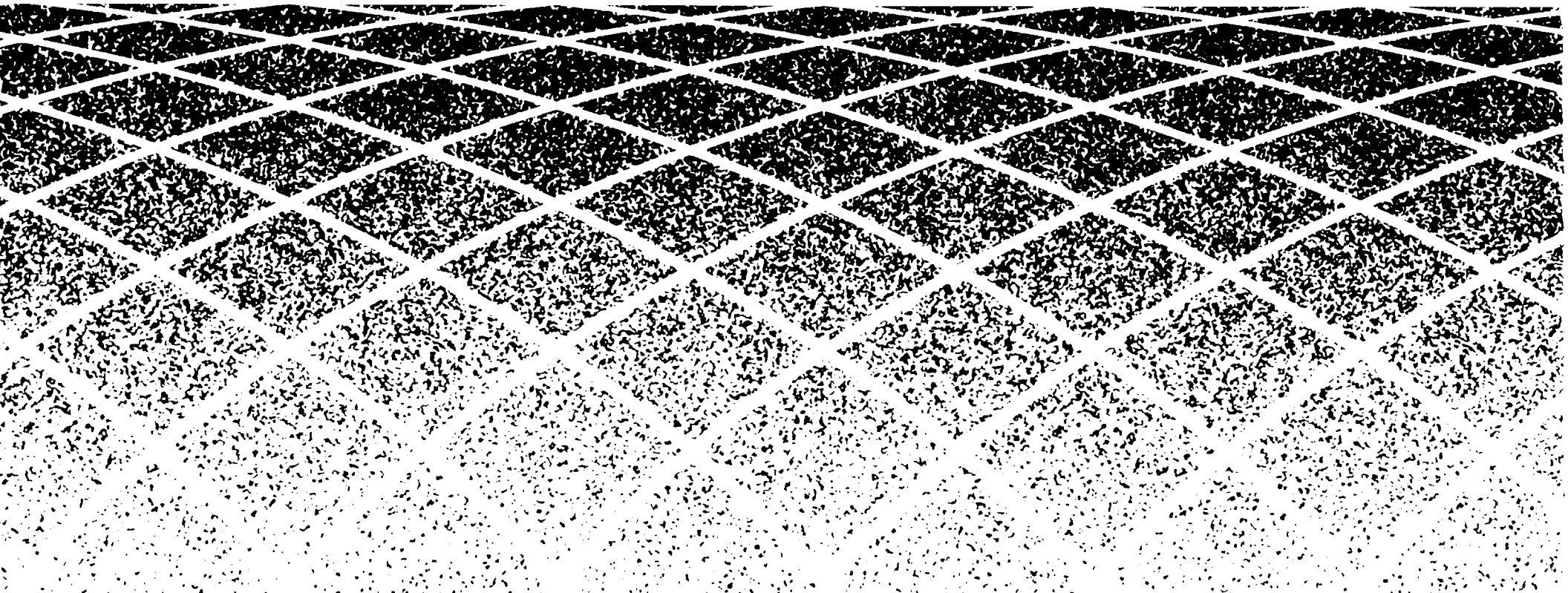
AT&T 234-351-021
Issue 1
February 1994

Task Oriented Practice (TOP)

J5A006C - 1 INPUT/OUTPUT PROCESSOR FRAME

4ESS™ Switch 1B PROCESSOR



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Developed by:

The AT&T Customer Information Development and Business Translations Organization

FIND YOUR JOB IN THE LIST BELOW	THEN GO TO
Acceptance	NTP-002
Alarm Test, Manual Power – SD-5A052-01 – Perform	DLP-501
Automatic Power Monitor Test Failure – Clear	TAP-121
Blown Fuse; +12E, –12E, or –48A – IOP Logic Unit (SD-5A052-01) or 1A Growth Unit (SD-4C049-01) – Clear	TAP-116
Blown Fuse; +24-1 – IOP Bus Unit (SD-5A052-01) – Clear	TAP-102
Blown Fuse; +24-2 – IOP Bus Unit (SD-5A052-01) – Clear	TAP-104
Blown Fuses; +24-3 and +24-3P – IOP Bus Unit (SD-5A052-01) – Clear	TAP-106
Blown Fuse; +24-4 or +24-5 – IOP Logic Unit (SD-5A052-01) – Clear	TAP-112
Blown Fuse; +24S22 – IOP Bus Unit (SD-5A052-01) – Clear	TAP-108
Blown Fuses; –48 and –48P – IOP Logic Unit (SD-5A052-01) – Clear	TAP-110
Blown Fuse; –48B – IOP Logic Unit (SD-5A052-01) – Clear	TAP-118
Circuit Pack (SD-5A052-01) – Replace	NTP-003
DC-to-DC Converter (SD-5A052-01) – Replace	NTP-004
Diagnostic Failure – By Analyzing Raw Data and Replacing Suspect Packs – Clear	TAP-131
Diagnostic Failure – TLP Abort – Clear	TAP-126
Diagnostic Failure – TLP Disk Queue Full – Clear	TAP-123
Diagnostic Failure – TLP Inhibit – Clear	TAP-125
Diagnostic Failure – TLP Queue Blockage – Clear	TAP-124
Diagnostic Failure – By Replacing Packs on TLP Suspected Faulty Equipment List – Clear	TAP-130
Diagnostic Failure – TLP Tape Acquisition Error – Clear	TAP-128
Diagnostic Failure – TLP Tape Not Mounted – Clear	TAP-129
Diagnostic Failure – TLP Tape Version X Does Not Match Version Y – Clear	TAP-127

FIND YOUR JOB IN THE LIST BELOW	THEN GO TO
Lamps; Power Switch – Test	DLP-505
Lighted LED; Converter – Fuse Not Blown – Clear	TAP-119
Lighted LED; Microprocessor Control – Fuse Not Blown (SD-5A052-01) – Clear	TAP-120
Maintenance Philosophy	TAD-100
PFLR F-Level Interrupt, IOP Frame (SD-5A052-01) Equipped With 1A Growth Unit (SD-4C049-01) – Clear	TAP-133
PFLR Base Level Maintenance (MTCE) Request, IOP Frame (SD-5A052-01) Equipped With 1A Growth Unit (SD-4C049-01) – Clear	TAP-134
PFLR Base Level Maintenance Poll Failure, IOP Frame (SD-5A052-01) Equipped With 1A Growth Unit (SD-4C049-01) – Clear	TAP-135
Power Switch – Replace	DLP-500
TLP Abort – Diagnostic Failure – Clear	TAP-126
TLP Disk Queue Full – Diagnostic Failure – Clear	TAP-123
TLP Inhibit – Diagnostic Failure – Clear	TAP-125
TLP Queue Blockage – Diagnostic Failure – Clear	TAP-124
TLP Tape Acquisition Error – Diagnostic Failure – Clear	TAP-128
TLP Tape Not Mounted – Diagnostic Failure – Clear	TAP-129
TLP Tape Version X Does Not Match Version Y – Diagnostic Failure – Clear	TAP-127
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}]STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUSPECTED FAULTY EQUIPMENT NOTE COLUMN DOES NOT CONTAIN NOTE 2	TAP-130
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}]STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUSPECTED FAULTY EQUIPMENT NOTE COLUMN CONTAINS NOTE 2 FUSE BLOWN	See Blown Fuse Entries

FIND YOUR JOB IN THE LIST BELOW	THEN GO TO
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUSPECTED FAULTY EQUIPMENT NOTE COLUMN CONTAINS NOTE 2 NO FUSES BLOWN	TAP-121
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] NULL PACK TEST GENERATED SD-5A052-01	TAP-131
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUMMARY DATA QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0001	TAP-123
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUMMARY DATA QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0002	TAP-124
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] SUMMARY DATA QUEUE ACCESS DENIED:DATA NOT RETAINED:CODE 0004	TAP-125
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] ABORTED	TAP-126
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] TLP PROGRAM ABORTED	TAP-126
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] TLP WARNING:VERSION X DOES NOT MATCH EXPECTED VERSION Y	TAP-127
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF ANALY:TLPFILE IOUS a,[{IPUB b|IOUC c|IOMP d}] TLP TAPE ACQUISITION ERROR MOUNT TAPE WITH FILE = F	TAP-128

FIND YOUR JOB IN THE LIST BELOW	THEN GO TO
TTY Printout – DGN:IOUS a,[{IPUB b|IOUC c|IOMP d}] STF REPT:TAPE MUST BE MOUNTED FOR FUNCTION TLP	TAP-129
TTY Printout – REPT:BASE LEVEL PFLR ------- IOP (SD-5A052-01 EQUIPPED WITH SD-4C049-01 UNIT) DATA ------- POLL FAILURE	TAP-135
TTY Printout – REPT:BASE LEVEL PFLR ------- IOP (SD-5A052-01 EQUIPPED WITH SD-4C049-01) DATA ------- MAINTENANCE REQUEST	TAP-134
TTY Printout – REPT:F-LEVEL PFLR ------- IOP (SD-5A052-01 EQUIPPED WITH SD-4C049-01)	TAP-133

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.

DO THE ITEMS BELOW IN THE ORDER LISTED	FOR DETAILS, GO TO
1 Notify Users That Channels are to be Removed From Service	–
2 Replace Circuit Pack	DLP-503

DO THE ITEMS BELOW IN THE ORDER LISTED . . . . . FOR DETAILS, GO TO		
1	Notify Users That Channels are to be Removed From Service	–
2	Replace DC-to-DC Converter	DLP-502

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 I/O Manuals, SDs, PKs, PRs, etc., which are available to the operating telephone company offices are referenced where applicable rather than duplicating that information in the 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 parameters involved in circuits being tested, adjusted, or checked are usually prescribed. However, the setup and method of operation is not described unless it is unusual or unique in some manner.

IXL PHILOSOPHY

The Task Index List (IXL-001) is structured to provide fast access to procedures in this document.

Power problems are sensed by scan points which generate a major or minor alarm. It is assumed that the user can locate the frame with the power fault which was automatically powered down (1B power switch with **PWR OFF** lamp lighted and **OFF NORM** lamp off) by following the aisle pilot lights or by reading the **REPT:PA** printout which would identify the frame with a power fault. The precise structure of the message is given in the Input/Output (I/O) message manuals. The symptoms described in the IXL reflect the assumptions above and indicate other conditions that are observable at the frame that would enable the user to access the proper trouble-clearing procedure. These conditions are blown fuses, lighted LEDs on converters, or power function circuit packs, etc.

In general, most logic circuit failures cause the fault recovery program to request a diagnostic program. This method of requesting the diagnostic program includes the TLP option. The IXL reflects this in the teletypewriter (TTY) messages listed. Outside of the first two supplementary messages (**ANALY:FLPFILE:**), all other supplementary messages pertain to problems in generating a **SUSPECTED FAULTY EQUIPMENT** list and reference to procedures (TAPs) which attempt to correct the problem. If successful in generating a **SUSPECTED FAULTY EQUIPMENT** list, those procedures reference to the appropriate procedure which indicates what to do with this list. If not successful, they reference the next level of trouble-clearing, raw-data analysis which is an alternative to the first and most common trouble-clearing approach.

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, and when directing the user to perform an action, it is assumed that the action is performed correctly. Similarly, when directed to make replacements, the replacement part and equipment used for testing, both built-in (hardware and software) and commercial, are assumed to be good. Only consistent fault signatures are covered.

The trouble-clearing TAPs provided for diagnostic failures are provided on three levels.

The first level addresses what to do with a software-generated (TLP) **SUSPECTED FAULTY EQUIPMENT** list and provides a step-by-step procedure for replacing circuit packs one at a time, and analyzing the results. This level is straightforward and requires some familiarity with the equipment (Descriptive AT&T Practices), TTY techniques, and diagnostic printouts.

The second level of trouble clearing is accessed from the first level. This level is referenced when the **SUSPECTED FAULTY EQUIPMENT** list has been exhausted without clearing the problem; or, it can be accessed directly from the IXL or any of the **ANALY:TLPFILE:** TAPs which produce a **NULL PACK TEST GENERATED** response. This level of trouble clearing is known as raw data analysis and describes what to do with the summary and supplemental data printed either with or instead of the **SUSPECTED FAULTY EQUIPMENT** list. It is expected that this leads to the identification of faulty circuits within the SD and possible additional suspected circuit packs not previously identified. This level of trouble clearing is more complex and requires knowledge of the equipment, TTY techniques and printouts, and SDs, PKs, PRs, etc.

The third level of trouble clearing is signal tracing using interactive diagnostics. This procedure is accessible only from the previous level and uses information derived in the performance of that procedure. This level of trouble clearing requires an increase in the capabilities cited in the first two levels and requires additional knowledge and skill in the setup and operation 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. Access to trouble-clearing procedures must be obtained by locating procedural data provided in the Task Index List (IXL-001). Most DLPs are built to support TAPs and NTPs with preconditioning and system restoration steps covered in those level procedures (TAPs, NTPs). Therefore, access to data (DLPs) on a hunt-and-find basis is a threat to equipment operation and may compound trouble-clearing problems.

Another method of trouble clearing that may be utilized is interrupt analysis. Interrupt analysis may produce a list of circuit packs that could be responsible for the interrupt. Prior to changing the circuit packs, diagnostics should be run with ATP expected. If diagnostics produce the following:

(1) ATP – The first identified interrupt analysis circuit pack should be changed. Should this be the wrong circuit pack, then the probability is high that the interrupt occurs again with the same symptom. At this time, the next identified pack should be changed.

(2) STF – The most suspect circuit pack is the pack that appears on both the TLP pack list and list generated from analysis of interrupt.

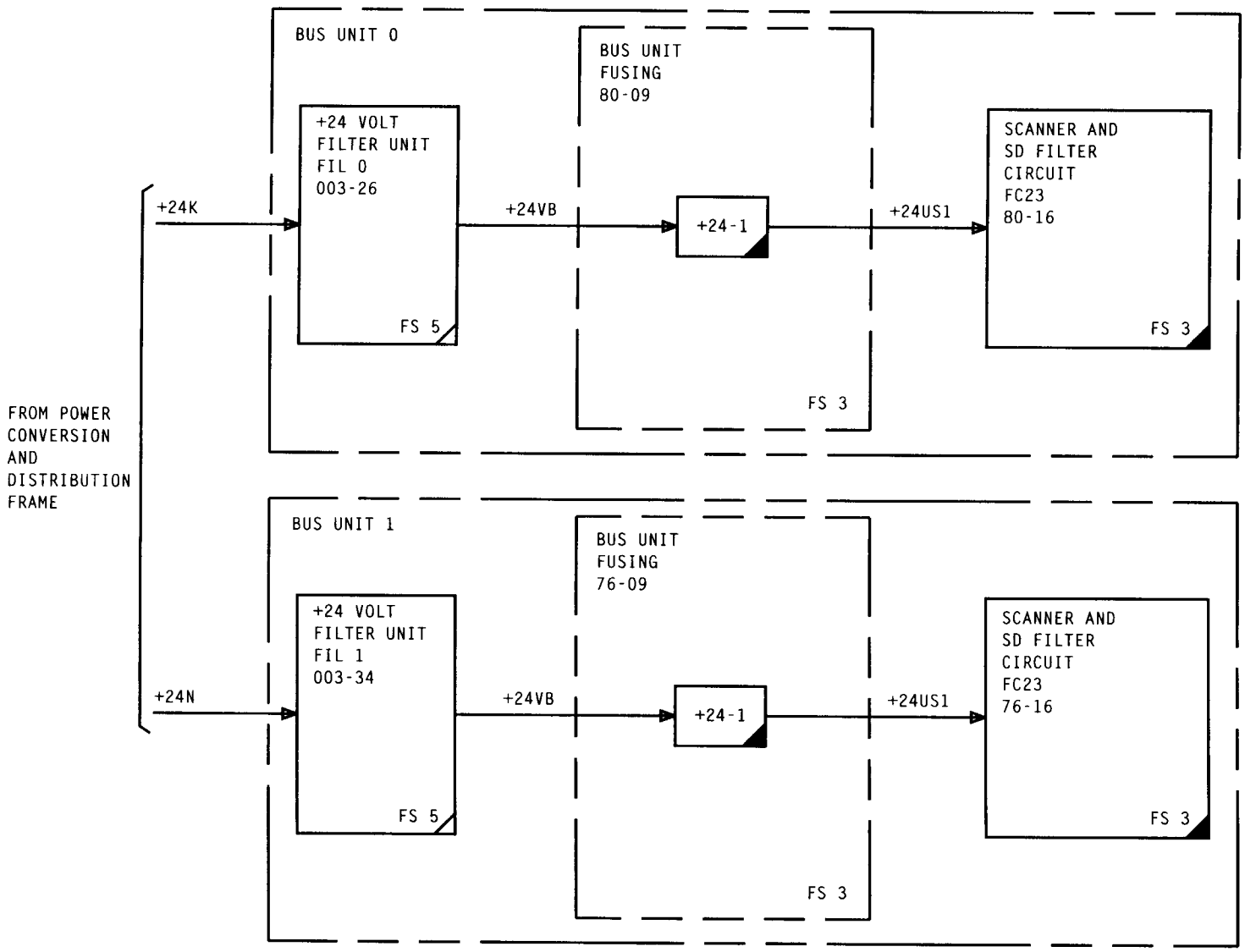
TERMINOLOGY

A component location given in TAPs and DLPs, such as 80/76-16, means that only the appropriate component, either at 80-16 or 76-16, is designated. The component location to be chosen is only on the unit that has been taken out of service.

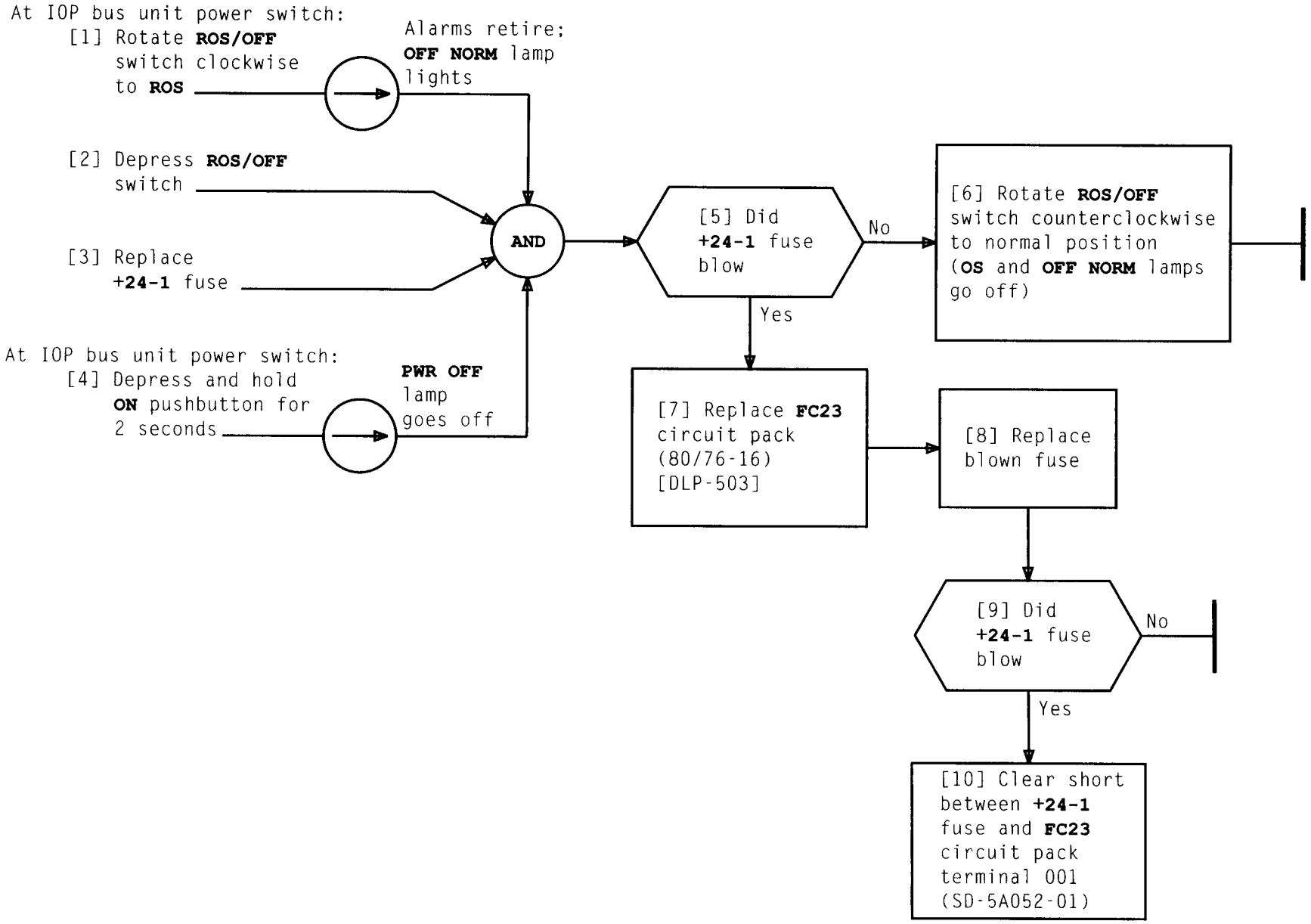
EQUIPMENT TEST LIST

This is a list of tasks recommended for routine preventive maintenance. Information on the list is arranged in the following order from left to right: Frequency, title, and procedure number

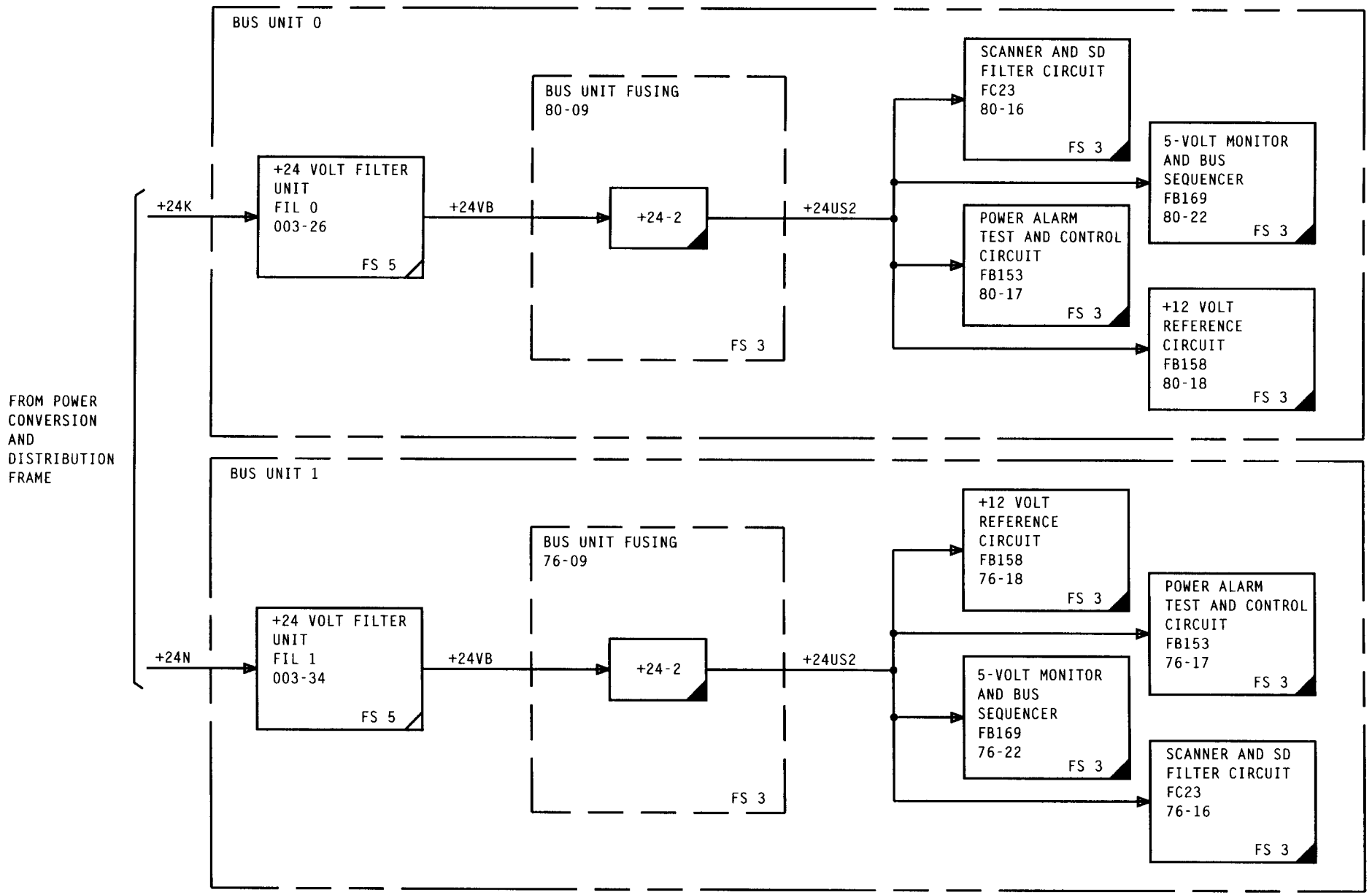
12M	Perform Manual Power Alarm Test	DLP-501
6M	Test Power Switch Lamps	DLP-505



+24-1 FUSE POWER DISTRIBUTION, IOP BUS UNIT (SD-5A052-01)



CLEAR BLOWN +24-1 FUSE, IOP BUS UNIT (SD-5A052-01)



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+24-2 FUSE POWER DISTRIBUTION, IOP BUS UNIT (SD-5A052-01)

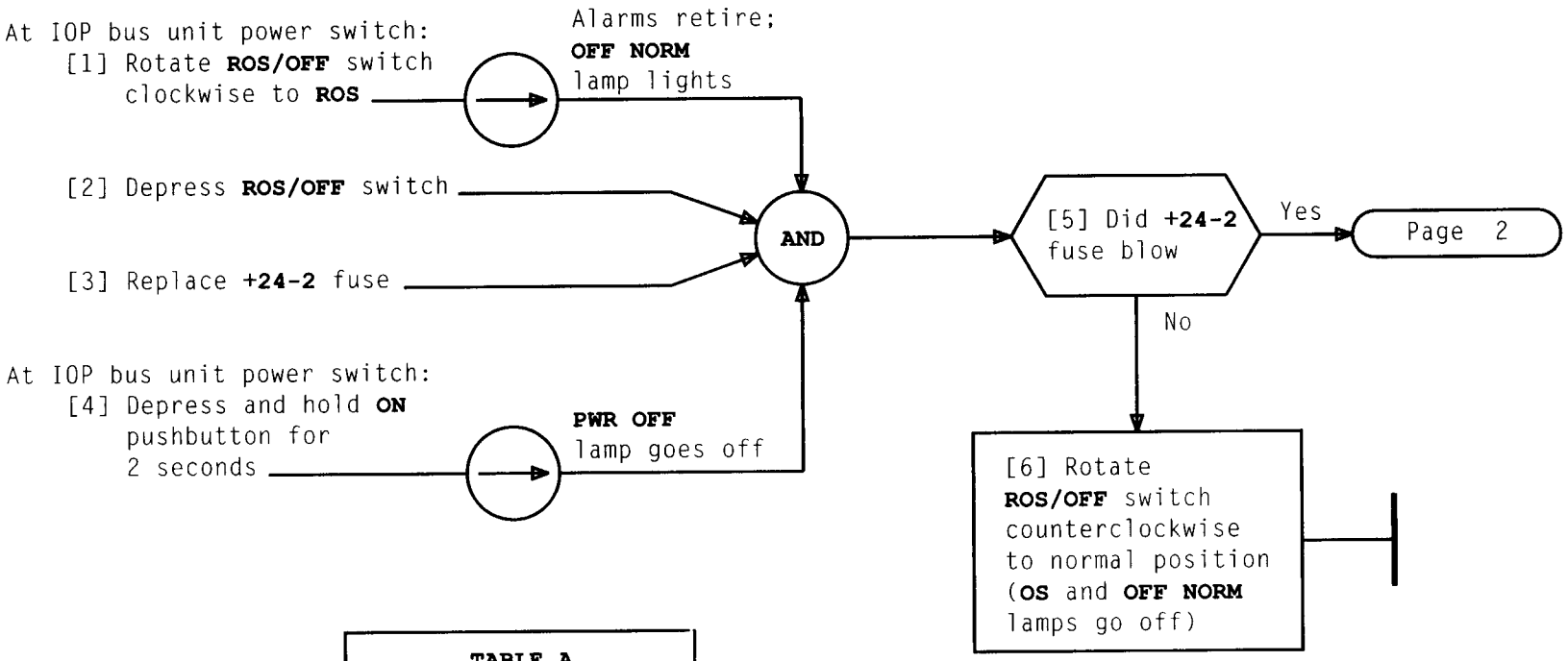


TABLE A

+24-2 FUSE RELATED CIRCUIT PACKS

TYPE	LOCATION	
	BUS 0	BUS 1
FB169	80-22	76-22
FC23	80-16	76-16
FB153	80-17	76-17
FB158	80-18	76-18

CLEAR BLOWN +24-2 FUSE, IOP BUS UNIT (SD-5A052-01)

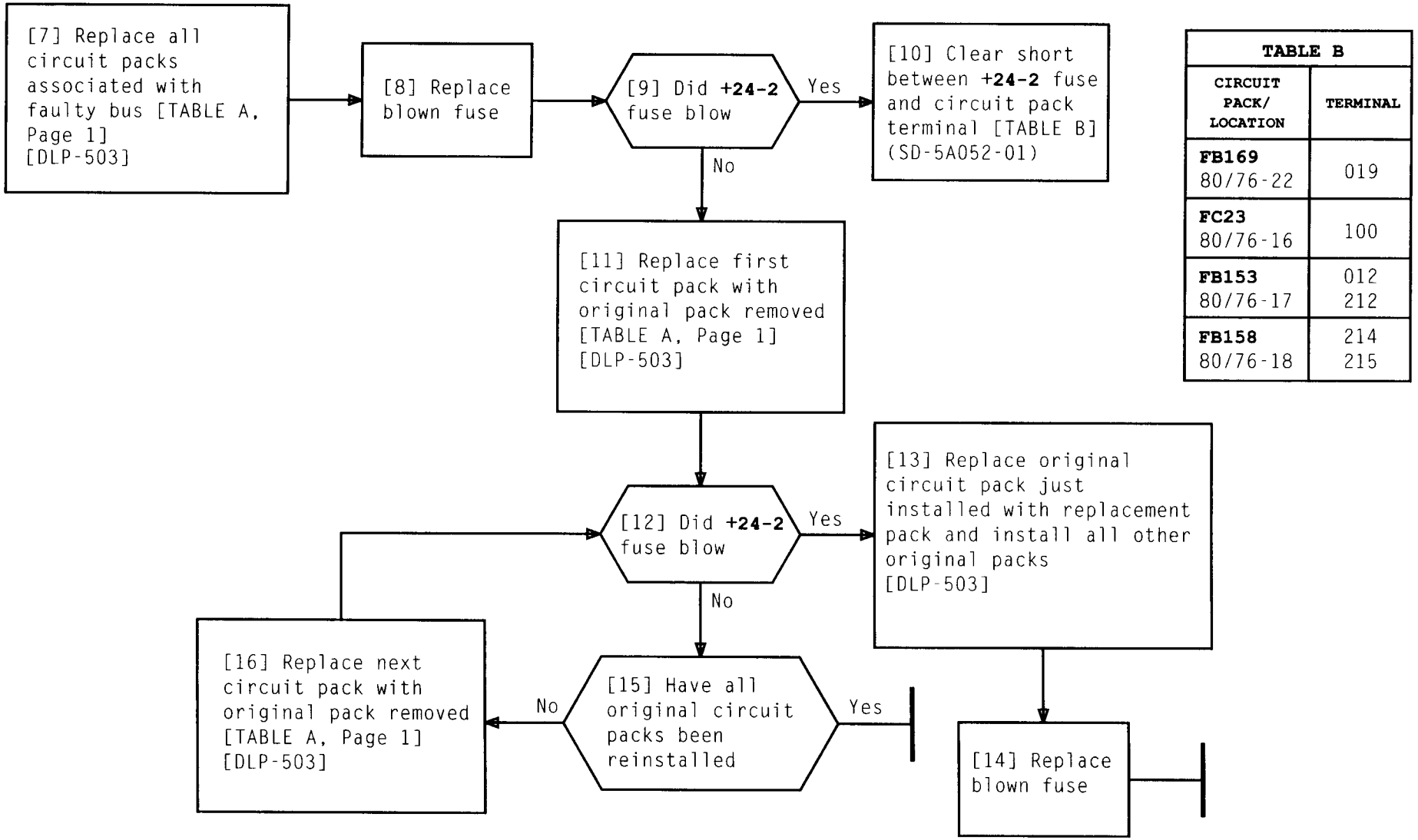
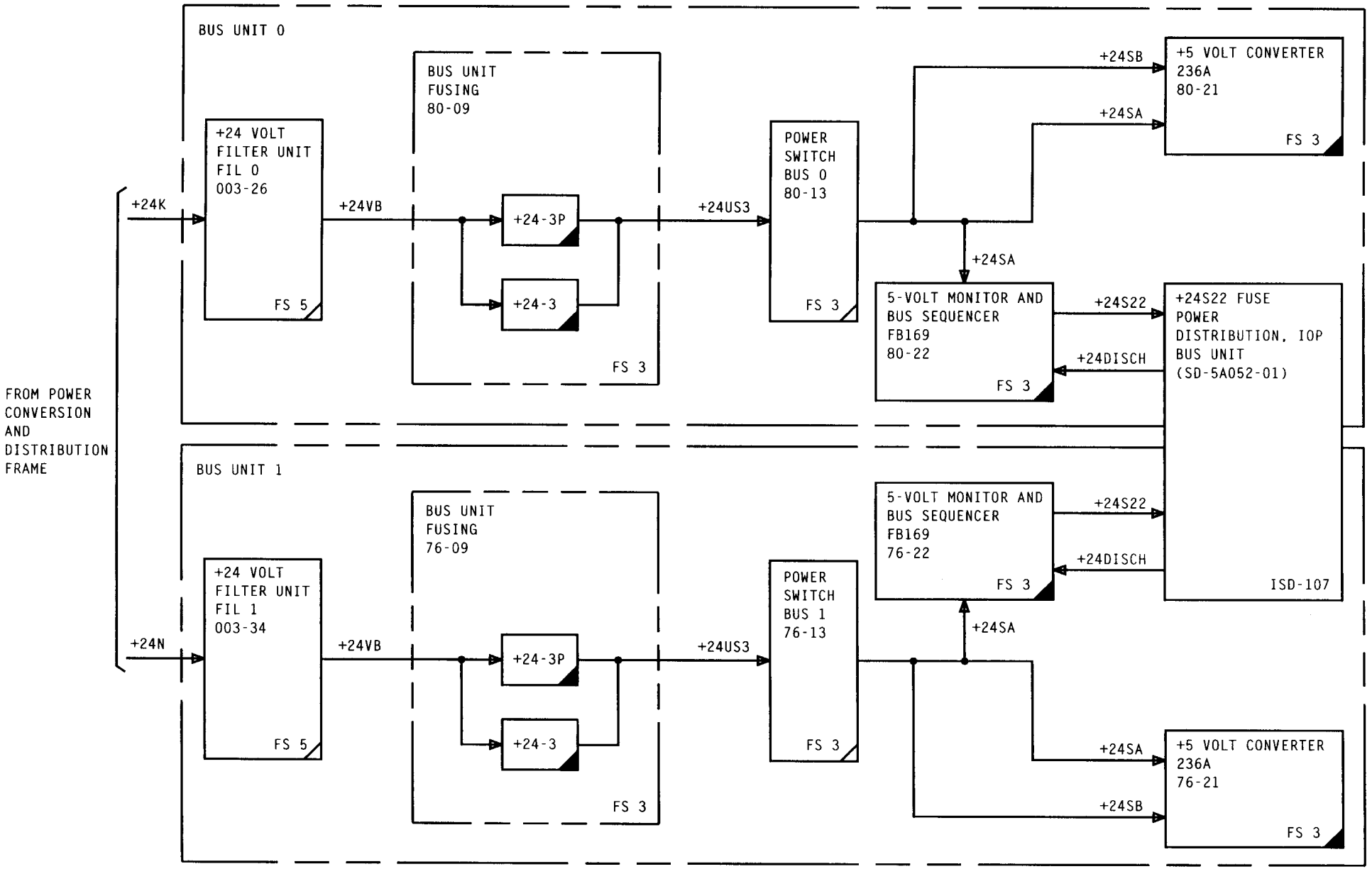


TABLE B

CIRCUIT PACK/ LOCATION	TERMINAL
FB169 80/76-22	019
FC23 80/76-16	100
FB153 80/76-17	012 212
FB158 80/76-18	214 215

CLEAR BLOWN +24-2 FUSE, IOP BUS UNIT (SD-5A052-01)



+24-3 AND +24-3P FUSE POWER DISTRIBUTION, IOP BUS UNIT (SD-5A052-01)

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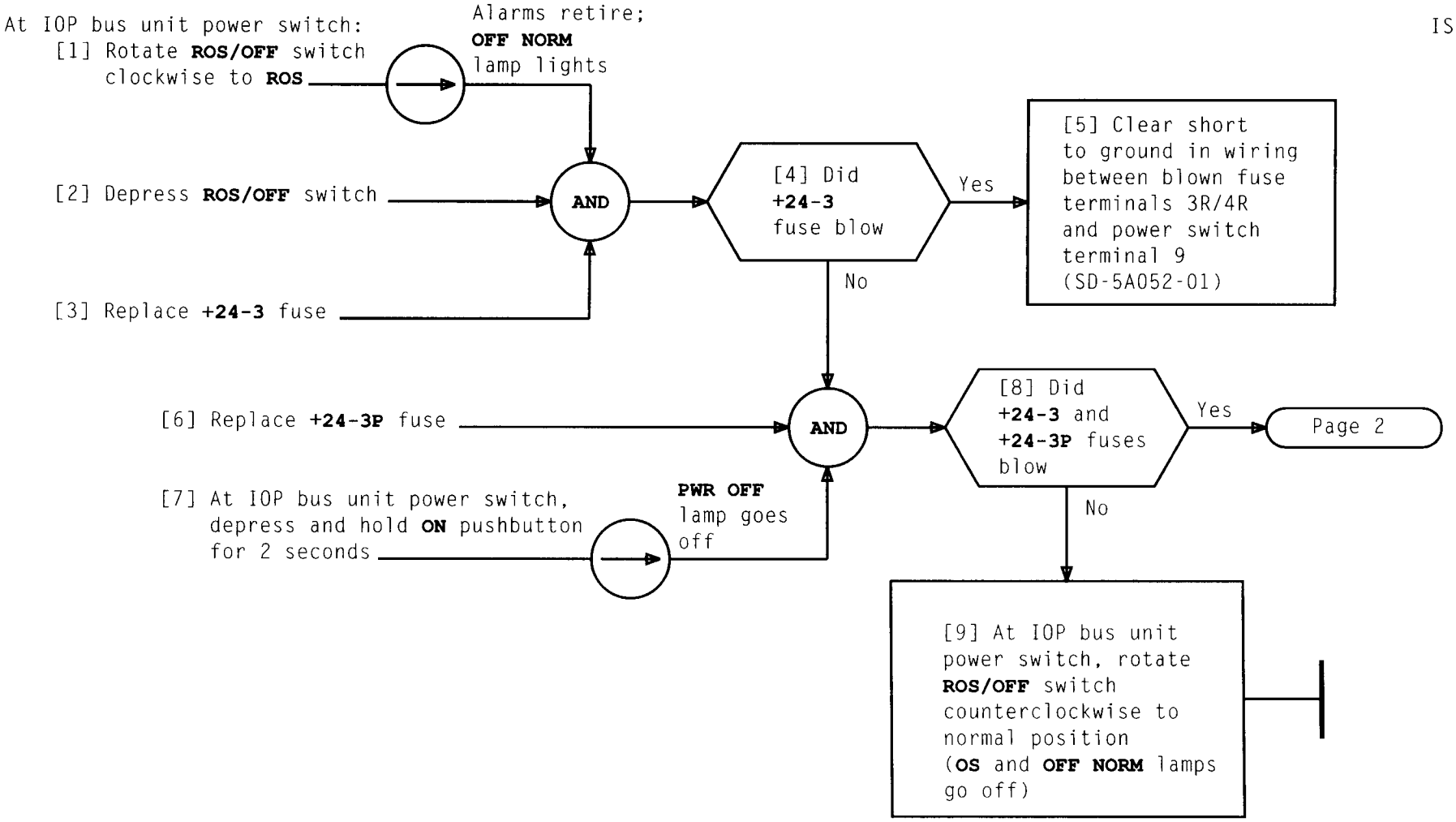


CLEAR BLOWN +24-3 AND +24-3P FUSES, IOP BUS UNIT (SD-5A052-01)

[10] Replace **236A** DC-to-DC converter (80/76-21) [DLP-502]

[11] Replace blown fuses

[12] Did fuses blow

No

[13] At IOP bus unit power switch, rotate **ROS/OFF** switch counterclockwise to normal position (**OS** and **OFF NORM** lamps go off)

Yes

[14] Replace five circuit packs associated with faulty bus [TABLE A] [DLP-503]

[15] Replace blown fuses

[16] Did fuses blow

No

Page 3

Yes

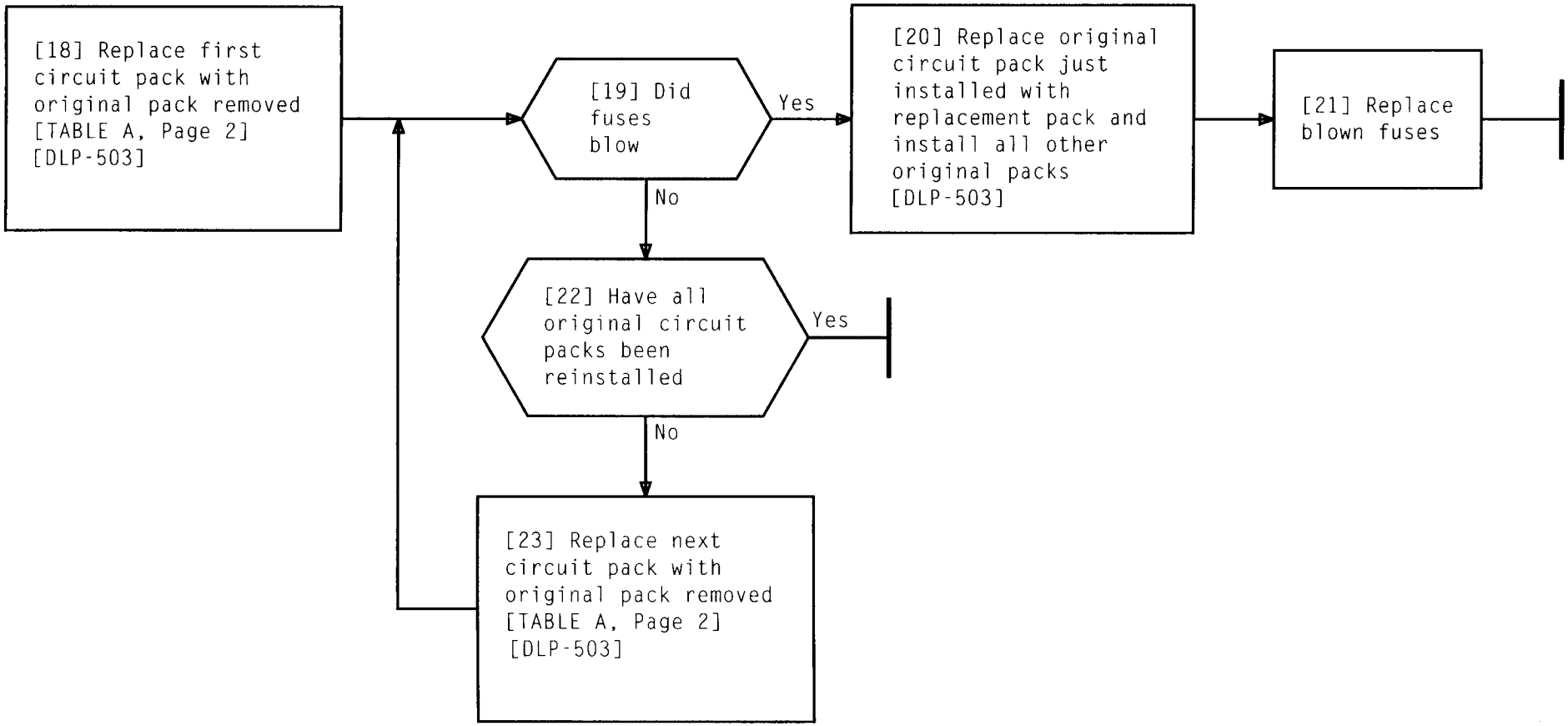
[17] Clear short to ground in wiring between power switch terminal 10 and either +5V converter terminals 012, 212 (80/76-21) or **FB169** circuit pack terminal 012 (80/76-22) (SD-5A052-01)

TABLE A

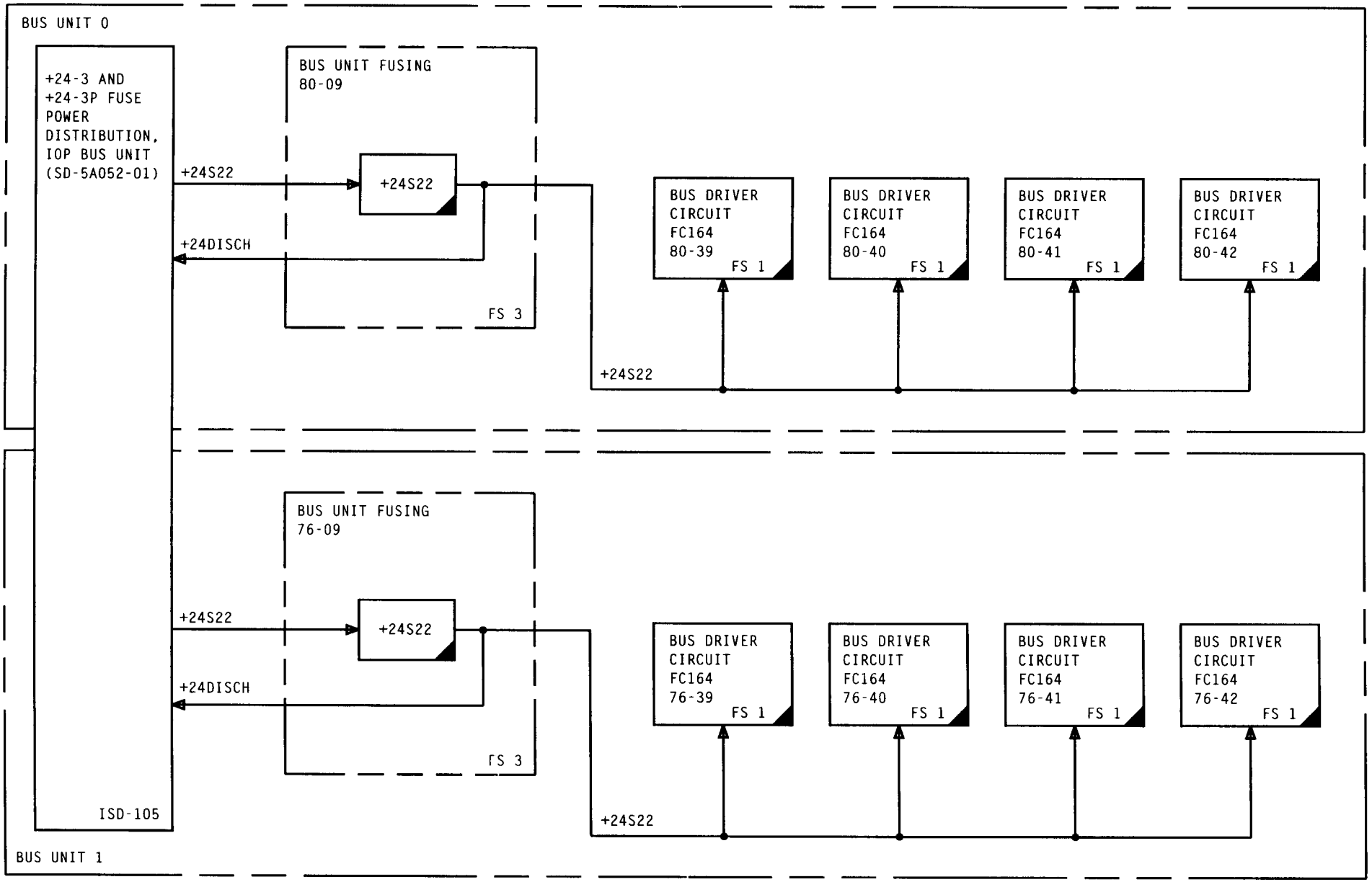
+24-3 AND +24-3P FUSE RELATED CIRCUIT PACKS

TYPE	LOCATION	
	BUS 0	BUS 1
FB169	80-22	76-22
FC164	80-39	76-39
FC164	80-40	76-40
FC164	80-41	76-41
FC164	80-42	76-42

CLEAR BLOWN +24-3 AND +24-3P FUSES, IOP BUS UNIT (SD-5A052-01)



CLEAR BLOWN +24-3 AND +24-3P FUSES, IOP BUS UNIT (SD-5A052-01)



+24S22 FUSE POWER DISTRIBUTION, IOP BUS UNIT (SD-5A052-01)

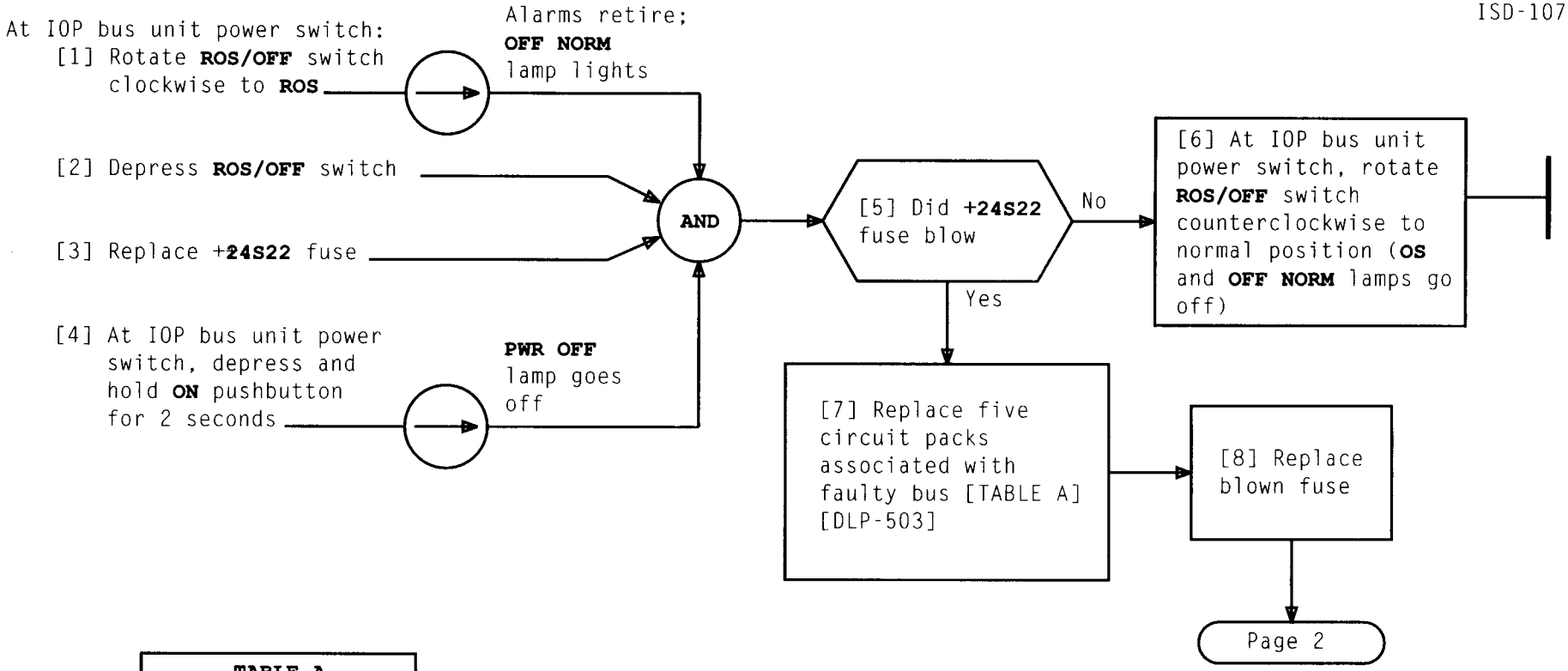
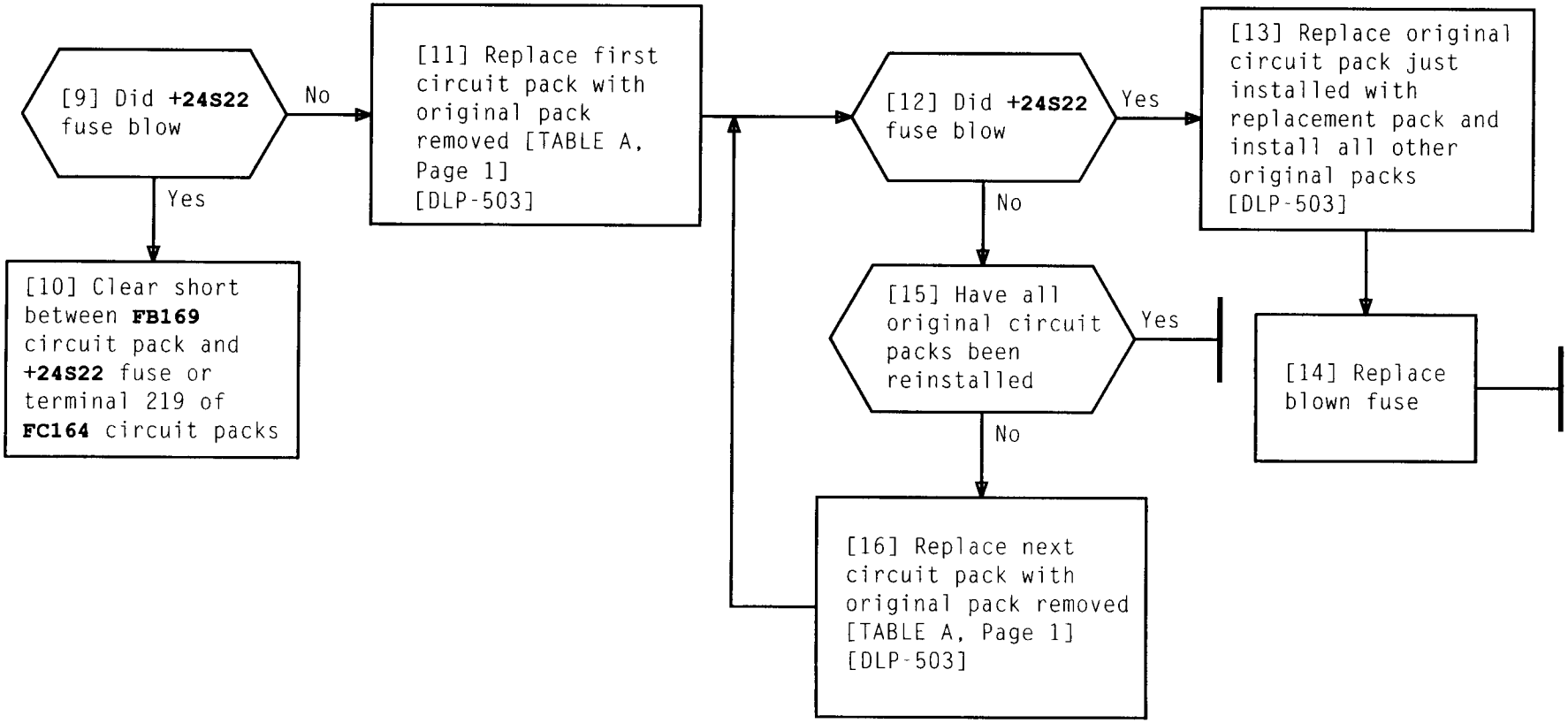
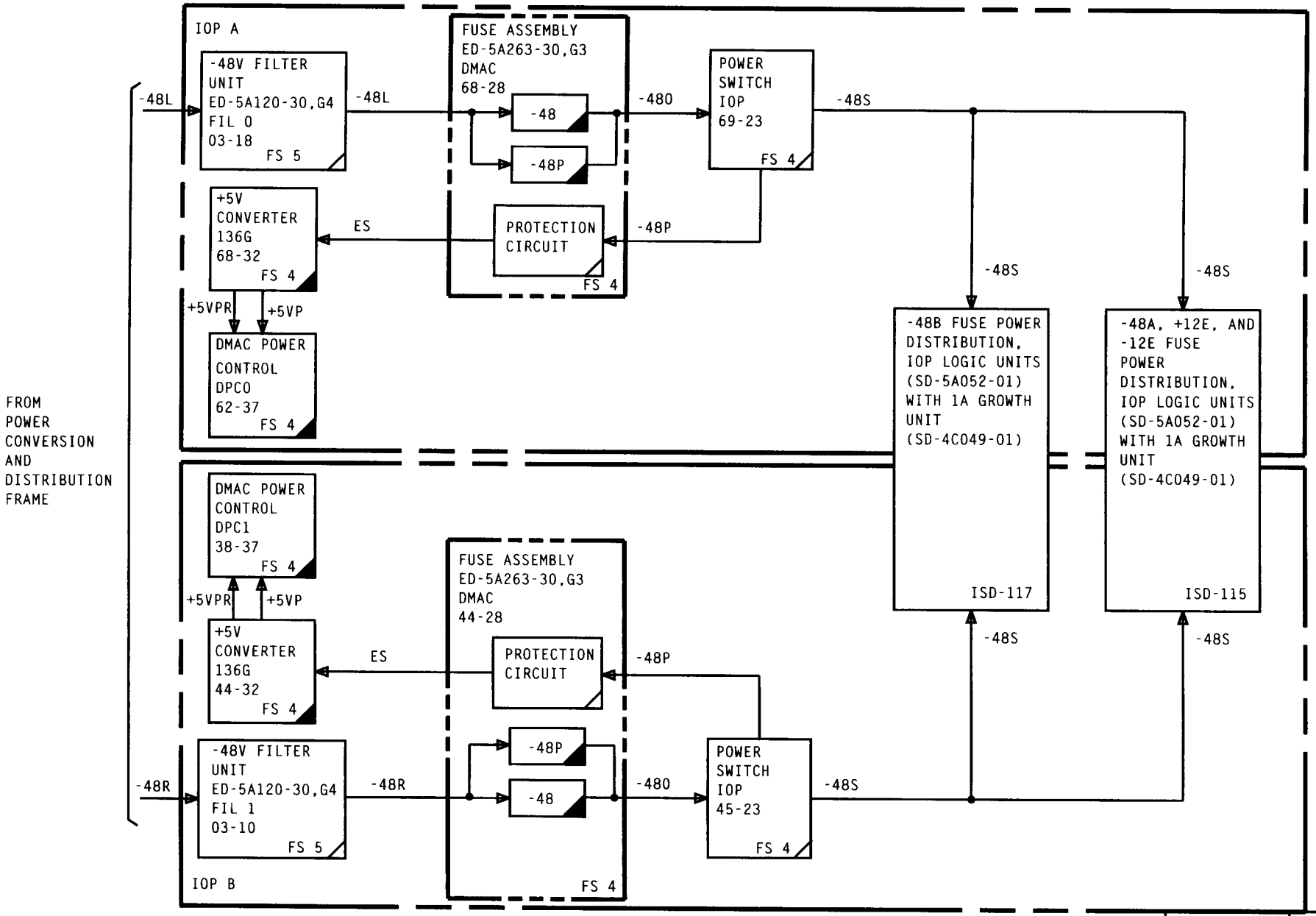


TABLE A		
+24S22 FUSE RELATED CIRCUIT PACKS		
TYPE	**LOCATION**	
	BUS 0	**BUS 1**
FB169	80-22	76-22
FB164	80-39	76-39
FB164	80-40	76-40
FB164	80-41	76-41
FB164	80-42	76-42

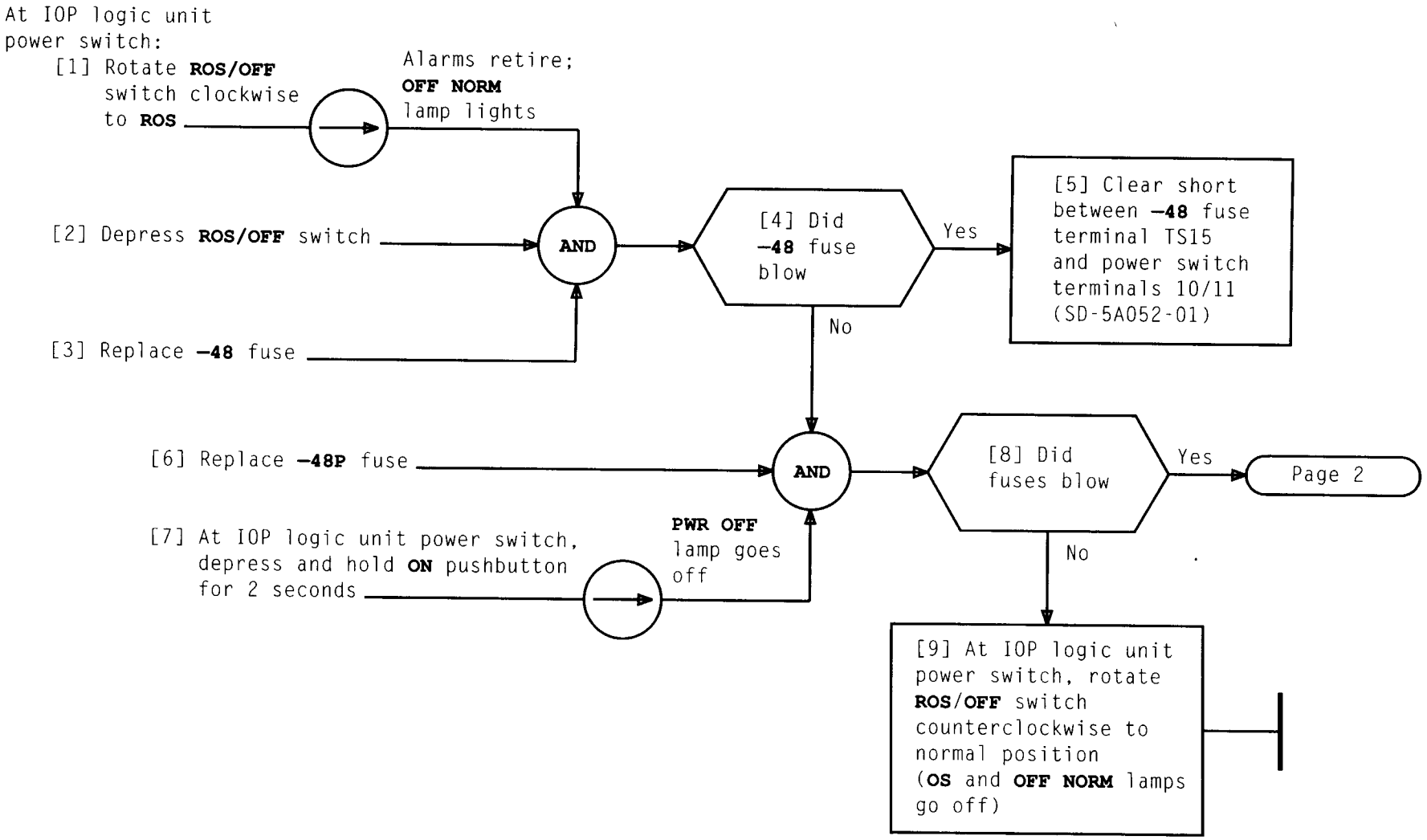
CLEAR BLOWN +24S22 FUSE, IOP BUS UNIT (SD-5A052-01)



CLEAR BLOWN +24S22 FUSE, IOP BUS UNIT (SD-5A052-01)



–48 AND –48P FUSE POWER DISTRIBUTION, IOP LOGIC UNIT (SD-5A052-01)



CLEAR BLOWN –48 AND –48P FUSES, IOP LOGIC UNIT (SD-5A052-01)

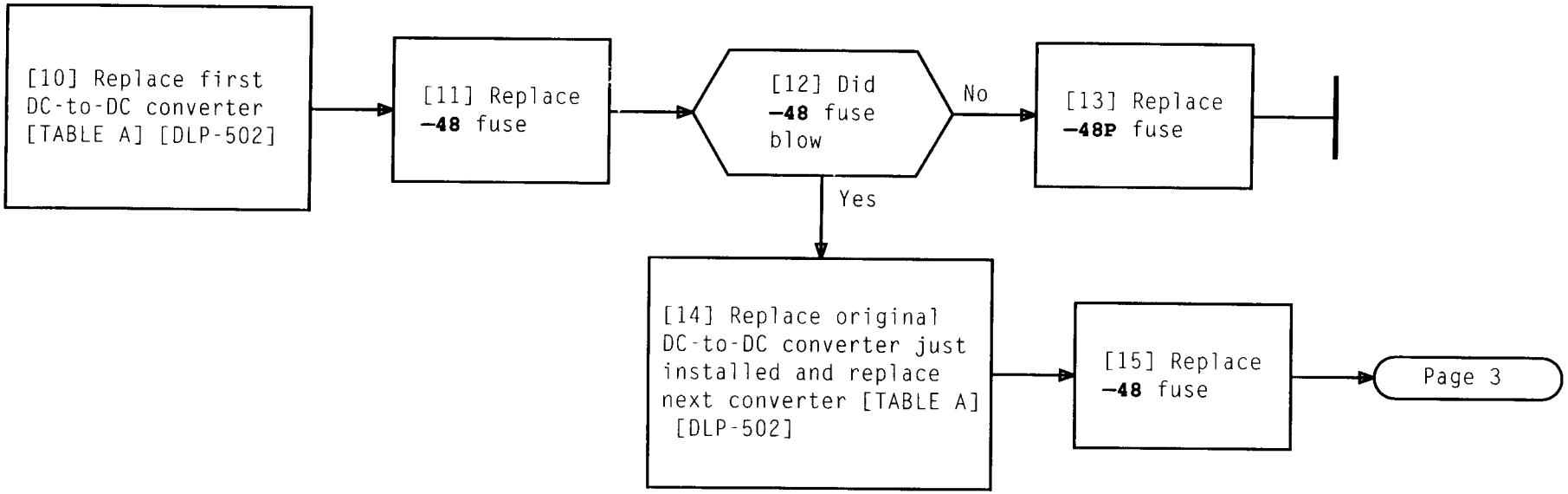


TABLE A		
CONVERTER LOCATIONS		
TYPE	LOCATION	
	IOP 0	IOP 1
136H	68-02	44-02
136G	68-32	44-32
136H	52-32	28-32

CLEAR BLOWN -48 AND -48P FUSES, IOP LOGIC UNIT (SD-5A052-01)

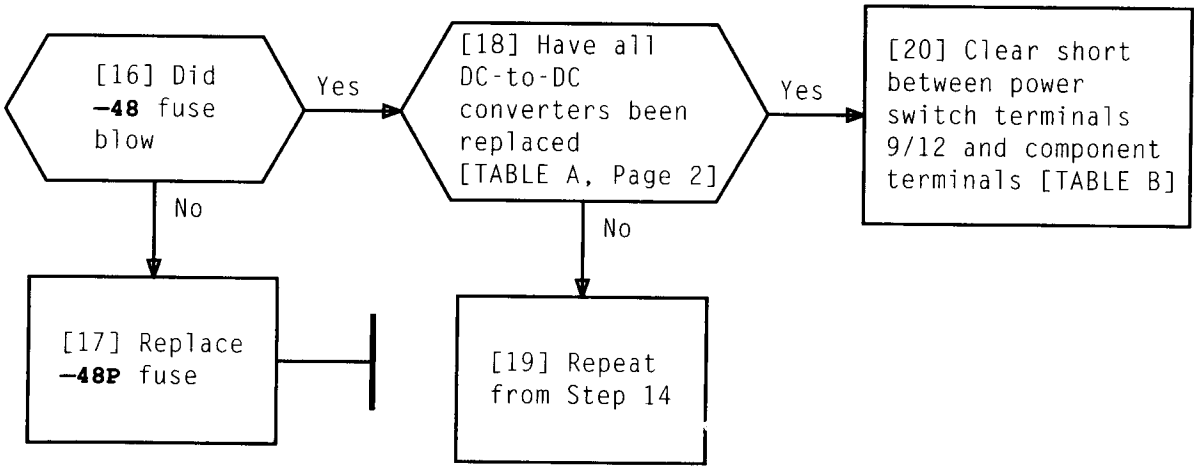
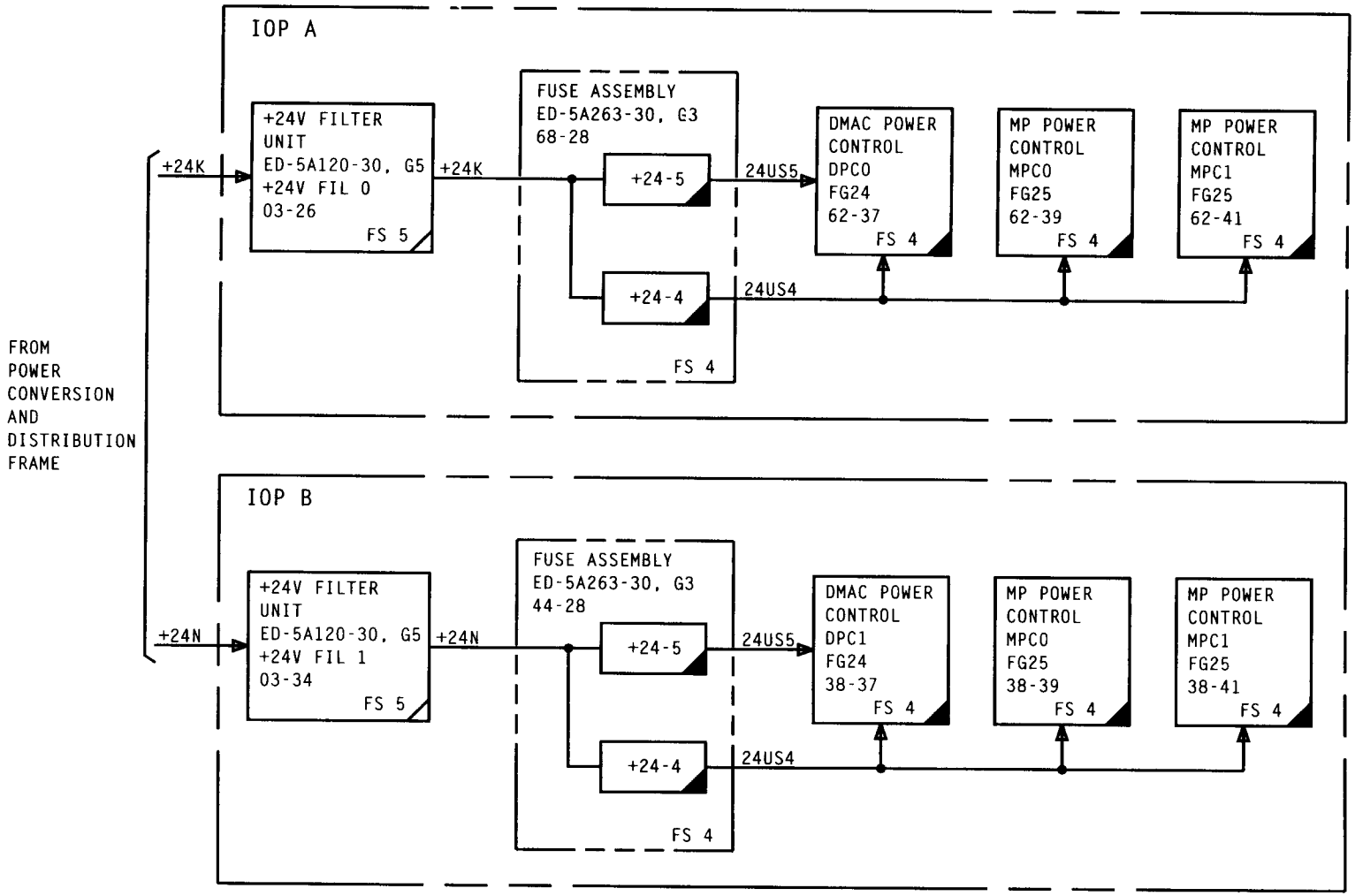


TABLE B

UNIT	COMPONENT				
	NAME	TYPE	LOCATION		TERMINALS
			IOP 0	IOP 1	
Logic	Fuse Block	ED-5A264-30-G3	68-28	44-28	TS1-1, TS1-3, TS2-4
Logic	Power Supply	**136H**	68-02	44-02	S, T, U
Logic	Power Supply	**136G**	68-32	44-32	S, T, U
1A Growth	Power Supply	**136H**	52-32	28-32	S, T, U

CLEAR BLOWN −48 AND −48P FUSES, IOP LOGIC UNIT (SD-5A052-01)



+24-4 AND +24-5 FUSE POWER DISTRIBUTION, IOP LOGIC UNIT (SD-5A052-01)

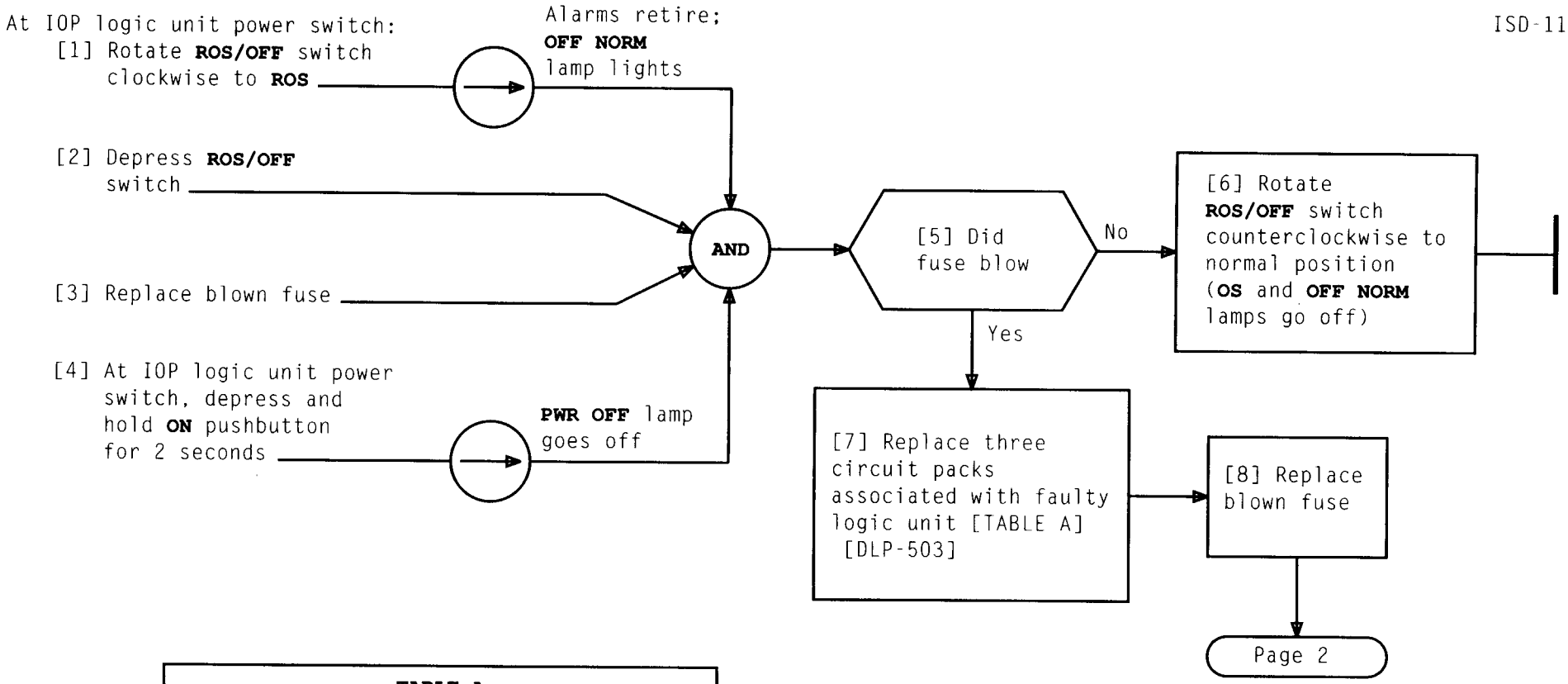


TABLE A			
+24-4 AND +24-5 FUSE RELATED CIRCUIT PACKS			
UNIT	**CIRCUIT PACK LOCATIONS**		
	FIRST	**SECOND**	**THIRD**
IOP 0	62-37	62-39	62-41
IOP 1	38-37	38-39	38-41

CLEAR BLOWN +24-4 OR +24-5 FUSE, IOP LOGIC UNIT (SD-5A052-01)

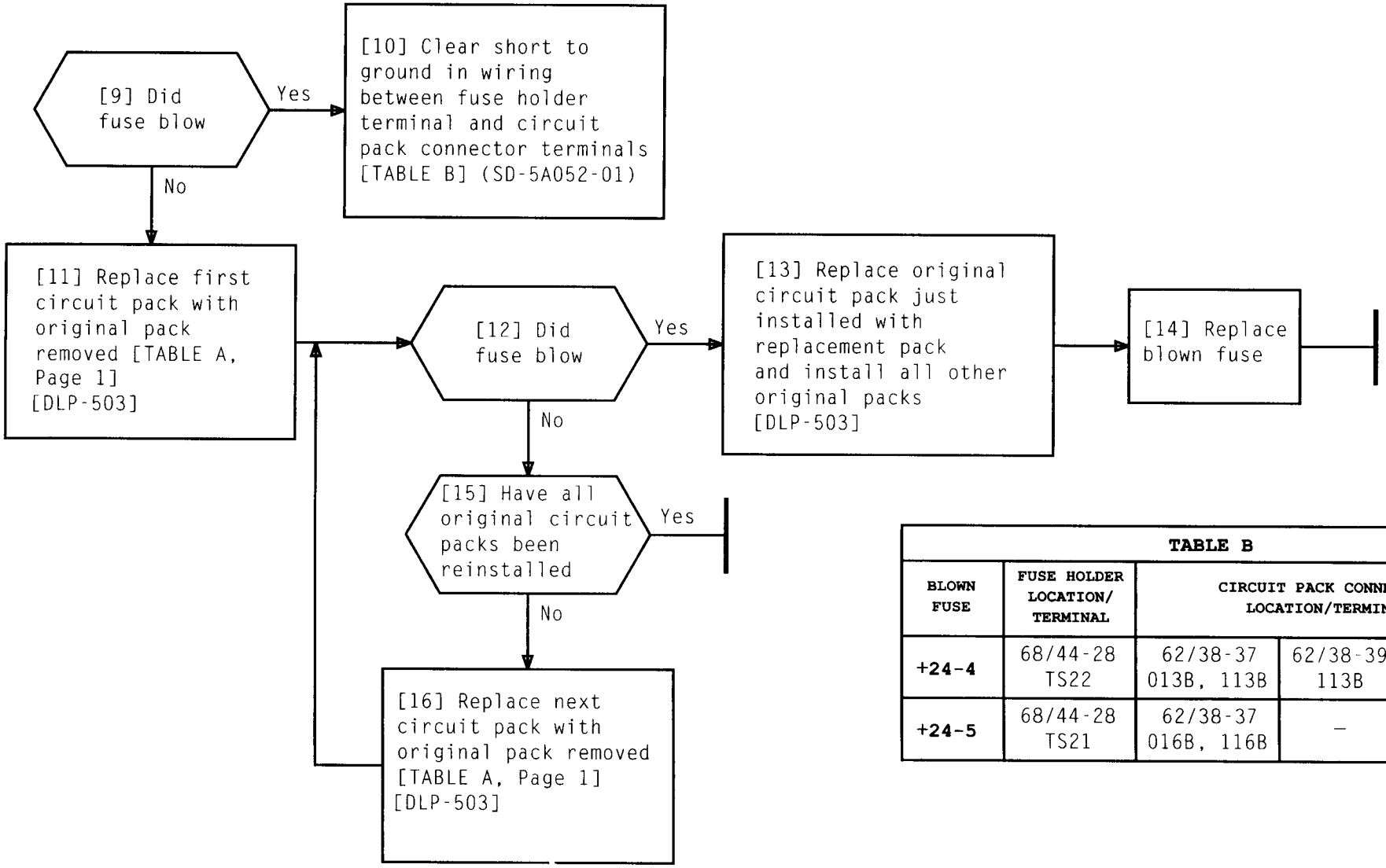
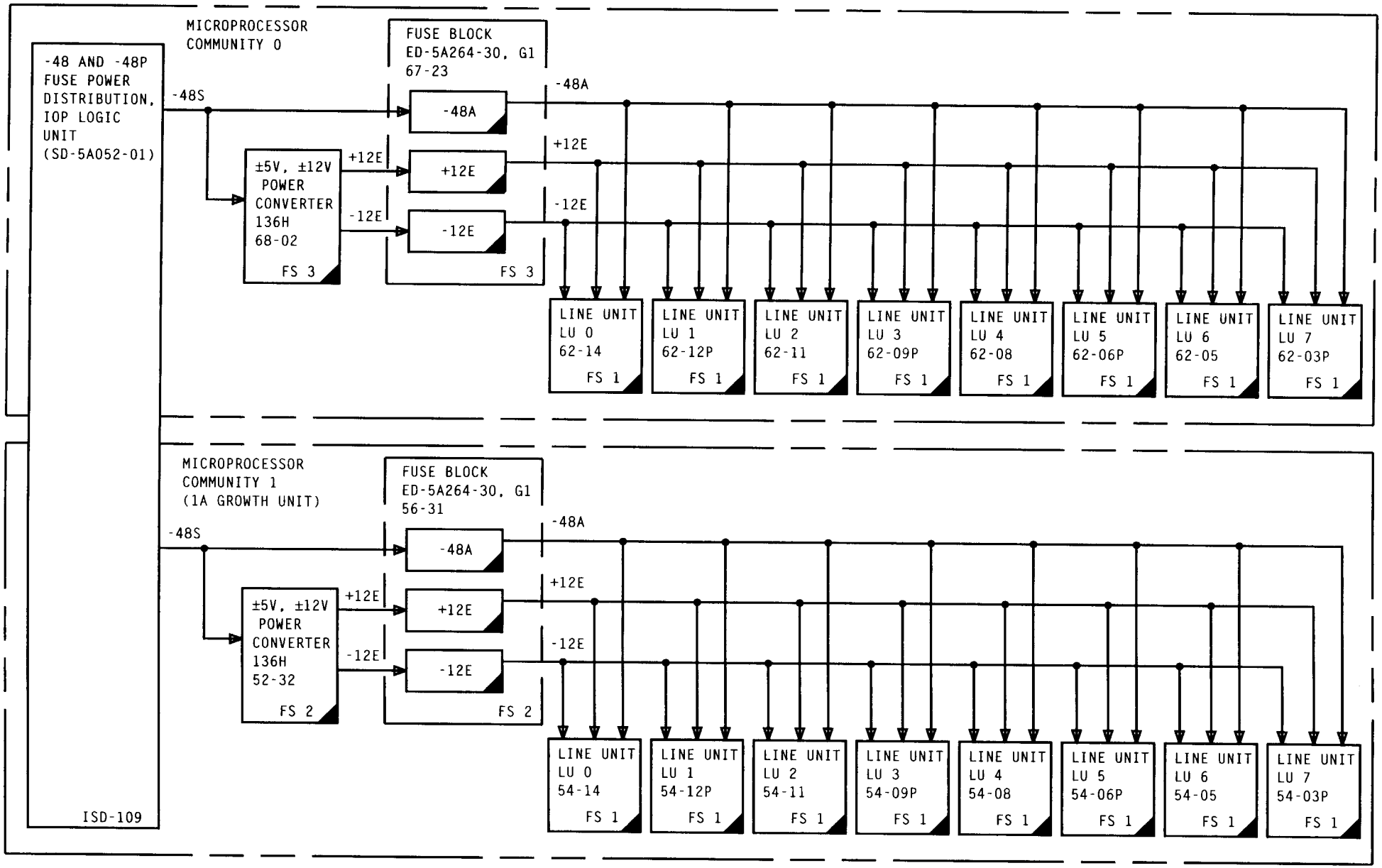


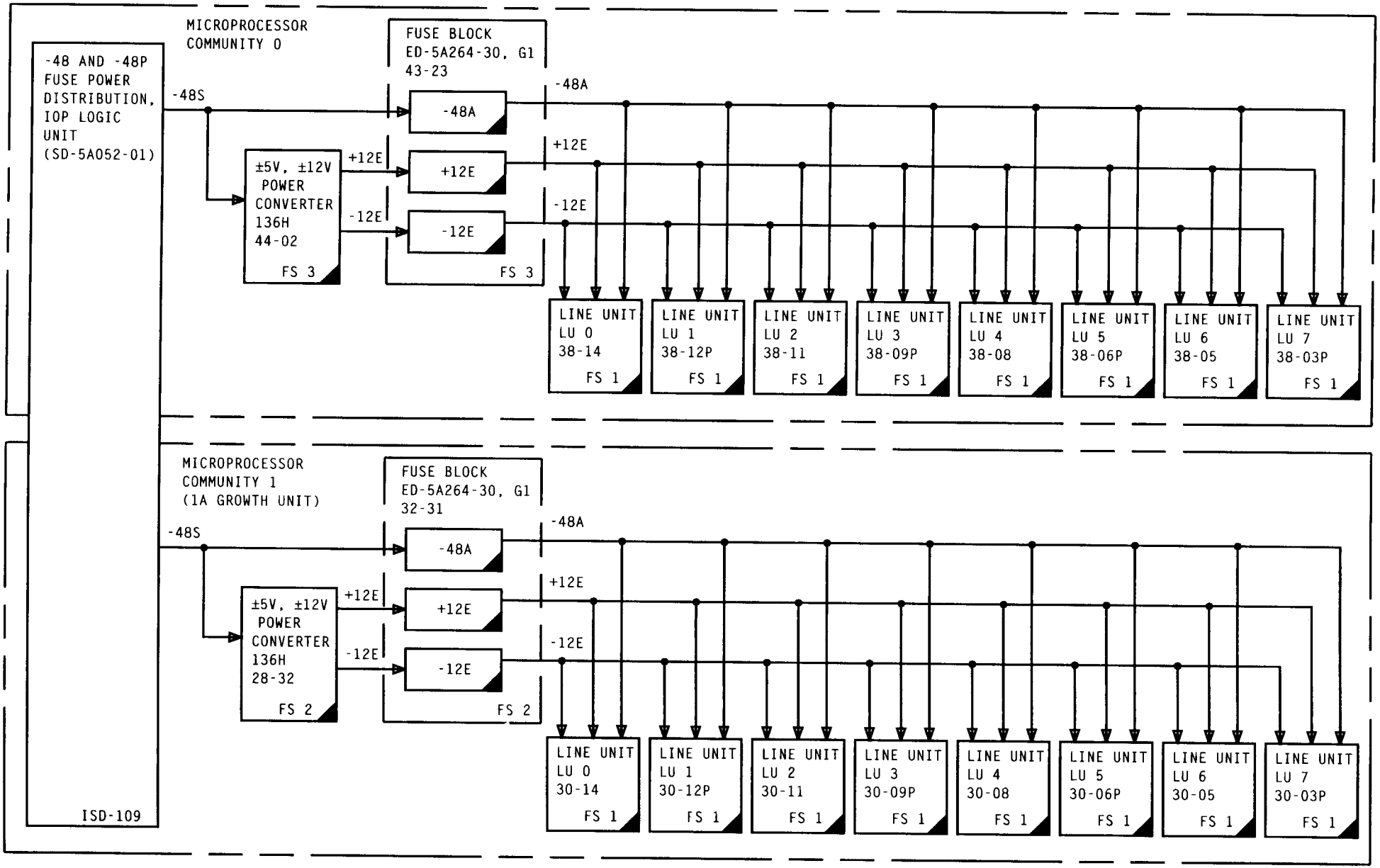
TABLE B

BLOWN FUSE	FUSE HOLDER LOCATION/ TERMINAL	CIRCUIT PACK CONNECTOR LOCATION/TERMINAL		
+24-4	68/44-28 TS22	62/38-37 013B, 113B	62/38-39 113B	62/38-41 113B
+24-5	68/44-28 TS21	62/38-37 016B, 116B	–	–

CLEAR BLOWN +24-4 OR +24-5 FUSE, IOP LOGIC UNIT (SD-5A052-01)



-48A AND ±12E FUSE POWER DISTRIBUTION, IOP A LOGIC UNIT (SD-5A052-01) WITH 1A GROWTH UNIT (SD-4C049-01)



-48A AND ±12E FUSE POWER DISTRIBUTION, IOP B LOGIC UNIT (SD-5A052-01) WITH 1A GROWTH UNIT (SD-4C049-01)

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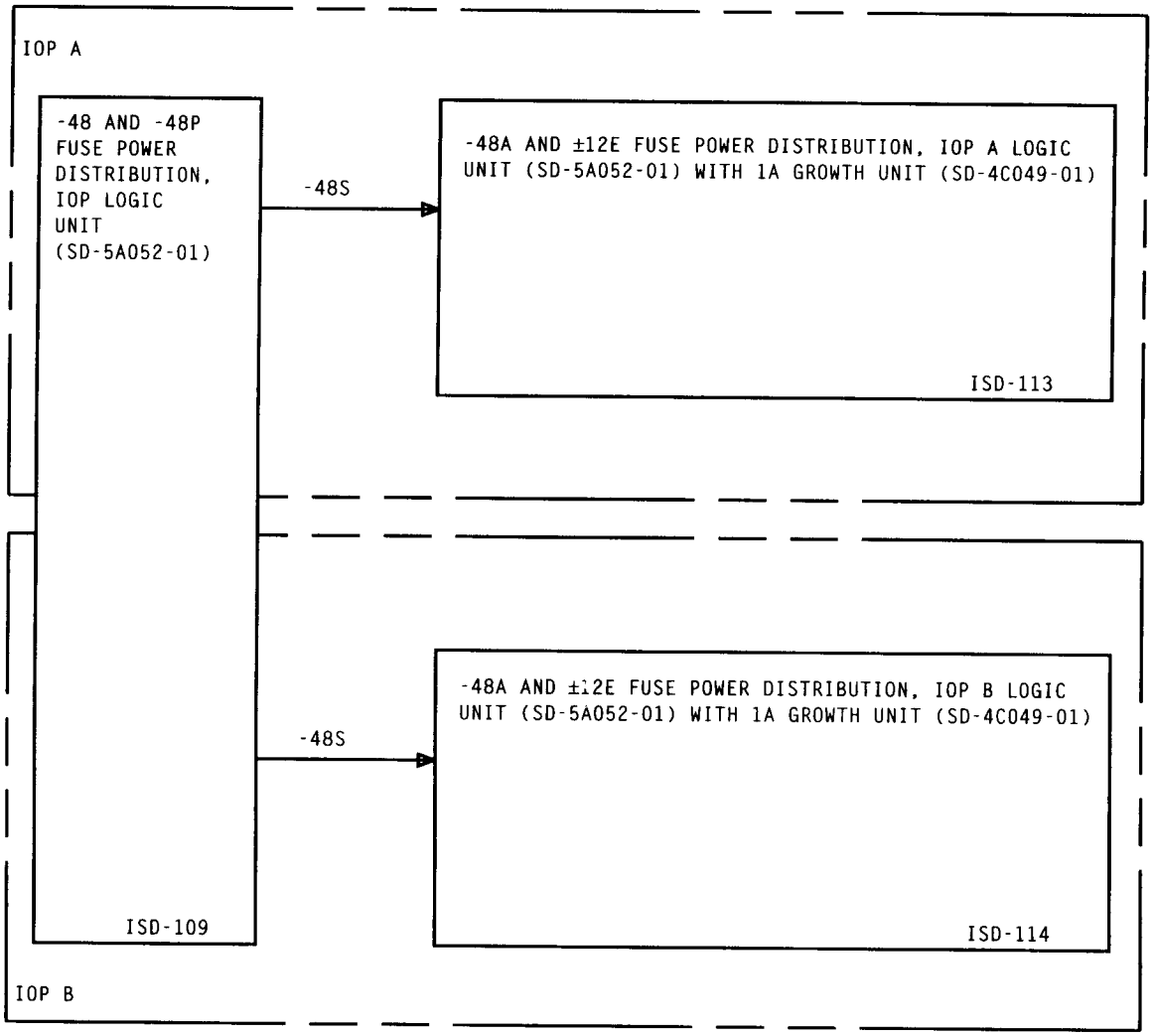


-48A AND ±12E FUSE POWER DISTRIBUTION, IOP LOGIC UNITS (SD-5A052-01) WITH 1A GROWTH UNIT (SD-4C049-01)

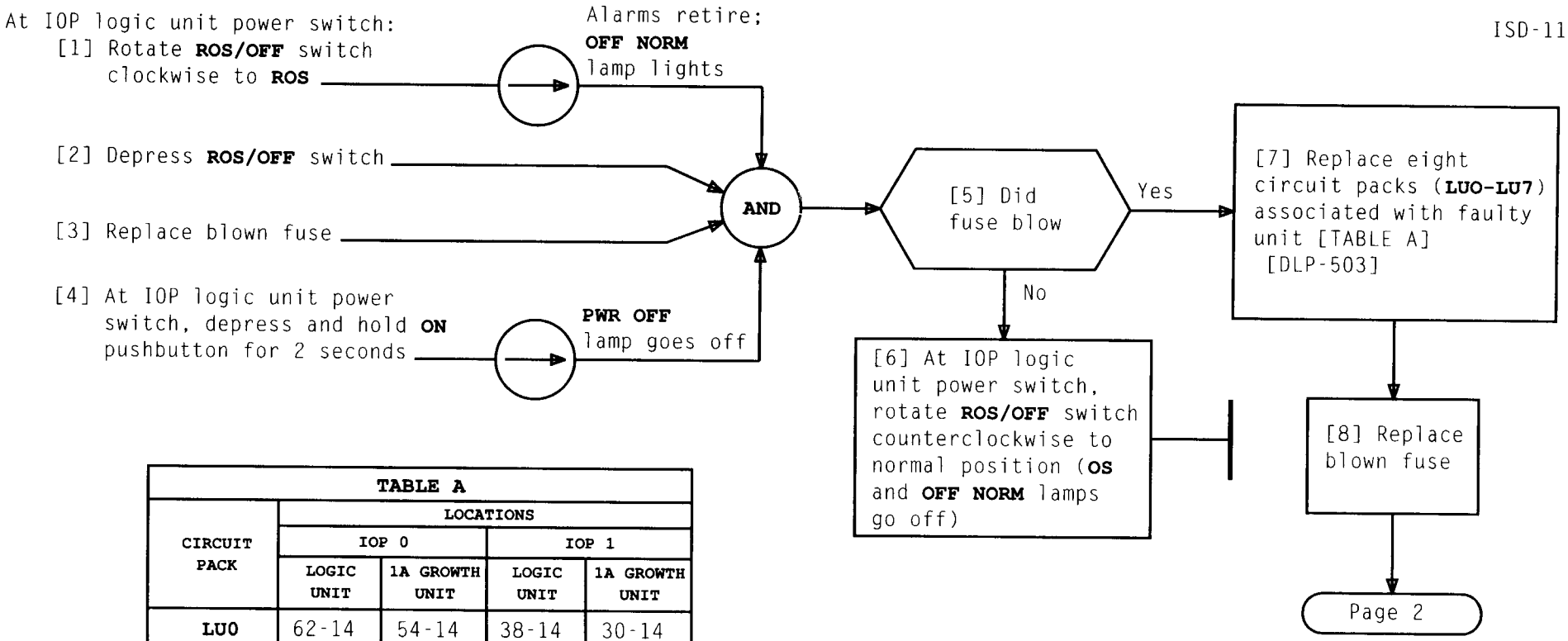


TABLE A

CIRCUIT PACK	LOCATIONS			
	IOP 0		IOP 1	
	LOGIC UNIT	1A GROWTH UNIT	LOGIC UNIT	1A GROWTH UNIT
LU0	62-14	54-14	38-14	30-14
LU1	62-12P	54-12P	38-12P	30-12P
LU2	62-11	54-11	38-11	30-11
LU3	62-09P	54-09P	38-09P	30-09P
LU4	62-08	54-08	38-08	30-08
LU5	62-06P	54-06P	38-06P	30-06P
LU6	62-05	54-05	38-05	30-05
LU7	62-03P	54-03P	38-03P	30-03P

CLEAR BLOWN +12E, −12E, OR −48A FUSE, IOP LOGIC UNIT (SD-5A052-01) OR 1A GROWTH UNIT (SD-4C049-01)

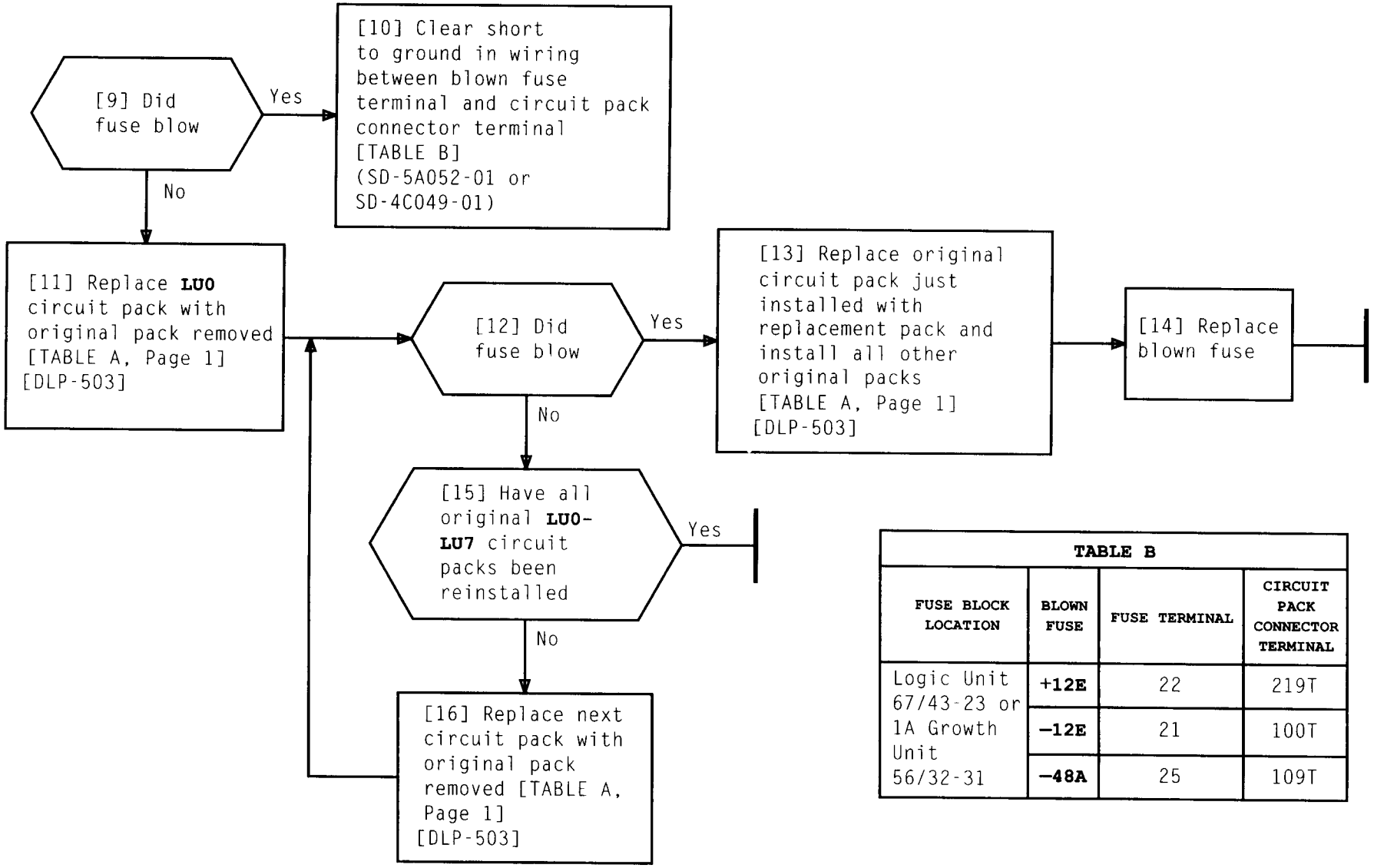
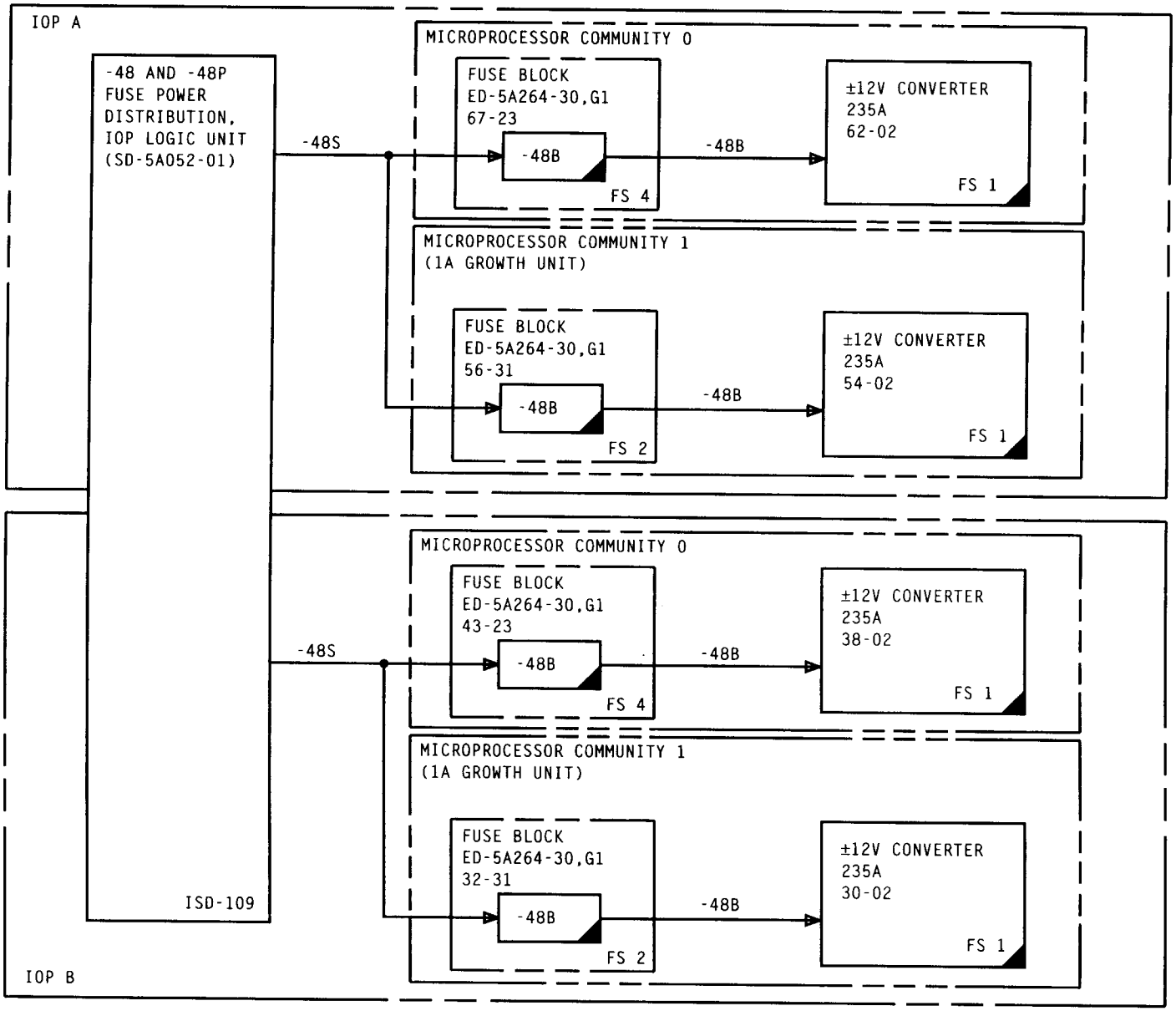


TABLE B

FUSE BLOCK LOCATION	BLOWN FUSE	FUSE TERMINAL	CIRCUIT PACK CONNECTOR TERMINAL
Logic Unit 67/43-23 or 1A Growth Unit 56/32-31	**+12E**	22	219T
	−12E	21	100T
	−48A	25	109T

CLEAR BLOWN +12E, −12E, OR −48A FUSE, IOP LOGIC UNIT (SD-5A052-01) OR 1A GROWTH UNIT (SD-4C049-01)



-48B FUSE POWER DISTRIBUTION, IOP LOGIC UNITS (SD-5A052-01) WITH 1A GROWTH UNIT (SD-4C049-01)

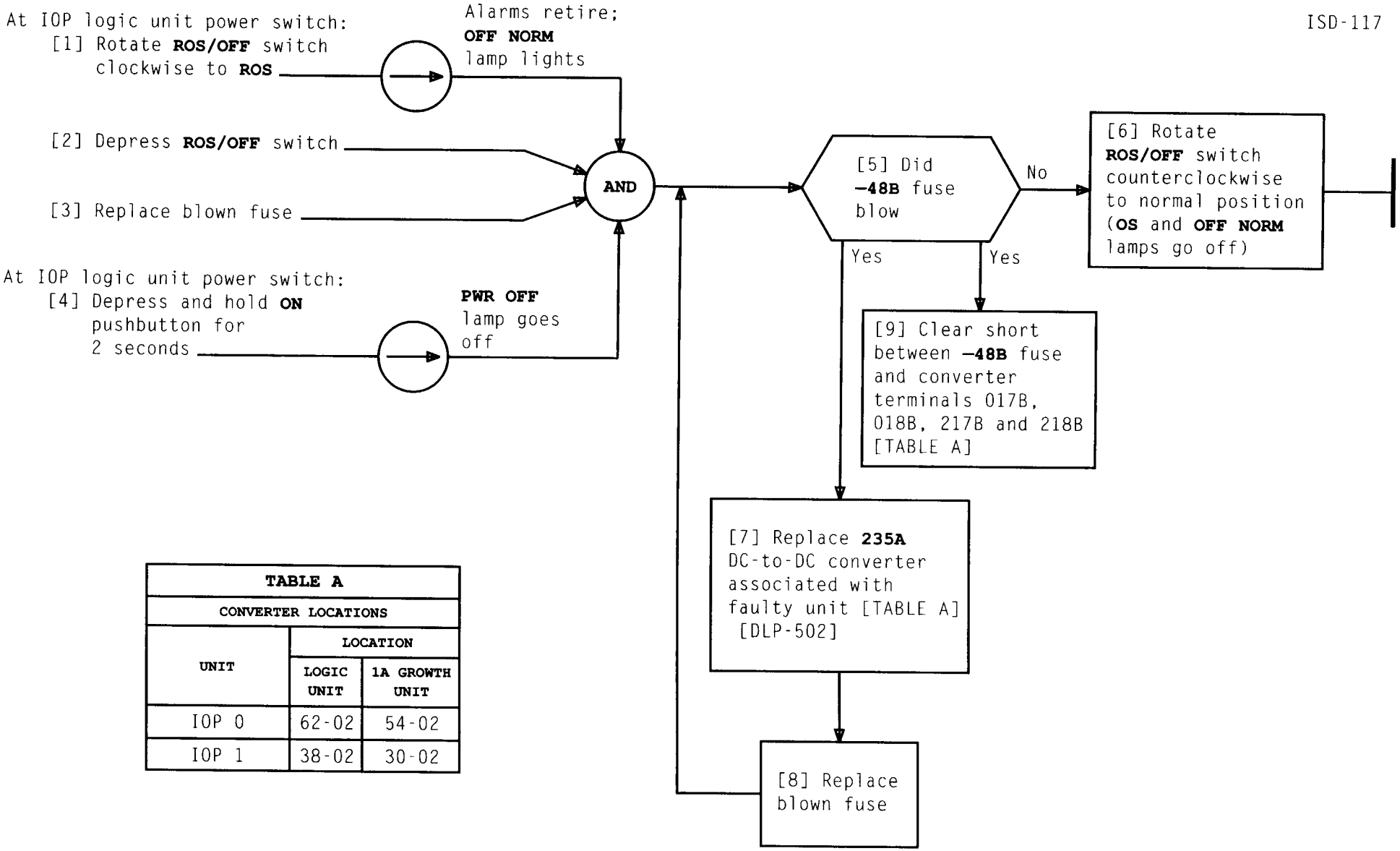


TABLE A

CONVERTER LOCATIONS

UNIT	LOCATION	
	LOGIC UNIT	1A GROWTH UNIT
IOP 0	62-02	54-02
IOP 1	38-02	30-02

CLEAR BLOWN −48B FUSE, IOP LOGIC UNIT (SD-5A052-01)

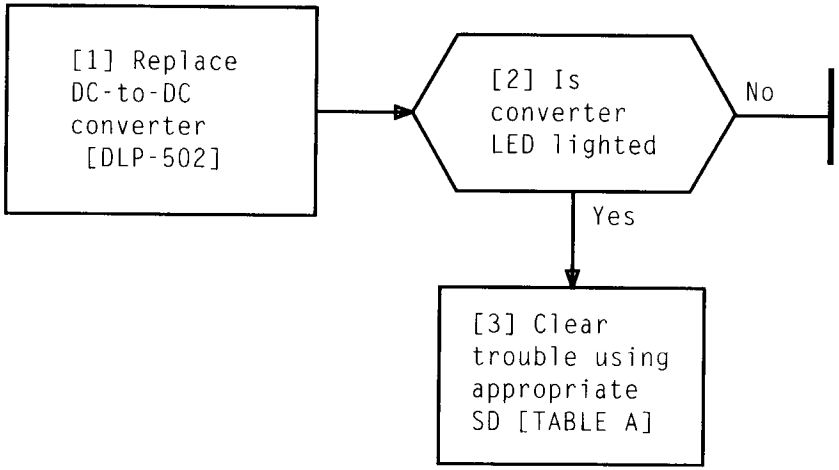
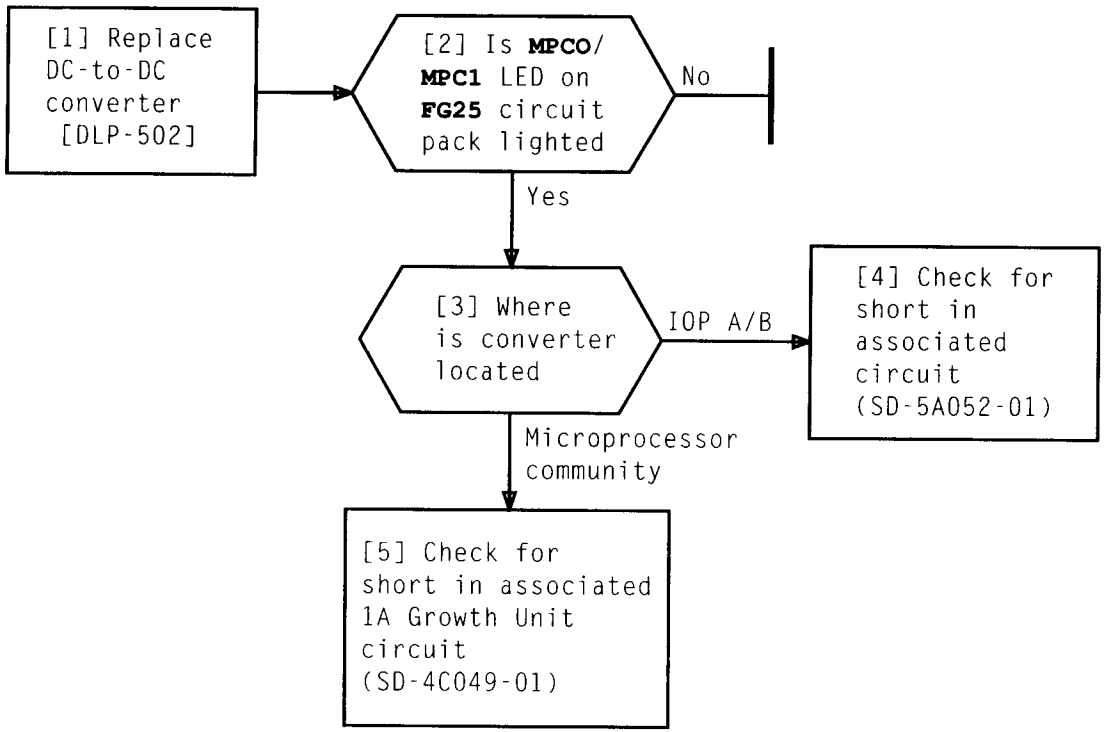


TABLE A

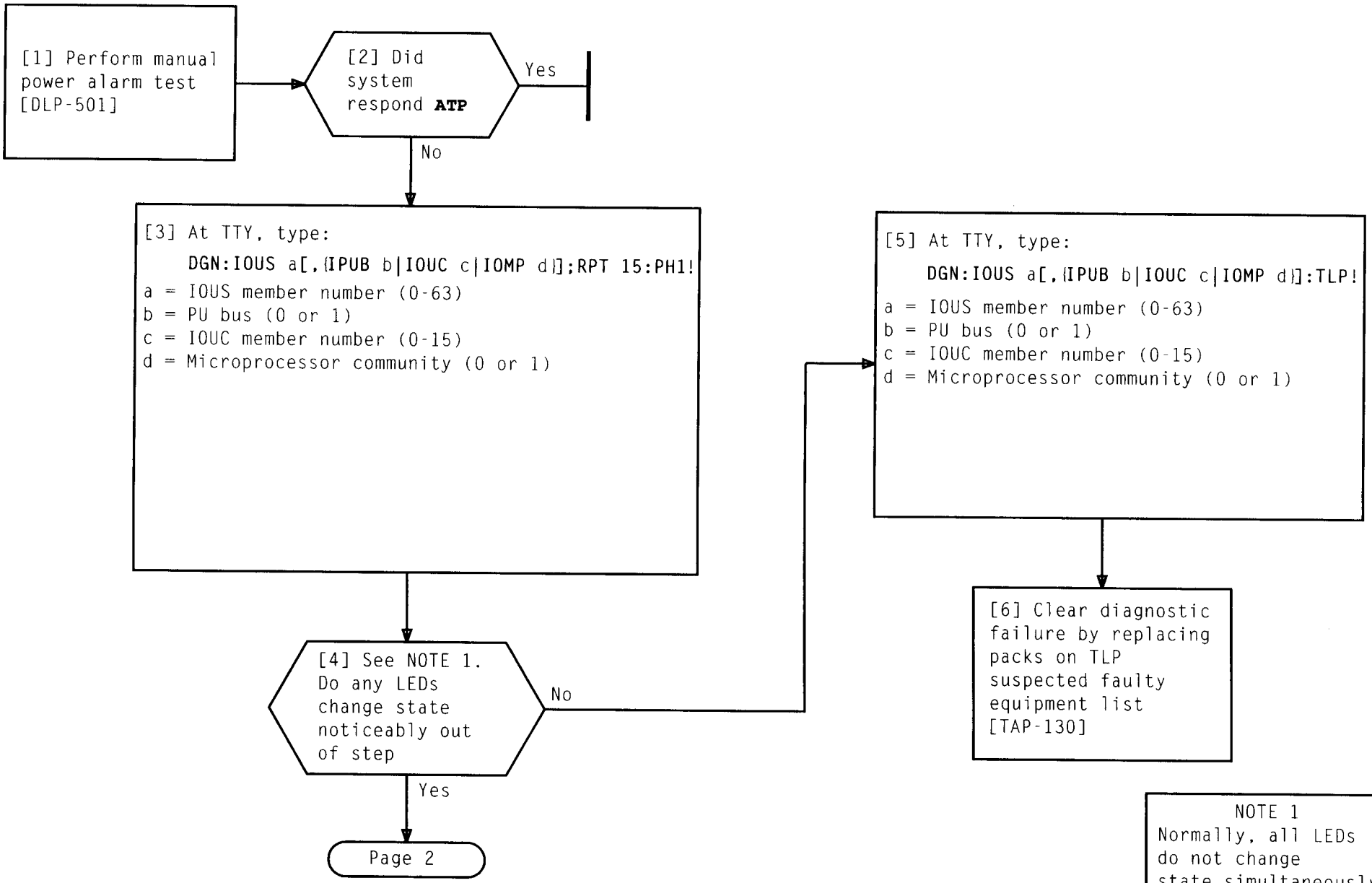
UNIT	UNIT SD
IOP bus unit	SD-5A052-01
IOP logic unit	SD-5A052-01 and SD-5A049-01
1A growth unit *	SD-4C049-01

* Optional units

CLEAR LIGHTED CONVERTER LED, FUSE NOT BLOWN



CLEAR LIGHTED MICROPROCESSOR CONTROL LED, FUSE NOT BLOWN (SD-5A052-01)



CLEAR AUTOMATIC POWER MONITOR TEST FAILURE

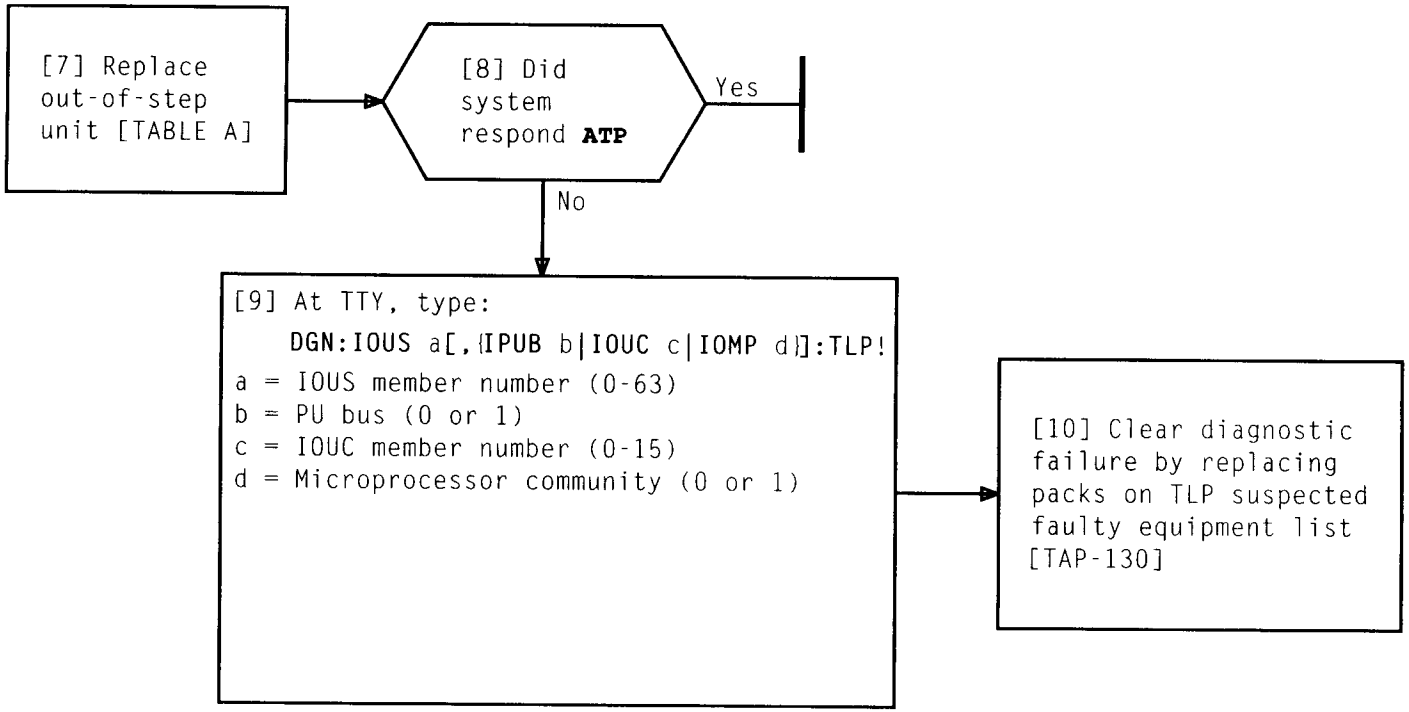
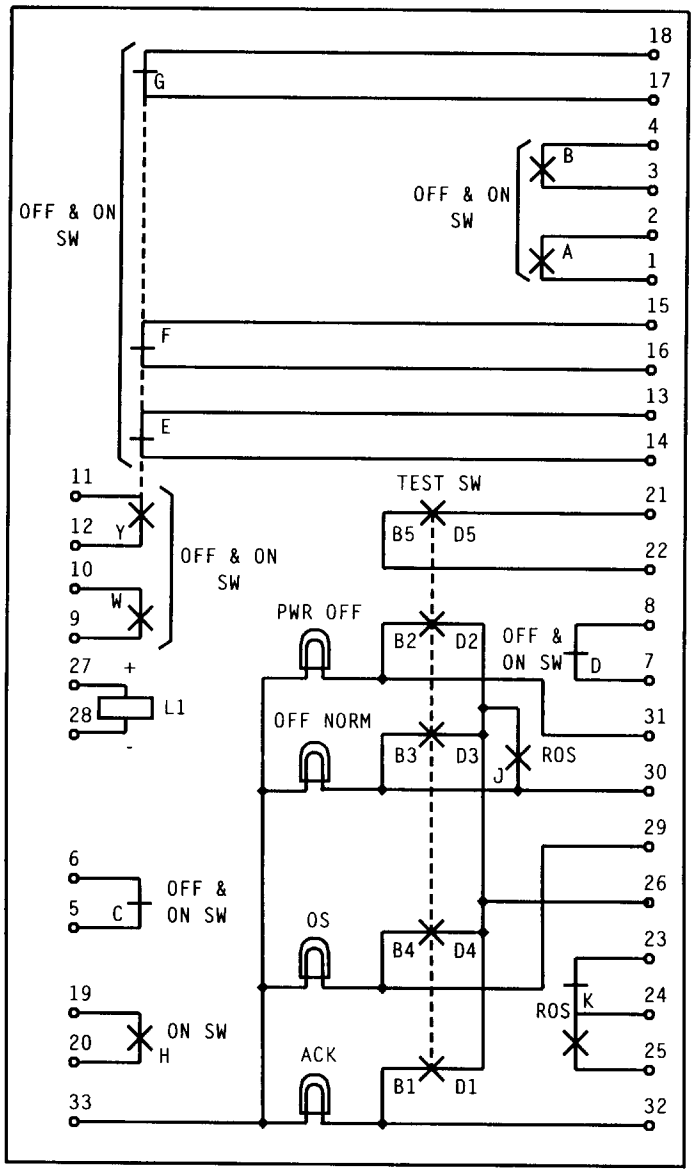


TABLE A

UNIT	PROCEDURE
Circuit pack	DLP-503
Converter	DLP-502

CLEAR AUTOMATIC POWER MONITOR TEST FAILURE



POWER SWITCH (KS-20738)

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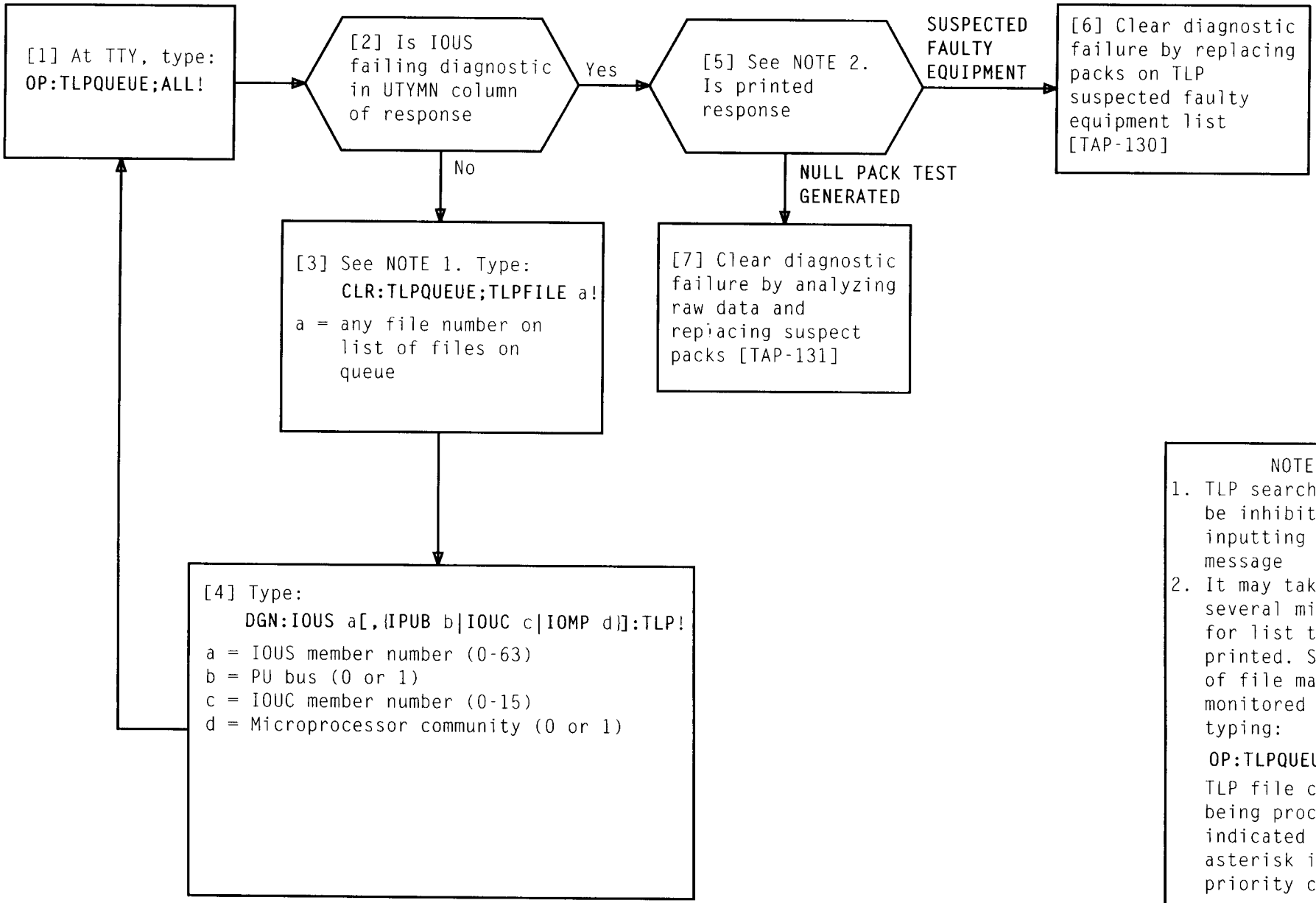


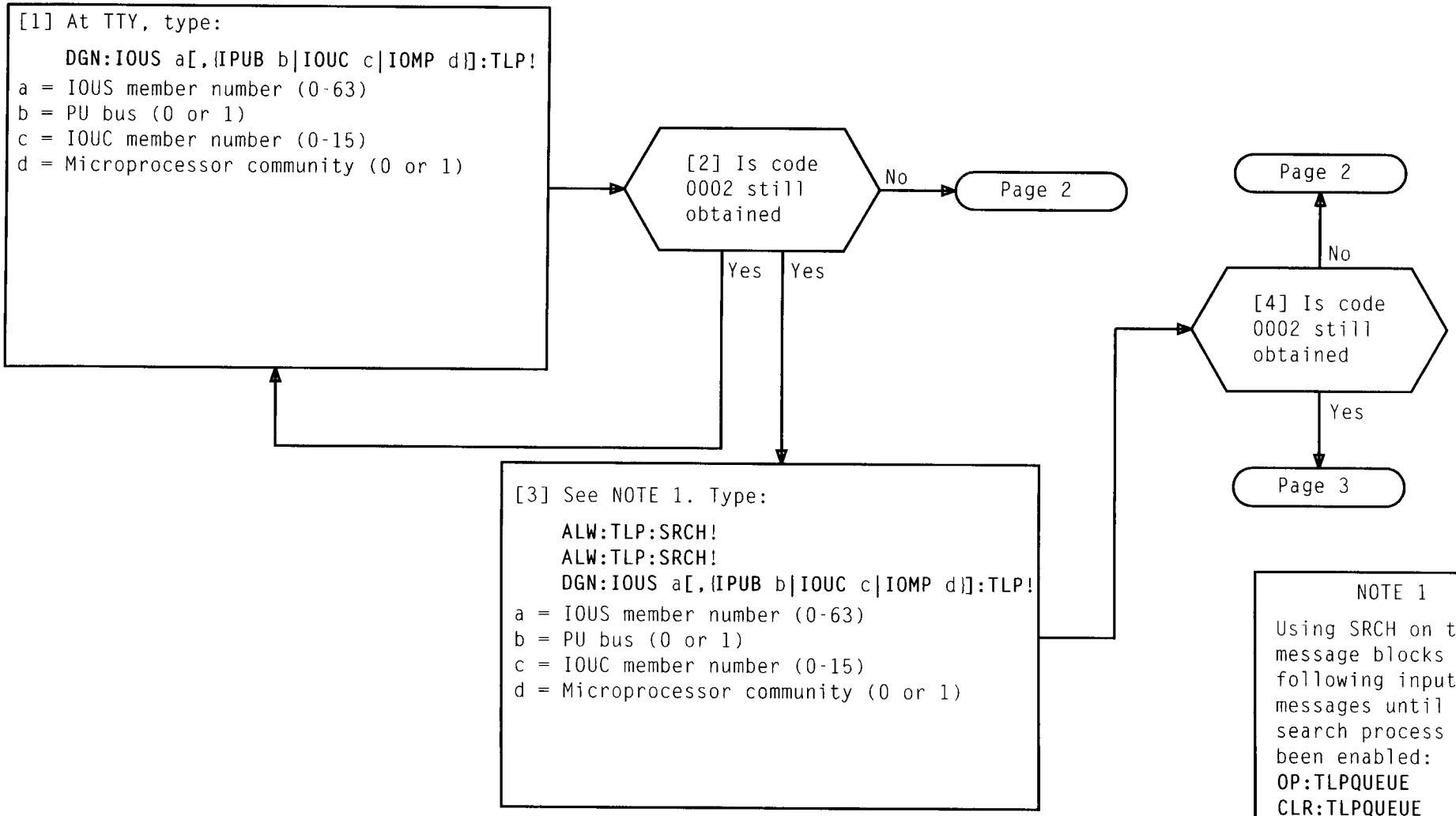
NOTES

1. TLP searches may be inhibited after inputting this message
2. 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

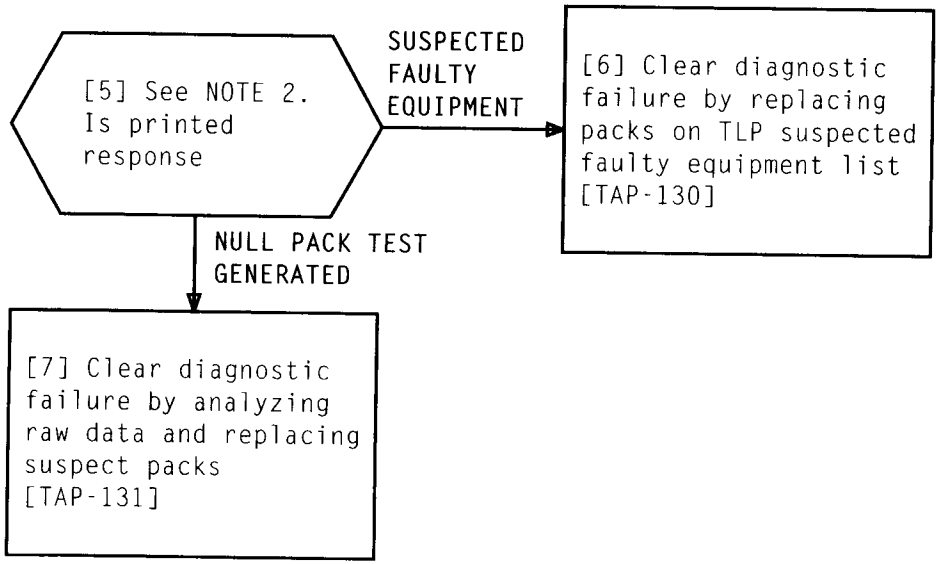
CLEAR DIAGNOSTIC FAILURE, TLP DISK QUEUE FULL



NOTE 1

Using SRCH on this message blocks 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
input message

CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE



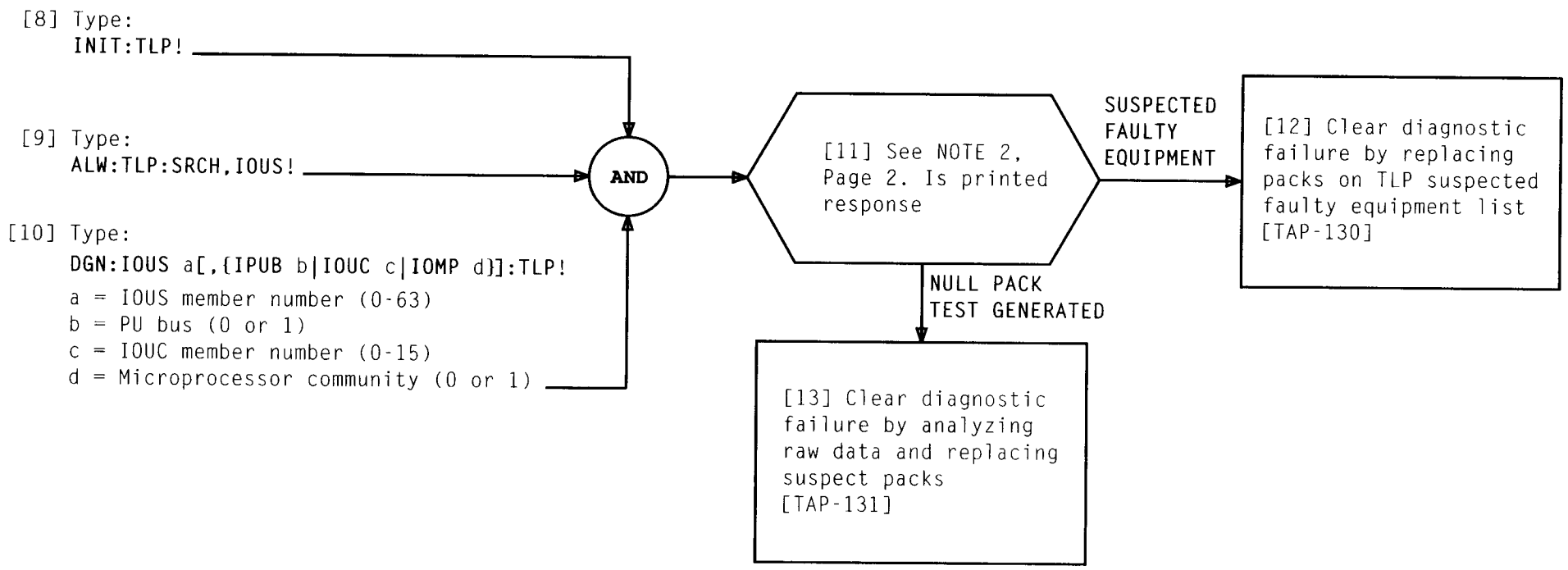
NOTE 2

It may take several minutes for list to be printed. Status of file may be monitored by typing:

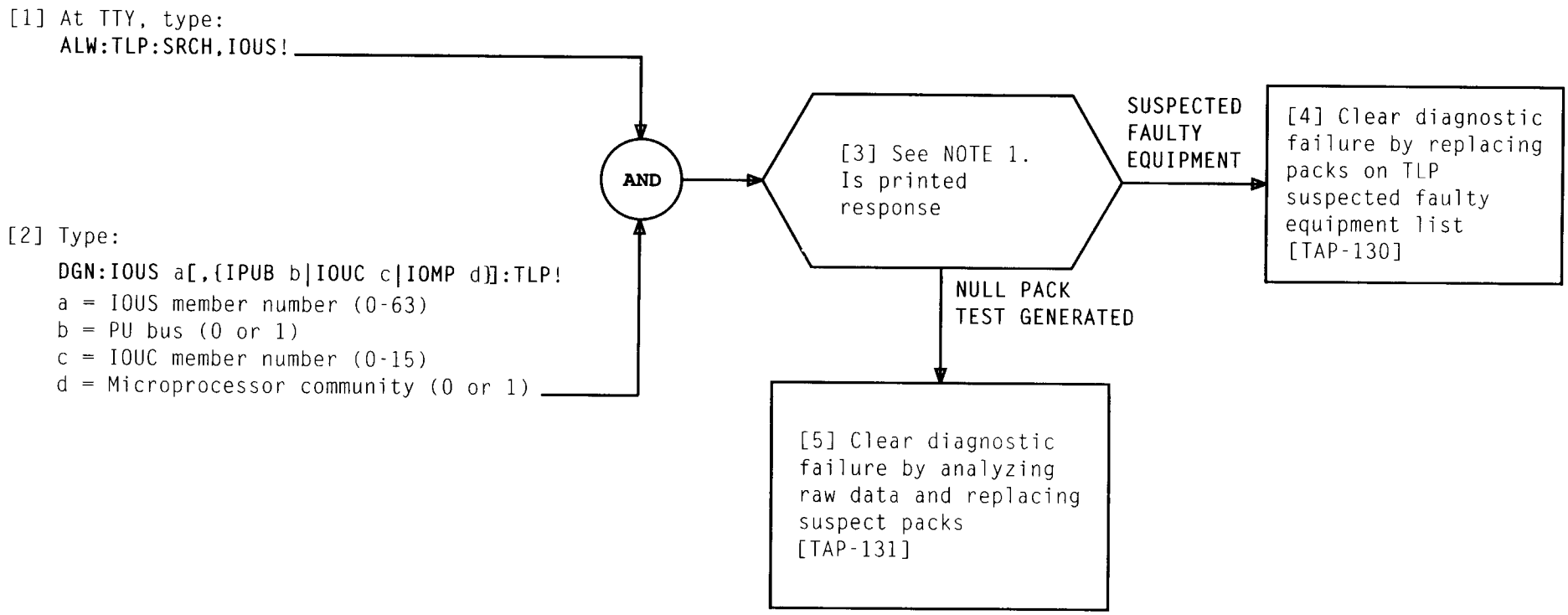
OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE



CLEAR DIAGNOSTIC FAILURE, TLP QUEUE BLOCKAGE

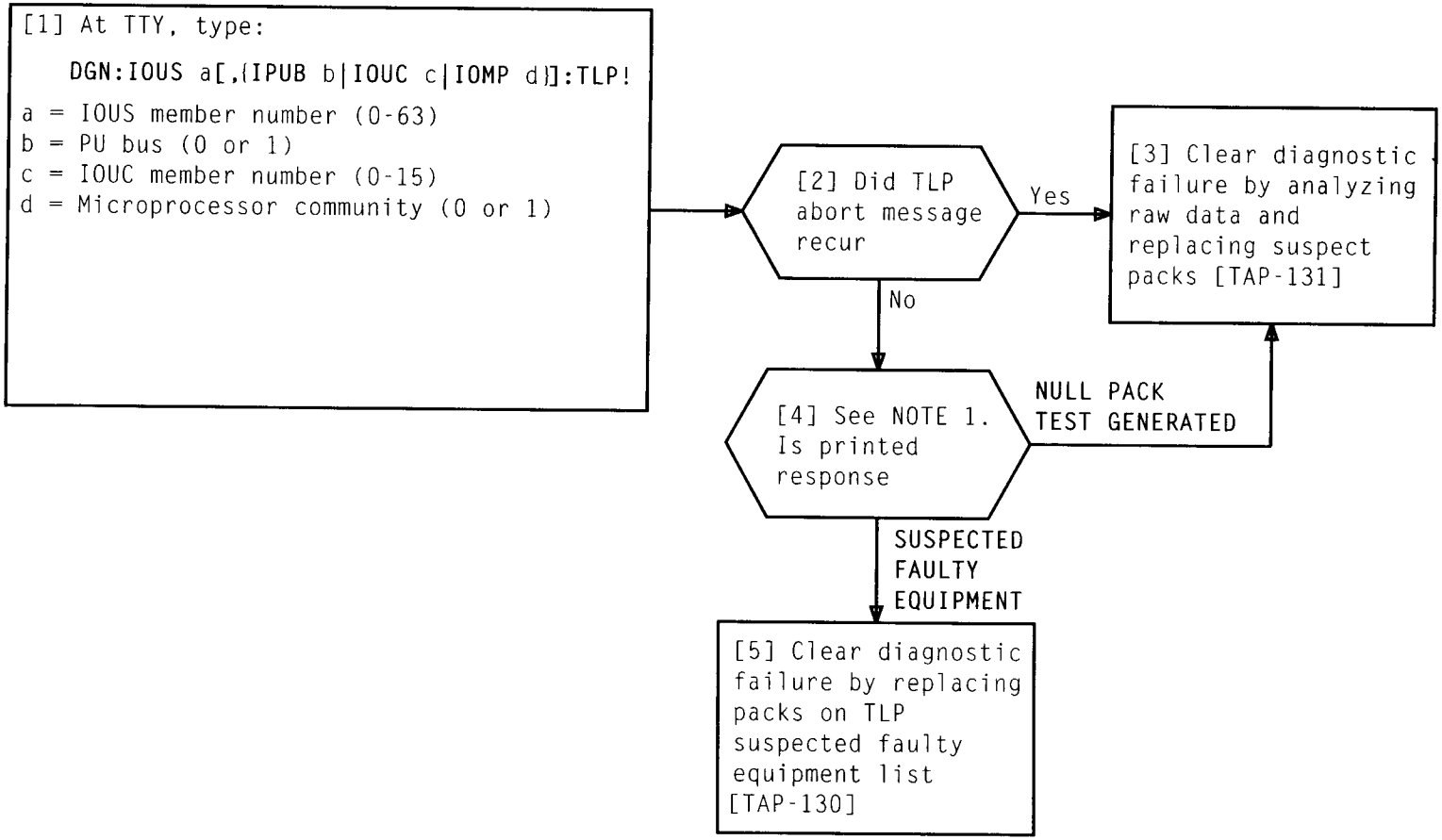


NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing:

OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

CLEAR DIAGNOSTIC FAILURE, TLP INHIBIT

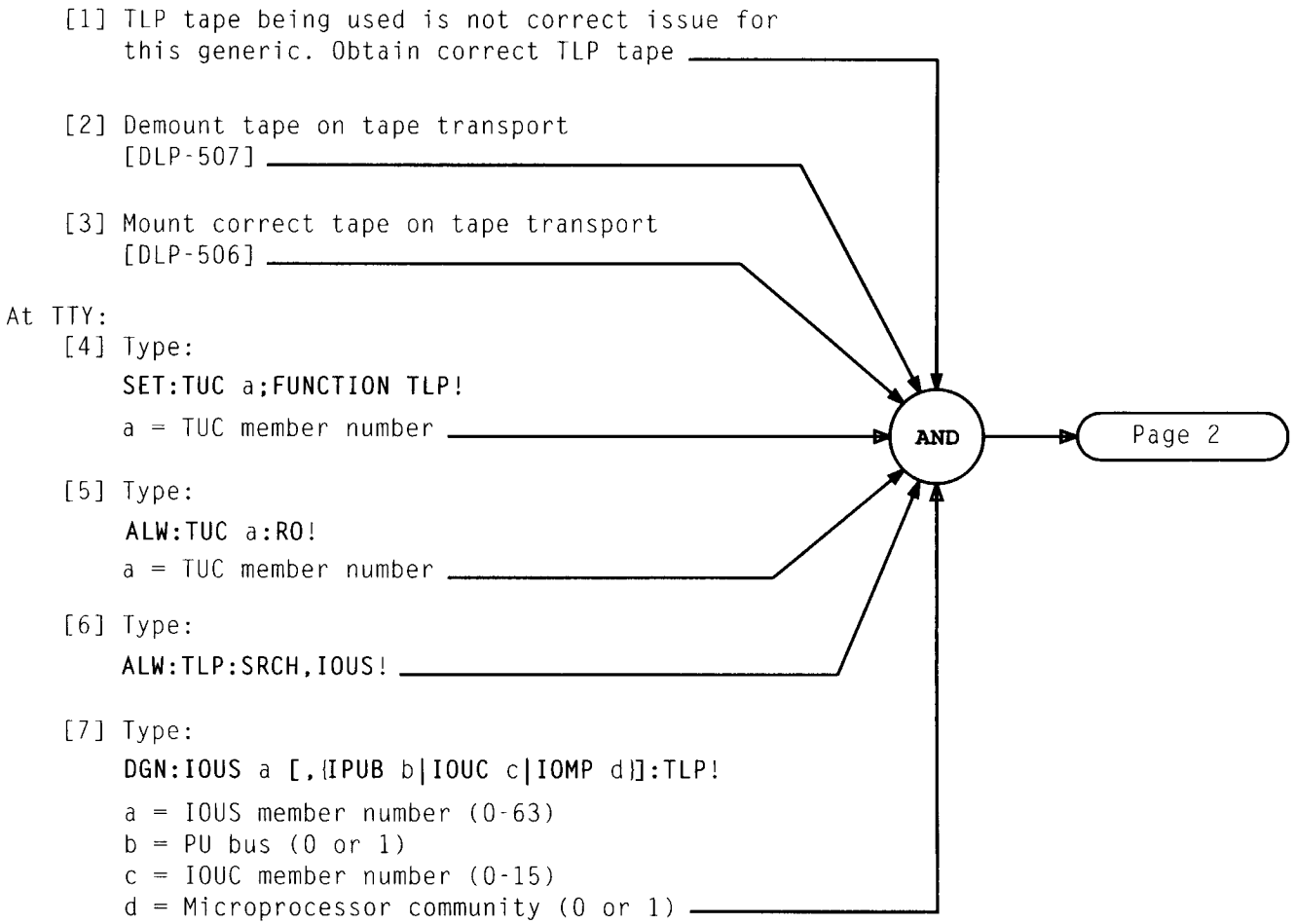


NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing:

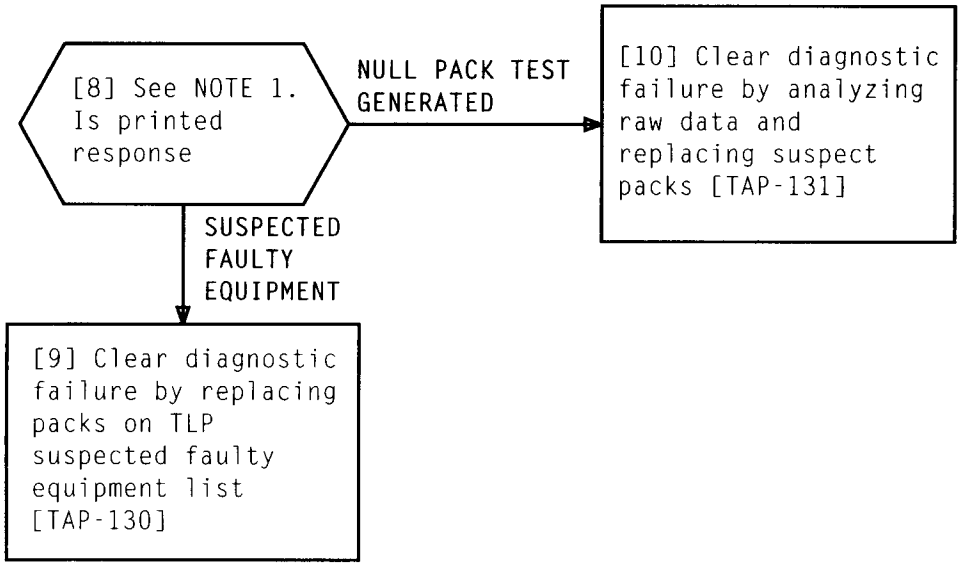
OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

CLEAR DIAGNOSTIC FAILURE, TLP ABORT



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

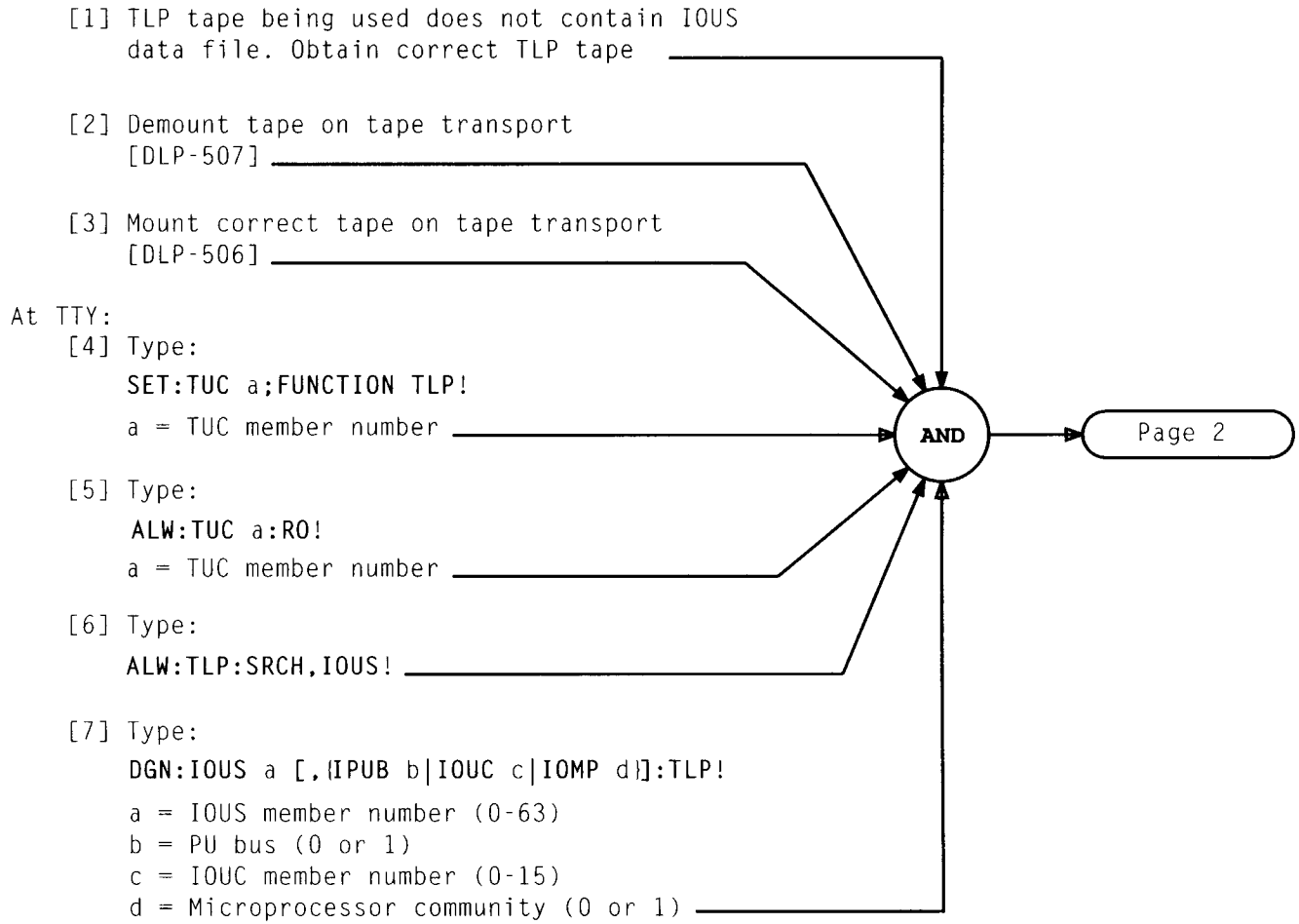


NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing:

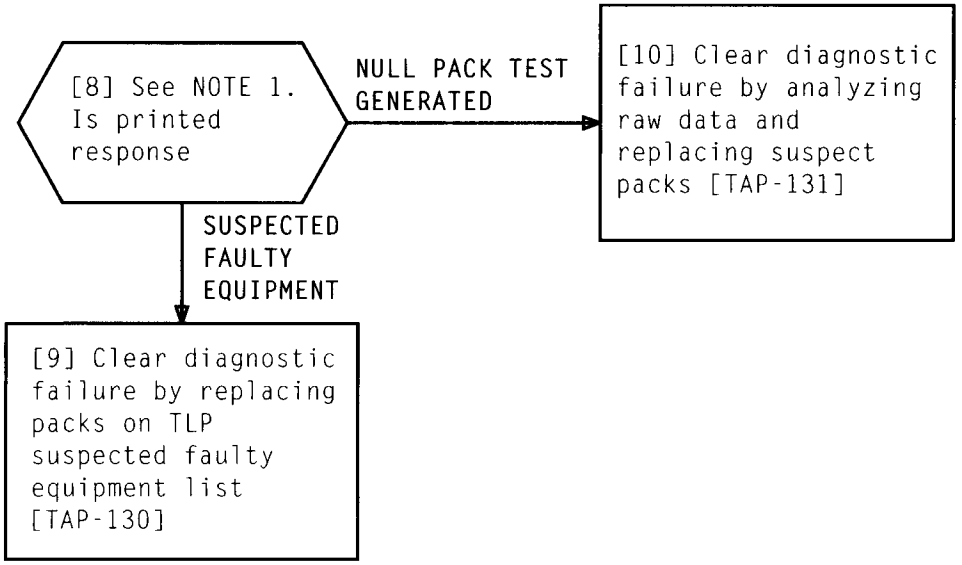
OP:TLPQUEUE;ALL!

TLP file currently being processed is indicated by asterisk in priority column

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



CLEAR IAGNOSTIC FAILURE, TLP TAPE ACQUISITION ERROR



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

CLEAR DIAGNOSTIC FAILURE, TLP TAPE ACQUISITION ERROR

[1] If required, demount tape on tape transport [DLP-507]

[2] Obtain and mount appropriate tape [DLP-506]

AND

[3] At TTY, type:

```
SET:TUC a;FUNCTION TLP!
ALW:TUC a:RO!
ALW:TLP:SRCH,IOUS!
DGN:IOUS b [,(IPUB c|IOUC d|IOMP e)]:TLP!
```

a = TUC member number
b = IOUS member number (0-63)
c = PU bus (0 or 1)
d = IOUC member number (0-15)
e = Microprocessor community (0 or 1)

[4] See NOTE 1. Is printed response

SUSPECTED FAULTY EQUIPMENT

[6] Clear diagnostic failure by replacing packs on TLP suspected faulty equipment list [TAP-130]

NULL PACK TEST GENERATED

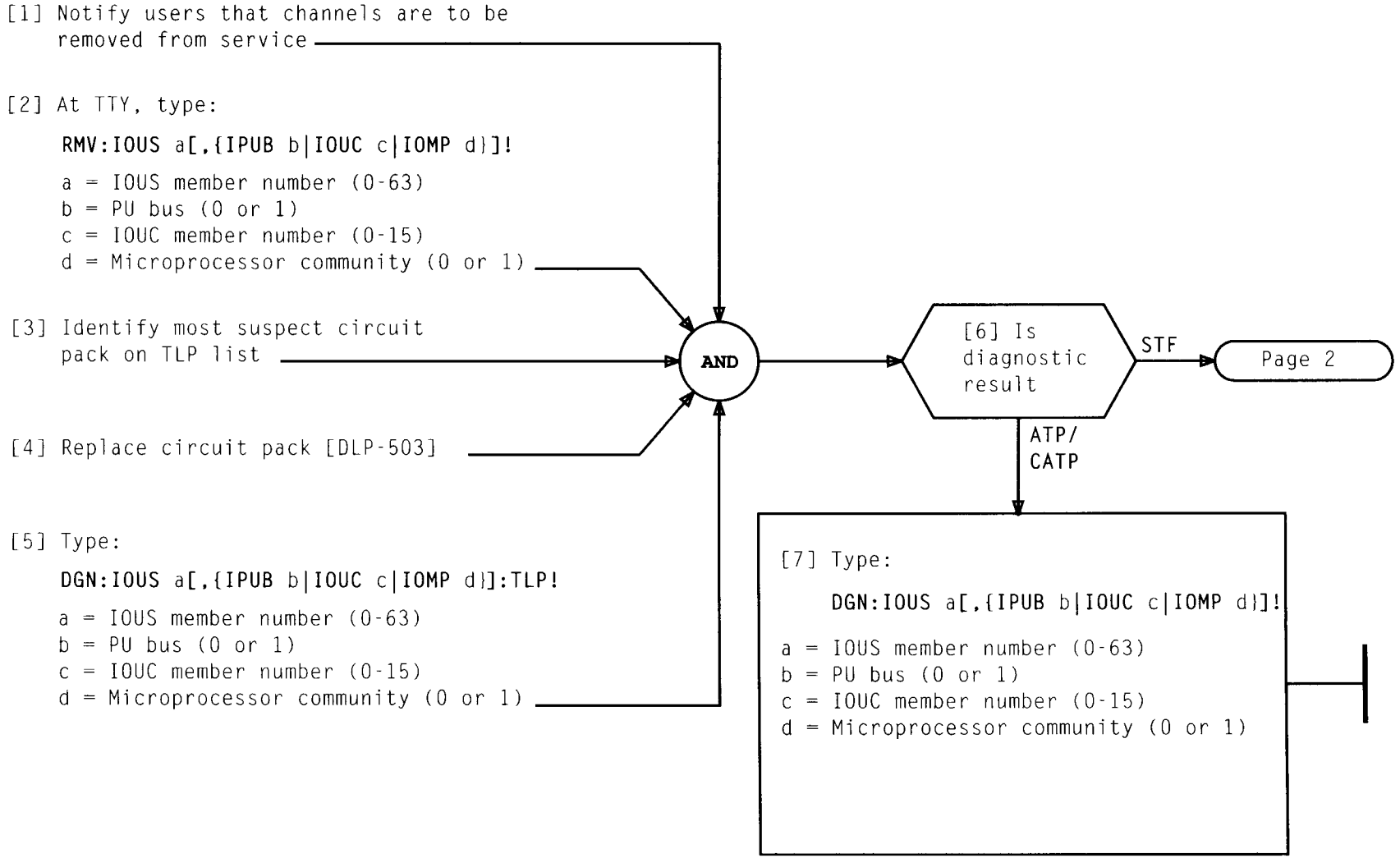
[5] Clear diagnostic failure by analyzing raw data and replacing suspect packs [TAP-131]

NOTE 1
It may take several minutes for list to be printed. Status of file may be monitored by typing:

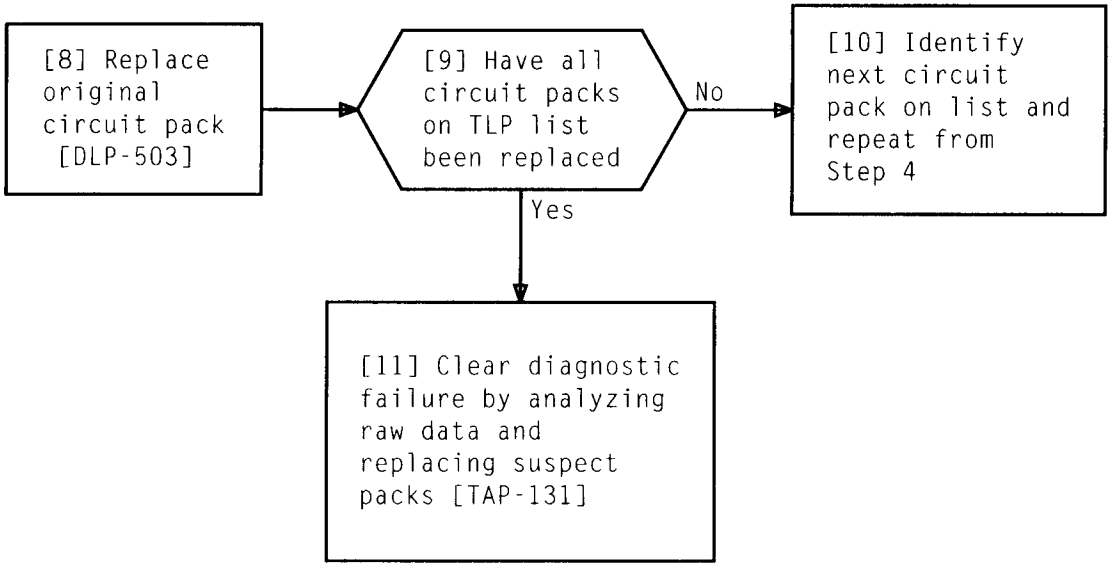
OP:TLPQUEUE;ALL!

TLP file, currently being processed, is indicated by asterisk in priority column

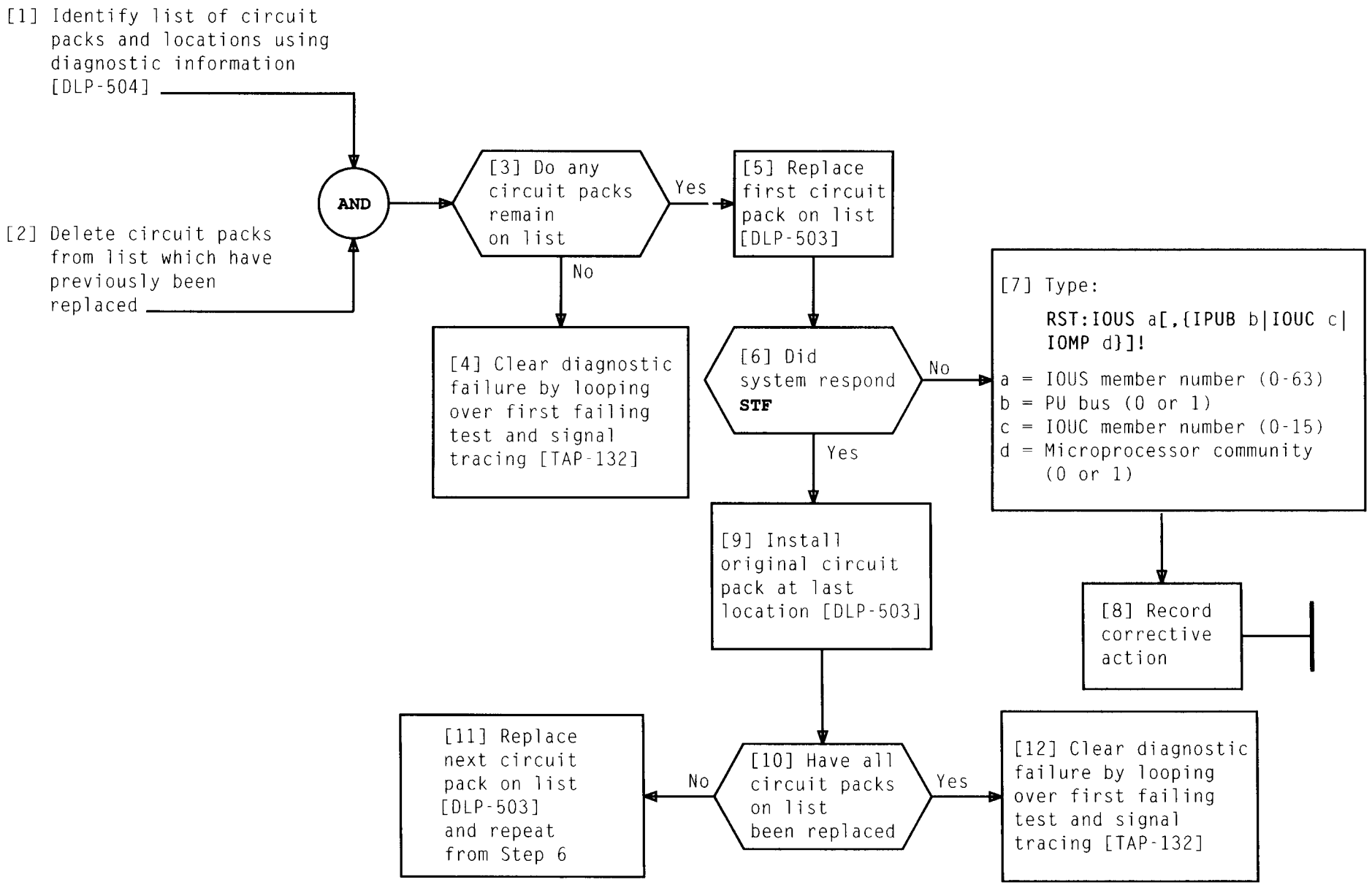
CLEAR DIAGNOSTIC FAILURE, TLP TAPE NOT MOUNTED



CLEAR DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST



CLEAR DIAGNOSTIC FAILURE BY REPLACING PACKS ON TLP SUSPECTED FAULTY EQUIPMENT LIST



CLEAR DIAGNOSTIC FAILURE BY ANALYZING RAW DATA AND REPLACING SUSPECT PACKS

[1] Obtain and power up oscilloscope allowing period for scope to stabilize

[2] Determine looping parameters [DLP-508]

At TTY:

[3] See NOTE 1. Type:

EX:IOUS a,IOUC b;START!

a = IOUS member number (0-63)
b = IOUC member number (0-15)

AND

Page 2

[4] Type:

EX:IOUS a:SYNC b,ENABLE c!

a = IOUS member number (0-63)
b = failing phase
c = failing test number

[5] Type:

EX:IOUS a;RPT 2:PH b,ADR c!

a = IOUS member number (0-63)
b = failing phase
c = looping address range

NOTE 1

To discontinue looping condition, MACLI MTCE subclass assigned to frame under test should be identified by typing:

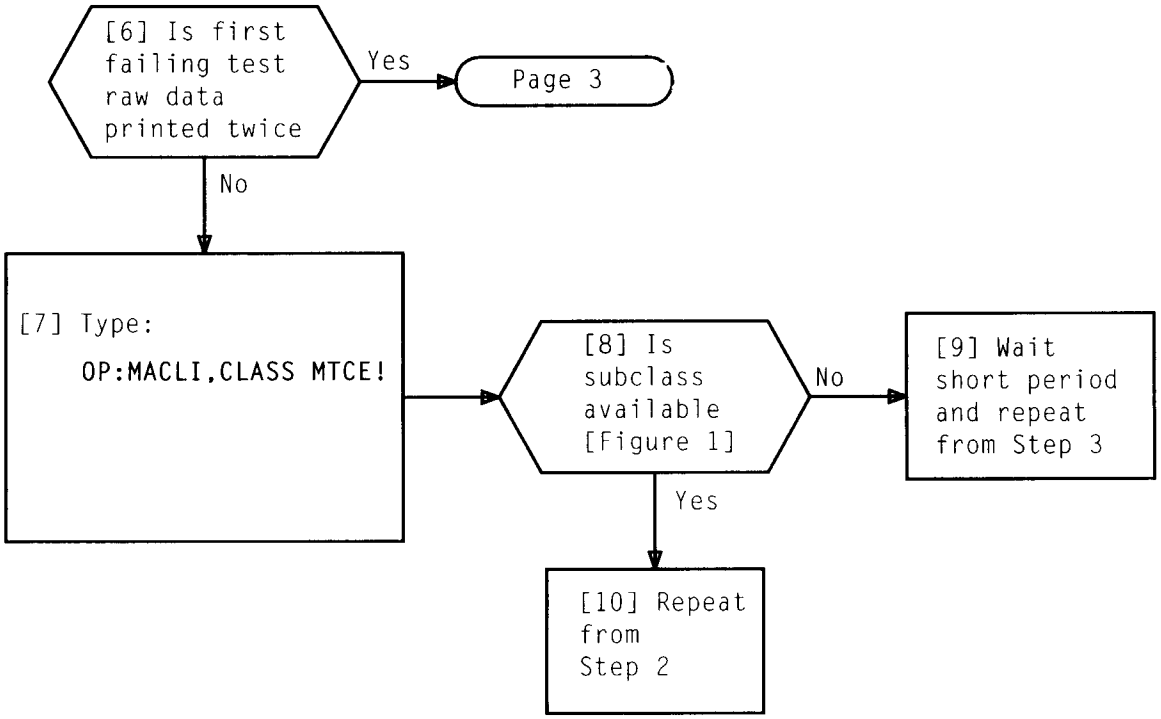
OP:MACLI,CLASS MTCE!

then type:

STOP:MACLI,CLASS MTCE, SUBCLASS a!

a = subclass assigned to frame under test

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




```
M 13 OP:MACLI
    CLASS MTCE SUBCLASS 0 4 69 0 14261252 DT 19
    CLASS MTCE SUBCLASS 1 NONE
    CLASS MTCE SUBCLASS 2 NONE
    #223

    AVAILABLE
    OCCUPIED
```

Figure. 1 — Example of Output Message Showing Status of MACLI

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

[11] Set up oscilloscope [Figure 2]

At TTY:

[12] See NOTE 1. Type:

EX:IOUS a,IOUC b;START!

a = IOUS member number (0-63)
b = IOUC member number (0-15)

[13] Type:

EX:IOUS a:SYNC b,ENABLE c!

a = IOUS member number (0-63)
b = failing phase
c = failing test number

[14] Type:

EX:IOUS a:PH b,ADR c!

a = IOUS member number (0-63)
b = failing phase
c = looping address range

AND

[15] Using frame SD, CD, PK, circuit pack data and raw data analysis information, signal trace path of failing bit to isolate and clear problem [DLP-509]

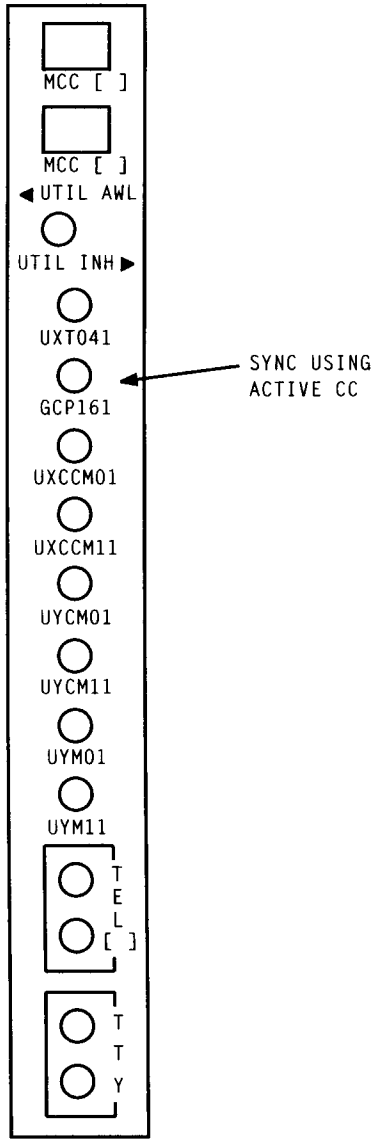


Figure 2 - Sample Layout of MCC Terminal Connectors

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

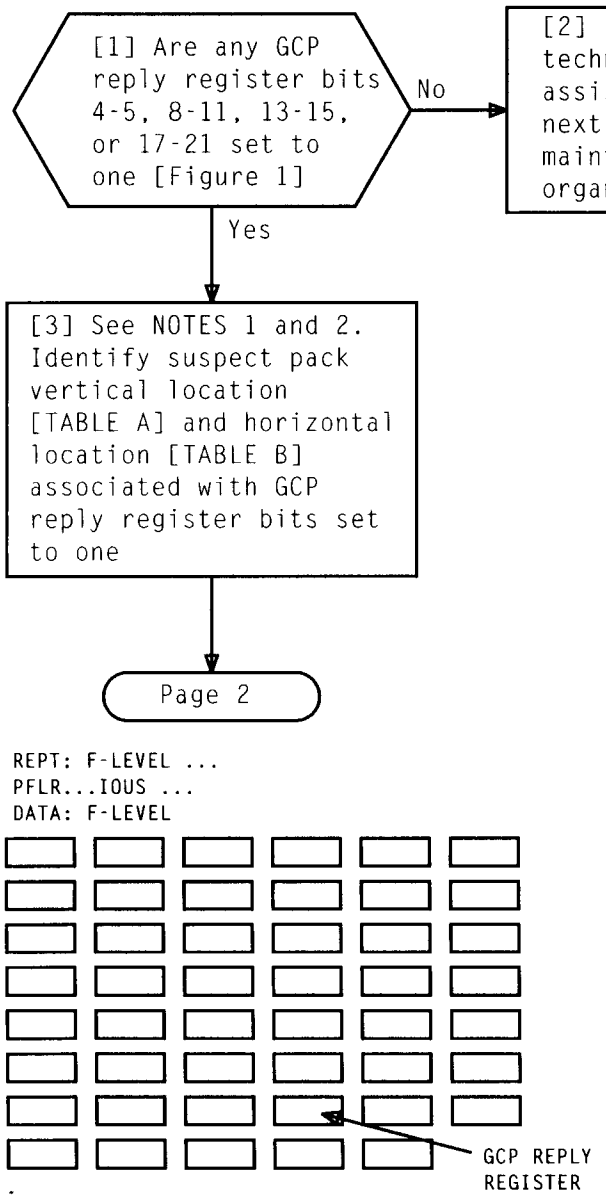


Figure 1 – Part of Interrupt Printout

TABLE A

IOUS	IOMP	FRAME VERTICAL LOCATION
0	0	62
	1	54
1	0	38
	1	30
2	0	62
	1	54
3	0	38
	1	30
4	0	62
	1	54
5	0	38
	1	30
6	0	62
	1	54
7	0	38
	1	30

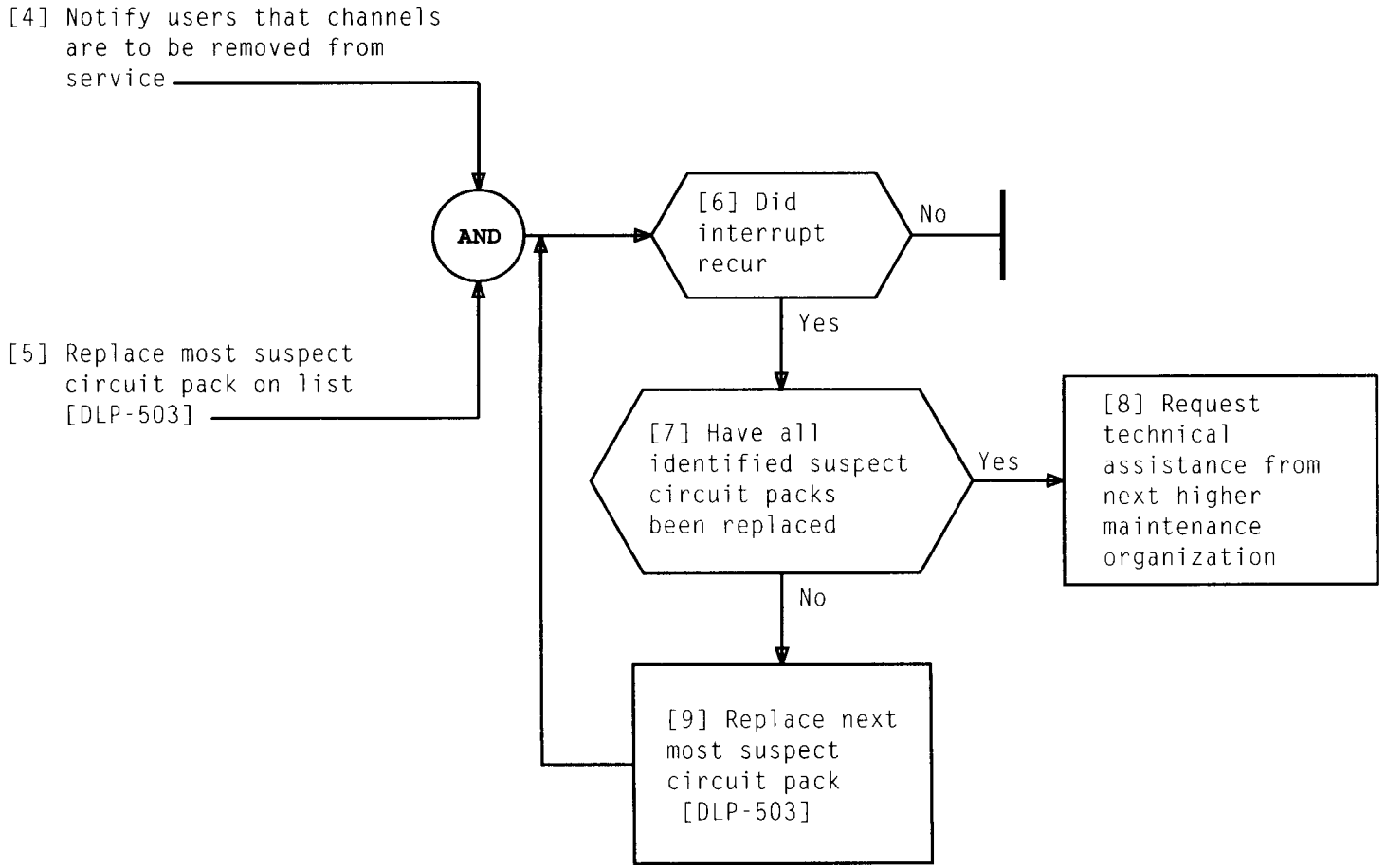
TABLE B
GCP REPLY REGISTER

GCP BIT	SUSPECT EQUIPMENT		
	TYPE	HORIZONTAL LOCATION	COMMENTS
4,5	**FG23**	35	–
	FG41	24	–
	FG25	39	–
	136H	08	Power unit*
	235A	02	Power unit
8,9	**FG41**	24	–
	FG44	28	May be **FG87**
10,11	**FG20**	22	–
	FG43	31	May be **FG86**
13,14	**FG44**	28	May be **FG87**
	FG22	26	–
15	**FG20**	22	–
	FG22	26	–
17	**FG44**	28	May be **FG87**
	FG22	26	–
18,19	**FG43**	31	May be **FG86**
	FG44	28	May be **FG87**
	FG42	33	May be **FG85**
20	**FG22**	26	–
21	**FG22**	26	–
	FG42	33	May be **FG85**

* Even IOUS – Vert 68
Odd IOUS – Vert 38

NOTES
1. If IOUS only is indicated, IOMP 0 should be assumed for TABLE A use
2. IOUS number on printout is same as IOP number on power switch

CLEAR PFLR F-LEVEL INTERRUPT, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)



CLEAR PFLR F-LEVEL INTERRUPT, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)

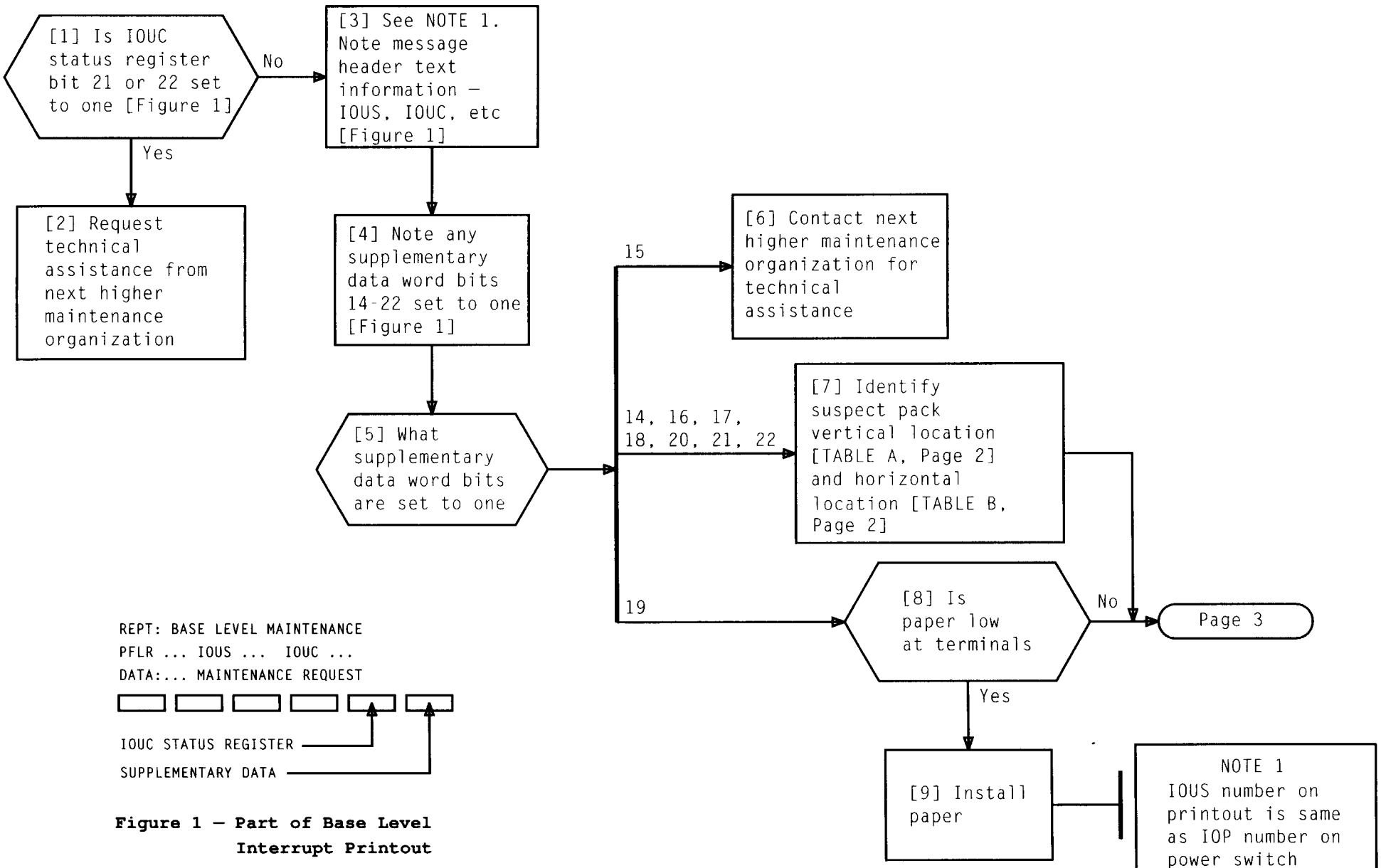


Figure 1 — Part of Base Level Interrupt Printout

NOTE 1
IOUS number on printout is same as IOP number on power switch

CLEAR PFLR BASE LEVEL INTERRUPT MTCE REQUEST, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)

TABLE A		
IOUS	IOUC	FRAME VERTICAL LOCATION
0	0-7	62
	8-15	54
1	0-7	38
	8-15	30
2	0-7	62
	8-15	54
3	0-7	38
	8-15	30
4	0-7	62
	8-15	54
5	0-7	38
	8-15	30
6	0-7	62
	8-15	54
7	0-7	38
	8-15	30

TABLE B		
IOUC	SUSPECT PACK	
	TYPE	HORIZONTAL LOCATION
0, 8	*	14
1, 9	*	12P
2, 10	*	11
3, 11	*	09P
4, 12	*	08
5, 13	*	06P
6, 14	*	05
7, 15	*	03P
* FG19, FG26, or FG27		

CLEAR PFLR BASE LEVEL INTERRUPT MTCE REQUEST, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)

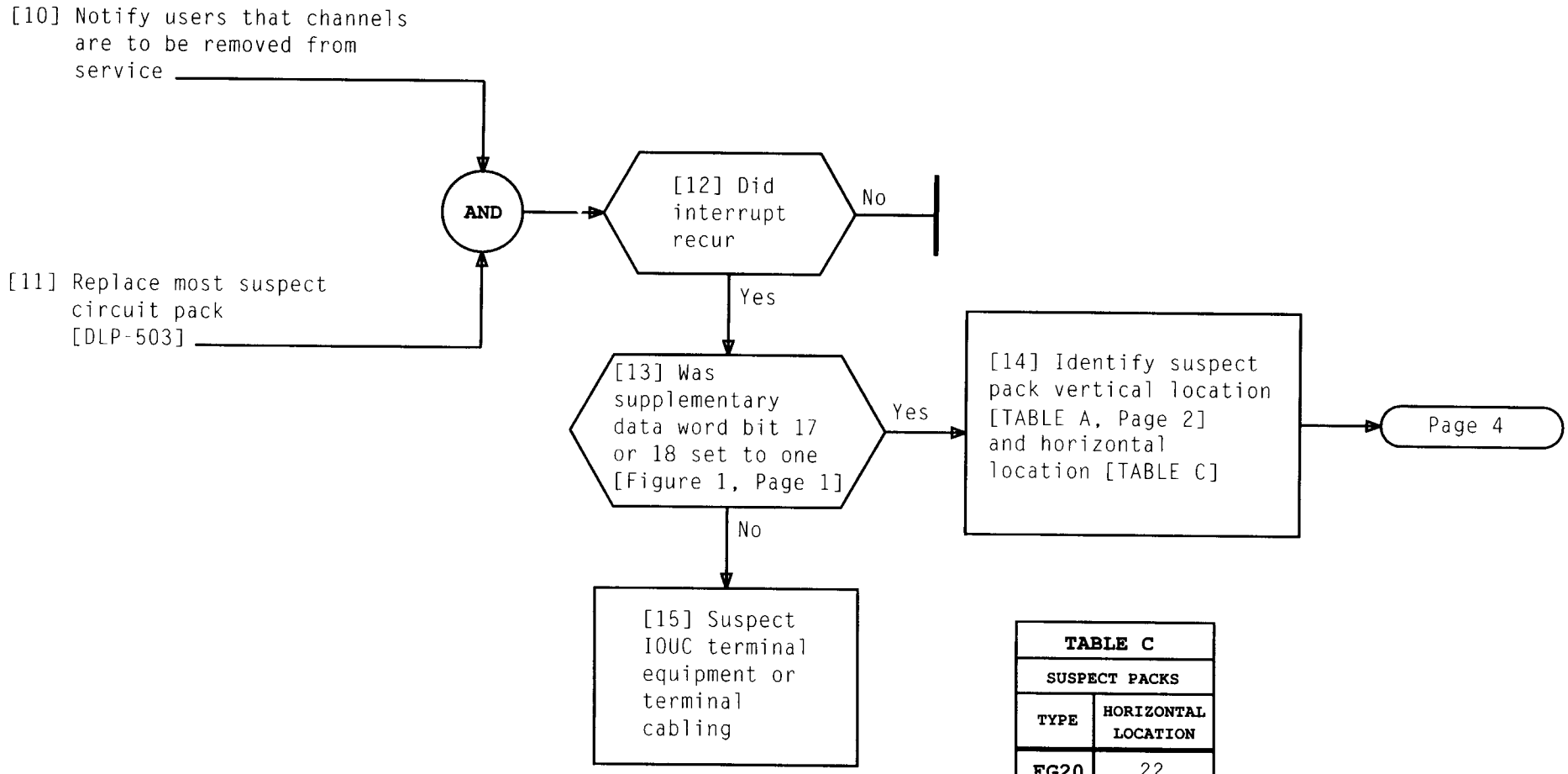
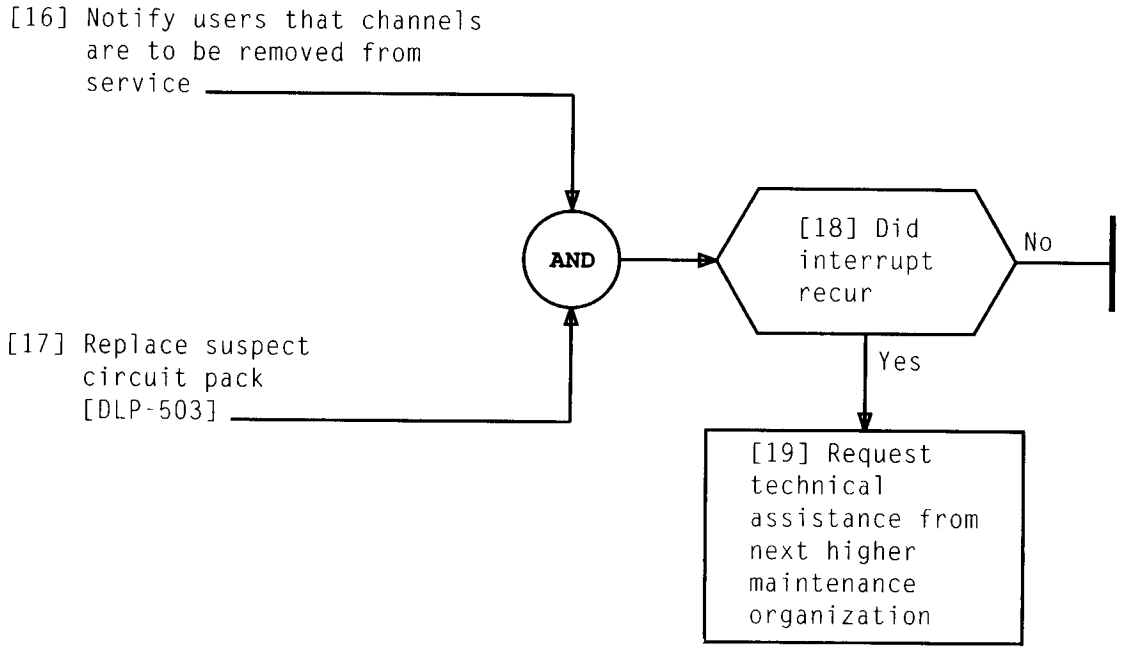
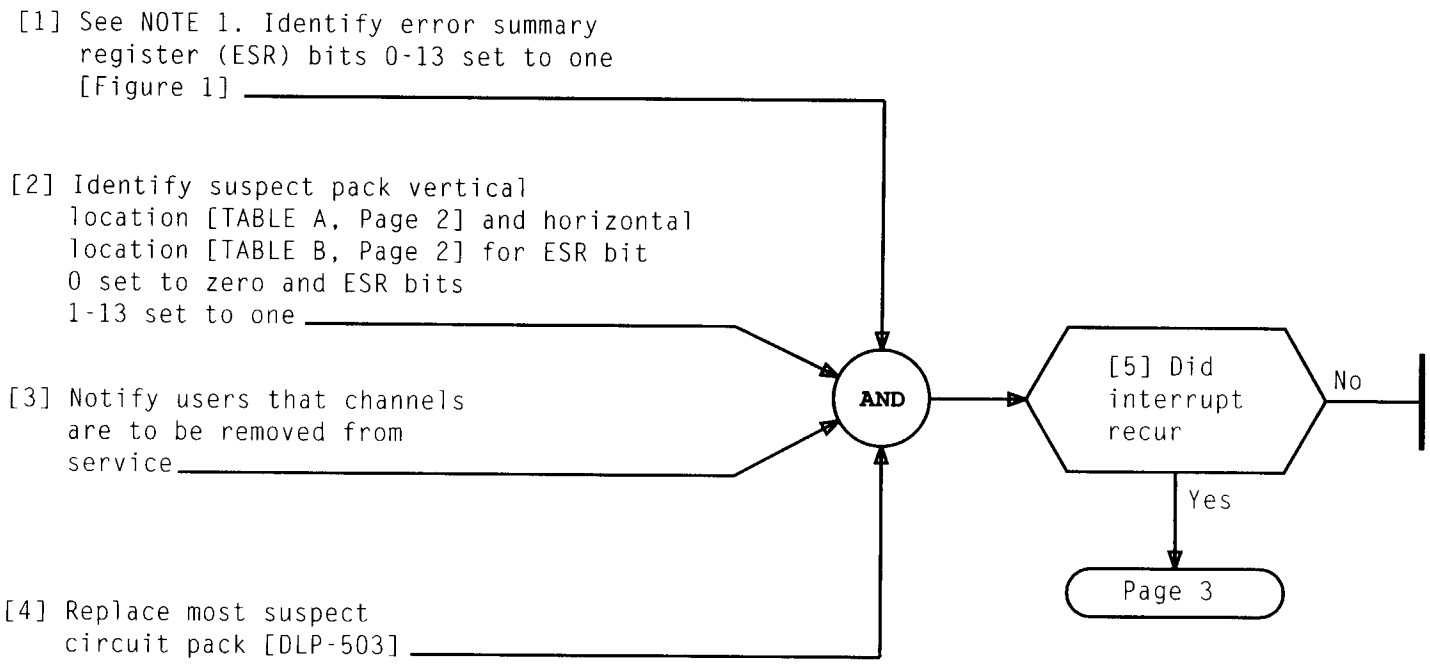


TABLE C	
SUSPECT PACKS	
TYPE	HORIZONTAL LOCATION
FG20	22
FG41	24

CLEAR PFLR BASE LEVEL INTERRUPT MTCE REQUEST, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)



CLEAR PFLR BASE LEVEL INTERRUPT MTCE REQUEST, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)



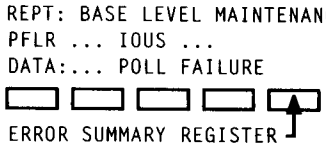


Figure 1 — Part of Base Level Interrupt Printout

NOTE 1
If IOUS only is indicated on printout, IOMP 0 should be assumed for TABLE A use. IOUS number on printout is same as IOP number on power switch

CLEAR PFLR BASE LEVEL INTERRUPT POLL FAILURE, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)

TABLE A

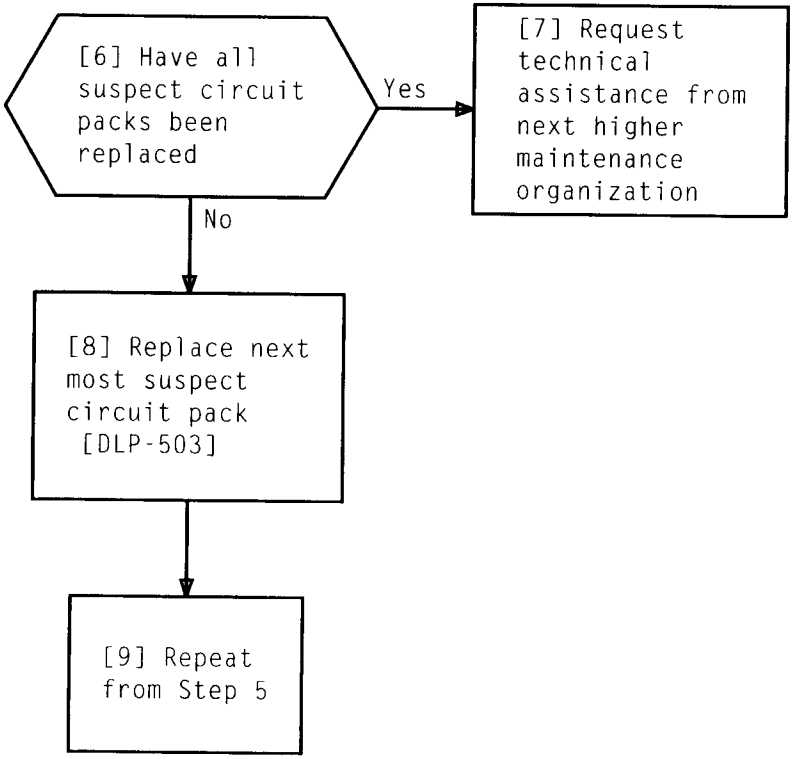
IOUS	IOMP	FRAME VERTICAL LOCATION
0	0	62
	1	54
1	0	38
	1	30
2	0	62
	1	54
3	0	38
	1	30
4	0	62
	1	54
5	0	38
	1	30
6	0	62
	1	54
7	0	38
	1	30

TABLE B

ESR BIT		SUSPECT PACK		
POSITION	SET	TYPE	HORIZONTAL LOCATION	COMMENTS
0	No	**FG41**	24	–
1	Yes	**FG41**	24	Pin 5, 6 bottom 400NS square wave
2	Yes	**FG41**	24	–
3	Yes	**FG21**	18	
		FG41	24	
4	Yes	**FG20**	22	
		FG41	24	
		FG22	26	
5,6	Yes	**FG41**	24	
7	Yes	*	14	Line unit packs not listed in order of fault probability
		*	12P	
		*	11	
		*	09P	
		*	08	
		*	06P	
		*	05	
		*	03P	
8-13	Yes	**FG43**	31	May be **FG86**
		FG44	28	May be **FG87**
		FG22	26	–
		FG23	35	
		FG42	33	May be **FG85**

* **FG19**, **FG26**, or **FG27**

CLEAR PFLR BASE LEVEL INTERRUPT POLL FAILURE, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)



CLEAR PFLR BASE LEVEL INTERRUPT POLL FAILURE, IOP FRAME (SD-5A052-01) EQUIPPED WITH 1A GROWTH UNIT (SD-4C049-01)

[1] At TTY, type:

RMV:IOUS a [,{IPUB b|IOMP c}]!

a = IOUS member number (0-63)
b = PU bus (0 or 1)
c = Microprocessor community (0 or 1)

System responds:
RMV:IOUS a [{IPUB b|IOMP c}]**COMPLETED**

[2] At power switch, rotate **ROS/OFF** switch clockwise to **ROS**

OS and **OFF NORM** lamps light

PWR OFF lamp lights

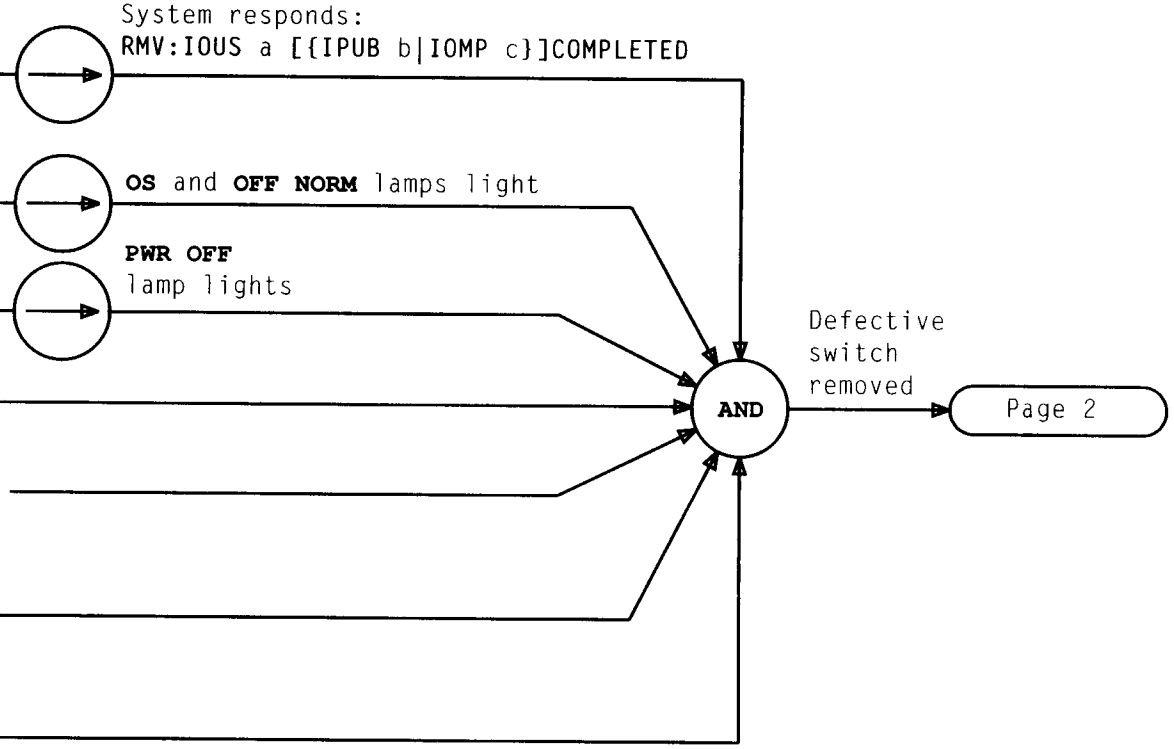
[3] Depress **ROS/OFF** switch

[4] Remove power switch fuses [TABLE A]

[5] Cover apparatus below switch with drop cloth

[6] See NOTE 1. Tag and remove frame wiring from switch terminals

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



NOTE 1
Do not remove surface wiring on switch terminals. It is used as the guide to surface wire replacement switch

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REPLACE POWER SWITCH

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

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

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

[11] Replace fuses removed [TABLE A]

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

PWR OFF lamp goes off

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

OS and **OFF NORM** lamps go off

[14] At TTY, type:

RST:IOUS a [,{IPUB b|IOMP c}]!

a = IOUS member number (0-63)
b = PU bus (0 or 1)
c = Microprocessor community (0 or 1)

System responds:

RST:IOUS a [{IPUB b|IOMP c}]
COMPLETED

AND

TABLE A

SWITCH LOCATION	FUSE	
	BLOCK LOCATION	NAME
80-13	80-09	**+24-3, +24-3P**
76-13	76-09	**+24-3, +24-3P**
69-23	68-28	**-48, -48P**
45-23	44-28	**-48, -48P**

REPLACE POWER SWITCH

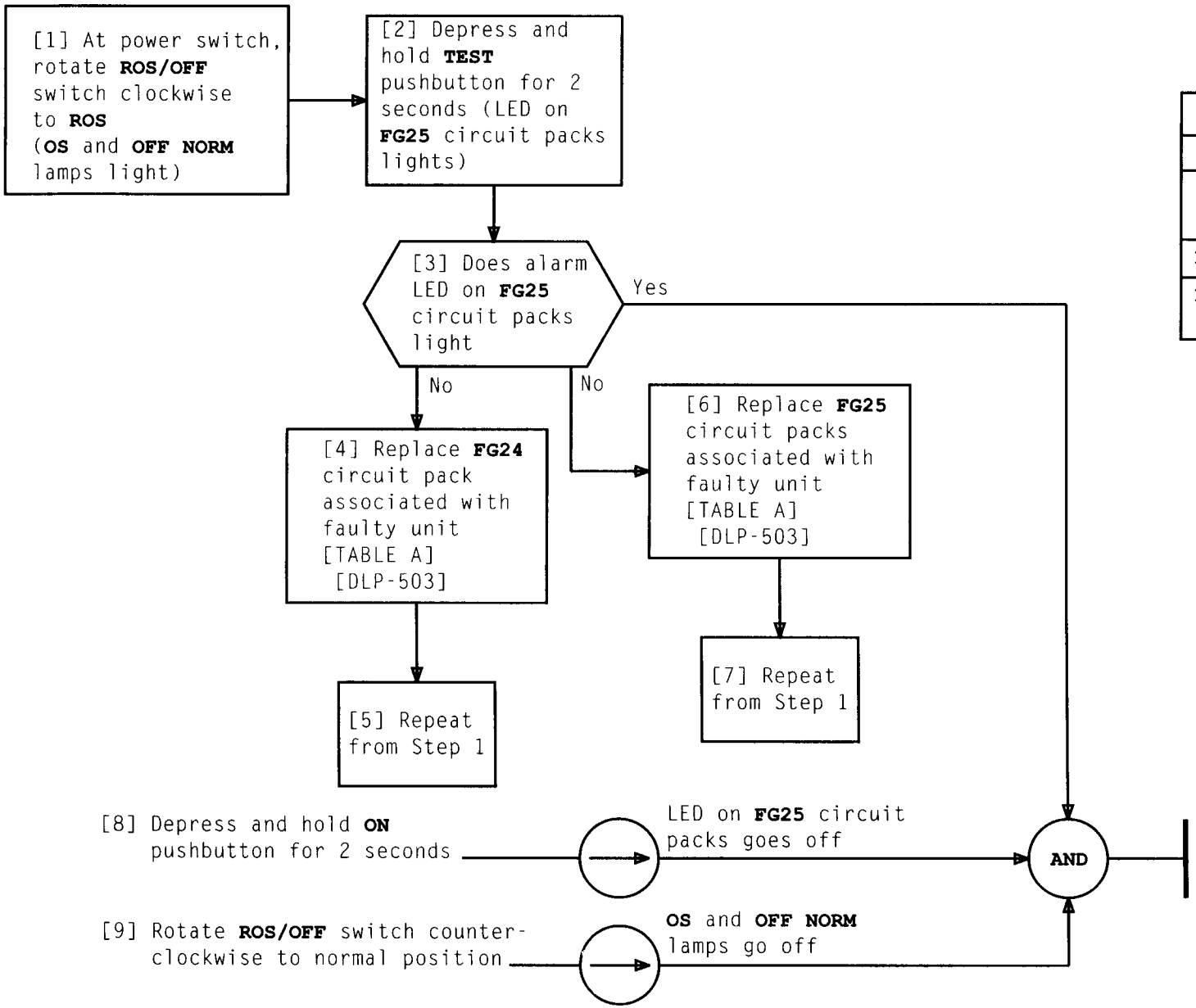


TABLE A		
CIRCUIT PACK		
TYPE	LOCATION	
	IOP 0	IOP 1
FG24	64-37	40-37
FG25	64-39 64-41	40-39 40-41

PERFORM MANUAL POWER ALARM TEST (SD-5A052-01)

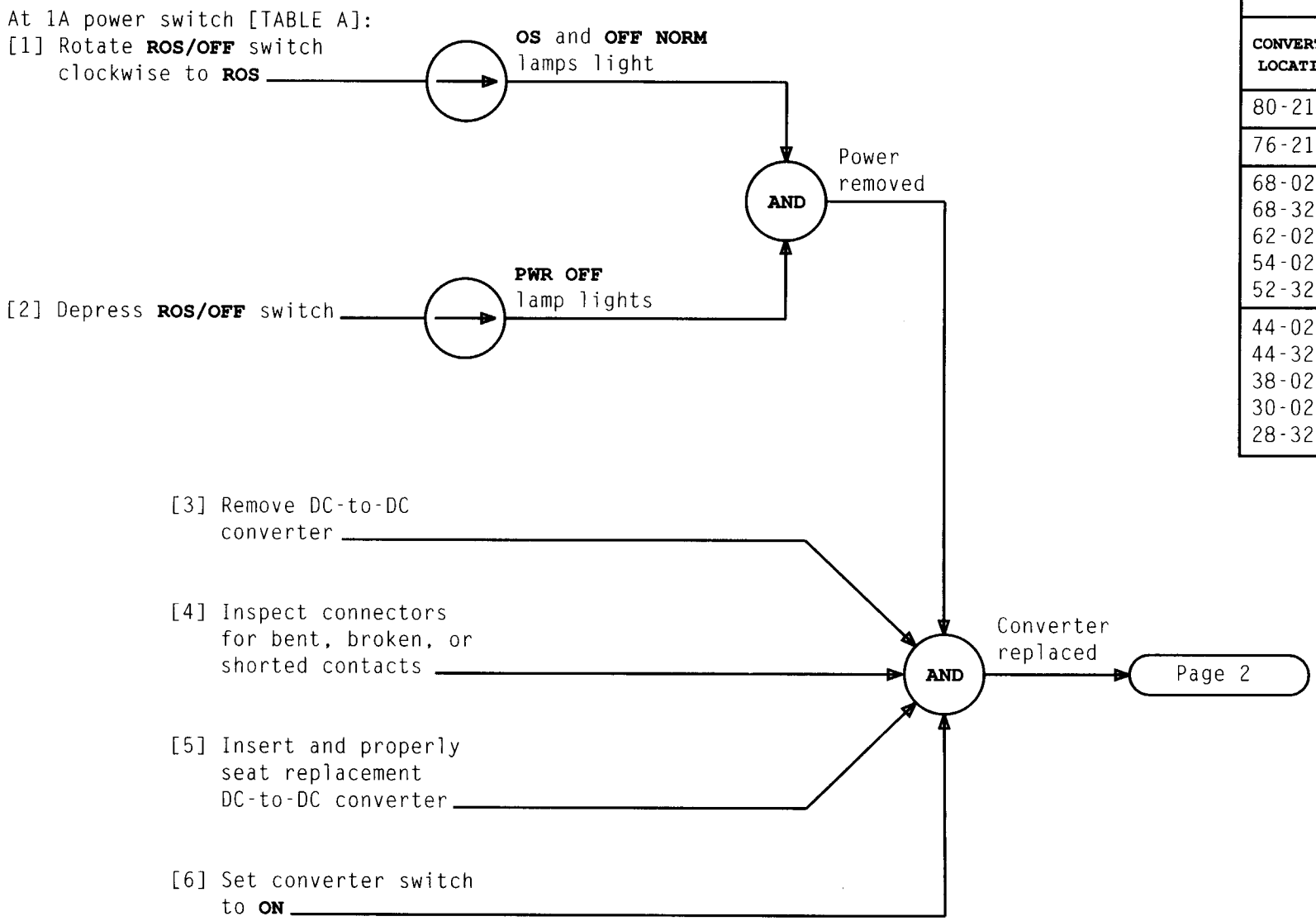
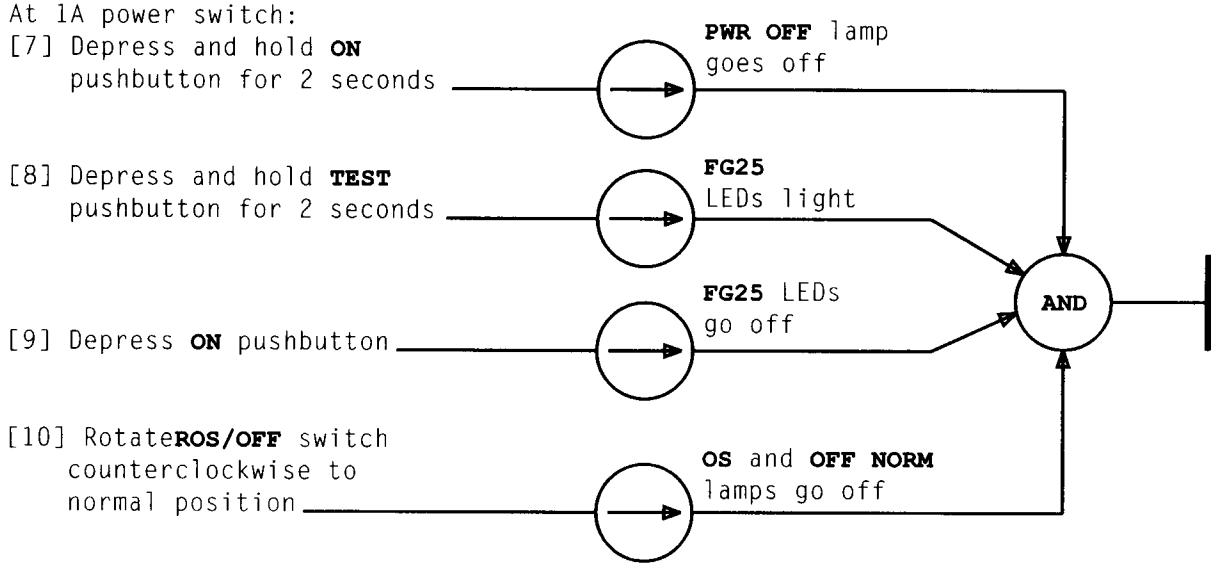


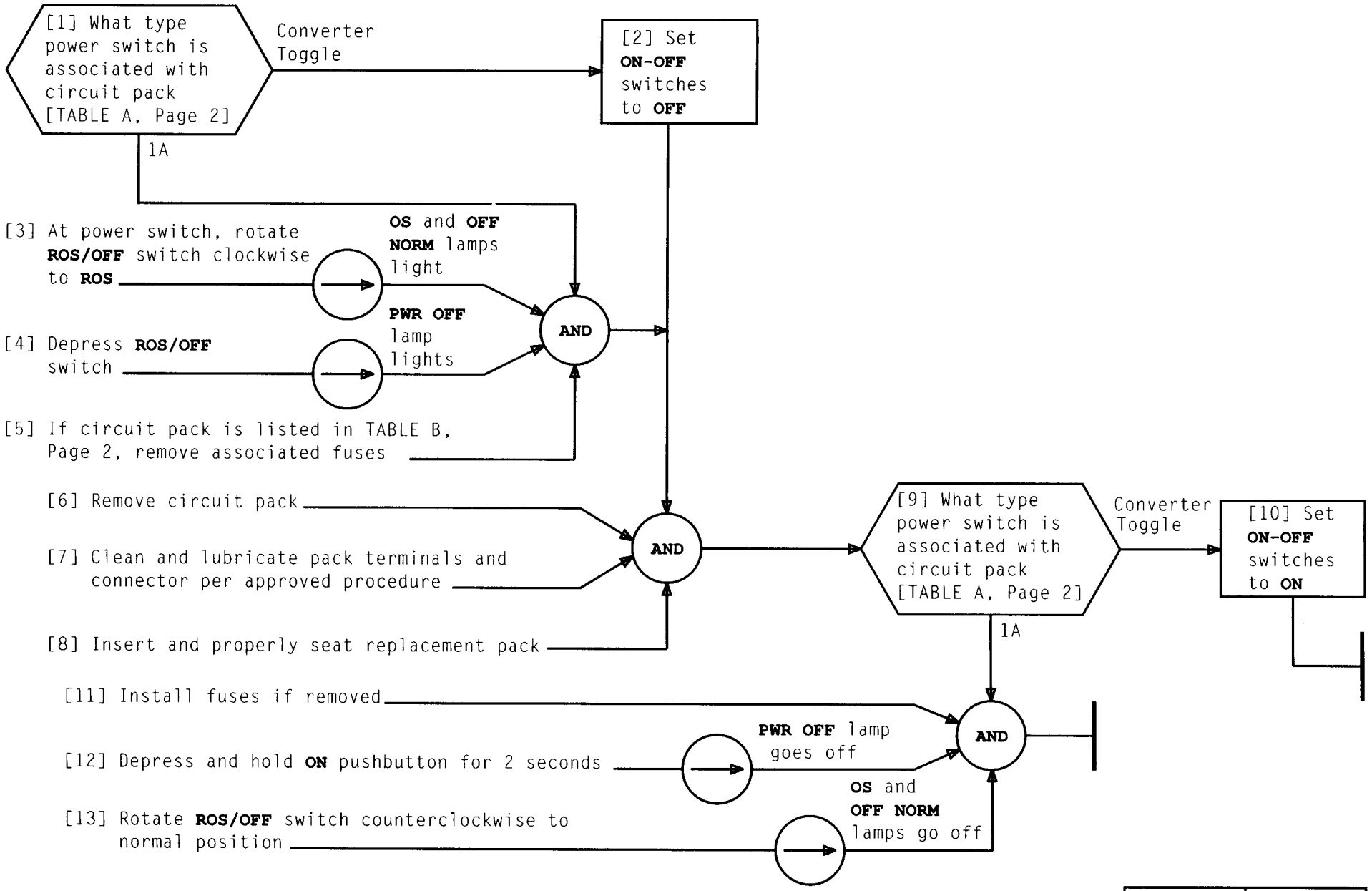
TABLE A

CONVERTER LOCATION	POWER SWITCH	
	LOCATION	NAME
80-21	80-13	**BUS 0**
76-21	76-13	**BUS 1**
68-02 68-32 62-02 54-02 52-32	69-23	**IOP 0**
44-02 44-32 38-02 30-02 28-32	45-23	**IOP 1**

REPLACE DC-TO-DC CONVERTER



REPLACE DC-TO-DC CONVERTER



REPLACE CIRCUIT PACK

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TABLE A			
POWER SWITCHES			
CIRCUIT PACK LOCATION	POWER SWITCH		
	TYPE	LOCATION	DESIGNATION
80-16....80-42	1A	80-13	**BUS 0**
76-16....76-42	1A	76-13	**BUS 1**
62-03P....62-14	Converter Toggle	68-02	**ON-OFF**
62-16....62-24	Converter Toggle	68-02, 62-02	**ON-OFF**
62-26....62-41	1A	69-23	**IOP 0**
54-03P....54-14	Converter Toggle	54-32	**ON-OFF**
54-16....54-24	Converter Toggle	54-02, 54-32	**ON-OFF**
38-03P....38-14	Converter Toggle	44-02	**ON-OFF**
38-16....38-24	Converter Toggle	44-02, 38-02	**ON-OFF**
38-26....38-41	1A	45-23	**IOP 1**
30-03P....30-14	Converter Toggle	30-32	**ON-OFF**
30-16....30-24	Converter Toggle	30-02, 30-32	**ON-OFF**

TABLE B		
FUSES		
CIRCUIT PACK LOCATION	FUSE	
	LOCATION	DESIGNATION
80-16	80-09	**+24-1, +24-2**
80-17, 18, 22	80-09	**+24-2**
76-16	76-09	**+24-1, +24-2**
76-17, 18, 22	76-09	**+24-2**
62-37	68-28	**+24-4, +24-5**
62-39, 41	68-28	**+24-4**
38-37	44-28	**+24-4, +24-5**
38-39, 41	44-28	**+24-4**

REPLACE CIRCUIT PACK

[1] Identify first failing phase on diagnostic printout [Figure 1]

[2] Identify and obtain PR for first failing phase [TABLE A]

[3] Within PR, locate first failing test indicated on diagnostic printout [Figure 1]

AND

Page 2

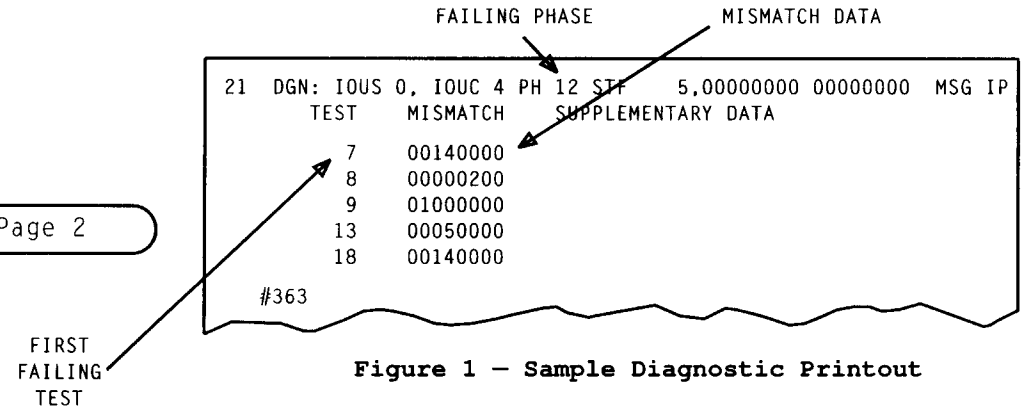


Figure 1 — Sample Diagnostic Printout

TABLE A

PHASE	PR NO.	PHASE	PR NO.	PHASE	PR NO.
	5A788	24	5A807	54	5A430
01	5A789	25	5A807	55	5A430
02	5A790	26	5A807	56	5A430
03	5A791	27	5A807	57	5A430
04	5A792	28	5A807	58	5A430
11	5A798	29	5A815	61	5A431
12	5A799	31	5A816	91	5A449
13	5A800	41	5A428	92	5A450
14	5A801	42	5A429	99	5A825
21	5A807	51	5A430		
22	5A807	52	5A430		
23	5A807	53	5A430		

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION

[4] Using PR data, determine **MODE** and **ADDRESS** [Figure 2]

[5] Locate **MISMATCH** data on diagnostic printout [Figure 1, Page 1]

[6] Convert **MISMATCH** data to binary and determine failing bit (1 = failing bit)

[7] Obtain PK-5A052 and locate desired page using **MODE** and **ADDRESS** previously determined (upper-left-hand corner) [Figure 3, Page 3]

AND

[8] Using PK-5A052, identify SD, FS, and symbol using failing bit identified [Figure 3, Page 3]

[9] Using SD, convert FS and symbol to circuit pack

[10] Identify and record circuit packs that supply inputs to and receive outputs from circuit pack

AND

FAILING TEST

MODE

ADDRESS

```
                    2920,     34        IOREAD  OPER(RDSTATM),MASK(M(IO1IBO,IO1CPF,IO1OBO,IO1IMR,IO1MR,IO1UNL
                                                BUF,IO1LPA,IO1CFA,IO1IDLE,IO1INPUT,IO1BRKREC,IO1OUTPUT,IO1SOI
                                                IO1LODBUF)),EXPECT(M(IO1SOI,IO1INPUT,IO1UNLBUF)),MTCPU
                        -002-   37 #.......ACCESS: READ, OPERATION CODE = 170,MASK = 77773000,EXPECT = 1420000
  38  #****************************************
  39  #*
  40  # TEST 7
  41  #*
  42  #****************************************
20740032                -002-   43        DATA    1 = 0,1 = 1,1 = 0,3 = IDG_UNUSED,7 = IDGRDSTATM,5 =
                                                IDG_UNUSED,6 = IDGIOREAD
77773000                -002-   45        DATA    24 = M(IO1IBO,IO1CPF,IO1OBO,IO1MR,IO1MR,IO1UNLBUF,IO1LPA,IO1
                                                CFA,IO1IDLE,IO1INPUT,IO1BRKREC,IO1OUTPUT,IO1SOI,IO1LODBUF)
01420000                -002-   47        DATA    24 = M(IO1SOI,IO1INPUT,IO1UNLBUF)
```

Figure 2 — Sample PR Data

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION

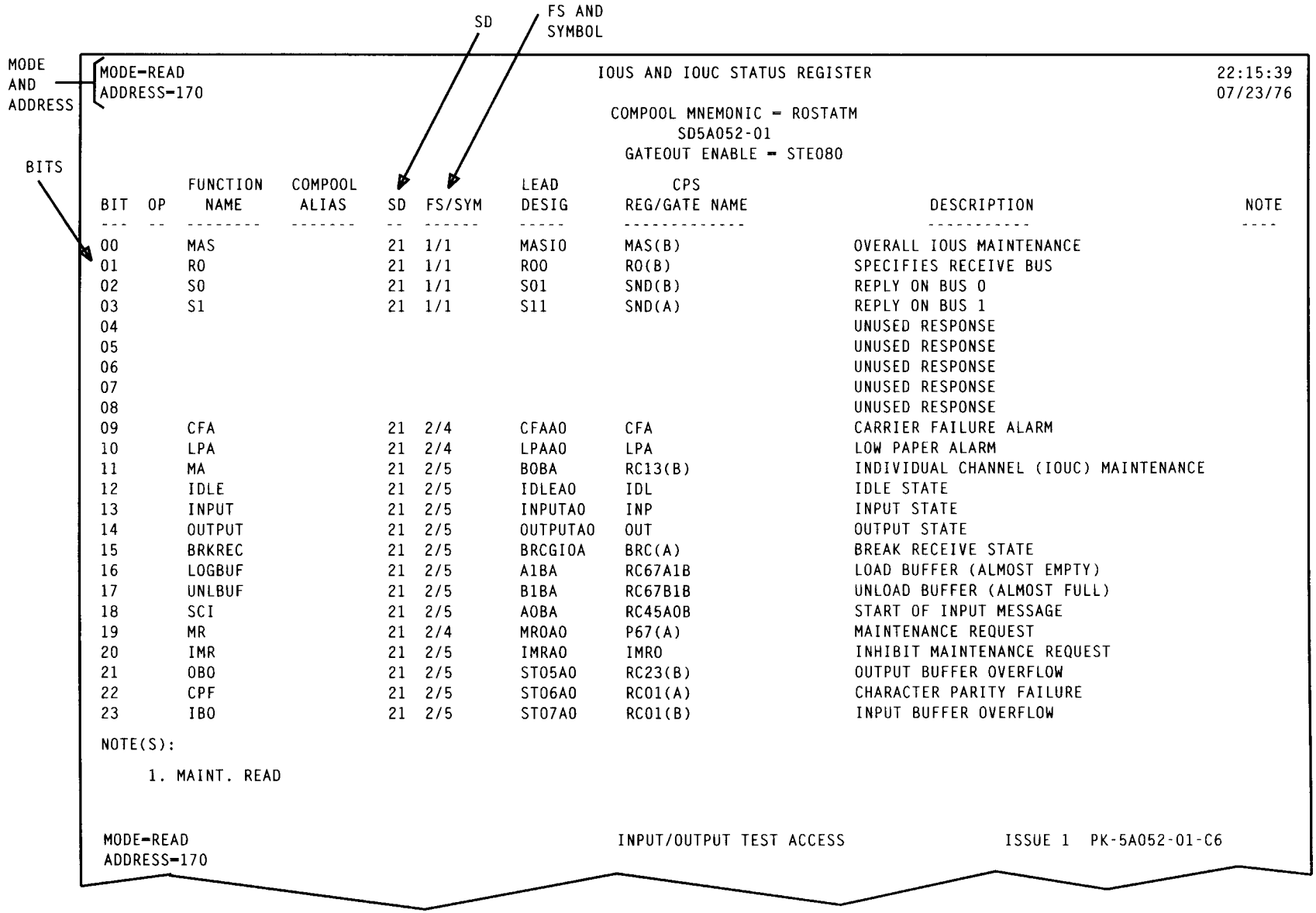
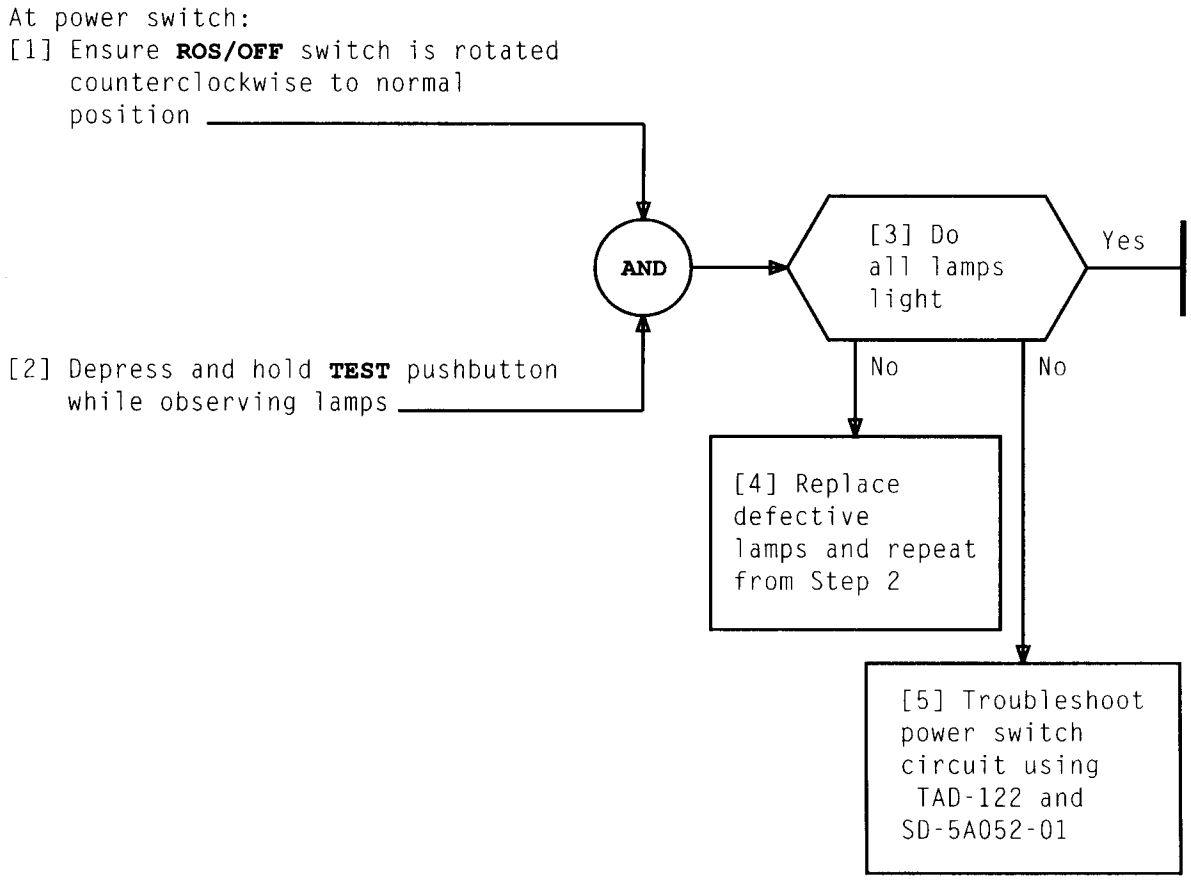


Figure 3 — Sample Test Access Document (PK) Format

IDENTIFY CIRCUIT PACKS AND LOCATIONS USING DIAGNOSTIC INFORMATION



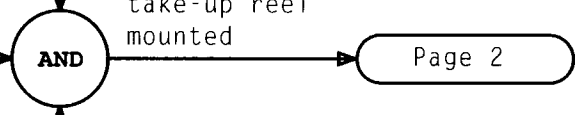
TEST POWER SWITCH LAMPS

At tape transport:

[1] Verify interlock switch plunger is in out position; **LOCAL/REMOTE** switch is in **LOCAL** lighted condition and lower (take-up) reel is same size or larger than tape reel to be mounted

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

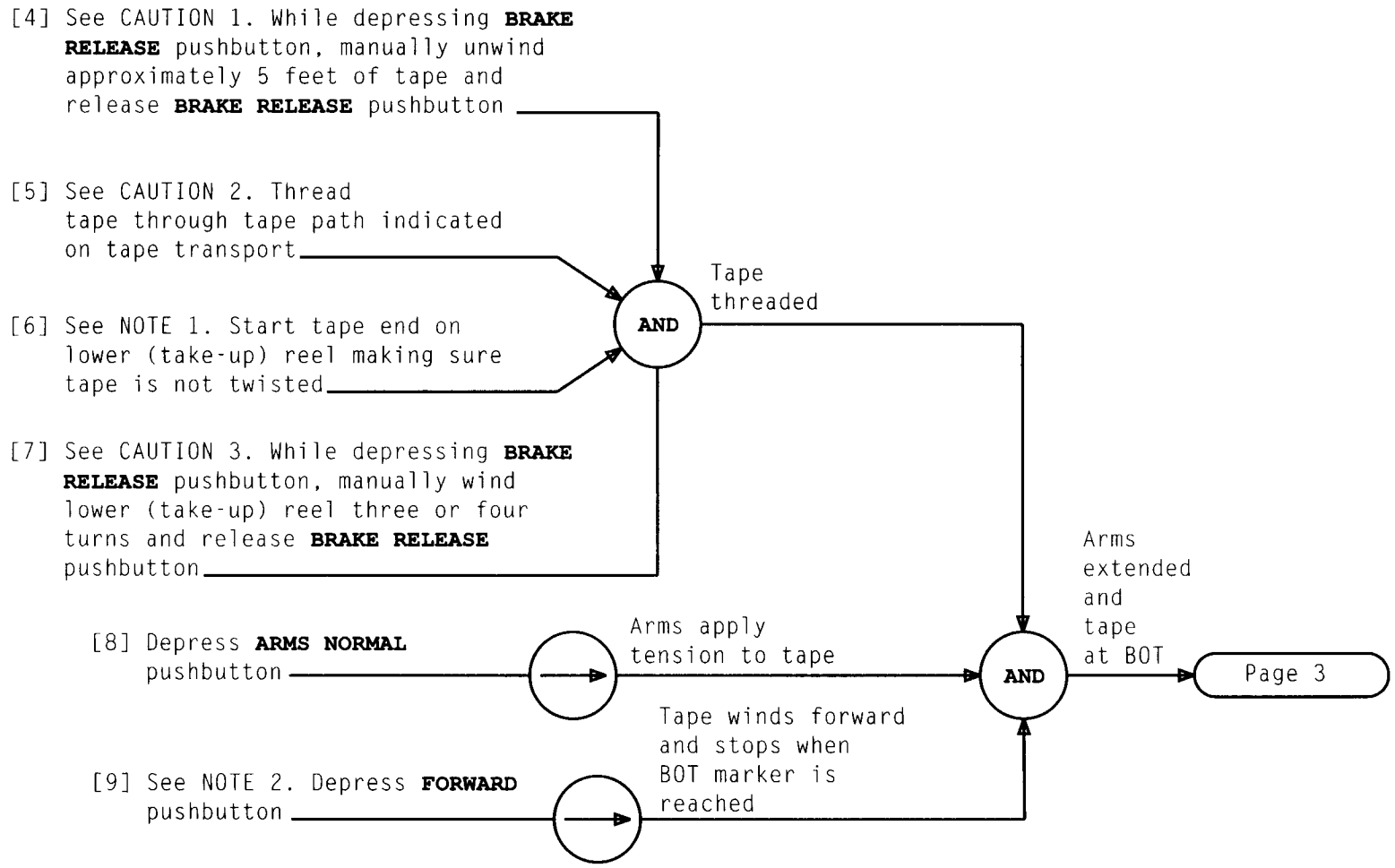
[3] Rotate hub (knob) of upper reel holder clockwise to lock tape reel securely



Tape reel and take-up reel mounted

Page 2

MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



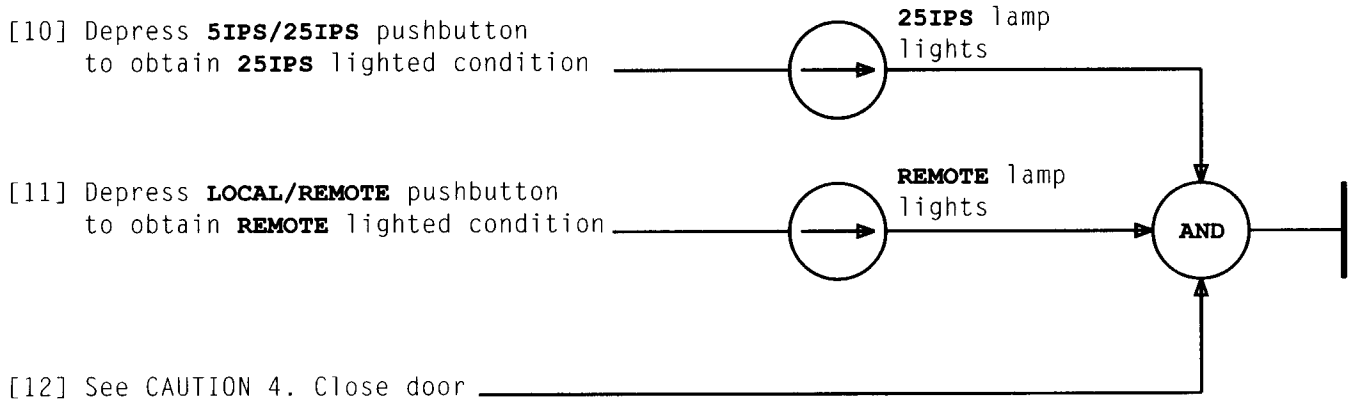
NOTES

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

CAUTIONS

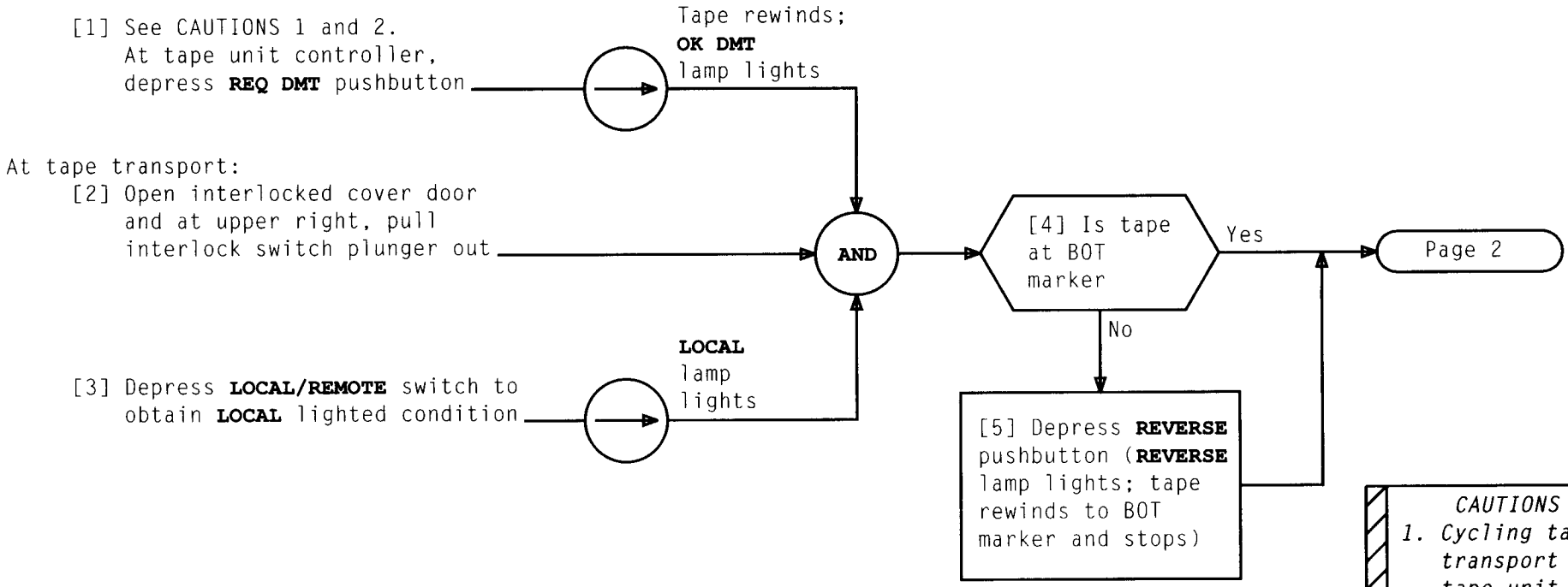
1. *Contamination of tape by contact with floor damages tape heads*
2. *Tape head surfaces should not be touched; body oils contaminate tape*
3. *If tape is not properly aligned along rollers and guides or is too loose, tape may be damaged*

MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



CAUTION 4
Closing tape transport door in harsh manner may upset alignment

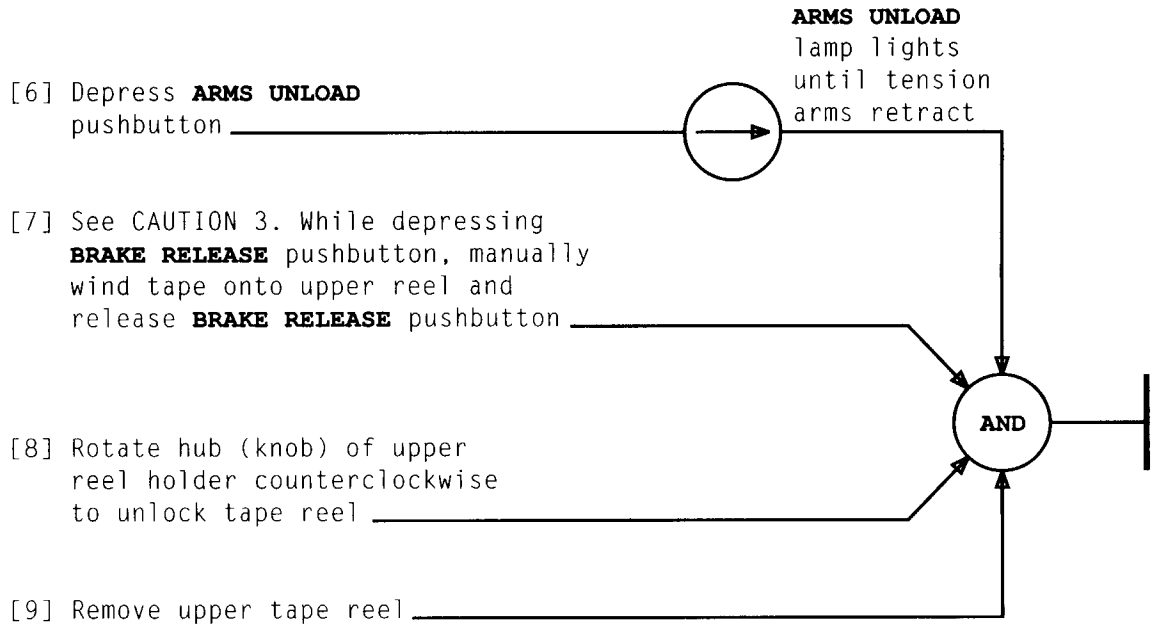
MOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



CAUTIONS

1. *Cycling tape transport or tape unit controller with tape over read/write heads may damage tape*
2. *If tape is being demounted due to a faulty tape unit, the proper tape unit maintenance documentation should be used*

DEMOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT



CAUTION 3
Pulling or dragging last 2 feet of tape across heads may contaminate heads

DEMOUNT TAPE ON TAPE TRANSPORT, TAPE UNIT

1. Obtain PR for failing phase [TABLE A]

2. Locate test number index page near end of PR [Figure 1, Page 2]

3. Locate first failing test on test index page

4. After failing test, locate and record location (LOC)

5. After failing test, locate and record looping address (ADR)

TABLE A

PHASE	PR NO.	PHASE	PR NO.	PHASE	PR NO.
00	5A788	24	5A807	54	5A430
01	5A789	25	5A807	55	5A430
02	5A790	26	5A807	56	5A430
03	5A791	27	5A807	57	5A430
04	5A792	28	5A807	58	5A430
11	5A798	29	5A815	61	5A431
12	5A799	31	5A816	91	5A449
13	5A800	41	5A428	92	5A450
14	5A801	42	5A429	99	5A825
21	5A807	51	5A430		
22	5A807	52	5A430		
23	5A807	53	5A430		

DETERMINE LOOPING PARAMETERS

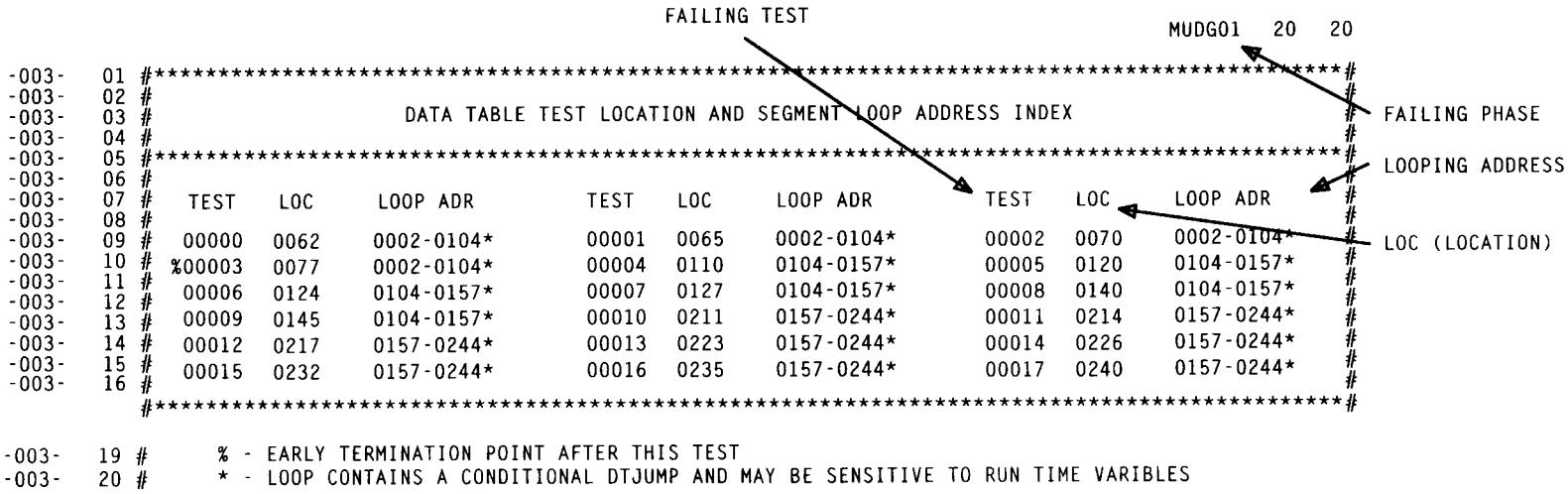


Figure 1 — Sample PR Data

On Summary Data Printout [Figure 1]:

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: In Test Access PK Document: Negative addresses 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 are further removed from fault and PR data may be of greater value

3. Locate 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. Under column heading **DESIG**, locate gate name

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

8. At gate, note lead name and terminal leaving gate to outside pack [Figure 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. Locate lead interconnection section for this symbol

12. Using terminal and lead name noted, locate corresponding SD lead name

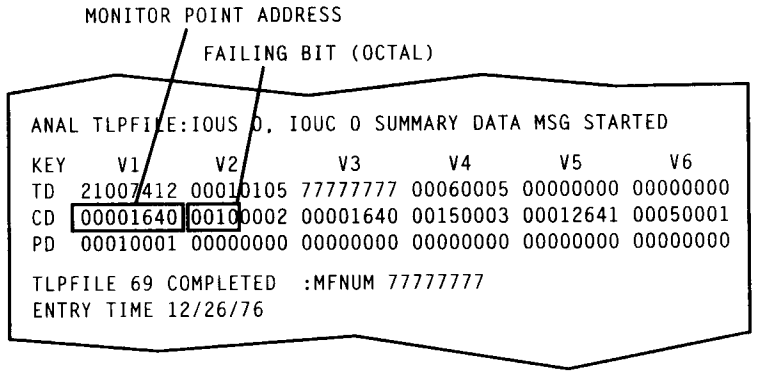


Figure 1 — Example of Summary Data Printout

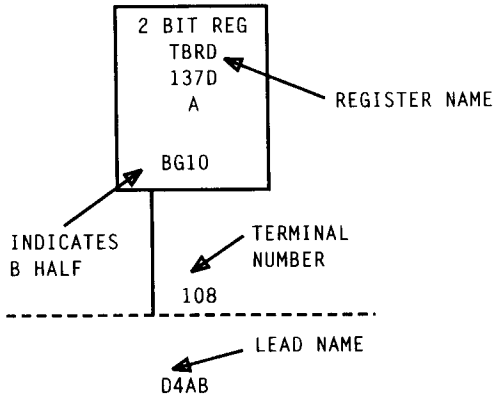


Figure 2 — Example of Lead Leaving B Half of CPS Register

SIGNAL TRACE PATH OF FAILING BIT USING SUMMARY DATA PRINTOUT AND TEST ACCESS PK DOCUMENT

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
• TPG-000		• TAP-130									
• IXL-001		• TAP-131									
• NTP-002		• TAP-132									
• NTP-003		• TAP-133									
• NTP-004		• TAP-134									
• TAD-100		• TAP-135									
• ISD-101		• DLP-500									
• TAP-102		• DLP-501									
• ISD-103		• DLP-502									
• TAP-104		• DLP-503									
• ISD-105		• DLP-504									
• TAP-106		• DLP-505									
• ISD-107		• DLP-506									
• TAP-108		• DLP-507									
• ISD-109		• DLP-508									
• TAP-110		• DLP-509									
• ISD-111		• CKL-891									
• TAP-112		• TNG-893									
• ISD-113											
• ISD-114											
• ISD-115											
• TAP-116											
• ISD-117											
• TAP-118											
• TAP-119											
• TAP-120											
• TAP-121											
• TAD-122											
• TAP-123											
• TAP-124											
• TAP-125											
• TAP-126											
• TAP-127											
• TAP-128											
• TAP-129											

CHECKLIST

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