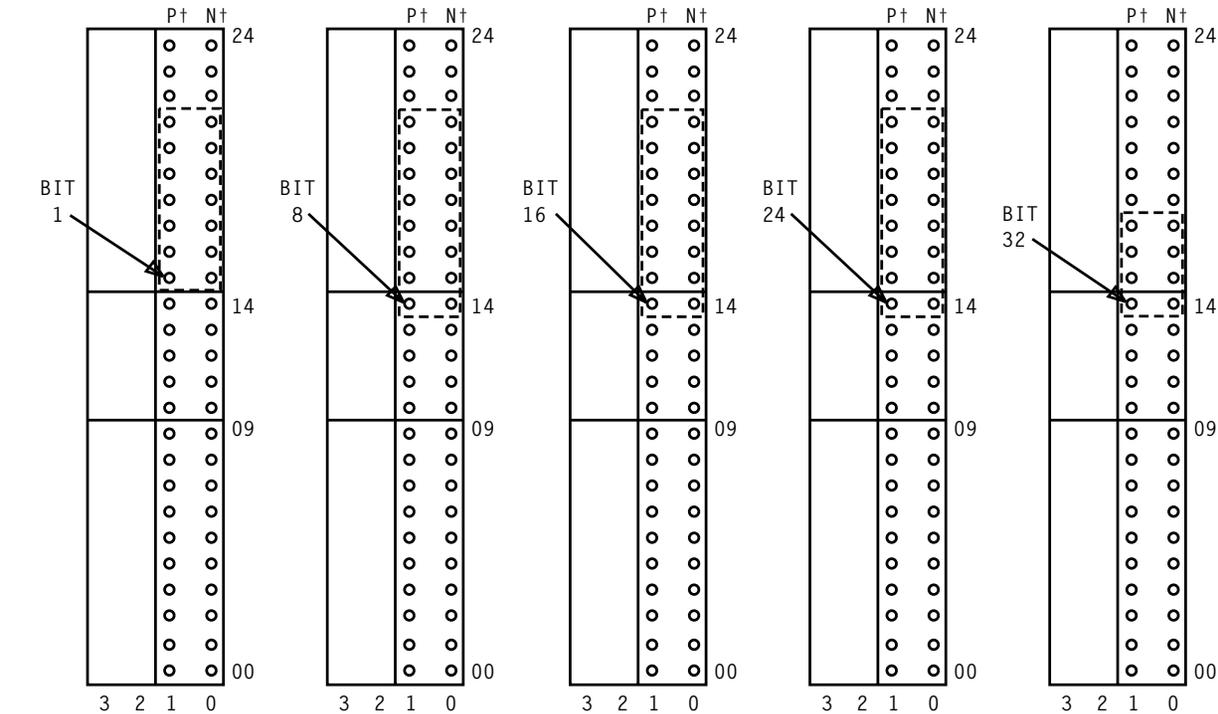


PUBB FRAME (Pre-PCO Scoping)	Branches	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23	BITS 24 TO 31	BITS 32 TO 35
UNIT 1	A-D	*76-20	*76-13	*76-35	*76-07	*76-10
UNIT 2	E-H	*64-20	*64-13	*64-35	*64-07	*64-10
UNIT 3	K-R	*48-20	*48-13	*48-35	*48-07	*48-10
UNIT 4	T-X	*36-20	*36-13	*36-35	*36-07	*36-10

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

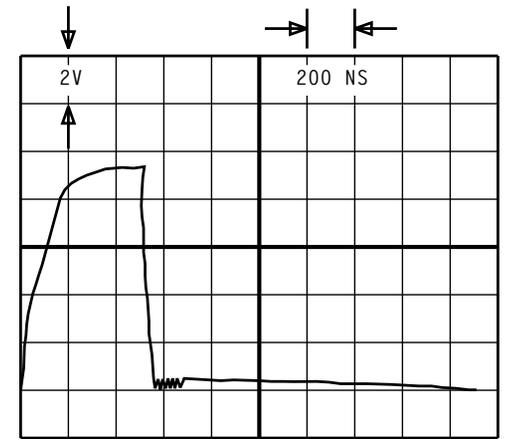
**FIG. 4 – Terminal Connection for Write Bus Bit 1 Through 35
PUBB Frame (1B Processor During Pre-PCO)**



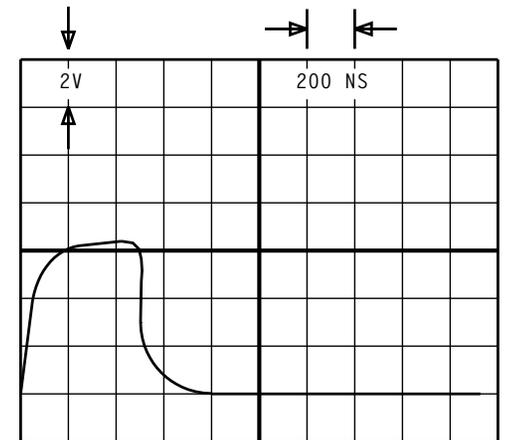
FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23	BITS 24 TO 31	BITS 32 TO 35
DIF or DIFE (24-31)					
BUS 0	180-109	180-103	180-097	180-091	180-085
BUS 1	180-257	180-251	180-245	180-239	180-233
PUC					
BUS 0	080-109	080-103	080-097	080-091	080-085
BUS 1	080-257	080-251	080-245	080-239	080-233

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 5 - Terminal Connections for Write Bus Bits 1 Through 35 - DIF and PUC Frames



NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 6 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver

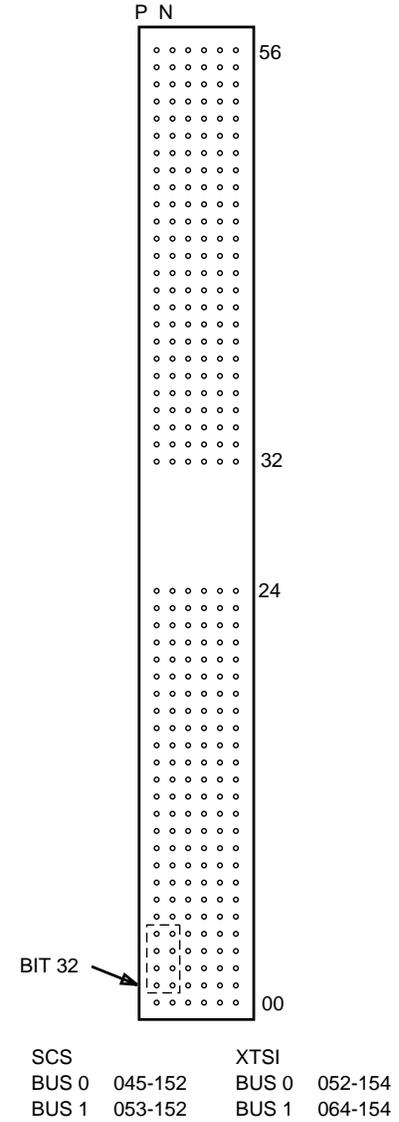
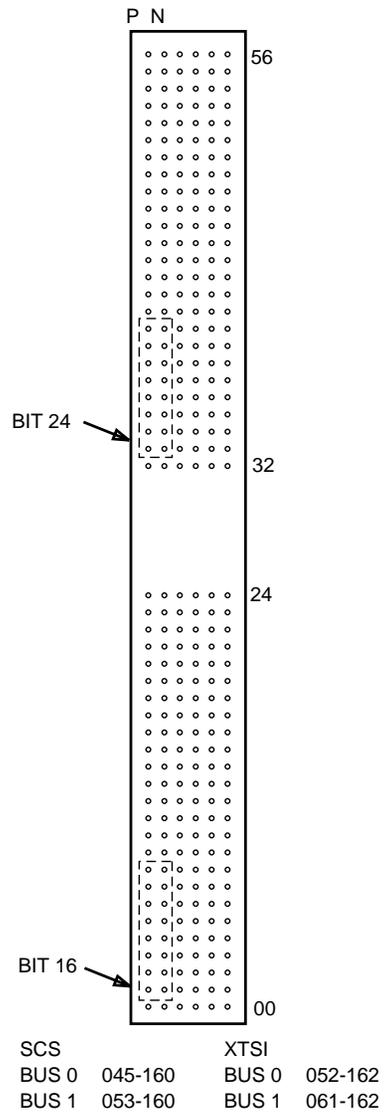
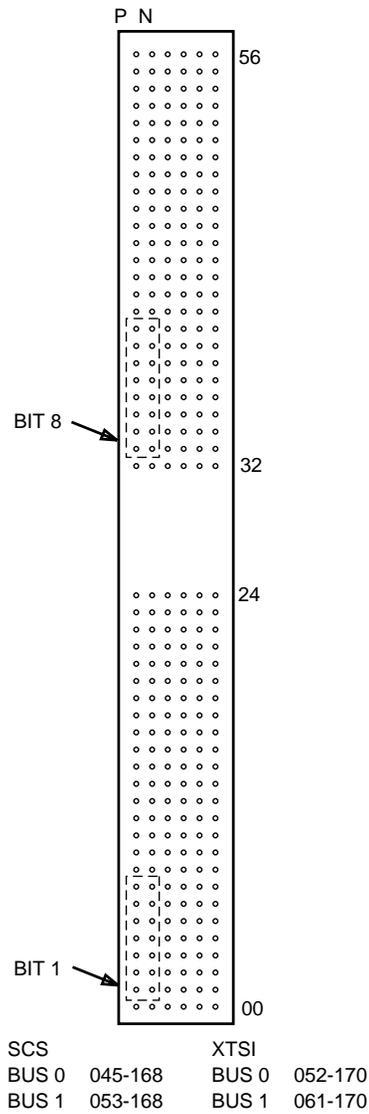


FIG. 6

[1] Locate line on FIG. 1, 2, 3, 4 or 5, Pages 2, 3, 4 and 5, respectively, that contains last frame where PU enable address bus is terminated on bus branch to be scoped

[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in each dashed line box, per FIG. 1, 2, 3, 4 or 5, Pages 2, 3, 4 and 5, respectively, at connector locations on line in Step 1. Observe oscilloscope waveform [FIG. 5, Page 5]. See NOTE 1

PU enable address bus bits 0 to 11 scoped

AND

[4] Were all observations per waveform in FIG. 5, Page 5. See NOTE 1

Yes

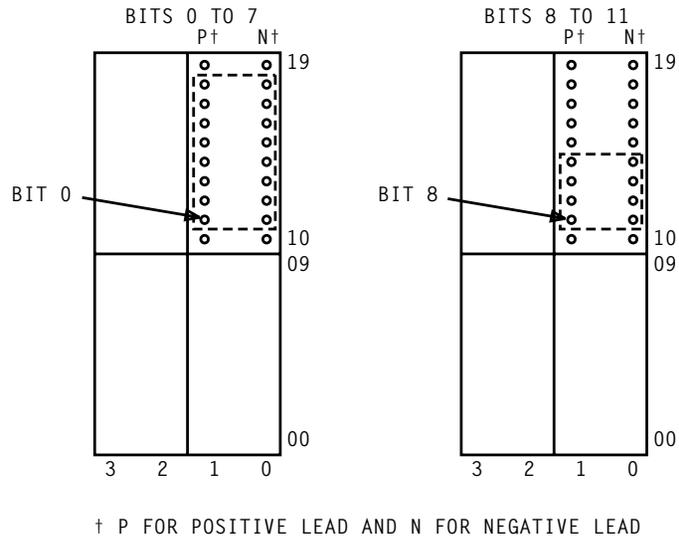
No

[5] Clear equipment trouble PU bus [TAD-111]



NOTE 1
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 5, Page 5

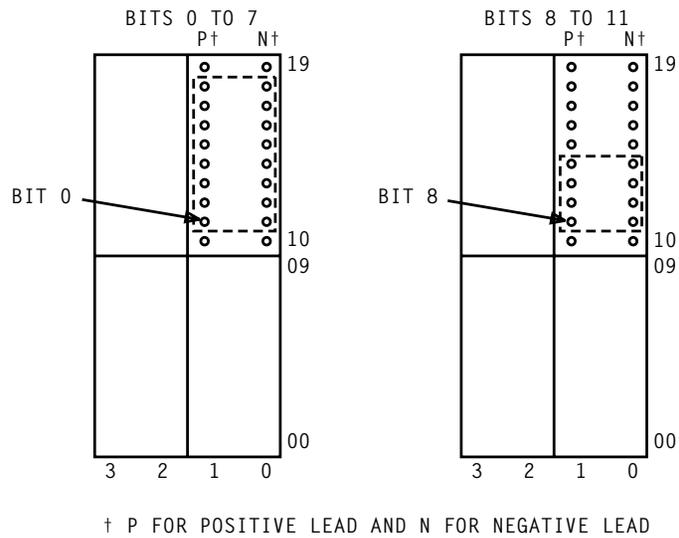
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 6	513



FRAME	BITS 0 TO 7	BITS 8 TO 11
CCIS	*80-16	*80-15
EST		
BUS 0	080-12	080-11
BUS 1	080-33	080-32
IO		
BUS 0	080-08	080-09
BUS 1	080-33	080-34
IOP		
BUS 0	080-24	080-27
BUS 1	076-24	076-27
NCLK	*60-35	*60-34
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-09	380-08
BUS 1	480-09	480-08
SP 1 (WITH COMBINED MATRIX FR)		
BUS 0	280-24	280-23
BUS 1	380-24	380-23
SP 2		
BUS 0	180-23	180-22
BUS 1	280-23	280-22
TMS A-1,2	*80-09	*80-08
TMS B		
BUS 0	‡76-24	‡76-23
BUS 1	‡80-24	‡80-23
TSI A-1	*80-41	*80-40
TSI A-2	*80-43	*80-42
TSI B	*80-47	*80-46

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR 1 FOR
 PUB TERMINATING AT TMS BAY 1

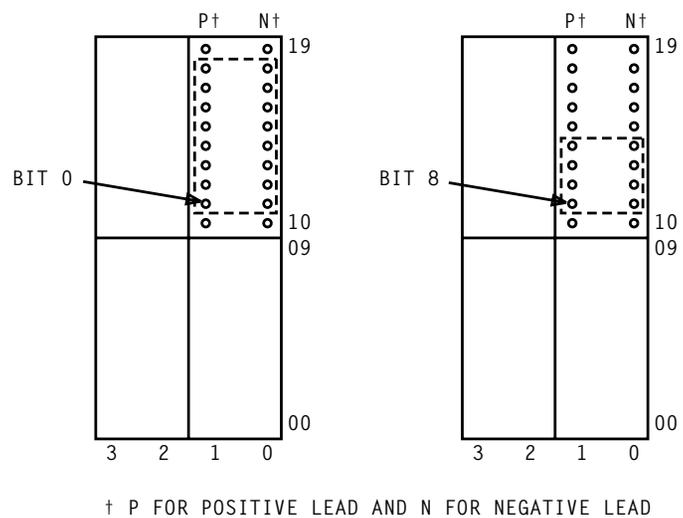
FIG. 1 - Terminal Connections for Enable Address Bus Bits 0 Through 11 - CCIS, EST, IO, IOP, NCLK, SP, TMS and TSI Frames



PUBB FRAME	BITS 0 TO 7	BITS 8 TO 11
BRANCH A	*76-37	*76-40
BRANCH B	*72-36	*72-38
BRANCH C	*76-39	*76-42
BRANCH D	*72-37	*72-39
BRANCH E	*64-37	*64-40
BRANCH F	*60-36	*60-38
BRANCH G	*64-39	*64-42
BRANCH H	*60-37	*60-39
BRANCH K	*48-37	*48-40
BRANCH L	*44-36	*44-38
BRANCH M	*48-39	*48-42
BRANCH R	*44-37	*44-39
BRANCH T	*36-37	*36-40
BRANCH V	*32-36	*32-38
BRANCH W	*36-39	*36-42
BRANCH X	*32-37	*32-39

* 0 FOR BUS 0 OR 1 FOR BUS 1

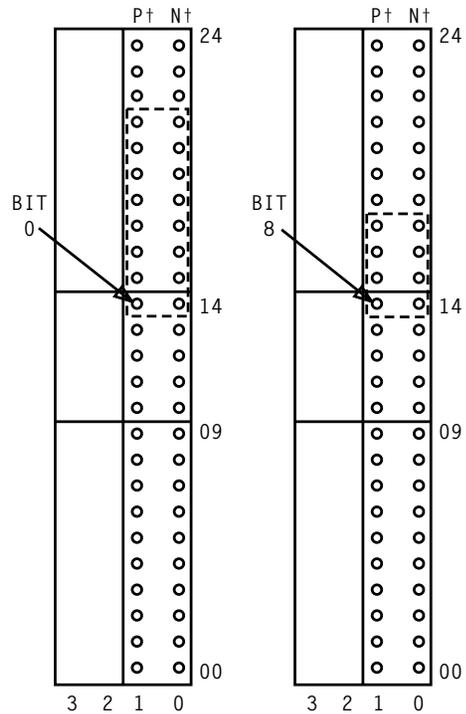
FIG. 2 - Terminal Connections for Enable Address Bus Bits 0 Through 11 - PUBB Frame



PUBB FRAME (PRE-PCO Scoping)	Branches	BITS 0 TO 7 LOCATION	BITS 8 TO 11 LOCATION
UNIT 1	A-D	*76-38	*76-41
UNIT 2	E-H	*64-38	*64-41
UNIT 3	K-R	*48-38	*48-41
UNIT 4	T-X	*36-38	*36-41

* 0 FOR BUS 0 OR 1 FOR BUS 1

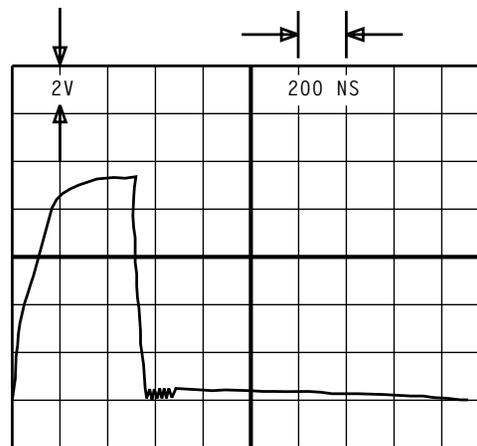
FIG. 3 - Terminal Connection for Enable Address Bus Bit 0 Through 11
PUBB FRAME - (1B Processor During Pre-PCO)



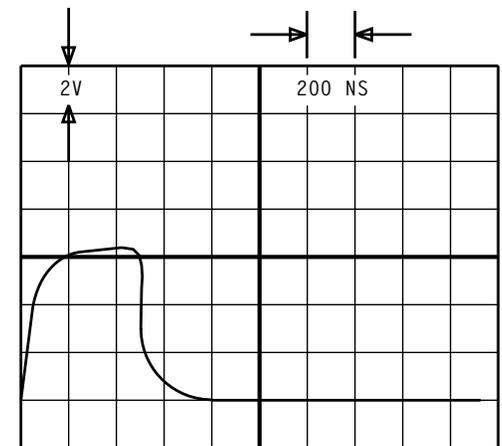
FRAME	BITS 0 TO 7	BITS 8 TO 11
DIF or DIFE (24-31)		
BUS 0	180-079	180-073
BUS 1	180-227	180-221
PUC		
BUS 0	080-079	080-073
BUS 1	080-227	080-221

† P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

**FIG. 4 - Terminal Connections
for Enable Address Bus
Bits 0 Through 11 -
DIF and PUC Frames**

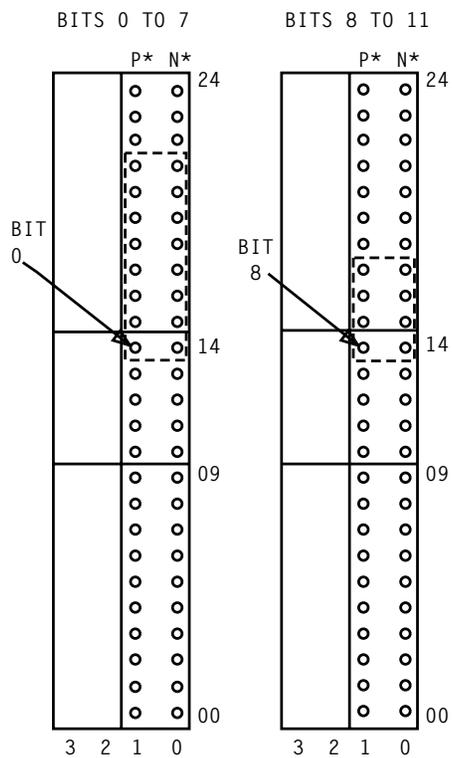


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

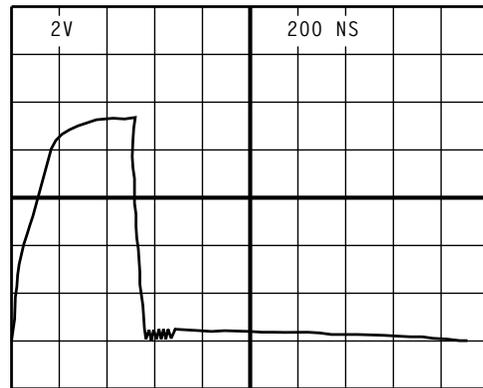
**FIG. 5 - Example Waveforms of Normal Pulse at
Driver and 500 Feet From Driver**



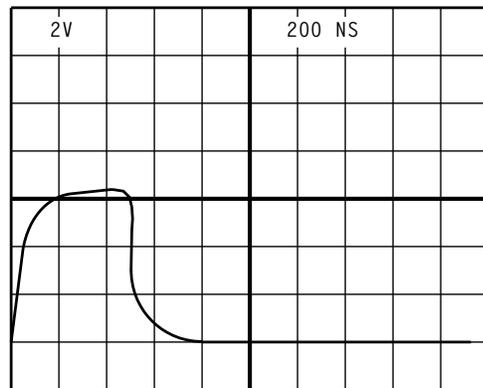
DIF or DIFE (24-31)		
BUS 0	180-079	180-073
BUS 1	180-227	180-221
PUC		
BUS 0	080-079	080-073
BUS 1	080-227	080-221

* P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD

FIG. 3

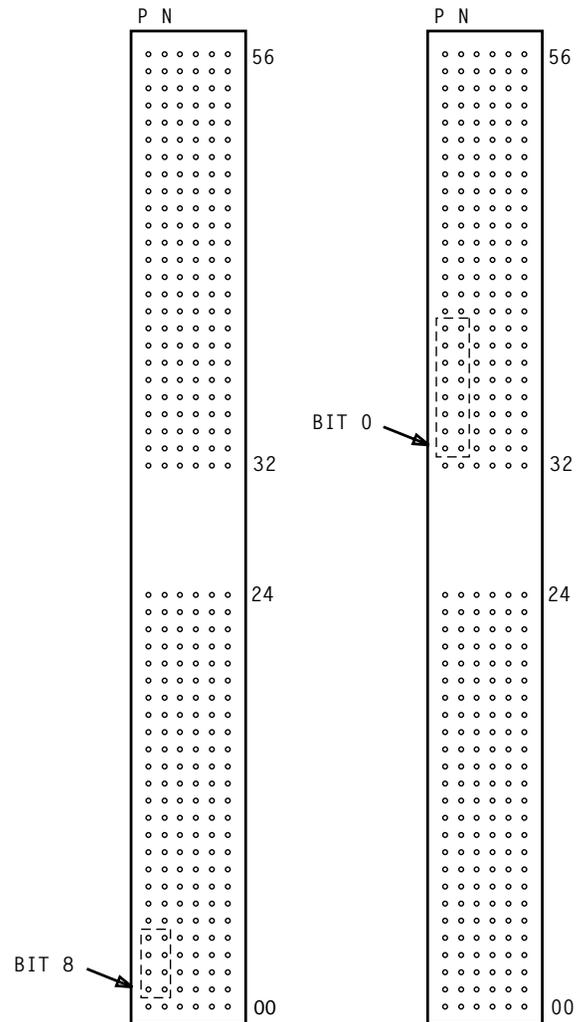


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 4



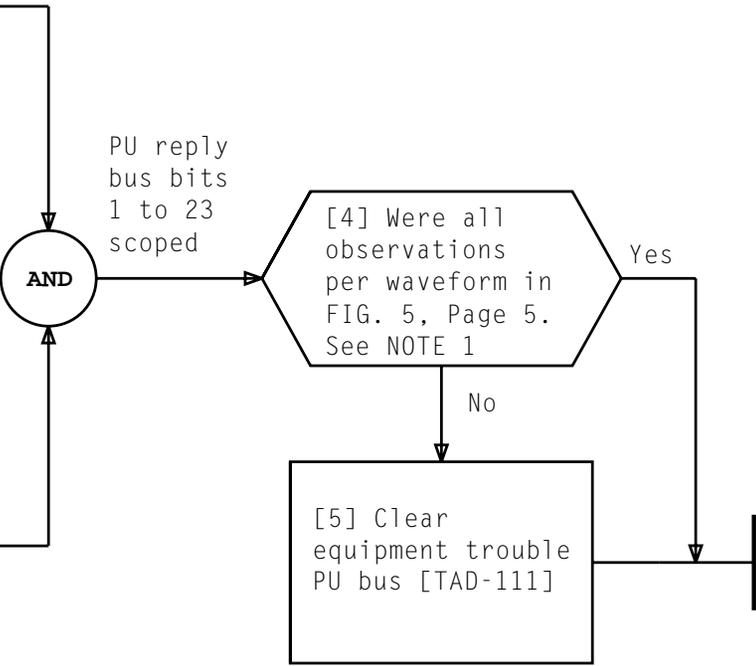
SCS	XTSI	SCS	XTSI
BUS 0 045-144	BUS 0 052-146	BUS 0 045-152	BUS 0 052-154
BUS 1 053-144	BUS 1 061-154	BUS 1 053-152	BUS 1 061-154

FIG. 5

[1] Locate line in FIG. 1, 2, 3, 4 or 5, Pages 2, 3, 4, 5 and 6, respectively, that contains last frame where PU reply bus is terminated on bus branch to be scoped

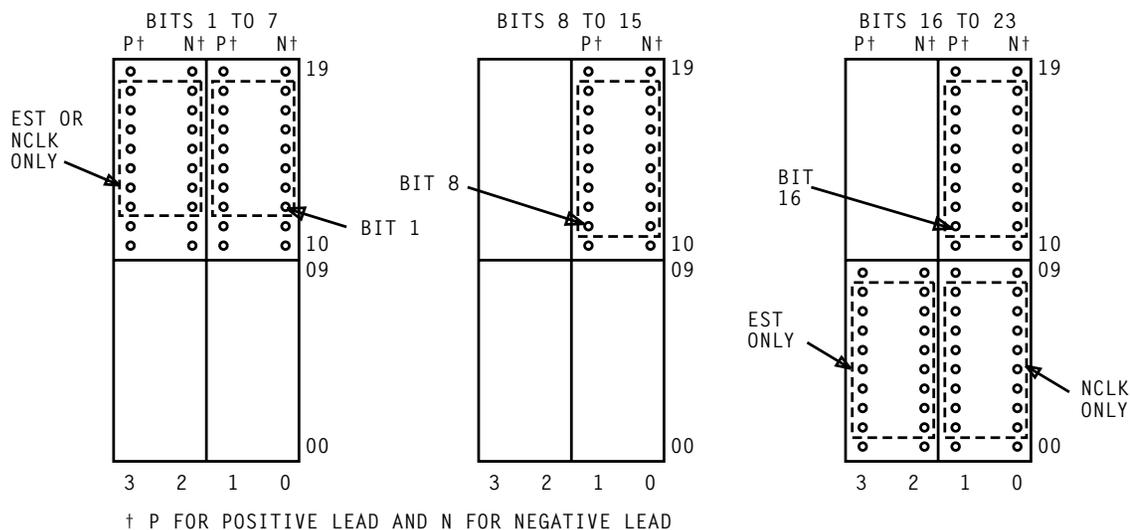
[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in each dashed line box, per FIG. 1, 2, 3, 4 or 5, Pages 2, 3, 4, 5 and 6, respectively, at connector locations on line in Step 1. Observe oscilloscope waveform [FIG. 5, Page 5]. See NOTE 1



NOTE 1
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 5, Page 5

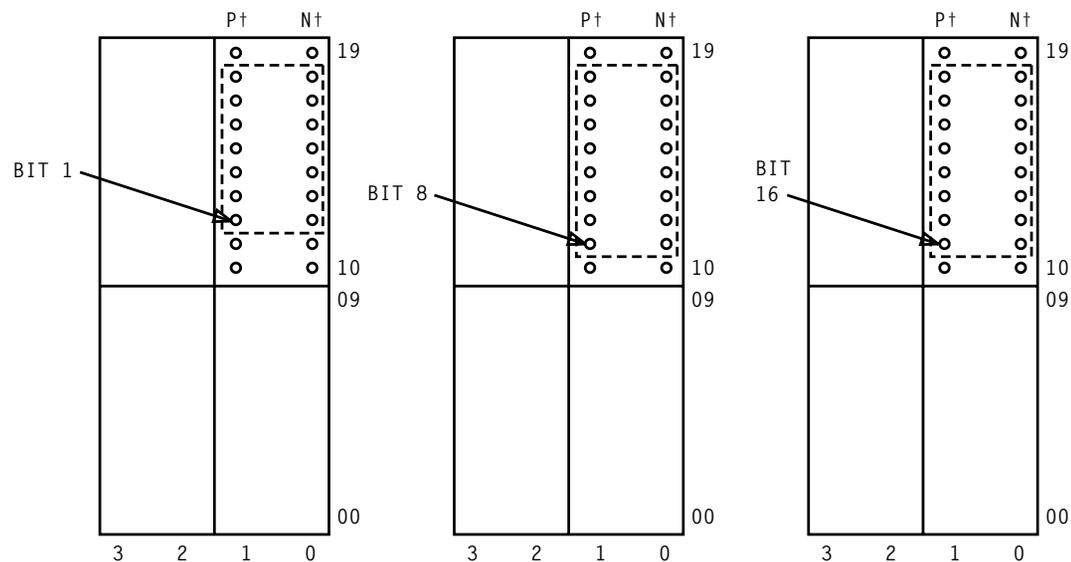
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 6	514



FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
CCIS	*80-33	*80-32	*80-31
EST			
BUS 0	080-02	080-02	080-02
BUS 1	080-23	080-23	080-23
IO			
BUS 0	080-11	080-12	080-13
BUS 1	080-36	080-37	080-38
IOP			
BUS 0	080-40	080-41	080-42
BUS 1	076-40	076-41	076-42
NCLK	*60-48	*60-48	*60-48
SP 1 (W/O COMBINED MATRIX FR)			
BUS 0	380-04	380-03	380-02
BUS 1	480-04	480-03	480-02
SP1 (WITH COMBINED MATRIX FR)			
BUS 0	280-20	280-18	280-16
BUS 1	380-20	380-18	380-16
SP 2			
BUS 0	180-18	180-17	180-16
BUS 1	280-18	280-17	280-16
TMS A-1,2	*80-04	*80-03	*80-02
TMS B			
BUS 0	‡76-20	‡76-18	‡76-16
BUS 1	‡80-20	‡80-18	‡80-16
TSI A-1	*80-36	*80-35	*80-34
TSI A-2	*80-39	*80-37	*80-35
TSI B	*80-43	*80-41	*80-39
VIF			
BUS 0	152-15	152-14	152-13
BUS 1	152-25	152-24	152-23

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0
OR 1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 1 - Terminal Connections for Reply Bus Bits 1 Through 23 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI and VIF Frames

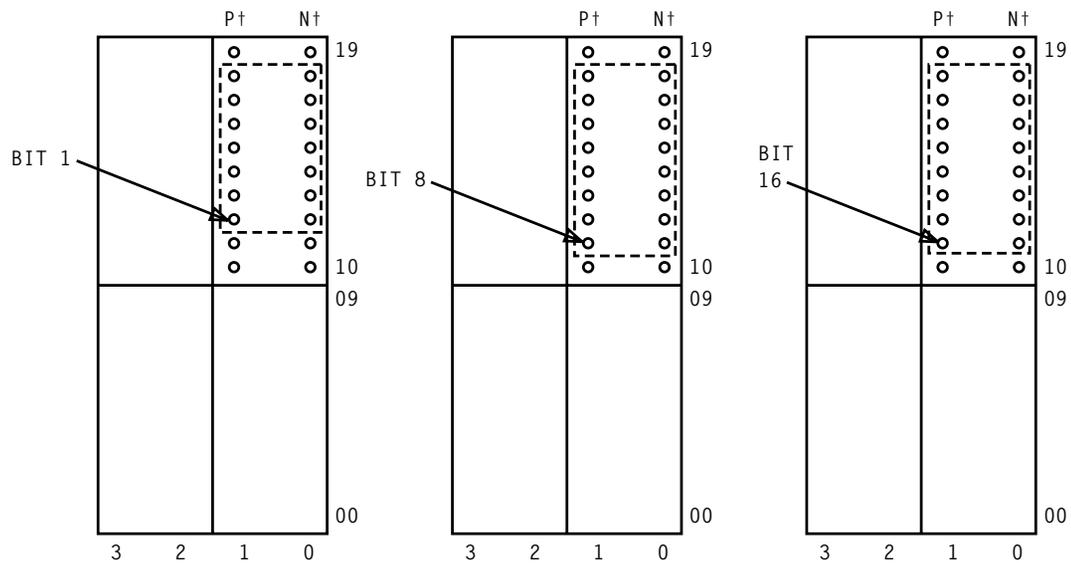


PUBB FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
BRANCH A	*76-19	*76-21	*76-23
BRANCH B	*72-17	*72-19	*72-25
BRANCH C	*76-20	*76-22	*76-24
BRANCH D	*72-18	*72-20	*72-26
BRANCH E	*64-19	*64-21	*64-23
BRANCH F	*60-17	*60-19	*60-25
BRANCH G	*64-20	*64-22	*64-24
BRANCH H	*60-18	*60-20	*60-26
BRANCH K	*48-19	*48-21	*48-23
BRANCH L	*44-17	*44-19	*44-25
BRANCH M	*48-20	*48-22	*48-24
BRANCH R	*44-18	*44-20	*44-26
BRANCH T	*36-19	*36-21	*36-23
BRANCH V	*32-17	*32-19	*32-25
BRANCH W	*36-20	*36-22	*36-24
BRANCH X	*32-18	*32-20	*32-26

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 2 - Terminal Connections for Reply Bus Bits 1 Through 23 - PUBB Frame

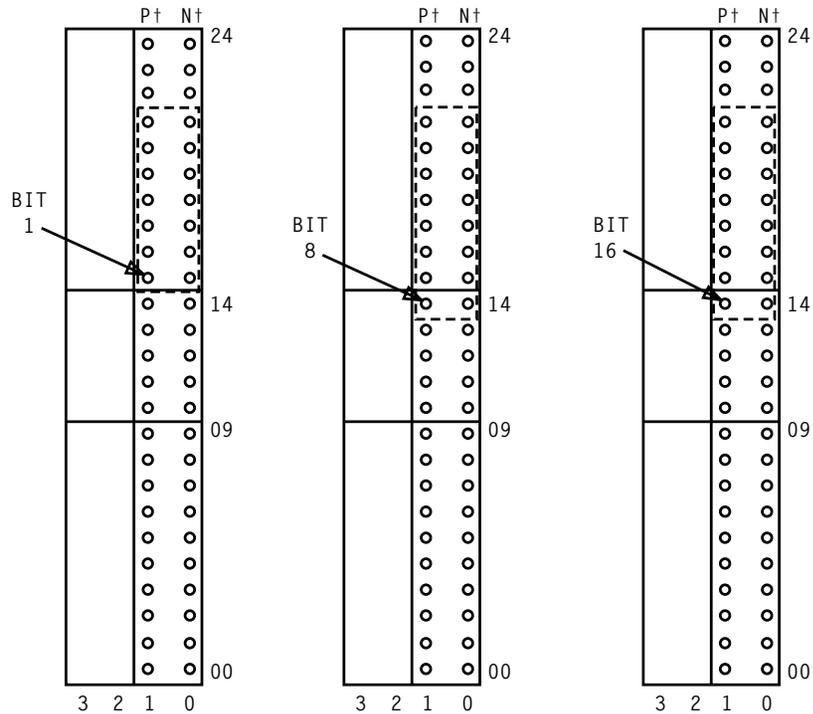


PUBB FRAME (Pre-PCO Scoping)	Branches	BITS 1 TO 7 LOCATION	BITS 8 TO 15 LOCATION	BITS 16 TO 23 LOCATION
UNIT 1	A-D	*76-20	*76-21	*76-25
UNIT 2	E-H	*64-20	*64-21	*64-25
UNIT 3	K-R	*48-20	*48-21	*48-25
UNIT 4	T-X	*36-20	*36-21	*36-25

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

**FIG. 3 – Terminal Connection for Reply Bus Bit 1 Through 23
PUBB Frame (1B Processor During Pre-PCO)**



FRAME	BITS 1 TO 7	BITS 8 TO 15	BITS 16 TO 23
DIF or DIFE (24-31)			
BUS 0	180-053	180-041	180-035
BUS 1	180-201	180-189	180-183
PUC			
BUS 0	080-053	080-041	080-035
BUS 1	080-201	080-189	080-183

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 4 - Terminal Connections for Reply Bus Bits 1 Through 23 - DIF and PUC Frames

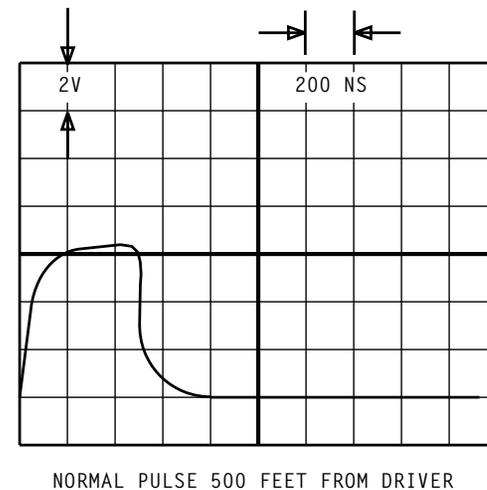
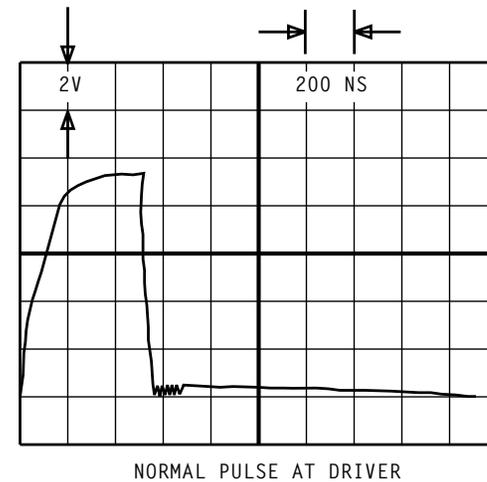


FIG. 5 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver

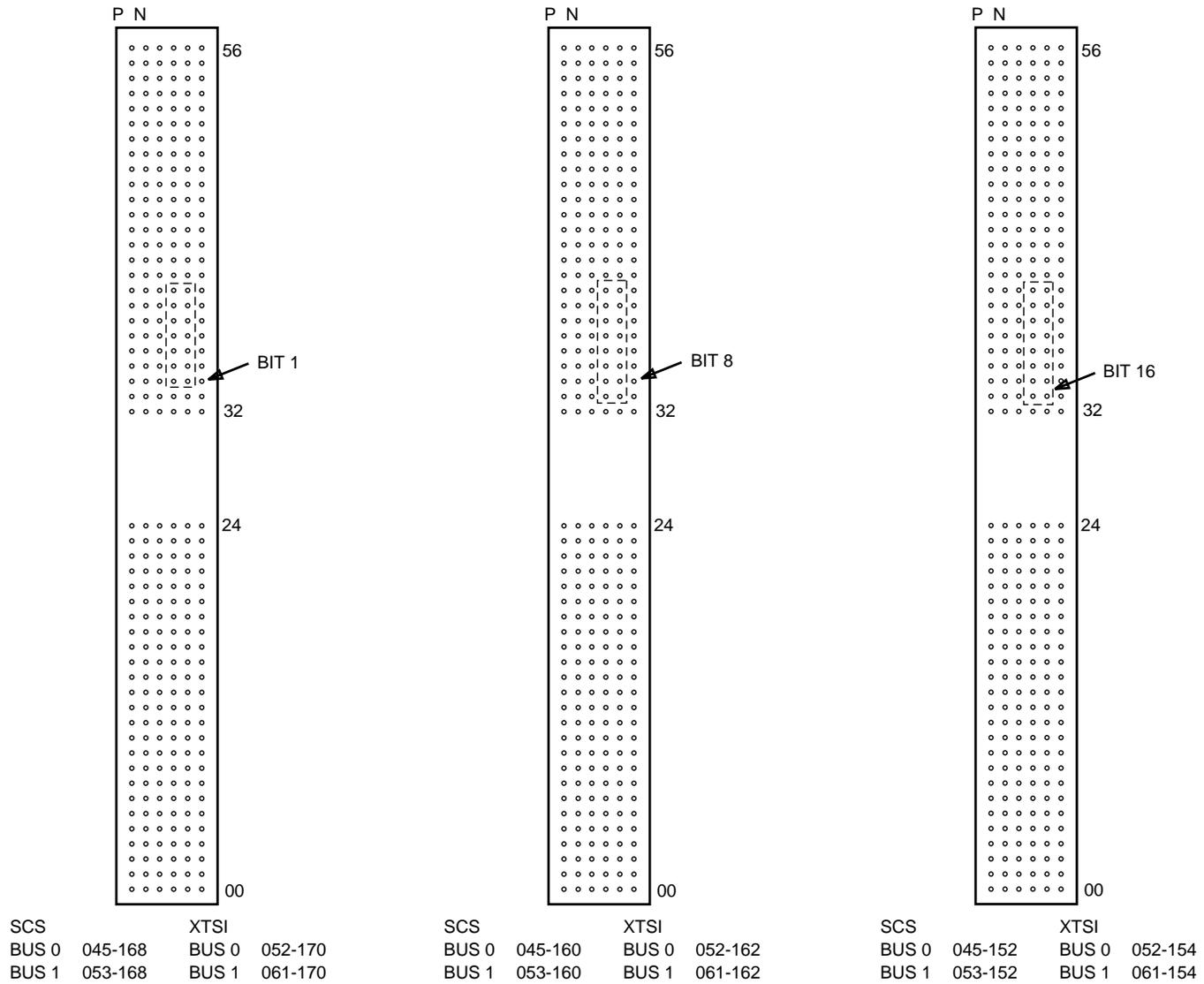
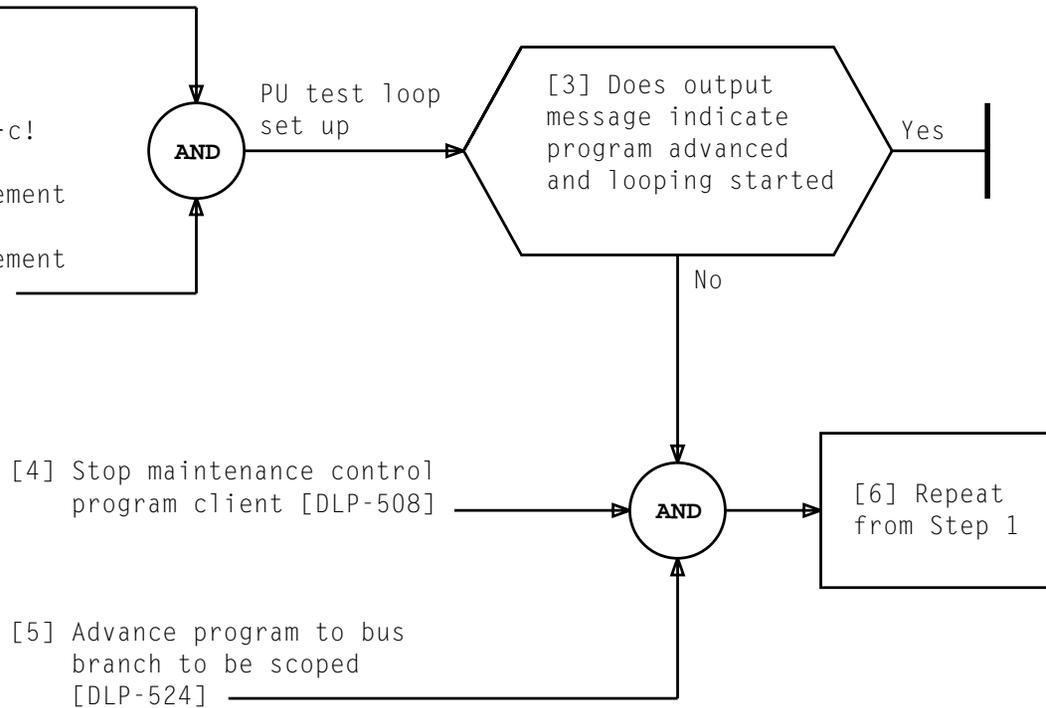


FIG. 5

At TTY:

[1] Type EX:PUB a;STEP!
a = Bus 0 or 1

[2] Type EX:PUB a:ADR b-c!
a = Bus 0 or 1
b = address of statement
label PBTS4400
c = address of statement
label PBTS13800



Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	515

[1] Locate line in FIG. 1, 2, 3, 4, 5 or 7, Pages 2, 3, 4, 5, 6 and 7, respectively, that contains last frame where PU control bus and miscellaneous bus bits are terminated on bus branch to be scoped

[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in dashed line box of connector 1, per FIG. 1, 3, 4, 5 or 7, Pages 2, 4, 5, 6 and 7, respectively, at connector location on line in Step 1. Observe oscilloscope waveform [FIG. 6, Page 6]. See NOTE 1. If problem occurs in seeing bit, use external trigger on scope and connect to trigger bit associated with faulty bit. See TABLE A and FIG. 1, 3, or 4, Pages 2, 4, and 5, respectively

[4] Scope P- and N-pins in each dashed line box of connectors 2 through 4, per FIG. 1, 2, 3, 4, 5 or 6, Pages 2, 3, 4, 5 and 6, respectively, at connector locations on line in Step 1. Observe oscilloscope waveform [FIG. 6, Page 6]. See NOTE 1

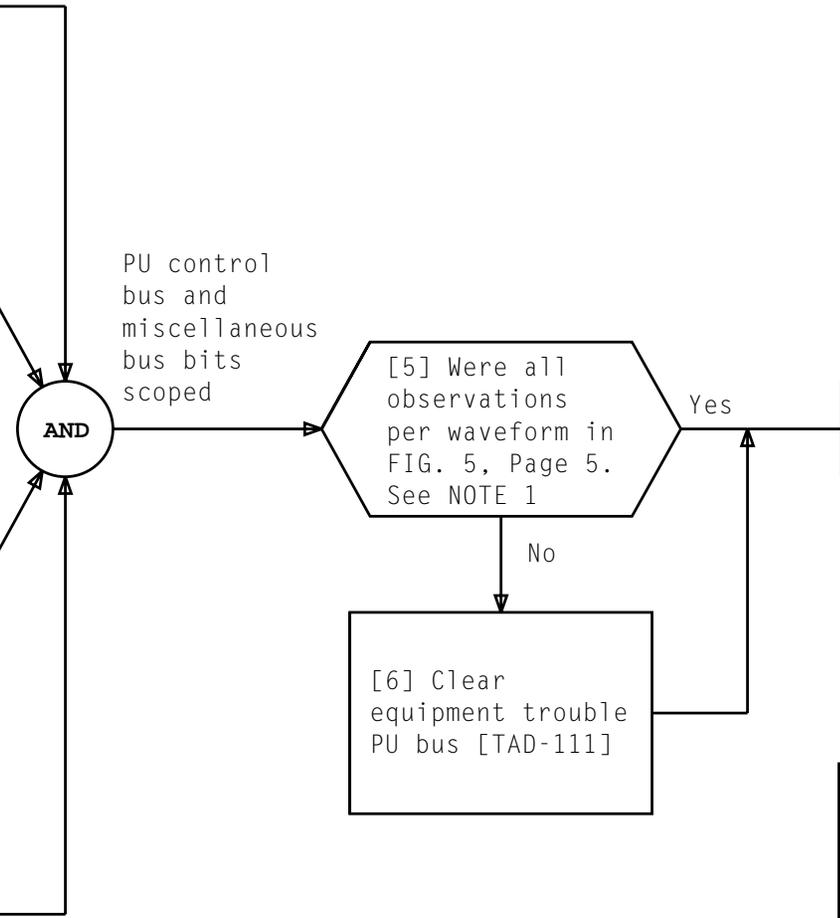
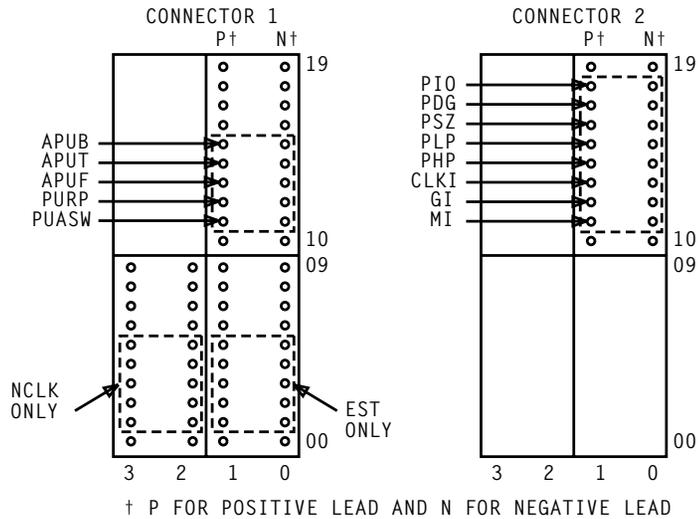


TABLE A	
FAULTY BIT	TRIGGER BIT
APUB	PSZ
APUF	CLKI
APUT	PLP
PUASW	MI
PURB	GI

NOTE 1
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 6, Page 6

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 7	516

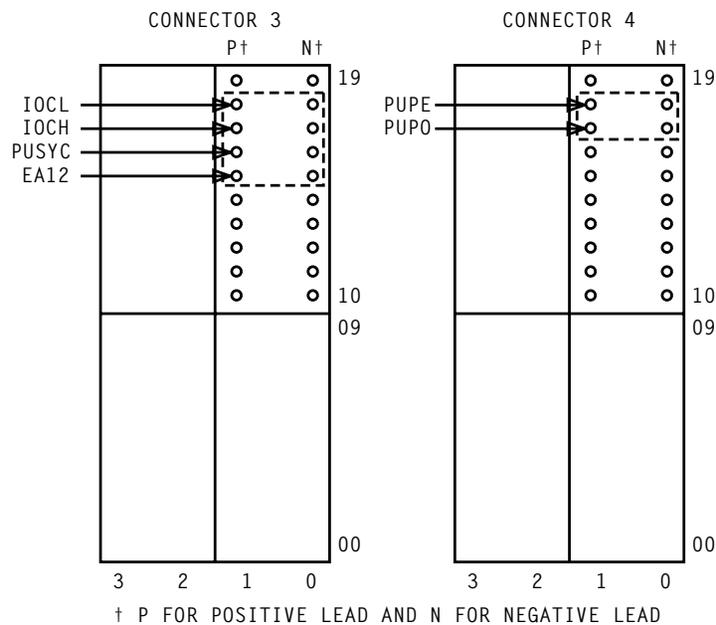


FRAME	CONNECTOR 1	CONNECTOR 2
CCIS	*80-30	*80-13
EST		
BUS 0	080-02	080-10
BUS 1	080-23	080-31
IO		
BUS 0	080-14	080-10
BUS 1	080-39	080-35
IOP		
BUS 0	080-39	080-29
BUS 1	076-39	076-29
NCLK	*60-48	*60-47
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-01	380-07
BUS 1	480-01	480-07
SP1 (WITH COMBINED MATRIX FR)		
BUS 0	280-14	280-21
BUS 1	380-14	380-21
SP 2		
BUS 0	180-15	180-21
BUS 1	280-15	280-21
TMS A-1,2	*80-01	*80-07
TMS B		
BUS 0	‡76-14	‡76-21
BUS 1	‡80-14	‡80-21
TSI A-1	*80-33	*80-39
TSI A-2	*80-33	*80-40
TSI B	*80-37	*80-44
VIF		
BUS 0	152-12	152-09
BUS 1	152-22	152-27

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS BAY 0
 OR 1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 1 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1 and 2 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI and VIF Frames

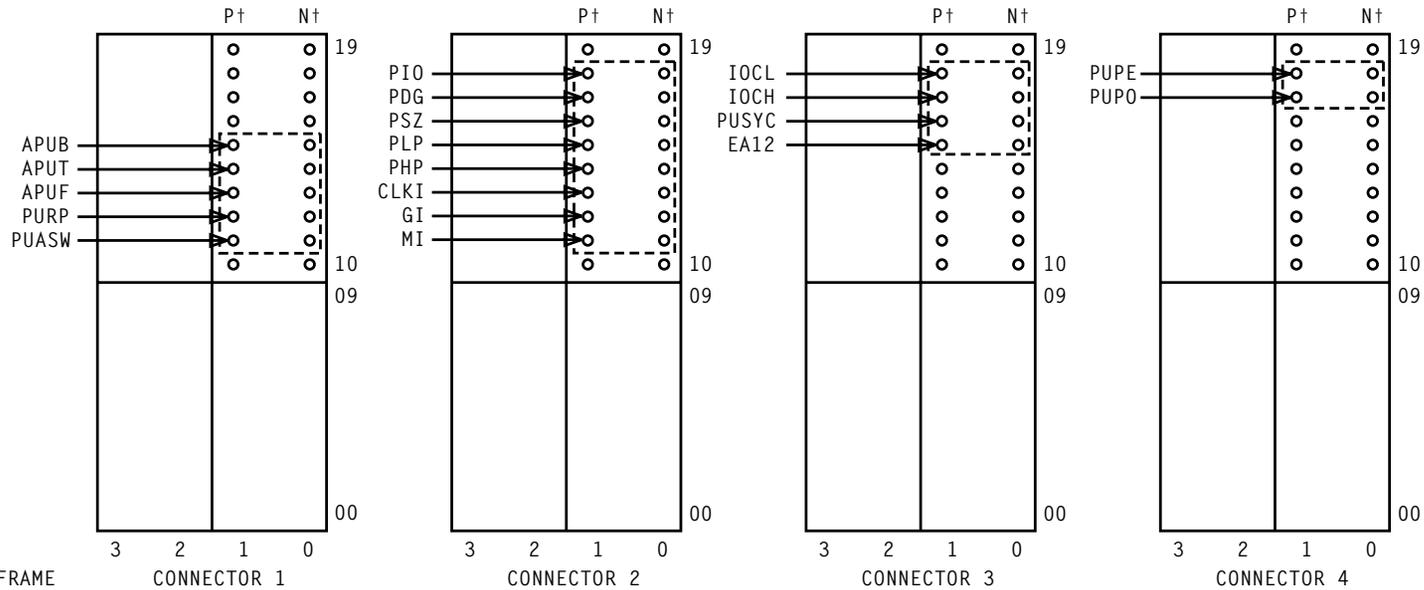
Issue 4	NOV 1995
234-151-015	DLP
PAGE 2 of 7	516



FRAME	CONNECTOR 3	CONNECTOR 4
CCIS	*80-15	*80-18
EST		
BUS 0	080-11	080-13
BUS 1	080-32	080-34
IO		
BUS 0	080-09	080-07
BUS 1	080-34	080-32
IOP		
BUS 0	080-27	080-37
BUS 1	076-27	076-37
NCLK	*60-34	*60-36
SP 1 (W/O COMBINED MATRIX FR)		
BUS 0	380-08	380-10
BUS 1	480-08	480-10
SP1 (WITH COMBINED MATRIX FR)		
BUS 0	280-23	280-26
BUS 1	380-23	380-26
SP 2		
BUS 0	180-22	180-24
BUS 1	280-22	280-24
TMS A-1,2	*80-08	*80-10
TMS B		
BUS 0	‡76-23	‡76-26
BUS 1	‡80-23	‡80-26
TSI A-1	*80-40	*80-42
TSI A-2	*80-42	*80-45
TSI B	*80-46	*80-49
VIF		
BUS 0	NONE	NONE
BUS 1	NONE	NONE

* 0 FOR BUS 0 OR 1 FOR BUS 1
 ‡ 0 FOR PUB TERMINATING AT TMS BAY 0
 OR 1 FOR PUB TERMINATING AT TMS BAY 1

FIG. 2 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 3 and 4 - CCIS, EST, IO, IOP, NCLK, SP, TMS, TSI and VIF Frames



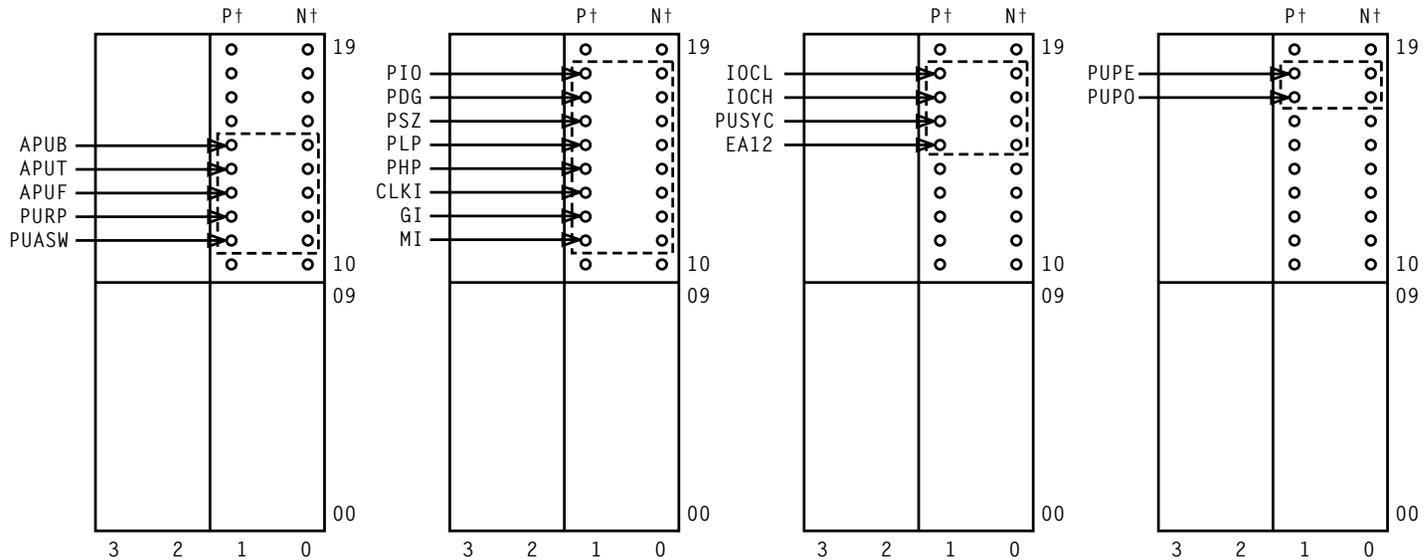
PUBB FRAME	CONNECTOR 1	CONNECTOR 2	CONNECTOR 3	CONNECTOR 4
BRANCH A	*76-25	*76-31	*76-40	*76-09
BRANCH B	*72-27	*72-32	*72-38	*72-10
BRANCH C	*76-26	*76-33	*76-42	*76-11
BRANCH D	*72-28	*72-33	*72-39	*72-11
BRANCH E	*64-25	*64-31	*64-40	*64-09
BRANCH F	*60-27	*60-32	*60-38	*60-10
BRANCH G	*64-26	*64-33	*64-42	*64-11
BRANCH H	*60-28	*60-33	*60-39	*60-11
BRANCH K	*48-25	*48-31	*48-40	*48-09
BRANCH L	*44-27	*44-32	*44-38	*44-10
BRANCH M	*48-26	*48-33	*48-42	*48-11
BRANCH R	*44-28	*44-33	*44-39	*44-11
BRANCH T	*36-25	*36-31	*36-40	*36-09
BRANCH V	*32-27	*32-32	*32-38	*32-10
BRANCH W	*36-26	*36-33	*36-42	*36-11
BRANCH X	*32-28	*32-33	*32-39	*32-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 3 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1, 2, 3 and 4 - PUBB Frame

Issue 4	NOV 1995
234-151-015	DLP
PAGE 4 of 7	516

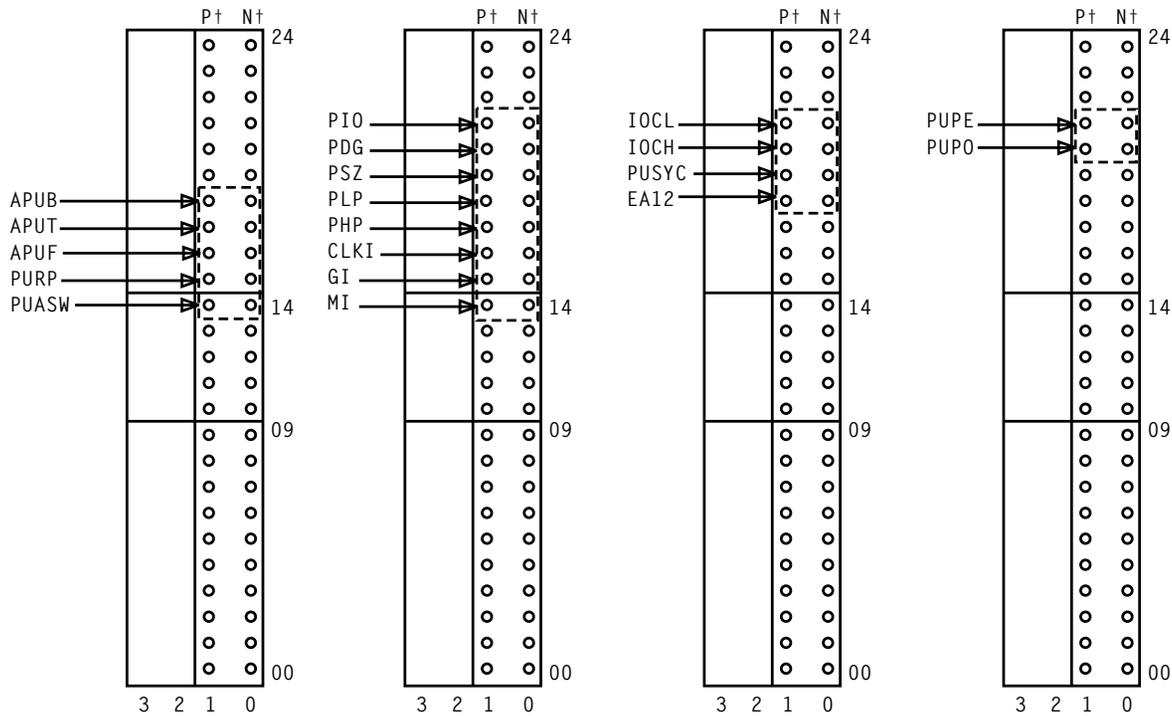


PUBB FRAME (Pre-PCO Scoping)	Branches	CONNECTOR 1 LOCATION	CONNECTOR 2 LOCATION	CONNECTOR 3 LOCATION	CONNECTOR 4 LOCATION
UNIT 1	A-D	*76-28	*76-33	*76-39	*76-11
UNIT 2	E-H	*64-28	*64-33	*64-39	*64-11
UNIT 3	K-R	*48-28	*48-33	*48-39	*48-11
UNIT 4	T-X	*36-28	*36-33	*36-39	*36-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

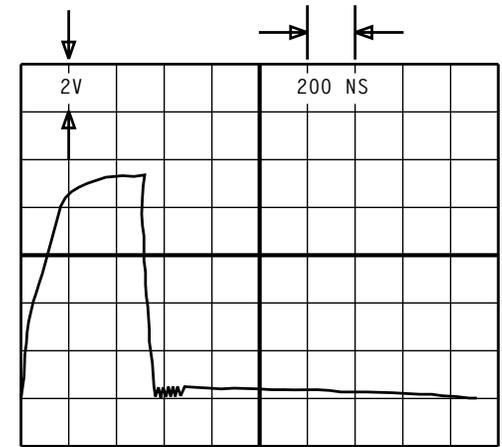
**FIG. 4 - Terminal Connection for Control Bus Bit and Miscellaneous Bus Bits,
Connectors 1, 2, 3 and 4 - PUBB Frame (1B Processor During Pre-PCO)**



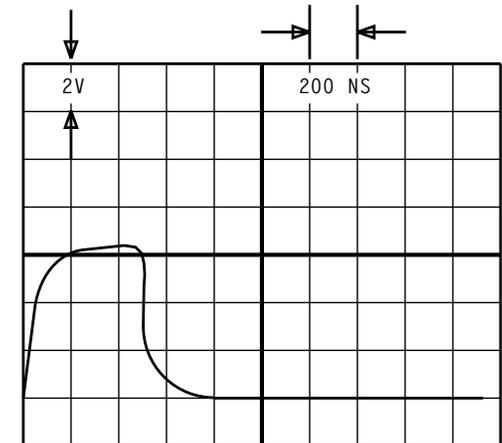
FRAME	CONNECTOR 1	CONNECTOR 2	CONNECTOR 3	CONNECTOR 4
DIF				
BUS 0	180-023	180-067	180-073	180-085
BUS 1	180-171	180-215	180-221	180-233
PUC				
BUS 0	080-023	080-067	080-073	080-085
BUS 1	080-171	080-215	080-221	080-233

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 5 - Terminal Connections for Control Bus and Miscellaneous Bus Bits, Connectors 1, 2, 3 and 4 - DIF and PUC Frames



NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 6 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver

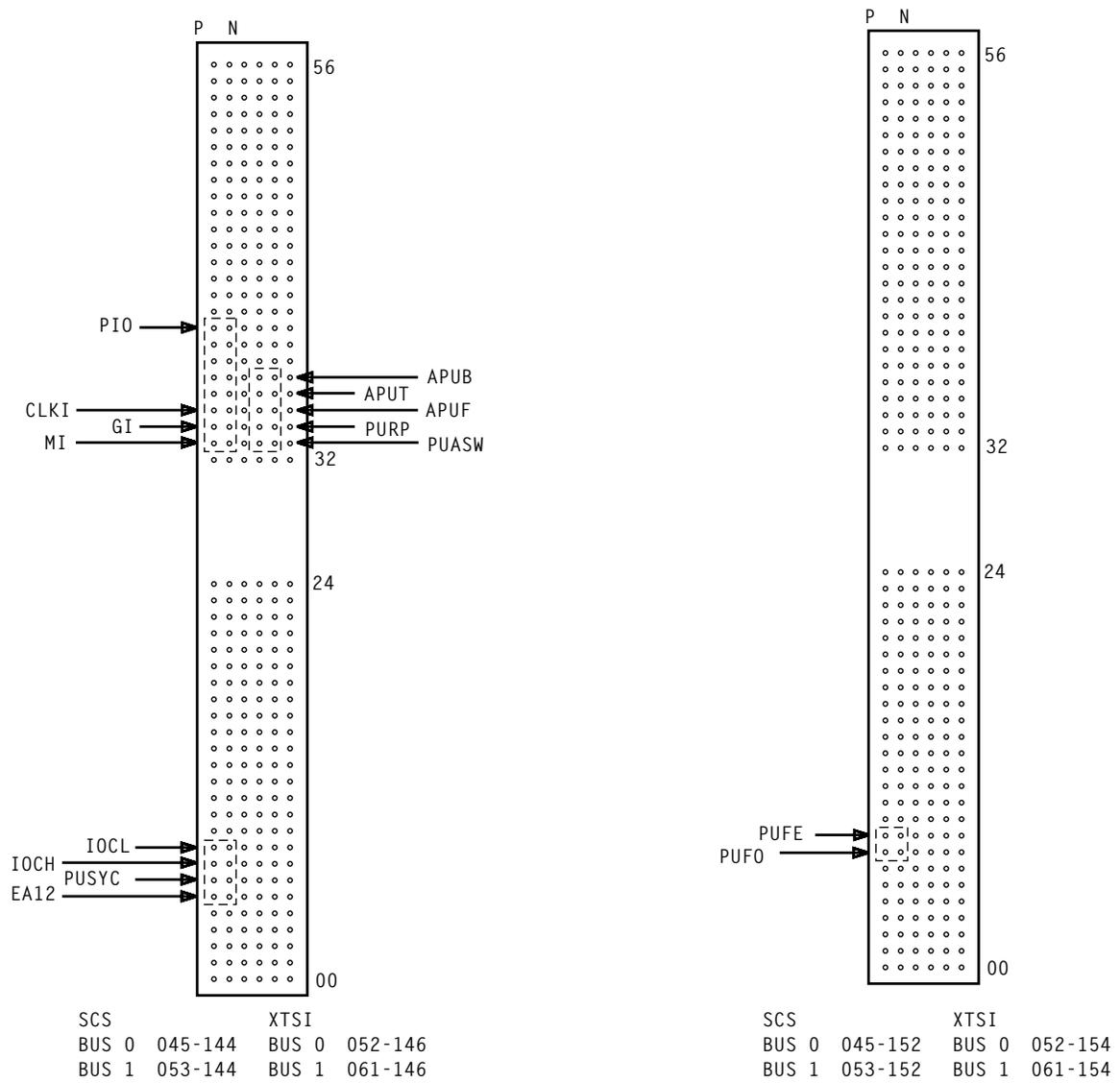


FIG. 6

1. Locate segment statement that determined failing test was not in automatic segment
2. Note segment statement index word address for later use (loop start address)
3. Locate first segment statement after failing test
4. Note index word address of DIAL statement that follows segment statement located (loop end address)
5. At TTY, type EX:PUB a;RPT 2:PH b,ADR c-d!
a = failing PUB (0 or 1)
b = first failing phase number
c = loop start address
d = loop end address

End of procedure

**SET UP LOOP OVER FIRST FAILING TEST,
WHEN TEST IS IN FORCE SEGMENT**

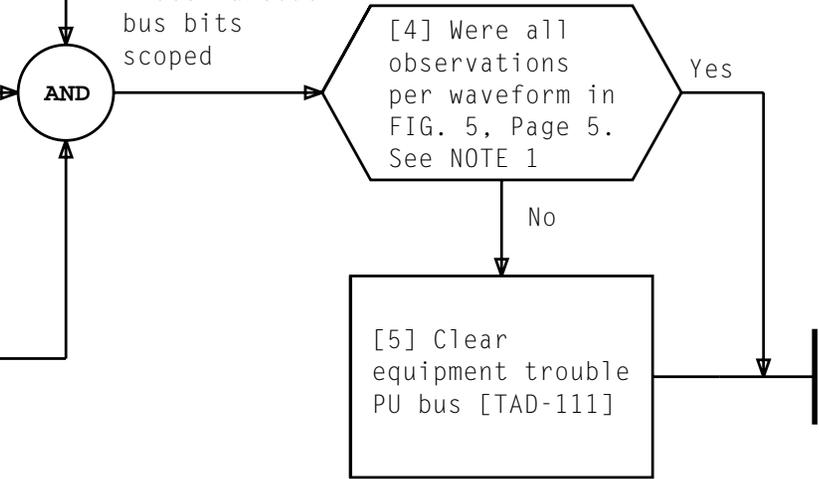
Issue 4	NOV 1995
234-151-015	DLP
PAGE 1 of 1	517

[1] Locate line in FIG. 1, 2, 3 or 4, Pages 2, 3, 4 and 5, respectively, that contains last frame where PU miscellaneous bus bits are terminated on bus branch to be scoped

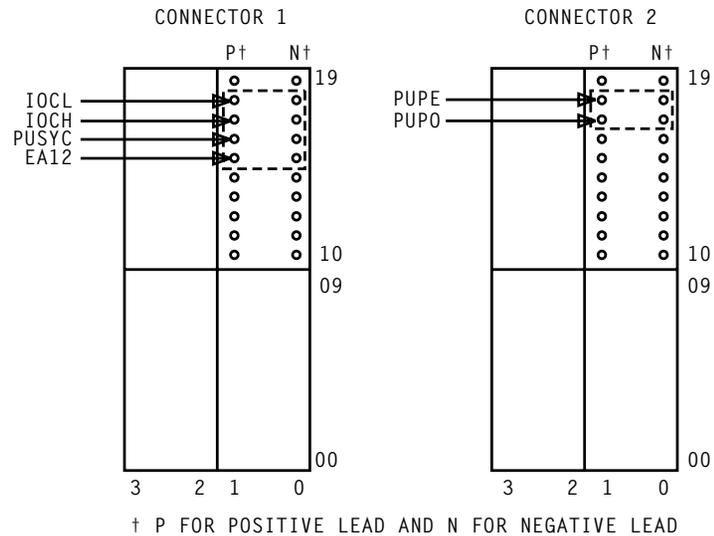
[2] Assure that scope probes are wrapped around each other with positive lead connected to Channel 1 and negative lead connected to Channel 2 and that ground leads are attached together

[3] Scope P- and N-pins in each dashed line box, per FIG. 1, 2, 3 or 4, Pages 2, 3, 4 and 5, respectively, at connector locations on line in Step 1. Observe oscilloscope waveform [FIG. 5, Page 5]. See NOTE 1

PU miscellaneous bus bits scoped



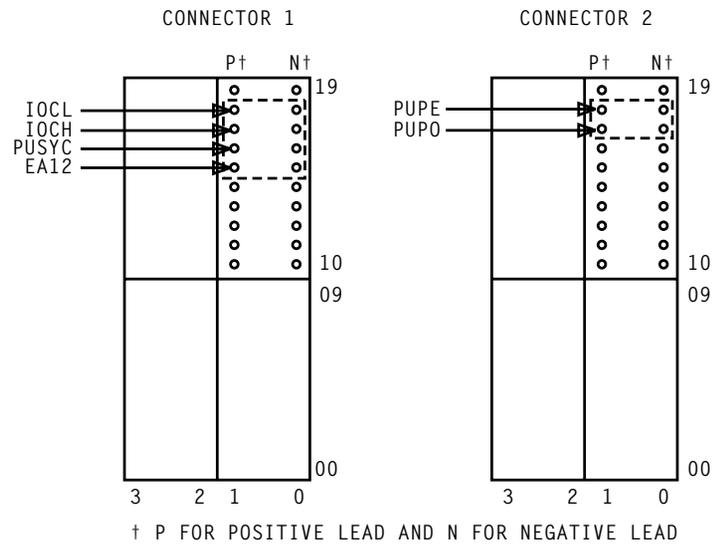
NOTE 1	
Pulse waveform will vary, depending on distance away from driver. Waveform measurements should be similar to examples shown in FIG. 5, Page 5	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	518



FRAME	CONNECTOR 1	CONNECTOR 2
CCIS	*80-15	*80-18
EST		
BUS 0	080-11	080-13
BUS 1	080-32	080-34
IO		
BUS 0	080-09	080-07
BUS 1	080-34	080-32
IOP		
BUS 0	080-27	080-37
BUS 1	076-27	076-37
NCLK	*60-34	*60-36
SP 1 (W/O COMBINED MATRIX FA)		
BUS 0	380-08	380-10
BUS 1	480-08	480-10
SP 1 (WITH COMBINED MATRIX FA)		
BUS 0	280-23	280-26
BUS 1	380-23	380-26
SP 2		
BUS 0	180-22	180-24
BUS 1	280-22	280-24
TMS A-1,2	*80-08	*80-10
TMS B		
BUS 0	‡76-23	‡76-26
BUS 1	‡80-23	‡80-26
TSI A-1	*80-40	*80-42
TSI A-2	*80-42	*80-45
TSI B	*80-46	*80-49

* 0 FOR BUS 0 OR 1 FOR BUS 1
‡ 0 FOR PUB TERMINATING AT TMS BAY 0 OR 1 FOR PUB TERMINATING AT TMS BAY 1

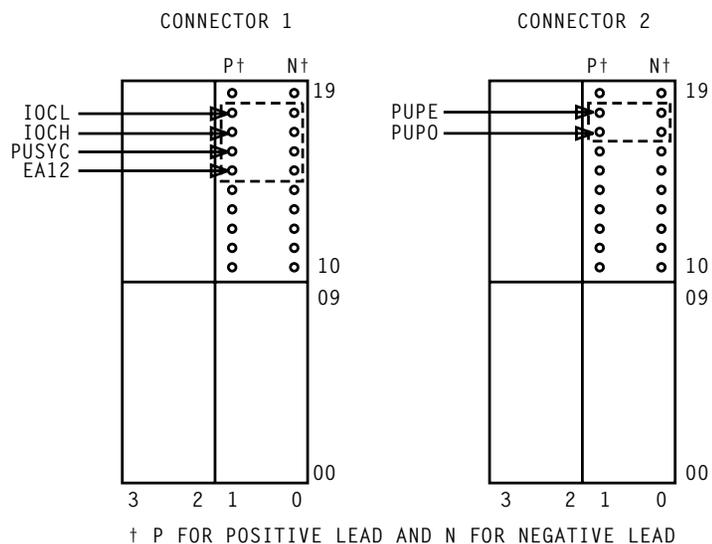
FIG. 1 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - CCIS, EST, IO, IOP, NCLK, SP, TMS and TSI Frames



PUBB FRAME	CONNECTOR 1	CONNECTOR 2
BRANCH A	*76-40	*76-09
BRANCH B	*72-38	*72-10
BRANCH C	*76-42	*76-11
BRANCH D	*72-39	*72-11
BRANCH E	*64-40	*64-09
BRANCH F	*60-38	*60-10
BRANCH G	*64-42	*64-11
BRANCH H	*60-39	*60-11
BRANCH K	*48-40	*48-09
BRANCH L	*44-38	*44-10
BRANCH M	*48-42	*48-11
BRANCH R	*44-39	*44-11
BRANCH T	*36-40	*36-09
BRANCH V	*32-38	*32-10
BRANCH W	*36-42	*36-11
BRANCH X	*32-39	*32-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 2 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - PUBB Frame

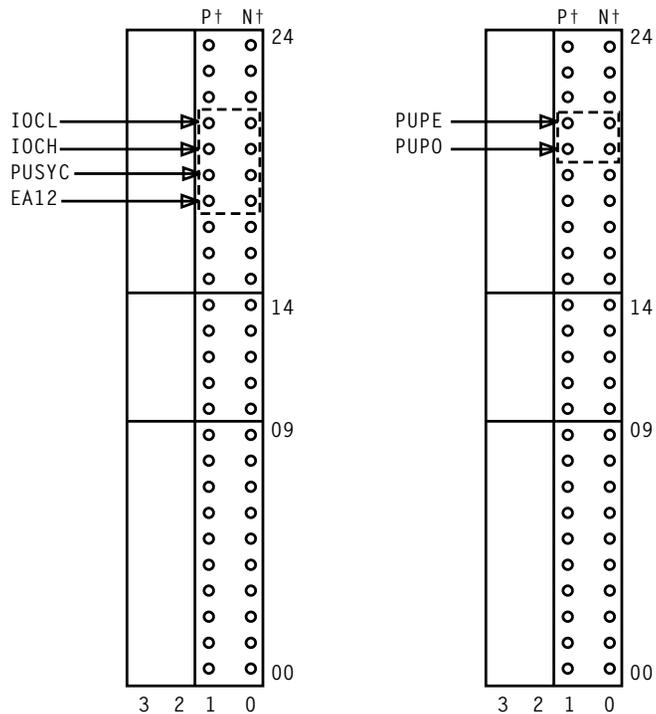


PUBB FRAME (PRE-PCO Scoping)	Branches	CONNECTOR 1 LOCATION	CONNECTOR 2 LOCATION
UNIT 1	A-D	*76-39	*76-11
UNIT 2	E-H	*64-39	*64-11
UNIT 3	K-R	*48-39	*48-11
UNIT 4	T-X	*36-39	*36-11

* 0 FOR BUS 0 OR 1 FOR BUS 1

FIG. 3 - Terminal Connection For Control Bus Bit and Miscellaneous Bus Bits, Connectors 1, 2, 3 and 4 - PUBB Frame (1B Processor During Pre-PCO)

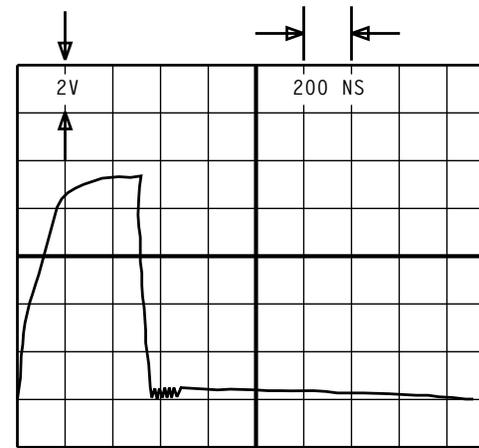
Issue 4	NOV 1995
234-151-015	DLP
PAGE 4 of 5	518



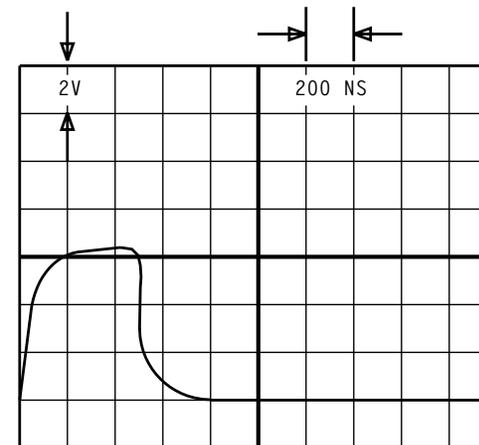
FRAME	CONNECTOR 1	CONNECTOR 2
DIF or DIFE (24-31)		
BUS 0	180-073	180-085
BUS 1	180-221	180-233
PUC		
BUS 0	080-073	080-085
BUS 1	080-221	080-233

† P FOR POSITIVE LEAD AND N FOR NEGATIVE LEAD

FIG. 4 - Terminal Connections for Miscellaneous Bus Bits Not Terminated at VIF Frame, Connectors 1 and 2 - DIF and PUC Frames



NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 5 - Example Waveforms of Normal Pulse at Driver and 500 Feet From Driver

[1] On raw data printout [FIG. 1, Page 2], locate last data word printed for first failing test _____

In first failing phase PIDENT:

[2] Use last data word address to locate where first subroutine was called _____

[3] Read any comments at CALLSUB statement located _____

[4] Note name of subroutine called in CALLSUB statement label item _____

[5] Locate and read prologue of program unit containing CALLSUB statement _____

In loader map symbols section:

[6] In SYMBOL column, locate name of subroutine called _____

[7] In PIDENT column, note PIDENT containing subroutine, and obtain PIDENT _____

In PIDENT containing subroutine:
[8] Locate subroutine using PIDENT reference section _____

[9] Read subroutine prologue _____

[11] On raw data printout [FIG. 1], locate next preceding subroutine data word _____

In subroutine previously located:

[12] Use subroutine data word address to locate where next subroutine was called _____

NOTE 1
On raw data printout, sixth digit in fifth data word following mismatch data indicates number of subroutines called

AND

AND

[10] See NOTE 1. Have all subroutines been located

Yes

[14] Note failing test is in last subroutine located

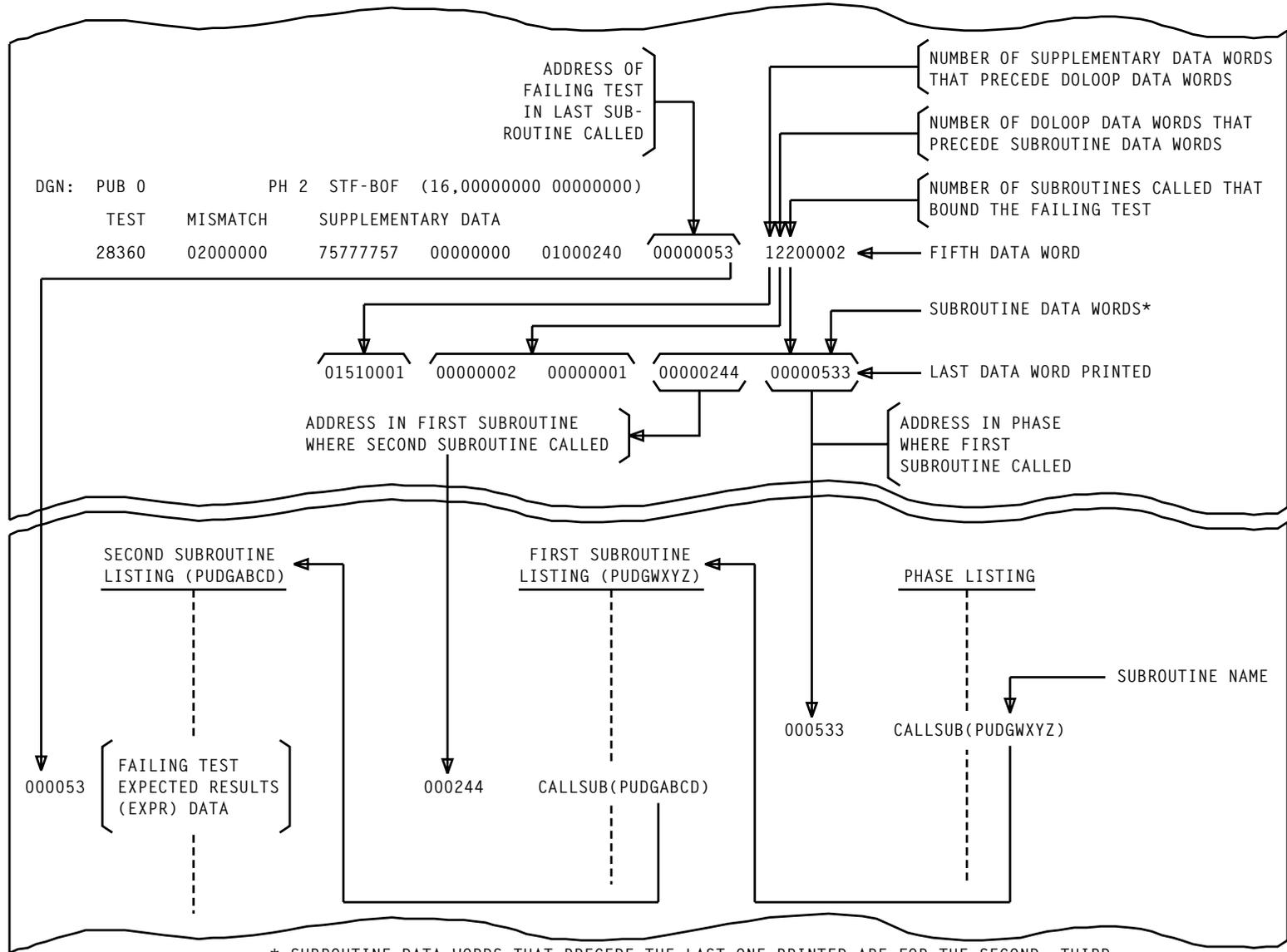
No

AND

[13] Repeat from Step 3

DETERMINE LOCATION AND FUNCTION OF SUBROUTINES CALLED

Issue 4	NOV 1995
234-151-015	DLP
PAGE 1 of 2	519



* SUBROUTINE DATA WORDS THAT PRECEDE THE LAST ONE PRINTED ARE FOR THE SECOND, THIRD, ETC, SUBROUTINES CALLED (RIGHT TO LEFT)

FIG. 1 - Relationship of Subroutine Data Words to Phase and Subroutine Listings

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	519

DETERMINE LOCATION AND FUNCTION OF SUBROUTINES CALLED

1. Read several DIAL statements just before failing test to determine what was occurring prior to test failing

NOTE: Section 234-180-020 contains description of DIAL statements

2. Read failing test DIAL statement and any comments

3. Note "asterisk data" that follows failing test number in listing

4. Note relationship of asterisk line data to first five raw data words that follow mismatch data [FIG. 1]

5. In TABLE A, Page 2 locate failing DIAL statement and use description column to determine meaning of data contained in second and third raw data words following mismatch data

End of procedure

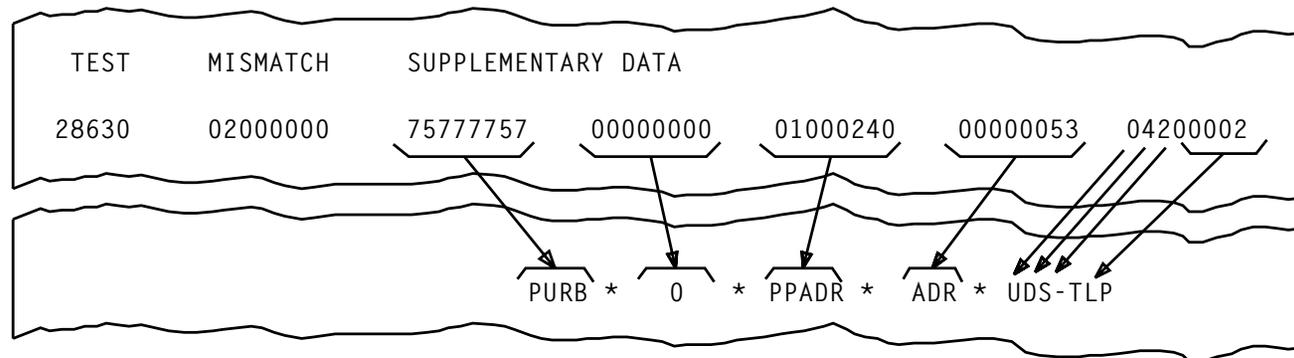


FIG. 1 - Example of Raw Data Printout Relationship to Asterisk Line at Failing Test

TABLE A
DESCRIPTION OF DATA CONTAINED IN SECOND AND THIRD DATA WORD FOR EACH TYPE DIAL TEST STATEMENT

DIAL TEST STATEMENT	DESCRIPTION*	DIAL TEST STATEMENT	DESCRIPTION*		
CCBB	A = B = 0, C = buffer bus address	SCANI	A (bits 11-2) = SP K-code B = SP OP code to read scan points 0/(1540) C = address of point		
CITOP CITOPI	Standard PUB format†				
CLKOP	A = fault chain, B = reply bus C = CC pulse point address	SDI	A (bits 11-2) = SP K-code B = SP OPCODE to read SD points 0/(1440) C = address of point		
MEMOPI	Standard PUB format† PUWB bits 16-10 = address of memory accessed PUWB bits 9-7 = memory level For time slot memories and busy-idle map Memories bit 0 = switching and permuting CKT	SESOP	Standard PUB format†		
		STORE	A = B = 0, C = specified expected result for VIC diagnostic, B = VIC failing test		
		TMSOP TMSOPI	Standard PUB format† PUWB bits 16-10 = address of memory accessed		
MTXMOP	Standard PUB format† PUWB bits 8-0 = matrix under test	TSIESR	Standard PUB format† except C = do not care		
PLOP	"MA" pulse point accessed by an SP: A (bits 11-2) = SP-K code B = SP OPCODE to bit pulse point 0/ (1640) C = address of point "MA" pulse point accessed by CC pulse point A = B = 0, C = CC pulse point address	TSIMOP	Same as MEMOPI statement		
		<p>*The following format relates A, B, and C to the second and third data words following mismatch data:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"><u>SECOND WORD</u></td> <td style="text-align: center;"><u>THIRD WORD</u></td> </tr> <tr> <td style="text-align: center;">AAAABBBB</td> <td style="text-align: center;">CCCCCCCC</td> </tr> </table>		<u>SECOND WORD</u>	<u>THIRD WORD</u>
<u>SECOND WORD</u>	<u>THIRD WORD</u>				
AAAABBBB	CCCCCCCC				
PUDROP PUDROPI	Standard PUB format†	<p>†The standard PUB format is: A = PUEA/PUAB B = PUWB (bits 35-24) = OPAD, (bits 35-29) = OPCODE C = PUWB (bits 23-0) = ADDRESS</p>			
PULSE	A = B = 0, C = CC pulse point address				
PLUSI	Same as PLOP statement				
PUOP PUOPI	Standard PUB format†				
PUOPBBR PUOPIBBR	PUOP part: standard PUB format† BBR part: A = B = 0, C = buffer bus address				

In first failing phase PIDENT:

[1] Locate first failing test using
EXPR address on raw data
printout [FIG. 1, Page 2]

[2] Note page and line
number of EXPR data

[3] Locate endloop MACRO
in PIDENT reference
section

[4] Note endloop reference
that is closest to, but
beyond EXPR data

[5] Locate endloop statement
previously noted (Step 4)



[6] Locate doloop
statement using
label (in
parentheses) at
endloop statement

[7] Does doloop
statement precede
location of EXPR
data previously
noted (Step 2)

No

Yes

[11] Locate endloop
statement next
closest to failing
test, and repeat
from Step 6

[8] Read any comment at
doloop statement

AND

[9] See NOTE 1. Obtain
doloop index value
from raw data printout
and note its meaning for
this doloop [FIG. 1]

[10] Have number
of doloops
indicated on raw
data printout been
located [FIG. 1]

No

Yes

NOTE 1
First doloop
located is
innermost, next
doloop located is
next innermost,
etc. Doloop values
often indicate
unit under test,
memory, etc

**DETERMINE LOCATION AND FUNCTION OF DOLOOPS,
NO SUBROUTINES CALLED**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	521

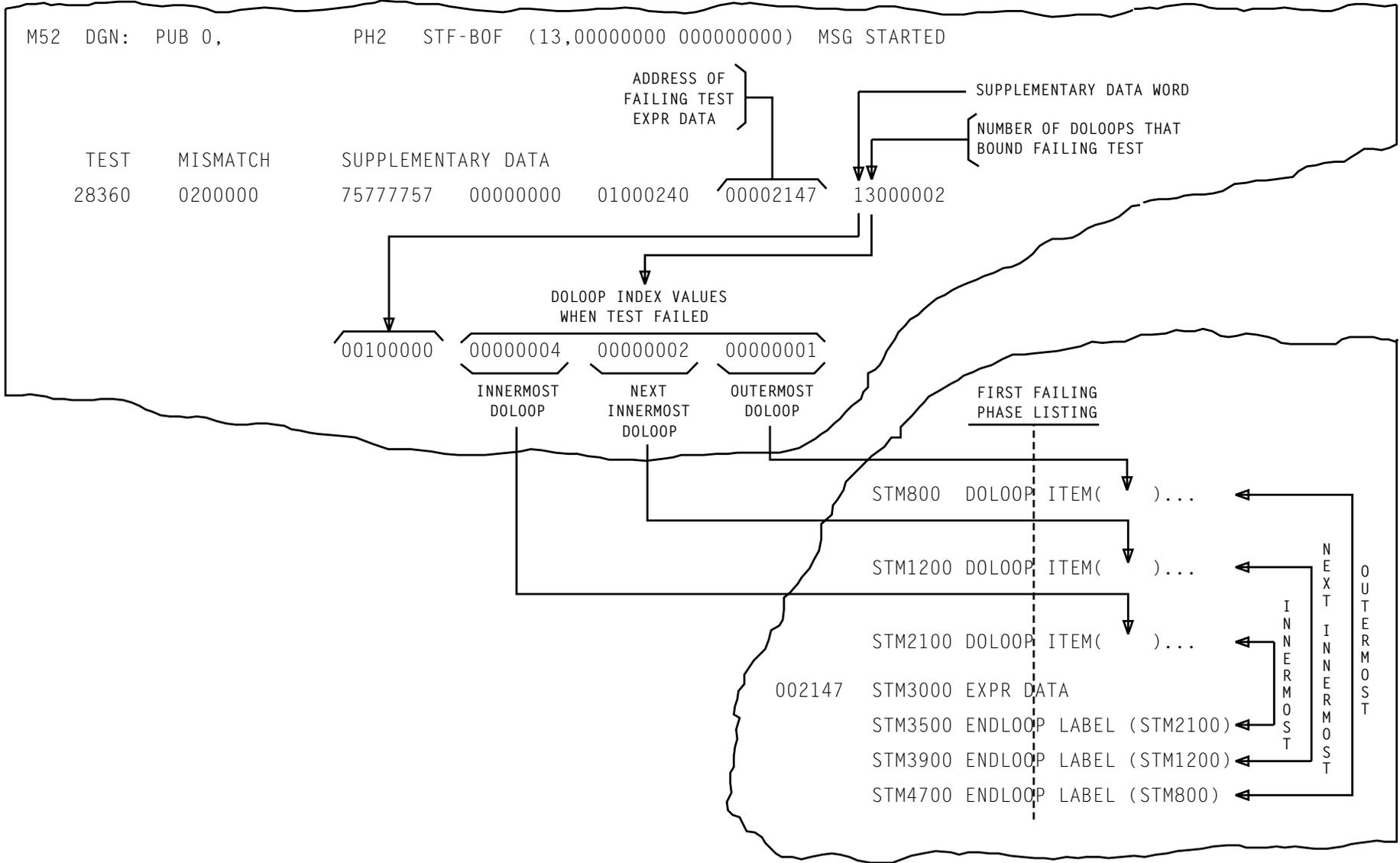


FIG. 1 - Example of Raw Data Doloop Word Relationship to Phase Listing

DETERMINE LOCATION AND FUNCTION OF DOLOOPS,
 NO SUBROUTINES CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	521

SUMMARY

Using program listing, doloop raw data, and DIAL statements, locate failing test in last subroutine called. Look PAST failing test for endloop statements. For each endloop statement located in subroutine, use endloop label variable to identify location of associated doloop statements. Locate each doloop statement. Obtain doloop

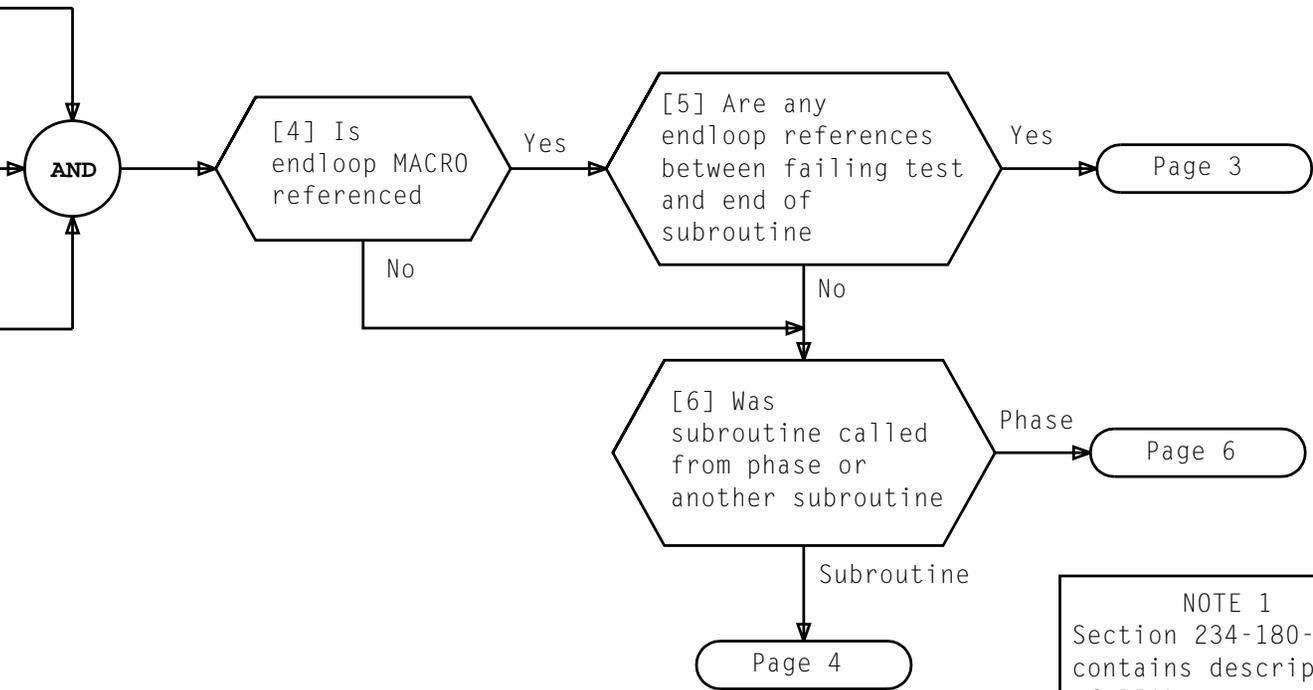
index values from raw data printout and determine meaning for each doloop. If endloop statement was not found in subroutine, go to where subroutine was called and look for endloop statements after CALLSUB statement. Continue to look for endloop statements after CALLSUB statements until all doloops indicated on raw data printout for first failing test are located. Read any comments at doloop statements

Using program listing, doloop raw data, and DIAL statements [NOTE 1]:

[1] Locate failing test in last subroutine called, and note page and line number of expected results (EXPR)

[2] Locate last address in subroutine, and note page and line number

[3] Locate subroutine PIDENT reference section

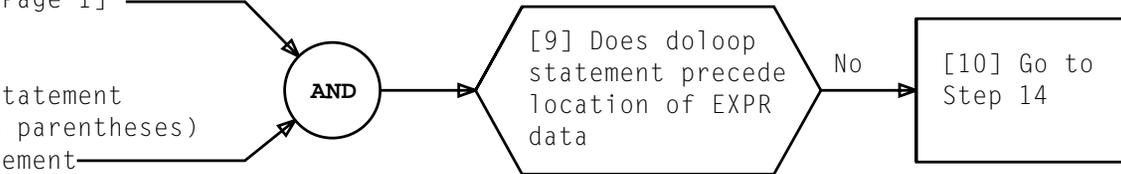


NOTE 1	
Section 234-180-020 contains description of DIAL statements	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 6	522

DETERMINE LOCATION AND FUNCTION OF DOLOOPS, SUBROUTINES CALLED

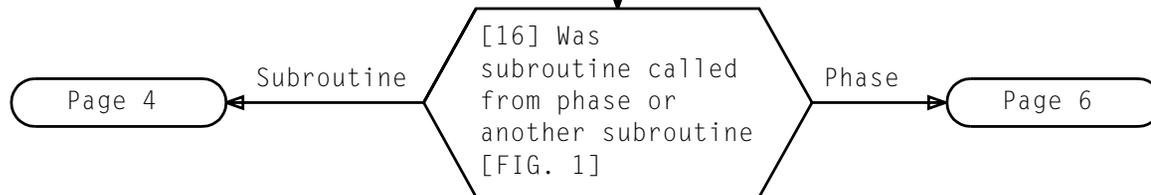
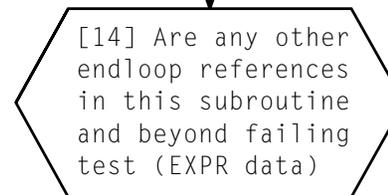
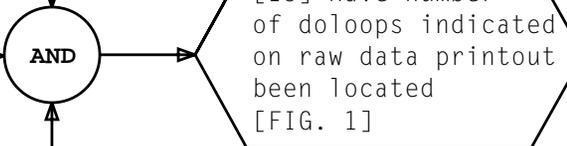
[7] Locate referenced endloop statement closest to, but beyond EXPR data previously noted [Step 1, Page 1]

[8] Locate doloop statement using label (in parentheses) at endloop statement



[11] Read any comments at doloop statement

[12] See NOTE 2. Obtain doloop index value from raw data printout, and note its meaning for this doloop [FIG. 1, Page 2]



NOTE 2
 First doloop located is innermost, next doloop located is next innermost, etc. Doloop values often indicate unit under test, memory, etc

[15] Locate endloop statement next closest to EXPR data, and repeat from Step 8

DETERMINE LOCATION AND FUNCTION OF DOLOOPS, SUBROUTINES CALLED

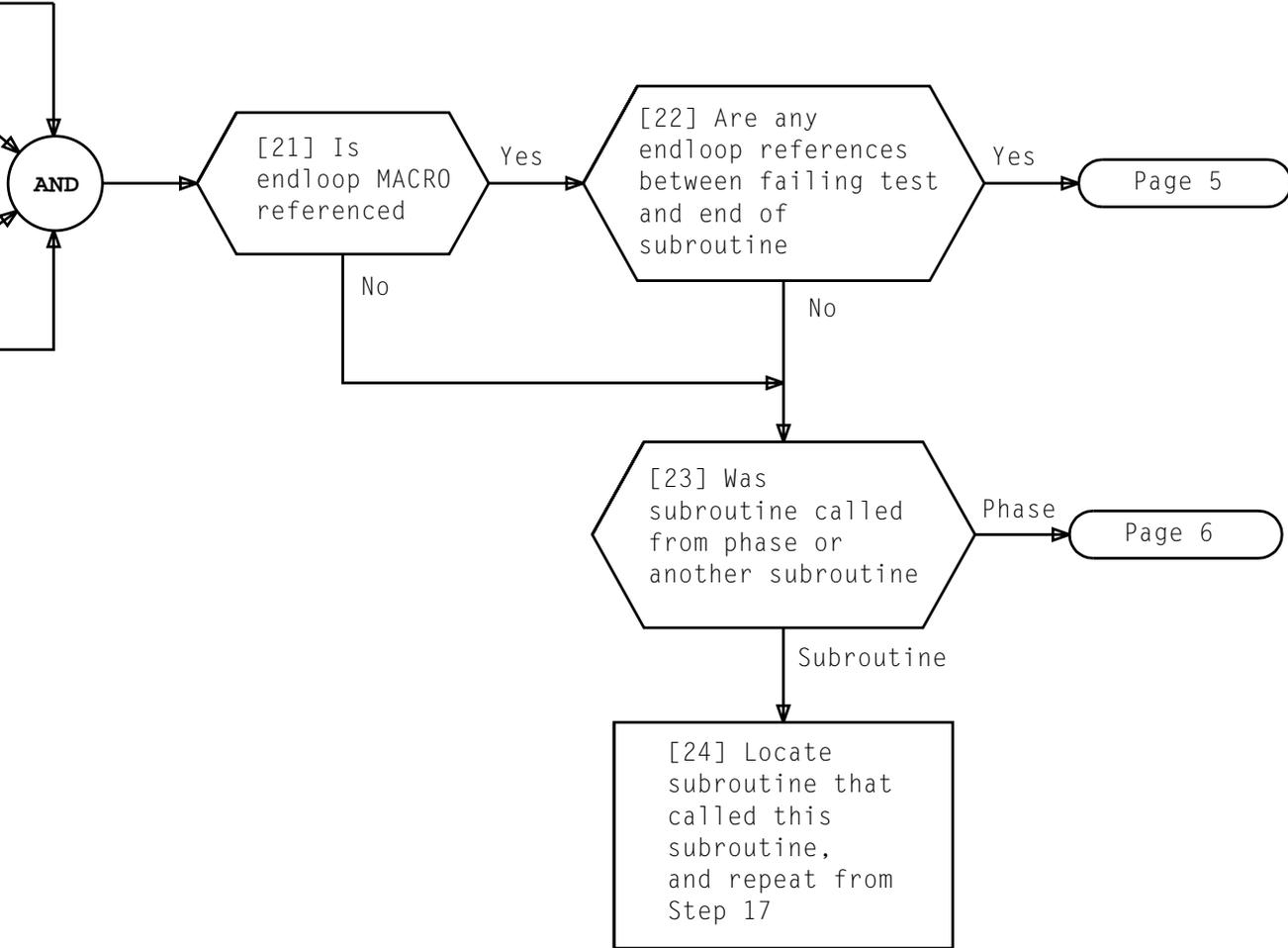
Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 6	522

[17] In subroutine that called last subroutine checked for doloops, locate CALLSUB statement that called subroutine

[18] Note page and line number of CALLSUB statement

[19] Locate last address in this subroutine and note page and line number

[20] Locate subroutine PIDENT reference section

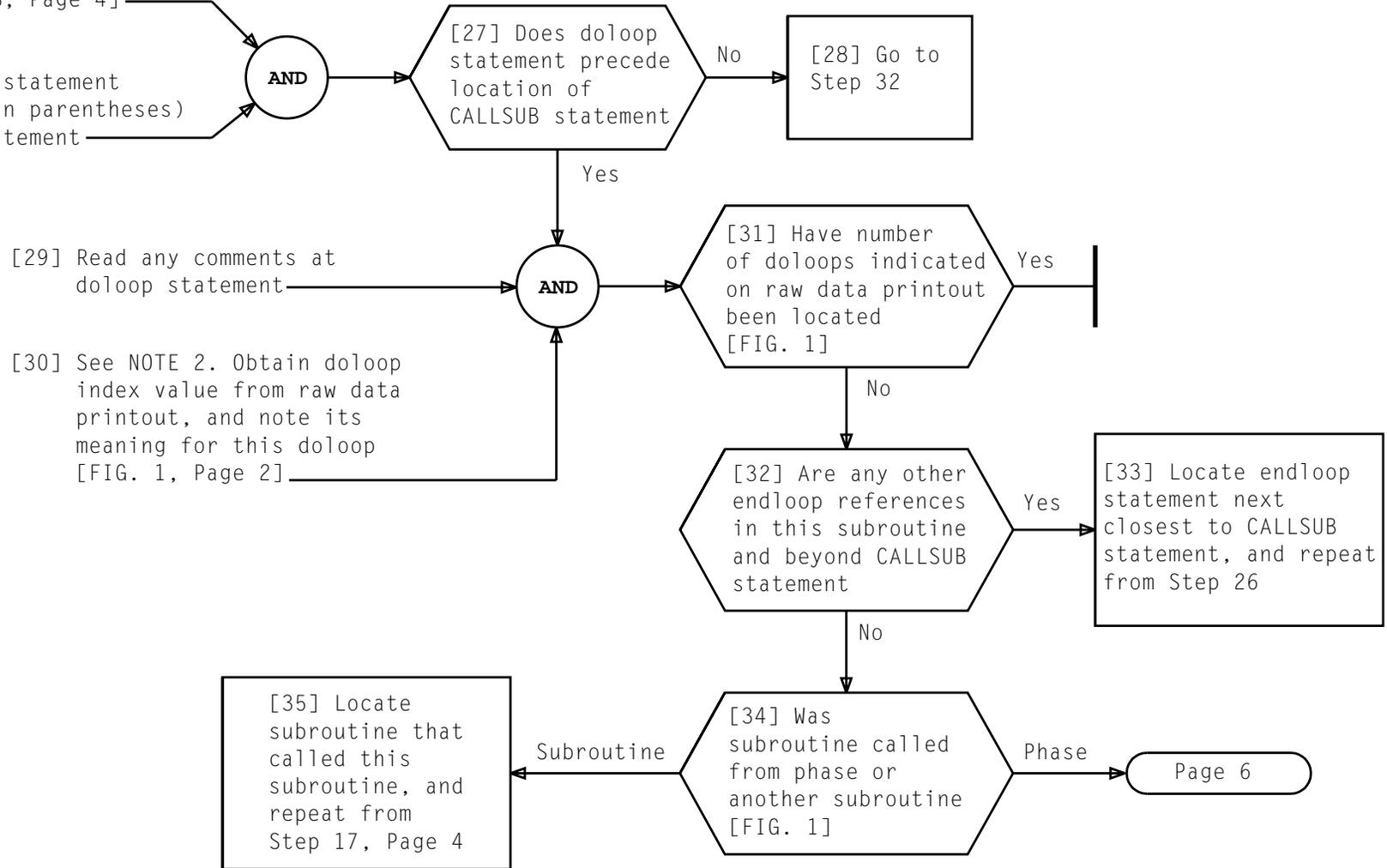


DETERMINE LOCATION AND FUNCTION OF DOLOOPS, SUBROUTINES CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 4 of 6	522

[25] Locate referenced endloop statement closest to, but beyond CALLSUB statement previously noted [Step 18, Page 4]

[26] Locate doloop statement using label (in parentheses) at endloop statement



**DETERMINE LOCATION AND FUNCTION OF DOLOOPS,
SUBROUTINES CALLED**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 5 of 6	522

In first failing phase PIDENT:

[36] Locate CALLSUB statement that called last subroutine checked for doloops [FIG. 1, Page 2]

[37] Note page and line number of CALLSUB statement

[38] Locate endloop MACRO in PIDENT reference section

[39] Note endloop reference that is closest to, but beyond CALLSUB statement

[40] Locate endloop statement noted



AND

[41] Locate doloop statement using label (in parentheses) at endloop statement

[42] Does doloop statement precede location of CALLSUB statement previously noted [Step 38]

No

[43] Locate endloop statement next closest to CALLSUB statement, and repeat from Step 41

Yes

[44] Read any comments at doloop statement

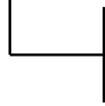
AND

[46] Have number of doloops indicated on raw data printout been located [FIG. 1]

No

[45] See NOTE 2. Obtain doloop index value from raw data printout and note its meaning for this doloop [FIG. 1]

Yes



DETERMINE LOCATION AND FUNCTION OF DOLOOPS, SUBROUTINES CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 6 of 6	522

On Summary Data Printout [FIG. 1, Page 2]:

1. Note monitor point address on first CD line under **v1** column
2. Convert octal failing bit in leftmost four octal digits of word under adjacent **v2** column to decimal

NOTE: Negative addresses eg, 77771510 precede positive addresses in PK. If address is not found, other addresses and bits may be investigated using other V column pairs (first CD line or other CD lines). The PK data for these addresses will be further removed from fault and PR data may be of greater value.

In Test Access PK Document:

3. Find address and failing bit
4. Note pack type and gate name for failing bit

In CPS for Pack Type:

5. Locate component list section

NOTE: If A or B appears after gate name in test access PK, it indicates A or B half of register (gate)

6. Look in each DESIG column for gate name

7. In adjacent SH LOC column, use location indicated to find gate in CPS

NOTE: If A or B appears after gate name in test access PK, it indicates A or B half of register (gate)

8. See NOTE 2. At gate, note lead name and terminal leaving gate to outside pack [FIG. 2, Page 2]

In Test Access PK Document:

9. For failing bit, note FS, SD, and symbol name

In SD FS indicated:

10. Locate symbol number having same symbol name as indicated in Test Access PK for failing bit
 11. Find lead interconnection section for this symbol
 12. Using terminal and lead name noted, find corresponding SD lead name
- End of procedure

IDENTIFY LEAD IN PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT AND TEST ACCESS PK DOCUMENT

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	523

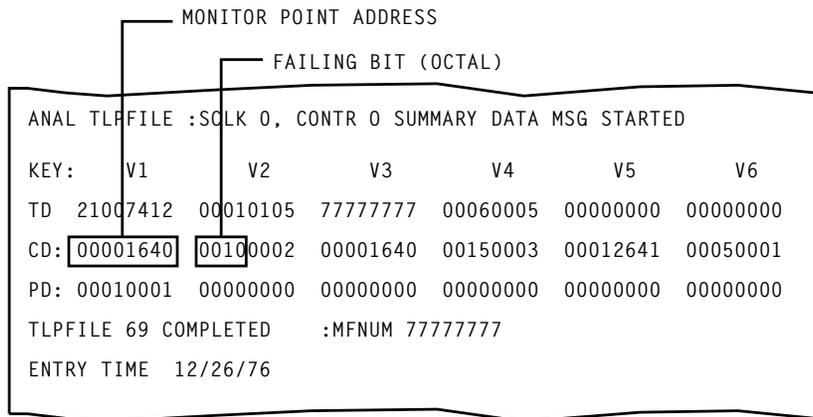


FIG. 1 - Example of Summary Data Printout

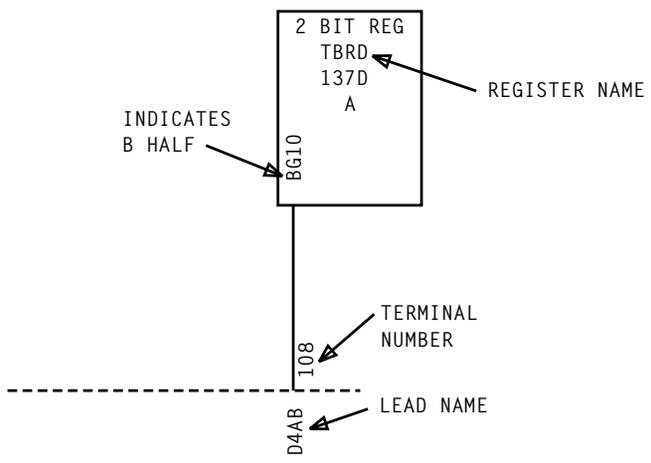


FIG. 2 - Example of Lead Leaving B Half of CPS Register

IDENTIFY LEAD IN PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT AND TEST ACCESS PK DOCUMENT

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	523

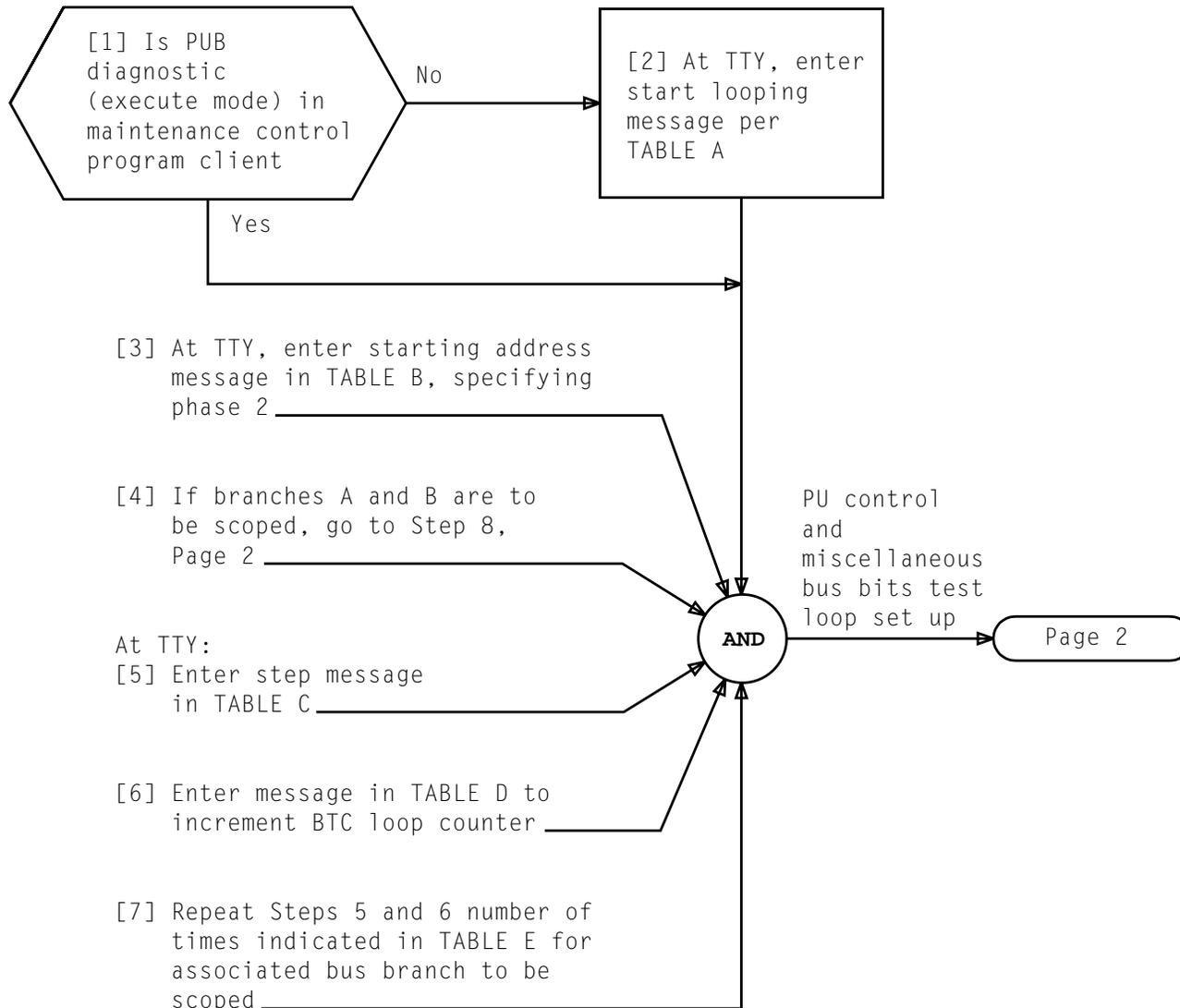


TABLE A
EX:PUB a;START!
a = Bus 0 or 1

TABLE B
EX:PUB a:PH 2,ADR b!
a = Bus 0 or 1
b = Address of statement label STM10600

TABLE C
EX:PUB a;STEP!
a = Bus 0 or 1

TABLE D
EX:PUB a:ADR b!
a = Bus 0 or 1
b = Address of statement label STM10600

TABLE E	
BRANCHES	REPEAT NUMBER
C,D	0
E,F	1
G,H	2
K,L	3
M,R	4
T,V	5
W,X	6

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	524

ADVANCE PROGRAM TO BE SCOPED AND SET UP LOOP TO OBSERVE PU CONTROL BUS AND MISCELLANEOUS BUS BITS

[8] Enter step message
 EX:PUB a;STEP!
 a = Bus 0 or 1

[9] Enter looping message
 in TABLE F

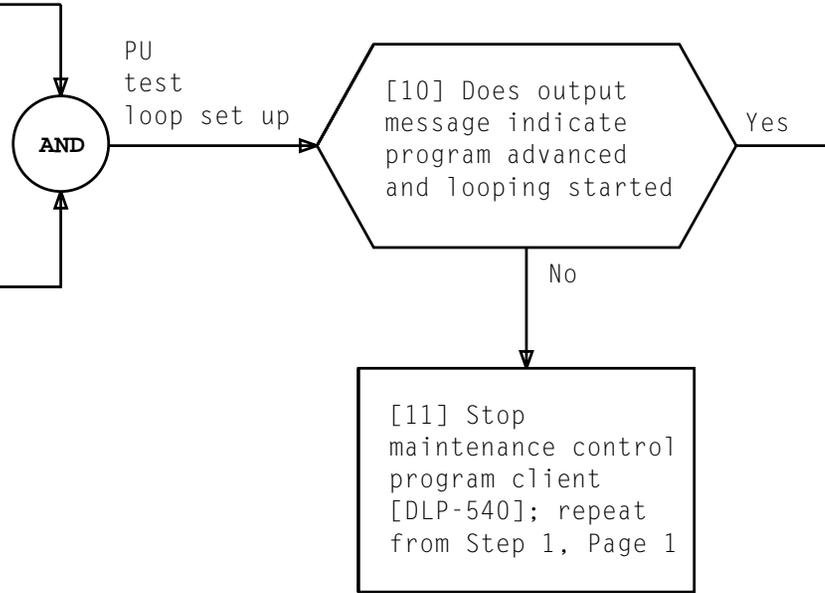


TABLE F	
EX:PUB a:ADR b-c!	
a = Bus 0 or 1	
b = Address of statement label PBTS4400 for bit	
c = Address of statement label PBTS13800 for bit	

ADVANCE PROGRAM TO BE SCOPED AND SET UP LOOP TO OBSERVE PU CONTROL BUS AND MISCELLANEOUS BUS BITS

1. Define error using PMDs [TABLE A]

End of procedure

TABLE A			
PMD-1	Growth unit	PMD-21	Bus at unit fault configuration was simplex controllers; duplex bus controller 0 and minor bus (IPUB) 1 suspect
PMD-2	Soft error configuration was duplex controllers	PMD-22	Bus at unit fault configuration was simplex controllers; duplex bus controller 1 and minor bus (IPUB) 0 suspect
PMD-3	Soft error configuration was simplex controller 0	PMD-23	Bus at unit fault configuration was simplex controllers; duplex bus controller 1 and minor bus (IPUB) 1 suspect
PMD-4	Soft error configuration was simplex controller 1	PMD-24	Bus at unit fault configuration was simplex controllers; duplex PUB, simplex bus at unit CONTR 0 and minor bus (IPUB) 0 suspect
PMD-5	Transient error configuration was duplex controllers	PMD-25	Bus at unit fault configuration was simplex controllers; duplex PUB, simplex bus at unit CONTR 0 and minor bus (IPUB) 1 suspect
PMD-6	Transient error configuration was simplex controller 0	PMD-26	Bus at unit fault configuration was simplex controllers; duplex PUB, simplex bus at unit CONTR 1 and minor bus (IPUB) 0 suspect
PMD-7	Transient error configuration was simplex controller 1	PMD-27	Bus at unit fault configuration was simplex controllers; duplex PUB, simplex bus at unit CONTR 1 and minor bus (IPUB) 1 suspect
PMD-10	Bus at unit fault configuration was duplex controllers; duplex bus controller 0 and minor bus (IPUB) 0 suspect	PMD-30	PUB fault configuration was duplex; bus major bus 0 suspect
PMD-11	Bus at unit fault configuration was duplex controllers; duplex bus controller 0 and minor bus (IPUB) 1 suspect	PMD-31	PUB fault configuration was duplex; bus major bus 1 suspect
PMD-12	Bus at unit fault configuration was duplex controllers; duplex bus controller 1 and minor bus (IPUB) 0 suspect	PMD-32	PUB fault configuration was simplex; bus major bus 0 suspect
PMD-13	Bus at unit fault configuration was duplex controllers; duplex bus controller 1 and minor bus (IPUB) 1 suspect		
PMD-14	Bus at unit fault configuration was duplex controllers; simplex bus controller 0 and minor bus (IPUB) 0 suspect		
PMD-15	Bus at unit fault configuration was duplex controllers; simplex bus controller 0 and minor bus (IPUB) 1 suspect		
PMD-16	Bus at unit fault configuration was duplex controllers; simplex bus controller 0 and minor bus (IPUB) 1 suspect		
PMD-17	Bus at unit fault configuration was duplex controllers; simplex bus controller 1 and minor bus (IPUB) 0 suspect		
PMD-20	Bus at unit fault configuration was simplex controllers; duplex bus controller 0 and minor bus (IPUB) 0 suspect		

TABLE A (Contd)

PMD-33	PUB fault configuration was simplex; bus major bus 1 suspect	PMD-47	CC fault suspect stand-by CC 1
PMD-34	Controller fault configuration was duplex controllers; controller 0 suspect	PMD-50	Interrupt from duplex failed unit
PMD-35	Controller fault configuration was duplex controllers; controller 1 suspect	PMD-51	No unit found; PBFR could not identify a unit that was responsible for the interrupt or interject
PMD-36	Controller fault configuration was simplex controllers; controller 0 suspect	PMD-52	System clock controller fault configuration was simplex system clock controllers; controller 0 suspect
PMD-37	Controller fault configuration was simplex controllers; controller 1 suspect	PMD-53	System clock controller fault configuration was simplex system clock controllers; controller 1 suspect
PMD-40	Controller fault configuration was simplex controller; bus suspect undetermined	PMD-54	System clock controller fault configuration was simplex system clock controller; and bus suspect undetermined
PMD-41	Controller fault configuration was simplex controller; bus suspect undetermined	PMD-55	System clock controller fault configuration was simplex system clock controller; and bus suspect undetermined
PMD-42	Controller fault configuration was duplex controllers; controller 0 suspect, but not conclusively. Sequence table will try to remove and diagnose mate controller on subsequent interrupts if they occur	PMD-56	System clock soft error configuration was simplex system clock controllers; controller 0 suspect
PMD-43	Controller fault configuration was duplex controllers; controller 1 suspect, but not conclusively. Sequence table will try to remove and diagnose mate controller on subsequent interrupts if they occur	PMD-57	System clock soft error configuration was simplex system clock controllers; controller 1 suspect
PMD-44	CC fault suspect active CC 0	PMD-60	System clock transient error configuration was simplex system clock controllers; controller 0 suspect
PMD-45	CC fault suspect active CC 1	PMD-61	System clock transient error configuration was simplex system clock controllers; controller 1 suspect
PMD-46	CC fault suspect stand-by CC 0		

[1] See NOTE 1. Identify failing test type and failing test number (in octal) [FIG. 1 and 2]

[2] Identify failing data bit positions (binary)

[3] Identify PBFR relative address that initiated test

[4] On TABLE A, Page 2 identify failing test function

SUBMEMBER AND DECISION REACHED

FR PROGRAM ADDRESS WHERE DECISION WAS REACHED

UNIT TYPE AND MEMBER NUMBER

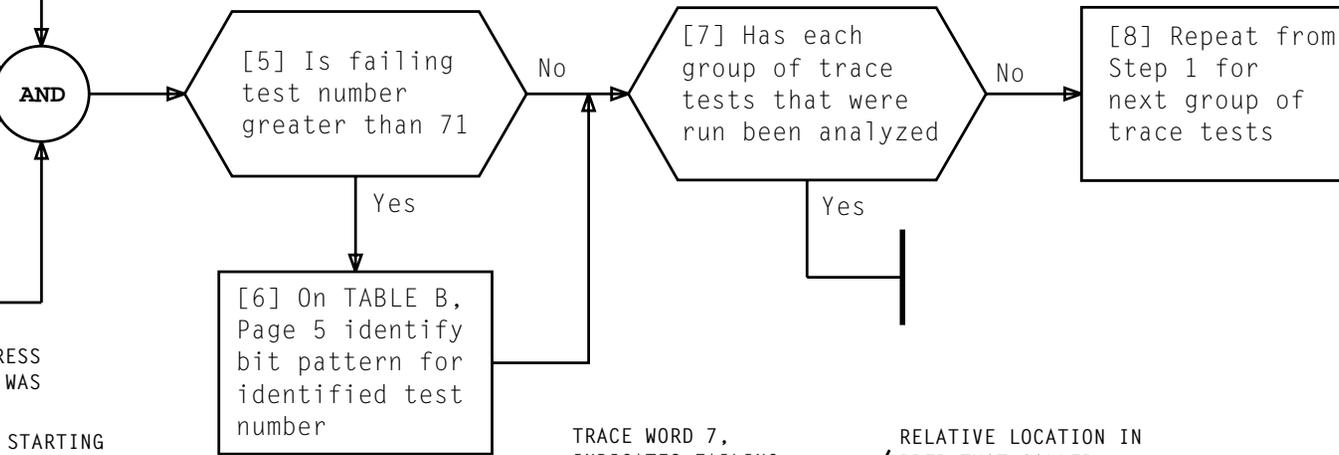
PMD

STARTING ADDRESS OF PBFR

```

DATA:PERIPHERAL FAULT RECOGNITION RESULTS
0/0/0/40/10/0/ 0/0/0/0/0/0/0/0/1 0/0/0/0/4217 16242751 16234546 0/0/0/0/0/0/17
0/0/40/10/0/2 0/0/0/0/0/0/0/1 0/0/0/0/4717 0/0/0/0/0/0/0/0/ 0/0/0/0/0/0/0/0/ 0/0/0/0/5165
0/0/40/10/0/2 0/0/0/0/0/0/0/1 0/0/0/0/610/7
  
```

FIG. 1 - Part of PBFR Printout With Trace Data Words 6 Through 14



TRACE WORD 6

TRACE WORD 7, INDICATES FAILING (MISMATCHED) DATA BITS

RELATIVE LOCATION IN PBFR THAT CALLED ACCESS OR LOOP TEST

00401002 00000001 00004717

4TH OCTAL DIGIT INDICATES TEST RESULTS:
 0 INDICATES TEST PASSED
 1 INDICATES ACCESS TEST FAILED
 2 INDICATES BUS LOOP TEST FAILED

FIRST THREE OCTAL DIGITS RECORD FAILING TEST NUMBER

FIG. 2 - Trace Word Layout

NOTE 1
 Trace tests are in groups of three trace words for each test run and always begin with word 6 in printout

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	526

TABLE A			
ACCESS TEST	PBFR TABLE OF ACCESS TESTS	ACCESS TEST	PBFR TABLE OF ACCESS TESTS
1	Reset MA, read SR to verify MA=0	30	Looparound pattern 20202020
2	Set MA, read SR to verify MA=1	31	Read reply register, verify 20202020
3	Verify ASWEPU=0 due to above orders	32	Looparound 57575757
4	Looparound pattern 00000000	33	Read reply register, verify 57575757
5	Read reply register, verify 00000000	34	Looparound pattern 40404040
6	Looparound pattern 77777777	35	Read reply register, verify 40404040
7	Read reply register, verify 77777777	36	Looparound 37373737
10	Looparound pattern 01010101	37	Read reply register, verify 37373737
11	Read reply register, verify 01010101	40	Looparound 07007007
12	Looparound 76767676	41	Read reply register, verify 07007007
13	Read reply register, verify 76767676	42	Looparound 70770770
14	Looparound pattern 02020202	43	Read reply register, verify 70770770
15	Read reply register, verify 02020202	44	Looparound 700700700
16	Looparound 75757575	45	Read reply register, verify 700700700
17	Read reply register, verify 75757575	46	Looparound 077077077
20	Looparound pattern 04040404	47	Read reply register, verify 077077077
21	Read reply register, verify 04040404	50	Looparound 00700707
22	Looparound 73737373	51	Read reply register, verify 00700707
23	Read reply register, verify 73737373	52	Looparound 77077070
24	Looparound pattern 10101010	53	Read reply register, verify 77077070
25	Read reply register, verify 10101010	54	Verify APEPU = 0 & non-TMS, TSI ASWEPU=0
26	Looparound 67676767	55	Clear ESR, read ESR, verify PFE=0 & PFO=0
27	Read reply register, verify 67676767		

TABLE A (Contd)

ACCESS TEST	PBFR TABLE OF ACCESS TESTS	ACCESS TEST	PBFR TABLE OF ACCESS TESTS
56	Looparound with EDATA (bit 10) inverted, verify PFE,PF0=0	75	Set IP1,IP2=1, send bit pattern D, verify PFE,PF0=1
57	Looparound with EDATA (bit 11) inverted, verify PFE,PF0=0	76	Set IP1,IP2=1, send bit pattern E, verify PFE,PF0=1
60	Looparound with EDATA (bit 12) inverted, verify PFE,PF0=0		MTCPU=1 BIT 35 =0
61	Looparound with EDATA (bit 13) inverted, verify PFE,PF0=0	77	Set IP1,IP2=1, send bit pattern F, verify PFE,PF0=1
62	Looparound with EDATA (bit 14) inverted, verify PFE,PF0=0		MTCPU=1 BIT 35 =0
63	Looparound with EDATA (bit 15) inverted, verify PFE,PF0=0	100	Set IP1,IP2=1, send bit pattern G, verify PFE,PF0=1
64	Looparound with EDATA (bit 16) inverted, verify PFE,PF0=0		MTCPU=1 BIT 35 =0
65	Looparound with EDATA (bit 17) inverted, verify PFE,PF0=0	101	Set IP1,IP2=1, send bit pattern H, verify PFE,PF0=1
66	Looparound with EDATA (bit 18) inverted, verify PFE,PF0=0		MTCPU=1 BIT 35 =0
67	Looparound with EDATA (bit 19) inverted, verify PFE,PF0=0	102	Set IP1,IP2=1, send bit pattern I, verify PFE,PF0=1
70	Looparound with EDATA (bit 20) inverted, verify PFE,PF0=0		MTCPU=1 BIT 35 =0
71	Looparound with EDATA (bit 21) inverted, verify PFE,PF0=0	103	Set IP1,IP2=1, send bit pattern J, verify PFE,PF0=1
	MTCPU=1 BIT 35 =0		MTCPU=0 BIT 35 =0
72	Set IP1,IP2=1, send bit pattern A, verify PFE,PF0=1	104	Set IP1,IP2=1, send bit pattern K, verify PFE,PF0=1
	MTCPU=1 BIT 35 =0		MTCPU=0 BIT 35 =1
73	Set IP1,IP2=1, send bit pattern B, verify PFE,PF0=1	105	Set IP1,IP2=1, send bit pattern U, verify PFE,PF0=1
	MTCPU=1 BIT 35 =0		MTCPU=0 BIT 35 =1
74	Set IP1,IP2=1, send bit pattern C, verify PFE,PF0=1	106	Set IP1,IP2=1, send bit pattern L, verify PFE,PF0=1
	MTCPU=1 BIT 35 =0		MTCPU=0 BIT 35 =1
		107	Set IP1,IP2=1, send bit pattern V, verify PFE,PF0=1
			MTCPU=0 BIT 35 =1

TABLE A (Contd)

ACCESS TEST	PBFR TABLE OF ACCESS TESTS	ACCESS TEST	PBFR TABLE OF ACCESS TESTS
110	Set IP1,IP2=1, send bit pattern M, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	120	Set IP1,IP2=1, send bit pattern Q, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
111	Set IP1,IP2=1, send bit pattern W, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	121	Set IP1,IP2=1, send bit pattern 1, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
112	Set IP1,IP2=1, send bit pattern N, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	122	Set IP1,IP2=1, send bit pattern R, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
113	Set IP1,IP2=1, send bit pattern X, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	123	Set IP1,IP2=1, send bit pattern 2, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
114	Set IP1,IP2=1, send bit pattern O, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	124	Set IP1,IP2=1, send bit pattern S, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
115	Set IP1,IP2=1, send bit pattern Y, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	125	Set IP1,IP2=1, send bit pattern 3, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
116	Set IP1,IP2=1, send bit pattern P, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	126	Set IP1,IP2=1, send bit pattern T, verify PFE,PF0=1 MTCPU=0 BIT 35 =1
117	Set IP1,IP2=1, send bit pattern Z, verify PFE,PF0=1 MTCPU=0 BIT 35 =1	127	Set IP1,IP2=1, send bit pattern 4, verify PFE,PF0=1

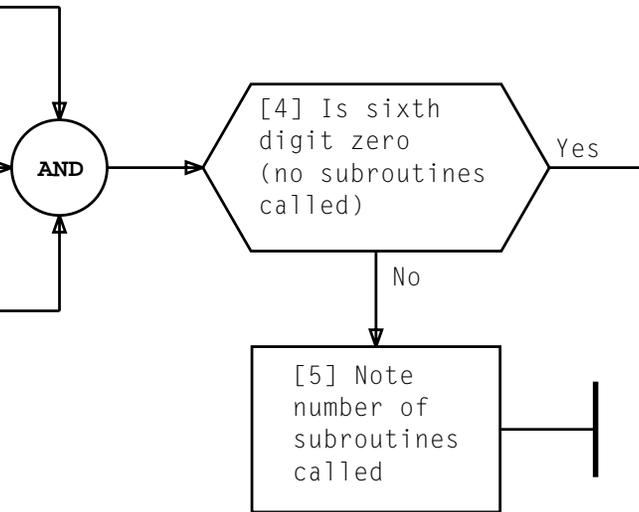
TABLE B PBFR TABLE OF ACCESS TESTS					
BIT PATTERN	PRM	PRL	BIT PATTERN	PRM	PRL
A	0000	00000000	0	7410	10101010
B	0001	01010101	P	7420	20202020
C	0002	02020202	Q	7440	40404040
D	0004	04040404	R	7507	07007007
E	0010	10101010	S	7570	70070070
F	0020	20202020	T	7577	00700707
G	0011	40404040	U	7577	77777777
H	0022	07007007	V	7576	76767676
I	0037	70070070	W	7575	75757575
J	0007	00700707	X	7573	73737373
TESTS	72-103	Skip for EST, TMS, and TSI 72-127 Skip for PUC, and DIF 104-127 Skip for TAC, SYSCLK	Y	7567	67676767
			Z	7557	57575757
			1	7537	37373737
			2	7470	70770770
K	7400	00000000	3	7407	07707707
L	7401	01010101	4	7400	77077070
M	7402	02020202			
N	7404	04040404			

On raw data printout [FIG. 1, Page 2]:

[1] Locate first failing
test raw data

[2] Locate fifth data
word following
mismatch data

[3] Identify sixth digit
of fifth data word



DETERMINE IF SUBROUTINES WERE CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	527

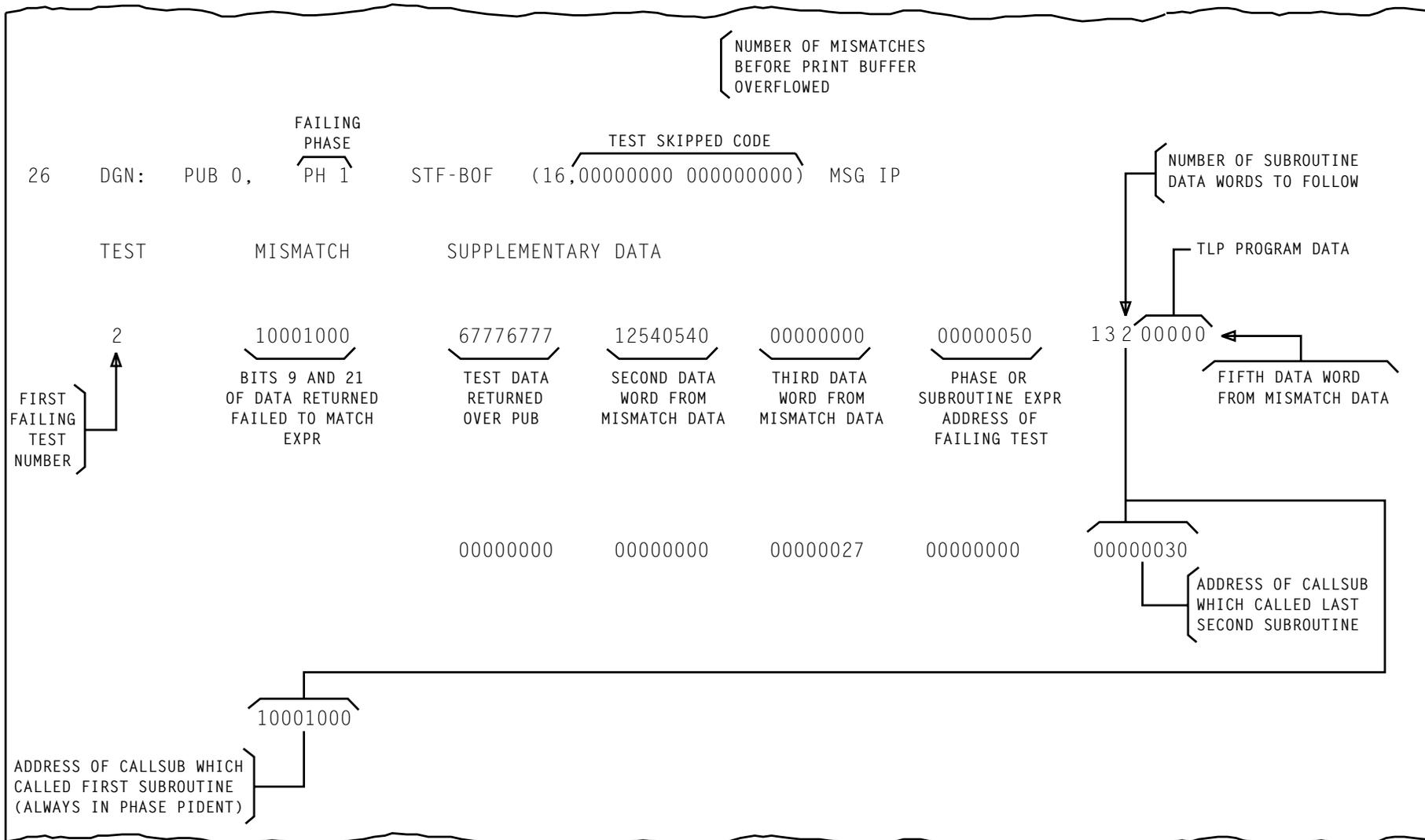


FIG. 1 - Example of PUBB Frame Raw Data Printout

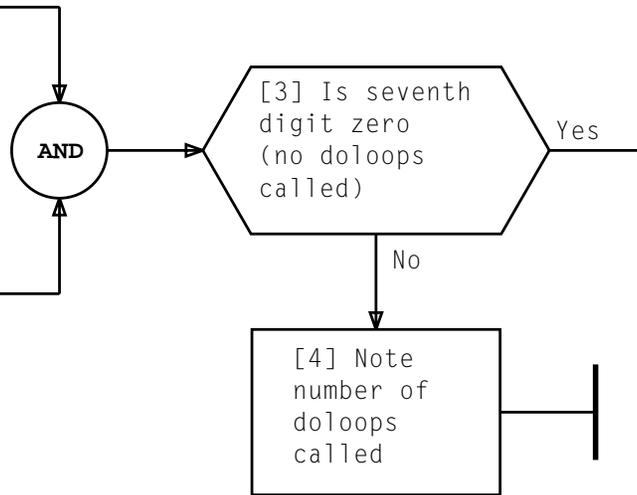
DETERMINE IF SUBROUTINES WERE CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	527

On raw data printout [FIG. 1, Page 2]:

[1] Locate fifth data word
following mismatch data

[2] Identify seventh digit
of fifth data word



DETERMINE IF DOLOOPS WERE CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	528

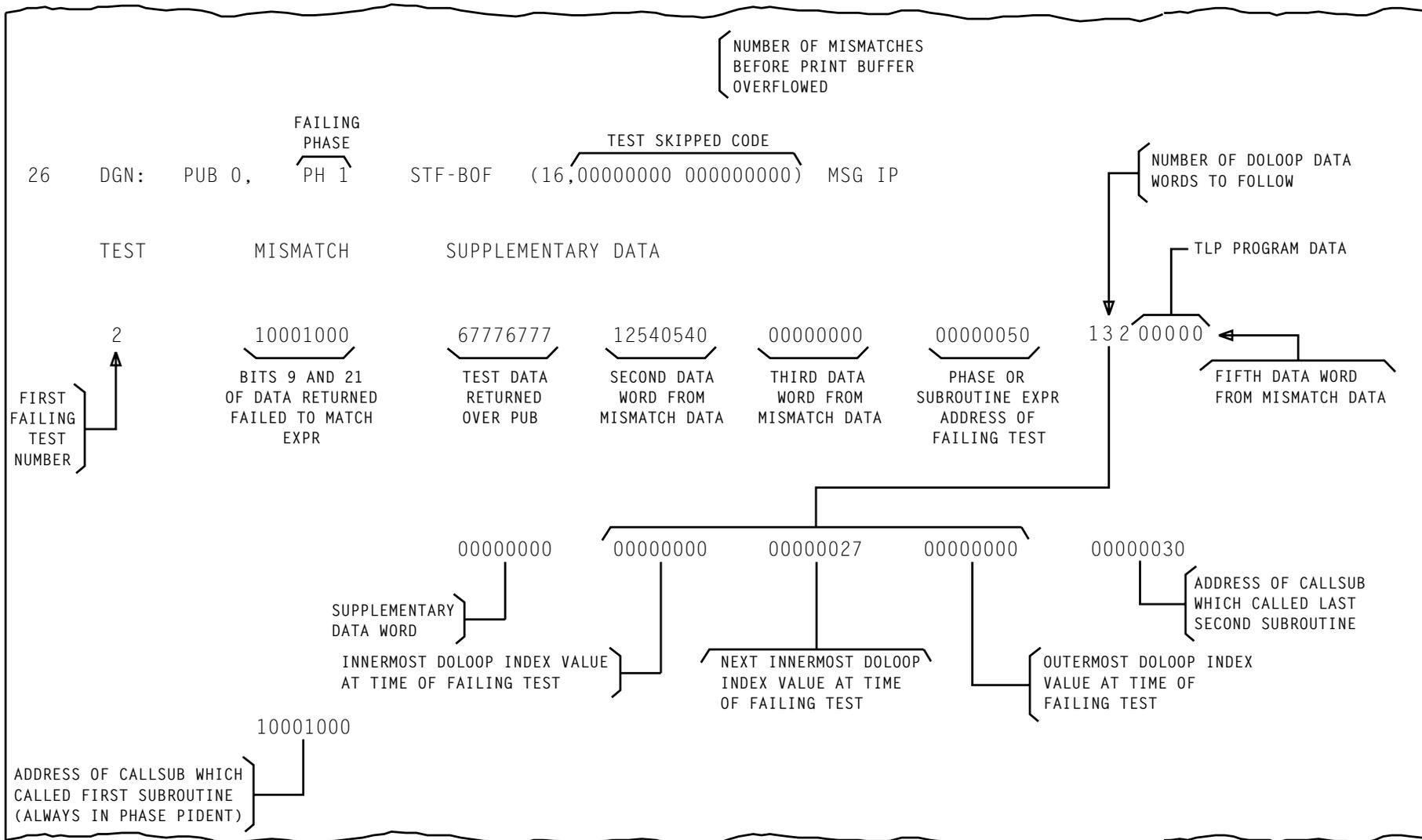


FIG. 1 - Example of PUBB Frame Raw Data Printout

DETERMINE IF DOLOOPS WERE CALLED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	528

SUMMARY

Using PUBB verify entry input message, call up PUBB UT translator and verify that submember equipage for growth circuit half is unequipped. If data is in error, degrow submember equipage. Using same PUBB UT translator,

verify that controllers 0 and 1 version number agree with appropriate office record and shipping information. If data is in error, perform functional word change. Refer to entry word explanations of TABLE B, Page 3, as required, for assistance in interpreting specific data fields

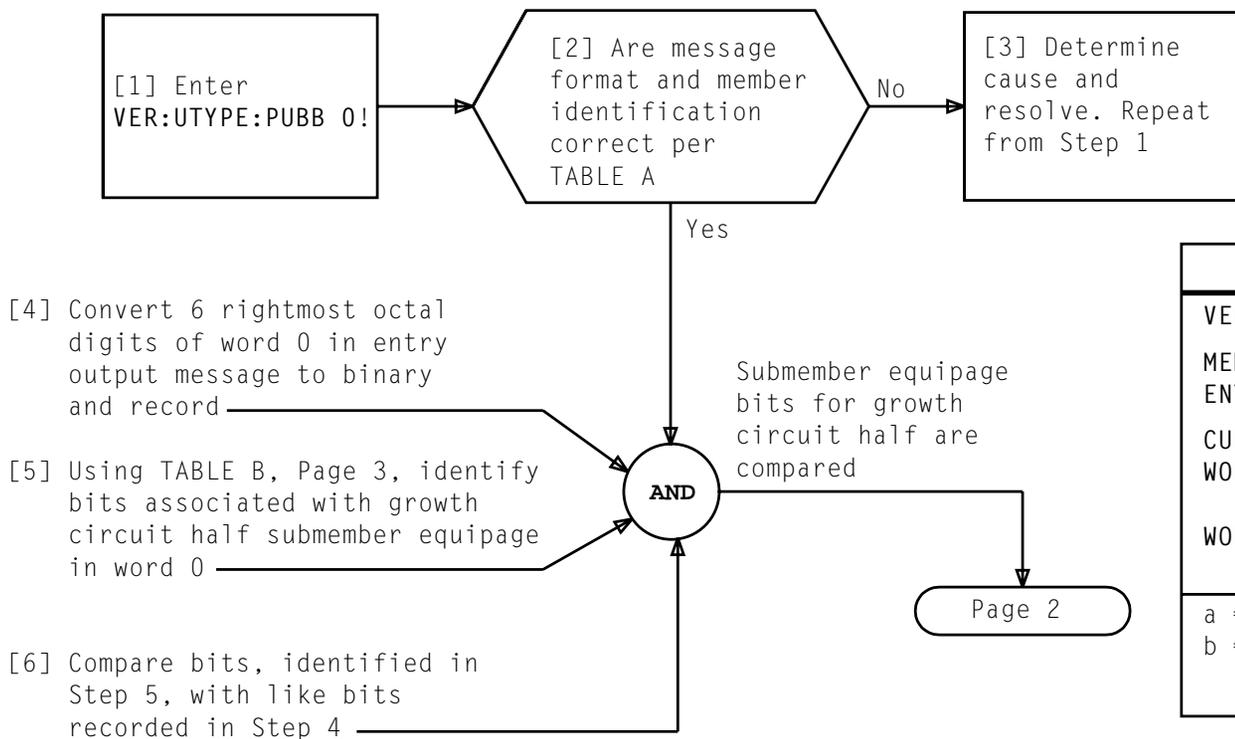
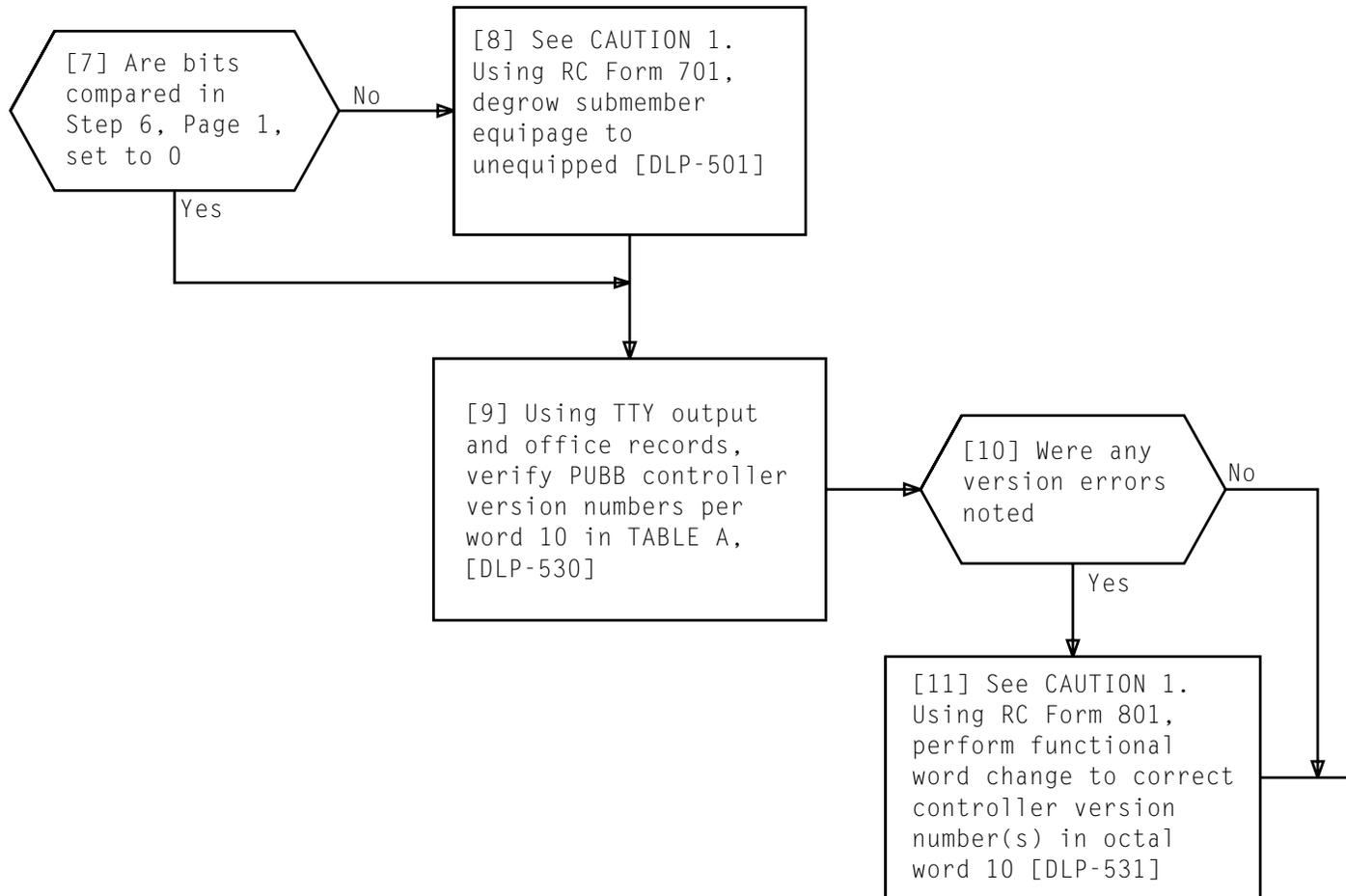


TABLE A	
VER:UTMN;OPT(),	CUR: FLN a, UTYN PUBB,
MEMN 0,	ME OPER,
ENTRY ADDRESS b,	ENTRY SIZE 14,
CUR	
WORD 0	_____

WORD 10	_____

a = Floor location number	
b = Starting octal address for unit type entry	



CAUTION 1
Depending on local procedures, supervisory or TELCO engineering approval must be obtained prior to performing any data change

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 3	529

TABLE B

ENTRY WORD (OCTAL)	UT ENTRY DATA AND WORD CONFIGURATION																									
0	entry data octal output	Y		Y		Y		Y		Y		Y		Y		7										
	bit position	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
	binary values									X	X	X	X	X	X	X	X	X	X	X	1	1	1	1		
	binary values									1	0	1	0	1	0	1	0	1	0	1	0					
						3				2				1				0								
		Circuit half (0 or 1) submember equipage PUBB loop around unit																								
		XX = 2-digit code giving status of circuit half (0 or 1)								Y...Y = Variable octal numbers																
		= 00 = Unequipped																								
		= 11 = Operational																								
10	entry data octal output	0		0		0		0		0		0		0		Y		Y								
	bit position	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
	binary values	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X	X	X
	binary values																			CONTROLLER 1			CONTROLLER 0			
																				PUBB CONTROLLER VERSION NUMBER						
		XX = Version numbers of PUBB equipment as reflected in appropriate office record drawings and shipping info																Y = Variable octal numbers								

[4] Using TABLE A, select version numbers associated with LDI issue numbers obtained in Step 3. See NOTE 1

TABLE A					
UNIT	SD NUMBER	MEMBER VERSION NUMBER			
		0	1	2	3
PUBB Controller	4A019-01	1A	2A	—	—
	4A038-01	1A	2A	—	—

[5] Compare version numbers of Step 4 with version numbers calculated in Step 2



NOTE 1	
PECC diagnostic center may be consulted for current version information if not listed in TABLE A	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	530

Using TTY and CRT display of RC Form 801:

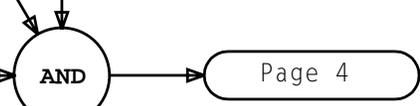
[6] In field following **WORDNO**,
type decimal number of
UT translator word to
be changed

[7] Determine quantity of
consecutive bits which
span all bits requiring
change in this UT
translator word

[8] In field following **SIZE**,
type decimal number of
bits determined in Step 7.
See example of FIG. 2,
Page 3

[9] Determine bit position
number (range of 0 to 23)
identifying rightmost of
consecutive bits
determined in Step 7

[10] In field following **DISP**,
type decimal number
determined in Step 9.
See example of FIG. 2,
Page 3



**PERFORM FUNCTIONAL WORD CHANGE TO CORRECT
UT TRANSLATOR WORD, THEN VERIFY**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 6	531

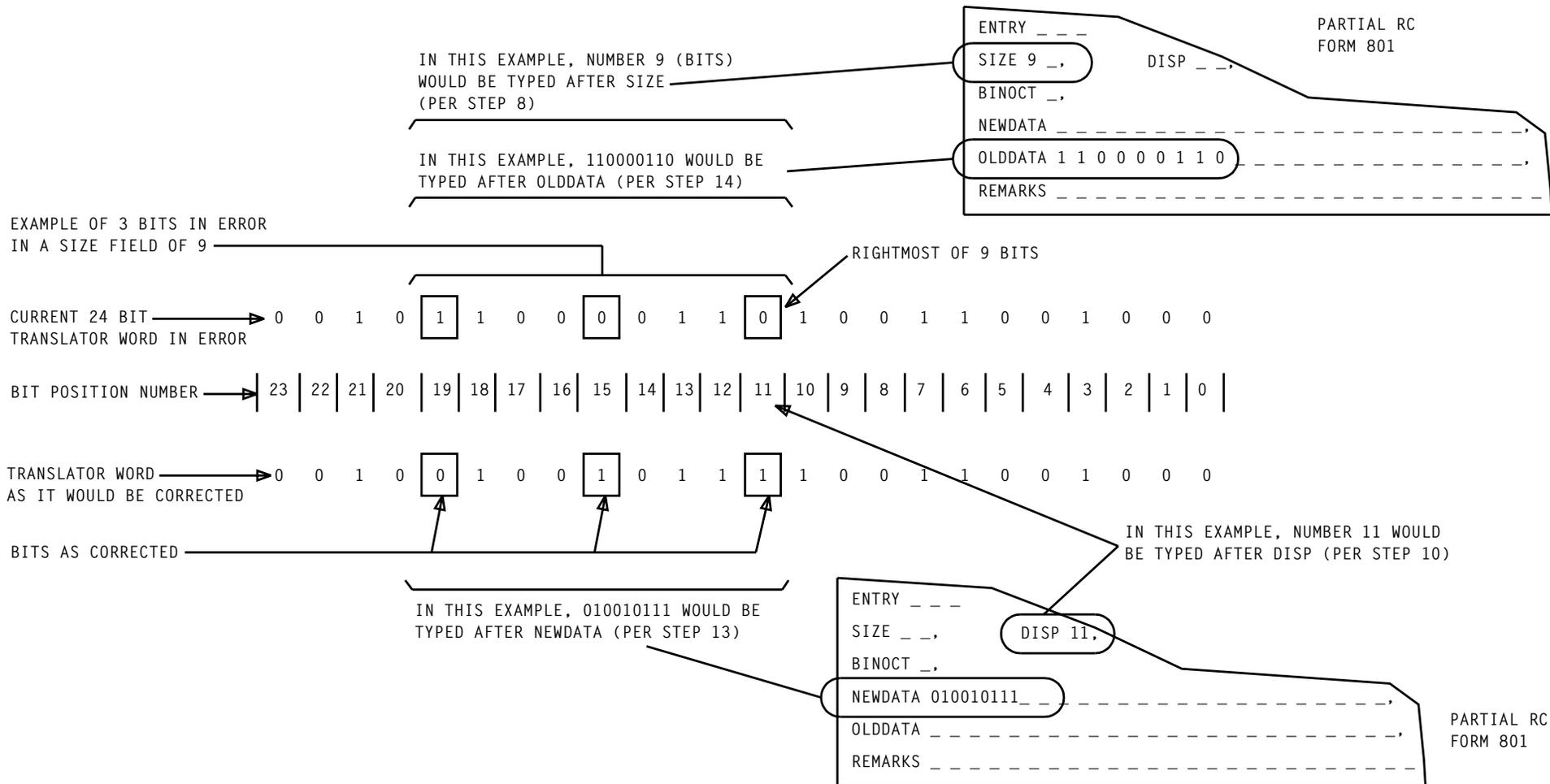


FIG. 2 - Example of Functional Word Change Considerations

PERFORM FUNCTIONAL WORD CHANGE TO CORRECT
 UT TRANSLATOR WORD, THEN VERIFY

Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 6	531

Using TTY and CRT display of RC Form 801:

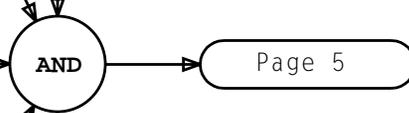
[11] Type B in field following BINOCT

[12] See NOTE 1. Determine binary bits to be inserted into UT translator word to correct that word. See example of FIG. 2, Page 3

[13] In field following NEWDATA, type binary bits determined in Step 12. See example of FIG. 2, Page 3

[14] See NOTE 2. In field following OLDDATA, type current binary contents of only that portion of UT translator word requiring change. See example of FIG. 2, Page 3

[15] Enter form



NOTES

1. Quantity of binary bits to be entered as NEWDATA must be equal to decimal number entered as SIZE
2. Quantity of binary bits to be entered as OLDDATA must be equal to quantity of bits entered as NEWDATA

PERFORM FUNCTIONAL WORD CHANGE TO CORRECT UT TRANSLATOR WORD, THEN VERIFY

Issue 5	NOV 1995
234-151-015	DLP
PAGE 4 of 6	531

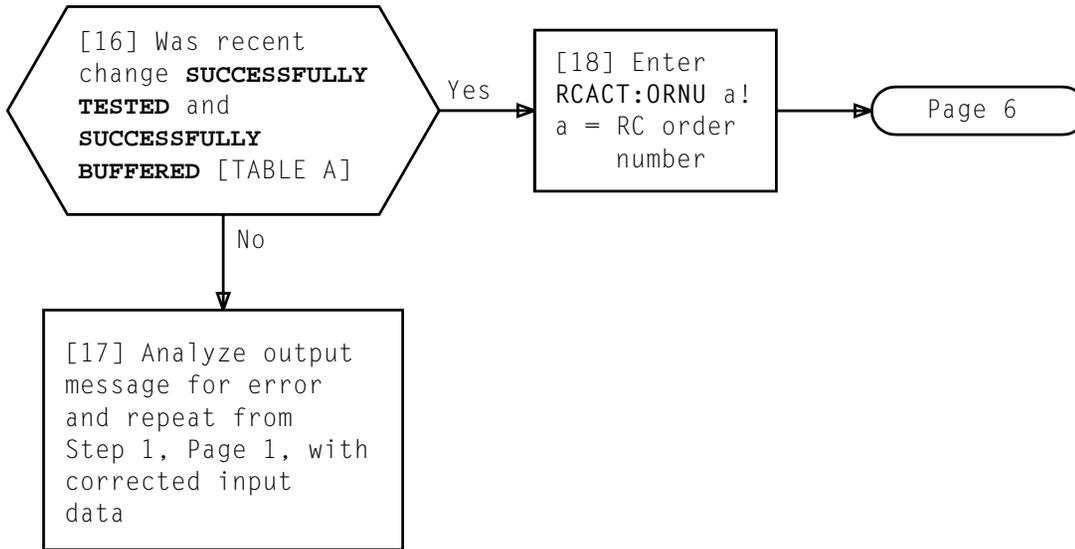


TABLE A	
RC ORNU a	SUCCESSFULLY TESTED
RC ORNU a	SUCCESSFULLY BUFFERED
RC:FUNC;CHG;OPT(TRANS),BUF:	TRANSID UTPUBB,
ORNU a,	
ENTRY b,	WORDNO c,
SIZE d,	DISP e,
BINOCT B,	
NEWDATA f,	
OLDDATA g,	
REMARKS	-----!
REPT:RC DUMP OF UNIT TYPE ENTRY AS IT WILL APPEAR AFTER THE MESSAGE IS ACTIVATED	
WORD 0	_____

WORD 10	_____

a = RC order number b = Member number of growth frame c = Decimal number of word changed d = Decimal number of bit changed e = Decimal number of bit position changed (rightmost bit) f = Binary bits inserted to correct data g = Binary contents of portion of word changed	

PERFORM FUNCTIONAL WORD CHANGE TO CORRECT UT TRANSLATOR WORD, THEN VERIFY

Issue 5	NOV 1995
234-151-015	DLP
PAGE 5 of 6	531

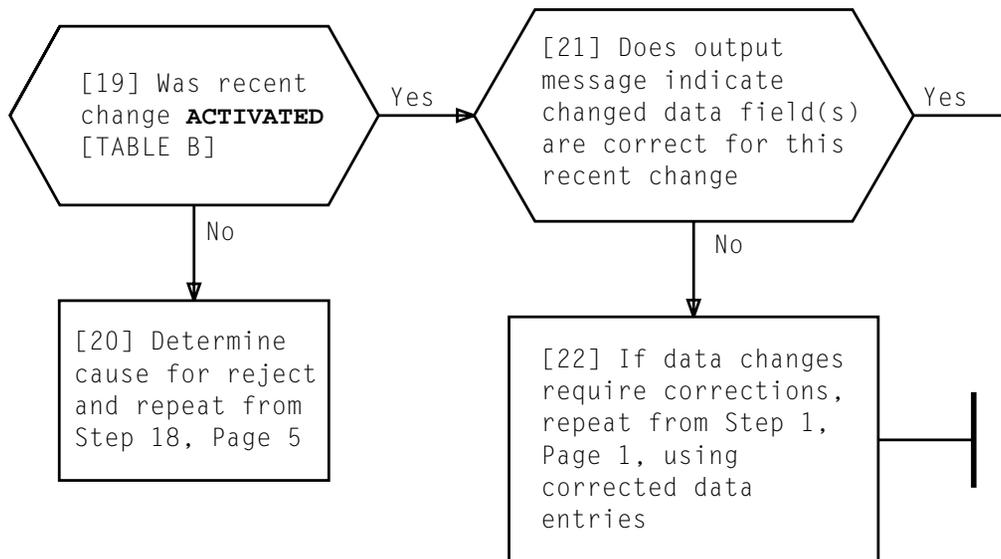
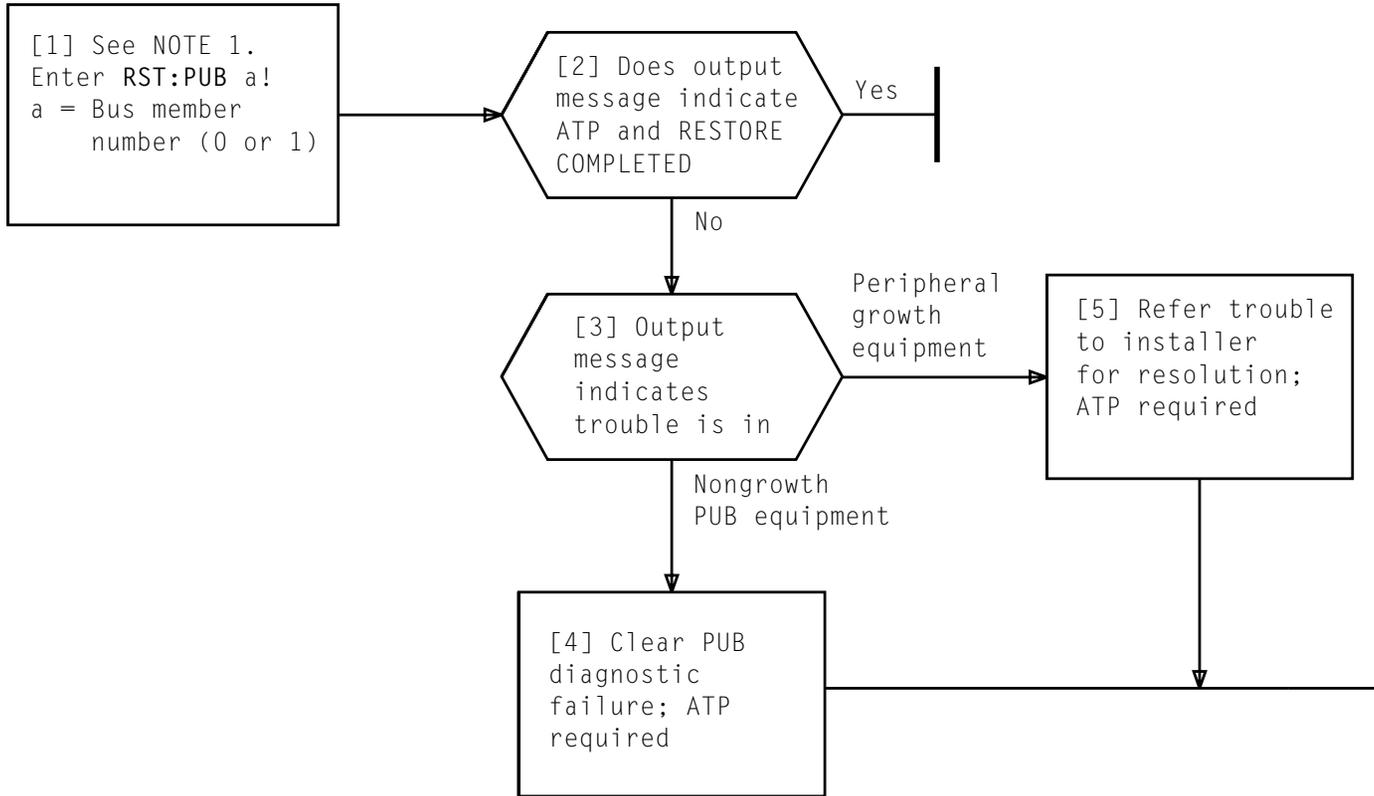


TABLE B	
RC ORNU a ACTIVATED	
RC:FUNC;CHG;OPT(TRANS),BUF: TRANSID UTPUBB, ORNU a,	
ENTRY b,	WORDNO c,
SIZE d,	DISP e,
BINOCT B,	
NEWDATA f,	
OLDDATA g,	
REMARKS..... !	
a = RC order number	
b = Member number of growth frame	
c = Decimal number of word changed	
d = Decimal number of bits changed	
e = Decimal number of bit position changed (rightmost bit)	
f = Binary bits inserted to correct data	
g = Binary contents of portion of word changed	

**PERFORM FUNCTIONAL WORD CHANGE TO CORRECT
UT TRANSLATOR WORD, THEN VERIFY**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 6 of 6	531

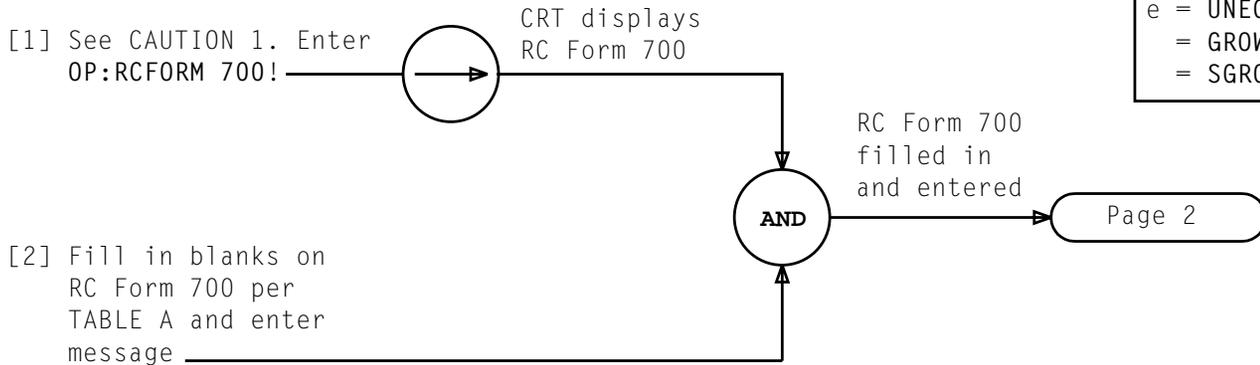


NOTE 1	
Restore message will cause PUB diagnostic to be run. PUB will be restored if ATP	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	532

SUMMARY

Call up RC Form 700 on CRT. Using TTY, fill in blanks on RC Form 700 to change submember equipage. Using assigned order number, activate recent change; then verify current translations

TABLE A	
RC:UTYPE;CHG;OPT(EQP,GROW),TST:	UTYN a,
ORNU b,	
MEMN c,	ME (----, ----),
	OLD NEW
SUBMEM d,	SME (e , e),
	OLD NEW
REMARKS-----!	
a = Unit type = PUBB	
b = RC order number	
c = Member number of growth associated frame	
d = Submember name	
= CKHEQ00 (for PUBB Unit 1, Half 0)	
= CKHEQ01 (for PUBB Unit 1, Half 1)	
= CKHEQ10 (for PUBB Unit 2, Half 0)	
= CKHEQ11 (for PUBB Unit 2, Half 1)	
= CKHEQ20 (for PUBB Unit 3, Half 0)	
= CKHEQ21 (for PUBB Unit 3, Half 1)	
= CKHEQ30 (for PUBB Unit 4, Half 0)	
= CKHEQ31 (for PUBB Unit 4, Half 1)	
e = UNEQ, GROW or	
= GROW, SGRO or	
= SGRO, OPER	



*CAUTION 1
Calling up RC
form will cause
all CRT data to
be cleared*

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 4	533

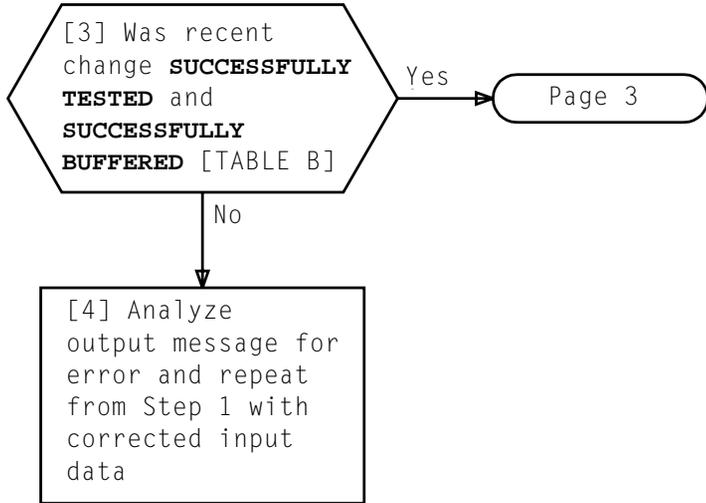


TABLE B	
RC ORNU a	SUCCESSFULLY TESTED
RC ORNU a	SUCCESSFULLY BUFFERED
RC:UTYPE;CHG;OPT(EQP,GROW),BUF:	UTYN PUBB,
ORNU a,	
	OLD NEW
MEMN b,	ME (----, ----),
	OLD NEW
SUBMEM c,	SME (d, d),
REMARKS	----- !
a = RC order number b = Member number of growth associated frame c = Submember name = CKHEQ00 (for PUBB Unit 1, Half 0) = CKHEQ01 (for PUBB Unit 1, Half 1) = CKHEQ10 (for PUBB Unit 2, Half 0) = CKHEQ11 (for PUBB Unit 2, Half 1) = CKHEQ20 (for PUBB Unit 3, Half 0) = CKHEQ21 (for PUBB Unit 3, Half 1) = CKHEQ30 (for PUBB Unit 4, Half 0) = CKHEQ31 (for PUBB Unit 4, Half 1) d = Entered submember equipage	

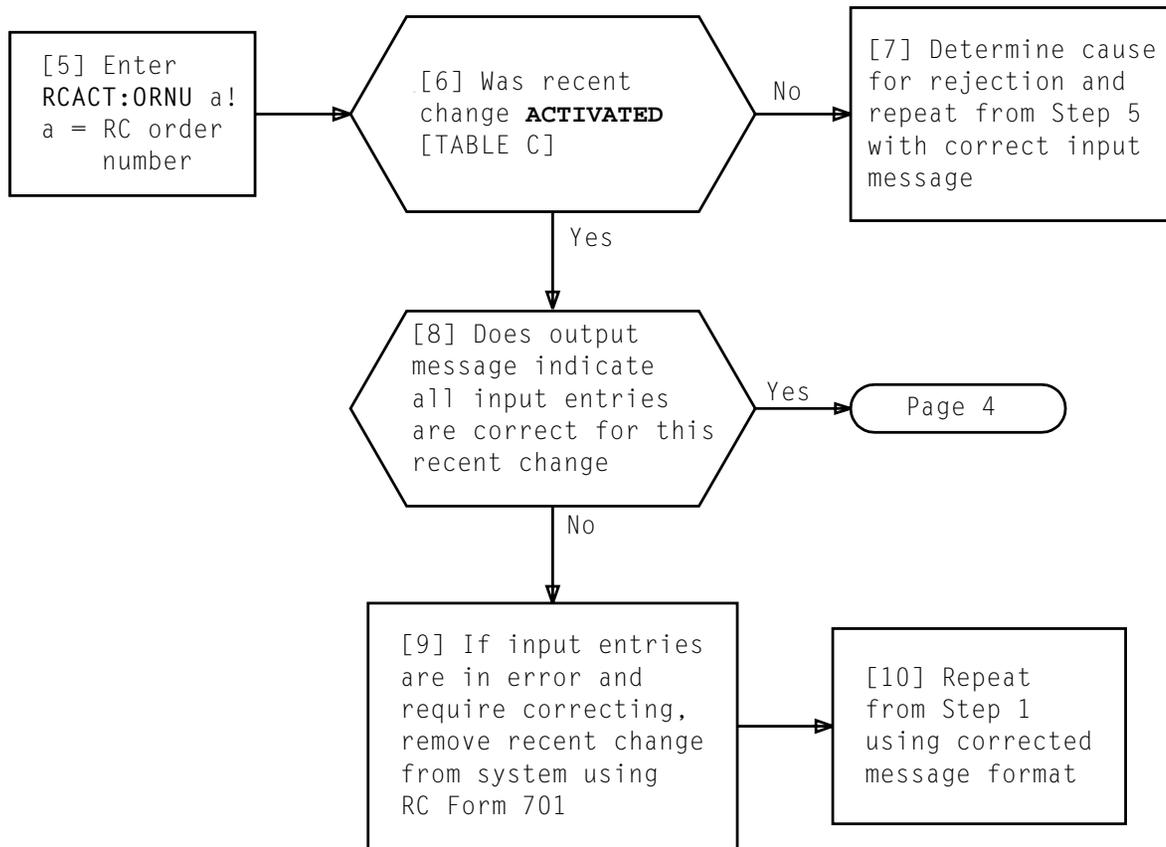


TABLE C	
RC ORNU a ACTIVATED	
RC:UTYPE;CHG;OPT(EQP,GROW),BUF: UTYN PUBB,	
ORNU a,	
MEMN b,	ME (---,---),
	OLD NEW
SUBMEM c,	SME (d , d),
	OLD NEW
REMARKS-----!	
a = RC order number	
b = Member number of growth associated frame	
c = Submember name	
= CKHEQ00 (for PUBB Unit 1, Half 0)	
= CKHEQ01 (for PUBB Unit 1, Half 1)	
= CKHEQ10 (for PUBB Unit 2, Half 0)	
= CKHEQ11 (for PUBB Unit 2, Half 1)	
= CKHEQ20 (for PUBB Unit 3, Half 0)	
= CKHEQ21 (for PUBB Unit 3, Half 1)	
= CKHEQ30 (for PUBB Unit 4, Half 0)	
= CKHEQ31 (for PUBB Unit 4, Half 1)	
d = Entered submember Equipage	

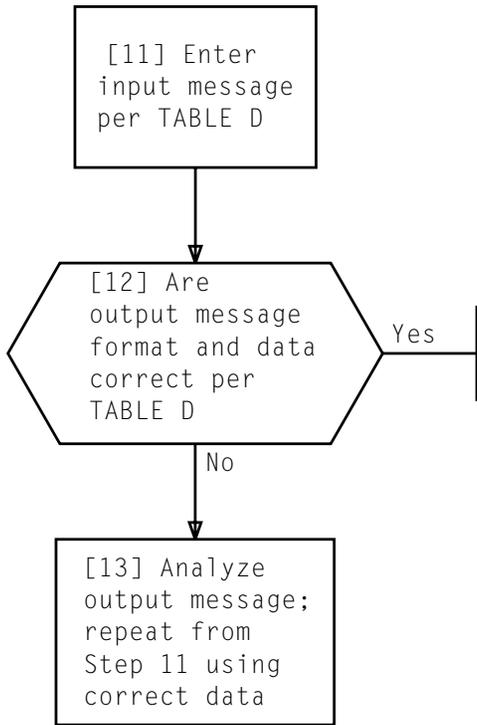
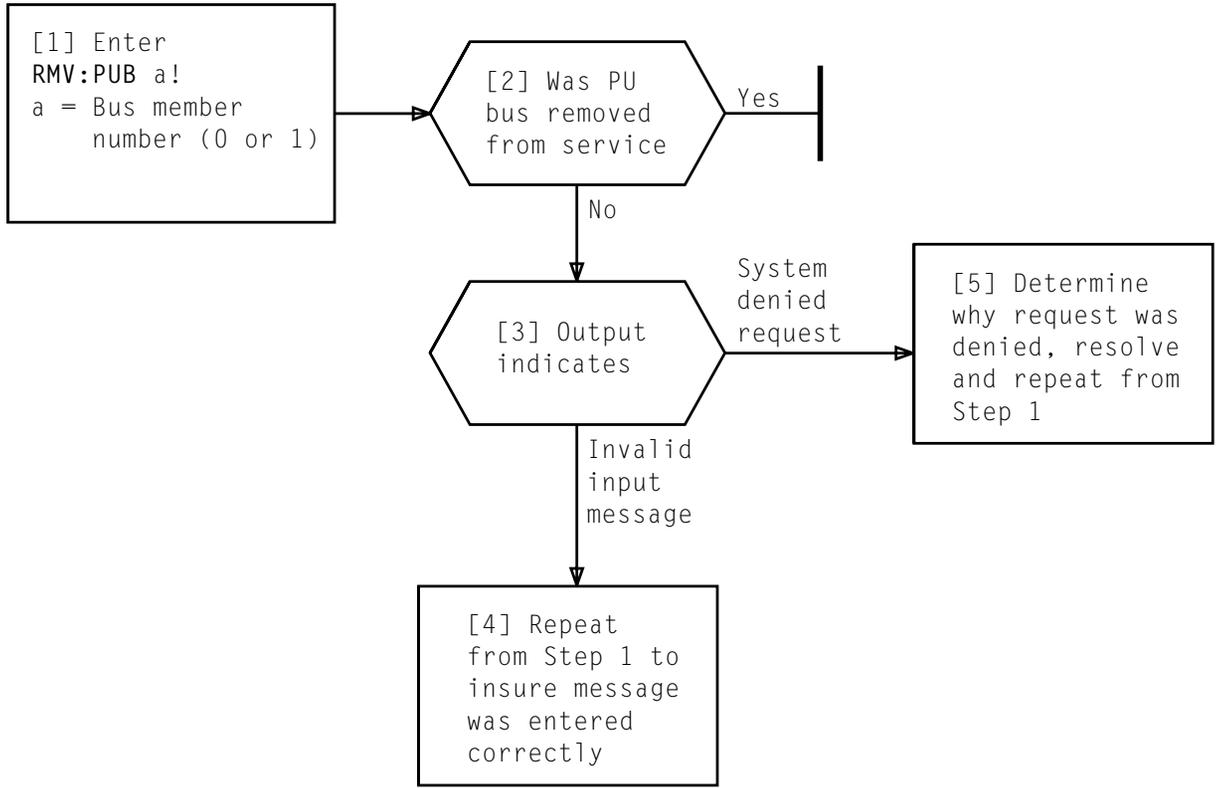
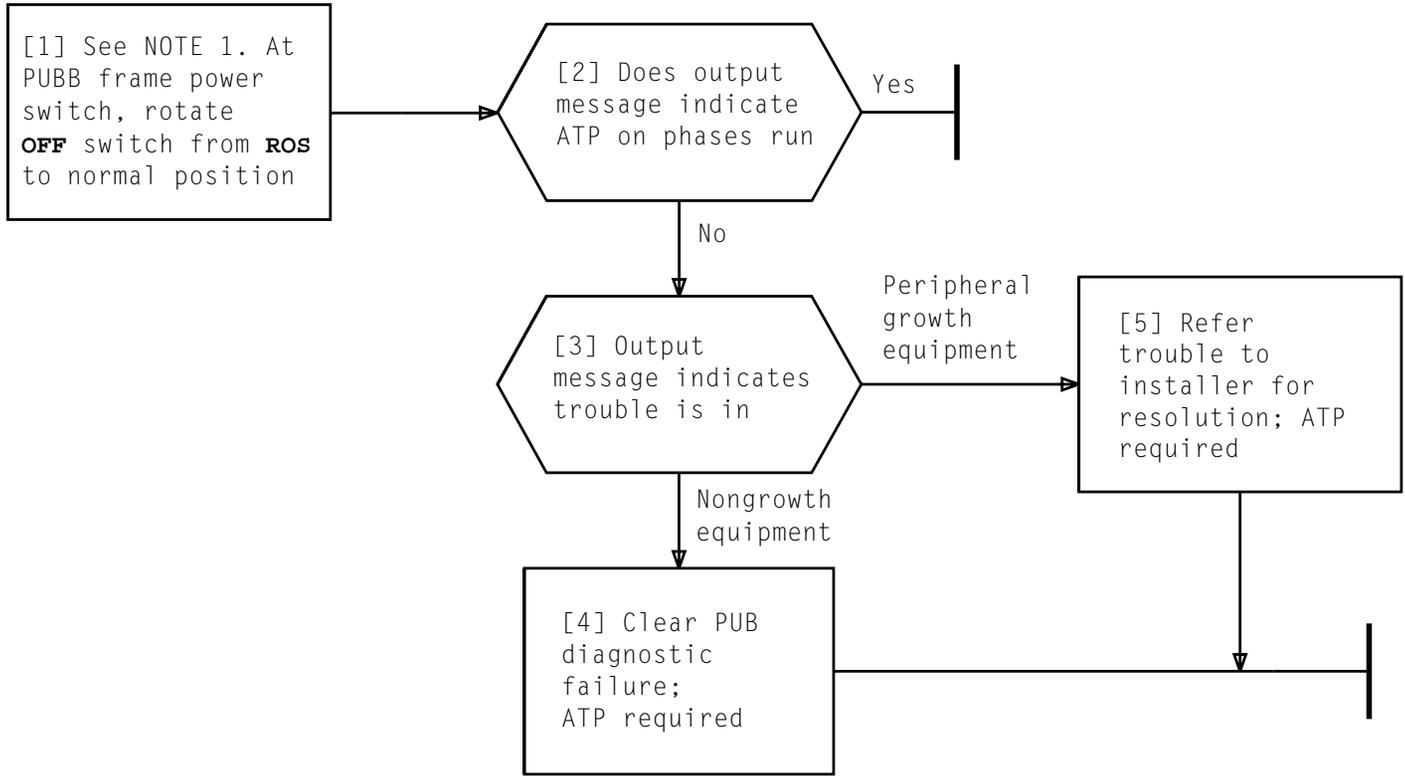


TABLE D	
INPUT MESSAGE	OUTPUT MESSAGE
VER:UTYPE:b c,SME f!	VER:UTMN;OPT(SME),CUR: FLN a, UTYN b, MEMN c, ME d, SUBMEM e, SME f,
a = Floor location number b = Unit Type = PUBB c = Member number of growth associated frame d = GROW, SGRO, or OPER e = Entered submember equipage f = SME index number = 70 (for PUBB Unit 1, Half 0) = 71 (for PUBB Unit 1, Half 1) = 72 (for PUBB Unit 2, Half 0) = 73 (for PUBB Unit 2, Half 1) = 74 (for PUBB Unit 3, Half 0) = 75 (for PUBB Unit 3, Half 1) = 76 (for PUBB Unit 4, Half 0) = 77 (for PUBB Unit 4, Half 1)	



REMOVE PERIPHERAL UNIT BUS FROM SERVICE

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	534



NOTE 1	
Operation of OFF switch from ROS to normal position will cause diagnostic to be run	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	535

RESTORE PUBB FRAME POWER SWITCH TO NORMAL

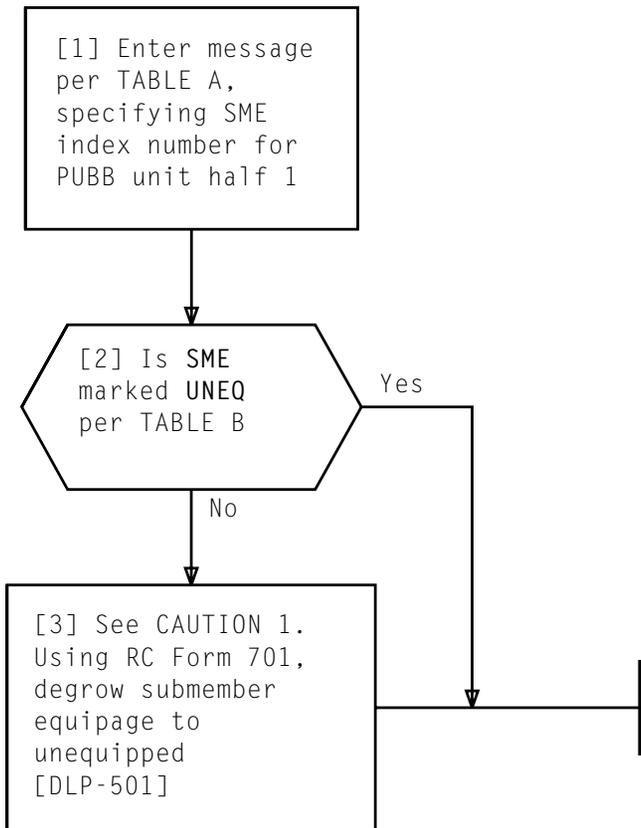


TABLE A
VER:UTYPE:PUBB 0,SME a!
a = SME index number
= 71 (for PUBB Unit 1)
= 73 (for PUBB Unit 2)
= 75 (for PUBB Unit 3)
= 77 (for PUBB Unit 4)

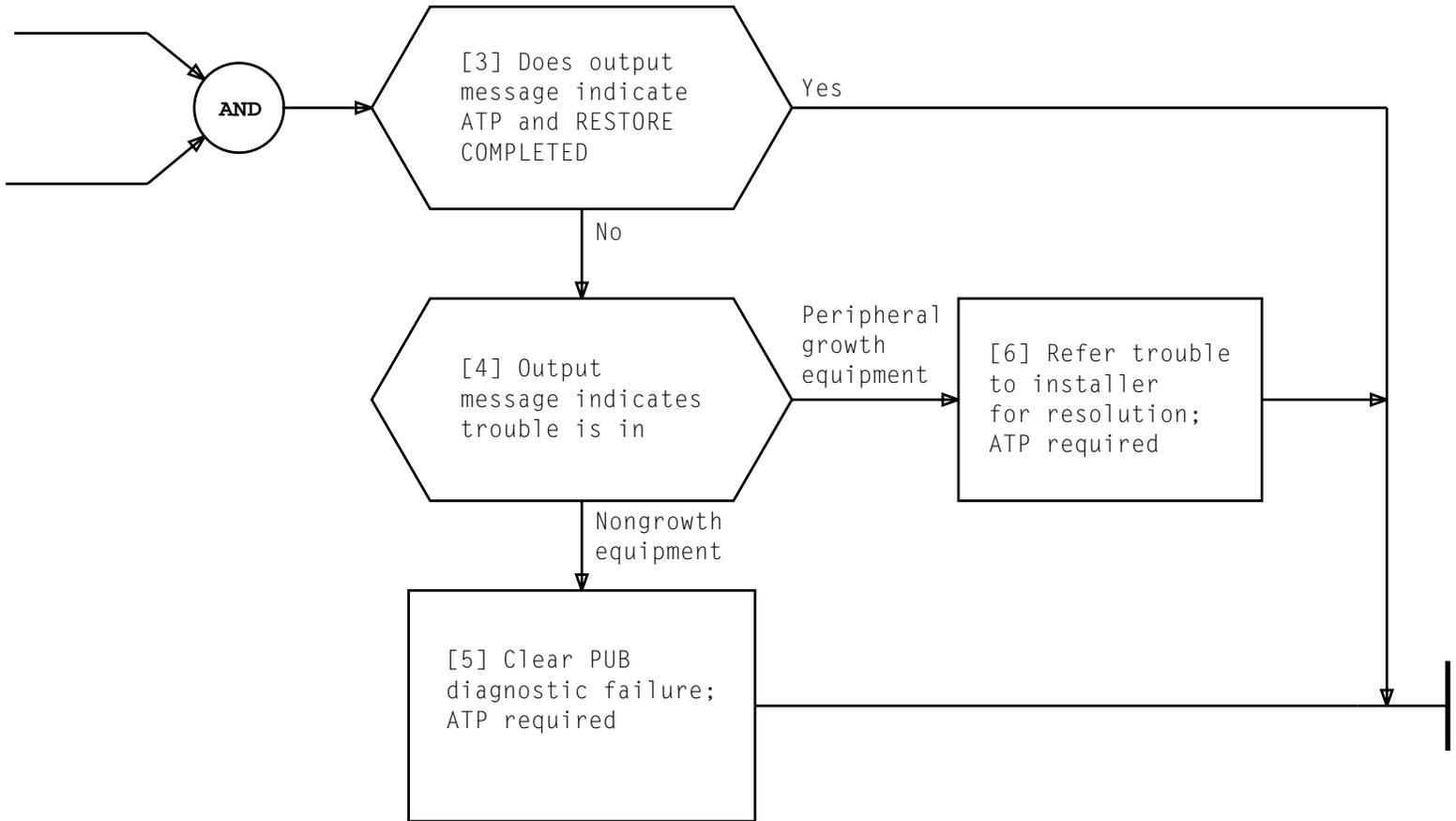
TABLE B
VER:UTMN;OPT(SME),CUR: FLN a, UTYN PUBB,
MEMN 0, ME OPER,
SUBMEM b, SME UNEQ,
a = Floor location number
b = SME index number
= 71 (for PUBB Unit 1)
= 73 (for PUBB Unit 2)
= 75 (for PUBB Unit 3)
= 77 (for PUBB Unit 4)

CAUTION 1
 Depending on local procedures, supervisory or TELCO engineering approval must be obtained prior to performing any data change

VERIFY UNEQ STATUS OF PERIPHERAL UNIT BUS BRANCHING UNIT HALF 1 TO BE ADDED

[1] At power switch, rotate **OFF** switch to normal position

[2] See NOTE 1.
Depress **ON** switch



NOTE 1

Operation of **ON** switch will cause diagnostic to be run

Issue 5	NOV 1995
---------	----------

234-151-015	DLP
-------------	-----

PAGE 1 of 1	537
-------------	-----

1. Get program listings PR-4A510 (PUDGPBGR) and PR-4A512 (PUDGPB02) (See FIG. 1)
2. Using PR-4A512, obtain and record address of ITEM 1 in TABLE A
3. Using PR-4A510, obtain and record addresses of ITEMS 2 through 6 in TABLE A

TABLE A		
ITEM	STATEMENT LABEL	ADDRESS
1	STM10600	
2	PBTS2600	
3	PBTS2900	
4	PBTS3600	
5	PBTS4400	
6	PBTS13800	

```

      USE FIRST ADDRESS
      (DOWN FROM STM10600)
      STM10600
000542AB 4643 00 00010135    4370.    38 STM10500 SEGMENT FORCE(AUTO)
      -002-    39      DATA 9 = 1DG_UNUSED,9 = 0(101),6 = INDEX(4DGSEGMENT)

      4376.    41 #
      4378.    42 #
      4380.    43 #
      4382.    44 #
      4384.    45 # SET UP MASK TO CHECK BTC EQUIPAGE
      4386.    46 (STM10600) MOVEDATA_ITEM(PB4BTCEQMSK),CONST(=0(3)),
      4388.    47 #
      4390.    48 # CALCULATE AMOUNT OF SHIFT. SHIFT=(BTCOUNT*2)
      /
      /
      /

      4420.    17 # SHIFT EQUIPAGE BITS BACK TO DO COMPARE.
      4422.    18      ME      ITEM(PB4TEST),LOC(PB4TEST),SHIFT(DG4PULTAB+22)
      (000543)AB 4643 00 00070136    -003-    19      DATA 9 = 1DG_UNUSED,9 = 0(701),6 = INDEX(4DGMovedata)

      -003-    21      * ITEM(PB4BTCEQMSK)
      000544AB 4643 00 00000003    -003-    22      DATA 24 = 0(00000003)      #LITERAL CONSTANT
      000545AB 4643 00 40200323    -003-    23      DATA 2 = 2,5 = 0(0),5 = 0(20),12 = 0(0323) #TO ITEM
      000546AB 4643 00 00000000    -003-    24      DATA 2 = 1DG_UNUSED,5 = 0(0),5 = 0(0),12 = 0(0000) #INDEX
      000547AB 4643 00 00300000    -003-    25      DATA 2 = 0,5 = 0(0),5 = 0(30),9 = 1DG_UNUSED,3 = 0 #MASK,FLAGS
      000550AB 4643 00 00000000    -003-    26      DATA 24 = 0(00000000)      #NO OPERATION
  
```

FIG. 1 - Location of STM10600 and Address to Use

STORE INPUT MESSAGES ON TTY FOR PUB LOOPING TEST

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	538

At TTY:

4. Depress **FORM ENTER** key to ON

CAUTION: The messages must not be entered into system at this time

5. Type input messages per TABLE B

6. Depress **FORM ENTER** key to OFF

End of procedure

TABLE B			
NUMBER	INPUT MESSAGE	NUMBER	INPUT MESSAGE
1	EX:PUB a ;START! a = Bus 0 or 1	7	EX:PUB a:ADR b-c! a = Bus 0 or 1 b = Address of statement label PBTS4400 c = Address of statement label PBTS13800
2	EX:PUB a :PH 2,ADR b! a = Bus 0 or 1 b = Address of statement label STM10600	8	EX:PUB a:ADR b! a = Bus 0 or 1 b = Address of statement label STM10600
3	EX:PUB a ;STEP! a = Bus 0 or 1	9	OP:MACLI,CLASS MTCE!
4	EX:PUB a :ADR b-c! a = Bus 0 or 1 b = Address of statement label PBTS2600 c = Address of statement label PBTS2900	10	STOP:MACLI,CLASS MTCE,SUBCLASS a! a = CLASS MTCE SUBCLASS number from output message assigned to PUB diagnostic*
5	EX:PUB a! a = Bus 0 or 1	*To obtain CLASS MTCE SUBCLASS number, type and send OP:MACLI,CLASS MTCE!. From system TTY response, determine which maintenance subclass number is associated with PUB and use that number for "a" for NUMBER 10 message	
6	EX:PUB a :ADR b-c! a = Bus 0 or 1 b = Address of statement label PBTS2900 c = Address of statement label PBTS3600		

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	538

STORE INPUT MESSAGES ON TTY FOR PUB LOOPING TEST

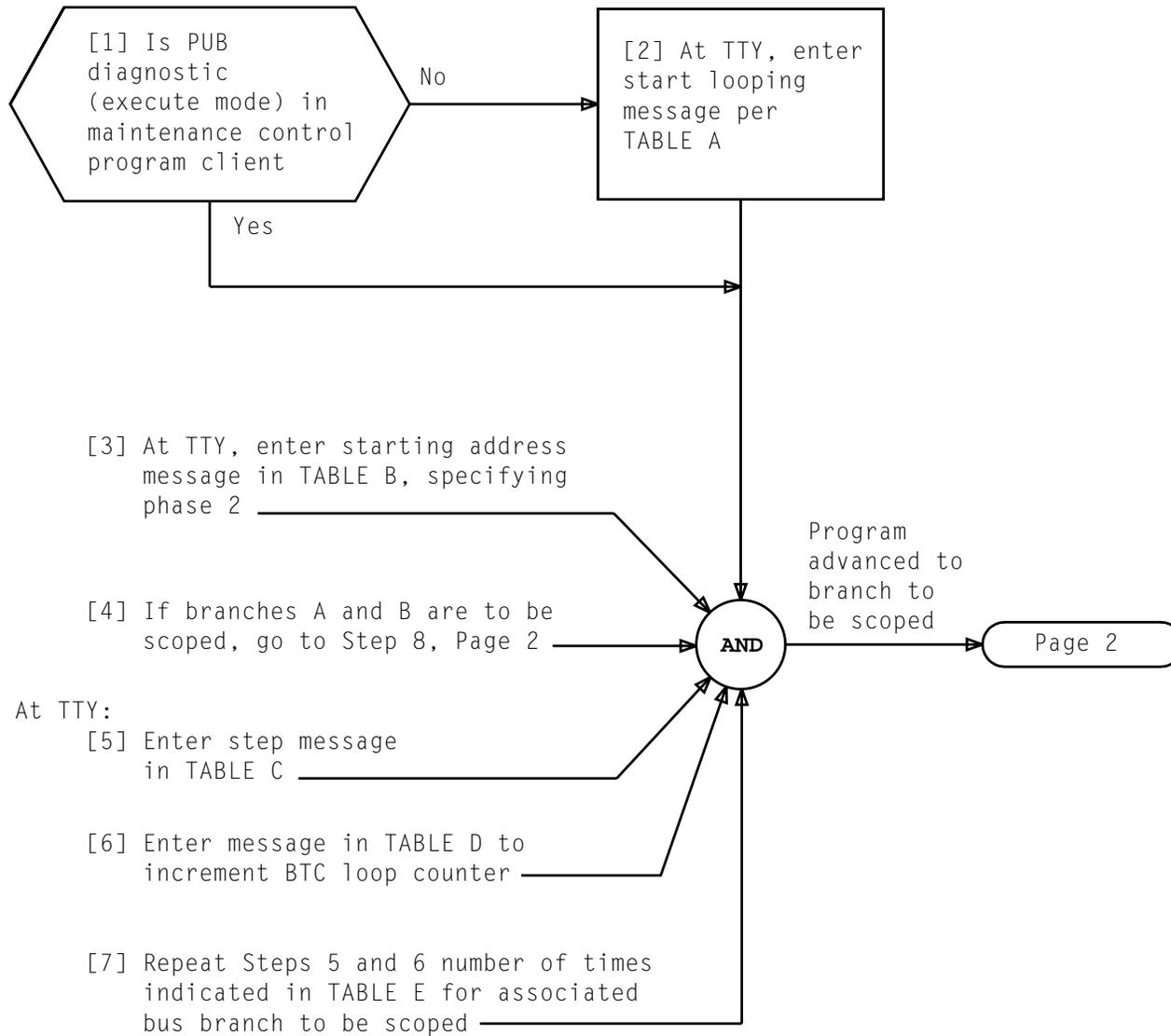


TABLE A
EX:PUB a;START!
a = Bus 0 or 1

TABLE B
EX:PUB a:PH 2,ADR b!
a = Bus 0 or 1
b = Address of statement label STM10600

TABLE C
EX:PUB a;STEP!
a = Bus 0 or 1

TABLE D
EX:PUB a:ADR b!
a = Bus 0 or 1
b = Address of statement label STM10600

BRANCHES	REPEAT NUMBER
C,D	0
E,F	1
G,H	2
K,L	3
M,R	4
T,V	5
W,X	6

ADVANCE PROGRAM TO BRANCH TO BE SCOPED AND SET UP LOOP TO OBSERVE BIT ON PU ENABLE ADDRESS AND/OR WRITE AND REPLY BUSES

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	539

[8] Enter step message
 EX: PUB a;STEP!
 a = Bus 0 or 1

[9] Enter looping message
 in TABLE F

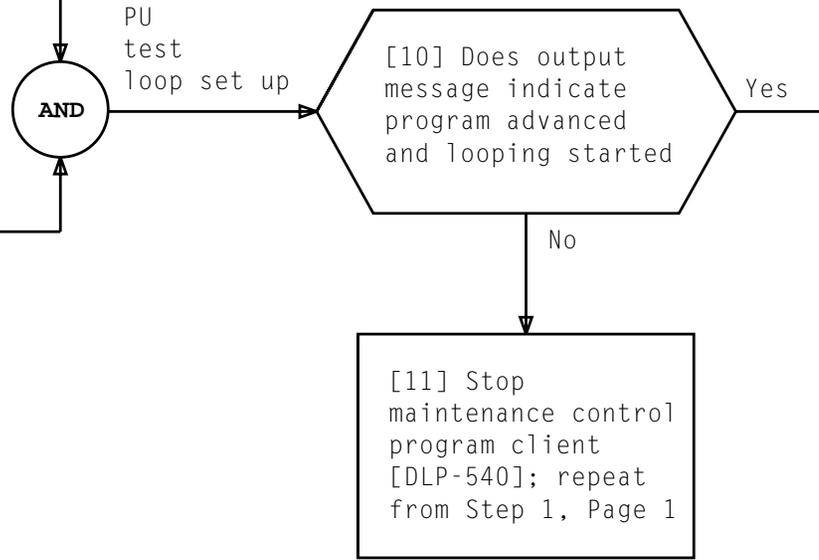


TABLE F	
EX: PUB a:ADR b-c!	
a = Bus 0 or 1	
b = Address of statement label PBTS2600 for bit 0 PU write and reply bus or PBTS2900 for other bits	
c = Address of statement label PBTS2900 for bit 0 PU write and reply bus or PBTS3600 for other bits	

ADVANCE PROGRAM TO BRANCH TO BE SCOPED AND SET UP LOOP TO OBSERVE BIT ON PU ENABLE ADDRESS AND/OR WRITE AND REPLY BUSES

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	539

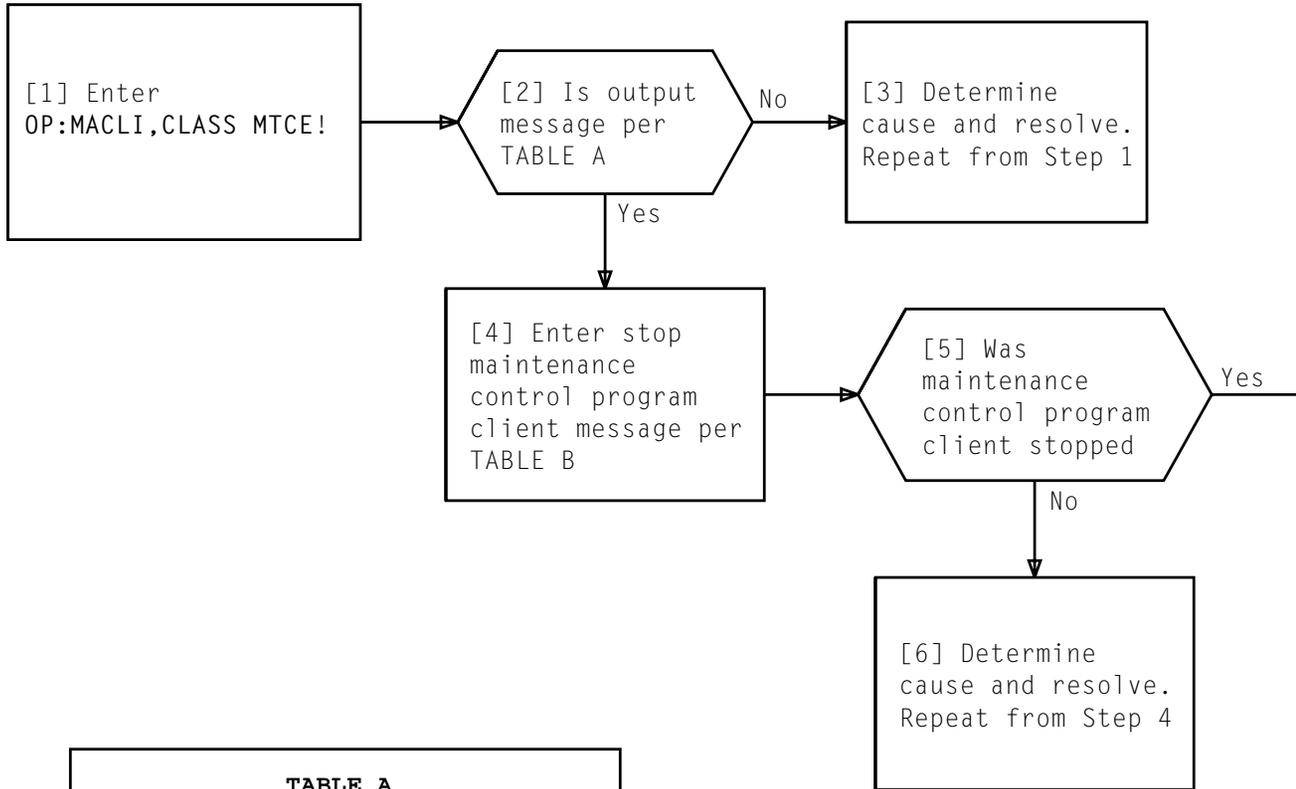


TABLE A	
OP:MACLI	
CLASS MTCE SUBCLASS 0	a - d e f
CLASS MTCE SUBCLASS 1	a - d e f
CLASS MTCE SUBCLASS 2	a - d e f
a - d = NONE or variable data	
e = Unit type	
f = Member number	

TABLE B
STOP:MACLI,CLASS MTCE,SUBCLASS a!
a = CLASS MTCE SUBCLASS number from output message assigned to PUB diagnostics

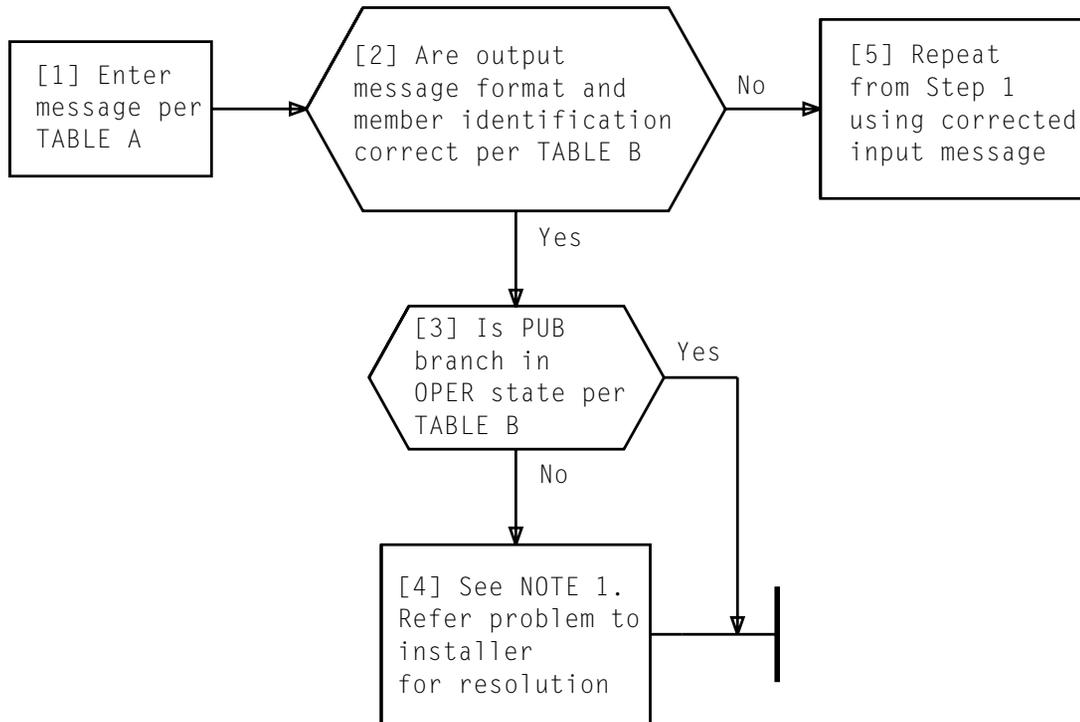


TABLE B	
VER:UTMN;OPT(SME),CUR: FLN a, UTYN PUBB,	
MEMN 0, ME OPER,	
SUBMEM b, SME OPER,	
a = Floor location number b = SME index number =	
SME	INDEX NO.
PUB Unit 1(Half 0)	70
PUB Unit 1(Half 1)	71
PUB Unit 2(Half 0)	72
PUB Unit 2(Half 1)	73
PUB Unit 3(Half 0)	74
PUB Unit 3(Half 1)	75
PUB Unit 4(Half 0)	76
PUB Unit 4(Half 1)	77

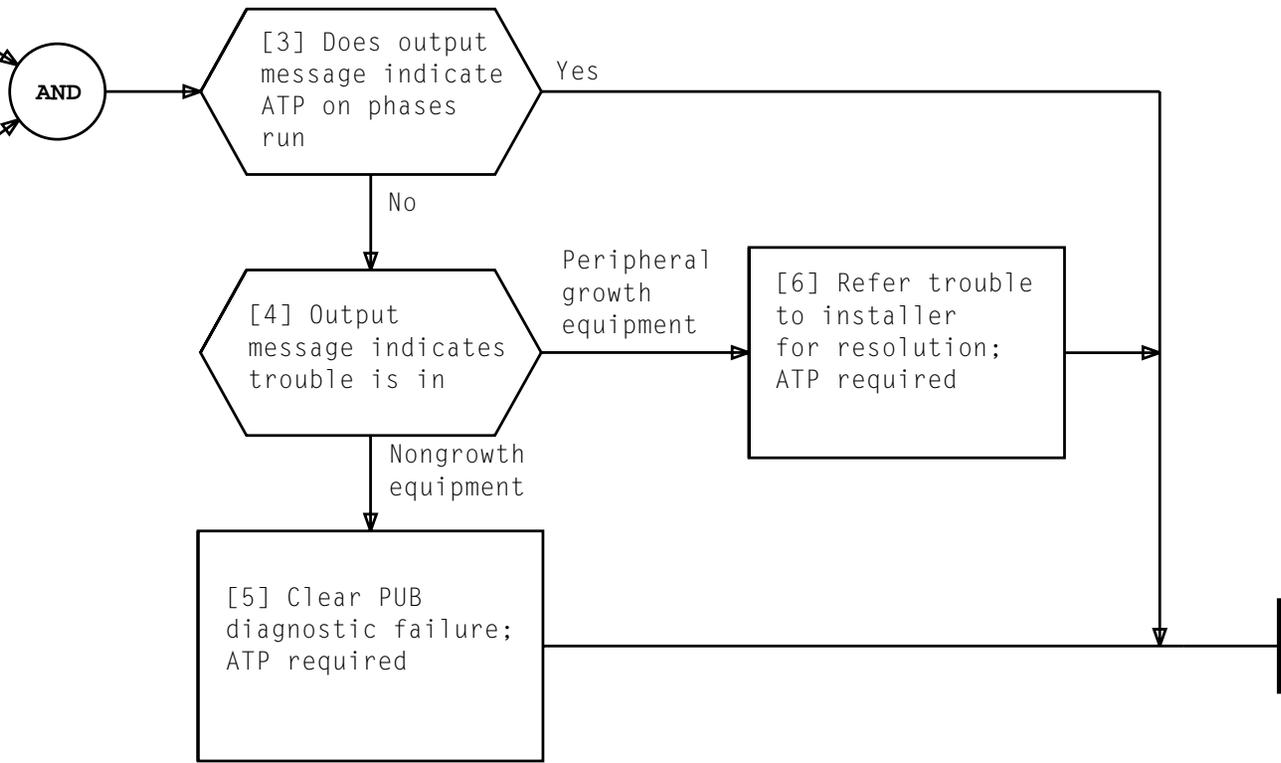
TABLE A	
VER:UTYPE:PUBB 0,SME a!	
a = SME index number =	
SME	INDEX NO.
PUB Unit 1(Half 0)	70
PUB Unit 1(Half 1)	71
PUB Unit 2(Half 0)	72
PUB Unit 2(Half 1)	73
PUB Unit 3(Half 0)	74
PUB Unit 3(Half 1)	75
PUB Unit 4(Half 0)	76
PUB Unit 4(Half 1)	77

NOTE 1
Growth procedure adding PUBB equipment must be completed before proceeding

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	541

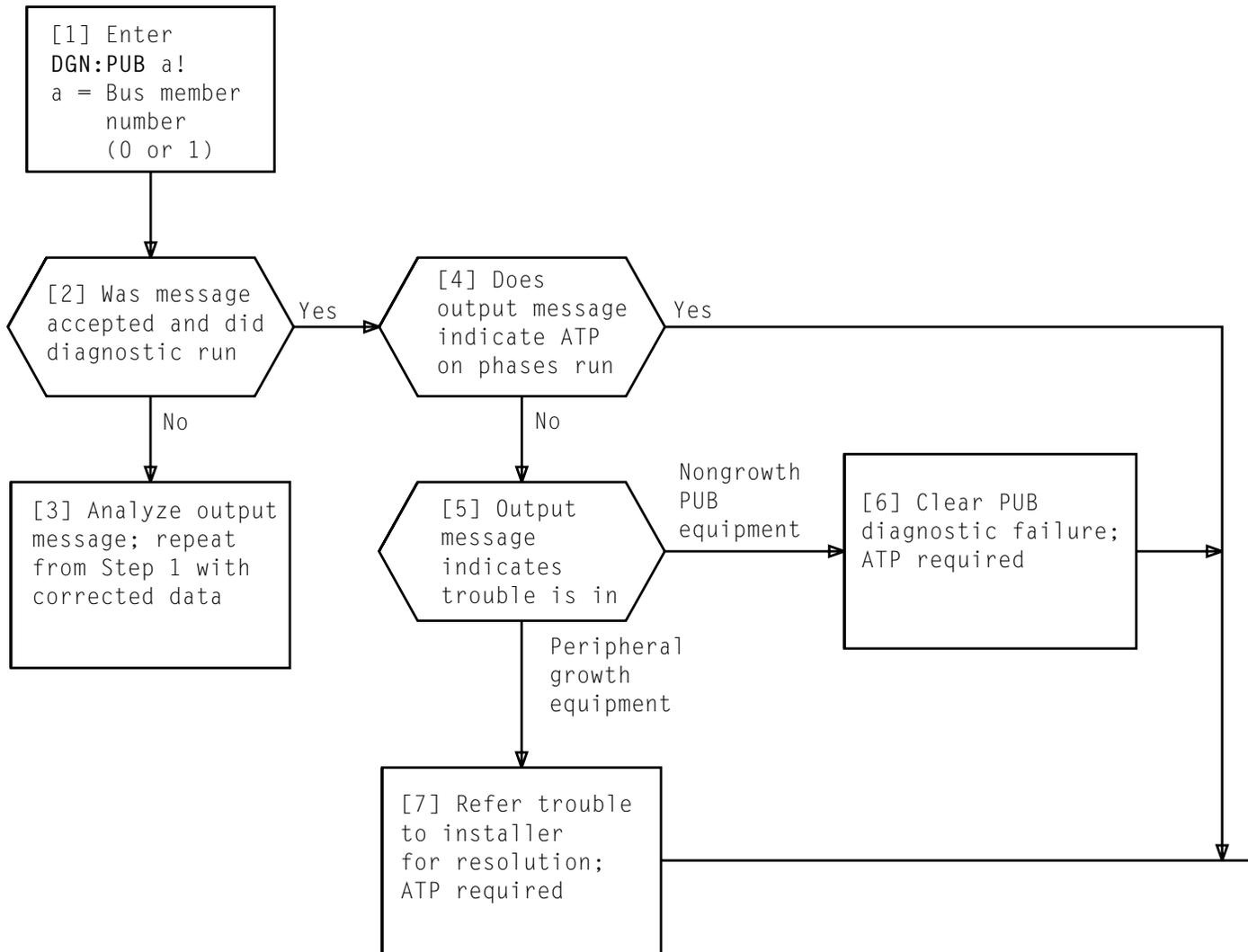
[1] At power switch, assure that **OFF** switch is set to **ROS**

[2] See NOTE 1.
Depress **ON** switch



NOTE 1	
Operation of ON switch will cause diagnostic to be run	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	542

RESTORE POWER WITH POWER SWITCH (LEAVING OFF SWITCH IN ROS)



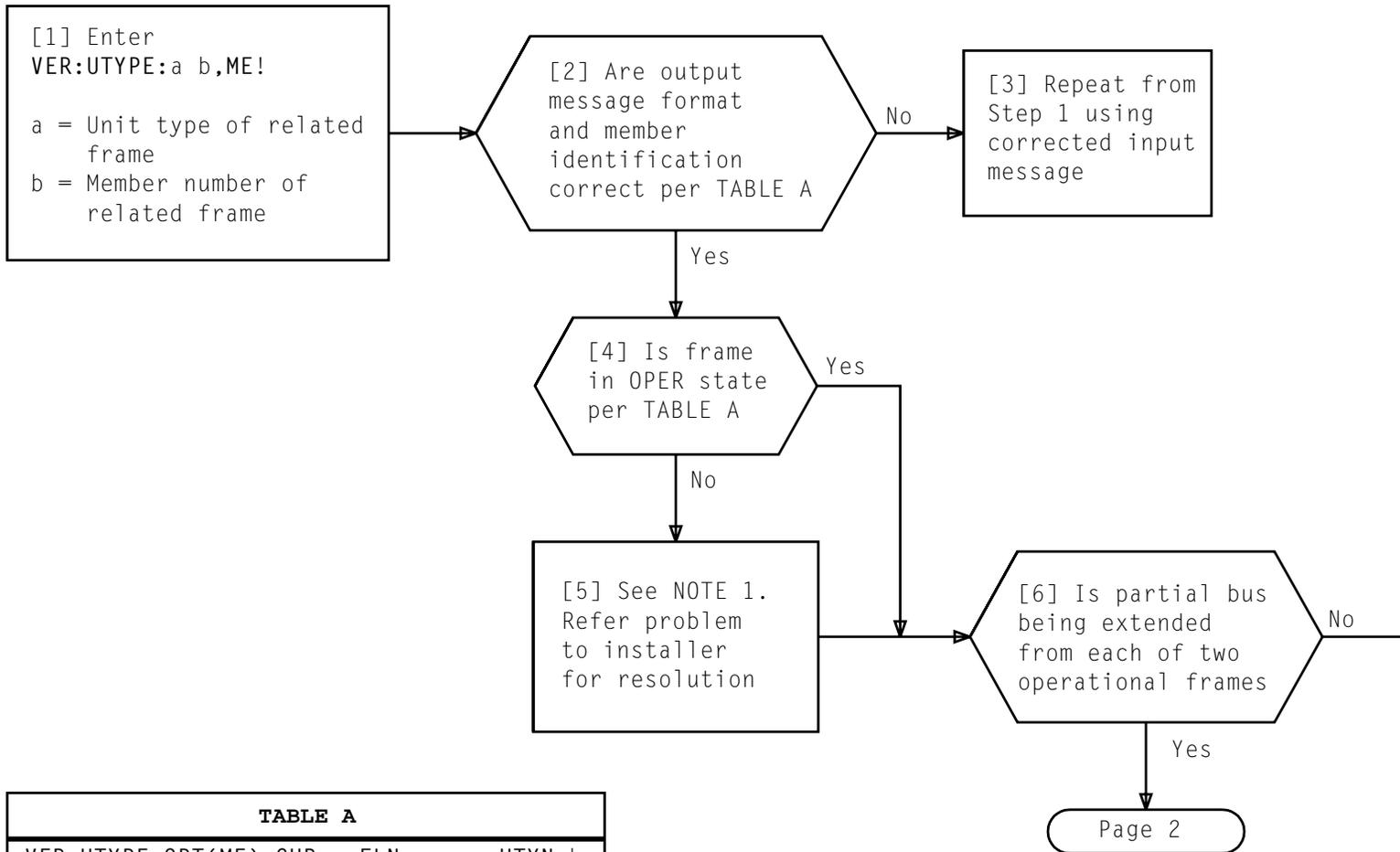
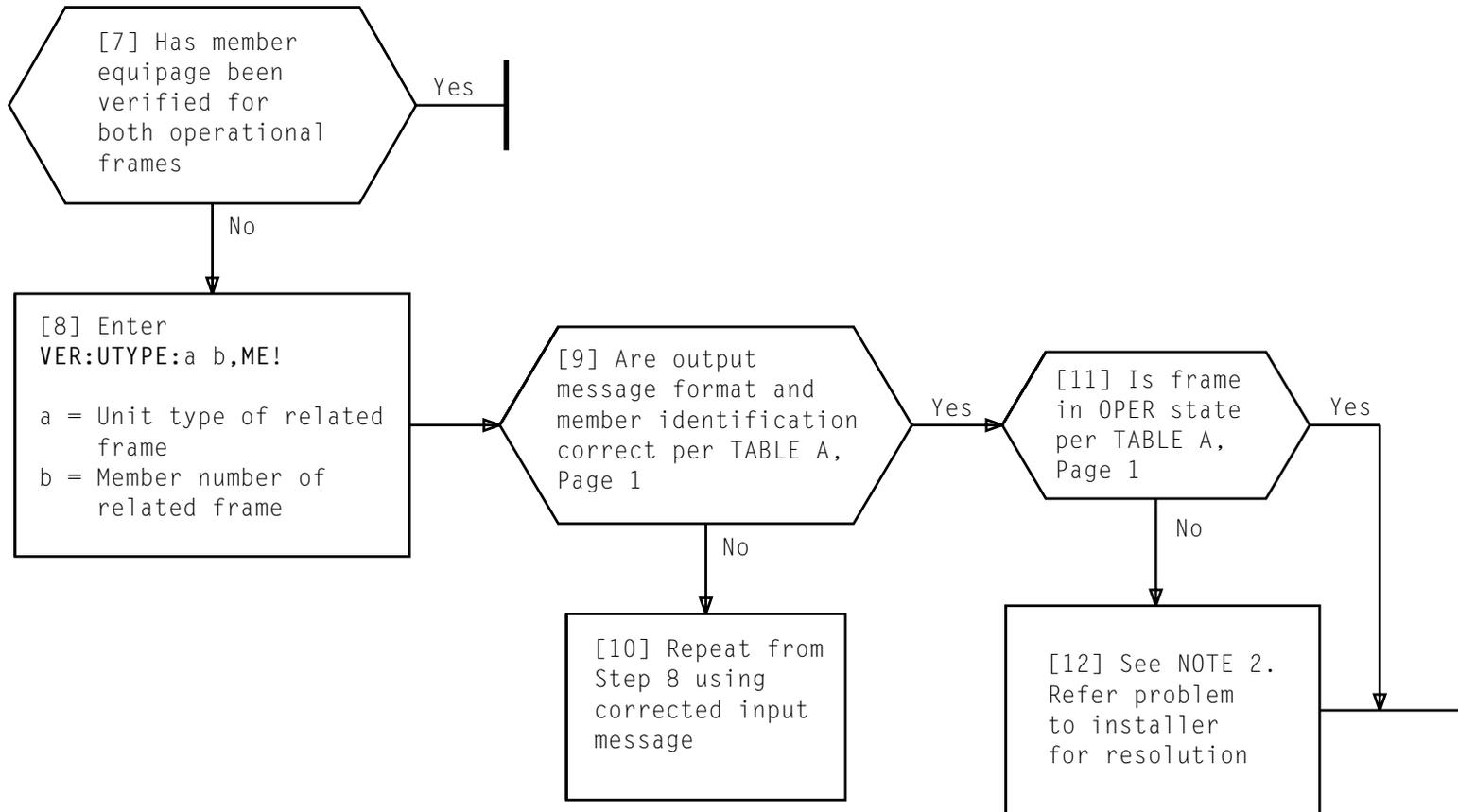


TABLE A	
VER:UTYPE;OPT(ME),CUR: FLN a,	UTYN b,
MEMN c,	ME OPER,
a = Floor location number b = Unit type of related frame c = Member number of related frame	

NOTE 1 Frame growth procedure must be completed before proceeding	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	544



NOTE 2	
Frame growth procedure must be completed before proceeding	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	544

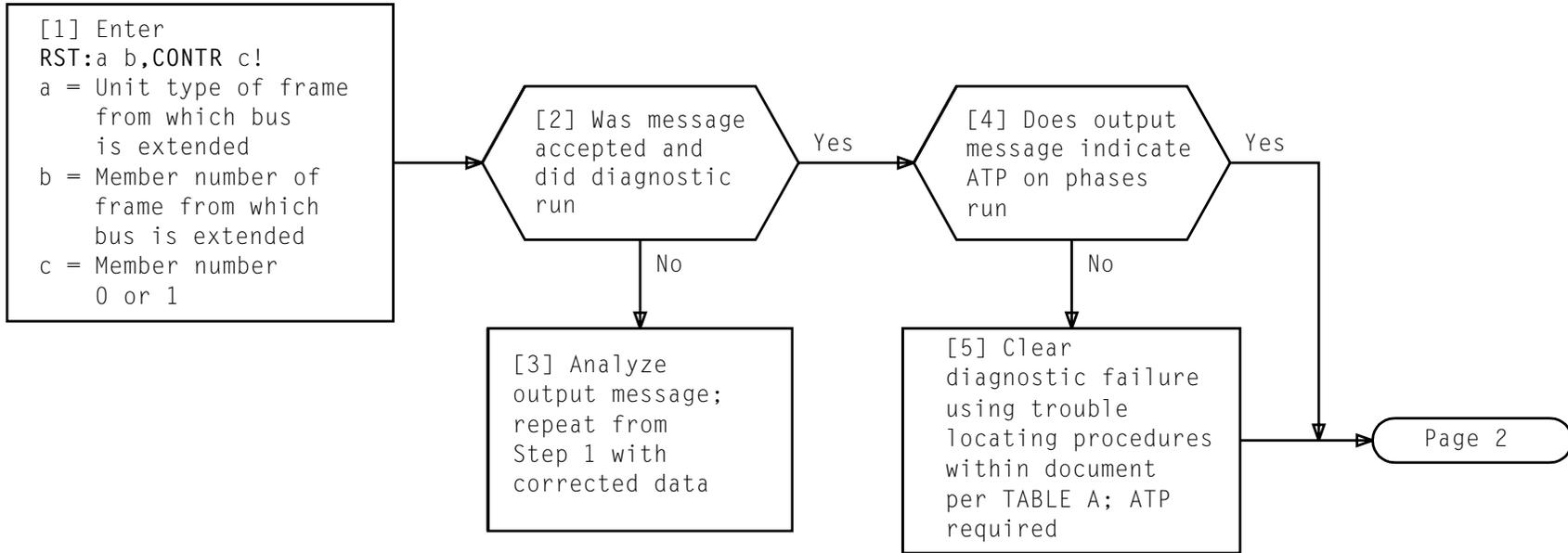
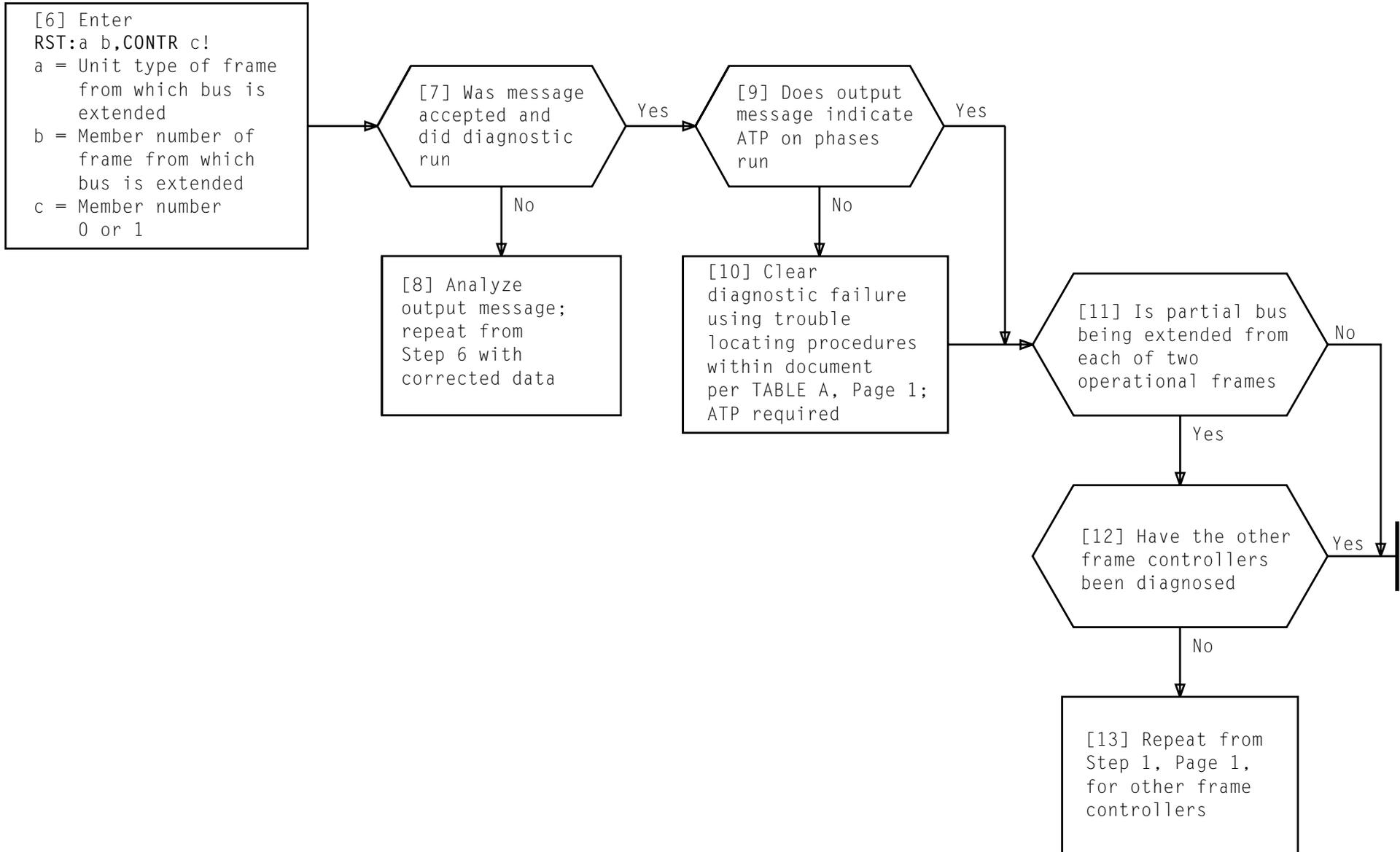


TABLE A	
UNIT TYPE	TOP
VIF	234-151-025
SP	234-151-031
TGR	234-151-033
EST	234-151-050
TMSP	234-151-011
TSI	234-151-012
DIF	234-151-055
PUC	234-151-017
IOP	254-251-020

**DIAGNOSE CONTROLLERS OF FRAME(S) FROM WHICH
BUS IS BEING EXTENDED**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 2	545

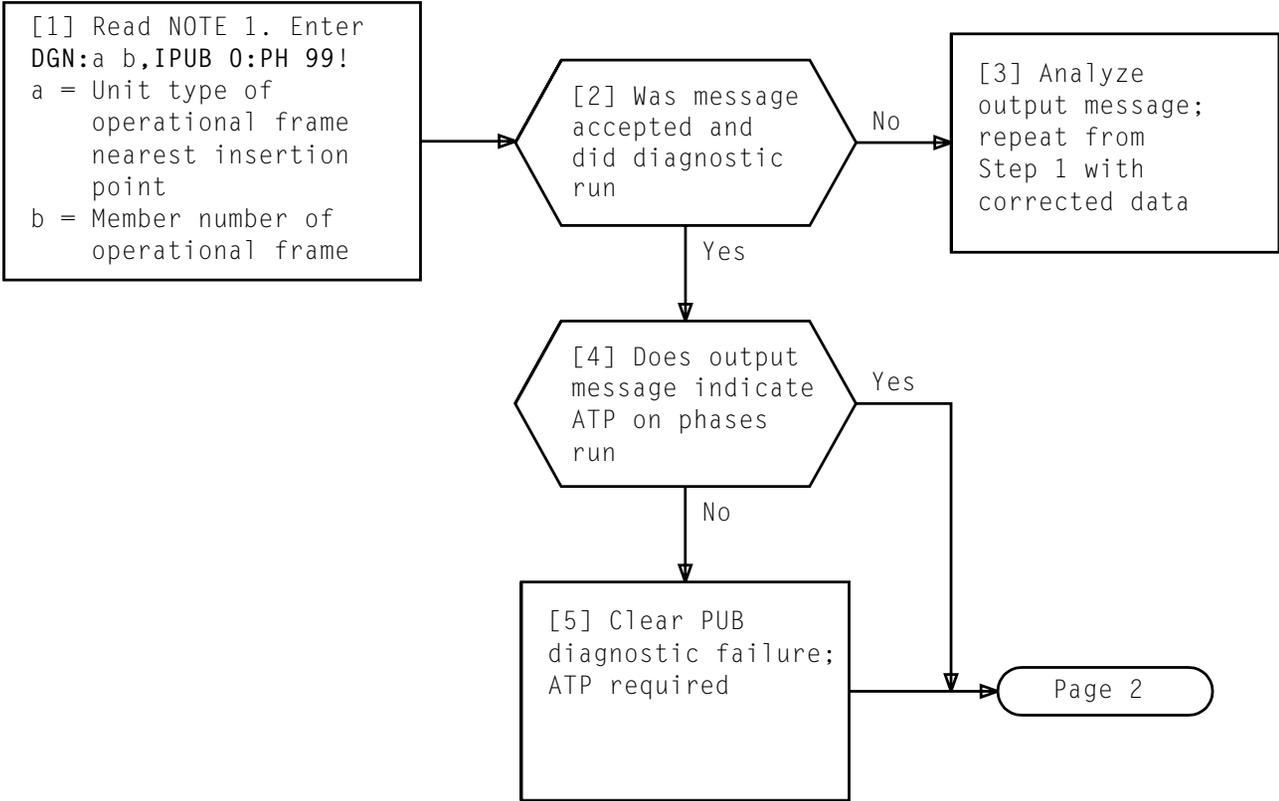


DIAGNOSE CONTROLLERS OF FRAME(S) FROM WHICH BUS IS BEING EXTENDED

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 2	545

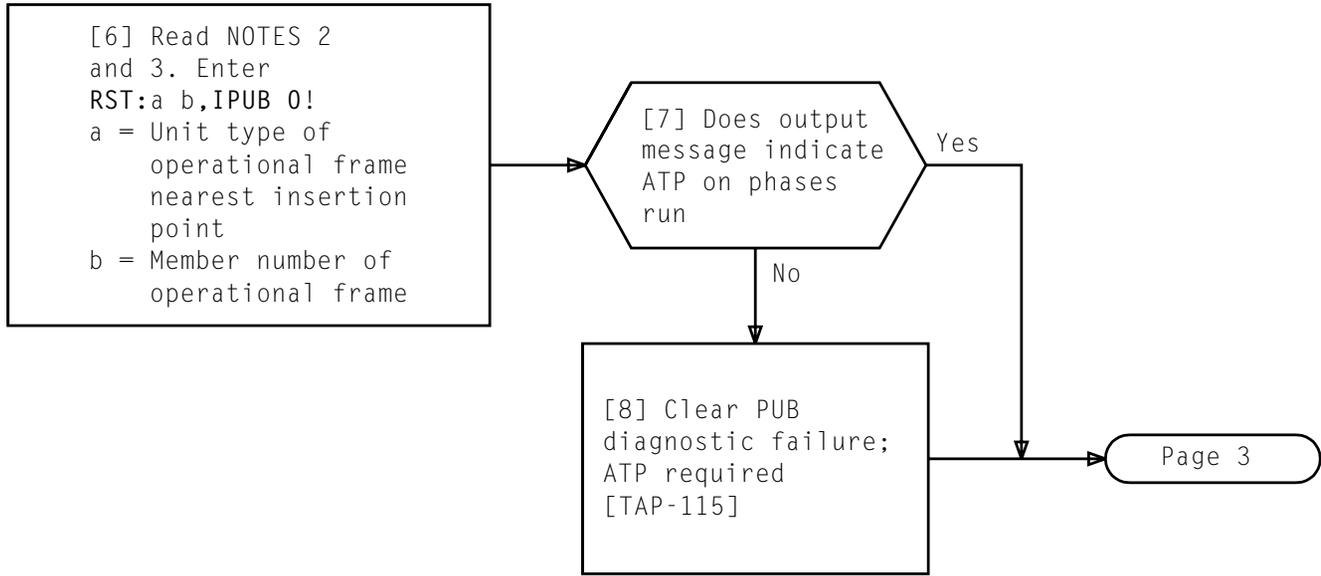
SUMMARY

Diagnose PU bus interface 0, specifying phase 99. After ATP, restore PU bus interface 0 to service. Repeat diagnostic and restoral for PU bus interface 1

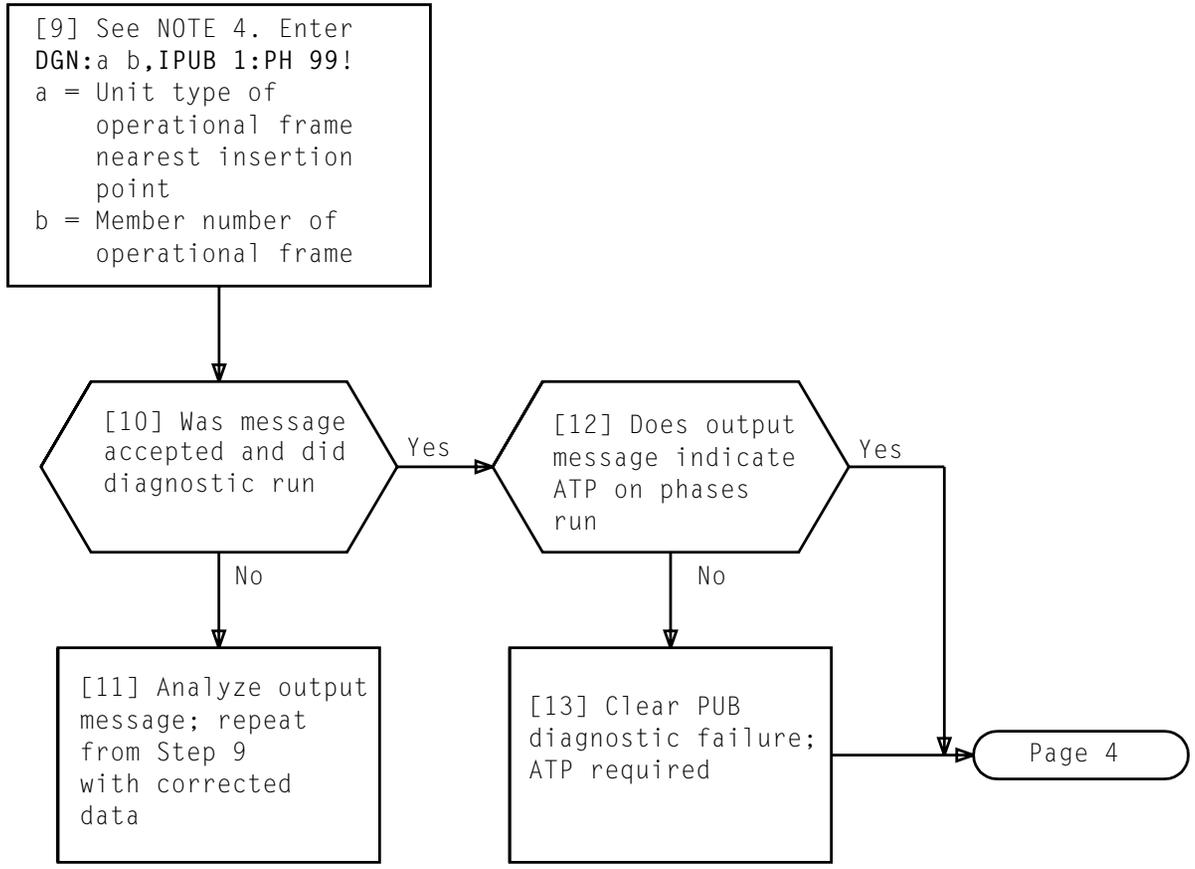


NOTE 1	
For TMSP unit type, field IPUB must be replaced with C1IPUB	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 4	546

DIAGNOSE (SPECIFYING PHASE 99) AND RESTORE PERIPHERAL UNIT BUS INTERFACE 0 AND 1

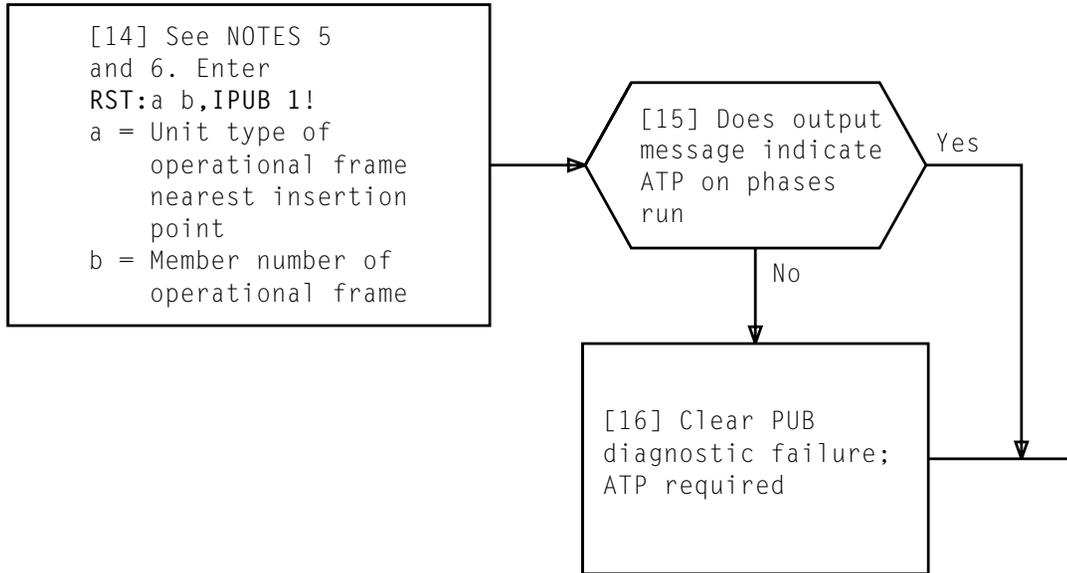


NOTES	
2. Restore message will cause bus interface diagnostic to be run. Bus interface will be restored if ATP	
3. For TMSP unit type, field IPUB must be replaced with C1IPUB	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 4	546

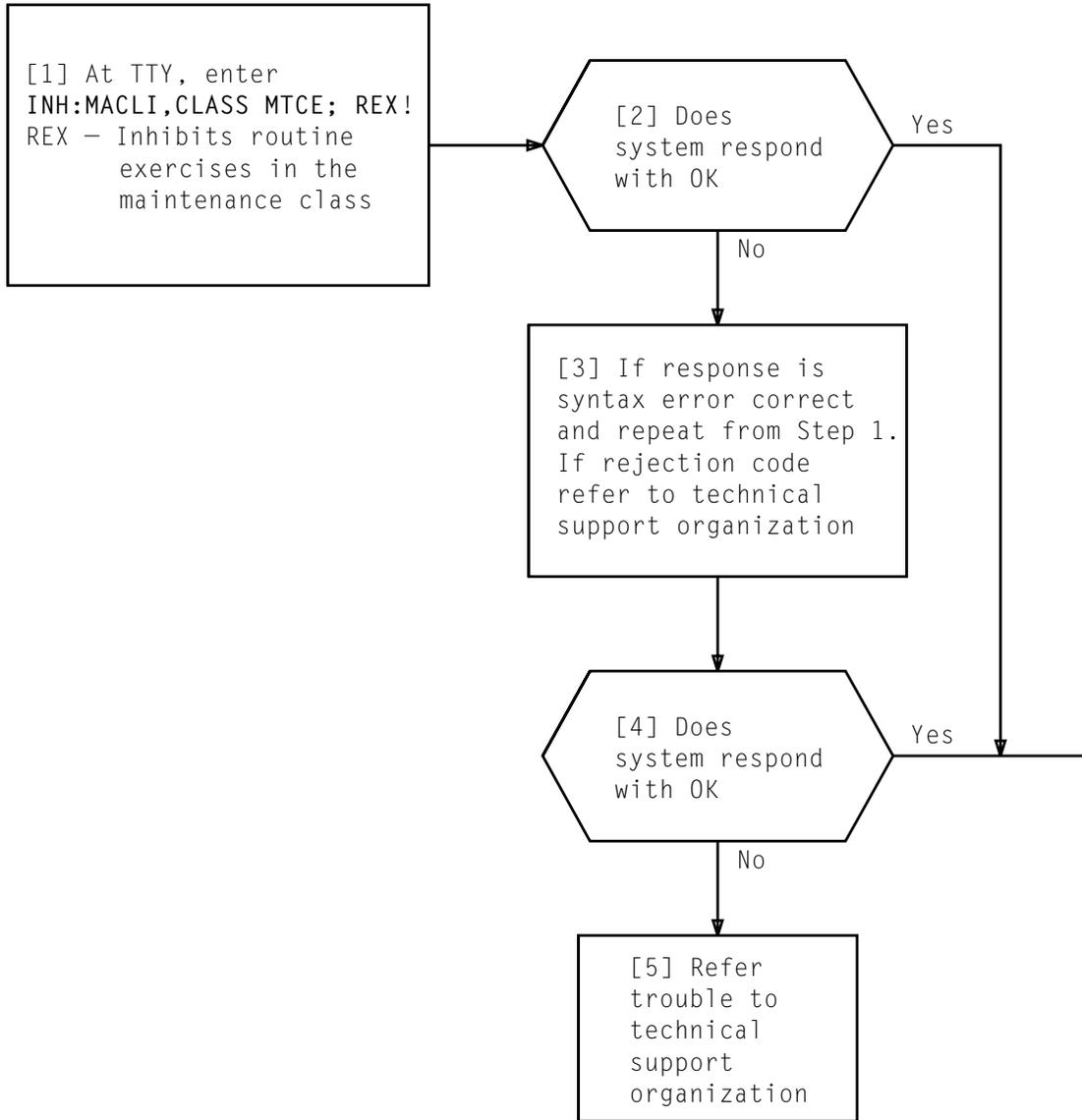


NOTE 4 For TMSP unit type, field IPUB must be replaced with C1IPUB	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 4	546

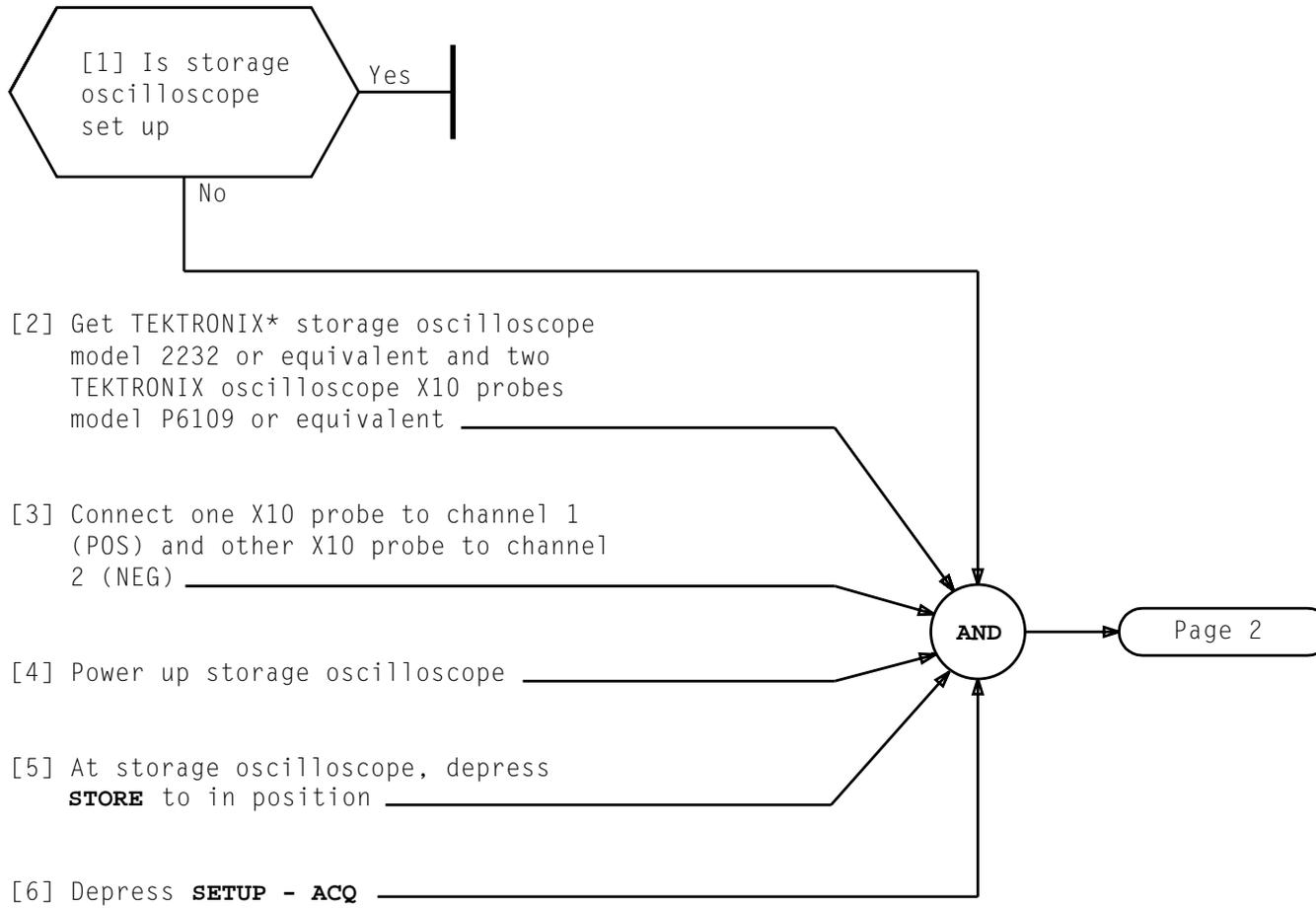
DIAGNOSE (SPECIFYING PHASE 99) AND RESTORE PERIPHERAL UNIT BUS INTERFACE 0 AND 1



NOTES	
5. Restore message will cause bus interface diagnostic to be run. Bus interface will be restored if ATP	
6. For TMSP unit type, field IPUB must be replaced with CIPUB	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 4 of 4	546



NOTE ALW:MACLI,CLASS,MTCE! should be done	
Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 1	547



* Registered trademark of TEKTRONIX, Inc.

SET UP STORAGE OSCILLOSCOPE FOR PUB LOOPING TEST

Issue 5	NOV 1995
234-151-015	DLP
PAGE 1 of 5	548

[7] Observe storage oscilloscope screen and set ACQ controls per TABLE A by depressing switch associated with control not set correctly _____

[8] Depress **SETUP - DISPLAY** _____

[9] Observe storage oscilloscope screen and set DISPLAY controls per TABLE B by depressing switch associated with control not set correctly _____

[10] Depress **SETUP - REF** _____

[11] Observe storage oscilloscope screen and set REF controls per TABLE C by depressing switch associated with control not set correctly _____



TABLE A		
COLUMN	CONTROLS	SWITCH*
1	Peakdet	SAVE REF
2	Scan	1
3	Fast	2
5	Swp Lim: NO LIMIT	4K (for Swp Lim:) and adjust CURSORS to obtain NO LIMIT
5	Trig Pos: 2048/4K	4K (for Trig Pos:), ACQUISITION - 1K/4K (for 4K) and adjust CURSORS to obtain 2048

*Switches under display screen are associated with column that they are under except for Trig Pos: and Swp Lim:

Page 3

TABLE B		
COLUMN	CONTROLS	SWITCH*
1	ΔT	SAVE REF
2	ON	1
3	ON	2

*Switches under display screen are associated with column that they are under

TABLE C		
COLUMN	CONTROLS	SWITCH*
1	Format	SAVE REF
2	Ref1	1
3	CH1	2
4	X1	3
5	Vert Gain: 0.2V	4K (for Vert Gain:) and adjust CURSORS to obtain 0.2V

*Switches under display screen are associated with column that they are under

Issue 5	NOV 1995
234-151-015	DLP
PAGE 2 of 5	548

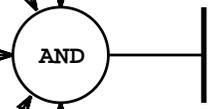
[12] Depress **SETUP** – **REF** to return to screen

[13] Determine one location in FIG. 1, Page 5 where bus scoping adapter can be connected

[14] Connect storage scope with bus scoping adapter to connector location determined in Step 13 [see DLP-539 on how to use bus scoping adapter]

[15] Set bus scoping adapter to position 2

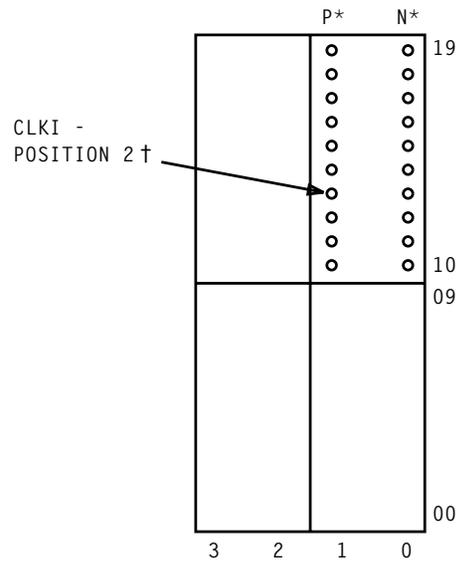
[16] Adjust storage scope per TABLE D, Page 4 for waveform in FIG. 2, Page 5



SET UP STORAGE OSCILLOSCOPE FOR PUB LOOPING TEST

Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 5	548

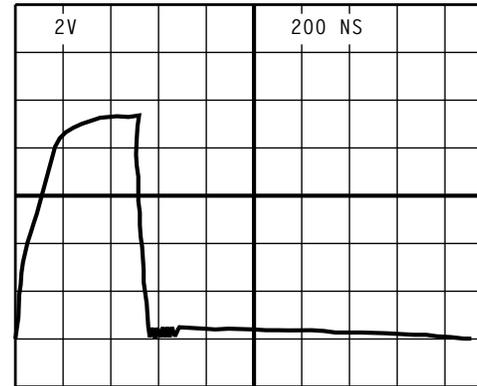
TABLE D OSCILLOSCOPE CONTROL SETTINGS FOR MODEL 2232	
CONTROLS	POSITION
SAVE/CONT	Depress until SAVE is not displayed
STORE	Depress (out)
VAR HOLDOFF	Rotate to 1 o'clock position
VERTICAL - POSITION (left)	Rotate to 2 o'clock position
VERTICAL - A/B SWP SEP	Rotate to 12 o'clock position
VERTICAL - POSITION (right)	Rotate to 10 o'clock position
VERTICAL MODE - CH 1 BOTH CH 2	BOTH
VERTICAL MODE - X-Y	Out position
VERTICAL MODE - BW LIMIT	Out position
VERTICAL MODE - ADD ALT CHOP	ADD
VERTICAL - CH 1 VOLTS/DIV	2
VERTICAL - CH 1 VOLTS/DIV - AC GND DC	DC
VERTICAL - INVERT	Depress (in)
VERTICAL - CH 2 VOLTS/DIV	2
VERTICAL - CH 2 VOLTS/DIV - AC GND DC	DC
HORIZONTAL - POSITION	Rotate to 1 o'clock position
HORIZONTAL - MODE	A
HORIZONTAL - A and B SEC/DIV	.2 μ s
CURSORS	Adjust until ΔT is 0.0 μ s on screen
B TRIGGER - SLOPE	Out position
B TRIGGER - LEVEL	Rotate to 8 o'clock position
A TRIGGER - TV FIELD - NORM	Depress (in)
A TRIGGER - SLOPE	Out position
A TRIGGER - LEVEL	Rotate to 12 o'clock position
A TRIGGER - A & B SOURCE	CH 1
A TRIGGER - A COUPL	NORM
A TRIGGER - A EXT COUPL	AC



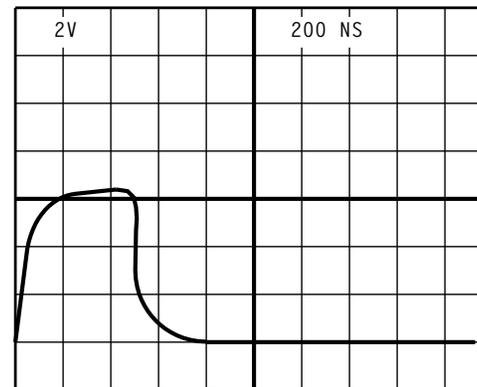
FRAME	
IO	
BUS 0	080-10
BUS 1	080-35
IOP	
BUS 0	080-29
BUS 1	076-29

* P FOR POSITIVE LEAD AND
N FOR NEGATIVE LEAD
† POSITION 2 IS ON BUS SCOPING ADAPTER

FIG. 1

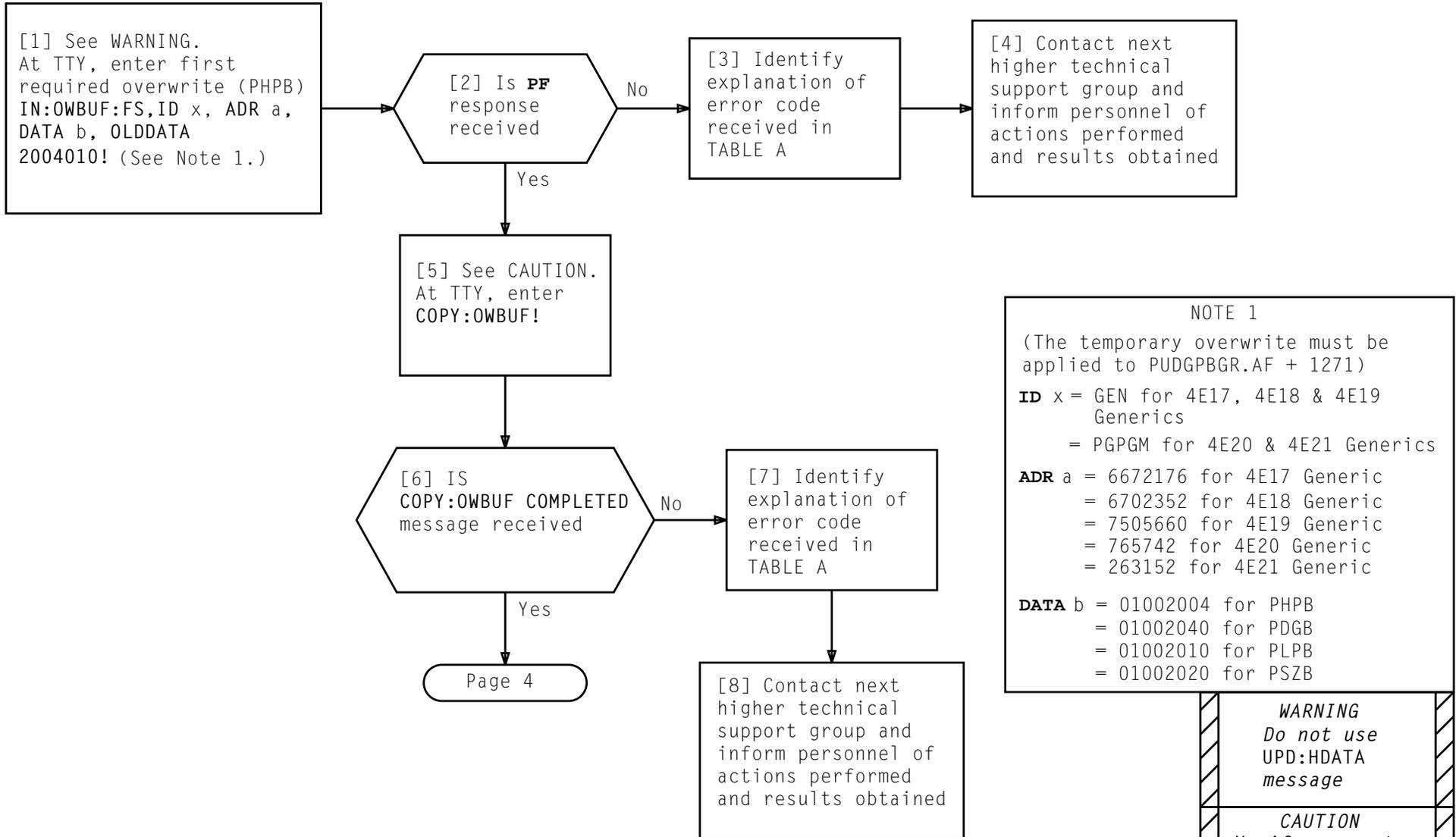


NORMAL PULSE AT DRIVER



NORMAL PULSE 500 FEET FROM DRIVER

FIG. 2



NOTE 1

(The temporary overwrite must be applied to PUDGPBGR.AF + 1271)

ID x = GEN for 4E17, 4E18 & 4E19 Generics
 = PGPGM for 4E20 & 4E21 Generics

ADR a = 6672176 for 4E17 Generic
 = 6702352 for 4E18 Generic
 = 7505660 for 4E19 Generic
 = 765742 for 4E20 Generic
 = 263152 for 4E21 Generic

DATA b = 01002004 for PHPB
 = 01002040 for PDGB
 = 01002010 for PLPB
 = 01002020 for PSZB

WARNING
Do not use
UPD:HDATA
message

CAUTION
Verify correct
output message
response of OLD
DATA and NEW DATA

SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS AT PERIPHERAL FRAME

**TABLE A
OVERWRITE ERROR CODES**

ERROR CODE	EXPLANATION	ERROR CODE	EXPLANATION
DPLX FAIL	GULP cannot be paged to parse the message because the file stores are duplex failed.	115	Incorrect ID tag specified for a file store only overwrite.
50	Conditional printout may follow. This acknowledgement is used if disk files are duplex failed and GULP is being paged from tape.	120	Part or all non-library main memory overwrite is not backed up on file store.
		121	File store backup range is not contiguous. Overwrite must be split on main memory store boundary.
100	Invalid syntax. Check input manual to verify that no extra keywords have been input.	122	PKG, ADR conversion failed. This is due to either invalid or unknown PKG name, relative address larger than size of PKG, or library package not loaded.
101	No argument for keyword ID.		
102	No argument for keyword PKG.		
103	No argument for keyword FPKG.		
104	No argument for keyword ADR.		
105	No argument for keyword DATA.	123	FPKG, ADR conversion failed. Invalid FPKG name.
106	Number of arguments of OLDDATA is different from number of arguments of DATA.	124	Library overwrite outside of library Kcode.
110	Overwrites of system merge ID tag cannot be mixed with overwrites of other ID tags.	131	Overwrite in progress from another channel.
111	Overwrite overlaps two ID tags.	132	Previously input COPY:OWBUF request has not yet completed. Enter STOP:OVRWRT.
112	Wrong ID tag specified for a library file store only overwrite.	133	Hash mismatch on COPY:OWBUF. Enter STOP:OVRWRT.
113	Input address is not in hashed range.	134	Previously input UPD:HDATA request has not yet completed. Enter STOP:OVRWRT.
114	Invalid ID tag mnemonic.	135	No overwrite in progress

**SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS
AT PERIPHERAL FRAME**

**TABLE A (CONTD)
OVERWRITE ERROR CODES**

ERROR CODE	EXPLANATION	ERROR CODE	EXPLANATION
136	UPD:HDATA may be input only from the maintenance channel (or its backup if the maintenance channel is out-of-service) or the SCC channel. Before entering message, check for audit printouts or interrupts to assure overwrite is not incorrect.	160	File store queue full.
		161	DKAD reject – core ADR is out of range. Request technical assistance.
		162	DKAD reject – file store address mismatches ID tag.
137	A COPY:OWBUF message must be input.	163	DKAD reject – write request not multiple of 32 or not on sector boundary.
138	Core only overwrite backed out.		
140	Overwrite buffer full.	164	DKAD reject – size too big.
141	Library program not loaded in PS36 library Kcode.	165	DKAD reject – file specified is out-of-service.
143	Input overwrite overlaps with overwrite currently in buffer.	166	DKAD reject – blocked.
		167	DKAD reject – write (trouble) to in-service file.
144	Old data specified in message does not match data in system.	168	DKAD reject – queue invalid for GULP.
145	Library system in transition state. Wait a few seconds and reenter the message.	169	DKAD reject – mutilated queue.
		170	DKAD reject – no queue specified.
150	Library program is not currently loaded in library Kcode. The overwrite has been bypassed.	180	Execution of GULP function is in progress.
		181	Message processing in progress.
152	Hash sum input on COPY:OWBUF does not match computed hash. This indicates that some data in the buffer is different than was expected when input hash was generated. Enter STOP:OVRWRT and check printout.	182	Dataset input mode in progress on another channel.
		183	Dataset execution is in progress.
153	Hash update by SAWS failed. Enter STOP:OVRWRT. Tape audit (SAST) must be run to correct hash errors.	184	Message print in progress.
		185	Failure to page in GULP or failure to seize general buffer table (GBT).

**SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS
AT PERIPHERAL FRAME**

Issue 5	NOV 1995
234-151-015	DLP
PAGE 3 of 6	549

[9] Enter diagnostic looping messages
 EX:PUB x;START!
 EX:PUB x:PH 2,ENABLE yyyy,ADR 1262-1275!
 (yyyy=3195 for CC 0 or 56955 for CC 1)
 (x = PUB 0 or 1)

TABLE B		
NET NAME	PULSE POINT	DATA
LPP PDGB	(PPU065)	01002040
LPP PSZB	(PPU064)	01002020
LPP PLPB	(PPU063)	01002010
LPP PHPB	(PPU062)	01002004

[16] Enter stop maintenance control program client message
 STOP:MACLI,CLASS MTCE,SUBCLASS a!
 and repeat from Step 1 and enter overwrite for next Polling Bit to be scoped in TABLE B
 [a = subclass number (0-7)]

[10] Is frame to be scoped DIFE or SCS

DIFE FRAME

[11] See NOTE 2. Connect scope probes across the BTR locations for bit to be scoped (FIG. 2 and Table B)

SCS FRAME

[12] See NOTE 1. Connect scope probes across the BTR at locations for bit to be scoped (FIG. 1 and Table B)

[13] Verify the Pollable Bit per waveform (FIG. 3)

[14] At TTY, enter stop looping and stop overwrite messages EX:PUB x!
 STOP:OVRWRT!

No

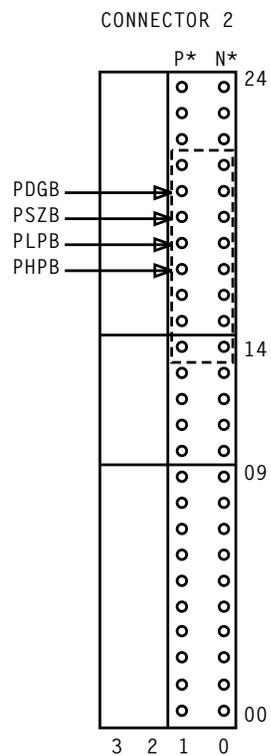
[15] Have all Pollable Bits been scoped

Yes

[17] Return to procedure

NOTE 2
 Scope probe cables are twisted together. The ground leads of the two cables are connected together, but are not grounded.

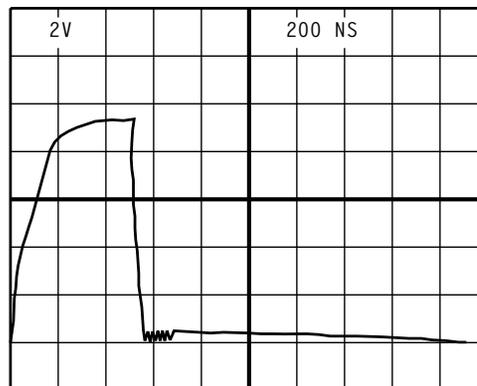
SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS AT PERIPHERAL FRAME



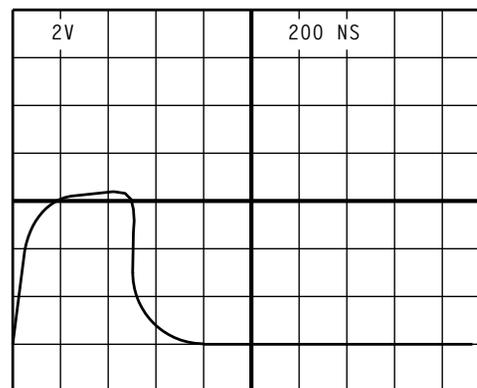
DIF or DIFE (24-31)
 BUS 0 180-067
 BUS 1 180-215

* P FOR POSITIVE LEAD AND
 N FOR NEGATIVE LEAD

FIG. 2



NORMAL PULSE AT DRIVER

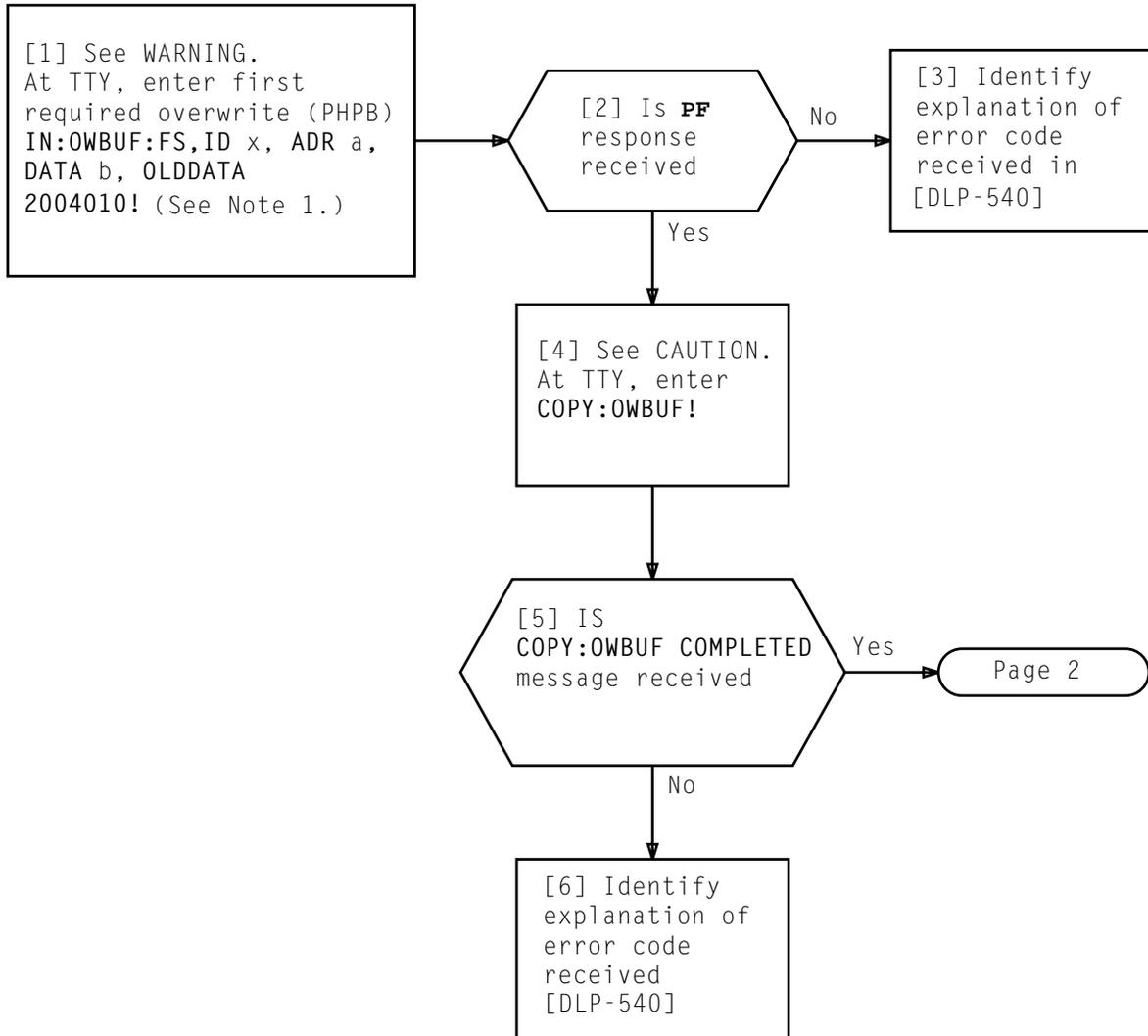


NORMAL PULSE 500 FEET FROM DRIVER

FIG. 3

SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS AT PERIPHERAL FRAME

Issue 5	NOV 1995
234-151-015	DLP
PAGE 6 of 6	549



NOTE 1

(The temporary overwrite must be applied to PUDGPBGR.AF + 1271)

ID x = GEN for 4E17, 4E18 & 4E19 Generics
 = PGPGM for 4E20 & 4E21 Generics

ADR a = 6672176 for 4E17 Generic
 = 6702352 for 4E18 Generic
 = 7505660 for 4E19 Generic
 = 765742 for 4E20 Generic
 = 263152 for 4E21 Generic

DATA b = 01002004 for PHPB
 = 01002040 for PDGB
 = 01002010 for PLPB
 = 01002020 for PSZB

<i>WARNING</i> Do not use UPD:HDATA message	
<i>CAUTION</i> Verify correct output message response of OLD DATA and NEW DATA	
Issue 5	JUN 1994
234-151-015	DLP
PAGE 1 of 3	550

**SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS
AT PUBB FRAME**

[7] Enter diagnostic looping messages
 EX:PUB x;START!
 EX:PUB x:PH 2,ENABLE yyyy,ADR 1262-1275!
 (yyyy=3195 for CC 0 or 56955 for CC 1)
 (x = PUB 0 or 1)

[8] See NOTE 2.
 Connect scope probes
 across the BTR at
 locations for bit to
 be scoped (FIG. 1
 and Table A)

[9] Verify the
 Pollable Bit
 per waveform
 (FIG. 2)

[10] At TTY, enter
 stop looping and
 stop overwrite
 messages EX:PUB x!
 STOP:OVRWRT!

[11] Have all
 Pollable Bits
 been scoped

[13] Return
 to procedure

[16] Enter stop
 maintenance control program
 client message
 STOP:MACLI,CLASS MTCE,SUBCLASS a!
 and repeat from Step 1 and enter
 overwrite for next Polling Bit
 to be scoped in TABLE A
 [a = subclass number (0-7)]

TABLE A

NET NAME	PULSE POINT	DATA	CHANNEL 1*	CHANNEL 2*
LPP PDGB	(PPU065)	01002040	06-28-117	06-28-017
LPP PSZB	(PPU064)	01002020	06-28-115	06-28-015
LPP PLPB	(PPU063)	01002010	06-28-113	06-28-013
LPP PHPB	(PPU062)	01002004	06-28-111	06-28-011

* BTRs for pulse points from CC0 are in Bay 1. BTRs for pulse points from CC1 are in Bay 0. They are wired to the backplane pins at the indicated Channel 1 and Channel 2 locations.

NOTE 2
 Scope probe cables
 are twisted together.
 The ground leads of
 the two cables are
 connected together,
 but are not grounded.

**SET UP LOOP TO OBSERVE AND SCOPE EXPANDED POLLABLE BITS
 AT PUBB FRAME**

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
TPG-000		DLP-505		• DLP-540							
IXL-001		DLP-506		• DLP-541							
NTP-002		DLP-507		• DLP-542							
NTP-003		DLP-508		• DLP-543							
NTP-004		DLP-509		• DLP-544							
• NTP-005		DLP-510		• DLP-545							
• NTP-006		DLP-511		• DLP-546							
• NTP-007		DLP-512		• DLP-547							
• NTP-008		DLP-513		• DLP-548							
• NTP-009		DLP-514		• DLP-549							
TAD-100		DLP-515		• DLP-550							
TAD-101		DLP-516		• CKL-891							
TAP-102		DLP-517		• TNG-893							
TAP-103		DLP-518									
TAP-104		DLP-519									
TAP-105		DLP-520									
TAP-106		DLP-521									
TAP-107		DLP-522									
TAP-108		DLP-523									
TAP-109		DLP-524									
TAP-110		DLP-525									
TAD-111		DLP-526									
TAP-112		DLP-527									
TAP-113		DLP-528									
TAP-114		• DLP-529									
TAP-115		• DLP-530									
TAP-116		• DLP-531									
TAP-117		• DLP-532									
TAP-118		• DLP-533									
TAP-119		• DLP-534									
DLP-500		• DLP-535									
DLP-501		• DLP-536									
DLP-502		• DLP-537									
DLP-503		• DLP-538									
DLP-504		• DLP-539									

• REVISED OR ADDED ITEM

☐ CANCELED ITEM

Issue 4 | NOV 1995

234-151-015

CKL

PAGE 1 of 1

891

CHECKLIST