TM 11-6625-3081-23-1

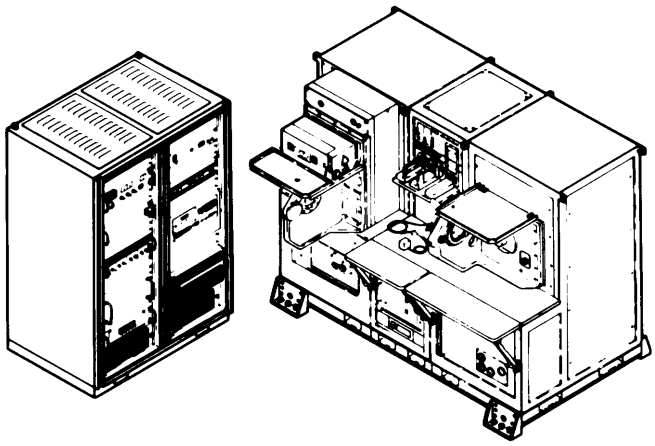
TECHNICAL MANUAL

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR

ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

13082808-39, 13231600, 13231650 AND 13231800

INTRODUCTION ORGANIZATIONAL MAINTENANCE



EQUIPMENT DESCRIPTION AND DATA (P 1-7)

PRINCIPLES OF OPERATION (P 1-116)

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (P 2-39)

SELF-TEST PROCEDURES (P 2-62)

ELECTRONIC STATION MAINTENANCE PROCEDURES (P 2-181)

DAYSIDE TEST BENCH 2A1 MAINTENANCE PROCEDURES (P 2-248)

TEST CONSOLE TEST BENCH 2A2 MAINTENANCE PROCEDURES (P 2-254)

NIGHTSIDE TEST BENCH 2A3 MAINTENANCE PROCEDURES (P 2-311)

TEST PROGRAM SETS MAINTENANCE PROCEDURES (P 2-317)

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1 FEBRUARY 1986

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HEADQUARTERS
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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL

ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT 13082808-39, 13231600, 13231650 AND 13231800

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	Remove pages	Insert pages
List of Effective Pages	A through F	A through G/(H blank)
Chapter 1	1-3 and 1-4	1-3 and 1-4
	1-69 through 1-73/(1-74 blank)	1-69 through 1-73/(1-74 blank)
	1-157 and 1-158	1-157 and 1-158
Chapter 2	2-95 through 2-98.1/ (2-98.2 blank)	2-95 through 2-98.2
	2-150.1/(2-150.2 blank)	2-150.1/(2-150.2 blank)
	2-277 through 2-282	2-277 through 2-282

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ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL
FOR

ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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A through F	A through F
2–95 through 2–98	2–95 through 2-98
2–234.5 through 2–234-8	2-234.5 through 2–234.8

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Remove pages	Insert pages
A through F	A through F
vii and 1-0	vii and 1-0
1-3 through 1-6	1-3 through 1-6
1-69 through 1-73/(1-74 blank)	1-69 through 1-73/(1-74 blank)
1-93 and 1-94	1-93 and 1-94
1-101 and 1-102	1-101 and 1-102
1-106.7 and 1-106.8	1-106.7 and 1-106.8
1-106.11 through 1-106.14	1-106.11 through 1-106.14
1-106.14.1/(1-106.14.2 blank)	1-106.14.1/(1-106.14.2 blank)
1-106.15 and 1-106.16	1-106.15 and 1-106.16
1-106.16.1 and 1-106.16.2	1-106.16.1 and 1-106.16.2
1-106.17 and 1-106.18	1-106.17 and 1-106.18
1-127 and 1-128	1-127 and 1-128
1-157 and 1-158	1-157 and 1-158
1-165 through 1-168	1-165 through 1-168
2-31 and 2-32	2-31 and 2-32
2-63 and 2-64	2-63 and 2-64
2-67 and 2-68	2-67 and 2-68
2-71 through 2-74	2-71 through 2-74
2-88.1 and 2-88.2	2-88.1 and 2-88.2
2-89 and 2-90	2-89 and 2-90
2-95 through 2-98	2-95 through 2-98
2-117 and 2-118	2-117/(2-118 blank)
2-142.37 and 2-142.38	2-142.37 and 2-142.38
-----	2-142.38.1 through 2-142.38.3/ (2-142.38.4 blank)
2-142.39 and 2-142.40	2-142.39 and 2-142.40
2-279 and 2-280	2-279 and 2-280
FO-29/(FO-30 blank)	FO-29/(FO-30 blank)

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ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT
TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through D	A through D
i and ii	i and ii
1-5 and 1-6	1-5 and 1-6
1-101 and 1-102	1-101 and 1-102
1-106.3 and 1-106.4	1-106.3 and 1-106.4
1-165 through 1-168	1-165 through 1-168
2-62.1 and 2-62.2	2-62.1 and 2-62.2
2-95 and 2-96	2-95 and 2-96
2-98.1/(2-98.2 blank)	2-98.1/(2-98.2 blank)
2-99 and 2-100	2-99 and 2-100
2-149 and 2-150	2-149 and 2-150

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through F	A through F
2-43 and 2-44	2-43 and 2-44
2-61 and 2-62	2-61 and 2-62
2-62.1 and 2-62.2	2-62.1 and 2-62.2
2-63 and 2-64	2-63 and 2-64
2-69 and 2-70	2-69 and 2-70
----	2-70.1/(2-70.2 blank)
2-71 and 2-72	2-71 and 2-72
2-87 and 2-88	2-87 and 2-88
2-89 through 2-98	2-89 through 2-98
2-99 and 2-100	2-99 and 2-100
----	2-100.1/(2-100.2 blank)
2-142.39 and 2-142.40	2-142.39 and 2-142.40
2-159 through 2-162	2-159 through 2-162
2-252.1 and 2-252.2	2-252.1 and 2-252.2
2-253 and 2-254	2-253 and 2-254
FO-35/(FO-36 blank)	FO-35/(FO-36 blank)

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through F	A through F
2-62.1 and 2-62.2	2-62.1 and 2-62.2
2-89 and 2-90	2-89 and 2-90
2-95 through 2-98	2-95 through 2-98
2-142.39 and 2-142.40	2-142.39 and 2-142.40

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ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT
TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through F	A through F
1-101 and 1-102	1-101 and 1-102
1-106.21/1-106.22	1-106.21 and 1-106.22
2-171 and 2-172	2-171 and 2-272
2-179 and 2-180	2-179 and 2-180

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CHANGE
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WASHINGTON, D.C., 15 April 1991

ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT
TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through D	A through D
1-101 and 1-102	1-101 and 1-102
1-106.18.1/1-106.18.2	1-106.18.1 and 1-106.18.2
1-106.19 and 1-106.20	1-106.19 and 1-106.20

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through D	A through D
2-89 and 2-90	2-89 and 2-90
2-95 through 2-98	2-95 through 2-98
2-99 and 2-100	2-99 and 2-100

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A through F	A through F
2-161 and 2-162	2-161 and 2-162
2-181 and 2-182	2-181 and 2-182
2-279 and 2-280	2-279 and 2-280
2-324.1/2-324.2	2-324.1/2-324.2

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CHANGE
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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
A and B (Warning page)	a and b
A through L	A through F
1-1 and 1-2	1-1 and 1-2
1-33 and 1-34	1-33 and 1-34
1-34.2	1-34.2
1-35 and 1-36	1-35 and 1-36
1-53 and 1-54	1-53 and 1-54
----	1-54.1/1-54.2
1-55 and 1-56	1-55 and 1-56
1-85 and 1-86	1-85 and 1-86
2-47 and 2-48	2-47 and 2-48
(2-135 and 2-136	2-135 and 2-136
2-143/2-144	2-143/2-144
----	2-149 and 2-150
----	2-150.1/2-150.2
2-151 and 2-152	2-151 and 2-152

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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	Remove pages	Insert pages
Table of Contents	i and ii	i and ii
	iii/iv	iii and iv
How to Use	vii and 1-0	vii and 1-0
Chapter 1	1-5 and 1-6	1-5 and 1-6
	1-9 through 1-12	1-9 through 1-12
	----	1-12.1/1-12.2
	1-13 and 1-14	1-13 and 1-14
	----	1-14.1/1-14.2
	1-33 and 1-34	1-33 and 1-34
	----	1-34.2
	1-59 and 1-60	1-59 and 1-60
	1-93 through 1-96	1-93 through 1-96
	1-101 through 1-104	1-101 through 1-104
	1-106.9 through 1-106.14	1-106.9 through 1-106.14
	----	1-106.14.1/1-106.14.2
	1-107 and 1-108	1-107 and 1-108
	1-108.1 and 1-108.2	----
	1-121 through 1-124	1-121 through 1-124
	1-129 and 1-130	1-129 and 1-130
	----	1-130.1/1-130.2
	1-141 through 1-144	1-141 through 1-144
	----	l-144.l/l-144.2
	1-165 through 1-168	1-165 through 1-168
Chapter 2	2-1 and 2-2	2-1 and 2-2
	2-39 and 2-40	2-39 and 2-40
	2-40.1/2-40.2	2-40.1 and 2-40.2
	2-41 through 2-62	2-41 through 2-62
	2-62.1 and 2-62.2	2-62.1 and 2-62.2
	2-63 through 2-66	2-63 through 2-66
	----	2-66.1/2-66.2
	2-75 through 2-80	2-75 through 2-80
	2-83 through 2-88	2-83 through 2-88
	2-88.l/2-88.2	2-88.1 and 2-88.2
	2-95 through 2-98	2-95 through 2-98
	----	2-98.1/2-98.2
	2-99 and 2-100	2-99 and 2-100
	----	2-142.13 through 2-142.56
	2-143 and 2-144	2-143/2-144

TM 11-6625-3081-23-1
C 9

Remove pages	Insert pages
2-145 through 2-150	----
2-151 and 2-152	2-151 and 2-152
2-161 through 2-164	2-161 through 2-164
----	2-164.1 and 2-164.2
2-165 and 2-166	2-165 and 2-166
2-166.1/2-166.2	2-166.1 and 2-166.2
2-171 through 2-174	2-171 through 2-174
2-181 and 2-182	2-181 and 2-182
----	2-186.1 through 2-186.4
----	2-190.1/2-190.2
2-234.1 and 2-234.2	2-234.1 and 2-234.2
2-247 and 2-248	2-247 and 2-248
-----	2-252.1 and 2-252.2
2-253 and 2-254	2-253 and 2-254
2-263 and 2-264	2-263 and 2-264
2-303 and 2-304	2-303 and 2-304
2-319 and 2-320	2-319 and 2-320
2-323 and 2-324	2-323 and 2-324
----	FO-4.l/FO-4.2
Old 2028's	New 2028's
Cover	Cover

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CHANGE
NO. 8

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 February 1989

ORGANIZATIONAL AND DIRECT SUPPORT
MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT
TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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Remove pages	Insert pages
1-101 and 1-102	1-101 and 1-102
1-105 and 1-106	1-105 and 1-106
2-3 and 2-4	2-3 and 2-4
---	2-4.1 through 2-4.5/2-4.6
2-5 and 2-6	2-5 and 2-6
2-13 and 2-14	2-13 and 2-14
2-61 through 2-64	2-61 through 2-64
2-95 through 2-98	2-95 through 2-98
2-117 and 2-118	2-117 and 2-118

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT 13082808-39, 13231600, 13231650 AND 13231800

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Remove pages	*Insert pages*
l-53 through l-56	l-53 through l-56
l-91 and l-92	l-91 and l-92
l-lll and l-112	l-lll and l-112
l-117 and l-118	l-117 and l-118
2-11 and 2-12	2-11 through 2-12.3/(2-12.4 blank)
2-39 and 2-40	2-39 through 2-40.1/(2-40.2 blank)
2-97 and 2-98	2-97 and 2-98
2-117 and 2-118	2-l17 and 2-118
2-128.7 and 2-128.8	2-128.7 and 2-128.8
2-165 through 2-168	2-l 65 through 2-l68
2-171 and 2-172	2-171 and 2-172
2-180.l through 2-186	...2-180.l through 2-186
2-234.5/(2-234.6 blank)	...2-234.5 through 2-234.8

2. File this change sheet in the front of the publication for reference purposes.

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No. 6

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ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT 13082808-39, 13231600, 13231650 AND 13231800

TM 11-6625-3081-23-1, 1 February 1986, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number or by a miniature pointing hand.

Remove pages	*Insert pages*
i through iv	i through iv
l-9 and l-10	l-9 and l-10
l-10.1/(1-10.2 blank)	None
l-11 and l-12	l-ll and l-12
l-23 through l-26	l-23 through l-26
l-26.1 through l-26.4	l-26.1/(1-26.2 blank)
l-107 through l-108.2	l-107 and l-108
l-121 and l-122	l-121 and l-122
l-133 and l-134	l-133 and l-134
l-143 and l-144	l-143 and l-144
l-149 through l-156	l-149 through l-156
2-159 and 2-160	2-159 and 2-160
2-171 and 2-172	2-171 and 2-172
None	2-176.1/(2-176.2 blank)
2-177 and 2-178	2-177 and 2-178
2-235 through 2-240	2-235/(2-236 blank)
2-241 through 2-246	2-241 through 2-246
2-246.1 through 2-246.3/(2-246.4 blank)	2-247 and 2-248
2-265 through 2-268	2-265 through 2-268
2-281 and 2-282	2-281 and 2-282
2-315 and 2-316	2-315 and 2-316
2-323 and 2-324	2-323 and 2-324

Remove pages	*Insert pages*
FO-l/(FO-2 blank)	FO-l/(FO-2 blank)
FO-3/(FO-4 blank)	FO-3/(FO-4 blank)
FO-5/(FO-6 blank)	FO-5/(FO-6 blank)
FO-9/(FO-10 blank)	FO-9/(FO-10 blank)
FO-11/(FO-12 blank)	None
FO-12.l/(FO-12.2 blank)	FO-12.l/(FO-12.2 blank)
FO-17/(FO-18 blank)	FO-17/(FO-18 blank)
FO-21/(FO-22 blank)	FO-21/(FO-22 blank)
FO-25/(FO-26 blank).	FO-25/(FO-26 blank)
FO-27/(FO-28 blank).	FO-27/(FO-28 blank)

2. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31A AVUM and AVIM requirements for AH-64A.

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 August 1988

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT 13082808-39, 13231600, 13231650 AND 13231800

TM 11-6625-3081-23-1, 1 February 1986, is changed as follows:

1. Title of manual is changed as shown above.

2. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

Remove pages	*Insert pages*
i through l-0	i through l-0
l-3 through l-6	l-3 through l-6
l-53 and l-54	l-53 and l-54
l-59 through l-68	l-59 through l-68
l-101 and l-102	l-l0l and l-102
l-106.13 and l-106.14	l-106.13 and l-106.14
l-115 through l-118	l-115 through l-118
l-125 and l-126	l-125 and l-126
l-129 and l-130	l-129 and l-130
l-135 through l-140	l-135 through l-139/(1-140 blank)
2-l and 2-2	2-l and 2-2
2-88.1/(2-88.2 blank)	2-88.l/(2-88.2 blank)
2-29 through 2-94	2-89 through 2-94
2-128.7 and 2-128.8	2-128.7 and 2-128.8
2-142.5 through 2-142.12.	..2-142.5 through 2-142.12
2-142.13/(2-142.14 blank)	None
2-143 through 2-152	..2-143 and 2-152

3. File this change sheet in the front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31A AVUM and AVIM requirements for AH-64A.

Change
No. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 July 1988

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

TM 11-6625-3081-23-1, 1 February 1986 is changed as follows:

1. Remove and insert pages as indicated below.

Remove pages	Insert pages
1-7 thru 1-12	1-7/(1-8 blank) 1-9 and 1-10 1-10.1/(1-10.2 blank) 1-11 and 1-12
1-19 and 1-20	1-19 and 1-20
1-23 thru 1-28	1-23 thru 1-26 1-26.1 thru 1-26.4 1-27 and 1-28
1-33 thru 1-42	1-33 and 1-33 (1-34.1 blank)/1-34.2 1-35 thru 1-40 1-40.1 and 1-40.2 1-41 and 1-42
1-49 thru 1-52	1-49 thru 1-52
1-107 thru 1-110	1-107 and 1-108 1-108.1 and 1-108.2 1-109 and 1-110 1-110.1 and 1-110.2
1-121 and 1-122	1-121 and 1-122
1-135 thru 1-138	1-135 thru 1-138 1-138.1 and 1-138.2

Remove pages	Insert pages
2-3 thru 2-10	2-3 thru 2-10
2-27 and 2-28	2-27/(2-28 blank)
2-51 and 2-52	2-51 and 2-52
2-61 thru 2-64	2-61 and 2-62 2-62.1/(2-62.2 blank) 2-63 and 2-64
2-69 thru 2-76	2-69 thru 2-76
2-79 and 2-80	2-79 and 2-80
2-85 thru 2-88	2-85 thru 2-88
2-95 thru 2-100	2-95 thru 2-98 2-98.1/(2-98.2 blank) 2-99 and 2-100
2-105 thru 2-110	2-105 and 2-106 2-106.1/(2-106.2 blank) 2-107 thru 2-110
2-113 and 2-114	2-113 and 2-114
2-119 thru 2-128	2-119 thru 2-128
2-128.5 thru 2-128.8	2-128.5 thru 2-128.8
2-135 and 2-136	2-135 and 2-136
2-140.1 and 2-140.2	2-140.1 and 2-140.2
2-141 thru 2-142.3/(2-142.4 blank)	2-141 thru 2-142.13/(2-142.14 blank)
2-159 thru 2-162	2-159 thru 2-162
2-181 and 2-182	2-181 and 2-182
--	2-234.1 thru 2-234.5/(2-234.6 blank)
2-241 thru 2-248	2-240.1 thru 2-240.7/(2-240.8 blank) 2-241 thru 2-246 2-246.1 thru 2-246.3/(2-246.4 blank) 2-247 and 2-248
2-253 and 2-254	2-253 and 2-254
--	2-256.1/(2-256.2 blank)
2-263 and 2-264	2-263 and 2-264
2-289 and 2-290	2-289 and 2-290
2-311 and 2-312	2-311 and 2-312
--	2-316.1/(2-316.2 blank)
2-323 and 2-324	2-323, 2-324, and 2-324.1/(2-324.2 blank)
2-327 and 2-328	2-327 and 2-328
- -	FO-12.1/(FO-12.2 blank)

2. New or changed material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand. Changes in wiring diagrams are indicated by shaded areas.

3. Retain these pages in front of manual for reference purposes.

TM 11-6625-3081-23-1
C 3

Change)
)
No. 3)

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 15 January 1988

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

TM 11-6625-3081-23-1, 1 February 1986, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number and by pointing hands on the illustration pages.

Remove pages	Insert pages
iii/(iv blank)	iii/(iv blank)
2-61 through 2-64	2-61 through 2-64
2-87 and 2-88	2-87 through 2-88.1/(2-88.2 blank)
2-89 through 2-100	2-89 through 2-106.1/(2-106.2 blank)
2-119 and 2-120	2-119 and 2-120
2-123 through 2-128	2-123 through 2-128
2-141 and 2-142	2-141 through 2-142.3/(2-142.4 blank)
2-187 and 2-188	2-187 and 2-188
2-257 through 2-262	2-257 through 2-261/(2-262 blank)
2-29l and 2-292	2-291 and 2-292

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31A literature requirements for EEC AH-64A.

Change
No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
Washington, DC, 15 September 1987

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

TM 11-6625-3081-23-1, 1 February 1986, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a pointing hand on the illustration pages.

Remove pages	Insert pages
1-3 and 1-4	1-3 and 1-4
1-7/(1-8 blank)	1-7/(1-8 blank)
1-101 through 1-106.2	1-101 through 1-106.2
1-106.7 through 1-106.10	1-106.7 through 1-106.10
1-106.15 through 1-106.20	1-106.15 and 1-106.16
None	1-106.16.1 through 1-106.16.4
None	1-106.17 through 1-106.18.1/ (1-106.18.2 blank)
None	1-106.19 through 1-106.20.1/ (1-106.20.2 blank)
1-165 and 1-166	1-165 and 1-166
2-151 and 1-152	1-151 and 1-152
2-159 through 1-162	2-159 through 1-162
2-180.1 through 2-182	2-180.1 through 1-182
2-187 and 2-188	2-187 and 2-188
2-191 and 2-192	2-191 and 2-192
2-197 and 2-198	2-197 and 2-198
2-201 through 2-204	2-201 through 2-204
2-209 and 2-210	2-209 and 2-210
2-213 and 2-214	2-213 and 2-214
2-221 through 2-230	2-221 through 2-230
2-235 and 2-236	2-235 and 2-236
2-241 and 2-242	2-241 and 2-242

TM 11-6625-3081-23-1

Remove pages	Insert pages
2-247 and 2-248	2-247 and 2-248
2-253 and 2-254	2-253 and 2-254
2-257 through 2-268	2-257 through 2-268
2-271 and 2-272	2-271 and 2-272
2-277 through 2-284	2-277 through 2-284
2-287 and 2-288	2-287 and 2-288
2-291 through 2-300	2-291 through 2-300
2-303 through 2-312	2-303 through 2-312
2-317 and 2-318	2-317 and 2-318
2-321/(2-322 blank)	2-321/(2-322 blank)
2-325 and 2-326	2-325 and 2-326

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31A literature requirements for EEC AH-64.

Change

No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
Washington, DC, 15 August 1987

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

TM 11-6625-3081-23-1, 1 February 1986, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a miniature pointing hand. Changes in wiring diagrams are indicated by shaded areas.

Remove pages	Insert Pages
iii/(iv blank)	iii/(iv blank)
1-21 and 1-22	1-21 and 1-22
1-47 and 1-48	1-47 and 1-48
1-77 and 1-78	1-77 and 1-78
1-83 and 1-84	1-83 and 1-84
1-91 and 1-92	1-91 and 1-92
1-101 and 1-102	1-101 and 1-102
1-121 and 1-122	1-121 and 1-122
1-135 and 1-136	1-135 and 1-136
1-143 through 1-148	1-143 through 1-148
1-161 through 1-164	1-161 through 1-164
2-13 through 2-16	2-13 through 2-16
2-43 through 2-48	2-43 through 2-48
2-71 and 2-72	2-71 and 2-72
2-89 through 2-100	2-89 through 2-100
2-107 through 2-112	2-107 through 2-112
2-117 through 2-122	2-117 through 2-122
2-125 and 2-126	2-125 and 2-126
2-131 through 2-144	2-131 through 2-140
None	2-140.1 through 2-140.3/ (2-140.4 blank)
None	2-141 through 2-144
2-161 and 2-162	2-161 and 2-162
2-165 and 2-166	2-165 and 2-166
2-169 and 2-170	2-169 and 2-170

Remove pages	Insert pages
2-279 through 2-282	2-279 through 2-282
2-307 and 2-308	2-307 and 2-308
2-323 and 3-324	2-323 and 3-324
FO-1/(FO-2 blank)	FO-1/(FO-2 blank)
FO-3/(FO-4 blank)	FO-3/(FO-4 blank)
FO-5/(FO-6 blank)	FO-5/(FO-6 blank)
FO-7/(FO-8 blank)	FO-7/(FO-8 blank)
FO-9/(FO-10 blank)	FO-9/(FO-10 blank)
FO-13/(FO-14 blank)	FO-13/(FO-14 blank)
FO-15/(FO-16 blank)	FO-15/(FO-16 blank)
FO-17/(FO-18 blank)	FO-17/(FO-18 blank)
FO-19/(FO-20 blank)	FO-19/(FO-20 blank)
FO-21/(FO-22 blank)	FO-21/(FO-22 blank)
FO-23/(FO-24 blank)	FO-23/(FO-24 blank)
FO-27/(FO-28 blank)	FO-27/(FO-28 blank)
FO-29/(FO-30 blank)	FO-29/(FO-30 blank)
FO-33/(FO-34 blank)	FO-33/(FO-34 blank)
FO-37/(FO-38 blank)	FO-37/(FO-38 blank)
FO-39/(FO-40 blank)	None
FO-41/(FO-42 blank)	None
FO-43/(FO-44 blank)	None
FO-45/(FO-46 blank)	None
FO-47/(FO-48 blank)	None
FO-49/(FO-50 blank)	None
FO-51/(FO-52 blank)	None
FO-53/(FO-54 blank)	None
FO-55/(FO-56 blank)	None
FO-57/(FO-58 blank)	None
FO-59/(FO-60 blank)	None
FO-61/(FO-62 blank)	None
FO-63/(FO-64 blank)	None

2. File this change in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

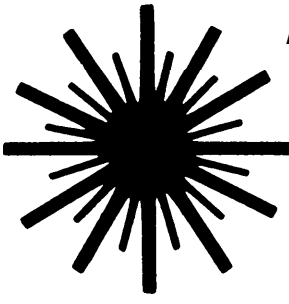
Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31A literature requirements for AH-64A.

DANGER

INVISIBLE LASER RADIATION
AVOID EYE EXPOSURE TO DIRECT RADIATION



ACTIVE LASERS ARE USED IN CERTAIN TESTS. OBSERVE ALL SAFETY PRECAUTIONS. ENSURE THAT LASER PROTECTION COVER IS CLOSED. NEVER LOOK AT OR ALONG THE AXIS OF A LASER BEAM.

PROCEDURES IN THIS MANUAL DO NOT REQUIRE ANY FIRING OF THE LASER INTO OPEN SPACE. TESTING IS ACCOMPLISHED IN A PROTECTIVE ENCLOSURE WHICH PREVENTS EXPOSURE TO THE POTENTIALLY DANGEROUS LASER RADIATION.

YOUR SUPERVISOR WILL HAVE LASER SAFETY GOGGLES AVAILABLE IF ANY PROBLEM PRESENTS A POSSIBLE EXPOSURE TO THE LASER RADIATION. A STANDARD LASER SAFETY GOGGLE, NSN 4240-00-258-2054, WILL PROVIDE ADEQUATE PROTECTION IF REQUIRED. OTHER LASER SAFETY GOGGLES CAN BE USED, BUT SHOULD BE SPECIFIC FOR AND LABELLED WITH THE 1064 NANOMETER WAVELENGTH.

WARNING

HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

May result if personnel fail to observe safety precautions. Learn the areas containing high voltage in each piece of equipment. Be careful not to contact high-voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and ground points of high potential before touching them.

For Artificial Respiration, refer to FM 21-11

WARNING

HAZARDOUS SOLVENTS

When you use solvents, be sure that the place you work in is well ventilated. WEAR GLOVES AND EYE PROTECTION. If you don't have good ventilation, read TB MED 223 and use the recommended respiratory (breathing) protection.

DON'T USE FLAMMABLE SOLVENTS AROUND HEAT, OPEN FLAME, OR SPARKS.

IF YOU GET SOLVENT IN YOUR EYES OR ON YOUR SKIN, FLUSH THE SOLVENT AWAY WITH WATER FOR 15 MINUTES; THEN GET MEDICAL HELP.

Freon reacts with highly active free metals such as sodium, barium, or potassium, and may produce toxic byproducts, fires, or explosions. Do not use Freon near highly active free metals.

TOXIC AND FLAMMABLE CHEMICALS

Use the same care for toxic and flammable chemicals as you would for hazardous solvents.

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL CONTAMINATION

Notify your supervisor if you think you have been exposed to chemical, biological, or radiological contamination. TM 9-1300-275/2 gives procedures for decontamination.

PNEUMATIC SYSTEMS

PNEUMATIC PRESSURE SHOULD BE TURNED OFF AND SYSTEM BLED DOWN TO PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

HEAVY OBJECTS

HEAVY OBJECTS LIFTED OR CARRIED MAY REQUIRE MORE THAN ONE PERSON TO PREVENT INJURY TO PERSONNEL AND/OR DAMAGE TO EQUIPMENT.

INSERT LATEST CHANGE PAGES. DESTROY SUPERSEDED PAGES.

LIST OF EFFECTIVE PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Original . . .. 0.... 01 February 1986
Change . . . . .. l . . .. l5 August 1987
Change . . . . .. 2 . . .. 15 September 1987
Change . . . . .. 3 . . .. 15 January 1988
Change . . . . .. 4 . . .. 01 July 1988
Change . . . . .. 5 . . .. 01 August 1988
Change . . . . .. 6 . . .. 01 January 1989
Change . . . . .. 7 . . .. l5 May 1989
Change . . . . .. 8 . . .. 20 February 1990
Change . . . . .. 9.... 28 February 1990
Change . . . .. 10 . . .. 06 June 1990
Change . . . .. 11 . ... 26 September 1990
Change . . . .. 12 . ... 26 February 1991
Change . . . .. 13 . . .. 15 April 1991
Change . . . .. 14 . . .. 30 August 1991
Change . . . .. 15 . ... 30 June 1992
Change . . . .. 16 . ... 26 February 1993
Change . . . .. 17 . . .. 30 July 1993
Change . . . .. 18 . . ..30 November 1993
Change . . . .. 19 . ... 27 November 1994
Change . . . .. 20 . . .. 31 July 1996

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 728, CONSISTING OF THE FOLLOWING:

Page No.	*Change No.	Page No.	*Change No.
Title	5	1-6	18
a — B	0	1-7	4
A - G	20	1-8 Blank	0
H Blank	20	1-9	4
i	17	1-10 — 1-12	9
ii	9	1-12.1	9
iii	5	1-12.2 Blank	9
iv	9	1-13	9
v	5	1-14	0
vi - vii	0	1-14.1	9
1-0	18	1-14.2 Blank	9
1-1	0	1-15 – 1-19	0
1-2	10	1-20	4
1-3	20	1-21	0
1-4 — 1-5	5		

*Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGE PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Page No.	*Change No.
1-22	1
1-23	0
1-24 — 1-26	6
1-26.1	6
1-26.2 Blank	6
1-26.3 — 1-26.4 Deleted	6
1-27	4
1-28 — 1-33	0
1-34	10
1-34.1 Blank	4
1-34.2	10
1-35	10
1-36 — 1-38	4
1-39	0
1-40	4
1-40.1 — 1-40.2	4
1-41 — 1-42	4
1-43 — 1-47	0
1-48	1
1-49	0
1-50 — 1-51	4
1-52 — 1-53	0
1-54	10
1-54.1	10
1-54.2	10
1-55	10
1-56 — 1-59	0
1-60	9
1-61 — 1-63	5
1-64	0
1-65	5
1-66 — 1-67 Deleted	5
1-68 — 1-69	0
1-70 — 1-73	20
1-74 Blank	0
1-75 — 1-76	0
1-77	1
1-78 — 1-82	0
1-83	1
1-84	0
1-85	10
1-86 — 1-91	0
1-92	7
1-93	0
1-94	18
1-95 1-96	9
1-97 — 1-100	0
1-101 — 1-102	18
1-103 - 1-104	9
1 - 1 0 5	2
1-106	8
1 - 1 0 6 . 1	0
1-106.2	2
1-106.3 — 1-106.4	17
1-106.5 — 1-106.7	0
1-106.8	18
1-106.9	0
1-106.10	9
1-106.11	18
1-106.12	9
1-106.13	18
1-106.14	9
1-106.14.1	18
1-106.14.2 Blank	9
1-106.15 — 1-106.16	18
1-106.16.1	18
1-106.16.2 — 1-106.16.4	2
1-106.17	2
1-106.18	18
1-106.18.1 — 1-106.19	13
1-106.20	0
1-106.20.1	2
1-106.20.2 Blank	0
1-106.21	14
1-106.22	14
1-107	9
1-108	6
1-108.1 — 1-108.2 Deleted	6

*Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGE PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Page No.	*Change No.
1-109 - 1-110	4
1-110.1 — 1-110.2	4
1-111	7
1-112 — 1-115	0
1-116	5
1-117	7
1-118	5
1-119 — 1-120	0
1-121 — 1-123	9
1-124 — 1-125	0
1-126	5
1-127	18
1-128 — 1-129	0
1-130	9
1-130.1	9
1-130.2 Blank	9
1-131 — 1-133	0
1-134	6
1-135	4
1-136 — 1-139	5
1-140 Blank	5
1-141	9
1-142 — 1-143	0
1-144	9
1-144.1	9
1-144.2 Blank	9
1-145	1
1-146	0
1-147	1
1-148 — 1-149	0
1-150	6
1-151	0
1-152 — 1-155	6
1-156	0
1-157 — 1-158	20
1-159-1-160	0
1-161	1
1-162	0
1-163	1
1-164	0
1-165	18
1-166	0
1-167	9
1-168	18
2-1	5
2-2	9
2-3	0
2-4	8
2-4.1 — 2-4.5	8
2-4.6 Blank	8
2-5 — 2-6	8
2-7	4
2-8	0
2-9	4
2-10 — 2-11	0
2-12	7
2-12.1 — 2-12.3	7
2-12.4 Blank	7
2-13	8
2-14	0
2-15 — 2-16	1
2-17 — 2-26	0
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2-31	18
2-32 — 2-38	0
2-39 — 2-40	9
2-40.1 — 2-40.2	9
2-41 — 2-42	9
2-43	16
2-44 — 2-47	9
2-48	10
2-49 — 2-61	9
2-62	16
2-62.1	16
2-62.2	17
2-63	18

*Zero in this column indicates an original page.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGE PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text effected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

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2-69-2-70	16
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2-70.2 Blank	16
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2-72 — 2-73	18
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2-78	0
2-79	9
2-80 — 2-83	0
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2-86	4
2-87	16
2-88	9
2-88.1 — 2-88.2	18
2-89 — 2-90	18
2-91	3
2-92 — 2-94	16
2-95 — 2-98	20
2-98.1 — 2-98	20
2-99	17
2-100	16
2-100.1	16
2-100.2 Blank	16
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2-112	1
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2-118	8
2-119 — 2-122	4
2-123	3
2-124 - 2-125	4
2-126	3
2-127	4
2-128	3
2-128.1 - 2-128.4	3
2-128.5 - 2-128.6	4
2-128.7 - 2-128.8	7
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2-133	0
2-134	1
2-135	4
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2-140.3	1
2-140.4 Blank	1
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2-142.1 — 2.142.4	4
2-142.5 — 2.142.7	5
2-142.8 — 2-142.9	4
2-142.10	5
2-142.11	4
2-142.12	5
2-142.13 — 2.142.36	9
2-142.37 — 2-142.38	18
2-142.38.1 — 2-142.38.3	18
2-142.38.4 Blank	18
2-142.39	18
2-142.40	16
2-142.41 — 2-142.56	9
2-143	10
2-144 Blank	9
2-145 — 2-148 Deleted	5
2-149	17

*Zero in this column indicates an original page.

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LIST OF EFFECTIVE PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Page No.	*Change No.
2-150	10
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2-151	10
2-152	2
2-153 – 2-158	0
2-159	2
2-160 – 2-161	16
2-162 — 2-164	9
2-164.1 — 2.164.2	9
2-165 — 2-166	9
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2-171	7
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2-181	11
2-182 – 2-185	7
2-186	0
2-186.1 – 2-186.4	9
2-187	3
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2-201	2
2-202 – 2-203	0
2-204	2
2-205 – 2-208	0
2-209	2
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2-214 - 2-220	0
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2-234.5	7
2-234.6 — 2-234.8	19
2-235	6
2-236 Blank	6
2-237 – 2-240 Deleted	6
2-240.1 – 2-240.7	4
2-240.8 Blank	4
2-241 – 2-246	6
2-246.1	6
2-246.2 Blank	6
2-246.3 – 2-246.4 Deleted	6
2-247	6
2-248	9
2-249 – 2-252	0
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2-252.2	16
2-253	16
2-254	4

*Zero in this column indicates an original page.

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Page No.	*Change No.
2-255 — 2-256	0
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2-256.2 Blank	4
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2-264	4
2-265	6
2-266 — 2-267 Deleted	6
2-268	2
2-269 — 2-271	0
2-272	2
2-273 — 2-276	0
2-277	2
2-278	20
2-279	0
2-280 — 2-282	20
2-283 — 2-284	2
2-285 — 2-287	0
2-288	2
2-289	0
2-290	4
2-291	2
2-292	3
2-293	2
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2-295	2
2-296	0
2-297	2
2-298	0
2-299	2
2-300 — 2-302	0
2-303	2
2-304	9
2-305	2
2-306	0
2-307	1
2-308	2
2-309	0
2-310	2
2-311	4
2-312 — 2-315	0
2-316	6
2-316.1	4
2-316.2 Blank	4
2-317	2
2-318 — 2-319	0
2-320	9
2-321	2
2-322 Blank	0
2-323	9
2-324	6
2-324.1	11
2-324.2 Blank	4
2-325	2
2-326	0
2-327 — 2-328	4
FO-1	6
FO-2 Blank	0
FO-3	6
FO-4 Blank	0
FO-4.1	9
FO-4.2 Blank	9
FO-5	6
FO-6 Blank	0
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FO-9	6
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FO-11 — FO-12 Deleted	6
FO-12.1	6
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FO-15	1
FO-16 Blank	0

*Zero in this column indicates an original page.

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Page No.	*Change No.	Page No.	*Change No.
FO-17	6	FO-28 Blank	0
FO-18 Blank	0	FO-29	18
FO-19	1	FO-30 Blank	0
FO-20 Blank	0	FO-31	1
FO-21	6	FO-32 Blank	0
FO-22 Blank	0	FO-33	1
FO-23	1	FO-34 Blank	0
FO-24 Blank	0	FO-35	16
FO-25	6	FO-36 Blank	0
FO-26 Blank	0	FO-37	1
FO-27	6	FO-38 Blank	0

*Zero in this column indicates an original page.

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd, St. Louis, MO 63120-1798. A reply will be furnished to you.

TABLE OF CONTENTS (cont)

TABLE OF CONTENTS (cont)

LIST OF ILLUSTRATIONS

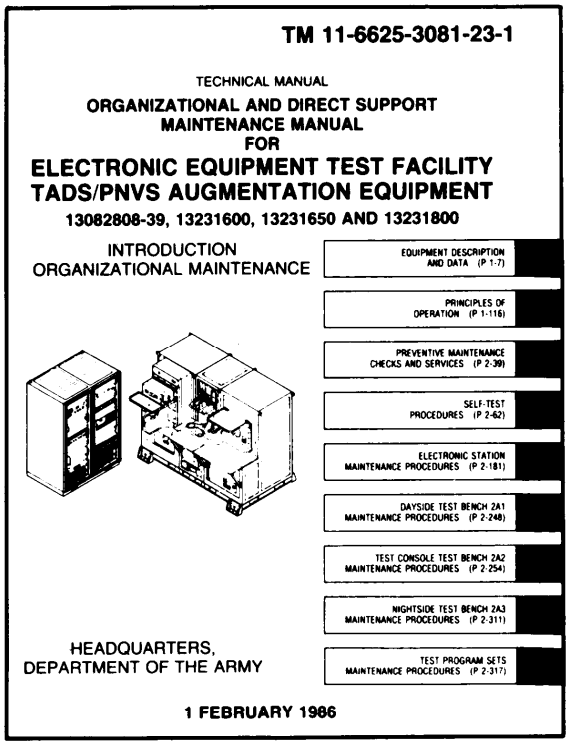
TM 11-6625-3081-23-1

TM 11-6625-3081-23-2

HOW TO USE THIS MANUAL

There are five manuals used in support of the electronic equipment test facility TADS/PNVS augmentation equipment. To become familiar with these manuals, spend some time looking through them to see what- they contain. TM 11-6625-3081-23-1 includes equipment description, principles of operation, self-test instructions, and organizational maintenance instructions. TM 11-6625-3081-23-2 contains wiring data for the electronic station and electro-optical test bench set. TM 11-6625-3081-23-3 contains wiring data for test program sets. TM 11-6625-3081-23-4 contains direct support maintenance instructions, appendixes, alphabetical index, and glossary. TM 11-6625-3081-23-5 contains troubleshooting methodology and fault isolation. Once you are familiar with this manual, there are three ways to find information:

- Use The Front Cover Index
- Use The Table of Contents
- Use The Alphabetical Index


TM 11-6625-3081-23-1

TECHNICAL MANUAL

ORGANIZATIONAL AND DIRECT SUPPORT MAINTENANCE MANUAL FOR

ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

13082808-39, 13231600, 13231650 AND 13231800

INTRODUCTION
ORGANIZATIONAL MAINTENANCE

EQUIPMENT DESCRIPTION AND DATA (P 1-7)
PRINCIPLES OF OPERATION (P 1-116)
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (P 2-39)
SELF-TEST PROCEDURES (P 2-62)
ELECTRONIC STATION MAINTENANCE PROCEDURES (P 2-181)
DAYSIDE TEST BENCH 2A1 MAINTENANCE PROCEDURES (P 2-248)
TEST CONSOLE TEST BENCH 2A2 MAINTENANCE PROCEDURES (P 2-254)
NIGHTSIDE TEST BENCH 2A3 MAINTENANCE PROCEDURES (P 2-311)
TEST PROGRAM SETS MAINTENANCE PROCEDURES (P 2-317)

HEADQUARTERS, DEPARTMENT OF THE ARMY

1 FEBRUARY 1986

Use The Front Cover Index

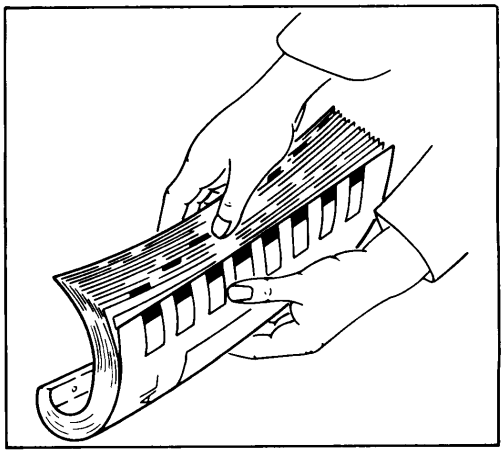
1. Suppose you have been told to replace control unit assembly 1A1 in the electronic station at the organizational level.

2. Look at the cover of TM 11-6625-3081-23-1. See the black bars near the right edge with subject titles next to them. You will find "ELECTRONIC STATION MAINTENANCE PROCEDURES (page 2-181)." If You turned to the page indicated, you would be at the section you would use to replace control unit assembly 1A1.

OR

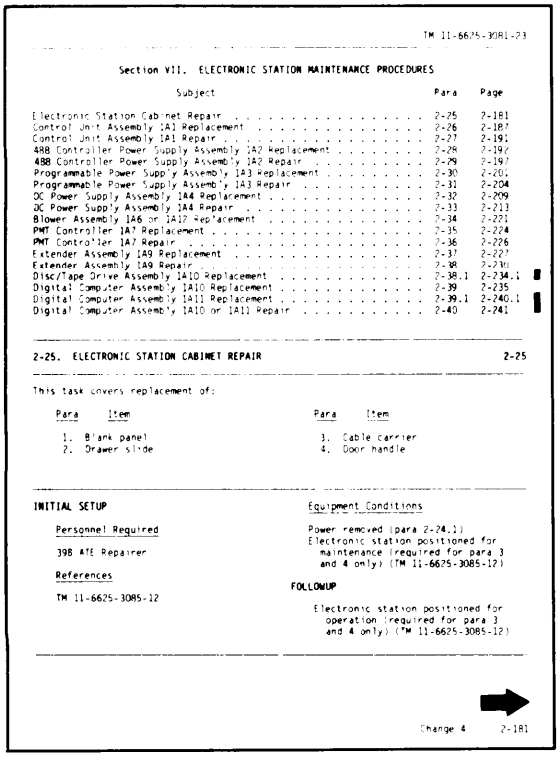
3. You can use the black bars to quickly find the section. If you were to bend the pages a little, you would see black bars on them. The bars on the pages will line up with the black bars on the cover.

4. If you were to put your thumbnail on the first page with the black bar that lines up with the one on the cover for "ELECTRONIC STATION MAINTENANCE PROCEDURES," your thumbnail would be on page 2-181.



5. When you open the book to page 2-181 you will see that you are in section VII and that there is an index of the paragraphs in section VII.

6. The example below shows you that control unit assembly 1A1 replacement is performed in paragraph 2-26 on page 2-187. Note that the maintenance paragraphs are organized in reference designation sequence.



TM 11-6625-3081-23

Section VII. ELECTRONIC STATION MAINTENANCE PROCEDURES

Subject	Para	Page
Electronic Station Cabinet Repair	2-25	2-181
Control Unit Assembly 1A1 Replacement	2-26	2-187
Control Unit Assembly 1A1 Repair	2-27	2-191
488 Controller Power Supply Assembly 1A2 Replacement	2-28	2-197
488 Controller Power Supply Assembly 1A2 Repair	2-29	2-197
Programmable Power Supply Assembly 1A3 Replacement	2-30	2-201
Programmable Power Supply Assembly 1A3 Repair	2-31	2-204
DC Power Supply Assembly 1A4 Replacement	2-32	2-209
DC Power Supply Assembly 1A4 Repair	2-33	2-213
Blower Assembly 1A6 or 1A12 Replacement	2-34	2-221
PMT Controller 1A7 Replacement	2-35	2-224
PMT Controller 1A7 Repair	2-36	2-226
Extender Assembly 1A9 Replacement	2-37	2-227
Extender Assembly 1A9 Repair	2-38	2-234
Disc/Tape Drive Assembly 1A10 Replacement	2-38.1	2-234.1
Digital Computer Assembly 1A10 Replacement	2-39	2-235
Digital Computer Assembly 1A11 Replacement	2-39.1	2-240.1
Digital Computer Assembly 1A10 or 1A11 Repair	2-40	2-241

2-25. ELECTRONIC STATION CABINET REPAIR 2-25

This task covers replacement of:

Para	Item	Para	Item
1.	Blank panel	3.	Cable carrier
2.	Drawer slide	4.	Door handle

INITIAL SETUP

Personnel Required

398 ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (required for para 3 and 4 only) (TM 11-6625-3085-12)

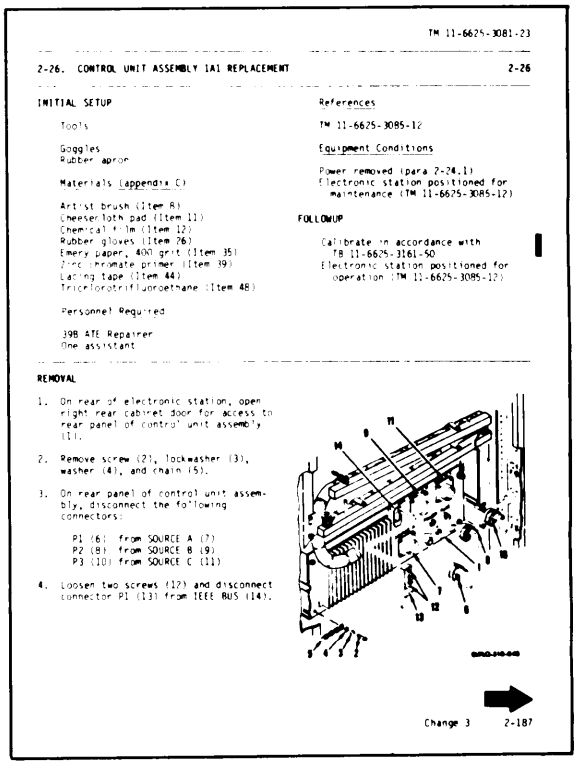
FOLLOWUP

Electronic station positioned for operation (required for para 3 and 4 only) (TM 11-6625-3085-12)

Change 4 2-181

7. Following is a reproduction of page 2-187. The beginning of the paragraph has an INITIAL SETUP. This tells you what you will need to perform the procedure.

8. INITIAL SETUP means, DO THIS FIRST BEFORE STARTING THE TASK. Review the INITIAL SETUP table and become familiar with the requirements.



TM 11-6625-3081-23

2-26. CONTROL UNIT ASSEMBLY 1A1 REPLACEMENT 2-26

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (Appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 76)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Calibrate in accordance with TB 11-6625-3161-50
Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

1. On rear of electronic station, open right rear cabinet door for access to rear panel of control unit assembly (11).
2. Remove screw (2), lockwasher (3), washer (4), and chain (5).
3. On rear panel of control unit assembly, disconnect the following connectors:
   P1 (6) from SOURCE A (7)
   P2 (8) from SOURCE B (9)
   P3 (10) from SOURCE C (11)
4. Loosen two screws (12) and disconnect connector P1 (13) from IEEE BUS (14).

Change 3 2-187

9. INITIAL SETUP lists tools, materials, and personnel required to perform the task and condition the equipment should be in before performing the task.

10. FOLLOWUP should be performed after the basic task has been completed.

11. Following the INITIAL SETUP are illustrated step-by-step procedures for replacement of control unit assembly 1A1.

12. Procedural steps are illustrated and keyed by callout numbers in the text and on-the illustration.

13. A black arrow head in the lower right corner of a page indicates the task is continued on the following page.

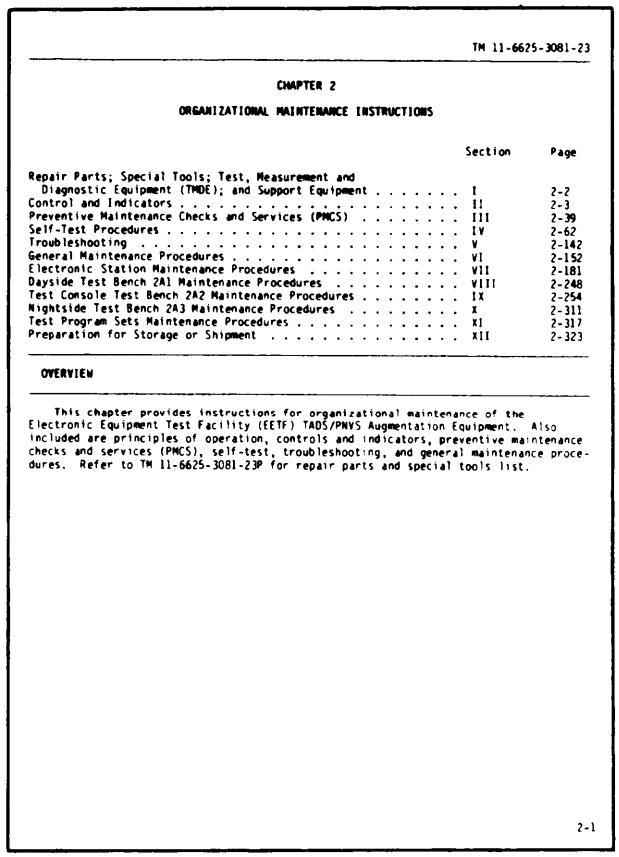
HOW TO USE THIS MANUAL (cont)

Use The Table Of Contents

1. The table of contents is a list of all the chapters and sections in the manual.

2. Using the same example, you could go directly to the table of contents. There you would see Chapter 2 ORGANIZATIONAL MAINTENANCE INSTRUCTIONS (page 2-1).

3. Turning to page 2-1, you will find an index of the sections in chapter 2. Then you would proceed using the section index as in the previous example.



TM 11-6625-3081-23

CHAPTER 2

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

OVERVIEW

This chapter provides instructions for organizational maintenance of the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment. Also included are principles of operation, controls and indicators, preventive maintenance checks and services (PMCS), self-test, troubleshooting, and general maintenance procedures. Refer to TM 11-6625-3081-23P for repair parts and special tools list.

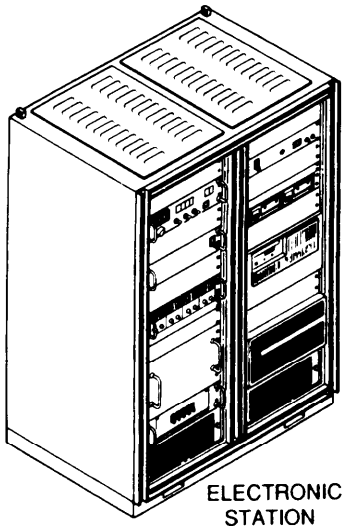
2-1

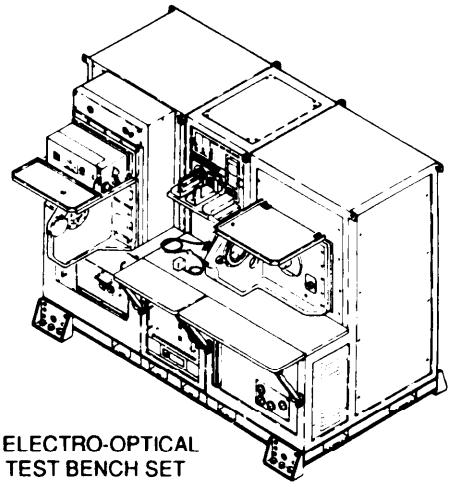
Use The Alphabetical Index

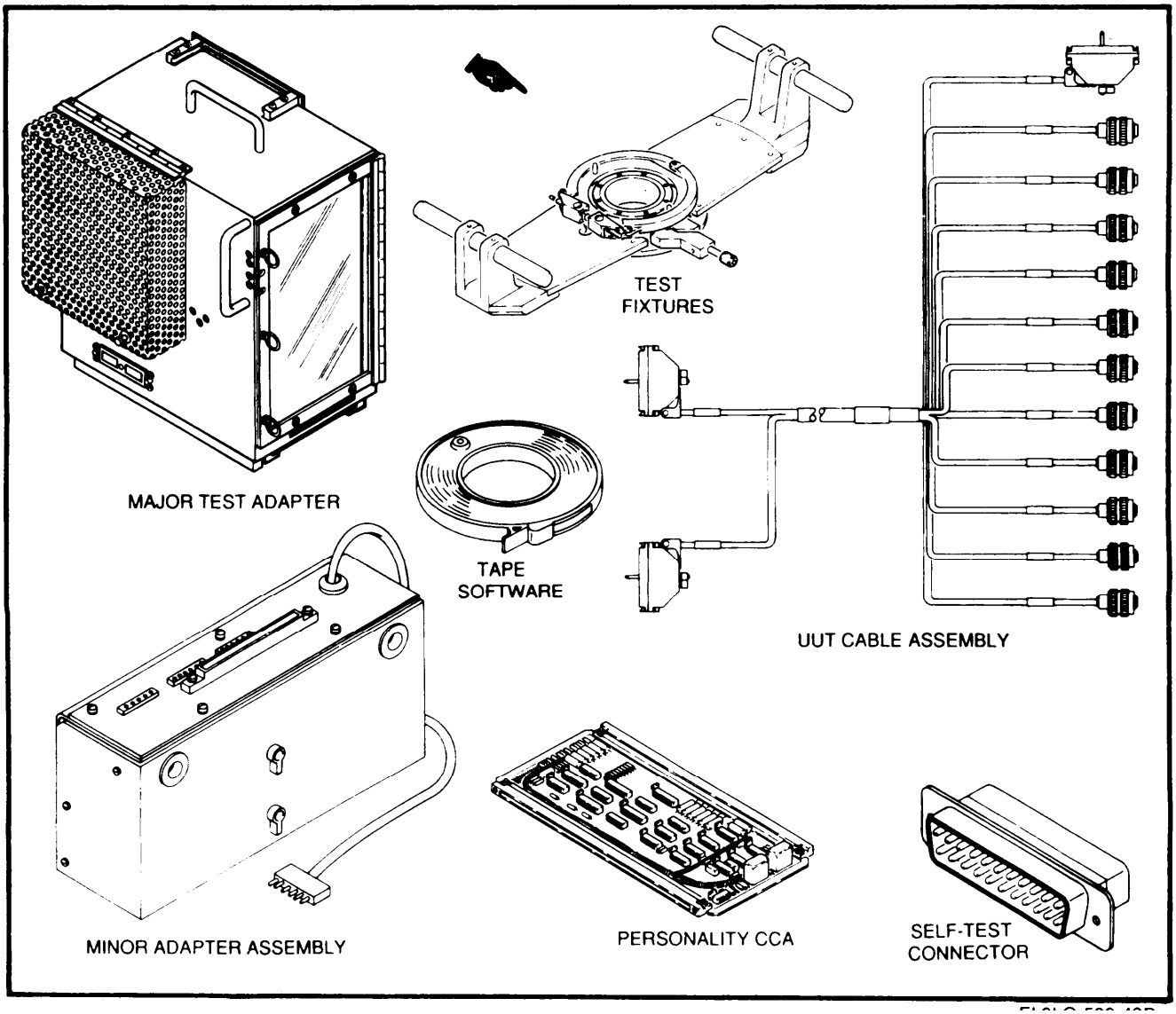
1. The alphabetical index lists all of the subjects that are in each manual in alphabetical order. It provides a reference to the paragraph number(s) that provide coverage for the subject. Note that paragraph numbers of prime paragraphs are provided on both sides of the page to make it easier to find a specific paragraph.

2. Each subject is listed two or three ways so that it can be easily located. For example, “Secondary heat source assembly 2A3A1A17" is also listed as ‘Heat source assembly, secondary heat source assembly 2A3A1A17.”

3. This index is most useful when you know the name of the equipment or item you are trying to locate.







Electronic Equipment Test Facility (EETF)
TADS/PNVS Augmentation Equipment

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter provides general information and descriptions of the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment.

Section I. GENERAL INFORMATION

1-1. SCOPE 1-1

a. TYPE OF MANUAL. This manual provides organizational and direct support maintenance instructions for the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment.

b. MODEL NUMBER AND EQUIPMENT NAME. (To be supplied).

c. PURPOSE OF EQUIPMENT. The EETF TADS/PNVS Augmentation Equipment provides the electro-optical and electronic test capabilities for the Target Acquisition Designation Sight (TADS) and the Pilot Night Vision Sensor (PNVS) line replaceable units (LRUs) and shop replaceable units (SRUs). These LRUs and SRUs are tested as unit-under-test (UUT) at the organizational maintenance level and at the direct support maintenance level.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS 1-2

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-751, The Army Maintenance Management System (TAMMS).

1-3. PREPARATION FOR STORAGE OR SHIPMENT 1-3

Refer to paragraph 2-70 for any unique instructions about preparation for storage or shipment.

1-4. NOMENCLATURE CROSS-REFERENCE LIST 1-4

a. This listing includes nomenclature cross-references used in this manual.

Common Name	Official Nomenclature
AC Control Panel Assembly 1A5	AC Control Circuit Breaker Assembly
Analog to Digital Converter Assembly 2A2A13	E/O Bench (center section) Analog to Digital Converter Assembly
EETF TADS/PNVS Augmentation Equipment	Electronic Equipment Test Facility TADS/PNVS Augmentation Equipment
Bracket Assembly 2A1A1A4	Heads Out Display Mounting Bracket Assembly
Buffer Interface CCA 1A11A13	Buffer Card Circuit Card Assembly
Cable Entry Panel 1A13	Electronic Station Cable Entry Panel
Cable Entry Panel 1A14	Electronic Station Cable Entry Panel
Cable Entry Panel 2A1A2A17	Bulkhead Plate Assembly
Cable Entry Panel 2A1A4	Bulkhead Plate Assembly
Cable Entry Panel 2A1A5	Bulkhead Plate Assembly
Cable Entry Panel 2A2A14	Electrical/Optical Bench Cable Entry Panel
Cable Entry Panel 2A3A4	E.O. FIR Cable Entry Panel
Camera Head Control Unit 2A2A7A3	Camera Head/Camera Control Unit
CID Video Camera 2A1A2A1A1A15	Camera/Bracket Assembly
Circuit Card Assembly 2A2A12A1	Self-Test Card
Circuit Card Assembly 2A2A12A2	Self-Test Card
Clutch/Cable Assembly 2A3A1A1W17	W17 Electrical Special Purpose Cable Assembly
Clutch/Cable Assembly 2A3A1A1W26	W26 Electrical Special Purpose Cable Assembly
Dayside Test Bench 2A1	Dayside Test Bench Assembly
Disc Drive Assembly 1A10	Disc/Tape Drive Assembly

1-4. NOMENCLATURE CROSS-REFERENCE LIST (cont) 1-4

Common Name	Official Nomenclature
Digital Computer Assembly 1A11	Electronic Station Controller Digital Computer Assembly
Electronic Station 1	Full Electronic Station
Filter and Detector Assembly 2A1A1A1A4	Optical Signal Analyzer Filter and Detector Assembly
Hand Held Temperature Probe 2A2W26	W26 Heat Temperature Probe Electrical Special Purpose Cable Assembly
Harness Assembly 1W1	Electronic Station 1W1 Branched Wiring Harness Assembly
Heat Sink Assembly 2A2A7A5	Video Signal Generator Electrical Electronic Component Heat Sink Assembly
Heat Source Assembly 2A3A1A1A1	Heat Source - 2.00 Inch
Heat Source Assembly 2A3A1A1A2	Heat Source - 1.50 Inch
Indirect View Display (IVD) 2A1A3	Head Down Display/Indirect View Display Assembly
Inner Module 2A1A2	Dayside Test Bench Inner Module
Interface Assembly 2A1A1A8	PMT Electronic Filter Interface Assembly
Interface Assembly 2A2A1A1	Digital Clock Interface Assembly
Laser Cover Assembly 2A1A2A19	Laser Protective Cover Assembly
Laser Power Supply Assembly 2A1A6	Power Supply Assembly
Main Access Door Interlock Switch 2A1A1A5	Sensitive Switch Assembly
Major Test Adapter	Test Adapter No. 1
Motor/Cable Assembly 2A3A1A1W16	Electrical Special Purpose Cable Assembly
Multiprogrammer Assembly 2A2A11	E/O Bench (center section) Multiprogrammer Assembly
Multiprogrammer Extender Assembly 2A2A11	E/O Bench (center section) Multiprogrammer Extender Assembly
Nightside Optical Assembly 2A3A1	Nightside Test Bench Optical Assembly
Nightside Test Bench 2A3	Nightside Test Bench Assembly

1-4. NOMENCLATURE CROSS-REFERENCE LIST (cont) 1-4

Common Name	Official Nomenclature
Optical Switch/Cable Assembly 2A3A1A1W20	Electrical Special Purpose Cable Assembly
Photomultiplier Bracket Assembly 2A1A1A7	Optical Signal Analyzer Photomultiplier and Bracket Assembly
Photon Emitter Assembly 2A1A1A3	PMT Calibration Light Source Photon Emitter Assembly
PMT Access Door Interlock 2A1A1A11	Sensitive Switch Assembly
PNVS	Pilot Night Vision Sensor Assembly AN/AAQ-11
Programmable Digitizer 2A2A1	Programmable Digitizer Assembly
Programmable Power Supply Assembly 1A3	Programmable Power Supply Drawer Assembly
Programmer CCA	Programmer Card
Radiometer Assembly 2A1A2A3	Modified Radiometer Assembly
Relay Assembly 2A1A1A12	Optical Signal Analyzer Relay Assembly
Secondary Heat Source 2A3A1A17	Heat Source - 1.50 Inch
Sensor Mount Assembly 2A1A2A4A10	Dayside Sensor Mount Assembly
Sensor Mount Assembly 2A3A1A3	VIS FLIR Sensor Mount Assembly
Solenoid/Cable Assembly 2A3A1A1W13	Electrical Special Purpose Cable Assembly
TADS	Target Acquisition Designation Sight Assembly AN/ASQ-170
Test Console Test Bench 2A2	Electrical/Optical Bench Test Console Test Bench Assembly
Test Station	Electronic Equipment Test Facility AN/USM-410
Yoke Load Coil Assembly	Electrical Coil Assembly
488 Controller Power Supply	488 Controller Power Supply Drawer Assembly 1A2 Assembly

b. Refer to the glossary for abbreviations used as common names but not having official nomenclature.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) 1-5

EIR can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR may be submitted on SF 368 (Quality Deficiency Report). Mail directly to: Commander, U.S. Army Aviation and Troop Command, ATTN: AMSAV-R-EQ, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

1-6. CALIBRATION 1-6

The following equipment in the EETF requires calibration:

Equipment	Calibration Procedure
Control Unit Assembly 1A1	TB 1-6625-724-50
Temperature Control Unit 1A1	TB 1-6625-727-50
Radiometer - Modified 2A1A2A3	TB 1-6625-725-50
Optical Signal Generator 2A2A3	TB 1-6625-726-50

1-7. OPERATING PR0CEDURES 1-7

Refer to TM 11-6625-3085-12 for operating procedures that prepare the EETF TADS/PNVS Augmentation Equipment for use in the normal test mode. Paragraph 2-16 provides data for performance of the self-test program.

1-8. REFERENCE DESIGNATIONS 1-8

Refer to appendix E for a complete listing of the EETF TADS/PNVS Augmentation Equipment reference designations used in this manual.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. SYSTEM DESCRIPTION AND DATA 1-9

a. SYSTEM INTERFACE. The EETF TADS/PNVS Augmentation Equipment provides the electrical, electronic, optical, and mechanical interface for test and repair of the TADS/PNVS LRUs and SRUs. The augmentation equipment, other AH-64A test equipment, AN/USM-410 Electronic Equipment Test Facility, and a mobile expandable van make up a complete AH-64A EETF. When the AH-64A EETF is set up for operation it then becomes a sophisticated computer controlled test platform for testing, evaluating, and repairing all of the AH-64A helicopter airborne components.

b. EETF TADS/PNVS AUGMENTATION EQUIPMENT. The EETF TADS/PNVS Augmentation Equipment is comprised of three major groups of equipment; (1) electronic station, (2) electro-optical (E/0) test bench set, and (3) test program sets (TPS). This equipment is used in conjunction with, and under computer control of, the AN/USM-410 Electronic Equipment Test Station.

(1) The electronic station is a two bay cabinet containing electrical and electronic assemblies. These assemblies function as the control and communication link between the test station (AN/USM 410) and the electro-optical test bench set. The electronic station provides the electrical interface, buffering, power supplies, stimulus and measurement capabilities required to augment (but not duplicate) the inherent capabilities of the test station.

(2) The electro-optical (E/0) test bench set consists of three individual test benches; dayside, test console (center section), and nightside. These test benches provide the electrical/electronic, optical, and mechanical interface with the UUT. The electro-optical test bench set is mounted on a base assembly that pneumatically provides shock isolation during optical testing.

(3) The test program sets (TPS) are comprised of the software and hardware (interface devices) required to perform UUT test and checkout of 41 UUTS. There are 18 TPSS designated for use at the direct support maintenance level with the remainder allocated for depot use. The direct support TPS interface devices consist of one major test adapter, 57 test fixtures, 38 UUT cable assemblies, 99 self-test connectors, and 37 personality circuit card assemblies.

c. CHARACTERISTICS/FEATURES. The overall characteristics and features of the electronic station and electro-optical test bench set are listed below:

DIMENSIONS

Electro-optical test bench

Length	104 in
Depth	68.7 in
Height	77 in

Electronic station

Length	48 in
Depth	33 in
Height	73 in

WEIGHTS

Electro-optical test bench set	4,980 lb (less base)
Electronic station	1,103 lb

ELECTRICAL REQUIREMENTS

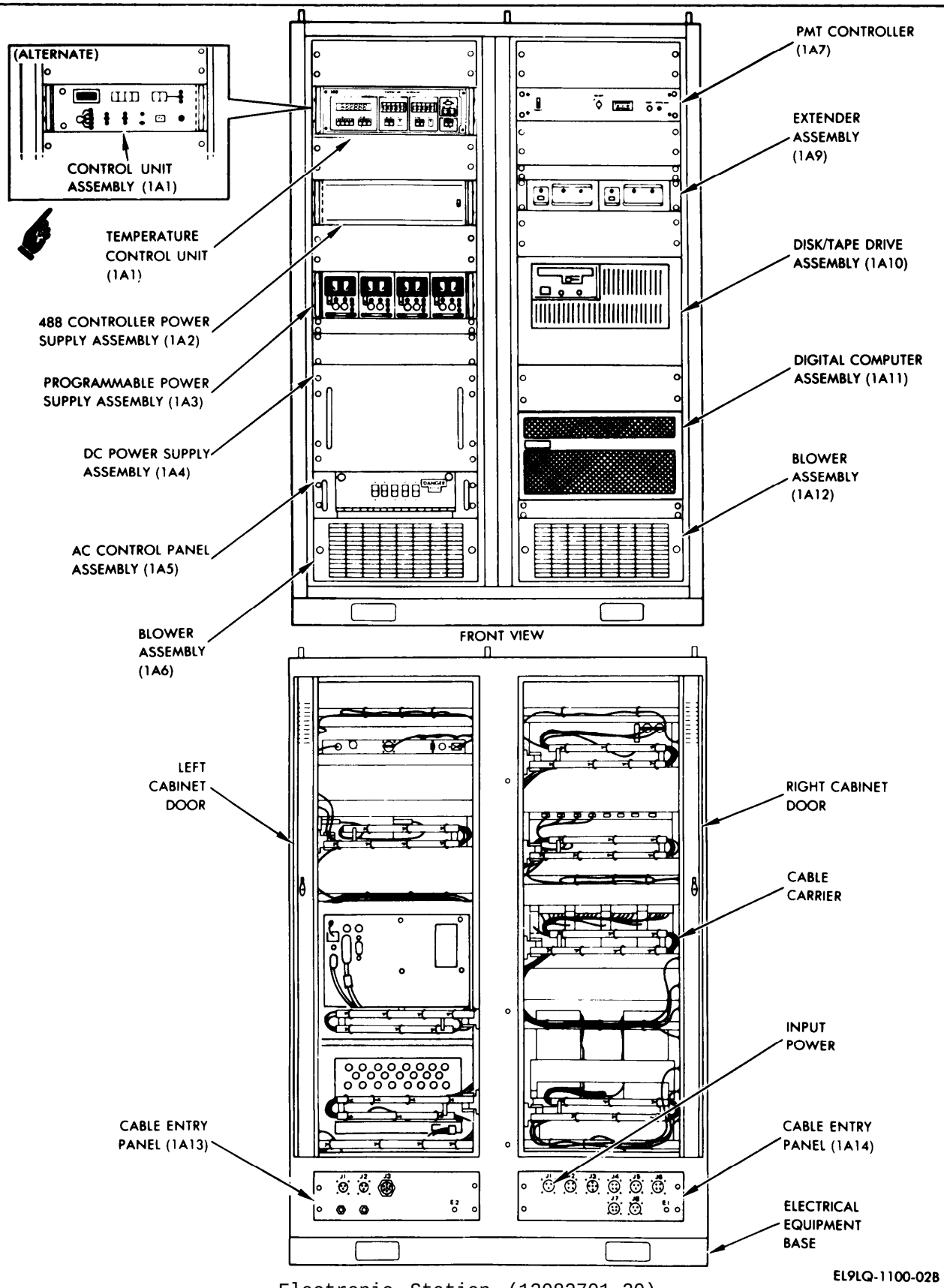
	A*	B**
Voltage	110 vac	110 vac
Line frequency	60 Hz	400 Hz
Phase	single	three
Power consumption	<7000W	<500W

OPERATIONAL ENVIRONMENT

Temperature	77.5°F + 12.5°F
Relative humidity	45% ± 25%
Altitude	50,000 ft (max)
Shock	15g, 11 msec half sine wave (max)
Vibration	1.5g RMS

*Supplied by van
**supplied by AN/USM-410 EETF

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



Electronic Station (13082701-29)

a. GENERAL

In general, the electronic station consists of a two-bay cabinet and the following rack mounted electrical/electronic assemblies:

- Temperature control unit 1A1 (alternate: Control unit assembly 1A1)
- 488 controller power supply 1A2
- Programmable power supply 1A3
- DC power supply 1A4
- AC control panel 1A5
- Blower 1A6
- Photomultiplier tube (PMT) controller 1A7
- Extender 1A9
- Disk/tape drive 1A10
- Digital computer 1A11
- Blower 1A12
- Cable entry panel 1A13
- Cable entry panel 1A14

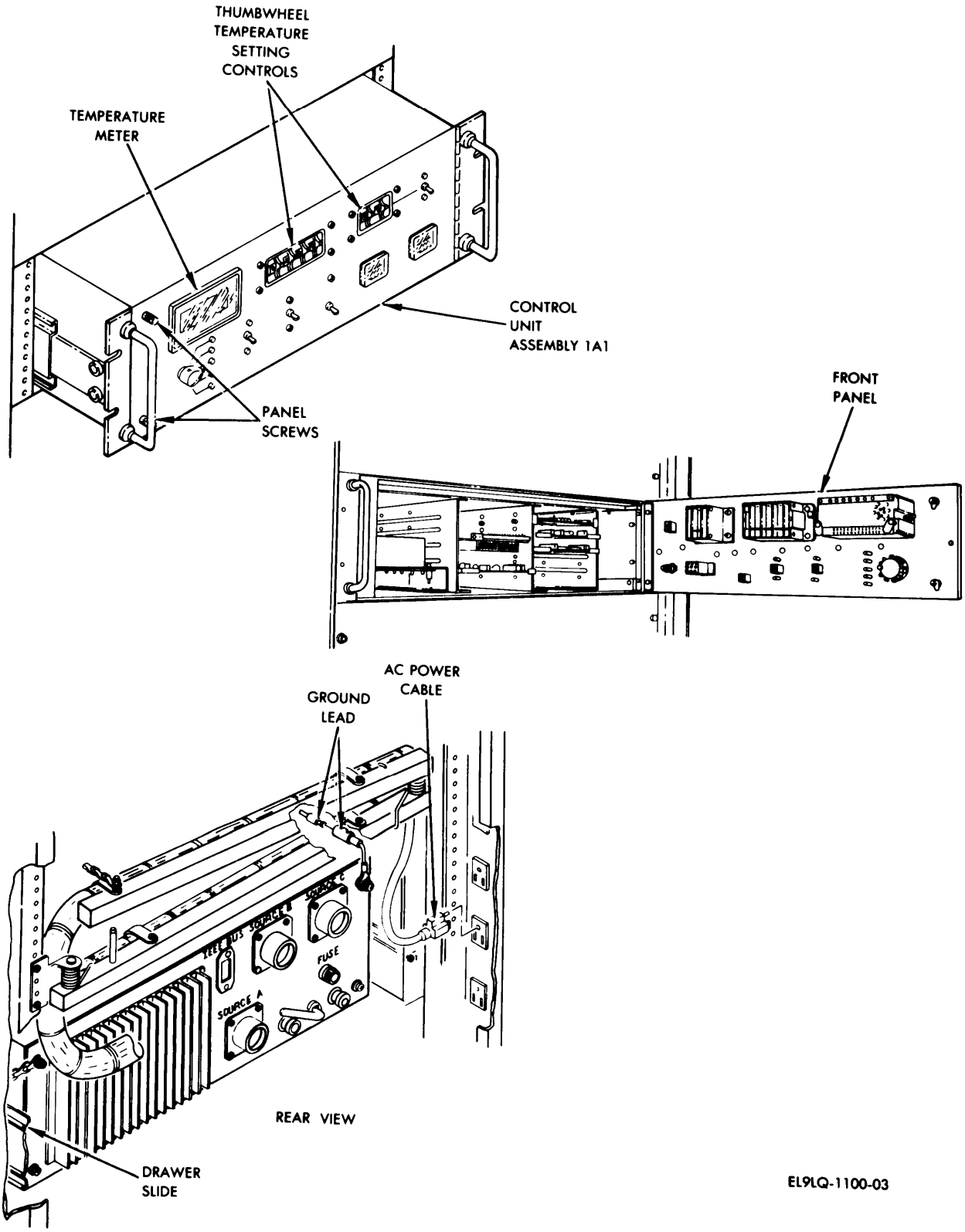
Description of these items follow in reference designation order beginning with the two-bay cabinet.

b. TWO-BAY CABINET

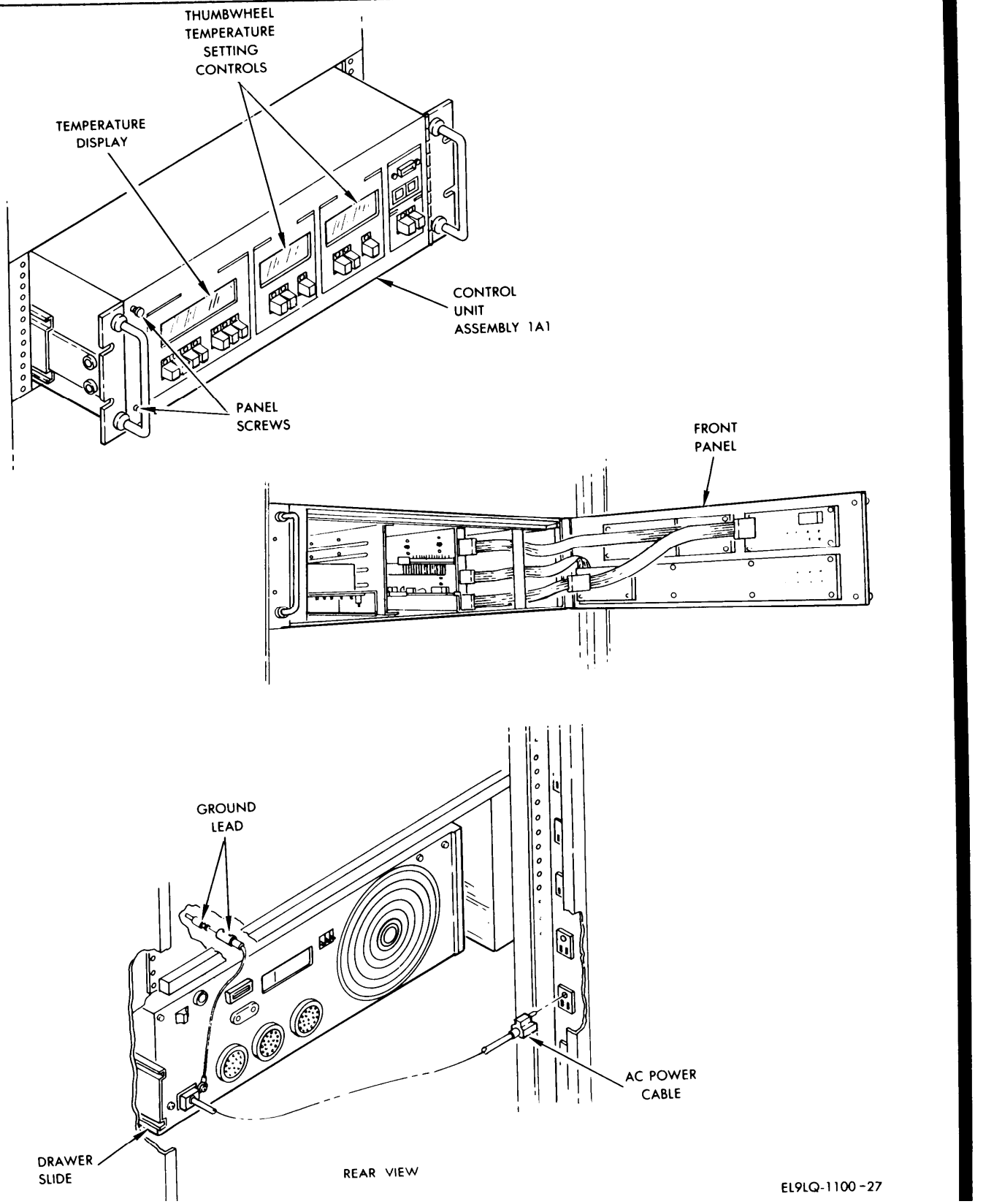
(1) The two-bay (steel) cabinet is centered on, and secured to, an electrical equipment steel base with four mounting bolts. Located at the bottom of each single equipment rack bay is a blower assembly that forces air up and around the electrical/ electronic chassis assemblies and out through louvered openings at the top of the cabinet.

(2) Assemblies 1A1, 1A2, 1A3, 1A4, 1A9, 1A10, and 1A11 are individual slide mounted rack assemblies. Assemblies 1A5, 1A6, 1A7, and 1A12 are mounted to equipment mounting channels. Cable assemblies, cable carriers, cable mounting hardware, circuit card assemblies (CCAs), equipment rear Panel controls and indicators, and ground leads are accessible from the rear of the cabinet through left or right cabinet doors. All of the slide mounted electronic assemblies are secured to rack mounting channels. Electrical cables that mate with each slide mounted electronic assembly are secured to retracting cable carriers. As the assembly is pulled out, the cable and carrier arm extend with the assembly. A chain, attached between the cable carrier and the back panel of each chassis assembly, prevents tension on electrical cable connections. When the slide mounted electronic assembly is removed, the cable carrier and cable assemblies retract to the rear of the cabinet.

(3) Cable entry panels 1A13 and 1A14 located on the rear of the electronic station provide power and signal distribution. Input power is 115v, 60 Hz single-phase. Eight ground terminal bonding positions 1A1E1 thru 1A1E8 provide chassis and cabinet grounding against shock hazard.



Control Unit Assembly 1A1 (Alternate)



Temperature Control Unit 1A1

b.1 TEMPERATURE CONTROL UNIT 1A1

The temperature control unit is an electronic assembly containing front and rear panel controls, indicators, electrical connectors, and an ac power cable. The front panel has a seven-segment temperature display, thumbwheel switches to set the source A and Δ source temperatures, a joystick connector, and several switches and indicators. On the rear panel are connectors for the source A, B, and C inputs and a power input connector. Also on the rear panel are a GPIB interface bus connector and a GPIB address switch. The GPIB address switch is used to set the unique address of the temperature control unit to allow for the interchange of electronic data between the control unit and other electronic equipment. A ground lead connects to system ground. The temperature control unit is mounted to drawer slides so that it can be pulled out from the electronic station cabinet for maintenance purposes. The front panel will swing open for access to internal components. A master power switch on the rear panel is normally left in the ON position and the unit is powered up when EO bench power is applied.

Characteristics	Parameters
Stability	+/- 0.003°C short term +/- O.O1°C long term
Settling Time	<30 seconds
Resolution	
Display	O.01°C
Setpoint	O.O1°C, all sources

Physical Data:

Length 18.88 in
Width 19.00 in
Height 5.25 in
Weight 30 lb

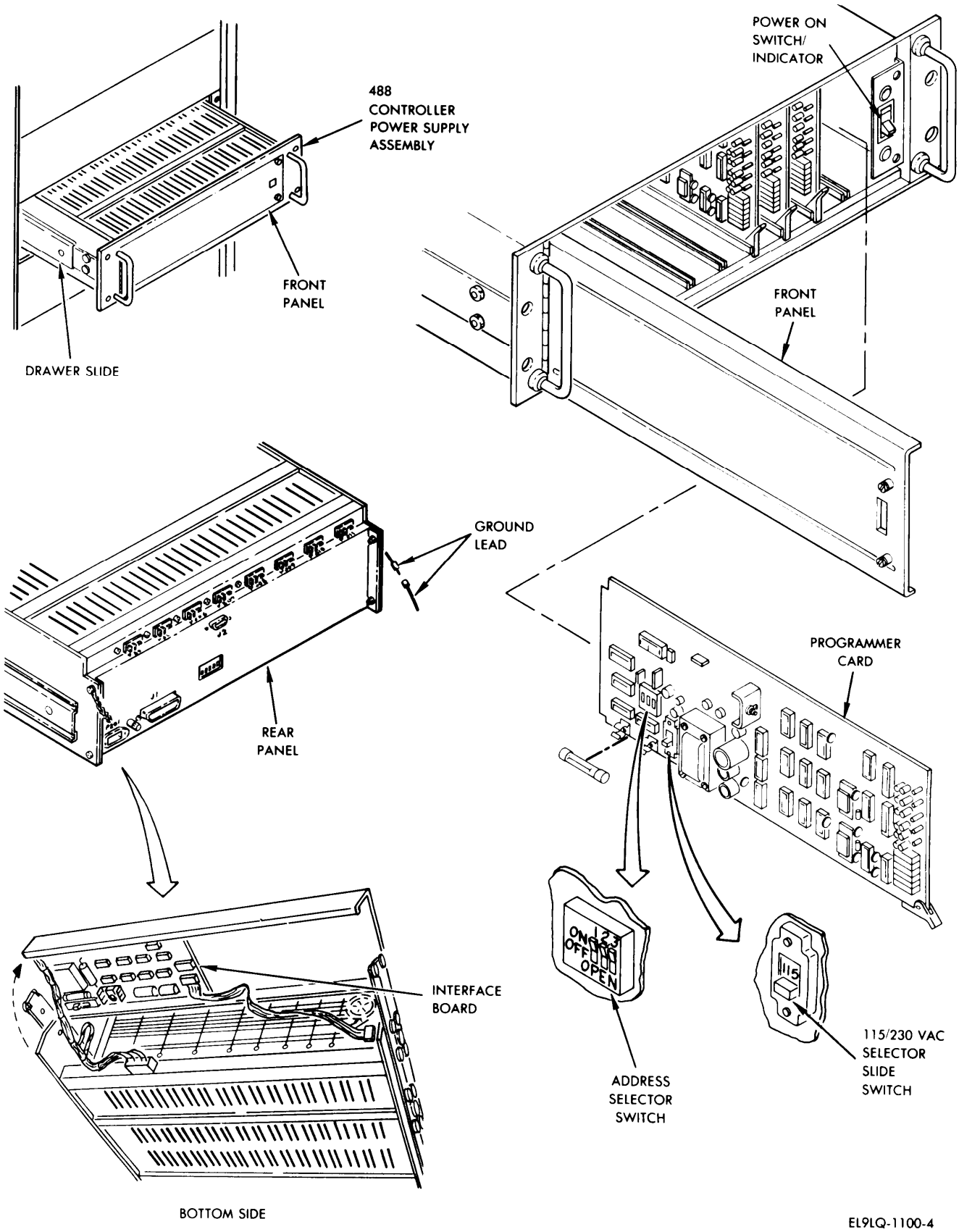
Electrical Input:

115v 60 Hz

c. CONTROL UNIT ASSEMBLY 1A1 (ALTERNATE)

The control unit assembly 1A1 consists of a temperature controller (DBA Model 220) and drawer slides. The temperature controller is an electronic assembly containing front and rear panel controls, indicators, electrical connections and ac power cable. A ground lead is installed on the rear panel and connects to an electronic station ground terminal. On the front panel are thumbwheel temperature setting controls, temperature meter, switches, and LED indicators DS1 thru DS13. The front panel is hinge-mounted and will swing open after loosening two panel screws. CCAs, sensitive board mounted adjustable resistors, LED indicators, and other electronic devices are located inside the temperature controller. Four LED indicators, visible when-the front panel is open, are used to determine if the IEEE-488 bus is functioning. Each LED identity is placarded on the appropriate CCA. The following table identifies the LED placard and function.

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



LED Placard	Function
PWR	5 vdc power and IEEE-488 operation good.
RDY	Ready indicates two status lines match user selection.
MTA	System operating in “mode talk”.
MLA	System operating in “mode listen”.

The power input is controlled by a POWER ON/off switch located on the front panel. A computer/local operation switch is located beside the POWER ON/off switch. On the rear panel are connections for the (A, B, and C) heat sources which are described in the nightside test bench description. The purpose of the temperature controller is to control and monitor the heat source operation. The temperature controller and the heat sources make up a closed loop system.

Characteristics	Parameters
Operating Temperature:	65° thru 95°F
Differential Temperature (T Range):	14° thru 122°F
Spectral Output:	Graybody minimum emissivity > 0.98
Temperature Control Dial Range:	0 to 99.99°c

Physical Dimensions:

Length 20.00 in
Width 19.00 in
Height 5.25 in
Weight 30 lb

Electrical Input:

115v + 11.5v -21.5v, 48 Hz thru 66 Hz

d. 488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2

(1) The 488 controller power supply assembly 1A2 consists of a power supply programmer (Kepco Model SNR488-8), interface board, four programmer cards (Kepco Model SN488-B), and drawer slides. The rack cabinet contains front and rear panel controls, indicators, electrical connections, and input power circuit fusing. A ground lead is installed on the rear panel which connects, to a ground lead attached to a ground terminal on the electronic station. The front panel is mounted to a piano hinge and will swing open after loosening two panel screws.

(2) The POWER ON switch indicator is accessible with the front panel in either the open or closed position. The card cage contains eight programmer card guide positions accessible from the front. Four card guide positions have programmer cards 1A2A1 thru 1A2A4 installed. The rear panel contains a connector bus distribution for each programmer card, IEEE Std 488 HPIB connection, input power connector, and address selector switch. An interface board is located inside the rear panel.

(3) The address selector switch is a six-position rocker switch used to establish either the “listen only” or “addressable” mode and to provide interface address. The preset position for the present configuration is a decimal address of -4. The interface board (an IEEE circuit card) contains a 115/230 vac selector slide switch and a fused circuit.

(4) Each programmer card contains two electrically common circuits that convert digital input commands to analog output commands. Included on each programmer card is a 115/230 vac selector switch, a fused circuit, and a three-position address selector switch used to code the location of the programmer card.

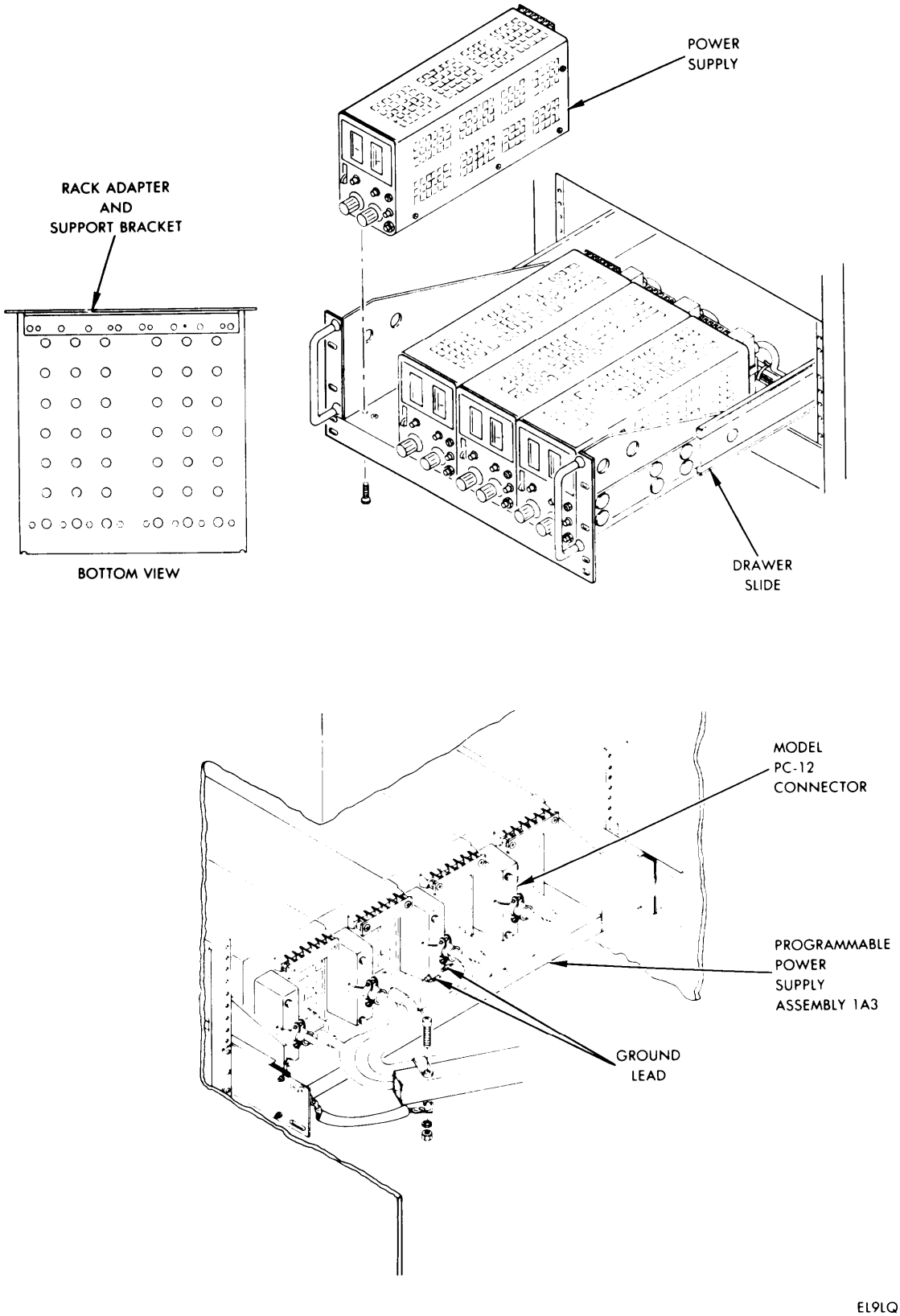
(5) The purpose of the 488 controller power supply assembly 1A2 is to interface with programmable power supply assembly 1A3 and provides an analog output to the Analog to Digital (A/D) Converter Assembly 2A2A13.

Physical Dimensions:

Length 19.00 in
Width 17.81 in
Height 5.22 in
Weight 27 lb

Electrical Input: 115v ±10v, 60 Hz ±1O Hz

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



Programmable Power Supply Assembly 1A3

e. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

(1) The programmable power supply assembly 1A3 consists of four power supplies (1A3A1 and 1A3A2, Kepco Model ATE 36-3M and 1A3A3 and 1A3A4, Kepco Model ATE 75-1.5M) mounted on a rack adapter (Kepco Model RA-37), and drawer slides. A support bracket is secured to the bottom front section of the rack adapter. It is required to support over 75 pounds of equipment (four power supplies) in the rack.

(2) A ground lead is installed on the rear of the rack adapter that connects to a ground lead connected to the electronic station.

(3) Power supplies 1A3A1 and 1A3A2 provide a programmed controlled output (O vdc thru 36 vdc and O amps thru 3 amps). Power supplies 1A3A3 and 1A3A4 provide a programmed controlled output (O vdc thru 75 vdc and O amps thru 1.5 amps).

(4) The front panel of each power supply contains current/voltage level control switches and meters, LED mode indicators, a CROWBAR reset power on/off switch, and a CROWBAR trigger level pushbutton switch. The CROWBAR reset power on/off switch is for protection of the system when the preset voltage/current level is exceeded.

(5) The rear panel contains a circuit card type connector that accepts a 50-contact connector. The rear panel also has a 115 vac input power connection and a five-contact terminal board used for sensing outputs.

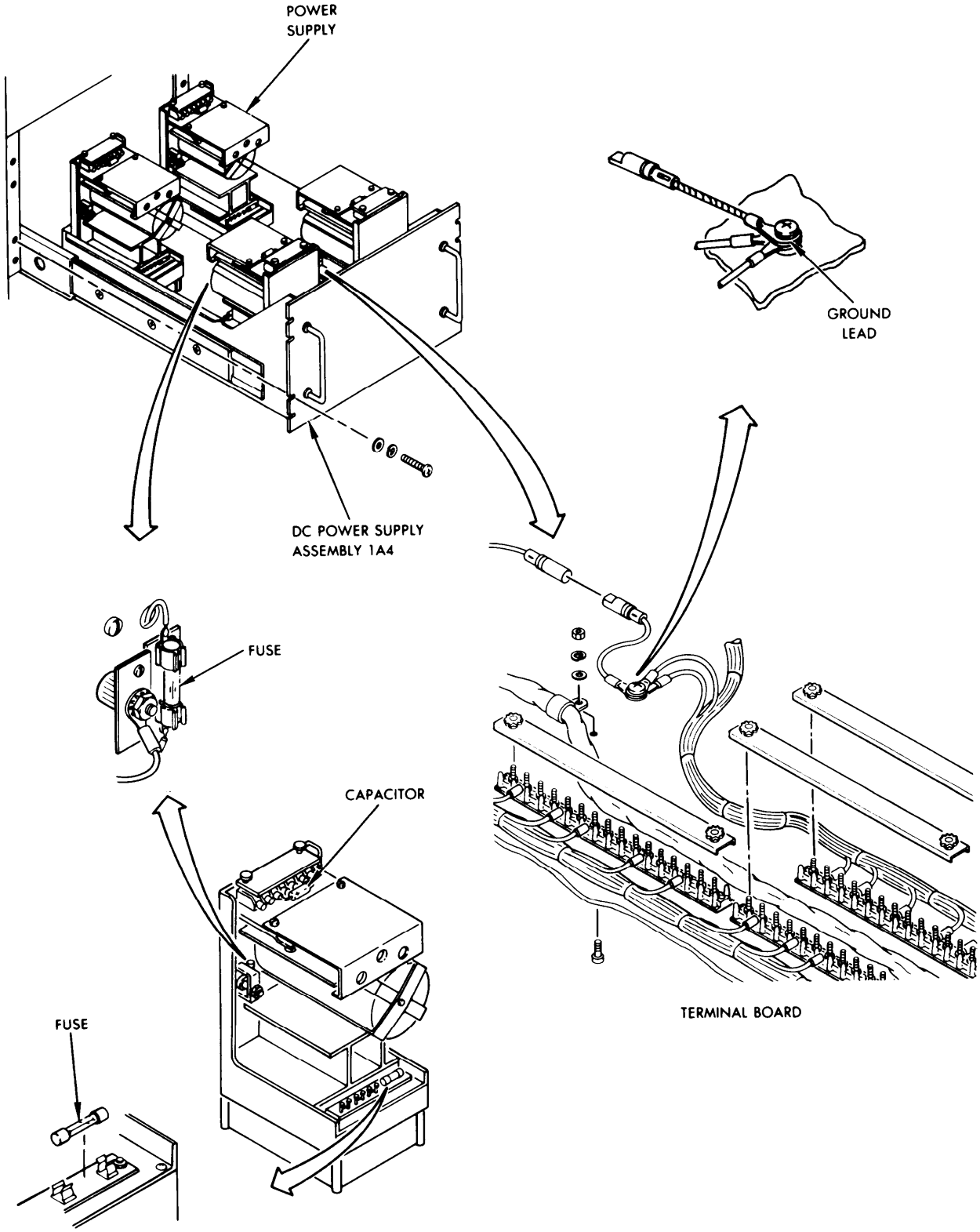
(6) The programmable power supply assembly provides voltage outputs to the Matrix Switch Assembly 2A2A1O and to connector 2A2A4J1 (thru relay assembly 2A2A4A1) as directed by the digital computer assembly 1A1O.

Physical Dimensions:

Length 21.6 in
Width 19.0 in
Height 5.2 in
Weight 87 lb

Electrical Input: 115v ±1Ov, 60 Hz
Operating Temperature: 32° thru 149°F

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



DC Power Supply Assembly 1A4

f. DC POWER SUPPLY ASSEMBLY 1A4

(1) The dc power supply assembly provides fixed voltage outputs to the electro-optical test bench set. It consists of a chassis assembly, four power supplies 1A4PS1 thru 1A4PS4 (Kepco Models BKF5-11, two each BKF15-6, and BKF28-4), four capacitor assemblies 1A4C1 thru 1A4C4, three 16-contact terminal boards 1A4TB1 thru 1A4TB3, and drawer slides. Three electrical cable assemblies enter the rear of the chassis and terminate at the terminal boards. A ground lead is installed on the base of the dc power supply assembly and connected to a ground lead which is connected to the electronic station.

(2) The power supplies are mounted to the base of the assembly. They are voltage regulated dc sources and each contains circuits for overvoltage and fused circuits for short circuit protection. A seven-contact terminal board is mounted on top of each power supply. Wiring and one electrolytic current aiding capacitor assembly are connected to the terminal board.

Power Supply Characteristics:

Reference Designation	output vdc	Maximum Overvoltage Protection	output Amps	Maximum Input Amperage*
1A4PS1	28 ±5%	35.32	0-4	2.2 Amps
1A4PS2/PS3	+15/-T5 ±5%	19.5	0-6	2.0 Amps
1A4PS4	5 ±5%	6.5	0-11	1.4 Amps

*Based on maximum voltage input of 125 vac.

Physical Dimensions

Length 26.0 in
Width 16.5 in
Height 12.2 in
Weight 100 lb (approximate)

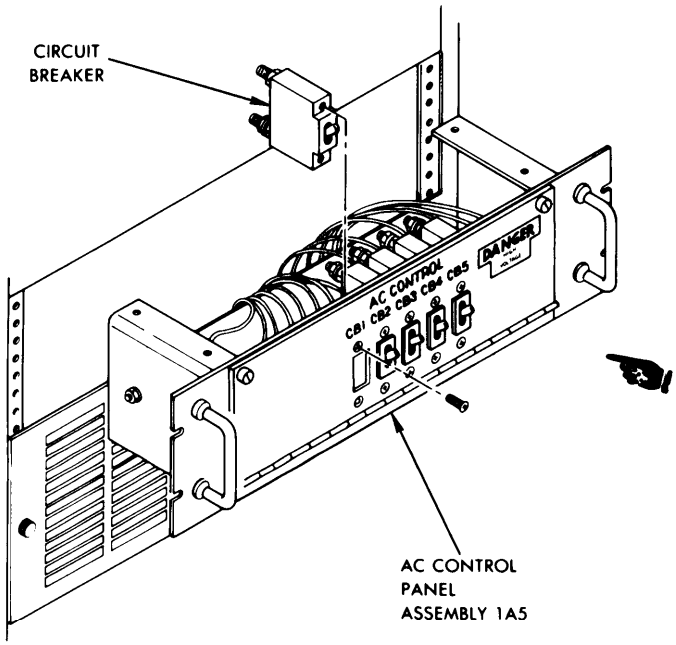
Electrical Input: 115v + 10v, 60 Hz
Operating Temperature: 32 thru 149°F

g. AC CONTROL PANEL ASSEMBLY 1A5

The AC control panel assembly 1A5 provides primary 115v, 60 Hz power distribution to the electronic station and electro-optical test bench. Five 15-amp, single pole circuit breakers (CB) provide overcurrent protection. CB1 through CB5 are accessed by loosening two screws and lowering the front panel access cover. A ground lead is connected between a 16-contact terminal board and the front panel.

Physical Dimensions:

Length	19.00 in
Width	5.75 in
Height	5.21 in
Weight	5 lb (approximate)



EL9LQ-1100-7A

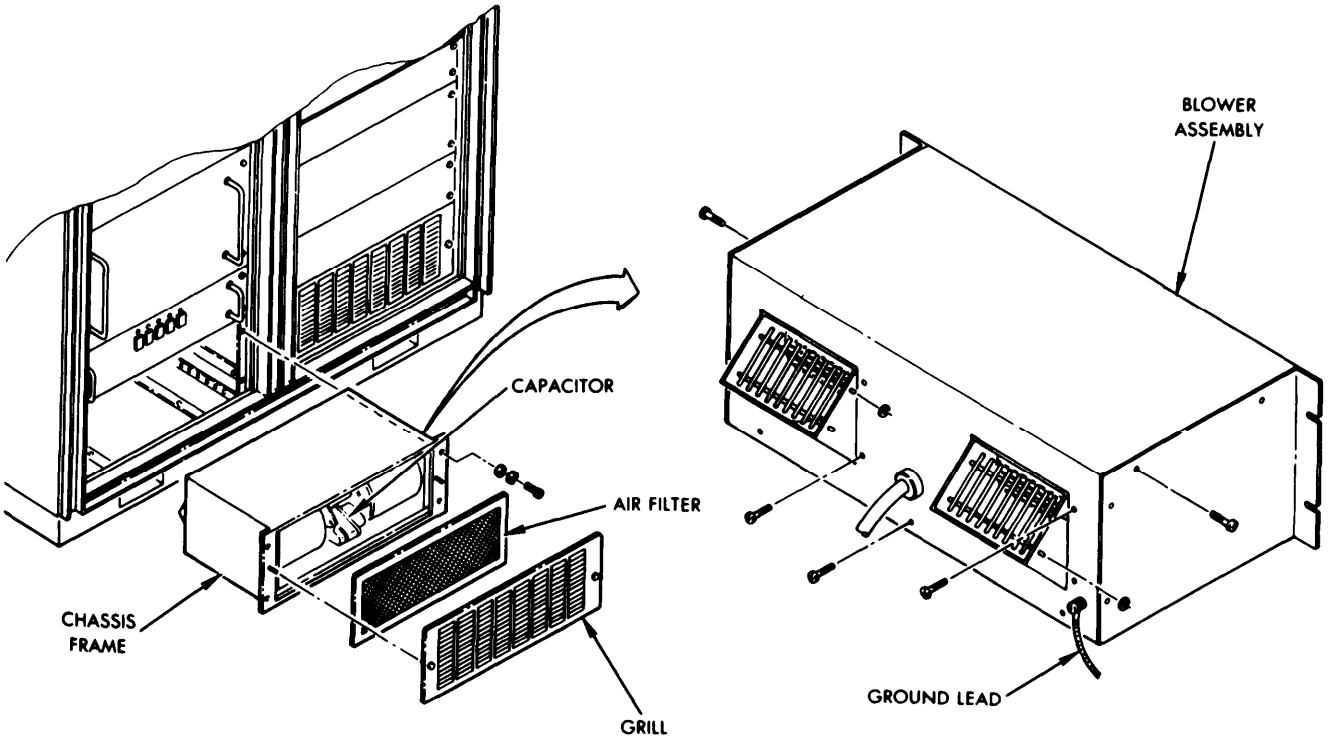
1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10

h. BLOWER ASSEMBLY 1A6

The blower assembly 1A6 (Kooltronic Model KP729) consists of a chassis frame, an induction motor that is shaft mounted between two barrel type fans, a reusable aluminum mesh air filter, and grill. The filter is positioned in front of the blower and held in place by a grill secured to the chassis frame by two captive nuts. A 4 u f capacitor mounts in front of the motor. A ground lead, installed on the back of the chassis frame cover, is connected to a ground lead on the electronic station. The blower assembly stabilizes cabinet temperature by providing a continuous air flow around the electronic assemblies.

Physical Dimensions:

Length 19.00 in	Electrical Input: 115v, 60 Hz
Width 8.25 in	Air Flow: 475 cfm
Height 7.00 in	Motor: 1.7 amps, 180 watts, 3,250 rpm
Weight 20 lb (approximate)	



EL9LQ-1100-84

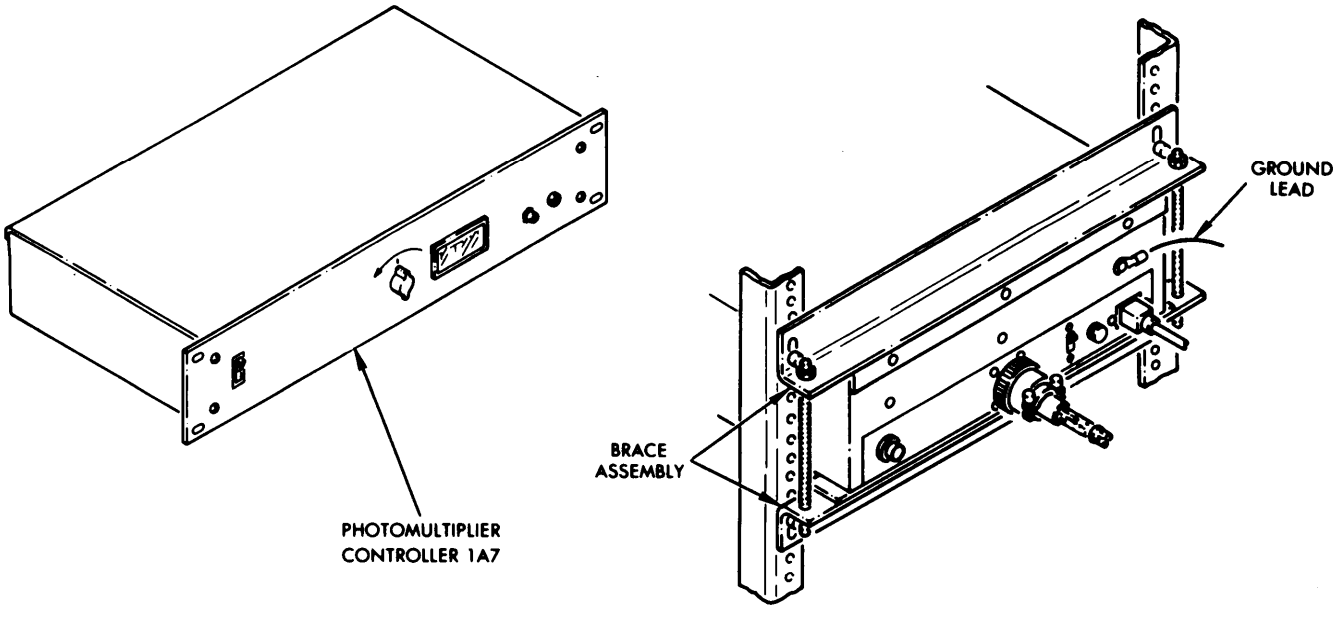
i. PMT CONTROLLER 1A7

The PMT controller (Pacific Precision Model 33-2124 power supply) is a thermo-electric power supply/temperature controller that is mounted to the front cabinet mountings rails and secured with a brace assembly at the rear of the unit. The front panel contains a pushbutton power switch, one LED indicator, a temperature control adjustment knob, and temperature panel meter. The rear panel contains a 115/230 vac selector slide switch, and a fused circuit. A ground lead, installed on the rear panel, is connected to a ground lead on the electronic station. The PMT controller directs control of the closed-loop temperature control system by maintaining the PMT Housing (model 3457) operating temperature at 5° - 15°C. The PMT housing is described further in the dayside description.

Physical Dimensions:

Length 19.0 in
Width 12.0 in
Height 3.5 in
Weight 19 lb

Electrical Input: 115v, 60 Hz



1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10

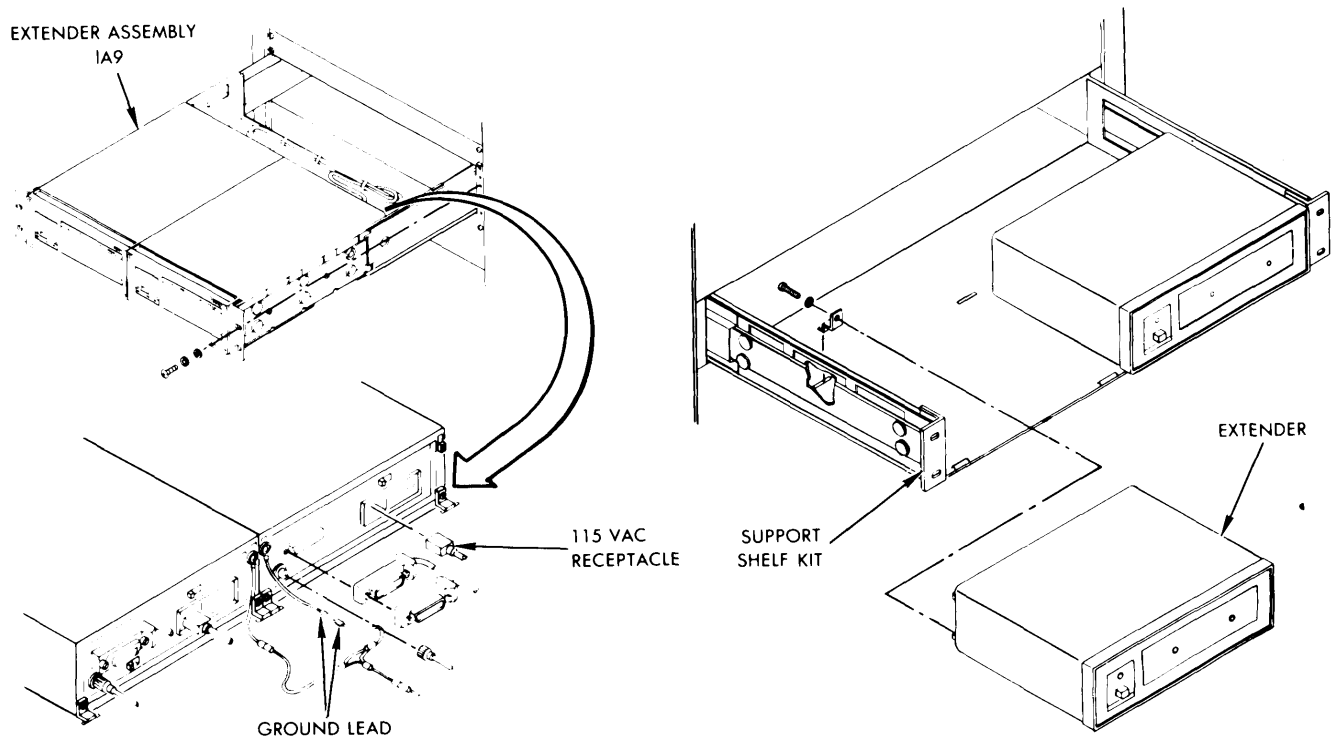
j. EXTENDER ASSEMBLY 1A9

The extender assembly 1A9 consists of two HP-IB extenders 1A9A1 and 1A9A2 (Hewlett Packard Model 37203A), a support shelf kit, and drawer slide sections. The front panel of each extender contains an input power ON/OFF pushbutton switch and a POWER ON LED indicator. It contains two other front panel mounted LEDs used for DATA LOSS and DATA ERRORS indications. The rear panel contains a HP-16 coaxial connection for interconnection between extenders, a 115/230 vac receptacle and fused circuit, a MASTER/SLAVE switch, and SERIAL DATA RATE switch. The fused circuit features a safe guard situation that requires removal of the 115/230 vac receptacle before the fuse can be removed. A ground lead is installed on the rear of the extender shelf and connected to a ground lead on the electronic station. The HP-IB communication linkup is set up in a tandem configuration where all extenders are connected in series. The extender converts the HP-IB protocol parallel input signal into a series output signal and transmits same to a receiving extender.

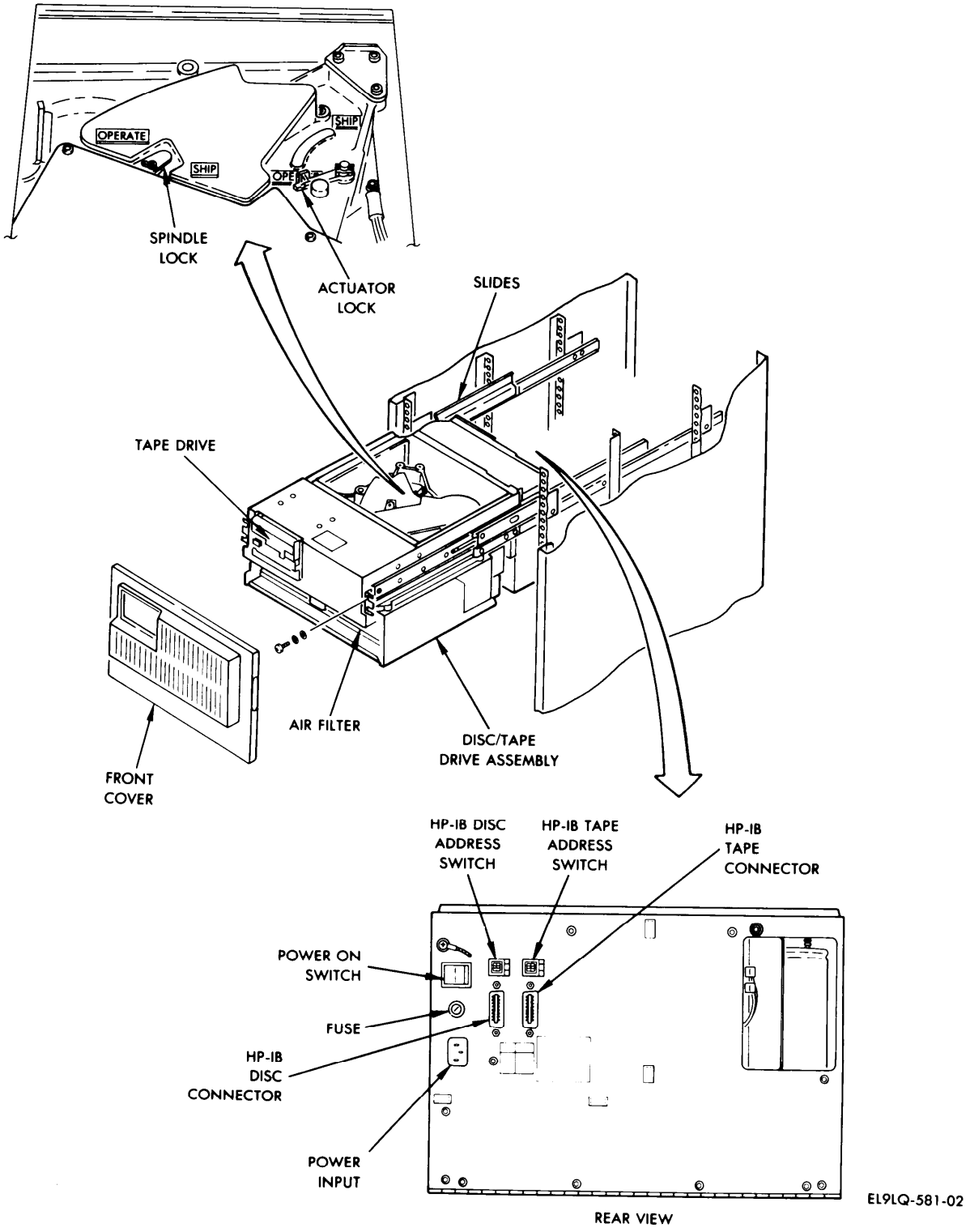
Physical Dimensions:

Length	14.02 in
Width	8.39 in
Height	3.50 in
Weight	7.7 lb

Electrical Input: 115v +11v -7v, 48 Hz to 66 Hz
Operating Temperature: 32° thru 131°F



1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



Disc/Tape Drive Assembly 1A10

k. DELETED

k.1. DISC/TAPE DRIVE ASSEMBLY 1A1O

(1) Disc/tape drive assembly 1A1O (Hewlett Packard HP 7914R) consists of a chassis assembly, disc drive assembly, and tape drive assembly. Primary purpose of the disc/tape drive assembly is to store the computer operating system software program.

(2) The chassis assembly provides the mounting support for the tape drive, disc drive, CCA card cage, power supply, and fan assembly. Located on the rear is a power on switch, HP-IB disc address switch, HP-IB tape address switch, two HP-IB connectors, a power input receptacle and in-line fuse.

(3) The disc drive is located towards the rear of the chassis and accessed through the top of the disc/tape drive assembly. The disc can store 132.1 megabytes of information. Located on top of the disc drive are two locks; (1) spindle lock and (2) actuator lock. These locks must be in the OPERATE position to use the disc drive. During transportation or shipment, these locks must be set to the SHIP position to prevent damage to the disc and drive assembly.

(4) The tape drive is located at the front of the disc/tape drive assembly. Information can be loaded onto the disc through the tape drive. A DC600 type tape cartridge is used with this unit. Tape drive control and indicators are located on the front panel. They consist of an eject lever, UNLOAD switch, BUSY indicator, PROTECT indicator, restore switch, and save switch. Refer to controls and indicators for a functional description of these controls and indicators.

(5) An air filter is located behind the front cover. Air is drawn into the unit from the front and exhausted through the rear. The front panel is removed by pulling it forward.

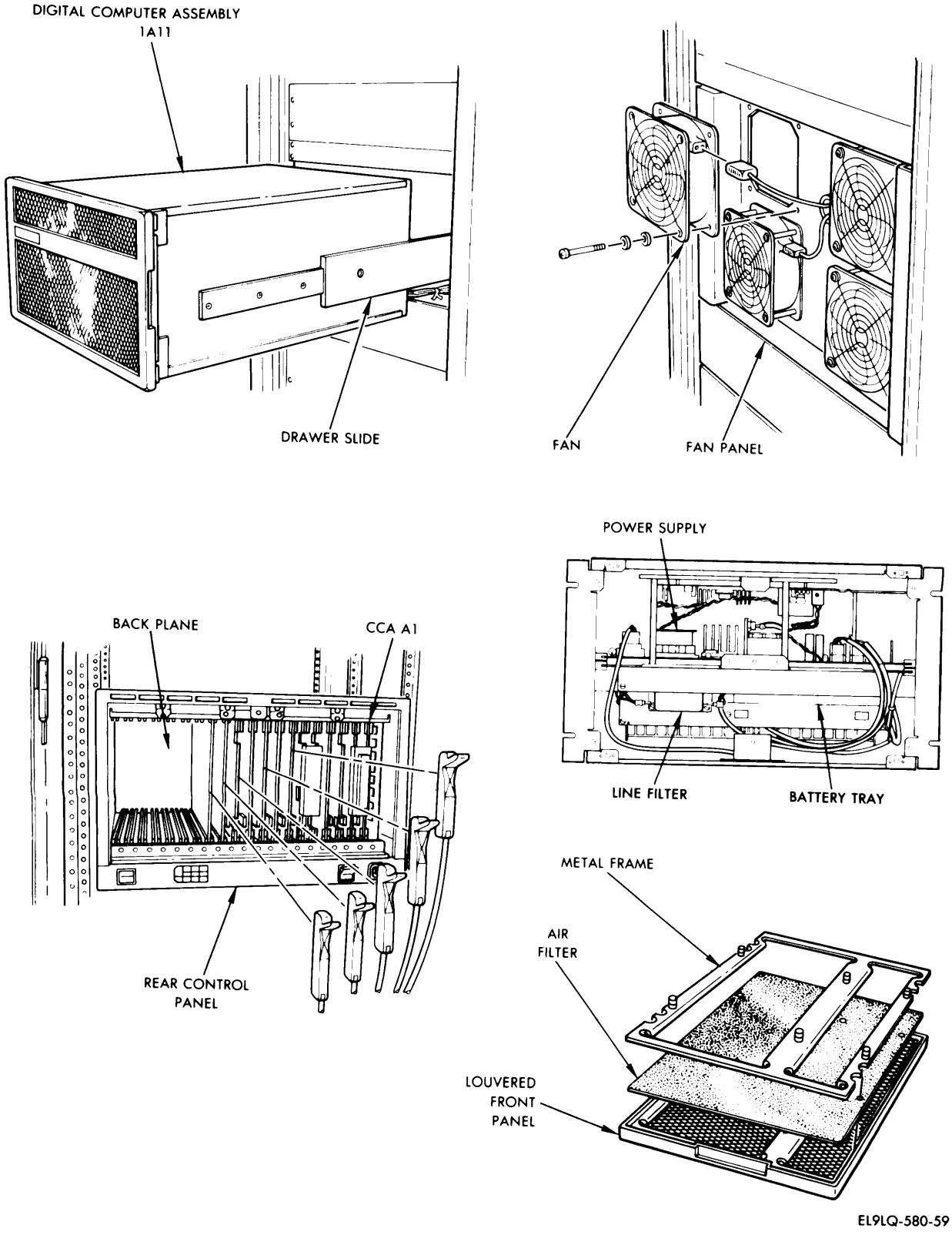
(6) Physical Characteristics:

Length: 27.8 in
Width: 17.75 in
Height: 12.25 in
Weight: 148 lb

(7) Power requirements:

120 vac +5%, -10%, 48 to 66 Hz
700 watts maximum power required.

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10



1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10

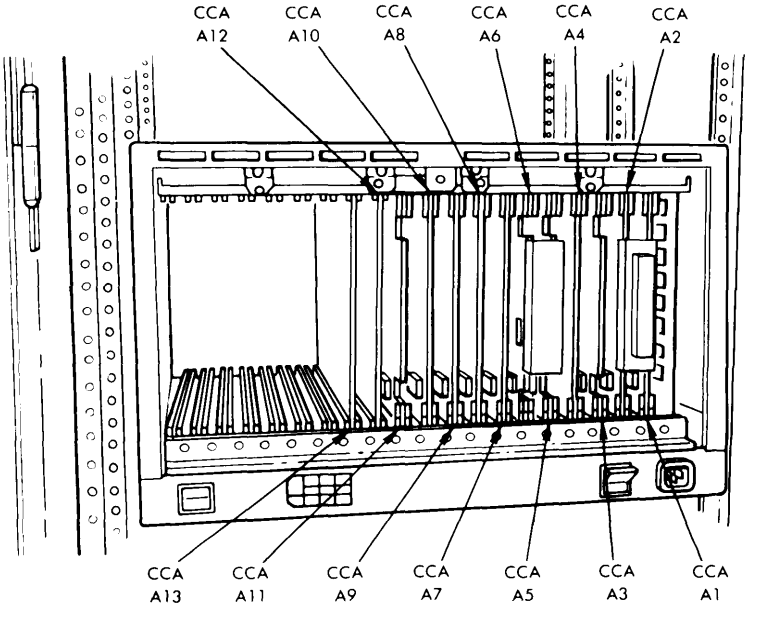
k.2. DIGITAL COMPUTER ASSEMBLY 1A11

(1) Digital computer assembly 1A11 (Hewlett Packard HP1OOO A900) consists of a computer chassis assembly, CCAs Al thru A13, drawer slides, and jumper assembly ground lead.

(2) Computer chassis assembly consists of a 20 slot card cage, power supply, fan panel, line filter, battery tray, and rear control panel. All CCAs are accessed by removing the rear panel. Each CCA slot is placarded from Al thru A20. Inside the card cage is a backplane which contains an electrical interface for CCAS and electronic components located in the front section of the computer chassis assembly. The rear control panel contains an ac power connector, power switch, test point connector, and ENABLE/DISABLE battery power switch. The backup power source (which includes the battery tray) is not provided for this configuration. A 115 vac input power line filter is located in the front section adjacent to the power supply. The power supply is a two tier CCA positioned on card guides and plugged into the backplane connector. The fan panel containing four fans is located behind the front panel . A multi-connector cable assembly connects the power supply to each of four fans. Air flow is from front to rear at approximately 120 CFM per fan. The louvered front panel contains a washable filter element.

(3) Digital computer assembly 1A11 contains 13 CCAs as follows:

1A11A1 Control Store
1A11A2 Sequencer
1A11A3 Data Path
1A11A4 Cache Control
1A11A5 Memory Controller
1A11A6 Memory
1A11A7 HP-IB Interface
1A11A8 Asynchronous Serial Interface
1A11A9 IEEE Interface
1A11A10 Priority Jumper
1A11A11 HP-IB Interface
1A11A12 Parallel Interface
1A11A13 Buffer



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(4) Physical characteristics:

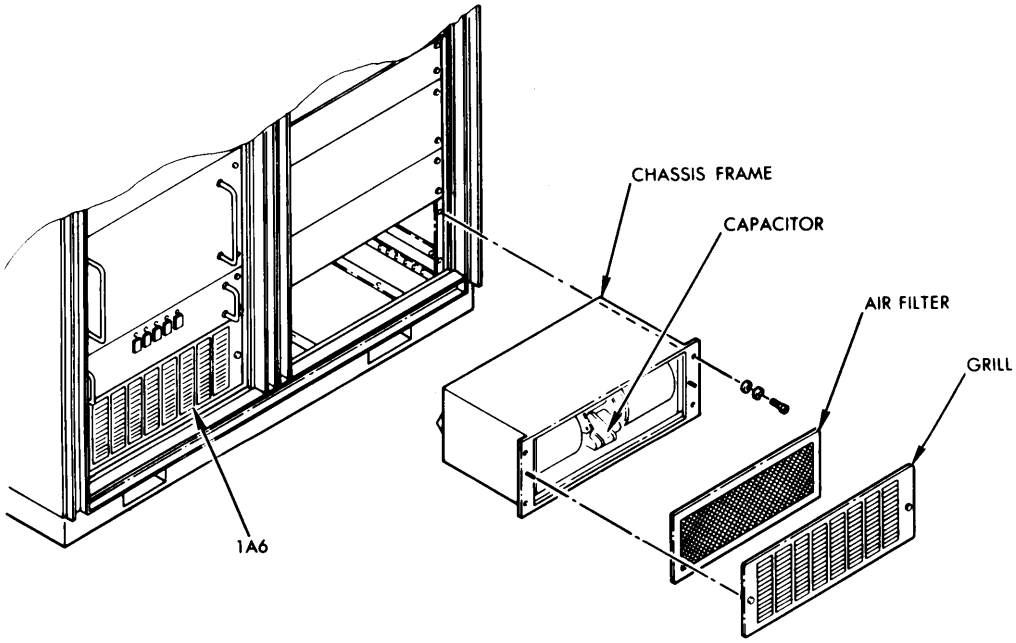
Length: 24.0 in
Width: 19.0 in
Height: 10.5 in
Weight: 64 lb

(5) Input power requirements:

115 vac 47.5 to 66 Hz
800 watts maximum power required.

l. BLOWER ASSEMBLY 1A12

This blower assembly is the same as blower assembly 1A6. Refer to paragraph h above.

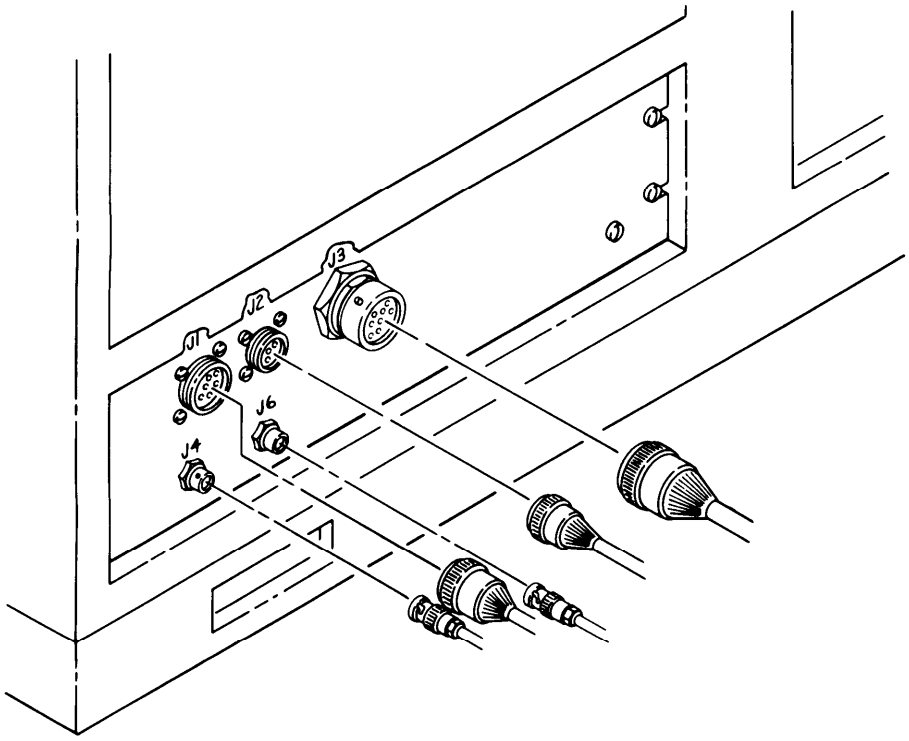


EL9LQ-1100-86

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10

m. CABLE ENTRY PANEL 1A13

The cable entry panel 1A13 accepts five electrical cable assemblies (two are coaxial cables) and one ground lead. Four of the cable connections interface with the electro-optical test bench set and the fifth connection interfaces with the IEEE bus data coaxial input from the Electronic Equipment Test Station AN/USM-410.

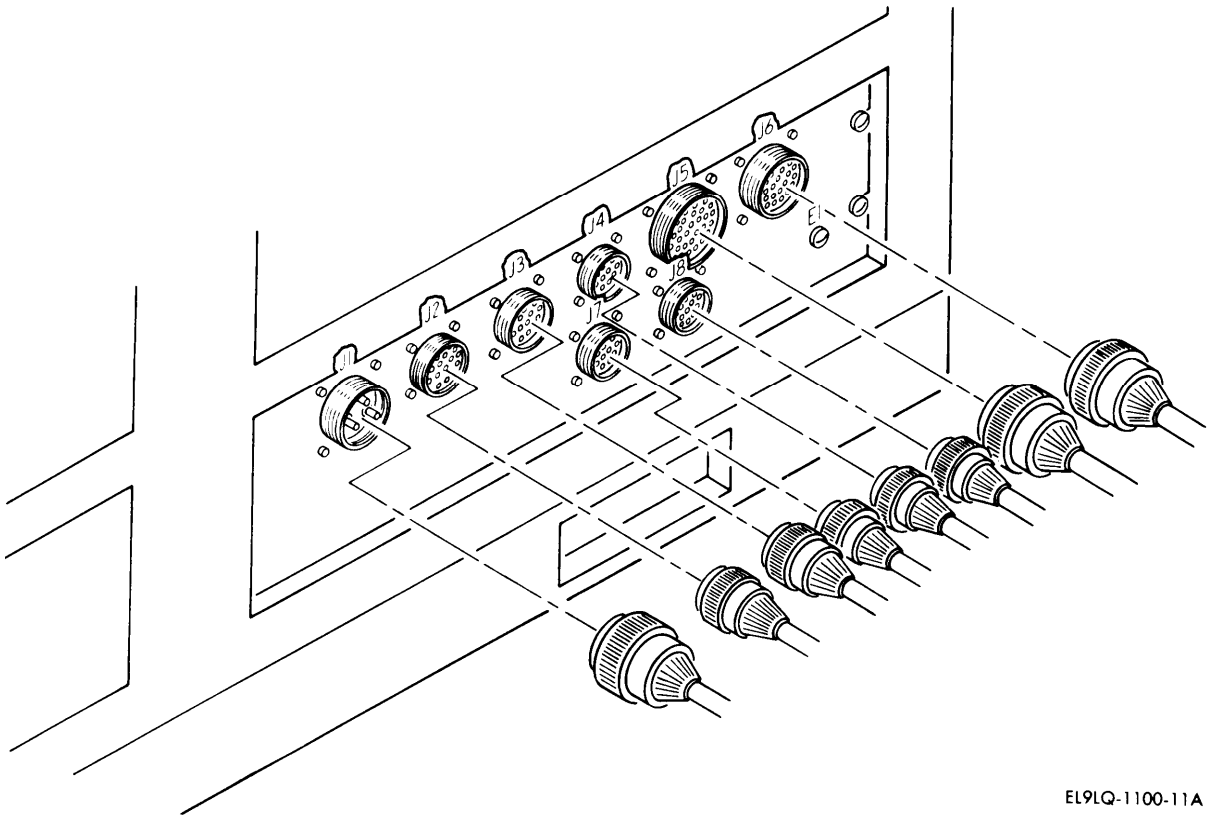


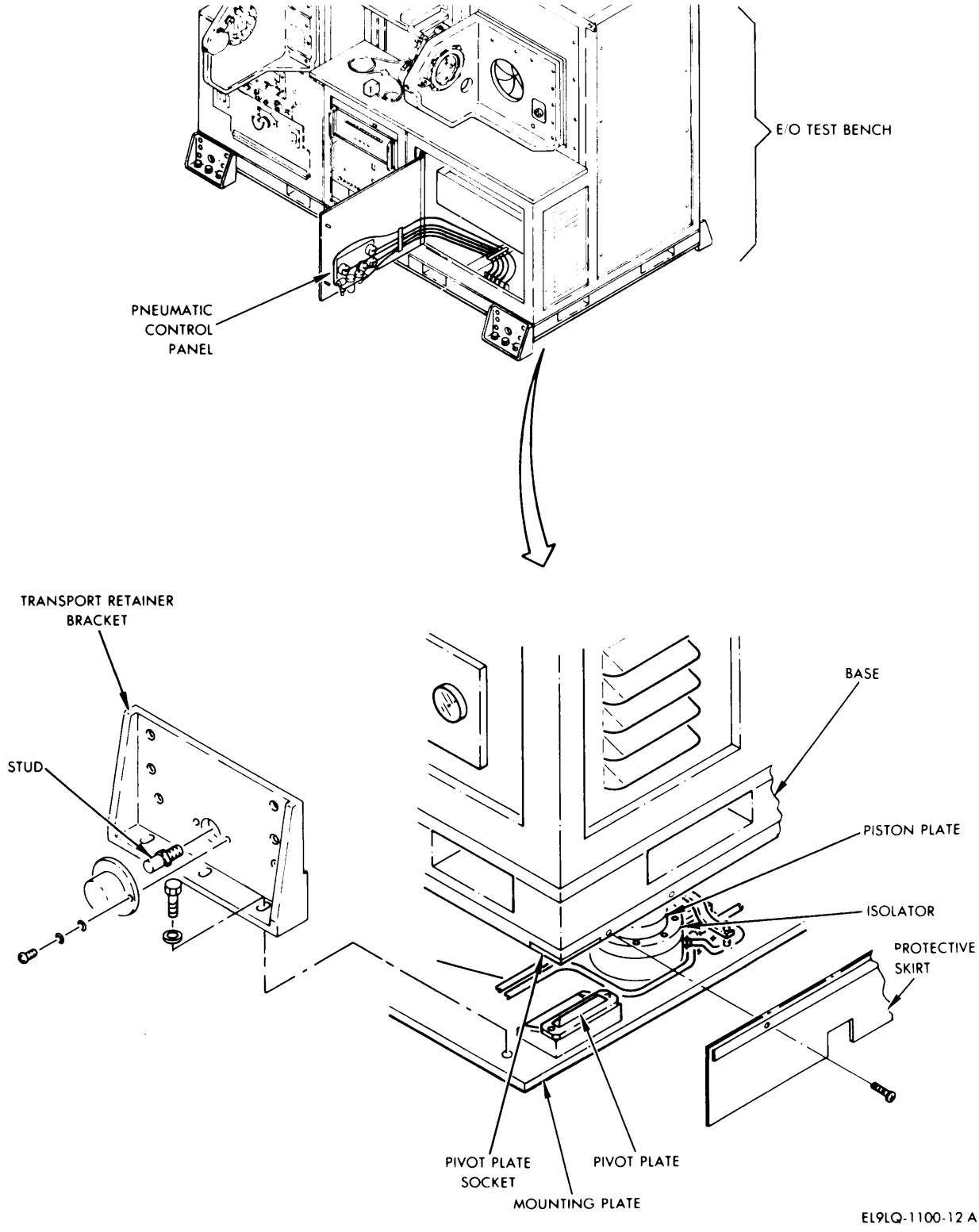
EL9LQ-1100-100

1-10. DESCRIPTION OF ELECTRONIC STATION (cont) 1-10

n. CABLE ENTRY PANEL 1A14

The cable entry panel 1A14 accepts eight electrical cable assemblies and one ground lead. Seven of the cable assemblies interface with the electro-optical test bench. The other cable assembly provides 115v, 60 Hz single-phase input power from the van.





Electro-Optical Test Bench Set Base Assembly

1-11. DESCRIPTION OF ELECTRO-OPTICAL TEST BENCH SET (cont) 1-11

The electro-optical test bench set consists of a base assembly, a pneumatic system and three test benches; the dayside test bench, test console test bench, and nightside test bench. The base assembly and pneumatic system are described in a and b below and the three test benches are described in paragraphs 1-12, 1-13, and 1-14.

a. BASE ASSEMBLY

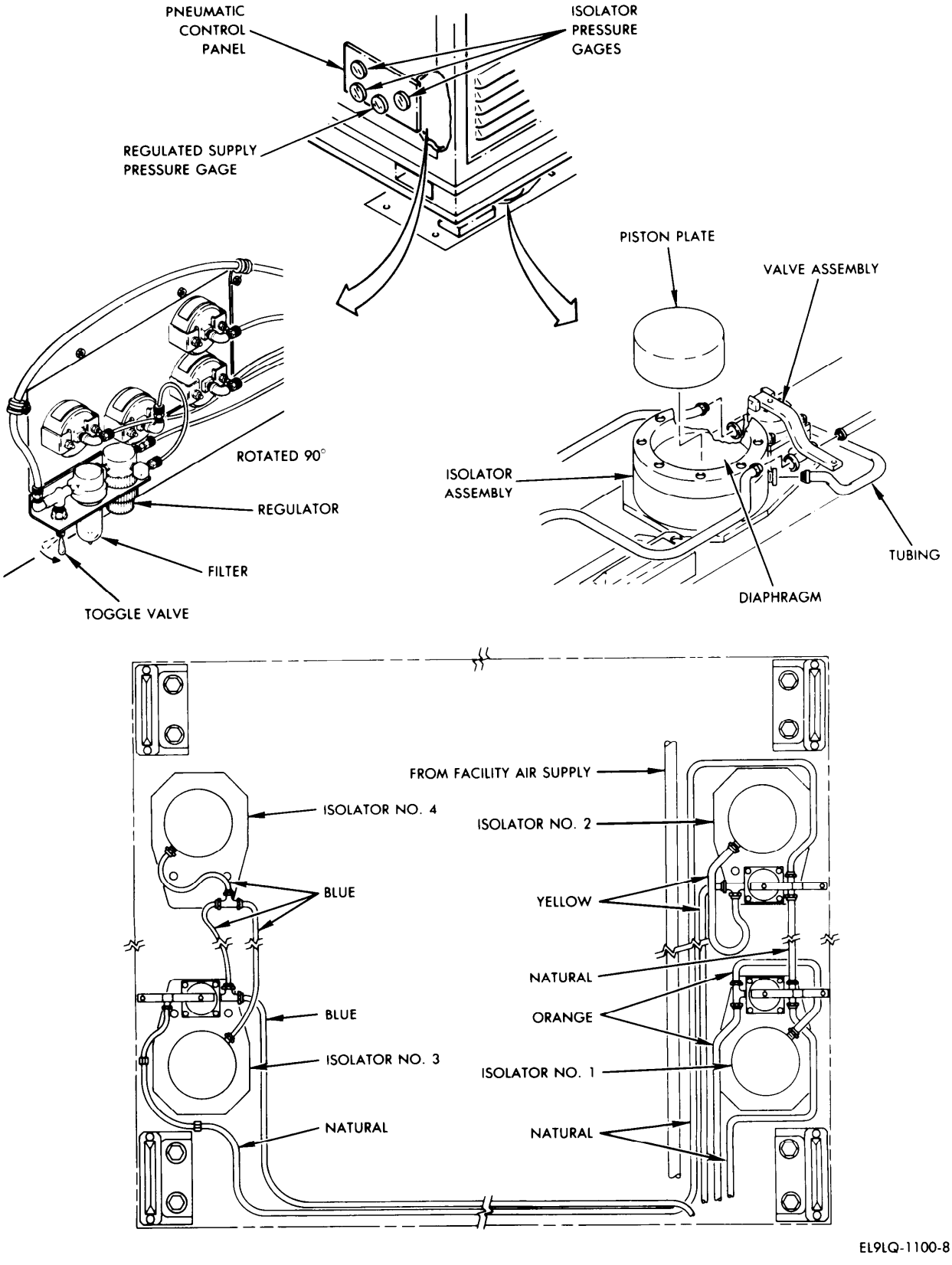
The base assembly consists of a machined steel casting on which the dayside, test console, and nightside test benches are mounted. Physical dimensions are listed below.

On the underside of the base, at each of four corners, a pivot plate socket is fastened. The pivot plate socket rests on the pivot plate mounted in the van floor. These are the hard points the E/O bench assembly rests on when the pneumatic isolation system is not in use. Also located on the underside of the base are four cavities where the pneumatic piston plates contact. This occurs when the pneumatic isolation system is activated. Excessive movement of the E/O bench is limited by four studs protruding from the base through holes in the transport retainer brackets. Around the edge of the base, stiff vinyl protective skirts are fastened. These skirts prevent the operator and maintenance personnel from placing feet or hands under the base while the pneumatic isolation system is in operation. Holes are provided in the side skirts to access isolator adjusting arms. A hole is provided in the base where pneumatic tubing passes from the pneumatic control panel through to the isolator assemblies.

During transport the E/O bench is secured by the transport retainer brackets. These brackets are bolted to the E/O bench and the mounting plates in the van floor. During operation the transport retainers are bolted only to the floor and are spaced approximately 0.5 inch from the bench.

Physical Dimensions:

Length:	96,0 in
Width:	48.0 in
Height:	3.4 in



Electro-Optical Test Bench Set Pneumatic System

b. PNEUMATIC SYSTEM

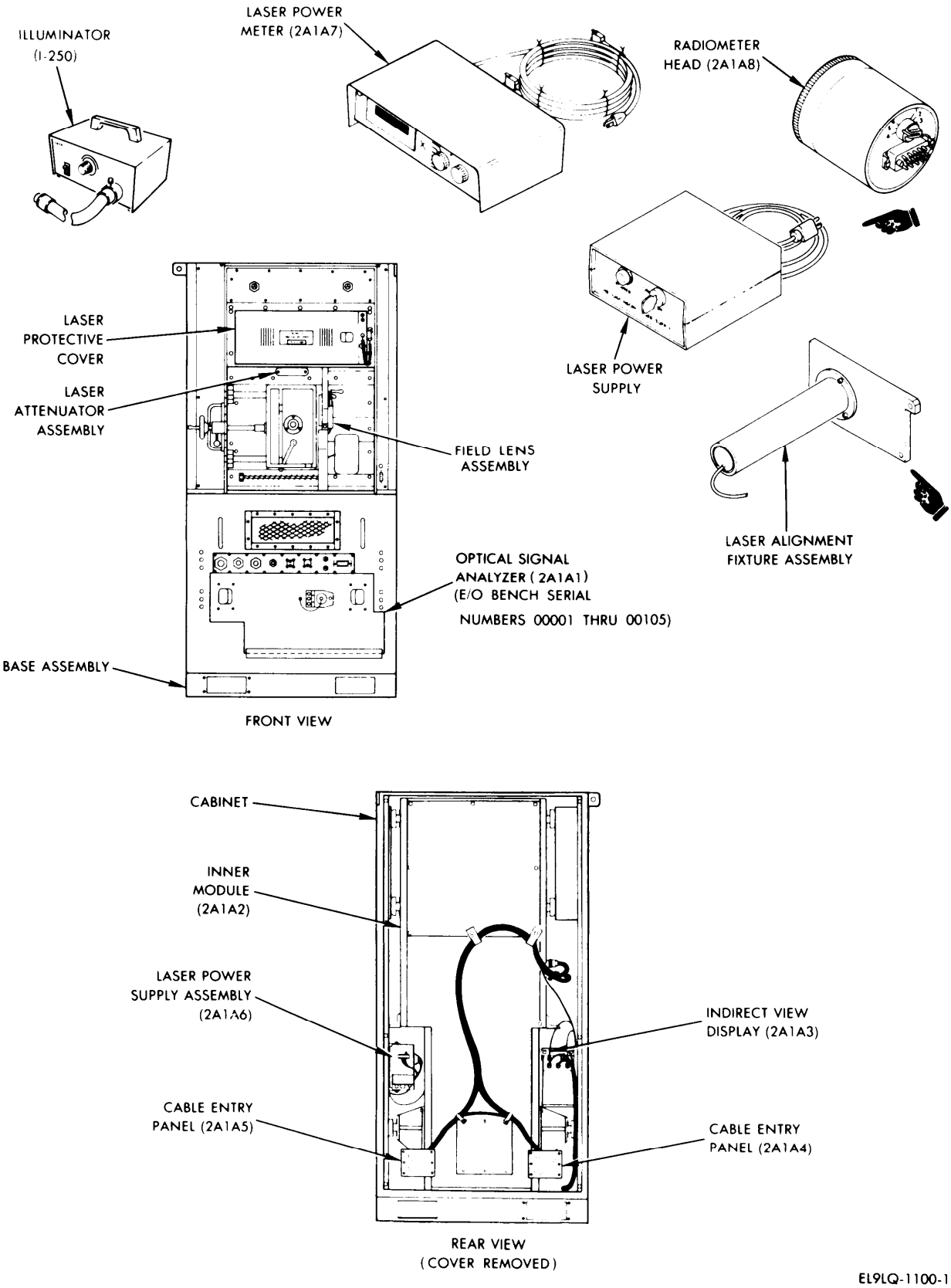
(1) The pneumatic system (Barry controls, SERVA-LEV'L Vibration Isolation System AGL-2) consists of a pneumatic control panel and four pneumatic isolators. The following data provides information on the individual sections of the pneumatic system.

(a) The pneumatic control panel is located on the front lower section of the nightside test bench. It is attached to a piano hinged access panel that is secured by two panel screws. It contains four pressure gages (0-160 psi), a filter and filter bowl, regulator, toggle valve, and color coded 1/4 inch polyethylene tubing that connects to the isolator assemblies.

(b) The E/O bench is supported by four pneumatic (stabilizing) isolators. Each isolator contains a piston plate that rests on a rubber diaphragm. An isolator is bolted to the van floor under each of the four corners of the base assembly. Three of the four isolators each have a mechanically adjustable valve assembly. The air supplied to the isolators must not exceed 125 psi.

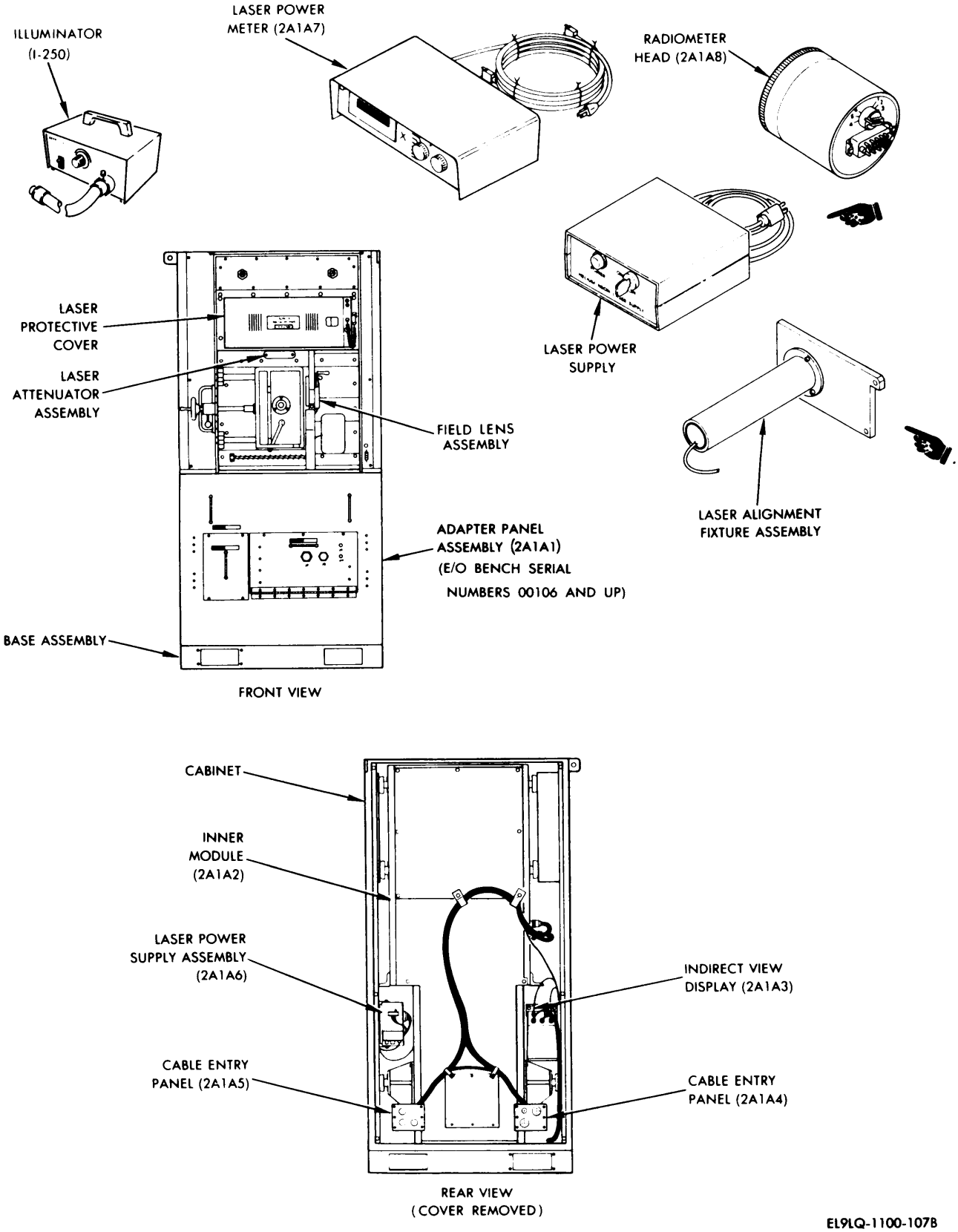
(2) The purpose of the pneumatic system is to isolate the E/O test bench assembly from any externally created physical disturbances during testing of LRUs containing optical elements. Three test program sets (TPS) call for use of the pneumatic system. All other TPS use the E/O bench in a deflated mode.

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 1-12



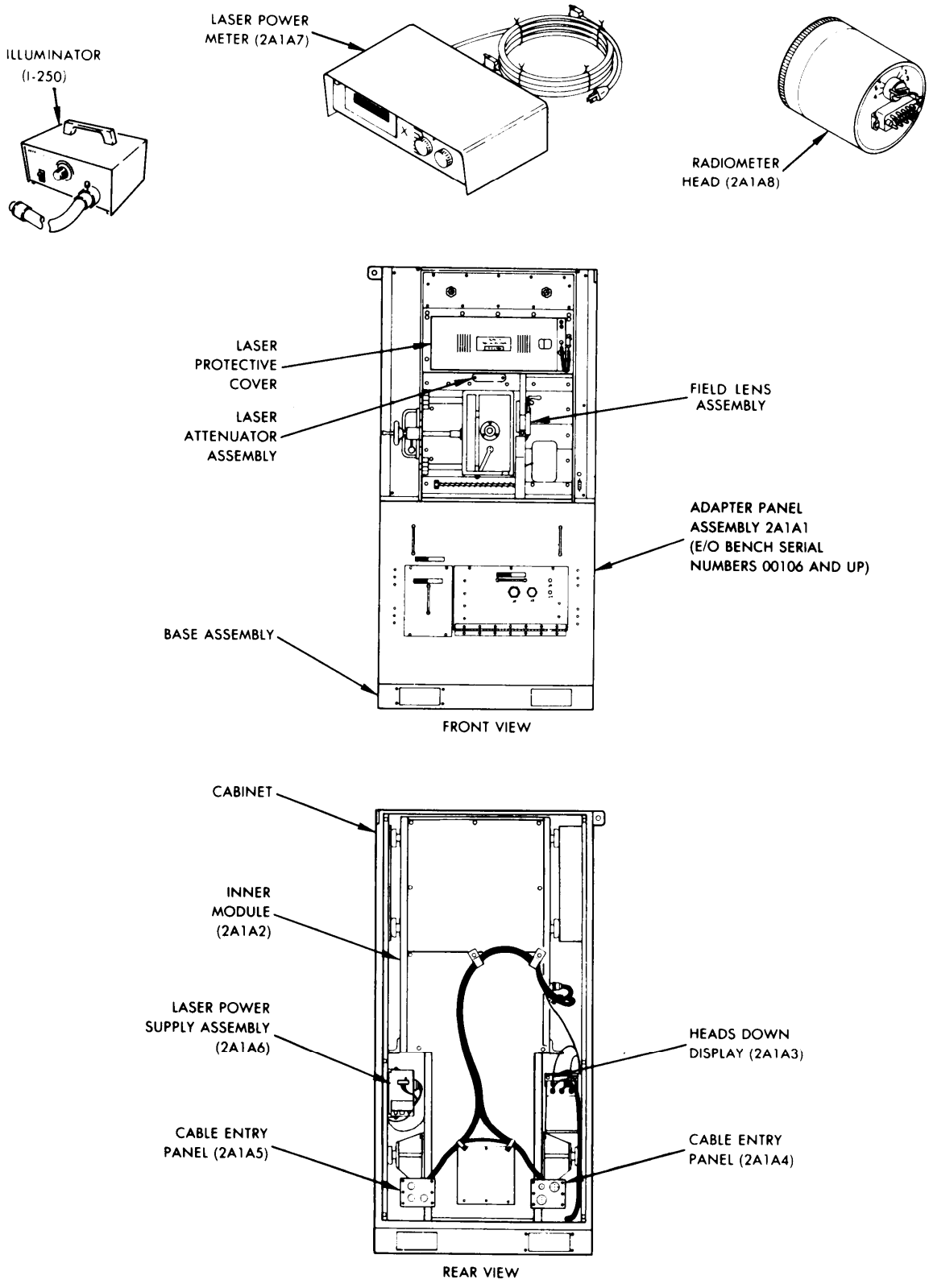
Dayside Test Bench 2A1

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12



Dayside Test Bench 2A1

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12



Dayside Test Bench 2A1

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12

a. GENERAL

The dayside test bench 2A1 consists of a cabinet and the following assemblies:

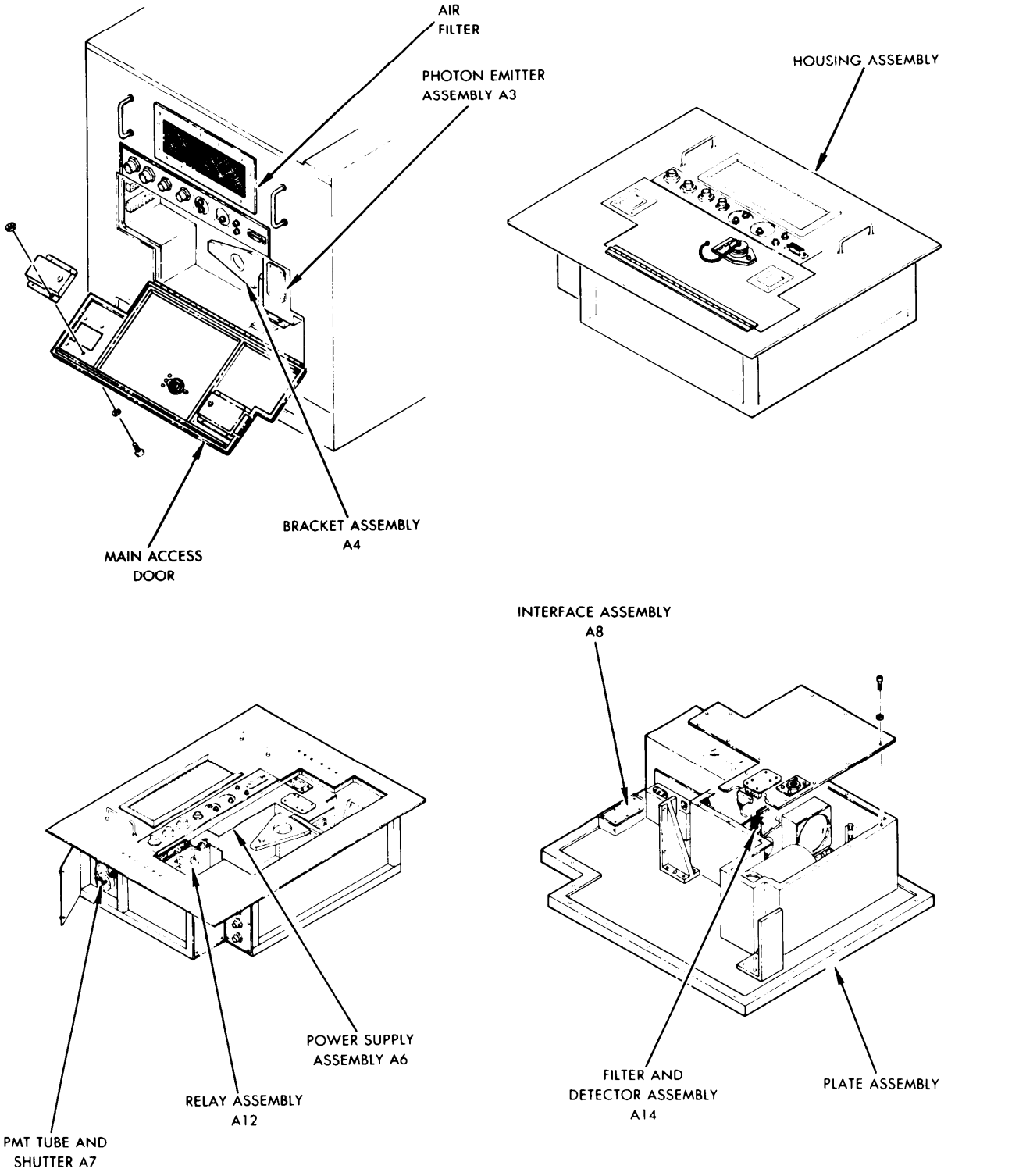
- Optical signal analyzer 2A1A1 (E/O bench serial numbers 00001 thru 00105 only)
- Adapter panel assembly 2A1A1 (E/O bench serial numbers 00106 and up)
- Inner module 2A1A2
- Indirect view display 2A1A3
- Cable entry panel 2A1A4
- Cable entry panel 2A1A5
- Laser power supply assembly 2A1A6
- Laser power meter 2A1A7
- Radiometer head 2A1A8
- Laser alignment fixture assembly

b. DAYSIDE TEST BENCH CABINET

The dayside test bench cabinet is constructed of aluminum alloy and secured to an aluminum alloy base pallet with four mounting bolts. Nine removable panels allow access to assemblies. Four ground terminal bonding positions (2A1E1 thru 2A1E4) provide grounding against shock hazard.

Physical Dimensions:

Length	68.7 in (includes dayside sensor mount assembly)
Width	36.0 in
Height	76.0 in
Weight	2385 lb



Optical Signal Analyzer (OSA) 2A1A1
(E/O Bench Serial Number 00001 thru 00105 only)

c. OPTICAL SIGNAL ANALYZER (OSA) 2A1A1 (E/O BENCH WITH OSA ONLY)

(1) The OSA is an electro-optical test chassis that provides an enclosure and test capability for two UUTs, heads out display (HOD), and heads down display/indirect view display (HDD/IVD). Located on front of the dayside test bench, the OSA consists of a housing assembly, plate assembly, and electrical and mechanical assemblies. Drawer slides allow extension away from the cabinet for maintenance.

(2) The OSA housing assembly is an aluminum alloy frame that interfaces with the plate assembly. The front panel consists of an air filter (dust arresting electromagnetic shielding air vent panel), 10 electrical connectors, a fiber optics connector, and a main access door. The door provides access to the OSA bay for installing the UUTs. A main door interlock switch assembly 2A1A1A5 is mounted on the housing assembly and actuates when the door is closed. The door is light tight and provides a dust free bay for the UUTs. Maintaining a light seal prevents damage to the photomultiplier tube (PMT) by a sudden exposure to light. Light from an 1-250 illuminator is directed through a fiber optics bundle to the fiber optics connector. From there, another fiber optics bundle directs the light into the OSA, for use during testing. Two sliding flush latch assemblies lock/unlock the door. Two bow handles provide carrying leverage.

(3) The side panel contains the PMT/PMT housing, PMT door interlock switch assembly 2A1A1A11, and electrical connections. These components are located behind the PMT door. The interlock switch is actuated when the door is closed and secured to the housing with two quick-release captive screws.

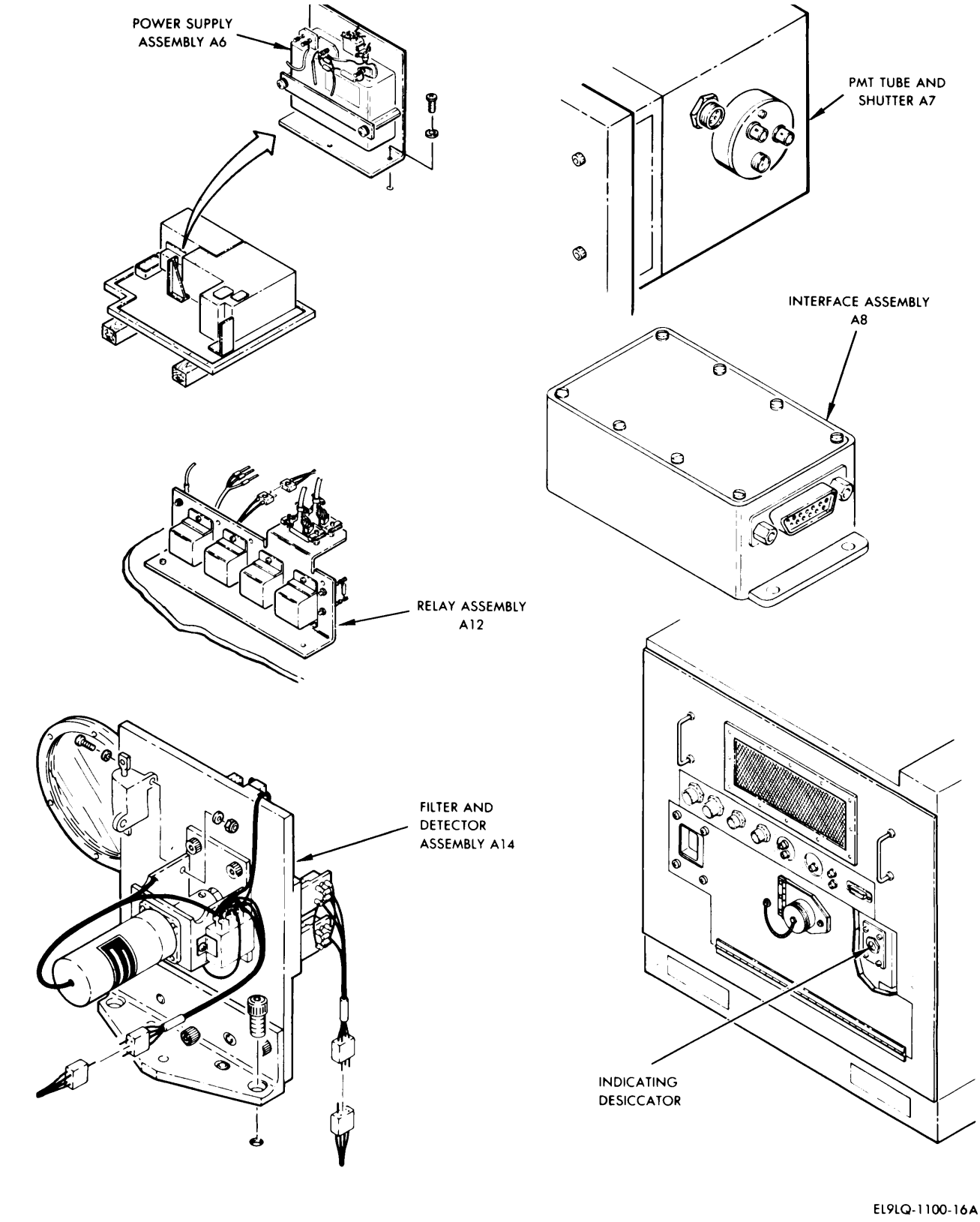
(4) The plate assembly mounts on the rear of the housing assembly and supports the chassis. Items mounted to the plate assembly include the following:

- Photon emitter assembly 2A1A1A3
- Bracket assembly (focus motor) 2A1A1A4
- Power supply assembly 2A1A1A6
- Photomultiplier/bracket assembly (PMT tube and shutter) 2A1A1A7
- Interface assembly 2A1A1A8
- Relay assembly 2A1A1A12
- Filter and detector assembly 2A1A1A14
- Mechanical assemblies

(a) The photon emitter assembly 2A1A1A3 (calibration light source test LED) consists of a CCA and cover assembly. The CCA contains a resistor network and light emitting diode (green diffused LED). The LED is the test light source situated behind a mask of hole patterns that provides a monitoring source for the PMT.

(b) The mounting bracket assembly 2A1A1A4 (focus motor) focuses on the CRT of the HOD. It consists of a stepper motor assembly (O to 32,000 steps), target wheel sensor assembly, motor adapting plate, adjusting bracket, and a clamping bracket assembly. Two quick-release pins (part of clamping bracket assembly) secure the HOD to the mounting bracket assembly.

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12



Optical Signal Analyzer (OSA) 2A1A1
(E/O Bench with OSA only)

(c) The power supply assembly 2A1A1A6 provides high voltage to the PMT. It is located behind the main access door and consists of a power supply and resistor/ relay network mounted to a bracket.

(d) The photomultiplier/bracket assembly (PMT tube and shutter) 2A1A1A7 contains the photomultiplier, shutter plate adapter, and Prontor magnetic shutter assemblies supported by a mounting bracket assembly attached to the OSA plate assembly.

1. The photomultiplier assembly is made up of the PMT housing (Pacific End-On-Tube Housing, Model 3457), photomultiplier tube (PMT) (model XP2012B), and component board. The PMT is enclosed in the PMT housing keeping it cooled to -40°C. A fan mounted on the PMT housing forces air past the heat exchanger. OSA chassis intake and exhaust vents prevent air currents from affecting the PMT cooling function. The anode (plate) of the PMT requires 1200 volts. The component board contains circuitry that provides the electrical interface with the PMT. The PMT is operated in a very light-sensitive condition and could be damaged by extraneous light. Interlocks on the PMT and main access doors prevent operation when the doors are open.

2. The shutter plate adapter assembly and prontor magnetic shutter assembly combine to provide a filter and shutter action.

(e) Interface assembly 2A1A1A8 interfaces electrically with the PMT and shutter assembly. It is located behind the OSA main access door and consists of a shielded filter box, circuit card assembly (CCA) and electrical connector.

(f) The relay assembly 2A1A1A12 deactivates the PMT circuitry by electrically interfacing with the main access and PMT door interlock switches. It is located behind the OSA main access door and consists of a mounting bracket, four relays (K1 thru K4), and electrical connections.

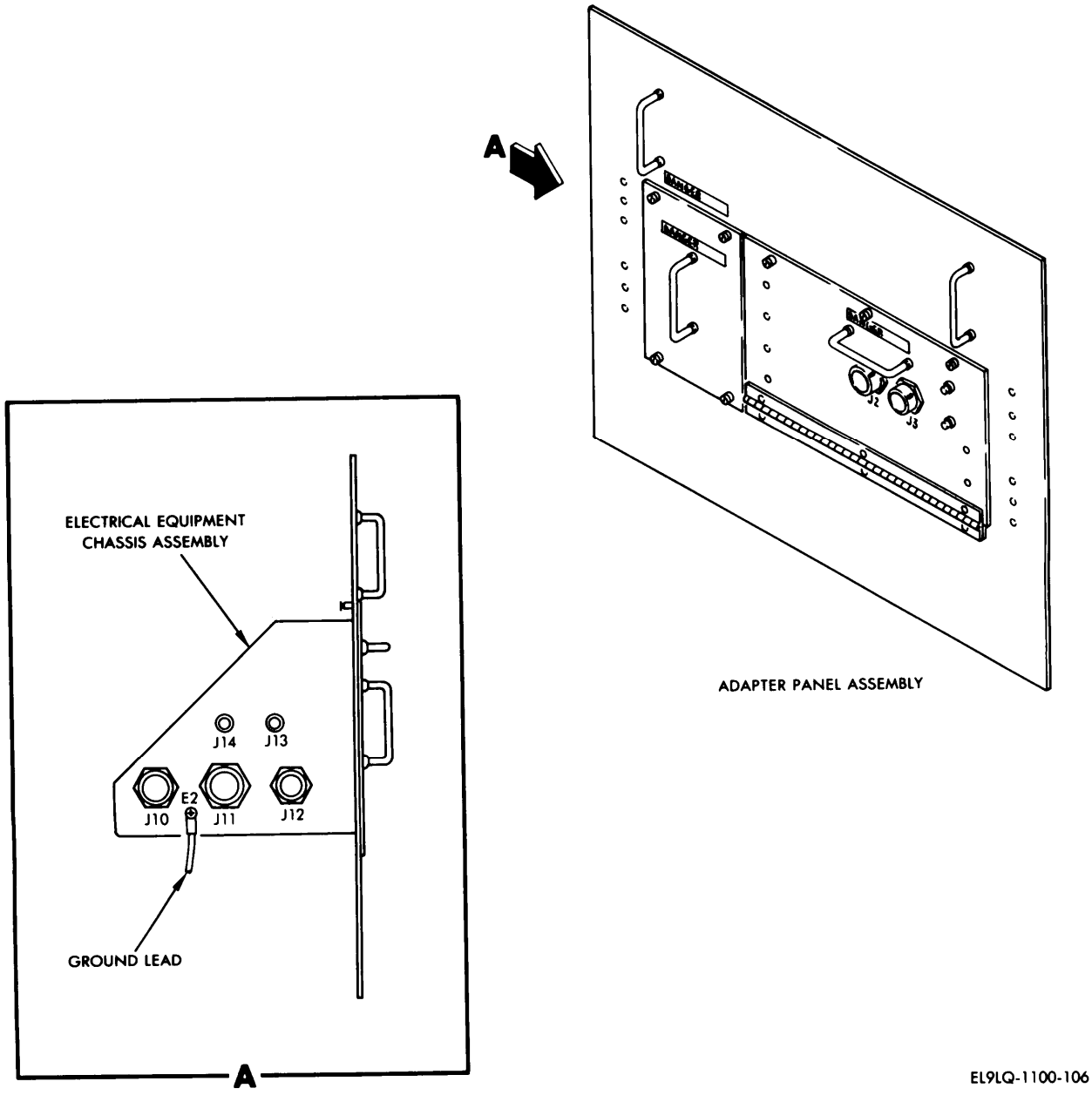
(g) The filter and detector assembly 2A1A1A14 provides a neutral density filter that is positioned in or out of the optical path. It is located behind the mounting plate and access requires removal of the OSA. It consists of a filter and bracket assembly, motor, neutral density filter, a relay, actuator switches S1 and S2, optical switches Al and A3, resistors, and connectors.

(h) Mechanical assemblies include lens cell housings, an exhaust fitting, light baffles, and a desiccant indicator. Lens cell housings support lens elements. The exhaust fitting provides an outlet for heated air currents. Light baffles are actually light traps. The indicating desiccator provides moisture conditions within the OSA chassis. This indicator will change color when the desiccant has reached moisture saturation. Access to the indicator is through the main access door.

Physical Dimensions:

Length 10.00 in
Width 35.75 in
Height 29.75 in
Weight 185 lb

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12

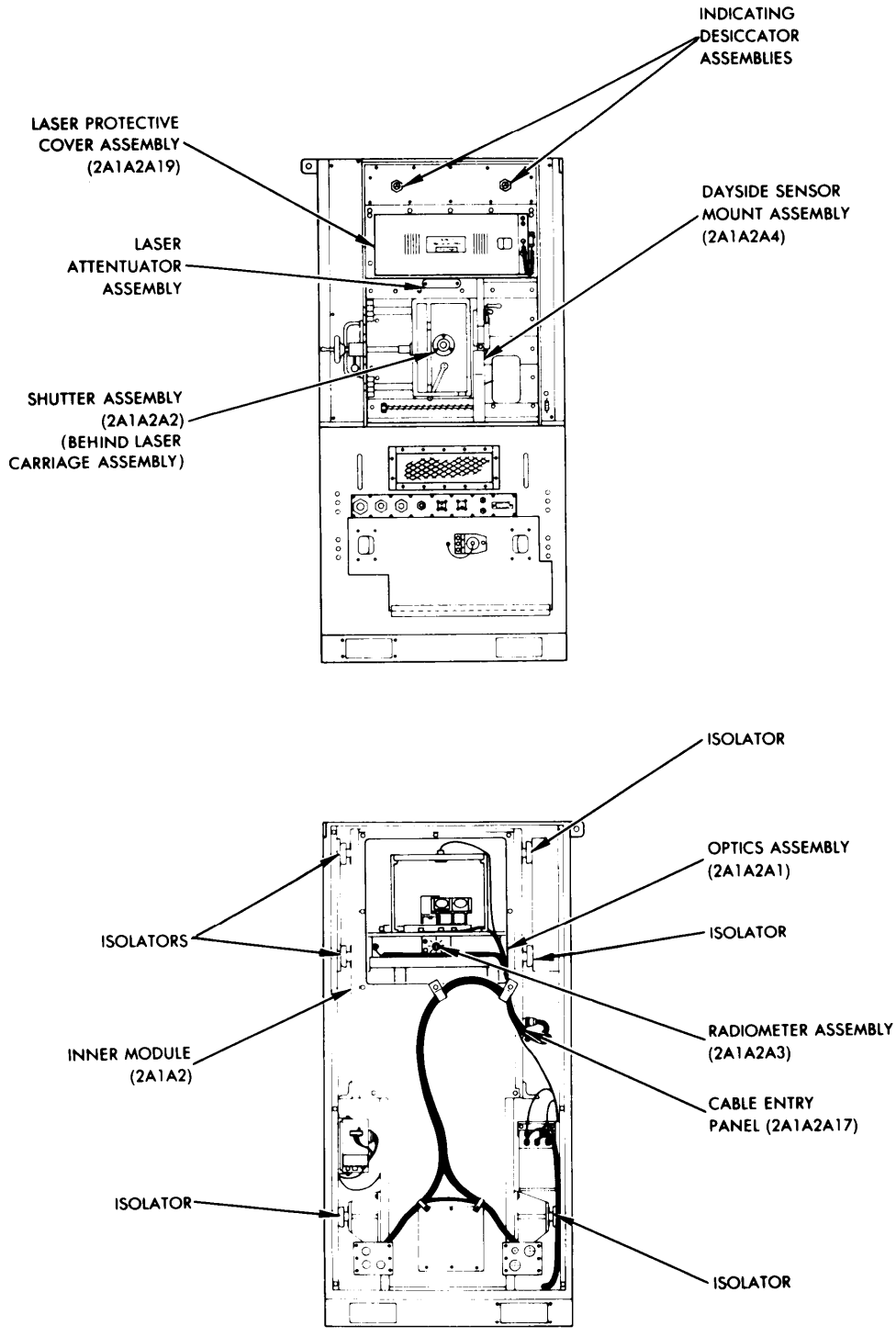


EL9LQ-1100-106

c.1. ADAPTER PANEL ASSEMBLY

(1) The adapter panel assembly is an electrical interface that provides connections from the internal IVD 2A1A3 and power supplies.

(2) The adapter panel assembly is an aluminum alloy plate with subassemblies attached, including the electrical equipment chassis assembly and the access panel assembly. The electrical equipment chassis assembly is mounted on a hinge and can be opened by loosening two quick fasteners at the top of the panel.



Inner Module 2A1A2

d. INNER MODULE 2A1A2

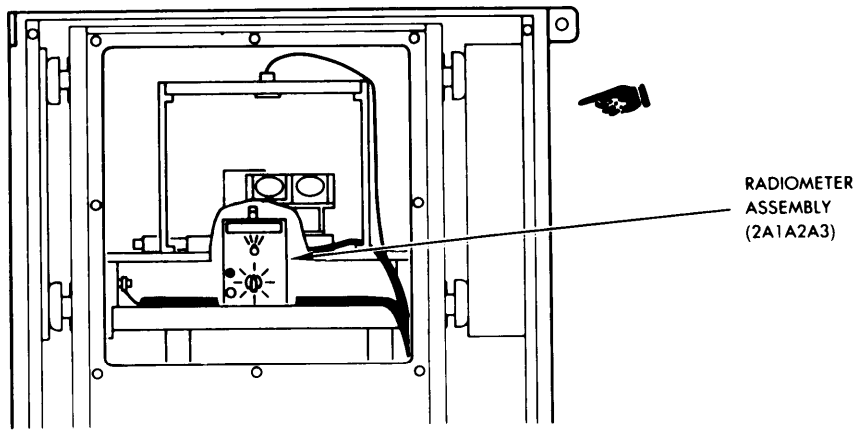
The inner module 2A1A2 is an assembly made up of heavy gauge, (1.24 inch thick), aluminum alloy. The unit is positioned inside the dayside test bench cabinet on 12, zinc-plated, elastomer isolators (maximum load rating of 250 lb each). These isolators, six on the left side and six on the right side, secure the inner module to the inner walls of the dayside cabinet. Two grounded terminal-bonding connections protect against radio frequency interference. One is a jumper assembly which connects the cabinet to the inner module, while the other connects the inner module to the laser cover assembly. An access plate, located above the laser cover assembly, contains two indicating desiccator assemblies. The purpose of the inner module is to provide an enclosed test cell (platform) for the dayside collimator electrical and optical assemblies.

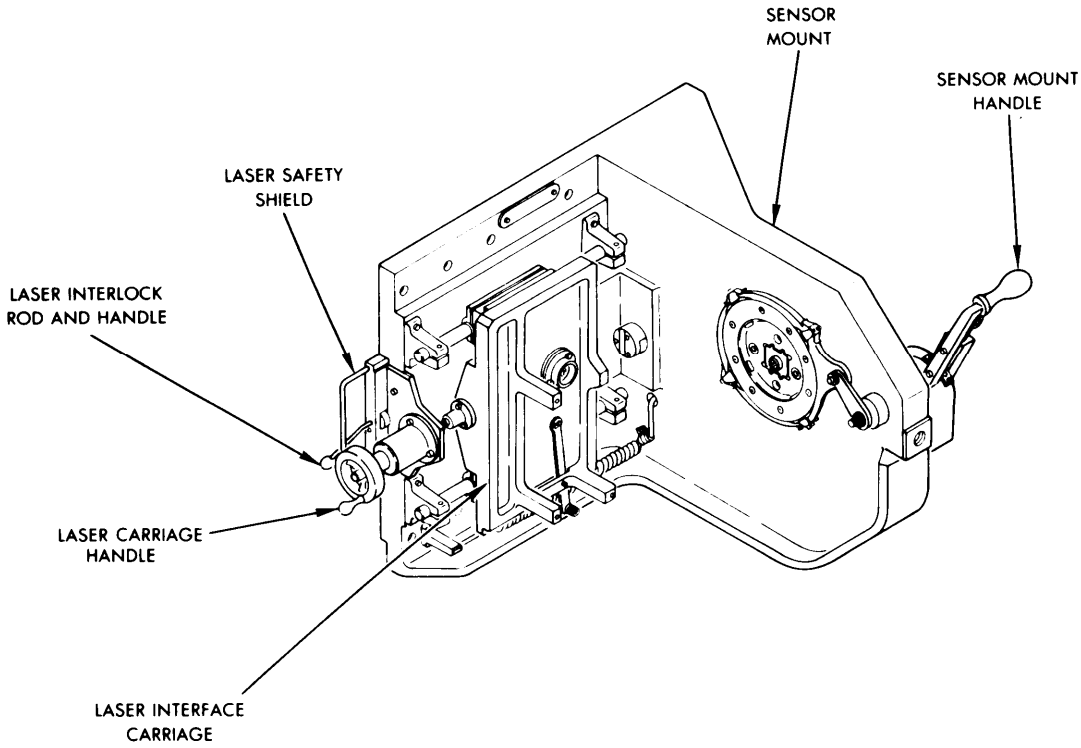
Items installed on the inner module include:

- Optics assembly 2A1A2A1
- Shutter assembly 2A1A2A2
- Radiometer assembly 2A1A2A3
- Dayside sensor mount assembly 2A1A2A4
- Laser fold mirror assembly 2A1A2A6
- Filter wheel/motor assembly 2A1A2A10
- Lampholder assembly 2A1A2A11
- Automatic focus control assembly 2A1A2A12
- Beam sampler 2A1A2A13
- Cable entry panel 2A1A2A17
- Laser protective cover assembly 2A1A2A19

(1) The optics assembly 2A1A2A1 contains the laser test module and three cable assemblies with sensors. Contained in the laser test module are a camera (General Electric model TN 2500 CID Matrix Array). The camera is used to measure the laser beam divergence (spread) using an array of photodetectors.

(2) The shutter assembly 2A1A2A2 is located on the front side of the dayside test bench assembly. It contains ‘a solenoid and arm assembly, a cable assembly 2A1A2A2W4 containing two optical switches and various mechanical parts required for operating the eight, interlinked shutter blades. Two connectors J1 and J2, located on the shutter assembly connector mounting plate, provide the power source and control voltages for shutter assembly operation. The shutter assembly provides a protective cover for inadvertent laser firing and an opening for interfacing the dayside test bench with the TADS day sensor assembly UUT.





EL9LQ-1100-18B

Inner Module 2A1A2

(3) The radiometer assembly 2A1A2A3 is located in the top center section of the test bench behind the beam sampler 2A1A2A13 and laser mount. The assembly consists of a detector head, a radiometer, and a component assembly (power supply and filtering network). The radiometer assembly mounts to a support assembly that is secured to the inner module. The rear panel of the detector head contains a toggle switch, two rotary switches, a coaxial connector, and a rectangular connector. These switches and the coaxial connector are used for testing the radiometer assembly. Coaxial cable assembly 2A1A2W22 connects between the detector head and cable entry panel 2A1A2A17 for system output. Cable assembly 2A1A2W40 connects to the rectangular connector and inputs power, transmits feedback signals, and provides a signal measurement source. The purpose of the radiometer assembly is to make laser power tests, detect missed laser pulses, and determine pulse width and energy stability between pulses.

Radiometer Assembly Characteristics:

Maximum Peak Current: 100 mA
Maximum Average Current: 1.0 mA
Effective Active Area (Diffuser): 2.58 in^2; 16.6 cm^2
Pulse Rise Time (Scope viewing): 8 ns across 50 ohms
Pulse Viewing Resistors: 50 ohms, 500 ohms, 5000 ohms, OPEN
Aperture Ratios: 1, 1/3, 1/10, 1/30, 1/100, 1/300, 1/1000, and 1/3000

Physical Dimensions:

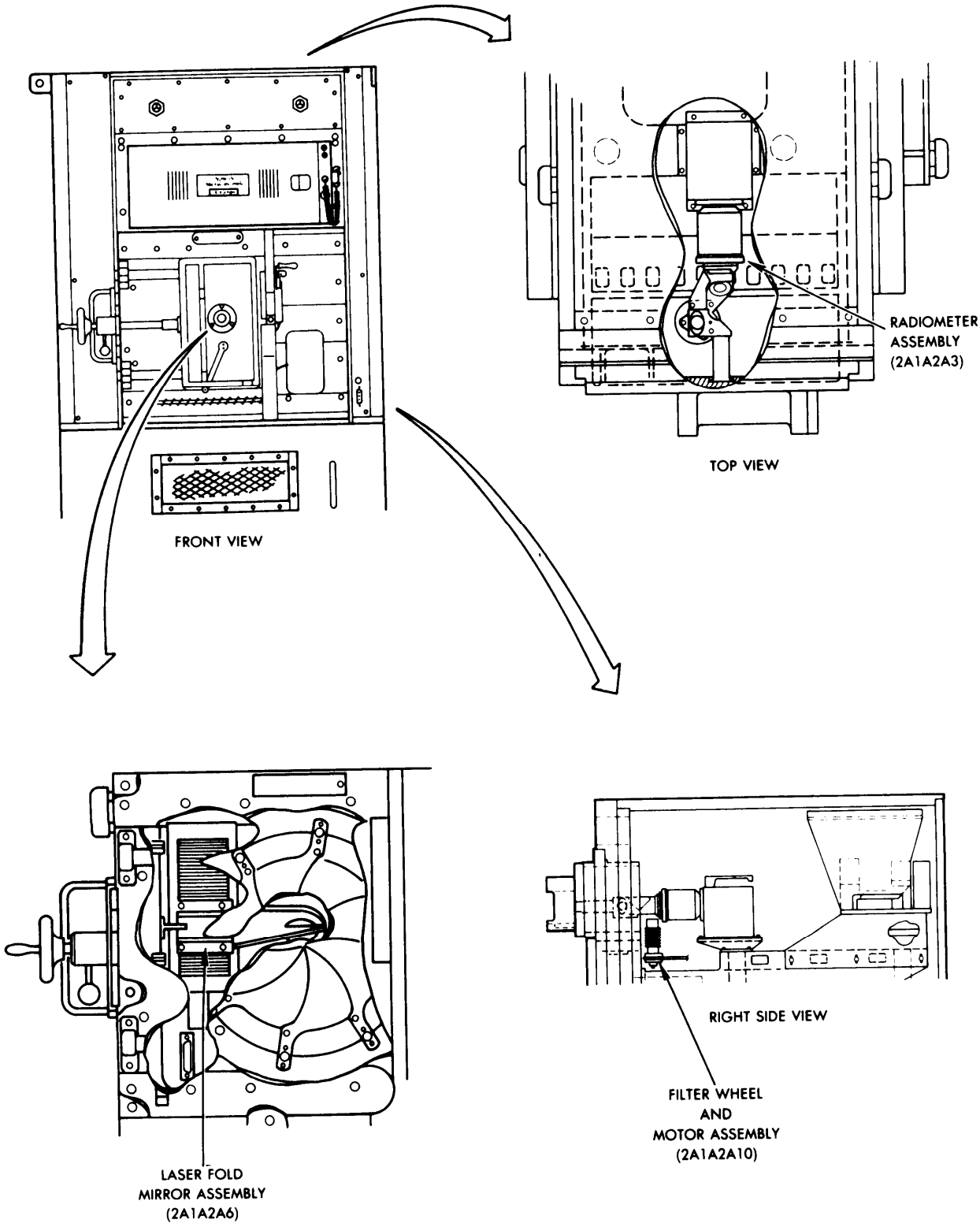
Length 6.50 in
Width 5.25 in
Height 7.50 in
Weight 8 lb

(4) The dayside sensor mount assembly 2A1A2A4 is a heavy, cast aluminum mount that supports and positions the TADS day sensor assembly UUT for testing. It is mounted to the front side of the dayside test bench and consists of sensor mount, laser safety shield, laser interface carriage, end plate, laser interlock rod, four cable assemblies, an actuator switch, and a UUT dayside mounting adapter.

(a) The sensor mount contains the mount bracket, sensor mount (UUT locking) handle, and cable assembly. The handle is manually positioned to lock or to unlock the UUT to the mount bracket. The handle in the forward position (unlock-towards dayside test bench) retracts four locking cams. The handle in the aft position reverses the position of the cams and locks the UUT to the mount bracket. The cable assembly contains two optical switch assemblies, A1 and A2, that sense the lock or unlock position.

(b) The laser safety shield, laser interface carriage, laser carriage handle, laser interlock rod, and end plate make up the holding assembly for the UUTs, laser transceiver and laser tracker receiver.

1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont)



EL9LQ-1100-19A

Inner Module 2A1A2

(c) Four cable assemblies contain optical switches that sense the movement of various items in the mount. An actuator switch SW1 is also installed on the mount.

(d) A specially-fitted, dayside mounting adapter fits to the mount for UUT installation. This mounting adapter, once fitted to a dayside test bench, becomes a permanent part of that unit and is not interchangeable with another dayside test bench.

(5) The laser fold mirror assembly 2A1A2A6 consists of a translator assembly 2A1A2A6A8 and the laser mirror assembly. It is located next to the shutter assembly and its optical path. The translator assembly is an incremental encoder (one micrometer increment per step) driven by a gear reduction, direct current motor. The translator assembly does the following:

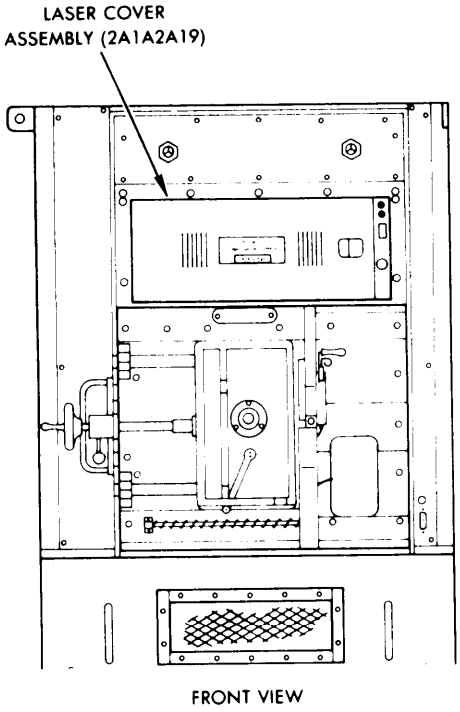
(a) Position the mirror assembly for directing laser energy from the laser transmitter to the matrix array camera.

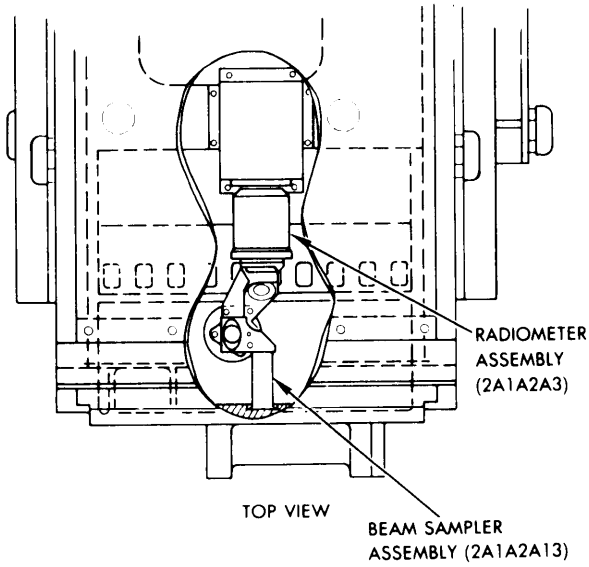
(b) Position the mirror assembly away from laser energy path (a) to permit the collimator port to be used for laser spot tracker and optical device testing.

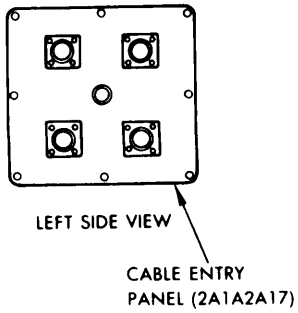
(6) The filter wheel/motor assembly 2A1A2A1O is located below the beam sampler 2A1A2A13. It consists of a filter wheel assembly and a cable assembly that includes the motor.

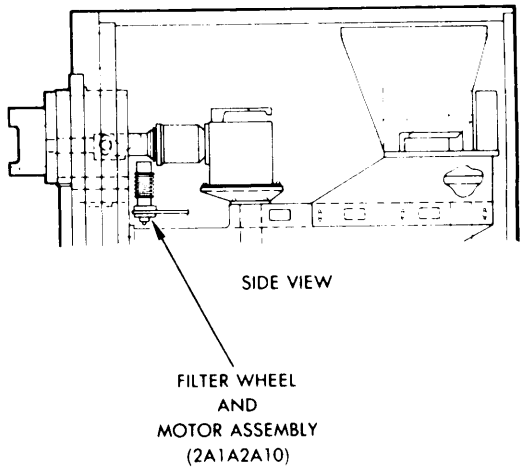
(a) The filter wheel assembly consists of two, flat (360 degree) disk filters mounted approximately l/2-inch apart on a hub assembly. Part of the filter wheel extends into a cutaway on the front plate of the inner module as it revolves on its hub axis. The neutral density (ND) filter coating is on the inside surface of each disk and varies in density (clockwise) from 2.430 to 0.024 ND.

(b) The cable assembly consists of a connector, wiring, and gearhead stepper direct current motor assembly.









EL9LQ-1100-20

Inner Module 2A1A2

(c) The purpose of the filter wheel/motor assembly is to provide an ND variation that attenuates the laser energy being directed to the matrix array camera. The level of filtering is reduced incrementally (1 micrometer increment per step) by the gearhead stepper motor assembly.

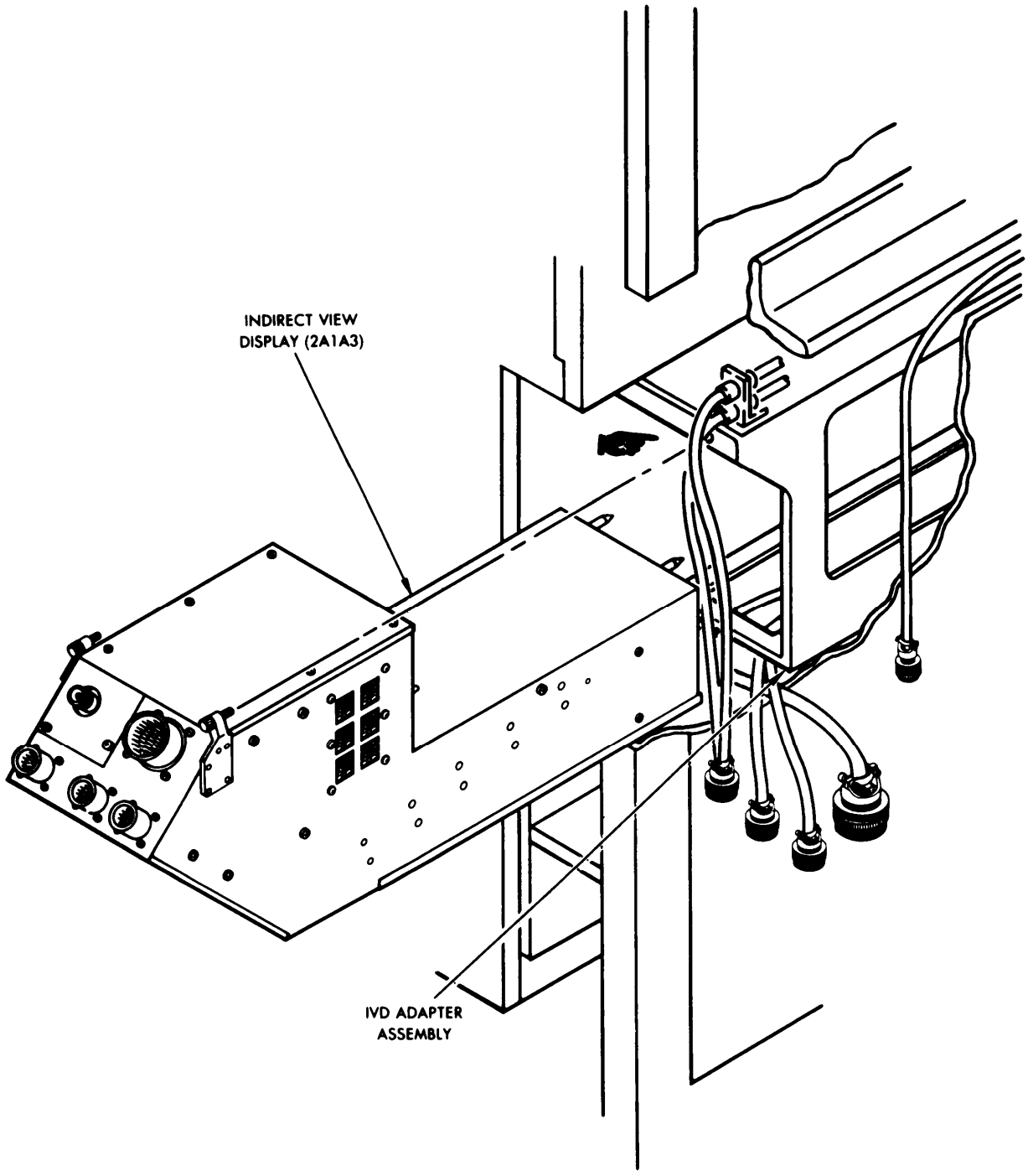
(7) The lampholder assembly contains a lamp which is used for alinement of the dayside test bench inner module during calibration.

(8) The automatic focus control assembly 2A1A2A12 is located under the filter wheel/motor assembly 2A1A2A1O. It contains a lens housing assembly and mates with a gearhead stepping motor and incremental encoder (linear translator). The purpose of the 2A1A2A12 is to position the lens assembly to compensate for slight changes in focal path length due to temperature changes. Direct commands can also be used based on type of unit under test and the spectral range required.

(9) The beam sampler assembly 2A1A2A13 is located in front of the radiometer narrow beam attenuator (part of the radiometer assembly). It is an optical transfer-ring device made up primarily of a base and housing, two optical beam splitter lenses, and a protective cap. The purpose of the beam sampler is to split the laser beam path into two separate paths.

(10) The cable entry panel 2A1A2A17 is located on the left side of the inner module. It is accessible by removing the upper left panel on the dayside cabinet. It contains four electrical connectors J1 thru J4, and a center panel mounted coaxial connector J5.

(11) The laser cover assembly 2A1A2A19 is a rectangular box that is hinged to the left front section of the dayside test bench. The outside of the cover contains two indicators, a key and switch lock assembly, electrical cable with a pistol grip switch attached, and three multipin connectors, J1, P1, and P2. Two interlock switches . are located behind the cover. The key and switch lock assembly provides positive control for opening and closing the laser protective cover. The purpose of the laser cover assembly is to prevent firing the laser transceiver unit UUT without ensuring an enclosed, shielded environment protection for using personnel.



Indirect View Display (IVD) 2A1A3

EL9LQ-1100-21A

e. INDIRECT VIEW DISPLAY (IVD) 2A1A3

The IVD is an electronic assembly located in the rear of the dayside test bench. It is accessible by removing a rear dayside test bench panel. It mounts to an IVD adapter assembly and is secured by two, special-purpose screws. Four connectors, J1 thru J4, and a coaxial connector are located on the IVD panel. These connectors interface with the electrical cables routed from the OSA. The dayside test bench IVD is used to test its airborne systems counterpart. The dayside test bench IVD cannot be used to replace an airborne IVD (UUT), since it does not contain five additional circuit card assemblies installed in the airborne UUT. The airborne system IVD (UUT) is installed in the OSA IVD mount for testing.

Physical Dimensions:

Length	18.85 in (approximate)
Width	5.50 in
Height	8.35 in
Weight	19.9 lb

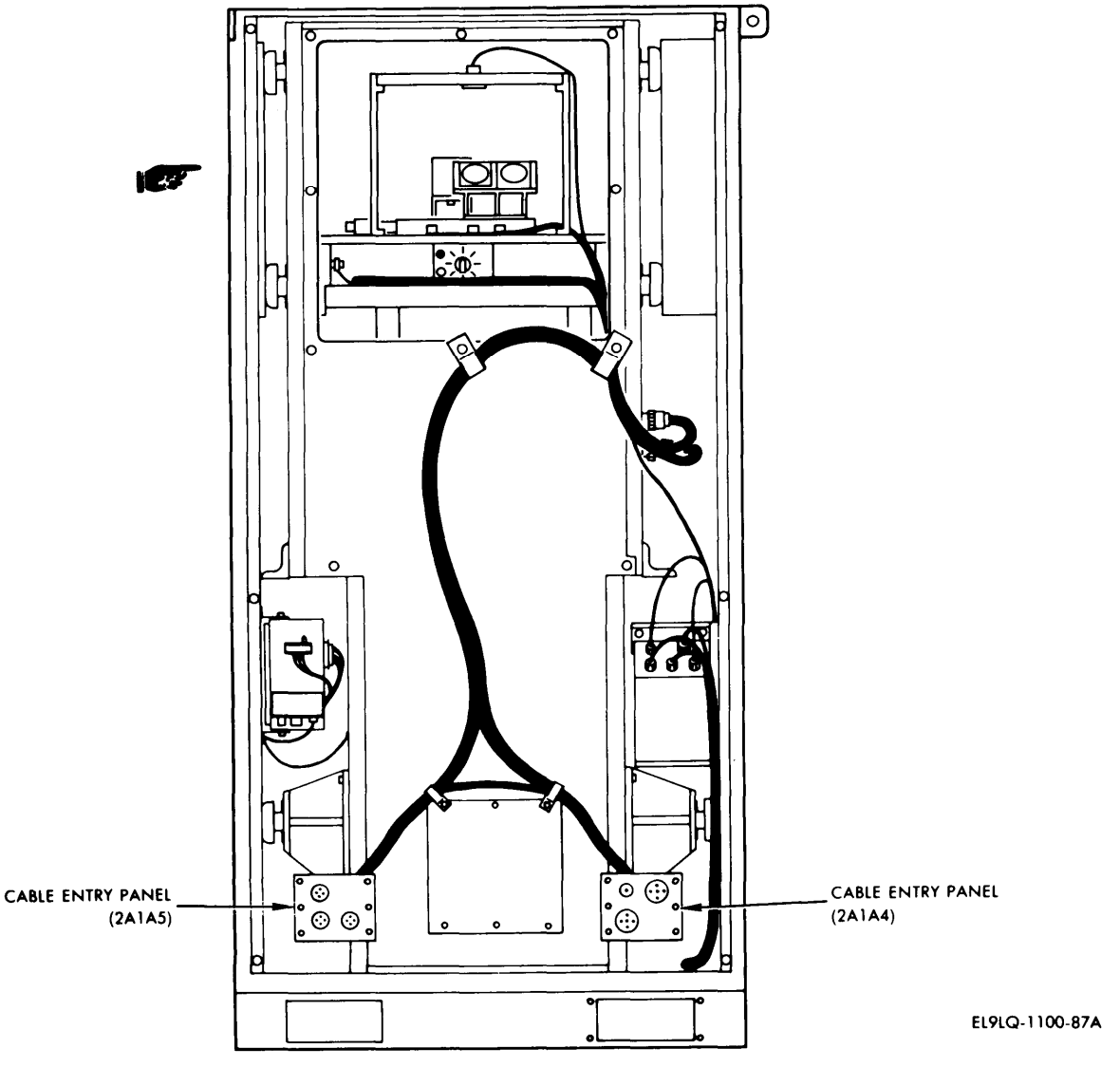
Power Input: 115v, 400 Hz, 3 phase
28 vdc

f. CABLE ENTRY PANELS 2A1A4 AND 2A1A5

The two cable entry panels are mounted on the rear panel. Panel 2A1A4 contains connectors J1 and P2 and coaxial connector J6. Panel 2A1A5 contains connectors J2, J4, and J5. These connectors interface with the electrical cables that interconnect between the electronic station and the electro-optical test bench set.

Physical Dimensions:

Width 5.75 in
Height 4.75 in

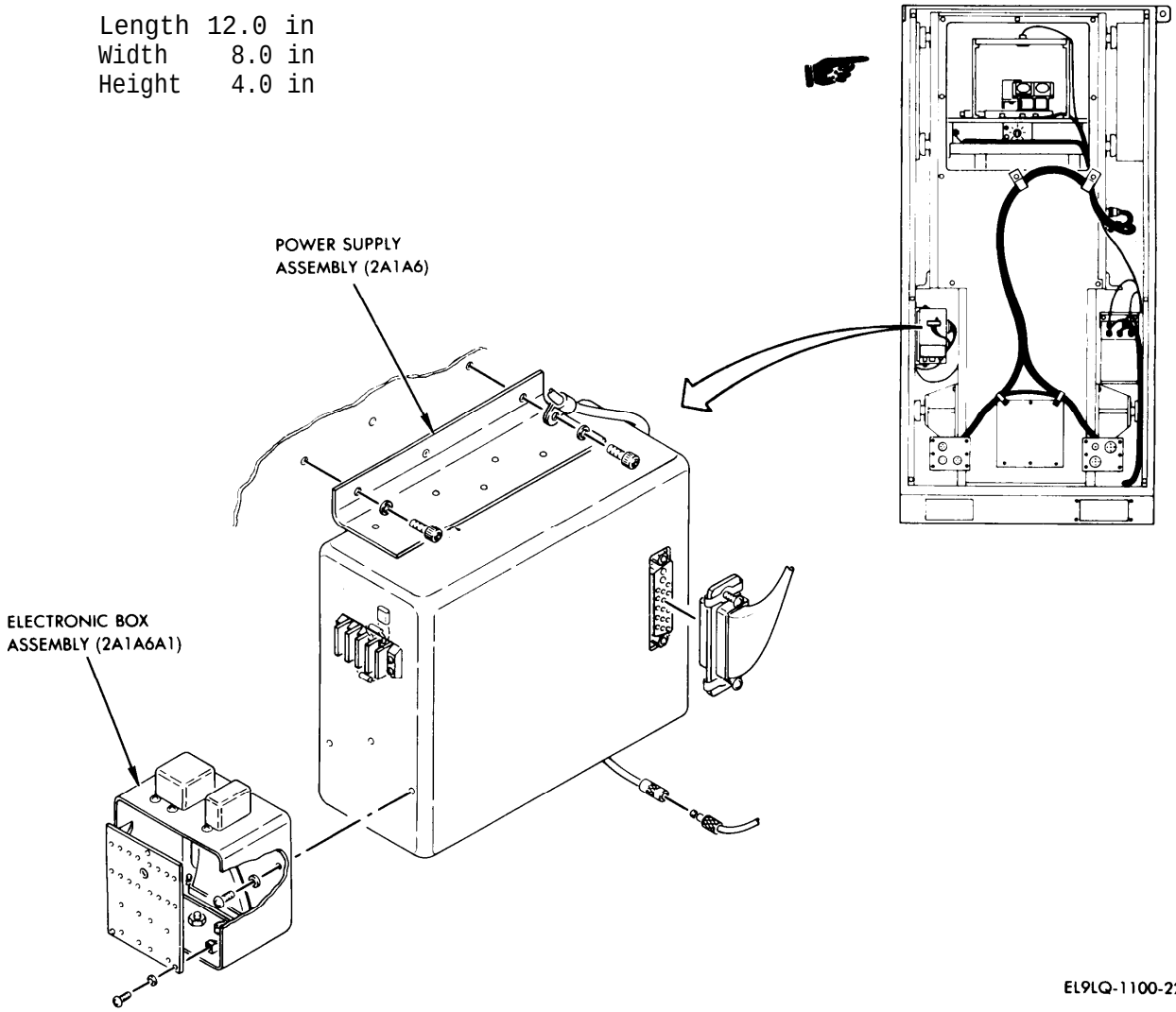


g. LASER POWER SUPPLY ASSEMBLY 2A1A6

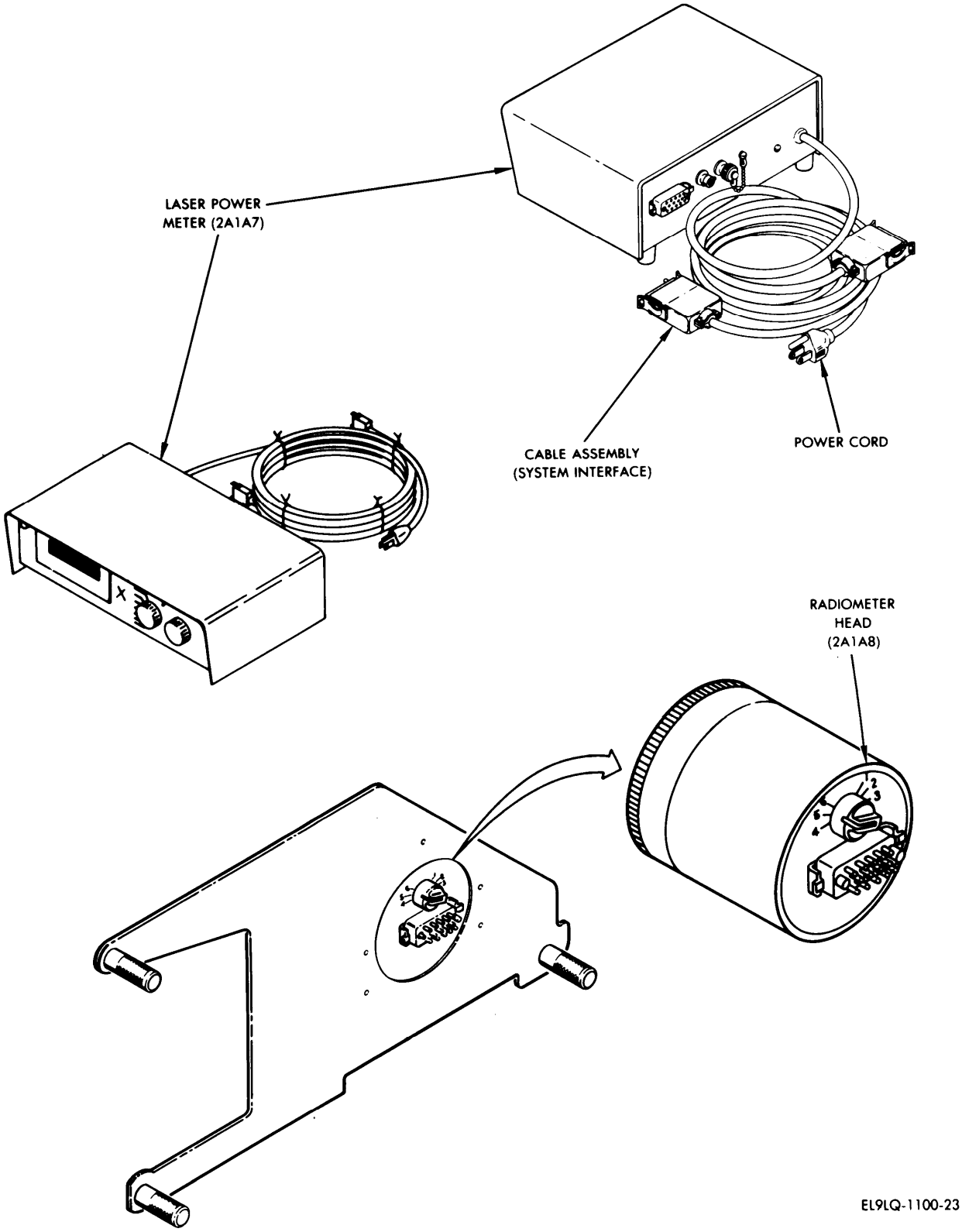
The laser power supply assembly 2A1A6 consists of a high-voltage power supply (HVPS) and an electronic box assembly 2A1A6A1. The power supply assembly is located between the inner module and the cabinet wall on the right side of the dayside test bench. The electronic box assembly contains a connector and two relays, K1 and K2, that control the electrical output distribution of the HVPS. The high voltage outputs are 600 and 1000 vdc. A terminal board with one capacitor, one resistor and four jumper lugs is located on the outside casing of the HVPS. The purpose of the laser power supply assembly is to provide the required voltages to the laser system components. In addition, the assembly prevents these voltaqes from beinq distributed when the laser system-operating condition is unsafe for personnel use:

Physical Dimensions:

Length	12.0 in
Width	8.0 in
Height	4.0 in



1-12. DESCRIPTION OF DAYSIDE TEST BENCH 2A1 (cont) 1-12



Laser Power Meter 2A1A7/
Radiometer Head 2A1A8

h. LASER POWER METER 2A1A7

The laser power meter 2A1A7 (EG & G Electro-Optics model 460-1) is part of the model 460 laser power meter portable system used to test the TADS dayside assembly (UUT). Its front panel controls include a power ON/OFF pushbutton switch, a four-digit number display, a six-position (full-scale) multiplier selector dial, and an automatic wavelength indicator (rated in amperes). The purpose of the laser power meter is to measure the output of the laser tracker unit and laser transceiver (UUTS).

Characteristics	Parameters
Range:	10^{-3} thru 10^{-8}
Readout Accuracy:	1% +1 count
Response Time:	Almost instantaneous
Analog/Recorder Output:	0 thru 1,999 volts

Physical Dimensions:

Depth	7.50 in
Width	8.25 in
Height	3.00 in
Weight	4 lb

Electrical Input: 115v, 60 Hz
Power Usage: 4 watts

i. RADIOMETER HEAD 2A1A8

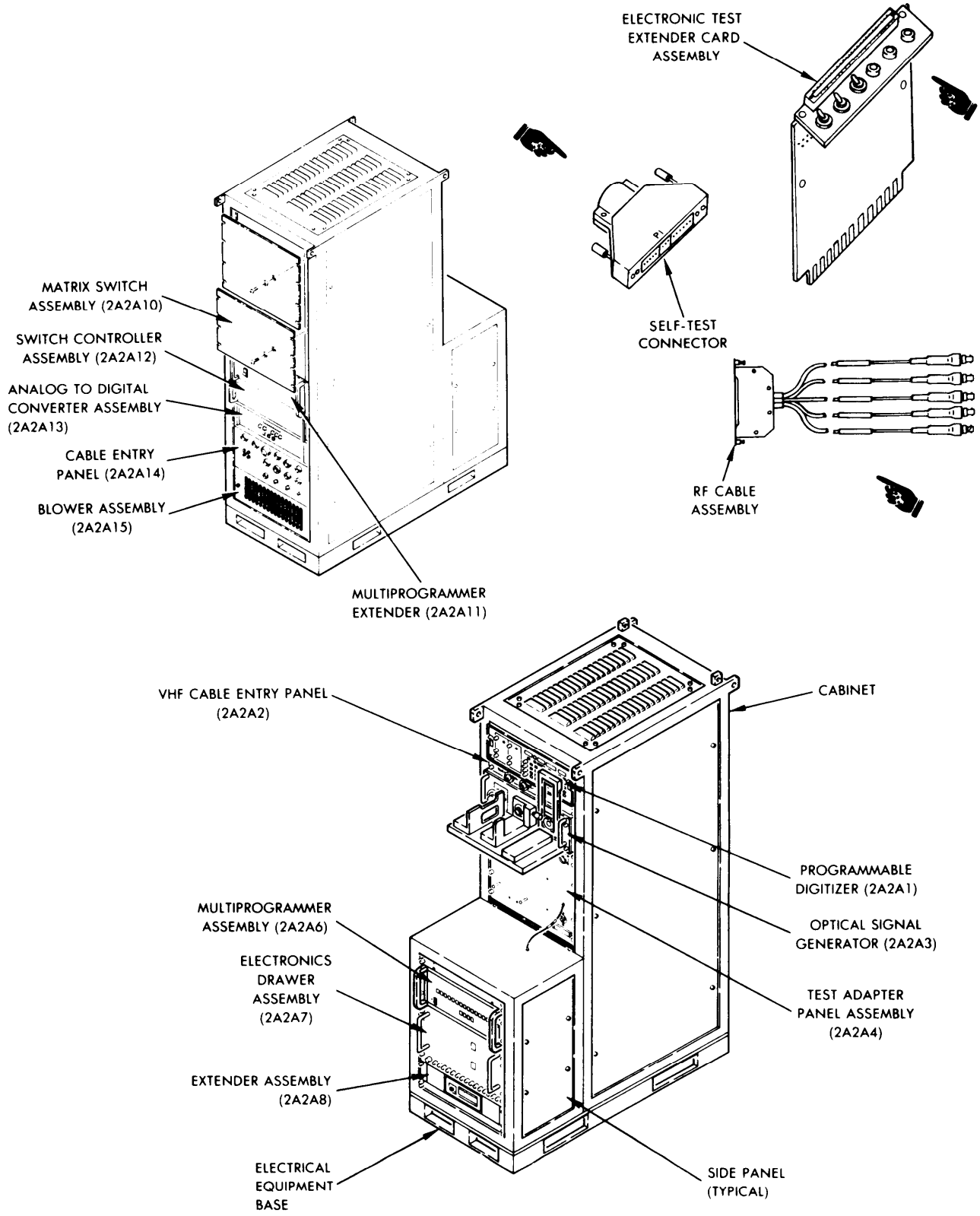
The radiometer head (EG & G Electro-Optics model 460-2 Silicon Detector Head) is also part of the model 460 laser power meter portable system. A silicon photovoltaic detector is located inside the radiometer head, and when in use scans the laser or photodiode output. A multipin connector mates with a system interface cable assembly that connects to the power meter. A protective cover for the open-cavity area leading to the detector is installed anytime the unit is not in use. A six-position, rotary switch and a connector are on the rear of the unit. The switch positions are:

Position	Measured Wavelength	Used For
1	441.6 nm	Helium - Cadmium Laser
2	448.0 nm	Argon Laser
3	514.5 nm	Argon Laser
4	632.8 nm	Helium - Neon Laser
5	904.0 nm	Gallium Arsenide Laser
6	200 to 1100 nm	Direct photocurrent measurement

j. LASER ALIGNMENT FIXTURE ASSEMBLY

The laser alignment fixture assembly consists of a low power helium-neon laser and a laser power supply. The laser is used when alignment of the mirror assemblies in the dayside test bench is being performed. It is attached to the laser mount inside the laser protective cover assembly. It transmits a precise beam of laser energy through the beamsplitter and laser fold mirrors inside the test bench into the CID camera. The CID camera converts the received laser energy into electrical signals that are displayed on an oscilloscope. The third fold mirror is adjusted in the horizontal and vertical directions as necessary until the laser energy is centered in the CID camera.

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2



Test Console Test Bench 2A2 EL9LQ-1100-24C

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13

a. GENERAL

The test console test bench consists of an electrical equipment cabinet and the following assemblies:

- Programmable digitizer 2A2A1
- VHF cable entry panel 2A2A2
- Optical signal generator 2A2A3
- Test adapter panel 2A2A4
- Multiprogrammer 2A2A6
- Electronics drawer 2A2A7
- Extender 2A2A8
- Matrix switch 2A2A10
- Multiprogrammer extender 2A2A11
- Switch controller 2A2A12
- Analog to digital converter 2A2A13
- Cable entry panel 2A2A14
- Blower 2A2A15
- Electrical-optical calibration kit

b. ELECTRICAL EQUIPMENT CABINET

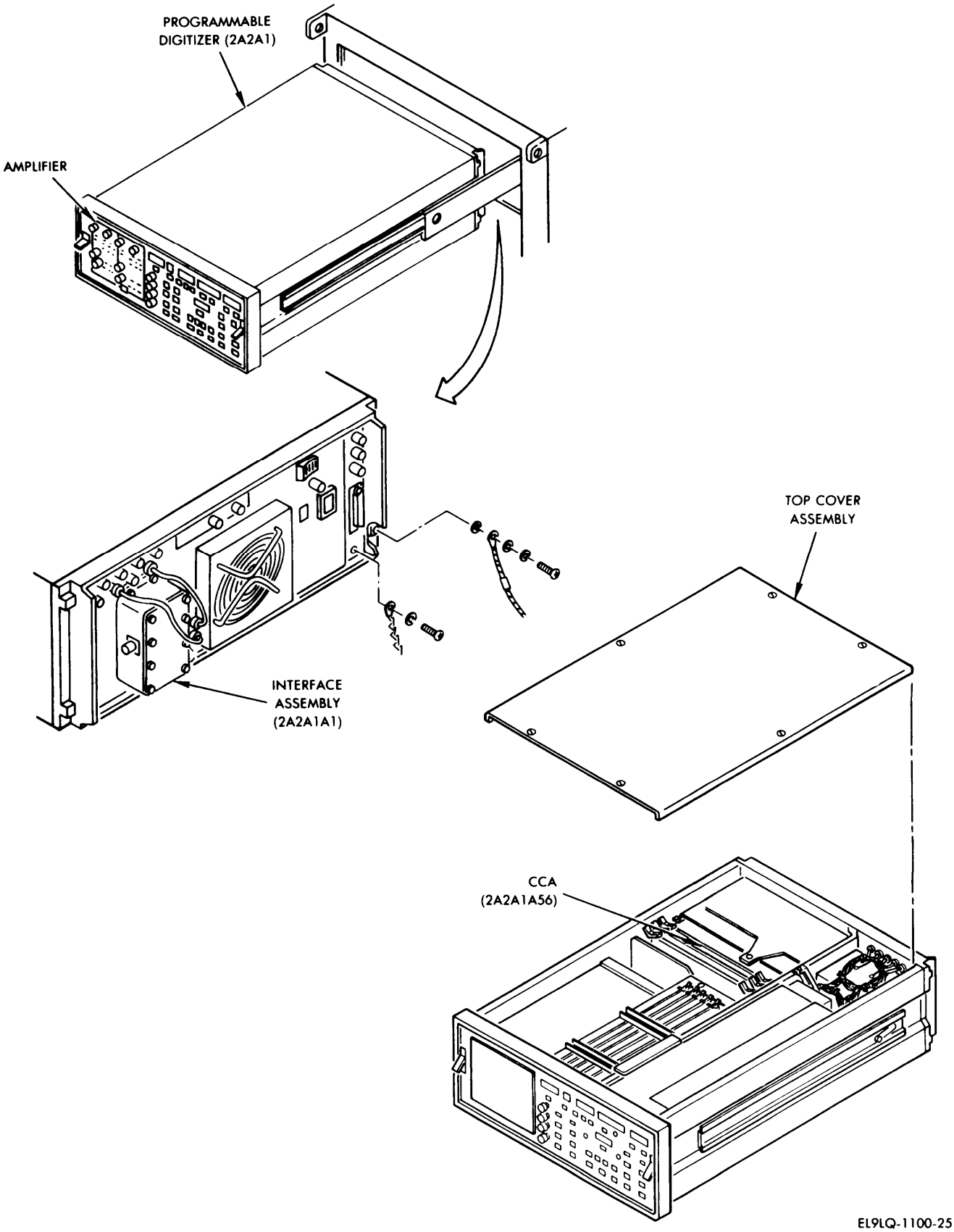
(1) The electrical equipment steel cabinet consists of a 30 inch high floor standing rack bolted to a standard 68 inch high full size rack. The cabinet is centered on and bolted to a structured steel electrical equipment mounting base. Located at the bottom of the full size rack is a blower assembly that forces air up and around the electrical/electronic chassis assemblies and out through louvered openings at the top of the cabinet.

(2) Assemblies 2A2A1, A3, A6, A7, A8, A10 thru A13 are individual slide mounted rack assemblies. Assemblies 2A2A2, A4, A5, A14, and A15 are hard mounted to equipment mounting channels. All assemblies except 2A2A11 thru 2A2A15 are accessed from the front of the test console test bench. Two removable side panels are located on each side of the test console test bench. Before these panels can be removed, the dayside and/or nightside test benches will have to be moved. Cable assemblies, cable carriers, cable mounting hardware, equipment rear panel controls and devices, and ground leads are accessed by pulling open or removing the applicable electronic assembly. The electrical cables that mate with each slide mounted electronic assembly are secured to spring retracting steel cable carriers. As the assembly is pulled out, the cable and carrier arm extend with the assembly. A chain attached to the cable carrier and the back panel of each electronic assembly, prevents putting tension on electrical cable connections. When the electronic assembly is removed, the cable carrier and attaching electrical cable assemblies retract to the rear.

(3) Cable entry panel 2A2A14 provides power and signal distribution. Power input, routed from the electronic station AC control panel assembly, is 115v, 60 Hz single-phase. Power distribution within the test console test bench is routed by two plugmold cable assemblies. Eight ground terminal bonding positions 2A2E1 thru 2A2E8 provide chassis and cabinet grounding against shock hazard.

Physical Dimensions:

Length:	48.00 in
Width:	23.31 in
Height:	63.38 in



Programmable Digitizer Assembly 2A2A1

c. PROGRAMMABLE DIGITIZER ASSEMBLY 2A2A1

(1) The programmable digitizer assembly 2A2A1 (Tektronix 7612D) consists of a mainframe, mounting provisions for two programmable plug-in amplifiers (Tektronix 7A16P - preamplifier), and a rear panel mounting for the interface assembly 2A2A1A1.

(2) The digitizer is a microprocessor-based, dual-channel, waveform-digitizing instrument that analyzes waveforms in lieu of using an oscilloscope. It is located on the front of the test console test bench and is rack mounted using drawer slides.

(3) The mainframe consists of the time bases, triggering circuits, controls, displays, and functions as the IEEE 488 bus interface for the programmable plug-in amplifiers. The front panel provides total control and is divided into three main control (function) groups that are panel color coded. These are:

Function	Panel Color
Instrument control	gray and yellow
Time base	blue
Trigger	green

(4) A CCA (2A2A1A56) containing two address selector switches is located inside the unit. It is accessed by removing the programmable digitizer top cover assembly.

(5) The rear panel contains 11 coax connectors, an IEEE 488 bus connector, a power switch, a fuse, and a fan. The fan forces air over the heat sensitive digital electronic circuitry.

(6) Two identical programmable plug-in amplifiers (channel A and channel B) are installed in the digitizer. They provide display and trigger output signals to the digitizer.

(7) The interface assembly 2A2A1A1 is mounted to the rear panel. It is powered by a direct current input and provides a fixed 200 megahertz clock signal output to the digitizer. This signal drives the channel A and B time bases.

(8) The purpose of the digitizer is to digitize video inputs, provide the system clock, and perform measurements. The digitizer is used when testing the TADS NSA, PNVS turret assembly, LTU, TV sensor, EO Mux LT/R, IVD, HOD TV CCA, video processor assembly, and video preamp synchronizer.

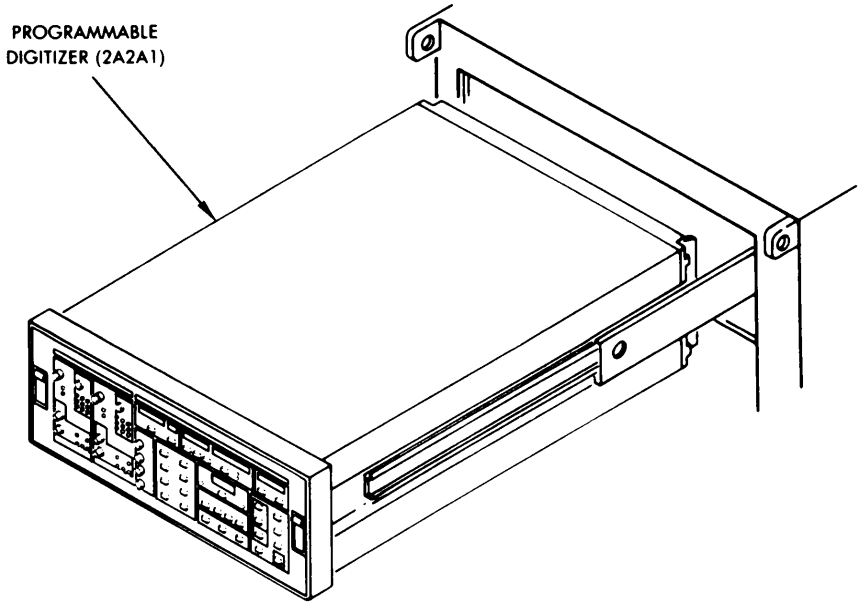
Physical Dimensions:

Digitizer

Length: 26.75 in
Width: 19.00 in
Height: 6.95 in
Weight: 55 lb

Digitizer plus two amplifiers 60 pounds

Operating Temperature: 32° thru 104°F
Humidity Range: 0 thru 95%
Internal Fan Air Flow: 120 cfm



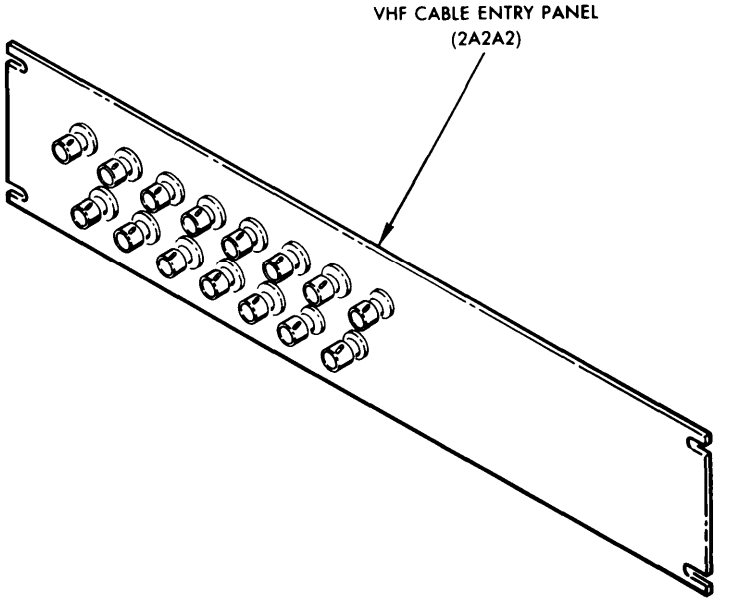
EL9LQ-1100-88

d. VHF CABLE ENTRY PANEL 2A2A2

The VHF connector panel contains 15 coaxial connections 2A2A2 J1 thru J15. Cable connections provide the electrical interface with cable entry panel 2A2A14 and the electronic drawer 2A2A7.

Physical Dimensions:

Width: 19.00 in
Height: 1.72 in



EL9LQ-1100-26

e. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3

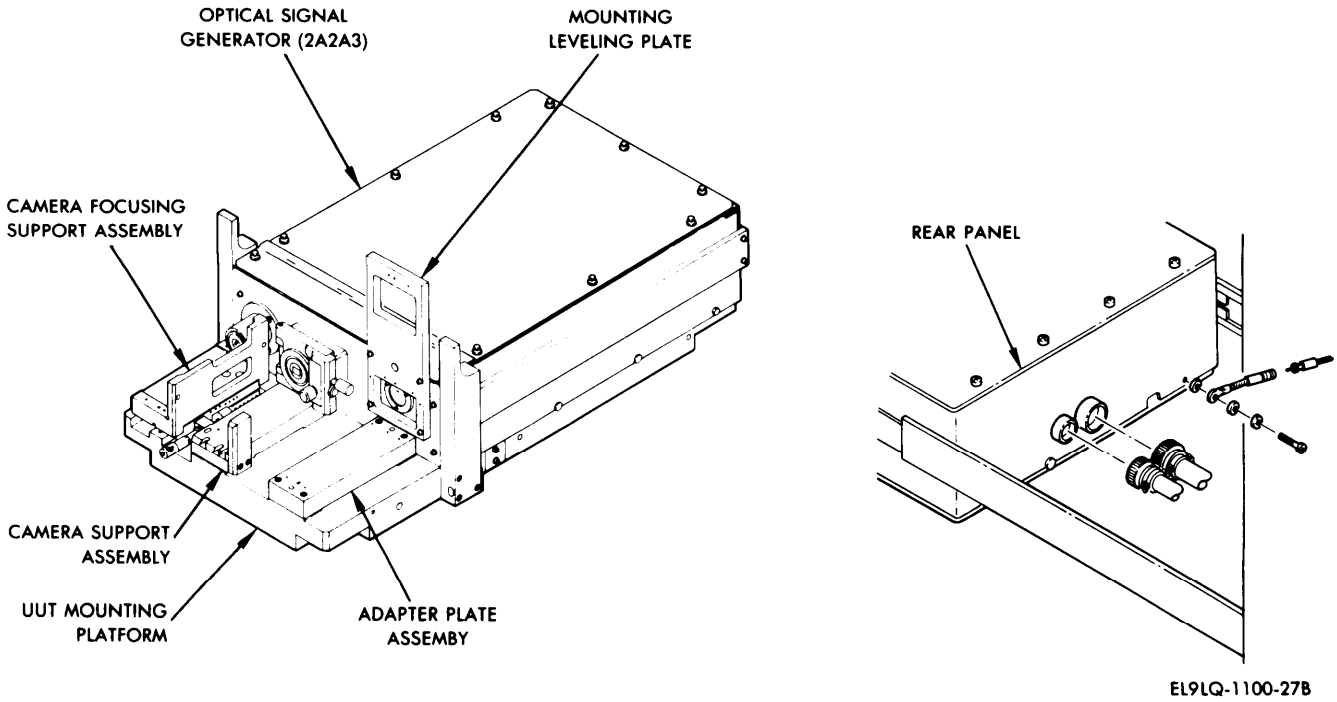
(1) The OSG is an electro-optical test chassis that provides a platform, light source and target image for testing the TADS television sensor assembly, TADS visual multiplexer assembly, and PNVS visual relay/multiplexer assembly UUTs. It is located in the test console test bench below the VHF connector panel, and consists of a drawer assembly, electro-optical assemblies, a front panel with UUT mounting platform, and rear panel. Drawer slides allow extension of the assembly away from the cabinet for access to the electro-optical assemblies. A cover and gasket assembly provides a dust free area for the optical assemblies.

(2) The front panel contains the following assemblies:

- Mounting leveling plate
- Adapter plate (PNVS visual relay/multiplexer assembly)
- Camera focusing support assembly
- Camera support assembly

(a) The mounting leveling plate which extends above the OSG height dimension is part of the mounting plate arrangement for supporting the TADS visual multiplexer assembly.

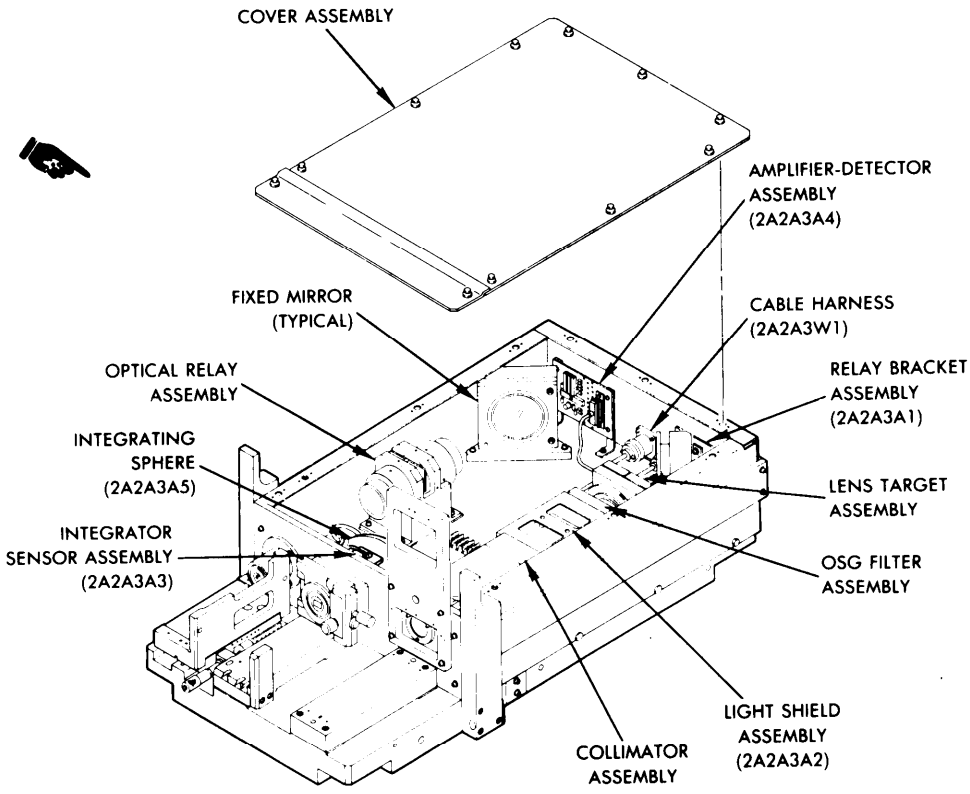
(b) The adapter plate is used for holding the PNVS visual relay/multiplexer assembly in place.



(3) The rear panel contains two connectors, J1 and J2 (part of cable harness 2A2A3W1), and a ground lead. The ground lead is hardware mounted and has a quick disconnect on the other end.

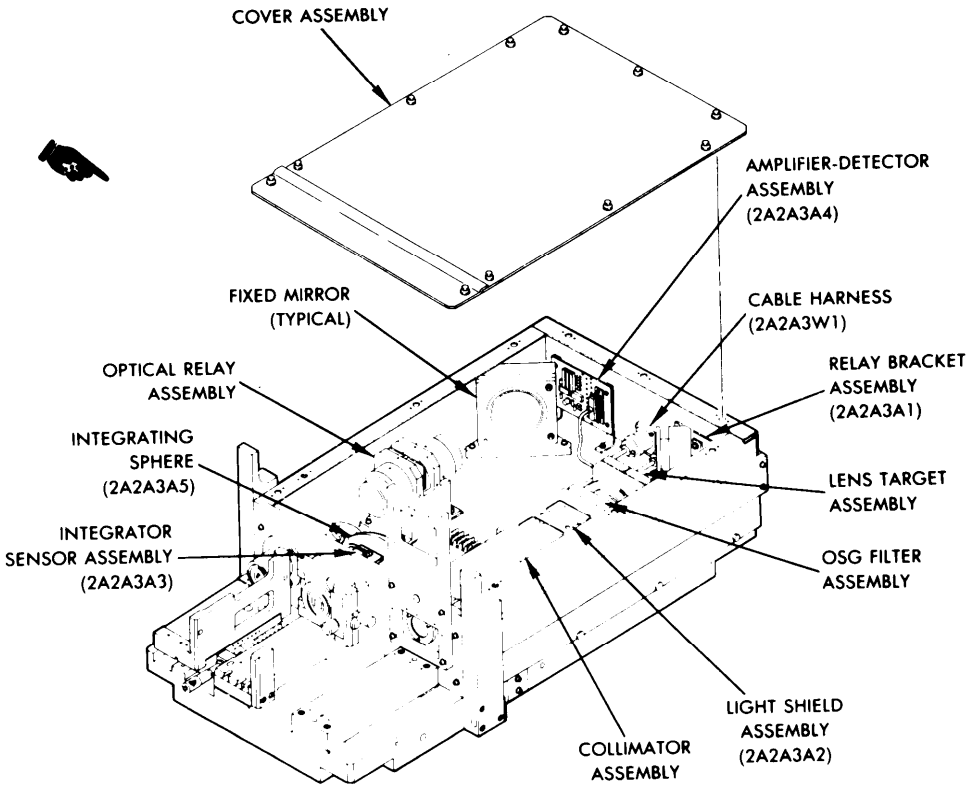
(4) The drawer assembly contains the following assemblies:

- Relay bracket 2A2A3A1
- Light shield 2A2A3A2
- Integrator sensor 2A2A3A3
- Amplifier-detector 2A2A3A4
- Integrating sphere 2A2A3A5
- Collimator
- Fixed mirror
- Optical relay
- Lens target
- Cable harness 2A2A3W1



EL9LQ-1100-89B

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



EL9LQ-1100-89B

b. SELF-TEST DESCRIPTION (cont)

MAIN MENU

1) E/O BENCH SELF-TEST MODE
2) E/O BENCH ALIGNMENT MODE
99) EXIT PROGRAM

ENTER CHOICE:

SELF-TEST MENU

1) ALL TESTS MODE
2) SINGLE TEST MODE
3) PRINT EQUIPMENT LIST
99) RETURN TO MAIN MENU

ENTER CHOICE:

Single self-test may be used to run a specific procedure for check out, trouble-shooting or after a repair has been made. There are three single self-test menus. These menus are selected by system software depending on E/O bench configuration and site activity. The menus are based on the following criteria:

- OSA delete panel installed
- OSA installed and AVIM test site
- OSA installed and depot test site

Single self-test should not be used unless modules CALCST, PLLBUS, MTRXSW, ADST, and DIGITST have been performed successfully. The three single self-test menus are shown below.

Single self-test menu with OSA delete panel installed.

SINGLE SELF-TEST MENU

1) CALCST	9) VSGST	17) DCBMIR	25) LASERST
2) PLLBUS	10) FIRCSST	18) DCINTCAM	26) FIXTST
3) MTRXSW	11) FIRCTGST	19) DCEXSO	27) IVD
4) ADST	12) FIRCAST	20) DCFOCUS	28) AUGTEM
5) DIGITST	13) DCDCS	21) DCVARF	29) BITCHECK
6) FPSST	14) DCDCTL	22) DCEXTCAM	30) VIDEOST
7) PPSST	15) EXTRAD	23) INTRAD	99) RETURN
8) PPGTST	16) DCAMIR	24) OSGST	

ENTER CHOICE:

Single self-test menu with OSA installed and AVIM test site.

SINGLE SELF-TEST MENU

1) CALCST	9) VSGST	17) DCBMIR	25) LASERST
2) PLLBUS	10) FIRCSST	18) DCINTCAM	26) FIXTST
3) MTRXSW	11) FIRCTGST	19) DCEXSO	27) OSACABLE
4) ADST	12) FIRCAST	20) DCFOCUS	28) IVDST
5) DIGITST	13) DCDCS	21) DCVARF	29) AUGTEM
6) FPSST	14) DCDCTL	22) DCEXTCAM	30) BITCHECK
7) PPSST	15) EXTRAD	23) INTRAD	31) VIDEOST
8) PPGTST	16) DCAMIR	24) OSGST	99) RETURN

ENTER CHOICE:

Single self-test menu with OSA installed and depot test site.

SINGLE SELF-TEST MENU

1) CALCST	10) FIRCSST	19) DCEXSO	28) IVDST
2) PLLBUS	11) FIRCTGST	20) DCFOCUS	29) OSADAF
3) MTRXSW	12) FIRCAST	21) DCVARF	30) OSADAS
4) ADST	13) DCDCS	22) DCEXTCAM	31) OAFOCUS
5) DIGITST	14) DCDCTL	23) INTRAD	32) PMTLED
6) FPSST	15) EXTRAD	24) OSGST	33) AUGTEM
7) PPSST	16) DCAMIR	25) LASERST	34) BITCHECK
8) PPGTST	17) DCBMIR	26) FIXTST	35) VIDEOST
9) VSGST	18) DCINTCAM	27) OSACABLE	99) RETURN

ENTER CHOICE:

c. ALIGNMENT DESCRIPTION

EO bench alignment is a menu driven program consisting of six stand-alone modules called procedures. These procedures are performed individually. Begin EO bench alignment by entering input code EOBST at the AN/USM 410 VDT. When the MAIN MENU is displayed, select EO BENCH ALIGNMENT MODE. From the alignment menu, select the number of the individual alignment module and press RETURN.

ALIGNMENT MENU

1) DIGITIZER	5) PMT/OSA
2) FIR COLLIMATOR	6) POWER SUPPLIES
3) IVD ASSEMBLY	7) VIS/NIR
4) OSG	8) EOB MAINTENANCE

99) RETURN TO MAIN MENU

ENTER CHOICE:

(a) The relay bracket assembly 2A2A3A1 consists of three relays K1 thru K3, a connector, and a mounting bracket. It provides relay control of signals to the collimator/image lamp, and uniformity lamp.

(b) Deleted.

(c) The collimator assembly is located between the front panel and the light shield assembly. It directs the light source to the EO aperture.

(d) The amplifier-detector assembly 2A2A3A4 consists of integrated circuits, fixed resistors, variable resistors, terminals, and an electrical connector, mounted on a printed wiring board.

(e) Integrator sensor 2A2A3A3 is a photo sensitive diode mounted atop the integrating sphere.

(f) Deleted.

(g) Light shield assembly 2A2A3A2 consists of a lamp retainer, photo-quartzline lamp, and light sensor.

(h) Integrating sphere 2A2A3A5 is a globe shaped chamber housing three lamps. It provides uniform light outputted at the shading port.

(i) The cable harness assembly 2A2A3W1 provides all of the electrical requirements for operating the OSG. It consists of connectors J1 thru J2 and P1 thru P5.

(j) Two fixed mirror assemblies are mounted on the assembly. These assemblies are in line with the TV target source and operate in conjunction with the optical relay assembly to direct the target image to the TV camera.

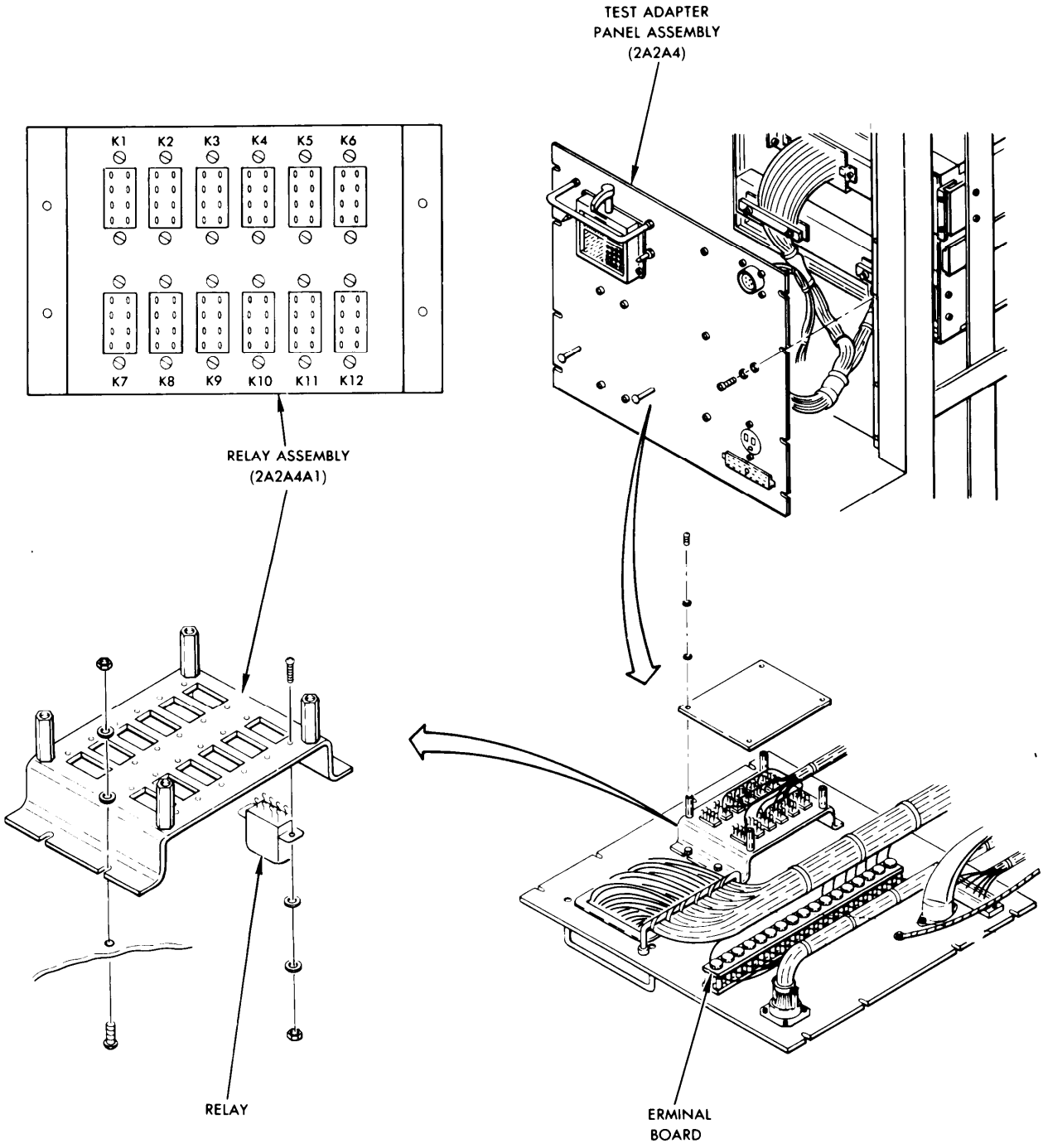
(k) The optical relay assembly is located between the fixed mirrors and front panel. Its purpose is to reduce by one half the size of the incoming TV target image.

(l) The lens target assembly is located between the optical filter and fixed mirror assemblies. It provides the target that is optically directed to the TV camera.

Physical Dimensions:

Length: 23.75 in
Width: 16.88 in
Height: 5.968 in
Weight: 65 lb

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Test Adapter Panel Assembly 2A2A4

f. TEST ADAPTER PANEL ASSEMBLY 2A2A4

(1) The test adapter panel 2A2A4 assembly consists of a connector panel and electrical components that include the-relay assembly 2A2A4A1, connectors J1, J2, J3, and J6 (part of cable assembly W11), and terminal board TB1. The connector panel is the mounting platform for the electrical components. Two bow handles are located on the panel, one on the frontside and one on the backside. A ground terminal El secures two quick disconnect ground wires.

(2) The relay assembly 2A2A4A1 consists of a mounting bracket and 12 relays, K1 thru K12. Relays K1 thru K4 and K7 thru K1O each contain a diode connected across two relay contacts.

(3) The electrical (zero force) connector J1 is the augmentation programmable interface connector (APIC). J6 is also a zero force connector. J2 and J3 are cylindrical connectors. A terminal board TB1 with terminal positions El thru E16 is mounted on the backside of the front panel.

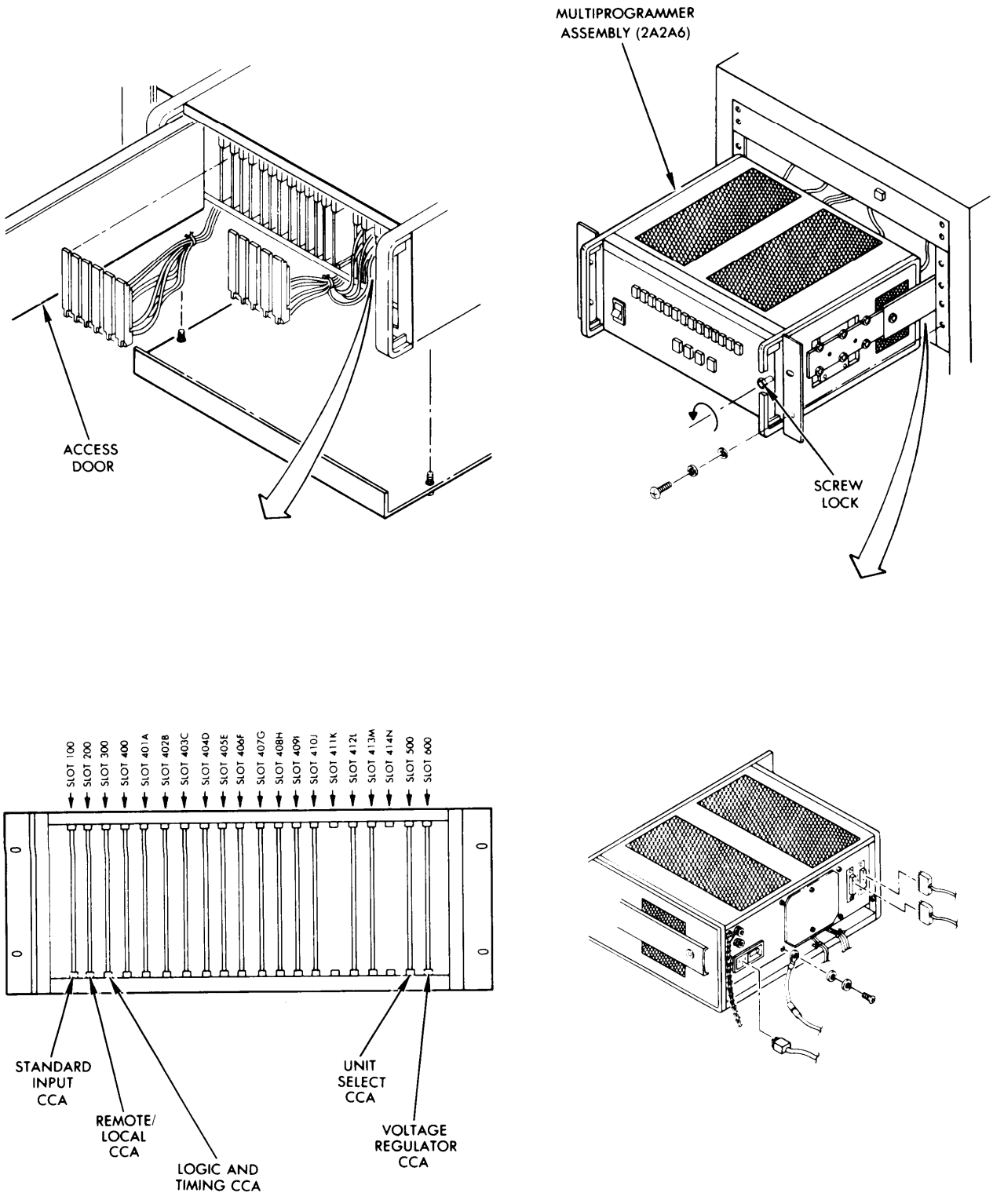
(4) The purpose of the test adapter panel is to electrically interface with the major adapter for use during self-test and selected UUT tests.

Physical Dimensions:

Height: 17.46 in
Width: 19 in

g. Deleted.

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Multiprogrammer Assembly 2A2A6

h. **MULTIPROGRAMMER ASSEMBLY 2A2A6**

(1) The multi programmer assembly 2A2A6 (Hewlett Packard model 6940B) is the master control unit for the multiprogrammer system. It consists of a multi-programmer rack assembly, two slides, two adapters, 18 circuit card assemblies (CCA) and a dc power supply.

(2) The multiprogrammer rack assembly consists of a multiprogrammer master mainframe and a rack flange kit (two flanges for cabinet support and a filler strip). The mainframe consists of a hinged-front control panel, a 20-slot card cage, and a rear panel.

(a) The front panel (access door) contains 20 pushbutton switches, a power ON rocker switch, and a screwlock fastener, which when released, allows the access door to swing open for access to the CCAs.

(b) Eighteen of the 20 card cage slots are used. Seventeen of the 18 CCAs contain electrostatic sensitive components and require protection from static discharge anytime the CCA is handled.

(c) The rear panel contains three fuse assemblies F1 thru F3, an input power receptacle, and two data connectors (J1 is DATA INPUT and J2 is DATA OUTPUT).

(3) The purpose of the multiprogrammer assembly 2A2A6 is to communicate with the system computer and multiplex the computer I/O channel signal for use in the E/O test bench set.

Multiprogrammer Assembly Characteristics:

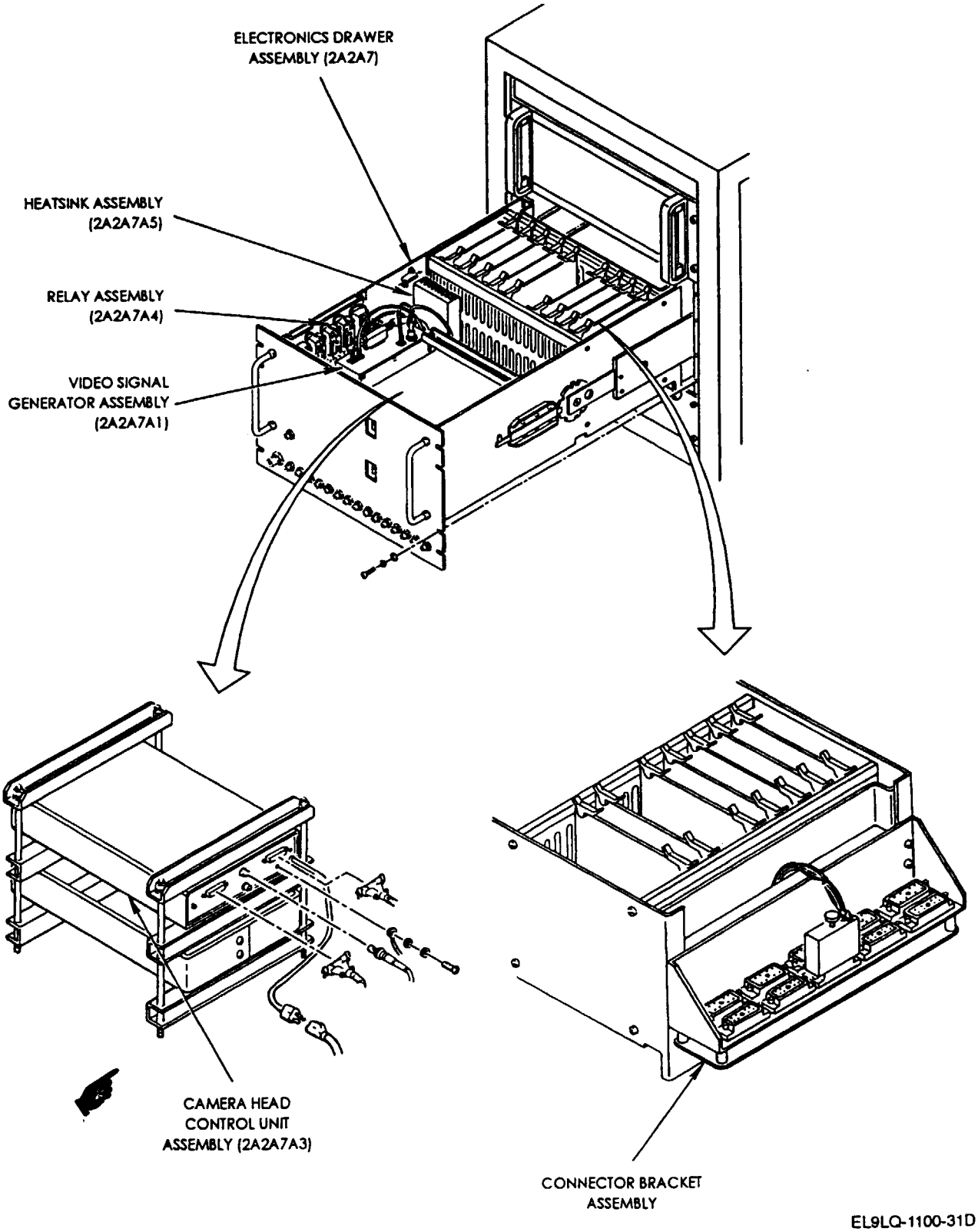
Data Word Transfer Rate:	20K word per minute
Data Resolution:	12 bits
Physical Position of Unit During Operation:	30° max from horizontal

Physical Dimensions:

Length:	21.25 in
Width:	19.00 in
Height:	6.78 in
Weight:	40 lb

Electrical Input: 115v +11v -7v, 48 Hz thru 440 Hz
Operating Temperature: 32° thru 131°F

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Electronics Drawer Assembly 2A2A7

i. ELECTRONICS DRAWER ASSEMBLY 2A2A7

(1) Electronics drawer assembly 2A2A7 contains the electronic equipment chassis assembly, video signal generator case assembly A1, camera head control unit A3, relay assembly A4, heat sink assembly A5, card rack assembly A6, drawer slides, and cable assemblies.

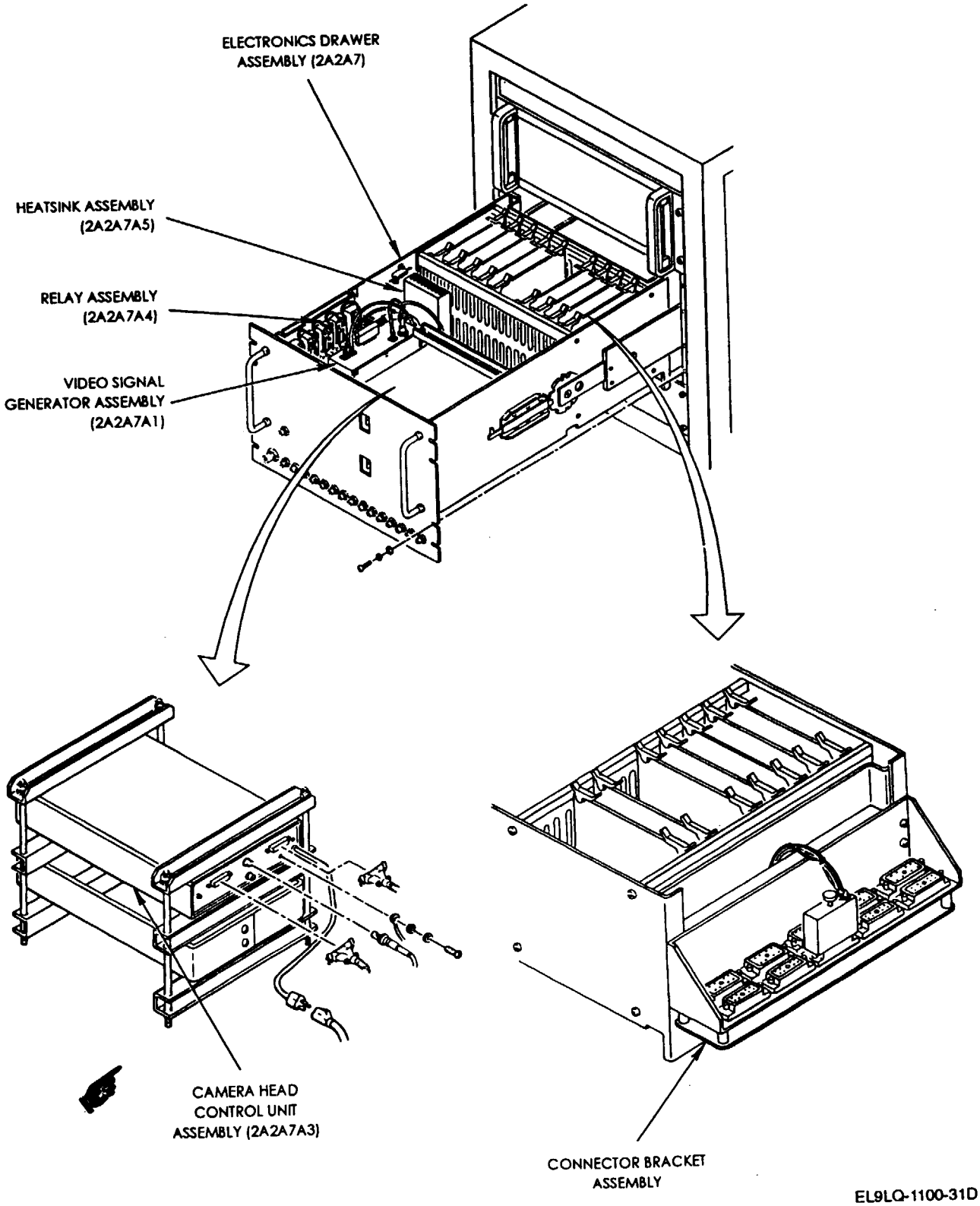
(2) The electronic equipment chassis assembly consists of a front panel, side plating, mounting plate (base), and a connector bracket assembly mounted to the rear of the chassis. The front panel contains CAMERA CONTROL POWER ON INT (internal) and EXT (external) switches, coaxial cable connectors J11 thru J27, and drawer handles. Left and right pivoting drawer slide assembles are secured to the side plating. The base supports the electronic assemblies A1 thru A5, a 13 slot CCA cage rack assembly, and the connector bracket assembly that contains zero force keyed connectors J1 thru J10. The rack assembly 2A2A7A6 contains the following CCAs:

- Motor control driver 2A2A7A6A1
- Motor control logic 2A2A7A6A2
- MUX motor control 2A2A7A6A3
- Temperature measurement 2A2A7A6A4
- FIFO memory 2A2A7A6A5
- Bus multiplexer 2A2A7A6A7
- Programmable pulse generator 2A2A7A6A8
- Programmable pulse generator II 2A2A7A6A9
- Programmable pulse generator analog 2A2A7A6A10

(3) The electronic assemblies are as follows:

- Video signal generator 2A2A7A1
- Camera head control unit 2A2A7A3 (internal CID)
- Relay 2A2A7A4
- Heatsink 2A2A7A5

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Electronics Drawer Assembly 2A2A7

(a) The video signal generator assembly 2A2A7A1 is mounted between the relay and camera head control unit assembly on the mounting plate. Five connectors J1 thru J5 are on the top side of the case. A CCA and other miscellaneous electronic devices are located inside the case. The purpose of the video signal generator is to form complex video waveforms as directed by the test station.

(b) Camera head control unit 2A2A7A3 is mounted on the base of the electronics drawer assembly. The camera head control unit is one part of the camera head/control unit assembly (General Electric model 4TN2500A12). The other part is the CID video camera (camera head). The camera head and control unit assembly make up a serialized matched set. Camera head control unit 2A2A7A3 and camera head 2A1A2A1A1A15, located in the dayside test bench, make up the matched set. The camera head control unit contains a front panel POWER ON rocker switch and rear panel connectors (four signal and control connectors, a power connector, and quick disconnect ground lead). The purpose of the camera head control unit is to provide the timing and drive inputs to the camera head and receive and process the video returns from the camera head.

(c) Relay assembly 2A2A7A4 is located on the left side plate of the drawer assembly. It consists of a relay bracket and 15 control relays.

(d) Heatsink assembly 2A2A7A5 is located behind video signal generator 2A2A7A1. It consists of a heat sink bracket assembly, a microcircuit Q1, a power resistor R1, and a terminal board TB1 (terminal 1 thru 4).

Physical Dimensions:

Length: 25.75 in
Width: 19.00 in
Height: 12.219 in

j. EXTENDER ASSEMBLY 2A2A8

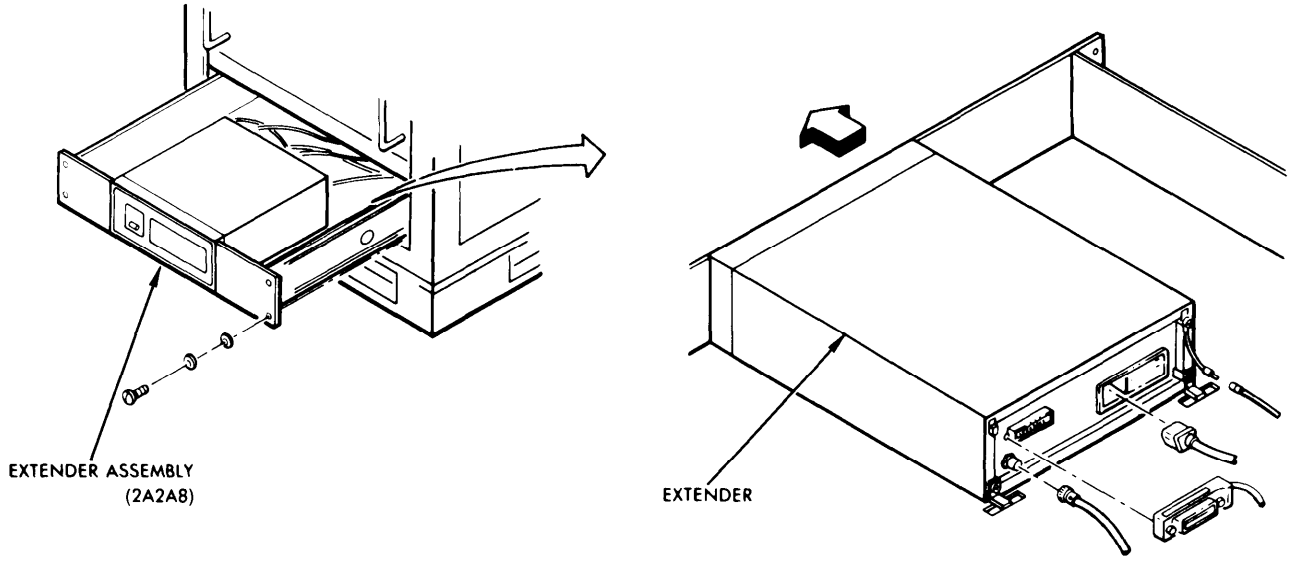
The extender assembly 2A2A8 located on the bottom front side of the cabinet, consists of one HP-19 extender (Hewlett Packard model 37203A), a support shelf kit, two filler panels, and drawer slide sections. The front panel contains an input power ON/OFF pushbutton switch and a power on LED indicator, and two other LED indicators for DATA LOSS and DATA ERRORS. The rear panel has a connection for the HP-19, coaxial connection for interfacing with other extenders, a 115/230 vac panel receptacle and fuse holder, a MASTER/SLAVE switch, and SERIAL DATA RATE switch. The fuse holder provides a safeguard feature that requires removal of the power connector before the fuse can be removed. A ground lead is installed on the rear of the extender shelf and connects to a ground on the electronic station cabinet. The extender is the last item in the tandem configuration and HP-IB commnunication linkup of the assigned extenders. The purpose of the extender is to convert the HP-19 parallel input signal into a series output signal and transmit signal to the extender that it is directly in series with.

Physical Dimensions:

	Extender	Extender Assembly
Length:	14.02 in	21.0 in
Width:	8.39 in	19.0 in
Height:	3.50 in	3.5 in
Weight:	8 lb	

Electrical Input: 115v +llv -7v, 48 Hz thru 66 Hz, 25 va (max)

Operating Temperature: 32° thru 131°F



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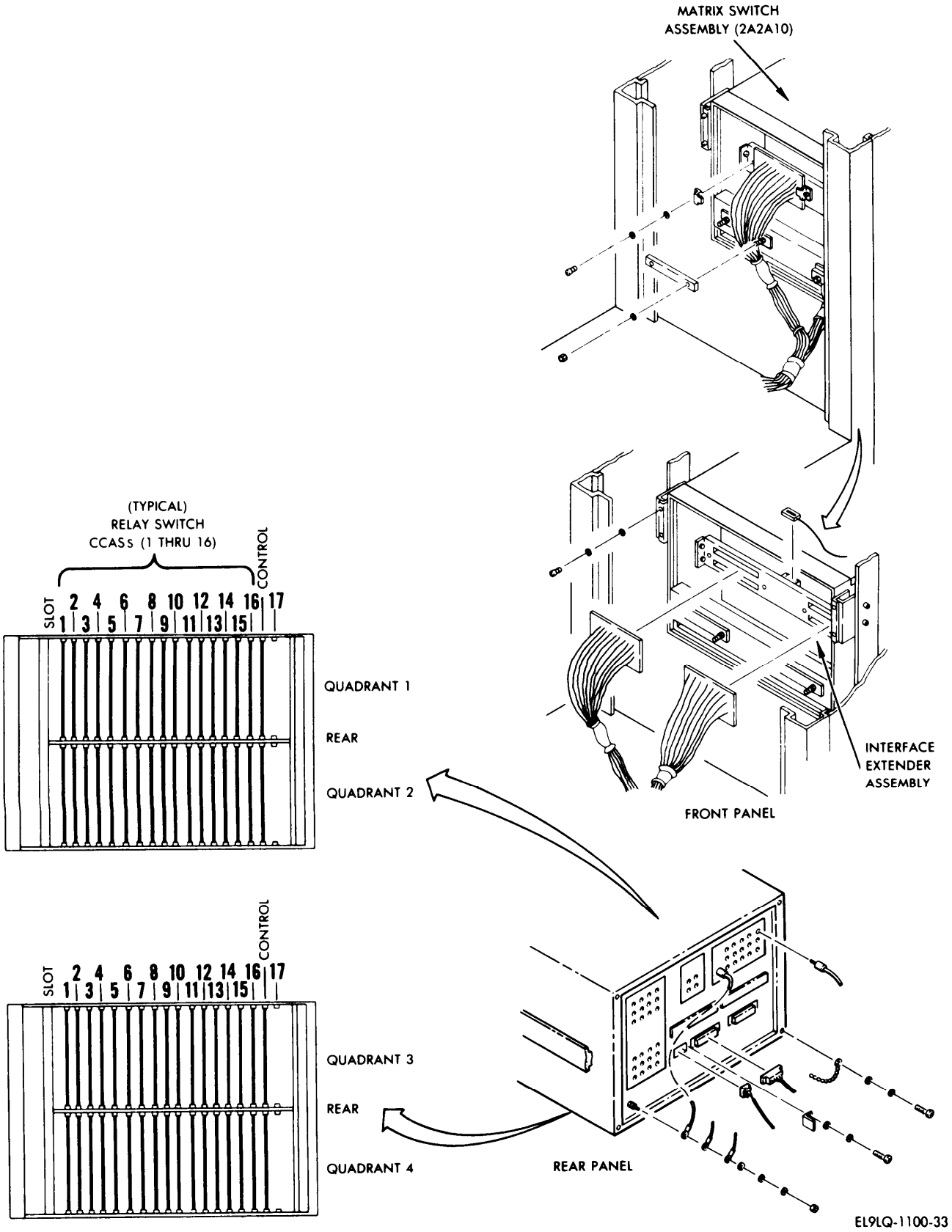


Matrix Switch Assembly 2A2A10

k. MATRIX SWITCH ASSEMBLY 2A2A1O

(1) The matrix switch assembly 2A2A1O consists of a model HP 9414A matrix switch, four quadrant control CCAS (model HP 94140B), 64 relay switch CCAS (model HP 94140A), and a pair of drawer slide assemblies. Two dedicated cables, one dc power cable (HP 09412-60003), and a control cable (HP 09412-60004) are supplied with the matrix switch. These cables interface the matrix switch with the switch controller 2A2A12• A 23 cable connector distribution bus cable assembly interfaces the matrix switch with test console test bench assemblies 2A2A4, 2A2A7, 2A2A11, and 2A2A14. A shorting plug is installed between matrix ground terminal El and matrix number 16 coaxial connector. A cabinet ground wire is installed on El.

The matrix switch consists of a mainframe, a motherboard assembly, an interface extender assembly, a front section and a rear panel. The mainframe is divided into four quadrants. Each quadrant contains a quadrant control CCA and 16 relay switch CCAs that connect to the motherboard. All of these CCAs are electrostatic discharge sensitive. Quandrant one and two is located on the upper side of the motherboard and quadrant three and four on the lower side of the motherboard. The interface extender assembly consists of two CCAs plugged into the four motherboard output connectors. The interface extender CCA labeled TOP is electrically connected to quadrants one and two and the other to quadrants three and four. Each interface extender CCA contains two fuses F1 and F2. The front section, where the interface extender assembly is located, interfaces the cabling between the matrix switch and the test adapter panel assembly 2A2A4. The rear panel assembly contains the electrical connections required for accepting the cabling from the test console test bench assemblies.

(2) The purpose of the matrix switch assembly is to operate under the control of the switch controller 2A2A12 and provide for the proper switching and sequencing of signals via the test adapter panel assembly to the UUT.

Physical Dimensions:

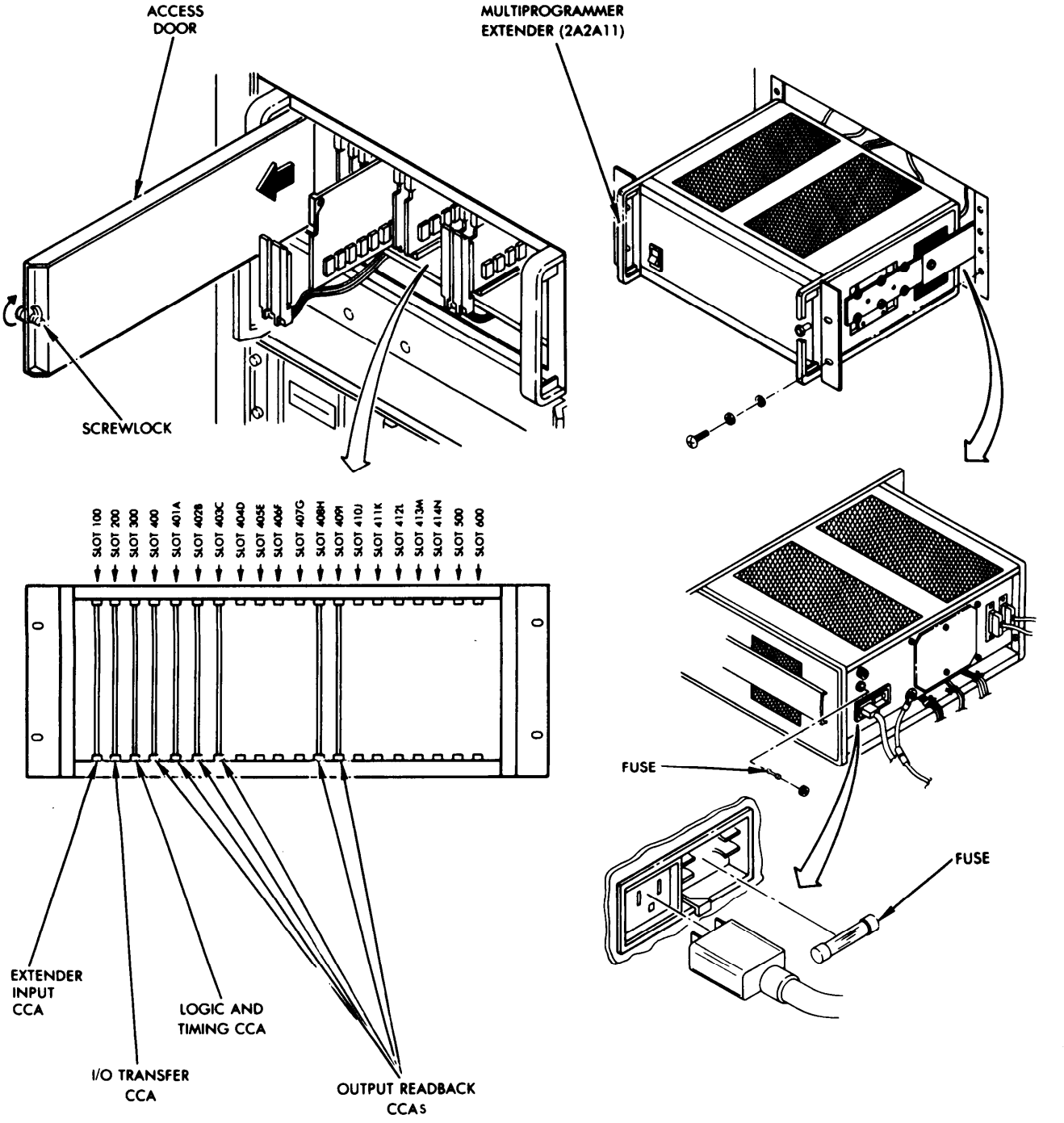
Length: 22 in
Width: 17 in
Height: 12 in
Weight: 60 lb (includes the 68 CCAs)

Electrical Input: +5 vdc and -12 vdc for logic
+12 vdc for relays

Operating Temperature: 32° thru 131°F

Humidity: 95% relative humidity at 32° thru 104°F (0° thru 40°C)

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



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l. MULTIPROGRAMMER EXTENDER 2A2A11

(1) The multiprogrammer extender 2A2A11 assembly consists of a model HP 6941B multiprogrammer extender, six model HP 69433A output readback CCAs, a pair of cabinet slide adapters, drawer slides, and a rack mounting kit.

(a) The multiprogrammer extender has the same basic mainframe (20 slot card cage, rear panel, and dc volt power supply) as the multiprogrammer 2A2A6. The main difference is the access door and the installation arrangement of the assigned CCAs. Three CCAs are dedicated to the basic functions of the multiprogrammer extender. These CCAs are extender input 06941-60026, I/0 transfer 06941-60025, and logic and timing 5060-2689. The output readback CCAs are located in slots 400, 401A, 402B, 403C, 408H, and 4091, and are address selected by the multiprogrammer assembly. These CCAs are electrostatic discharge sensitive.

(b) The access door contains an ac power on switch and a screwlock which when released, allows it to swing open for access to the CCAs.

(c) The rear panel contains three fuses (F1 thru F3), an ac power connector, and two data connectors (J1 is DATA INPUT and J2 is DATA OUTPUT). J1 interconnects with multiprogrammer assembly J2 DATA OUTPUT. The multiprogrammer J2 DATA OUTPUT connector is not used.

(2) The purpose of the multiprogrammer extender is to increase the operational capacity of the multiprogrammer system. It is intended for use only as an addition to the programmer assembly and is controlled by same.

Multiprogrammer Extender Assembly Characteristics:

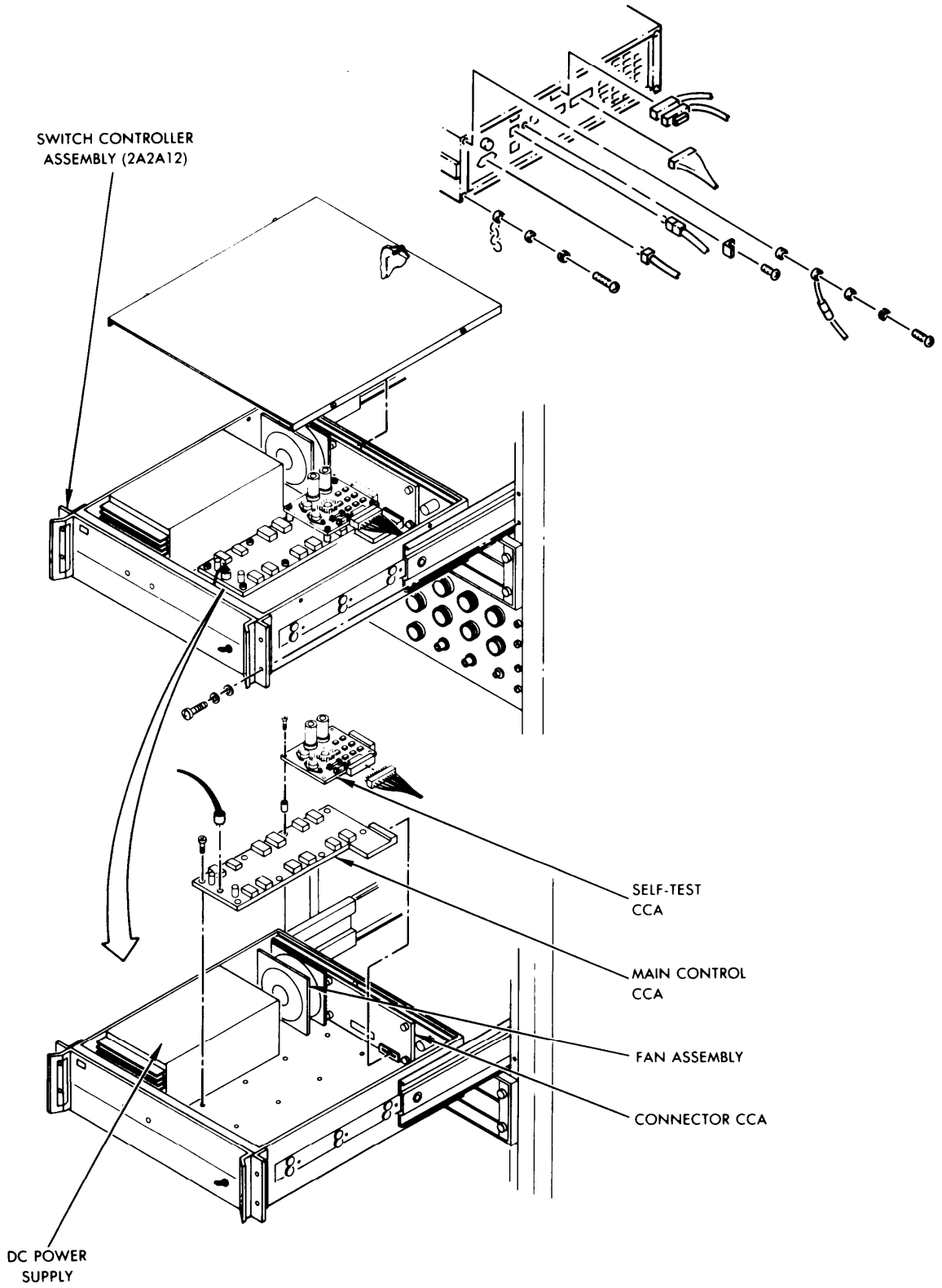
Data Word Transfer Rate:	20K words per minute
Data Resolution:	12 bit
Physical Position of Unit During Operation:	30° max from horizontal

Physical Dimensions:

Length:	21.25 in
Width:	19.00 in
Height:	6.78 in
Weight:	40 lb

Electrical Input: 115 vac +11, -7, 60 Hz
Operating Temperature: 32° thru 131°F

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Switch Controller Assembly 2A2A12

m. SWITCH CONTROLLER ASSEMBLY 2A2A12

(1) The switch controller assembly 2A2A12 consists of a model HP 9411A switch controller, two drawer slide assemblies (extension slides, rack mounting kit, slide mounting kit), and a quick disconnect ground lead.

(a) Some of the important electronic components in the switch controller are the main control CCA, self-test CCA, connector CCA, fan assembly, and dc power supply. The main control CCA is modified with HP option 26. The self-test CCA mounts on top of the main control CCA and the connector CCA is at the rear of the main frame. All of these CCAS are electrostatic discharge sensitive.

(b) The front panel contains the power LINE ON switch and two LED indicators, HP-IB addressed indicator (talk or listen) and the service requested indicator.

(c) The rear panel contains a fuse, address selector switch, HP-IB and switch control connectors, and input and output power connectors.

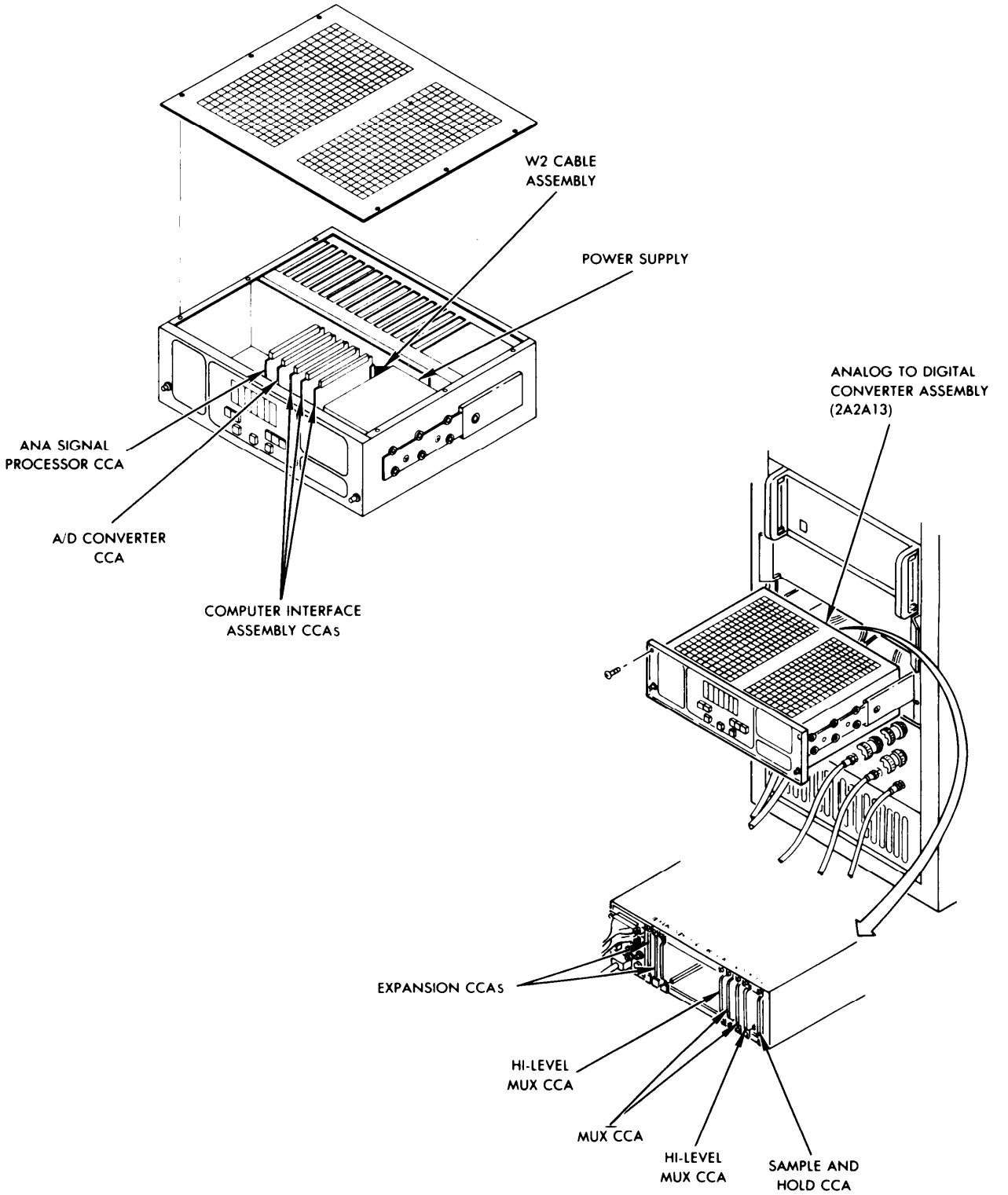
(2) The purpose of the switch controller is to provide the control signals and relay power for the matrix switch assembly 2A2A1O. It also provides a switching self-test function for the matrix switch assembly. The switch controller is in direct communication with the HP-IB CCA of the digital computer assembly 1A1O.

Physical Dimensions:

Length: 19.76 in
Width: 16.77 in
Height: 5.24 in
Weight: 27 lb

Electrical Input: 115 vac +11, -7 48 Hz thru 66 Hz
Operating Temperature: 0° to 55°C (32° to 131°F)
Humidity: 95% relative humidity at 32° thru 104°F

1-13. DESCRIPTION OF TEST CONSOLE TEST BENCH 2A2 (cont) 1-13



Analog to Digital Converter Assembly 2A2A13

n. ANAL0G T0 DIGITAL CONVERTER ASSEMBLY 2A2A13

(1) The analog to digital converter assembly 2A2A13 consists of Analogic ANDS 5400 chassis (model 5400), control I/0 CCA section, input CCA section, and two drawer slide assemblies. Both the control I/0 CCA section and input CCA section contain electrostatic discharge sensitive CCAs.

(a) The Analogic ANDS 5400 chassis front control panel contains 14 push and release switches and two LED information panels. The rear panel contains four connectors (J19 and J20 - CONTROL IN/OUT, J28 - TRIGGER, J29 - 115 vat), a fuse, and access to CCAs installed at the rear of the chassis. A top cover, when removed, allows access to a control I/0 CCA section, +15 and +5 vdc power supply, and system altered internal (ribbon type) W2 cable assembly. Two of its connectors (J19 and J20) are hardware mounted to the rear panel. The connectors on the other end of the cable assembly connect to the CCAs in the control I/0 CCA section.

(b) The control I/0 CCA section uses five CCA card cage slot numbers 73 thru 77; slot 73 - ANA signal processor (model AC 262), slot 74 - A/D converter (model 8016-20), and slots 75 thru 77 - three computer interface assembly CCAs.

(c) The input and simultaneous sample hold (SSH) section uses eight CCA card cage slots numbered J1, J4 thru J8, J17, and J18. The following CCAs apply: slot J1 - sample and hold (model AC 280), slots J5 and J6 - mux bus (model AC 4060), slots J4, J7, and J8 - (hi-level) mux (model AC 4720), slot J17 - expansion (model AC 333-1), and slot J18 - expansion (model AC 333-2). Input connectors P1 through P4 and P6 of system altered 2A2W1 cable assembly connects to the rear panel installed CCAs.

(2) The analog to digital converter is a precision data acquisition/ distribution device that can process analog signals into digital data and digital data into analog signals.

Physical Dimensions:

Length: 17 in
Width: 17 in
Height: 5.22 in
Weight: 40 lb

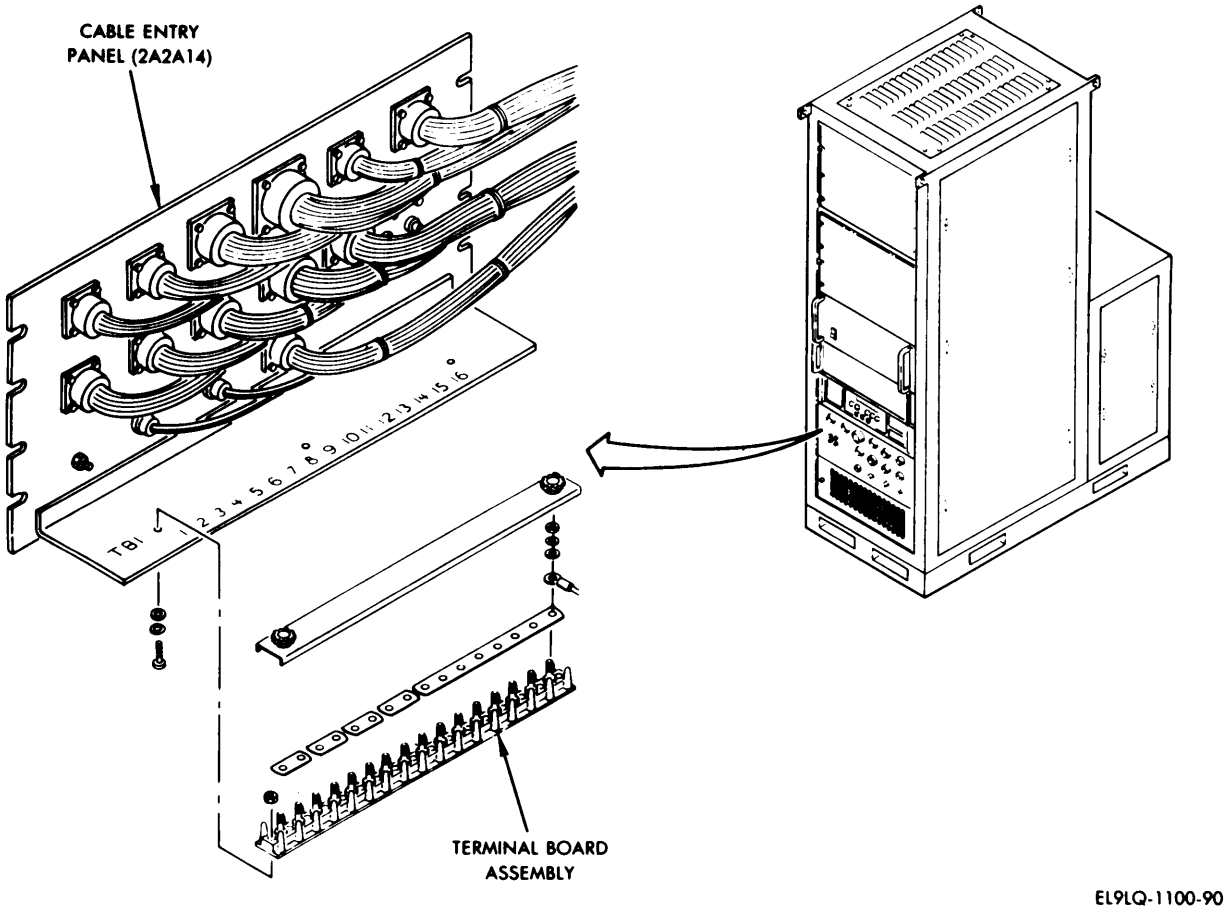
Electrical Input: 120v, 47 Hz thru 400Hz
Operating Temperature: 32° thru 140°F
Humidity Range: O thru 80%

o. CABLE ENTRY PANEL 2A2A14

The cable entry panel accepts 14 connectors (J1 thru J14) and five grounds (E1 thru E5). These connectors and grounds interface with the electrical cables that interconnect between the electronic station and dayside/nightside test benches. A mounting bracket that supports a 16 contact terminal board assembly is mounted on the rear of the cable entry panel.

Physical Dimensions:

Width: 19 in
Height: 9.22 in



p. BLOWER ASSEMBLY 2A2A15

(1) The blower assembly (McLean "Sidewinder" model 1EB980B) consists of a chassis frame, a two-speed (rubber shock mounted) motor, a reusable aluminum mesh air filter and grill. The filter is positioned in front of the blower and held in place by a grill secured to the chassis frame by two captive nuts. A power cable protrudes from the right side of the blower assembly and connects to a power receptacle on plug mold number two (cable assembly 2A2W2A2). A ground lead, installed on the right side is connected to the test console test bench cabinet. A two-position slide switch (up position - high speed, down position - low speed), mounted on the right side, is only accessible when the blower assembly is partially removed from its installed position. The switch must always be set to the high speed position to provide maximum air output.

(2) The purpose of the blower assembly is to stabilize cabinet temperature by providing a continuous air flow around the electronic assemblies.

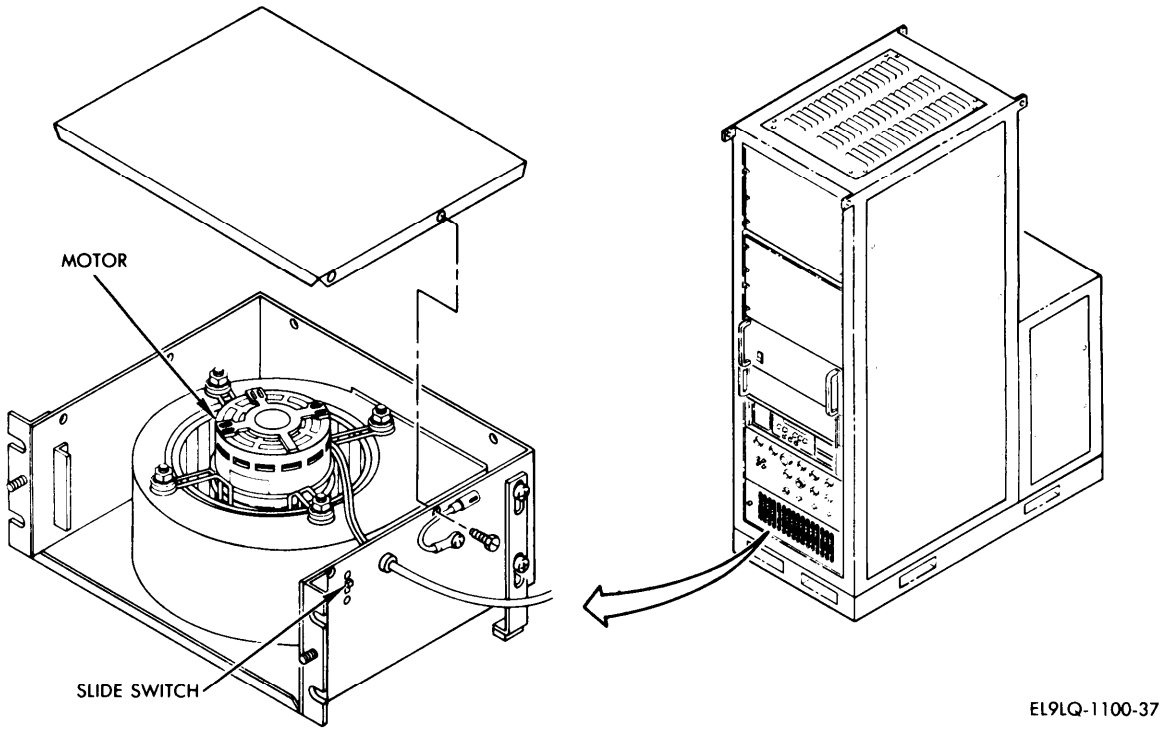
Blower Assembly Characteristics:

Physical Dimensions:

Length: 15.2 in
Width: 19.0 in
Height: 7.0 in
Weight: 20 lb (approximate)

Electrical Input: 115v, 60 Hz

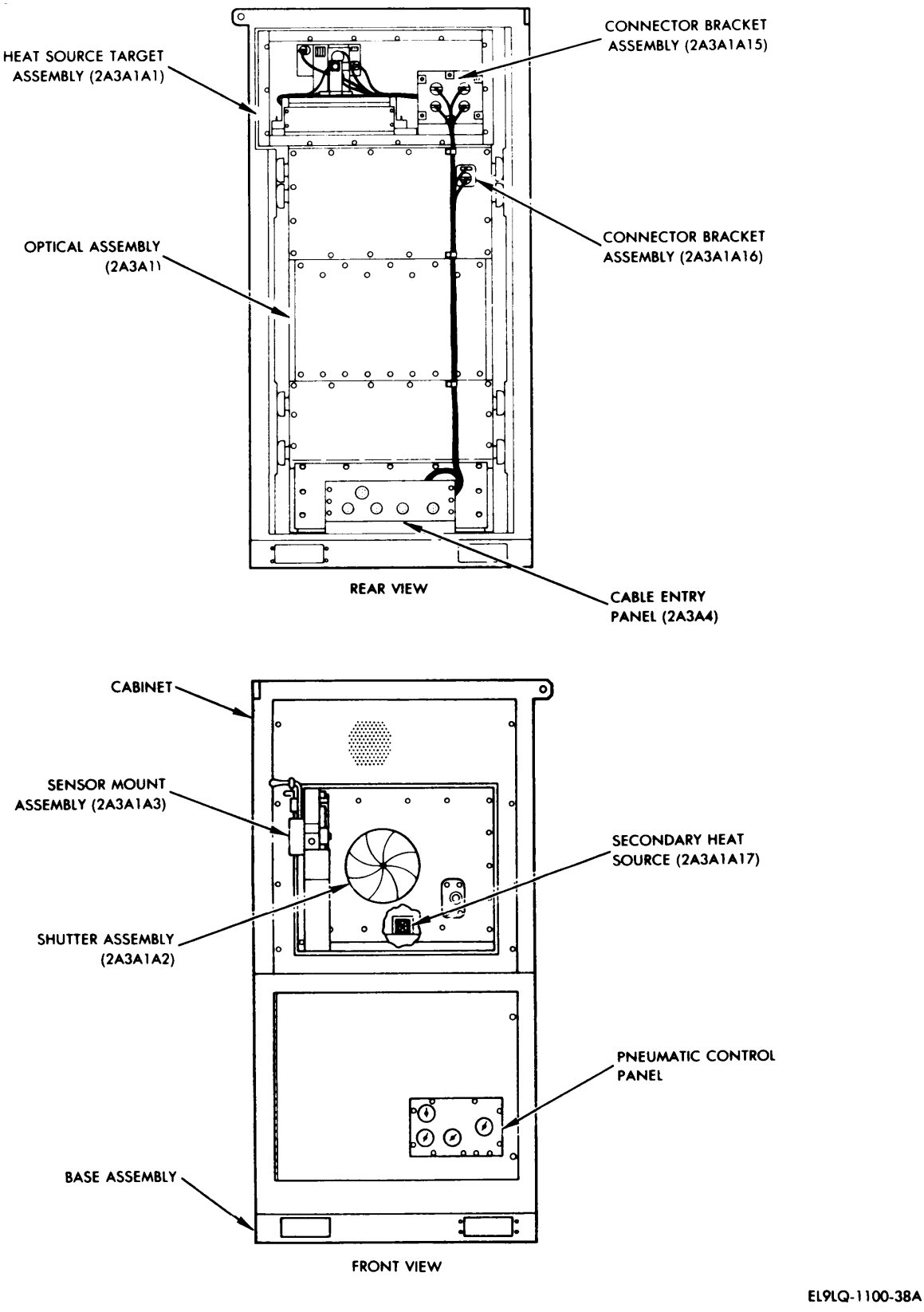
Air Flow: 550 cfm



q. ELECTRICAL-OPTICAL CALIBRATION KIT

The electrical-optical calibration kit is used during alignment of the analog to digital converter. The kit consists of an electronic test extender card, an RF cable assembly, and a self-test connector.

1-14. DESCRIPTION OF NIGHTSIDE TEST BENCH 2A3



Nightside Test Bench 2A3

a. GENERAL

The nightside test bench 2A3 consists of a cabinet and the following assemblies:

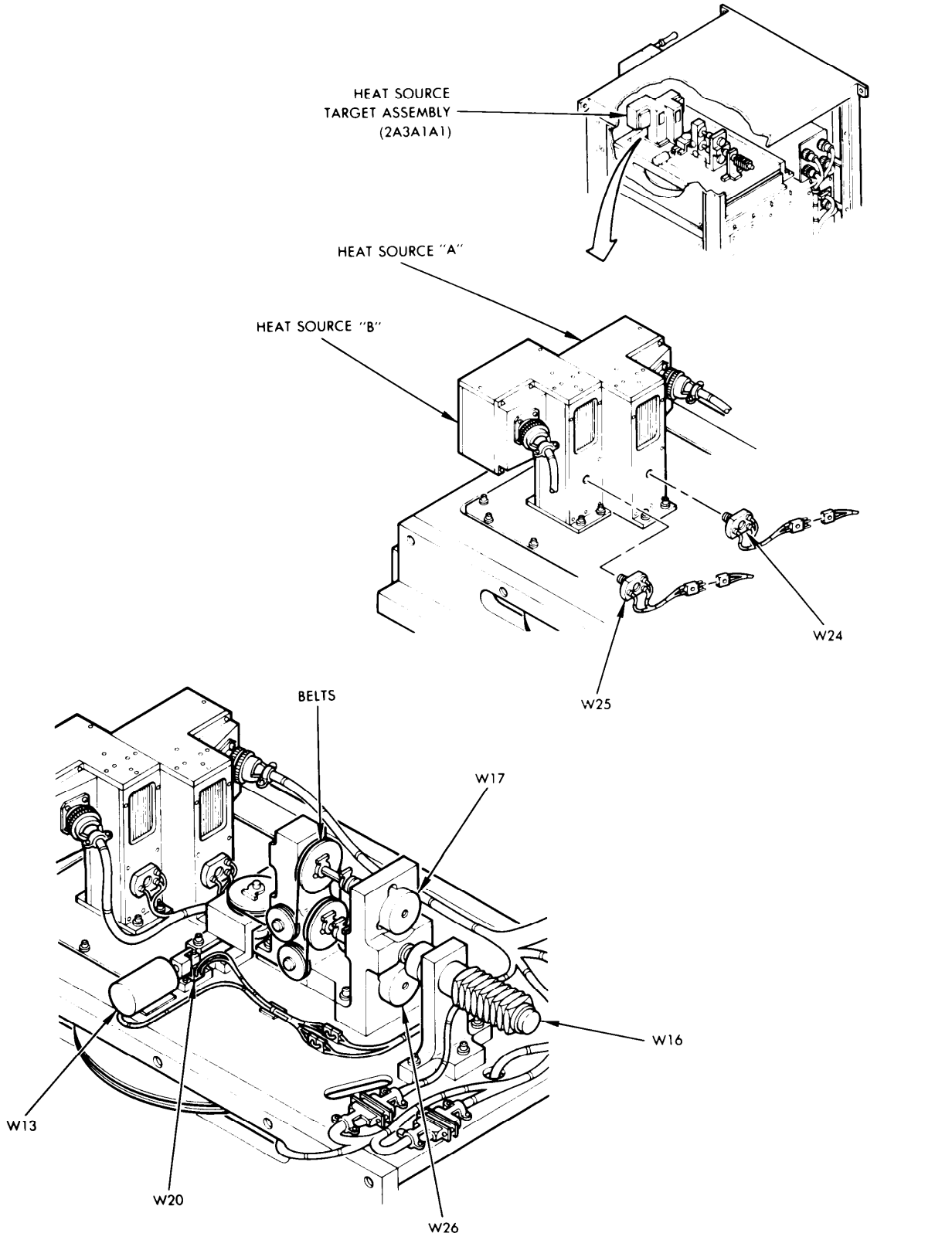
- Nightside optical assembly 2A3A1
- Pneumatic control panel
- Cable entry panel 2A3A4

b. NIGHTSIDE TEST BENCH CABINET

The nightside test bench cabinet is constructed of aluminum alloy and secured to an aluminum alloy base pallet with four mounting bolts. Six removable panels and a lower section, front mounted door provide access to the inside. Two ground terminal bonding positions (2A3E1 and 2A3E2) provide grounding against shock hazard.

Physical Dimensions:

Length:	48.00 in
Width:	36.00 in
Height:	68.50 in
Weight:	1761 lb (including assemblies)



Nightside Optical Assembly 2A3A1

2-15. REPAIR MESSAGES (cont) 2-15

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - PPSST

Item (Ref Des/Part No.)	Reference (Para No.)
1A2/13082835 (SN488B)	2-28
1A2A1/SN488B	2-29
1A2A2/SN488B	2-29
1A2A3/SN488B	2-29
1A2A4/SN488B	2-29
1A3PS1/ATE 36-3M	2-31
1A3PS2/ATE 36-3M	2-31
1A3PS3/ATE 75-1.5M	2-31
1A3PS4/ATE 75-1.5M	2-31
2A2A11XX (Slot 409)/HP69433A	2-57
2A2A4A1/13083063	5-33

Input Code - DCAMIR

Item (Ref Des/Part NO.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - DCFOCUS

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2XX/13081588-49	5-23
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (Slot J4)/AC4720	2-61

Input Code - DCBMIR

Item (Ref Des/Part No.)	Reference (Para No.)
A1/13082800-59	5-9
2A1A2A1W48/13082263-69	5-20
2A1A2A1W49/13082263-79	5-20
2A1A2A1W50/13082263-89	5-20
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - DCDCTL

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A4A1K9/13083063	5-33
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4K5/13081572	5-34

Input Code - DCEXSO

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A4A1K8/13083063	5-33
2A2A6XX (Slot 408)/69331B	2-49
2A2A7A4K3/13081572	5-34
W64/13081836	3-32

2-15. REPAIR MESSAGES (cont) 2-15

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - DCEXTCAM

Item (Ref Des/Part No.)	Reference (Para No.)
1A11A9/13081742	2-40
2A2A7A2/13083700-1/3700-2	2-51
2A2A7A6A5/13082717	2-51
2A2A7A/13082714	2-51

Input Code - DCINTCAM

Item (Ref Des/Part No.)	Reference (Para No.)
1A11A9/13081742	2-40
2A1/13082800-59	5-9
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A7A3/13083700-1	2-51
2A2A7A6A5/13082717	2-51
2A2A7A6A7/13082714	2-51

Input Code - DCVARF

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2W53/13082263-49	3-19
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - IVDST

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A3/13078701	5-25

Input Code - INTRAD

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A2A4A1/13083063	5-33
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34

Input Code - LASERST

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-59	5-9
2A1A2A19/13083360-39	5-22
2A1A6A1/13082272	5-29
2A1A6/13081582	5-29
2A1A6XX/13079420	5-29
2AA6XX/13079722	5-29

(3) The shutter assembly 2A3A1A2 is mounted on the front side of the nightside optical assembly adjacent to the sensor mount assembly 2A3A1A3. The shutter assembly consists of a shutter assembly housing, eight shutter vanes, cable assembly W7 (cable with optical switch assembly attached), cable assembly W8 (cable with shutter solenoid attached) and electrical connector plate assembly. A dust cover is placed over the shutter assembly whenever a UUT is not installed. The purpose of the shutter assembly is to remain open during UUT operation and closed for protection of the nightside test bench mirror assemblies when a UUT is not operating.

(4) The sensor mount assembly 2A3A1A3 is a heavy, cast aluminum mount that supports and positions the night sensor assembly UUT for testing. It is mounted to the front side of the nightside test bench and primarily consists of a mounting base plate, handle assembly, sensor mount bracket assembly, and W1O cable assembly. The handle assembly locks the UUT to the sensor mount assembly. The W1O cable assembly contains two optical switch assemblies Al and A2 that sense the lock and unlock condition of the handle assembly.

(5) The connector bracket assemblies (2A3A1A15 and 2A3A1A16) are two separate cable entry panels. These panels interface the cabling coming from cable entry panel 2A3A4 and the internal cabling of the nightside optical assembly.

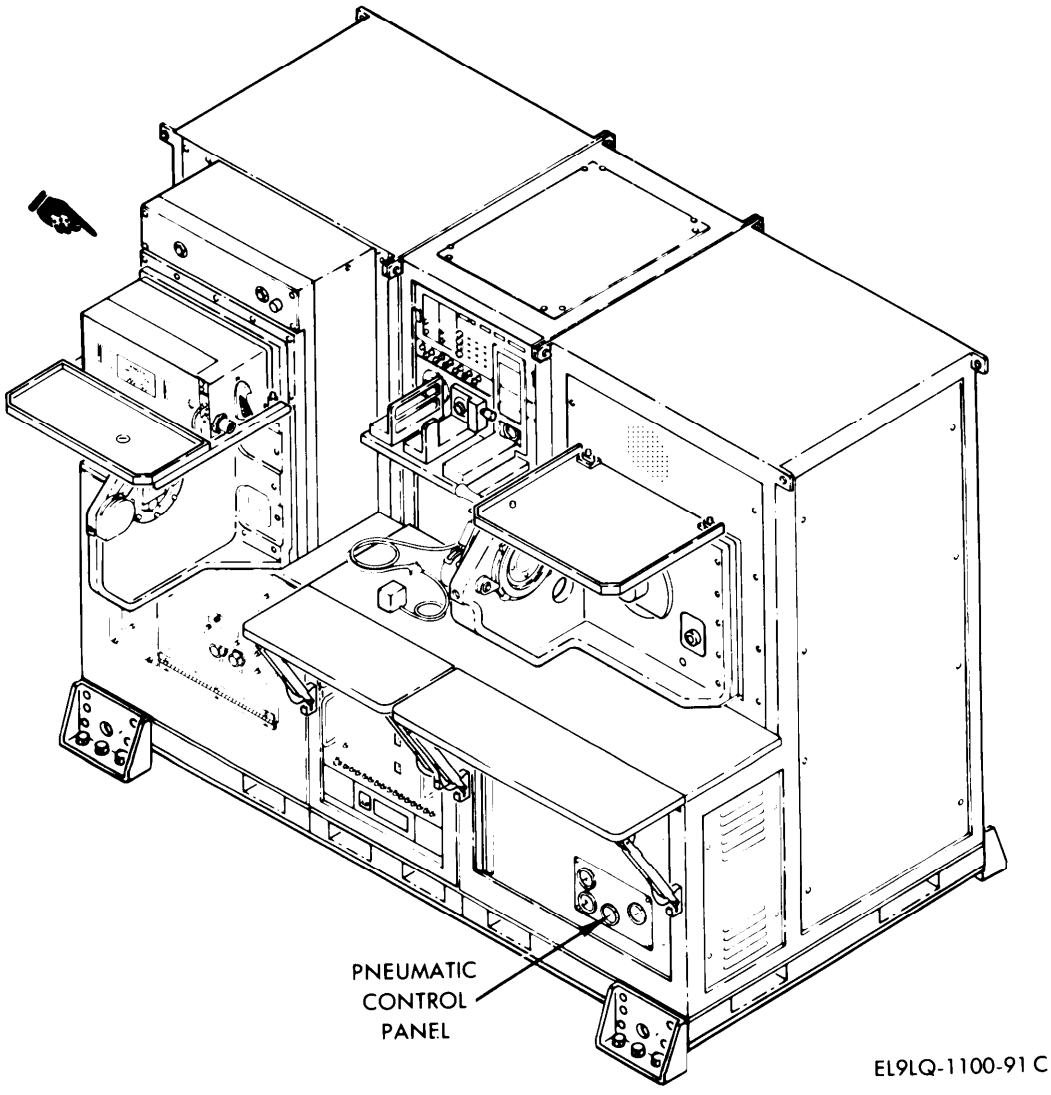
(6) The secondary heat source assembly 2A3A1A17 is positioned inside the nightside optical assembly below the upper mirror assembly. It primarily consists of a 1.5 inch heat source (heat source “C”), fold mirror housing assembly, air outlet duct assembly, and microcircuit and heat sink assembly. The latter assembly threads into the plate of the heat source “C”. The microcircuit and heat sink assembly consist of a cable assembly wired to a temperature sensor mounted inside a heat sink. Heat source “C” contains a 1.5 inch square radiating surface controlled to an accuracy of 1.O°C incremental steps. A fan is contained inside the heat source “C”.

(7) Cable assemblies 2A3A1W5 and W6 contain all the connectors for interfacing the assemblies contained in the nightside optical assembly. W5 contains connectors P4, P5, and J1 thru J5. W6 contains one wired in temperature sensor, connectors J1 thru J4, and P1 thru P15.

1-14. DESCRIPTION OF NIGHTSIDE TEST BENCH 2A3 (cont) 1-14

d. PNEUMATIC CONTROL PANEL

The pneumatic control panel is physically located on the front lower section of the nightside test bench. It is part of the pneumatic system and is described in paragraph 1-11b.

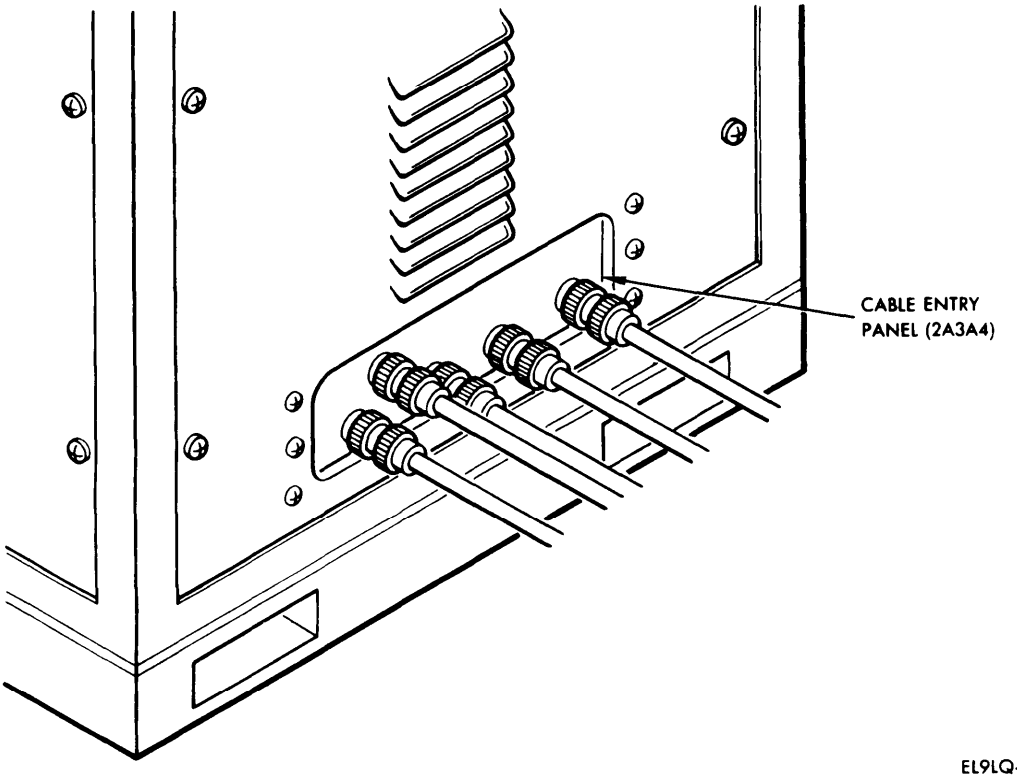


e. CABLE ENTRY PANEL 2A3A4

The cable entry panel 2A3A4 is mounted on the rear, lower side of the nightside test bench. Five cable connectors, part of four internal cable assemblies 2A3W1 thru 2A3W4, mount to the panel. The connectors on the other end of the cable assemblies mount to connector bracket assemblies 2A3A1A15 and 2A3A1A16, part of the nightside optical assembly. The cable entry panel connector locations are placarded J1 thru J5.

Physical Dimension:

Height: 7.0. in
Width: 16.0 in



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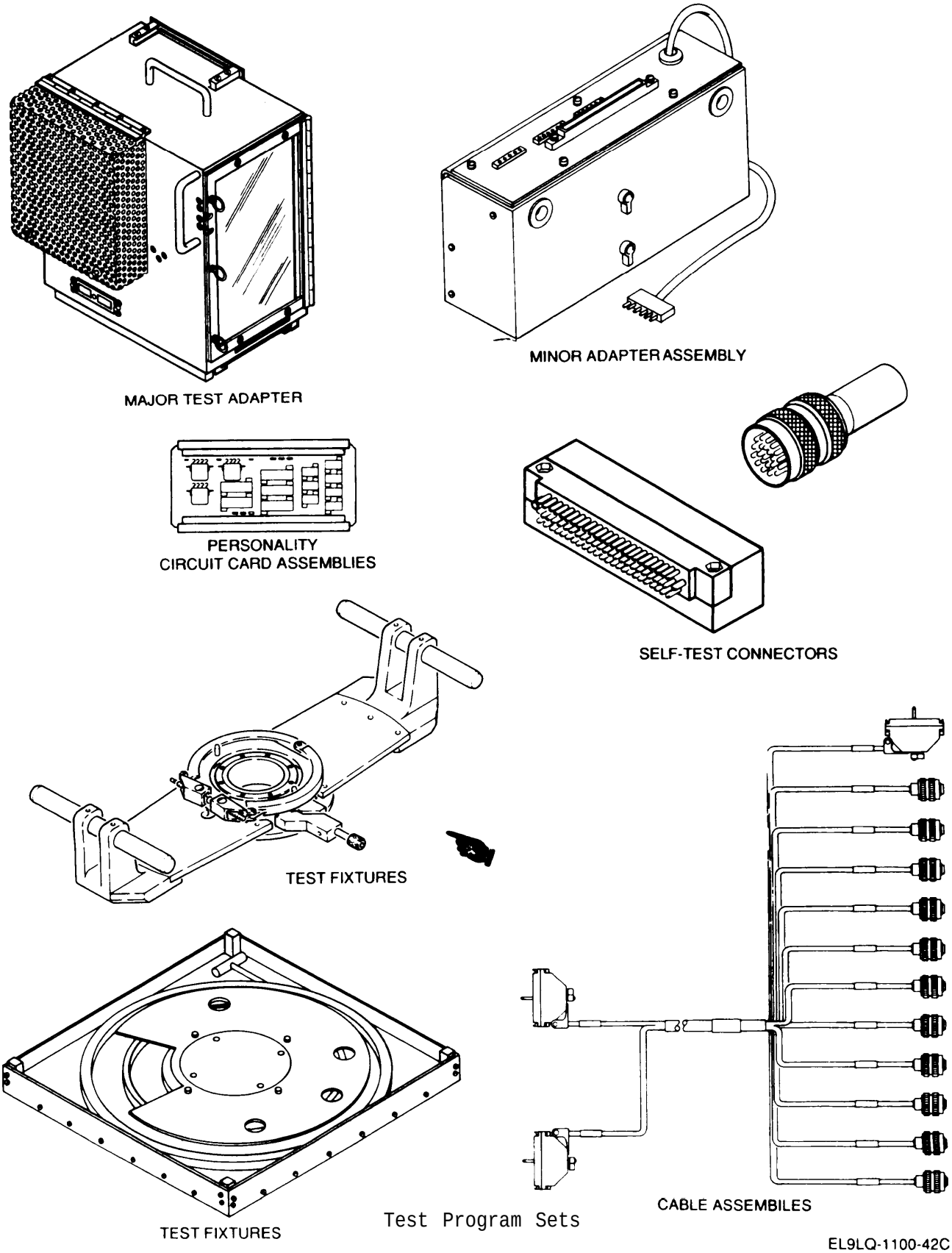
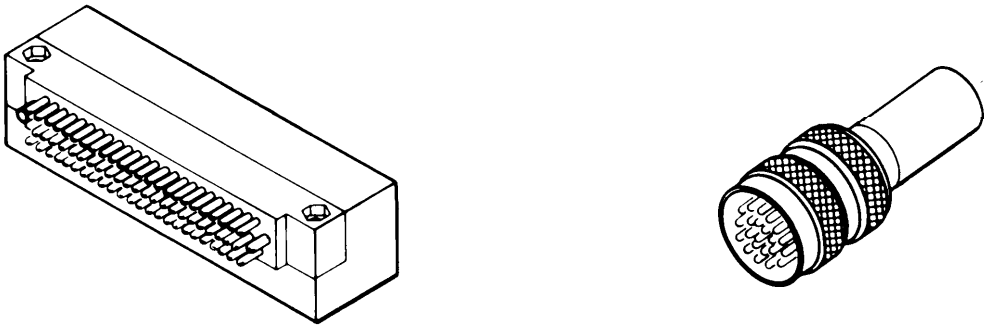


Test Program Sets

h. SELF-TEST CONNECTORS

Self-test connectors are either rectangular or cylindrical potted connectors. Some are wired in daisy chain fashion and others are wired from one particular pin to another. Self-test connectors are shorting plugs used during the interface device self-test portion of the test program. They connect to the minor adapter assemblies, cables or test fixtures used during a particular TPS. The self-test connectors are used to perform a continuity check of the interface device hardware before testing a UUT. Many self-test connectors are used in only one TPS, but some are used more than once.



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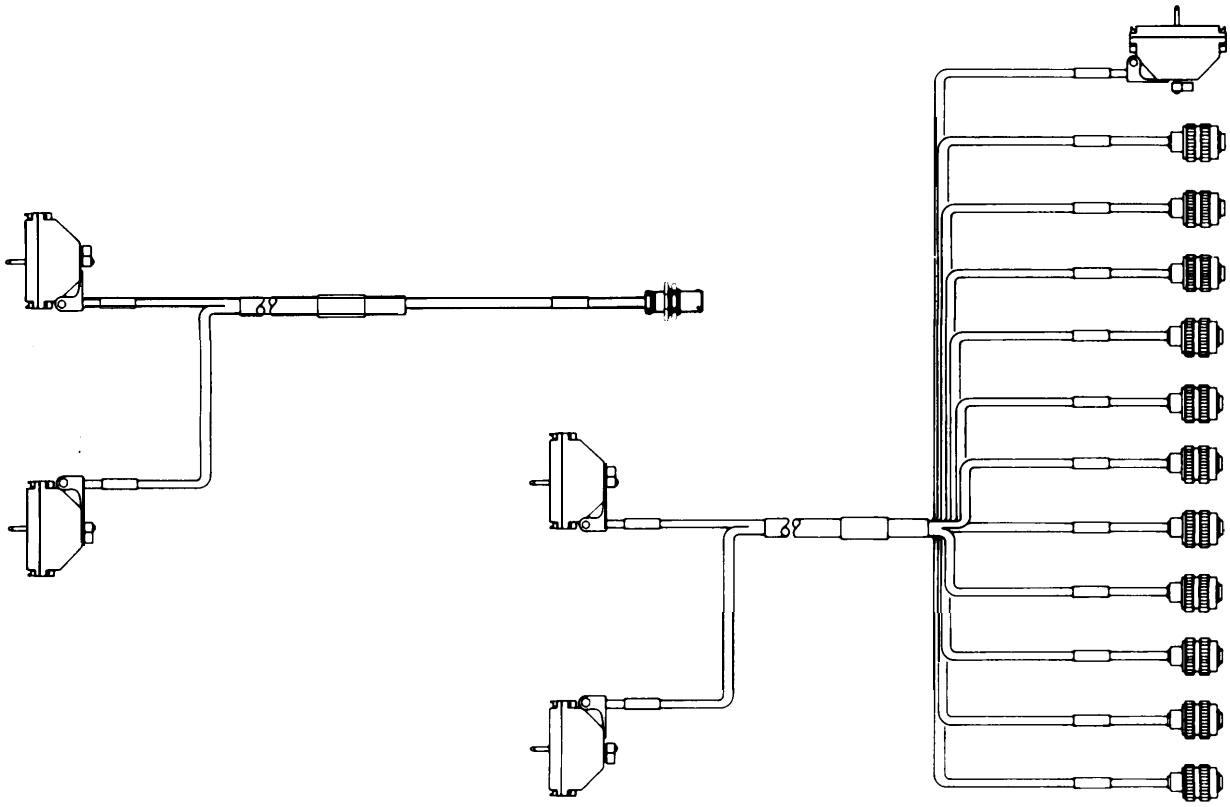
i. CABLE ASSEMBLIES

The cable assemblies interface the UUT to the test equipment input/output connectors. They are typically a branched cable to access the multiple connectors on the UUT and/or test equipment. The cable assemblies have an overall shield covered with flexible heat shrinkable sleeving and the connectors contain strain relief bushings to withstand the frequent handling.



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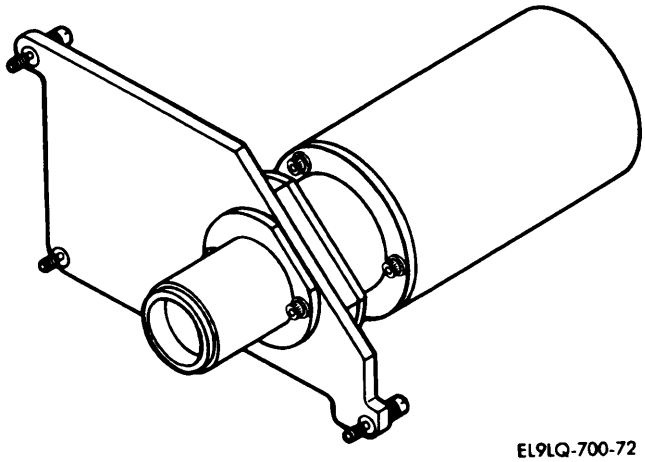
j. TEST FIXTURES

Test fixtures provide additional capabilities of interfacing the UUT to the test equipment. They provide mechanical handling/mounting capabilities and additional electrical Interfacing beyond that of the other interface devices. In some cases critical alignments are attained merely by bolting the fixture on the test equipment and then mounting the UUT onto the fixture, which is keyed for precise alignment. The test fixtures required for direct support maintenance are listed below. For individual descriptions refer to the corresponding paragraph number.

Paragraph	Name	Part No.
(1)	Radiometer assembly	13081475
(2)	Deleted	
(3)	MTF target mount	13081927
(4)	Deleted	
(5)	Insert/adapter assembly (TADS NSA)	13082064-29
(5.1)	Insert/adapter assembly (day sensor subassembly)	13082064-49
(6)	Azimuth gimbal alignment assembly tool	13082292
(7)	Deleted	
(8)	Terminal box assembly	13082747
(9)	Deleted	
(lo)	Fiber optic adapter assembly	13083077, 13083077-29
(11)	HOD and IVD optical alignment assembly	13083078-39
(12)	HOD bracket assembly	13083082
(13)	Deleted	
(14)	Illuminator fiber optic assembly	13083098
(15)	Upper IVD protective cover assembly	13083110
(16)	HOD brackets captive screw	13083111
(17)	Lower IVD protective cover assembly	13083114
(18)	IVD optical alignment reticle assembly	13083115
(19)	HOD protective cover assembly	13083117
(20)	Optical alignment reticle assembly	13083119
(21)	Nightside alignment tool assembly	13083129
(22)	Electro-optical mask and window assembly	13083136
(23)	Mask assembly	13083157
(24)	Deleted	
(25)	Deleted	
(26)	HOD mounting bracket assembly	13083489-29
(27)	Channel balance adapter assembly	13083603-19
(28)	Insert/adapter assembly (PNVS NSA)	13082064-39
(29)	Deleted	
(30)	Retroreflector assembly	13083952
(31)	Deleted	
(32)	Light source assembly	13083956
(33)	Line-of-sight laser housing assembly	13083958
(34)	Deleted	
(35)	Deleted	
(36)	HOD interlock protective cover assembly	13230921
(36.1)	Shroud grounding set	13231057
(37)	Deleted	

Paragraph	Name	Part No.
(38)	Deleted	
(39)	Deleted	
(40)	Deleted	
(41)	Deleted	
(42)	Deleted	
(43)	Deleted	
(43.1)	Electrical equipment cabinet assembly	13231501
(43.2)	Electrical equipment monitor shelf assembly	13231558
(43.3)	Spanner wrench assembly	13231653
(43.4)	Camera adapter assembly	13231654
(43.5)	Electrical equipment shelf assembly	13231659
(43.6)	Television monitor	13231666
(43.7)	Tubeaxial fan assembly	13231670
(44)	High voltage lead assembly	2-830126-5
(45)	Deleted	
(45.1)	Tee electrical connector	31-008
(46)	Level transit	326 PZ
(46.1)	BNC feed-thru termination	4119-50
(46.2)	Tripod	742
(46.3)	Trimmer adjustment tool	8TO05
(47)	Test weight	C1120-SP/3
(48)	Illuminator	1-250
(49)	Force gage	L5
(49.1)	Coaxial connector adapter	M55339/15-oo491
(50)	Force gage tip	PG-14T45
(51)	Connector adapter	TNA2-75
(52)	Cooling adapter	59140-4, C6013-2, 7050-6, 66030-1

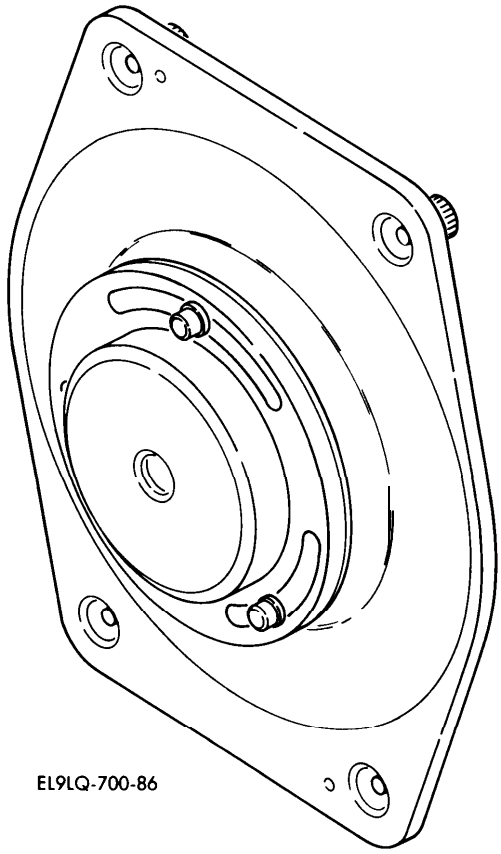
(1) The radiometer assembly mounts on the day sensor subassembly and is used to perform transmission tests of the day sensor laser path.



EL9LQ-700-72

(2) (Deleted)

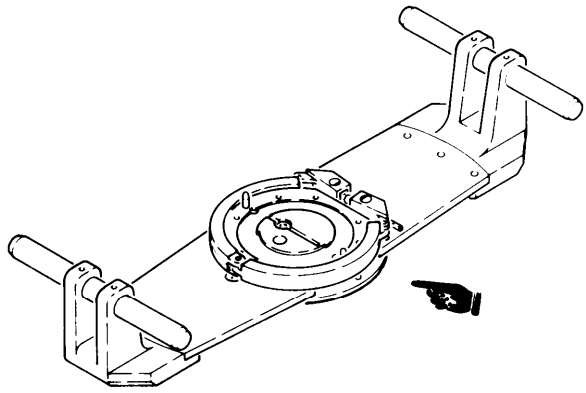
(3) The MTF target mount provides the test target for testing both the narrow and wide field-of-view of the day sensor subassembly.



EL9LQ-700-86

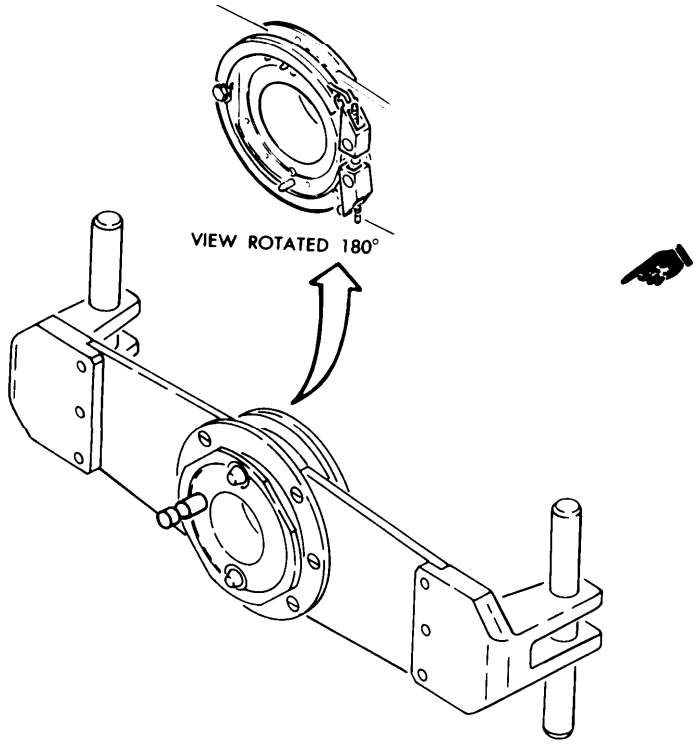
(4) (Deleted)

(5) The insert/adapter assembly is the mounting fixture for TADS night sensor assembly during testing. It contains two handles for ease of handling the UUT when mounting onto the nightside test bench. Each insert/adapter assembly is serialized to a particular sensor mount assembly on a nightside test bench. To ensure correct alinement, the insert/adapter assembly must be used only with the serialized (matched) sensor mount assembly.



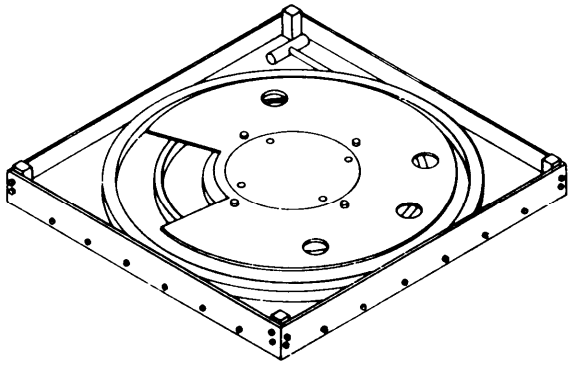
EL9LQ-700-37A

(5.1) The insert/adapter assembly is the mounting fixture for the TADS day sensor assembly during UUT testing. It contains two handles for ease of handling the UUT when mounting onto the dayside test bench. Each insert/adapter is serialized to a particular sensor mount assembly on a dayside test bench. To ensure correct alinement, the insert/adapter assembly must be used only with the serialized (matched) sensor mount assembly.



EL9LQ-776-017

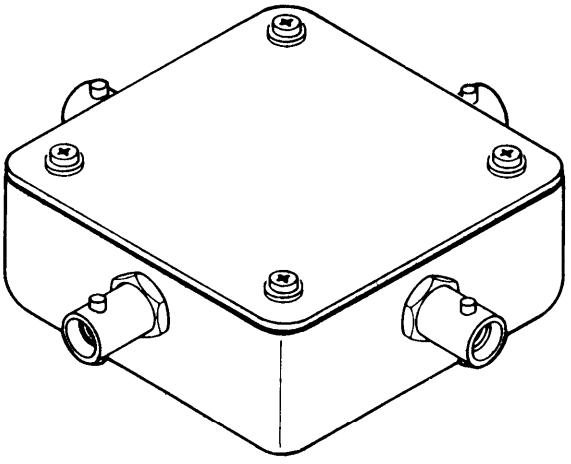
(6) The azimuth gimbal alignment tool is the mounting test fixture for the PNVS azimuth drive gimbal assembly UUT during testing. The UUT is mounted to the test fixture which sits on a bench top. The test fixture contains four rubber bumpers and two switch actuators. The switch actuators provide the means for checking the limit switches. The test fixture also provides the capability of nulling the resolver at 0 degrees, testing backlash between the bull gear and pinion gear, checking the limit switches, and checking the limit stops of the PNVS azimuth drive gimbal assembly.



EL9LQ-700-116

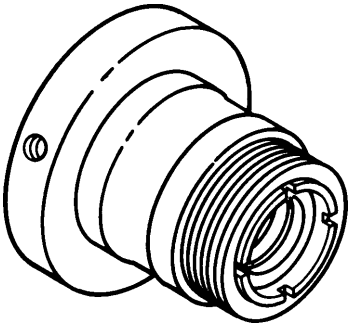
(7) (Deleted)

(8) The terminal box assembly, used during testing of the TADS night sensor assembly and PNVS night sensor assembly, is a rectangular box made of aluminum alloy containing four coax connectors P1-P4 and resistors R1-R4. The terminal box assembly provides impedance termination to the connected equipment and allows sampling of FLIR video outputs to go to the TV monitor of the AN/USM-410 test station.



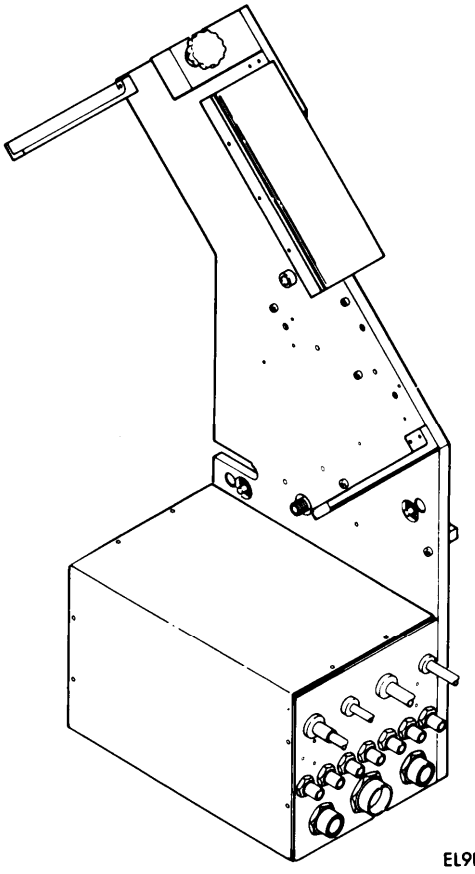
(9) (Deleted)

(10) The fiber optic adapter assembly is a multipurpose filter holder used in testing of the dayside sensor assembly.



EL9LQ-700-89

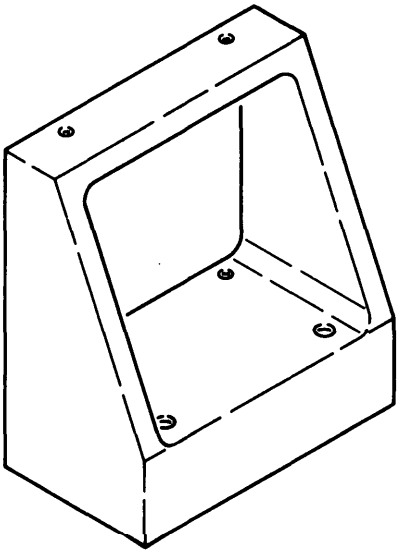
(11) The HOD and IVD optical alignment assembly is the mounting fixture for the IVD during testing. It contains two interlock switches, high voltage power supply, microscope, light shield assembly, connector panel assembly, and a control panel assembly. The connector panel assembly interfaces the UUT and test equipment through connectors P1-P4, J2-J4, and BNC connectors J5-J11. The control panel assembly contains adjusting knobs for brightness, contrast, and vertical horizontal spacing and position and provides the electronics to display test patterns on the CRT screen of the IVD and simulates the HOD being connected to the IVD.



EL9LQ-700-52

1-15. DESCRIPTION OF TEST PROGRAM SETS (cont) 1-15

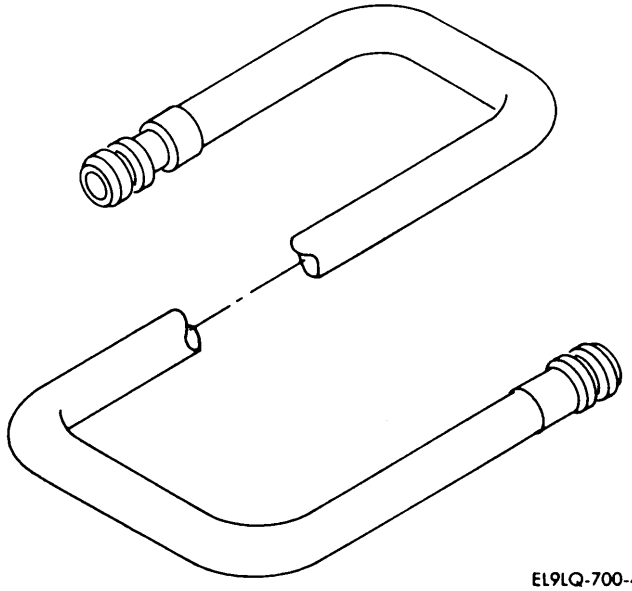
(12) The HOD bracket assembly attaches the UUT to the HOD and IVD optical alignment assembly.



EL9LQ-700-76

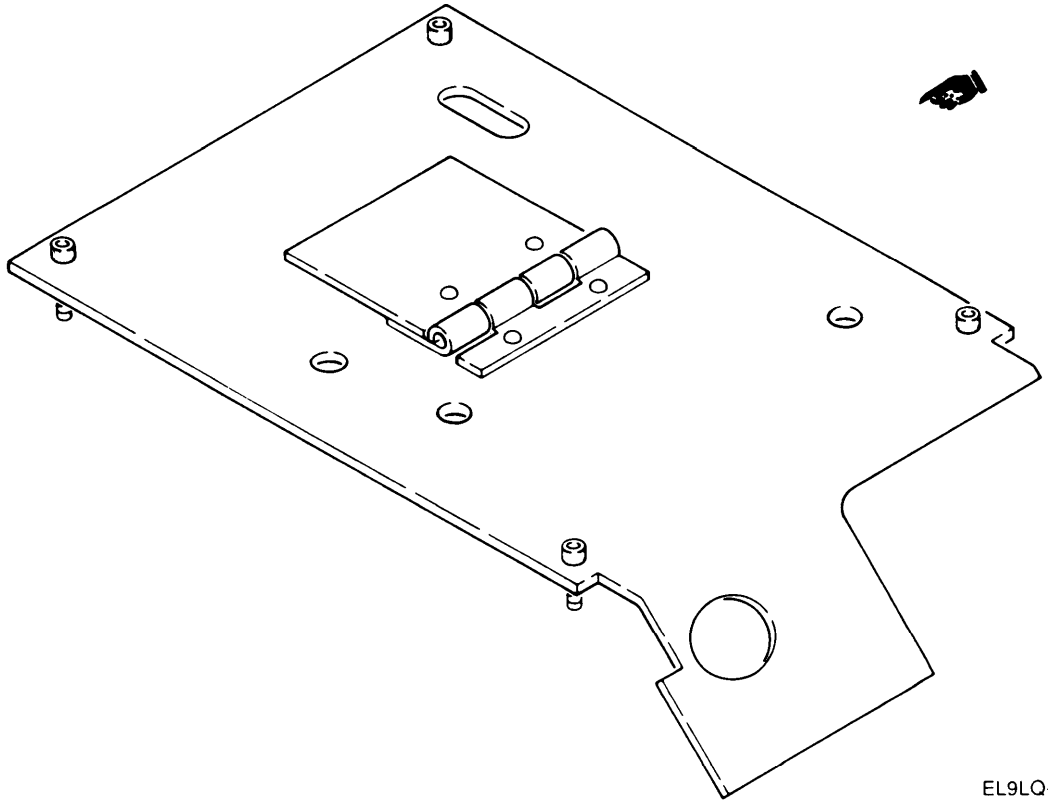
(13) (Deleted)

(14) The illuminator fiber optic assembly, used during testing of the IVD, is a fiber optic cable assembly that connects between the OSA and an illuminating light source. It illuminates the OSA cavity to calibrate the photomultiplier tube prior to testing the IVD.



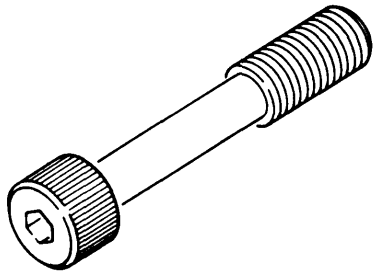
EL9LQ-700-43

(15) The upper IVD protective cover assembly replaces the upper IVD cover and allows access to the adjustment potentiometer.



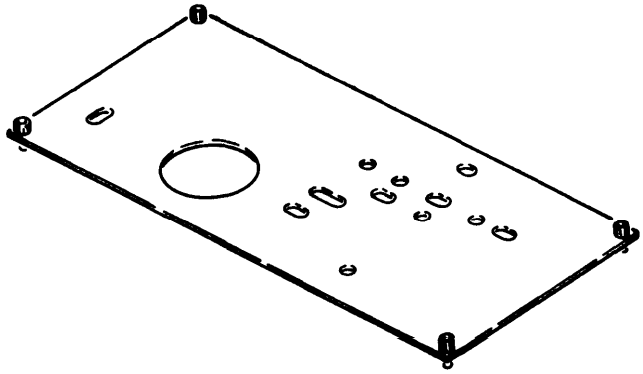
EL9LQ-700-78.1

(16) The HOD brackets captive screw is used to secure the HOD bracket assembly to the HOD and IVD optical alignment assembly.



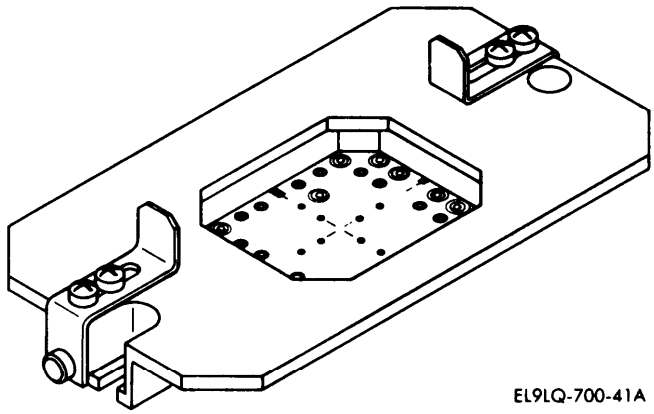
EL9LQ-700-119

(17) The lower IVD protective cover assembly replaces the lower IVD cover and allows access to the adjustment potentiometers.



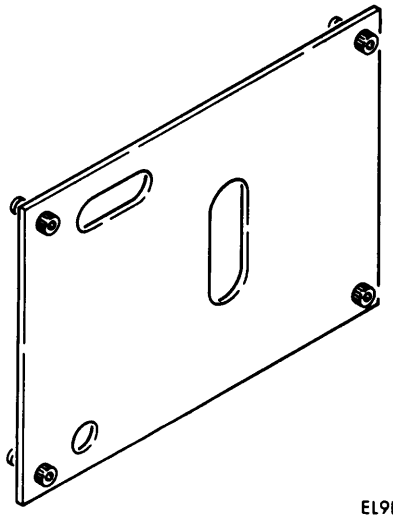
EL9LQ-700-79.1

(18) The IVD optical alignment reticle assembly mounts over the CRT of the IVD during testing. It contains an optical alignment bezel assembly with a reticle mounted inside the bezel assembly and two spring loaded retaining pins which hold the IVD optical alignment reticle assembly in place. Test patterns of known size and dimension are displayed on the CRT, then the reticle is used to measure and verify these known dimensions.



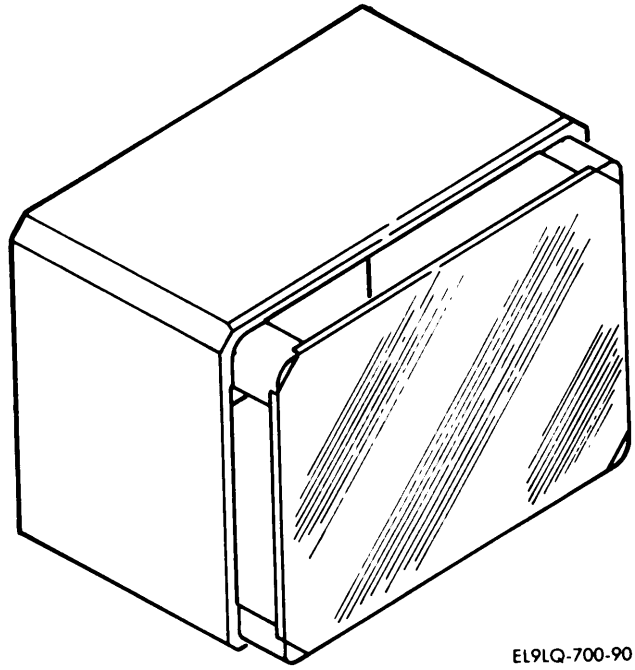
EL9LQ-700-41A

(19) The HOD protective cover assembly replaces the top HOD panel and allows access to the adjustment potentiometers.



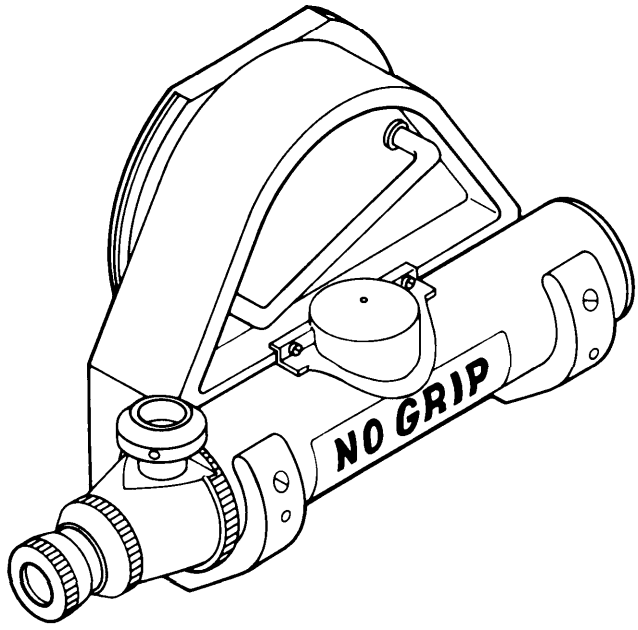
EL9LQ-700-80

(20) The optical alignment reticle assembly provides a visual display which is used to perform alignments.



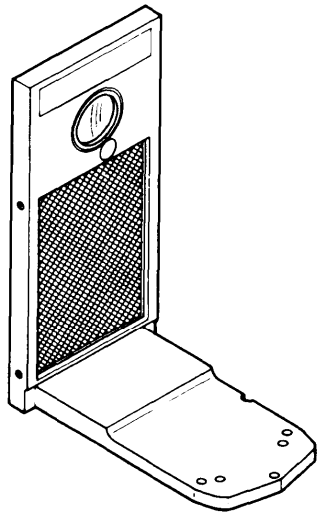
EL9LQ-700-90

(21) The nightside alignment tool assembly is an optical alignment device containing a telescope, a self-lock spring plunger, and a bow handle for carrying ease. It mounts to the insert/adapter assembly and then to the nightside test bench to obtain data for further testing of the TADS and PNVS night sensor assemblies. Once mounted, the operator looks through the nightside alignment tool assembly at the target in the test bench to obtain the X and Y coordinates of the target. This data is saved to compare with the UUT measurements during testing.



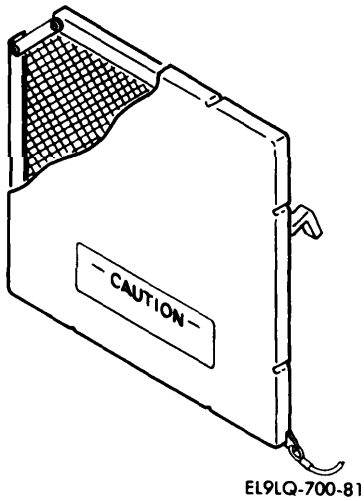
EL9LQ-700-42

(22) The electro-optical mask and window assembly is installed on the PNVS night sensor in place of the shroud assembly. It contains a honeycomb grill which provides a uniform background and a glass to allow the view to be aimed into the targets.



EL9LQ-700-91

(23) The mask assembly has a honeycomb grill which provides a uniform background for aligning the TADS night sensor assembly.

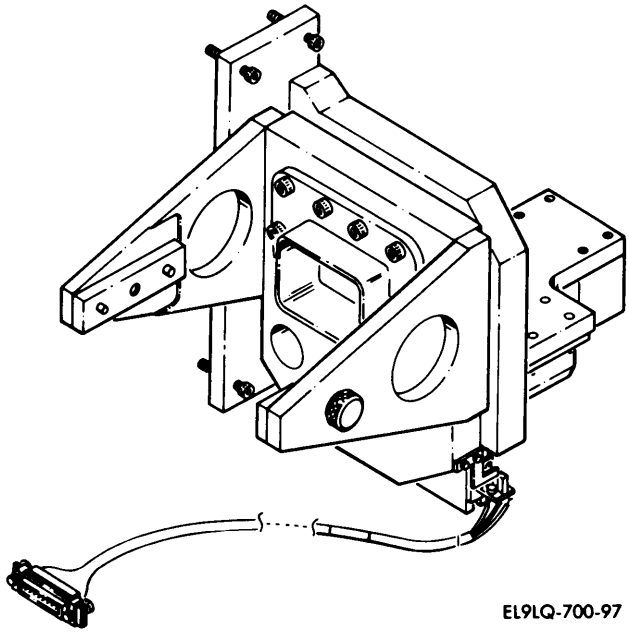


EL9LQ-700-81

(24) (Deleted)

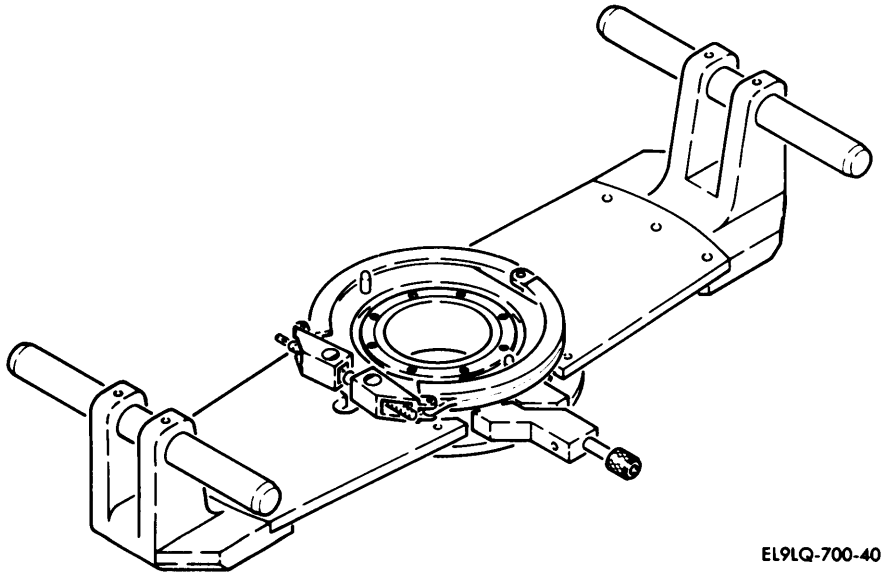
(25) (Deleted)

(26) The HOD mounting bracket assembly allows the HOD to be mounted inside the OSA. This provides the means to accomplish electro-optical measurements.



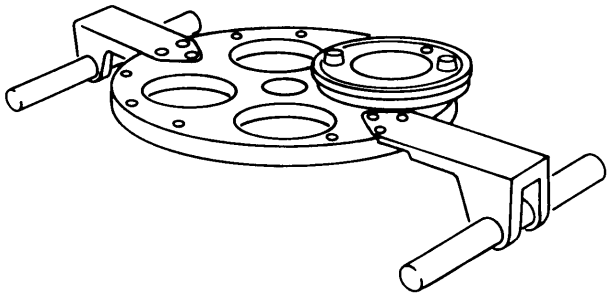
EL9LQ-700-97

(27) The channel balance adapter assembly is used for mounting the TADS night sensor assembly to the nightside test bench during particular tests. Ball bearings allow the UUT to rotate on its axis while mounted to the test bench, and a detent thumbscrew is provided to select the amount of rotation necessary.



EL9LQ-700-40

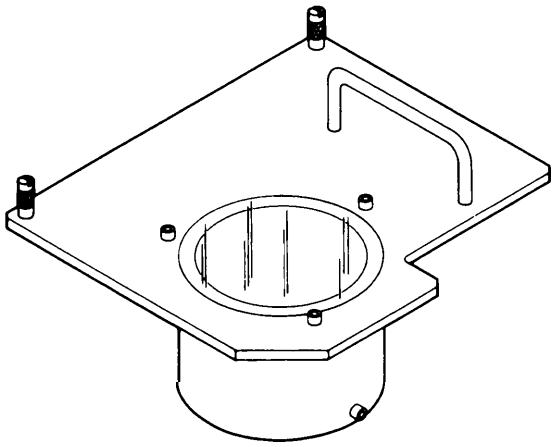
(28) The insert/adapter assembly is the mounting fixture for the PNVS night sensor assembly during testing. It contains two handles for ease of handling the UUT when mounting to the nightside test bench. Each insert/adapter assembly is serialized to a particular sensor mount assembly on a nightside test bench. To ensure correct alinement, the insert/adapter must be used only with the serialized (matched) sensor mount assembly.



EL9LQ-700-38

(29) (Deleted)

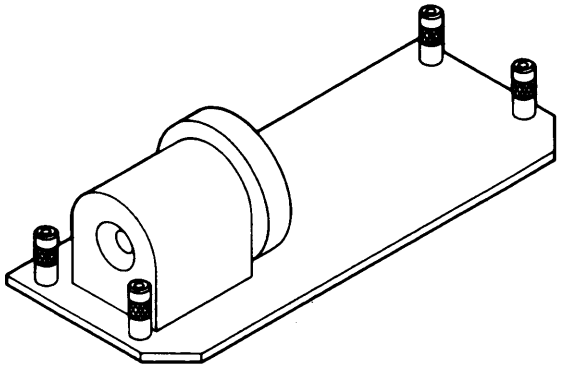
(30) The retroreflector assembly is used to test the reticle alignment on the day sensor subassembly.



EL9LQ-700-82

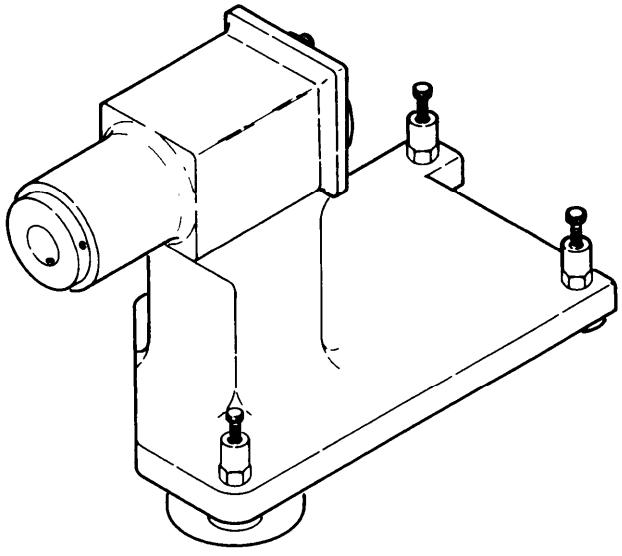
(31) (Deleted)

(32) The light source assembly provides an MTF test target used to test the day sensor subassembly optical path.



EL9LQ-700-83

(33) The line-of-sight laser housing assembly is used to test the laser path boresight of the day sensor subassembly.

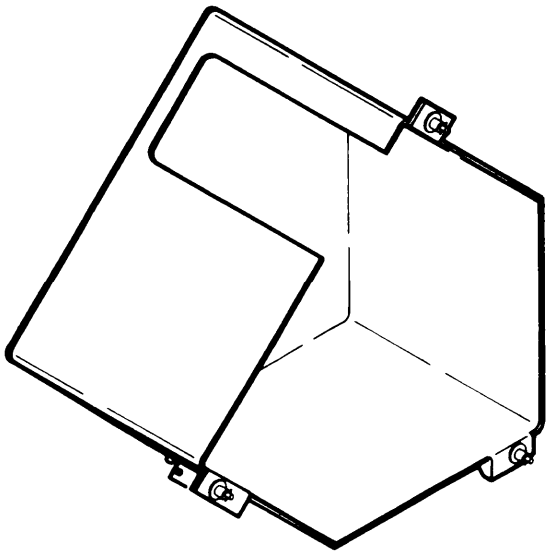


EL9LQ-700-99

(34) (Deleted)

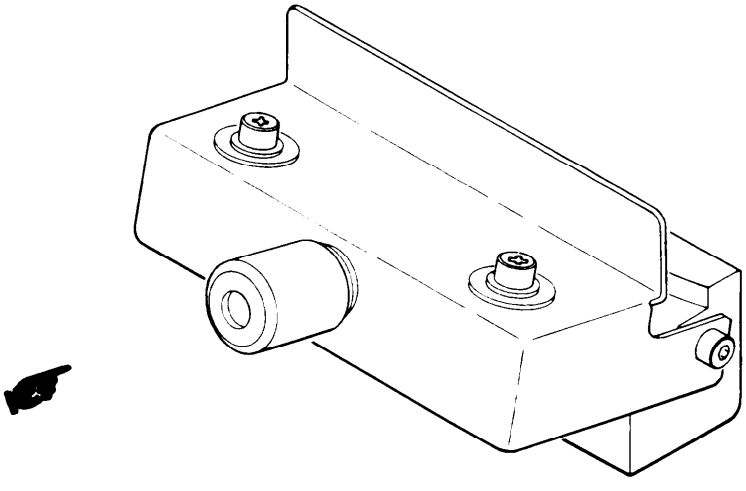
(35) (Deleted)

(36) The HOD interlock protective cover assembly is used to protect personnel from high voltage when testing the HOD. The locking screws control switches that remove the high voltage if this cover is removed.



EL9LQ-700-84

(36.1) The shroud grounding set is used with the TPS for the PNVS shroud assembly, night sensor shroud assembly, and day sensor shroud assembly. Its purpose is to provide an electrical ground to the shrouds during UUT testing.



EL9LQ-771-054

(37) (Deleted)

(38) (Deleted)

(39) (Deleted)

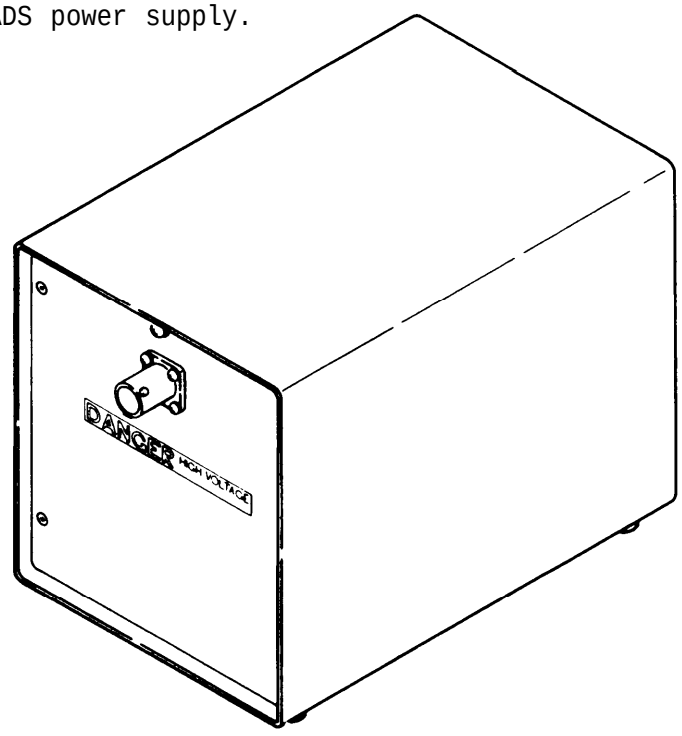
(40) (Deleted)

(41) (Deleted)

(42) (Deleted)

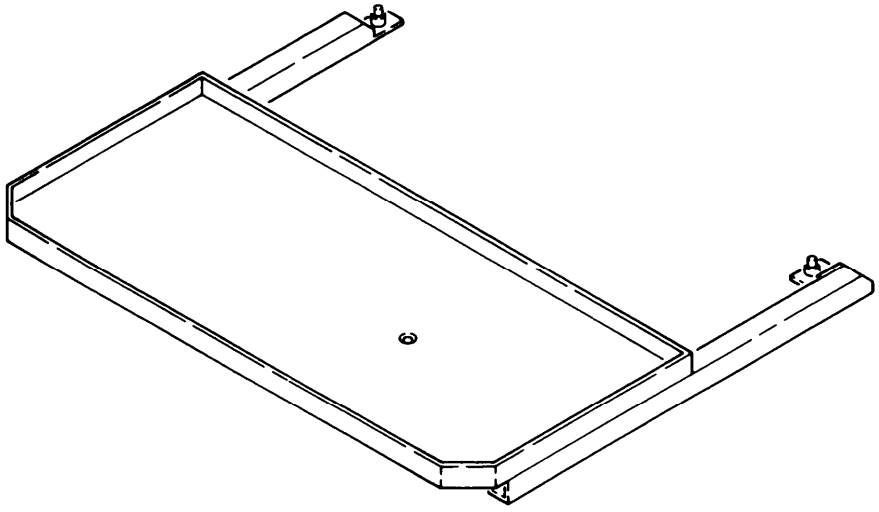
(43) (Deleted)

(43.1) The electrical equipment cabinet assembly is used as a load for proper testing of the TADS power supply.

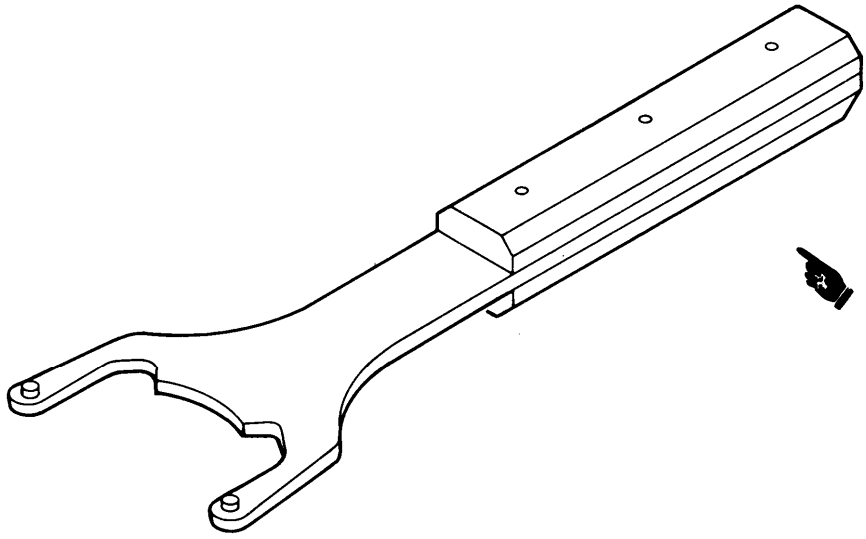


EL9LQ-700-162

(43.2) The electrical equipment/monitor shelf assembly is installed on the electro-optical bench to allow additional shelfspace for the television monitor used in certain video checks.

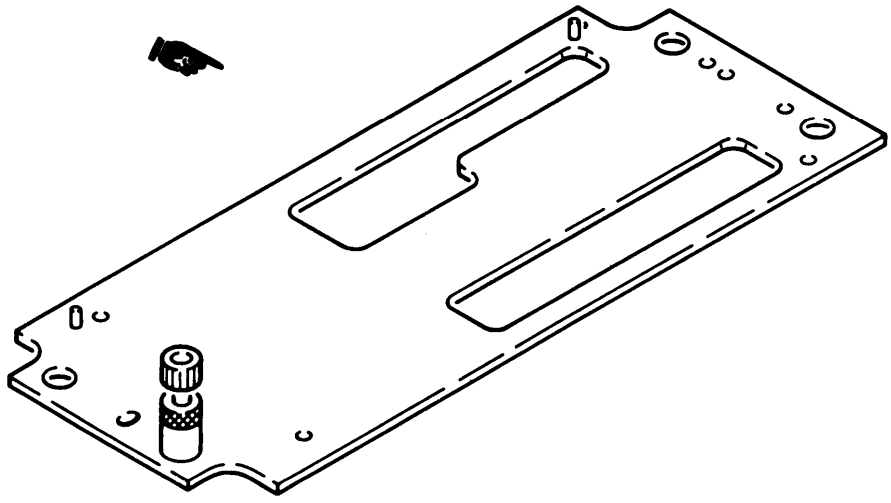


(43.3) The spanner wrench assembly is used for adjustment of the television sensor assembly, visual multiplexer assembly, and the visual relay/multiplexer assembly.



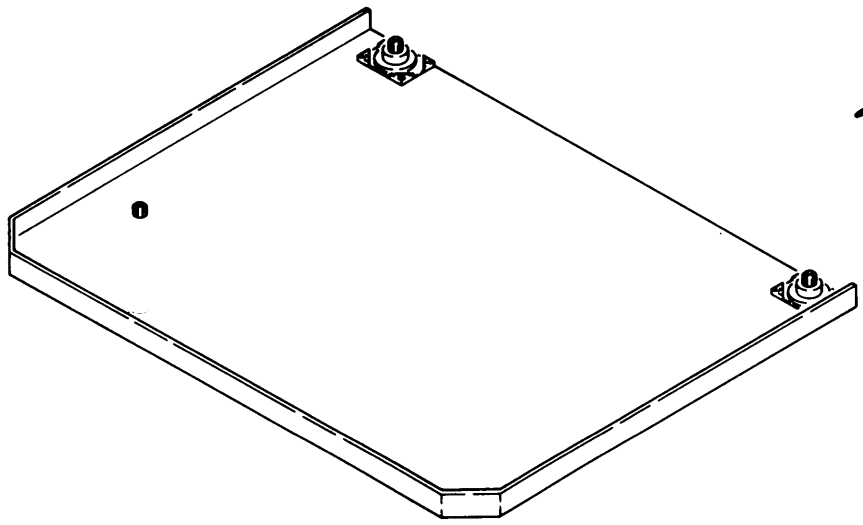
EL9LQ-700-167

(43.4) The camera adapter assembly is used to mount the television sensor assembly to OSG shading port.



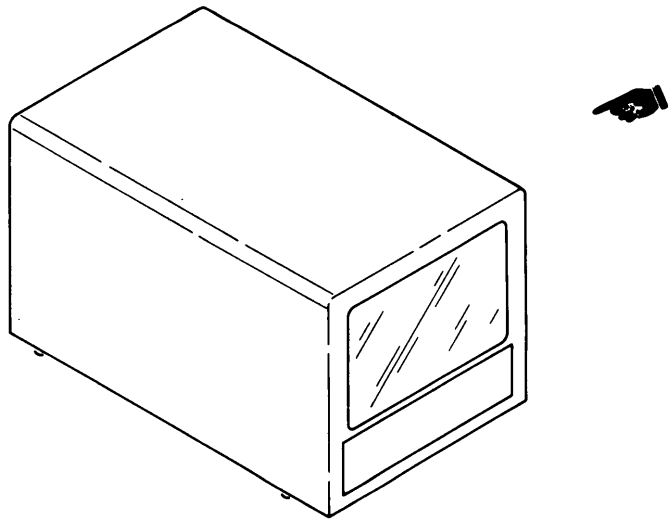
EL9LQ-700-168

(43.5) The electrical equipment shelf assembly is mounted to the electro-optical bench to allow additional shelf space for electrical equipment required during certain TPSs.



EL9LQ-700-166

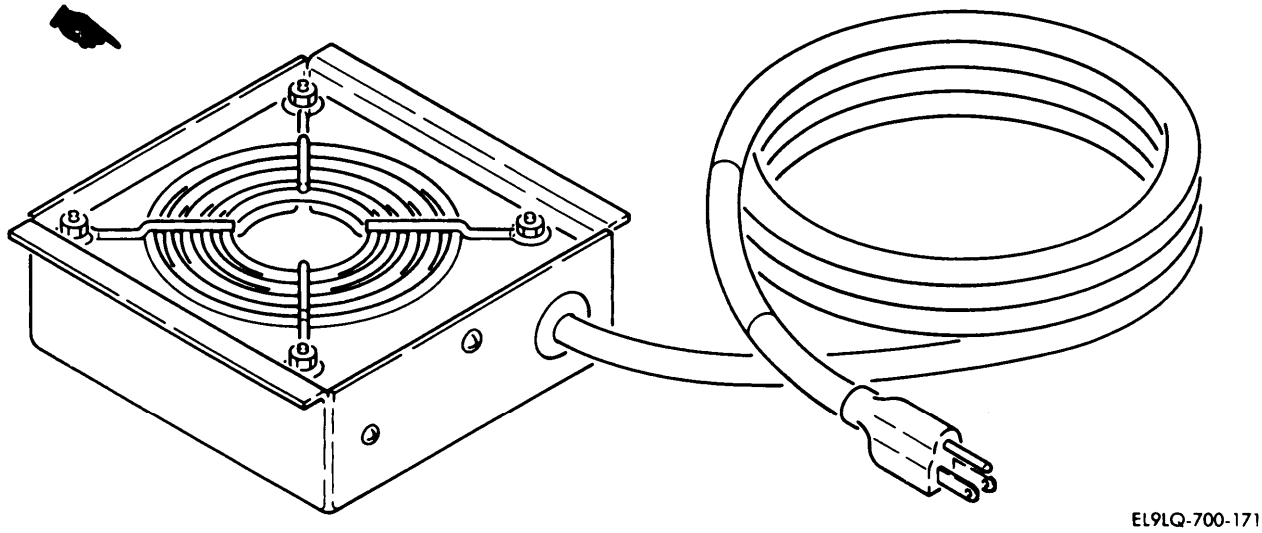
(43.6) The television monitor is used to perform video checks of the television sensor assembly.



EL9LQ-700-164

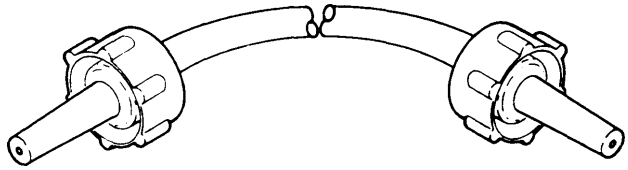
1-15. DESCRIPTION OF TEST PROGRAM SETS (cont) 1-15

(43.7) The tube axial fan assembly is mounted to the major test adapter to provide cooling while testing the TADS power supply.



EL9LQ-700-171

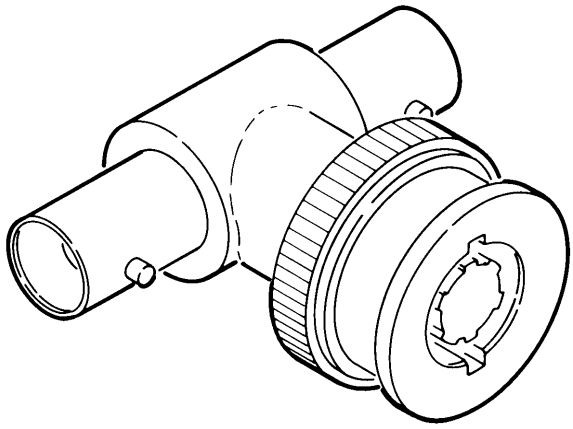
(44) The high voltage lead assembly connects the high voltage power supply to the HOD control panel.



EL9LQ-700-106A

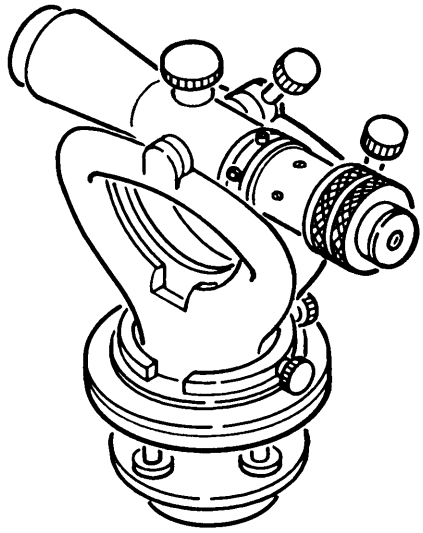
(45) (Deleted)

(45.1) The tee electrical connector is a coaxial adapter used to connect three coaxial connectors.



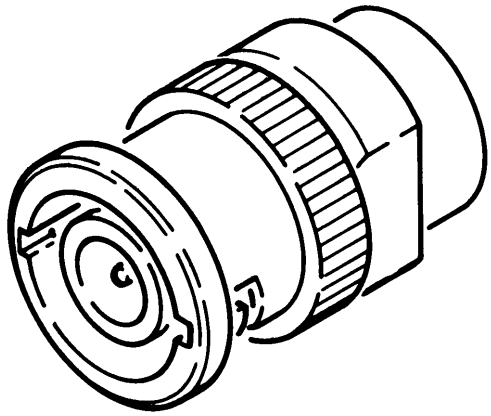
EL9LQ-700-122

(46) The transit level is mounted on the tripod (46.2) and is used with the day sensor subassembly test program set. It allows the technician to view the day sensor subassembly optics for proper alignment and condition.



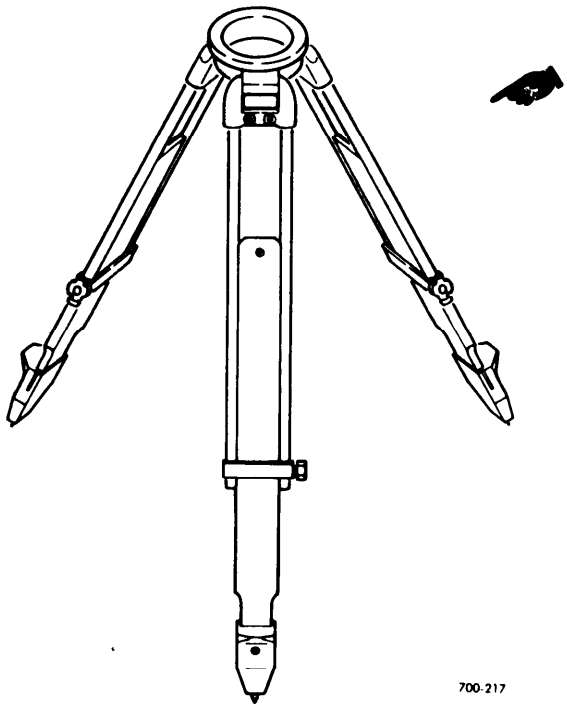
700-216

(46.1) The BNC feed-thru termination contains a 50-ohm load used in testing coaxial cable.



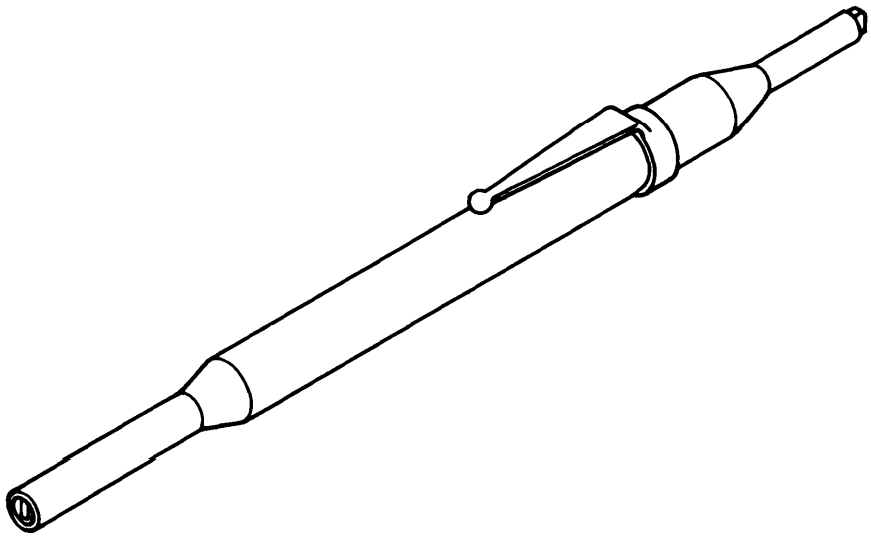
EL9LQ-700-163

(46.2) The tripod is used with the day sensor subassembly test program set and is used to hold the transit level in the proper position for viewing the optics.



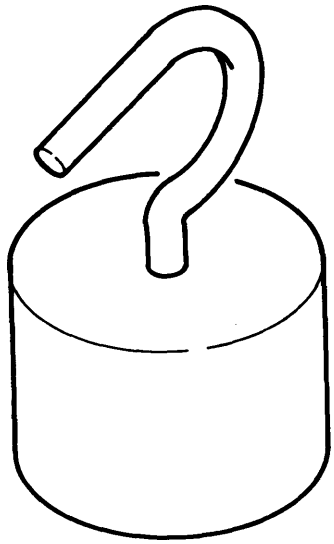
700-217

(46.3) The trimmer adjustment tool is used to adjust various potentiometers during testing of the television sensor assembly.



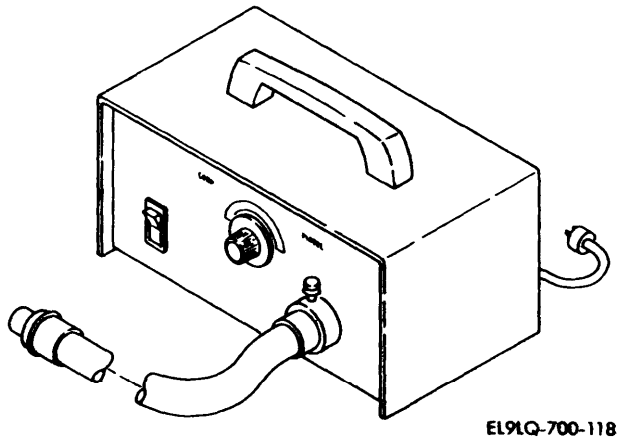
EL9LQ-700-170

(47) The test weight is used to verify the condition of the force gage prior to use in testing.



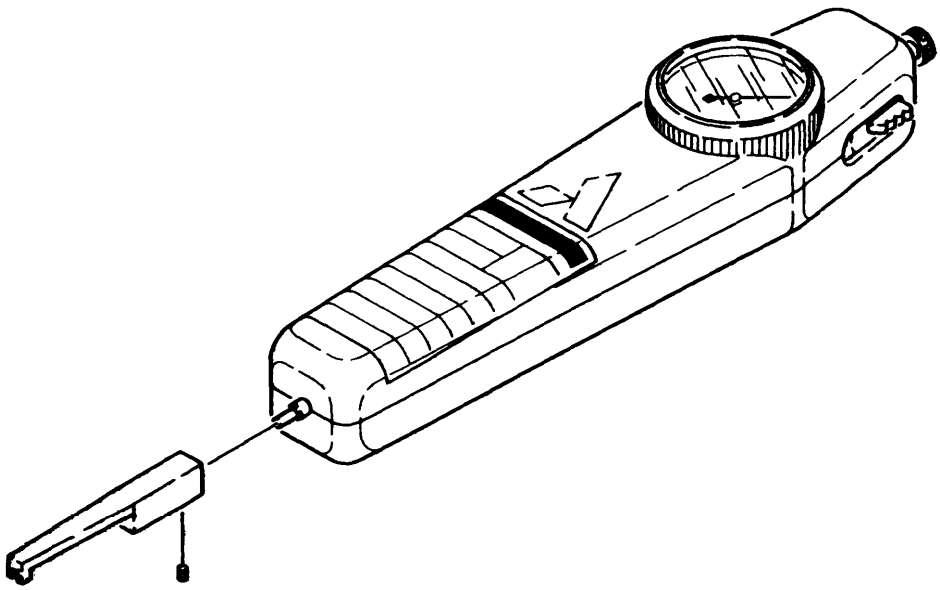
EL9LQ-700-123

(48) The illuminator provides a light which is used in various tests. It has a potentiometer which allows the generated light to be varied. This illuminator is normally connected by a fiber optic cable.



EL9LQ-700-118

(49) The force gage is used to measure the force required to move the PNVS azimuth drive gimbal.



EL9LQ-700-107

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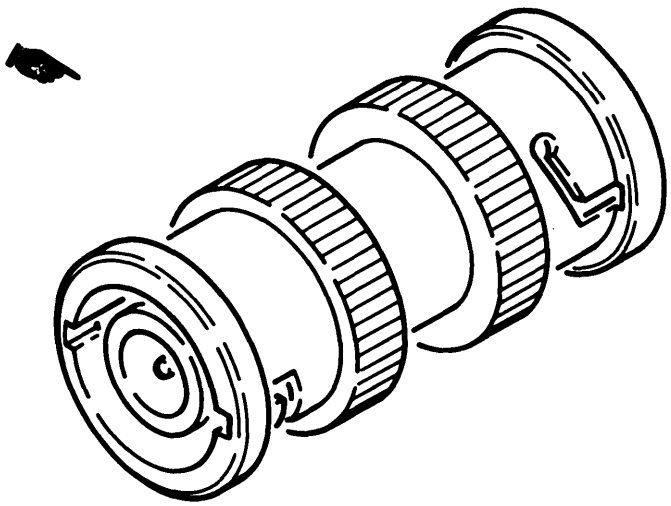
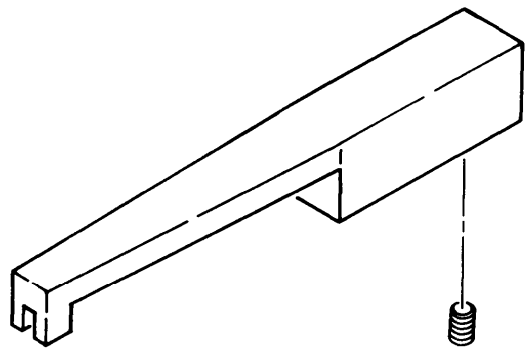
(49.1) The coaxial connector adapter is used to electrically connect the terminal box assembly to the portable television monitor.



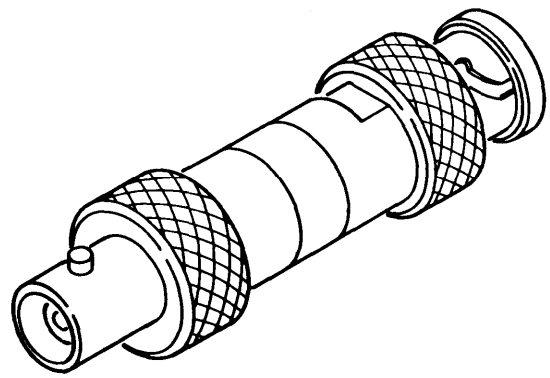
EL9LQ-700-169

(50) The force gage tip is attached to the force gage to allow testing of the PNVS azimuth drive gimbal.

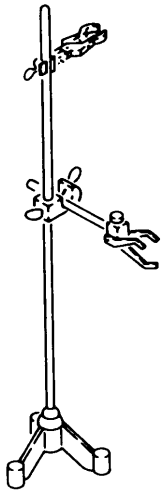


EL9LQ-700-126

(51) The connector adapter provides an internal 75-ohm termination to allow proper video signal measurements.



EL9LQ-700-124 A

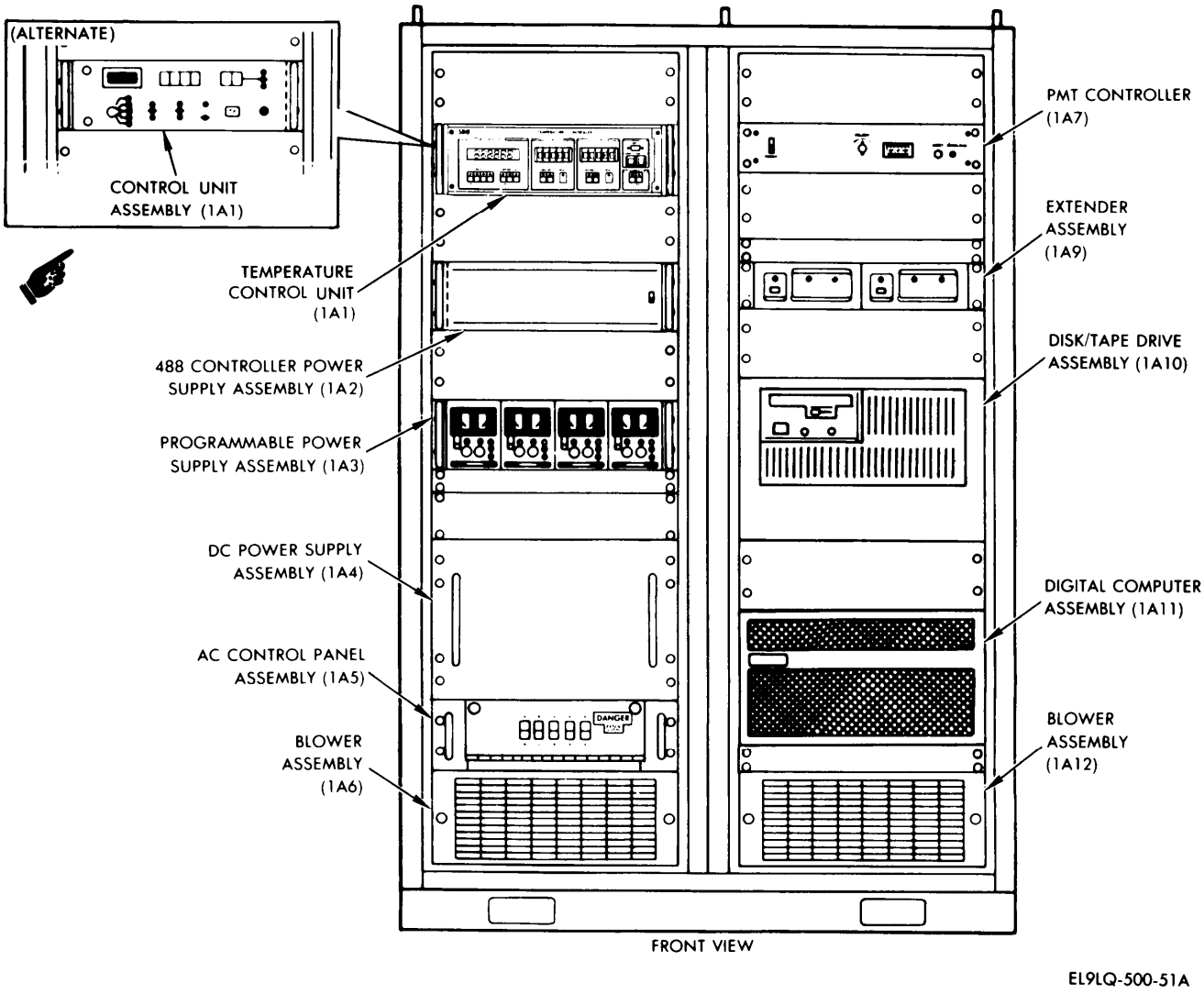


EL9LQ-700-228

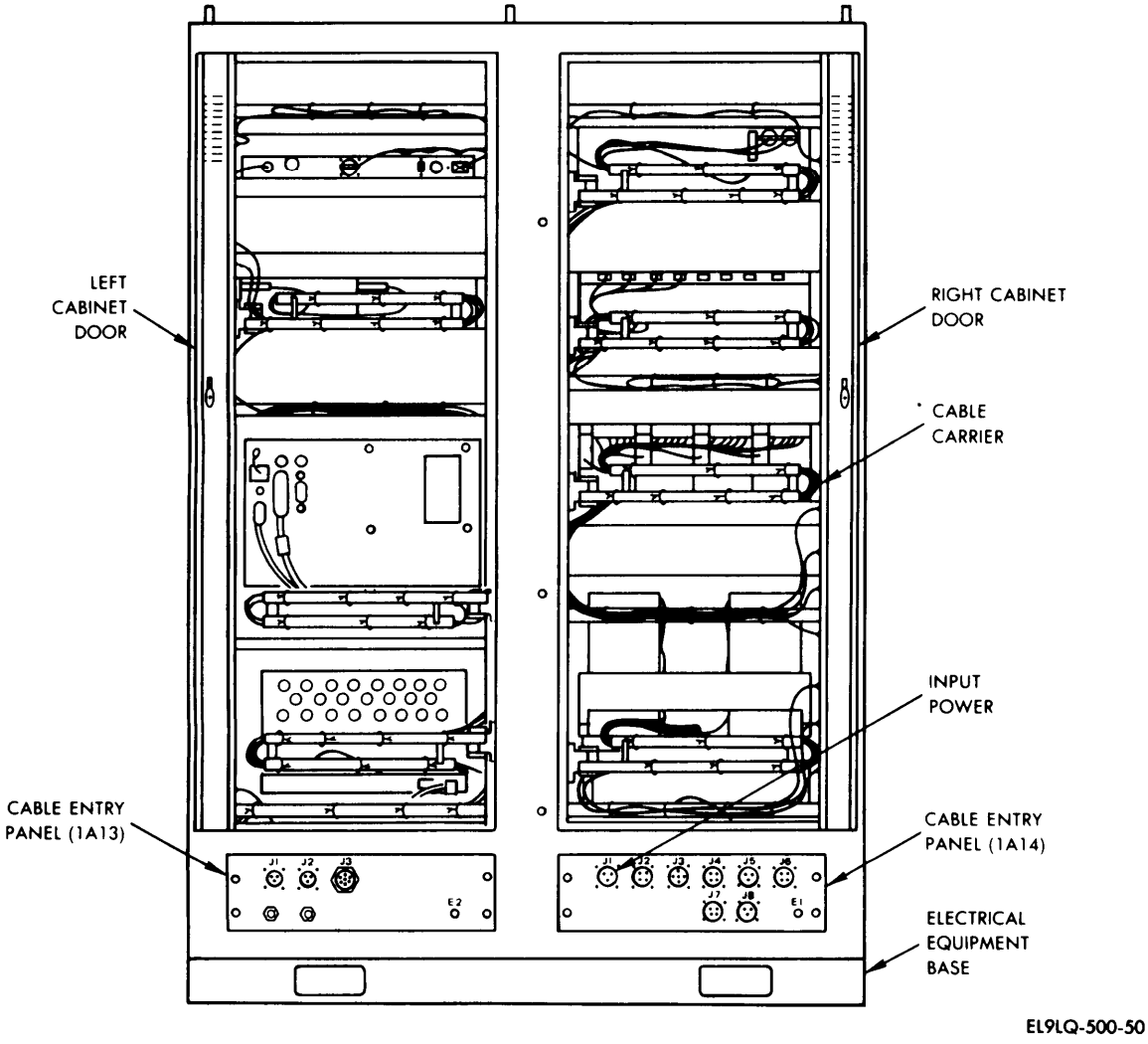
(52) The cooling adapter is used to position the cooling air hose in any desired position when the PNVS night sensor assembly is being tested. It consists of a support, an extension clamp, a support clamp, and a utility clamp.

1-16. EQUIPMENT LOCATOR VIEWS

The following views of the electronic station and the electro-optical test bench set are provided to orient the location of the various assemblies. These views should be studied since they should be used to facilitate assembly location during performance of maintenance. The maintenance tasks contained in chapters 2 through 5 do not use locator views in each task.

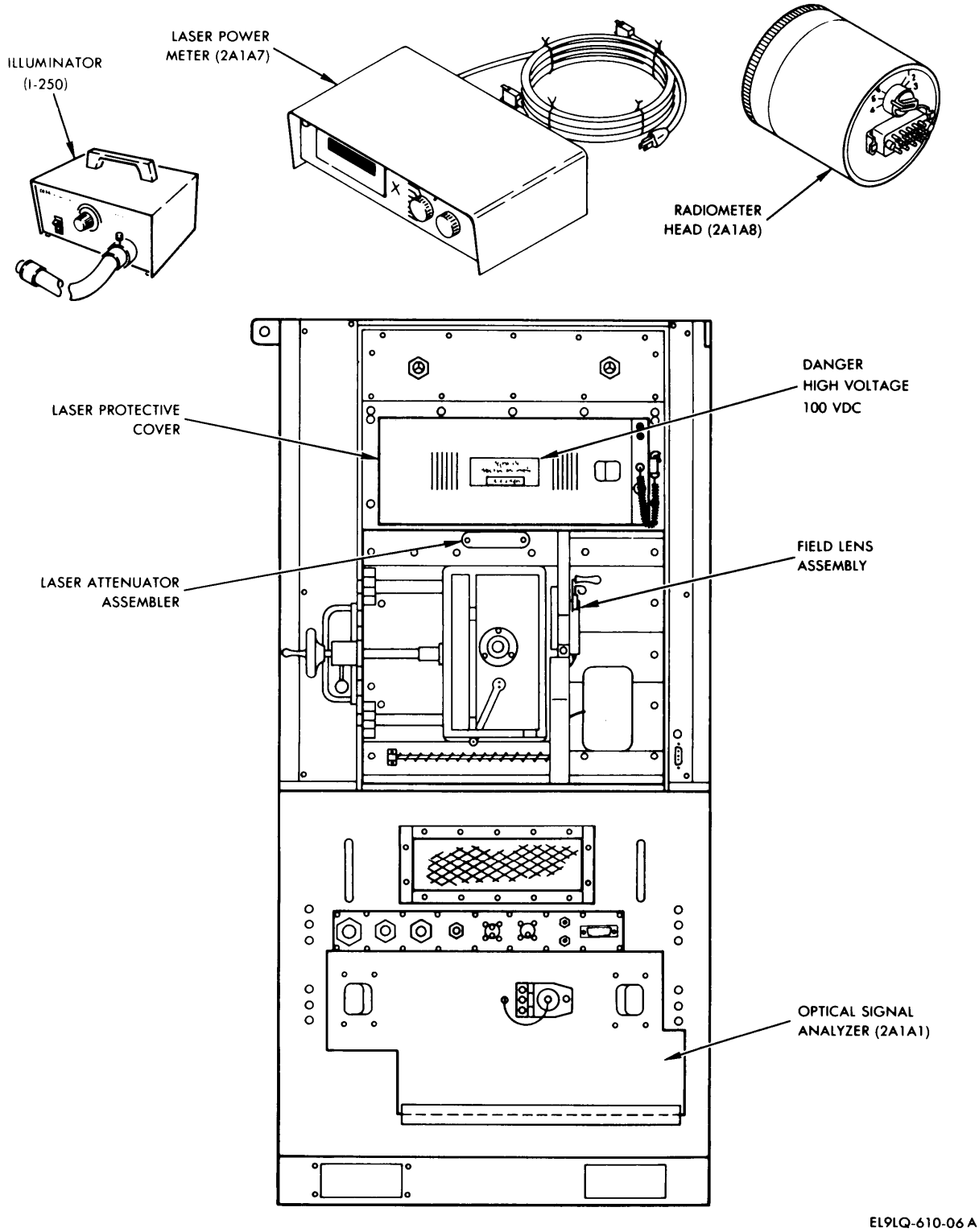


Electronic Station Locator View (Front)

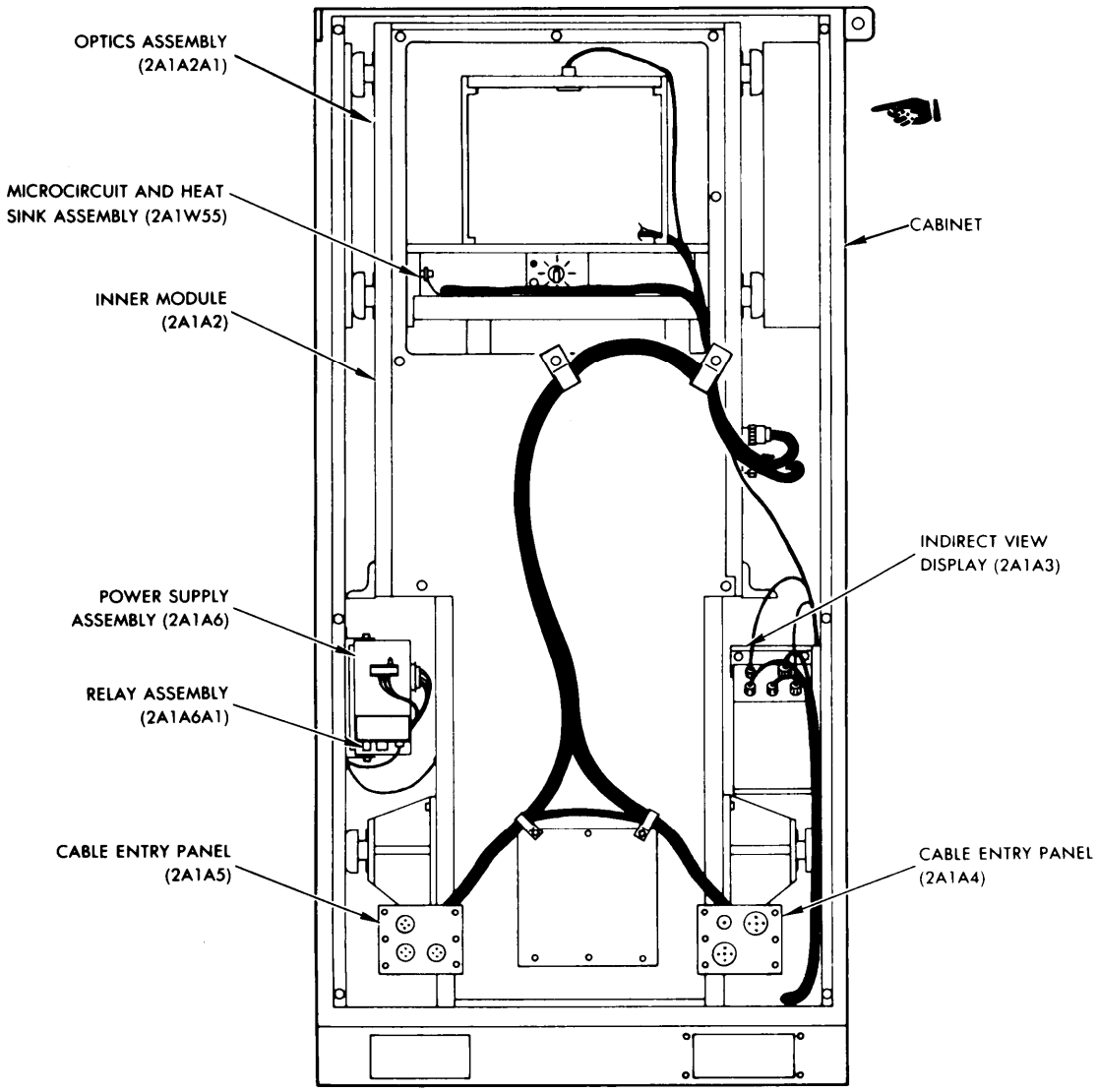


Electronic Station Locator View (Rear)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16

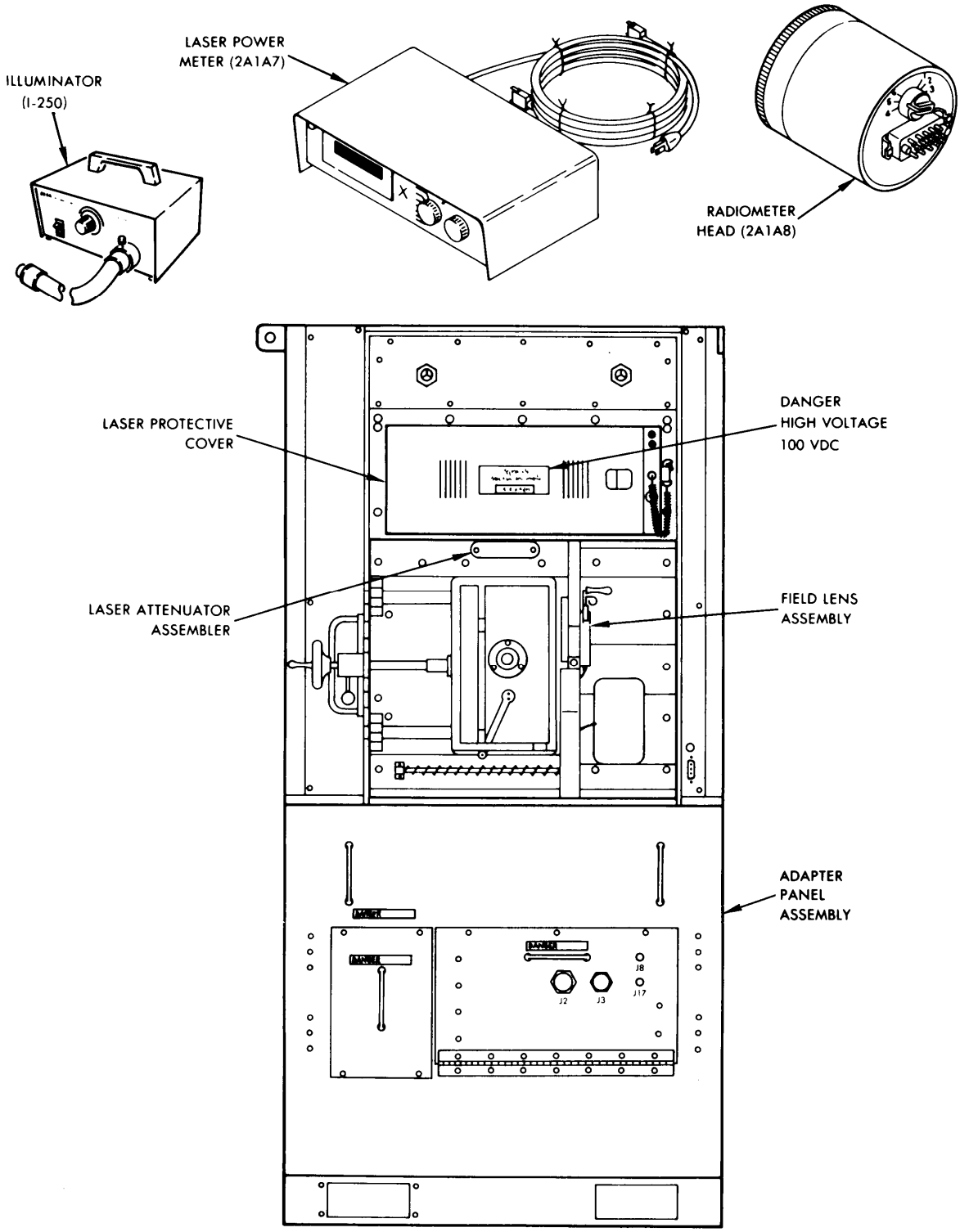


Dayside Test Bench with OSA Locator View (Front)



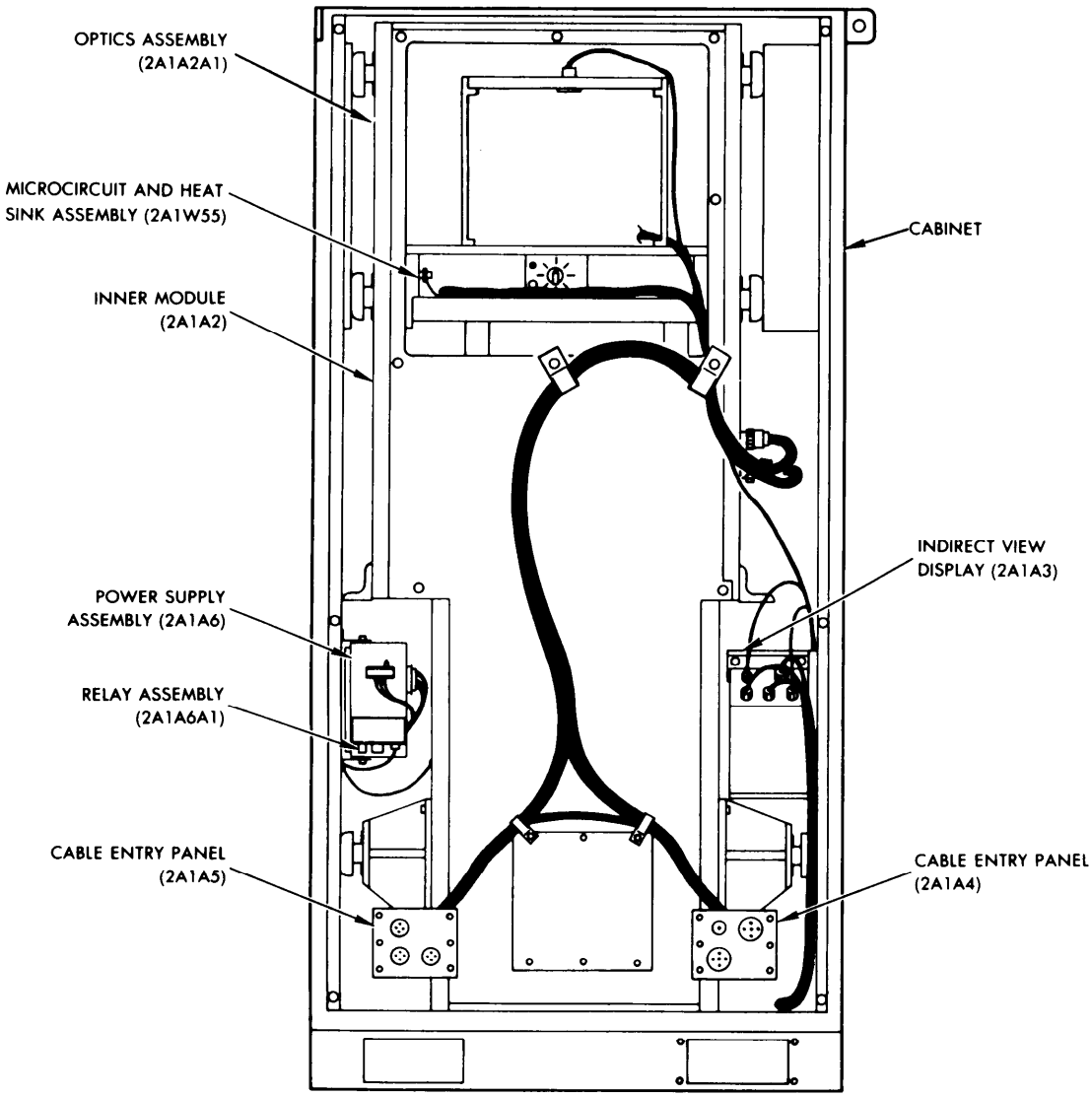
Dayside Test Bench Locator View (Rear)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16



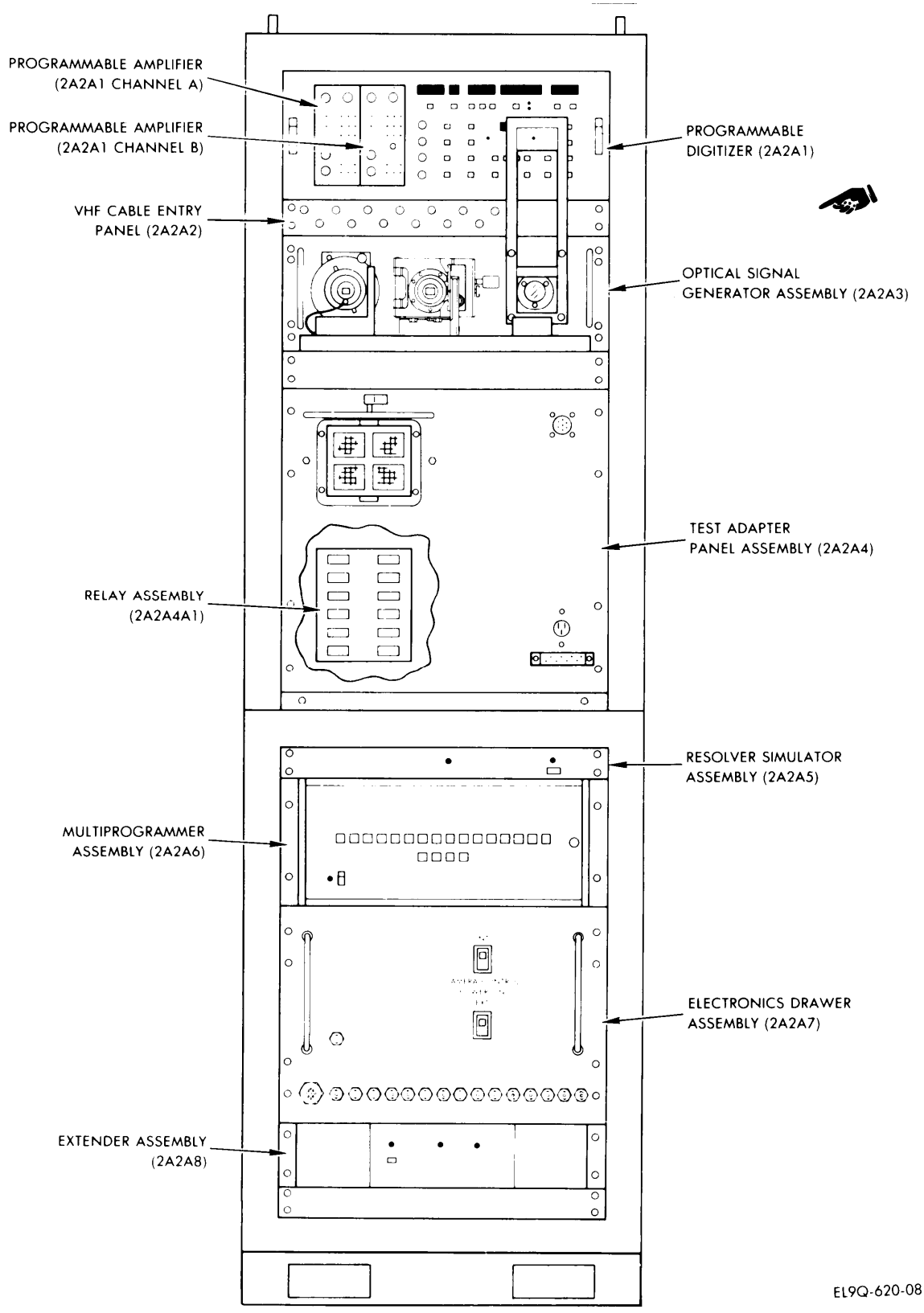
EL9LQ-610-83

Dayside Test Bench Without OSA Locator View (Front)



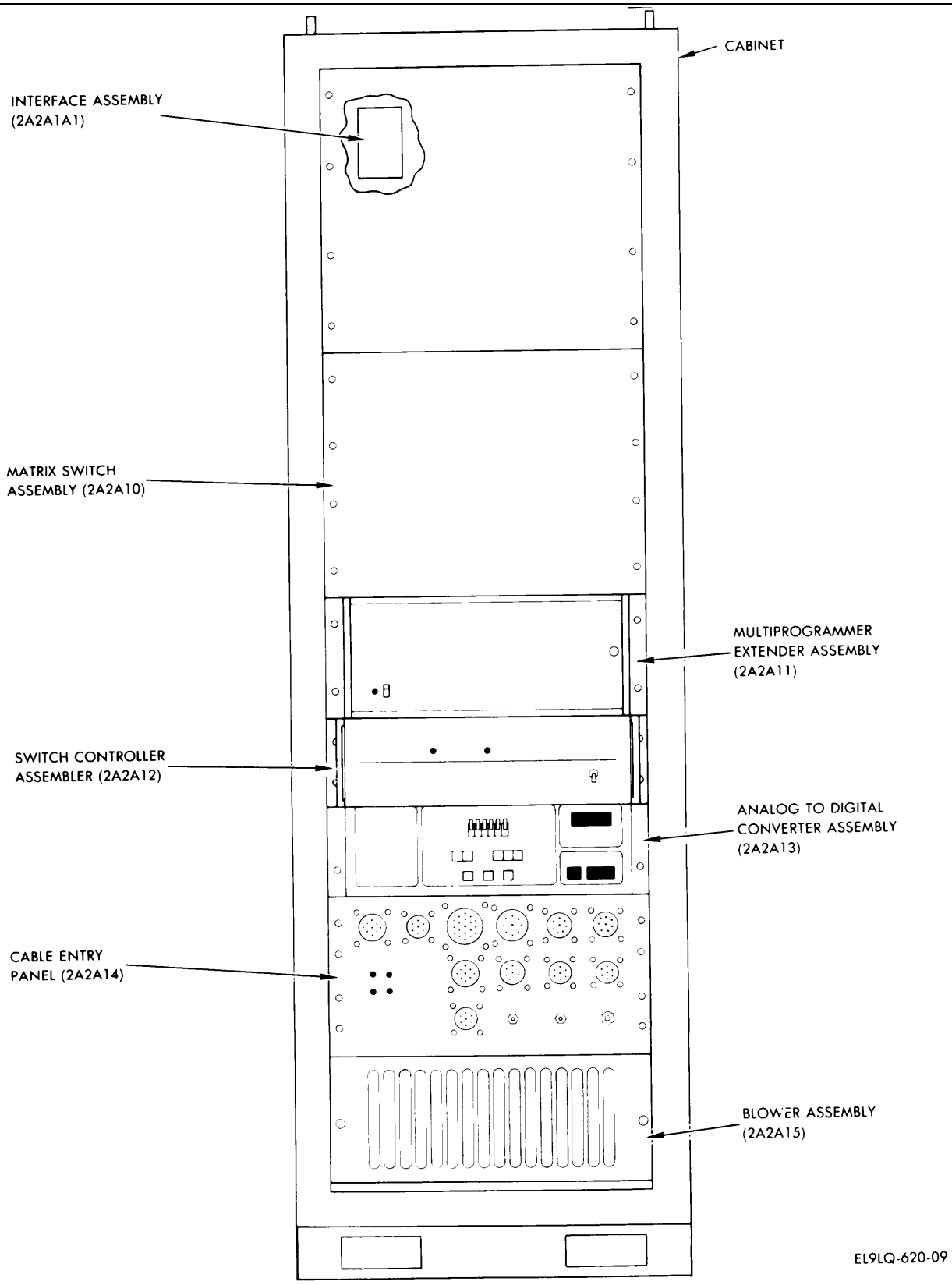
Dayside Test Bench Without OA Locator View (Rear)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16



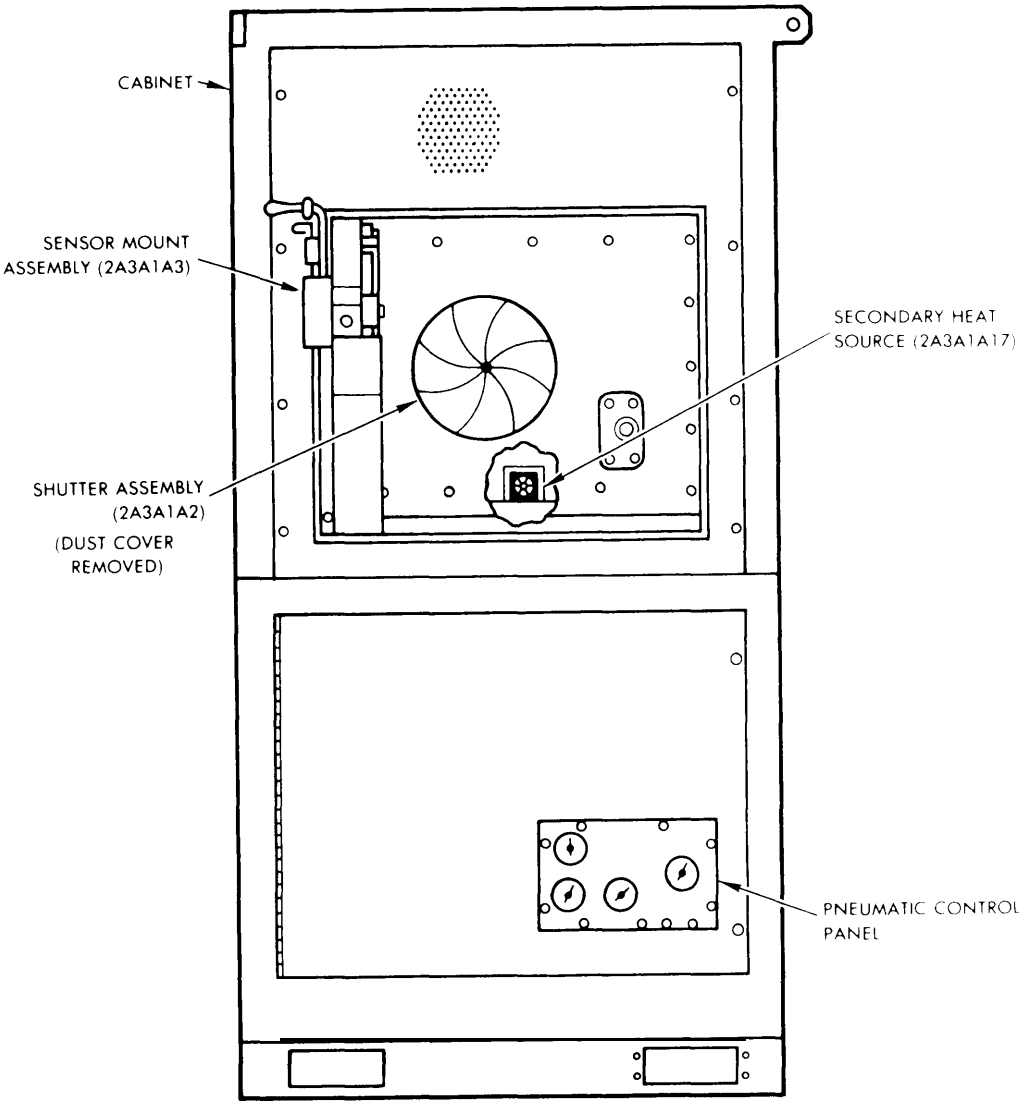
Test Console Test Bench Locator View (Front)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16



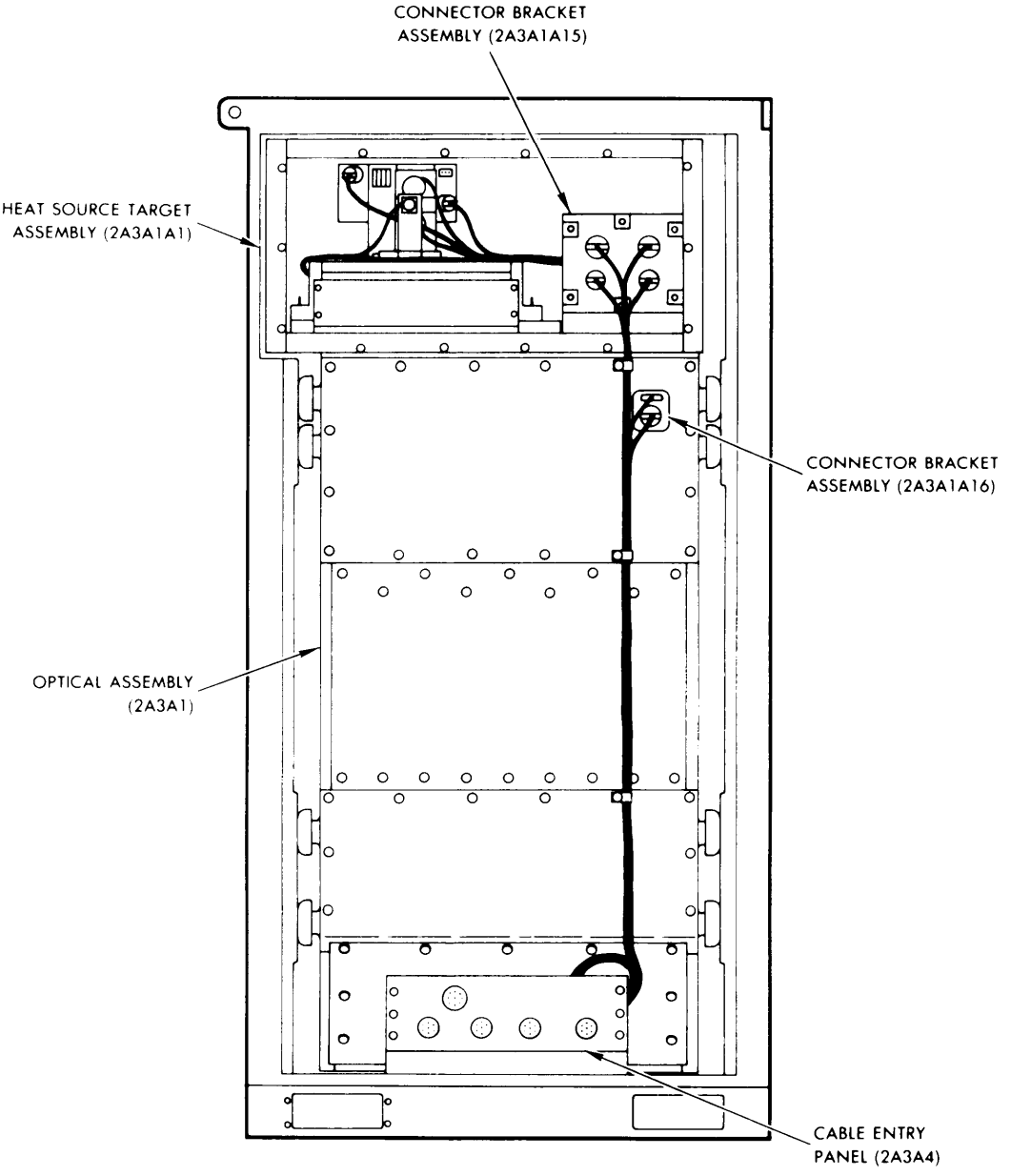
Test Console Test Bench Locator View (Rear)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16



Nightside Test Bench Locator View (Front)

1-16. EQUIPMENT LOCATOR VIEWS (cont) 1-16



Nightside Test Bench Locator View (Rear)

1-17. DIFFERENCES BETWEEN MODELS 1-17

There are no differences between models covered in this issue.

1-18. SAFETY, CARE, AND HANDLING 1-18

This equipment uses numerous optical devices that require extreme care be exercised when working around them. Refer to paragraph 2-29 for optical cleaning procedures and appropriate cautions.

There are several tests conducted on this equipment that use lasers. Be sure to follow all laser safety precautionary measures. Refer to the laser warning on the warning page of this manual.

Section III. PRINCIPLES OF OPERATION

1-19. PURPOSE 1-19

This paragraph explains the purpose of the EETF TADS/PNVS Augmentation Equipment. A brief functional description is given, followed by a more detailed description, of each of the units in the electronic station, dayside test bench, test console test bench, and nightside test bench. Also, the electro-optical (E/0) test bench set pneumatic leveling and isolation system is described. Finally, the test program sets (TPS) are described.

a. ELECTRONIC STATION

The electronic station functions as the control and communication link between the AN/USM-410 electronic equipment test station and the E/O test bench set. It provides electrical interface, buffering, power supplies and stimulus measurement. The following describes the purpose of each of the assemblies in the electronic station:

- Control unit assembly 1A1 - senses and controls IR heat sources, which are located in the nightside test bench.
- 488 controller power supply assembly 1A2 - provides digital to analog conversion for voltage control of the four programmable power supplies.
- Programmable power supply assembly 1A3 - supplies two voltages of O to 36 vdc, and two voltages of O to 75 vdc.
- DC power supply assembly 1A4 - supplies +15 vdc, -15 vdc, +5 vdc, and +28 vdc.
- AC control panel assembly 1A5 - provides control and protection of 115 vac for units in electronic station and E/O test bench set.
- PMT controller 1A7 - senses and controls temperature of PMT housing in OSA.
- Extender assembly 1A9 - extends the IEEE 488 bus between the test station, digital computer assembly 1A11, and E/O test bench set.

- Disc/tape drive assembly 1A1O - 132.1 megabyte storage device used in conjunction with the digital computer assembly.

- Digital computer assembly 1A11 - controls and programs the augmentation equipment for self test, calibration, and UUT testing.

b. ELECTRO-OPTICAL TEST BENCH SET

The E/O test bench set provides the electrical, optical, and mechanical interface with the UUT. It consists of the following assemblies.

- Dayside test bench
- Test console test bench
- Nightside test bench
- Pneumatic leveling and isolation system

(1) Dayside Test Bench. The dayside test bench provides the stimulus and test devices required to test those UUTs associated with day functions; television, and laser operations. It consists of two major assemblies:

- Optical signal analyzer (OSA) (E/O bench serial No. 00001 thru 00105)
- Inner module assembly

(a) The OSA provides the capability to test the heads down display (HDD), indirect view display (IVD), and heads out display (HOD). The test parameters checked are as follows:

- Brightness range
- Distortion
- Raster size
- Shading

(b) The inner module assembly is used to test the TADS day sensor assembly, laser transceiver unit, laser tracker/receiver, range receiver, and control panel assembly.

(c) The test parameters checked during testing of the day sensor assembly are:

- Boresight adjustment of the day sensor assembly vision optics (DVO) narrow field-of-view (NFOV).

- Alinement of the wide field-of-view (WFOV) to the NFOV on the DVO and TV optics.

- Verify the wide and narrow field-of-view to the optical center reference on the DVO and TV optics.

- Verify the focus range of the TV.

- Verify the ratio of the illuminance of the received vision to the illuminance of the actual image.

- Verify that the light beam after going through optics shows no loss caused by optics.

(2) Test Console Test Bench. The test console test bench serves as the control and communications link between the electronics station and the dayside and nightside test benches. The following describes the purpose of each of the assemblies in the test console test bench.

- Programmable digitizer 2A2A1 - measures pulses and waveshapes, which are stored in memory and compared against limits.
- VHF cable entry panel 2A2A2 - provides BNC connectors for cable hook-up during testing.
- Optical signal generator assembly 2A2A3 - tests TV sensor, E/O multiplexer, and visual multiplexer.
- Test adapter panel assembly 2A2A4 - provides interface-between the E/O test bench set and the major test adapter. The major test adapter is used during self-test and UUT testing.
- Multiprogrammer assembly 2A2A6 - converts a single input/output channel into multiple input/output channels.
- Electronics drawer assembly 2A2A7 - provides a video signal generator, motor control, temperature measurement, programmable pulse generators, video camera controls, and solid state relays.
- Extender assembly 2A2A8 - extends the IEEE 488 bus to the E/O test bench set.
- Matrix switch assembly 2A2A1O - provides 120 data lines to the UUT.
- Multiprogrammer extender assembly 2A2A11 - extends the number of input/output channels.
- Switch controller assembly 2A2A12 - provides commands for controlling the matrix switches.
- Analog to digital converter assembly 2A2A13 - processes analog signals to digital data.

(3) Nightside Test Bench. The nightside test bench is comprised of two major assemblies:

- Nightside optical assembly
- Pneumatic control panel

(a) The nightside optical assembly provides test devices to test the TADS night sensor assembly and the PNVS turret assembly.

(b) The test parameters checked during testing are as follows:

- Boresight alinement of the following:

  -NFOV to the optical center reference
  -Medium field-of-view (MFOV) to NFOV
  - WFOV to NFOV

- Range focus on the TADS NFOV

(c) The test parameters checked during testing of the laser transceiver unit are as follows:

- Boresight of laser transceiver
- Laser pulse energy per pulse
- Stability of laser pulse energy from pulse to pulse
- Divergence of laser beam does not exceed desired parameters
- No laser pulses are missed during transmission
- Average pulse width of laser beam remains constant
- Sensitivity of laser transceiver

(d) The test parameters checked during testing of the optical relay tube (ORT) are as follows:

- Transmittance of light energy in the ORT is within prescribed tolerances
- Ratio or the illuminance of the receiver image to the illuminance of the actual image

(e) The test parameters checked during testing of the laser tracker/receiver are as follows:

- Minimum detectable energy requirements
- Proper optical/electronic noise (shading) exists
- Ratio of illuminance of the received signal to the illuminance of the actual image is within the prescribed tolerance
- Verify minimum detectable signal (just above noise) using a temperature valve
- Verify amount of increase in . temperature required to change an image from noise to a completely black image

(f) The pneumatic control panel is located in the lower portion of the nightside test bench. It is used when any UUT with optical paths is tested to provide a stabilized platform for the E/O test bench set.

(4) Pneumatic Leveling and Isolation System. To provide a stabilized platform for the E/O test bench set, the cabinets are mounted to a base assembly which is supported by four air springs (isolators). The isolators control the orientation of the base (and the cabinets), therefore the preset orientation of the base with respect to the floor remains fixed.

c. TEST PROGRAM SETS

The test program sets (TPS) consists of hardware and software.

(1) Software. The software is on magnetic tape; each reel of tape contains the program for one UUT.

(2) Hardware. Hardware items include the following:

- Major test adapter
- Minor adapter assemblies
- Self-test connectors
- Cable assemblies
- Test fixtures
- Personality CCAs

(3) Testing Sequence. The testing sequence is as follows:

(a) Survey test
(b) Install interface device hardware
(c) Install self-test connector
(d) Run self-test of interface devices
(e) Remove self-test connector
(f) Install UUT
(g) Signature test
(h) Safe to power up
(i) Functional test

- If GO - next text
- If NO GO - fault isolation

a. GENERAL

The electronic equipment test facility (EETF) TADS/PNVS Augmentation Equipment is described briefly in this paragraph and in greater detail in subsequent paragraphs. The description is given in reference designation order. Refer to FO-1 for a block diagram of the EETF TADS/PNVS Augmentation Equipment. This paragraph describes the Augmentation Equipment in the following order:

- Electronic station
- Dayside test bench 2A1
- Test console test bench 2A2
- Nightside test bench 2A3

b. ELECTRONIC STATION

(1) Temperature Control Unit 1A1. The temperature control unit 1A1 (alternate: control unit assembly 1A1) is the controller used with three associated heat sources to make up an ambient range infrared (IR) source system. The heat sources are used in the nightside test bench optical assembly 2A3A1 to provide program controlled IR stimulus for performing the various types of IR tests on the TADS night sensor assembly and PNVS night sensor assembly UUTS.

(2) 488 Controller Power Supply Assembly 1A2. The 488 controller power supply assembly 1A2 receives data from the digital computer assembly 1A1O on the IEEE 488 bus and converts this data into analog signals. These signals are used to command the outputs of the programmable power supply assembly 1A3.

(a) The analog outputs are also applied to the A/D converter assembly 2A2A13 which changes the analog signal to digital data. The A/D converter serves as a high accuracy digital voltmeter.

(b) The analog outputs from the 488 controller power supply assembly (O to 10 volts with reference to analog common) are applied to the comparator circuits of four power supplies in the programmable power supply assembly 1A3. Internal feedback in each power supply is such that the O to 10 volts control the full output range.

(3) Programmable Power Supply Assembly 1A3. The programmable power supply assembly 1A3 output voltages are routed to relay assembly 2A2A4A1. When the relays in relay assembly 2A2A4A1 are energized, these voltages are applied to connector J1 on the test adapter panel assembly 2A2A4 and to matrix switch assembly 2A2A1O. The signals that energize the relays come from multiprogrammer extender assembly 2A2A11.

(4) DC Power Supply Assembly 1A4. The DC power supply assembly 1A4 consists of four power supplies. The output voltages (+28 vdc, +15 vdc, -15 vdc, +5 vdc) are routed to the cable entry panel 2A2A14 terminal block TB1. From there, the voltages are distributed throughout the electro-optical test bench set.

(5) AC Control Panel Assembly 1A5. The AC control panel assembly 1A5 contains five 15 ampere circuit breakers and a terminal block. The five circuit breakers supply 115 vac power to plug molds 1J1 and 1J2 in the electronic station, disc/tape drive assembly 1A1O, digital computer assembly 1A11, and plug molds 2A2W2A1 and 2A2W2A2 in the test console test bench.

(6) Photomultiplier Tube (PMT) Controller 1A7. The PMT controller 1A7 provides power to maintain the PMT at a constant temperature. The PMT is located in the dayside test bench optical signal analyzer 2A1A1. It is a measurement device for counting the number of photons being emitted by the CRT of the UUT.

(7) Extender Assembly 1A9. Extender assembly 1A9 consists of two HP-16 extenders, 1A9A1 and 1A9A2. Extender 1A9A2 is the input/output link between the TADS/PNVS augmentation equipment and the HP-IB extender connected to (and supplied with) the AN/USM-410 electronic equipment test station.

(a) The HP-IB extenders communicate with each other using 22-bit data frames. These data frames shuttle back and forth between extenders, continuously updating each with the current state of the devices and extenders at the other end.

(b) The data frames are transmitted serially between the HP-IB extenders. Upon arrival at the HP-IB extender, serial data is decoded and output in 16-bit parallel fashion.

(c) Parallel data from HP-IB extender 1A9A2 is applied to the digital computer assembly 1A10. The digital computer assembly transmits and receives data from HP-IB extender 1A9A1 via the IEEE 488 bus. Serial data shuttles back and forth between HP-IB extender 1A9A1 and HP-IB extender 2A2A8 in the text console test bench.

(8) Digital Computer Assembly 1A11. The digital computer assembly 1A11 provides interface and switching control between the AN/USM-410 electronic equipment test station and the TADS/PNVS augmentation equipment. The computer transmits and receives 16-bit parallel data to and from the following units:

- Extender assembly 1A9
- Control unit assembly 1A1
- 488 controller power supply assembly 1A2
- Multiprogrammer assembly 2A2A6
- Electronics drawer assembly 2A2A7

c. DAYSIDE TEST BENCH 2A1

(1) Optical Signal Analyzer 2A1A1. The OSA 2A1A1 (EO bench serial numbers 00001 thru 00105) is an electro-optical test device used to test the HOD and IVD UUTs. The UUT is loaded into the OSA and enclosed by a light-tight door when the test is in progress. The OSA consists of a photomultiplier tube (PMT), shutter, lens filter, focus lens, and a photon emitter assembly.

(a) The PMT is a measurement device used for counting the number of photons being emitted by the CRT of the UUT. (A photon is a unit of intensity of light.) The PMT is enclosed in a housing which is cooled by thermoelectric elements that pump heat to a heat exchanger, where a fan moves the heated air out of the OSA. There are temperature and overheat sensors used for temperature control. A shutter protects the PMT from damage due to continued exposure to light. The shutter is programmed to open during test operations.

(b) The PMT, shutter, lens filter, and focus lens are under program control. The PMT housing is controlled by PMT controller 1A7. The photon emitter assembly is used during self-test and is under program control.

(1.1) Adapter Panel Assembly 2A1A1. The adapter panel assembly (EO bench 00106 and up) is an electrical Interface used to route certain cable connections from inside the dayside test bench to its front panel. It contains no active components.

(2) Inner Module 2A1A2. The inner module 2A1A2 provides an enclosed test cell for the dayside test bench electrical and optical assemblies. The inner module contains the following assemblies:

- Optics assembly 2A1A2A1
- Shutter assembly 2A1A2A2
- Radiometer assembly 2A1A2A3
- Dayside sensor mount 2A1A2A4
- Laser fold mirror assembly 2A1A2A6
- Filter wheel/motor assembly 2A1A2A1O
- Lampholder assembly 2A1A2A11
- Automatic focus control assembly 2A1A2A12
- Beam sampler 2A1A2A13
- Laser cover assembly 2A1A2A19

(a) The optics assembly contains the laser simulator assembly, translator, and charged induced device (CID) video camera. The laser simulator assembly provides low-level laser energy for testing the sensitivity of the laser spot tracker and laser range receiver UUTS.

(b) The translator contains two mirrors, mounted on a linear translator, driven by a stepper motor. The translator moves the mirrors to three positions.

(c) The CID video camera is used to measure the laser beam divergence (spread) using an array of photodetectors. The video output is sent to the camera head control unit in the electronics drawer assembly 2A2A7, where the video images are changed to electrical signals.

(d) The shutter assembly is a safety device which prevents laser energy from escaping the inner module. It is opened by a solenoid, under computer command, during testing that uses the laser simulator or test lamp. Two optical switches sense the shutter open and shutter closed positions. The shutter is always closed during laser transceiver testing, If it is not closed, an interlock will prevent firing of the laser.

(e) The radiometer assembly detects laser radiation from the UUT and transmits output signals to an output connector on the VHF cable entry panel 2A2A2. Using TPS cables, these signals are routed to an input connector on the programmable digitizer 2A2A1, where they are converted to digital data for analysis by the computer. The radiometer is used for making laser power tests, detecting missed pulses, determining pulse width, and pulse-to-pulse energy stability.

(f) The dayside sensor mount assembly supports and positions the TADS dayside sensor assembly for testing. The UUT is locked in place by use of the sensor mount handle, which contains two optical switch assemblies that sense the lock and unlock positions. The dayside sensor mount assembly contains the following assemblies:

- Laser interface assembly
- Laser attenuator
- Laser safety shield assembly

(g) The laser interface assembly supports the laser spot tracker and laser range receiver UUTS for testing. A handle on the left side is turned to move the laser interface assembly right (carriage in) or left (carriage out). Two optical switches sense the carriage in and carriage out positions.

(h) The laser attenuator is located on the front of the laser interface assembly. It consists of an attenuator lens which is moved in and out of the optic path by a lever (attenuator handle). Two optical switches sense the attenuator in and attenuator out positions.

(i) The laser safety shield assembly is located between the laser interface assembly and the shutter assembly. The shield has a handle on the left side which is used to move the shield to the right (closed) and to the left (open). Before the shield can be opened, the laser interlock handle must be moved to the down position (unlocked). After the shield is closed the laser interlock handle is moved up to lock. This actuates the interlock actuator switch (part of the laser interlock circuit) and also mechanically locks the UUT mounting adapter, located inside the laser cover assembly. Two optical switches sense the shield open and shield closed positions.

(j) The laser fold mirror assembly consists of a two-position translator with a single fold mirror. The translator positions the mirror in the optic path to direct laser energy from the laser transceiver UUT to the CID video camera. The translator removes the mirror from the path to permit the optic port to be used for the laser spot tracker and optical device UUT testing. The mirror is “in” for laser transceiver unit UUT tests and “out” for all other devices. Two optical switches sense the “mirror in” and “mirror out” positions.

(k) The computer controlled filter wheel/motor assembly is located in the optic path between the beam sampler and the laser fold mirror assembly. The filter wheel/motor assembly consists of two flat filter disks, mounted approximately 1/2-inch apart on a hub assembly. The disk filters are continuously variable, neutral density filters with maximum density in the optic path when in the “home” position. This is the most counterclockwise position usable on the wheel. There is a clear 40-degree section of the wheel that is not used. The filter attenuates the laser energy being directed to the CID video camera to prevent clipping of the beam signal. The level of filtering is reduced as testing progresses to permit proper evaluation of the signal.

(l) The lampholder assembly contains a lamp which is used for alinement of the dayside test bench inner module during calibration.

(m) The automatic focus control assembly is located in the optic path between the filter wheel/motor assembly and the UUT. The computer positions the automatic focus control assembly to compensate for slight changes in focal path length due to temperature changes within the inner module. Focus adjustments are based on type of tests to be performed, and on the spectral range in use. The nominal is for the direct view optics spectrum and then adjustments are made for the TV spectrum, and the laser spectrum, and in every case for temperature shifts.

(n) The beam sampler assembly is located in front of the radiometer narrow beam attenuator; a part of the radiometer assembly. The beam sampler is an optical transferring device made up of a base and housing, two optical beam splitter lenses, and a protective cover. The purpose of the beam sampler is to split the laser beam path into two separate paths. One path is through the laser port inside the laser cover assembly and the other path is down through the filter wheel/motor assembly.

(o) The laser cover assembly forms part of the laser interlock circuit to prevent firing of the laser transceiver unit UUT without an enclosed shielded environment. Two door interlock switches and a key switch are part of the laser interlock circuit which must be enabled before the laser can be fired.

(3) Indirect View Display 2A1A3. The IVD is an electronic assembly located in in the rear of the dayside test bench. It is used to test the airborne IVD and the HOD UUTS. The dayside test bench IVD is identical to its airborne counterpart, except it does not contain five CCAS installed in the airborne IVD.

(4) Laser Power Supply Assembly 2A1A6. The laser power supply assembly is located in the rear of the dayside test bench. It receives 115 vat, 400 Hz 3-phase voltage from the major test adapter and returns 1000 vdc. It also receives +28 vdc from the major test adapter and returns 600 vdc.

(5) Laser Power Meter 2A1A7 and Radiometer Head 2A1A8. The laser power meter and radiometer head form a portable system used to measure the output of the laser tracker unit and laser transceiver UUTS.

d. TEST CONSOLE TEST BENCH 2A2

(1) Programmable Digitizer 2A2A1. The programmable digitizer 2A2A1 is used to digitize video (analog) inputs, which are accepted under program control by two plug-in amplifiers.

(a) Analog to digital conversion is performed by two special electron-bombarded semiconductor (EBS) tubes (one per channel).

(b) A signal from programmable pulse generator (PPG) #2 CCA in the electronics drawer assembly 2A2A7 is used to set trigger parameters on the basis of front panel input or commands received on the IEEE 488 bus.

(c) The programmable digitizer transmits a system clock signal to the video signal generator (VSG) in the electronics drawer assembly 2A2A7.

(2) VHF Cable Entry Panel 2A2A2. The VHF cable entry panel 2A2A2 contains 15 BNC connectors. Only three are used. One (J1) is connected by coaxial cable to the radiometer assembly 2A1A2A3, and two (J2, J3) are connected to the video signal generator in the electronics drawer assembly 2A2A7. These connectors are used during test to connect TPS or test instrument cables.

(3) Optical Signal Generator 2A2A3. The optical signal generator provides the optical stimuli needed to test and evaluate performance characteristics of the electro-optical multiplexer and TV sensor UUTs. Three photo-quartzline lamps provide the stimulus which is modified by filters and targets and routed to two optical outlet ports.

(4) Test Adapter Panel Assembly 2A2A4. The test adapter panel assembly 2A2A4 contains four connectors, a relay assembly, and a terminal block.

(a) Augmentation programmable interface connection (APIC) connector J1 connects 120 output lines from the matrix switch assembly 2A2A1O to the major test adapter.

(b) Dedicated interface unit (DIU) connector J6 connects lines from the matrix switch assembly 2A2A1O, electronics drawer assembly 2A2A7, and relay assembly 2A2A4A1 to external equipment.

(c) Connector J2 connects +28 vdc (supplied to connector J6 from an external source) to the external CID camera and external light. The voltage is routed from connector J6, through relay assembly 2A2A4A1 contacts to connector J2. Relay assembly 2A2A4A1 is program controlled.

(d) Connector J3 supplies 115 vac to external devices. The 115 vac is supplied by facility power and controlled by the AC control panel assembly 1A5.

(e) Relay assembly 2A2A4A1 is program controlled and contains 12 relays. Four of these relays are not wired.

(5) Deleted.

(6) Multiprogrammer Assembly 2A2A6 and Multiprogrammer Extender Assembly 2A2A11.

(a) The multiprogrammer assembly is the master control unit for the multiprogrammer system. The multiprogrammer extender assembly increases the system input/output capacity.

(b) The multiprogrammer assembly expands the 16-bit input, 16-bit output register of the digital computer assembly 1A1O to control up to 240 12-bit input or output channels.

(7) Electronics Drawer Assembly 2A2A7. The electronics drawer assembly 2A2A7 contains nine circuit cards used for motor control, temperature measurements, pulse generation, and signal multiplexing.

(a) A camera head/control unit receives video images, changes the images to electrical signals, and transmits these signals to a first-in-first-out (FIFO) memory CCA for temporary storage.

(b) AVSG receives pulses of information from the PPG CCAs and converts these pulses to video information and clock signals.

(c) A relay assembly contains 15 solid state relays which provide 13 functions for the E/O bench set.

(8) Matrix Switch Assembly 2A2A1O and Switch Controller Assembly 2A2A12. The switch controller assembly 2A2A12 translates switch-unit command messages, present on the IEEE 488 bus, into command and timing signals that control the matrix switch assembly 2A2A1O. The controller also provides a switching self-test function for both the controller and the matrix switch assembly.

(a) In addition, the switch controller assembly provides +5 vdc logic power and +12 vdc relay power for the matrix switch assembly.

b) The matrix switch assembly allows any one of the 16 inputs to be connected to any one of 120 outputs.

(c) The inputs are as follows:

- 1-10 - ten inputs from DIU connector J6 on the test adapter panel assembly 2A2A4.
- 11-15 - five inputs from analog to digital converter assembly 2A2A13.
- 16 - this input is grounded.

(d) The outputs are as follows:

- T/P 1-1 20 - 120 output lines routed to APIC connector J1 on the test adapter panel assembly 2A2A4.

(9) Analog to Digital Converter Assembly 2A2A13. The analog to digital converter assembly 2A2A13 is a data acquisition and distribution system used to process analog signals to digital data.

(a) Input signals from the motor control driver CCA and temperature measurement CCA in the electronics drawer assembly 2A2A7, optical signal generator 2A2A3, and multiprogrammer extender 2A2A11 are scanned by high-speed multiplexing techniques under program control.

(b) Each of four input signals from 488 controller power supply assembly 1A2 are isolated and multiplexed to the analog bus under program control.

(c) Simultaneous sample and hold signals and a trigger signal from matrix switch assembly 2A2A1O are interrogated and put on the analog bus.

(d) Digital output is applied to the multiprogrammer assembly 2A2A6 and to the bus multiplexer CCA in the electronics drawer assembly 2A2A7.

e . NIGHTSIDE TEST BENCH 2A3

(1) Nightside Optical Assembly 2A3A1. The nightside optical assembly provides program controlled infrared (IR) signals to the TADS nightside assembly and PNVS UUTs. The nightside assembly contains three heat sources, designated A, B, and C, which are controlled by the control unit assembly 1A1. Heat sources A and B are in the heat source target assembly and heat source C (secondary heat source) is inside the nightside test bench optical assembly, directly behind the shutter assembly. The nightside optical assembly contains the following assemblies:

- Heat source target assembly 2A3A1A1
- Shutter assembly 2A3A1A2
- Sensor mount assembly 2A3A1A3
- Secondary heat source 2A3A1A17

(a) The heat source target assembly 2A3A1A1 contains heat sources A and B which are mounted above an aperture wheel and target assembly. The aperture wheel and target wheel are used in-conjunction with the-heat sources to provide the stimulus pattern for performing various IR tests. Five mirrors are used to collimate the energy and route it to the shutter assembly aperture.

(b) The target wheel and aperture wheel are driven to different positions depending upon the test requirement. The target wheel, mounted below the aperture wheel, has 10 positions, and the aperture wheel has four. A single four-phase stepper motor, which drives both wheels through two magnetic clutches (one for each wheel), is activated by the motor control CCAs in the electronics drawer assembly 2A2A7. Each clutch rotates a coupling to a gear train which drives a belt on a sprocket, which in turn moves the target wheel and aperture wheel.

(c) The shutter assembly provides a protective overlapping cover to the nightside optical assembly. A rotary solenoid drives an arm to rotate the shutter ring. Rotation of the ring pulls open the seven shutter vanes, and a coiled spring provides closure. Two mechanical stops are mounted on the bottom of the ring to limit rotation. Two optical sensors provide shutter open and shutter closed signals to the motor control CCAs.

(d) The sensor mount assembly uses a locking handle to secure the nightside sensor assembly UUT. The forward position of the handle (toward the nightside optical assembly) unlocks the UUT by retracting the four locking cams. In the rear position (away from the nightside optical assembly) the four locking cams are extended to the sensor. Two optical sensors are used to sense the open and closed positions.

(e) The secondary heat source (c) provides an IR source for the wider field-of-view of the PNVS UUT. Sources B and C are always referenced to the precision (A) source. Only one source (B or C) can be selected at a time.

1-21. ELECTRONIC STATION 1-21

a. GENERAL

Refer to FO-2 for a block diagram of the electronic station. The electronic station is described in the following order:

- Control unit assembly 1A1
- 488 controller power supply assembly 1A2
- Programmable power supply assembly 1A3
- DC power supply assembly 1A4
- AC control panel assembly 1A5
- PMT controller 1A7
- Extender assembly 1A9
- Disc/tape drive assembly 1A1O
- Digital computer assembly 1A11

a.1 TEMPERATURE CONTROL UNIT 1A1

(1) General. The temperature control unit (FO-2.1) consists of the temperature controller, three blackbodies (heat sources), and an ambient probe. These items together make up an ambient range IR source system. A blackbody contains a surface that emits high IR radiation, the exact temperature of which is controlled by the temperature controller. The temperature control unit thus provides an accurate source of IR energy. In addition, the temperature difference between the blackbody and some other surface may be controlled, providing a precise energy contrast. One of the blackbodies, designated source A, can be controlled in two modes: absolute or differential. In absolute mode, the absolute temperature of the blackbody is set directly in degrees C. In differential mode, the temperature of the blackbody is set relative to the ambient sensor. The two other blackbodies, designated source-B and source C, can be controlled in differential mode relative to source A. Either source B or source C can be controlled, with the other source in an unpowered idle state.

Temperatures may be set either from thumbwheel switches on the front panel, or through the GPIB (IEEE standard 488) interface. The absolute temperature of any source, as well as its differential temperature, can be displayed on the front panel. In addition, the absolute temperature of any source, as well as the differential temperature of source A, may be read through the GPIB.

(2) Temperature Measurement. The A/D converter measures resistances between approximately 150 to 360 ohms with a resolution of 0.0002 ohms. Used with a 200 ohm platinum resistance thermometer (PRT), this allows measurement of temperatures between -60 and +200°C with a resolution of 0.0005 degrees. Two A/D converters are used. One measures the ambient (reference) probe and the PRT in source B. The other measures the PRTs in sources A and C. The multiplexer is operated in a temperature controlled oven for maximum stability. It switches control and temperature data between the probes and the A/D converters.

(3) Temperature Control. The temperature controller contains an analog servo loop which controls the temperatures of the blackbodies. The microprocessor controls the set-point of the loop. The set-point is continually adjusted based on the temperature measurement data available to the microprocessor.

(4) Input/Output. The front panel interface is the link between the microprocessor and the control panel. Interfaces are provided for Up to four 8-digit displays, thumbwheel switches, and pushbutton switches. A joystick is plugged into a front panel connector for use during equipment calibration.

(5) STD Bus. The STD bus standardizes the physical and electrical aspects of the modularized pc cards used in the temperature control unit. The standardized pinout and 56-pin connector scheme lend themselves to a bussed backplane that permits any card to work in any slot. The standard bus is dedicated to internal communications. Peripheral and input/output devices can be connected to the system according to their own unique connector and cabling requirements.

(6) IEEE STD 488 Interface. A digital interface conforming to IEEE standard 488-1978 allows the temperature control unit to communicate with the other equipment. A DIP switch on the rear panel is used to set the IEEE bus 5-bit binary address of the device.

b. CONTROL UNIT ASSEMBLY 1A1 (ALTERNATE)

(1) General. Control unit assembly 1A1 (FO-3) is the controller used with three associated sources to make up an ambient range IR source system. In order to describe the function of the controller the complete system is covered, even though the three heat sources are located in the nightside test bench. Each heat source contains a bidirectional thermoelectric heater/cooler assembly and a platinum resistance thermometer (PRT). They are of a special structure and have a black, high-body sources or blackbody IR emitters; hereafter called emitters. In addition, emitter A has a connector from which a cable with a PRT (hereafter called sensor) extends to sample ambient air temperature.

(2) Ambient Sensor. The temperature range of the ambient sensor is from 00.00 to 99.99°C. It is displayed on the ΔTEMPERATURE °C digital panel meter when the temperature display control switch is set to the AMBIENT position. (Δis the delta symbol, used to indicate change.) Temperature changes cause the resistance of the sensor to change. This change is converted to electrical signals in the ambient sensor amplifier, then applied to the summer and to the combined circuitry of the temperature display control and the COMPUTER/PANEL CONTROL switch. These signals are indicated by the ΔTEMPERATURE °C digital panel meter and applied to the binary-coded decimal (BCD) output bus and to the IEEE 488 bus interface.

(3) Emitter A. Emitter A has a 2-inch square radiating surface, precisely controlled in O.O1°C increments. Emitter A may be controlled automatically to an absolute temperature set point, or it may be slaved to track the ambient sensor. When tracking the ambient sensor, a fixed amount of temperature offset may be added to, or subtracted from the emitter A temperature (differential temperature).

(a) A temperature setting for either an absolute or differential emitter A temperature is set on the four-digit EMITTER ΔTEMPERATURE SET thumbwheel switch. The BCD output of the thumbwheel switch is converted to an analog signal in a digital to analog converter and applied to the summer.

(b) Output of the summer is integrated and used to drive a power amplifier which regulates the power applied to emitter A. Variations in resistance of sensor A are applied to sensor A amplifier whose output is entered into the summer. In the summer, the output of the sensor A amplifier is compared to the output of the EMITTER A ΔTEMPERATURE SET thumbwheel switch (coming from the digital/analog converter).

(c) When the output of the integrator stabilizes (as it nears the temperature set into the thumbwheel switch), the FLAG indicator lights, indicating that the temperature of emitter A is within 0.02°C of the preset temperature. At the same time, a digital flag signal is sent to the IEEE 488 bus interface.

(4) Emitters B and C. Emitters B and C, which are physically identical, have a 1.5-inch square radiating surface, controlled in l.O°C increments, relative to the temperature of emitter A.

(a) Emitters B and C share a single sensors B and C amplifier, summer, integrator, power amplifier, and the two-digit ΔTEMPERATURE SET thumbwheel switch. As a result, emitter C cannot function while emitter B is in operation and emitter B cannot function when emitter C is in use.

(b) Emitters B and C are slaved to the set point temperature of emitter A. They can only have the same temperature or a higher temperature offset relative to emitter A. Offset temperature values on the two-digit ΔTEMPERATURE SET thumbwheel switch are in BCD format and pass through a digital to analog converter to the summer.

(c) This digital to analog signal is compared to the output of the sensors B and C amplifier and to the signal from the summer in the emitter A circuitry. The resultant signal is integrated and applied to the power amplifier to heat or cool the thermoelectric element in the emitter. As the thermoelectric element heats or cools, the resistance of the sensor changes. This changing resistance of the sensor is applied to the sensors A and B amplifier and supplied to the summer.

c. 488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2

(1) General. The 488 controller power supply assembly 1A2 (FO-4) receives data from the computer on the IEEE 488 bus and converts this data into analog signals which are in turn used to command the outputs of four programmable power supplies.

(2) Interface. Data flow is asynchronous, ensuring compatibility among devices with varying response times. Asynchronous transmission is accomplished by means of the three handshake lines (DAV, NRFD, and NDAC). The state of the interface is determined by the listen mode flip flop. If the interface listen address is received while line ATN is low, the flip flop is set and the interface enters the listener-addressed state. If the unlisten command is received while line ATN is low, the flip flop is reset and the interface exits the listener-active state. While the interface is in the listener-addressed state, ASCII data received via the IEEE 488 bus is converted to hexadecimal format by the read only memory (ROM) and passed to the backplane.

(3) Programmer CCAs The four programmer CCAs are plugged into the backplane and receive digital input signals in the form of hexadecimal data bytes. Since the circuitry in the four programmer CCAs are identical, the following description applies to all. A total of nine data bytes, plus a data transfer strobe following each byte, constitutes a complete instruction sequence.

(a) The first three data lines and the address select switches are monitored by the card address detector. If the content of the three data lines and the switch positions coincide, the card address is correct and the MCA signal is applied to the control logic. If the subsequent incoming signal is identified as the ASCII character "=" on its separate line, the control circuit enables the transfer of the next seven data bytes, as well as a shift and a latch signal, across the opto-isolators.

(b) The data bytes are now entered into the shift registers by means of the shift command, which enables the shift registers until all seven data bytes are placed. Following the last data byte, the latch command strobes the parallel data into the latches. The data bytes representing the channel A and channel B fields are applied to the digital to analog converters (DAC-A, DAC-B), while the range and polarity byte is transferred to the control circuits within the programmable amplifiers to establish the amplifier polarity and output ranges. Channel A supplies O to ± 10 volts, with reference to analog common, and Channel-B supplies O to ± 1 volt, with reference to analog common, to programmable power supply assembly 1A3.

d. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3

(1) General. The programmable power supply assembly 1A3 (FO-5) consists of four power supplies (PS1-PS4). PS1 and PS2 are adjustable form O-36 vdc output. PS3 and PS4 are adjustable from O-75 vdc output. Refer to FO-9 for dc power distribution diagram. Circuits of the four power supplies are identical, therefore the following description applies to all. The power supply is basically a voltage and current stabilized dc source with a sharp crossover between the voltage and current mode of operation, A linear series pass element is controlled by either the current control channel or the voltage control channel. The operating mode is determined by the value of the front panel adjusted (or externally controlled) output voltage and output current, and by the magnitude of the load resistance.

(2) Voltage Mode. In the voltage mode of operation, the voltage comparator amplifier senses any change in the output voltage by comparing it to a reference potential, developed by the voltage control amplifier. When a change is detected, an error signal is amplified and becomes a control signal for the driver stage. The control signal is applied, via the driver stage, to the pass element which increases or decreases its conductance in response to the driver signal as required to maintain the output voltage at the desired value.

(3) Current Mode. In the current mode of operation, the current comparator amplifier senses any change in the output current by comparing an amplified sensing voltage to a reference potential, developed by the current control amplifier. When a change is detected, an error signal is amplified and becomes a control signal for the driver stage. The control signal is applied via the driver stage to the pass element, which increases or decreases its conductance in response to the driver signal as required to maintain the output current constant and vary the output voltage proportionally.

(4) Output Control. The internal feedback components in the voltage, as well as in the current control channel, are such that a O to ±10 vdc signal applied to the voltage comparator amplifier, or O to ±1 vdc applied to the current comparator amplifier, controls the full output range. 'For local (front panel) control of the output quantities, a control amplifier is used in a similar manner for the voltage as well as for the current channel to produce the required O to ±10 vdc or O to ±1 vdc control signal.

(5) Overvoltage. A portion of the output voltage is taken from the sense terminals and continuously compared at the overvoltage comparator to a reference voltage, produced by the overvoltage reference amplifier, and adjusted by the CROWBAR SET LEVEL control on the front panel. The circuit is inactive as long as the output voltage sample stays below the reference voltage. If an overvoltage occurs, the overvoltage comparator produces an output signal which turns the crowbar on, and lights the CROWBAR indicator on the front panel. When the crowbar is on, the power supply output is shorted and the front panel circuit breaker is tripped. The front panel CROWBAR DISARM pushbutton (when depressed) disables the crowbar when adjusting the CROWBAR SET LEVEL control. The CROWBAR indicator is not affected.

e. DC POWER SUPPLY ASSEMBLY 1A4

(1) General. The dc power supply assembly 1A4 (FO-6) consists of four power supplies (PS1-PS4). PS1 supplies +28 vdc, PS2 supplies +15 vdc, PS3 supplies -15 vdc, and PS4 supplies +5 vdc, for system operation. Refer to FO-34 for dc power distribution diagram. Circuits of the four power supplies are identical, the following description applies to all.

(2) Voltage and Current Control. Source voltage of 115 vac is converted to a usable level by the power transformer. The power transformer is connected in series with the pass element and the sensing resistor, thus producing dc output voltage.

(a) Output voltage is constantly compared to the reference voltage in the IC regulator (adjusted by the voltage adjust) while the output current is monitored across the sensing resistor. Any variation in either the output voltage or the output current produces an error signal which is amplified by its associated amplifier in the IC regulator and transferred as a command to the driver.

(b) The pass element responds to the driver signal by changing its series resistance. It either corrects for variation of the output voltage or, if the signal from the current amplifier is dominant, it tends to cut off the output, limiting the output current to the preadjusted value of the current adjust.

(3) Overvoltage. If the output voltage exceeds the zener reference level, a crowbar turn-on signal is produced. The signal is amplified and applied to the crowbar circuit. The crowbar is turned on, shorting out the power supply output until the ac input power is recycled.

f. AC CONTROL PANEL ASSEMBLY 1A5

(1) General.The ac control panel assembly 1A5 (FO-7) consists of five 15 ampere circuit breakers (CB1-CB5) and a terminal block (TB1). Refer to FO-33 for ac power distribution diagram.

(2) Circuit Description

(a) Facility power of 115 vac is applied to the ac control panel assembly on three wires (neutral, ground, and hot). The neutral wire is connected to TB1, terminal 1 (terminals 1-4 are connected), and the ground wire is connected to TB1, terminal 11 (terminals 11-16 are connected). The hot wire is connected to TB1 (terminals 6-9) and then connects to the line side of circuit breakers CB1 thru CB5. All of the output cables neutral and ground wires are connected together at their respective terminals, while the hot wires are switched by circuit breaker CB1 thru CB5. The circuit breakers function normally as on-off switches and if the delivered current exceeds 15 amperes they disconnect the circuit. To reset, the circuit breaker handle must first be set to OFF, then to ON.

(b) Circuit breaker CB1 supplies power to electronic station plugmold 1J2, CB2 supplies power to electronic station plugmold 1J1, CB3 supplies power to electronic station disc/tape drive assembly 1A1O and digital computer assembly 1A11, CB4 supplies power to test console test bench plugmold 2A2W2A2, and connector 2A2A4J3, and CB5 supplies power to test console test bench plugmold 2A2W2A1.

g. PMT CONTROLLER 1A7

(1) General. The PMT controller 1A7 (FO-8) provides power to maintain the optical signal analyzer 2A1A1 PMT at a constant temperature. When describing the function of the PMT controller, the complete system is discussed.

(a) The PMT housing unit is cooled by two thermoelectric elements pumping heat to a heat exchanger, where the heat is removed by a fan. A thermistor (sensor) mounted in the cold area of the housing monitors temperature.

(b) When the PMT controller is first turned on, it will pump current through the elements. This cools the housing and lowers the temperature of the sensor. The resistance of the sensor increases as the temperature decreases until the temperature of the housing is equal to the temperature preset by the front panel temperature control.

(2) Voltage. Line voltage of 115 vac is supplied to the voltage transformer and PMT housing fan through the POWER switch/indicator and power relay. From there it is rectified and sent to the input of the power amplifier.

(3) Control

(a) A temperature reference point voltage is established by the temperature control. This voltage is summed in a differential amplifier with the PMT housing temperature sensor voltage through the temperature sensor amplifier. The differential amplifier output is proportional to the difference between the actual temperature of the cooled housing and the temperature point set by the temperature control. This difference voltage is amplified by the driver (which drives the power amplifier) and supplies current to the temperature elements in the PMT housing.

(b) The scope drive amplifier subtracts the temperature control reference voltage from the output of the differential amplifier and its output is used to monitor the temperature control voltage at the rear panel SCOPE DRIVE connector.

(4) Overload. If a cooling system failure occurs, the overheat thermistor (sensor) increases in temperature, thus decreasing its resistance. The decrease in resistance causes the overheat sensor amplifier to energize the overload relay. When the overload relay energizes, it causes the power relay to reenergize and turn off the power supply. With the POWER switch/indicator turned on and the power supply deactivated, the OVERLOAD indicator turns on. After the PMT housing overheat condition passes, the PMT controller can be reactivated by pressing the RESET switch.

h. EXTENDER ASSEMBLY 1A9

(1) General. The extender assembly 1A9 (FO-9) consists of two HP-IB extenders (1A9A1, 1A9A2). Extender 1A9A2 transmits and receives serial data from the HP-IB extender connected to, and supplied with, the AN/USM-410 electronic equipment test station. Extender 1A9A1 transmits and receives serial data from the HP-IB extender 2A2A8 in the test console test bench. Both extenders transmit and receive 16-bit parallel data from the digital computer assembly 1A10 or 1A11.

(2) Receive Mode

(a) A data frame arrives as a string of 22 bits at the receive coupler. As the data passes through the receive coupler, it is synchronized with an internal clock.

(b) From the receive coupler, the data frame is clocked into the decoder. After decoding, it is clocked into the 16-bit data register where the four parity bits, start bit, stop bit, and frame reject signal are checked. If correct, the 16 data bits are converted from serial data to parallel data and loaded into the parallel register.

(c) The parallel data is transferred to the IEEE 488 bus interface where a status check is performed, the handshake sequence between extenders is performed, and the data frame is put onto the IEEE 488 bus.

(3) Transmit Mode. After the receive data frame has been accepted and the handshake sequence completed, the HP-IB extender assembles a return frame. The return frame is passed to the 16-bit data register, clocked into the encoder, encoded into a transmit data frame, and transmitted over coaxial cable by the transmit driver.

i. DISC/TAPE DRIVE ASSEMBLY 1A1O

(1) Disc/tape drive assembly 1A1O (Hewlett Packard HP7914R) consists of a chassis assembly, tape drive assembly, disc drive assembly, power supply assembly, and CCA card cage.

(2) The disc drive is a medium performance, random access, data storage device with a formatted storage capacity of 132.1 megabytes. The disc module includes an electromagnetic rotary head positioning system, spindle, spindle and blower motor, air filtration and cooling system, and-associated electronic components.

(3) The power supply is mounted to the rear and contains a transformer, filter capacitors, ac input circuitry, fuses, and power regulator.

(4) The cartridge tape unit uses a preformatted data cartridge. Data is loaded onto the disc drive via the cartridge tape unit. Also data copies can be made by loading data from the disc drive onto a cartridge tape.

(5) The CCA card cage is located and accessible from the front of the chassis assembly. CCAs are located in slots and provide for tape control, disc control, and HPIB interface bus.

(6) Internal diagnostics are used to detect and isolate malfunctions within the disc/tape drive assembly. These diagnostics are automatically performed during power-up, while the drive is idle, or when manually initiated. The diagnostic program is resident in the microprocessor CCA.

i.1. DIGITAL COMPUTER ASSEMBLY 1A11

(1) General. Digital computer assembly 1A11 (FO-1O.1) consists of a backplane, power supply the following CCAs:

- Control store A1
- Sequencer A2
- Data path A3
- Cache control A4
- Memory controller A5
- Memory A6
- HP-IB interface A7/A11
- Asynchronous serial interface A8
- IEEE interface A9
- Priority jumper A1O
- Parallel interface A12
- Buffer interface A13

(a) The backplane is a multilayered printed circuit card which contains plug-in connectors for CCAs and power supply. It provides the electrical interfaces required for power distribution, address bus, data bus, and control lines. Each I/0 interface CCA contains circuitry to standardize the I/0 interface to the backplane.

(b) The power Supply is contained on a single CCA which plugs into the backplane. It supplies +5 vdc, +12 vdc, and -12 vdc. Power is distributed by the backplane interface to all CCAs.

(2) Input/Output Function. The I/0 function allows data transfer between the computer and external devices. Data can be transferred under CPU control or directly into or out-of memory.

(a) Direct memory access (DMA) allows data transfer directly into or out-of memory by passing the CPU. Each I/0 interface CCA contains circuitry for direct memory accessing. Once DMA is initialized, the complete routine is handled by the I/0 interface CCA. This transfer routine occurs as follows:

- To memory: (1) between external device and its I/0 interface CCA, and
  (2) between I/0 interface CCA and memory via the backplane data bus.
- To external device: (1) between memory and I/0 interface device via the backplane data bus, and
  (2) between I/0 interface CCA and external device.

(b) A CPU or programed I/0 transfer allows the CPU to manipulate data during the transfer process. Transfer of data to and from memory is the same as that discussed during a DMA transfer. The difference is that all data is under CPU control. This transfer takes a little longer. DMA transfer is quicker and especially useful with high-speed devices.

(3) Input/Output Priority.

(a) Input/output priority is established by CCA position within the card cage or backplane. CCA located in position A1 has highest priority while CCA in position A13 has lowest priority. Control store CCA occupies position A1 while I/0 interface CCAS begin at position A7. HP-IB interface CCA at position A7 has highest I/0 priority while buffer interface CCA A13 has the lowest priority.

(b) When an input/output device is ready to be serviced, it causes its I/0 interface CCA to request an interrupt so that the computer will interrupt the current program and service the device. With the I/0 interface CCA supplying its select code to the address bus, an instruction in memory caused a program jump to the service routine for that select code. The instruction automatically saves the return address for a later return to the CPU program.

(4) Input/Output Addressing. An external device is connected by cable directly to an I/0 interface located In the computer mainframe. The I/0 interface, in turn, plugs into one of the input/output slots in the backplane. Note that the select code (I/0 address) of each interface is independent of its priority. The computer communicates with a specific device on the basis of its select code, which is set by switches on the I/0 interface CCA.

(5) Input/Output Processing. Most I/O instructions are executed by an input/output processor (IOP) chip on each I/0 interface CCA. When an I/0 interface CCA determines it should execute the instruction fetched, it also decides if execution will require interaction with the CPU.

(a) If the CPU is needed:

- The interface requests an I/0 handshake with the CPU.
- The CPU acknowledges the I/0 handshake request after DMA requests are complete.
- The interface that requested the handshake responds by driving a command work onto the data bus at completion of the handshake.

(b) I/0 instructions are broken down into three groups:

- Data transfer I/0 instructions
- Status sensing I/0 instruction
- Status altering instructions

1-22. ELECTRO-OPTICAL TEST BENCH SET 1-22

a. GENERAL

The electro-optical test bench set is comprised of a dayside test bench, test console test bench, and a nightside test bench, mounted to a common base assembly. The base assembly together with the pneumatic system (FO-11) provides Support, leveling, and isolation of the electro-optical test bench set. The dayside test bench, test console test bench, and nightside test bench are described in paragraphs 1-23, 1-24, and 1-25.

b. PNEUMATIC LEVELING AND ISOLATION SYSTEM

(1) Pneumatic Isolators. The E/O bench assembly is supported by four air springs (isolators) controlled by three height sensing servo valves. When the isolators are deflated, the E/O bench assembly rests on four pivot plates. (The pivot plates fit into pivot plate sockets on the base assembly.) The three master isolators (isolators with servo valves) control the height of the base assembly. Once the system is activated and operating height adjusting screws are locked, the base assembly maintains its height and remains level, even though the total weight and/or center of gravity varies. This function is performed by the height sensing mechanical servo valves. When the load on each master isolator is balanced by the internal air pressure, both sides of the servo valves remain closed. When the load is decreased, the bleed side of the valve opens and releases pressure. The preset position of the base assembly with respect to the floor remains fixed.

(2) Pneumatic Control Panel. Air pressure (maximum 125 psi) from a facility air supply is supplied to an on/off valve on the pneumatic control panel. When the valve is opened (on or down position) air is routed through an air filter to an air regulator. The air regulator is used to reduce air supply pressure to an operating pressure. From the air regulator, air is routed through the REGULATED AIR PRESSURE gage to three servo valves. The three servo valves are attached to isolators number 1, number 2, and number 3. Isolator number 4 (located at rear of dayside test bench) is controlled by the servo valve attached to isolator number 3. Air pressure from each servo valve output is monitored by a gage on the front of the panel.

a. GENERAL

Refer to FO-12 for a block diagram of the dayside test bench. The dayside test bench is described in the following order:

- Optical signal analyzer 2A1A1
- Inner module 2A1A2
- Indirect view display 2A1A3
- Laser power supply assembly 2A1A6
- Laser power meter 2A1A7
- Radiometer head 2A1A8

b. OPTICAL SIGNAL ANALYZER 2A1A1 (EO BENCH SERIAL NUMBERS 00001 THRU 00105)

(1) General. The optical signal analyzer (OSA) 2A1A1 (FO-13) is an electro-optical test device used to test the HOD, IVD, high voltage power supply and pulse forming network UUTs. The UUT is loaded into the-analyzer and enclosed by a light-tight door when the test is in progress. The OSA consists of the following assemblies:

- Photon emitter assembly 2A1A1A3
- Bracket assembly 2A1A1A4
- Main access door interlock switch 2A1A1A5
- Power supply assembly 2A1A1A6
- Photomultiplier bracket assembly 2A1A1A7
- Interface assembly 2A1A1A8
- Tray assembly 2A1A1A9
- PMT access door interlock 2A1A1A11
- Relay assembly 2A1A1A12
- Filter and detector assembly 2A1A1A14

(2) Photon Emitter Assembly 2A1A1A3.

(a) The photon emitter assembly 2A1A1A3 consists of a CCA and a cover assembly. The CCA contains a resistor and green diffused LED. The LED is the test light source situated behind a mask of hole patterns that provides a monitoring source for the photomultiplier tube.

(b) A digital output signal OA TEST SOURCE from the multiprogrammer assembly 2A2A6 controls the operation of the photon emitter assembly.

(3) Bracket Assembly 2A1A1A4. The focus lens is mounted directly in front of the CRT of the UUT and is part of the UUT mounting bracket (bracket assembly 2A1A1A4).

(a) Signals OSAF 01, OSAF 02, OSAF 03, and OSAF (04 from the motor control driver CCA in the electronics drawer assembly 2A2A7 drive 4-phase stepper motor M1, which positions the focus lens. Full travel of the focus lens lead screw requires 32,000 steps.

(b) Signals OSAF EN1 and OSAF EN2 from stepper motor M2 encoder and signals OSAF D1 and OSAF D2 from optical switch assembly Al transmit the focus lens position to the motor mux CCA in the electronics drawer assembly 2A2A7.

(4) Main Access Door Interlock Switch 2A1A1A5.

(a) The photomultiplier tube could be damaged by ambient light. There is a interlock switch on the main access door to prevent operation of the photomultiplier tube if the light seal is broken, and thus prevent the photomultiplier tube from being damaged.

(b) The DOOR INTERLOCK line (+28 VDC) is applied to one side of the main access door interlock switch. If the door is closed, the switch is enabled, and +28 VDC is applied to OA SHUTTER line. The OA SHUTTER LINE enables four relays in the relay assembly 2A1A1A12. One of these relays applies +28 VDC to enable the OSA shutter.

(5) Power Supply Assembly 2A1A1A6 and PMT Access Door Interlock 2A1A1A11.

(a) The power supply assembly supplies high voltage (300 VDC) necessary to operate the PMT.

(b) The OR PMT HV signal from multiprogrammer assembly 2A2A6 is routed through relay contacts of relay assembly 2A2A7A4 (energized by FIFO CCA 2A2A7A6A5), and applied to one side of PMT access door interlock 2A1A1A11. If the PMT access door is closed, +28 VDC is applied to power supply PSI in the power supply assembly. Output (300 VDC) of the power supply assembly is supplied to the PMT and a HV/300 signal is sent to analog to digital converter assembly 2A2A13.

(6) Photomultiplier Bracket Assembly 2A1A1A7 and Interface Assembly 2A1A1A8. The PMT is a measurement device for counting the number of photons being emitted by the CRT of the unit under test. It is enclosed in a housing which is cooled by thermoelectric elements that pump heat to a heat exchanger, where a fan moves the heated air out of the optical signal analyzer. There are temperature and overheat sensors used for temperature control. A shutter protects the PMT from damage and is opened during testing.

(a) The PMT output signal A2 PMT is applied to interface assembly 2A1A1A8 where it is filtered electronically and output to connector P6 (output signal A1 PMT AMD). (A TPS cable is connected from connector P6 to the programmable digitizer 2A2A1 during test.) Digital output data from multiprogrammer assembly 2A2A6 controls electronic filtering of the interface assembly 2A1A1A8.

(b) A temperature sensor attached to the PMT transmits signals SB1, SB2, and SBG to temperature measurement CCA 2A2A7A6A4, and signal SBG to analog to digital converter assembly 2A2A13. These signal are used by the computer to correct for temperature change of the PMT.

(c) During operation of the PMT, multiprogrammer assembly 2A2A6 transmits an OSA SHUTTER signal to relay assembly 2A2A7A4 contacts. When relay assembly 2A2A7A4 is energized by FIFO CCA 2A2A7A6A5, the OSA SHUTTER signal is routed to contacts in relay assembly 2A1A1A12. When relay assembly 2A1A1A12 is energized, OSA SHUTTER signal activates a linear solenoid which pulls the PMT shutter vanes to the open positon. Optical switch assemblies A1 and A2 transmit shutter position signals OSA SHUTTER CLOSED and OSA SHUTTER OPEN, respectively, to multiprogrammer assembly 2A2A6.

(d) PMT controller 1A7 provides power to maintain the PMT at a constant temperature (DRIVE AND DRIVE RTN).

(e) SENSOR-A and SENSOR-B lines inform the PMT controller of the PMT housing temperature.

(f) OVERHEAT-A and OVERHEAT-B lines inform the PMT controller of an overheat condition in the PMT housing.

(g) AC FAN-A and AC FAN-B lines supply power to the cooling fan in the PMT housing.

(7) Tray Assembly 2A1A1A9. Tray assembly 2A1A1A9 normally is not contained in the OSA, but is installed to test the high voltage power supply and pulse forming network UUTS.

(8) Relay Assembly 2A1A1A12. Relay assembly 2A1A1A12 (FO-14) contains four solid-state relays (K1-K4) used to supply 115 vac 400-Hz 3-phase power to the UUTS. All relays are energized by the same signal (+28 vdc) which is applied only when the OSA access door is closed.

(a) Power of 115 vac 400-Hz 3-phase is supplied by the AN/USM-410 electronic equipment test station at OSA connectors J2 and J4. From connector J2, the power is routed to relay K1 (input). If the OSA access door is closed, relay K1 is energized and the power is routed to connector J2 (TP) and to contacts of relay K2. Relay K2 is energized (same time as relay K1) so power is routed to the indirect view display (2A1A3). There is one set of contacts in relay K2 that supplies +28 vdc to the OSA shutter.

(b) From connector J4, power is supplied to relay K3. Relay K3 energized (same time as relay K1), so power is routed to contacts of relay K4 and to connector J2 (TP). Relay K4 is energized (same time as relay K1), so power is routed to tray assembly 2A1A1A9. There is one set of contacts in relay K4 that applies a DOOR INTERLOCK signal to the digital input of multiprogrammer assembly 2A2A6.

(9) Filter and Detector Assembly 2A1A1A14. The filter and detector assembly 2A1A1A14 (FO-15) contains a relay and two microswitches (S1,S2) which control the filter motor (M1). The motor rotates the filter 45 degrees to a position directly in front of the PMT shutter. Two optical switches (A1,A3) are used to inform the computer of the lens position.

(a) During operation of the PMT, the OA FILTER 1 signal is routed to the filter and detector assembly, and energizes relay K1. This action routes +28 vdc through microswitch S1 contacts and relay K1 contacts (A3,A2) to filter motor M1. the circuit is completed through another set of contacts (B2,B3) in relay K1, to ground, and the motor moves the filter into the optic path. When fully into the optic path, switch S1 contacts open and motor M1 stops turning. At this time, optical switch A1 transmits on OA FILTER POS 1 signal to the multiprogrammer assembly 2A2A6.

(b) To return the filter to the start position (out of the optic path), the OA FILTER 1 signal is removed, causing relay K1 to reenergize. This action causes +28 vdc to be routed through contacts of switch S2 and relay K1 (B1,B2) to filter motor M1. The circuit is completed (in opposite direction) through another set of relay K1 contacts (A1,A2), to ground, and the motor moves the filter out of the optic path. When the filter is fully out of the optic path, switch S2 contacts are opened and the motor stops turning. At this time, optical switch A3 transmits an OA FILTER POS 2 signal to the multi programmer assembly.

b.1 ADAPTER PANEL ASSEMBLY 2A1A1 (EO BENCH SERIAL NUMBERS 00106 AND UP)

(1) The adapter panel assembly is an electrical interface that allows connections from the IVD and power supplies to be available at its front panel.

(2) Signals applied to J11 on the side panel are routed to J2 and J3 on the front panel. Signals applied to J3 and J17 on the side panel are routed to J8 and J14, respectively, on the front panel.

c. INNER MODULE 2A1A2

(1) General. The inner module 2A1A2 (FO-16) provides an enclosed test cell for the dayside bench electrical and optical assemblies. It contains the following assemblies:

- Optics assembly 2A1A2A1
- Shutter assembly 2A1A2A2
- Radiometer assembly 2A1A2A3
- Dayside sensor mount assembly 2A1A2A4
- Laser fold mirror assembly 2A1A2A6
- Filter wheel/motor 2A1A2A1O
- Lampholder assembly 2A1A2A11
- Automatic focus control assembly 2A1A2A12
- Beam sampler 2A1A2A13
- Laser cover assembly 2A1A2A19

(2) Optics Assembly 2A1A2A1. The optics assembly contains the following assemblies:

- Laser simulator assembly
- Translator
- CID video camera

(a) The laser simulator assembly provides low-level laser energy for testing the sensitivity of the laser spot tracker and the laser range receiver UUTs. It is operated in continuous or pulsed mode at a rate set by computer command.

(b) The laser simulator assembly consists of laser simulator A1, laser detector A2, and power supply PS1.

(c) Power supply PS1 receives +28 vdc from the laser simulator assembly CCA and returns 600 vdc.

(d) The laser simulator assembly is connected to laser power supply assembly 2A1A6 by a TPS cable, during test.

(e) Multiprogrammer assembly 2A2A6 transmits programmed output signals (DC LASER LCW, DC LASER CH ON, DC LASER RESET) to the laser simulator CCA. A digital to analog solid state output switch signal (LASER SIMULATOR) is sent. Analog signals (DC LASER PWR, DC LASER AMP, DC LASER SIM) are returned from the laser simulator assembly to the analog to digital converter assembly 2A2A13 and a LASER CH OUT signal is sent to the PPG #1 CCA in the electronics drawer assembly 2A2A7.

(f) Translator (A8) consisting of two mirrors mounted on a single linear translator moves the mirrors into one of three positions to perform the following functions:

- Position 1 selects the path for laser beam divergence tests, direct view optics tests, and TV optics tests (dayside sensor tests).
- Position 2 selects the path for laser spot tracker sensitivity tests, laser range receiver tests, and laser path transmittance tests.
- Position 3 moves the mirrors out of the path to permit alinement functions.

(g) The translator is driven by signals (DSMB (01-04) from the motor control driver CCA 2A2A7A6A1. Control signals (DSMB EN1, DSMB EN2) from motor mux CCA 2A2A7A6A3, select the translator positions.

(h) Position of the translator is detected by three optical switches and transmitted to the motor mux CCA 2A2A7A6A3 on three lines (DSMB01, DSMB02, and DSMB03).

(i) The CID video camera (A15) is used to measure laser beam divergence (spread) using an array of photodetectors. Video output is sent to the camera head/control unit 2A2A7A2, where the video images are changed to electrical signals.

(3) Shutter Assembly 2A1A2A2. The shutter assembly is a safety device which prevents laser energy from escaping the inner module. It is opened by a solenoid, under computer command, during testing that uses the laser simulator or test lamp. Two optical switches sense the shutter open and shutter closed positions. The shutter is always closed during laser transceiver testing. If it is not closed, an interlock will prevent firing of the laser.

(a) The DC SHUTTER OPEN signal from multiprogrammer assembly 2A2A6 is routed to relay assembly 2A2A7A4. When the relay (K4) is energized by a signal from FIFO CCA 2A2A7A6A5, the DC SHUTTER OPEN signal is routed to the shutter assembly solenoid and the shutter opens. A spring pulls the shutter vanes closed when the DC SHUTTER OPEN signal is removed.

(b) The DC SHUTTER OPEN and DC SHUTTER CLOSED signals from two optical switches are routed to the digital input cards in the multiprogramner assembly 2A2A6.

(4) Radiometer Assembly 2A1A2A3. The radiometer assembly detects laser radiation from the UUT and transmits output signals to the programmable digitizer 2A2A1. The programmable digitizer converts these signals to digital data for analysis by the computer. The radiometer is used for making laser power tests, detecting missed pulses, determining pulse width, and pulse-to-pulse energy stability.

(5) Dayside Sensor Mount Assembly 2A1A2A4. The dayside sensor mount assembly supports and positions the TADS day sensor assembly UUT, for testing. The UUT is locked in place by use of the sensor mount handle, which contains two optical switch assemblies that sense the lock and unlock positions. The dayside sensor mount assembly contains the following assemblies.

- Laser interface assembly
- Laser attenuator assembly
- Laser safety shield assembly

(a) The laser interface assembly supports the laser spot tracker and the laser range receiver UUTS for testing. A handle on the left side is turned to move the laser interface assembly right (carriage in) or left (carriage out). Two optical switches sense the carriage in and carriage out positions, and transmit CARRIAGE SENSOR 1 (in) and CARRIAGE SENSOR 2 (out) signals to multiprogrammer assembly 2A2A6.

(b) The laser attenuator assembly is located on the front of the laser interface assembly. It consists of an attenuator lens which is moved in and out of the optical path by a lever (attenuator handle). Two optical switches sense the attenuator in and attenuator out positions, and transmit SHIELD SENSOR 1 (in) and SHIELD SENSOR 2 (out) signals to multiprogramner assembly 2A2A6.

(c) The laser safety shield assembly is located between the laser interface assembly and the shutter assembly. It has a handle on the left side which is used to move the shield to the right (closed) and to the left (open). Before the shield can be opened, the laser interlock handle must be moved to the down position (unlocked). After closing the shield, pull the laser interlock handle up to lock. This actuates the interlock actuator switch (part of the laser interlock circuit) and mechanically locks the UUT mounting adapter, located inside the laser cover. Two optical switches sense the shield open and shield closed positions, and transmit SHIELD SENSOR 1 (in) and SHIELD SENSOR 2 (out) signals to multiprogramner assembly 2A2A6. The interlock actuator switch completes the interlock circuit on the SWITCH and SWITCH RTN lines to the laser cover assembly 2A1A2A19.

(6) Laser Fold Mirror Assembly 2A1A2A6.

(a) The laser fold mirror assembly consists of a two-position translator with a single fold mirror. The translator positions the mirror in the optical path to direct laser energy from the laser transceiver UUT to the CID video camera. The translator removes the mirror from the path to permit the inner module shutter aperture to be used for laser spot tracker and optical device testing. The mirror is “in” for laser transceiver unit tests and “out” for all other devices. Two optical switches sense the mirror in and mirror out positions.

(b) The translator is driven by four signals (DSMA01, DSMA02,DSMAli13, DSMA04) from the motor control driver CCA (2A3A7A6A1). Two control signals (DSMAEN1, DSMAEN2) from the motor mux CCA (2A2A7A6A3) are used to select positioning of the translator. Two optical switches transmit signals (DSMA01,DSMA02) to the motor mux CCA (2A2A7A6A3), used to inform the computer of laser fold mirror assembly position.

(7) Filter Wheel/Motor Assembly 2A1A2A10.

(a) The computer controlled filter wheel/motor assembly is located in the optical path between the beam sampler and the laser fold mirror assembly. It consists of two flat (360 degree) disk filters, mounted approximately 1/2 inch apart on a hub assembly. The disk filters are continuously variable, neutral density filters with maximum density in the optical path when in the “home” position. This is the most counterclockwise position usable on the wheel.

(b) The filter wheel/motor assembly is driven by four signals (DSFA01, DSFA02,DSFA03,DSFA04) from the motor control driver CCA (2A2A7A6A1). Two control signals (DSFAEN1,DSFAEN2) from the motor mux CCA (2A2A7A6A3) are used to select positioning of the filter wheel. Two optical switches transmit signals (DSFAD1, FILTER INTERLOCK) to the motor mux CCA (2A2A7A6A3) and multiprogrammer assembly (2A2A6), respectively. These signals are used to inform the computer of filter wheel/motor assembly position.

(8) Automatic Focus Control Assembly 2A1A2A12.

(a) The automatic focus control assembly is located in the optical path between the filter wheel/motor assembly and the UUT. The computer positions the assembly to compensate for slight changes in focal path length due to temperature changes within the inner module. Focus adjustments are based on the type of tests to be performed, and on the spectral range in use. The nominal is for the direct view optics spectrum, and then adjustments are made for the TV spectrum and the laser spectrum, and in every case for temperature shifts.

(b) The automatic focus control assembly is driven by four signals (DSFC01,DSFC02,DSFC03,DSFC04) from the motor control driver CCA (2A2A7A6A1). Two control signals (DSFCEN1,DSFCEN2) from the motor mux CCA (2A2A7A6A3) are used to select positioning of the automatic focus control assembly.

(9) Beam Sampler 2A1A2A13. The beam sampler is located in front of the radiometer narrow beam attenuator, a part of the radiometer assembly. The beam sampler is an optical transferring device consisting of a base and housing, two optical beam splitter lenses, and a protective cover. The purpose of the beam sampler is to split the laser beam path into two separate paths. One path is through the laser aperture inside the laser cover assembly and the other path is down through the filter wheel/motor assembly.

(10) Laser Cover Assembly 2A1A2A19. The laser cover assembly 2AlA2A19 (FO-17) forms part of the laser interlock circuit (FO-35) to prevent firing of the laser transceiver unit (UUT) without an enclosed shielded environment. Two door interlock switches and a key switch are part of the laser interlock circuit which must be enabled before the laser can be fired.

d, INDIRECT VIEW DISPLAY 2A1A3

(1) The indirect view display 2A1A3 is an electronic assembly located in the rear of the dayside test bench. It is used to test the airborne IVD and the HOD UUTS. The dayside test bench IVD is identical to its airborne counterpart, except it does not contain five circuit card assemblies installed in the airborne IVD.

(2) Five connectors on the IVD supply the following signals and voltages:

- Connector J1 - control and status signals
- Connector J2 - 115 vat, 400 Hz, 3-phase and +28 vdc
- Connector J3 - video No. 1 input and video drive (HOD) output
- Connector J4 - video signals and voltages
- Connector J5 - coaxial cable to HOD (UUT)

e. LASER POWER SUPPLY ASSEMBLY 2A1A6

(1) General. The laser power supply assembly 2A1A6 (FO-18) is located in the rear of the dayside test bench. It consists of a high-voltage power supply and an electronic box assembly. Input and output connections are made through connector 2A1W45-J1, located on the front of the dayside test bench.

(2) Electronic Box Assembly. External power of 115 vat, 400 Hz, 3-phase is applied to contacts of relay K1. When all interlock switches are closed (laser safe), HV INTERLOCK signal enables relay K1, which applies the 3-phase voltage to the high-voltage power supply. At the same time, relay K2 is enabled by the HV INTERLOCK signal and applies +28 vdc and -15 vdc to the laser transceiver unit UUT. Then, +28 vdc is applied to power supply A2 in the high-voltage power supply. Terminal board assembly Al is supplied 1000 vdc and 600 vdc from the high voltage power supply and transmits those voltages to the major test adapter.

(3) HV Power Supply. The electronic box assembly supplies 115 vat, 400 Hz, 3-phase to the contacts of solid-state relay CR2. When the OPERATE SIGNAL line is enabled, the 3-phase voltage is applied to the transformer and rectifier circuitry which transmits 1000 vdc to the electronic box assembly. Power supply A2 changes +28 vdc to 600 vdc and transmits this voltage to the electronic box assembly.

f. LASER POWER METER 2A1A7 AND RADIOMETER HEAD 2A1A8

(1) General. The laser power meter and the radiometer head form a portable system used measure the output of the laser tracker unit and laser transceiver UUTS. When in use, the meter is placed on top of the laser protective cover and plugged into receptacle J3 on the test adapter panel assembly 2A2A4, for AC power. A cable connects the laser power meter to the radiometer head, which is positioned in the laser path. The radiometer head functions the same as the internal radiometer assembly (2A1A2A3), but over a different spectral range.

(2) Functional Description. A silicon photovoltaic detector in the radiometer head transmits signals to amplifier Al in the laser power meter. Output of amplifier Al is calibrated using front panel AMBIENT ZERO control. A range selector switch provides system sensitivity over six full-scale decades. Amplifier Al output is transmitted to amplifier A2 through wavelength selector switch. The wavelength selector switch is a six-position switch on the rear of the radiometer head. It is used to select one of five standard laser wavelength positions that have been calibrated (internal adjustments) for direct readout of power or energy. The remaining switch position permits the photocurrent to be measured directly. An automatic wavelength annunciator on the front panel of the laser power meter provides a visual indication of the measurement wavelength selected. Amplifier A2 output is displayed on a digital meter located on the front panel of the laser power meter.

1-24. TEST CONSOLE TEST BENCH 2A2

a. GENERAL

Refer to FO-19 for a block diagram of the test console test bench. The test console test bench is described in the following order:

- Programmable digitizer 2A2A1
- VHF cable entry panel 2A2A2
- Optical signal generator assembly 2A2A3
- Test adapter panel assembly 2A2A4
- Multiprogrammer assembly 2A2A6
- Electronics drawer assembly 2A2A7
- Extender assembly 2A2A8
- Matrix switch assembly 2A2A1O
- Multiprogrammer extender assembly 2A2A11
- Switch controller assembly 242A12
- Analog to digital converter assembly 2A2A13

b. PROGRAMMABLE DIGITIZER 2A2A1

(1) General. The programmable digitizer 2A2A1 (FO-20) is a microprocessor-based, dual-channel waveform-digiti zing instrument used to digitize video inputs, provide the system clock, and perform measurements. Analog signals are accepted under program control by two plug-in programmable amplifiers and stored in a high-speed semiconductor memory for subsequent transfer over the IEEE 488 bus. Front panel (local) control is accomplished by pressing the appropriate function key and decreasing or increasing the parameter with the DECREMENT/INCREMENT keys. The parameter cycles through only those values which are valid for the current state of the digitizer, minimizing the possibility of error. The digitizer checks the settings each time the ARM button is pressed in local mode or the ARM command is received in remote mode. Errors are reported on the front panel and over the IEEE 488 bus.

(a) Analog to digital conversion is performed by two special electron-bombarded semiconductor (EBS) tubes (one per channel). The EBS tube is an electron tube with a silicone-diode target at one end and an electron gun at the other. The target consists of a set of diodes fabricated in vertical stripes with parts of the stripes masked by a thick metal film to form a gray-code pattern. The electron gun produces a lo-kilovolt beam which strikes an area of the target that is exposed, causing the diode to conduct, generating an output current. Each diode stripe defines one bit in the eight-bit, gray-code output, so the output code from the target defines the vertical position of the beam. By applying the analog-input voltage to the vertical deflection plates of the tube and sampling the digital output, the analog signal is digitized.

(b) Digitized output from the EBS tubes is continuously sampled by two independent time bases (one per channel) and stored in memory. The time bases are programmed to partition their memory (2K by eight-bit block) into one to eight records of equal length. Since each record requires a separate trigger to initiate acquisition, several occurrences of a signal may be acquired before data must be read from memory. Valid record lengths are 256, 512, 1024, and 2048 bytes. Records can be further divided into 1 to 14 segments.

(2) Analog Signals. The analog input signals from the plug-in programmable amplifiers are coupled to the digitizer through the plug-in interface. The differential outputs of the plug-in interface drive the deflection amplifiers, which in turn drive the vertical deflection plates of the EBS tubes. Since the electron beam covers the entire target horizontally, no horizontal deflection is necessary.

(a) The plug-in interface also carries the analog trigger signals for the trigger generators which accept the signals from the plug-ins (or the rear panel TRIG IN connectors) and generate digital trigger signals for the time base.

(b) Trigger parameters such as level, slope, coupling, and source are set by the 6800 microprocessor (MPU) on the basis of front panel inputs or commands received on the IEEE 488 bus.

(c) Circuits are included to position the beam and control its rotation with respect to the vertical diode stripes on the target. The high-voltage supply generates the 10-kilovolt accelerating potential and the focus potentials for the tubes.

(3) Data Flow. The eight-bit, gray-code outputs from the EBS tubes are continuously sampled at 5 nanosecond intervals by the strobed, hybrid comparators. The time bases control data storage by providing the memory addresses, clock signals, and select signals for the data memory. Data is stored in the memory in gray-code format. On output, the data is converted to binary by a gray code-to-binary converter on the translator board. It is then sent over an internal, high-speed, data bus to the IEEE 488 bus interface.

(4) Digitizer Control. The 6800 microprocessor system is the digitizer master controller. It accepts and decodes commands from the front panel or the IEEE 488 bus and sets the digitizer operating parameters in response to these commands. It also controls the IEEE 488 bus and the plug-in interface.

c. VHF CABLE ENTRY PANEL 2A2A2

(1) General. The VHF cable entry panel 2A2A2 contains 15 BNC connectors, only three are used. One (J1) is connected to the radiometer assembly 2A1A2A3, and two (J2,J3) are connected to the video signal generator in the electronics drawer assembly 2A2A7. These connectors are used during testing to connect TPS or test instrument cables.

d. OPTICAL SIGNAL GENERATOR (OSG) 2A2A3

(1) General. OSG 2A2A3 (FO-21) provides optical stimuli to test and evaluate EO multiplexer TV sensor UUTs. Imaging port is used for the TV sensor and collimating port is for the EO multiplexer. Both imaging and collimating ports share a common light source. Their optical information is modified by an assortment of filters, target data, and optical elements as needed. Uniformity port is used by both TV sensor and EO multiplexer. This port provides diffused light by using a sphere and independent light source.

(2) Imaging Port Operation. This port is used to mount TV sensor UUT and provides target information for testing.

(a) Relay bracket assembly 2A2A3A1 has 28-volt relay power applied to one side of relay coils K1 and K2. Positive lamp power is also applied to A contacts of K1 and K2. When proper signals are received and decoded by amplifier-detector assembly 2A2A3A4, COLLIMATOR/IMAGE LAMP ENABLE signal (ground) is sent to relay bracket assembly and energizes relay K1, closing contacts A and B.

(b) A halogen lamp (2A2A3DS1) is located beneath lamp shield assembly 2A2A3A2. Negative lamp power (ground) is applied to one side of lamp 2A2A3DS1. When relay 2A2A3A1K1 is energized, positive lamp power is routed through A contacts to light lamp 2A2A3DS1.

(c) A light sensor is located on light shield assembly 2A2A3A2. This sensor is biased on when lamp 2A2A3DS1 is lit, sending signal COLLIMATOR/IMAGE LAMP DETECT to relay bracket assembly 2A2A3A1. This signal passes through closed B contacts of relay K1 and routed to amplifier-detector assembly 2A2A3A4. This signal is then fed to a comparator. The comparator outputs an analog signal (OSG DETECTOR) to analog-to-digital converter assembly 2A2A13 where it is converted for use by the computer to control lamp intensity.

(d) Optical routing of light is first through the optical filter assembly and lens target assembly. Optical filter diffuses the light and lens target assembly provides a target image required for the TV sensor UUT. This image is then relayed by two 90-degree fixed fold mirrors to optical relay assembly. The optical relay assembly contains eight lens elements and an aperture providing a target image reduction ratio of 2:1. The final image is routed through the imaging port and to the TV sensor UUT.

(3) Collimating Port Operation. This port is used to mount the EO multiplex; and provides target information for testing.

(a) Lamp and sensor operation are identical to the imaging port. Refer to paragraph (2)(a) through (2)(c) above.

(b) Optical routing is through the collimator assembly and out the collimating port. Collimator assembly contains a filter, condenser, target, and lens doublets and collimators. Light enters in and passes through a filter, condenser, and target. Target assembly provides an optical image pattern for EO multiplexer. This image is modified by a collimator element, two doublet elements, another collimator element and doublet before exiting the collimator assembly. This final image is passed through the collimating port and to the EO multiplexer UUT.

(4) Uniformity Port Operation. The uniformity port is used to perform shading tests for both EO multiplexer and TV sensor UUTs. Its purpose is to provide an even diffused light source with no hot spots.

(a) Relay bracket assembly 2A2A3A1 has 28-volt relay power applied to one side of relay coils K1 and K2. Positive lamp power is also applied to the A contacts of K1 and K2. When proper signals are received and decoded by amplifier-detector assembly 2A2A3A4, UNIFORMITY LAMP POWER signal (ground) is sent to relay bracket assembly and energizes relay K2 closing contacts A and B.

(b) Three halogen lamps (2A2A3A5DS1 - DS3) are located within integration sphere assembly 2A2A3A5. Negative lamp power (ground) is applied to one side of lamps 2A2A3A5DS1 - DS3. When relay 2A2A3A1K2 is energized, positive lamp is routed through the A contacts to light lamps 2A2A3A5DS1 - DS3.

(c) Integrator light sensor 2A2A3A3 is located above and in front of integration sphere 2A2A3A5. This sensor is biased on when lamps 2A2A3A5DS1 - DS3 are lit, sending signal UNIFORMITY LAMP DETECT to relay bracket assembly 2A2A3A1. This signal passes through the closed B contacts of relay K2 and routed to amplifier-detector assembly 2A2A3A4. This signal is fed to a comparator. The comparator outputs an analog signal (OSG DETECTOR) to analog-to-digital converter assembly 2A2A13. It is converted for use by the computer to control lamp intensity.

(d) The optical path is controlled by the integration sphere. The sphere houses three halogen lamps which are uniformly spaced. When lit, light from these lamps are reflected around and about the inside of the sphere. The inside of the sphere is coated with barium sulfide. This material diffuses light and evenly distributes light to provide a uniform light source. Light exits the sphere through the uniformity port and is inputed to a TV sensor or EO multiplexer UUT.

e. TEST ADAPTER PANEL ASSEMBLY 2A2A4

(1) General. The test adapter panel assembly 2A2A4 (FO-22) contains four connectors, a relay assembly, and a terminal block.

(a) Augmentation programmable interface connection (APIC) connector J1 connects 120 output lines from the matrix switch assembly 2A2A1O to the major test adapter.

(b) Dedicated interface unit (DIU) connector J6 connects lines from the matrix switch assembly 2A2A1O, electronics drawer assembly 242A7, and relay assembly 2A2A4A1 to external equipment.

(c) Connector J2 connects +28 vdc (supplied to connector J2 from the AN/USM-410 EETS) to the external CID camera and external light (test fixture). The voltage is routed from connector J2 through relay assembly 2A2A4A1 contacts and returned to connector J2. Relay assembly 2A2A4A1 is energized under program control.

(d) Connector J3 supplies 115 vac to external devices. The 115 vac is supplied by the facility and controlled by the ac control panel assembly 1A5.

(e) Relay assembly 2A2A4A1 contains 12 relays. Four of these relays are not wired.

f. DELETED

g. MULTIPROGRAMMER ASSEMBLY 2A2A6 AND MULTIPROGRAMMER EXTENDER ASSEMBLY 2A2A11

(1) General. The multiprogrammer assembly is the master control unit for the multiprogrammer system. The multiprogrammer extender assembly increases the system input/output capacity. Refer to FO-24 for a block diagram of multiprogrammer assembly 2A2A6 and multiprogrammer extender assembly 2A2A11.

(a) The multiprogrammer assembly consists of hinged-front control panel, a 20-slot card cage, a dc power supply, and a rear panel containing input and output data and ac power connectors. Of the 20 card slots, four (slots 100, 200, 300, and 500) contain interfacing, data processing, and control CCAs, 13 (slots 400 thru 410, 412, and 413) contain input/output CCAs, and one (slot 600) contains a voltage regulator CCA. Slots 411 and 414 are empty.

(b) The multiprogrammer extender assembly is physically similar to the multiprogrammer assembly, but has no provisions for local programming. Its control panel contains only an ON/OFF power switch and associated indicator lamp. The card cage, dc power supply, and rear panel are the same, however, only the extender input CCA A1 (slot 100), input/output transfer CCA A2 (slot 200), logic and timing CCA A3 (slot 300), and six input/output CCAs A4 (slots 400 thru 403, 408, and 409) are used. The remaining slots are empty.

(2) Multiprogrammer Assembly

(a) Data and control signals are exchanged between the computer and multiprogrammer assembly through connector J1. Computer inputs (16 data bit lines and a control gate line) are routed through adapter CCA A7 to the back-plane wiring of interconnect board A9. Input CCA A1 (slot 100) is the first plug-in CCA to receive the inputs, which are applied to identical termination networks. The networks minimize noise and ringing on transmission lines.

(b) After being interfaced, the computer inputs are applied to remote/local CCA A2 (slot 200). The remote/local CCA selects either the computer or the local control panel as the programming source and distributes the data to the logic and timing CCA.

(c) Logic and timing CCA A3 (slot 300) has three main functions:

1. It provides buffer amplification for the remote or local address and data bits received from the remote/local CCA.

2. It selects either programmed data bits or control panel data bits.

3. It generates the flag signal for output to the computer. The flag notifies the computer whether the multiprogrammer system is busy processing the last programmed task or it is ready for the next one.

(d) Unit select CCA A5 (slot 500) examines specific bits of the programed data to determine if the data represents a control word or a data or address word. If the unit select CCA determines that the programmed word is a control word, it decodes and stores the unit selection. The multiprogrammer is assigned unit number zero and the extender is unit number one.

(e) Voltage regulator CCA A6 (slot 600) supplies operating voltage for the two digital-to-analog CCAs. It contains isolated +15 vdc and -15 vdc regulated supplies.

(f) Digital input CCAs A4 (slots 400 thru 405) accept data from the electronics drawer assembly and output data and status to the computer. These CCAs contain gate and flag circuits for exchange of control signals with the electronics drawer assembly.

(g) Digital output CCAs A4 (slots 406 thru 410) provide programmed outputs to the electronics drawer assembly. These CCAs contain gate and flag circuits for exchange of control signals with the electronics drawer assembly.

(h) Digital to analog CCAs A4 (slots 412, 413) provide solid-state output switches to control relay coils using an external dc power source. Each output circuit is rated at up to 30 vdc and 40 milliamperes.

(i) The buffered data and addressed bits, unit selection lines, and mode control and timing signals are conveyed to output connector J2 by adapter CCA A8. A cable is connected from output connector J2 of the multiprogrammer to input connector J1 of the extender. In the other direction, the input data and extender control signals are received at connector J2 from the extender.

(3) Multiprogrammer Extender Assembly

(a) Data and control signals are routed through adapter A7 to the back-plane wiring of interconnect CCA A9. Extender input CCA A1 (slot 100), I/0 transfer CCA A2 (slot 200), and logic and timing CCA A3 (slot 300) function the same as in the multiprogrammer, except there are no local selection functions.

(b) Output readback CCAs A4 (slots 400 thru 403, 408, and 409) provide relay outputs, gate and flag signals, and input data lines that can be read by the computer and which indicate the relay coil voltage status.

h. ELECTRONICS DRAWER ASSEMBLY 2A2A7

(1) General. Electronics drawer assembly 2A2A7 (FO-25) contains many electronic components used for a variety of E/O bench functions. Nine CCAs are used for motor control, temperature measurements, pulse generation, and signal multiplexing. A camera head control unit receives video images, changes these images to electrical signals, and transmits these signals to a FIFO memory for temporary storage. A video signal generator receives pulses of information from the programmable pulse generator (PPG) and converts these pulses to video information and clock signals. Power for the video signal generator is supplied by the heat sink assembly. A relay assembly supplies control signals to the E/O bench.

(2) Video Signal Generator (VSG) 2A2A7A1. The VSG receives signals (CAMERA VIDEO, R0-R7) from PPG #1 (2A2A7A6A8), signals (WINDOW, BH BLANK, B VID SYNC, 6.25MHZ) from PPG #2 (2A2A7A6A9), and a CLOCK signal (200MHZ) from programmable digitizer 2A2A1. Video signals are generated in the VSG by analog CCA A1 and the clock is generated by digital CCA A2. These signals are routed to VHF cable entry panel 2A2A2 for use during test.

(3) Camera Head Control Unit 2A2A7A3.

(a) Camera head control unit 2A2A7A3 is matched to the internal camera head, located in the dayside test bench. The camera uses the General Electric charge induced device (CID) which is essentially an array of photo detectors whose outputs are converted to digital format as the camera scans at a TV rate.

(b) Camera head (CID video camera) output is transmitted to its matched camera head control unit. The output of the camera head control unit is transmitted to FIFO memory 2A2A7A6A5.

(4) Relay Assembly 2A2A7A4. Refer to FO-26 for illustration of relay assembly 2A2A7A4. Digital output signals from multiprogrammer assembly 2A2A6 are routed to relays K1 through K12. Relays K13 through K15 are not used. All 15 relays are energized by a signal (+5V SS RELAYS) from FIFO memory CCA 2A2A7A6A5.

(5) Heat Sink Assembly 2A2A7A5. The heat sink assembly consists of a power transistor and a resistor mounted on a heat sink. It provides the voltage needed by the video signal generator 2A2A7A1.

(6) Motor Control. The motor drive CCA (2A2A7A6A1), motor logic CCA (2A2A7A6A2), and motor mux CCA (2A2A7A6A3) control nine motors in the EO bench; five in the dayside test bench, one in the nightside test bench, and three in the test console test bench.

(a) The dayside test bench uses four motors in the inner module 2A1A2 and one motor in the OSA 2A1A1.

- Translator 2A1A2A1A1A8
- Translator 2A1A2A6A8
- Automatic focus control 2A1A2A12
- Filter wheel/motor assembly 2A1A2A10
- Focus motor 2A1A1A4 (OSA)

(b) The nightside test bench uses one motor (2A3A1A1A10) in the heat source target assembly 2A3A1A1.

(c) The test console test bench uses three motors in the optical signal generator.

- Filter motor
- Diffuser motor
- Flip mirror motor

(7) Temperature Measurement CCA 2A2A7A6A4. The temperature measurement CCA 2A2A7A6A4 (FO-27) receives inputs from several sensors and after amplifying, detecting, and comparing, it transmits responses to the analog to digital converter 2A2A13. One of the inputs is the Mimco temperature probe, which is used in the test console test bench to provide high-accuracy temperature measurements. In addition, there are three temperature sensors in the dayside test bench and three in the nightside test bench.

(a) The dayside test bench uses two temperature sensors in the inner module and one in the optical signal analyzer (OSA).

- Microcircuit and heat sink assembly 2A1A2W54
- Microcircuit and heat sink assembly 2A1A2W55
- Photomultiplier and bracket assembly 2A1A1A7 (OSA)

(b) The nightside test bench uses two sensors in the heat source target assembly 2A3A1A1 and-one in the optical assembly 2A3A1.

- Microcircuit and heat sink assembly (heat source A)
- Microcircuit and heat sink assembly (heat source B)
- Microcircuit and heat sink assembly (heat source C) (optical assembly)

(8) FIFO Memory CCA 2A2A7A6A5. The FIFO memory functions as a temporary storage. Data from the internal camera is processed faster than the handling rate of the bus multiplexer, so the FIFO memory acts as a buffer between the two.

(a) Video “A” signals from the internal camera head control unit are inputs to the FIFO memory.

(b) Command, flag, and timing signals from the digital computer assembly 1A1O control the transfer of camera signals to the bus multiplexer CCA 2A2A7A6A7.

(9) Bus Multiplexer CCA 2A2A7A6A7. The bus multiplexer CCA operates in different modes to process data between the digital computer assembly and the multiprogrammer assembly, analog to digital converter assembly, and FIFO memory.

(10) Programmable Pulse Generator (PPG). The PPG logic CCA, PPG mux CCA, and PPG analog CCA provide digital pulses for the video signal generator and UUTs. Twelve connectors on the front of electronics drawer assembly route signals from the PPG CCAs to UUTS.

i. EXTENDER ASSEMBLY 2A2A8

(1) General. The extender assembly receives and transmits serial data to the HP-1B extender 1A9A1 in the electronic station.

(2) Receive Mode

(a) A data frame arrives as a string of 22 bits at the receive coupler where the data passes through and is synchronized with an internal clock frequency of 24 MHz. The rear panel SERIAL DATA RATE switch is set to NORMAL.

(b) From the receive coupler, the data frame is clocked into the decoder. After decoding, it is clocked into the 16-bit data register. Then the four parity bits, start bit, stop bit, and frame reject signal are checked, and if correct the 16 data bits are loaded into the parallel register. Transfer from the 16-bit data register to the parallel register is the serial-to-parallel conversion.

(c) Data is transferred to the bus interface, status is checked, the hand-shake sequence between extenders is performed, and the data frame is put onto the IEEE 488 bus.

(3) Transmit Mode. After the receive data frame has been accepted and the hand-shake sequence completed, the HP-IB extender assembles a return frame. The return frame is passed to the 16-bit data register, clocked into the encoder, encoded into a transmit data frame, and transmitted over coaxial cable by the transmit driver.

j. MATRIX SWITCH ASSEMBLY 2A2A1O

(1) General. The matrix switch assembly 2A2A1O (FO-28) is remotely controlled to enable external instruments in the AN/USM-410 test station to access units under test (UUT). Control of the matrix switch assembly is from the switch controller assembly 2A2A12, operating under computer control via the IEEE 488 bus.

(2) Control Signals. Control signals from the switch controller assembly are routed through the rear panel board and the motherboards to the quadrant control CCAs. The relay control signals generated by each of the quadrant control CCAs are routed through the motherboards to 16 matrix relay CCAs in each quadrant. Control signals are used to select the CCA and the relay and to control the relay. There are 30 signal relays on each of the quadrants' 16 matrix relay CCAs. The signal relays are controlled from the switch controller assembly in groups of 30, each relay corresponds to one UUT pin; UUT pins 1 thru 30 are in quadrant 1, 31 thru 60 in quadrant 2, 61 thru 90 in quadrant 3, and 91 thru 120 in quadrant 4.

(3) Matrix Inputs. The 16 matrix input connectors located on the matrix switch assembly rear panel are used as input/output ports to the external stimulus/ measurement instruments. The connectors are numbered from 1 thru 16 corresponding to the matrix relay CCAs in each quadrant. Any one of 16 stimulus input signals can be sent to any of the 120 UUT pins. Any signal from the UUT can be sent to any of the instruments connected to the matrix switch assembly.

k. SWITCH CONTROLLER ASSEMBLY 2A2A12

(1) General. The switch controller assembly 2A2A12 (FO-29) controls the matrix switch asssembly 2A2A10 by translating computer command messages, present on the IEEE 488 bus, into command and timing signals.

(2) Microprocessor and Associated Circuits. The switch controller assembly is a microprocessor- driven instrument. The microprocessor control circuits are comprised of the microprocessor, the control decoder, and the clock circuit. These circuits, in conjunction with the IEEE 488 bus handshake circuit and the interrupt gating circuits, process all commands received from the IEEE 488 bus. They perform all of the functions necessary to control the matrix switch assembly.

(3) Bus Architecture. The switch controller assembly circuitry is implemented using bus architecture. The major buses contained in the switch controller are:

- Main Data Bus (8 bits) is used to transmit data bidirectionally between the microprocessor circuits and the interface circuits.
- Control Bus (8 bits) is used to transmit data bidirectionally between the microprocessor circuits and the interface circuits for the control lines.
- Processor Bus (8 bits) connects the main data bus to the microprocessor via the main data bus switch driver circuits. Because this bus also connects to each of the ROMs that comprise the memory of the unit, the data output from any enabled ROM is fed by this bus to the microprocessor.
- ROM Address Bus (9 bits) transmits address information from the microprocessor to the ROMs.
- Control-Decoder Bus consists of the four, device-select control bits from the microprocessor.

l. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13

(1) General. The analog to digital converter assembly 2A2A13 (FO-30) is a data acquisition distribution system capable of processing analog signals to digital data and digital data into analog signals. In this system, it is used only in the analog to digital configuration. It simply serves as a high-accuracy, digital voltmeter with 16-bit accuracy. It consists of a chassis containing two power supplies, internal backplane, display/control panel, and user CCA backplane.

(a) The standard power supply provides +15 vdc, -15 vdc, and +5 vdc to the system. An optional power supply is used to increase the current-carrying capacity of the system. It is identical to the standard power supply.

(b) The internal backplane contains the signal processor CCA (slot J73), A/D converter CCA (slot J74), and three computer interface CCAs (slots J75 thru J77).

(c) The display/control panel contains timing logic used by the control signals and the displays that show the current signal processor range code, channel address, and data value. It also contains control logic that comes into action in the local control mode allowing manual access to all system functions. In addition, it has high-speed registers for digital address multiplexing and address and range storage.

(d) The user CCA backplane, accessible from the rear of the chassis, has 18 CCA slots, labeled J1 thru J18. It contains the simultaneous sample and hold CCA (slot J1), three multiplexer CCAs (slots J4,J7,J8), two isoplexer CCAs (slots J5, J6), the self-test CCA (slot J16), and two expansion CCAs (slots J17, J18).

(2) Internal Backplane CCAs

(a) Signal Processor CCA. The signal processor CCA receives analog signals from the expansion CCAS and buffers these signals to drive the A/D converter. Additionally, certain timing and control functions related to the measurement process take place on the signal processor CCA. The signal processor CCA contains a sample and hold located just before the A/D converter. This sample and hold is commanded into “hold” mode just before every conversion, returning to “sample” immediately after the conversion is complete. This sample and hold is necessary in all data systems because of the nature of successive approximation A/D converters. These converters must have a constant input during the conversion process. Valid measurements may be made on a changing signal only if the signal is temporarily held constant during the conversion process.

(b) A/D Converter CCA. The A/D converter CCA performs very high speed, analog-to-digital conversion.

(c) Computer Interface CCAs. The general purpose interface (consisting of CCAs 13082276-2 and 13082276-3) is a data buffer for the input/output data words. The control CCA (AC471-1B) detects and decodes the upper four bits of the input data word from the computer. These bits contain an operation code that directs a specific operation within the A/D converter. The result of the decoding operation is the generation of the control signals required to perform the activity directed.

(3) Backplane CCAs

(a) Simultaneous Sample and Hold CCA. The simultaneous sample and hold CCA contains four sample and hold amplifiers together with the necessary digital control and analog multiplexing circuitry required for operating and interrogating the sample and hold circuits. The sample and hold channels acquire analog signals and simultaneously hold them for processing. Channels are then scanned by high-speed, multiplexing techniques and the resulting data represents the analog signal in digital format.

(b) Multiplexer CCA. The multiplexer CCA transfers 16 differential channels of input signals under program control. Each channel is independently protected against applied overvoltages.

(c) Isoplexer CCA. The isoplexer CCA isolates each of four input signals from common mode voltages and multiplexes the isolated differential outputs to the analog bus under system program control.

(d) Self-test CCA. The self-test CCA provides measurement of system power supplies and A/D converter accuracy and settling time, under control of the computer test program.

(e) Expansion CCAs. The expansion CCAs serve to select the correct chassis (master or expansion) for analog and digital transactions. Since there is no expansion chassis used, the master chassis is selected. The expansion CCAs transmit the analog signals “even,“ “odd,” and “signal return” to the signal processor CCA and then to the A/D converter CCA. The digital section of the expansion CCAs receives bits Al thru All of the 12-bit analog address word, generated from the address register on the front panel. A12, the least significant bit of the analog address word, goes only to the signal processor CCA where it is used in channel selection during single-ended operation.

1-25. NIGHTSIDE TEST BENCH 2A3

a. GENERAL

Refer to FO-31 for a block diagram of the nightside test bench. The pneumatic control panel is located in the front of the nightside test bench, but is not discussed here. Refer to paragraph 1-22 for description of pneumatic control panel.

b. NIGHTSIDE OPTICAL ASSEMBLY 2A3A1

(1) General. The nightside optical assembly provides program controlled infrared (IR) signals to the TADS nightside assembly and PNVS UUTs. The nightside optical assembly contains three heat sources, designated A, B, and C, which are controlled by the control unit assembly 1A1. Heat sources A and B are in the heat source target assembly and heat source C (secondary heat source) is inside the nightside test bench optical assembly, directly behind the shutter assembly. The nightside optical assembly contains the following assemblies:

- Heat source target assembly 2A3A1A1
- Shutter assembly 2A3A1A2
- Sensor mount assembly 2A3A1A3
- Secondary heat source assembly 2A3A1A17

(2) Heat Source Target Assembly 2A3A1A1.

(a) Heat sources A and B are mounted above the aperture wheel and target wheel assembly. The aperture wheel and target wheel are used in conjunction with the heat sources to provide the stimulus pattern for performing various IR tests. Five mirrors are used to collimate the energy and route it to the output port where the UUT is mounted.

(b) The target wheel and aperture wheel are driven to different positions depending upon the test requirement. The target wheel, mounted below the aperture wheel, has 10 positions, and the aperture wheel has four. A single four-phase stepper motor, which drives both wheels through two magnetic clutches (one for each wheel), is activated by signals NST EN1, NST EN2, NST 01-NST 04 from the motor control CCAs in the electronics drawer assembly 2A2A7. Each clutch rotates a coupling to a gear train which drives a belt on a sprocket, which in turn moves the target wheel and aperture wheel.

(3) Shutter Assembly 2A3A1A2. The shutter assembly provides a protective overlapping cover to the nightside optical assembly. IR SHUTTER OPEN signal from the motor control CCAs in the electronic drawer assembly 2A2A7 causes a rotary solenoid to drive an arm to rotate the shutter ring. Rotation of the ring pulls open the seven shutter vanes, and a coiled spring provides closure. Two mechanical stops are mounted on the bottom of the ring to limit rotation. Two optical sensors send IR SHUTTER OPEN and IR SHUTTER CLOSED signals to the multiprogrammer assembly 2A2A6.

(4) Sensor Mount Assembly 2A3A1A3. The sensor mount assembly uses a locking handle to secure the nightside sensor assembly UUT. The forward position of the handle (toward the nightside optical assembly) unlocks the UUT by retracting the four locking cams. In the rear position (away from the nightside optical assembly) the four locking cams are extended to lock the sensor. Two optical sensors are used to sense the open and closed positions. Signals INTERLOCK 1 (open) and INTERLOCK 2 (closed) are sent to the multiprogrammer assembly 2A2A6.

(5) Secondary Heat Source 2A3A1A17. The secondary heat source (c) provides an IR source for the wider field-of-view of the PNVS UUT. Sources B and C are always referenced to the precision source (A). Only one source (B or C) can be selected at a time.

(a) The secondary heat source is enabled by IR SOURCE #3 signal from control unit assembly 1A1. A temperature sensor in the heat source transmits a signal (SENSOR C) to the control unit assembly for temperature control.

(b) A microcircuit and heat sink assembly (sensor) transmits a SIG signal to analog to digital converter assembly 2A2A13, and SIG, SI1, S12 signals to temperature measurement CCA in the electronics drawer assembly 2A2A7.

1-26. TEST PROGRAM SET (TPS) 1-26

a. GENERAL

A TPS consists of those peculiar items necessary to test a UUT on the AN/USM-410 test station and EETF TADS/PNVS augmentation equipment. A TPS is classified as either AVIM or depot and of these 51 TPSs, there are 14 AVIM and 37 depot test program sets. A TPS includes the following:

- Test program software
- TPS hardware
- Additional instructions (as required)

b. TEST PR0GRAM SOFTWARE

The test program software written in adapted ATLAS contains Instructions which, when executed by the test equipment, will provide stimuli and measurements required to test a UUT. The objective of the test is to automatically determine the operational readiness of the UUT and to isolate a fault if it exists. The test program software begins by performing three tests to ensure the test adapter and test equipment are operational. The first test performed is the survey test. This test ensures that the following test equipment functions are operational:

- All test equipment stimuli and measurement connections used in the test program software can be made.
- All test equipment sources used in the test program software can be programmed to at least one set of used parameters within the required tolerances.
- All measurement hardware devices used can be programmed to make at least one measurement within the required tolerances.

The second test performed is the Interface Device Self Test (IDSELFTEST). This test is performed just before the UUT is connected to verify that every switched signal path through the test accessories used in the test program software can be closed or opened. It also verifies that every active signal conditioning function in the test accessories performs to the required tolerance. The third test is the safe- to-power up test. It ensures the test program software can be started without causing damage to the UUT or test equipment because of excess current or less than minimum safe UUT input impedance. Once these preliminary tests are satisfied the test program software is run to test the UUT.

c. TPS HARDWARE

TPS hardware are those peculiar items necessary to interface the UUT to the AN/USM-410 and EETF TADS/PNVS augmentation equipment. The test program includes the necessary connections of these interface devices although not all TPSS contain every interface. The interface device hardware includes the following:

- Major test adapter
- Minor adapter assembly
- Cable assemblies
- Self-test connectors
- Test fixtures
- Personality circuit card assemblies

(1) Major Test Adapter. The major test adapter is the universal adapter. It provides the means of interfacing the test equipment to the UUT, minor adapter, and cables. It also houses the five types of personality circuit card assemblies needed for additional interfacing or signal conditioning between the UUT, interface devices, and test equipment. The major test adapter is passive and contains only two safety interlock switches and a signature resistor in addition to its wiring.

(2) Minor Adapter Assembly. The minor adapter assembly interfaces a particular UUT to the major test adapter. It provides signal routing of the stimuli and measurement data to/from the UUT and on to the major test adapter. The minor adapter assembly contains up to two connectors which connect to the major test adapter and the for a UUT. A minor adapter assembly is used when the UUT is a circuit card assembly and only during a depot TPS.

(3) Cable Assemblies. TPS cable assemblies interface the test equipment input/output connectors to the UUT and interface device hardware. They are typically a branched cable to access the multiple connectors of the UUT and/or test equipment, and will in some cases have branches to the major test adapter, minor adapter assembly, and test fixtures. Some cables are used for more than one TPS and others are used during the EETF TADS/PNVS augmentation equipment self-test.

(4) Self-Test Connectors. Self-test connectors are used during the IDSELFTEST portion of the test program. They are connected to the interface device hardware as displayed on the VDT. After these connections are performed, IDSELFTEST is run which performs a continuity check on all the interface device hardware used during that particular TPS. If continuity is not satisfied the broken path where continuity did not exist is displayed on the VDT and IDSELFTEST is aborted.

(5) Test Fixtures. Some TPSs require additional interface device hardware called test fixtures. They provide handling/mounting capabilities beyond that of the other interface devices. The test fixtures are simple devices, but precise, such that critical alignments are attained by bolting the fixture onto the test equipment and then mounting the UUT to the fixture, which is keyed for alignment. Some test fixtures may simply be holding devices which include actuators or just an additional signal routing path while others are used in direct relation with a particular measurement during a test.

(a) Deleted

(b) The azimuth gimbal alignment tool provides the capability of nulling the resolver at 0 degrees, testing backlash between the bull gear and pinion gear, checking the limit switches, and checking the limit stops of the PNVS azimuth drive gimbal assembly.

(c) The HOD and IVD optical alignment assembly aligns the IVD with the microscope. It provides the electronics to display test patterns on the CRT screen of the IVD and simulates the HOD being connected to the IVD. It enables the operator to control brightness, contrast, vertical spacing and position, and horizontal spacing and position of the CRT.

(d) The terminal box assembly provides impedance termination to the connected equipment. It allows sampling of FLIR video outputs to go to the TV monitor of the AN/USM-410 test station.

(e) The insert/adapter assembly is the mounting fixture for the TADS night sensor assembly and the nightside alignment tool assembly. It holds the UUT or alignment tool in place by a gimbal clamp assembly. The insert/adapter assembly is serialized to a particular sensor mount assembly. The numbered guide pins on the insert/adapter assembly match with the numbered holes on the sensor mount assembly.

(f) The PNVS interface structure insert provides mounting capabilities of the PNVS night sensor assembly to the nightside test bench.

(g) The day/night sensor assembly adapter is part of the insert/adapter assembly. It provides mounting capabilities of the UUT to the test bench.

(h) The channel balance adapter assembly enable the UUT to rotate on its axis when mounted to the nightside test bench. It allows the UUT to pan up and down the target in the test bench so the target spans the channels of the UUT. A detent thumbscrew is provided to select the amount of rotation necessary.

(i) The nightside alignment tool assembly is an optical alignment device used to obtain data before testing the UUT. It mounts to the insert/adapter assembly and then to the nightside test bench. Once mounted the operator looks through it at the target in the test bench to obtain the X and Y coordinates of the target. This data is saved to compare with the UUT measurements during testing.

(j) The illuminator fiber optic assembly is a fiber optic cable that connects between a calibrated light source and the OSA. It illuminates the OSA cavity to calibrate the photomultiplier tube prior to testing the IVD.

(k) The optical alignment - IVD reticle assembly measures the IVD CRT displays while testing. Test patterns of known size and dimension are displayed on the CRT, then the reticle is used to measure and verify these known dimensions.

(6) Personality Circuit Card Assemblies There are five different types of personality circuit card assemblies (personality cards):

- Signal conditioning
- Programmable resistor
- Signal routing
- Hi-watt load
- Spare

Each of these types are housed in the major test adapter in one of five card slots, A5-A9; signal conditioning in slot A5, programmable resistor in slot A6, signal routing in slot A7, hi-watt load in slot A8, and spare in slot A9. Each personality card has a P1 and P2 connector, and depending on the instructions displayed on the VDT is connected to the motherboard inside the major test adapter by either connector.

(a) The signal conditioning personality card provides circuitry to amplify or attenuate signals to/from the UUT. It may also include circuitry to provide additional signals needed that are not supplied by the test equipment.

(b) Programmable resistor personality card contains different values of resistors that are programmable by the test program. If a particular value of impedance is needed, the test program energizes the appropriate relays to switch the resistance value needed into the signal path.

(c) Signal routing personality card provides necessary signal routing from one connector or personality card in the major test adapter to another. It provides additional connections that are normally not present in the major test adapter.

(d) Hi-watt load personality card is used if a high power signal is present during testing. It contains the components (hi-watt resistors, transistors, etc.) to handle and attenuate if necessary, a high-watt signal between the UUT and test equipment.

(e) The spare personality card is used for miscellaneous functions not covered by one of the other four personality cards.

d. ADDITIONAL INSTRUCTIONS

Of the 14 AVIM TPSs, six require instructions that cannot be displayed on the AN/USM-410 VDT. The instructions are in the form of illustrations, procedures, or both. TM 9-6625-476-30 contains these additional instructions. When one of the six TPSs requiring additional instructions is tested, the test program software will reference specific illustration or paragraph numbers in the TM at the point in the program where they are required.

CHAPTER 2

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

OVERVIEW

This chapter provides instructions for organizational maintenance of the Electronic Equipment Test Facility (EETF) TADS/PNVS Augmentation Equipment. Also included are principles of operation, controls and indicators, preventive maintenance checks and services (PMCS), self-test, troubleshooting, and general maintenance procedures. Refer to TM 11-6625-3081-23P for repair parts and special tools list.

Section I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT 2-1

The maintenance task contained in this chapter uses tools contained in Tool Kits, Electronic Equipment TK-100/G and TK 105/G. Other tools required are listed in paragraph 2-2 and in the INITIAL SETUP of the specific maintenance task.

2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT 2-2

For authorized special tools and support equipment pertaining to organizational maintenance, refer to TM 11-6625-3081-23P, Repair Parts and Special Tools List (RPSTL). For some work on the EETF TADS/PNVS Augmentation Equipment, special tools, TMDE, or support equipment are needed. The following is a list of these items. Each item is identified in the INITIAL SETUP of each maintenance task that requires its use.

Item No.	National Stock No. or Part No.	Nomenclature
1	8415-00-082-6108	Apron, rubber
2	DELETED	
3	7910-00-530-6260	Cleaner, vacuum
4	AN/USM-410	EETF test station
5	4240-00-052-3776 (GGG-531CL1)	Goggles, acid-type safety
6	8211	Mat, workbench, conductive
7	AN/USM-451	Multimeter, digital
8	2212	Strap, wrist, conductive

2-3. REPAIR PARTS 2-3

Repair parts are listed and illustrated in the RPSTL (TM 11-6625-3081-23P) covering organizational and direct support maintenance for this equipment.

Section II. CONTROLS AND INDICATORS

2-4. GENERAL 2-4

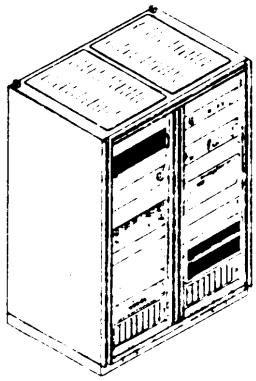
The controls and indicators for operating the EETF TADS/PNVS Augmentation Equipment are described and shown in this section.

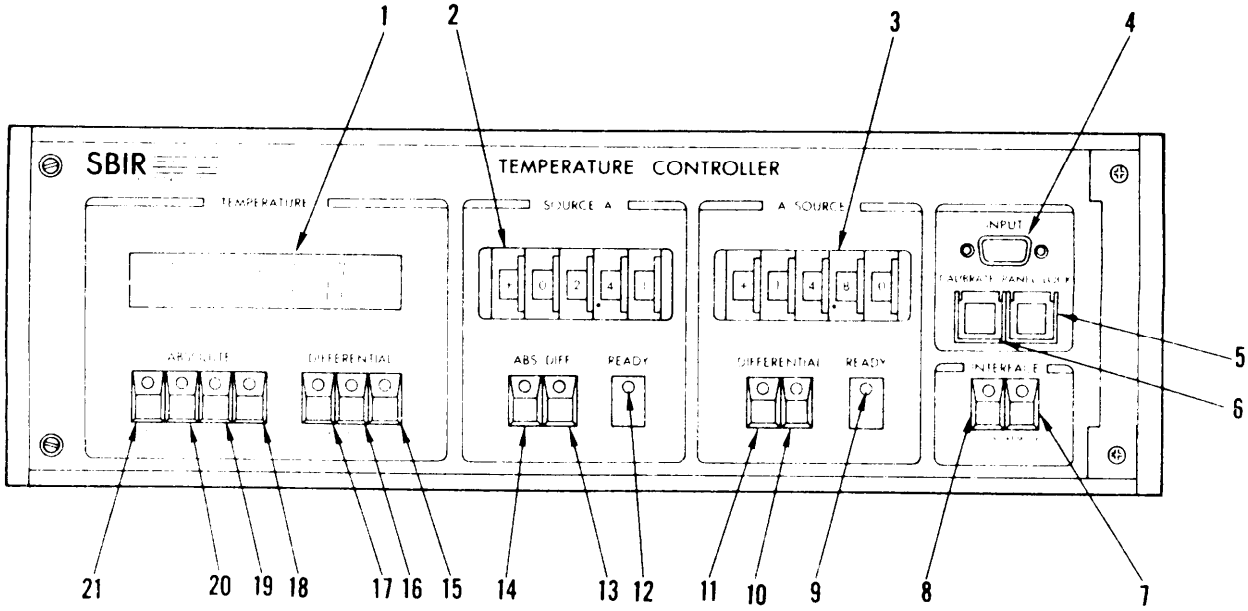
2-5. DAMAGE FROM IMPROPER SETTINGS 2-5

It is important to follow the proper sequence of any operational procedures. Deviation from operating instructions could result in damage to the equipment. Refer to TM 11-6625-3085-12 for operating instructions.

2-6. ELECTRONIC STATION CONTROLS AND INDICATORS

TEMPERATURE CONTROLLER UNIT 1A1





EL9LQ-510-25

2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont) 2-6

TEMPERATURE CONTROLLER UNIT 1A1 (cont)

Key	Control or Indicator	Function
1	LED Display	Displays absolute or differential temperatures as selected.
2	SOURCE A Thumbwheel Switch	Used to set the absolute or differential temperature of a blackbody connected to source A. Can be set positive or negative in relationship to the ambient sensor. Temperature can be set with a resolution of 0.01°C.
3	ΔSOURCE Thumbwheel Switch	Used to set the differential temperature of Source B or Source C, as selected. Can be set positive or negative with a resolution of 0.01°C.
4	INPUT Connector	Used to connect a joystick control used during calibration.
5	PANEL LOCK Switch	Used to disable pushbutton switches in the TEMPERATURE, SOURCE A, and ΔSOURCE areas of the panel.
6	CALIBRATE Switch	Used to select calibration mode of operation.
7	INTERFACE REMOTE Pushbutton Switch/ Indicator	Pushbutton switch enables remote operation of the controller. When remote mode enabled, both LOCAL and REMOTE indicators are lit. LOCAL indicator goes out when remote operation in progress.
8	INTERFACE LOCAL Pushbutton Switch/ Indicator	Pushbutton switch enables local (front panel) operation. When local operation is enabled, LOCAL indicator is lit and REMOTE indicator is out.
9	ΔSOURCE READY Indicator	Indicator lights when selected source temperature is stable and within 0.02 degrees of the set temperature.
10	ΔSOURCE DIFFERENTIAL C Pushbutton Switch/ Indicator	Pushbutton switch selects source C. Indicator lights to show source C selected. When selected, temperature of blackbody connected to source C will be controlled to within 0.02°C as set by thumbwheel switches. The temperature will be slaved either positive or negative to source A.
11	ΔSOURCE DIFFERENTIAL B Pushbutton Switch/ Indicator	Same as 10 except for blackbody source connected to B.

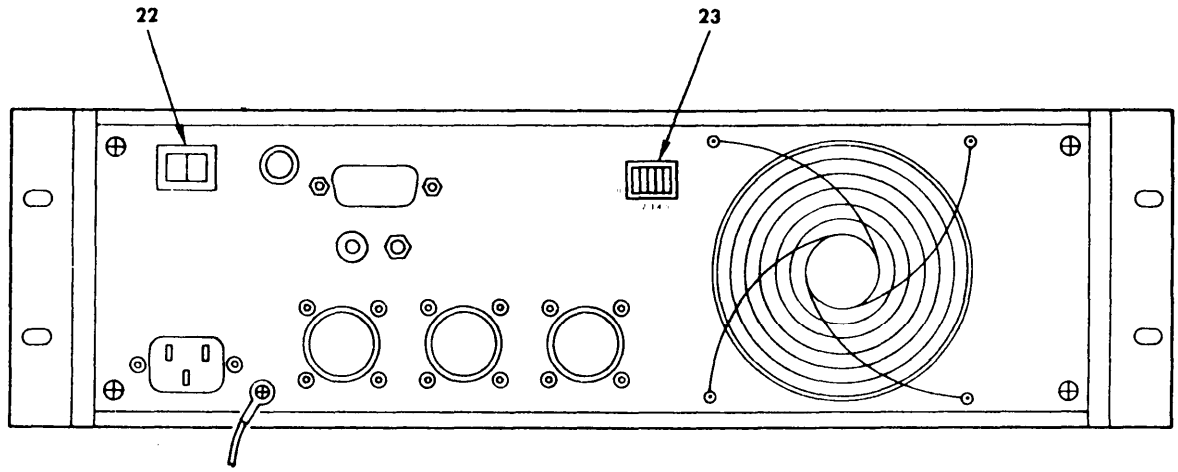
TEMPERATURE CONTROLLER UNIT 1A1 (cont)

Key	Control or Indicator	Function
12	SOURCE A READY Indicator	Indicator lights when source A temperature is stable and within 0.02°C of the set absolute or differential temperature.
13	SOURCE A DIFF Pushbutton Switch/ Indicator	Pushbutton switch enables differential temperature control. Source A temperature is slaved to the ambient sensor temperature. Source A temperature can be positive or negative in relationship to the ambient sensor temperature. If positive, source A temperature is regulated above the ambient temperature by the differential temperature set by the thumbwheel switches. If negative, source A temperature is regulated below the ambient temperature by the differential temperature set by the thumbwheel switches. Indicator lights to show differential temperature control is selected.
14	SOURCE A ABS Pushbutton Switch/ Indicator	Pushbutton switch enables absolute temperature control of blackbody connected to source A. Thumbwheel switch setting will directly determine temperature of blackbody surface. Indicator lights to show absolute temperature control is selected.
15	TEMPERATURE DIFFERENTIAL C-A Pushbutton Switch/ Indicator	Pushbutton switch selects display to show temperature difference between source C and source A. Indicator lights to show temperature difference between source C and source A is displayed.
16	TEMPERATURE DIFFERENTIAL B-A Pushbutton Switch/ Indicator	Pushbutton switch selects display to show temperature difference between source B and source A. Indicator lights to show temperature difference between source B and source A is displayed.
17	TEMPERATURE DIFFERENTIAL A-AMB Pushbutton Switch/ Indicator	Pushbutton switch selects display to show temperature difference between source A and the ambient sensor. Indicator lights to show temperature difference between source A and ambient sensor is displayed.

TEMPERATURE CONIROLLER UNIT 1A1 (cont)

Key	Control or Indicator	Function
18	TEMPERATURE ABSOLUTE C Pushbutton Switch/ Indicator	Pushbutton switch selects display to show absolute temperature of blackbody connected to source C. Indicator lights to show absolute temperature of source C is displayed.
19	TEMPERATURE ABSOLUTE B Pushbutton Switch/ Indicator	Pushbutton switch selects display to show absolute temperature of blackbody connected to source B. Indicator lights to show absolute temperature of source B is displayed.
20	TEMPERATURE ABSOLUTE A Pushbutton Switch/ Indicator	Pushbutton switch selects display to show absolute temperature of blackbody connected to source A. Indicator lights to show absolute temperature of source A is displayed.
21	TEMPERATURE ABSOLUTE AMB Pushbutton Switch/ Indicator	Pushbutton switch selects display to show absolute temperature of the ambient sensor. Indicator lights to show absolute temperature of ambient sensor is displayed.

TEMPERATURE CONTROLLER UNIT 1A1 (cont)



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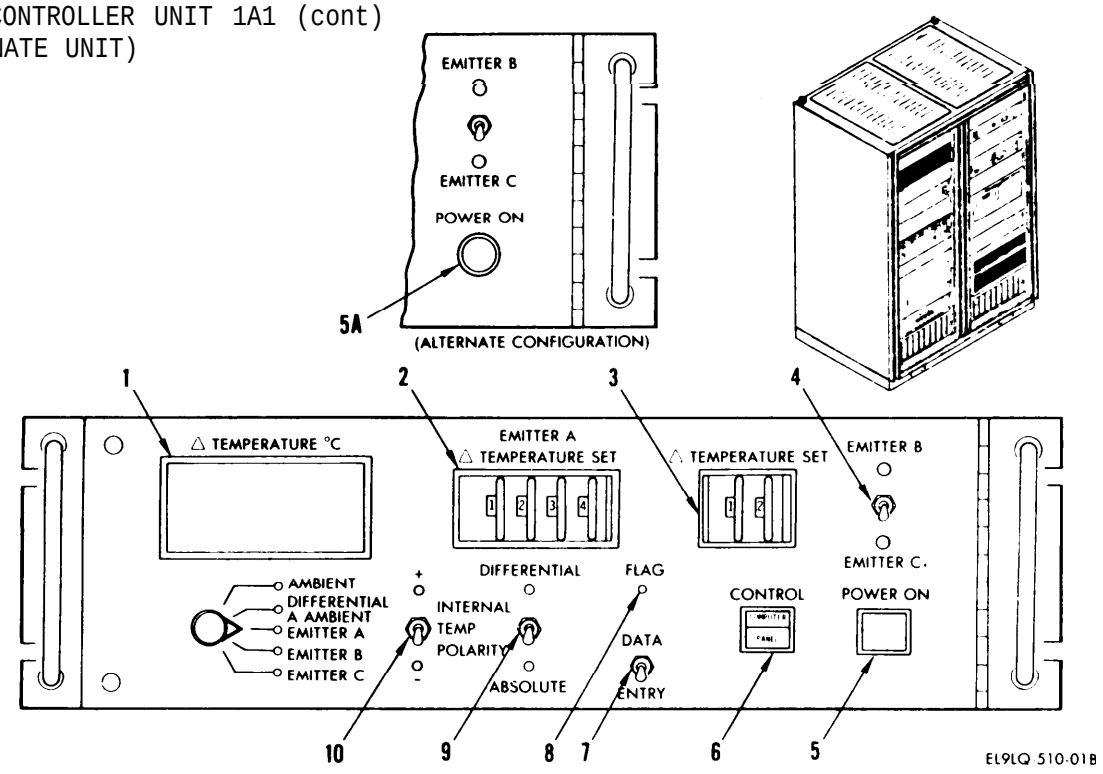
Key	Control or Indicator	Function
22	Power Switch	Turns ac power on or off.
23	Address Select Switch S1-S5	Used to preset interface address.

TEMPERATURE CONTROLLER UNIT 1A1 (cont)
(ALTERNATE UNIT)



Key	control or Indicator	Function
1	ΔTEMPERATURE °C Digital Panel Meter	Displays temperature measurements as selected by temperature display control switch.
2	EMITTER A TEMPERATURE SET Switches	Sets selected temperature of emitter A.
3	ΔTEMPERATURE SET Switches	Sets selected temperature of emitter B or C.
4	EMITTER B/EMITTER C Switch	Selects emitter B or C for ΔTEMPERATURE SET switches.
		LED (light emitting diode) lights to indicate emitter selection entered by front panel DATA ENTRY switches or computer command,
5	POWER ON Switch	Turns ac power on (lit) and off (not lit).
5A	POWER ON Indicator (Alternate Configuration)	Indicates rear panel POWER switch is on and ac power is applied.

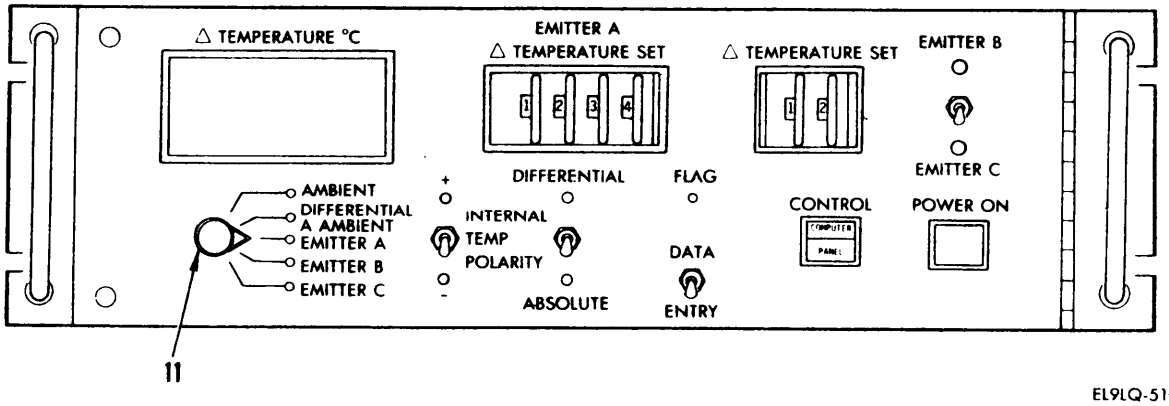
2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont) 2-6

TEMPERATURE CONTROLLER UNIT 1A1 (cont)
(ALTERNATE UNIT)

Key	Control or Indicator	Function
6	CONTROL Switch	Two-position illuminated switch changes position each time pushed. A clear plastic switch guard prevents unwanted changes. Lower PANEL section lit (green) - allows operator access to controller by use of front panel switches. Upper COMPUTER section lit (red) - computer has control. Both sections lit - computer has control and is waiting for operator action.
7	DATA ENTRY Switch	Enters data from other switches into controller. Change in setting will not be entered until switch is pressed.
8	FLAG Indicator	Indicates emitter A is stabilized to within 0.02°C of its final temperature.
9	DIFFERENTIAL/ABSOLUTE Switch	ABSOLUTE - selects absolute temperature as set by emitter A ΔTEMPERATURE SET switch. DIFFERENTIAL - emitter A temperature is an offset between temperature of external sensor and temperature entered by EMITTER A Δ TEMPERATURE SET switches. LED lights to indicate temperature selection entered by front panel DATA ENTRY switch or computer command.
10	INTERNAL TEMP POLARITY Switch	Up (+) position - emitter A is hotter than ambient sensor by temperature entered in EMITTER A ΔTEMPERATURE SET switches. Down (-) position - emitter A cooler than ambient sensor by temperature entered in EMITTER A ΔTEMPERATURE SET SWITCHES. LED lights to indicate TEMP POLARITY entered by front panel DATA ENTRY switch or computer command.

2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont) 2-6

TEMPERATURE CONTROLLER UNIT 1A1
(ALTERNATE UNIT)



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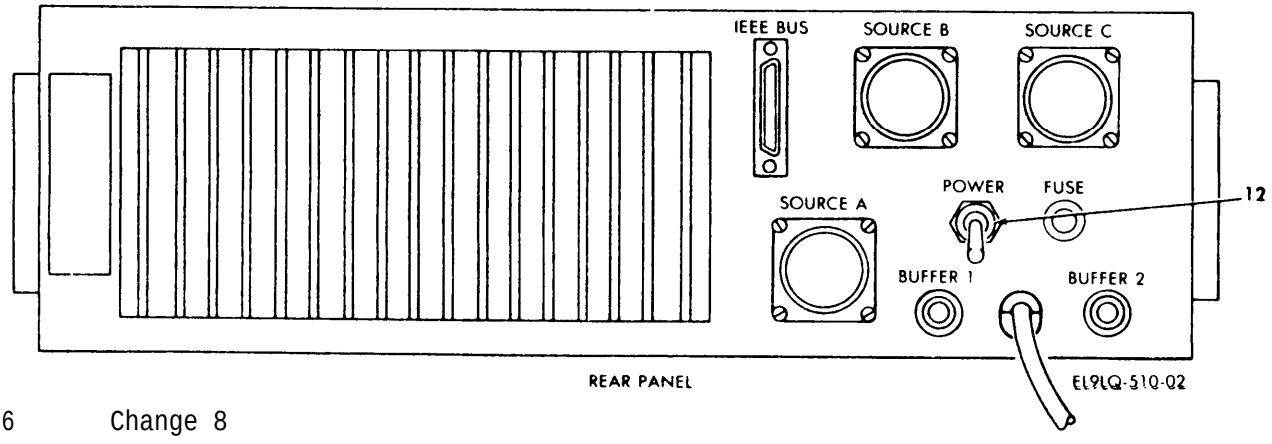
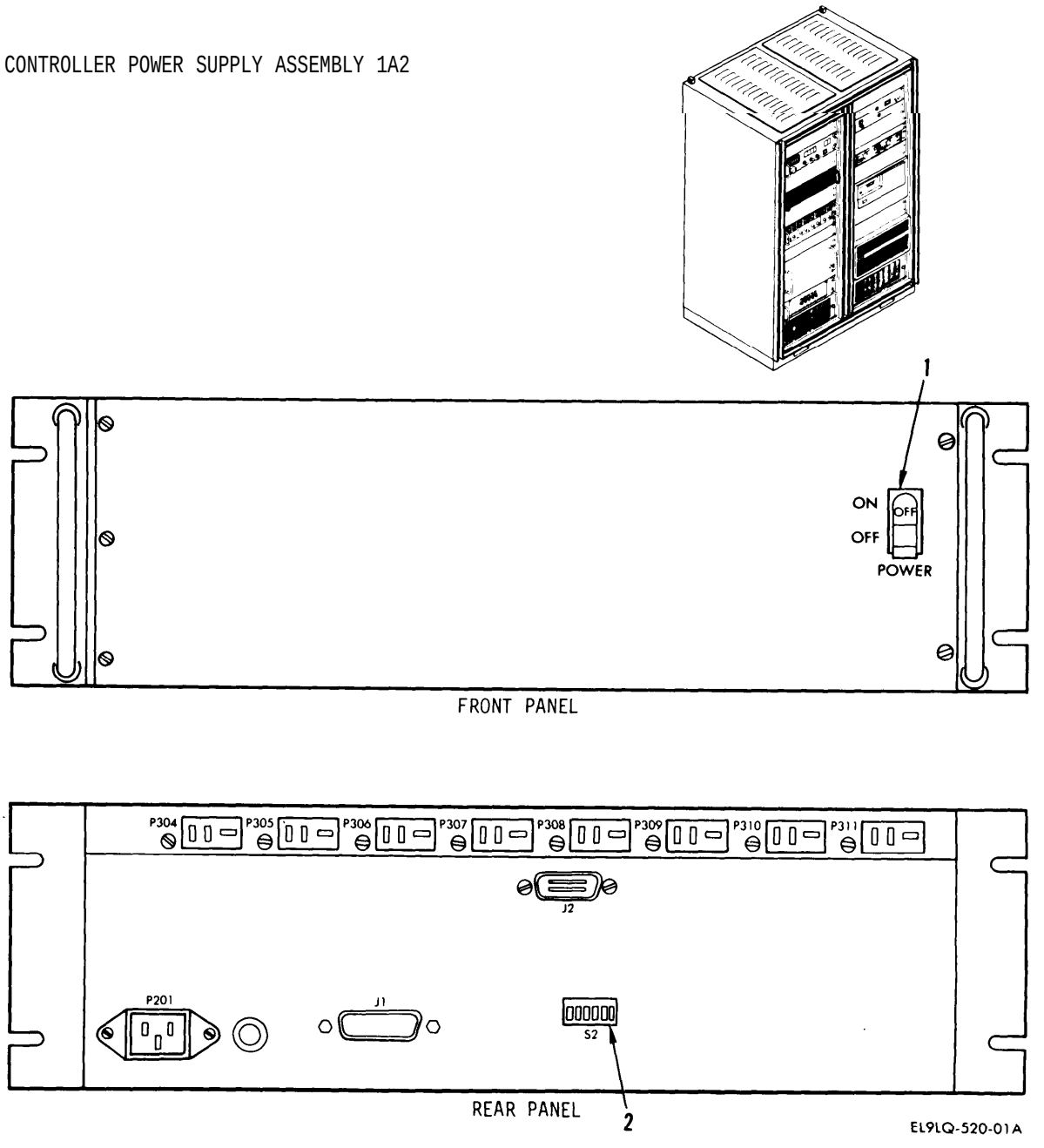
Key	Control or Indicator	Function
11	Temperature Display Control Switch	Selects one of five temperature measurements read by the Digital Panel Meter. ● AMBIENT - temperature of external ambient probe. ● DIFFERENTIAL A AMBIENT - emitter A temperature minus ambient temperature. ● EMITTER A - absolute temperature of emitter A. ● EMITTER B - absolute temperature of emitter B. ● EMITTER C - absolute temperature of emitter C. LED lights to indicate temperature measurement function entered by front panel DATA ENTRY switch or computer command.
12	POWER Switch (Alternate Configuration)	Turns ac power on (up) and off (down).



EL9LQ-510-02

2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont) 2-6

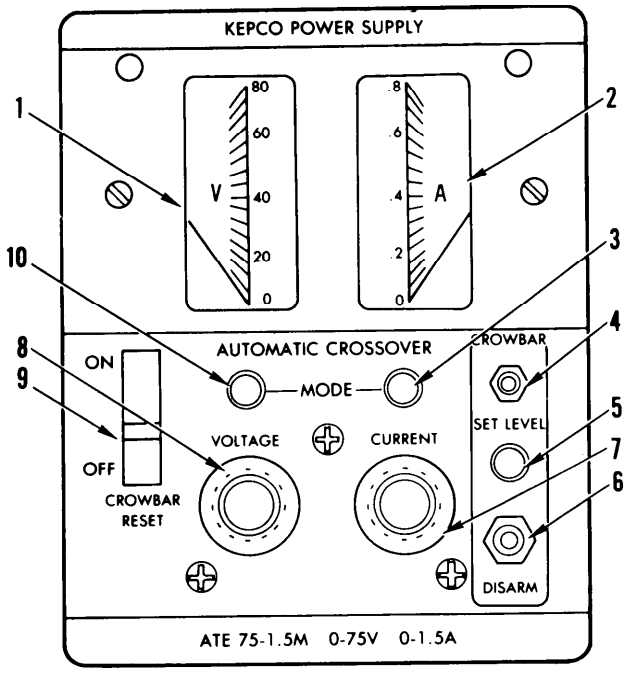
488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2

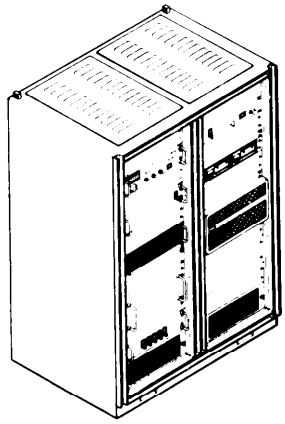


Key Control or Indicator	Function
1 POWER Switch	Turns ac power on and off.
	Lights when power is on.
2 Address Selector Switch	Presets interface address and sets interface to Listen Only or Addressable mode.

2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont)

PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3
Power Supplies 1A3PS1-1A3PS4





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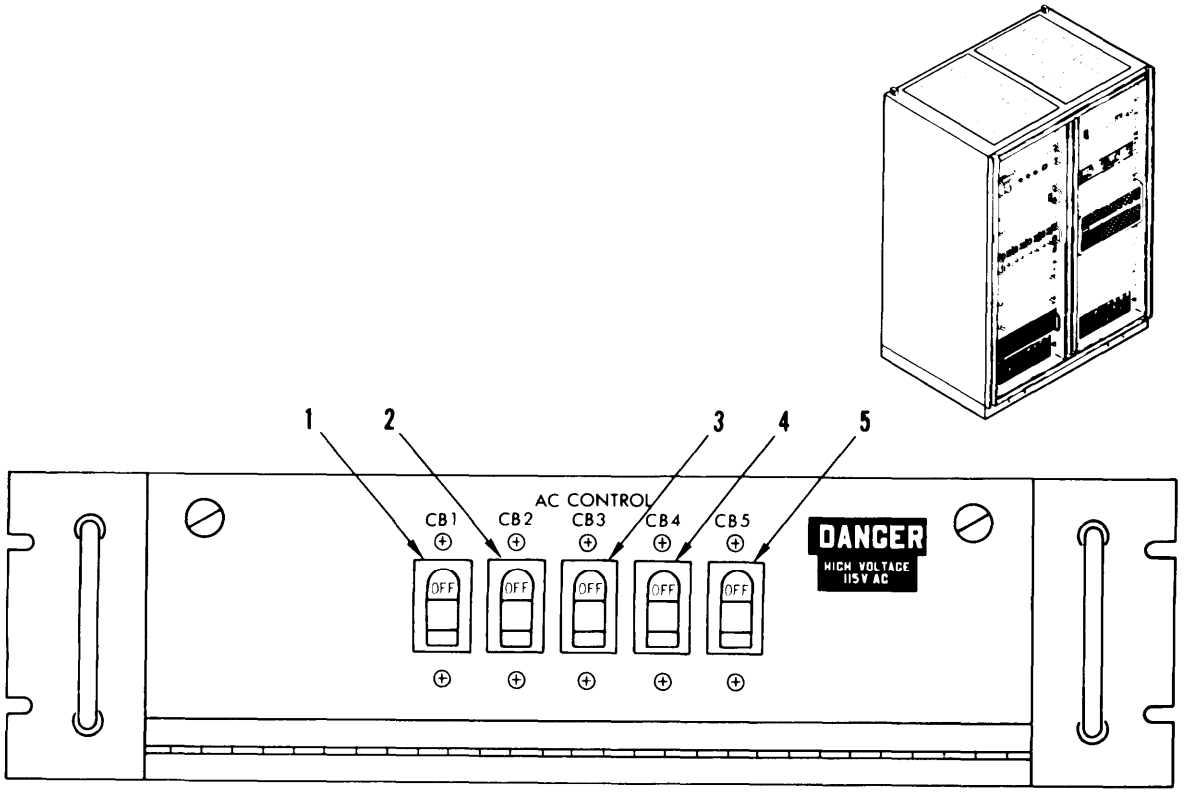
Key	Control or Indicator	Function
1	V Voltmeter	Monitors output voltage.
2	A Ammeter	Monitors output current.
3	MODE Indicator	Lights when in current mode.
4	CROWBAR SET LEVEL Potentiometer	Adjusts trigger level of crowbar circuit.
5	CROWBAR Indicator	Lights when crowbar is triggered on.
6	CROWBAR DISARM Switch	Press to set crowbar trigger level.
7	CURRENT Control	Adjusts current from zero to maximum.
8	VOLTAGE Control	Adjusts voltage from zero to maximum.
9	ON/OFF CROWBAR RESET	Turns ac power on and off. Turns ac power off on overload.
10	MODE Indicator	Lights when in voltage mode.

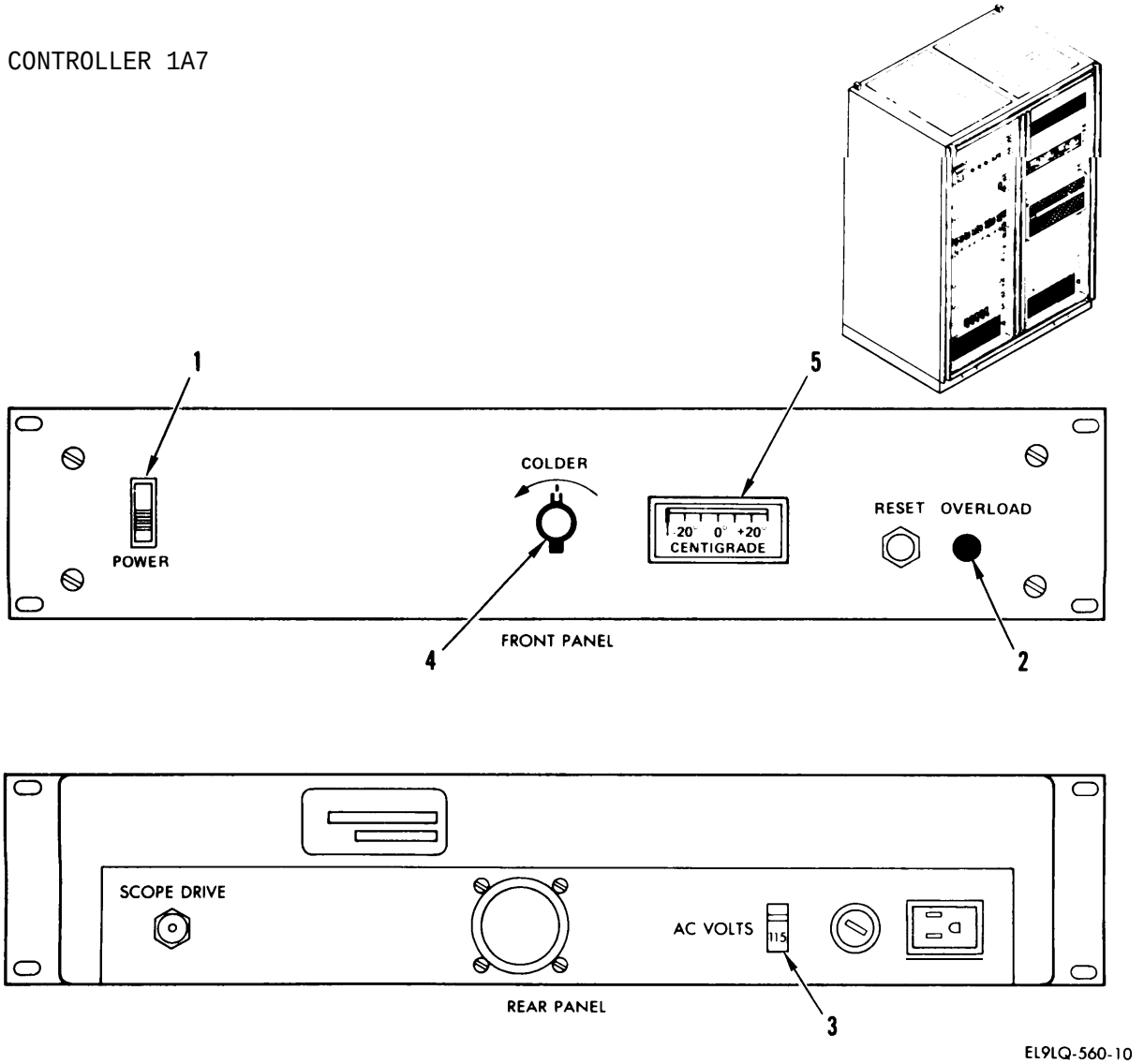
AC CONTROL PANEL ASSEMBLY 1A5



Key	Control or Indicator	Function
1	CB1 Circuit Breaker	Provides ac power and overload protection to left bay of Electronic Station.
2	CB2 Circuit Breaker	Provides ac power and overload protection to right bay of Electronic Station, except digital computer assembly.
3	CB3 Circuit Breaker	Provides ac power and overload protection to digital computer assembly.
4	CB4 Circuit Breaker	Provides ac power and overload protection to Test Console Test Bench.
5	CB5 Circuit Breaker	Provides ac power and overload protection to Test Console Test Bench.

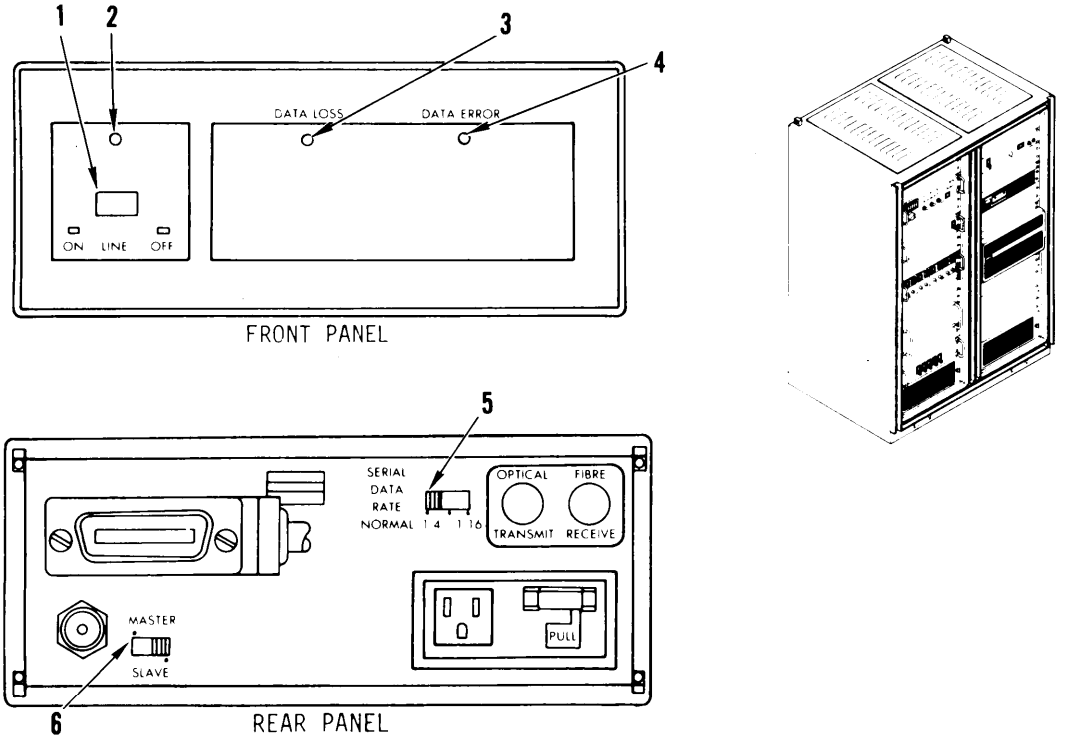
2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont)

PMT CONTROLLER 1A7



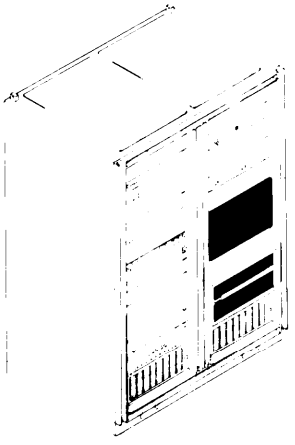
Key	Control or Indicator	Function
1	POWER Switch	Turns ac power on and off.
2	OVERLOAD Indicator	Indicates power shutdown caused by cooling failure.
3	AC VOLTS Switch	Matches controller to ac power voltage.
4	Temperature Control	Adjusts temperature of cooling supply.
5	Temperature Gage	Provides temperature measurement in centigrade.

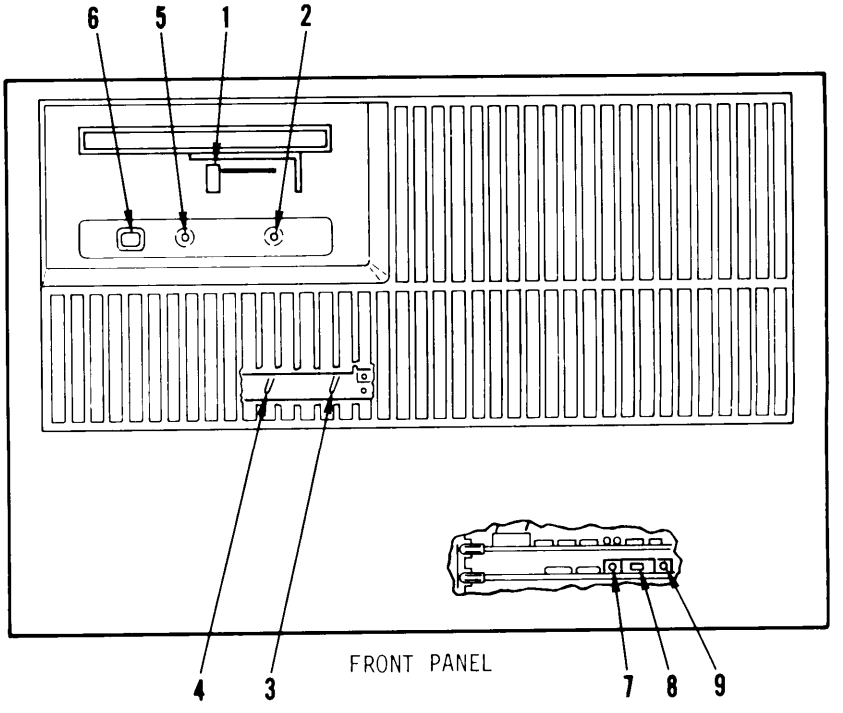
EXTENDER ASSEMBLY 1A9
Extender 1A9A1-1A9A2

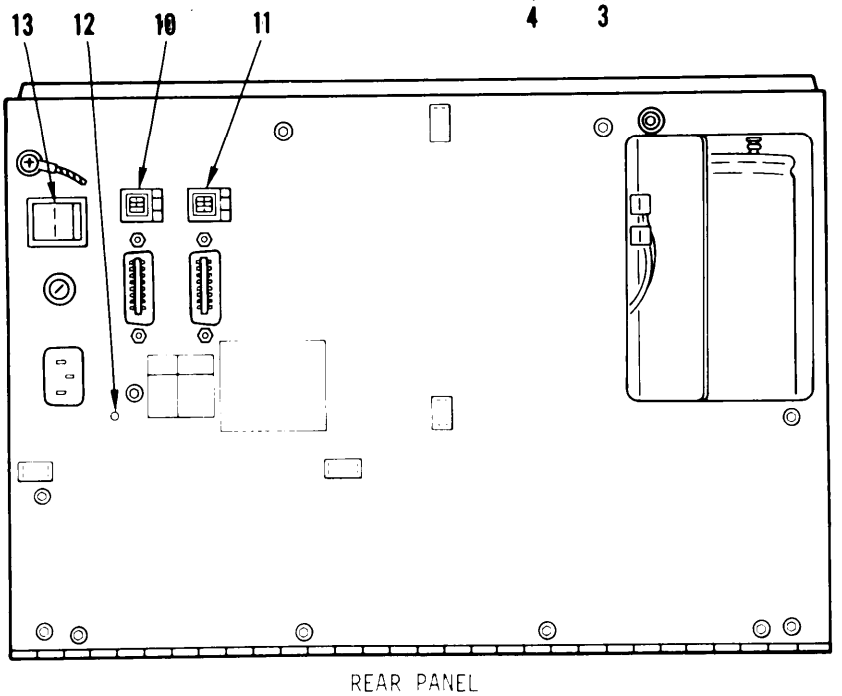


Key	Control or Indicator	Function
1	LINE ON/OFF Switch	Turns ac power on and off.
2	Line Indicator	Lights when ac power is on.
3	DATA LOSS Indicator	Lights to indicate loss of data frames.
4	DATA Error Indicator	Flashes when an error is detected and stays on when many errors occur.
5	SERIAL DATA RATE Switches	Sets operation speed of extender assembly.
6	MASTER/SLAVE Switch	Set to MASTER on unit at one end of serial link and to SLAVE on unit at the other end.

DISC/TAPE DRIVE ASSEMBLY 1A10







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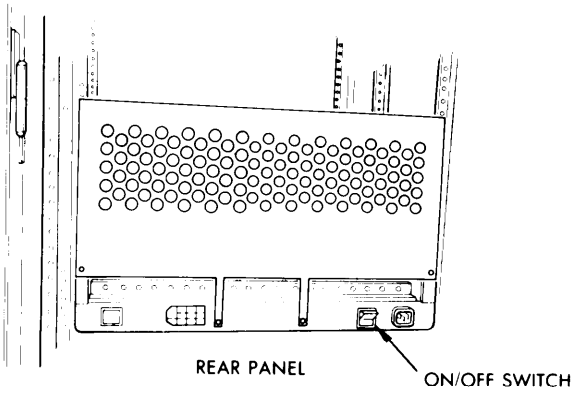
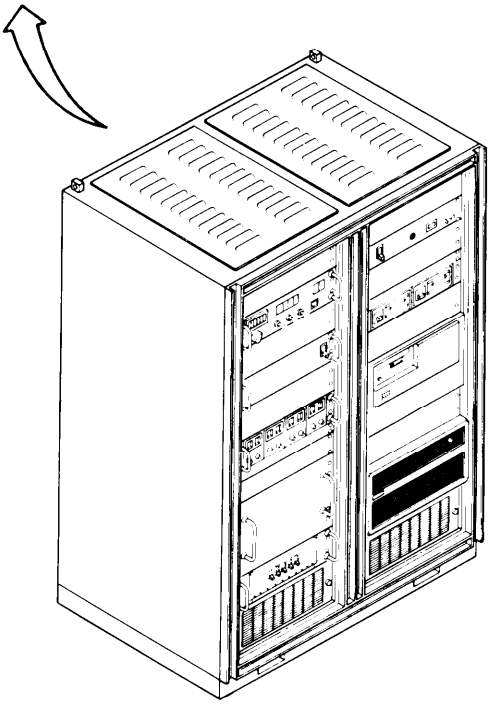
2-6. ELECTRONIC STATION CONTROLS AND INDICATORS (cont) 2-6

Key	Control or Indicator	Function
1	Eject Lever	Ejects cartridge out of tape unit.
2	PROTECT Indicator	Indicator illuminates when cartridge presently in tape unit has been set to SAFE.
3	SAVE DISC to TAPE Switch	Initiates a save operation to copy a full volume from disc drive to tape.
4	RESTORE TAPE to DISC Switch	Initiates a restore operation to copy entire contents of tape to disc drive.
5	BUSY Indicator	Indicates a tape operation is in progress. Also illuminates during save and restore operations.
6	UNLOAD Switch	Initiates an unload operation which requests a release from the host. Once released, the controller updates the error logs, rewinds the tape, and unlocks the cartridge. If pressed during a save or restore operation, it will temporarily stop those operations. If not pressed again in 5 seconds, save or restore operation is resumed. If pressed again within 5 seconds, an unload operation is performed.
7	Diagnostic Switch	Initiates an internal diagnostic routine to test the disc/tape drive. Results are displayed on the status readout.
8	Status Readout (LED)	Displays coded results of the diagnostic routine and self-test.
9	Self-Test Switch	Initiates internal self-test to verify the operational condition of disc/tape drive.
10	HP-IB DISC Address Switch (S1-S3 LSB-MSB)	Used to select one of eight unique address codes for the disc drive.

Key	Control or Indicator	Function
11	HP-IB TAPE Address Switch (S1-S3 LSB-MSB)	Used to select one of eight unique address codes for the tape drive. Not used.
12	Power Indicator (LED)	Indicates operating status of dc power supply. Indicator illuminated when all dc operating voltages are present,
13	LINE OFF/O ON/1 Switch	Applies ac power to blower motor and dc power supply in the ON/1 position. Removes ac power from blower motor and dc power supply in the OFF/O position.

DIGITAL COMPUTER ASSEMBLY 1A11





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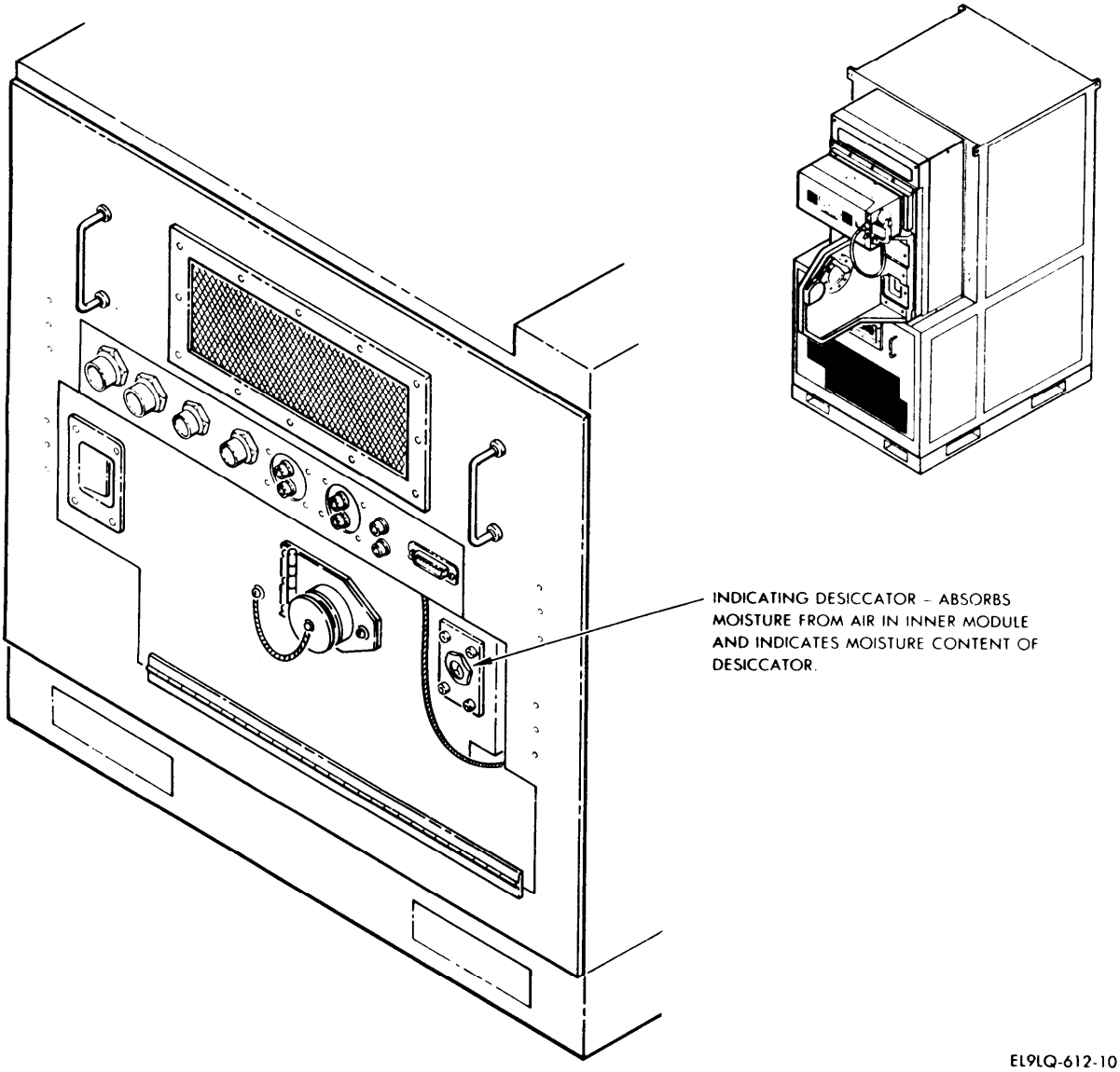
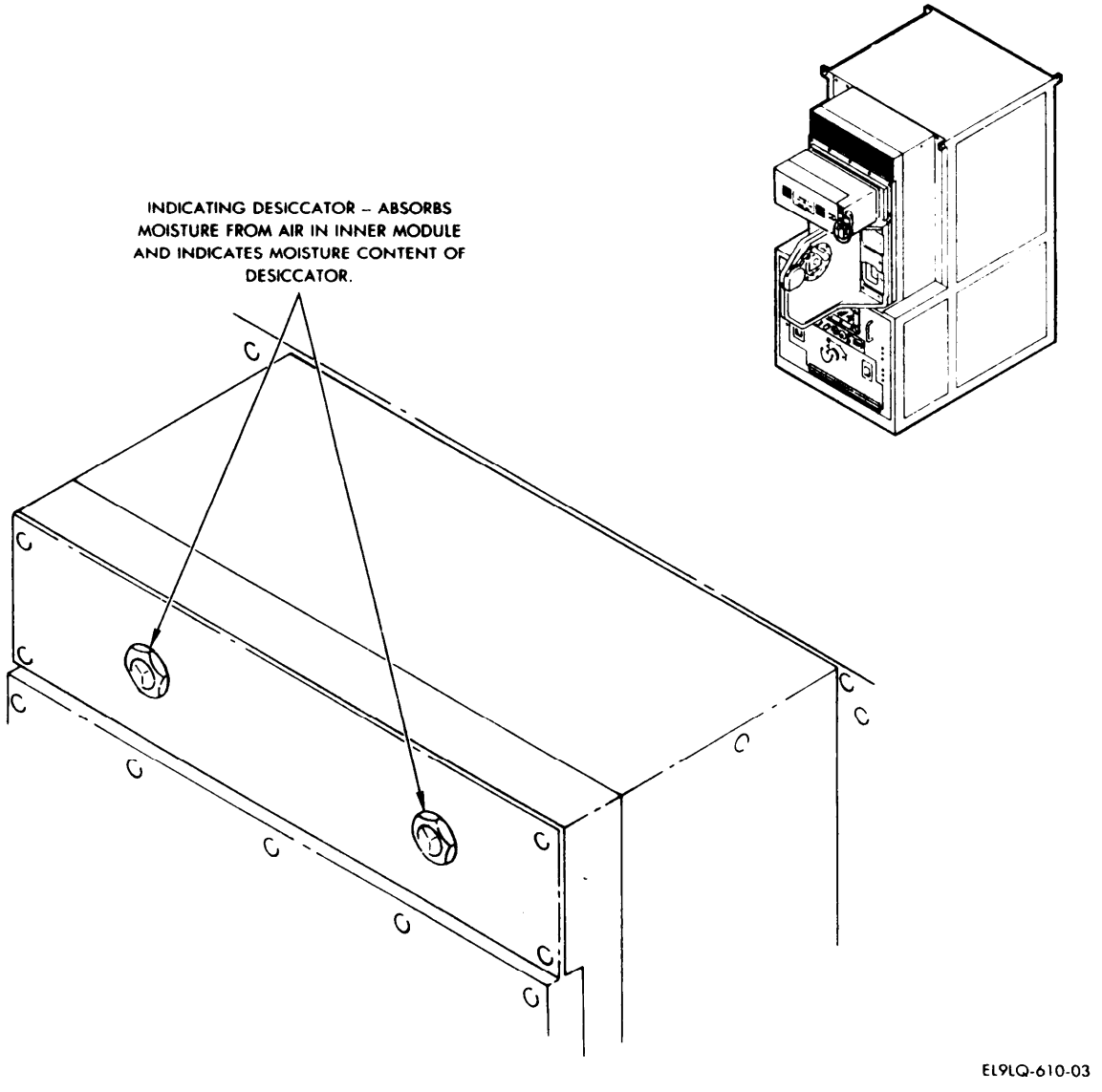
2-7. DAYSIDE TEST BENCH 2A1 CONTROLS AND INDICATORS

OPTICAL SIGNAL ANALYZER ASSEMBLY 2A1A1 (E/O BENCH SERIAL NO. 00001 THRU 00105)

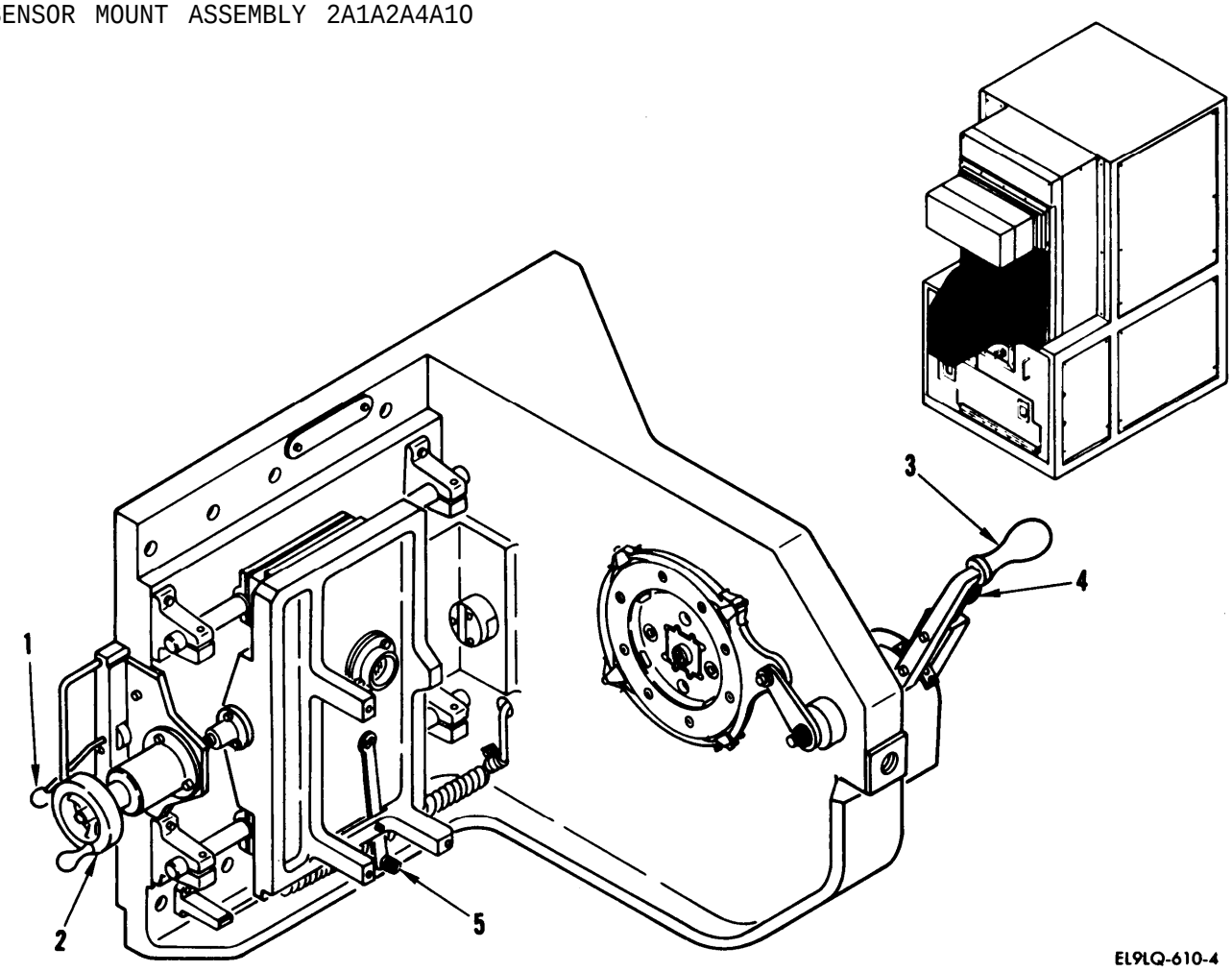


2-7. DAYSIDE TEST BENCH 2A1 CONTROLS AND INDICATORS (cont) 2-7

INNER MODULE 2A1A2



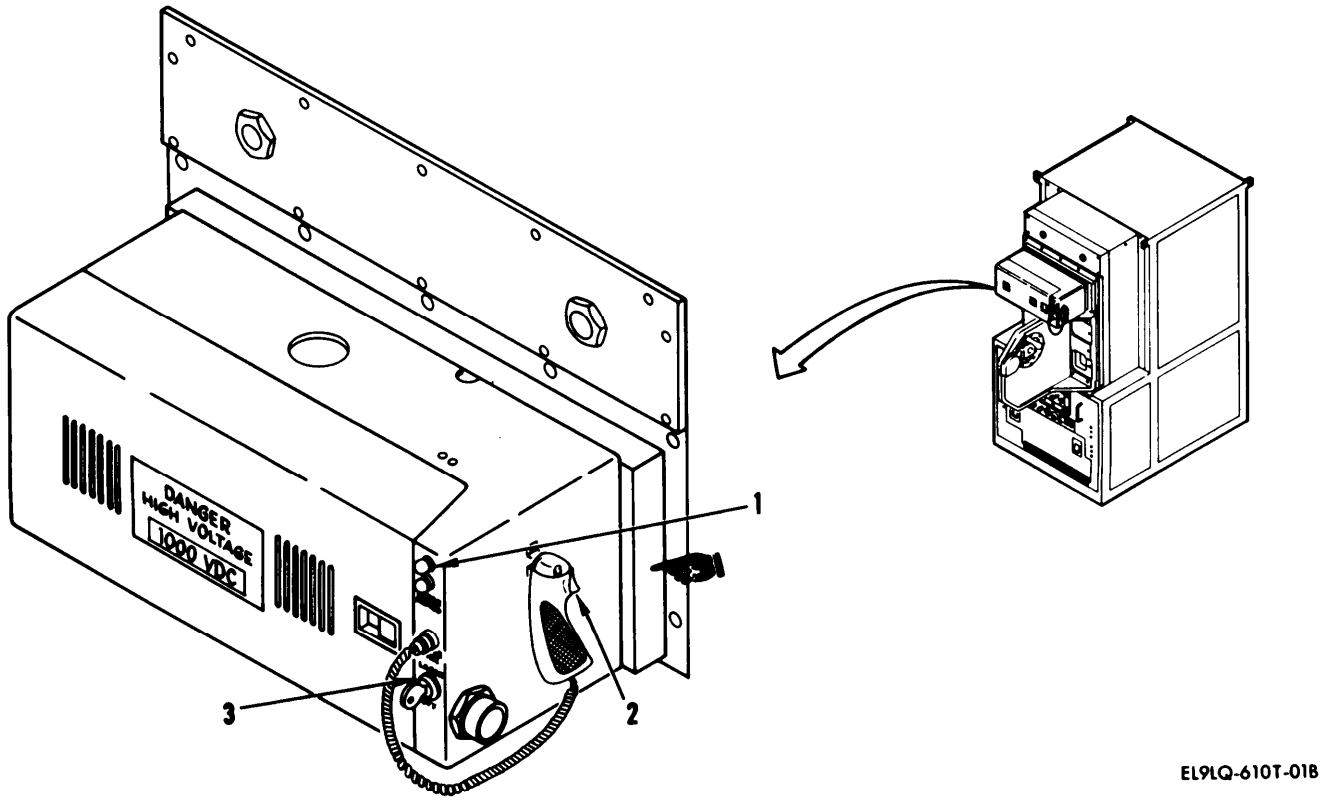
SENSOR MOUNT ASSEMBLY 2A1A2A4A10



Key	Control or Indicator	Function
1	Laser Interlock Handle	Locks laser safety shield in position and enables laser firing.
2	Laser Interface Carriage Handle	Moves carriage back and forth on rails.
3	Sensor Mount Handle	Secures unit-under-test in test bench.
4	Sensor Mount Handle Lock	Locks sensor mount handle in open or closed position.
5	Laser Attenuator Handle	Positions attenuator in optical path.

2-7. DAYSIDE TEST BENCH 2A1 CONTROLS AND INDICATORS (cont) 2-7

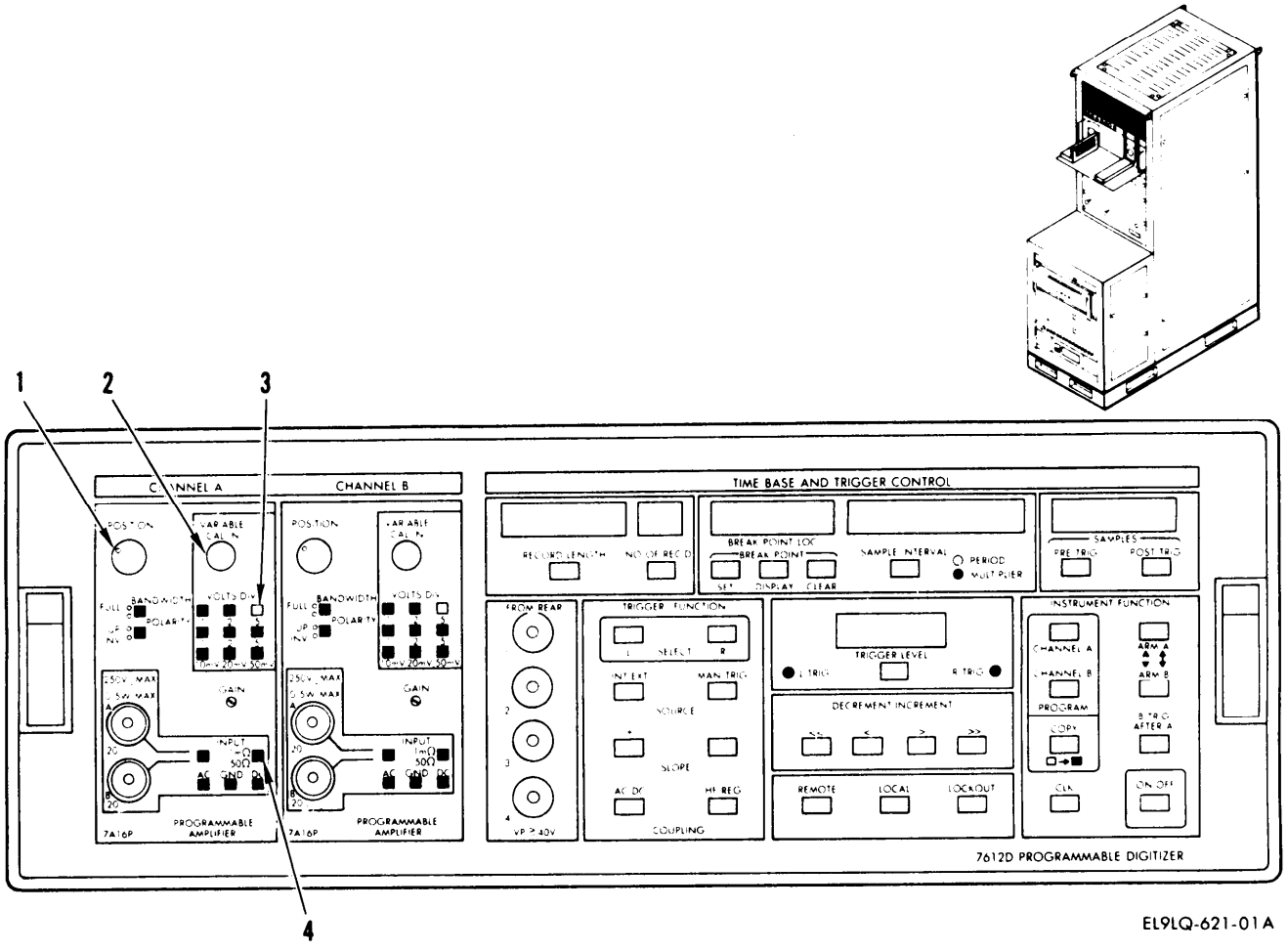
LASER COVER ASSEMBLY 2A1A2A19



Key	Control or Indicator	Function
1	LASER ARMED Indicators	Lights when laser is ready to fire.
2	LASER FIRE Switch	Fires laser. Pistol-grip switch spring-loaded to off position. Clips to side of laser cover when not in use.
3	LASER Key Switch	Key switch disables LASER FIRE switch.
		Lights LASER ARMED indicators when on.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS

PROGRAMMABLE DIGITIZER 2A2A1

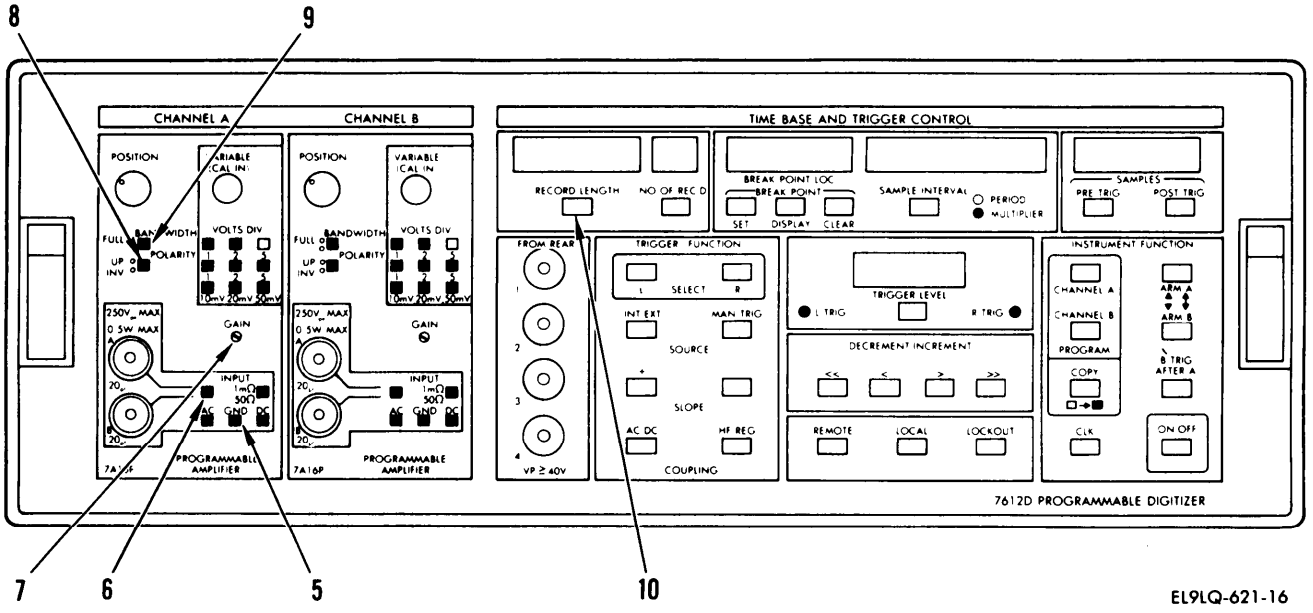


EL9LQ-621-01A

Key	Control or Indicator	Function
1	POSITION Control	Controls vertical position of CRT trace.
2	VARIABLE (CAL IN) Control	Provides changing deflection factors between calibrated steps.
3	VOLTS/DIV Switches	Selects calibrated deflection factors from 10 millivolts/division to 5 volts/division in nine steps. Lighted button indicates selected deflection factor.
4	1M/50 Ω Switch	Selects amplifier input impedance of either 1 megohm or 50 ohms. When lit, 50 ohms is selected.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

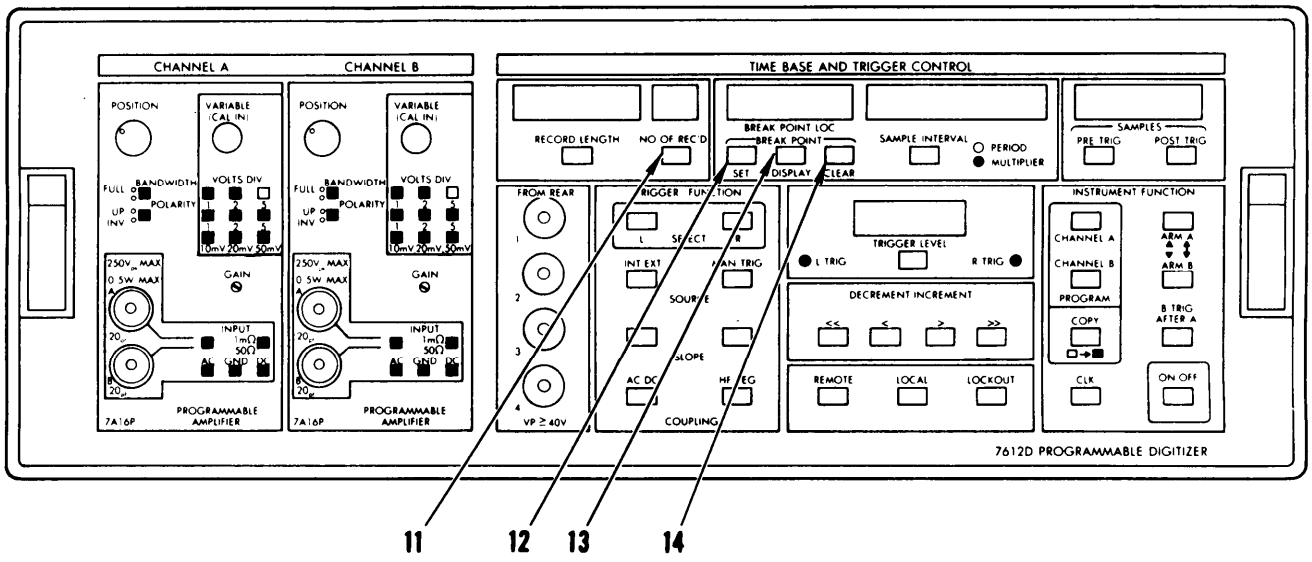
PROGRAMMABLE DIGITIZER 2A2A1 (cont)



Key	Control or Indicator	Function
5	AC-GND-DC Switches	Selects one of three input modes. ● AC - ac component of signal is coupled to input while dc component is blocked. ● GND - input connectors are disconnected from amplifier input. ● DC - both ac and dc components of signal are coupled to amplifier input. Lighted button indicates selected input coupling mode.
6	A-B Switch	Selects A or B input connector. When lit, B input is selected.
7	GAIN Potentiometer	Screwdriver adjustment varies amplifier gain over a narrow range to allow differences in gain between mainframes.
8	POLARITY Switch	Selects inverted or normal amplifier mode. When lit, inverted mode is selected.
9	BANDWIDTH Switch	Selects full amplifier bandwidth or reduced bandwidth of 20 megahertz. When lit, reduced bandwidth is selected.
10	RECORD LENGTH Switch	When pressed, record length for selected time base is set with DECREMENT/INCREMENT buttons. Lights when on. Displays record length for selected time base.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

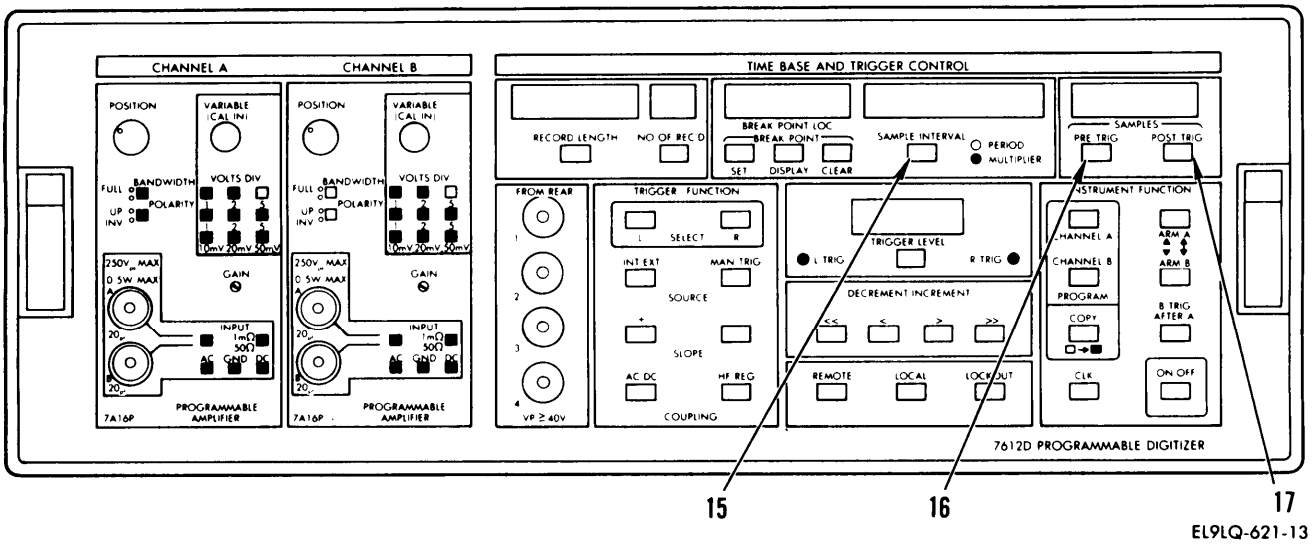
PROGRAMMABLE DIGITIZER 2A2Al (cont)



EL9LQ-621-12

Key	Control or Indicator	Function
11	NO. OF RECORDS Switch	When pressed, number of records for selected time base is set with DECREMENT/INCREMENT buttons. Lights when on. Displays number of records for selected time base.
12	BREAK POINT LOCATION SET Switch	When pressed, a new breakpoint location is set with DECREMENT/INCREMENT buttons. Breakpoint is set in all records in selected time base.
13	BREAK POINT LOCATION DISPLAY Switch	Displays existing breakpoints and corresponding sample intervals. DECREMENT/INCREMENT buttons allow user to cycle through existing breakpoints. Selects breakpoint to be cleared with CLEAR button. Breakpoints must be displayed before clearing.
14	BREAK POINT LOCATION CLEAR Switch	Clears breakpoint shown on BREAKPOINT LOCATION display. Displays location of breakpoint being set, examined, or cleared.

PROGRAMMABLE DIGITIZER 2A2A1 (cont)

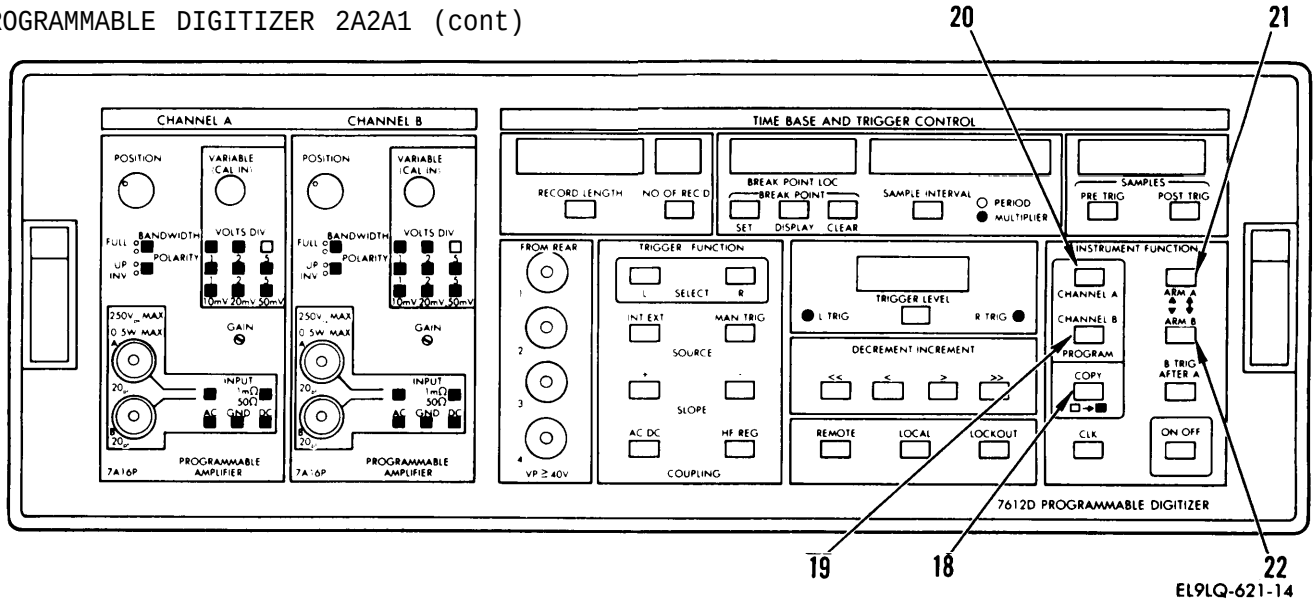


EL9LQ-621-13

Key	Control or Indicator	Function
15	SAMPLE INTERVAL Switch	Sets sample interval or external clock period multiplier for al 1 samples after displayed breakpoint and up to next breakpoint or at end of record. Displays sample interval or external clock period multiplier for al 1 samples from selected breakpoint to next breakpoint or at end of record, whichever comes first. PERIOD lights when internal clock is selected and value shown in SAMPLE INTERVAL display is the period in seconds. MULTIPLIER lights when external clock input is selected and value in SAMPLE INTERVAL display is the external clock period multiplier.
16	SAMPLES PRE-TRIGGER Switch	When pressed, the number of pre-trigger samples to be stored for selected time base is set with DECREMENT/INCREMENT buttons. Range of values is from zero to 16 less than number of samples in the first segment.
17	SAMPLES POST-TRIGGER Switch	When pressed, DECREMENT/INCREMENT buttons set number of samples after trigger that are ignored before data is stored. Allowable post-trigger values range from eight to record length. Displays number of samples of pre-or post-triggering selected.

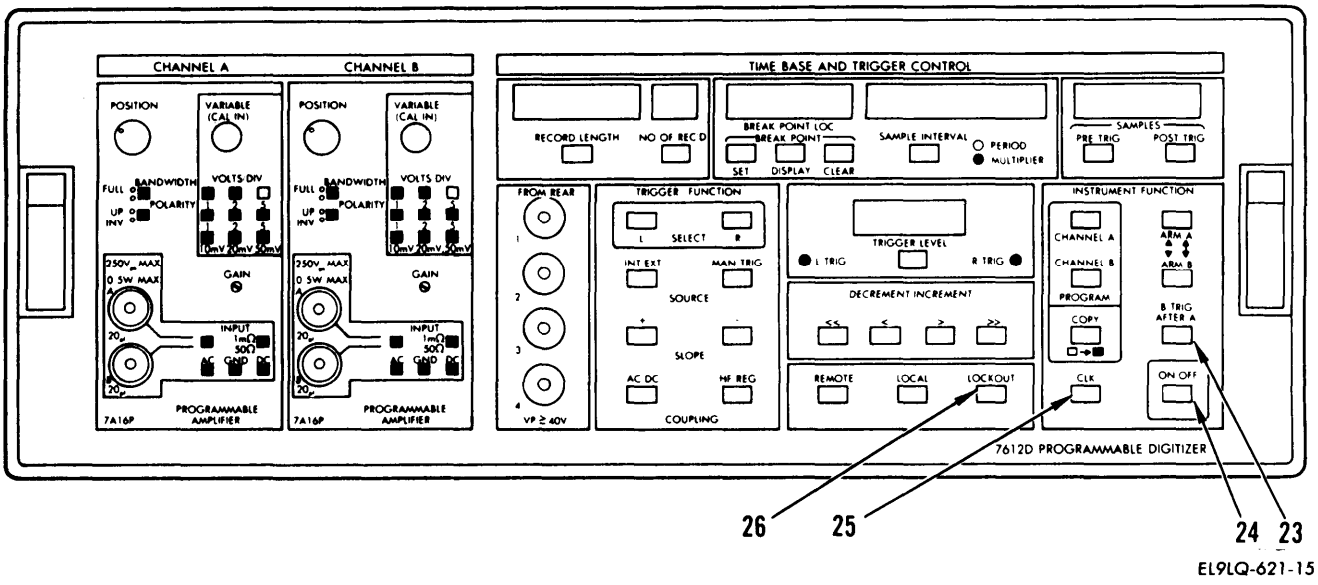
2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

PROGRAMMABLE DIGITIZER 2A2A1 (cont)



Key	Control or Indicator	Function
18	COPY Switch	Copies settings from selected time base to other time base. Example: Time base A is selected (CHANNEL A button lit). Pressing COPY button will copy all settings from time base A to time base B.
19	PROGRAM CHANNEL B Switch	Selects B channel to be programmed by time base and trigger function entries. Displays settings of channel B on front panel.
20	PROGRAM CHANNEL A Switch	Selects A channel to be programmed by time base and trigger function entries. Displays settings for channel A on front panel.
21	ARM A Switch	Arms the A time base. If changes were made to A time base settings since last arm operation, validity of settings is first verified. If errors are found during verification, a warning message is displayed in RECORD LENGTH indicators. When ARM operation is complete, time base becomes triggerable.
22	ARM B Switch	Arms the B time base. If changes were made to B time base settings since last arm operation, validity of settings is first verified. If errors are found during verification, a warning message is displayed in SAMPLES indicators. When ARM operation is complete, time base becomes triggerable.

PROGRAMMABLE DIGITIZER 2A2A1 (cont)

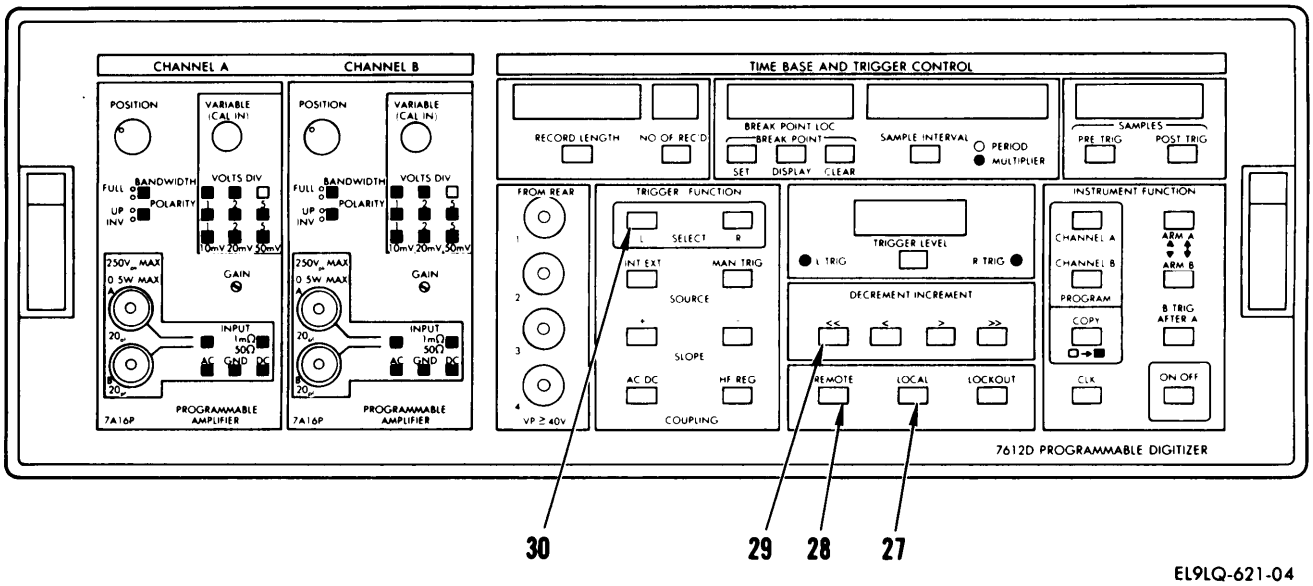


EL9LQ-621-15

Key	Control or Indicator	Function
23	B TRIG AFTER A Switch	Time base B becomes triggerable after first record of A. If only time base B is armed, it will not trigger until A is armed and has one record of data. MAN TRIG will not trigger time base B until this condition is satisfied.
24	ON/OFF Switch	Turns ac power on and off if rear panel PRINCIPAL POWER SWITCH is-on. Rear panel ACTUATE connector overrides ON/OFF switch. Lights when on.
25	CLK Switch	Selects internal or external clock as clock source for both channels. When set for internal, INT button lights and SAMPLE INTERVAL function selects a sample period in seconds. When set for external, EXT SAMPLE INTERVAL function selects a period multiplier for externally supplied clock signal.
26	LOCKOUT Switch	When pressed, primary and secondary IEEE 488 bus addresses are displayed in RECORD LENGTH SAMPLES indicators. Lights to indicate that unit is in local with lockout state or remote with lockout state.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

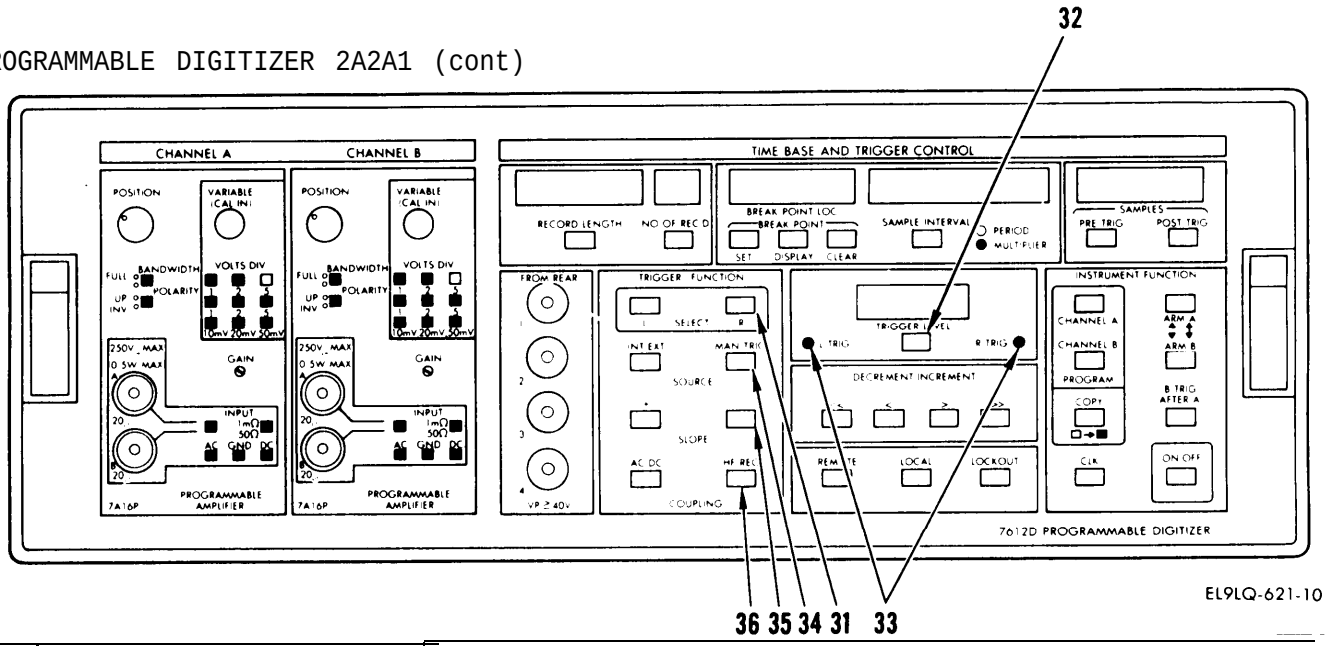
PROGRAMMABLE DIGITIZER 2A2A1 (cont)



EL9LQ-621-04

Key	Control or Indicator	Function
27	LOCAL Switch	Returns unit from remote state to local state unless system controller has set instrument to remote with lockout state. Lights when in local state.
28	REMOTE Switch	When pressed and system controller has enabled Remote Request function, this switch requests service from controller and reports remote request status. Lights to indicate when unit is set to remote state by IEEE 488 bus system controller.
29	DECREMENT/INCREMENT	Allows user to decrease or increase value for a selected time base or trigger parameter. The << and >> buttons cause the value to be decremented or incremented at a faster rate than the < and > buttons.
30	SELECT L Switch	Selects left trigger channel for programming by trigger function entries. Causes left trigger channel to be used as trigger source for time base being programmed. Trigger level for left channel is displayed in TRIG LEVEL indicators.

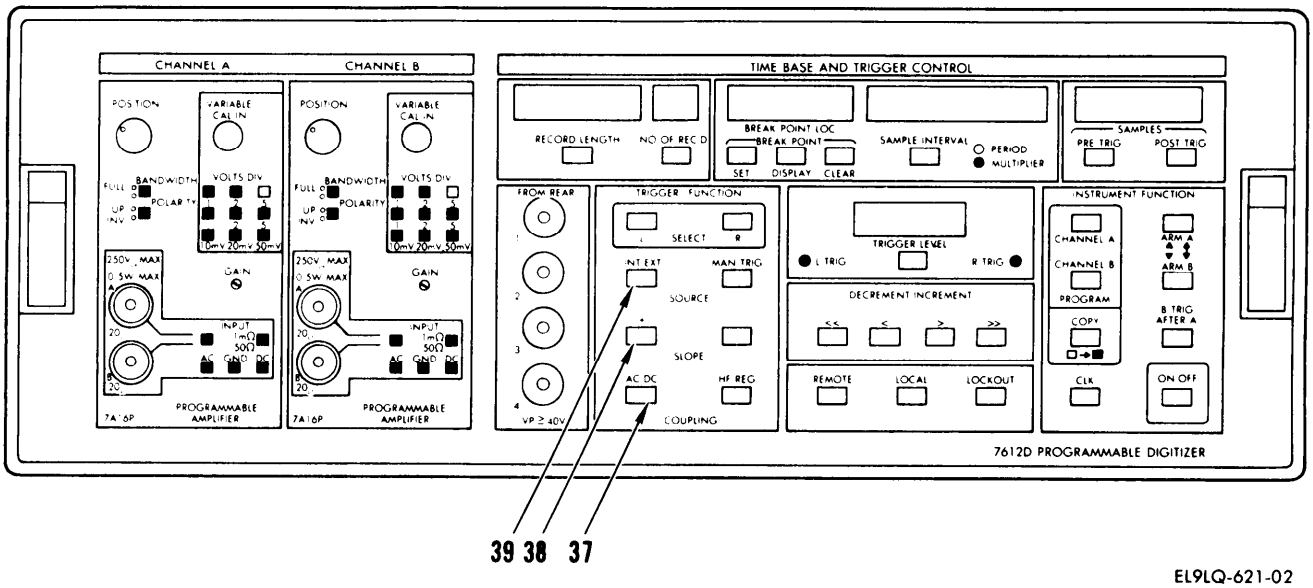
PROGRAMMABLE DIGITIZER 2A2A1 (cont)



Key	Control or Indicator	Function
31	SELECT R Switch	Selects right trigger channel for programing by trigger function entries. Causes right trigger channel to be used as trigger source for time base being programmed. Trigger level for right channel is displayed in TRIG LEVEL indicators.
32	TRIGGER LEVEL Switch	When pressed, trigger level for selected trigger channel can be set by DECREMENT/INCREMENT buttons. Displays trigger level value for selected trigger channel.
33	L and R TRIGGERED Indicators	Lights when corresponding trigger channel has received a valid trigger.
34	SOURCE MAN TRIG Switch	Causes armed channel(s) to trigger if signal input is not out of range.
35	SLOPE - Switch	Sets selected trigger channel to trigger on negative slope of waveform. Lights when selected.
36	COUPLING HF REJ Switch	Attenuates trigger signal frequent es above approximately 50 kilohertz. Lights when selected.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

PROGRAMMABLE DIGITIZER 2A2A1 (cont)

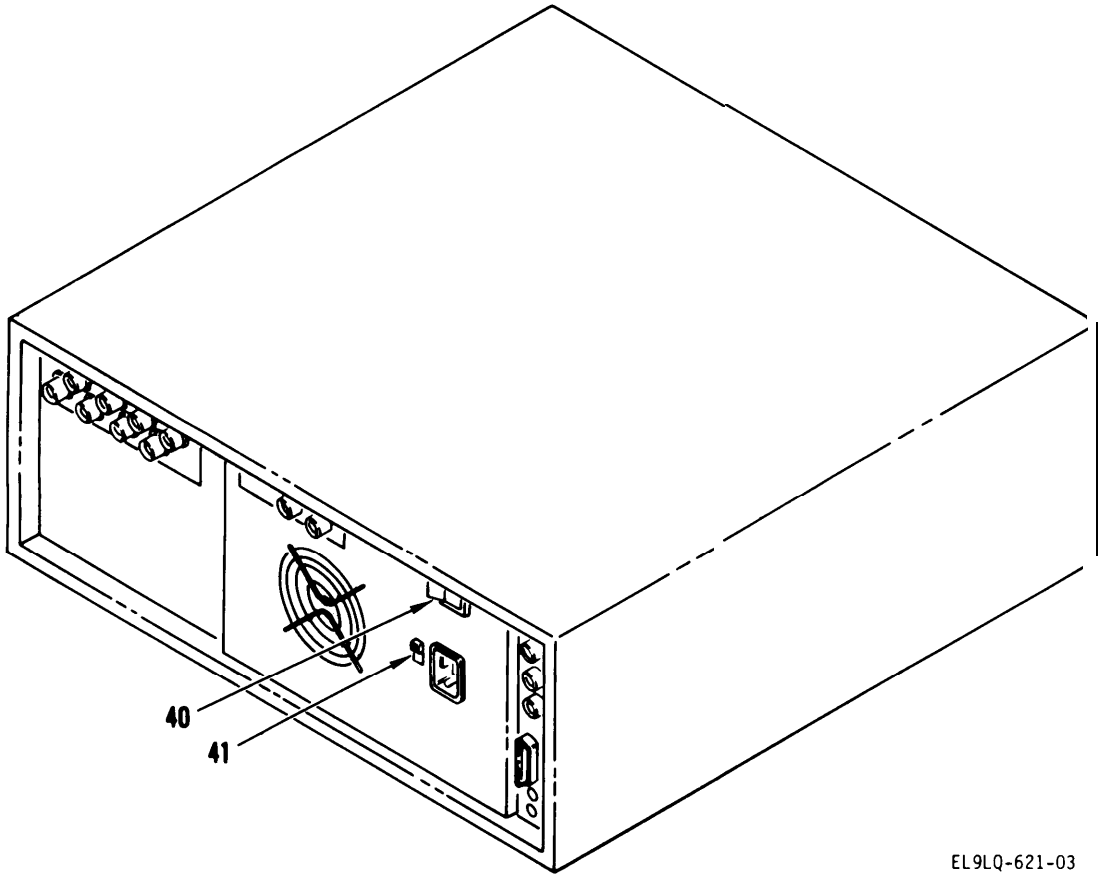


EL9LQ-621-02

Key	Control or Indicator	Function
37	COUPLING AC/DC Switch	Selects ac or dc coupling of triggering signal.
		Lights when ac is selected.
38	SLOPE + Switch	Sets selected trigger channel to trigger on positive slope of waveform.
		Lights when selected.
39	SOURCE INT/EXT Switch	Selects internal or external source for trigger signal.
		Lights when INT is selected.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont)

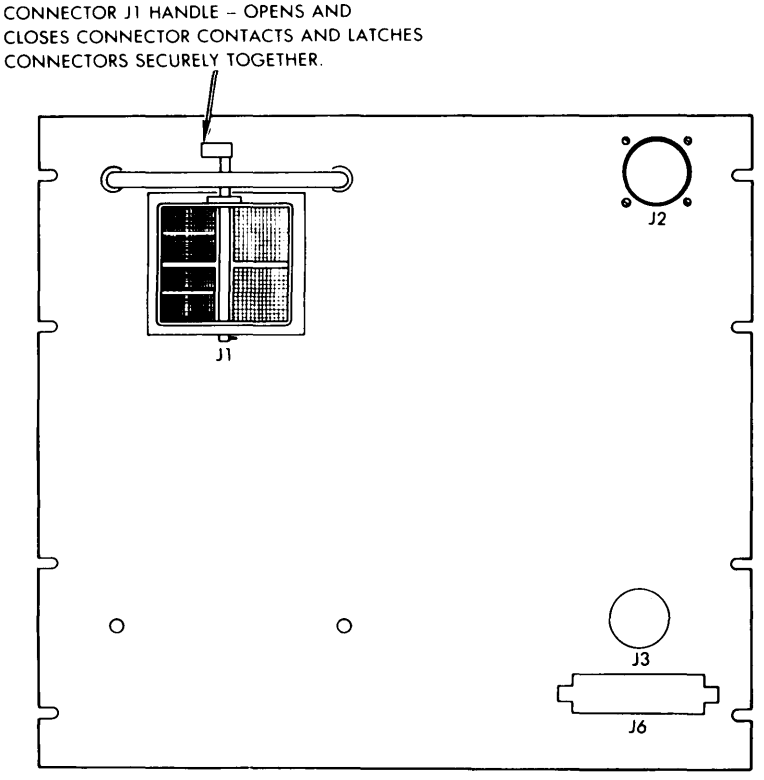
PROGRAMMABLE DIGITIZER 2A2A1 (cont)

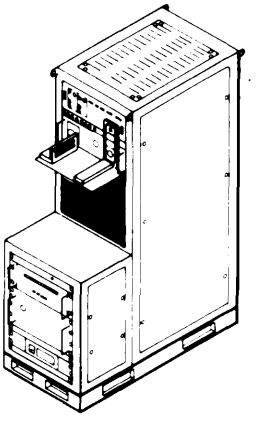


Key	Control or Indicator	Function
40	PRINCIPAL POWER Switch	Turns ac power on and off.
41	Line Voltage Selector Switch	Matches digitizer to ac power voltage.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

TEST ADAPTER PANEL ASSEMBLY 2A2A4





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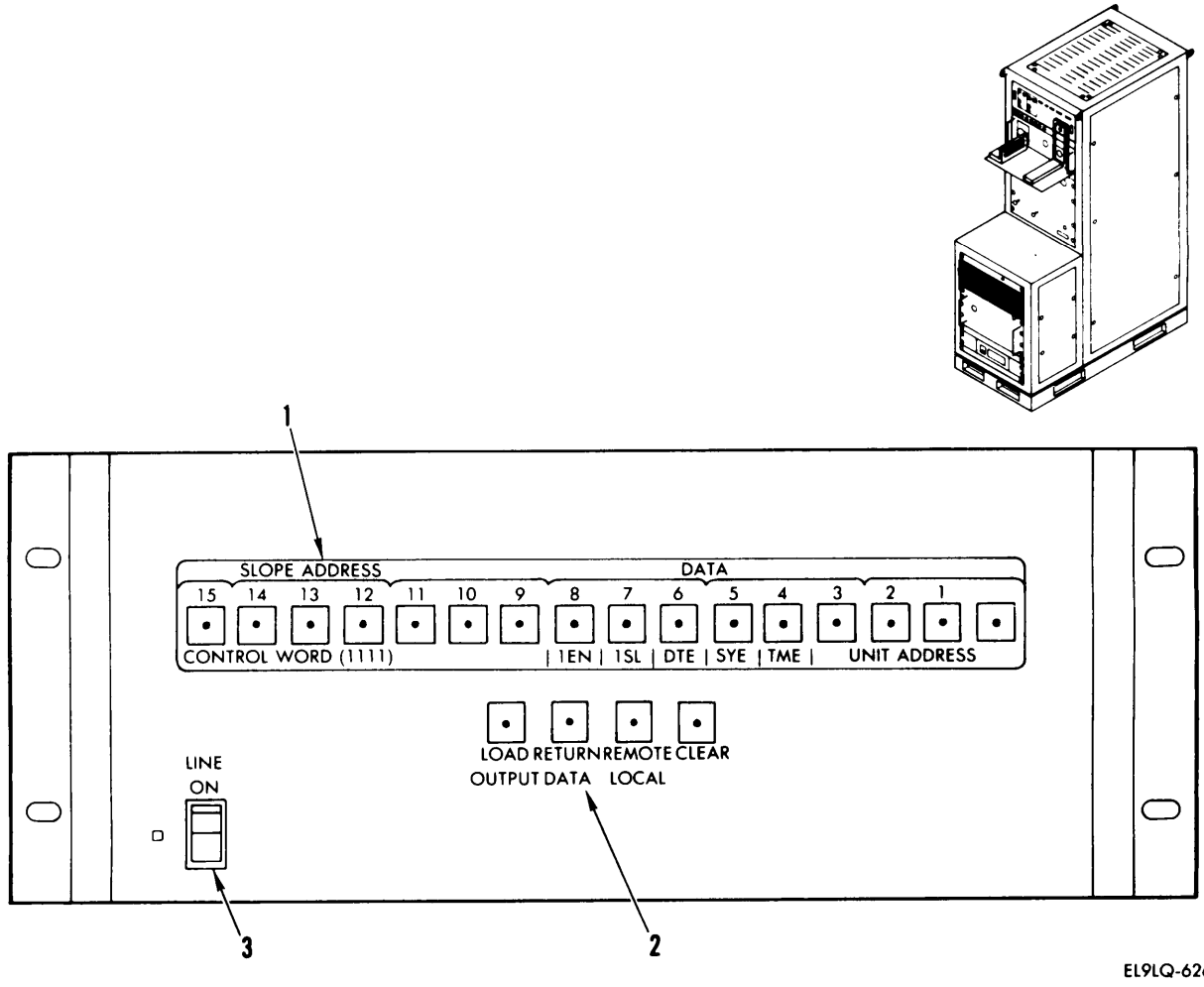
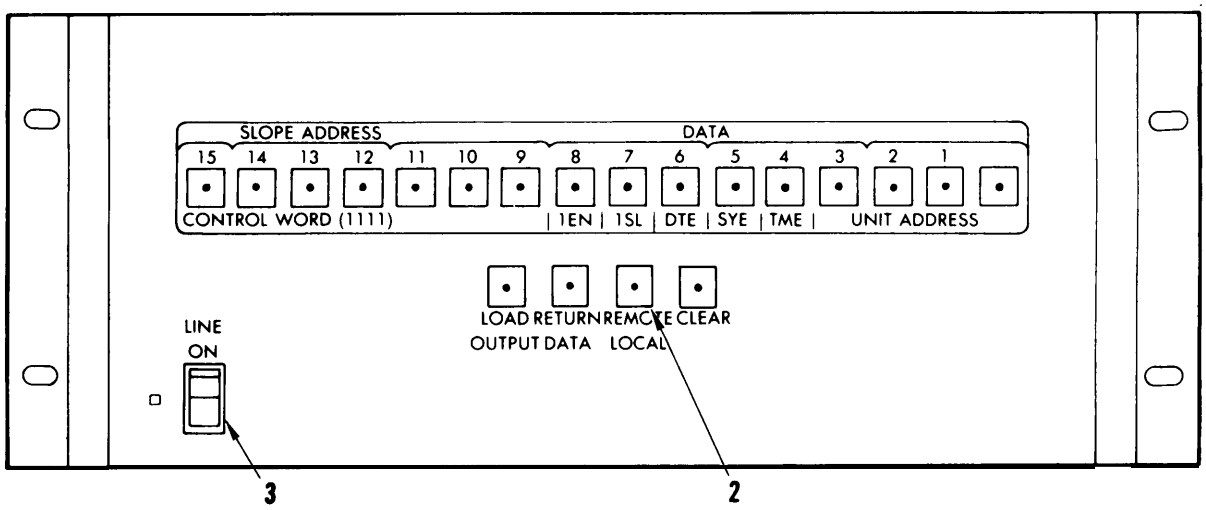
MULTIPROGRAMMER ASSEMBLY 2A2A6



Key	Control or Indicator	Function
1	Programming Switches	Sixteen pushbutton switches used to develop computer words. In LOCAL mode, logic level changes each time switch is pressed. Lighted LED in center of switch indicates a 1-state. In REMOTE mode, LEDs indicate computer words and status.

MULTIPROGRAMMER ASSEMBLY 2A2A6

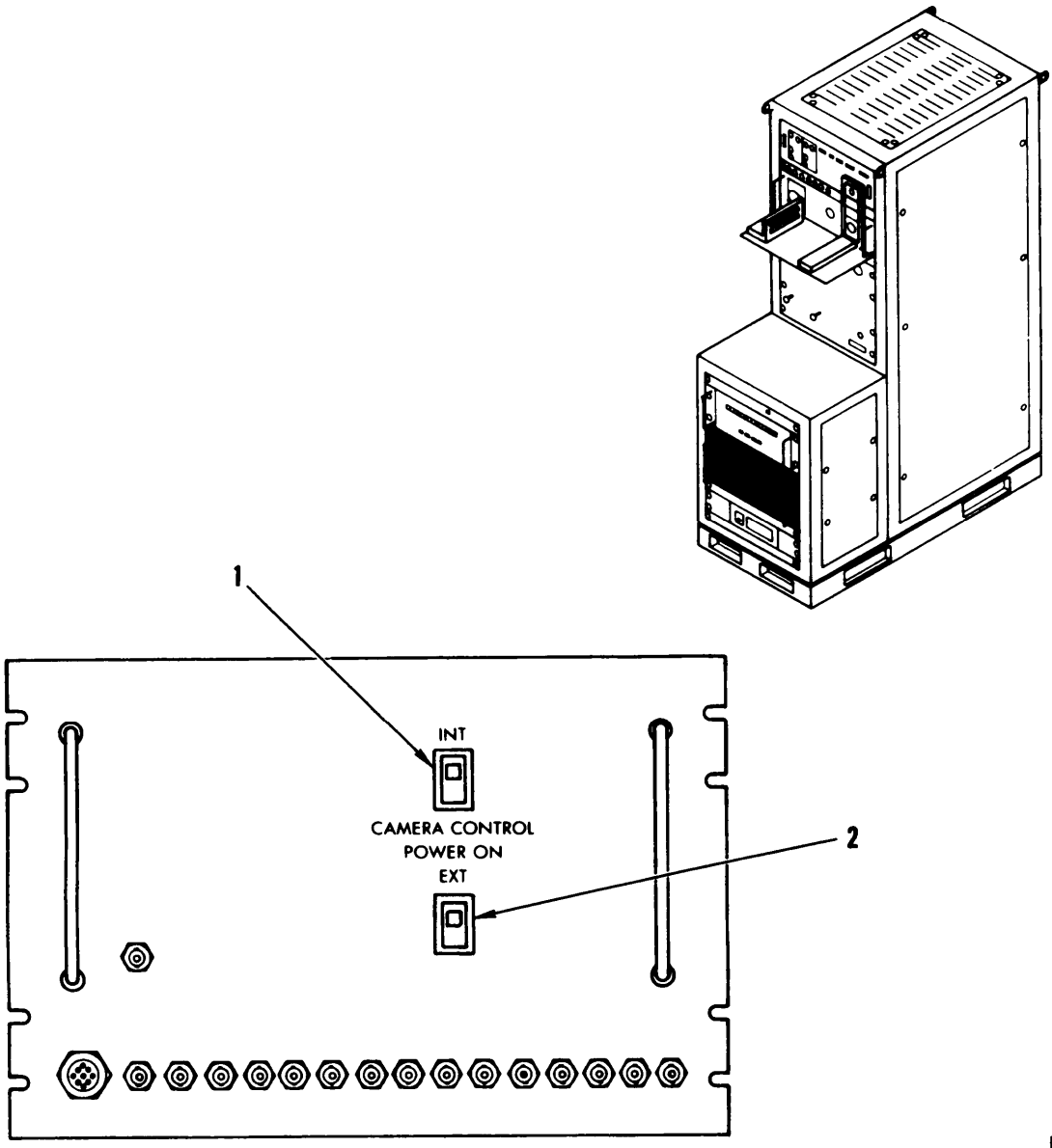


EL9LQ-626-14

Key	Control or Indicator	Function
2	Control Function Switches	Four pushbutton switches. ● LOAD OUTPUT - enters a computer word developed with Programming Switches into the multiprogrammer. LED in center of switch indicates load is complete. ● RETURN DATA - signals computer that data is available on return data lines. LED in center of switch indicates signal is sent. ● REMOTE/LOCAL - selects REMOTE or LOCAL programming. LED in center of switch indicates that multiprogrammer is in REMOTE. NOTE When local programming is selected for the first time after power is turned on, all 16 LEDs in the programming switches light to serve as a circuit test. ● CLEAR resets all 16 data bits to O-state. LED in center of switch is always on.
3	LINE Switch	Turns ac power on and off. Indicator lights when power is on.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

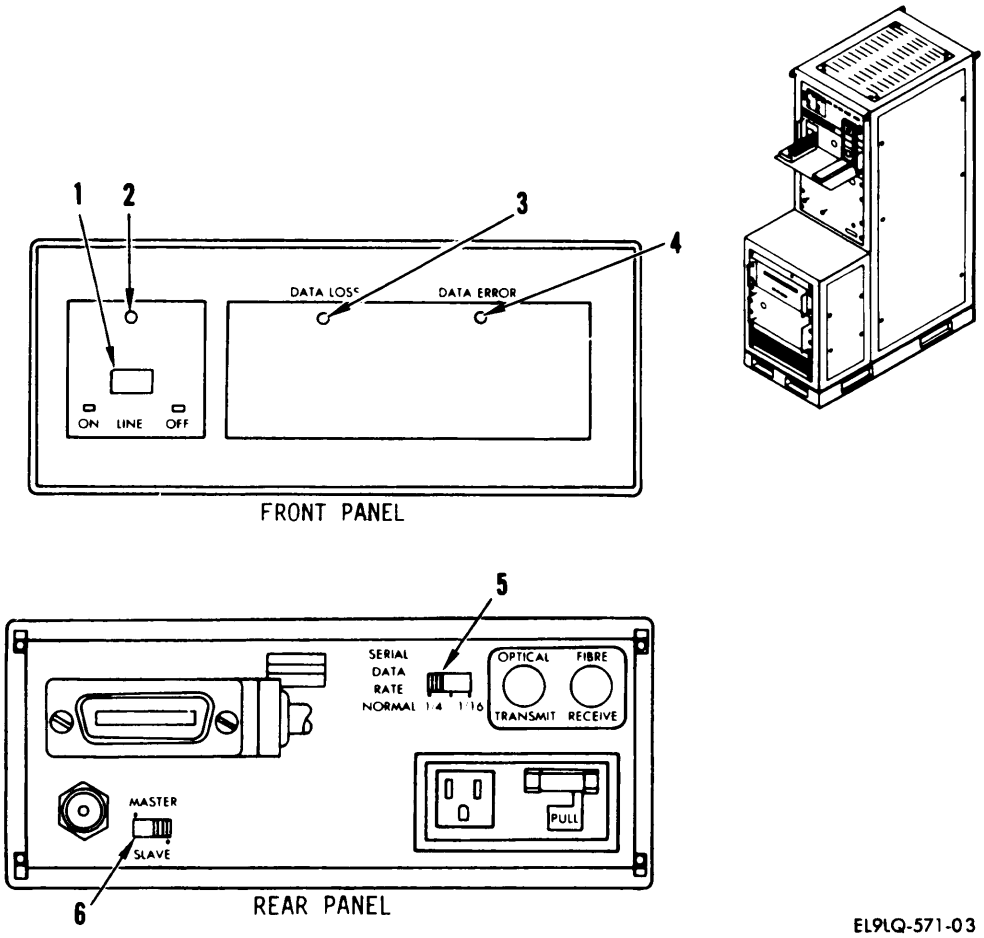
ELECTRONICS DRAWER ASSEMBLY 2A2A7



Key	Control or Indicator	Function
1	CAMERA CONTROL POWER ON/INT Switch	Turns internal camera control unit ac power on and off.
2	CAMERA CONTROL POWER ON/EXT Switch	Not used.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

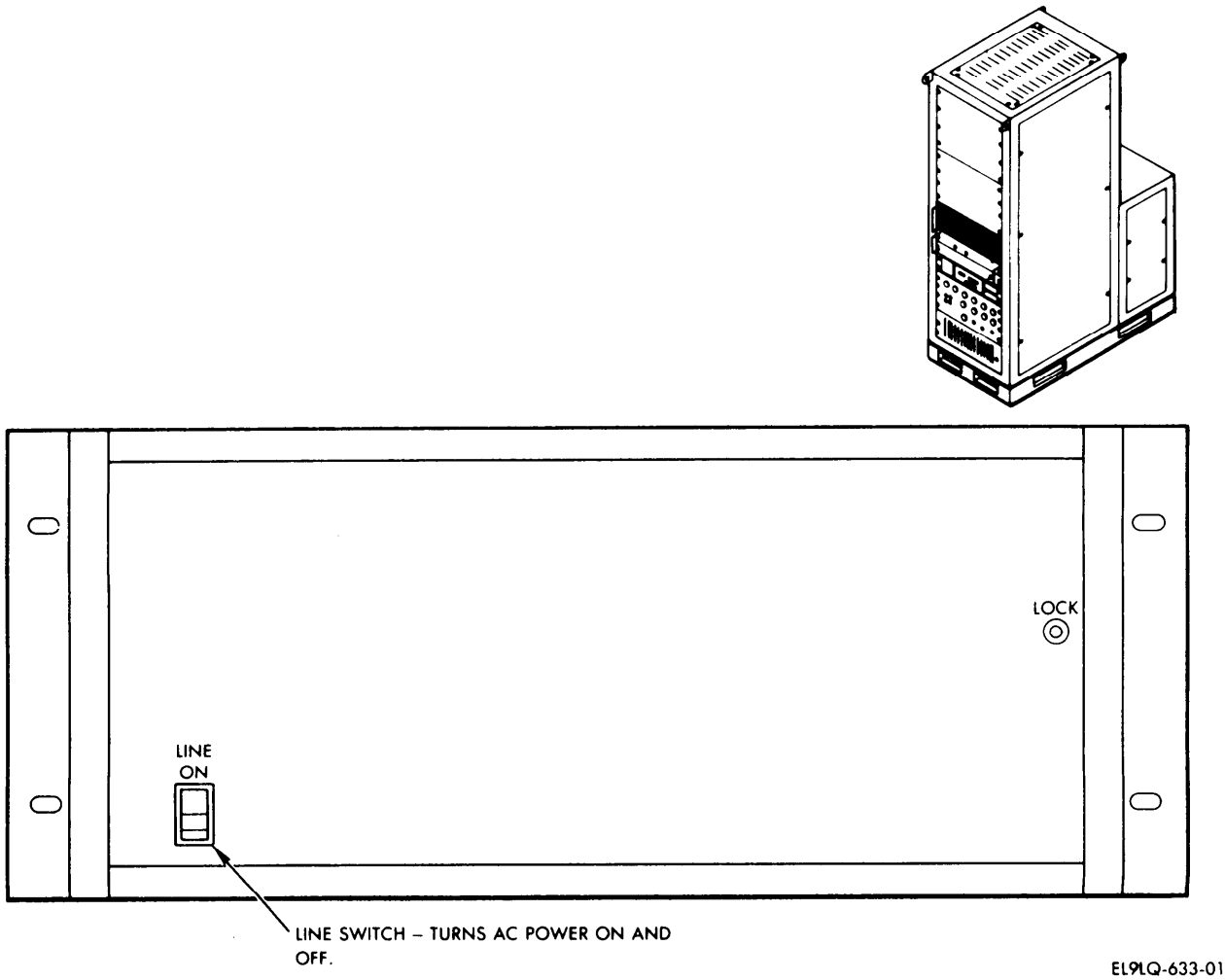
EXTENDER ASSEMBLY 2A2A8



Key	Control or Indicator	Function
1	LINE ON/OFF Switch	Turns ac power on and off.
2	Line Indicator	Lights when ac power is on.
3	DATA LOSS Indicator	Lights to indicate loss of data frames.
4	DATA ERROR Indicator	Flashes when an error is detected and stays on when many errors occur.
5	SERIAL DATA RATE Switches	Sets operation speed of extender assemby.
6	MASTER/SLAVE Switch	Set to MASTER on unit at one end of serial link and to SLAVE on unit at the other end.

2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

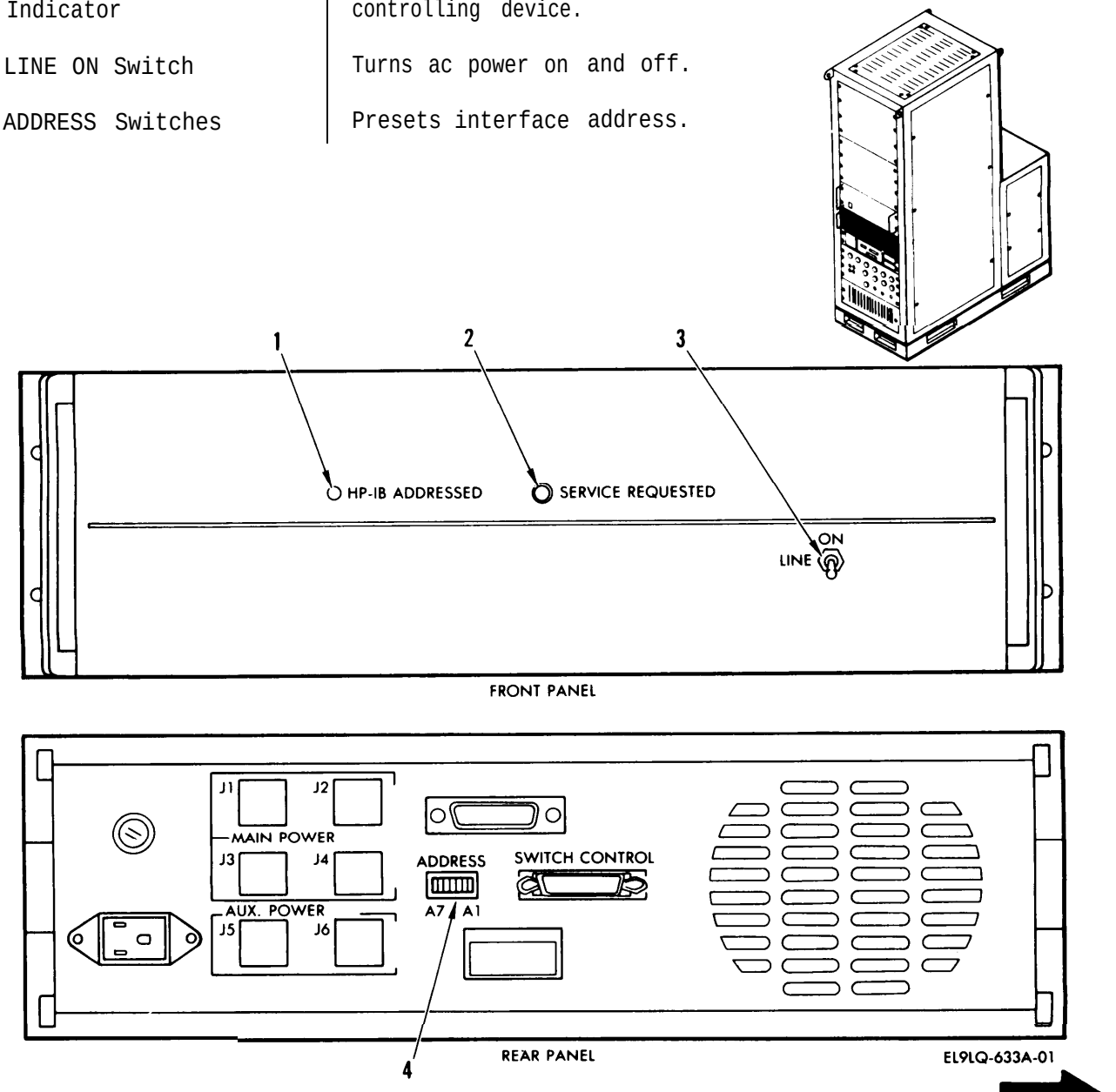
MULTIPROGRAMMER EXTENDER ASSEMBLY 2A2A11



2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

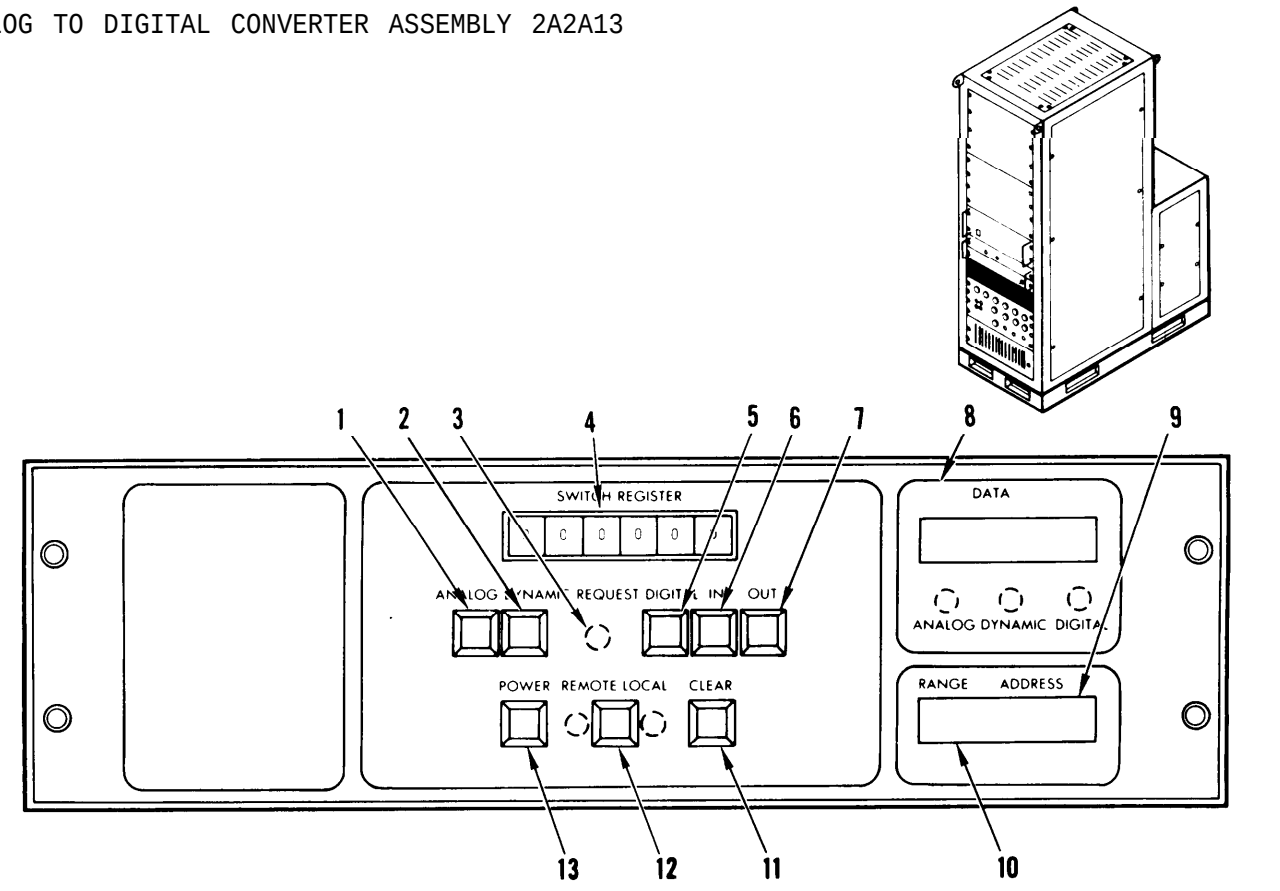
SWITCH CONTROLLER ASSEMBLY 2A2A12

Key	Control or Indicator	Function
1	HP-16 ADDRESSED Indicator	Lights when unit recognizes Talk or Listen addresses determined by ADDRESS switches located on rear panel. Stays lit until an unlisted address or another talk address is issued.
2	SERVICE REQUESTED Indicator	Lights when Switch Controller requests service from HP-16 controlling device.
3	LINE ON Switch	Turns ac power on and off.
4	ADDRESS Switches	Presets interface address.



2-8. TEST CONSOLE TEST BENCH 2A2 CONTROLS AND INDICATORS (cont) 2-8

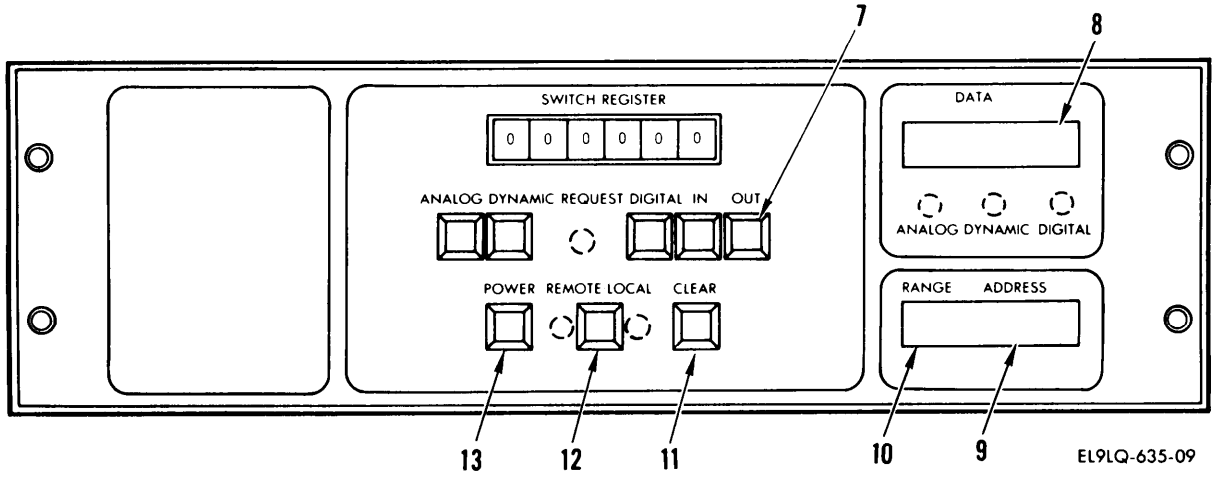
ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13



EL9LQ-635-01

Key	Control or Indicator	Function
1	ANALOG Switch	Loads range and address registers with information entered in SWITCH REGISTER. A/D conversions are made at a slow rate with the results appearing on DATA display.
2	DYNAMIC Switch	Simulates high speed selection and acquisition of a channel after ANALOG switch has been pressed.
3	REQUEST Indicator	Lights when a user card is requesting interrupt service.
4	SWITCH REGISTER Switches	Enters range and address information.
5	DIGITAL Switch	Loads address from SWITCH REGISTER into address register. Upper two digits of SWITCH REGISTER are not used.
6	IN Switch	Displays digital information from address on DATA lines. DIGITAL switch must be pressed before pressing IN switch.

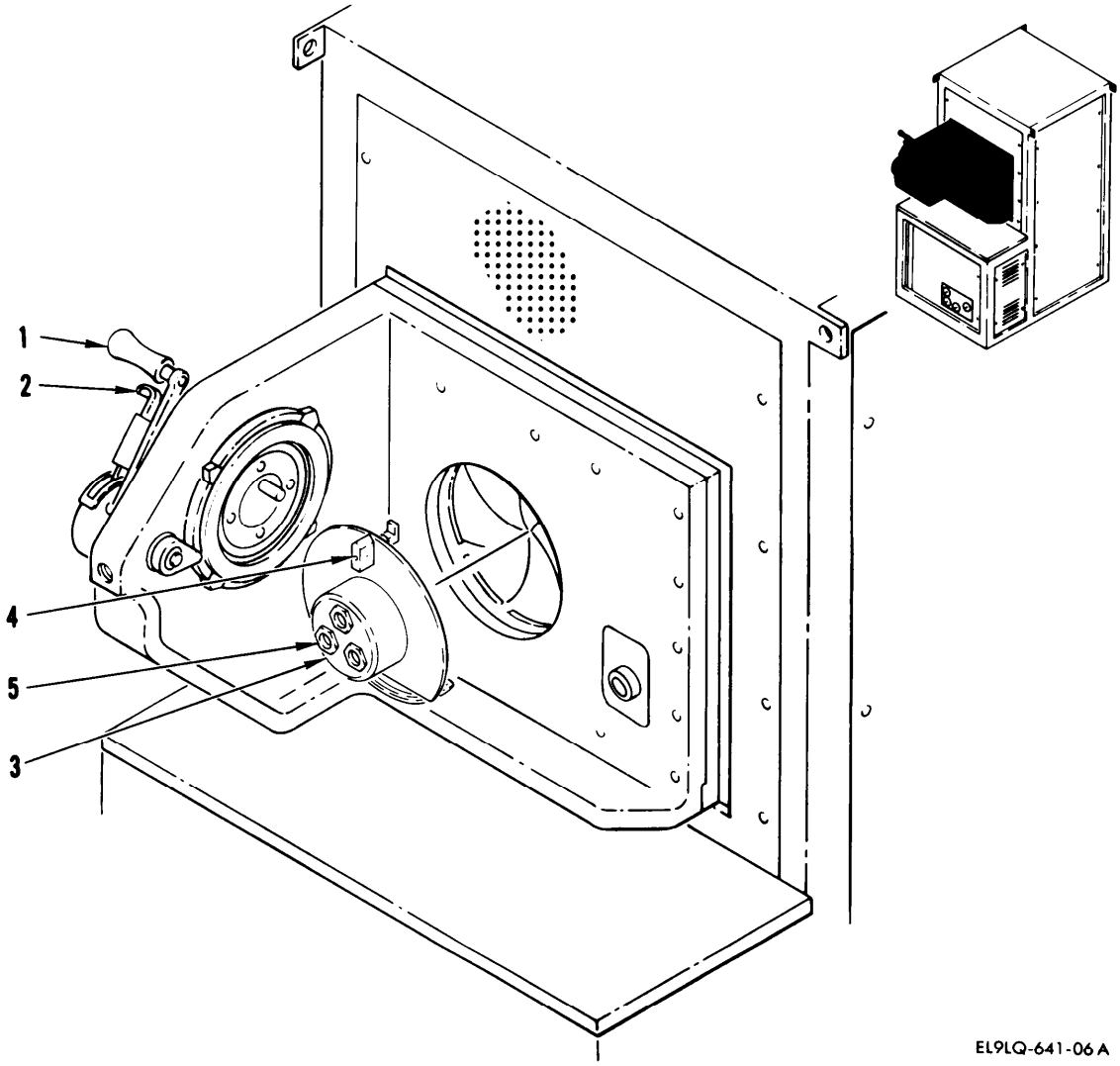
ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 (cont)



Key	Control or Indicator	Function
7	OUT Switch	Sends data entered in SWITCH REGISTER to digital device whose address is loaded into ADDRESS register. DIGITAL switches must be pressed before pressing OUT switch.
8	DATA Display	Displays data from a digital input device or system A/D converter. Three indicators show source of data. ● ANALOG - indicates source of data is the system A/D converter. ● DYNAMIC - indicates that system is operating in local dynamic mode of addressing. ● DIGITAL - indicates source of data is the digital device whose address is shown on ADDRESS display.
9	ADDRESS Display	Displays 12-bit address as four octal digits.
10	RANGE Display	Displays 4-bit range code when system is in analog mode.
11	CLEAR Switch	Sets the system in local control.
12	REMOTE/LOCAL Switch	Transfers system control between computer (remote mode) and front panel (local mode). Indicator lights to show mode selected.
13	POWER Switch	Turns ac power on and off.

2-9. NIGHTSIDE TEST BENCH 2A3 CONTROLS AND INDICATORS

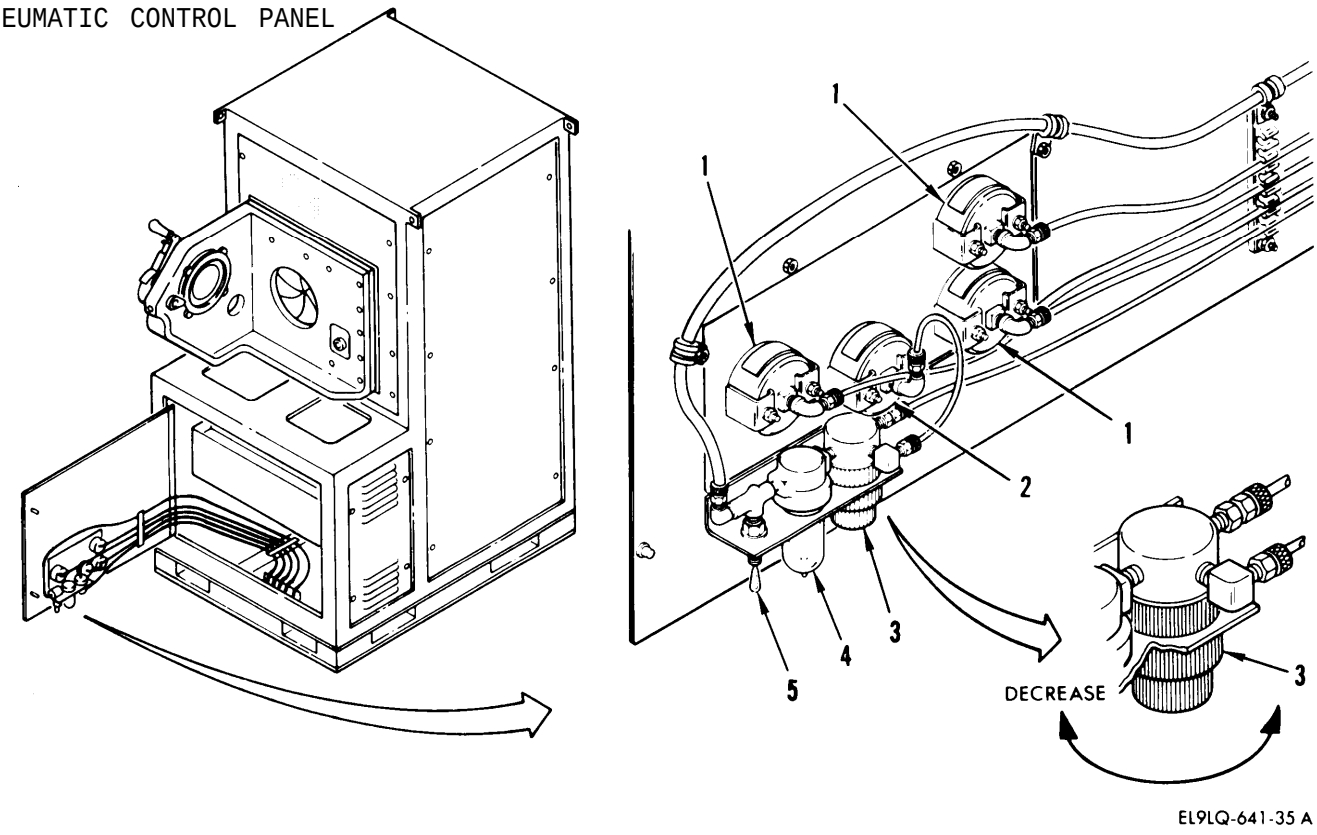
SENSOR MOUNT ASSEMBLY 23A1A3



Key	Control or Indicator	Function
1	Sensor Mount Handle	Secures unit-under-test in test bench.
2	Sensor Mount Handle Lock	Locks sensor mount handle in open or closed position.
3	Dust Cover	Covers shutter opening when not in use.
4	Dust Cover Lock	Locks dust cover in place.
5	Indicating Desiccator	Absorbs moisture from air in and indicates moisture content of desiccator.

2-9. NIGHTSIDE TEST BENCH 2A3 CONTROLS AND INDICATORS (cont)

PNEUMATIC CONTROL PANEL



EL9LQ-641-35 A

Key	Control or Indicator	Function
1	Isolator Gages	Indicates air pressure at each isolator.
2	Regulated Pressure Gage	Indicates air pressure at output side of pressure regulator.
3	Pressure Regulator Control Knob	Adjusts air pressure to isolators. Turn clockwise to increase pressure. NOTE Pull down red ring to allow control knob to turn. After completing air pressure adjustment, lock control knob by pushing up red ring.
4	Filter Water Drain Valve	Bleeds down system pressure and drains water from filter bowl.
5	Air Supply Valve Lever	Blocks air supply from control panel. Lever in horizontal position turns air off.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-10. GENERAL 2-10

To ensure that the EETF TADS/PNVS Augmentation Equipment is ready for operation at all times, it must be checked at regular intervals. These checks may uncover defects that must be corrected before they cause serious damage or failure.

2-11. PMCS PROCEDURES 2-11

PMCS information is contained in the following table. The following is an explanation of the column headings in the table.

a. The “Item No.” column contains the item number in logical order of performance regardless of interval. This column shall be used as a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

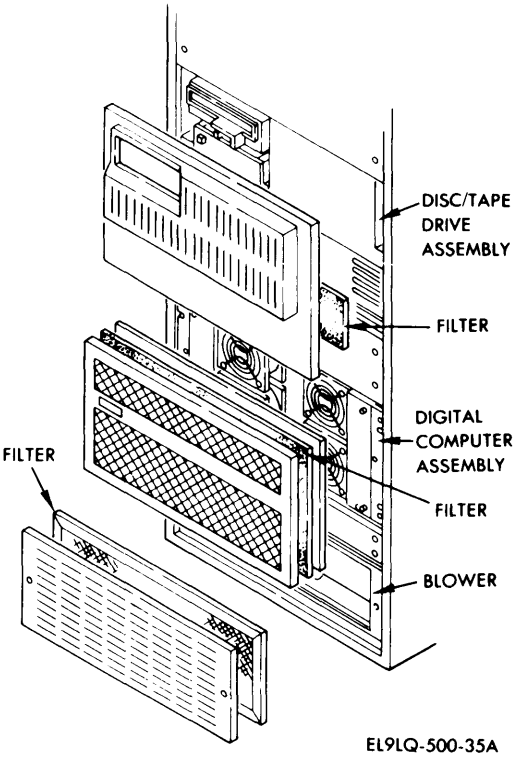
b. The “Interval” column tells you when to perform the PMCS; “D” (daily), “M” (monthly), “Q” (quarterly), “S” (semiannually), “8” (every 8 months), and “A” (annually).

c. The “Item to be Inspected/Procedure” column identifies the equipment area, the exact item of equipment, and procedures. Procedures that are too lengthy to be included in the table are referenced elsewhere in this manual .

d. The “Reference/Remarks” column references the procedure to be used to perform repairs/replacements (maintenance) should a defect be found while performing the PMCS. Where an operational check is to be performed, it is referenced as operation.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
							WARNING • BE SURE ALL ELECTRICAL POWER IS REMOVED BEFORE PERFORMING THE PMCS PROCEDURES LISTED BELOW. • BE SURE THE PNEUMATIC SYSTEM PRESSURE IS BLED DOWN.	
							ELECTRONIC STATION	
1							**Disc/Tape Drive Assembly 1A10**	
		X					Check filter for defects and cleanness. Clean as necessary.	Para 2-22 (cleaning) Para 2-39 (maintenance)



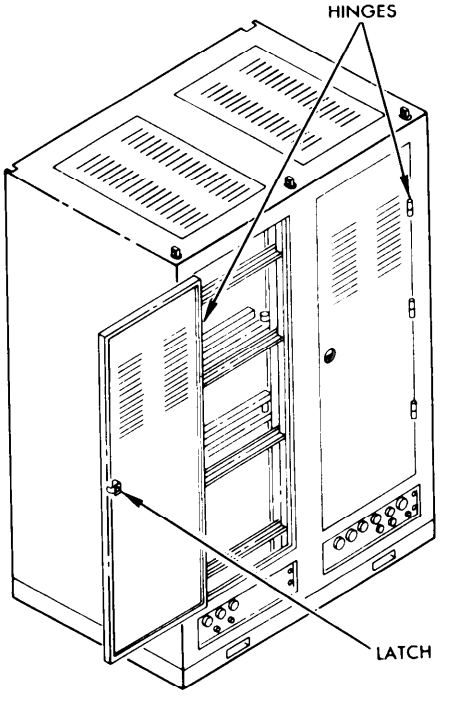
EL9LQ-500-35A

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
1.1							**Digital Computer Assembly 1A11**	
		X					Check filter for defects and cleanness. Clean as necessary.	Para 2-22 (cleaning) Para 2-40 (maintenance)
1.2							**Blower Assemblies 1A6 and 1A12**	
		X					On front of blower assembly, loosen two nuts and remove grill and filter. Check filters for defects and cleanness. Clean as necessary.	Para 2-22 (cleaning) Para 2-34 (maintenance)

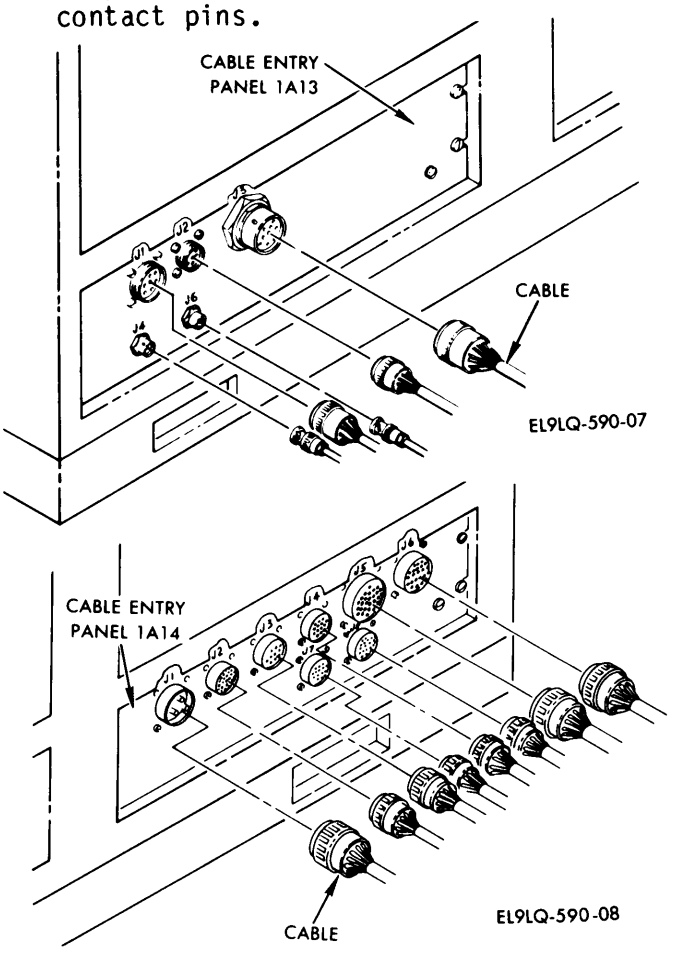
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
2				X			**Door Hinges** Lubricate hinges and latches on rear of electronic station using grease (item 27, appendix C).	



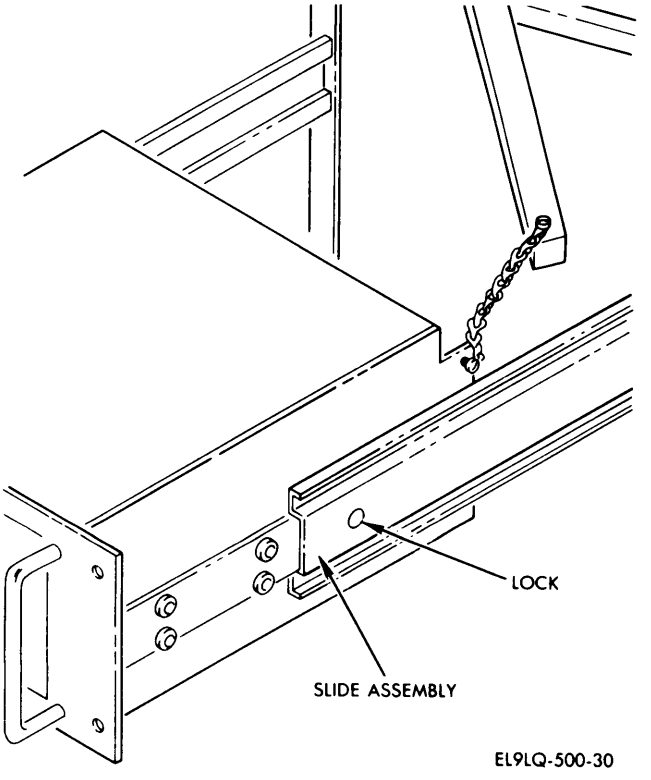
EL9LQ-500-29

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
3							**Cable Entry Panels 1A13 and 1A14**	
		X					Inspect connectors for broken or bent contact pins. 	Para 3-4 (maintenance)
4							**Cables**	
		X					a. Check for frayed, cracked, cut, or worn insulation.	
		X					b. Check for missing or illegible reference designation markers. Replace as necessary.	Para 2-20 (maintenance)

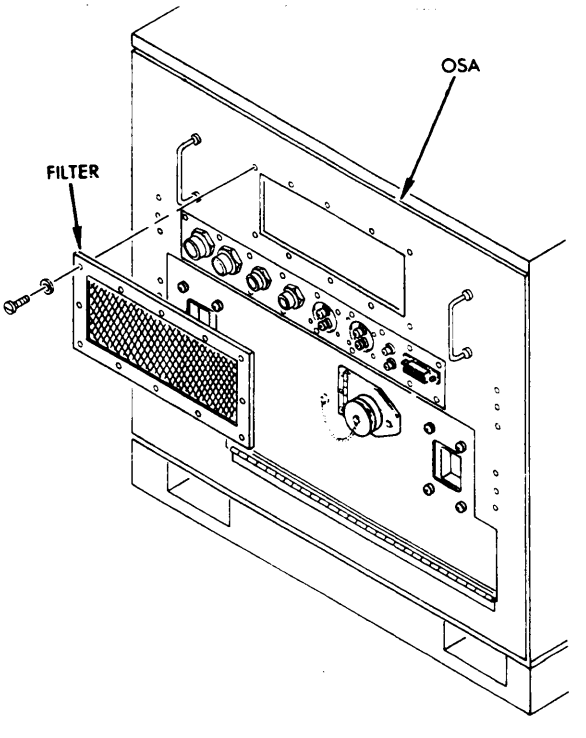
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
5							**Slide Assemblies**	
		X					Check for smooth operation of slide and and lock mechanisms.	Para 2-25 (maintenance)

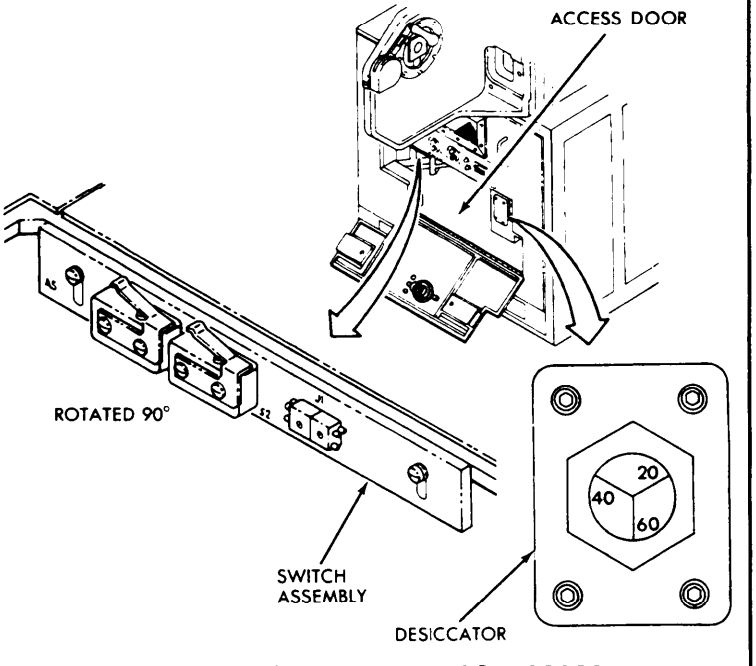


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
6							**Front Panel Assemblies**	
		X					a. Check for cracked or broken lamps or control knobs.	
		X					b. Check for missing or broken mounting hardware.	
							ELECTRO-OPTICAL TEST BENCH	
							DAYSIDE TEST BENCH 2A1	
7							**Optical Signal Analyzer 2A1A1 (if installed)**	
		X					a. Check OSA filter for defects and cleanness. Clean as necessary.	Para 2-22 (cleaning) Para 5-12 (maintenance)

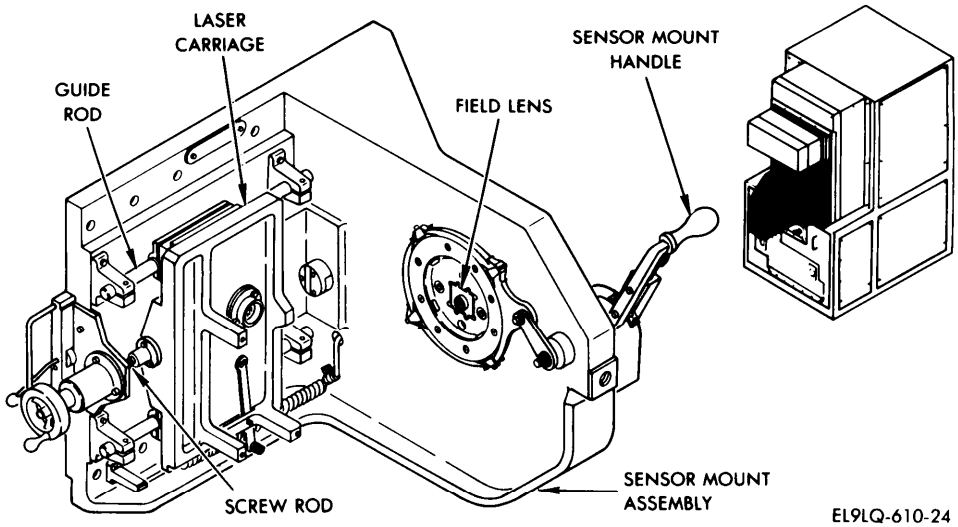


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
		X					b. Check desiccator for humidity level. If 60% section is pink, replace desiccant.	Para 2-41 (maintenance)
		X					c. Check connectors for broken or bent contact pins.	Para 3-4 (maintenance)
				X			d. Lubricate hinge and latches on OSA main access door, using grease (item 27, appendix C).	
		X					e. Check main access door interlock switch A5. If switches are loose, tighten.	Para 5-12 (maintenance)
								
7.1							**Indirect View Display Assembly 2A1A3**	
					X		Perform periodic alignment.	Para 8-2 (alignment)

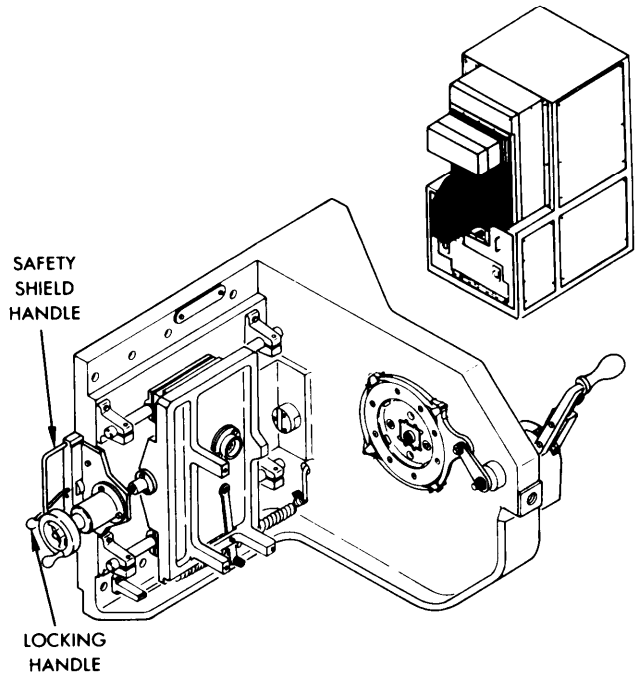
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
8							**Field Lens Assembly**	
		X					Check for scratches and cleanness. Clean as necessary.	Para 5-28 (maintenance) Para 2-22 (cleaning)
9							**Sensor Mount Assembly Handle**	
		X					a. Check for missing or broken hardware.	
				X			b. Check handle/cam mechanism for smooth operation. Lubricate moving parts with grease (item 27, appendix C).	
10							**Laser Carriage Assembly**	
		X					a. Check guide rods and screw rod for buildup of dirt and dust. Clean as necessary.	Para 2-22 (cleaning)



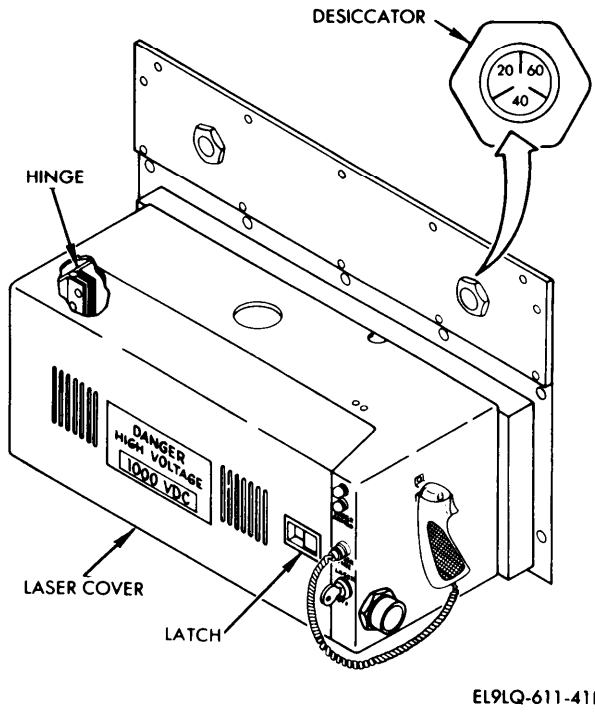
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
				X			b. Lubricate screw rod lightly using grease (item 27, appendix C).	
				X			c. Check that carriage mechanism moves freely with rotation of handle.	
10.1							**Laser Safety Shield**	
		X					a. Check that laser safety shield cannot be removed when locking handle is in up position.	Para 2-12 LASERST (self-test)
		X					b. Check that laser safety shield can be removed when locking handle is in down position.	Para 2-12 LASERST (self-test)



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

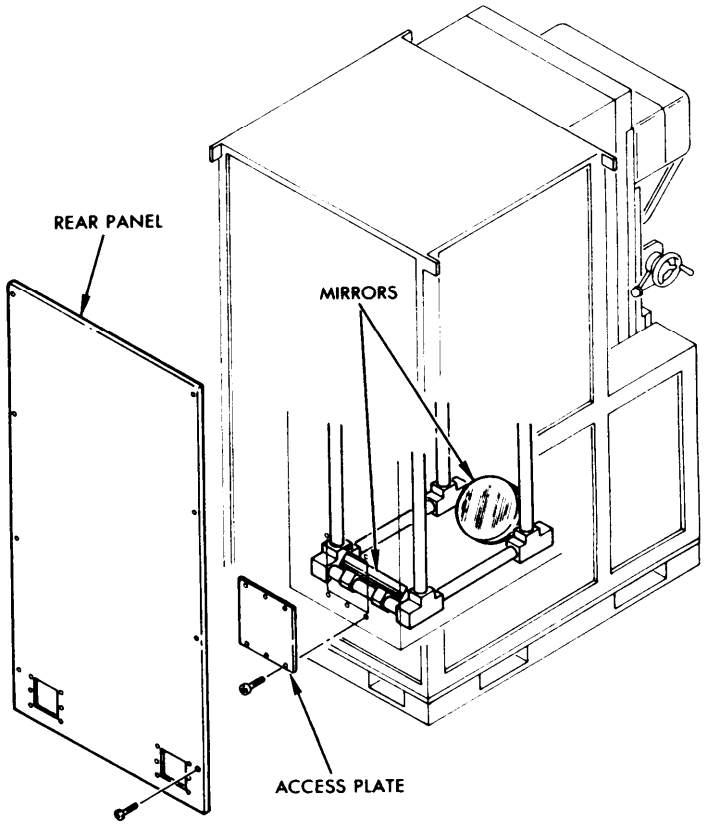
Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
11							**Laser Protective Cover**	
		X					a. Check for broken or missing hardware or indicating lamps and switches.	Para 5-22 (maintenance)
		X					b. Lubricate latch and hinge lightly, using grease (item 27, appendix C).	
12							**Desiccators**	
		X					Check desiccators for humidity level. If 60% section is pink, replace desiccant.	Para 2-41 (maintenance)



EL9LQ-611-41B

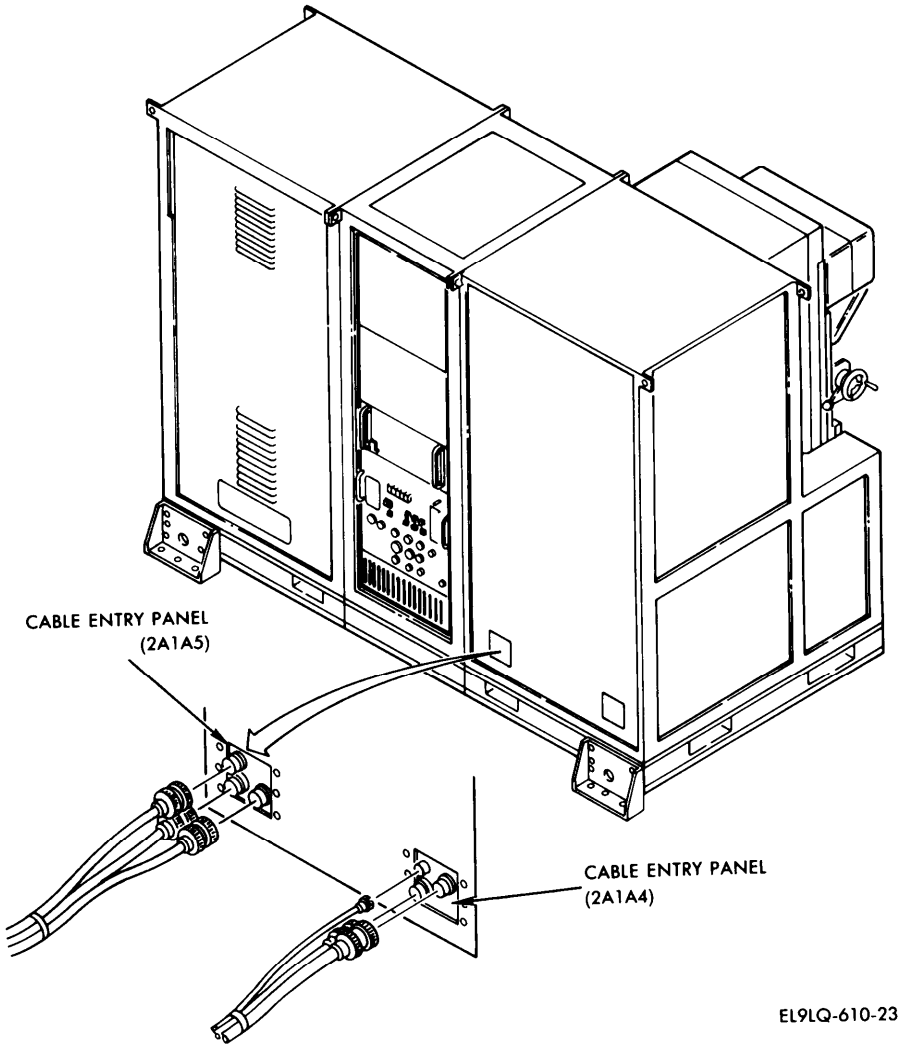
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
13							**Optical Assemblies**	
					X		Perform VIS/NIR alignment check.	Para 2-18.2 (trouble-shooting)
			X				Remove rear panel and access plate as shown below to inspect mirrors for damage and cleanness. Clean as necessary.	Para 2-41 (maintenance) Para 2-22 (cleaning)



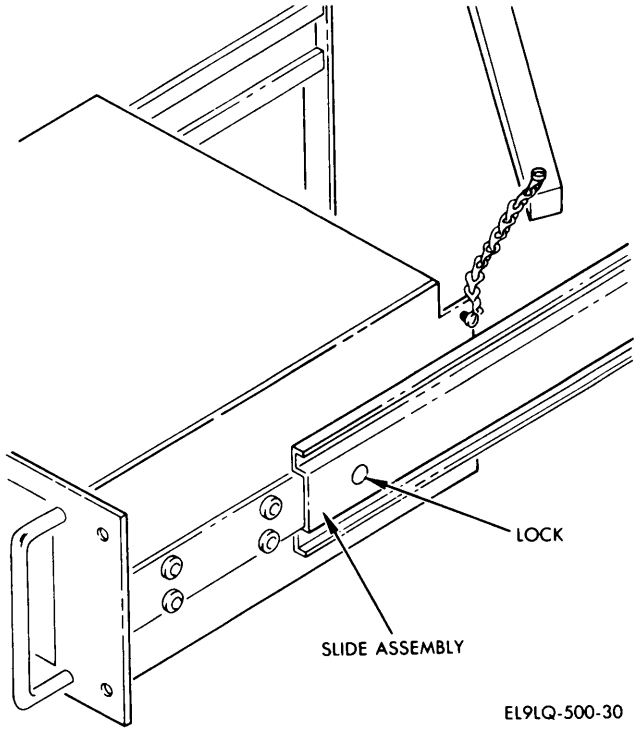
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
14							**Cable Entry Panels 2A1A4 and 2A1A5**	
		X					On rear of dayside test bench, inspect connectors for bent or broken contact pins.	Para 3-4 (maintenance)



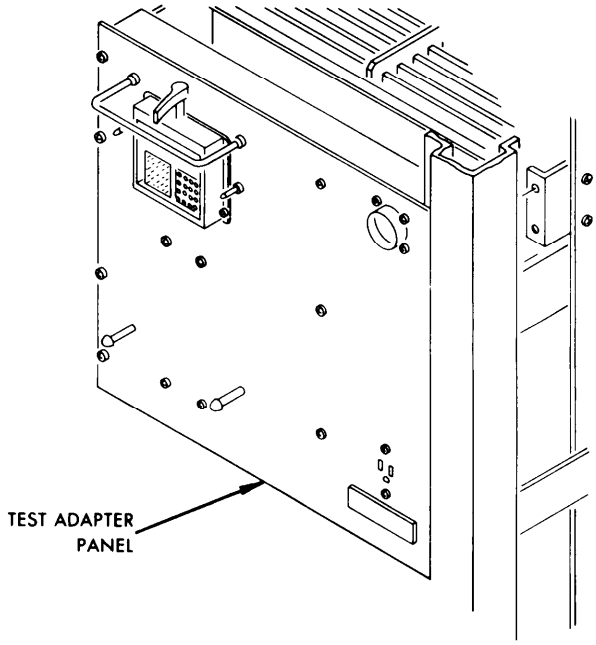
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
							TEST CONSOLE TEST BENCH 2A2	
15							**Front Panel Assemblies**	
		X					a. Check for cracked or broken lamps or control knobs.	
		X					b. Check for missing or broken mounting hardware.	
		X					c. Check for missing or illegible reference designator markings.	Para 2-20 (maintenance)
16							**Slide Assemblies**	
		X					Check for smooth operation of slides and lock mechanisms.	Para 5-31 (maintenance)



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

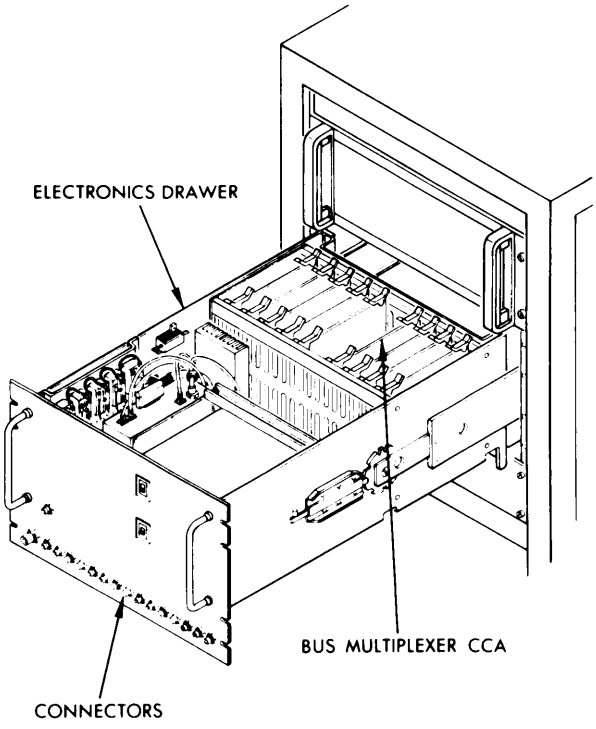
Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
17							**Programmable Digitizer 2A2A1**	
						X	Perform periodic alinement.	Para 8-5 (alinement)
18							**Test Adapter Panel 2A2A4**	
		X					Inspect connectors for bent or broken contact pins.	Para 3-4 (maintenance)



EL9LQ-624-07

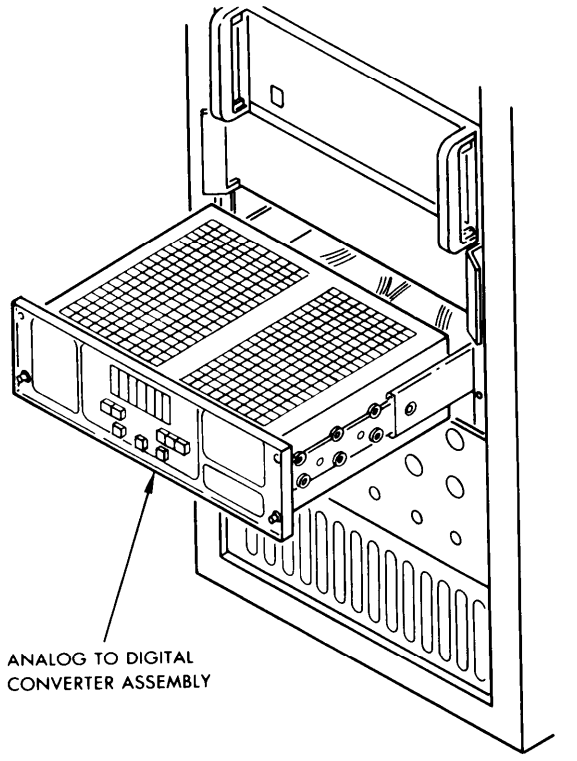
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
19							**Electronics Drawer Assembly 2A2A7**	
		X					Inspect connectors for bent or broken contacts.	Para 3-4 (maintenance)
19.1							**Bus Multiplexer CCA 2A2A7A6A7**	
					X		Perform periodic alinement	Para 8-4 (alinement)

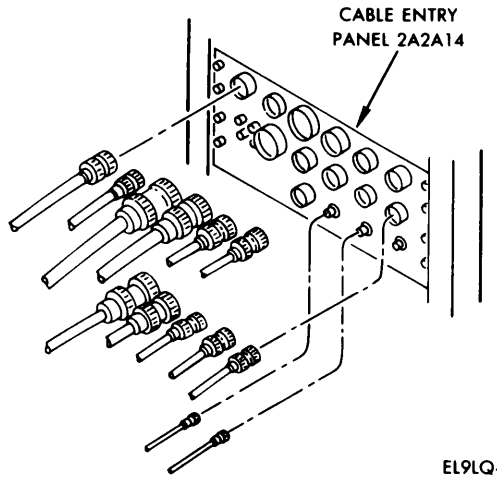
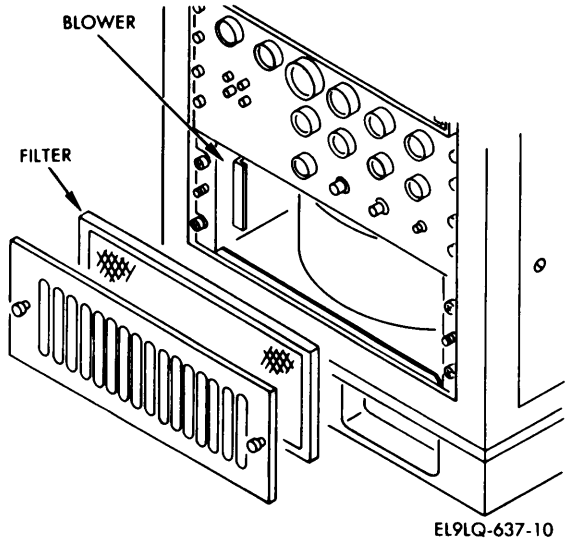


EL9LQ-627-23B

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

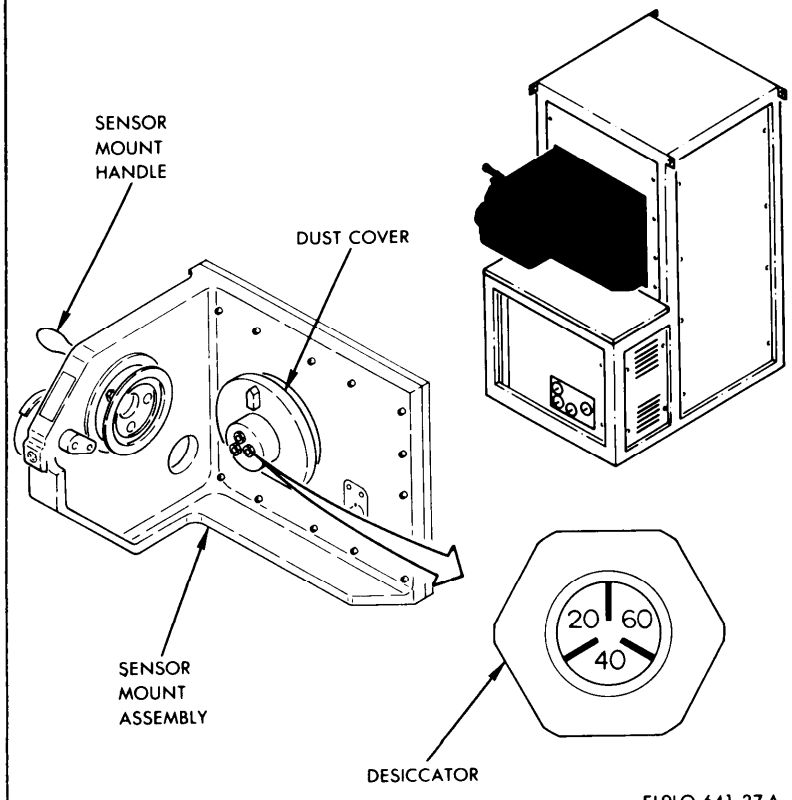
Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
19.2							**Analog to Digital Converter 2A2A13**	
						X	Perform periodic alinement.	Para 8-3 (alinement)
							 EL9LQ-635-27	
20							**Rear Panel Assemblies**	
		X					a. Check for cracked or broken lamps or control knobs.	
		X					b. Check for missing or broken mounting hardware.	
		X					c. Check for missing or illegible reference designation markings.	Para 2-20 (maintenance)

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
21							**Cable Entry Panel 2A2A14**	
		X					Inspect connectors for bent or broken contact pins.  EL9LQ-600-07	Para 3-4 (maintenance)
22							**Blower Assembly 2A2A15**	
	X						Check filters for defects and cleanness. Clean as necessary.  EL9LQ-637-10	Para 2-22 (cleaning)

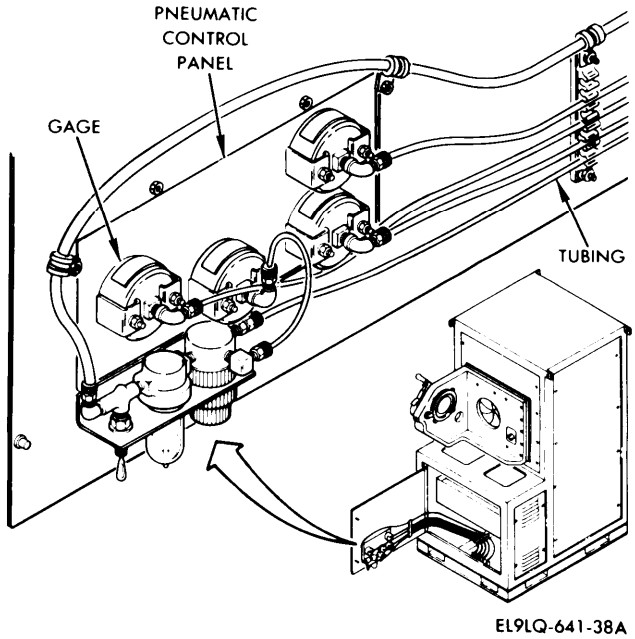
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
							NIGHTSIDE TEST BENCH 2A3	
23							**Sensor Mount Assembly 2A3A1A3**	
		X					a. Check for missing or broken hardware.	
		X					b. Check handle/cam mechanism for smooth operation. Lubricate moving parts with grease (item 27, Appendix C).	
		X					c. Check desiccator for humidity level. If 60% section is pink, replace desiccant. To replace desiccant remove dust cover and remove end cap from rear of desiccator.	



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

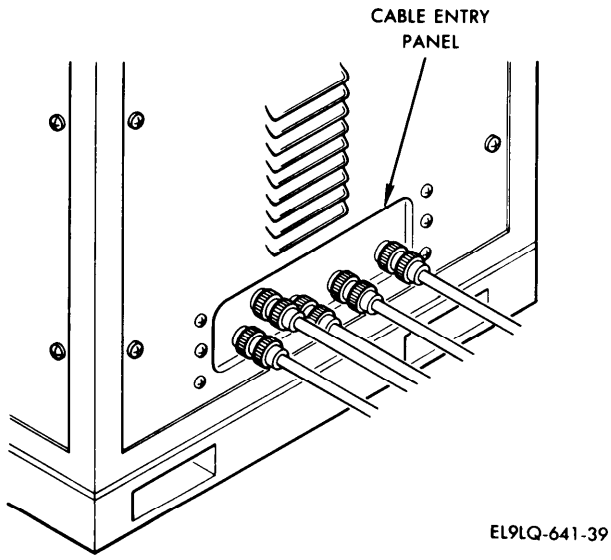
Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
24							**Pneumatic Control Panel**	
		X					a. Check for missing or broken hardware.	
		X					b. Check gages for cracked or broken lens.	
		X					c. Open door and check tubing and fittings for cracks, cuts, or abrasion.	Para 5-37 (maintenance)
	X						d. Check pneumatic base for proper operation.	TM 11-6625-3085-12 (operation) Para 5-6 (maintenance)



EL9LQ-641-38A

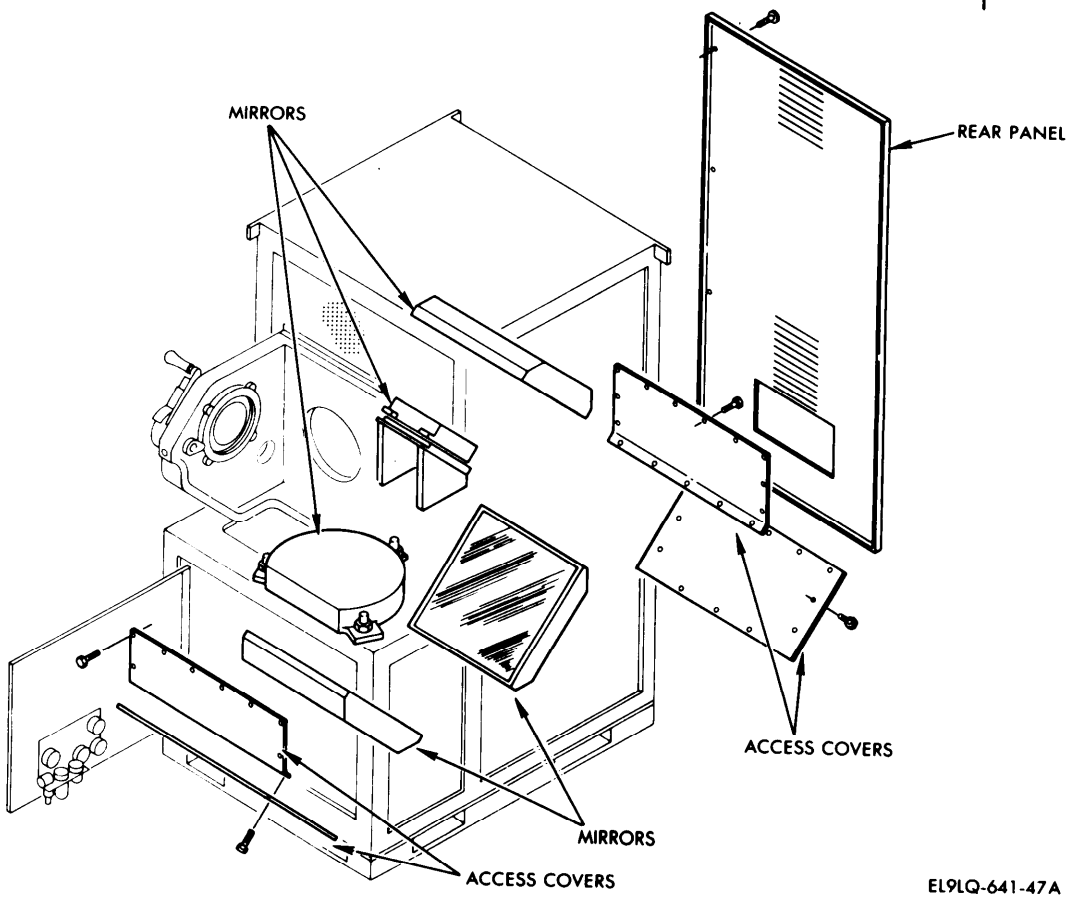
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
25							**Cable Entry Panel 2A3A4**	
		X					Inspect connectors for bent or broken contact pins.	Para 3-4 (maintenance)



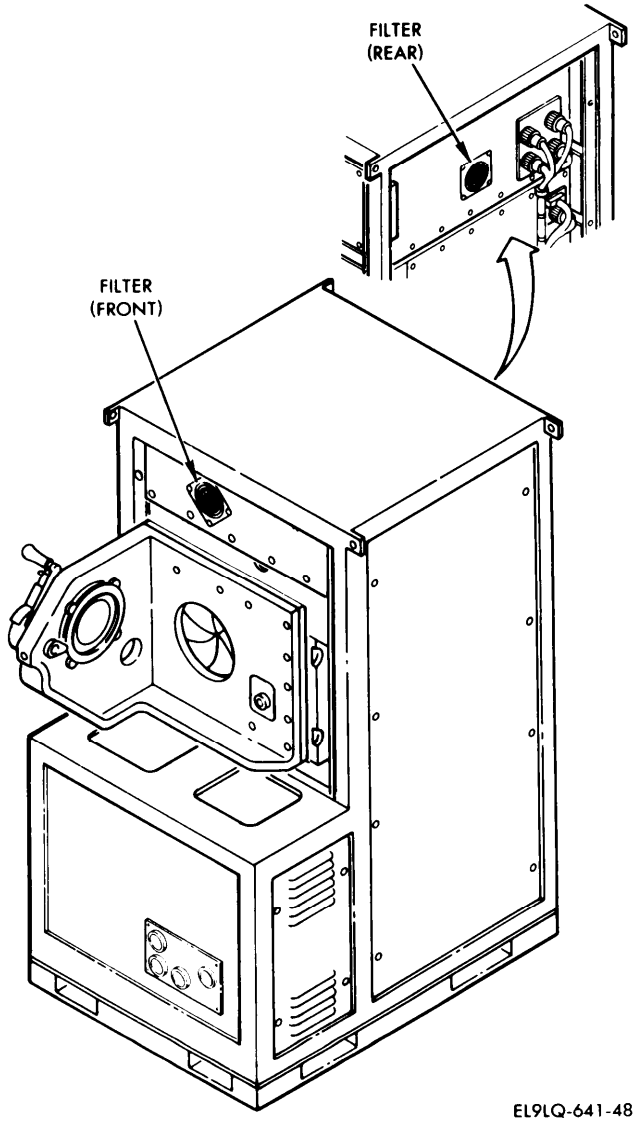
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
26							**Optical Assemblies**	
			X				Remove rear panel and front and rear access covers to inspect mirrors for damage and cleanness. Two mirrors at top are accessed through shutter. Clean as necessary.	Para 2-64 (maintenance) Para 2-22 (cleaning)
					X		Perform boresight check.	Para 2-18.1 (troubleshooting)



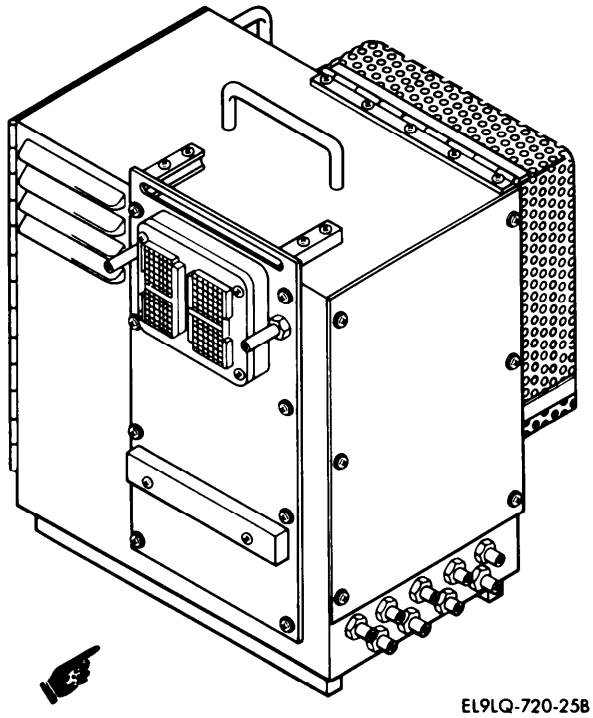
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
27		X					**Filter Assemblies** Remove front and rear panels to access filter assemblies. Inspect filters and clean or replace as necessary.	Para 2-64 (maintenance)



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
							TEST PROGRAM SETS	
28							**Major Test Adapter**	
		X					Inspect connectors for bent or broken contact pins.	Para 3-31 (maintenance)



EL9LQ-720-25B

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (cont)

Item No.	Interval D	M	Q	S	8	A	Item to be Inspected Procedure	Reference Remarks
29							**Test Fixtures**	
		X					Check for defects, broken, or missing hardware.	Para 2-66 (maintenance)
30							**Cable Assemblies**	
		X					a. Check for frayed, cracked, cut, or worn insulation.	Para 3-4 (maintenance)
		X					b. Inspect connectors for bent or broken contact pins.	
		X					c. Check for missing or illegible reference designations on cable markers. Replace as necessary.	
31							**Self-Test Connectors**	
		X					a. Inspect for broken or bent contact pins.	Para 2-68 (maintenance)
		X					b. Check for missing or damaged hardware.	
		X					c. Check for missing or illegible reference designations. Replace as necessary.	
32							**Personality Circuit Card Assemblies**	
		X					Check for missing or damaged hardware.	Para 2-69 (maintenance)

Section IV. SELF-TEST PROCEDURES

2-12. GENERAL

2-12

a. SCOPE

The information in this section applies to the SELF-TEST and EO bench alignment programs for EETF TADS/PNVS Augmentation Equipment.

b. SELF-TEST DESCRIPTION

CAUTION

When connecting zero-force connectors to equipment, ensure that male connector is seated squarely onto female connector. Do not apply uneven pressure. When turning locking lever, discontinue if resistance is felt and inspect connectors for bent pins.

Self-test is a menu driven program consisting of one senior executive module (EOBST), 37 self-test modules, and six stand-alone modules called procedures. These procedures can be performed individually or automatically in a predetermined sequence. Self-test is started by entering TEST EOBST. The operator then follows instructions displayed on AN/USM 410 video display terminal (VDT). The operator can select from the main menu E/O BENCH SELF-TEST MODE, E/O BENCH ALIGNMENT MODE or EXIT PROGRAM. Upon selecting E/O bench self-test mode, the operator is asked if an OSA is installed. If yes, the operator is asked if the test site is a depot test site. Answers to these questions determine which of three self-test menus will be used.

The operator can select from self-test menu ALL TESTS MODE, SINGLE TEST MODE, PRINT EQUIPMENT LIST or RETURN TO MAIN MENU. In all tests mode, the procedures are run end-to-end. In single test mode, any procedure can be run separately.

The program also selects and records failed test data, which upon completion is printed by the AN/USM 410 printer. This printed data provides failed test number, upper and lower limits, and indication or measurement obtained during test. If a failure occurs, refer to chapter 7 and follow replace/repair actions as listed by self-test. VDT self-test menu displays are shown below.

b. SELF-TEST DESCRIPTION (cont)

MAIN MENU

1) E/O BENCH SELF-TEST MODE
2) E/O BENCH ALIGNMENT MODE
99) EXIT PROGRAM

ENTER CHOICE:

SELF-TEST MENU

1) ALL TESTS MODE
2) SINGLE TEST MODE
3) PRINT EQUIPMENT LIST
99) RETURN TO MAIN MENU

ENTER CHOICE:

Single self-test may be used to run a specific procedure for check out, trouble-shooting or after a repair has been made. There are three single self-test menus. These menus are selected by system software depending on E/O bench configuration and site activity. The menus are based on the following criteria:

- OSA delete panel installed
- OSA installed and AVIM test site
- OSA installed and depot test site

Single self-test should not be used unless modules CALCST, PLLBUS, MTRXSW, ADST, and DIGITST have been performed successfully. The three single self-test menus are shown below. IVD contains all the procedures included in IVDST (with OSA installed), plus the code necessary for checking cable 13083701 and the OSA delete panel internal wiring.

Single self-test menu with OSA delete panel installed.

SINGLE SELF-TEST MENU

1) CALCST	9) VSGST	17) DCBMIR	25) LASERST
2) PLLBUS	10) FIRCSST	18) DCINTCAM	26) FIXTST
3) MTRXSW	11) FIRCTGST	19) DCEXSO	27) IVD
4) ADST	12) FIRCAST	20) DCFOCUS	28) AUGTEM
5) DIGITST	13) DCDCS	21) DCVARF	29) BITCHECK
6) FPSST	14) DCDCTL	22) DCEXTCAM	30) VIDEOST
7) PPSST	15) EXTRAD	23) INTRAD	99) RETURN
8) PPGTST	16) DCAMIR	24) OSGST	

ENTER CHOICE:

Single self-test menu with OSA installed and AVIM test site.

SINGLE SELF-TEST MENU

1) CALCST	9) VSGST	17) DCBMIR	25) LASERST
2) PLLBUS	10) FIRCSST	18) DCINTCAM	26) FIXTST
3) MTRXSW	11) FIRCTGST	19) DCEXSO	27) OSACABLE
4) ADST	12) FIRCAST	20) DCFOCUS	28) IVDST
5) DIGITST	13) DCDCS	21) DCVARF	29) AUGTEM
6) FPSST	14) DCDCTL	22) DCEXTCAM	30) BITCHECK
7) PPSST	15) EXTRAD	23) INTRAD	31) VIDEOST
8) PPGTST	16) DCAMIR	24) OSGST	99) RETURN

ENTER CHOICE:

Single self-test menu with OSA installed and depot test site.

SINGLE SELF-TEST MENU

1) CALCST	10) FIRCSST	19) DCEXSO	28) IVDST
2) PLLBUS	11) FIRCTGST	20) DCFOCUS	29) OSADAF
3) MTRXSW	12) FIRCAST	21) DCVARF	30) OSADAS
4) ADST	13) DCDCS	22) DCEXTCAM	31) OAFOCUS
5) DIGITST	14) DCDCTL	23) INTRAD	32) PMTLED
6) FPSST	15) EXTRAD	24) OSGST	33) AUGTEM
7) PPSST	16) DCAMIR	25) LASERST	34) BITCHECK
8) PPGTST	17) DCBMIR	26) FIXTST	35) VIDEOST
9) VSGST	18) DCINTCAM	27) OSACABLE	99) RETURN

ENTER CHOICE:

c. ALIGNMENT DESCRIPTION

EO bench alignment is a menu driven program consisting of eight stand-alone modules called procedures. These procedures are performed individually. Begin EO bench alignment by entering TEST EOBST at the AN/USM 410 VDT. When the MAIN MENU is displayed, select EO BENCH ALIGNMENT MODE. From the alignment menu, select the number of the individual alignment module and press RETURN. If your bench contains an OSA delete panel instead of an OSA, menu selection 5) displays DO NOT USE.

ALIGNMENT MENU

1) DIGITIZER	5) PMT/OSA
2) FIR COLLIMATOR	6) POWER SUPPLIES
3) IVD ASSEMBLY	7) VIS/NIR
4) OSG	8) EOB MAINTENANCE

99) RETURN TO MAIN MENU

ENTER CHOICE:

2-13. MODULE INPUT CODES

This section lists the unit or function tested and the input code of each self-test module. The information is presented by major assembly and unit or function under test. Modules listed in e (common modules) below, are common to the electronic station, dayside test bench, test console test bench and the nightside test bench.

a. ELECTRONIC STATION 1

Unit/Function	Input Code
Digital Computer Assembly 1A11	CALCST
DC Power Supply Assembly 1A4	FPSST
Programmable Power Supply Assembly 1A3	PPSST
Power Supply 1A3, 1A4 Alignment	PSALIGN

b. DAYSIDE TEST BENCH 2A1

Unit/Function	Input Code
A Mirror	DCAMIR
Automatic Focus Control Assembly 2A1A2A12	DCFOCUS
B Mirror	DCBMIR
Cable Assembly (target lamp) 2A1A2A11W19	DCDCTL
Camera Test Special Purpose Cable (external source)	DCEXSO
CID Video Camera (internal camera) 2A1A2A1A1A15	DCINTCAM
Filter Wheel/Motor Assembly (variable filter) 2A1A2A1O	DCVARF
Indirect View Display (IVD) 2A1A3	IVD (W/OOSA)
Indirect View Display (IVD) 2A1A3	IVDST (OSA ONLY)
Laser Power Meter (internal radiometer) 2A1A7	INTRAD
Laser Power Supply Assembly 2A1A6 and Laser Cover Assembly 2A1A2A19	LASERST
Bracket Assembly 2A1A1A4	OAFOCUS (OSA ONLY)
Filter Bracket Assembly 2A1A1A14	OSADAF (OSA ONLY)
OSA 2A1A1 - Shutter	OSADAS (OSA ONLY)
Photomultiplier Bracket Assembly 2A1A1A7 and Photomultiplier Tube (PMT/LED source)	PMTLED (OSA ONLY)
Filter and Detector Assembly 2A1A1A14	OAFOCUS (OSA ONLY)
Radiometer Head 2A1A8 (external radiometer)	EXTRAD
Shutter Assembly 2A1A2A2	DCDCS
Optical - HOD and IVD Alignment Assembly	FIXTST
OSA Self-Test Cables	OSACABLE (OSA ONLY)
VIS/NIR Alignment	DCALIGN

2-13. MODULE INPUT CODES (cont) 2-13

c. TEST CONSOLE TEST BENCH 2A2

Unit/Function	Input Code
Analog-to-Digital (A/D) Converter 2A2A13	ADST
Matrix Switch Assembly 2A2A1O	MTRXSW
Optical Signal Generator (OSG) 2A2A3	OSGST
Programmable Digitizer 2A2A1	DIGITST
Programmable Pulse Generator (PPG) CCA 2A2A7A6A8	PPGTST
Video Signal Generator (VSG) Case Assembly 2A2A7A1	VSGST
Programmable Digitizer 2A1A1 Alignment	DIGALIGN
Optical Signal Generator 2A2A3 Alignment	OSGALIGN

d. NIGHTSIDE TEST BENCH 2A3

Unit/Function	Input Code
Heat Source Target Assembly 2A3A1A1 - Aperture	FIRCAST
Heat Source Target Assembly 2A3A1A1 - Target	FIRCTGST
Shutter Assembly 2A3A1A2	FIRCSST
FIR Alignment	FIRALIGN

e. COMM0N MODULES

Unit/Function	Input Code
Self-test Menu (start self-test program)	EOBST
Interlocks	BITCHECK
Parallel Bus	PLLBUS
Temperature Sensors	AUGTEM
Video Monitor	VIDEOST
A group of utility programs used in conjunction with several items of EO bench equipment	MAINT

2-14. MODULE DESCRIPTIONS 2-14

This section provides a basic description of the self-test and alinement modules. The information is presented by major assembly and module input code.

a. ELECTRONIC STATION

Input Code	Description
CALCST	This module gives the operator instructions to check extender assemblies 1A9A1, 1A9A2, 2A2A8, and the extender assembly in the AN/USM-410(V)2 for status of front panel lights. Then, the module exercises the calculate commands. If a time out error does not occur before the first calculate command test is completed, the IEEE 488 Bus, extender assemblies, and digital computer assembly 1A1O are functioning normally. Since a time out error "locks out" the self-test program, the error message is displayed at the start of the first calculate command test. A calculate error will cause a prompt to be displayed upon completion of the test.
FPSST	This module tests fixed power supplies 1A4PS1, 1A4PS2, 1A4PS3, and 1A4PS4. The 1A4PS1 28 vdc output is measured by using channel 226 of A/D converter assembly 2A2A13 and scaling accordingly. A prompt is displayed if the voltage is not +26.0 to +30.0 vdc. The 1A4PS2 +15 vdc output is measured using channel 227 of A/D converter assembly 2A2A13 and scaling accordingly. A prompt is displayed if the voltage is not +14.0 to +16.0 vdc. The 1A4P3 -15 vdc output is measured using channel 228 of A/D converter assembly 2A2A13 and scaling accordingly. A prompt is displayed if the voltage is not -14.0 to -16.0 vdc. The 1A4PS4 +5 vdc output is measured using channel 229 of A/D converter assembly 2A2A13, and scaling accordingly.
PPSST	A prompt is displayed if the voltage is not +4.5 to +5.5 vdc. This module tests programmable power supplies 1A3PS1, 1A3PS2, 1A3PS3, and 1A3PS4. Each of the programmable power supplies is programmed and checked at three different dc voltages and currents. The output voltage, load resistance, and noise (ac ripple) are measured and compared to upper and lower limits. The output current is calculated from the measured voltage and load resistance, and compared to upper and lower limits. A prompt is displayed at the completion of the test if an error is detected.

a. ELECTRONIC STATION (cont)

Input Code	Description
PSALIGN	This module measures the output voltages of the following fixed power supplies at A/D converter assembly 2A2A13: Ref. Des. Output Voltage Voltage at A/D conv. 1A4PS1 +28 vdc +7.703 to +7.255 1A4PS2 +15 vdc +5.225 to +4.920 1A4PS3 -15 vdc -5.073 to -4.920 1A4PS4 +5 vdc +5.150 to +4.850 If a power supply output voltage is out of tolerance, instructions are given to adjust its output voltage accordingly. This module also measures the output voltage of programmable power supply 1A3. If its output voltage is out of tolerance, instructions are given to adjust power supply controller 1A2 accordingly.

b. DAYSIDE TEST BENCH 2A1

Input Code	Description
DCALIGN	This module positions the A and B mirrors for alinement. If it cannot achieve proper positioning, it displays a prompt informing the operator to run DCAMIR or DCBMIR, as appropriate, for troubleshooting.
DCAMIR	This module tests the ability of the A mirror to respond to commands for both positions 1 and 2. The A mirror is programmed to position 1 and the motor status checked. A prompt is displayed at the completion of the test if motor status is in error. The A mirror is then programmed to position 2 and motor status checked. A prompt is displayed at the completion of the test if the motor status is in error.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
DCAMIR (cont)	The A mirror is then programmed from position 2 to position 1 and the motor status checked. A prompt is displayed if the motor status is in error.
DCFOCUS	This module tests the ability of automatic focus control assembly 2A1A2A12 to respond to position commands. The automatic focus control assembly is programmed to the home position and motor status checked. If the motor status is in error, a prompt is displayed at completion of the test. The automatic focus control assembly is then programmed off of home position and the motor status checked. If the motor status is in error, a prompt is displayed at the completion of the test. The automatic focus control assembly is then programmed back to the home position and motor status checked. If the motor status is in error, a prompt is displayed.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
DCBMIR	This module tests the ability of the B mirror to respond to commands for positions 1 thru 3. The B mirror is programed to position 1 and motor status checked. A prompt is displayed at the completion of the test if the motor position is in error. The B mirror is then programmed from position 1 to position 2 and motor status checked. A prompt is displayed at the completion of the test if the motor status is in error. The B mirror is then programmed from position 2 to position 3 and motor status checked. A prompt is displayed if the motor status is in error.
DCDCTL	This module tests the ability of cable assembly (target lamp) 2A1A2A11W19 to respond to on and off commands. The target lamp is programmed on and shutter assembly 2A1A2A2 opens. The operator observes the lamp by looking through the open shutter and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT. If NO is pressed, a prompt is displayed at the completion of the test. The target lamp is then programmed off. The operator observes the lamp through the open shutter and if lamp is on, presses [YES] or if lamp is off, presses [NO] on the AN/USM-410 VDT. If YES is pressed, a prompt is displayed.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
DCINTCAM	This module tests the ability of CID video camera (Internal camera) 2A1A2A1A1A15 to respond to commands to detect and measure energy from the target lamp. The B mirror is moved to position 3 and the target lamp programmed off. The average pixel value of the camera is read. If the average pixel value is not 221 to 225, a prompt is displayed at the completion of the test. The target lamp is programmed on and AN/USM-410 power supply DC2B ramped to 12 vdc. The average pixel value of the camera is read. If the average pixel value is not O to 220 a prompt is displayed.
DCVARF	This module tests the ability of filter wheel/motor assembly (variable filter) 2A1A2A1O to respond to position commands. The variable filter is programmed to the home position and motor status checked. If the motor status is in error, a prompt is displayed at the completion of the test.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
DCVARF (cont)	The variable filter is then programmed off the home position and motor status checked. If the motor status is in error, a prompt is displayed at the completion of the test. The variable filter is then programmed back to the home position and motor status checked. If the motor status is in error, a prompt is displayed.
PMTALIGN	This module adjusts the brightness and contrast on an IVD for proper settings (40 foot-lamberts). It then saves the settings and-uses those values to set the brightness and contrast of an IVD mounted in the OSA. Then it uses the OSA-mounted IVD calibration brightness to adjust the PMT for an output of 40 foot-lamberts.
IVDALIGN	This module tests the optical and electrical parameters of the internal IVD against their specifications, and performs alignment of the IVD as necessary.
IVD	Effectivity: Used with E/O bench equipped with OSA delete panel only. This module tests the ability of IVD 2A1A3 to produce correct outputs in response to function commands, and checks the OSA delete panel internal wiring. An error detected during any portion of the test will cause a prompt to be displayed at the completion of the test.
IVDST	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests the ability of the indirect view display (IVD)) 2A1A3 to produce correct outputs in response to function commands. An error detected during any of the following checks will display a prompt at the completion of the test. The optical signal analyzer (OSA) chassis to shield continuity is checked for 10 ohms or less. The OSA shutter interlock operation is verified by checking the shutter status with the OSA door open (shutter closed).

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
IVDST (cont)	The operator closes the OSA door, the shutter is programmed open, and shutter status checked. The internal and external relays 1 through 4, phase A, B, and C contacts are checked for a closed condition. The operator opens the OSA door and the OSA shutter is checked for a closed status. The internal and external relays 1 through 4, phase A, B, and C contacts are checked for an open status. The operator applies pressure to OSA door interlock switch S1 while OSA door interlock switch S2 is checked for a shorted condition. The operator then releases S1 and applies pressure to S2 while S1 is checked for a shorted condition. The operator then releases S2 and closes the OSA door. The OSA door status is checked. The IVD is then programmed to produce a vertical output pulse and a horizontal output pulse, which are checked for period and amplitude.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
INTRAD	This module tests the ability of laser power meter (internal radiometer) 2A1A7 to detect light energy from the flash lamp. The flash lamp is programmed off, and the output of the internal radiometer digitized and recorded. The flash lamp is then programmed on, and the internal radiometer output digitized and compared with the recorded lamp off output. If the off output is not +0.0125 to +0.080 vdc higher than the on output, a prompt is displayed at the completion of the test. The lamp is then programmed off, and the internal radiometer output digitized and compared to the previously recorded off output l A prompt is displayed if the difference is greater than +0.002 vdc.
LASERST	This module checks laser cover assembly 2A1A2A19 and laser power supply assembly 2A1A6. An error detected during any of the following checks will display a prompt at the completion of the test. The operator opens the laser enclosure, and turns the laser off switch to OFF. The laser shield interlock, laser cover assembly switches, and laser fire switch are checked. The operator then closes and locks the laser enclosure, and the above checks are repeated. The program then applies logic signals and voltages (115 vat, -15 vdc and +28 vdc) to check relays and interlocks. The operator checks for both LASER ARMED lights on. The programmable pulse generator is programmed for sync signals. The operator holds the laser fire switch in the on position and the interlocks and high voltage sample are checked. The operator then releases the laser fire switch.
OAFOCUS	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests the ability of bracket assembly 2A1A1A4 to respond to focus commands. The focus mechanism is programmed to the home position and motor status checked. If motor status is in error, a prompt is displayed at the completion of the test.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
OAFOCUS (cont)	The focus mechanism is then programmed to move off the home position and motor status is checked. If the motor status is in error, a prompt is displayed at the completion of the test. The focus mechanism is programed to the home position, and the motor status checked. If the motor status is in error, a prompt is displayed.
OSADAF	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests the ability of filter bracket assembly 2A1A1A14 to position the filter in response to commands. The OSA is cleared and the filter checked for position 1 (in). If the filter is in position 2 (out), a prompt is displayed at the completion of the test. The filter is programed to position 2 and position status checked. If the filter is in position 1, a prompt is displayed at the completion of the test. The filter is moved back to position 1 and position status checked. If the filter is in position 1, a prompt is displayed at the completion of the test.
OSADAS	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests the ability of photomultiplier bracket assembly 2A1A1A7 shutter to respond to open and close commands. The OSA is cleared, which programs the shutter closed. The operator opens the OSA door. The door interlock is tested by programming the shutter to open. The interlock should prevent the shutter from opening; it if does not, a prompt is displayed at the completion of the test.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
OSADAS (cont)	The operator closes the OSA door and the shutter is programmed to open. The shutter status is checked. If the shutter remains closed, a prompt Is displayed.
PMTLED	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests photomultiplier bracket assembly 2A1A1A7 filter and bracket assembly 2A1A1A14 photomultiplier tube (PMT) temperature, and ability to detect light energy. If an error is detected during any of the following checks, a prompt is displayed at the completion of the tests. The PMT cooler is checked by reading the OSA temperature sensors for 5.0° to 15.0°C. The OSA PMT is turned on and after a 15-second delay, the PMT high voltage test point is checked for -3.0 to -5.5 vdc. The operator is then prompted to connect the 1-250 illuminator to the adapter on the OSA assembly door 2A1A1 and adjust the illuminator for a voltage of 7.80 to 8.20 volts. The PMT level is then checked for each of 6 loads. PMT test 3 is selected and PMT output checked for 7.80 to 8.20 vdc. PMT test 3 with filter is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 4 with filter is selected and PMT output is checked for 7.00 to 9.00 vdc. PMT test 2 is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 1 is selected and PMT output is checked for 0.04 to 0.12 vdc. PMT test 5 is selected and PMT output checked for 0.04 to 0.12 vdc. PMT test 6 is selected and PMT output is checked for 0.72 to 0.88 vdc. PMT test 6 with low impedance is selected and PMT output is checked for -0.04 to 0.04 vdc.

b. DAYSIDE TEST BENCH 2A1 (cont)

Input Code	Description
DCDCS	This module tests the ability of shutter assembly 2A1A2A2 to respond to open and close commands. The dayside test bench is cleared and the shutter assembly sensors checked for position 2 (closed). If the sensors indicate position 1 (open), a prompt is displayed at the completion of the test. The shutter assembly is then programmed to open, and the shutter assembly sensors checked for position 1. If the sensors indicate position 2, a prompt is displayed at the completion of the test. The shutter assembly is then programmed to close, and the shutter assembly sensors checked for position 2. If the sensors indicate position 1, a prompt is displayed.
FIXTST	This module tests the optical alignment assembly through various voltage and resistance measurements. The values are compared to upper and lower limits and if an error is detected, a prompt is displayed at the end of the test.
OSACABLE	Effectivity: Used with E/O bench equipped with optical signal analyzer only. This module tests OSA self-test cables 13083701 and 13083702 by measuring pin to pin continuity, and insulation resistance. If an error is detected, the operator is prompted to repair or replace the cable.

c. TEST CONSOLE TEST BENCH 2A2

Input Code	Description
ADST	This module tests various channels of analog-to-digital (A/D) converter 2A2A13 for noise and gain. The tests are made on four channels of the simultaneous sample and hold card (SSH), differential input card, and two single-ended input cards. If an error is detected, a prompt is displayed at the completion of the test. The A/D converter channels are checked as follows: ● The SSH input is programed for 0.000 vdc. The noise is measured and recorded. An output of +7.5 vdc is applied to SSH input and voltage measured. The recorded noise at 0.000 vdc input is subtracted from the measured voltage at +7.5 vdc input then compared to an upper limit of +7.51 vdc and lower limit of +7.49 vdc. ● The differential input card input is programmed for 0.000 vdc and the noise measured and recorded. Then +7.5 vdc is applied to the differential input card input, and the output voltage measured. The recorded noise at 0.000 vdc is subtracted from the measured voltage +7.5 vdc input, and compared with an upper limit of +7.51 vdc and a lower limit of +7.49 vdc. ● The single-ended input card is then programmed for 0.000 vdc input and the noise measured and recorded. ● The single-ended input card is programmed for +7.5 vdc input and the output voltage measured. The recorded noise at 0.000 vdc input is subtracted from the measured voltage at +7.5 vdc input, then compared to an upper limit of +7.51 vdc and a lower limit of +7.49 vdc.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
MTRXSW	This module tests matrix switch assembly 2A2A1O 120 x 16 relays for both open and closed positions. The matrix switch assembly built-in self-test is performed on quadrants 1, 2, 3, and 4. If an error is detected, a prompt is displayed at the completion of the test.
OSGST	This module tests the ability of the optical signal generator (OSG) assembly 2A2A3 lamps to respond to on and off commands. Lamp detector Al is checked through the A/D converter lamp detector channel. Voltage is applied and output compared to an upper limit of 0.50 vdc and a lower limit of -1.00 vdc. The CTF lamp is then checked with an application of 10.0 vdc. After a 2 second delay output is compared to an upper limit of 4.00 vdc and lower limit of 0.80 vdc. Lamp detector A2 is checked for same parameters as detector A1. The sphere lamp is then checked with an application of 34.0 vdc. After a 2 second delay output is compared to an upper limit of 4.00 vdc and lower limit of 0.80 vdc. Lamp detector A3 is checked for same parameters as detector Al. The CTF lamp is then checked with an application of 23 vdc. After a 2 second delay output is compared to an upper limit of 8.00 vdc and lower limit of 2.00 vdc. If an error is detected a prompt is displayed at the completion of each test.
OSGALIGN	This module checks the alinement of potentiometers R2, R4, and R6 on the amplifier/detector CCA in optical signal generator 2A2A3. If the CCA is out of alinement, the software directs the operator to perform the appropriate adjustments.
DIGITST	This module tests the ability of programmable digitizer assembly 2A2A1 to accept stimulus inputs and convert them to digital equivalents. If an error is detected in the following checks, a prompt is displayed at the completion of the test.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
DIGITST (cont)	The programmable amplifier channel A is programmed to 1 V/D, POS -4 and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 0 to 15. Channel A is programmed to 1 V/D, POS -2 and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 52 to 76. Channel A is programmed to 1 V/D, POS 0, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 118 to 128. Channel A is programmed to 1 V/D, POS +2, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 180 to 204. Channel A is programmed to 1 V/D, POS +4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 240 to 255. The programmable amplifier channel B is programmed for 1 V/D, POS -4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 0 to 15. Channel B is programmed for 1 V/D, POS -2, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 52 to 76. Channel B is programmed for 1 V/D, POS 0, and coupling to ground, The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 118 to 128. Channel B is programmed to 1 V/D, POS +2, and coupling to ground. The data is sampled, moved to a matrix and averaged. The averaged sampled data is checked for 180 to 204.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
DIGITST (cont)	Channel B is programmed to 1 V/D, POS +4, and coupling to ground. The data is sampled, moved to a matrix, and averaged. The averaged sampled data is checked for 240 to 255. A 5v p-p, 10 kHz sine wave is applied to channel A input B. The sample rate is programmed to 0.1 microseconds per sample. The period of the sampled signal is checked for 99.0 to 101.0 microseconds. The signal measured by the programmable digitizer assembly is checked for 4.75 to 5.25v p-p. A 5v p-p, 10 kHz sine wave is applied to channel B, input B. The sample rate is programmed to 0.1 microseconds per sample. The period of the sampled signal is checked for 99.0 to 101.0 microseconds. The signal measured by the programmable digitizer assembly is checked for 4.75 to 5.25v p-p.
DIGALIGN	This module provides programmable digitizer 2A2A1 positioning alinement, gain alinement, and a check of the trigger level. Positioning alinement is performed with the inputs grounded. Minimum requirements for the positioning of each channel are: Position: -4 >0.0 and <21.0 counts Position: -3 32 +/- 21 counts Position: 0 128 +/- 21 counts Position: 3 223 +/- 21 counts Position: 4 >234 and <255 counts The actual values are displayed. The operator is then prompted to remove the appropriate preamplifier with power removed, and to adjust the POSN GAIN and POSN CTR controls on the preamplifier. The new positioning alinement values are then checked. This process continues until the operator ends the adjustment process. For the gain alinement, the gain voltages are checked at 0.2, 0.5, and 1.0 volts/division. If the voltages are not within 2 percent of the applied voltage, the operator is prompted to adjust the front panel GAIN control. Adjustments within 5 percent of the desired voltage level will pass, but adjustments within 2 percent are desired. For the trigger level check, the actual trigger level values are displayed along with the programmed levels. No adjustments are provided.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
PPGTST	This module tests the ability of the programmable pulse generator (PPG) 2A2A7A6A8 to produce correct output pulses in response to input function commands, Each of the four output channels is programed for a test pulse which is checked using the programmable digitizer assembly 2A2A1. PPG output 1 is programed for a 1.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 0.95 to 1.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc. An error in the pulse measurements will display a prompt at the completion of the test. PPG output 2 is programmed for a 2.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 1.95 to 2.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc. An error in the pulse measurements will display a prompt at the completion of the test. PPG output 3 is programed for a 3.0 microsecond pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 2.95 to 3.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc. An error in the pulse measurements will display a prompt at the completion of the test. PPG output 4 is programed for a 4.0 microsecond positive pulse. The PPG gating feature is programmed to switch off every other pulse resulting in a period of 10 microseconds. The measured pulse is checked for a pulse width of 3.95 to 4.05 microseconds with a period of 9.95 to 10.05 microseconds, a low state of -0.5 to +0.8 vdc, and a high state of +2.5 to +5.5 vdc. An error in the pulse measurements will display a prompt at the completion of the test.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
VSGST	This module tests the ability of video signal generator (VSG) case assembly 2A2A7A1 to produce video output signals in response to input function commands. If an error is detected during any of the following checks, a prompt is displayed at the completion of the test. The VSG is programmed for a 525 line rate and the blanking level to 0.3 volts. The displayed video output is measured by the programmable digitizer assembly, which is triggered by the VSG and the following checks made: ● The horizontal sync width for 4.0 to 6.0 microseconds. ● The horizontal sync period for 60.0 to 68.0 microseconds. ● The porch level of display output signal for -0.075 to +0.75 vdc. ● The difference between the porch level and sync level for 0.1 to 0.4 vdc. ● The time from the start of the last horizontal sync of the even field to the beginning of the odd vertical field for 60.0 to 68.0 microseconds.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
VSGST (cont)	● The time from the start of the odd field vertical sync to the start of the first pulse for 25.0 to 30.0 microseconds. ● The time from the start of the odd field vertical sync to the start of the sixth pulse for 188.0 to 196.0 microseconds. ● The time of the start of the sixth pulse of the odd field vertical sync to the next positive transition for 6.0 to 14.0 microseconds. ● The time from the first positive transition after the odd field vertical sync to the start of the next horizontal sync for 55.0 to 63.0 microseconds. ● The time from the start of the last horizontal sync of the odd field to the beginning of the even field vertical sync for 25.0 to 35.0 microseconds. The VSG is then Programmed for an 875 line rate and the blanking level for 0.3 volts; The d splayed video output is measured by the programmable digitizer, which is triggered by the VSG and the following checks made: ● The horizontal sync width for 2.0 to 3.5 microseconds. ● The horizontal sync period for 35.0 to 40.0 microseconds. ● The porch level of the display output signal for -0.075 to +0.75 vdc. ● The difference between the porch level and the sync level for +0.1 to +0.4 vdc. ● The time from the start of the last horizontal sync of the even field to the beginning of the odd field vertical sync for 36.0 to 40.0 microseconds. ● The time from the start of the odd field vertical sync to the start of the first pulse for 15.0 to 19.O microseconds. ● The time from the start of the odd field vertical sync to the start of the sixth pulse for 112.0 to 116.0 microseconds.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
VSGST (cont)	• The time from the start of the sixth pulse of the odd field vertical sync to the next positive transition for 3.0 to 6.0 microseconds. • The time from the first positive transition after the odd field vertical sync to the start of the next horizontal sync for 34.0 to 36.0 microseconds. • The time from the start of the last horizontal sync of the odd field to the beginning of the even field vertical sync for 15.0 to 22.0 microseconds. To check composite video without sine wave, a 20-microsecond window is placed 11 microseconds after the start of horizontal sync. The brightness level is programmed to +1.0 vdc and the programmable digitizer assembly is triggered 10 microseconds after the start of horizontal sync and the following checks made: • The window to start 0.6 to 1.4 microseconds after the trigger. • The width of the window for 19.6 to 20.4 microseconds. • The amplitude of the window for +0.25 to +0.75 vdc. To check the composite video with sine wave, the window in the previous check is reprogrammed to a brightness level of +0.5 vdc and modulated with a 10 mHz sine wave programmed for 0.5v p-p. The difference between the maximum and minimum samples during the window is checked for 0.25 to 0.30v p-p. The camera sync signals are checked with the VSG programmed for an 875 line rate. The programmable digitizer assembly is triggered 10 microseconds into line 18, and samples the camera sync (encoded sync) signals. The following checks are made: • The second pulse of the inverted sync signal for 3.7 to 3.9 microseconds. • The third pulse of the inverted sync signal for 3.7 to 3.9 microseconds. • The time interval between the first and second pulses of the inverted sync signal for 37.6 to 38.6 microseconds. • The time interval between the end of the second pulse and the start of the third pulse of the inverted sync signal for 0.9 to 1.1 microseconds.

c. TEST CONSOLE TEST BENCH 2A2 (cont)

Input Code	Description
VSGST (cont)	• The start of the first pulse of the inverted sync signal to occur at 27.7 to 28.1 microseconds in relation to the programmable digitizer trigger. • The first pulse of the noninverted sync signal for 3.7 to 3.9 microseconds. • The second pulse of the noninverted sync signal for 3.7 to 3.9 microseconds. • The third pulse of the noninverted sync signal for 3.7 to 3.9 microseconds. • The time interval between the first and second pulses of noninverted sync signal for 37.6 to 38.6 microseconds. • The time interval between the end of the second pulse and start of the third pulse of the noninverted sync signal for 0.9 to 1.1 microseconds. • The start of the first pulse of the noninverted sync signal to occur at 27.7 to 28.1 microseconds in relation to the programmable digitizer trigger. To check the camera video signal, the camera video output is programmed for windows of +2.00 vdc with a duration of 15 microseconds occurring on lines 100 and 101 at 15 microseconds after the start of the horizontal sync. The programmable digitizer assembly is triggered 10 microseconds into line 99, and the following checks are made: The width of the first window for 14.8 to 15.2 microseconds. The width of the second window for 14.8 to 15.2 microseconds. • The first window to occur 42.4 to 43.5 microseconds after the programmable digitizer trigger. • The second window to occur 80.5 to 81.6 microseconds after the programmable digitizer trigger. Line 102 for no camera window. • The camera video amplitude for +1.4 to +1.9 vdc.

d. NIGHTSIDE TEST BENCH 2A3

Input Code	Description
FIRCAST	This module tests the ability of heat source target assembly 2A3A1A1 aperture wheel positioner to position the proper aperture, in response to input commands. Aperture number 1 is selected and the sensor checked. If the sensor does not indicate status 22, a prompt is displayed at the completion of the test. Aperture number 2 is selected and the sensor checked. If the sensor does not indicate status 28, a prompt s displayed at the completion of the test. If the sensor does not indicate status 26, a prompt s displayed at the completion of the test. Aperture number 3 is selected and the sensor checked. If the sensor does not indicate status 28, a prompt is displayed at the completion of the test. Aperture number 4 is selected and the sensor checked. If the sensor does not indicate status 30, a prompt is displayed.
FIRCTGST	This module tests the ability of heat source target assembly 2A3A1A1 target wheel positioner to correctly position targets in response to-input commands. There are 10 selectable target wheel positions (position 2 thru 11). Each position is checked by this module. If an error is detected during any of the following checks, a prompt is displayed at the completion of the test. Target number 2 is selected and the target wheel sensor status checked for 2. Target number 3 is selected and the target wheel sensor status checked for 3. Target number 4 is selected and the target wheel sensor status checked for 4. Target wheel 5 is selected and the target wheel sensor status checked for 5. Target number 6 is selected and the target wheel sensor status checked for 6. Target number 7 is selected and the target wheel sensor status checked for 7. Target number 8 is selected and the target wheel sensor status checked for 8. Target number 9 is selected and the target wheel sensor status checked for 9. Target number 10 is selected and the target wheel sensor status checked for 10. Target number 11 is selected and the target wheel status checked for 11. The target wheel is then moved from target 11 to target 5 and the target wheel sensor status checked for 5.

d. NIGHTSIDE TEST BENCH 2A3 (cont)

Input Code	Description
FIRCSST	This module tests the ability of shutter assembly 2A3A1A2 to respond to position input commands. The nightside test bench is cleared and the shutter assembly sensors checked for position 2 (closed). If the sensors indicate position 1 (open), a prompt is displayed at the completion of the test. The shutter assembly is then programmed to open and the sensor checked for position 1. If the sensors indicate position 2, a prompt is displayed at the completion of the test. The shutter assembly is then programmed to close and the sensors checked for position 2. If the sensors indicate position 1, a prompt is displayed at the completion of the test.
BITCHECK	This module tests interlocks in dayside test bench 2A1 and nightside test bench 2A3. The program displays operator instructions to position controls, located on the dayside test bench and nightside test bench, which engage or disengage interlocks. The interlock sensors are checked for proper position status. If an error is detected, a prompt is displayed. Interlocks that are checked on the dayside test bench are laser interface carriage, laser interlock handle, and sensor mount handle. The interlock checked on the nightside test bench is the sensor mount handle.
FIRALIGN	This module is used to retrieve previously stored transmission factors, and to print them out upon request. If no transmission factor exists, transmission factors can be measured and stored for later retrieval. Boresight values can also be measured and stored for later retrieval. A list of equipment required can also be printed.

2-14. MODULE DESCRIPTIONS (cont)

e. COMMON MODULES

Input Code	Description
PLLBUS	This module tests the ability of the parallel bus to transfer 16 bits of information in parallel. The built-in, self-test feature of the parallel bus is used to check out the data and handshake lines of the interface. If an error is detected during the following checks, a prompt is displayed at the completion of the test. The following numbers are output to the parallel bus self-test address and the input value from the parallel bus self-test address to the AN/USM-410 is checked for the same value. Output -1 (all ones), O (all zeros), 1 (bit O), 2 (bit 1), 4 (bit 2), 8 (bit 3), 16 (bit 4), 32 (bit 5), 64 (bit 6), (bit 7), 256 (bit 8), 512 (bit 9), 1024 (bit 10), 2048 (bit 11), 4096 (bit 12), 8192 (bit 13), 16384 (bit 14), -32768 (bit 15), 21845 (even bits), and -21846 (odd bits).

e. COMMON MODULES (cont)

Input Code	Description
AUGTEM	The dayside test bench temperature sensors 1 and 3 are checked for 17.0° to 29.0°C and recorded. The two indications are compared for a difference of -2.5° to +2.5°C. The indications are displayed. If the indications are not within limits, a prompt is displayed. The nightside test bench thermal source controller ambient temperature sensor is checked for a 17.0° to 29.0°C indication. The indication is recorded and used as a base for other nightside test bench sensor tests. If the indication is not within limits, a prompt is displayed, and a 22°C ambient temperature assumed in all other tests. The A source is programmed to ambient and the A auxiliary-temperature sensor checked for an indication from -5.0° to +lO.O°C of the recorded ambient temperature indication. If the indication is not within limits, a prompt is displayed. The B source is programmed to ambient and the B auxiliary temperature sensor is checked for an indication from -5.0° to +10.O°C of the recorded ambient indication. If the indication is not within limits, a prompt is displayed. The C source is programmed to ambient, and the C auxiliary temperature sensor checked for an indication from -5.0° to +10.O°C of the recorded ambient temperature. If the indication is not within limits, a prompt is displayed. The A source is programmed to ambient and the A controller temperature sensor checked for an indication from -5.0° to +10.0°C of the recorded ambient temperature. If the indication is not within limits, a prompt is displayed.

e. COMMON MODULES (cont)

Input Code	Description
AUGTEM (cont)	The B source is programmed to ambient, and the B controller temperature sensor checked for an indication from -5.0° to +lO.O°C of the recorded ambient temperature. If the indication is not within limits, a prompt is displayed. The C source is programmed for ambient and the C controller temperature sensor checked for an indication from -5.0° to +lO.O°C of the recorded ambient temperature. If the indication is not within limits, a prompt is displayed. The A source is programmed to 30°C. The A controller sensor is checked, after a delay, for an indication of 29.0° to 31.0°C. If the indication is not within limits, a prompt is displayed. The A and C sources are programmed to -11° and +8°, respectively, relative to ambient. The A auxiliary temperature sensor is checked, after a delay, for an indication of -10° to -12°, relative to ambient. The C source is checked for ambient -2° to ambient -4°. If the indication is not within limits, a prompt is displayed. The C source is programmed to 1° relative to A, and the A source is programmed to 15° relative to ambient. The C auxiliary temperature is checked, after a delay, for an indication of 32.5°C to 37.5°C. If the indication is not within limits, a prompt is displayed. The A source is programmed to +45° relative to ambient, and the B source is programmed to 0° relative to ambient. The C auxiliary temperature sensor and the B source are checked, after a delay, for an indication of ambient plus 44°C to ambient plus 46°C.

e. COMMON MODULES (cont)

Input Code	Description
VIDEOST	This module tests the portable video monitor. The portable monitor is first checked for uniform brightness. The operator is prompted to observe the portable monitor for uniform brightness over the entire screen, and to press yes if the brightness is acceptable and no if it is unacceptable. If unacceptable, the operator is prompted to replace portable monitor. The operator is prompted to place the FULL UNDER switch to the under position and adjust the HEIGHT control until the vertical and horizontal borders are about the same on all four sides. The operator is prompted to press yes if acceptable and no otherwise. If no, the operator is prompted to replace the portable monitor. The operator is next prompted to place the FULL UNDER switch to the full position and verify that the display is now completely illuminated and the border has been completely removed. The operator presses yes if the display is completely illuminated, no otherwise. If no, the operator is prompted to replace the portable monitor. The operator is next prompted to observe that a fine vertical bar pattern is visible on the monitor and to press yes if the image is acceptable and no if the image is unacceptable. If no, the operator is prompted to replace the portable monitor.
EOBST	This module is an executive controller for the E/O augmentation bench self-test. This program is menu driven and controls all input, output, and file handling. All other modules are called by the executive controller as procedures. If a failure is encountered during a specific module the failure will be recorded and the operator will be given the option to continue or exit.
MAINT	This module contains 17 utility programs used in conjunction with several items of EO bench equipment. It is menu driven. The following are covered: MULTIPROGRAMMER DIG IN/OUT - Program a digital output CCA or read a digital input CCA. READ TEMPERATURE SENSORS - Read the following temperatures: Mirror A transmission, mirror B transmission, source A, source B, source C, OSA PMT, and temperature probe.

e. COMMON MODULES (cont)

Input Code	Description
MAINT (cont)	TEMPERATURE CONTROLLER - Program the following temperatures: 'A' absolute, 'A' relative to ambient, 'B' relative to 'A', 'C' relative to A. Read the following temperatures: ambient, 'A-ambient', 'A' source, 'B' or 'C' source. MOTORS - View the status of the following motors: OSA focus, NIR focus, NIR variable filter, NIR target wheel, NIR A mirror, NIR B mirror, FIR target wheel, FIR aperture wheel. PROGRAMMABLE POWER SUPPLIES - Program the output voltages of programmable power supplies 1 thru 4. A /D CONVERTER TESTS - Read the output voltages of A/D converters 1 thru 4. DIGITIZER - Read the values of channel A and B. MATRIX SWITCH TESTS - Clear the matrix switch, disconnect or connect a closed relay, and search for a closed relay. PARALLEL BUS - Manually enter a number to be placed onto the bus. CID CAMERAS - Generate a line or graphics to be applied to camera, and then displayed. MULTIPROGRAMMER RELAYS - Connect, disconnect, or clear any multiprogrammer relay from 1 to 120. MP QUAD DACS - Check the sync level, window 1 level, sine wave level, and camera video level on D/A converter CCA 1. Check the background level and window 2 level on D/A converter CCA 2. SHUTTERS - Open and/or close the day shutter, night shutter, and OSA shutter. PROGRAMMABLE PULSE GENERATOR - Display sync period, gate period, enable, cmd, ppg, arm gen, and arm gate pulses. VIDEO SIGNAL GENERATOR - Program the following: 525 line rate, 875 line rate, camera video level, brightness level, blanking level, frequency, sine level, phase, and window parameters. CALCULATE FUNCTIONS - Display the augmentation system software part number and revision level, and display the FIR transmission factor. EQUATE FUNCTIONS - Measure and program voltage and current values for power supplies DC2A, DC2B, DC3A, DC3B, and 400 Hz AC standard.

2-15. REPAIR MESSAGES 2-15

This section is a general description of repair messages and a cross reference list of items identified for replacement to the maintenance procedure.

a. GENERAL DESCRIPTION

Repair messages are generated and displayed on the AN/USM-410 VDT when an error is detected by the program. The messages list items to be replaced in order of probability of failure and identify the Items by reference designation, part number, and name. If the item to be replaced has no reference designation, the reference designation of the next higher assembly is listed followed by XX. For example: the HP94140A relay switch CCA, which has no reference designation and is part of the matrix switch assembly 2A2A1O, is listed as 2A2A1OXX. The part numbers and names are listed as an aid to further identify the item to be replaced. The module which produced the repair message should be exercised after each replace action is complete.

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE

The following listing provides a cross reference of items to be replaced to the replacement procedure. The information is presented by module input code. The item column identifies the item to be replaced by reference designation and part number. The reference column identifies the paragraph where the procedure is found in this manual. Each list is in reference designation order and only provides a cross reference to maintenance paragraphs. The operator should follow the VDT screen display for the proper sequence of repair/replace actions.

Input Code - CALCST

Item (Ref Des/Part No.)	Reference (Para No.)
1A9A1/37203A	2-38
1A9A2/37203A	2-38
1A11/13231746	2-39.1
1A11A1/HP12205A	2-40
1A11A2/HP12201A	2-40
1A11A3/HP12202A	2-40
1A11A4/HP12203A	2-40
1A11A5/HP12204A	2-40
1A11A6/HP12221A	2-40
1A11A7/HP12009A	2-40
1A11A8/HP12005B/002	2-40
1A11A9/13081742	2-40
1A11A10/HP12012A	2-40
1A11A11/HP12009A	2-40
1A11A12/13081431	2-40
1A11A13/13081483	2-40
1A11XX/12305A	2-40
2A2A8/37203A	2-52

Input Code - FPSST

Item (Ref Des/Part No.)	Reference (Para No.)
1A4PS1/BKF-28-4	2-33
1A4PS2/BKF-15-6	2-33
1A4PS3/BKF-15-6	2-33
1A4PS4/BKF-5-11	2-33
2A2A13XX (Slot J8)/AC4720	2-61
2A2A7A6A4/13082738	2-51

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - PPSST

Item (Ref Des/Part No.)	Reference (Para No.)
1A2/13082835 (SN488B)	2-28
1A2A1/SN488B	2-29
1A2A2/SN488B	2-29
1A2A3/SN488B	2-29
1A2A4/SN488B	2-29
1A3PS1/ATE 36-3M	2-31
1A3PS2/ATE 36-3M	2-31
1A3PS3/ATE 75-1.5M	2-31
1A3PS4/ATE 75-1.5M	2-31
2A2A11XX (Slot 409)/HP69433A	2-57
2A2A4A1/13083063	5-33

Input Code - DCAMIR

Item (Ref Des/Part NO.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - DCFOCUS

2A1/13082800-89	5-9
2A1A2XX/13081588-49	5-23
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (Slot J4)/AC4720	2-61

Input Code - DCBMIR

Item (Ref Des/Part No.)	Reference (Para No.)
A1/13082800-89	5-9
2A1A2A1W48/13082263-69	5-20
2A1A2A1W49/13082263-79	5-20
2A1A2A1W50/13082263-89	5-20
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/693316	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - DCDCTL

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A4A1K9/13083063	5-33
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4K5/13081572	5-34

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - DCINTCAM

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A1A2A11W19/13082266 (LAMP)	5-21
2A2A7A3/13083700-1	2-51
2A2A7A6A5/13082717	2-51
2A2A7A6A7/13082714	2-51

Input Code - DCVARF

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A1A2W53/13082263-49	3-19
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - IVDST

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A3/13078701	5-25

Input Code - INTRAD

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A4A1/13083063	5-33
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34

Input Code - LASERST

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A1A2A19/13083360-39	5-22
2A1A6A1/13082272	5-29
2A1A6/13081582	5-29
2A1A6XX/13079420	5-29
2A1A6XX/13079722	5-29

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - DCLASER

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A2A1W41/13081866-19	5-20
2A1A2A1A1A1/13082867-19	5-20
2A2A6XX (Slot 408)/69331B	2-49
2A2A6XX (Slot 413)/69332A	2-49
2A2A6XX (Slot 600)/69351C	2-49
2A2A7A6A8/13083050-19	2-51
2A2A7A6A9/13081467-19	2-51
2A2A13/13081746	2-60
2A2A13XX (Slot J7)/AC4720	2-61

Input Code - OAFOCUS

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1/13082799-29	5-11
2A1A1A141/13083919-19	5-14
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51

Input Code - OSADAF

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1/13082799-29	5-11
2A1A1A14XX/13083919-19	5-14
2A2A6/13081880	2-48
2A2A6XX/06940-60026	2-49
2A2A6XX (Slot 403)/13083412	2-49
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34

Input Code - OSADAS

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A1A7XX/1-176-257	5-15
2A1A1A14XX/13083919-19	5-14
2A1A1A11/13081425-19	5-12
2A2A6XX (Slot 403)/13083412	2-49
2A2A6XX (Slot 408)/69331B	2-49
2A2A7A4/13081572	5-34

Input Code - PMTLED

Item (Ref Des/Part No.)	Reference (Para No.)
1A7/MODEL 33-2124	2-35
2A1A1A1A7/13083875	5-15
2A1A1A7XX/1-176-257	5-15
2A1A1A8/13082137	5-17
2A1A1A11/13081425-19	5-12
2A1A1A6/13081943-19	5-16
2A2A6XX (Slot 408)/69331B	2-49
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (SlotJ4)/AC4720	2-61

Input Code - EXTRAD

Item (Ref Des/Part No.)	Reference (Para No.)
2A1A8/460-2	None (External Radiometer)

2-15. REPAIR MESSAGES (cont) 2-15

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - DCDCS

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A6XX (Slot 402)/13083412	2-49
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34

Input Code - ADST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6/13081880	2-48
2A2A6XX (Slot 300)/5060-2689	2-49
2A2A6XX (Slot 200)/06940-60025	2-49
2A2A6XX (Slot 500)/06940-60026	2-49
2A2A7A6A7/13082714	2-51
2A2A10/13081925	2-54
2A2A11/13081879	2-56
2A2A11XX (Slot 100)/06941-60026	2-57
2A2A11XX (Slot 200)/06941-60025	2-57
2A2A11XX (Slot 300)/5060-2689	2-57
2A2A11XX (Slot 400)/HP69433A	2-57
2A2A13/13081746	2-60
2A2A13XX (Slot J1)/AC280	2-61
2A2A13XX (Slot J4)/AC4720	2-61
2A2A13XX (Slot J5)/AC4060	2-61
2A2A13XX (Slot J6)/AC4060	2-61
2A2A13XX (Slot J7)/AC4720	2-61
2A2A13XX (Slot J8)/AC4720	2-61
2A2A13XX (Slot J17)/AC333	2-61
2A2A13XX (Slot J18)/AC333	2-61
2A2A13XX (Slot J73)/AC262	2-61
2A2A13XX (Slot J74)/AC8016-2D	2-61
2A2A13XX (Slot J75)/13082276-2	2-61
2A2A13XX (Slot J76)/13082276-3	2-61
2A2A13XX (Slot J77)/AC471-1B	2-61

Input Code - MTRXSW

Item (Ref Des/Part No.)	Reference (Para No.)
1A9A2/37203A	2-37
1A11A11/12009A	2-39
2A2A8/13082763 (37203A)	2-53
2A2A1OXX (Any of 64 identified by QUAD and slot)/HP94140A	2-55
2A2A10XX/HP94140B	2-55
2A2A12/13081427-19	2-58
2A2A12XX/09411-66502	2-59

Input Code - OSGST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A3/13082798-19	2-46
2A2A6XX (Slot 402)/13083412	2-49
2A2A6XX (Slot 409)/69331B	2-49
2A2A7A4/13081572	5-34
2A2A3XX/13082472	5-32
2A2A6XX (Slot 408)/69331B	2-49
2A2A3DS1/EYF	5-32
2A2A6XX (Slot 408)/69331B	2-49
2A2A4A1/13083063	5-33
2A2A13/13081746	2-60
2A2A13XX (Slot J7)/AC4720	2-61

2-15. REPAIR MESSAGES (cont) 2-15

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - DIGITST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A1/7612D	2-43
2A2A1XX (Channel A) 7A16P	2-43
2A2A1XX (Channel B) 7A16P	2-43

Input Code - PPGTST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (Slot 406)/69331B	2-46
2A2A7A6A8/13083050-19	2-51
2A2A7A6A9/13081467-19	2-51
2A2A11XX (Slot 400)/69433A	2-57

Input Code - RSST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A11XX (Slot 408)/69433A	2-57

Input Code - VSGST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A1A1/13083325	2-45
2A2A6/13081880	2-48
2A2A6XX (Slot 406)/HP69331B	2-49
2A2A7A1/13082244	5-34
2A2A7A6A7/13082714	2-51
2A2A7A6A8/13083050-19	2-51
2A2A7A6A9/13081467-19	2-51
2A2A7A6A10/13081471-19	2-51
2A2A11/13081879	2-56
2A2A11XX (Slot 100)/06941-60026	2-57
2A2A11XX (Slot 200)/06941-60025	2-57
2A2A11XX (Slot 300)/5060-2689	2-57
2A2A11XX (Slot 401)/69433A	2-57

Input Code - FIRCAST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A3/13082782-49	5-36
2A3A1A1W20/13082263-129	5-38
2A3A1A1W16/13082264-29	5-38
2A3A1A1XX/FS176	5-38
2A3A1A1W17/13081524	5-38

2-15. REPAIR MESSAGES (cont) 2-15

b. CROSS REFERENCE TO REPLACEMENT PROCEDURE (cont)

Input Code - FIRCTGST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (Slot 401)/13083412	2-49
2A2A6XX (Slot 407)/69331B	2-49
2A2A7A6A1/13082741	2-51
2A2A7A6A2/13082735	2-51
2A2A7A6A3/13082732	2-51
2A3/13082782-589	5-36
2A3A1A1W13/13082262	5-38
2A3A1A1W16/13082264-29	5-38
2A3A1A1XX/FS189	5-38
2A3A1A1A3A4/13082809	5-38
2A3A1A1W17/13081524	5-38

Input Code - FIRCSST

Item (Ref Des/Part No.)	Reference (Para No.)
2A2A6XX (Slot 403)/13083412	2-49
2A2A6XX (Slot 408)/69331B	2-49
2A2A6XX (Slot 410)/69331B	2-49
2A2A7A4/13081572	5-34
2A3/13082782-589	5-36

Input Code - BITCHECK

Item (Ref Des/Part No.)	Reference (Para No.)
2A1/13082800-89	5-9
2A2A6XX (SLOT 404)/13083412	2-49
2A2A6XX (Slot 405)/13083412	2-49
2A3/13082782-589	5-36

Input Code - PLLBUS

Item (Ref Des/Part No.)	Reference (Para No.)
1A4PS4/BKF-5-11	2-33
1A11/13231746	2-39.1
1A11A9/13081742	2-40
1A11A12/13081431	2-40
1A11A13/13081483	2-40
2A2A7A6A5/13082717	2-51
2A2A7A6A7/13082714	2-51

Input Code - AUGTEM

Item (Ref Des/Part No.)	Reference (Para No.)
1A1/13082765	2-26
2A1/13082800-89	5-9
2A1A2W54/13081588-39	5-23
2A2A7A6A4/13082738	2-51
2A2A13/13081746	2-60
2A2A13XX (Slot J4)/AC4720	2-61
W26/13081531	None (External Probe)
2A3/13082782-589	5-3
2A3A1A1A1/13082971	5-38
2A3A1A1W24/13081588-19	5-38
2A3A1A1A2/13082972	5-38
2A3A1W6/13081969-19	3-27
2A3A1A1/13082974-29	5-39
2A3A1A17W23/13081588	5-39

Input Code - FIXTST

Item (Ref Des/Part No.)	Reference (Para No.)
H20	6-10
13081937	6-10
13083124	6-10
13083123	6-10
BZ-2RQ1	6-10
13083126	6-10

2-16. SELF-TEST INSTRUCTIONS 2-16

a. SCOPE

This section provides setup and initialization requirements, instructions on how to exercise the self-test modules, and external cables and equipment requirements.

b. SETUP AND INITIALIZATION REQUIREMENTS

The following actions must be performed before exercising self-test modules:

(1) Save the calibrate file. Refer to TM 11-6625-2773-12 for procedure.

(2) Boot up the system. Refer to TM 11-6625-2773-12 for procedure.

(3) Perform system power up (TM 11-6625-3085-12). If entering self-test from an operating system, proceed to step 4.

(4) Restore the calibration file. Refer to TM 11-6625-2773-12 for procedure.

(5) If EETF uses DG S130 computer, load MTØ:Ø of self-test tape 13083904-17. If EETF uses DG MV7800 computer, load @MTBØ:Ø of self-test tape 13083904-620. Refer to TM 11-6625-2773-12 for procedure.

(6) Set video display and printer interface select switches to on. Refer to TM 11-6625-3085-12 for procedure.

(7) Connect extender assembly 37203A power cord to 115v 60 Hz. Set MASTER/SLAVE switch on rear of extender assembly to MASTER and SERIAL DATA RATE switch on rear of extender assembly to NORMAL.

(8) Connect cable assembly 13081454-29 from rear of extender assembly COAXIAL to electronic station cable entry panel 1A13J4.

(9) Connect cable HPIB10833C or HPIB10631C from rear of extender assembly HPIB to A21J6 of the AN/USM-410 VDT.

(10) Allow a minimum of 2 hours warmup of PMT controller 1A7, if PMT/LED module is to be exercised.

c. EXERCISING SELF-TEST MODULE

The operator performs setup and initialization actions then enters TEST followed by EOBST to start the menu driven self-test program. The following screen display will appear on the AN/USM-410 VDT.

2-16. SELF-TEST INSTRUCTIONS (cont) 2-16

```
-------------------------------------------------------
 ECP-185 AH-64 TABLE REVISION 3.07 - 18-DEC-90 10:11:48
-------------------------------------------------------
 ** ORIGINAL SYSTEM CAL APPLIED
 ** MEAS CAL APPLIED
 ** STEM CAL APPLIED


UUT: EOBST.IC
DATE:   15-JUN-92
TIME:   16:03:03

PROGRAM LOADED USING ALDR REVISION: 11.01
OLDEST MODULE COMPILED USING ATLAS REV: 11.01 TABLE 1.01 AUG-TABLE 1.01
 ** AH CAL APPLIED
SET SELECTOR SWITCHES. ENTER STARTING TEST STEP: 100
```

The operator then enters 1ØØ on the AN/USM-410 VDT and follows operator instruction messages, if any. Paragraph 2-17 provides amplification of operator instruction messages. When a failure is detected, a repair message is displayed on the AN/USM-410 VDT. A general description of repair messages, and a cross reference to the appropriate replacement procedure, is provided in paragraph 2-15.

d. EQUIPMENT REQUIREMENTS

(1) The following table lists the external cables and equipment required to exercise the self-test and alignment modules:

Part Number	Nomenclature	Qty
13081706	Cable assembly	4
13081706-29	Cable assembly	1
13081706-69	Cable assembly	2
13081830	Personality card	1
13081833	Self-test connector	1
13081836	Cable assembly	1
13081837	Cable assembly	1
13081998-79	Self-test connector	1
13082050	High watt card	1
13082064-39	Insert/adapter assembly	1
13082310	Personality card	1
13082316	Personality card	1
13082365	Personality card	1
13082411	Personality card	1

2-16. SELF-TEST INSTRUCTIONS (cont) 2-16

Part Number	Nomenclature	Qty
13082730	Cable assembly	1
13082747	Terminal box assembly	1
13083078-39	Optical alignment assy - HOD/IVD	1
13083091	Self-test connector	1
13083091-19	Self-test connector	1
13083092	Self-test cable assembly	1
13083093	Self-test cable assembly	1
13083098	Fiber optics cable assembly	1
13083110	Upper alignment covers (IVD)	1
13083114	Lower alignment covers (IVD)	1
13083115	Optical alignment reticle assembly	1
13083129	Night side alignment tool assembly	1
13083641	Programmable resistor card	1
13083701	Cable assembly	1
13083702	Cable assembly	1
13083633-19	Major test adapter	1
13083693-19	Cable assembly	1
13083880-19	Interface structure insert	1
13083904-17 or -620	Self-test tape	1
13083962-109	Self-test connector	1
13083962-419	Self-test connector	1
13083962-429	Self-test connector	1
13083962-439	Self-test connector	1
13083962-449	Self-test connector	1
13083962-459	Self-test connector	1
13083962-469	Self-test connector	1
13083962-479	Self-test connector	1
13083962-519	Self-test connector	1
13083962-529	Self-test connector	1
13083962-539	Self-test connector	1
13083962-549	Self-test connector	1
13083962-559	Self-test connector	1
13083962-569	Self-test connector	1
13083963-349	Self-test connector	1
13083963-359	Self-test connector	1
13230911	Self-test cable assembly	1
13231435	Cable assembly	1
13231525-19	Personality card	1
13231666	Video monitor	1
13231404	Cable assembly	1
015-0058-01	Current probe power supply	1

2-16. SELF-TEST INSTRUCTIONS (cont) 2-16

Part Number	Nomenclature	Qty
2308-UF	Headset	1
31-008	BNC tee connectors	2
4119-50	BNC terminator (50 ohm)	1
901-167	Connector adapters	2
A3003942	Self-test cable assembly	1
SM-C-943622	Adapter, BNC jack/pin tip plugs	1
1-250	Illuminator assembly	1
OS261C(V)1/U	Oscilloscope	1
P6021, 0PT13	Current probe	1
P6106A or P6105A	Oscilloscope probe	1
Type 134, 11Ov	Current probe amplifier	1

(2) The following is a list of the external cables and equipment necessary to exercise individual self-test modules. The information is presented by module input code.

Input Code	Required Cables and Equipment
CALCST	None
PLLBUS	None
MTRXSW	Major test adapter 13083633-19 Personality card 13082310 Self-test connector 13083091 Self-test connector 13083091-19 Cable assembly 13082730
ADST	Cable assembly 13082730
DIGITST	Major test adapter 13083633-19 Cable assembly 13082730 Self-test cable assembly 13083093
FPSST	None
PPSST	Major test adapter 13083633-19 Personality card 13082310 Cable assembly 13082730
PPGTST	Major test adapter 13083633-19 Cable assembly 13081706 Self-test cable 13083093
VSGST	Major test adapter 13083633-19 Cable assembly 13081706 Cable assembly 13081706-29 Self-test cable 13083092
FIRCSST	None
FIRCTGST	None
FIRCAST	None

2-16. SELF-TEST INSTRUCTIONS (cont)

Input Code	Required Cables and Equipment
DCDCS	None
DCDCTL	Cable assembly 13082730
DCAMIR	None
DCBMIR	None
DCINTCAM	Cable assembly 13082730
DCFOCUS	None
DCVARF	None
INTRAD	Cable assembly 13082730
OSGST	Cable assembly 13082730
OSADAF	None
OSADAS	None
OAFOCUS	None
PMTLED	Cable assembly 13081706 Illuminator assembly I-250 Fiber optics assembly 13083098
IVDST	AC current probe P6021 BNC tee connector, 31-008 Cable assembly 13081706 Cable assembly 13081706-29 Cable assembly 13082730 Cable assembly 13083701 Current probe amplifier Type 134 Current probe power supply, (015-0058-01) Major test adapter 13083633-19 Optical alignment assembly - HOD/IVD 13083078-39 Personality card 13082365 Personality card 13082411 Programmable resistor card 13083641 Self-test connector 13083962-559
IVD	Cable assembly 13081706 Cable assembly 13081706-29 Cable assembly 13081706-69 Personality card 13082365 Personality card 13082411 Optical alignment assembly - HOD/IVD 13083078-39 Major test adapter 13083633-19 Programmable resistor CCA 13083641 Cable assembly 13083701 Self-test connector 13083962-519 Self-test connector 13083962-529 Self-test connector 13083962-559 Self-test cable assembly 13230911 BNC tee connector 31-008 Current-probe amplifier type 134 AC current probe P6021 Current probe power supply 015-0058-01

2-16. SELF-TEST INSTRUCTIONS (cont) 2-16

Input Code	Required Cables and Equipment
AUGTEM	None
BITCHECK	None
LASERST	Major test adapter 13083633-19 Personality card 13081830 Cable assembly 13082730 Cable assembly 13081837 Self-test connector 13081833
FIXTST	Major test adapter 13083633-19 Personality card 13082365 Personality card 13082411 Cable assembly 13082730

Input Code	Required Cables and Equipment
FIXTST (cont)	Cable assembly 13083702
	Cable assembly 13081706
	Cable assembly 13081706-69
	Self-test connector 13083962-419
	Self-test connector 13083962-429
	Self-test connector 13083962-439
	Self-test connector 13083962-449
	Optical alignment assembly - HOD/IVD 13083078-39
OSACABLE	Cable assembly 13081706-69
	Cable assembly 13082730
	Cable assembly 13083701
	Cable assembly 13083702
	Major test adapter 13083633-19
	Personality card 13082365
	Personality card 13082411
	Self-test connector 13083962-109
	Self-test connector 13083962-429
	Self-test connector 13083962-439
	Self-test connector 13083962-529
	Self-test connector 13083962-539
VIDEOST	Cable assembly 13081706-69
	AN/USM-410 supplied connector adapter 901 - 167
	AN/USM-410 supplied self-test cable assembly A3003942
	Video monitor 13231666
DCALIGN	None
DIGALIGN	None
FIRALIGN	Major test adapter 13083633-19
	Personality card 13231525-19
	Personality card 13082316
	Personality card 13083641
	Cable assembly (3) 13081706
	Cable assembly (2) 13081706-79
	Cable assembly 13082730
	Cable assembly 13083693-19
	Cable assembly 13231435
	Interface structure insert 13083880-19
	Insert/adapter assembly 13082064-39
	Terminal box assembly 13082747
	Oscilloscope 0S261C(V)1/U
	Oscilloscope probe P6106
	Headset 2308-UF
MAINT	None
OSGALIGN	Cable assembly 13082730
	Spectra spotmeter model PR1500
	Spotmeter test cable TE782073
	Spotmeter fixture TE782036
	Potentiometer adjustment tool
PSALIGN	None

Input Code	Required Cables and Equipment
PMTALIGN	Major test adapter 13083633-19 Personality card 13083641 Personality card 13082365 Personality card 13082411 IVD assembly 13078001/13078701/13078701-19 Optical alignment assembly 13083078-39 Cable assembly 13082730 Cable assembly 13083702 Cable assembly (2) 13081706 Cable assembly 13081706-29 Tee connector 31-008 Spotmeter part of B4002619 Tripod 4-73010-7 Tripod head 4-72011-6 Power cable 79916697
IVDALIGN	Major test adapter 13083633-19 Personality card 13083641 Personality card 13082365 Personality card 13082411 Optical alignment assembly 130838078-39 Cable assembly 13082730 Cable assembly 13083702 Cable assembly (3) 13081706 Cable assembly 13081706-29 Cable assembly 13231404 Tee connector 31-008 Upper IVD protective cover assembly 79911518 Lower IVD protective cover assembly 79911517 Optical alignment reticle assembly 13083115 AC current probe type 6021 Current probe amplifier type 134

2-17. OPERATOR INSTRUCTION MESSAGES 2-17

This section is an amplification of external cable and equipment connection and manual intervention messages. The messages (shown shaded) are presented as they appear on the AN/USM-410 VDT, followed by expanded instructions. Illustrations and installation procedure references are used to clarify operator instructions. The information is presented by module input code.

NOTE

The numbers in parentheses are step and illustration references and do not appear on the AN/USM-410(V)2 VDT.

a. CALCST MESSAGES

(1) CHECK ALL FOUR BUS EXTENDERS (HP 37203A) FOR: ALL GREEN LIGHTS (LINE ON) RED LIGHTS. DEPRESS [YES] (F5) OR [NO] (F6).

(2) IF A TIME OUT ERROR OCCURS BEFORE THE SECOND TEST COMPLETES EITHER THE HP1OOOL CONTROLLER OR THE CONTROL INTERFACE CARD IS MALFUNCTIONING. CHECK THE LIGHTS IN THE BACK OF THE HP1OOOL TO SEE IF IT IS FUNCTIONING.

The operator checks extender assemblies installation 1A9A1, 1A9A2, 2A2A8, and on AN/USM-410. The green line indicator (1) should be on, the red DATA LOSS (2) and DATA ERROR (3) indicators should be off . If all extender assemblies have correct indications, press [YES] on the AN/USM-410 VDT; if not, press [NO].

b. PLLBUS MESSAGES

PLLBUS contains no external cable and equipment connect or manual intervention messages.

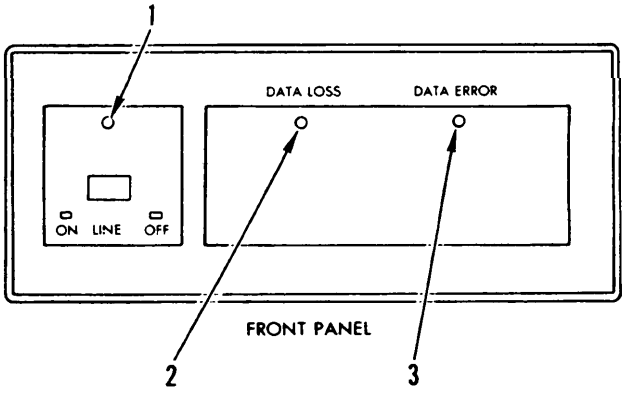
c. MTRXSW MESSAGES

(1) A CONNECT MAJOR TEST ADAPTER 13083633-19 IN TEST ADAPTER PANEL ASSEMBLY 2A2A4-J1.

Refer to paragraph 2-65 for installation procedure.

(2) B INSTALL PERSONALITY CARD 1308231O-P1 SIDE IN MAJOR TEST ADAPTER 13083633-19 A7 SLOT.

Refer to paragraph 2-69 for the procedure.



EL9LQ-571-06

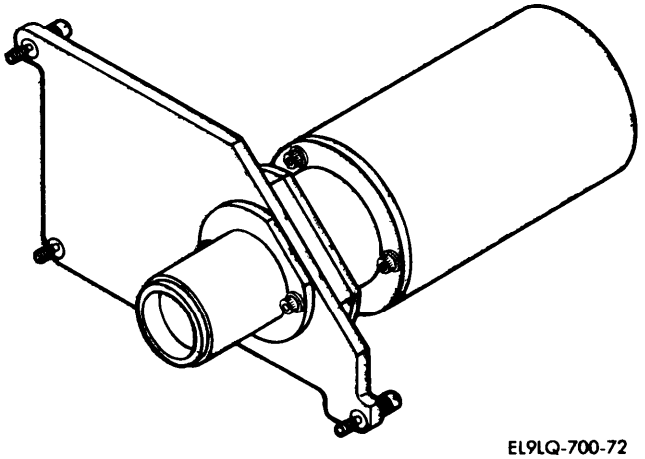
j. TEST FIXTURES

Test fixtures provide additional capabilities of interfacing the UUT to the test equipment. They provide mechanical handling/mounting capabilities and additional electrical interfacing beyond that of the other interface devices. In some cases critical alignments are attained merely by bolting the fixture on the test equipment and then mounting the UUT onto the fixture, which is keyed for precise alignment. The test fixtures required for direct support maintenance are listed below. For individual descriptions refer to the corresponding paragraph number.

Paragraph	Name	Part No.
(1)	Radiometer assembly	(13081475)
(2)	Deleted	
(3)	MTF target mount	(13081927)
(4)	Deleted	
(5)	Insert/adapter assembly (TADS NSA)	(13082064-29)
(5.1)	Insert/adapter assembly (day sensor subassembly)	(13082064-49)
(6)	Azimuth gimbal alignment assembly tool	(13082292)
(7)	Deleted	
(8)	Terminal box assembly	(13082747)
(9)	Deleted	
(lo)	Fiber optic adapter assembly	(13083077, 13083077-29)
(11)	HOD and IVD optical alignment assembly	(13083078-29)
(12)	HOD bracket assembly	(13083082)
(13)	Deleted	
(14)	Illuminator fiber optic assembly	(13083098)
(15)	Upper IVD protective cover assembly	(13083110)
(16)	HOD brackets captive screw	(13083111)
(17)	Lower IVD protective cover assembly	(13083114)
(18)	IVD optical alignment reticle assembly	(13083115)
(19)	HOD protective cover assembly	(13083117)
(20)	Optical alignment reticle assembly	(13083119)
(21)	Nightside alignment tool assembly	(13083129)
(22)	Electro-optical mask and window assembly	(13083136)
(23)	Mask assembly	(13083157)
(24)	Gimbal alignment set assembly	(13083245)
(25)	Deleted	
(26)	HOD mounting bracket assembly	(13083489-19)
(27)	Channel balance adapter assembly	(13083603-19)
(28)	Insert/adapter assembly (PNVS NSA)	(13082064-39)
(29)	Deleted	
(30)	Retroreflector assembly	(13083952)
(31)	CID camera mount assembly	(13083954-19)
(32)	Light source assembly	(13083956)
(33)	Line-of-sight laser housing assembly	(13083958)
(34)	Backlash tool assembly	13083995)
(35)	TADS shroud rim clenching clamp	(13084034)
(36)	HOD interlock protective cover assembly	(13230921)
(36.1)	Shroud grounding set	(13231057)
(37)	Dial indicator support assembly	(13231416)

Paragraph	Name	Part No.
(38)	Pinion clamp assembly	(13231437)
(39)	Angle indicator assembly	(13231438)
(40)	Dial indicator assembly	(13231451)
(41)	MTF camera aliGnment tool assembly	(13231455)
(42)	Bulkhead interface sign bracket assembly	(13231483)
(43)	Gimbal alignment fixture clamp assembly	(13231486)
(43.1)	Electrical equipment cabinet assembly	(13231501)
(43.2)	Electrical equipment monitor shelf assembly	(13231558)
(43.3)	Spanner wrench assembly	(13231653)
(43.4)	Camera adapter assembly	(13231654)
(43.5)	Electrical equipment shelf assembly	(13231659)
(43.6)	Television monitor	(13231666)
(43.7)	Tubeaxial fan assembly	(13231670)
(44)	High voltage lead assembly	(2-830126-5)
(45)	Torque wrench	(2502CI)
(45.1)	Tee electrical connector	(31-008)
(46)	Level transit	(327 PZ)
(46.1)	BNC feed-thru termination	(4119-50)
(46.2)	Tripod	(742)
(46.3)	Trimmer adjustment tool	(8TO05)
(47)	Test weight	(C1120-SP/3)
(48)	Illuminator	(I-250)
(49)	Force gage	(L5)
(49.1)	Coaxial connector adapter	(M55339/15-00491)
(50)	Force gage tip	(PG-14T45)
(51)	Connector adapter	(TNA2-75)
(52)	Cooling adapter	(59140-4, C6013-2, 7050-6, 66030-1)

(1) The radiometer assembly mounts on the day sensor subassembly and is used to perform transmission tests of the day sensor laser path.



EL9LQ-700-72

(5) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

f. FPSST MESSAGES

FPSST contains no external cable and equipment connect or manual intervention messages.

g. PPSST MESSAGES

(1) A INSTALL MAJOR TEST ADAPTER 13083633-19 IN TEST ADAPTER PANEL ASSEMBLY 2A2A4-J1 19.

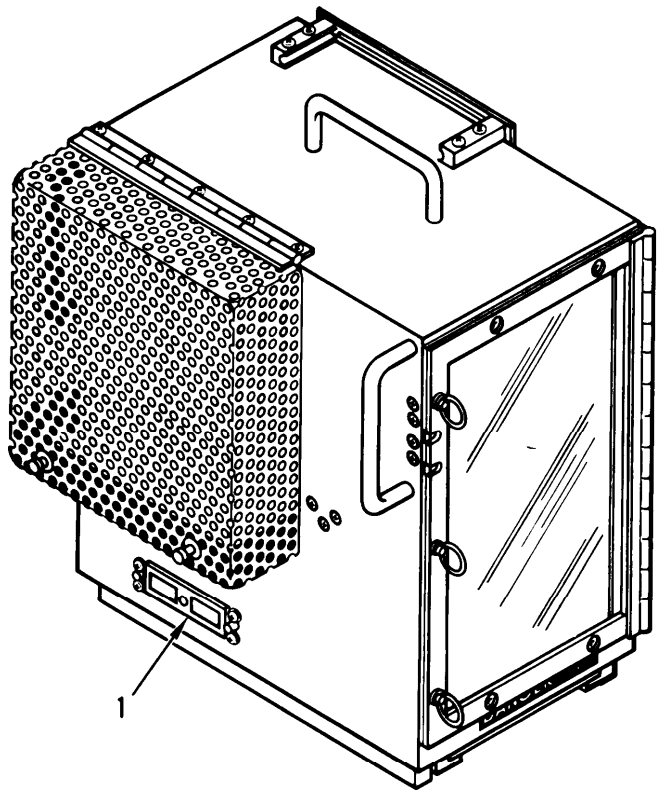
Refer to paragraph 2-65 for installation procedure.

(2) B INSTALL PERSONALITY CCA 13082310-P2 SIDE IN MAJOR TEST ADAPTER 13083633-19 SLOT A7. PRESS PROCEED WHEN COMPLETE.

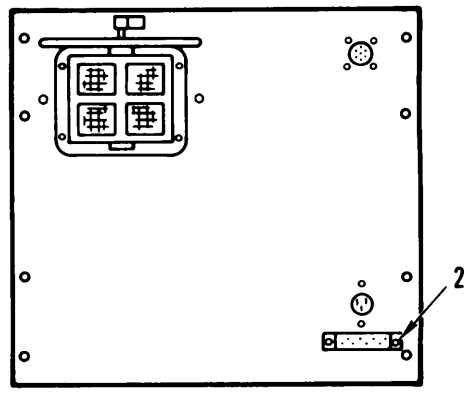
Refer to paragraph 2-69 for installation procedure.

(3) C CONNECT CABLE ASSEMBLY 13082730 AS FOLLOWS:

P1 TO MAJOR TEST ADAPTER
13083633-19 J4 (1)
P2 TO TEST ADAPTER PANEL ASSEMBLY
2A2A4-J6 (2)
P3 TO AN/USM-410 DIU A1A4-J26
P4 TO AN/USM-410 DIU A1A4-J32
P5 TO AN/USM-410 DIU A1A4-J1
P6 TO AN/USM-410 DIU A1A4-J2
P7 TO AN/USM-410 DIU A1A4-J9
P9 TO AN/USM-410 DIU A1A4-J29
P11 TO AN/USM-410 DIU A1A4-J34
P12 TO AN/USM-410 DIU A1A4-J36
P13 TO AN/USM-410 YIU A8-J110
P14 TO AN/USM-410 YIU A8-J109
PRESS PROCEED WHEN COMPLETE

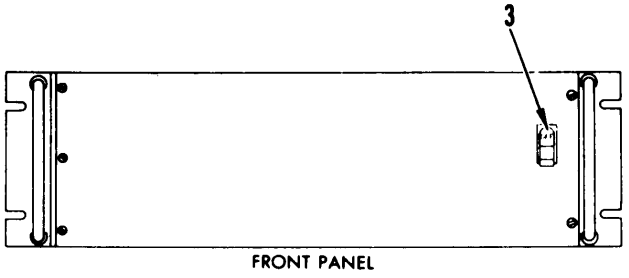


EL9LQ-720-16 A



EL9LQ-620-21

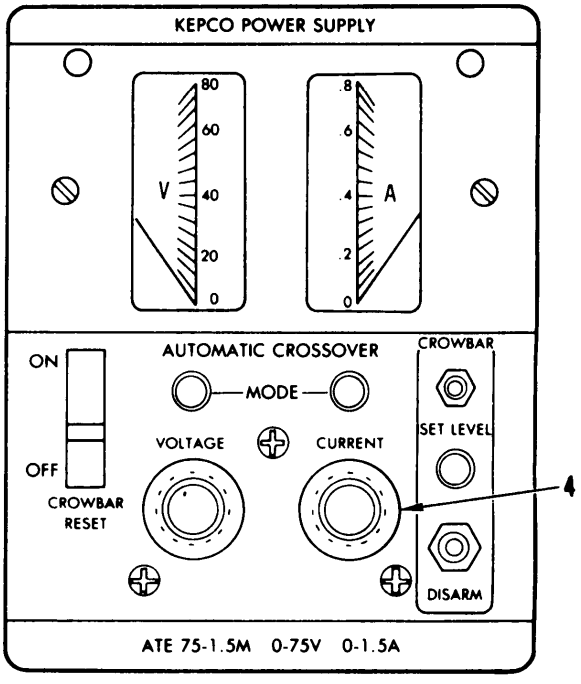
(4) D CHECK 488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2 FRONT PANEL POWER SWITCH (3) FOR ON. IF OFF SET TO ON POSITION.



EL9LQ-520-10

(5) E ROTATE THE CURRENT KNOB (4) ON PROGRAMMABLE POWER SUPPLIES 1A3PS1, 1A3PS2 , 1A3PS3, AND 1A3PS4 FULLY CLOCK-WISE . PRESS PROCEED WHEN COMPLETE.

(6) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-531-10

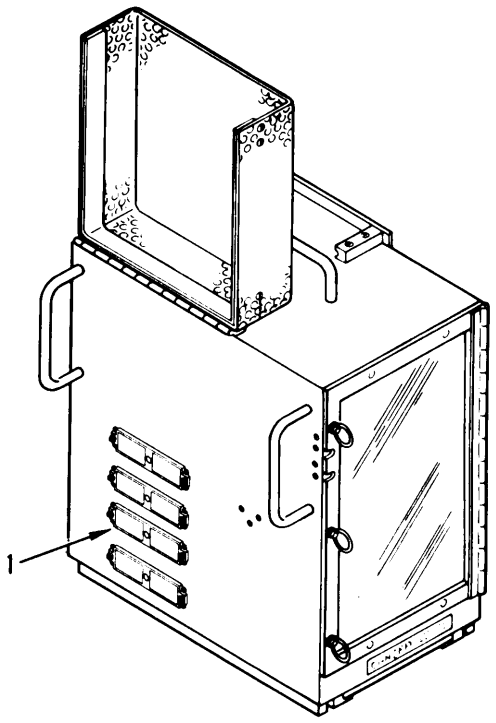
h . PPGTST MESSAGES

(1) A CONNECT MAJOR TEST ADAPTER 13083633-19 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J1.

Refer to paragraph 2-65 for installation procedure.

(2) B CONNECT SELF-TEST CABLE 13083093 AS FOLLOWS:

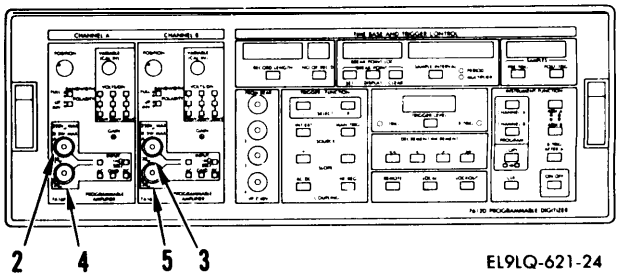
P1 TO MAJOR TEST ADAPTER 13083633-19 J3 (1).
P2 TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2).
P3 T0 PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT A (3).
P4 T0 PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT B (4).
P5 T0 PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT B (5).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-730-39 A

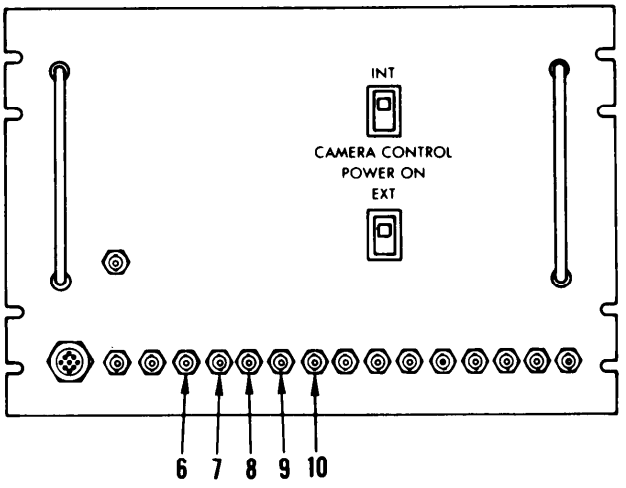
(3) DISCONNECT SELF-TEST CABLE 13083093 AS FOLLOWS:

P1 FROM MAJOR TEST ADAPTER 13083633-J3 (1).
P2 FROM PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2).
P3 FROM PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT A (3).
P4 FROM PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT B (4).
P5 FROM PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT B (5).
PRESS PROCEED WHEN COMPLETE.



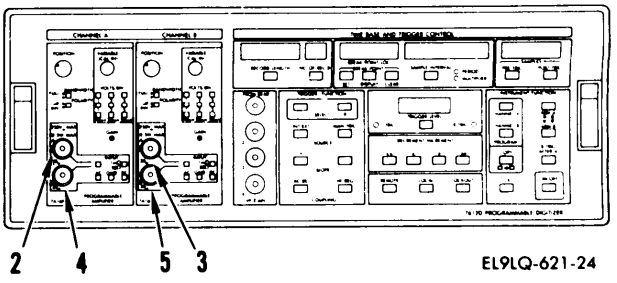
EL9LQ-621-24

(4) CONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J14 (6) TO DIGITIZER CHANNEL A INPUT A (2).
CONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J15 (7) TO DIGITIZER CHANNEL B INPUT A (3).
CONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J16 (8) TO DIGITIZER CHANNEL A INPUT B (4).
CONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J17 (9) TO DIGITIZER CHANNEL B INPUT B (5).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-627-30B

(5) DISCONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J14 (6) AND DIGITIZER CHANNEL A INPUT A (2).
DISCONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J15 (7) AND DIGITIZER CHANNEL A INPUT B (3).
DISCONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J16 (8) AND DIGITIZER CHANNEL B INPUT A (4).
DISCONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J17 (9) AND DIGITIZER CHANNEL B INPUT B (5).
CONNECT CABLE 13081706 FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J18 (10) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-621-24

(6) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

(4) A DISCONNECT COAXIAL CABLE 13081706 FROM VHF CABLE ENTRY PANEL 2A2A2-J3 (1) AND PROGRAMMABLE DIGITIZER 2A2AQ PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2).

(5) B CONNECT ELECTRONICS DRAWER ASSEMBLY 2A2A7-J20 (8) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2) USING COAXIAL CABLE 13081706. PRESS PROCEED WHEN COMPLETE.

TEST OF HORIZONTAL BLANKING

(6) A DISCONNECT COAX CABLE FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J20 (8).

(7) B CONNECT ELECTRONICS DRAWER ASSEMBLY 2A2A7-J21 (9) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2) USING COAXIAL CABLE 13081706. PRESS PROCEED WHEN COMPLETE.

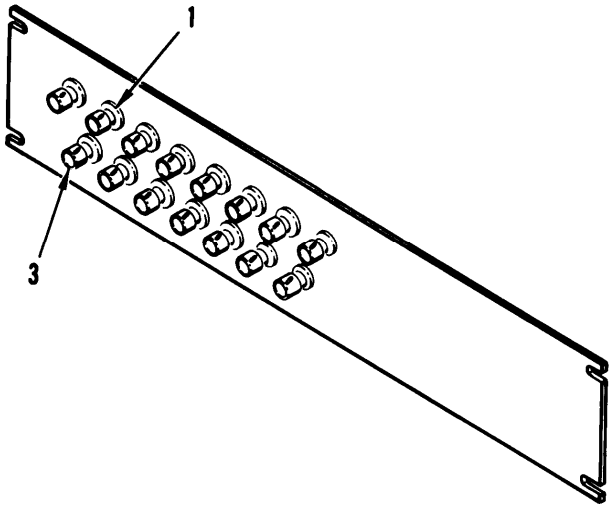
TEST OF VERTICAL BLANKING

(8) A DISCONNECT COAX CABLE FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J21 (9).

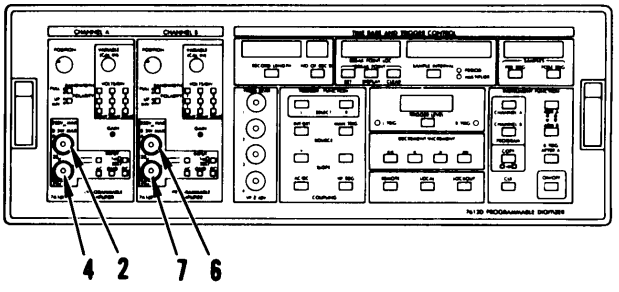
(9) CONNECT ELECTRONICS DRAWER ASSEMBLY 2A2A7-J22 (10) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2) USING COAXIAL CABLE 13081706. PRESS PROCEED WHEN COMPLETE.

TEST OF BIT VIDEO WHITE SIGNAL
TEST OF BIT VIDEO BLACK SIGNAL
TEST OF COMPOSITE BLANKING SIGNAL
TEST OF VIDEO SYNC SIGNAL

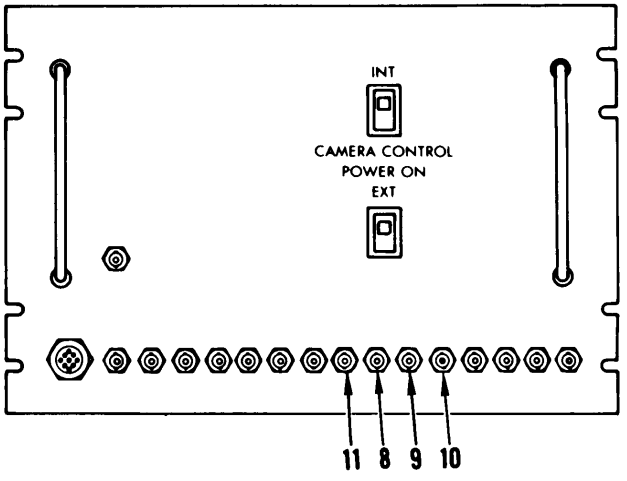
(10) A DISCONNECT COAX CABLE FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J22.



EL9LQ-620-30A



EL9LQ-621-23



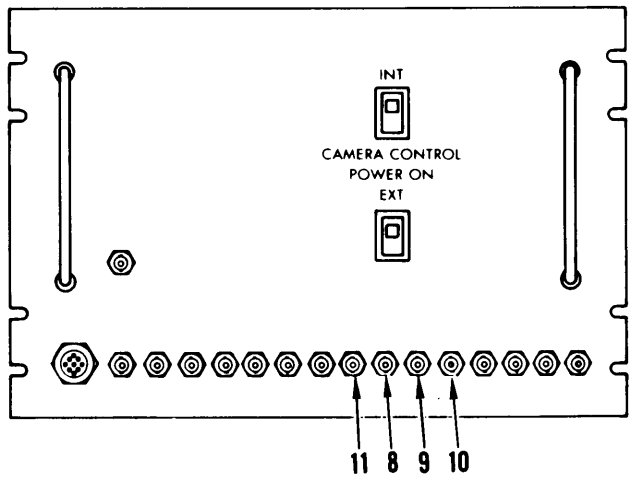
EL9LQ-627-31A

(11) B CONNECT ELECTRONICS DRAWER ASSEMBLY 2A2A7-J19 (11) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A USING COAXIAL CABLE 13081706. PRESS PROCEED WHEN COMPLETE.

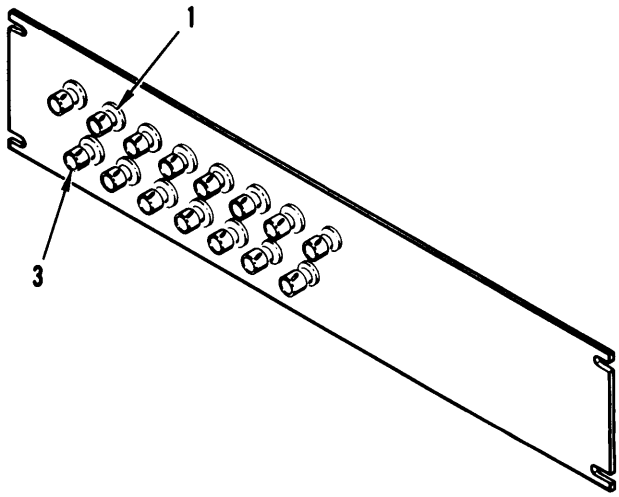
TEST OF SYMBOLOGY DRIVE SIGNAL
TEST OF DELAYED KEY CLAMP SIGNAL
TEST OF SAMPLE SIGNAL
TEST OF RESIN SIGNAL

(12) A DISCONNECT COAX CABLE FROM ELECTRONICS DRAWER ASSEMBLY 2A2A7-J19

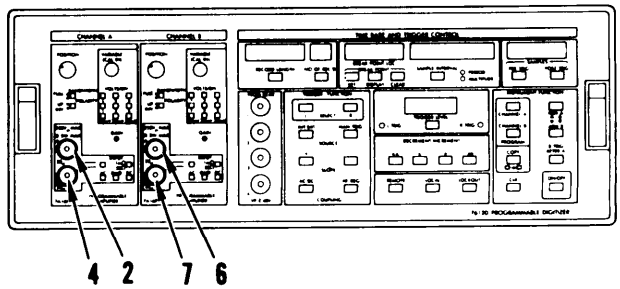
(13) B CONNECT VHF CABLE ENTRY PANEL 2A2A2-J3 (1) TO DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (2) USING COAXIAL CABLE 13081706. PRESS PROCEED WHEN COMPLETE.



EL9LQ-627-31A



EL9LQ-620-30A



EL9LQ-621-23

(14) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

j. DELETED

k. FIRCSST MESSAGES

FIRCSST contains no external cable and equipment connect or manual intervention messages.

l. FIRCTGST MESSAGES

FIRCTGST contains no external cable and equipment connect or manual intervention messages.

m. FIRCAST MESSAGES

FIRCAST contains no external cable and equipment connect or manual intervention messages.

n. DCDCS MESSAGES

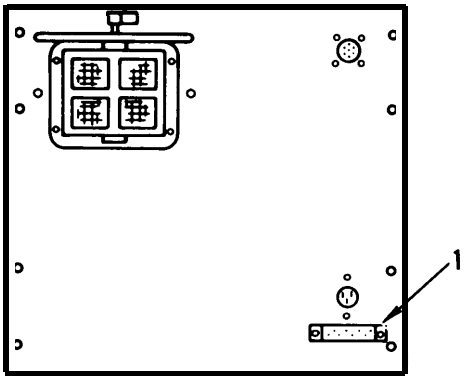
DCDCS contains no external cable and equipment connect or manual intervention messages.

o. DCDCTL MESSAGES

(1) A CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.

(2) B CONNECT CABLE ASSEMBLY 13082730-P2 T0 TEST ADAPTER PANEL ASSEMBLY 2A2A4-J6 (1).

(3) C ON AN/USM-410 DC POWER STATION A1A2, SET DC2B A1A2A3 CURRENT LIMITER IDC KNOB TO 5 AMP POSITION.

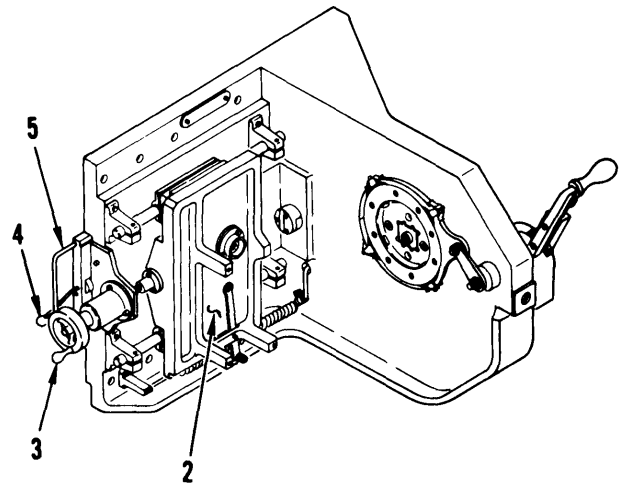


EL9LQ-620-35

(4) D MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE (2) TO LEFT STOP WITH LASER INTERFACE CARRIAGE HANDLE (3).

(5) E MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (4) TO DOWN POSITION AND OPEN LASER SAFETY SHIELD (5). PRESS PROCEED WHEN COMPLETE.

(6) OBSERVE TARGET LAMP ASSEMBLY 2A1A2A1A2 LAMP THROUGH OPEN SHUTTER ASSEMBLY 2A1A2A2. IF LAMP IS ON PRESS [YES] (F5), IF LAMP IS OFF PRESS [NO] (F6).



EL9LQ-610-52A

(7) OBSERVE TARGET LAMP ASSEMBLY 2A1A2A1A2 LAMP THROUGH OPEN SHUTTER ASSEMBLY 2A1A2A2. IF LAMP IS ON PRESS [YES] (F5), IF LAMP IS OFF PRESS [NO] (F6).

(8) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

p. EXTRAD MESSAGES

(1) A-MOUNT RADIOMETER HEAD 2A1A8 (1) TO SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE (2) USING RADIOMETER BRACKET ASSEMBLY 13081875.

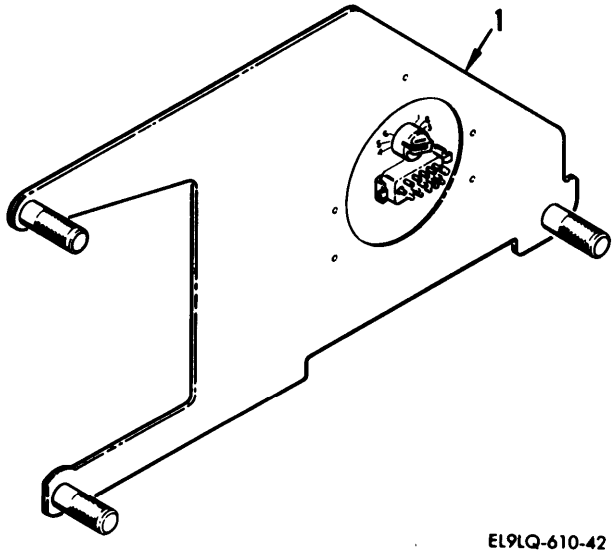
(2) B-POSITION SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE (2) TO EXTREME RIGHT POSITION USING LASER INTERFACE HANDLE (3).

(3) C-CLOSE LASER COVER ASSEMBLY 2A1A2A19 COVER (4).

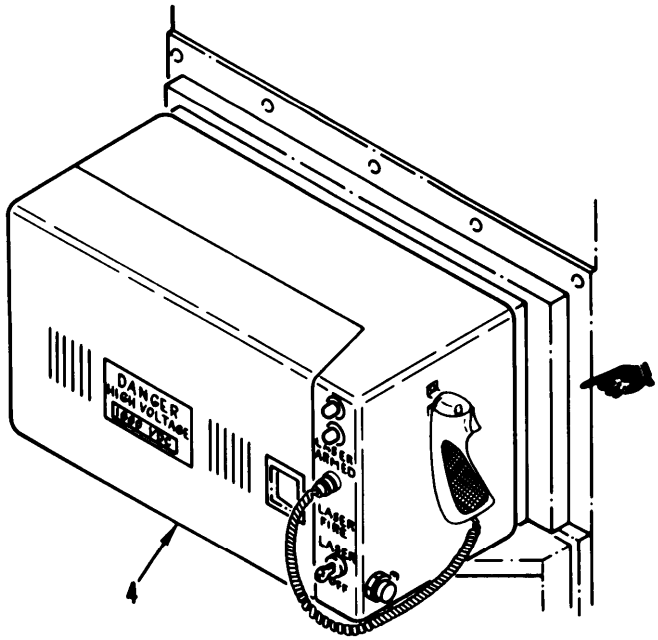
(4) D-MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (5) TO DOWN POSITION AND CLOSE LASER SAFETY SHIELD.

(5) E-MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (5) TO THE UP POSITION.

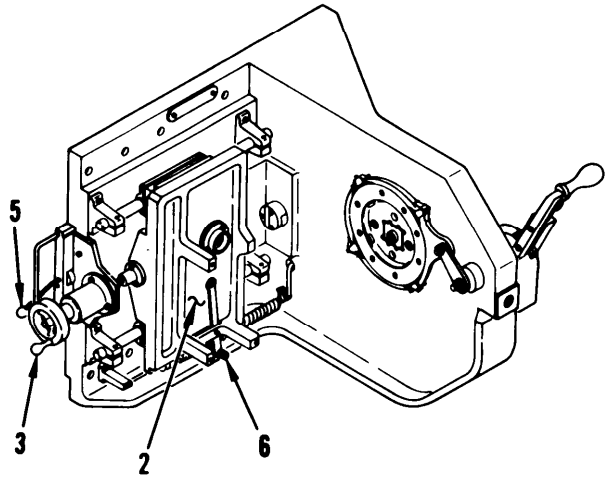
(5.1) MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER ATTENUATER HANDLE (6) TO THE RIGHT (OUT) POSITION.



EL9LQ-610-42



EL9LQ-610T-04B

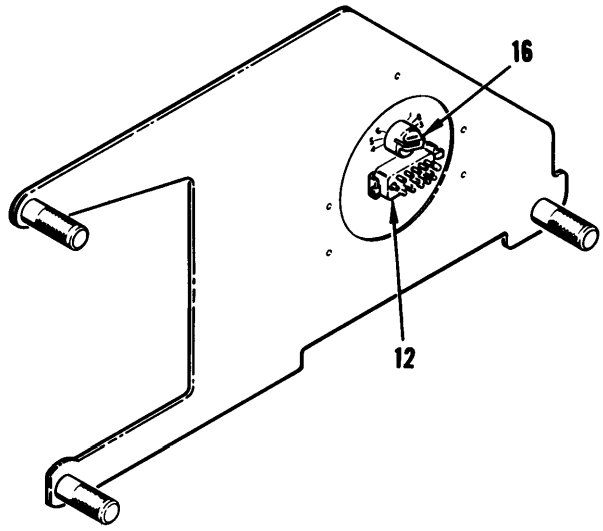


EL9LQ-610-35A

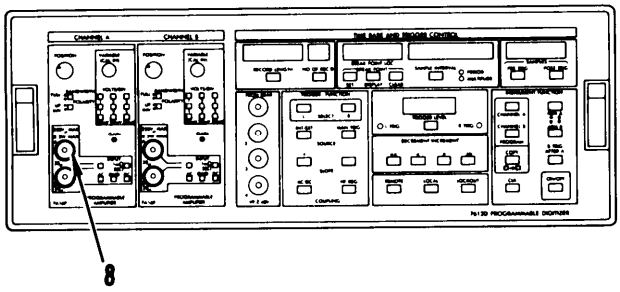
(6) G CONNECT COAXIAL CABLE 13081706 FROM LASER POWER METER 2A1A7 RECORDER OUTPUT JACK (7) TO 2A2A1, PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (8). PRESS PROCEED WHEN COMPLETE.

(7) H CONNECT LASER POWER METER 2A1A7 POWER CORD (9) TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J3 (10).

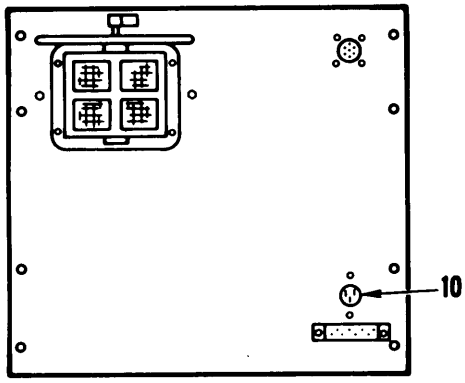
(8) I CONNECT DETECTOR HEAD CABLE (11) FROM RADIOMETER HEAD 2A1A8 JACK (12) TO LASER POWER METER 2A1A7 JACK (3).



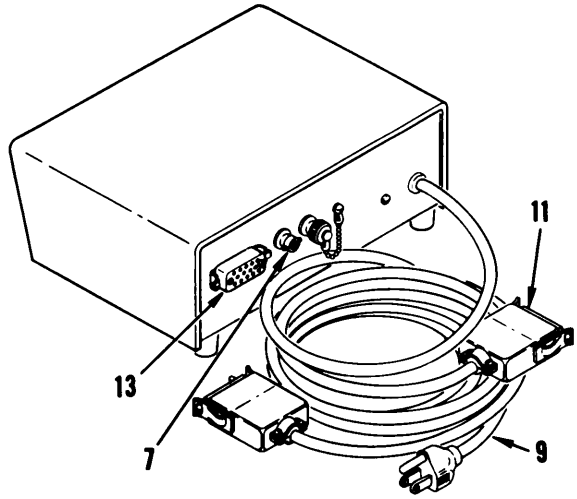
EL9LQ-610-37



EL9LQ-621-20



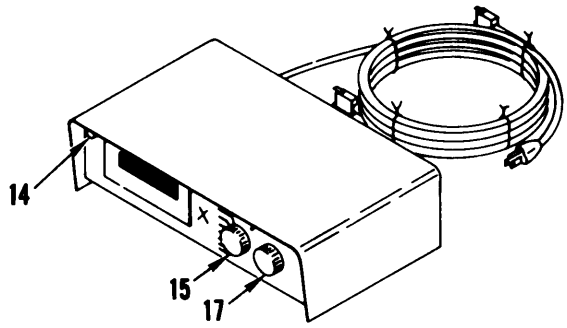
EL9LQ-620-26



EL9LQ-610-38

(9) J SET LASER POWER METER 2A1A7 POWER SWITCH (14) TO ON POSITION.

(10) K SET LASER POWER METER 2A1A7 RANGE SWITCH (15) TO 10-5 POSITION.

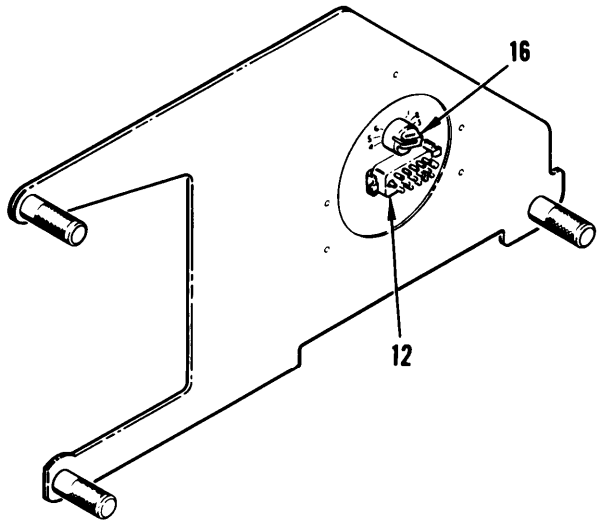


EL9LQ-610-41

(11) L SET RADIOMETER HEAD 2A1A8 SWITCH (16) TO POSITION 3.

(12) M ZERO LASER POWER METER 2A1A7 USING THE AMBIENT ZERO KNOB (17).

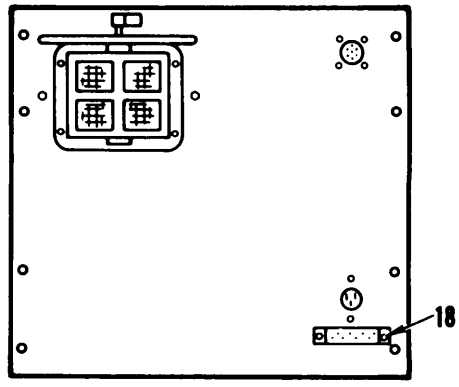
(13) N CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.



EL9LQ-610-37

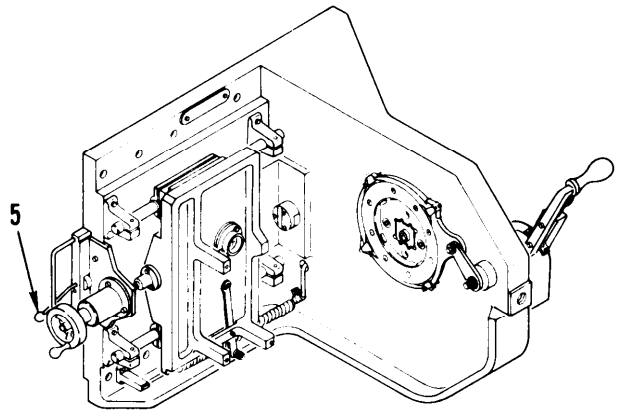
(14) O CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J6 (18).

(15) P ON AN/USM-410 DC POWER STATION A1A2, SET DC2B A1A2A3 CURRENT LIMITER IDC KNOB TO 5 AMP POSITION. PRESS PROCEED WHEN COMPLETE.



EL9LQ-620-27

(16) MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (5) TO DOWN POSITION AND OPEN LASER SAFETY SHIELD. PRESS PROCEED WHEN COMPLETE.



EL9LQ-610-40

(17) DISCONNECT ALL EXTERNAL CABLES , EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

q. DCAMIR MESSAGES

DCAMIR contains no external cable and equipment connect or manual intervention messages.

r. DCBMIR MESSAGES

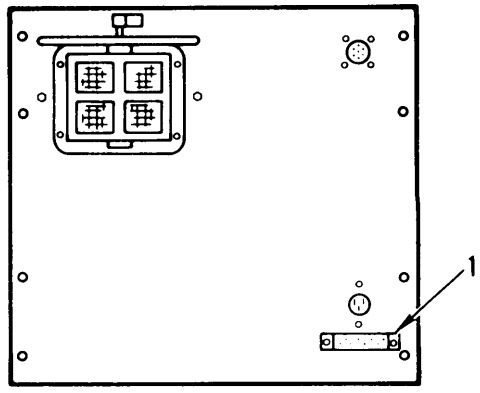
DCBMIR contains no external cable and equipment connect or manual intervention messages.

s. DCINTCAM MESSAGES

(1) A CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.

(2) B CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J6 (1).

A1A2 (3) C ON AN/USM-410 DC POWER STATION SET DC2B A1A2A3 CURRENT LIMITER KNOB TO 5 AMP POSITION. PRESS PROCEED WHEN COMPLETE.



EL9LQ-620-35

(4) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

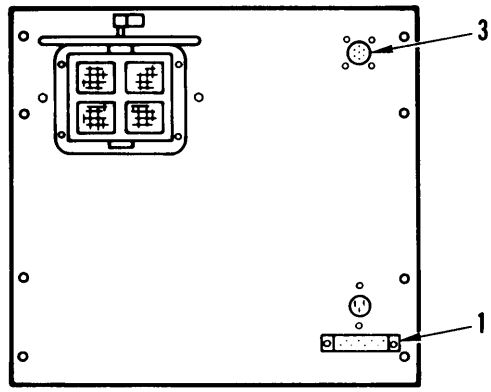
t. DCEXSO MESSAGES

(1) A CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.

(2) B CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J6 (1).

(3) C OH AN/USM-41O DC POWER STATION A1A2 AND SET DC2B A1A2A3 CURRENT LIMITER IDC KNOB T0 AMP POSITION.

(4) D CONNECT CAMERA TEST SPECIAL PURPOSE CABLE 13081836-P2 (2) TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J2 (3). PRESS PROCEED WHEN COMPLETE.

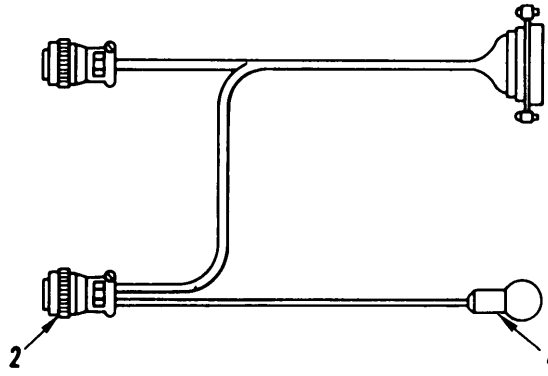


EL9LQ-620-32

(5) CHECK CAMERA TEST SPECIAL PURPOSE CABLE 13081836 LAMP (4). IF LAMP IS ON PRESS [YES] (F5), IF LAMP IS OFF, PRESS [NO] (F6).

(6) CHECK CAMERA TEST SPECIAL PURPOSE CABLE 13081836 LAMP (4). IF LAMP IS ON PRESS [YES] (F5), IF LAMP IS OFF, PRESS [NO] (F6).

(7) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST , DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-700-06

u. DCFOCUS MESSAGES

DCFOCUS contains no external cable and equipment connect or manual intervention messages.

v. DCVARF MESSAGES

DCVARF contains no external cable and equipment connect or manual intervention messages.

w. DELETED

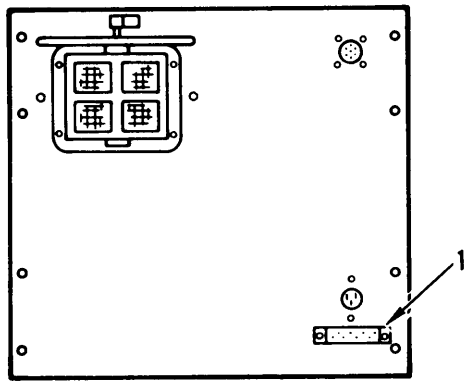
x. DELETED

y. INTRAD MESSAGES

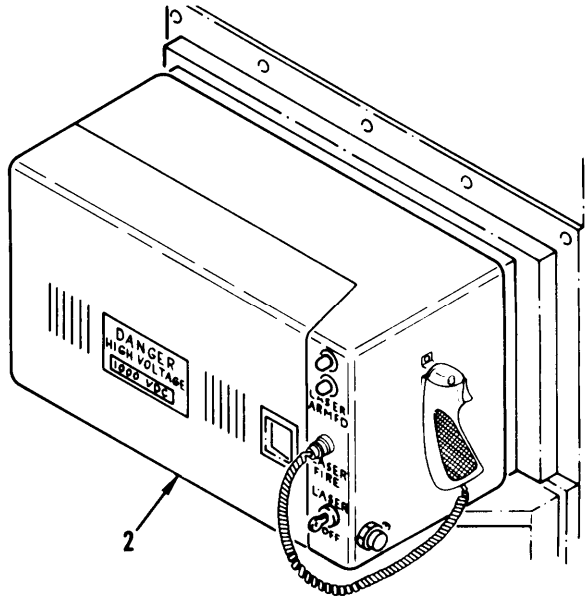
(1) A CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.

(2) B CONNECT CABLE ASSEMBLY 13082730-P2 T0 TEST ADAPTER PANEL ASSEMBLY 2A2A4-J6 (1).

(3) C CLOSE LASER COVER ASSEMBLY 2A1A2A19 (2).



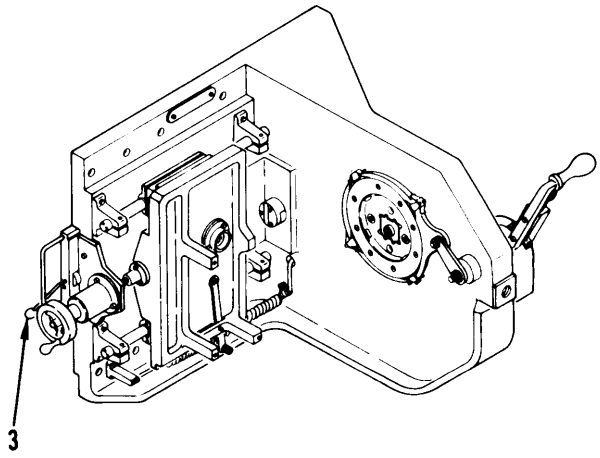
EL9LQ-620-35



EL9LQ-610T-02B

(4) D MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (3) TO DOWN POSITION AND CLOSE LASER SAFETY SHIELD.

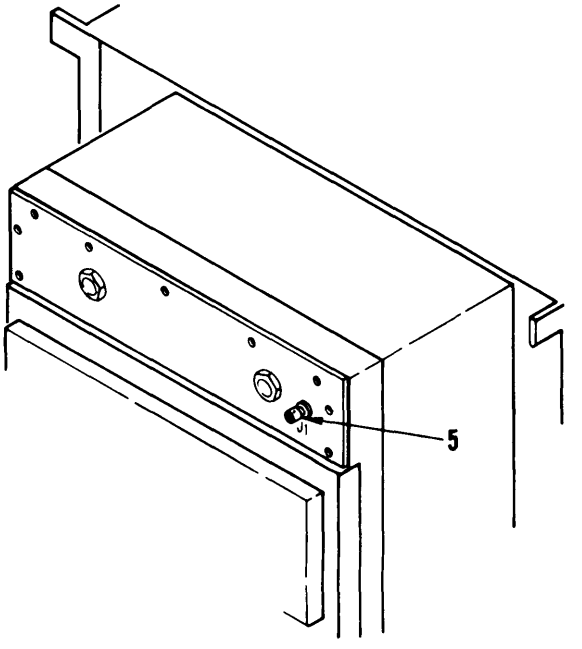
(5) E MOVE SENSOR MOUNT ASSEMBLY LASER INTERLOCK HANDLE (3) TO THE UP POSITION.



EL9LQ-610-62

(6) F CONNECT CABLE 13081706-29 FROM 2A1A2A18-J1 (5) ON THE DAYSIDE FRONT PANEL TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (6). PRESS PROCEED WHEN COMPLETE.

(7) DISCONNECT ALL EXTERNAL CABLES , EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-611-66

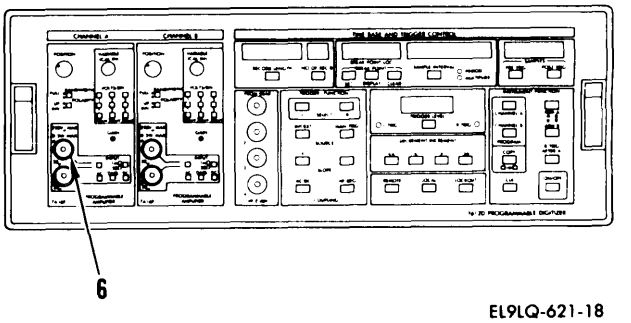
z. OSGST MESSAGES

(1) A CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM-410 DIU A1A4-J30.

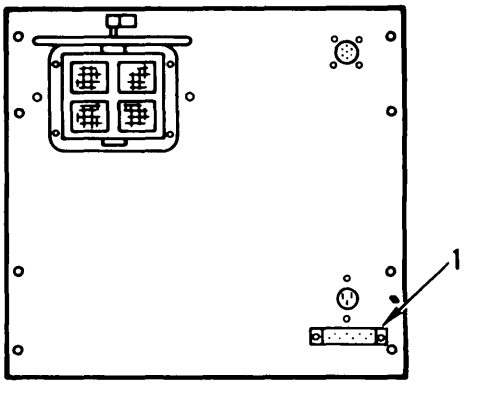
(2) B CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4 J6 (1).

(3) C ON AN/USM-410 DC POWER STATION A1A2, SET DC26A1A2A3 CURRENT LIMITER IDC KNOB TO 7 AMP POSITION. PRESS PROCEED WHEN COMPLETE.

(4) DISCONNECT ALL EXTERNAL CABLES, Equipment, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-621-18



EL9LQ-620-35

aa. OSADAF MESSAGES (OSA ONLY)

OSADAF contains no external cable and equipment connect or manual intervention messages.

ab. OSADAS MESSAGES (OSA ONLY)

(1) OPEN THE OSA ASSEMBLY 2A1A1 DOOR (1). PRESS PROCEED. YOU SHOULD GET AN ERROR . IF YOU 00, PRESS [RETURN].

If an error is displayed on AN/USM-410 VDT, press [RETURN] on VDT.

(2) CLOSE THE OSA ASSEMBLY 2A1A1 DOOR (1). PRESS-PROCEED.

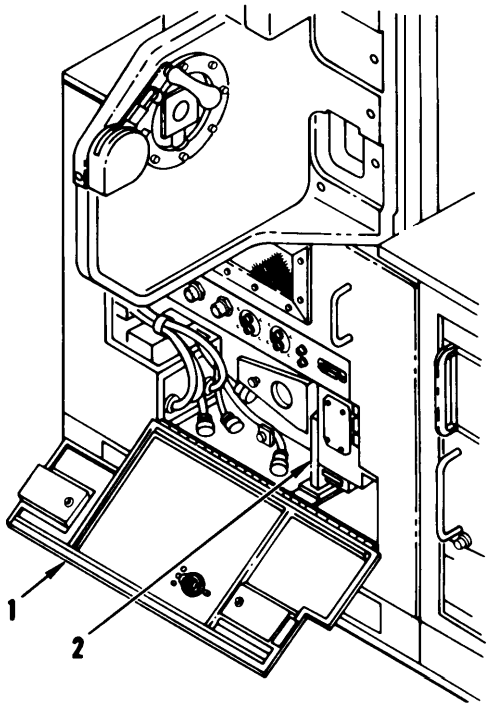
ac. OAFOCUS MESSAGES (OSA ONLY)

(1) OPEN OSA ASSEMBLY DOOR (1).

(2) ASSURE HEADS OUT DISPLAY MOUNTING BRACKET ASSEMBLY 13083489-19 (2) IS INSTALLED.

(3) CLOSE OSA ASSEMBLY 2A1A1 DOOR (1). PRESS PROCEED WHEN COMPLETE.

HEADS OUT DISPLAY (HOD) MOUNTING BRACKET IS NORMALLY STORED IN SUPPORT VAN. HOD MOUNTING BRACKET MOUNTS ON DOVETAIL SLIDE IN OSA.



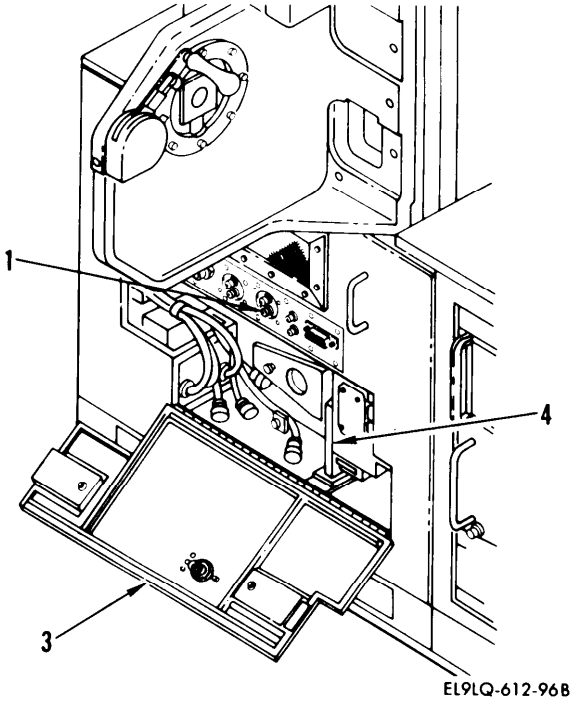
EL9LQ-612-101B

ad. PMTLED MESSAGES (OSA ONLY)

(1) A CONNECT COAXIAL CABLE 13081706 FROM OSA ASSEMBLY 2A1A1-J7 (1) TO PROGRAMABLE DIGITIZER 2A2A1. PROGRAMMABLE AMPLIFIER CHANNEL A INPUT B (2).

(2) OPEN OSA ASSEMBLY 2A1A1 DOOR (3) AND REMOVE HEADS OUT DISPLAY MOUNTING BRACKET ASSEMBLY 13083489-19 (4), IF IT IS INSTALLED.

(3) CLOSE OSA ASSEMBLY 2A1A1 DOOR (3). PRESS PROCEED WHEN COMPLETE.

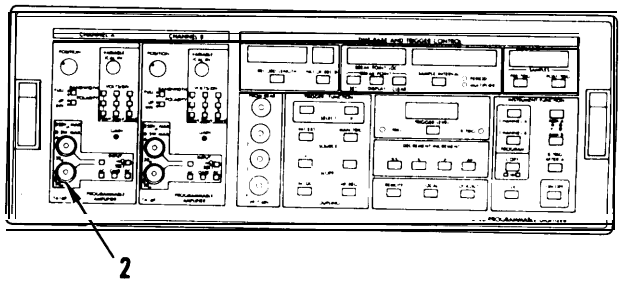


EL9LQ-612-96B

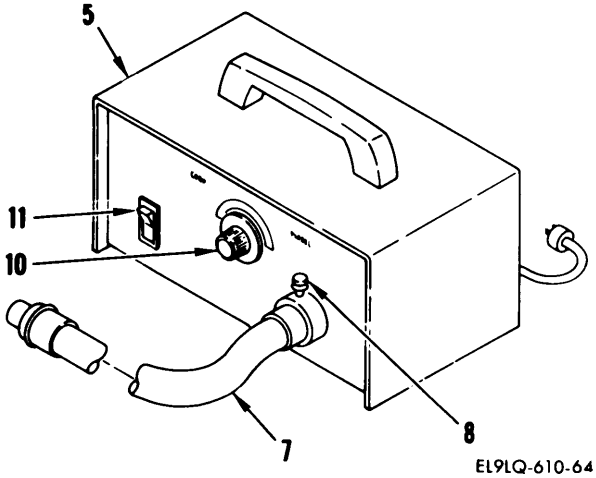
(4) PLACE ILLUMINATOR I-250 (5) ON CENTER SECTION TEST CONSOLE BENCH 2A2.

(5) CONNECT AC POWER CORD FROM ILLUMINATOR TO TEST ADAPTER PANEL ASSEMBLY 2A2A4J3 (6).

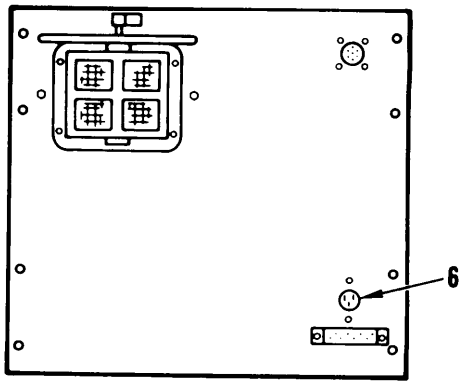
(6) INSERT FIBER OPTICS ASSEMBLY 13083098 (7) INTO ILLUMINATOR. TIGHTEN THUMBSCREWS (8) SO THAT FIBER OPTICS ASSEMBLY IS NOT EASILY REMOVED.



EL9LQ-621-19



EL9LQ-610-64



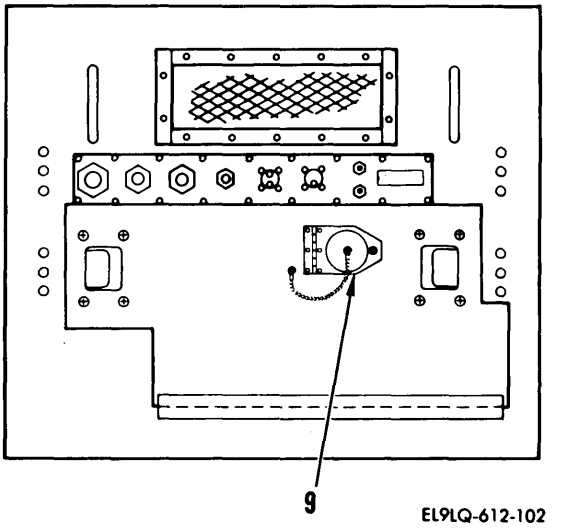
EL9LQ-620-40

(7) INSERT OTHER END OF FIBER OPTICS ASSEMBLY 13083098 INTO ADAPTER ON OSA ASSEMBLY DOOR 2A1A1 (9).

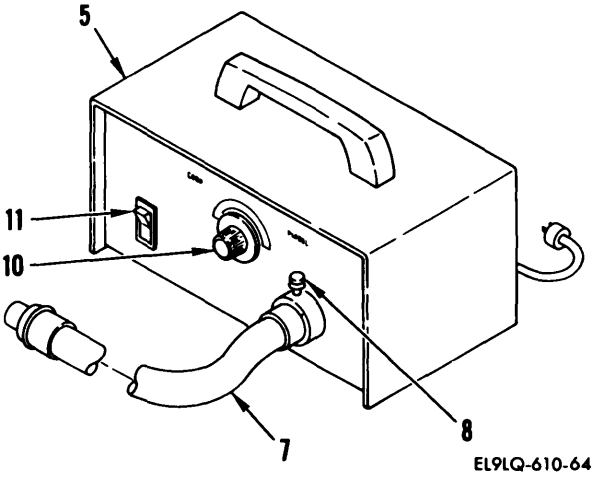
(8) TURN KNOB (10) ON ILLUMINATOR FULLY COUNTERCLOCKWISE AND PRESS POWER SWITCH (11) TO ON. PRESS PROCEED WHEN COMPLETE.

(9) YOUR PRESENT VOLTAGE READING IS #.## VOLTS. YOUR TARGET VOLTAGE IS 8.00 VOLTS. USING THE VARIABLE CONTROL KNOB (11) ON THE FRONT OF THE ILLUMINATOR, ADJUST TO OBTAIN THE TARGET VOLTAGE. (CLOCKWISE TO INCREASE, COUNTERCLOCKWISE TO DECREASE.) PRESS <YES> TO TAKE ANOTHER READING. PRESS <NO> TO CONTINUE (PMT WILL FAIL).

(10) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-612-102



EL9LQ-610-64

ae. IVDST MESSAGES (OSA ONLY)

(1) INSTALL MAJOR TEST ADAPTER 13083633-19 IN PIU STATION A9J1 AND CLOSE LOCKING LEVER.

Refer to paragraph 2-65 for installation.

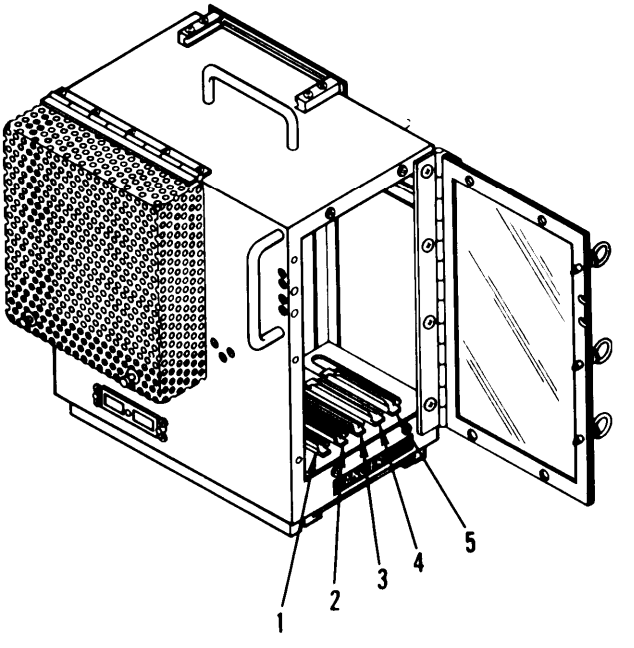
VERIFY THAT NO PERSONALITY CARDS ARE INSERTED IN MAJOR TEST ADAPTER CONNECTORS A5 (1), A6 (2), A7 (3), A8 (4), A9 (5). PRESS PROCEED WHEN COMPLETE.

(2) INSTALL CABLE ASSEMBLY 13082730 AS FOLLOWS:

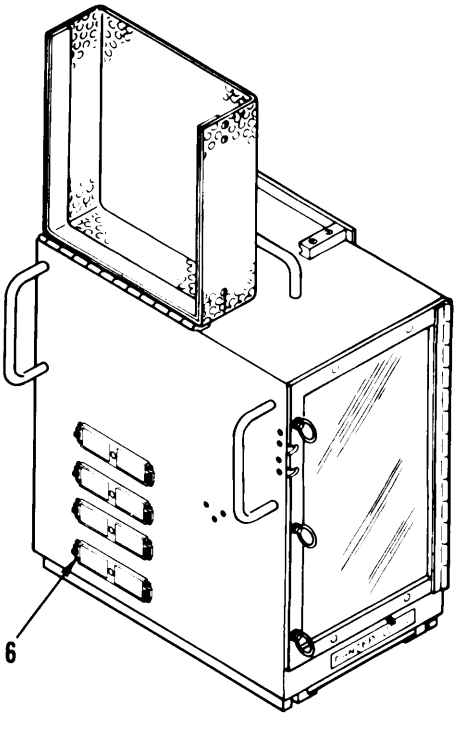
P1 TO MAJOR TEST ADAPTER 13083633-J4 (6).
P3 T0 AN/USM-410 DIU A1A4-J26
P4 T0 AN/USM-410 DIU A1A4-J32
P5 T0 AN/USM-410 DIU A1A4-J1
P6 TO AN/USM-410 DIU A1A4-J2
P9 TO AN/USM-410 DIU A1A4-J29
P1O TO AN/USM-410 DIU AIA4-J30
P11 TO AN/USM-410 DIU A1A4-J34
P12 TO AN/USM-410 DIU A1A4-J36
P13 TO AN/USM-410 YIU A8-J11O
P14 T0 AN/USM-410 YIU A8-J109
PRESS PROCEED WHEN COMPLETE.

(3) INSTALL PERSONALITY CARD SET IN MAJOR TEST ADAPTER AS FOLLOWS:

OPEN DOOR, IF CLOSED, ON MAJOR TEST ADAPTER.
INSTALL P1 OF PROGRAMMABLE RESISTOR CARD 13083641 IN MAJOR TEST ADAPTER CONNECTOR A6 (2).
INSTALL P2 OF SIGNAL ROUTING PERSONALITY CARD 13082365 IN MAJOR TEST ADAPTER CONNECTOR A7 (3).
INSTALL P2 OF SPARE PERSONALITY CARD 13082411 IN MAJOR TEST ADAPTER CONNECTOR A9 (5).
CLOSE AND SECURE DOOR ON MAJOR TEST ADAPTER.
PRESS PROCEED WHEN COMPLETE.



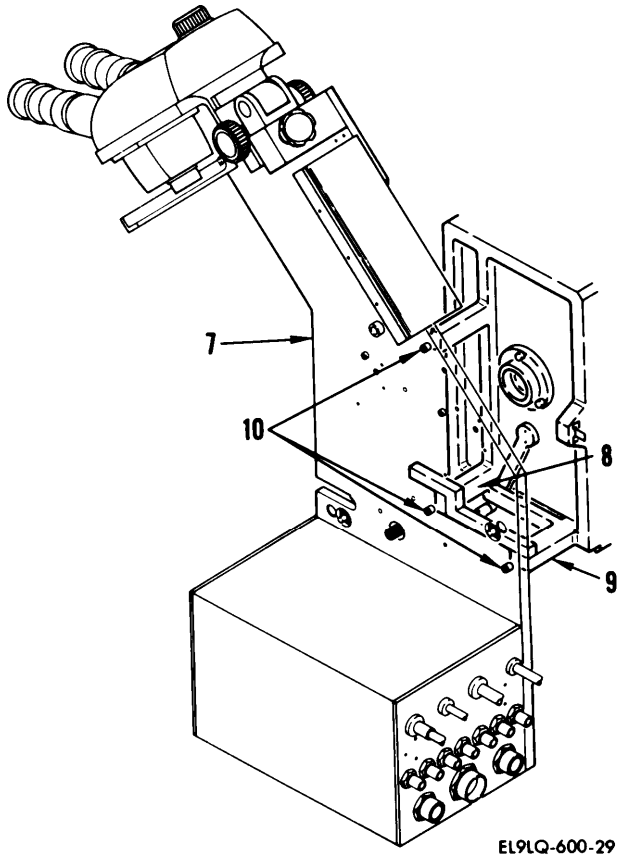
EL9LQ-720-34



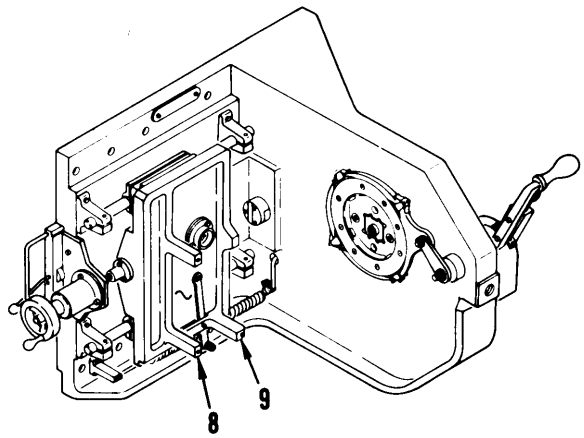
EL9LQ-730-47

(4) OPTICAL ALIGNMENT ASSEMBLY INSTALLATION. THE PURPOSE OF THIS PROCEDURE IS TO MOUNT THE OPTICAL ALIGNMENT ASSEMBLY 13083078-39 TO THE DAYSIDE TEST BENCH A1.

1. HOLDING THE OPTICAL ALIGNMENT ASSEMBLY (7) AT THE LOWER LEFT CORNER AND UPPER RIGHT UUT SUPPORT, REST THE LOWER "Z" SHAPED BRACKET, LOCATED ON THE REAR OF THE OPTICAL ALIGNMENT ASSEMBLY ONTO THE TWO LOWER SECURING POSTS (8) AND (9) OF THE DAYSIDE TEST BENCH.
2. SLIDE THE OPTICAL ALIGNMENT ASSEMBLY TO THE LEFT UNTIL THE "Z" BRACKET IS FIRMLY AGAINST THE LOWER LEFT SECURING POST (8). THE OPTICAL ALIGNMENT ASSEMBLY IS NOW APPROXIMATELY ALIGNED WITH THE THREE MOUNTING-SCREW HOLES IN THE UPPER AND LOWER SECURING POSTS.
PRESS PROCEED FOR ADDITIONAL INSTRUCTIONS.
3. WHILE SUPPORTING THE OPTICAL ALIGNMENT ASSEMBLY (7) WITH ONE HAND, INSERT AND START THE THREE ALLEN-HEAD SCREWS (10) INTO THEIR MOUNTING HOLES UNTIL THE SCREWS ARE HAND-TIGHT. DO NOT FORCE THE SCREWS OR INSERT THEM INTO THE MOUNTING HOLES AT AN ANGLE.
4. USING A 5/32-IN ALLEN WRENCH, TIGHTEN THE ALLEN-HEAD SCREWS (10) UNTIL THEY ARE SNUG AND THE OPTICAL ALIGNENT ASSEMBLY IS SECURELY FASTENED. DO NOT OVER-TIGHTEN THE ALLEN-HEAD SCREWS.
PRESS PROCEED WHEN COMPLETE.



EL9LQ-600-29



EL9LQ-610-74

(5) 1. CONNECT P1 OF CABLE 13083701 TO MAJOR TEST ADAPTER J2 (11).
2. CONNECT P2 OF CABLE 13083701 TO MAJOR TEST ADAPTER J3 (12).
PRESS PROCEED WHEN COMPLETE.

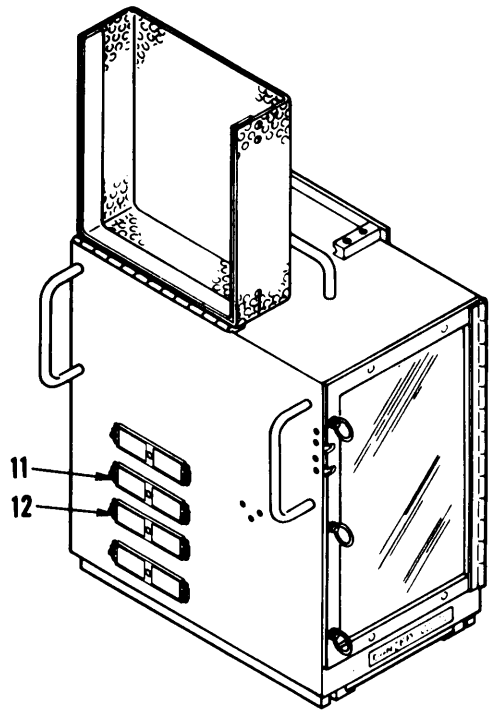
(6) 1. OPEN OSA ASSEMBLY A1A1 DOOR (13) IF NOT ALREADY OPEN.
2. DISCONNECT P2 OF OSA CABLE 13081941-19 FROM OSA TEE CONNECTOR A1A1J14 (14).
NOTE: TEE CONNECTOR IS LOCATED IN LOWER-LEFT FRONT CORNER.

WARNING

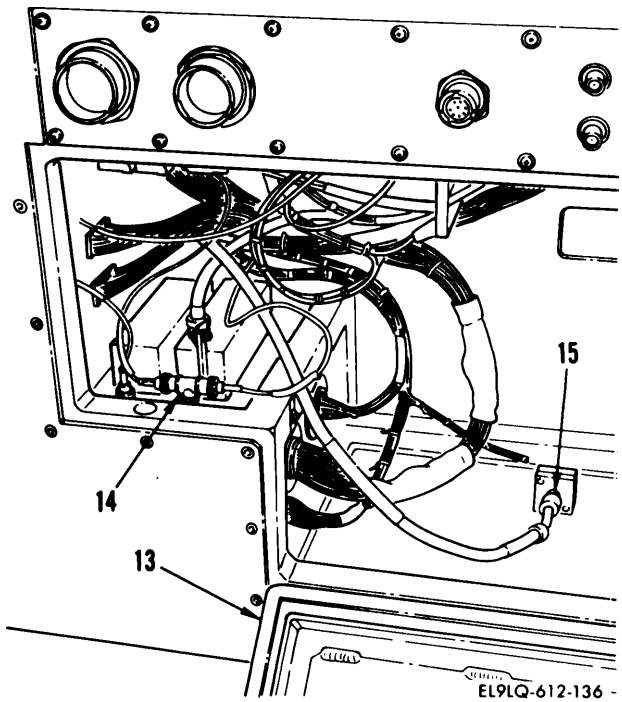
HIGH VOLTAGE

LETHAL SHOCK HAZARD OR EQUIPMENT DAMAGE. A 16,000 VOLT. POTENTIAL IS PRESENT ON THE W13 CABLE WHEN SYSTEM IS IN OPERATION. CABLE W13P1 MUST ALWAYS BE CONNECTED TO CONTROL PANEL ASSEMBLY CONNECTOR J1 OR TERMINATED AT THE OSA HIGH VOLTAGE TERMINATION CONNECTOR J1.

3. CONNECT CABLE ASSEMBLY (P/N 13081942) 2A1A1W13-P1 TO J1 OF OSA HIGH VOLTAGE TERMINATION CONNECTOR (15).
4. CLOSE OSA ASSEMBLY A1A1 DOOR (13).
PRESS PROCEED WHEN COMPLETE.



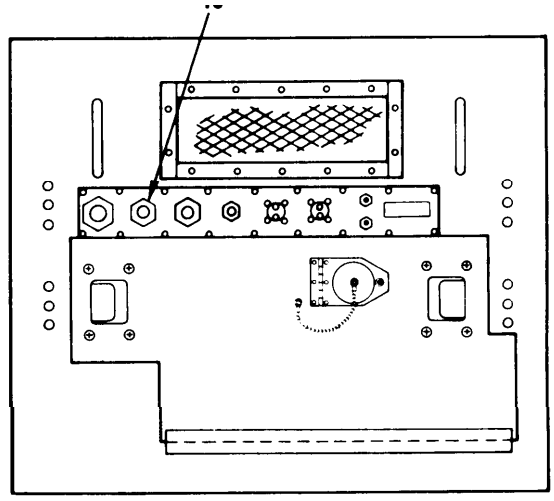
EL9LQ-730-48



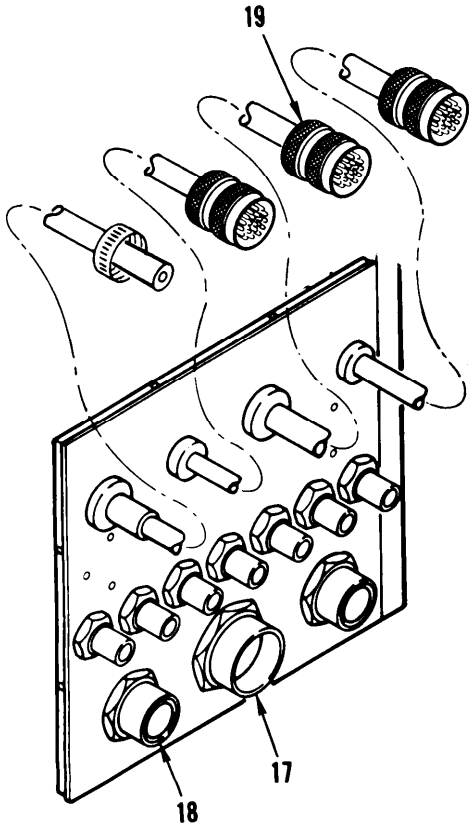
EL9LQ-612-136

2-17. OPERATOR INSTRUCTION MESSAGES (cont) 2-17

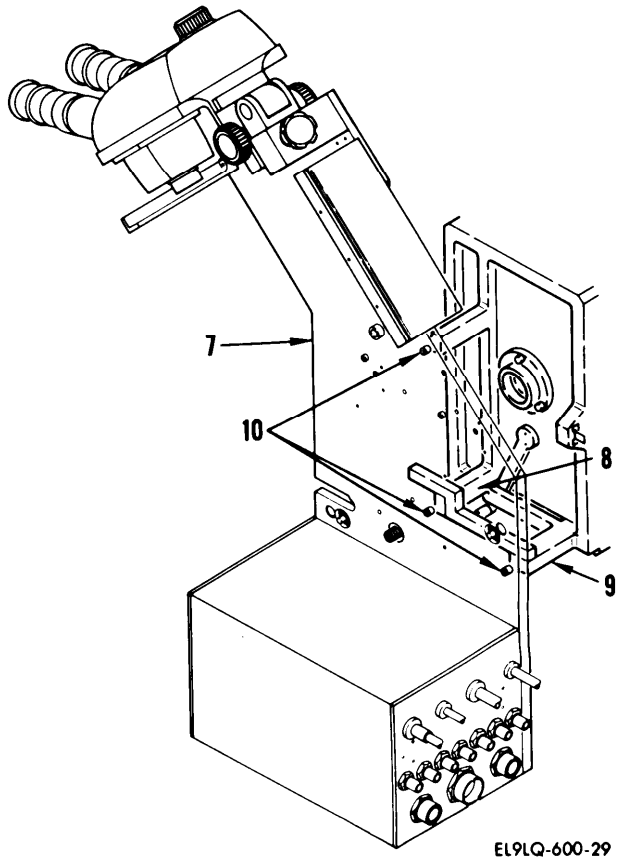
(7) 1. CONNECT P3 OF CABLE 13083701 TO OSA A1A1J2 (16).
2. CONNECT P6 OF CABLE 13083701 TO J3 (17) OF OPTICAL ALIGNMENT ASSEMBLY 13083078-39 (7).
3. CONNECT P7 0F CABLE 13083701 TO J4 (18) OF OPTICAL ALIGNMENT ASSEMBLY 13083078-39.
4. CONNECT SELF-TEST CONNECTOR 13083962-559 TO P4 (19) OF OPTICAL ALIGNMENT ASSEMBLY CABLE 13083078-39.
PRESS PROCEED WHEN COMPLETE.



EL9LQ-612-138



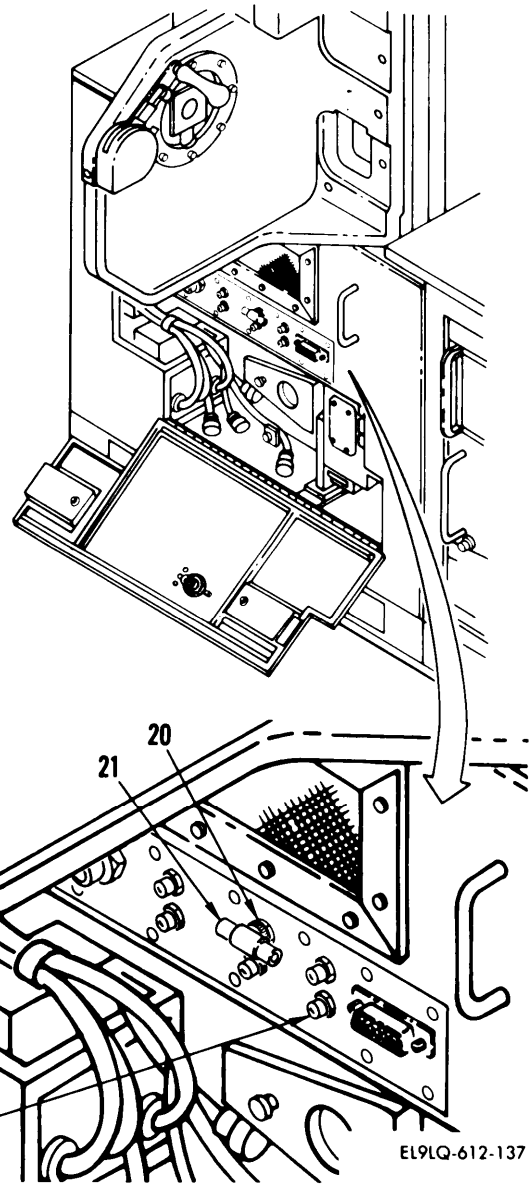
EL9LQ-700-173



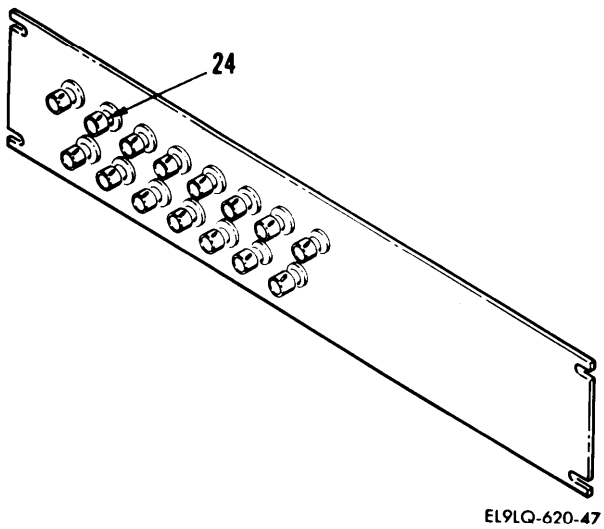
EL9LQ-600-29

(8) 1. CONNECT TEE CONNECTOR TO OSA A1A1J17 (20).
2. CONNECT P8 OF CABLE 13083701 TO TEE CONNECTOR AT A1A1J17 (21).
3. CONNECT P1 OF CABLE 13081706 TO TEE CONNECTOR AT A1A1J17 AND CONNECT P2 OF CABLE 13081706 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (22).
PRESS PROCEED WHEN COMPLETE.

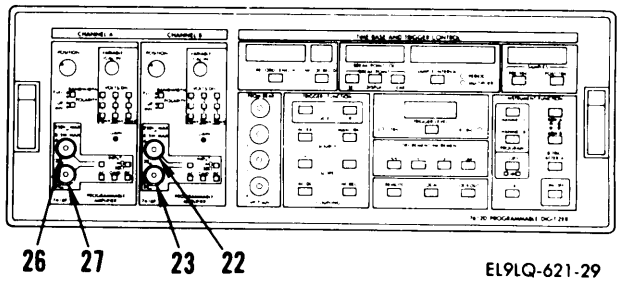
(9) 1. CONNECT TEE CONNECTOR TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
CONNECT P1 OF CABLE 13081706-29 TO TEE CONNECTOR ON PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT BAND CONNECT P2 OF CABLE 13081706-29 TO A2A2J3 (24).
3. CONNECT P1 OF CABLE 13081706 TO TEE CONNECTOR ON PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B AND CONNECT P2 OF CABLE 3081706 TO OSA A1A1J8 (25).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-612-137



EL9LQ-620-47



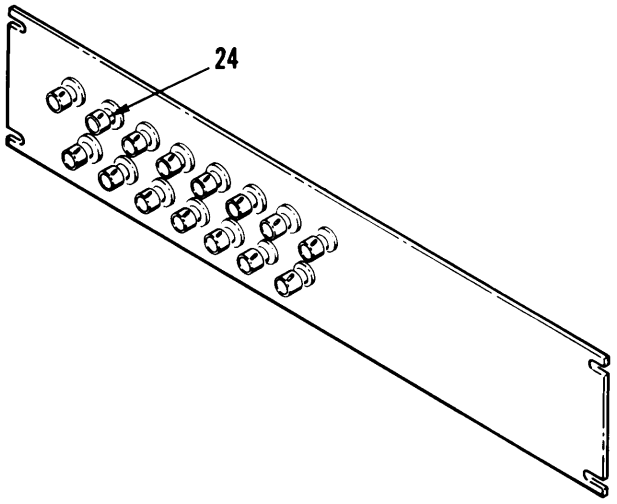
EL9LQ-621-29

(10) APPROXIMATELY 5 MINUTES DELAY FOR WARMUP.

(11) APPROXIMATELY 15 TO 45 SECONDS DELAY.

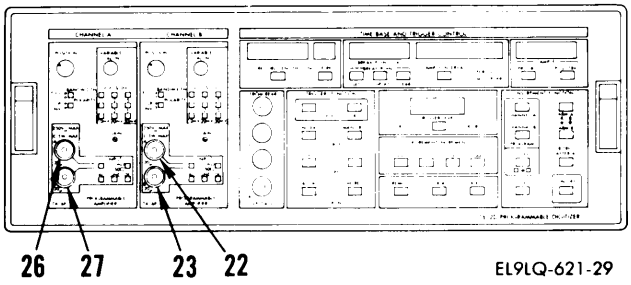
(12) APPROXIMATELY 30 SECONDS TO 1 MINUTE DELAY DURING AUTOMATIC VIDEO SIGNAL ADJUSTMENT.

(13) 1. DISCONNECT P1 OF CABLE 13081706-29 FROM TEE CONNECTOR AND P2 OF CABLE 13081706-29 FROM VHF CABLE ENTRY PANEL A2A2J3 (24).
DISCONNECT P1 OF CABLE 13081706 FROM TEE CONNECTOR AND CONNECT IT TO VHF CABLE ENTRY PANEL A2A2J3.
3. DISCONNECT TEE CONNECTOR FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-620-47

(14) 1. CONNECT P13 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (26).
2. CONNECT P14 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
3. CONNECT P16 OF CABLE 13083701 TO PR0GRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
PRESS PROCEED WHEN COMPLETE.



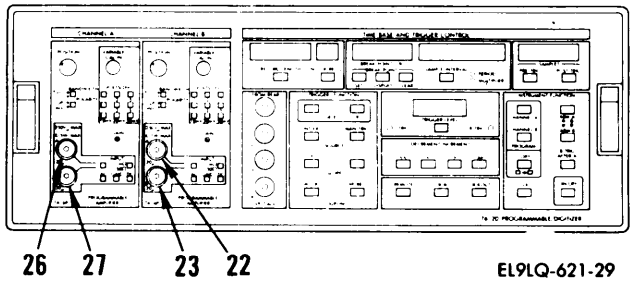
EL9LQ-621-29

(15) APPROXIMATELY 1 TO 5 MINUTES DELAY DURING AUTOMATIC CONTRAST ADJUSTMENT.

(16) APPROXIMATELY 15 TO 45 SECONDS DELAY.

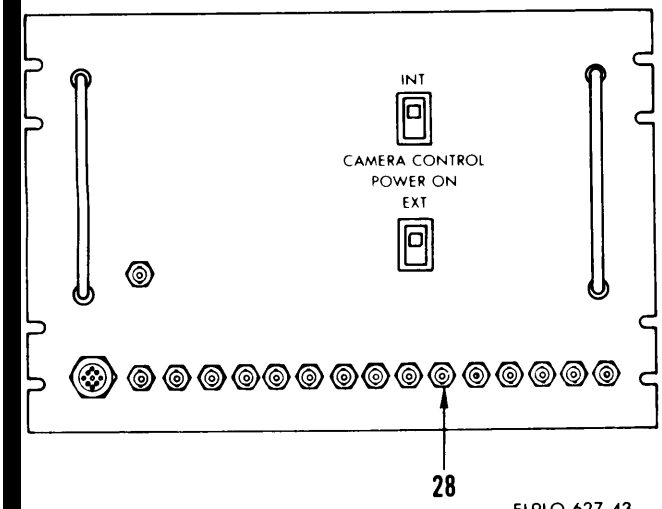
(17) GRAY SCALE GAIN ADJUSTMENT IN PROGRESS. APPROXIMATELY 5 TO 7 MINUTES DELAY FOR THIS ADJUSTMENT WITH THE POSSIBILITY OF UP TO 35 MINUTE DELAY.

(18) 1. DISCONNECT P13 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (26).
2. DISCONNECT P14 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
3. DISCONNECT P16 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
PRESS PROCEED WHEN COMPLETE.

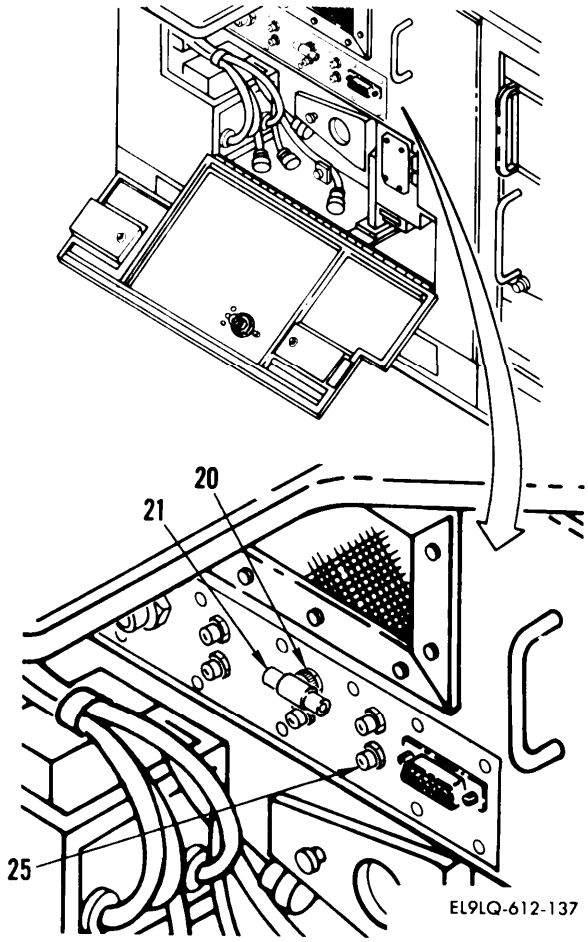


EL9LQ-621-29

(19) 1. CONNECT P18 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
2. CONNECT P1 OF CABLE 13081706 TO A2A7J21 (28) AND CONNECT P2 OF CABLE 13081706 T0 PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-627-43

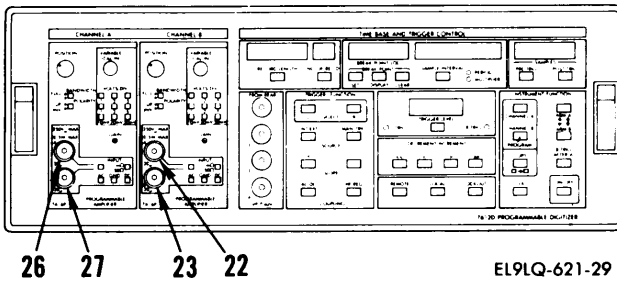


EL9LQ-612-137

(20) 1. DISCONNECT P1 OF CABLE 13081706 FROM OSA FRONT PANEL J17 (21) AND DISCONNECT P2 OF CABLE 13081706 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (22).
2. DISCONNECT P8 OF CABLE 13083701 FROM TEE CONNECTOR AT A1A1J17 (21).
3. DISCONNECT TEE CONNECTOR FROM OSA A1A1J17.
PRESS PROCEED WHEN COMPLETE.

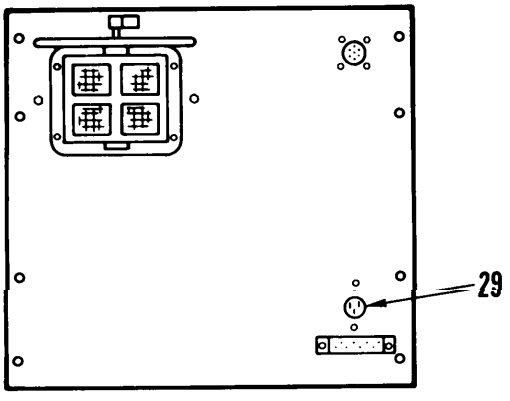
(21) 1. DISCONNECT P18 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
2. DISCONNECT P1 OF CABLE 13081706 FROM A2A7J21 (28) AND DISCONNECT P2 OF CABLE 13081706 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (23).
PRESS PROCEED WHEN COMPLETE.

(22) 1. CONNECT P13 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (26).
2. CONNECT CURRENT PROBE AMPLIFIER TYPE 134 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
3. SET CURRENT/DIV KNOB OF CURRENT PROBE AMPLIFIER TO 1A.
4. SET DEFLECTION FACTOR SWITCH OF CURRENT PROBE AMPLIFIER TO P6021/0.4MV.
5. CONNECT BNC CONNECTOR OF AC CURRENT PROBE P6021 TO CURRENT PROBE AMPLIFIER. PRESS PROCEED FOR ADDITIONAL INSTRUCTIONS.

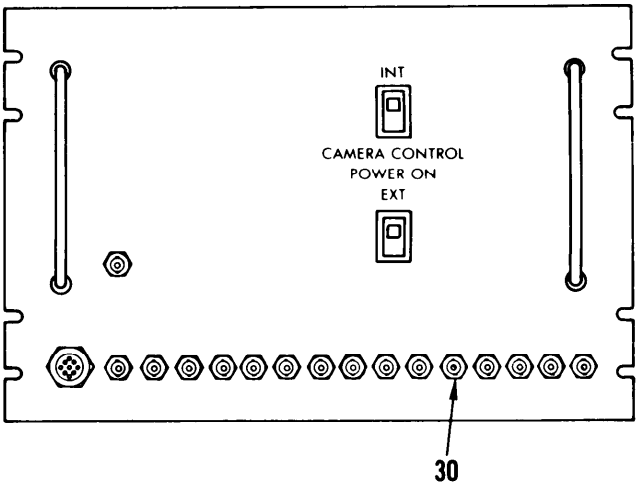


EL9LQ-621-29

6. CONNECT DC POWER INPUT OF CURRENT PROBE AMPLIFIER TO DC POWER OUTPUT OF POWER SUPPLY FOR TYPE 134 (015-0058-01).
7. CONNECT AC POWER CORD PLUG OF POWER SUPPLY INTO E/O BENCH A2A4J3 (29).
8. CONNECT P1 OF CABLE 13081706 TO PROGRAMMABLE DIGITIZER CHANNEL B INPUT A (22) AND P2 TO EOB ELECTRONICS DRAWER J22 (30).
9. CONNECT CURRENT PROBE TIP TO LOOP IN SHORTING PLUG 13083962-559. NOTE: CURRENT PROBE TIP ARROW MUST POINT TO SAME DIRECTION AS SHORTING PLUG ARROW. PRESS PROCEED WHEN COMPLETE.

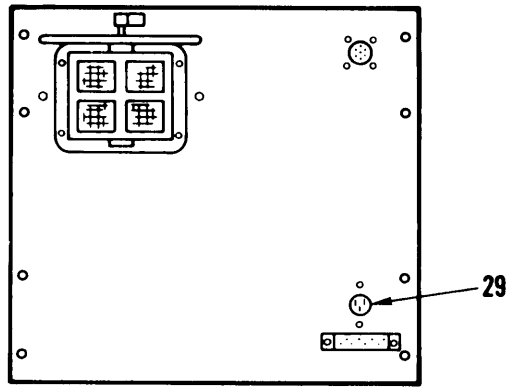


EL9LQ-620-46

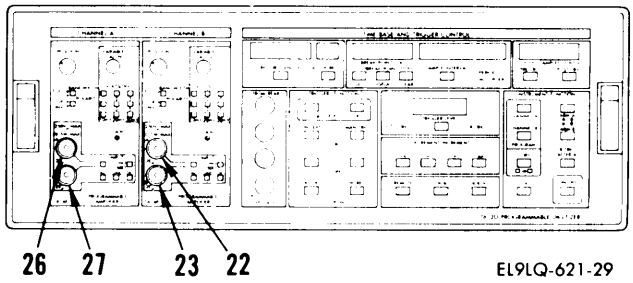


EL9LQ-627-42

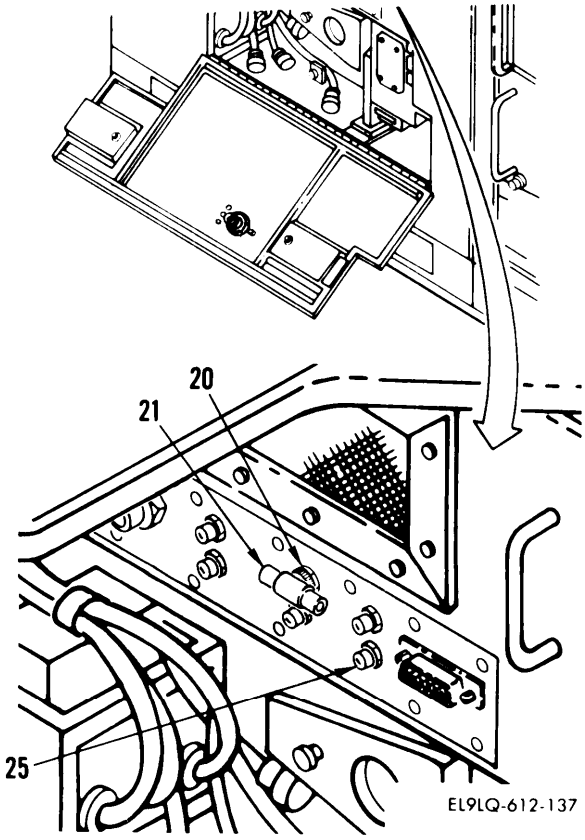
(23) 1. DISCONNECT CURRENT PROBE TIP FROM LOOP IN SHORTING PLUG 13083962-559.
2. DISCONNECT AC POWER CORD PLUG OF POWER SUPPLY FROM E/O BENCH A2A4J3 (29).
3. DISCONNECT DC POWER INPUT OF CURRENT PROBE AMPLIFIER FROM DC POWER OUTPUT OF POWER SUPPLY FOR TYPE 134 (015-0058-01).
4. DISCONNECT BNC CONNECTOR OF AC CURRENT PROBE P6021 FROM CURRENT PROBE AMPLIFIER.
5. DISCONNECT CURRENT PROBE AMPLIFIER TYPE 134 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (27).
PRESS PROCEED WHEN COMPLETE.



EL9LQ-620-46

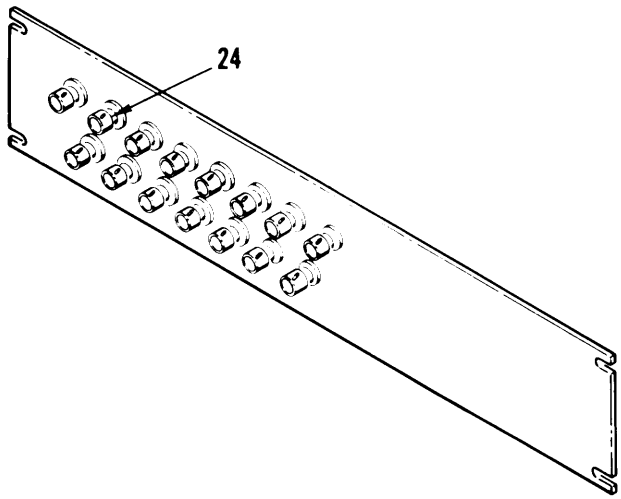


EL9LQ-621-29



EL9LQ-612-137

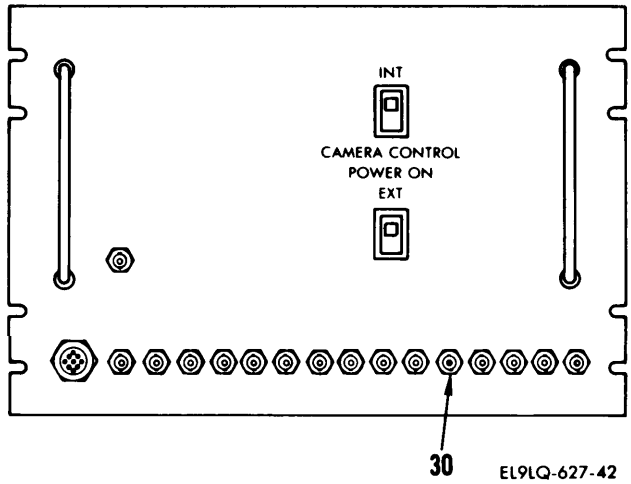
2. DISCONNECT P13 OF CABLE 13083701 FROM DIGITIZER A2A1 CHANNEL A INPUT A (26).



EL9LQ-620-47

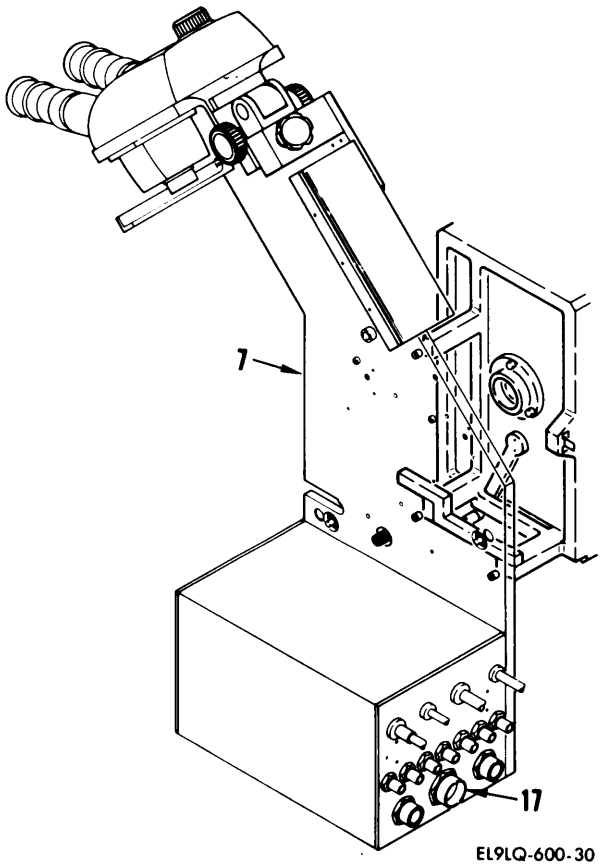
(24) 1. DISCONNECT P1 OF CABLE 13081706 FROM A2A2J3 (24) AND DISCONNECT P2 OF CABLE 13081706 FROM OSA A1A1J8 (25).

3. DISCONNECT P1 OF CABLE 13081706 FROM DIGITIZER CHANNEL B INPUT A (22) AND P2 FROM E0B ELECTRONICS DRAWER J22 (30). PRESS PROCEED WHEN COMPLETE.

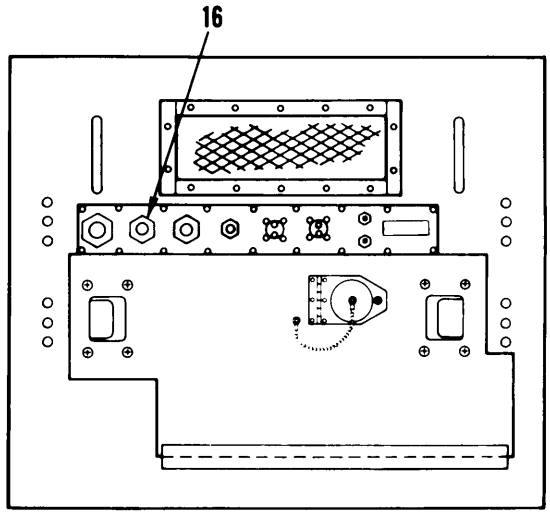


EL9LQ-627-42

(25) 1. DISCONNECT P3 OF CABLE 13083701 FROM OSA A1A1J2 (16).
2. DISCONNECT P6 0F CABLE 13083701 FROM J3 (17) OF OPTICAL ALIGNMENT ASSEMBLY 13083078-39 (7).

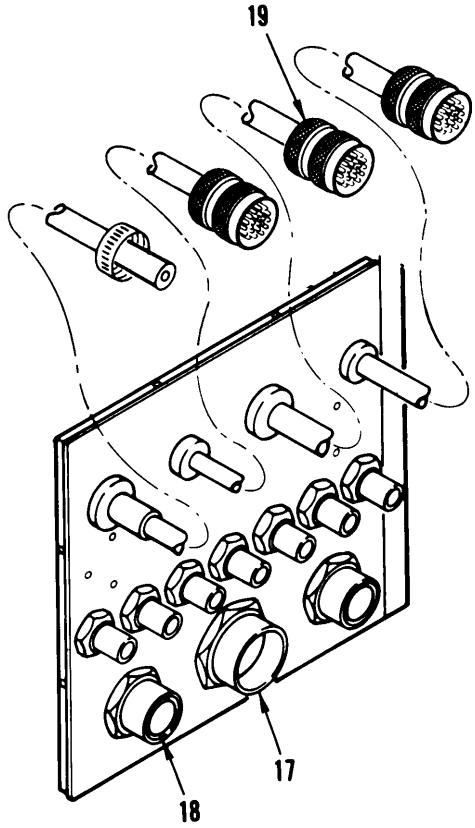


EL9LQ-600-30



EL9LQ-612-138

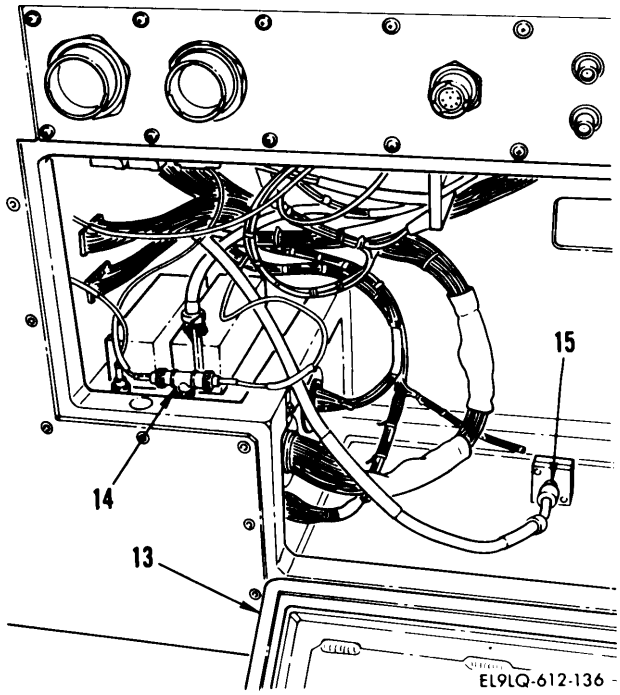
3. DISCONNECT P7 OF CABLE 13083701 FROM J4 (18) OF OPTICAL ALIGNMENT ASSEMBLY 13083078-39.
4. DISCONNECT SELF-TEST CONNECTOR 13083962-559 FROM P4 (19) OF OPTICAL ALIGNMENT ASSEMBLY CABLE 13083078.
PRESS PROCEED WHEN COMPLETE.



EL9LQ-700-173

(26) OPEN OSA ASSEMBLY A1A1 DOOR (13). CONNECT P2 OF OSA CABLE 13081941-19 TO OSA TEE CONNECTOR A1A1J14 (14). NOTE: TEE CONNECTOR IS LOCATED IN LOWER-LEFT FRONT CORNER. CLOSE OSA A1A1 DOOR (13).
PRESS PROCEED WHEN COMPLETE.

(27) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-612-136

af. AUGTEM MESSAGES

(1) IF YOU HAVE ONLY A DAYSIDE TEST BENCH ENTER 1.
IF YOU HAVE ONLY A NIGHTSIDE TEST BENCH ENTER 2.
IF YOU HAVE BOTH A DAYSIDE AND NIGHTSIDE TEST BENCH ENTER 3.
(2) AMBIENT TEMPERATURE = #.##DEG C OR #.##DEG F.
IS THIS A REASONABLE TEMPERATURE READING? DEPRESS <YES> (F5) OR <NO> (F6).

(3) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

ag. BITCHECK MESSAGES

(1) IF YOU HAVE ONLY A DAYSIDE TEST BENCH ENTER 1.
IF YOU HAVE ONLY A NIGHTSIDE TEST BENCH ENTER 2.
IF YOU HAVE BOTH DAYSIDE AND NIGHTSIDE TEST BENCHES ENTER 3.

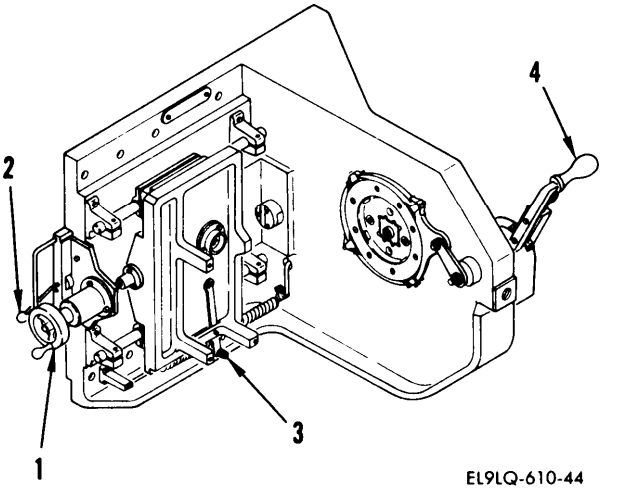
(2) A MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE TO LEFT STOP WITH LASER INTERFACE CARRIAGE HANDLE (1).

(3) B MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (2) TO DOWN POSITION AND OPEN LASER SAFETY SHIELD.

(4) C MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER ATTENUATOR (3) TO LEFT (IN) POSITION.

(5) D PUSH SENSOR MOUNT ASSEMBLY 2A1A2A4A10 UUT MOUNT HANDLE (4) TO THE UNLOCKED POSITION.

(6) E PUSH SENSOR MOUNT ASSEMBLY 2A3A1A3 UUT MOUNT HANDLE (4) TO THE UNLOCKED POSITION. PRESS PROCEED WHEN COMPLETE.



EL9LQ-610-44

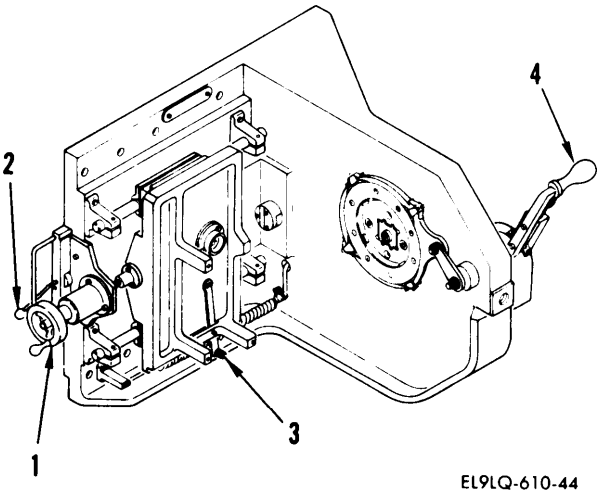
(7) A MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE TO RIGHT STOP WITH LASER INTERFACE CARRIAGE HANDLE (1).

(8) B MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER ATTENUATOR HANDLE (3) TO RIGHT (OUT) POSITION.

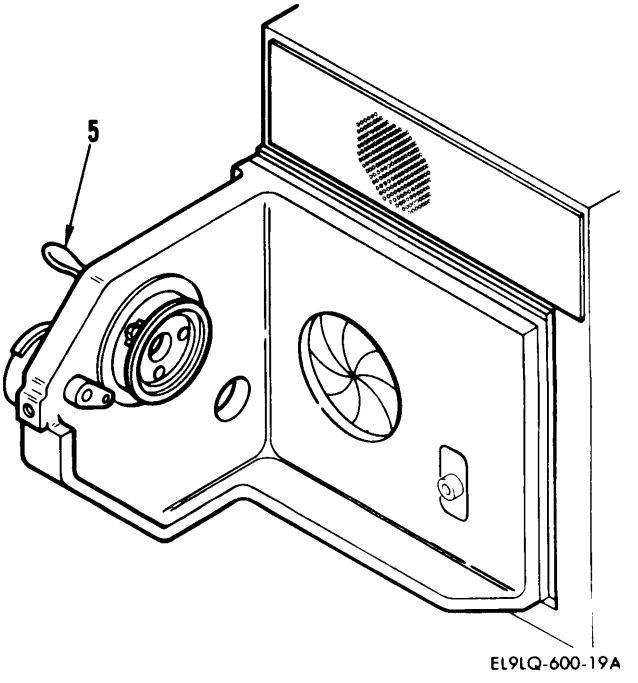
(9) C MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (2) TO DOWN POSITION AND CLOSE LASER SHIELD. THEN MOVE LASER INTERLOCK HANDLE TO THE UP POSITION.

(10) D PULL SENSOR MOUNT ASSEMBLY 2A1A2A410 UUT MOUNT HANDLE (4) TO THE LOCKED POSITION.

(11) E PULL SENSOR MOUNT ASSEMBLY 2A1A1A3 UUT MOUNT HANDLE (5) TO THE LOCKED POSITION. PRESS PROCEED WHEN COMPLETE.



EL9LQ-610-44



EL9LQ-600-19A

ah. LASERST MESSAGES

(1) A CONNECT MAJOR TEST ADAPTER 13083633-19 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4J1.

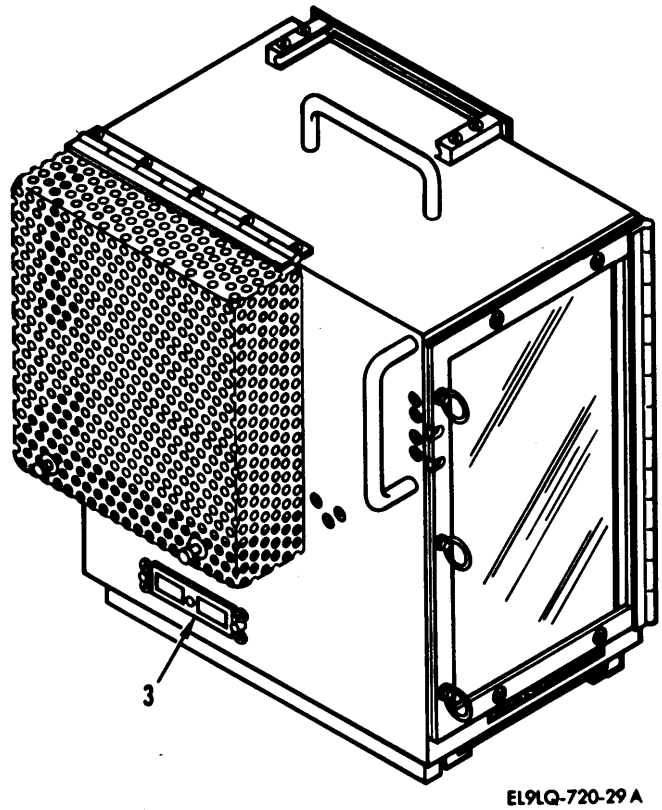
Refer to paragraph 2-65 for installation procedure.

(2) B INSTALL PERSONALITY CARD 13081830-P2 SIDE IN MAJOR TEST ADAPTER SLOT A7.

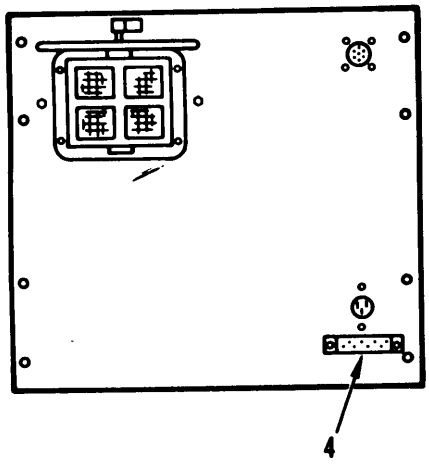
Refer to paragraph 2-69 for installation procedure.

(3) C CONNECT CABLE ASSEMBLY 13082730 AS FOLLOWS:

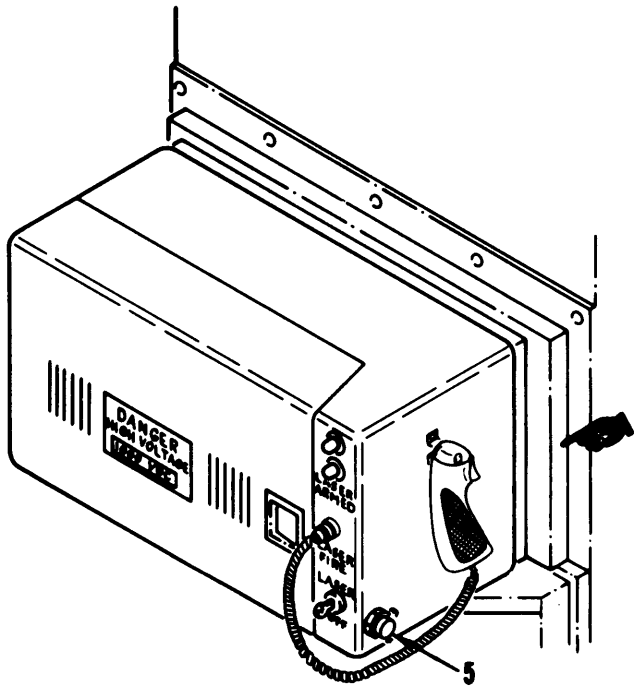
P1 TO MAJOR TEST ADAPTER
13083633-19 J4 (3).
P2 TO TEST ADAPTER PANEl ASSEMBLY
2A2A4-J6 (4).
P3 T0 AN/USM-410 DIU A1A4-J26.
P9 TO AN/USM-410 DIU A1A4-J29.
P10 TO AN/USM-410 DIU A1A4-J30.
P14 TO AN/USM-41O YIA A8-J109.
PRESS PROCEED WHEN COMPLETE.



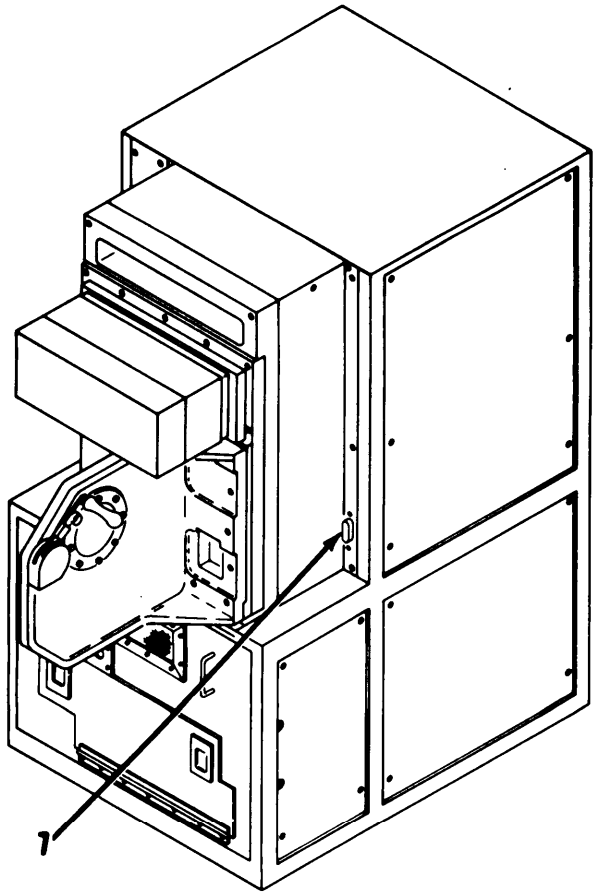
EL9LQ-720-29A



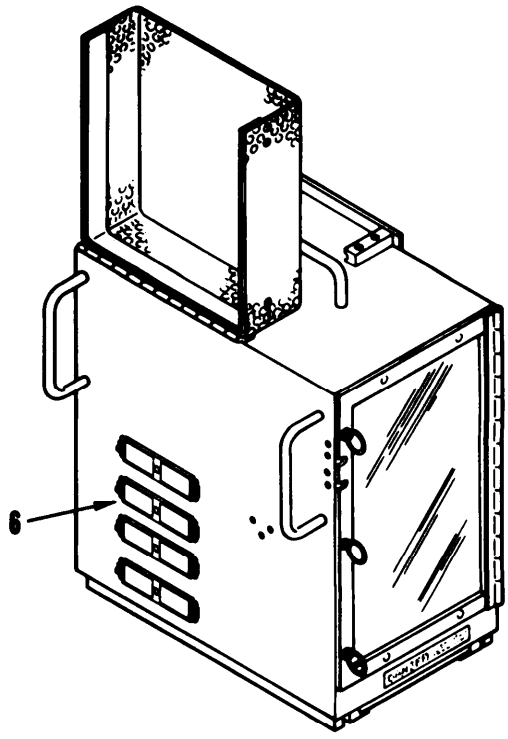
EL9LQ-620-34



EL9LQ-610T-03B



EL9LQ-610-32

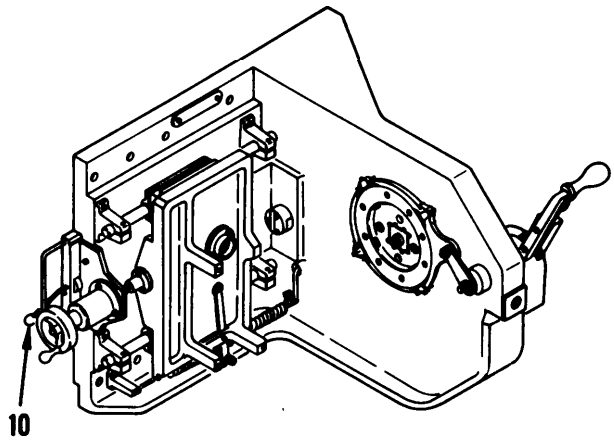


EL9LQ-730-37A

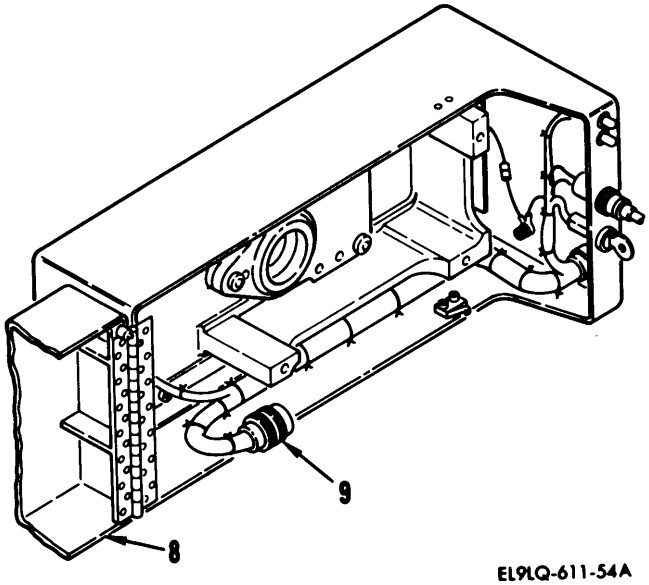
2-17. OPERATOR INSTRUCTION MESSAGES (cont)

(5) A OPEN LASER COVER ASSEMBLY 2A1A2A19 COVER (8) AND INSERT SHORTING PLUG 13081833 INTO LTU CONNECTOR P1 (9). LEAVE COVER OPEN.

(6) B MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (10) TO THE DOWN POSITION AND OPEN THE LASER SAFETY SHIELD.



EL9LQ-610-33

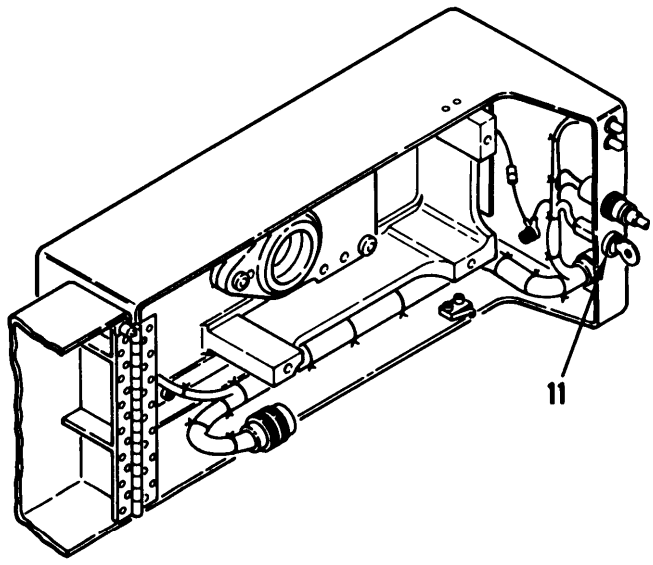


EL9LQ-611-54A

(7) C ON LASER COVER ASSEMBLY 2A1A2A19, TURN LASER KEY SWITCH (11) TO THE OFF POSITION. PRESS PROCEED WHEN COMPLETE.

(8) A MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (10) TO THE DOWN POSITION AND CLOSE THE LASER SAFETY SHIELD.

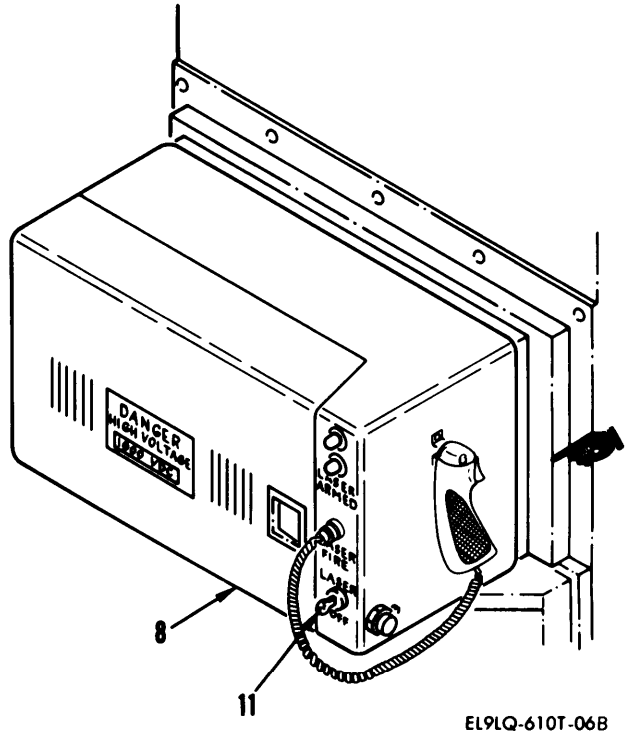
(9) B MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERLOCK HANDLE (10) TO THE UP POSITION. PRESS PROCEED WHEN COMPLETE.



EL9LQ-611-53A

(10) A CLOSE LASER COVER ASSEMBLY 2A1A2A19 COVER (8). PRESS PROCEED WHEN COMPLETE.

(11) A ON LASER COVER ASSEMBLY 2A1A2A19, TURN LASER KEY SWITCH (11) TO THE ON POSITION. PRESS PROCEED WHEN COMPLETE.



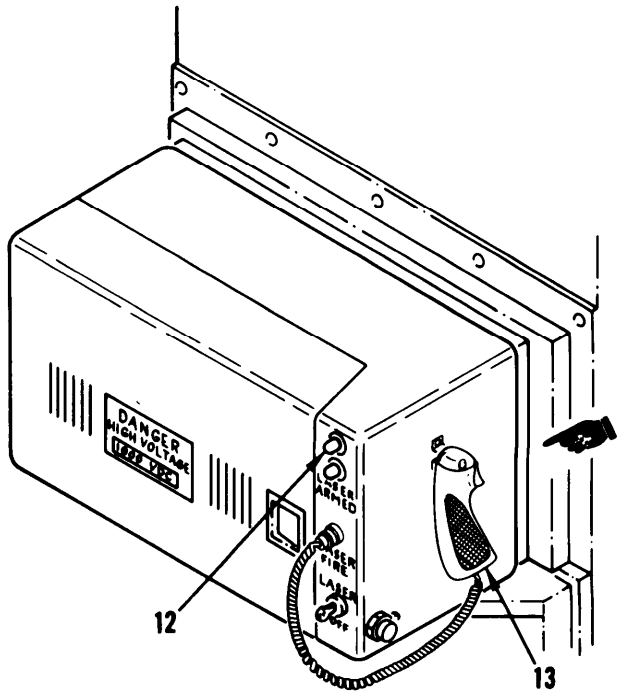
EL9LQ-610T-06B

(12) A OBSERVE BOTH LASER ARMED LIGHTS (12).

(13) B IF BOTH LIGHTS ARE ON PRESS [YES] (F5). IF ONE OR BOTH LIGHTS ARE OFF, PRESS [NO] (F6).

(14) A HOLD THE LASER COVER ASSEMBLY 2A1A2A19 LASER FIRE SWITCH (13) IN THE ON POSITION. PRESS PROCEED WHEN COMPLETE.

Hold laser fire switch in on position until operator message to release it.



EL9LQ-610T-05B

(15) A RELEASE THE LASER COVER ASSEMBLY 2A1A2A19 LASER FIRE SWITCH (13).

(16) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.

ai. FIXTST MESSAGES

(1) MOVE SENSOR MOUNT ASSEMBLY 2A1A2A4A10 LASER INTERFACE CARRIAGE (1) TO LEFT STOP WITH LASER INTERFACE CARRIAGE HANDLE (2).

(2) SECURE HOD/IVD ALIGNMENT ASSEMBLY 13083078-39 (3) TO SENSOR MOUNT ASSEMBLY 2A1A2A4A10. PRESS PROCEED WHEN COMPLETE.

(3) CONNECT MAJOR TEST ADAPTER 13083633-19 TO PIU A9A2-J1.

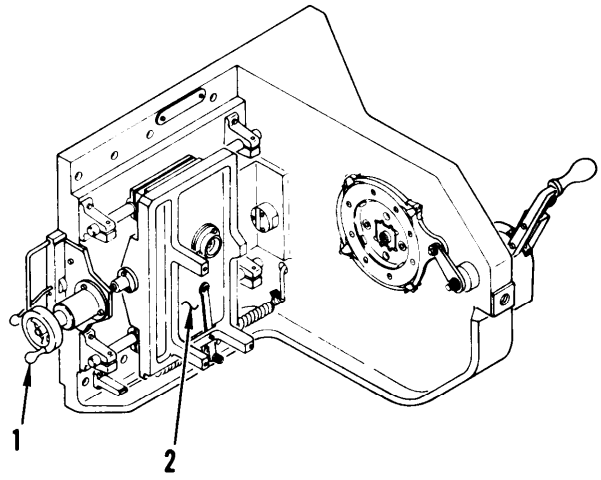
Refer to paragraph 2-65 for installation procedure.

(4) INSTALL PERSONALITY CARD 13082365-P2 IN MAJOR TEST ADAPTER 13083633-19 SLOT A7.

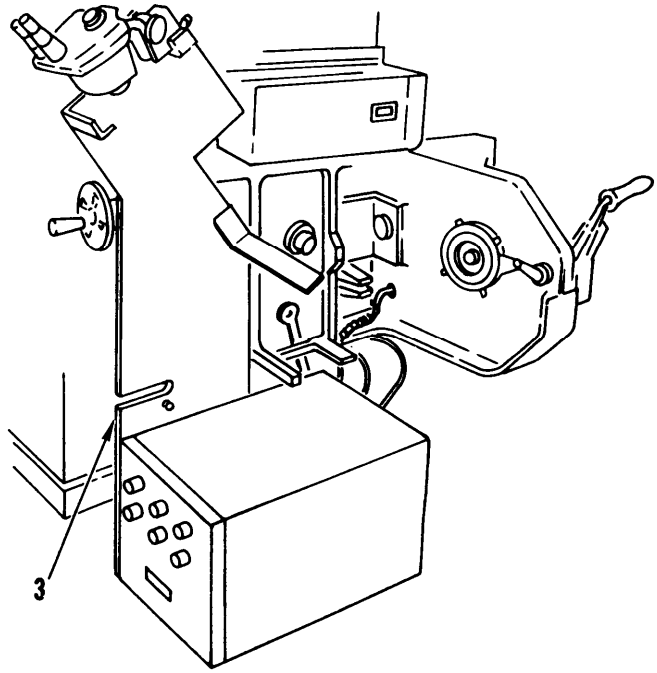
Refer to paragraph 2-69 for installation procedure.

(5) INSTALL PERSONALITY CARD 13082411-P2 IN MAJOR TEST ADAPTER 13083633-19 SLOT A9.

Refer to paragraph 2-69 for installation procedure.



EL9LQ-610-63



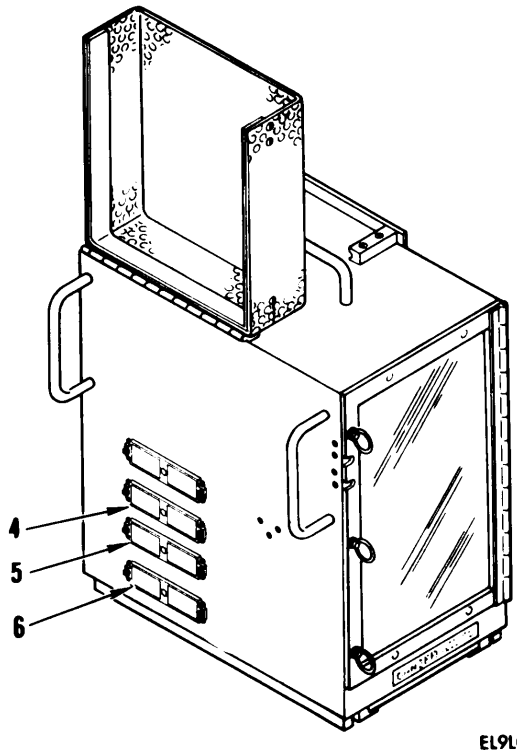
EL9LQ-600-20

(6) CONNECT CABLE 13083702-P1 TO MAJOR TEST ADAPTER 13083633-J2 (4).

(7) CONNECT CABLE 13083702-P2 TO MAJOR TEST ADAPTER 13083633-J3 (5). PRESS PROCEED WHEN COMPLETE.

(8) INSTALL CABLE ASSEMBLY 13082730 AS FOLLOWS:

P1 TO MAJOR TEST ADAPTER 13083633 J4 (6)
P3 TO AN/USM-410 DIU A1A4-J26
P4 TO AN/USM-410 DIU A1A4-J32
P5 TO AN/USM-410 DIU A1A4-J1
P6 TO AN/USM-410 DIU A1A4-J2
P9 TO AN/USM-410 DIU A1A4-J29
P10 TO AN/USM-410 DIU A1A4-J30
P11 TO AN/USM-410 DIU A1A4-J34
P12 TO AN/USM-410 DIU A1A4-J36
P13 TO AN/USM-410 YIU A1A4-J110
P14 TO AN/ USM-410 YIU A1A4-J109
PRESS PROCEED WHEN COMPLETE



EL9LQ-730-49A

(9) CONNECT CABLE 13083702 AS FOLLOWS:

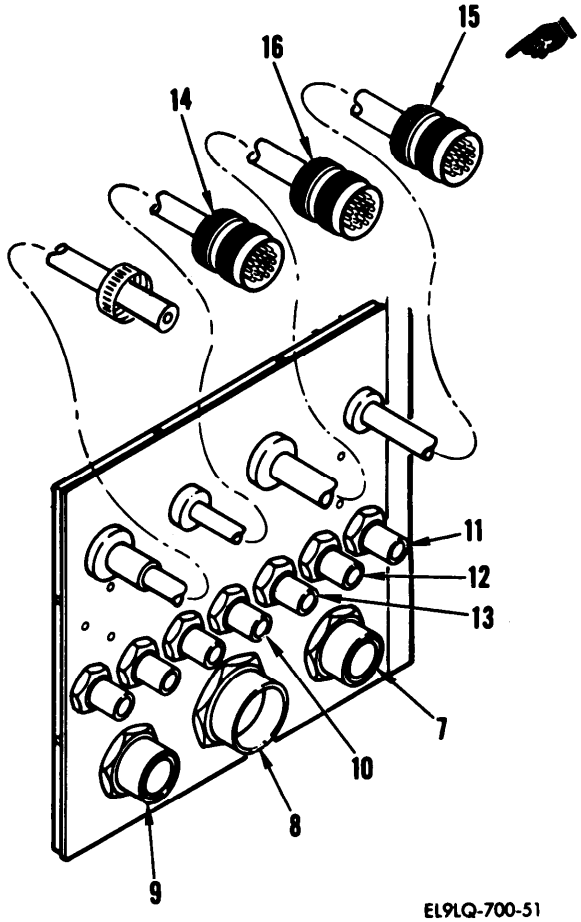
P4 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J2 (7)
P5 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J3 (8)
P6 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J4 (9)
P8 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J8 (10)
P9 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J9 (11)
P10 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J10 (12)
P11 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-J11 (13)
PRESS PROCEED WHEN COMPLETE.

(10) CONNECT SELF-TEST CONNECTOR 13083962-419 TO CABLE 13083702-P3.

(11) CONNECT SELF-TEST CONNECTOR 13083962-429 TO HOD/IVD ALIGNMENT ASSEMBLY 13083078-P3 (14).

(12) CONNECT SELF-TEST CONNECTOR 13083962-439 TO HOD/IVD ALIGNMENT ASSEMBLY 13073702-P2 (15).

(13) CONNECT SELF-TEST CONNECTOR 13083962-449 TO HOD/IVD ALIGNMENT ASSEMBLY 13083702-P4 (16).



EL9LQ-700-51

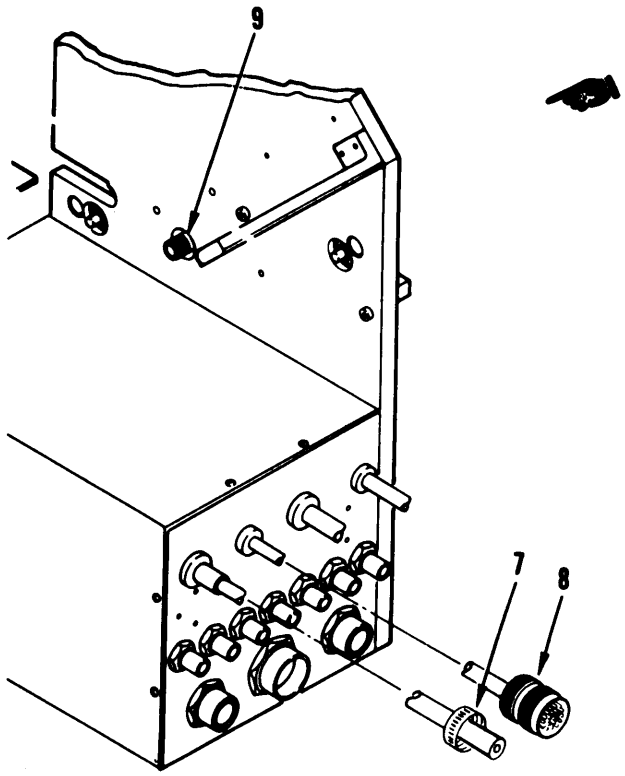
(14) CONNECT HDD/IVD ALIGNMENT ASSEMBLY 13083078-P1 (7) 13083078-J12 (8). PRESS PROCEED WHEN COMPLETE.

(15) DISCONNECT SELF-TEST CONNECTOR 13083962-429 FROM HDD/IVD ALIGNMENT ASSEMBLY 13083078-P3 (8). PRESS PROCEED WHEN COMPLETE.

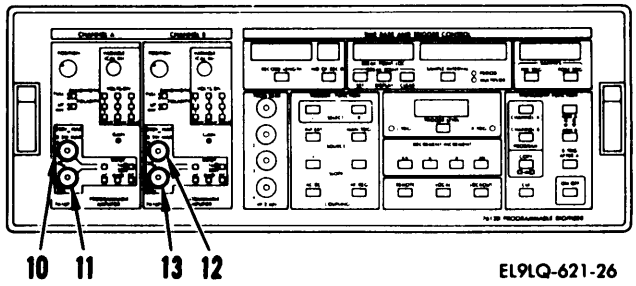
(16) VERIFY HDD/IVD ALIGNMENT ASSEMBLY 13083078-P1 CONNECTED TO 13083078-J12 (9). PRESS PROCEED WHEN COMPLETE.

(17) CONNECT CABLE 13083702-P13 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT A (10).
CONNECT CABLE 13083702-P14 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT B (11).
CONNECT CABLE 13083702-P15 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT A (12).
CONNECT CABLE 13083702-P16 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT B (13). PRESS PROCEED WHEN COMPLETE.

(18) DISCONNECT CABLE 13083702-P13 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT A (10).
DISCONNECT CABLE 13083702-P14 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT B (11).
DISCONNECT CABLE 13083702-P15 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT A (12).
DISCONNECT CABLE 13083702-P16 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT B (13).
CONNECT CABLE 13083702-P18 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT A (10).
CONNECT CABLE 13083702-P20 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT B (11).
CONNECT CABLE 13083702-P21 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT A (12).
CONNECT CABLE 13083702-P22 TO TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT B (13). PRESS PROCEED WHEN COMPLETE.



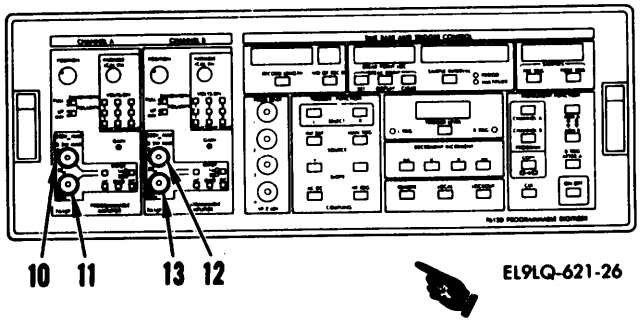
EL9LQ-700-50



EL9LQ-621-26

(19) DISCONNECT CABLE 13083702-P18 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT A (10).
DISCONNECT CABLE 13083702-P20 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL A INPUT B (11).
DISCONNECT CABLE 13083702-P21 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT A (12).

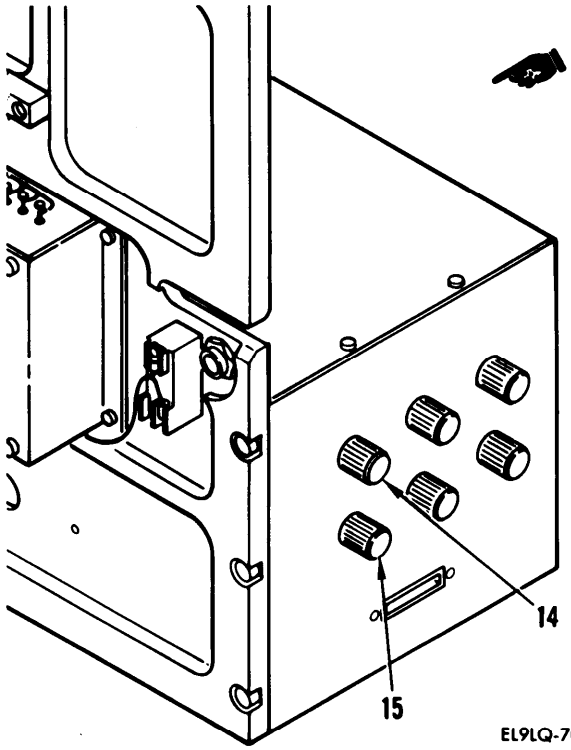
DISCONNECT CABLE 13083702-P22 FROM PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT B (13).
CONNECT CABLE 13083702-P19 TO PROGRAMMABLE DIGITIZER 2A2A1 CHANNEL B INPUT B (13). PRESS PROCEED WHEN COMPLETE.



EL9LQ-621-26

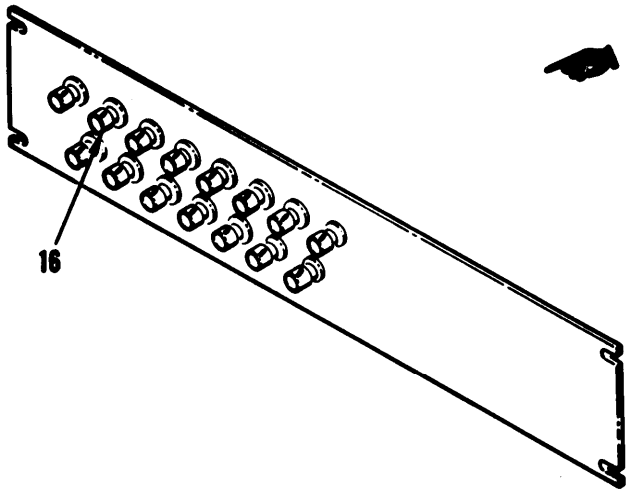
(20) ADJUST HOD/IVD ALIGNMENT ASSEMBLY 13083078 BRIGHTNESS (14) AND CONTRAST CONTROL KNOBS (15) FULLY COUNTERCLOCKWISE. PRESS PROCEED WHEN COMPLETE.

(21) ADJUST HOD/IVD ALIGNMENT ASSEMBLY 13083078 BRIGHTNESS (14) AND CONTRAST CONTROL KNOBS (15) FULLY CLOCKWISE. PRESS PROCEED WHEN COMPLETE.

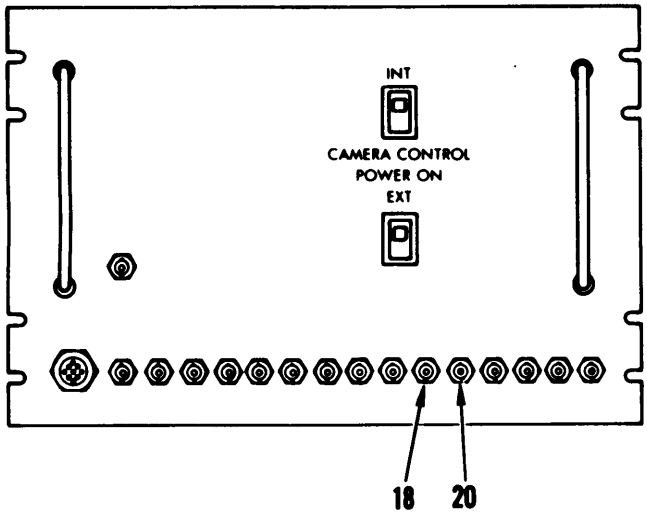


EL9LQ-700-49

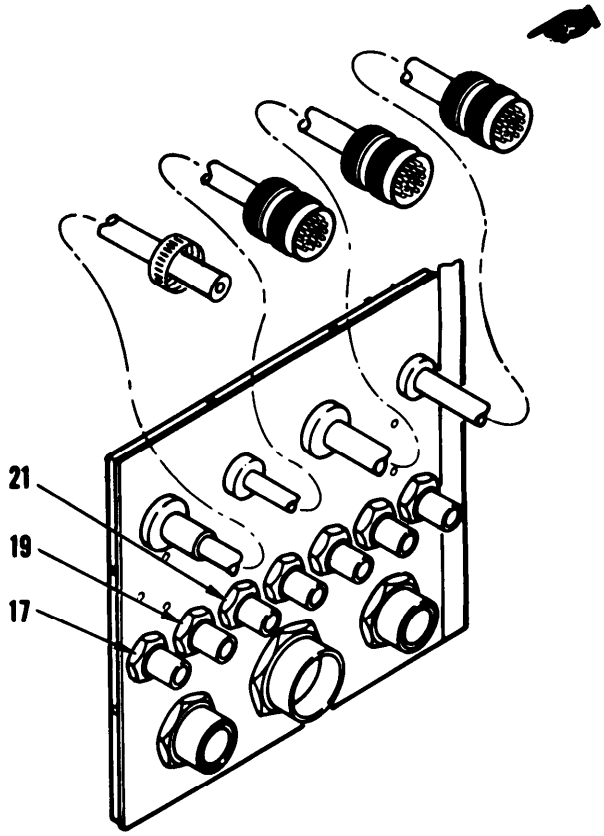
2-17. OPERATOR INSTRUCTION MESSAGES (cont) 2-17



EL9LQ-620-39



EL9LQ-627-32

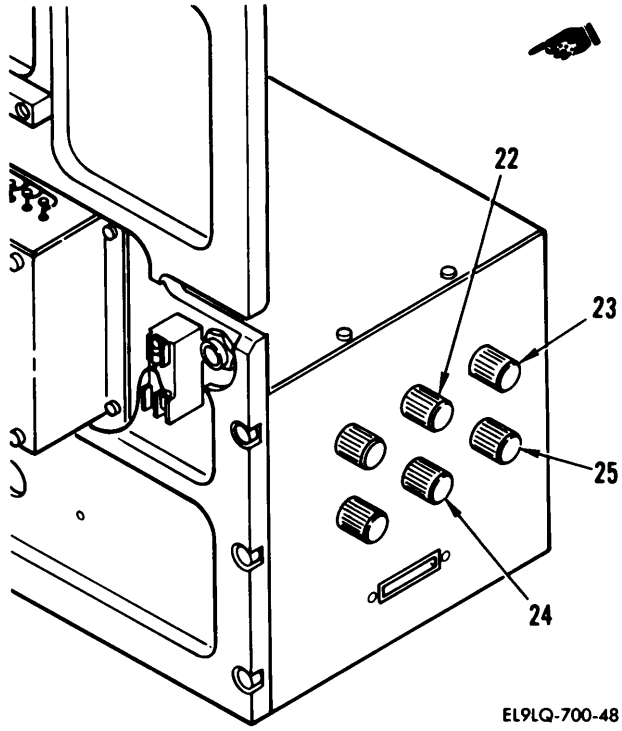


EL9LQ-700-44

(23) ADJUST HOD/IVD ALIGNMENT ASSEMBLY 13083078 V SPACING (22), V POSITION (23), H SPACING (24), AND H POSITION (25) CONTROL KNOBS FULLY CLOCKWISE. PRESS PROCEED WHEN COMPLETE.

(24) ADJUST HOD/IVD ALIGNMENT ASSEMBLY 13083078 V SPACING (22), V POSITION (23), H SPACING (24), AND H POSITION (25), CONTROL KNOBS FULLY COUNTERCLOCKWISE. PRESS PROCEED WHEN COMPLETE.

(25) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



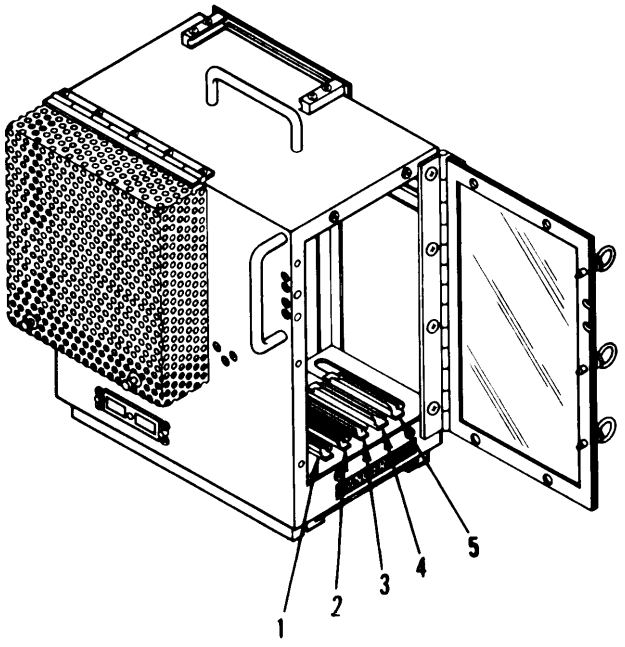
EL9LQ-700-48

aj. OSACABLE MESSAGES (OSA ONLY)

(1) INSTALL MAJOR TEST ADAPTER 13083633-19 IN AH-64A TEST SET/PIU CONNECTOR A1A9J1 AND CLOSE LOCKING LEVER. VERIFY THAT NO PERSONALITY CARDS INSERTED IN MAJOR TEST ADAPTER CONNECTORS A5 (1), A6 (2), A7 (3), A8 (4), A9 (5). PRESS PROCEED WHEN COMPLETE.

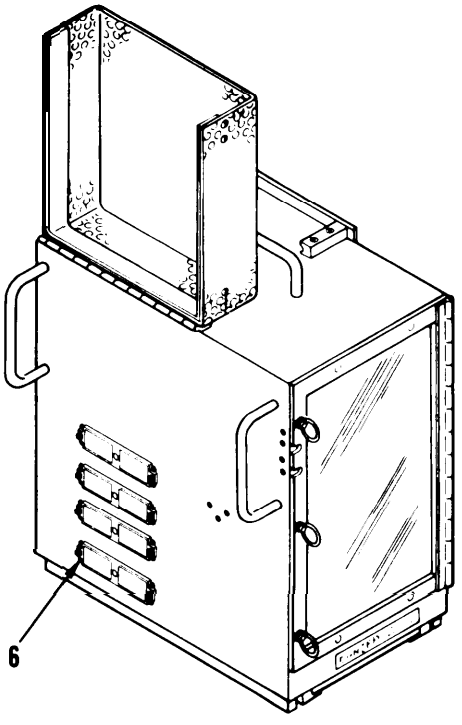
(2) INSTALL CABLE ASSEMBLY 13082730 AS FOLLOWS:

P1 TO MAJOR TEST ADAPTER 13083633-J4 (6)
P3 TO AN/USM-410 DIU A1A4-J26
P4 TO AN/USM-410 D1UA1A4-J32
P5 TO AN/USM-410 DIU A1A4-J1
P6 TO AN/USM-410 DIU A1A4-J2
P7 TO AN/USM-410 DIU A1A4-J9
P9 TO AN/USM-410 DIU A1A4-J29
P10 TO AN/USM-410 DIU A1A4-J30
P11 TO AN/USM-410 DIU A1A4-J34
P12 TO AN/USM-410 DIU A1A4-J36
P13 TO AN/USM-410 INTERFACE STATION A2A13A8J109
P14 TO AN/USM-410 INTERFACE STATION A2A13A8J110
PRESS PROCEED WHEN COMPLETE



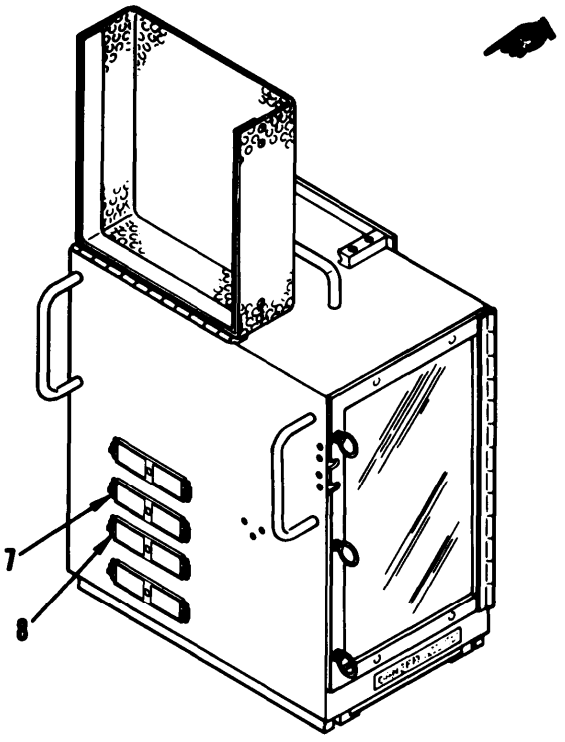
EL9LQ-720-34

(3) OPEN DOOR, IF CLOSED, ON MAJOR TEST ADAPTER. INSTALL P2 OF SIGNAL ROUTING PERSONALITY CARD 13082365 IN ADAPTER CONNECTOR A7 (3). INSTALL P2 OF SPARE PERSONALITY CARD 13082411 IN ADAPTER CONNECTOR A9 (5). CLOSE AND SECURE DOOR ON MAJOR TEST ADAPTER. PRESS PROCEED WHEN COMPLETE.



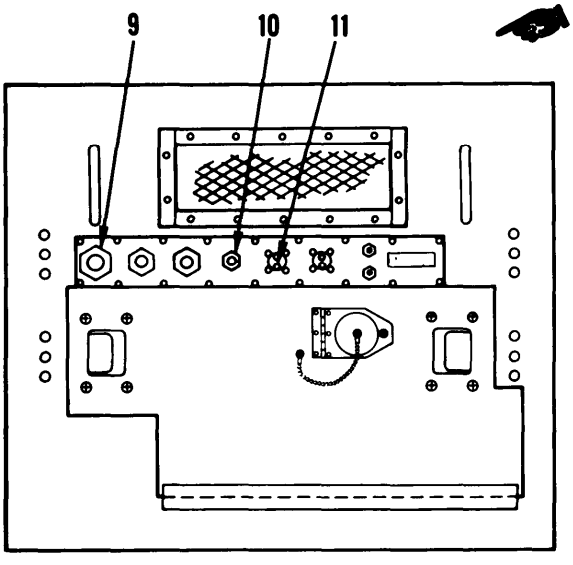
EL9LQ-730-147

(4) 1. CONNECT P1 OF CABLE 13083702 TO MAJOR TEST ADAPTER J2 (7).
2. CONNECT P2 OF CABLE 13083702 TO MAJOR TEST ADAPTER J3 (8).
3. CONNECT P3 OF CABLE 13083702 TO OSA A1A1J1 (9).
4. CONNECT P6 OF CABLE 13083702 TO OSA A1A1J4 (10).
5. CONNECT P1 OF CABLE 13081706-69 TO OSA A1A1J5 (11). CONNECT P2 TO AN/USM-410 DIU A1A4J37.
6. OPEN OSA A1A1 MAIN ACCESS DOOR BY PRESSING THE TWO DOOR LATCHES INWARD (TOWARD CENTER OF DOOR).
7. CONNECT SELF-TEST CONNECTOR 13083962-109 TO P1 OF CABLE 13081945 INSIDE OSA.
8. CONNECT SELF-TEST CONNECTOR 13083962-429 TO P1 OF CABLE 13081979 INSIDE OSA.
9. CONNECT SELF-TEST CONNECTOR 13083962-439 TO P1 OF CABLE 13081934 INSIDE OSA.
10. CLOSE AND SECURE OSA A1A1 MAIN ACCESS DOOR BY PRESSING THE TWO LATCHES OUTWARD (AWAY FROM CENTER). PRESS PROCEED WHEN COMPLETE.



EL9LQ-730-46

(5) 1. DISCONNECT P1 AND P2 OF CABLE 13083702 FROM THE MAJOR TEST ADAPTER.
2. DISCONNECT P3 OF CABLE 13083702 FROM OSA A1A1J1 (9).
3. DISCONNECT P6 OF CABLE 13083702 FROM OSA A1A1J4 (10).
4. DISCONNECT CABLE 13081706-69 FROM OSA A1A1J5 (11) AND AN/USM-410 DIU A1A4J37.
5. OPEN OSA A1A1 MAIN ACCESS DOOR BY PRESSING THE TWO DOOR LATCHES INWARD (TOWARD CENTER OF DOOR).
6. DISCONNECT SELF-TEST CONNECTOR FROM P1 OF CABLE 13081945.
7. DISCONNECT SELF-TEST CONNECTOR FROM P1 OF CABLE 13081979.
8. DISCONNECT SELF-TEST CONNECTOR FROM P1 OF CABLE 13081934. PRESS PROCEED WHEN COMPLETE.



EL9LQ-612-135

(6) 1. CONNECT P1 OF CABLE 13083701 TO MAJOR TEST ADAPTER J2.
2. CONNECT P2 OF CABLE 13083701 TO MAJOR TEST ADAPTER J3.
3. CONNECT P3 OF CABLE 13083701 TO 0SA A1A1J2. PRESS PROCEED WHEN COMPLETE.

(7) CONNECT SELF-TEST CONNECTOR 13083962-519 TO P1 OF CABLE 13081941-19 INSIDE OSA.
CONNECT SELF-TEST CONNECTOR 13083962-529 TO P6 OF CABLE 13083701.
PRESS PROCEED WHEN COMPLETE.

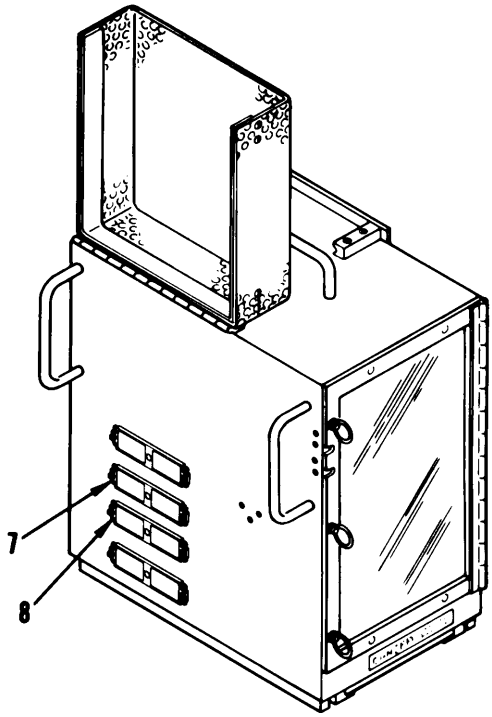
(8) CONNECT P1 OF CABLE 13081706-69 TO PI U STATION A9J2. CONNECT P2 OF CABLE 13081706-69 TO OSA A1A1J17. PRESS PROCEED WHEN COMPLETE.

(9) DISCONNECT P1 OF CABLE 13081706-69 FROM PIU STATION A9J2. DISCONNECT P2 OF CABLE 13081706-69 FROM OSA A1A1J17. PRESS PROCEED WHEN COMPLETE.

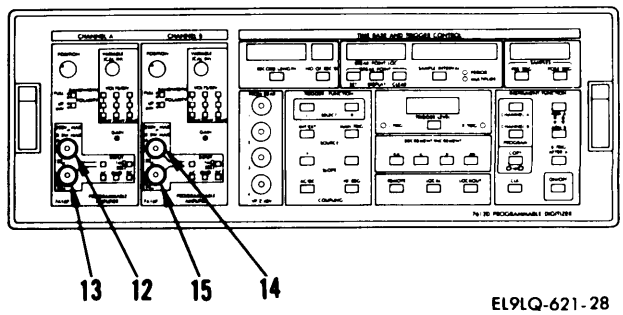
(10) DISCONNECT SELF-TEST CONNECTOR 13083962-529 FROM P6 0F CABLE 13083701. PRESS PROCEED WHEN COMPLETE.

(11) CONNECT P13 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (12).
CONNECTOR P11 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (13).
CONNECT P17 OF CABLE 13073701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (14).
CONNECT P9 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (15). PRESS PROCEED WHEN COMPLETE.

(12) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS AND ADAPTERS.



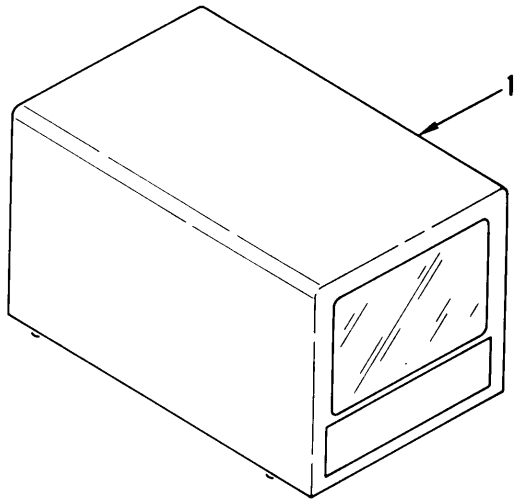
EL9LQ-730-46



EL9LQ-621-28

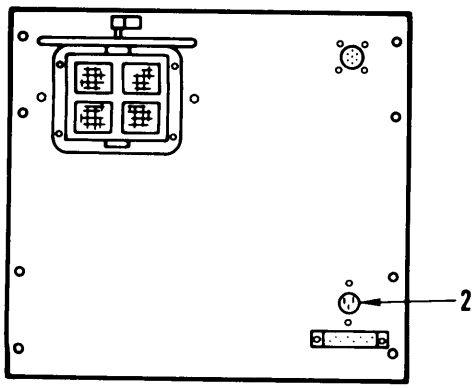
ak. VIDEOST MESSAGES

(1) PLACE THE PORTABLE MONITOR (1) ON THE INTERFACE STATION A13 TABLETOP WITH THE CRT FACING THE OPERATOR. PLUG THE PORTABLE MONITOR POWER CORD INTO THE TEST ADAPTER PANEL ASSEMBLY A2A4J3 (2). PRESS PROCEED WHEN COMPLETE.



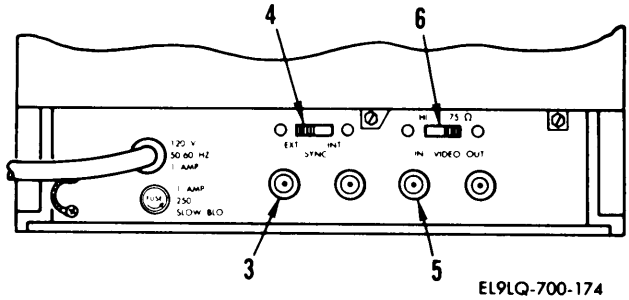
EL9LQ-700-164

(2) 1. CONNECT P7 0F CABLE A3003942 TO INTERFACE STATION A13A8J106.
2. CONNECT CONNECTOR ADAPTER 901-167 TO P3 0F SELF-TEST CABLE A3003942.
3. CONNECT P1 OF CABLE 13081706-69 TO CONNECTOR ADAPTER 901-167 AND CONNECT P2 OF CABLE 13081706-69 TO 'EXT SYNC' CONNECTOR (3) ON REAR PANEL OF PORTABLE MONITOR. SET SYNC SWITCH (4) ON REAR OF MONITOR TO 'EXT'.



EL9LQ-620-49

4. CONNECT SECOND CONNECTOR ADAPTER 901-167 TO P6 0F SELF-TEST CABLE A3003942.
5. CONNECT P1 OF SECOND CABLE 13081706-69 TO THE CONNECTOR ADAPTER AND CONNECTOR P2 TO THE 'VIDEO-IN' CONNECTOR (5) ON REAR PANEL OF THE PORTABLE MONITOR. SET VIDEO SWITCH (6) ON REAR OF MONITOR TO '75 OHMS'. PRESS PROCEED WHEN COMPLETE.



EL9LQ-700-174

(3) AT INTERFACE STATION A13, LOWER THE 'VIDEO TEST GENERATOR' PANEL AND PRESS THE 'POWER' SWITCH/INDICATOR. VERIFY THAT THE INDICATOR LIGHTS. CLOSE AND SECURE THE PANEL.
PLACE THE PORTABLE MONITOR POWER SWITCH (7) TO ON.
PRESS PROCEED WHEN COMPLETE.

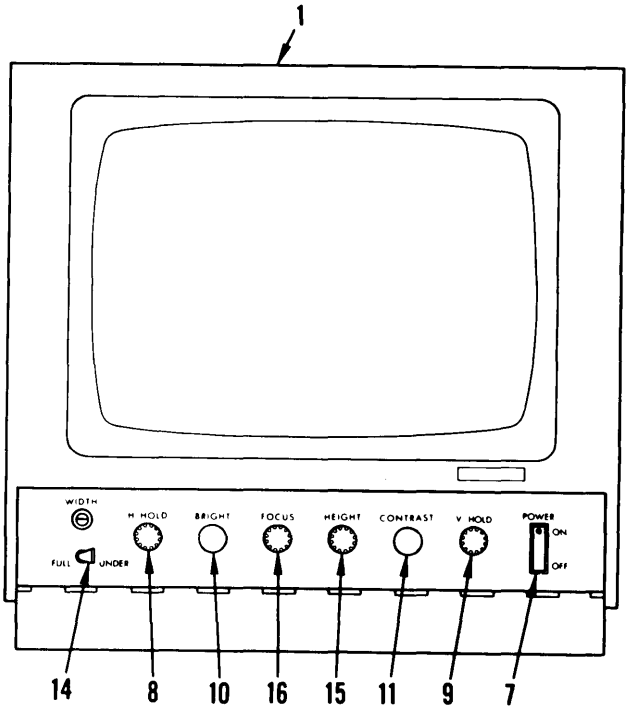
(4) ADJUST THE 'H. HOLD' (8), 'V. HOLD' (9), 'BRIGHTNESS' (10), AND 'CONTRAST' (11) CONTROLS ON THE PORTABLE MONITOR FOR A STABLE DISPLAY.

(5) TURN THE 'BRIGHTNESS' (10) AND 'CONTRAST' (11) CONTROLS ON THE PORTABLE MONITOR FULLY COUNTERCLOCKWISE. THEN TURN THE 'BRIGHTNESS' CONTROL CLOCKWISE UNTIL THE SCREEN JUST STARTS TO ILLUMINATE, THEN COUNTERCLOCKWISE SLIGHTLY TO EXTINGUISH BRIGHTNESS.

(6) TURN THE 'CONTRAST' CONTROL (11) CLOCKWISE UNTIL 10 VERTICAL BANDS OF BRIGHTNESS ARE VISIBLE ON THE SCREEN WITH THE DARKEST BAND ON THE LEFT AND THE BRIGHTEST BAND ON THE RIGHT. ADJUST THE 'BRIGHTNESS' (10) AND 'CONTRAST' (11) CONTROLS ON THE MONITOR SO THAT THE DARKEST BAND APPEARS 'BLACK' AND THE BRIGHTEST BAND IS CLEARLY VISIBLE.
PRESS YES IF ALL 10 BANDS ARE VISIBLE, NO OTHERWISE.

(7) OBSERVE THE PORTABLE MONITOR FOR UNIFORM BRIGHTNESS OVER THE ENTIRE SCREEN.
PRESS YES IF THE UNIFORM BRIGHTNESS IS ACCEPTABLE. NO IF SHADING IS PRESENT, OR IT IS UNACCEPTABLE.

(8) AT INTERFACE STATION A13, LOWER THE 'VIDEO TEST GENERATOR' PANEL AND PRESS THE 'POWER' SWITCH/INDICATOR TO OFF. VERIFY THAT THE INDICATOR GOES OUT. DISCONNECT P1 OF CABLE 13081706-69 FROM CONNECTOR ADAPTER 901-167 LOCATED ON P6 OF SELF-TEST CABLE A3003942. DISCONNECT CONNECTOR ADAPTER FROM P6 0N SELF-TEST CABLE A3003942. CONNECT P1 OF CABLE 13081706-69 TO VHF CABLE ENTRY PANEL 2A2A2J3 (12). PRESS PROCEED WHEN COMPLETE.



(9) DISCONNECT P1 OF CABLE 13081706-69 FROM CONNECTOR ADAPTER 901-167 LOCATED ON P3 OF SELF-TEST CABLE A3003942. DISCONNECT CONNECTOR ADAPTER FROM P3 ON SELF-TEST CABLE A3003942. CONNECT P1 OF CABLE 13081706-69 TO ELECTRONICS DRAWER 2A2A7J19 (13).

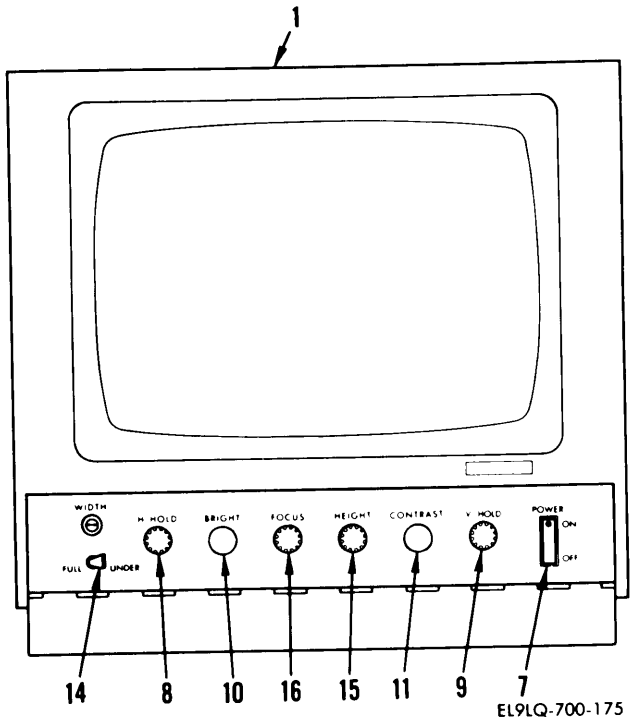
(10) PLACE THE PORTABLE MONITOR 'FULL UNDER SWITCH (14) IN THE UNDER POSITION, TURN THE 'HEIGHT' CONTROL (15) UNTIL THE VERTICAL BORDERS APPROXIMATELY MATCH THE HORIZONTAL BORDERS.
VERIFY THAT THE BORDER IS AB0UT THE SAME ON ALL FOUR SIDES OF THE DISPLAY.
PRESS YES IF THE BORDER IS ACCEPTABLE, AND NO OTHERWISE.

(11) PLACE THE PORTABLE MONITOR 'FULL UNDER' SWITCH (14) IN THE FULL POSITION. VERIFY THAT THE DISPLAY IS NOW COMPLETELY ILLUMINATED AND THE BORDER HAS BEEN. COMPLETELY REM0VED.
PRESS YES IF THE DISPLAY IS COMPLETELY ILLUMINATED, NO OTHERWISE.

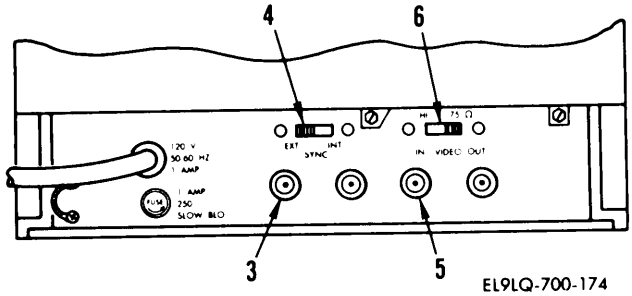
(12) OBSERVE THAT A FINE VERTICAL BAR PATTERN IS VISIBLE ON THE PORTABLE MONITOR. ADJUST THE 'FOCUS' CONTROL (16) TO PRODUCE A SHARP IMAGE ON THE PORTABLE MONITOR- CRT . NOTE: THE MONITOR BRIGHTNESS MAY BE ADJUSTED TO JUST EXTINGUISH THE BACKGROUND BRIGHTNESS, AS NECESSARY.
VERIFY THAT THE DISPLAYED BARS ARE STRAIGHT, STABLE, VERTICAL LINES WHICH ARE CLEARLY VISIBLE.
PRESS YES IF THE IMAGE IS ACCEPTABLE, NO IF THE IMAGE IS UNACCEPTABLE.

(13) PLACE THE PORTABLE MONITOR 'POWER' SWITCH (7) TO OFF.
DISCONNECT P1 OF CABLE 13081706-69 FROM VHF CABLE ENTRY PANEL A2A2J3 (12).
DISCONNECT P2 FROM 'VIDEO-IN' CONNECTOR (5) ON PORTABLE MONITOR .
DISCONNECT P1 OF CABLE 13081706-69 FROM ELECTRONICS DRAWER A2A7J19 (13).
DISCONNECT P2 FROM 'EXT SYNC' CONNECTOR (3) ON PORTABLE MONITOR.
PRESS PROCEED WHEN COMPLETE.

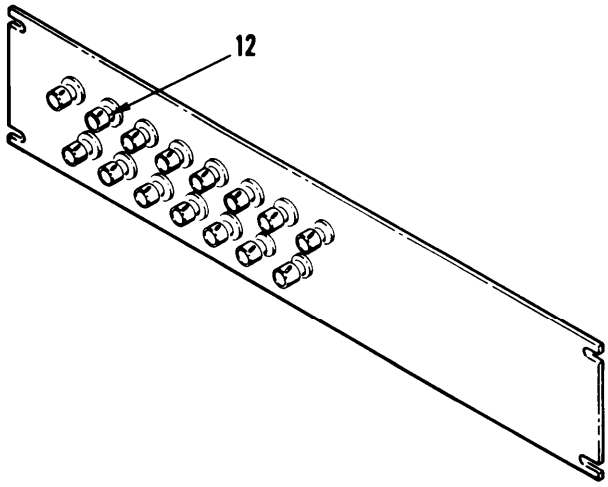
(14) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR ADAPTER 13083633. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS , AND ADAPTERS.



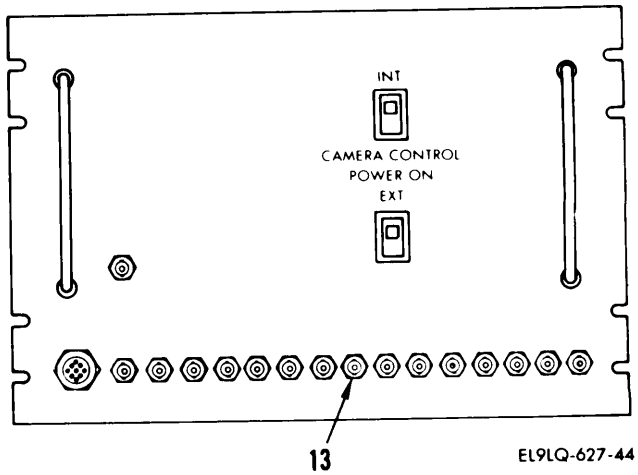
EL9LQ-700-175



EL9LQ-700-174



EL9LQ-620-48



EL9LQ-627-44

al. IVD MESSAGES

(1) INSTALL MAJOR TEST ADAPTER 13083633-19 IN PIU STATION A9J1 AND CLOSE LOCKING LEVER.

Refer to paragraph 2-65 for installation.

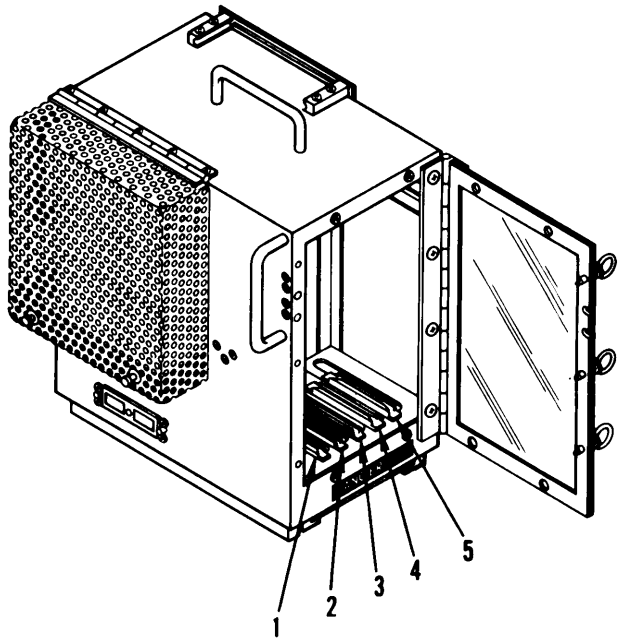
VERIFY THAT NO PERSONALITY CARDS ARE INSERTED IN MAJOR TEST ADAPTER CONNECTORS A5 (l), A6 (2), A7 (3), A8 (4),A9 (5). PRESS PROCEED WHEN COMPLETE.

(2) INSTALL CABLE ASSEMBLY 13082730 AS FOLLOWS:

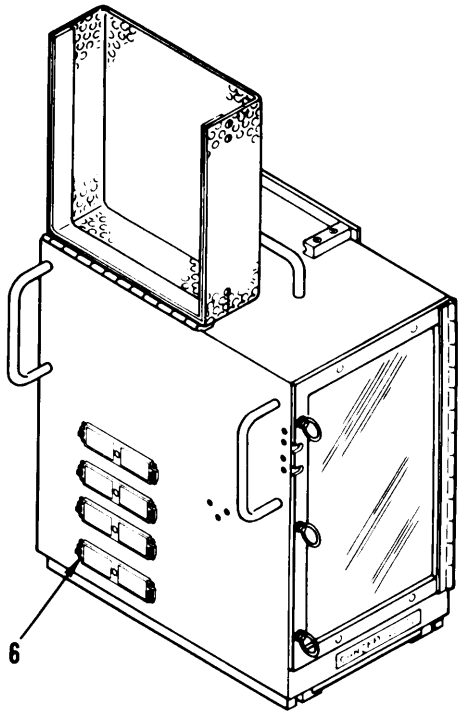
P1 TO MAJOR TEST ADAPTER 13083633-J4 (6).
P3 T0 AN/USM-410 DIU A1A4-J26
P4 T0 AN/USM-410 DIU A1A4-J32
P5 T0 AN/USM-410 DIU A1A4-J1
P6 T0 AN/USM-410 DIU A1A4-J2
P9 TO AN/USM-410 DIU A1A4-J29
P10 TO AN/USM-410 DIU A1A4-J30
P11 TO AN/USM-410 DIU A1A4-J34
P12 TO AN/USM-410 DIU A1A4-J36
P13 TO AN/USM-410 YIU A8-J110
P14 T0 AN/USM-410 YIU A8-J109
PRESS PROCEED WHEN COMPLETE.

(3) INSTALL PERSONALITY CARD SET IN MAJOR TEST ADAPTER AS FOLLOWS:

OPEN DOOR, IF CLOSED, ON MAJOR TEST ADAPTER.
INSTALL P2 0F SIGNAL ROUTING PERSONALITY CARD 13082365 IN MAJOR TEST ADAPTER CONNECTOR A7 (3).
INSTALL P2 0F SPARE PERSONALITY CARD 13082411 IN MAJOR TEST ADAPTER CONNECTOR A9 (5).
CLOSE AND SECURE DOOR ON MAJOR TEST ADAPTER.
PRESS PROCEED WHEN COMPLETE.



EL9LQ-720-34



EL9LQ-730-47

(4) OPTICAL ALIGNMENT ASSEMBLY INSTALLATION. THE PURPOSE OF THIS PROCEDURE IS TO MOUNT THE OPTICAL ALIGNMENT ASSEMBLY 13083078-39 TO THE DAYSIDE TEST BENCH A1.

1. HOLDING THE OPTICAL ALIGNMENT ASSEMBLY (7) AT THE LOWER LEFT CORNER AND UPPER RIGHT UUT SUPPORT, REST THE LOWER "Z" SHAPED BRACKET, LOCATED ON THE REAR OF THE OPTICAL ALIGNMENT ASSEMBLY ONTO THE TWO LOWER SECURING POSTS (8) AND (9) OF THE DAYSIDE TEST BENCH.

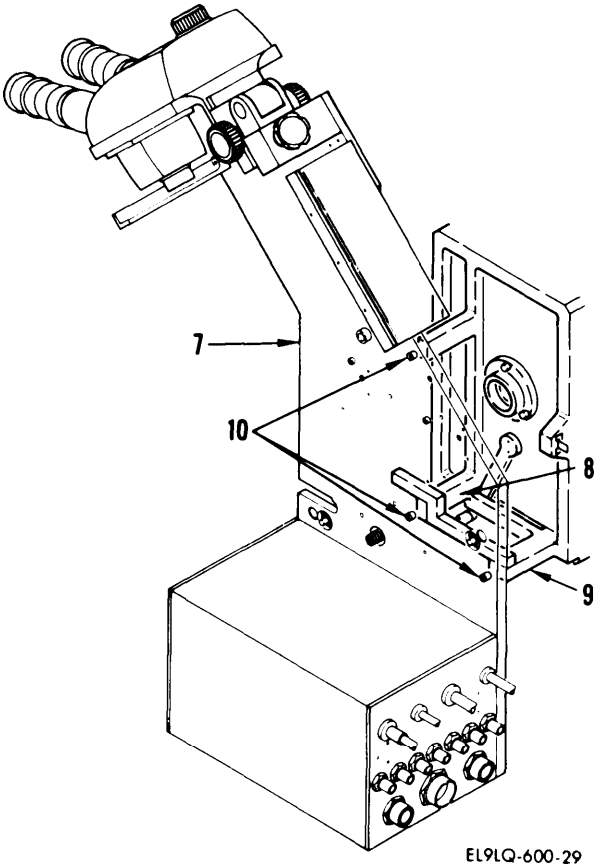
2. SLIDE THE OPTICAL ALIGNMENT ASSEMBLY TO THE LEFT UNTIL THE "Z" BRACKET IS FIRMLY AGAINST THE LOWER LEFT SECURING POST (8). THE OPTICAL ALIGNMENT ASSEMBLY IS NOW APPROXIMATELY ALIGNED WITH THE THREE MOUNTING SCREW HOLES IN THE UPPER AND LOWER SECURING POSTS.

PRESS PROCEED FOR ADDITIONAL INSTRUCTIONS.

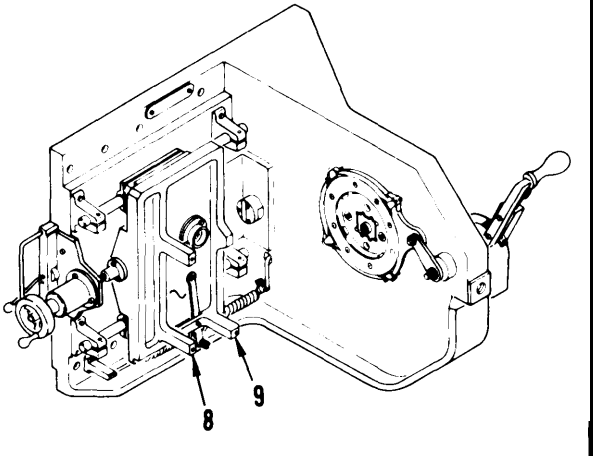
3. WHILE SUPPORTING THE OPTICAL ALIGNMENT ASSEMBLY (7) WITH ONE HAND, INSERT AND START THE THREE, ALLEN-HEAD SCREWS (10) INTO THEIR MOUNTING HOLES UNTIL THE SCREWS ARE HAND-TIGHT. D0 NOT FORCE THE SCREWS OR INSERT THEM INTO THE MOUNTING HOLES AT AN ANGLE.

4. USING A 5/32-IN ALLEN WRENCH, TIGHTEN THE ALLEN-HEAD SCREWS (10) UNTIL THEY ARE SNUG AND THE OPTICAL ALIGNMENT ASSEMBLY IS SECURELY FASTENED. DO NOT OVER -TIGHTEN THE ALLEN-HEAD SCREWS.

PRESS PROCEED WHEN COMPLETE.

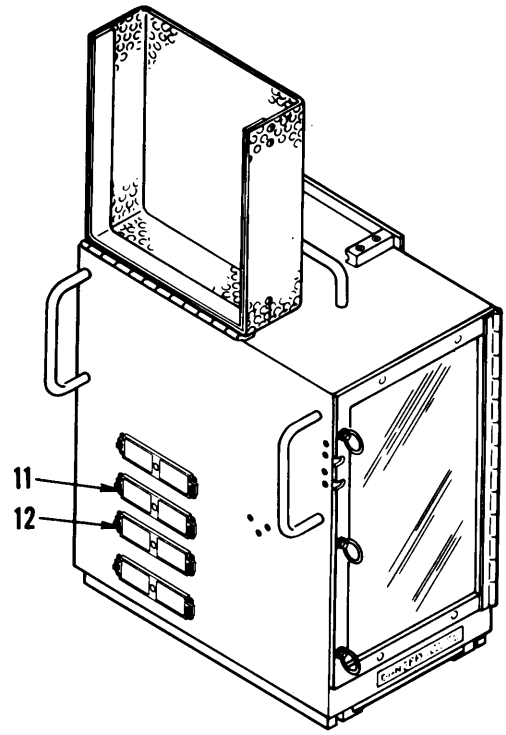


EL9LQ-600-29



EL9LQ-610-74

(5) 1. CONNECT P1 OF CABLE 13083701 TO MAJOR TEST ADAPTER J2 (11).
2. CONNECT P2 OF CABLE 13083701 TO MAJOR TEST ADAPTER J3 (12).
PRESS PROCEED WHEN COMPLETE.
3. CONNECT P3 OF CABLE 13083701 TO A1A1J2 (13). PRESS PROCEED WHEN COMPLETE.

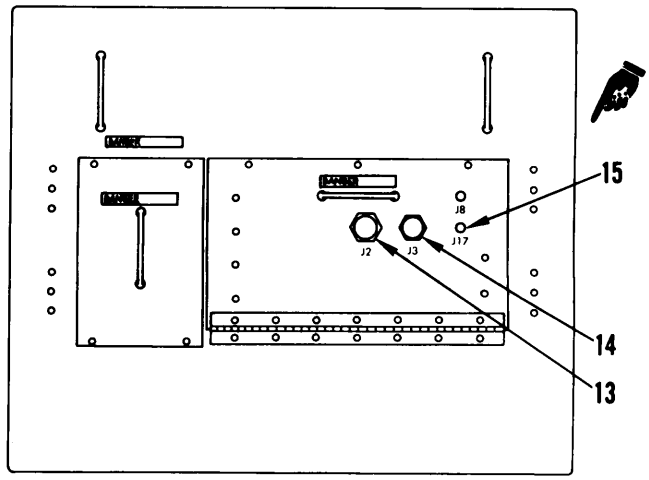


EL9LQ-730-48

(6) CONNECT P1 OF CABLE 13230911 TO A1A1J3 (14). CONNECT SELF-TEST CONNECTOR 13083962-519 TO P2 OF CABLE 13230911, CONNECT SELF-TEST CONNECTOR 13083962-529 TO P6 0F CABLE 13083701. PRESS PROCEED WHEN COMPLETE.

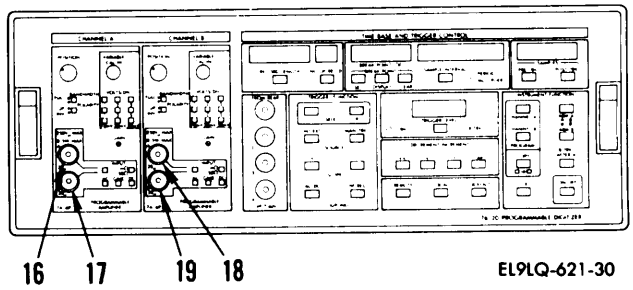
(7) CONNECT P1 (IF CABLE 13081706-69 TO PIU STATION A9J2. CONNECT P2 OF CABLE 13081706-69 TO A1A1J17 (15). PRESS PROCEED WHEN COMPLETE.

(8) DISCONNECT P1 OF CABLE 13081706-69 FROM PIU STATION A9J2. DISCONNECT P2 OF CABLE 13081706-69 FROM A1A1J17 (15). PRESS PROCEED WHEN COMPLETE.



EL9LQ-612-139

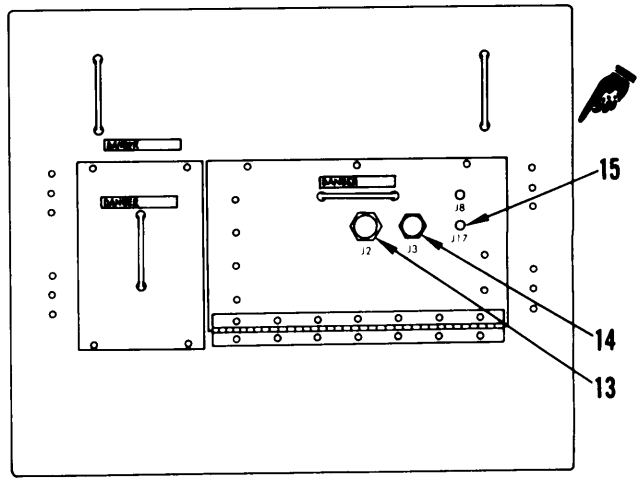
(9) DISCONNECT SELF -TEST CONNECTOR 13083962-529 FROM P6 OF CABLE 13083701. PRESS PROCEED WHEN COMPLETE.



EL9LQ-621-30

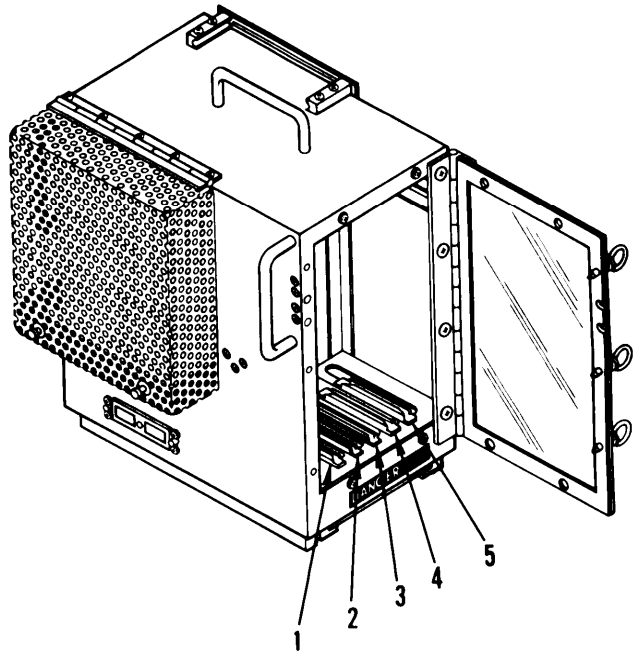
(10) CONNECT P13 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (16), CONNECT P11 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17). CONNECT P17 OF CABLE 13083701 TO PR0GRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (18). CONNECT P9 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). PRESS PROCEED WHEN COMPLETE.

(11) DISCONNECT P13 OF CABLE 13083701 FROM PR0GRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (16). DISCONNECT P11 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17). DISCONNECT P17 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (18). DISCONNECT P9 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). DISCONNECT SELF-TEST CONNECT0R 13083962-519 FROM P2 OF CABLE 13230911 AND DISCONNECT CABLE 13230911 FROM A1A1J3 (14). PRESS PROCEED WHEN COMPLETE.



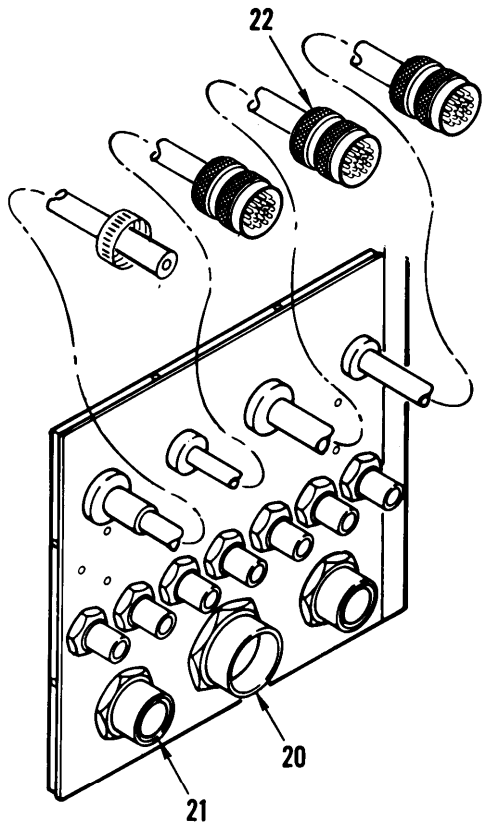
EL9LQ-612-139

(12) OPEN DOOR ON MAJOR ADAPTER. INSTALL P1 OF PROGRAMMABLE RESISTOR CARD 13083641 IN MAJOR TEST ADAPTER CONNECTOR A6 (2). CLOSE AND SECURE DOOR ON MAJOR ADAPTER. PRESS PROCEED WHEN COMPLETE.



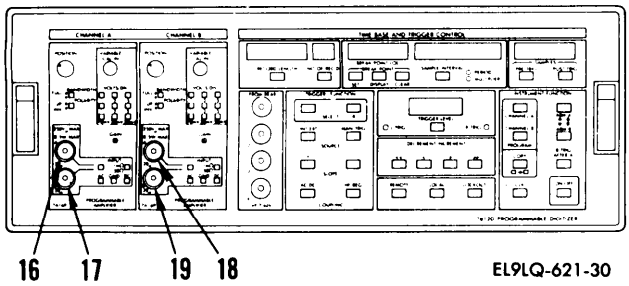
EL9LQ-720-34

(13) 1. CONNECT P6 OF CABLE 13083701 TO J3 (20) OF OPTICAL ALIGNMENT ASSEMBLY 13083078.
2. CONNECT P7 OF CABLE 13083701 TO J4 (21) OF OPTICAL ALIGNMENT ASSEMBLY 13083078.
3. CONNECT SELF-TEST' CONNECTOR 13083962-559 TO P4 (22) OF OPTICAL ALIGNMENT ASSEMBLY CABLE 13083078. PRESS PROCEED WHEN COMPLETE.

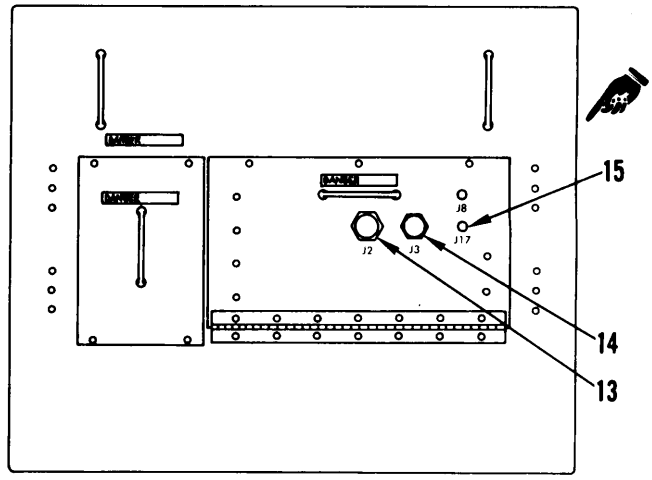


EL9LQ-700-197

(14) 1. CONNECT TEE CONNECTOR TO A1A1J17 (15).
2. CONNECT P8 OF CABLE 13083701 TO TEE CONNECTOR AT A1A1J17.
3. CONNECT P1 OF CABLE 13081706 TO TEE CONNECTOR AT A1A1J17 AND CONNECT P2 OF CABLE 13081706 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (18). PRESS PROCEED WHEN COMPLETE.

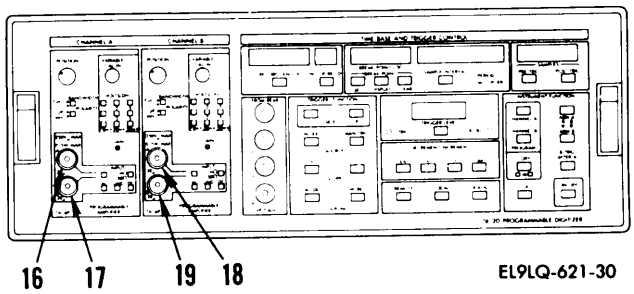


EL9LQ-621-30



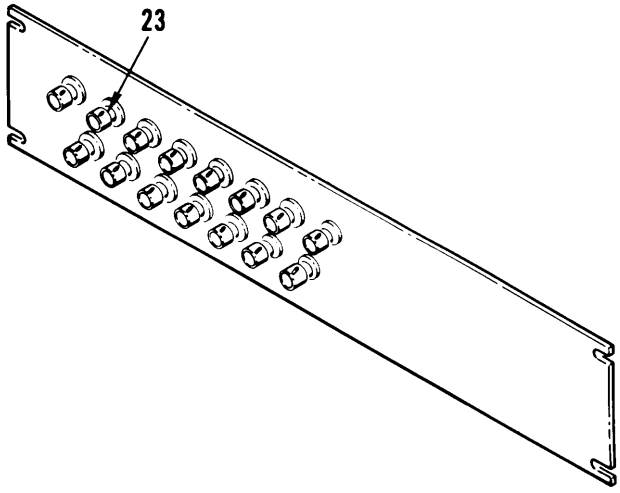
EL9LQ-612-139

(15) 1. CONNECT TEE CONNECTOR TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19).



EL9LQ-621-30

2. CONNECT P1 OF CABLE 13081706-29 TO TEE CONNECTOR ON PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B AND CONNECT P2 OF CABLE 13081706-29 TO A2A2J3 (23).



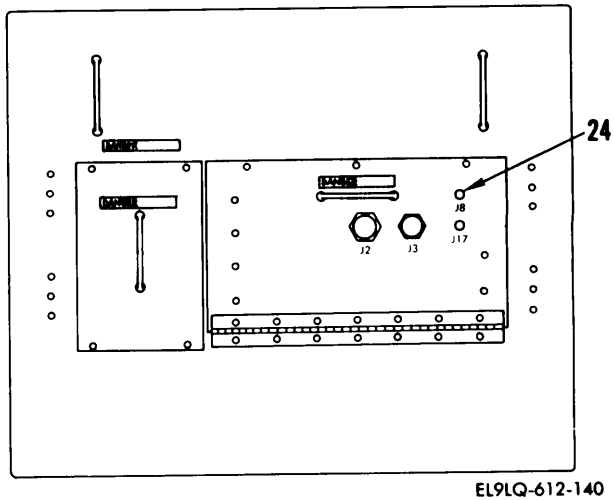
EL9LQ-620-51

3. CONNECT P1 OF CABLE 13081706 TO TEE CONNECTOR ON PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B AND CONNECT P2 OF CABLE 13081706 TO A1A1J8 (24). PRESS PROCEED WHEN COMPLETE.

APPROXIMATELY 5 MINUTES DELAY FOR WARMUP.

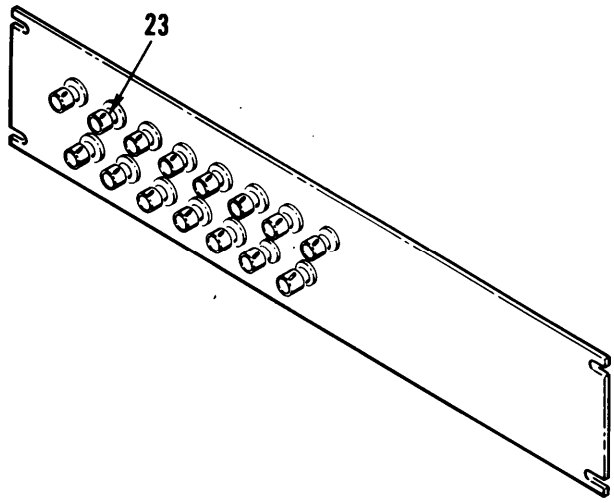
APPROXIMATELY 15 TO 45 SECONDS DELAY.

APPROXIMATELY 30 SECONDS TO 1 MINUTE DELAY DURING AUTOMATIC VIDEO SIGNAL ADJUSTMENT.



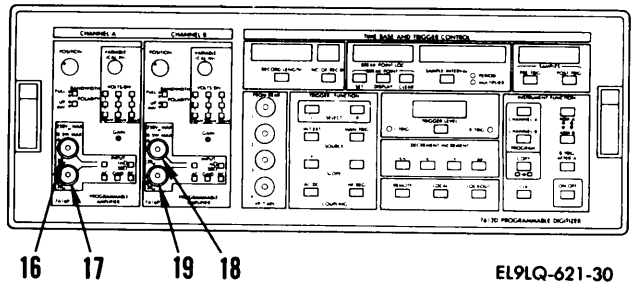
EL9LQ-612-140

(16) 1. DISCONNECT P1 OF CABLE 13081706-29 FROM TEE CONNECTOR AND P2 0F CABLE 13081706-29 FROM VHF CABLE ENTRY PANEL A2A2J3 (23).
2. DISCONNECT P1 OF CABLE 13081706 FROM TEE CONNECTOR AND CONNECT IT TO VHF CABLE ENTRY PANEL A2A2J3.
3. DISCONNECT TEE CONNECTOR FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). PRESS PROCEED WHEN COMPLETE.



EL9LQ-620-51

(17) 1. CONNECT P13 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (16).
2. CONNECT P14 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17).
3. CONNECT P16 OF CABLE 13083701 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). PRESS PROCEED WHEN COMPLETE.



EL9LQ-621-30

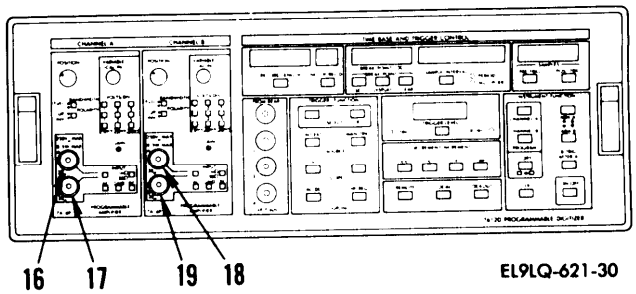
APPROXIMATELY 1 TO 5 MINUTES DELAY DURING AUTOMATIC CONTRAST ADJUSTMENT.

APPROXIMATELY 15 T0 45 SECONDS DELAY.

GRAY SCALE GAIN ADJUSTMENT IN PROGRESS.

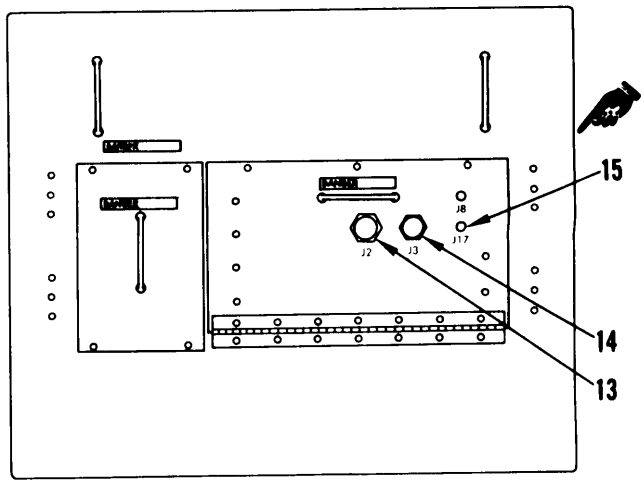
APPROXIMATELY 5 TO 7 MINUTES DELAY FOR THIS ADJUSTMENT WITH THE POSSIBILITY OF UP TO 35 MINUTES DELAY.

(18) 1. DISCONNECT P13 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (16).
2. DISCONNECT P14 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17).
3. DISCONNECT P16 0F CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). PRESS PROCEED WHEN COMPLETE.



EL9LQ-621-30

(19) 1. DISCONNECT P1 OF CABLE 13081706 FROM A1AkJ17 (15) AND DISCONNECT P2 OF CABLE 13081706 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (18).
2. DISCONNECT P8 OF CABLE 13083701 FROM TEE CONNECTOR AT A1A1J17 (15).
3. DISCONNECT TEE CONNECTOR FROM A1A1J17 (15). PRESS PROCEED WHEN COMPLETE.

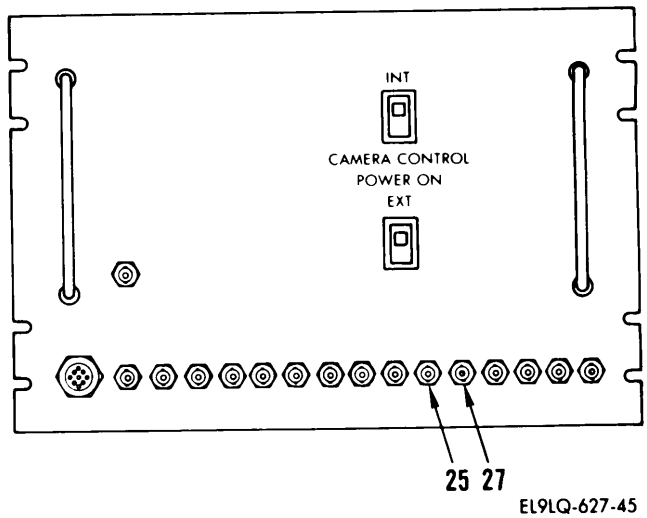


EL9LQ-612-139

(20) 1. CONNECT P18 OF CABLE 13083701 TO PR0GRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17).
2. CONNECT P1 OF CABLE 13081706 TO A2A7J21 (25) AND CONNECT P2 OF CABLE 13081706 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19).

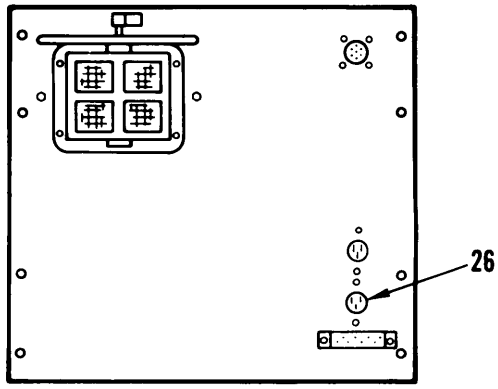
(21) 1. DISCONNECT P18 OF CABLE 13083701 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17). PRESS PROCEED WHEN COMPLETE.
2. DISCONNECT P1 OF CABLE 13081706 FROM A2A7J21 (25) AND DISCONNECT P2 OF CABLE 13081706 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT B (19). PRESS PROCEED WHEN COMPLETE.

(22) 1. CONNECT P13 OF CABLE 13083701 TO PR0GRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT A (16).
2. CONNECT CURRENT PROBE AMPLIFIER TYPE 134 TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17).
3. SET CURRENT/DIV KN0B OF CURRENT PROBE AMPLIFIER TO 1 A.
4. SET DEFLECTION FACTOR SWITCH OF CURRENT PROBE AMPLIFIER TO P6021/0.4 MV.
5. CONNECT BNC CONNECTOR OF AC CURRENT PROBE P6021 TO CURRENT PROBE AMPLIFIER. PRESS PROCEED FOR ADDITIONAL INSTRUCTI0NS.



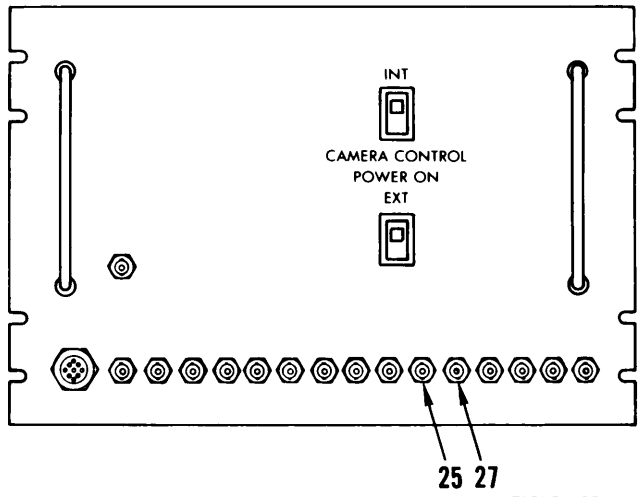
EL9LQ-627-45

6. CONNECT DC POWER INPUT OF CURRENT PROBE AMPLIFIER TO DC POWER OUTPUT OF POWER SUPPLY FOR TYPE 134 (015-0058-01).
7. CONNECT AC POWER CORD PLUG OF POWER SUPPLY INTO E/O BENCH A2A4J3 (26).
8. CONNECT P1 OF CABLE 13081706 T0 PROGRAMMABLE DIGITIZER CHANNEL B INPUT A (18) AND P2 TO EOB ELECTRONICS DRAWER J22 (27).
9. CONNECT CURRENT PROBE TIP TO LOOP IN SHORTING PLUG 13083962-559. NOTE: CURRENT PROBE TIP ARROW MUST POINT TO SAME DIRECTION AS SHORTING PLUG ARROW. PRESS PROCEED WHEN COMPLETE.

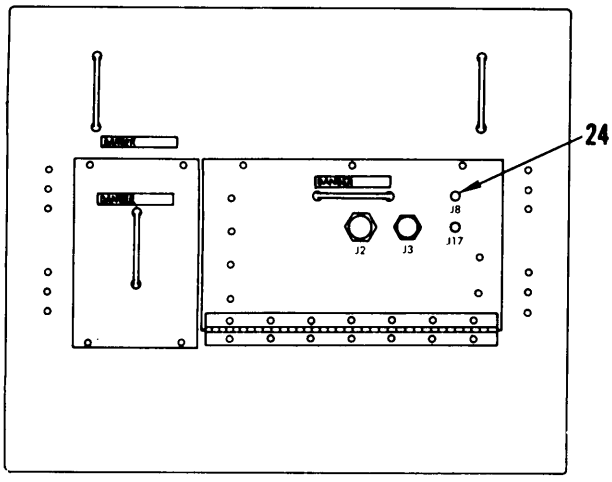


EL9LQ-620-52

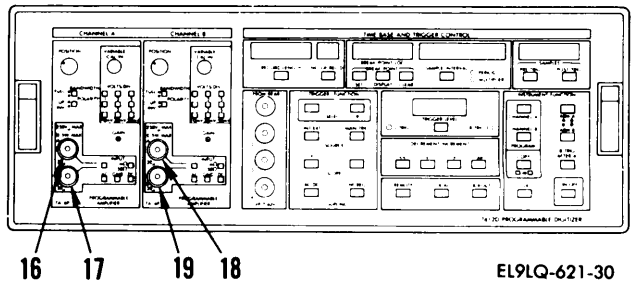
(23) 1. DISCONNECT CURRENT PROBE TIP FROM LOOP IN SHORTING PLUG 13083962-559.
2. DISCONNECT AC POWER CORD PLUG OF POWER SUPPLY FROM E/O BENCH A2A4J3 (26).
3. DISCONNECT DC POWER INPUT OF CURRENT PROBE AMPLIFIER FROM DC POWER OUTPUT OF POWER SUPPLY FOR TYPE 134 (015-0058-01).
4. DISCONNECT BNC CONNECTOR OF AC CURRENT PROBE P6021 FROM CURRENT PROBE AMPLIFIER.
5. DISCONNECT CURRENT PROBE AMPLIFIER TYPE 134 FROM PROGRAMMABLE DIGITIZER A2A1 CHANNEL A INPUT B (17). PRESS PROCEED WHEN COMPLETE.



EL9LQ-627-45



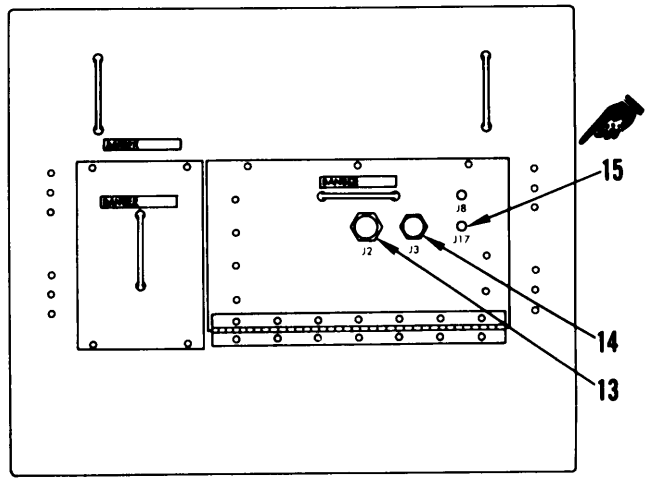
EL9LQ-612-140



EL9LQ-621-30

(24) 1. DISCONNECT P1 OF CABLE 13081706 FROM A2A2J3 AND DISCONNECT P2 0F CABLE 13081706 FROM A1A1J8 (24).
2. DISCONNECT P13 OF CABLE 13083701 FROM DIGITIZER A2A1 CHANNEL A INPUT A (16).
3. DISCONNECT P1 OF CABLE 13081706 FROM DIGITIZER CHANNEL B INPUT A AND P2 FROM EOB ELECTRONICS DRAWER J22 (27). PRESS PROCEED WHEN COMPLETE.

(25) 1. DISCONNECT P3 OF CABLE 13083701 FROM A1A1J2 (13).
2. DISCONNECT P6 0F CABLE 13083701 FROM J3 (20) OF OPTICAL ALIGNMENT ASSEMBLY 13083078.

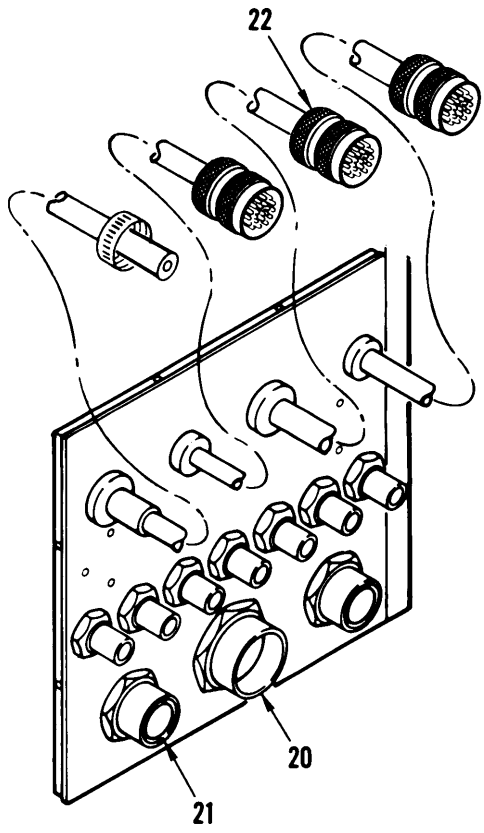


EL9LQ-612-139

3. DISCONNECT P7 OF CABLE 13083701 FROM J4 (21) OF OPTICAL ALIGNMENT ASSEMBLY 13083078.

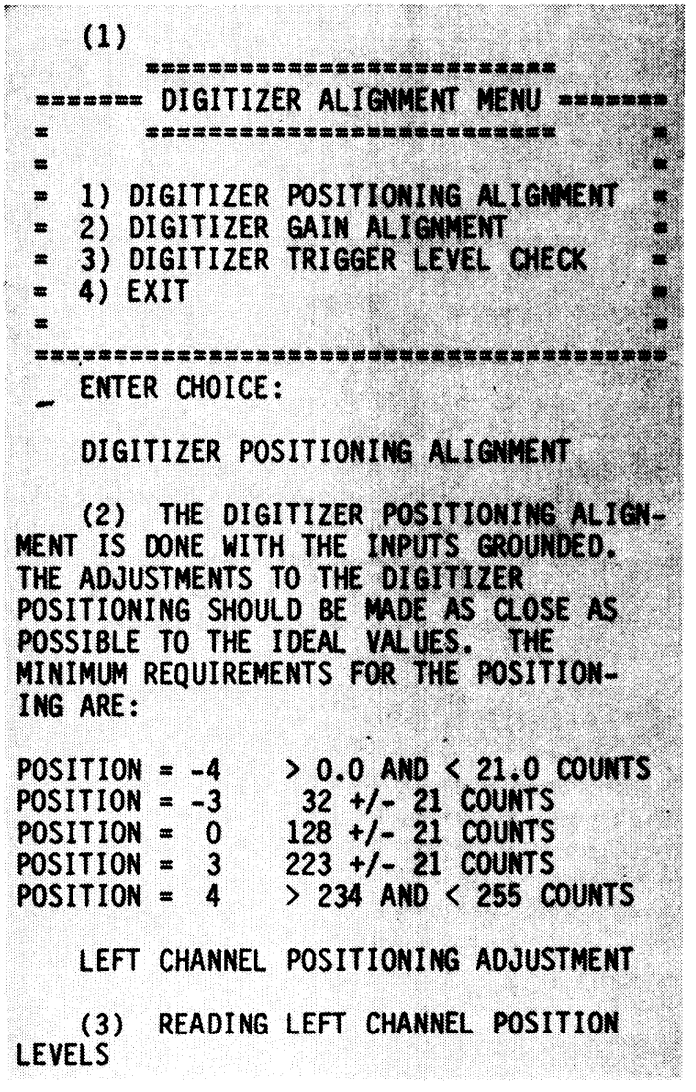
4. DISCONNECT SELF-TEST CONNECTOR 13083962-559 FROM P4 (22) OF OPTICAL ALIGNMENT ASSEMBLY CABLE 13083078. PRESS PROCEED WHEN COMPLETE.

(26) DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, AND SELF-TEST CONNNECTORS OTHER THAN CABLE ASSEMBLY 13082730 AND MAJOR TEST ADAPTER 13083633-19. IF THIS IS YOUR LAST TEST, DISCONNECT ALL EXTERNAL CABLES, EQUIPMENT, SELF-TEST CONNECTORS, AND ADAPTERS.



EL9LQ-700-197

am. DIGALIGN MESSAGES



```
    (1)
        ========================
 ======= DIGITIZER ALIGNMENT MENU =======
 =      ========================        =
 =                                      =
 =  1) DIGITIZER POSITIONING ALIGNMENT  =
 =  2) DIGITIZER GAIN ALIGNMENT         =
 =  3) DIGITIZER TRIGGER LEVEL CHECK    =
 =  4) EXIT                             =
 =                                      =
 ========================================
  _  ENTER CHOICE:

    DIGITIZER POSITIONING ALIGNMENT

    (2)  THE DIGITIZER POSITIONING ALIGN-
MENT IS DONE WITH THE INPUTS GROUNDED.
THE ADJUSTMENTS TO THE DIGITIZER
POSITIONING SHOULD BE MADE AS CLOSE AS
POSSIBLE TO THE IDEAL VALUES.  THE
MINIMUM REQUIREMENTS FOR THE POSITION-
ING ARE:

POSITION = -4    > 0.0 AND < 21.0 COUNTS
POSITION = -3     32 +/- 21 COUNTS
POSITION =  0    128 +/- 21 COUNTS
POSITION =  3    223 +/- 21 COUNTS
POSITION =  4    > 234 AND < 255 COUNTS

    LEFT CHANNEL POSITIONING ADJUSTMENT

    (3)  READING LEFT CHANNEL POSITION
LEVELS
```

The current left channel position values are determined.

```
    (4)
                POS -4   POS -3   POS  0
IDEAL VALUES:        0       32      128
MEASURED VALUE:
                         POS  3   POS  4
                            223      255
```

The current left channel position values are displayed on the VDT directly under the ideal values.

(5) PRESS YES <F5> TO MAKE ADJUSTMENTS TO THE LEFT CHANNEL POSITIONING.

PRESS NO <F6> TO END ADJUSTMENTS TO THE LEFT CHANNEL.

(6) LEFT CHANNEL POSITIONING ADJUSTMENT ROUTINE.

1) TURN OFF CB5 (1) ON THE ELECTRONICS STATION.

2) PULL OUT THE LEFT PREAMP AND REMOVE THE LEFT SIDE PANEL.

(7) 3) ADJUST POS GAIN (2) AND POS CENTERING (3) POTS AS NEEDED TO GET THE POSITIONING AS CLOSE AS POSSIBLE TO THE IDEAL VALUES.

Adjust POSN GAIN (2) and/or POSN CTR (3) control. If adjustment is incorrect, test program will allow you to make additional adjustments.

(8) 4) REPLACE LEFT SIDE PANEL AND INSERT LEFT PREAMP.

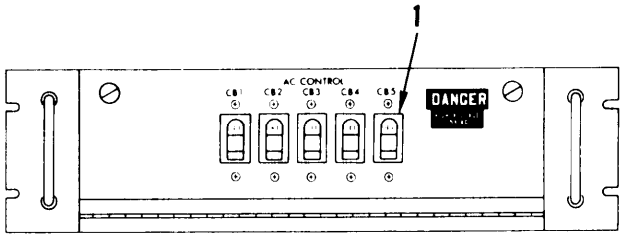
5) TURN ON CB5.

(9)

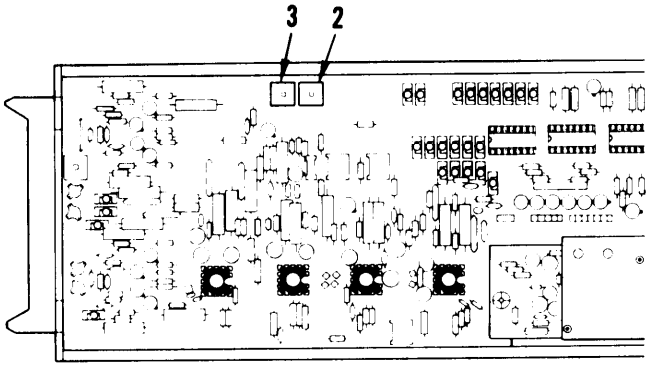
	POS -4	POS -3	POS 0	POS 3	POS 4
IDEAL VALUES:	0	32	128		
MEASURED VALUE:				223	255

The current left channel position values are displayed on the VDT directly under the ideal values.

(10) PRESS <PROCEED> FOR NEXT POSITIONING READING.



EL9LQ-599-73



EL9LQ-700A-05

When you press <PROCEED>, test program loops back to step (3), compares the current values with the ideal values (step (4)), and waits for you to press <YES> or <NO> to end left channel adjustments (step (5)). If the adjustments you made were not as close as possible to the ideal values, perform them again by pressing <YES> as often as necessary. When the best possible adjustments are obtained, press <NO> to exit.

POSITIONING READING ADJUSTMENT

(11) READING RIGHT CHANNEL POSITION LEVELS

The current right channel position values are determined.

(12)

	POS -4	POS -3	POS 0
IDEAL VALUES:	0	32	128
MEASURED VALUE:			

POS 3	POS 4
223	255

The current right channel position values are displayed on the VDT directly under the ideal values.

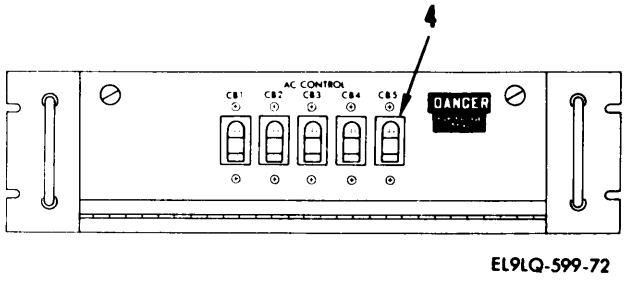
(13) PRESS YES <F5> TO MAKE ADJUSTMENTS TO THE RIGHT CHANNEL POSITIONING.

PRESS NO <F6> TO END ADJUSTMENTS TO THE RIGHT CHANNEL.

(14) RIGHT CHANNEL POSITIONING ADJUSTMENT ROUTINE.

1) TURN OFF CB5 (4) ON THE ELECTRONICS STATION.

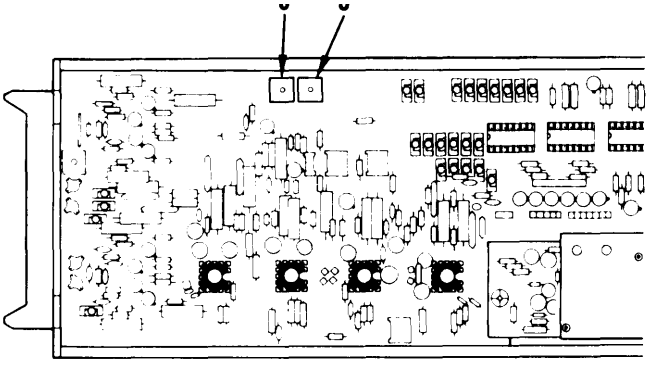
2) PULL OUT THE RIGHT PREAMP AND REMOVE THE LEFT SIDE PANEL.



EL9LQ-599-72

(15) 3) ADJUST POS GAIN (5) AND POS CENTERING (6) POTS AS NEEDED TO GET THE POSITIONING AS CLOSE AS POSSIBLE TO THE IDEAL VALUES.

Adjust POSN GAIN (5) and/or POSN CTR (6) control. If adjustment is incorrect, test program will allow you to make additional adjustments.



EL9LQ-700-09

(16) 4) REPLACE LEFT SIDE PANEL AND INSERT RIGHT PREAMP.

5) TURN ON CB5.

(17)

	POS -4	POS -3	POS 0
IDEAL VALUES:	0	32	128
MEASURED VALUE:			

POS 3	POS 4
223	255

The current right channel position values are displayed on the VDT directly under the ideal values.

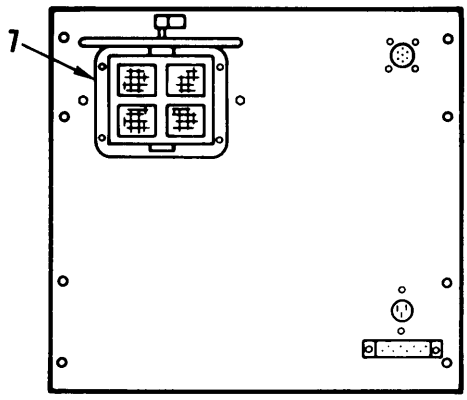
(18) PRESS <PROCEED> FOR NEXT POSITIONING READING.

When you press <PROCEED>, test program loops back to step (11), compares the current values with the ideal values (step (12)), and waits for you to press <YES> to make additional adjustments or <NO> to end right channel adjustments (step (13)). If the adjustments you made were not as close as possible to the ideal values, perform them again by pressing <YES> as often as necessary. When the best possible adjustments are obtained, press <NO> to exit. The test program loops back to the main menu.

DIGITIZER GAIN ALIGNMENT

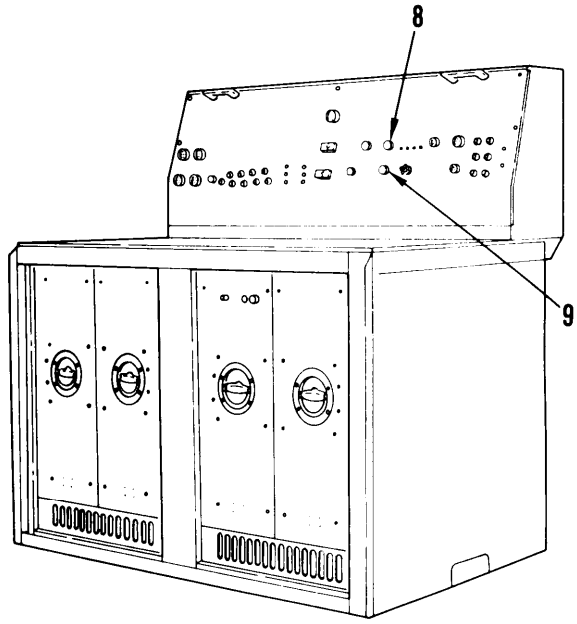
(19) A. CONNECT MAJOR TEST ADAPTER 13083633 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J1 (7).

Refer to paragraph 2-65 for installation procedure.



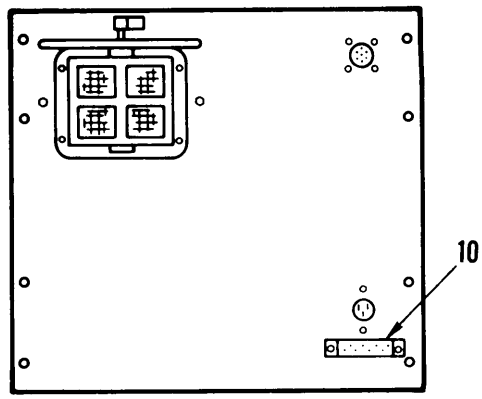
EL9LQ-620-54

(20) B. CONNECT CABLE ASSEMBLY 13082730-P4 TO AN/USM 410 DIU A1A4-J32 (8), AND CABLE ASSEMBLY 13082730-P10 TO AN/USM 410 DIU A1A4-J30 (9).



EL9LQ-700A-04

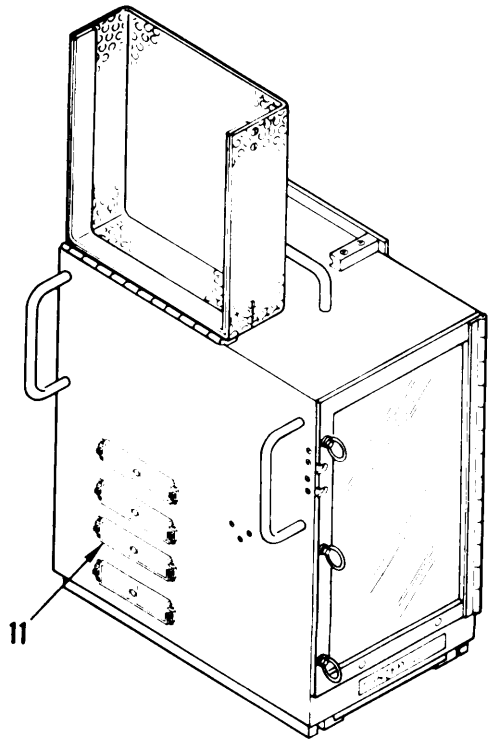
(21) C. CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY A2A2A4-J6 (10).



EL9LQ-620-55

(22) D. CONNECT SELF-TEST CABLE 13083093 AS FOLLOWS:

P1 TO MAJOR TEST ADAPTER 13083633-J3 (11)



EL9LQ-730-53

P2 TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (12)

P4 TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT A (13)

LEFT CHANNEL GAIN ADJUSTMENT

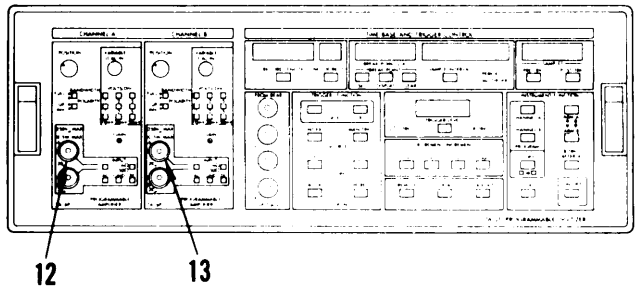
(23) READING CHANNEL A

Test program determines the gain value for channel A input A.

(24) CHANNEL A INPUT A

VOLTS/DIV SETTING	MEASURED AMPLITUDE	2% UL	2% LL	5% UL	5% LL
MEASURED PERIOD		UL	LL		

Test program displays the current gain values on the VDT.



EL9LQ-621-34

(25) NOTE: DIGITIZER ADJUSTMENTS WOULD BE MADE WITHIN THE 2% LIMITS, ADJUSTMENTS WITHIN THE 5% LIMITS WILL PASS THE ALIGNMENT.

PRESS YES <F5> TO MAKE GAIN ADJUSTMENT TO THE LEFT CHANNEL.

PRESS NO <F6> TO END ALIGNMENTS.

If the measured voltage is higher than the 2% upper limit value or lower than the 2% lower limit value, press <YES> and perform the adjustment. If you are unable to adjust the voltage within the 2% limits after several attempts but it is within the 5% upper and lower limit values, press <NO>. If you cannot adjust the voltage within the 5% upper and lower limit values, press <NO>.

(26) LEFT CHANNEL GAIN ADJUSTMENT:

TO INCREASE GAIN ADJUST FRONT PANEL GAIN POT (14) CLOCKWISE.

TO DECREASE GAIN ADJUST FRONT PANEL GAIN POT (14) COUNTERCLOCKWISE.

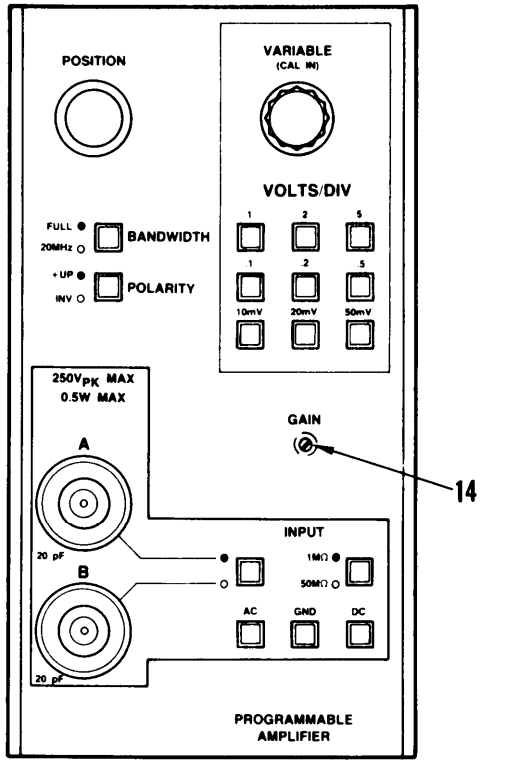
PRESS <PROCEED> FOR NEXT READING.

When you press <PROCEED>, test program loops back to step (23), displays the new gain value, and waits for you to press <YES> to make another adjustment or <NO> to end the channel A measurement.

RIGHT CHANNEL GAIN ADJUSTMENT

(27) READING CHANNEL B

Test program determines the gain value for channel B input A.



EL9LQ-700A-06

(28) CHANNEL B INPUT A

VOLTS/DIV MEASURED 2 %
SETTING AMPLITUDE UL LL

5% MEASURED
UL LL PERIOD UL LL

Test program displays the current gain values on the VDT.

(29) NOTE: DIGITIZER ADJUSTMENTS SHOULD BE MADE WITHIN THE 2% LIMITS, ADJUSTMENTS WITHIN THE 5% LIMITS WILL PASS THE ALIGNMENT

PRESS YES <F5> TO MAKE GAIN ADJUSTMENT TO THE RIGHT CHANNEL.

PRESS NO <F6> TO END ADJUSTMENTS.

If the measured voltage is higher than the 2% upper limit value or lower than the 2% lower limit value, press <YES> and perform the adjustment. If you are unable to adjust the voltage within the 2% limits after several attempts but it is within the 5% upper and lower limit values, press <NO>. If you cannot adjust the voltage within the 5% upper and lower limit values, press <NO>.

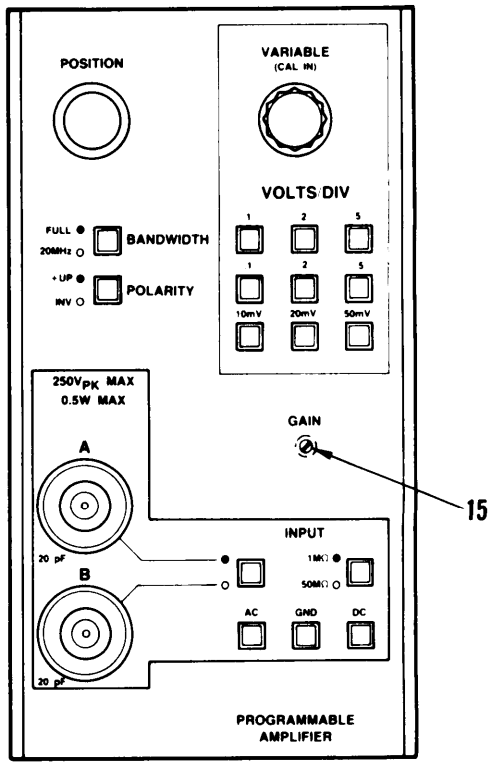
(30) RIGHT CHANNEL GAIN ADJUSTMENT:

TO INCREASE GAIN ADJUST FRONT PANEL GAIN POT (15) CLOCKWISE.

TO DECREASE GAIN ADJUST FRONT PANEL GAIN POT (15) COUNTERCLOCKWISE.

PRESS <PROCEED> FOR NEXT READING.

When you press <PROCEED>, test program loops back to step (27), displays the new gain value, and waits for you to press <YES> to make another adjustment or <NO> to end the channel B measurement. The test program loops back to the main menu.



EL9LQ-700A-08

DIGITIZER TRIGGER LEVEL CHECK

(31)

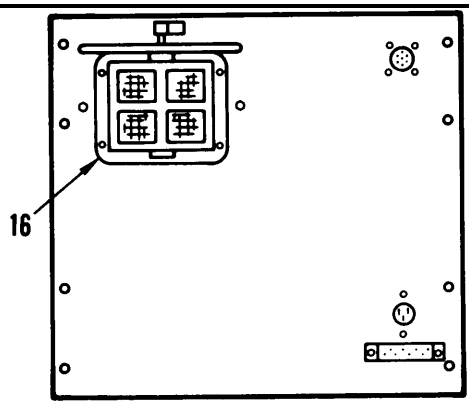
PROGRAMMED TRIGGER LEVEL (-127 THRU +127 COUNTS):	EXPECTED TRIGGER LEVEL (0 THRU 255 COUNTS): MODIFIED DIGITIZER/ UNMODIFIED DIGITIZER	
+96	224 +/- 19	236
+64	192 +/- 17	.
+32	160 +/- 15	.
0	128 +/- 13	128
-32	96 +/- 15	.
-64	64 +/- 17	.
-96	32 +/- 15	22

PRESS <PROCEED> TO BEGIN TRIGGER LEVEL TEST.

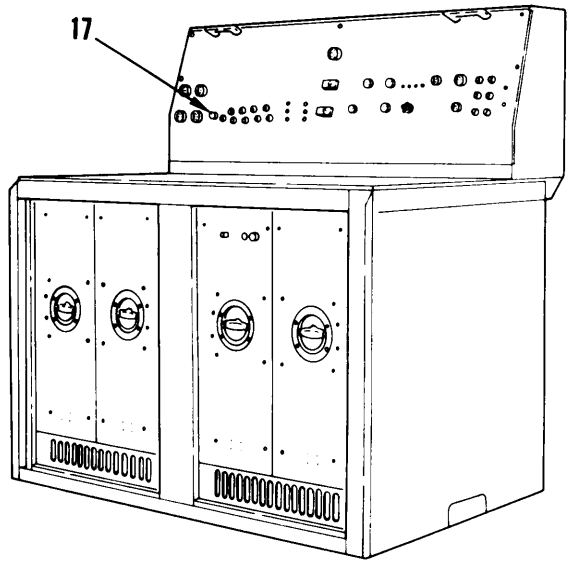
(32) A. CONNECT MAJOR TEST ADAPTER 13083633 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4-J1 (16).

If not already connected, refer to paragraph 2-65 for installation procedure.

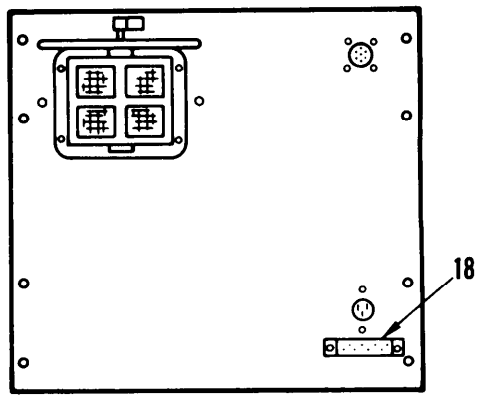
(33) B. CONNECT CABLE ASSEMBLY 13082730-P7 TO AN/USM 410 DIU A1A4-J9 (17).



EL9LQ-620-59



EL9LQ-700A-07



EL9LQ-620-56

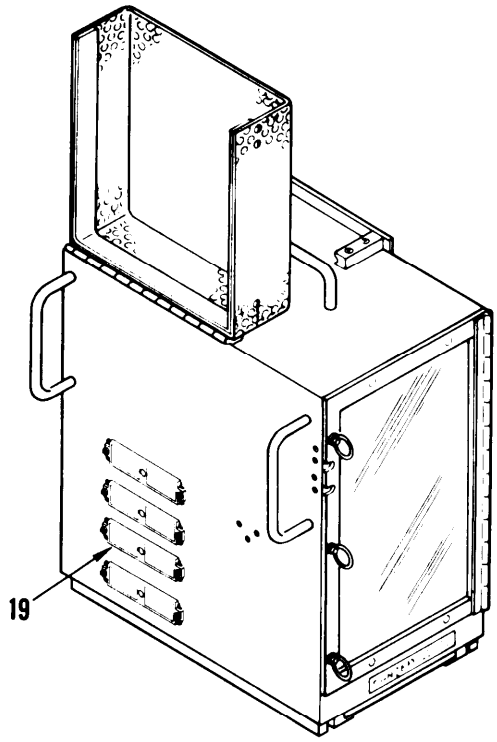
(34) C. CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY A2A2A4-J6 (18).

(35) D. CONNECT SELF-TEST CABLE 13083093 AS FOLLOWS:

P1 TO MAJOR TEST ADAPTER 13083633-J3 (19)

P2 TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL A INPUT A (20)

P4 TO PROGRAMMABLE DIGITIZER 2A2A1 PROGRAMMABLE AMPLIFIER CHANNEL B INPUT A (21)



EL9LQ-730-51

(36) LEFT CHANNEL TRIGGER LEVEL TEST:

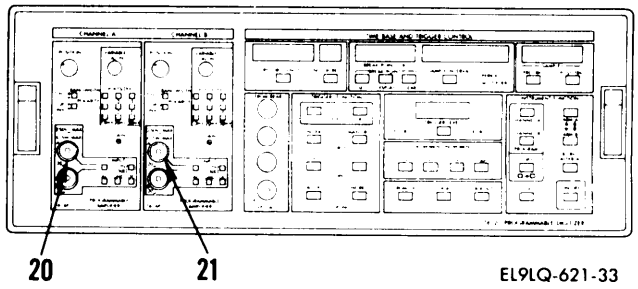
PROGRAMMED TRIGGER LEVEL	ACTUAL TRIGGER LEVEL
- - - - - - - - - - - - -	- - - - - - - - - - - -

Test program measures digitizer left channel (channel A input A) trigger level, displays the actual value compared to programmed value on VDT, and prints the values on the line printer.

(37) RIGHT CHANNEL RIGGER LEVEL TEST:

PROGRAMMED TRIGGER LEVEL	ACTUAL TRIGGER LEVEL
- - - - - - - - - - - - - - -	- - - - - - - - - - - -

Test program measures digitizer right channel (channel B input A) trigger level, displays the actual value compared to programmed value on VDT, and prints the values on the line printer.



EL9LQ-621-33

(38) DIGITIZER TRIGGER LEVEL TEST COMPLETE

Test program loops back to the main menu.

an. FIRALIGN MESSAGES

INSTALL MAJOR TEST ADAPTER 13083633-19 IN TEST ADAPTER PANEL ASSEMBLY A2A4J1 AND CLOSE LOCKING LEVER.

VERIFY THAT NO PERSONALITY CARDS ARE INSERTED IN MAJOR TEST ADAPTER CONNECTORS 45, A6, A7, A8, A9.

Refer to paragraph 2-65 for installation procedures.

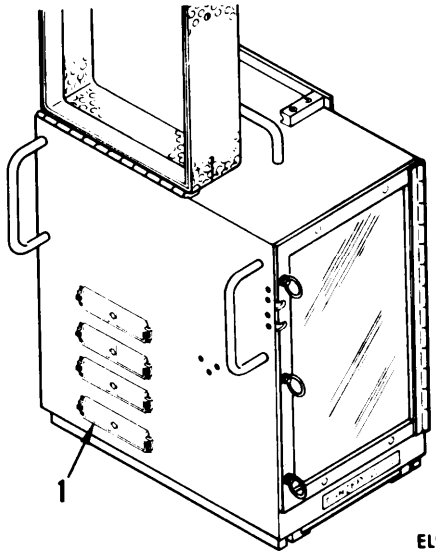
WARNING

HIGH VOLTAGE

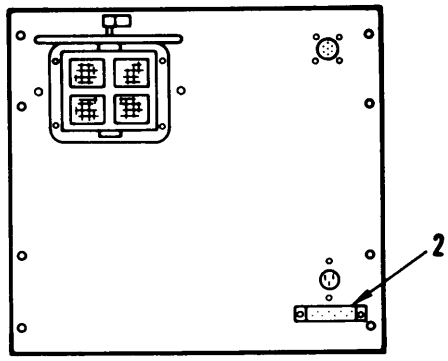
- OPEN DOOR ON AH-64A TEST SET DC POWER STATION A2 CABINET AND PLACE 'UUT PWR' CIRCUIT BREAKER ON AC CONTROL PANEL A2A11 TO 'OFF'.
- FAILURE TO REMOVE UUT POWER WILL CONSTITUTE A SHOCK HAZARD AND MAY CAUSE EQUIPMENT DAMAGE.
- DO NOT PLACE THIS CIRCUIT BREAKER TO 'ON' UNTIL INSTRUCTED TO DO SO.

WHEN COMPLETE, CLOSE CABINET DOOR ON DC POWER STATION AND PRESS <PROCEED>.

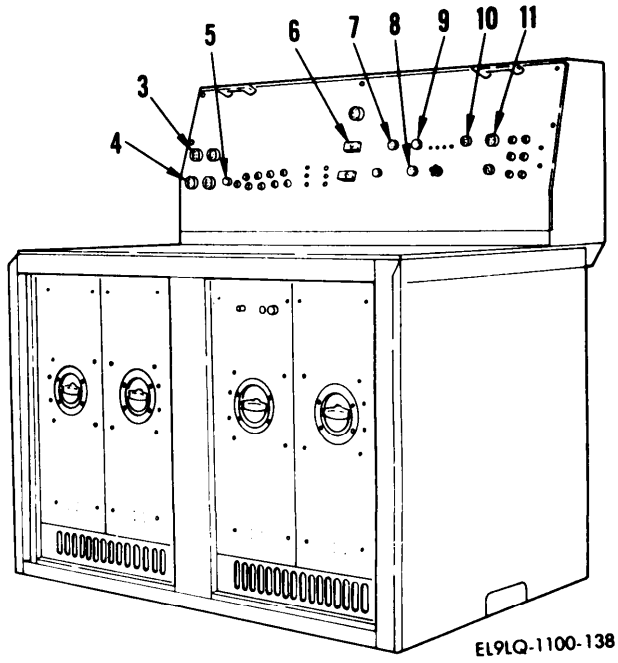
CONNECT P1 OF CABLE 13082730 TO MAJOR TEST ADAPTER J4 (1).
CONNECT P2 OF CABLE 13082730 TO TEST ADAPTER PANEL ASSEMBLY A2A4J6 (2).
CONNECT P5 OF CABLE 13082730 TO UUT STATION DIU A4J1 (3).
CONNECT P6 OF CABLE 13082730 TO UUT STATION DIU A4J2 (4).
CONNECT P7 OF CABLE 13082730 TO UUT STATION DIU A4J9 (5).
CONNECT P3 OF CABLE 13082730 TO UUT STATION DIU A4J26 (6).
CONNECT P9 OF CABLE 13082730 TO UUT STATION DIUA4J29 (7).
CONNECT P10 OF CABLE 13082730 TO UUT STATION DIU A4J30 (8).
CONNECT P4 OF CABLE 13082730 TO UUT STATION DIUA4J32 (9).
CONNECT P11 OF CABLE 13082730 TO UUT STATION DIU A4J34 (10?.
CONNECT P12 OF CABLE 13082730 TO UUT STATION DIU A4J36 (11).



EL9LQ-730-50



EL9LQ-620-60



EL9LQ-1100-138

CONNECT P14 OF CABLE 13082730 T0 INTERFACE STATION A13A8J109 (12).
CONNECT P13 OF CABLE 13082730 TO INTERFACE STATION A13A8J11O (13).
CONNECT P2 OF CABLE 13083693-19 TO MAJOR TEST ADAPTER J3 (14).
CONNECT P1 OF CABLE 13083693-19 TO MAJOR TEST ADAPTER J2 (15).

INSTALL PERSONALITY CARD SET IN MAJOR TEST ADAPTER AS FOLLOWS:

1. OPEN DOOR, IF CLOSED, ON MAJOR TEST ADAPTER.
2. INSTALL P1 OF SIGNAL ROUTING PERSONALITY CARD 13231525 IN ADAPTER SLOT A7.
3. INSTALL P1 OF PROGRAMMABLE RESISTOR PERSONALITY CARD 13083641 IN ADAPTER SLOT A6.
4. INSTALL P1 OF SIGNAL CONDITIONING PERSONALITY CARD 13082316 IN ADAPTER SLOT A5.
5. CLOSE AND SECURE DOOR ON MAJOR TEST ADAPTER.

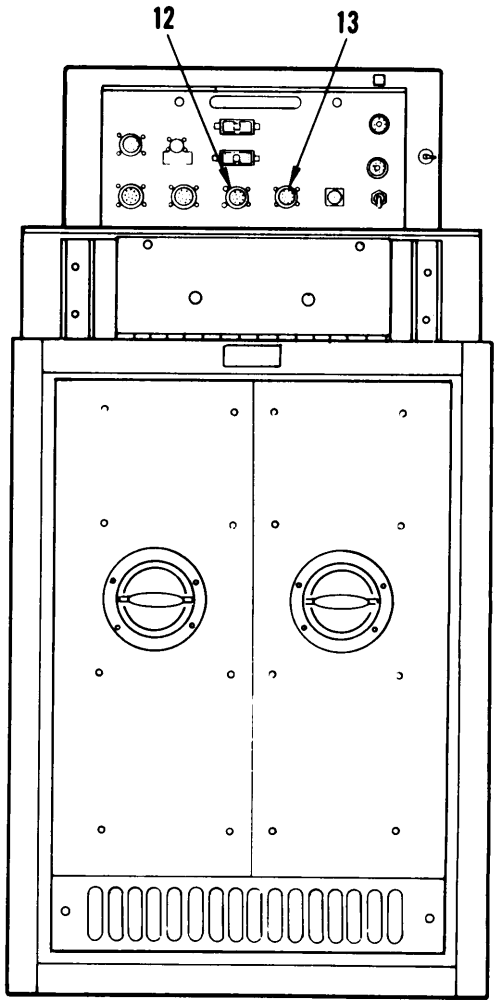
Refer to paragraph 2-69 for installation procedure.

INSTALL UUT (PNVS NIGHT SENSOR ASSY) ON NIGHTSIDE TEST BENCH 2A3 BY PERFORMING THE PROCEDURES IN PARA 3-11 IN TM 9-6625-476-30.

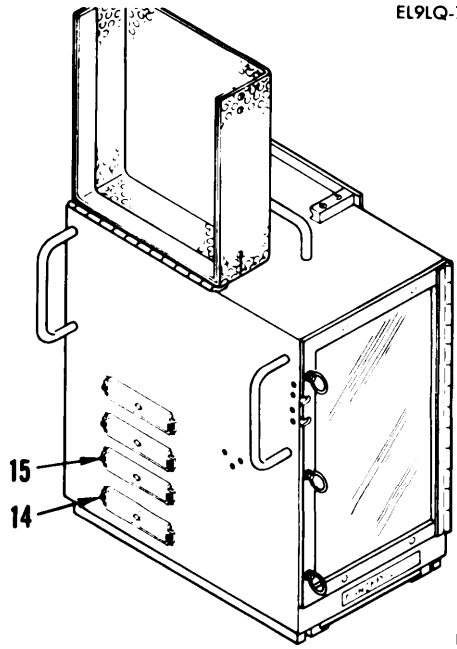
EXCEPTION
DO NOT REINSTALL MASK AND WINDOW ASSEMBLY.
[SKIP SUBPARAGRAPH 2-11-C-(6)].

ENSURE THAT DUST COVERS AT P1 AND J1 OF UUT ARE REMOVED.

DIRECT COOLING AIR DIRECTLY ONTO COOLER/DEWAR A29/A30. REFER TO FIG. 3-30 [N TM 9-6625-476-30, IF NECESSARY, FOR LOCATION OF COOLER/DEWAR.



EL9LQ-700A-10



EL9LQ-730-54

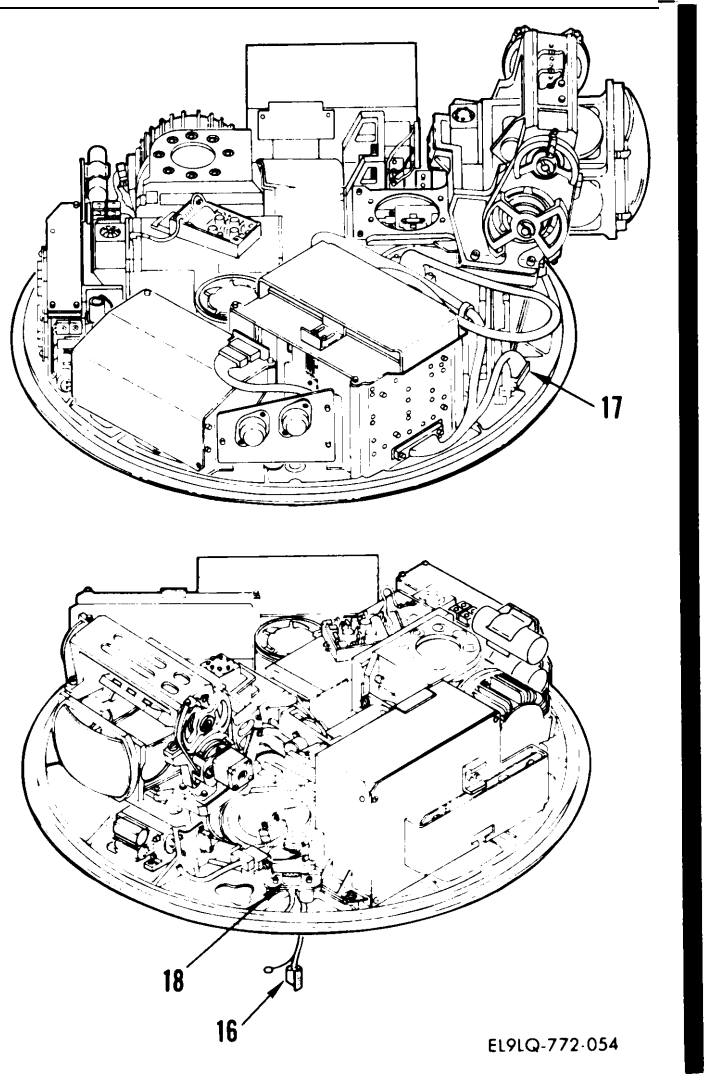
2-17. OPERATOR INSTRUCTION MESSAGES (cont)

CONNECT P3 OF CABLE 13083693-19 TO P1 (16) ON UUT.

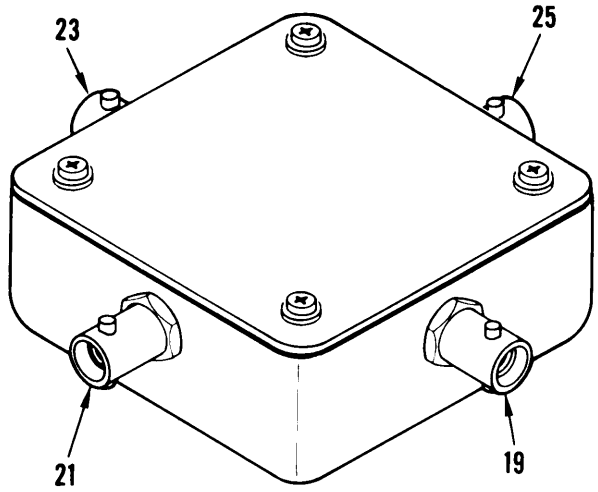
CONNECT P4 OF CABLE 13083693-19 TO J1 (17) ON UUT.

CONNECT P6 OF CABLE 13083693-19 TO J4 (18) ON UUT.

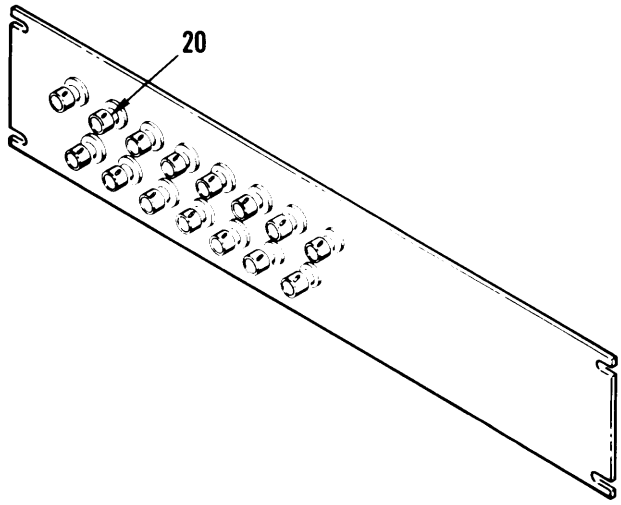
CONNECT GROUND STRAP A2A4E1 OR A2E9 TO SAFETY GROUND ON UUT WITH SUPPLIED NUT AND BOLT AND TIGHTEN.



CONNECT P1 OF CABLE 13081706 TO P1 (19) ON TERMINAL BOX ASSEMBLY 13082747. CONNECT P2 OF CABLE TO TEST CONSOLE TEST BENCH VHF CABLE ENTRY PANEL A2A2J3 (20).

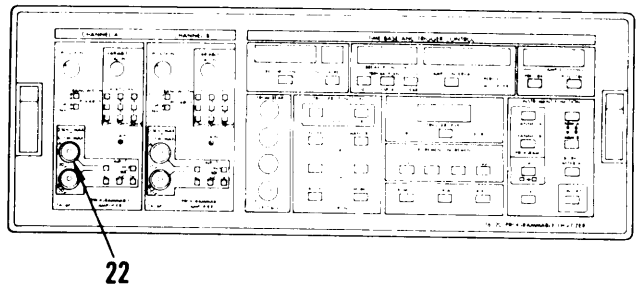


EL9LQ-700-209



EL9LQ-620-53

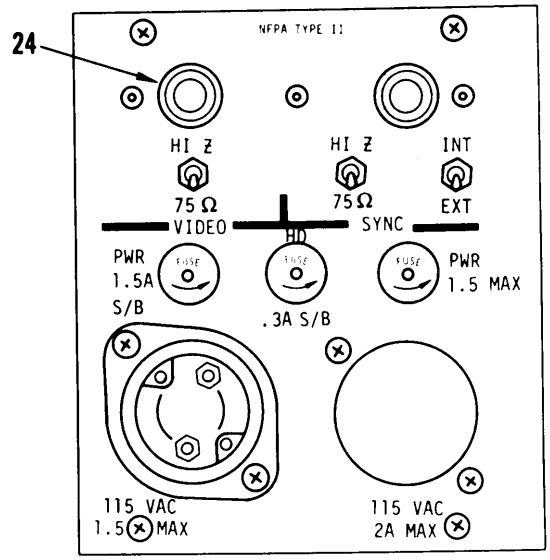
CONNECT P1 OF SECOND CABLE 13081706 TO P2 (21) ON TERMINAL BOX ASSEMBLY 13082747. CONNECT P2 OF CABLE TO PROGRAMMABLE A2A1 DIGITIZER CHANNEL A INPUT A (22).



EL9LQ-621-32

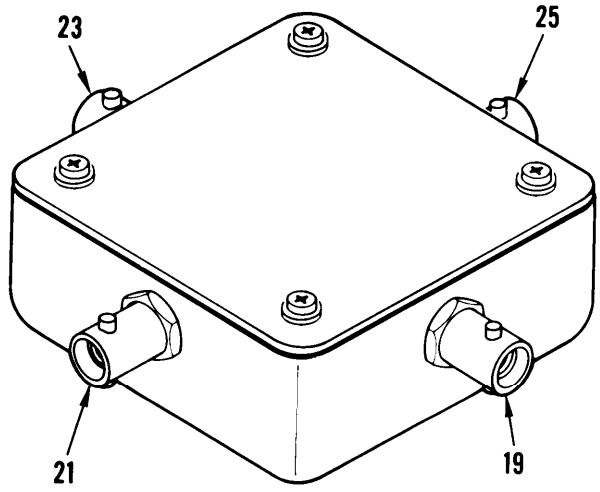
2-17. OPERATOR INSTRUCTION MESSAGES (cont) 2-17

CONNECT P1 OF THIRD CABLE 13081706 T0 P3 (23) ON TERMINAL BOX ASSEMBLY 13082747, CONNECT P2 OF CABLE 10 MONITOR 'VIDEO' JACK (24).



EL9LQ-700A-02

CONNECT P5 OF CABLE 13083693-19 TO P4 (25) ON TERMINAL B0X ASSSEMBLY 13082747.



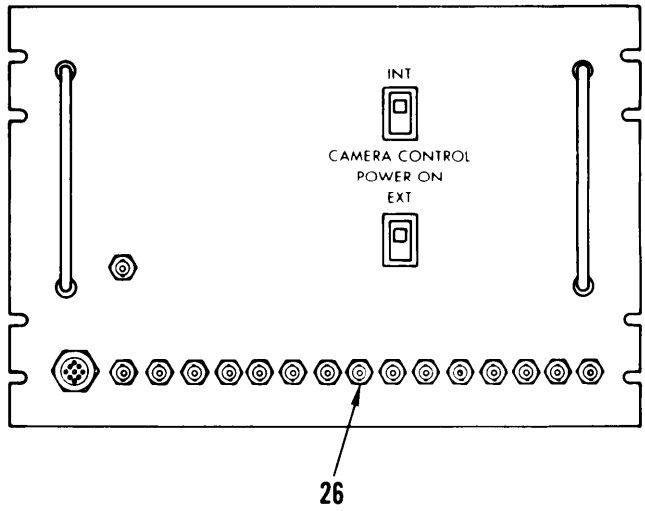
EL9LQ-700-209

1. CONNECT P1 OF CABLE 13081706 T0 ELECTRONICS DRAWER A2A7J19 (26). CONNECT P2 OF CABLE TO MONITOR 'SYNC' JACK (27).

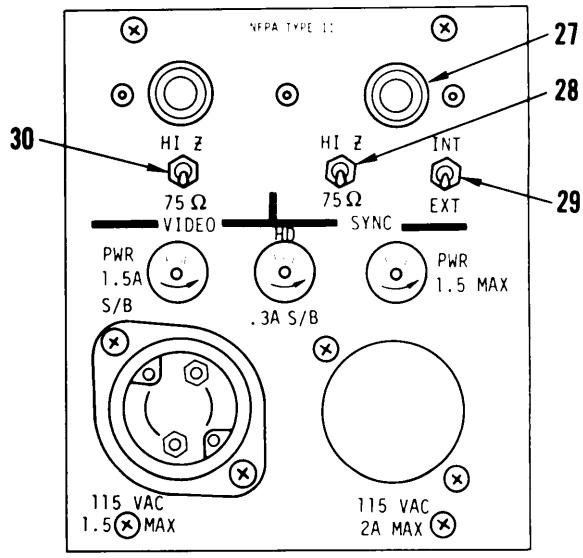
2. SET SWITCHES ON MONITOR AS FOLLOWS:

   SYNC SWITCHES (28, 29) TO 'HI Z' AND 'EXT'.
   VIDEO SWITCH (30) TO 'HI Z'.

REFER TO POST AMPLIFIER CONTROL DRIVER CCA DIAGRAM (FIG, 3-31) IN TM 9-6625-476-30. REMOVE COVER FROM CIRCUIT CARDS A12 THRU A18.



EL9LQ-627-56



EL9LQ-700A-03

2-17. OPERATOR INSTRUCTION MESSAGES (cont)

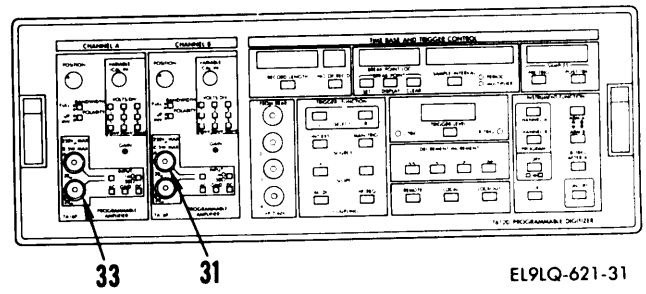
REFER TO FIGURE 3-30 IN TM 9-6625-476-30 AND LOCATE FAN B1 AND FAN B2 ON THE UUT DURING THE NEXT STEP POWER WILL BE APPLIED. YOU WILL BE REQUIRED TO ANSWER QUESTIONS CONCERNING FAN OPERATION.

DOES THE LARGE FAN 81 OPERATE CONTINUOUSLY AND BLOW AIR OUT OF THE UUT?

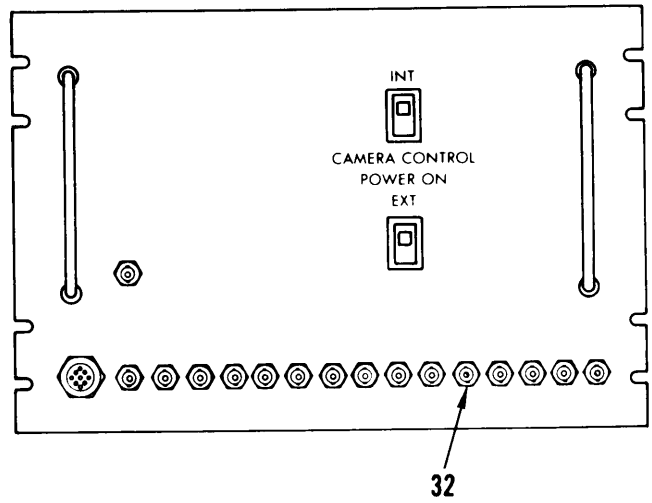
DOES THE SMALL FAN B2 OPERATE CONTINUOUSLY AND BLOW AIR OUT OF THE UUT?

1. REMOVE PROBE FROM OSCILLOSCOPE, IF CONNECTED, AND CONNECT IT TO PROGRAMMABLE DIGITIZER A2A1 CHANNEL B INPUT A (31). SEE FIGURE 3-31 AND 3-32 IN TM 9-6625-476-30 FOR EXACT LOCATION OF CHANNEL 84 (ON CCA A16) AND CONNECT PROBE TIP TO CHANNEL 84.

2. CONNECT P1 OF CABLE 13081706 TO ELECTRONICS DRAWER A2A7J22 (32). CONNECT P2 TO PROGRAMMABLE DIGITIZER CHANNEL A INPUT B (33).



EL9LQ-621-31



EL9LQ-627-55

DISCONNECT ALL TEST CABLES AND EQUIPMENT FROM AH-64A TEST SET AND TADS/PNVS AUGMENTATION EQUIPMENT.

REMOVE UUT FROM OPERATING SYSTEM BY DISCONNECTING CABLE ASSEMBLY 13083693-19 FROM THE UUT, AND BY DISCONNECTING GROUND STRAP A2A4E1 FROM UUT SAFETY GROUND.

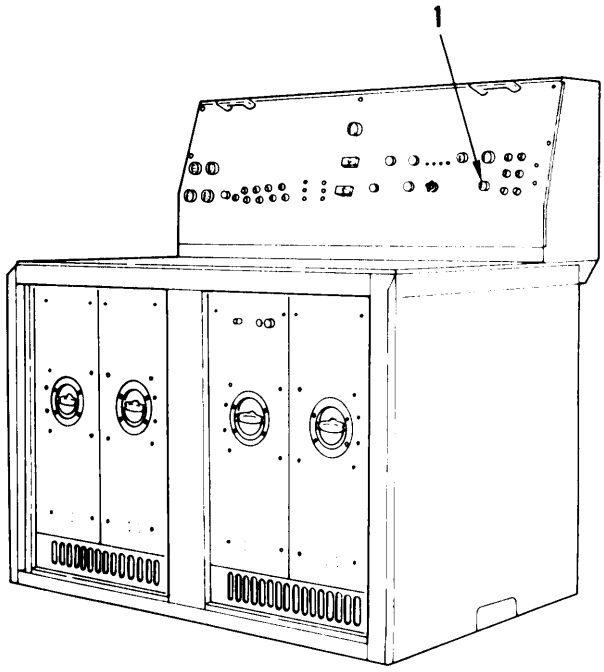
REMOVE THE PNVS NIGHT SENSOR ASSEMBLY FROM NIGHTSIDE TEST BENCH 2A3 BY PERFORMING THE PROCEDURES IN PARA 3-12 IN TM 9-6625-476-30.

ao. 0SGALIGN MESSAGES

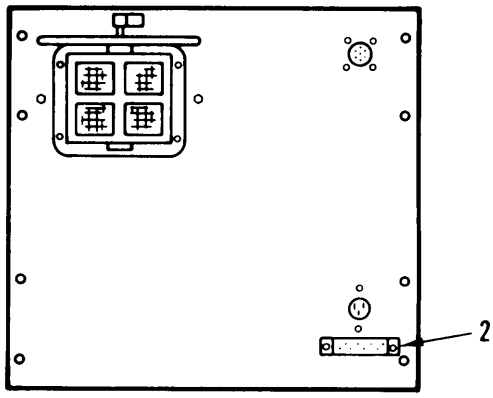
(1) THE FOLLOWING EQUIPMENT IS REQUIRED TO PERFORM THE OSG ALIGNMENTS:

- DIU CABLE ASSEMBLY, P/N 13082730
- SPECTRA SPOTMETER
- RADIOMETER TEST CABLE, P/N TE782073
- SPOTMETER FIXTURE, P/N TE782036
- POTENTIOMETER ADJUSTMENT TOOL

(2) A. CONNECT CABLE ASSEMBLY 13082730-P10 TO AN/USM 410 DIU A1A4-J30 (1).



EL9LQ-1100-117

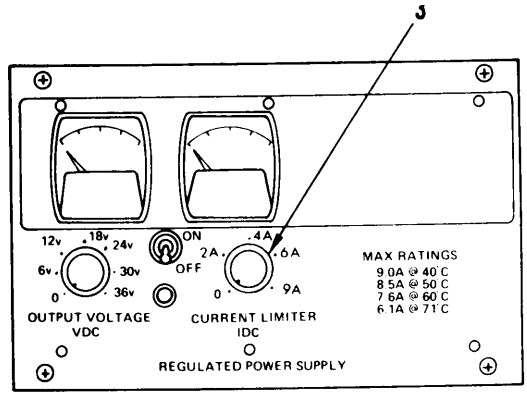


EL9LQ-620-58

(3) B. CONNECT CABLE ASSEMBLY 13082730-P2 TO TEST ADAPTER PANEL ASSEMBLY 2A2A4J6 (2).

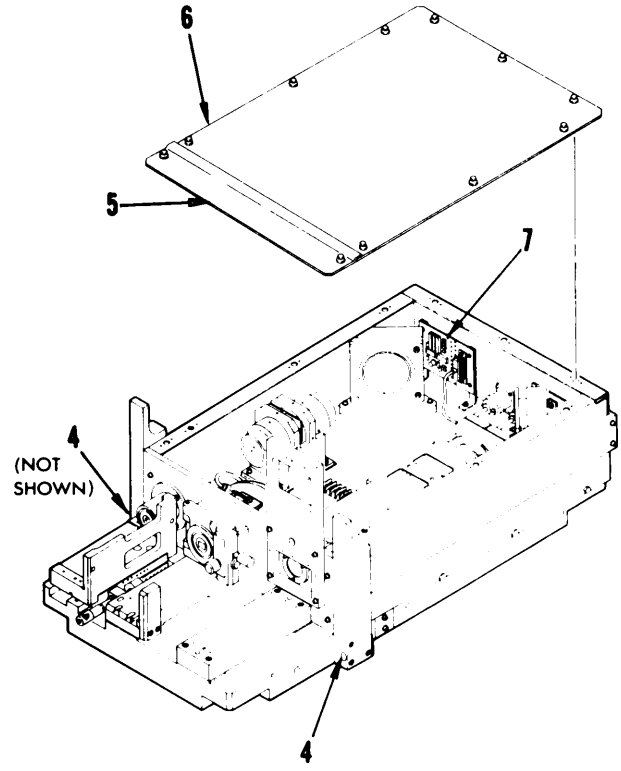
(4) C. ON AN/USM 410 DC POWER STATION A1A2, SET DC2B A1A2A3 CURRENT LIMITER TDC KNOB (3) TO AMP POSITIION.

(5) A. ON THE OSG P/N 13231679 LOCATED AT 2A2A3, REMOVE THE TWO CAP SCREWS (4) AND SLIDE THE 0SG AS FAR FORWARD AS POSSIBLE.



EL9LQ-1100-116

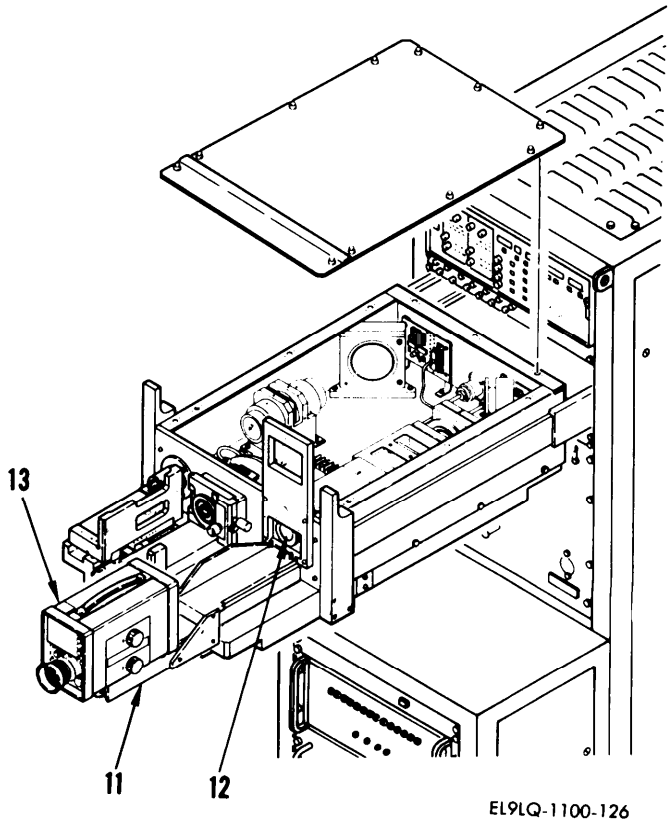
(6) B. LOOSEN THE TWO '1/4 TURN' FASTENERS ON THE FRONT TOP COVER (5) AND REMOVE THE COVER.



EL9LQ-1100-122

(7) C. LOOSEN THE 9 '1/4 TURN' FASTENERS ON THE MAIN TOP COVER (6) AND MOVE THE COVER AS FAR FORWARD AS POSSIBLE EXPOSING THE 'AMP/DET' CCA (7) WITH THE ALIGNMENT POTENTIOMETERS R2 (8), R4 (9), AND R6 (10).

A. MOUNT THE SPOTMETER FIXTURE (11) P/N TE782036 UNIT 11 TO THE COLLIMATOR (RIGHT) PORT (12) ON THE OSG.
B. MOUNT THE SPOTMETER (13) TO THE LEFT HOLE ON THE FIXTURE.



EL9LQ-1100-126

C. CONNECT SPOTMETER POWER CABLE P1 TO RADI0METER TEST CABLE TE782073-J1.
D. CONNECT RADIOMETER CABLE TE782073-P1 TO TEST ADAPTER PANEL A2A4-J3 (14).

A. SET SPOTMETER ‘SHUTTER AND X1OO ATTENUATOR’ KNOB (15) TO ‘CLOSE’.
B. SET SPOTMETER ‘ON/OFF/STANDBY’ SWITCH (16) T0 ‘ON’.

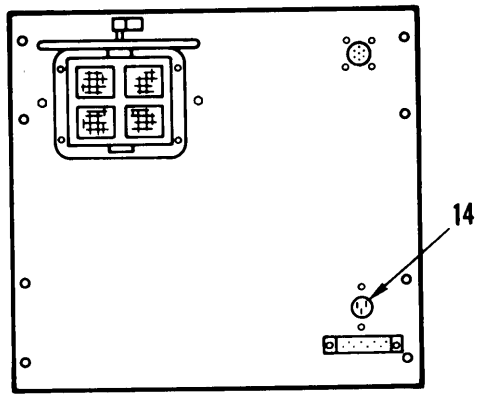
A. SET SPOTMETER ‘FILTER SELECTOR’ KNOB (17) T0 ‘ZERO].
B. SET SPOTMETER ‘SENSITIVITY MULTIPLIER’ KNOB (18) TO 'ZERO AMP'.
C. SET SPOTMETER ‘FAST/SLOW’ SWITCH (19) TO ‘FAST’.
D. ADJUST SPOTMETER 'AMP ZERO' KNOB (20) UNTIL DISPLAY READS ‘0.00’ (+/- 0.05).

A. SET SPOTMETER ‘SENSITIVITY MULTIPLIER’ KNOB (18) TO 'ZERO DK CRNT'.
B. ADJUST SPOTMETER ‘DK CRNT ZERO’ KNOB (21) UNTIL DISPLAY READS ‘0.00’ (+/- 0.10).

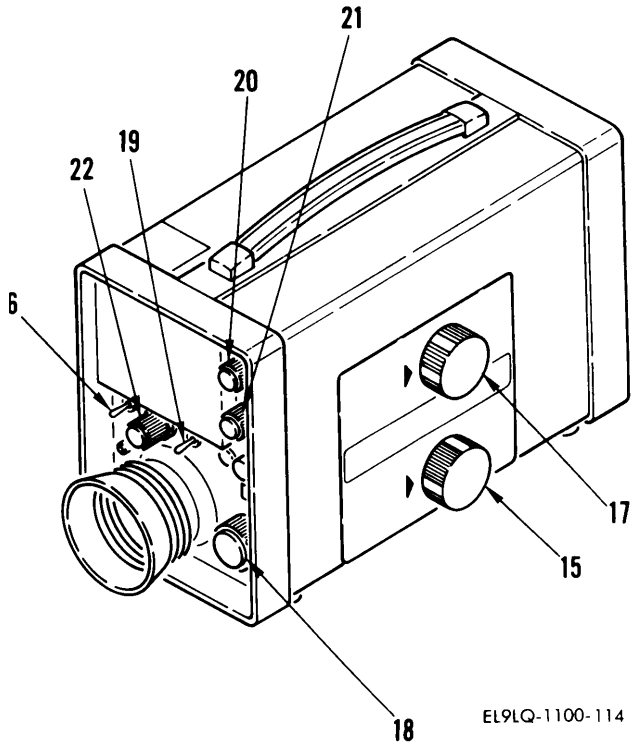
NOTE: ADJUST KNOB SLOWLY - SPOTMETER RESPONDS SLOWLY TO THIS ADJUSTMENT.

A. SET SPOTMETER ‘FILTER SELECTOR’ KNOB (17) TO ‘CAL’.
B. SET SPOTMETER ‘SENSITIVITY’ KNOB (18) TO POSITION DEFINED FOR LUMINANCE FOR THIS SPOTMETER. THE CALIBRATED NUMBER FOR LUMINANCE CAN BE FOUND ON THE TOP OF THE SPOTMETER LABELED ‘SENSITIVITY FACTORS’.
C. ADJUST SPOTMETER ‘SENS ADJUST’ KNOB (22) UNTIL DISPLAY READS THE CALIBRATED NUMBER FOR LUMINANCE (+/- 0.05).

VERIFY STABILITY OF SPOTMETER BY OBSERVING DISPLAY (APPROXIMATELY ONE MINUTE) FOR VARIATIONS GREATER THAN +/-. 0.05 OF INITIAL READING.



EL9LQ-620-57



EL9LQ-1100-114

A. REMOVE THE LENS CAP FROM THE SPOTMETER.
B. FOCUS SPOTMETER TO 1.25 FEET (X:XXX RATIO).
C. SET SPOTMETER 'SHUTTER AND X100 ATTENUATOR' KNOB (15) TO 'VIEW'.
D. OBSERVE SPOT THROUGH SPOTMETER VIEWFINDER. POSITION SPOTMETER SO SPOT IS CENTERED ON RED LIGHT.
E. SET SPOTMETER 'FILTER SELECTOR' KNOB (17) T0 'PHOT'.
F. SET SPOTMETER FOCUS TO INFINITY (SCREW LENS CLOSEST TO METER BODY).
G. SET SPOTMETER 'SHUTTER AND X100 ATTENUATOR' KNOB (15) TO 'CLOSE'.
H. SET SPOTMETER 'SENSITIVITY MULTIPLIER' (18) TO 0.

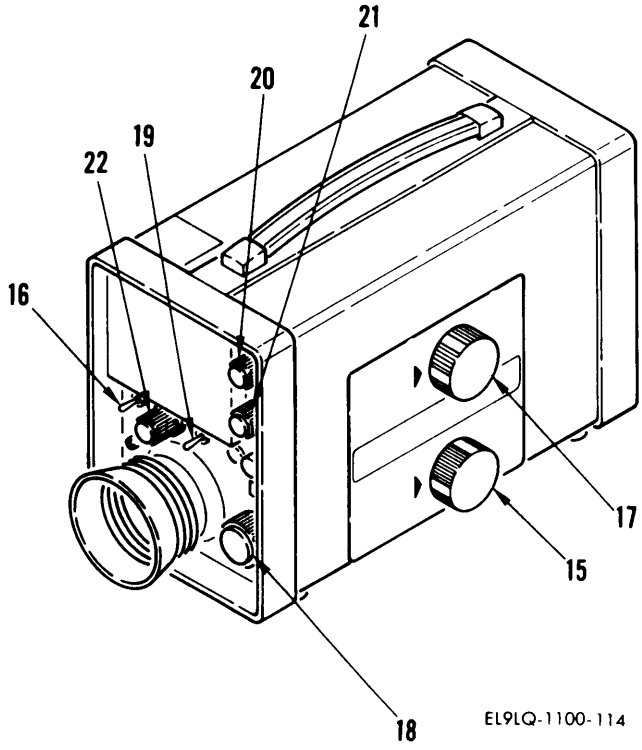
READ SPOTMETER DISPLAY AND ENTER VALUE:

Enter the value and press <RETURN>. If value is between 0 and 24, it is within the required range and will pass.

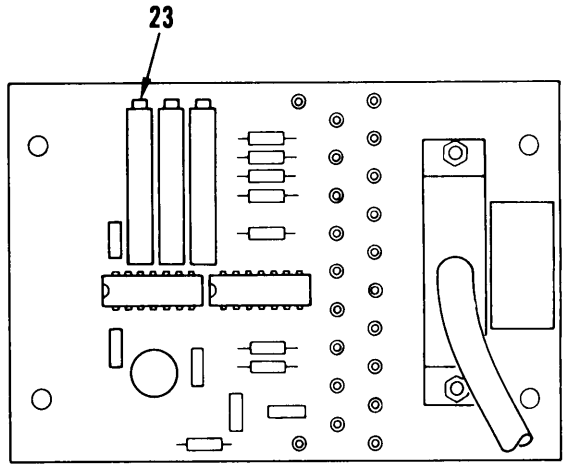
(15) BEGIN ADJUSTING
R6 (23) CLOCKWISE --> 3 BEEPS
R6 (23) COUNTERCLOCKWISE - > SINGLE BEEP
PROCEDURE WILL CONTINUE WHEN ADJUSTMENT IS COMPLETE.

(16) ADJUST CLOCKWISE and/or ADJUST COUNTERCLOCKWISE.

Perform adjustments as necessary.



EL9LQ-1100-114



EL9LQ-1100-119

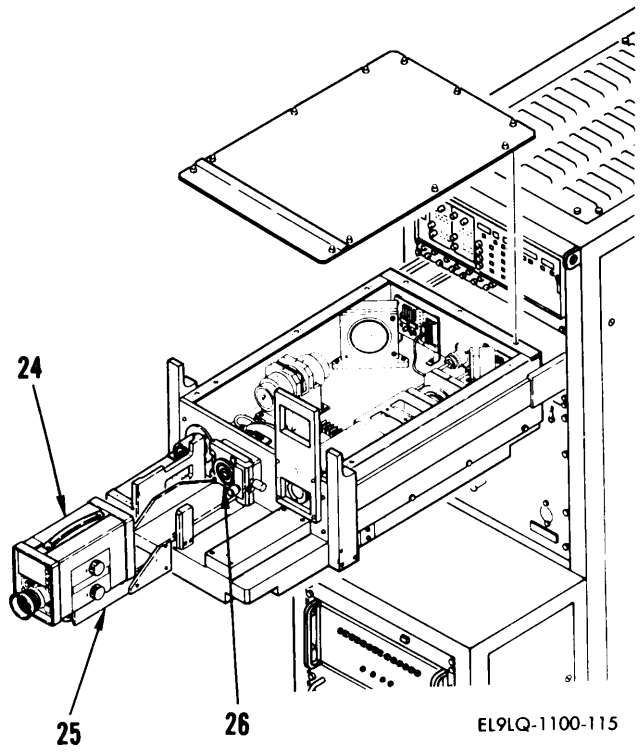
(17) PHOTODETECTOR VOLTAGE = #.###
(IN TOLERANCE) - VERIFICATION IN 8 SEC.

(18) PHOTODETECTOR (LAMP = 1)
VOLTAGE = #.### INPUT VOLTAGE = #.##.

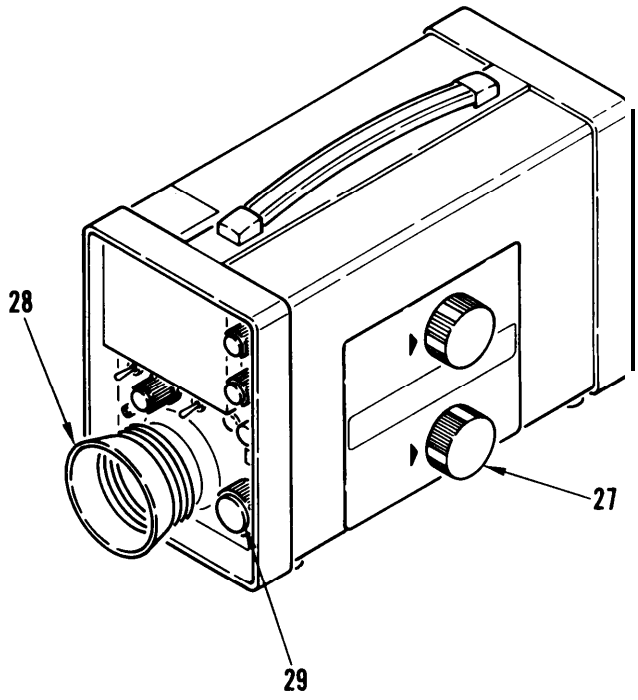
A. LEAVE SPOTMETER (24) IN FIXTURE (25).
B. MOVE FIXTURE (& SPOTMETER) TO SHADING (CENTER) PORT (26).
C. SET SPOTMETER 'SENSITIVITY AND X100 ATTENUATOR' KNOB (27) TO 'VIEW'.
D. FOCUS SPOTMETER ON SURFACE AROUND RECTANGULAR RED LIGHT.
E. 0BSERVE SPOT THROUGH SPOTMETER VIEWFINDER (28). POSITION SPOTMETER SO SPOT IS INSIDE THE RECTANGULAR RED LIGHT.
F. SET SPOTMETER 'SHUTTER AND X100 ATTENUATOR' KNOB (27) TO 'CLOSE'.
G. SET SPOTMETER 'SENSITIVITY MULTIPLIER' (29) TO 0.
H. SET SPOTMETER FOCUS TO INFINITY (SCREW LENS CLOSEST TO METER BODY).

(21) READ SPOTMETER DISPLAY AND ENTER VALUE:

Enter the value. If value is between 0 and 24, it is within the required range and will pass.



EL9LQ-1100-115

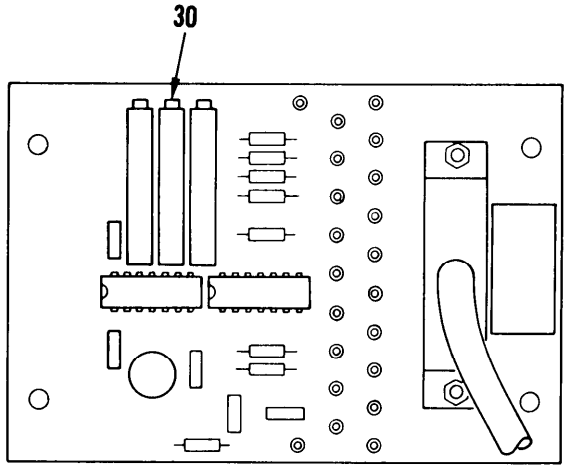


EL9LQ-1100-11

(22) BEGIN ADJUSTING
R4 (30) CLOCKWISE - - > 3 BEEPS
R4 (30) COUNTERCLOCKWlSE - > SINGLE BEEP
PROCEDURE WILL CONTINUE WHEN ADJUSTMENT IS COMPLETE.

(23) ADJUST CLOCKWISE and/or ADJUST COUNTERCLOCKWISE.

Perform adjustments as necessary.



EL9LQ-1100-120

(24) PHOTODETECTOR VOLTAGE = #.### (IN TOLERANCE) - VERIFICATION IN 8 SEC.

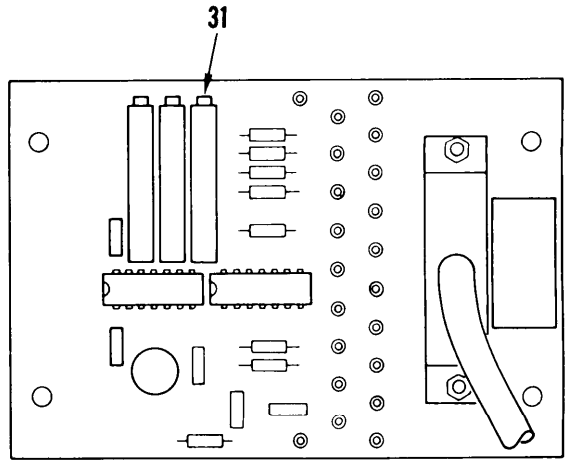
(25) PHOTODETECTOR (LAMP = 2) VOLTAGE = #.### INPUT VOLTAGE = #.##.

(26) BEGIN ADJUSTING
R2 (31) CLOCKWISE - - > 3 BEEPS
R2 (31) COUNTERCLOCKWISE -> SINGLE BEEP
PROCEDURE WILL CONTINUE WHEN ADJUSTMENT IS COMPLETE.

(27) ADJUST CLOCKWISE and/or ADJUST COUNTERCLOCKWISE.

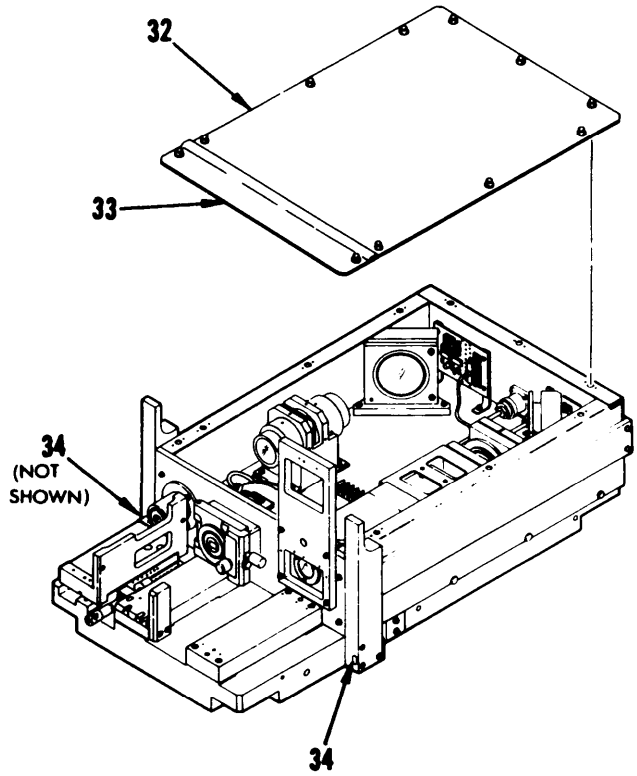
perform adjustments as necessary.

(28) PHOTODETECTOR VOLTAGE = #.### (IN TOLERANCE) - VERIFICATION IN 8 SEC.



EL9LQ-1100-121

```
   (29)  PHOTODETECTOR (LAMP = 2)
VOLTAGE = #.### INPUT VOLTAGE = #.##.

   (30)  OPTICAL SIGNAL GENERATOR
ALIGNMENT COMPLETE.

   (31)  A.  REPLACE THE MAIN TOP COVER
(32) AND TIGHTEN THE 9 '1/4 TURN'
FASTENERS.
         B.  REPLACE THE FRONT TOP COVER
(33) AND TIGHTEN THE TWO '1/4 TURN'
FASTENERS.
         C.  SLIDE IN THE OSG AND SCREW
IN THE TWO CAPSCREWS (34).
```



EL9LQ-1100-123

ap. PSALIGN MESSAGES

```
   (1)
      ----------------------------
------ POWER SUPPLY ALIGNMENT MENU ----
      ----------------------------
-     1) FIXED POWER SUPPLY          -
-     2) PROGRAMMABLE POWER SUPPLY   -
-        DACS                        -
-     3) PROGRAMMABLE POWER SUPPLIES -
-     4) EXIT                        -
-                                    -
-------------------------------------

        ENTER CHOICE:
```

If you enter 1, the following appears:

```
   (2)  FIXED POWER SUPPLY ALIGNMENT:

        THE OUTPUT VOLTAGE OF THE FIXED
        POWER SUPPLIES ARE MEASURED AT
        THE A/D CONVERTER.

                        A/D CONVERTER
                      EQUIVALENT MEASURED
POWER SUPPLY                VOLTAGE
-----------------------------------------
   +28 VDC              7.479 VDC ±3%
   +15 VDC              5.073 VDC ±3%
   -15 VDC             -5.073 VDC ±3%
   + 5 VDC              5.000 VDC ±3%
```

(3) A. REMOVE THE EIGHT SCREWS (1) FROM THE FRONT OF THE FIXED POWER SUPPLY DRAWER 1A4.

B. SLIDE THE FIXED POWER SUPPLY DRAWER (2) FORWARD AS FAR AS POSSIBLE.

(4) THE +28 VOLT FIXED POWER SUPPLY IS IN TOLERANCE MEASURED VOLTAGE = #.## VDC.

(5) THE +15 VOLT FIXED POWER SUPPLY IS IN TOLERANCE MEASURED VOLTAGE = #.## VDC.

(6) THE -15 VOLT FIXED POWER SUPPLY IS IN TOLERANCE MEASURED VOLTAGE = #.## VDC.

(7) THE +5 VOLT FIXED POWER SUPPLY IS IN TOLERANCE MEASURED VOLTAGE = #.## VDC.

(8) A. SLIDE IN THE FIXED POWER SUPPLY DRAWER (3).

B. SECURE THE EIGHT SCREWS (4) IN THE FIXED POWER SUPPLY DRAWER.

(9) FIXED POWER ALIGNMENT COMPLETE.

If you enter 2, the following appears:

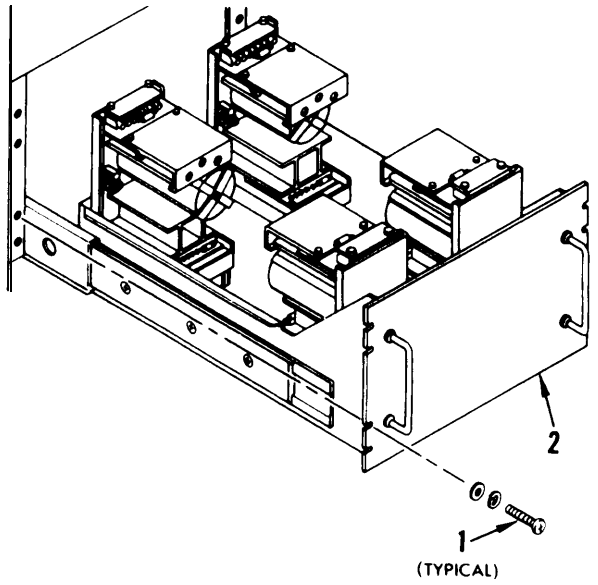
(10) PROGRAMMABLE POWER SUPPLY DAC ALIGNMENT:

(11) P/S 1 VOLTAGE CONTROL DAC VOLTAGE = #.####.

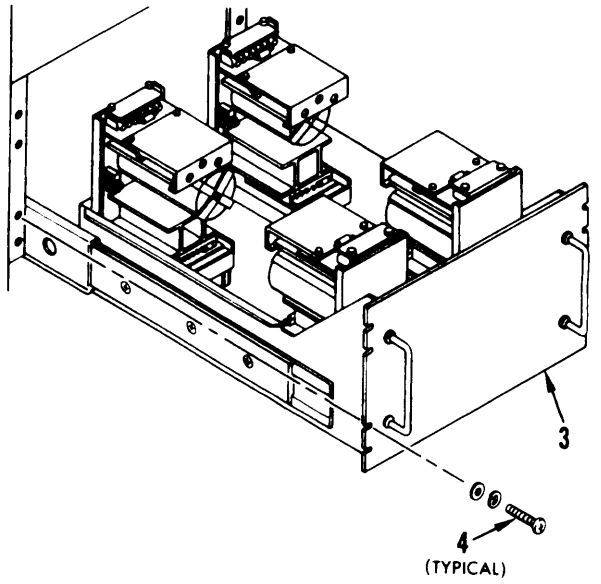
(12) P/S 1 CURRENT CONTROL DAC VOLTAGE= #.####.

(13) P/S 2 VOLTAGE CONTROL DAC VOLTAGE = #.####.

(14) P/S 2 CURRENT CONTROL DAC VOLTAGE = #.####.

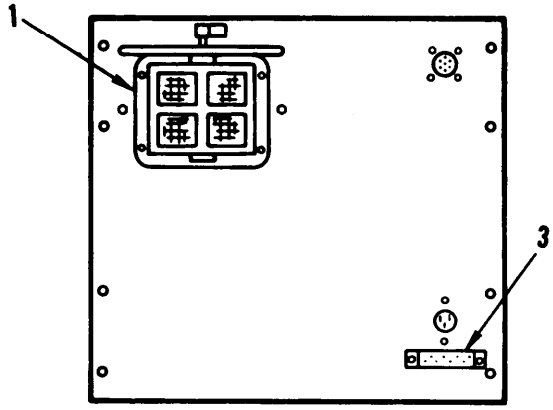


EL9LQ-1100-124



EL9LQ-1100-125

```
(15) P/S 3 VOLTAGE CONTROL DAC
VOLTAGE = #.####.

(16) P/S 3 CURRENT CONTROL DAC
VOLTAGE = #.####.

(17) P/S 4 VOLTAGE CONTROL DAC
VOLTAGE = #.####.

(18) P/S 4 CURRENT CONTROL DAC
VOLTAGE = #.####.

(19) PROGRAMMABLE POWER SUPPLY DAC
ALIGNMENT COMPLETE.

CLOSE THE DOOR OF THE KEPCO POWER
SUPPLY CONTROLLER.

If no adjustment was required,
the door will be closed.
```



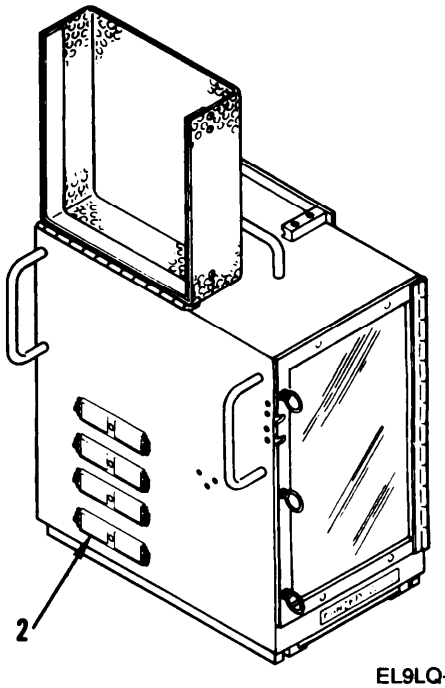
EL9LQ-620-61

If you enter 3, the following appears:

```
PROGRAMMABLE POWER SUPPLY ALIGNMENT:

A - INSTALL MAJOR TEST ADAPTER
    13083633-19 IN TEST ADAPTER
    PANEL ASSEMBLY 2A2A4-J1 (1).
```

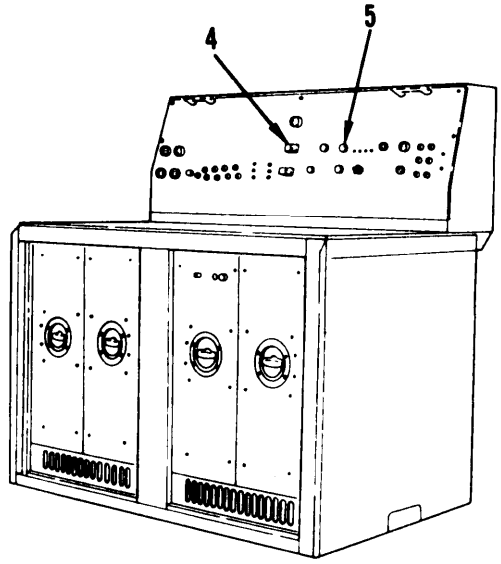
If not already connected, refer to paragraph 2-65 for installation procedures.

```
B - CONNECT CABLE ASSEMBLY 13082730
    AS FOLLOWS:

    P1 TO MAJOR TEST ADAPTER
       13083633-19 -J4 (2)
    P2 TO TEST ADAPTER PANEL
       ASSEMBLY 2A2A4-J6 (3)
```



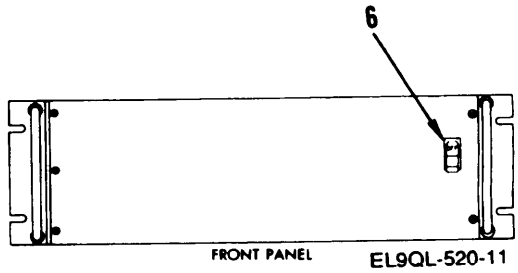
EL9LQ-730-60

```
        P3 TO AN/USM 410 DIU A1A4-J26
          (4)
        P4 TO AN/USM 410 DIU A1A4-J32
          (5)

        PRESS (PROCEED) WHEN COMPLETE.

  C  -  CHECK 488 CONTROLLER POWER
        SUPPLY ASSEMBLY 1A2 FRONT PANEL
        POWER SWITCH (6) FOR ON.  IF
        OFF SET TO ON POSITION.

  D  -  ROTATE THE CURRENT KNOB (7) ON
        PROGRAMMABLE POWER SUPPLIES

        1A3PS1, 1A3PS2, 1A3PS3, AND
        1A3PS4 FULLY CLOCKWISE.

        PRESS (PROCEED) WHEN COMPLETE.
```



EL9LQ-1100-144

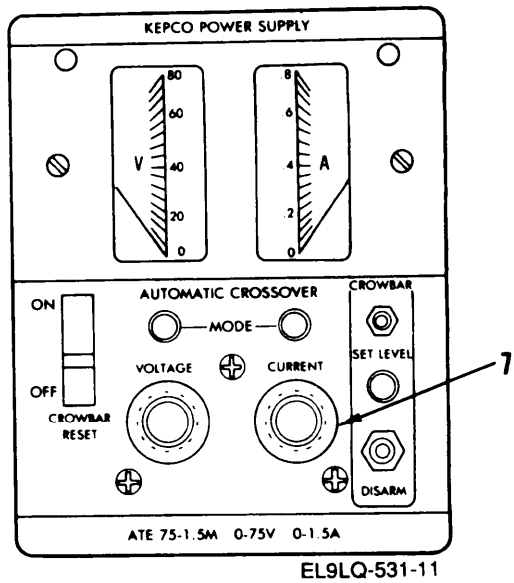
```
==== PROGRAMMABLE P/S ALIGNMENT MENU ====

=     1) PROGRAMMABLE POWER SUPPLY 1    =
=     2) PROGRAMMABLE POWER SUPPLY 2    =
=     3) PROGRAMMABLE POWER SUPPLY 3    =
=     4) PROGRAMMABLE POWER SUPPLY 4    =
=     5) RETURN TO POWER SUPPLY         =
=        ALIGNMENT MENU                 =
=========================================

        ENTER CHOICE:
```



EL9QL-520-11

If you enter 1 or 2, the following appears:

```
        MEASURING OUTPUT VOLTAGES FROM P/S #

        POWER SUPPLY # OUTPUT VOLTAGES: IL".

        OUTPUT VOLTAGE PROGRAMMED AT 5 VDC =
        ##.## VDC (UL = 5.10  LL = 4.90)
        OUTPUT VOLTAGE PROGRAMMED AT 15 VDC
        = ##.## VDC (UL = 15.22  LL = 14.77)
        OUTPUT VOLTAGE PROGRAMMED AT 30 VDC
        = ##.## VDC (UL - 30.60  LL = 29.40)

        PRESS (YES) TO MAKE ADJUSTMENTS TO
        THE POWER SUPPLY OUTPUT VOLTAGE
        PRESS (NO) TO END ADJUSTMENTS.
```



EL9LQ-531-11

```
POWER SUPPLY # OUTPUT VOLTAGES IS IN
TOLERANCE:",

OUTPUT VOLTAGE PROGRAMMED AT 5 VDC =
##.## VDC (UL = 5.10  LL = 4.90)
OUTPUT VOLTAGE PROGRAMMED AT 15 VDC
= ##.## VDC (UL = 15.22  LL = 14.77)
OUTPUT VOLTAGE PROGRAMMED AT 30 VDC
= ##.## VDC (UL - 30.60  LL = 29.40)


MEASURING OUTPUT CURRENTS FROM P/S #

OUTPUT CURRENT PROGRAMMED AT 0.5
AMPS = #.### AMPS (UL = 0.520
LL = 0.470)
OUTPUT CURRENT PROGRAMMED AT 1.5
AMPS = #.### AMPS (UL = 1.545
LL = 1.455)
OUTPUT CURRENT PROGRAMMED AT 2.0
AMPS = #.### AMPS (UL = 2.100
LL = 1.900)

PRESS (YES) TO MAKE ADJUSTMENTS TO
THE POWER SUPPLY OUTPUT CURRENT
PRESS (NO) TO END ADJUSTMENTS.


POWER SUPPLY # OUTPUT CURRENT:

POWER SUPPLY # OUTPUT CURRENT IS IN
TOLERANCE:

OUTPUT CURRENT PROGRAMMED AT 0.5
AMPS = #.### AMPS (UL = 0.520
LL = 0.470)
OUTPUT CURRENT PROGRAMMED AT 1.5
AMPS = #.### AMPS (UL = 1.545
LL = 1.455)
OUTPUT CURRENT PROGRAMMED AT 2.0
AMPS = #.### AMPS (UL = 2.100
LL = 1.900)

PRESS (PROCEED) TO CONTINUE.
```

If you enter 3 or 4, the following appears:

```
MEASURING OUTPUT VOLTAGES FROM P/S #

POWER SUPPLY # OUTPUT VOLTAGES:

OUTPUT VOLTAGE PROGRAMMED AT 10 VDC
= ##.## VDC (UL = 10.20  LL = 9.80)
OUTPUT VOLTAGE PROGRAMMED AT 30 VDC
= ##.## VDC (UL = 30.45  LL = 29.55)
OUTPUT VOLTAGE PROGRAMMED AT 70 VDC
= ##.## VDC (UL - 71.40  LL = 68.40)

PRESS (YES) TO MAKE ADJUSTMENTS TO
THE POWER SUPPLY OUTPUT VOLTAGE
PRESS (NO) TO END ADJUSTMENTS.


POWER SUPPLY # OUTPUT VOLTAGE IS IN
TOLERANCE:

OUTPUT VOLTAGE PROGRAMMED AT 10 VDC
= ##.## VDC (UL = 10.20  LL = 9.80)
OUTPUT VOLTAGE PROGRAMMED AT 30 VDC
= ##.## VDC (UL = 30.45  LL = 29.55)
OUTPUT VOLTAGE PROGRAMMED AT 70 VDC
= ##.## VDC (UL - 71.40  LL = 68.40)

PRESS (PROCEED) TO CHECK OUTPUT
CURRENT."$


MEASURING OUTPUT CURRENTS FROM P/S #

POWER SUPPLY # OUTPUT CURRENT:

OUTPUT CURRENT PROGRAMMED AT 0.4
AMPS = #.### AMPS (UL = 0.42
LL = 0.38)
OUTPUT CURRENT PROGRAMMED AT 1.0
AMPS = #.### AMPS (UL = 1.03
LL = 0.97)
OUTPUT CURRENT PROGRAMMED AT 1.3
AMPS = #.### AMPS (UL = 1.36
LL = 1.23)

PRESS (YES) TO MAKE ADJUSTMENT TO
THE POWER SUPPLY OUTPUT CURRENT
PRESS (NO) TO END ADJUSTMENTS."$
```

```
POWER SUPPLY # OUTPUT CURRENT IS IN
TOLERANCE:

OUTPUT CURRENT PROGRAMMED AT 0.4
AMPS = #.### AMPS (UL = 0.42
LL = 0.38)
OUTPUT CURRENT PROGRAMMED AT 1.0
AMPS = #.### AMPS (UL = 1.03
LL = 0.97)
OUTPUT CURRENT PROGRAMMED AT 1.3
AMPS = #.### AMPS (UL = 1.36
LL = 1.23)

PRESS (PROCEED) TO CONTINUE.

PROGRAMMABLE POWER SUPPLY #
ALIGNMENT IS COMPLETE.
```

aq. MAINT MESSAGES

```
(1) EOB MAINTENANCE DATA:

(2)

        EOB MAINTENANCE MENU

= 1) MULTIPROGRAMMER IO) CID CAMERAS   =
=    DIG IN/OUT      11) MULTIPRO-    =
= 2) READ                GRAMMER      =
=    TEMPERATURE         RELAYS       =
=    SENSORS         12) MP QUAD DACS  =
= 3) TEMPERATURE     13) SHUTTERS     =
=    CONTROLLER      14) PROG. PULSE   =
= 4) MOTORS              GENERATOR    =
= 5) PROGRAMMABLE    15) VIDEO SIGNAL =
=    POWER SUPPLIES      GENERATOR    =
= 6) A/D CONVERTER    16) CALCULATE    =
= 7) DIGITIZER           FUNCTIONS    =
= 8) MATRIX SWITCH    17) EQUATE       =
= 9) PARALLEL PLUS       FUNCTIONS    =
=                     99) EXIT         =

ENTER CHOICE:

MULTIPROGRAMMER DIG IN/OUT (1)
```

```
(3) MULTIPROGRAMMER DIGITAL INPUT/
OUTPUT CCAS:

    1 - PROGRAM DIGITAL OUTPUT CARD
    2 - READ DIGITAL INPUT CARD
    3 - RETURN TO MAIN MENU

ENTER CHOICE:

    1 - PROGRAM DIGITAL OUTPUT CARD

(4) ENTER THE NUMBER OF THE DIGITAL
OUTPUT CARD YOU WISH TO SET (3-5):
```

If you enter 1 or 2, the following menu appears:

```
(5) ENTER THE BIT NUMBER (1-12) AND
VALUE (1=SET - 0=CLEAR) YOU WISH TO
CHANGE
```

If you enter 3, the following menu appears:

```
(6) DIGITAL OUTPUT CARD NUMBER 3

BIT  1 - (NOT USED)
BIT  2 - DC LASER SIM. RESET
BIT  3 - DC LASER SIM. BAR
BIT  4 - FIR SHUTTER OPEN
BIT  5 - PMT FILTER, BIT 5
BIT  6 - OSG LAMP ON
BIT  7 - OUTSIDE TEST LAMP ON
BIT  8 - PMT FILTER, BIT 1
BIT  9 - PMT FILTER, BIT 2
BIT 10 - PMT FILTER, BIT 3
BIT 11 - PMT FILTER, BIT 4
BIT 12 - S-T DIG IN 5
```

If you enter 4, the following menu appears:

```
(7)  DIGITAL OUTPUT CARD NUMBER 4

BIT  1 - DC SHUTTER OPEN
BIT  2 - DC T-LAMP ON
BIT  3 - DC FLASH LAMP ON
BIT  4 - OA PMT TEST SOURCE
BIT  5 - OA PMT HV ON
BIT  6 - OA FILTER POS 2 (IN)
BIT  7 - INTER. SCAN/SEQ-BAR
BIT  8 - OA SHUTTER OPEN
BIT  9 - OSG DIFFUSER OUT
BIT 10 - OSG FO MUX FILTER IN
BIT 11 - OSG MIRROR OUT
BIT 12 - S-T DIG IN 6

ENTER THE BIT NUMBER (1-12) AND
VALUE (1=SET = 0=CLEAR) YOU WISH TO
CHANGE
```

If you enter 5, the following menu appears:

```
(8)  DIGITAL OUTPUT CARD NUMBER 5

BIT  1 - FIR BORESIGHT ON-BAR
BIT  2 - FIR SHUTTER HOLD OPEN
BIT  3 - OSG BIT 0
BIT  4 - OSG BIT 1
BIT  5 - (NOT USED)
BIT  6 - (NOT USED)
BIT  7 - (NOT USED)
BIT  8 - (NOT USED)
BIT  9 - (NOT USED)
BIT 10 - (NOT USED)
BIT 11 - (NOT USED)
BIT 12 - S-T DIG IN 6

ENTER THE BIT NUMBER (1-12) AND
VALUE (1=SET = 0=CLEAR) YOU WISH TO
CHANGE
```

Enter the bit number then press <RETURN>, then enter 0 or 1 number, then press <RETURN>.

```
(9)  MULTIPROGRAMMER DIGITAL INPUT/
OUTPUT CCAS:

1 - PROGRAM DIGITAL OUTPUT CARD
2 - READ DIGITAL INPUT CARD
3 - RETURN TO MAIN MENU

2 - READ DIGITAL INPUT CARD

(10)  ENTER THE NUMBER OF THE DIGITAL
INPUT CARD TO READ (1-6)
```

Data for the selected card is displayed on the VDT and printed on the line printer.

```
(11)

========== EOB MAINTENANCE MENU =======

= 1) MULTIPROGRAMMER DIG IN/OUT
= 2) READ TEMPERATURE SENSORS
= 3) TEMPERATURE CONTROLLER
= 4) MOTORS.
= 5) PROGRAMMABLE POWER SUPPLY
= 6) A/D CONVERTER
= 7) DIGITIZER
= 8) MATRIX SWITCH
= 9) PARALLEL PLUS
10) CID CAMERAS
11) MULTIPRO-GRAMMER RELAYS
12) MP QUAD DACS
13) SHUTTERS
14) PROG. PULSE GENERATOR
15) VIDEO SIGNAL GENERATOR
16) CALCULATE FUNCTIONS
17) EQUATE FUNCTIONS
99) EXIT

ENTER CHOICE:

READ TEMPERATURE SENSORS (2)

(12)
DC MIR A TRANS TEMPERATURE          = ###.##
DC MIR B TRANS TEMPERATURE          = ###.##
FC SOURCE 1 CHECK OF SOURCE A       = ###.##
FC SOURCE 2 CHECK OF SOURCE B       = ###.##
FC SOURCE 3 CHECK OF SOURCE C       = ###.##
OSA TEMPERATURE SENSOR (PMT)        = ###.##
TEMPERATURE PROBE                   = ###.##

PRESS <YES> TO REPEAT TEMPERATURE
READINGS
PRESS <NO>  TO RETURN TO MAIN MENU
```

(13)

```
                ======================
========== EOB MAINTENANCE MENU =======
                ======================      =
= 1) MULTIPROGRAMMER  10) CID CAMERAS       =
=    DIG IN/OUT       11) MULTIPRO-         =
= 2) READ                 GRAMMER           =
=    TEMPERATURE          RELAYS            =
=    SENSORS          12) MP QUAD DACS      =
= 3) TEMPERATURE      13) SHUTTERS          =
=    CONTROLLER       14) PROG. PULSE       =
= 4) MOTORS               GENERATOR         =
= 5) PROGRAMMABLE     15) VIDEO SIGNAL      =
=    POWER SUPPLIES       GENERATOR         =
= 6) A/D CONVERTER    16) CALCULATE         =
= 7) DIGITIZER             FUNCTIONS        =
= 8) MATRIX SWITCH    17) EQUATE            =
= 9) PARALLEL PLUS         FUNCTIONS        =
=                     99) EXIT              =
=========================================
```

ENTER CHOICE:

TEMPERATURE CONTROLLER

If you enter 3, the following menu appears:

(14) TEMPERATURE CONTROLLER

1 - PROGRAM 'A' ABSOLUTE
2 - PROGRAM 'A' RELATIVE TO AMBIENT
3 - PROGRAM 'B' RELATIVE TO 'A'
4 - PROGRAM 'C' RELATIVE TO 'A'
5 - READ TEMPERATURES (TAKES 20 SECONDS)
6 - READ AMBIENT SENSOR
7 - READ 'A-AMBIENT'
8 - READ 'A' SOURCE
9 - READ 'B' OR 'C' SOURCE
10 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - PROGRAM 'A' ABSOLUTE

(15) ENTER TEMPERATURE:

Enter the temperature, then press <RETURN>.

Test program programs the temperature controller 'A' source to entered temperature.

2 - PROGRAM 'A' RELATIVE TO AMBIENT

(16) ENTER TEMPERATURE:

Enter the temperature, then press <RETURN>.

Test program programs the temperature controller 'A' source to entered temperature relative to ambient.

3 - PROGRAM '8] RELATIVE TO 'A'

(17) ENTER TEMPERATURE:

Enter the temperature, then press <RETURN>.

Test program programs the temperature controller 'B' source to entered temperature relative to 'A' source.

4 - PROGRAM 'C' RELATIVE TO 'A'

{18) ENTER TEMPERATURE:

Enter the temperature, then press <RETURN>.

Test program programs the temperature controller 'C' source to entered temperature relative to 'A' source.

5 - REAR TEMPERATURES (TAKES 20 SECONDS)

(19) AMBIENT = ###.##
SOURCE A (RELATIVE) = ###.##
SOURCE A = ###.##
SOURCE B/C = ###.##

6- READ AMBIENT SENSOR

(20) AMBIENT TEMPERATURE = #.##

7 - READ 'A'-AMBIENT

(21) 'A-AMBIENT' TEMPERATURE = #.##

8 - READ 'A' SOURCE

(22) SOURCE 'A' TEMPERATURE = #.##

9 - READ 'B' OR 'C' SOURCE

(23) SOURCE 'B' OR 'C' TEMPERATURE = #.##

(24)

```
======== EOB MAINTENANCE MENU==========
=           ==================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
=    DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
=    SENSORS                RELAYS      =
= 3) TEMPERATURE        12) MP QUAD DACS=
=    CONTROLLER         13)  SHUTTERS   =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
=    POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
                            FUNCTIONS   =
                        99) EXIT        =
=============================================
```

ENTER CHOICE:

MOTORS (4)

(25)

WHAT MOTOR DO YOU WANT?

	MODULE	MOTOR	TARGET CODE	STEPS
1 - OSA FOCUS	3	5	..-	0-8000
2 - NIR FOCUS	2	5	---	0-16000
3 - NIR VARIABLE FILTER	2	6	---	0-16000
4 - NIR TARGET WHEEL	2	1	1-12	---
5 - NIR A MIRROR	2	3	1-2	---
6 - NIR B MIRROR	2	4	3,5,6	---
7 - FIR TARGET WHEEL	1	1	2-11	---
8- FIR APERTURE WHEEL	1	2	6,10, 12,14	---
9 - MOTOR STATUS				

ENTER NUMBER PRESS <RETURN>"$

1 - OSA FOCUS, 2 - NTR FOCUS, or
3- NTR VARIABLE FILTER

(26) ENTER NUMBER OF STEPS DESIRED

Enter desired number, then press <RETURN>.

(27) MODULE = # MOTOR = #

Test program operates motor through the desired number of steps.

4 - NIR TARGET WHEEL
6- NIR B MIRROR
7 - FIR TARGET WHEEL
8 - FIR APERTURE WHEEL

(28) ENTER TARGET CODE DESIRED

Enter desired number, then press <RETURN>.

(29) MODULE = # MOTOR - #

Test program operates motor according to the target code selected

9 - MOTOR STATUS

(30)

MOTOR	STATUS (OCTAL)
NIR TARGET WHEEL	####
NIR A MIRROR	####
NIR B MIRROR	####
FIR TARGET WHEEL	####
FIR APERTURE WHEEL	####

(31)

```
          ====================
========== EOB MAINTENANCE MENU ========
          ======================
=1) MULTIPROGRAMMER   10) CID CAMERA =
=    DIG IN/OUT         11) MULTIPRO-
=2) READ TEMPER-            GRAMMER RELAYS=
=    ATURE SENSORS      12) MP QUAD DACS =
=3) TEMPERATURE         13) SHUTTERS     =
=    CONTROLLER         14) PROG. PULSE  =
=4) MOTORS                  GENERATOR     =
=5) PROGRAMMABLE        15) VIDEO SIGNAL =
=    POWER SUPPLIES         GENERATOR     =
=6) A/D CONVERTER       16)  CALCULATE   =
=7) DIGITIZER               FUNCTIONS     =
=8) MATRIX SWITCH       17) EQUATE       =
=9) PARALLEL PLUS           FUNCTIONS     =
=                       99) EXIT          =
=========================================
```

ENTER CHOICE:

PROGRAMMABLE POWER SUPPLIES (5)

(32) PROGRAMMABLE POWER SUPPLIES

1 - DISCONNECT POWER SUPPLY
2 - CONNECT (THEN PROGRAM) POWER SUPPLY
3 - PROGRAM POWER SUPPLY (PS NOT CONNECTED)
4 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - DISCONNECT POWER SUPPLY

(33) ENTER POWER SUPPLY NUMBER (1-4)

Enter desired number, then press <RETURN>.

Test program disconnects the desired power supply.

2 - CONNECT (THEN PROGRAM) POWER SUPPLY

(34) ENTER POWER SUPPLY NUMBER (1-4)

Enter desired number, then press <RETURN>.

(35) POWER SUPPLY VOLTAGE RANGE

POWER SUPPLIES 1 AND 2 (O-36 VDC)
POWER SUPPLIES 3 AND 4 (O-75 VDC)

ENTER VOLTAGE:

Enter the exact voltage desired in volts, then press <RETURN>.

(36) POWER SUPPLY CURRENT RANGE

POWER SUPPLIES 1 AND 2 (O-3A)
POWER SUPPLIES 3 AND 4 (0-1.5 A)

ENTER CURRENT:

Enter the exact current desired in amperes, then press <RETURN>.

Test program programs the desired power supply and connects it.

3 - PROGRAM POWER SUPPLY (PS NOT CONNECTED)

(37) ENTER POWER SUPPLY NUMBER (1-4)

Enter desired number, then press <RETURN>.

(38) POWER SUPPLY VOLTAGE RANGE

POWER SUPPLIES 1 AND 2 (0-36 VDC)
POWER SUPPLIES 3 AND 4 (0-75 VDC)

ENTER VOLTAGE:

Enter the exact voltage desired in volts, then press <RETURN>.

(39) POWER SUPPLY CURRENT RANGE

POWER SUPPLIES 1 AND 2 (0-3 A)
POWER SUPPLIES 3 AND 4 (0-1.5 A)

ENTER CURRENT:

Enter the exact current desired in amperes, then press <RETURN>.

Test program programs the desired power supply.

(40)

```
                ====================
========== EOB MAINTENANCE MENU ========
=               ====================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
     DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
     SENSORS                RELAYS      =
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13) SHUTTERS    =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
     POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
                            FUNCTIONS   =
                        99) EXIT        =
=========================================
```

ENTER CHOICE:

A/D CONVERTER (6)

(41)

ENTER A/D CHANNEL TO READ (DECIMAL).
(0=SSH CHANNELS, 999= MAIN MENU)

Enter desired A/D channel number, then press <RETURN>.

(42) CHANNEL ### READS ###.##### VDC

If you enter Ø:

```
(43)  SSH 1  = ###.#### VDC
      SSH 2  = ###.#### VDC
      SSH 3  = ###.#### VDC
      SSH 4  = ###.#### VDC
```

(44)

```
                ====================
========== EOB MAINTENANCE MENU =======
=               ====================
= 1) MULTIPROGRAMMER      10) CID CAMERAS =
     DIG IN/OUT           11) MULTIPRO-   =
= 2) READ TEMPERATURE          GRAMMER    =
     SENSORS                   RELAYS     =
= 3) TEMPERATURE          12) MP QUAD DACS=
     CONTROLLER           13) SHUTTERS    =
= 4) MOTORS               14) PROG. PULSE =
= 5) PROGRAMMABLE              GENERATOR  =
     POWER SUPPLIES       15) VIDEO SIGNAL=
= 6) A/D CONVERTER             GENERATOR  =
= 7) DIGITIZER            16) CALCULATE   =
= 8) MATRIX SWITCH             FUNCTIONS  =
= 9) PARALLEL PLUS        17) EQUATE      =
                               FUNCTIONS  =
                          99) EXIT        =
=======================================
```

ENTER CHOICE:

DIGITIZER (7)

(45) DIGITIZER DATA

1 - READ CHANNEL A
2 - READ CHANNEL B
3 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - READ CHANNEL A

Test program reads the data from digitizer channel A.

2 - READ CHANNEL B

Test program reads the data from digitizer channel B.

(46)

```
                ====================
========== EOB MAINTENANCE MENU =======
=               ====================
= 1) MULTIPROGRAMMER      10) CID CAMERAS =
     DIG IN/OUT           11) MULTIPRO-   =
= 2) READ TEMPERATURE          GRAMMER    =
     SENSORS                   RELAYS     =
= 3) TEMPERATURE          12) MP QUAD DACS=
     CONTROLLER           13) SHUTTERS    =
= 4) MOTORS               14) PROG. PULSE =
= 5) PROGRAMMABLE              GENERATOR  =
     POWER SUPPLIES       15) VIDEO SIGNAL=
= 6) A/D CONVERTER             GENERATOR  =
= 7) DIGITIZER            16) CALCULATE   =
= 8) MATRIX SWITCH             FUNCTIONS  =
= 9) PARALLEL PLUS        17) EQUATE      =
                               FUNCTIONS  =
                          99) EXIT        =
=======================================
```

ENTER CHOICE:

MATRIX SWITCH (8)

(47) MATRIX SWITCH TESTS

ENTER CHOICE:

0 - CLEAR MATRIX SWITCH
1 - DISCONNECT RELAY
2 - CONNECT RELAY
3 - SEARCH FOR CLOSED RELAY
4 - RETURN TO MAIN MENU

0 - CLEAR MATRIX SWITCH

Test program clears the matrix switch

1 - DISCONNECT RELAY

(48) CENTER ROW NUMBER (1-120)?

Enter desired number, then press <RETURN>.

(49)

1 = AC STANDARD HI
2 = AC STANDARD LO
3 = DC STANDARD HI
4 = DC STANDARD LO
5 = WAVEFORM GENERATOR HI
6 = WAVEFORM GENERATOR LO
7 = MOTP 41
8 = MOTP 42
9 = MOTP 43
10 = MOTP 44
11 = SSH 1
12 = SSH 2
13 = SSH 3
14 = SSH 4
15 = ZERO CROSSING DETECTOR
16 = GROUND

ENTER COLUMN NUMBER (1-16):

Enter desired column number, then press <RETURN>.

Test program disconnects the desired relay.

2 - CONNECT RELAY

(50) CENTER ROW NUMBER (1-120)?

Enter desired row number, then press <RETURN>.

(51)

1 = AC STANDARD HI
2 = AC STANDARD LO
3 = DC STANDARD HI
4 = DC STANDARD LO
5 = WAVEFORM GENERATOR HI
6 = WAVEFORM GENERATOR LO
7 = MOTP 41
8 = MOTP 42
9 = MOTP 43
10 = MOTP 44
11 = SSH 1
12 = SSH 2
13 = SSH 3
14 = SSH 4
15 = ZERO CROSSING DETECTOR
16 = GROUND

ENTER COLUMN NUMBER (1-16):

Enter desired column number, then pres <RETURN>.

Test program connects the desired relay.

3 - SEARCH FOR CLOSED RELAY

(52) REMOVE SHORTING PLUGS AND PERSONALITY CCAS.

ENTER QUADRANT NUMBER OF SUSPECTED BAD SWITCH (1-4).

Enter desired quadrant number, then press <RETURN>.

(53) ENTER COLUMN NUMBER OF SUSPECTED BAD SWITCH (1-16)

Enter desired column number, then press <RETURN>.

(54) BAD SWITCH NUMBER = #

(55)

```
                    ====================
========== EOB MAINTENANCE MENU =======
=           ====================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
     DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER    =
     SENSORS                RELAYS      =
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13) SHUTTERS    =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
     POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
                            FUNCTIONS   =
                        99) EXIT        =
=======================================
```

ENTER CHOICE

PARALLEL BUS (9)

(56) PARALLEL BUS TEST:

ENTER NUMBER TO BE PUT OUT ON THE BUS.

Enter any desired number between 32767 and -32767, the press <RETURN>.

(57) PARALLEL BUS READS: ####

The number read from the bus must be the same number entered in step 66. Otherwise, the bus is faulty.

(58)

```
                    ====================
========== EOB MAINTENANCE MENU =======
=           ==================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
     DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER    =
     SENSORS                RELAYS
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13)  SHUTTERS   =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
     POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
                            FUNCTIONS   =
                        99) EXIT        =
=====================================
```

ENTER CHOICE:

CID CAMERAS (10)

(59) THE SELECTED CAMERA WILL PUT 240 LINES BY 160 PIXELS INTO MATRIX 1 (A BYTE MATRIX) AFTER YOU ENTER YOUR CHOICE. YOU WILL BE ASKED IF YOU WANT A LINE OR GRAPHICS - IF GRAPHICS EVERY OTHER PIXEL (2-158) ON LINES 10,20,30,... 230,240 WILL BE CONVERTED TO 0.9 AND DISPLAYED. 128 AND BELOW CONVERTS TO O, 128-160 CONVERTS TO 1 ETC.

1 - INTERNAL CAMERA
2 - EXTERNAL CAMERA
3 - RAMP UP DC EXTERNAL SOURCE TO 6V, INITIALIZE DAY SIDE
4 - TURN OFF DC EXTERNAL SOURCE
8 - SPECIAL INTERNAL CAMERA LOOP (LINE 120)
9 - RETURN TO MAIN MENU

1 - INTERNAL CAMERA or 2 - EXTERNAL CAMERA

Test program programs the selected camera to display data.

(60)

TO GET 'GRAPHICS' ENTER <-1>
TO RETURN TO CID MENU (GET NEW PIC) ENTER <O>
TO DISPLAY A LINE OF DATA ENTER <LINE #
TO RETURN TO MAIN MENU ENTER 999

If you enter -1:

(61) ENTER THE LINE # YOU WISH TO SEE

OR

ENTER O TO GET LINES 10-240 IN STEPS OF 10
ENTER -5 TO GET LINES 1O-24O IN STEPS OF 5
ENTER -20 TO GET LINES 10-240 IN STEPS OF 20, ETC.

Test program generates graphic according to the number you entered.

If you enter O, the test program loops back to step (63).

If you enter a line number, the test program displays the data for the line number.

3 - RAMP UP DC EXTERNAL SOURCE TO 6V, INITIALIZE DAYSIDE

Test program positions the DC A and B mirrors and the DC shutter, and turns on the DC external source/target.

4 - TURN OFF DC EXTERNAL SOURCE

The EO bench turns off the external source.

8 - SPECIAL INTERNAL CAMERA LOOP (LINE 120)

Test program sets up an internal camera loop.

(62)

```
                  ====================
========== EOB MAINTENANCE MENU =======
=           ====================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
     DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
     SENSORS                RELAYS
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13)  SHUTTERS   =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
     POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
                            FUNCTIONS   =
                        99) EXIT        =
====================================
```

ENTER CHOICE:

MULTIPROGRAMMER RELAYS (11)

(63) MULTIPROGRAMMER EXTENDER RELAYS (1-120)

ENTER CHOICE:

1 - CONNECT (CLOSE)
2 - DISCONNECT (OPEN)
3 - CLEAR (OPEN ALL)
4 - MAIN MENU

1 - CONNECT (CLOSE)

(64) ENTER RELAY NUMBER (1-120)?

Enter desired relay number, then press <RETURN>.

Test program closes the selected relay.

2 - DISCONNECT (OPEN)

(65) ENTER RELAY NUMBER (1-120)?

Enter the desired relay number, then press <RETURN>.

Test program opens the selected relay.

3- CLEAR (OPEN ALL)

Test program opens all relays.

(66)

```
                  ====================
========== EOB MAINTENANCE MENU ======
=           ====================
= 1) MULTIPROGRAMMER 10) CID CAMERAS =
     DIG IN/OUT         11) MULTIPRO-  =
= 2) READ TEMPERATURE       GRAMMER    =
     SENSORS                RELAYS
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13)  SHUTTERS  =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR  =
     POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR  =
= 7) DIGITIZER          16) CALCULATE  =
= 8) MATRIX SWITCH          FUNCTIONS  =
= 9) PARALLEL PLUS      17)   EQUATE   =
                            FUNCTIONS  =
                        99) EXIT       =
====================================
```

ENTER CHOICE:

MP QUAD DACS (12)

(67) MULTIPROGRAMMER QUAD DACS

CARD 1

1 - DAC 1 SYNC. LEVEL
2 - DAC 2 WINDOW 1 LEVEL
3 - DAC 3 SINE WAVE LEVEL
4 - DAC 4 CAMERA VIDEO LEVEL

CARD 2

5 - DAC 1 (NOT USED)
6 - DAC 2 BACKGROUND LEVEL
7 - DAC 3 WINDOW 2 LEVEL
8 - DAC 4 (NOT USED)
9 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - DAC 1 SYNC. LEVEL

(68) CENTER VOLTAGE (0-10)

Enter desired center voltage, then press <RETURN>.

Test program sets camera blanking level DAC to desired voltage.

2 - DAC 2 WINDOW 1 LEVEL

(69) CENTER VOLTAGE (0-10)

Enter desired voltage, then press <RETURN>.

Test program sets camera brightness level DAC to desired voltage.

3 - DAC 3 SINE WAVE LEVEL

(70) CENTER VOLTAGE (0-10)

Enter desired voltage, then press <RETURN>.

Test program sets camera sinewave level DAC to desired voltage.

4 - DAC 4 CAMERA VIDEO LEVEL

(71) CENTER VOLTAGE (0-10)

Enter desired voltage, then press <RETURN>.

Test program sets camera video level DAC to desired voltage.

6- DAC 2 BACKGROUND LEVEL

(72) CENTER VOLTAGE (0-10)

Enter desired voltage, then press <RETURN>.

Test program sets camera background level DAC to desired voltage.

7 - DAC 3 WINDOW 2 LEVEL

(73) CENTER VOLTAGE (0-10)

Enter desired voltage, then press <RETURN>.

Test program sets camera white level DAC to desired voltage.

(74)

```
                ====================
========== EOB MAINTENANCE MENU =======
=               ====================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
=    DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
=    SENSORS                RELAYS      =
= 3) TEMPERATURE        12) MP QUAD DACS=
=    CONTROLLER         13) SHUTTERS    =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
=    POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
=                           FUNCTIONS   =
=                       99) EXIT        =
=======================================
```

ENTER CHOICE:

SHUTTERS (13)

(75) E/O BENCH SHUTTERS:

1 - OPEN DAY SHUTTER
2 - OPEN NIGHT SHUTTER
3 - OPEN OSA SHUTTER
4 - CLOSE DAY SHUTTER
5 - CLOSE NIGHT SHUTTER
6 - CLOSE OSA SHUTTER

99 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - OPEN DAY SHUTTER

Test program opens the dayside test bench shutter.

2 - OPEN NIGHT SHUTTER

Test program opens the nightside test bench shutter.

3 - OPEN OSA SHUTTER

Test program opens the OSA shutter.

4 - CLOSE DAY SHUTTER

Test program closes dayside test bench shutter.

5 - CLOSE NIGHT SHUTTER

Test program closes nightside test bench shutter.

6- CLOSE OSA SHUTTER

Test program closes the OSA shutter.

(76)

```
                    ====================
========== EOB MAINTENANCE MENU =======
=           ====================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
=    DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
=    SENSORS                R E L A Y S =
= 3) TEMPERATURE        12) MP QUAD DACS=
=    CONTROLLER         13)  SHUTTERS   =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
=    POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
=                           FUNCTIONS   =
=                       99) EXIT        =
====================================
```

ENTER CHOICE:

PROG. PULSE GENERATOR (PPG) (14)

(77) PROGRAM PULSE GENERATOR:

1 - RESET
2 - SYNC PERIOD
3 - GATE PERIOD
4 - ENABLE
5 - CMD
6 - PPD
7 - ARM GEN
8 - ARM GATE
9 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - RESET

(78) PULSE, RESET

Test program resets the PPG.

2 - SYNC PERIOD

(79) ENTER SYNC PERIOD IN SECONDS:

Enter desired sync period, then press <RETURN>.

Test program programs the PPG to the desired sync period.

3 - GATE PER1OD

(80) ENTER GATE PERIOD IN SECONDS:

Enter desired gate period, then press <RETURN>.

Test program programs the PPG to the desired gate period.

4 - ENABLE

(81) ENTER ENABLE CODE (O=OFF, 1=PPGS ON, 2=LASER, 3=BOTH)

Enter desired enable code, then press <RETURN>.

Test program enables or disables the pulse generator, laser, or both.

5 - C M D

(82) ENTER CMD IN DECIMAL:

If you are familiar with the PPG circuitry, enter 12-bit CMD word and press <RETURN>. Otherwise, just press <RETURN>.

Test program programs the PPG with the 12-bit CMD word if one was sent.

6 - PPG

(83) ENTER PPG NUMBER (1-5)

Enter desired number, then press <RETURN>.

(84) ENTER DELAY IN SECONDS

Enter delay, then press <RETURN>.

(85) ENTER DURATION IN SECONDS

Enter duration, then press <RETURN>.

(86) ENTER OUTPUT CODE

Enter code, then press <RETURN>.

(87) ENTER GATE DELAY IN SECONDS

Enter gate delay, then press <RETURN>.

(88) ENTER GATE TIME IN SECONDS

Enter gate time, then press <RETURN>.

(89) ENTER GATE CODE

Enter gate code, then press <RETURN>.

(90) ARMGEN? [YES] OR [NO]

Press <YES> to arm the PPG output counters, or <NO> if you do not wish to arm them.

(91) ARMGATE? [YES] OR [NO]

Press <YES> to arm the PPG gate counter or <NO> if you do not wish to arm them.

Test program programs the program-mable pulse generator according to the data entered.

7 - ARM GEN

(92) PULSE, ARMEN

Test program arms the PPG output counters.

8 - ARM GATE

(93) PULSE, ARMGATE

Test program ARMS THE PPG gate counters.

(94)

```
                ====================
========== EOB MAINTENANCE MENU ========
=          ====================
= 1) MULTIPROGRAMMER     10) CID CAMERAS =
=    DIG IN/OUT          11) MULTIPRO-   =
= 2) READ TEMPERATURE        GRAMMER     =
=    SENSORS                 RELAYS       
= 3) TEMPERATURE         12) MP QUAD DACS=
=    CONTROLLER          13)  SHUTTERS   =
= 4) MOTORS              14) PROG. PULSE =
= 5) PROGRAMMABLE            GENERATOR   =
=    POWER SUPPLIES      15) VIDEO SIGNAL=
= 6) A/D CONVERTER            GENERATOR   =
= 7) DIGITIZER           16) CALCULATE   =
= 8) MATRIX SWITCH            FUNCTIONS   =
= 9) PARALLEL PLUS       17)   EQUATE    =
=                             FUNCTIONS   =
=                        99) EXIT         =
==================================
```

ENTER CHOICE:

VIDEO SIGNAL GENERATOR (15)

(95) PROGRAM VIDEO SIGNAL GENERATOR:

1 - 525 LINE RATE
2 - 875 LINE RATE (TCLOCK =0)
3 - CAMERA VIDEO LEVEL
4 - BRIGHTNESS
5 - BLANKING LEVEL
6 - FREQUENCY, SINE LEVEL, PHASE
7 - WINDOW PARAMETERS
8 - 875 LINE RATE (TCLOCK =1)
9 - RETURN TO MAIN MENU

ENTER CHOICE:

1 - 525 LINE RATE

Test program enables video sync, camera sync output, trigger output, and camera video output at the 525 line rate, and enables display windows 1, 2, and 3.

2 - 875 LINE RATE

Test program enables camera video sync, camera sync output, trigger output, and camera video output at the 875 line rate, and enables display windows 1, 2, and 3.

3 - CAMERA VIDEO LEVEL

(96) ENTER VIDEO LEVEL (O-5 VDC):

Enter desired video level, then press <RETURN>.

Test program sets camera video level to desired voltage.

4 - BRIGHTNESS

(97) ENTER BRIGHTNESS (O-2 VDC):

Enter desired brightness voltage, then press <RETURN>.

Test program sets camera brightness level to desired voltage.

5 - BLANKING LEVEL

(98) ENTER BLANKING LEVEL (0-0.5 VDC):

Enter desired blanking level voltage, then press <RETURN>.

Test program sets camera blanking level to desired voltage.

6 - FREQUENCY, SINE LEVEL, PHASE

(99) ENTER FREQUENCY IN MHZ (0,2,4,8,10):

Enter desired frequency, then press <RETURN>.

(100) ENTERS SINE LEVEL (O-1 VPP):

Enter desired sine level voltage, then press <RETURN>.

(101) ENTER PHASE (0-324 IN STEPS OF 36):

Enter desired angle in degrees (0,36,72,108,etc.), then press <RETURN>.

Test program sets VSG frequency, sinewave level, and phase angle.

7 - WINDOW PARAMETERS

(102) WINDOW?

Enter 1-8 according to the following menu, then press <RETURN>.

1 - DISPLAY WINDOW
2 - NOT USED
3 - CAMERA VIDEO
4 - EXTERNAL TRIGGER
5 - PNVS VIDEO PROCESSOR
6 - PNVS VIDEO PROCESSOR TRIGGER
7 - BIT VIDEO BLACK
8 - BIT VIDEO WHITE

(103) START LINE (2-437)?

Enter desired starting line (first line of window), then press <RETURN>.

(104) NUMBER OF LINES (LAST LINE - START LINE +1)?

Enter desired number of lines in window, then press <RETURN>.

(105) DELAY?

Enter TIME INTERVAL BETWEEN HORIZONTAL SYNC AND START OF WINDOW IN DECIMAL FORM (.000020, etc.), then press <RETURN>.

(106) DURATION?

Enter time duration of window in decimal form (.000025, etc.), then press <RETURN>.

(107) FIELD (0,1,2)?

Enter the fields in which target will appear (O = both, 1 = odd, 2 = even), then press <RETURN>.

(108) FRAMES (0,1,2)?

Enter number frames of window output (0 = no output, 1 = 1 frame, 2 = continuous), then press <RETURN>.

Test program programs VSG to produce desired window.

8 - 875 LINE RATE (TCLOCK=1)

(109) VSG,LINERATE=875, VSY,CSY,WEN, TRI,CVI,TCL=1

Test program enables camera video sync, camera sync output, trigger output and camera video output at the 875 linet, rate, and enables display windows 1, 2, and 3.

(110)

```
          ======================
========== E08 MAINTENANCE MENU ========
=          ====================
= 1) MULTIPROGRAMMER   10) CID CAMERAS =
     DIG IN/OUT        11) MULTIPRO-  =
= 2) READ TEMPERATURE      GRAMMER    =
=    SENSORS               RELAYS
= 3) TEMPERATURE       12) MP QUAD DACS=
=    CONTROLLER        13) SHUTTERS   =
= 4) MOTORS            14) PROG. PULSE =
= 5) PROGRAMMABLE          GENERATOR  =
=    POWER SUPPLIES    15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR  =
= 7) DIGITIZER         16) CALCULATE  =
= 8) MATRIX SWITCH          FUNCTIONS  =
= 9) PARALLEL PLUS     17) EQUATE     =
=                           FUNCTIONS  =
=                      99)    EXIT     =
================================
```

ENTER CHOICE:

CALCULATE FUNCTIONS (16)

(111)

1 -AUGMENTATION SYSTEM SOFTWARE PART NUMBER AND REVISION
2- FIR TRANSMISSION FACTOR
3- RETURN TO MAIN MENU

ENTER CHOICE:

1 - AUGMENTATION SYSTEM SOFTWARE PART NUMBER AND REVISION

(112) REVISION

AUGMENTATION SYSTEM SOFTWARE P/N = #

Test program displays system software part number and revision.

2 - FIR TRANSMISSION FACTOR

(113) FIR TRANSMISSION FACTOR = #.##

DATE ENTERED:

Test program displays the transmission factor and month, date, and year it was entered.

(114)

```
                ================
========== EOB MAINTENANCE MENU ======
=           ================
= 1) MULTIPROGRAMMER    10) CID CAMERAS =
=    DIG IN/OUT         11) MULTIPRO-   =
= 2) READ TEMPERATURE       GRAMMER     =
=    SENSORS                R E L A Y S  =
= 3) TEMPERATURE        12) MP QUAD DACS=
     CONTROLLER         13)  SHUTTERS   =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR   =
=    POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D CONVERTER          GENERATOR   =
= 7) DIGITIZER          16) CALCULATE   =
= 8) MATRIX SWITCH          FUNCTIONS   =
= 9) PARALLEL PLUS      17) EQUATE      =
=                           FUNCTIONS   =
=                       99) EXIT        =
====================================
```

ENTER CHOICE:

EQUATE FUNCTIONS (17)

(115)

1 - DC STANDARD VOLTAGE
2 - DC STANDARD CURRENT
3 - APPLY DC2A
4 - APPLY DC2B
5 - APPLY DC3A
6 - APPLY DC3B
7 - AC STANDARD (400 HZ)
8 -
9 - REMOVE ALL
11 - MEASURE DC
12 - MEASURE AC (RMS)
13- MEASURE PEAK VOLTAGE
14 - MEASURE PEAK TO PEAK (AC)
15 - MEASURE PEAK TO PEAK (DC)
16- MEASURE RESISTANCE
17 -
18-
19 -

99 - MAIN MENU

ENTER CHOICE:

1 - DC STANDARD VOLTAGE

(116) ENTER VOLTAGE

Enter desired voltage, then press <RETURN>.

Test program closes DIV standard switches, and applies dc signal dc standard voltage.

2 - DC STANDARD CURRENT

(117) ENTER CURRENT (MA)

Enter desired current, then press <RETURN>.

Test program closes DIV standard switches, and applies dc signal dc standard current.

3 - APPLY DC2A

(118) ENTER VOLTAGE

Enter desired voltage, then press <RETURN>.

Test program applies dc signal DC2A (A2A4) voltage.

4 - APPLY DC2B

(119) ENTER VOLTAGE

Enter desired voltage, then press <RETURN>.

Test program applies dc signal DC2B (A2A3) voltage.

5 - APPLY DC3A

(120) ENTER VOLTAGE

Enter desired voltage, then press <RETURN>.

Test program applies dc signal DC3A (A2A2) voltage.

6 -APPLY DC3B

(121) ENTER VOLTAGE

Enter desired voltage, then press <RETURN>.

Test program applies dc signal DC3B (A2A1) voltage.

7 - AC STANDARD (400HZ)

(122) ENTER VOLTAGE (RMS)

Enter desired voltage, then press <RETURN>.

Test program closes DIV standard switches, and applies ac signal ac standard 400 Hz voltage.

9 - REMOVE ALL

Returns to main menu.

11 - MEASURE DC

(123) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(124) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(125) VOLTAGE IS ###.####### VDC.

12 - MEASURE AC (RMS)

(126) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(127) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(128) VOLTAGE IS ###. ####### VRMS.

13 - MEASURE PEAK VOLTAGE

(129) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(130) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(131) MAX PEAK IS ###.####### V
MIN PEAK IS ###.####### V

14 - MEASURE PEAK TO PEAK (AC)

(132) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(133) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(134) VOLTAGE IS ###. ####### V P-P.

15. MEASURE PEAK TO PEAK (DC)

(135) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(136) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(137) VOLTAGE IS ###. ####### V P-P DC.

16 - MEASURE RESISTANCE

(138) ENTER HI TEST POINT:

Enter the high test point number to be measured, then press <RETURN>.

(139) ENTER LO TEST POINT:

Enter the low test point number to be measured, then press <RETURN>.

(140) RESISTANCE IS ######. ### OHMS.

(141)

```
                ======================
========== EOB MAINTENANCE MENU ========
                ====================
= 1) MULTIPROGRAMMER 10) CID CAMERAS =
=    DIG IN/OUT         11) MULTIPRO- =
= 2) READ TEMPERATURE       GRAMMER    =
=    SENSORS                RELAYS
= 3) TEMPERATURE        12) MP QUAD DACS=
=    CONTROLLER         13)  SHUTTERS  =
= 4) MOTORS             14) PROG. PULSE =
= 5) PROGRAMMABLE           GENERATOR  =
=    POWER SUPPLIES     15) VIDEO SIGNAL=
= 6) A/D) CONVERTER         GENERATOR  =
= 7) DIGITIZER          16) CALCULATE  =
= 8) MATRIX SWITCH          FUNCTIONS  =
= 9) PARALLEL PLUS      17)   EQUATE   =
=                           FUNCTIONS  =
=                       99) EXIT       =
=====================================
```

ENTER CHOICE:

EXIT (99)

(142) EOB maintenance COMPLETE

Section V. TROUBLESHOOTING

2-18. TROUBLESHOOTING METHODOLOGY 2-18

Troubleshooting methodology is a method used to correct malfunctions in the shortest possible time. Malfunctions fall into the following categories in order of probability of occurrence.

- Electronics - are fault isolated by direct callout on the AN/USM-410 Electronic Equipment Test Station Video Display Terminal (VDT).
- Cabinets, Slides, Base - are fault isolated by visual inspection.
- Blowers, Lamps, Etc. - are fault isolated by symptom.
- Cables, Harnesses - are fault isolated by elimination.
- Glass, Mechanical - are fault isolated by functional inference.

Refer to Chapter 7 for a detailed description of troubleshooting methodology used for TADS/PNVS augmentation equipment and step-by-step fault isolation procedures.

2-18.1. EO BENCH FIR MODULE FORESIGHT CHECK

INITIAL SETUP

Personnel Required

39B ATE Repairer
One Assistant

References

TM 9-6625-476-30

PREPARATION FOR ALIGNMENT

1. A PNVS night sensor assembly is required to perform this procedure. If necessary, run PNVS night sensor assembly test program 13082605-16 before running FIRALIGN.

ALIGNMENT

2. Run FIR alignment software test program FIRALIGN on AN/USM-410 automatic test equipment, as follows:

   a. Run self-test program EOBST (para 2-12).

   b. When MAIN MENU is displayed, select: 2) EO BENCH ALIGNMENT MODE.

   c. When ALIGNMENT MENU is displayed, select: 3) FIR.

   d. When ALIGNMENT MENU is displayed at end of the test, select: 99) RETURN to MAIN MENU.

   e. When MAIN MENU is displayed, select: 99) EXIT PROGRAM.

EQUIPMENT DISPOSITION

3. When testing is complete, return PNVS night sensor assembly to stock.

2-18.2. VISUAL/NEAR INFRARED (VIS/NIR) ALIGNMENT CHECK 2-18.2

INITIAL SETUP

Personnel Required

39B ATE Repairer
One Assistant

Equipment Status

Power off (para 2-24.1)

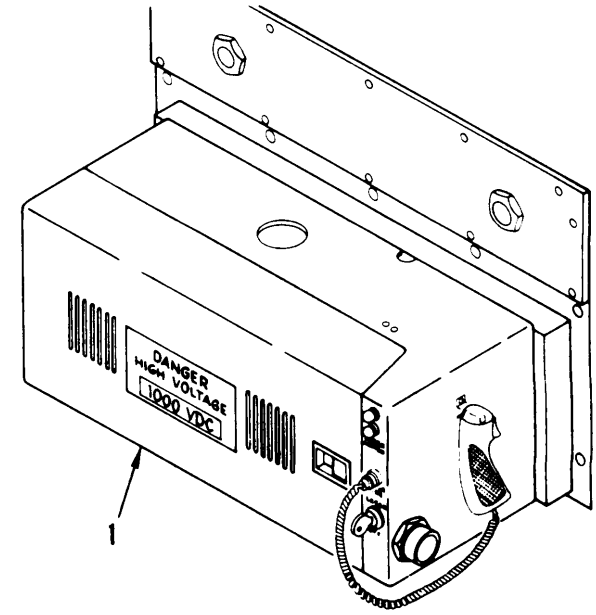
Equiment Required

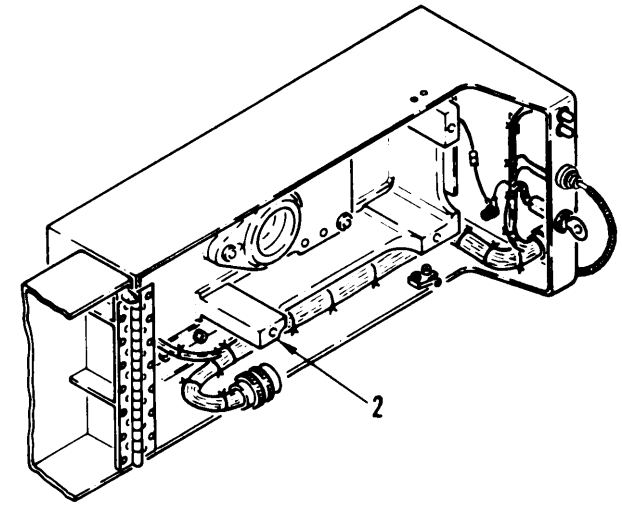
Laser alignment fixture assembly 13231053 (HeNe laser and power supply)
Sync cable
Oscilloscope (Tektronix 475 or equivalent)

PREPARATION

1. On dayside test bench, open laser protective cover (1) and install laser on laser mount (2).

2. Place laser power supply on test bench. Connect power cable between power supply and laser. Connect ac power cord to laser power supply and 115V power source. Turn on laser power supply.





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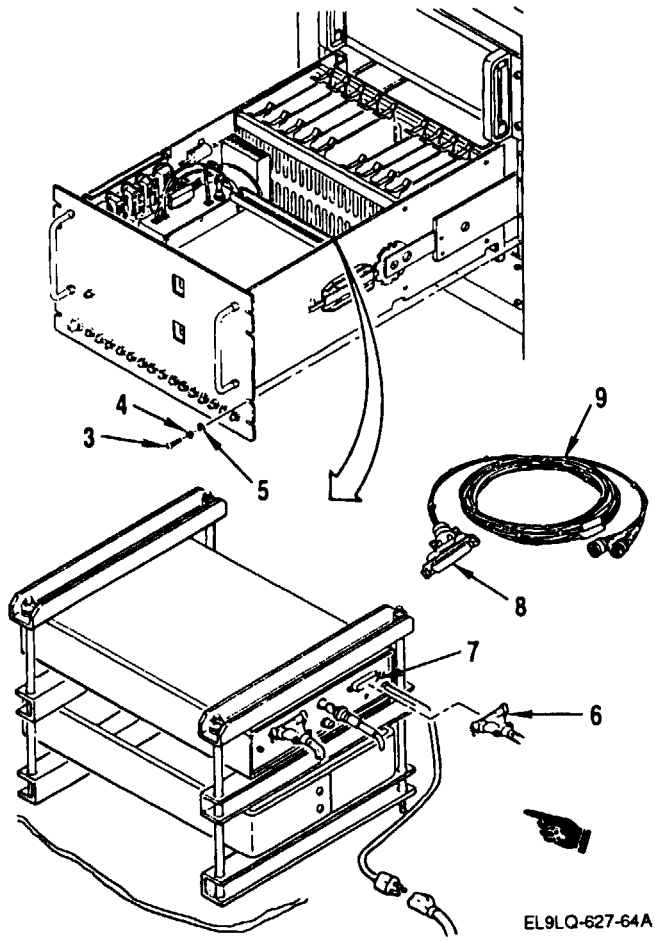
2-18.2. VISUAL/NEAR INFRARED (VIS/NIR) ALIGNMENT CHECK (cont) 2-18.2

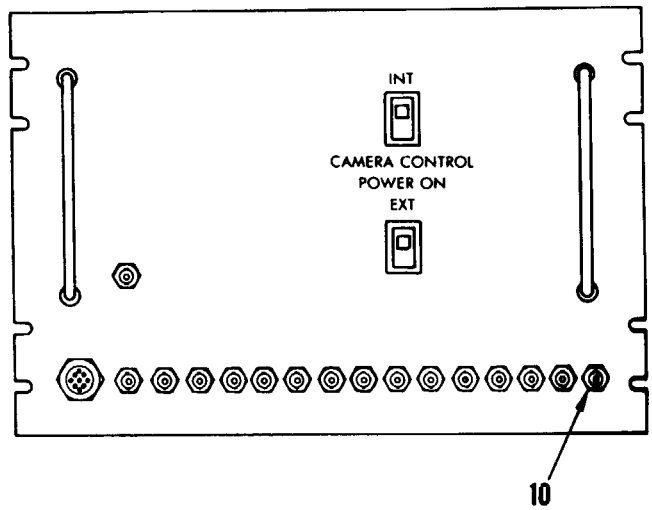
3. On electronics drawer assembly, remove eight screws (3), lockwashers (4), and flat washers (5). Slide out electronics drawer.

4. Disconnect connector (6) from camera controller connector (7).

5. Connect connector (8) of sync cable (9) to camera controller connector (7). Connect ODD FIELD connector of sync cable to channel 2 on oscilloscope.

6. Connect P1 of a 13081706 cable to electronics drawer connector J26 (10). Connect P2 of 13081706 cable to channel 1 on oscilloscope.





EL9LQ-627-63

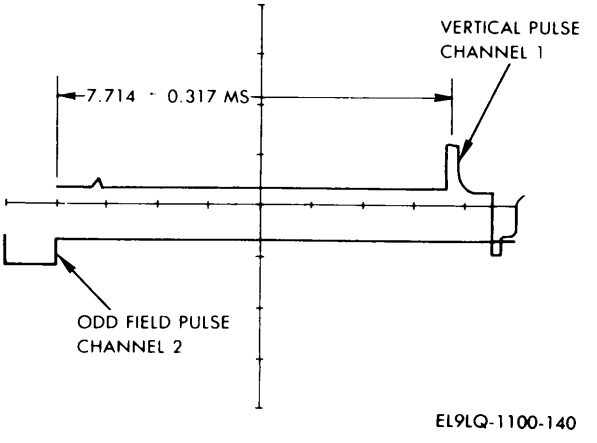
7. Set up oscilloscope as follows:

Sweep:	1 MSEC/DIV
Channel 1:	1V/DIV
Channel 2:	5V/DIV
Coupling:	AC
Horizontal display:	A (locks knobs)
Trigger mode:	LF REJECT
Trigger source:	CH2

8. Allow 20 minutes warmup time.

VERTICAL POSITION ALIGNMENT CHECK

9. Check oscilloscope for position of vertical pulse. From rising edge of ODD FIELD pulse, pulse should be delayed between 7.379 and 8.031 milliseconds.



EL9LQ-1100-140

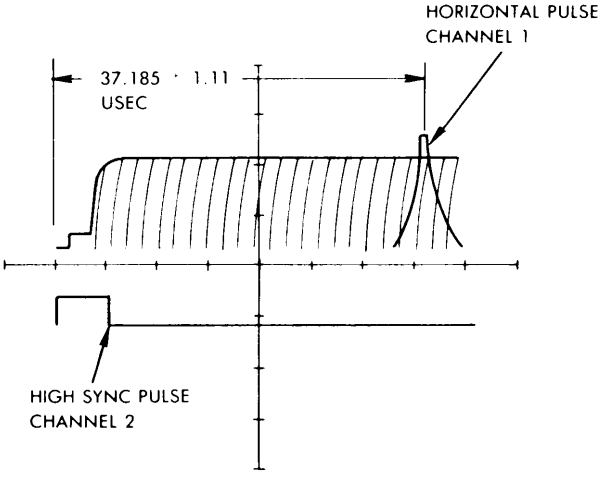
10. Disconnect ODD FIELD connector of sync cable from oscilloscope channel 2.

HORIZONTAL POSITION ALIGNMENT CHECK

11. Connect HIGH SYNC connector of sync cable to oscilloscope channel 2.

12. Change oscilloscope sweep setting to 5 USEC/DIV.

13. Check oscilloscope for position of horizontal pulse. From rising edge of high sync pulse, pulse should be delayed between 36.075 and 38.295 microseconds.



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EQUIPMENT DISPOSITION

14. When testing is complete, return equipment to stock. If VIS/NIR optical path fails alignment check, notify appropriate maintenance personnel.

END OF TASK

Section VI. GENERAL MAINTENANCE PROCEDURES

2-19. SURFACE PREPARATION 2-19

This task covers surface preparation of:

Para	Item
1.	Ground lead bonding
2.	Structure and hardware corrosion control

INITIAL SETUP

Tools

Goggles
Digital multimeter
Rubber apron
Hard bristle brush

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Pipe cleaner (Item 37)
Zinc chromate primer (Item 39)
Trichlorotrifluoroethane (Item 48)
Distilled water (Item 49)

Personnel Required

39B ATE Repairer

Reference

TM 11-6625-3085-12

Equipment Condition

Power removed (para 2-24.1)

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2-19. SURFACE PREPARATION (cont) 2-19

1. GROUND LEAD BONDING

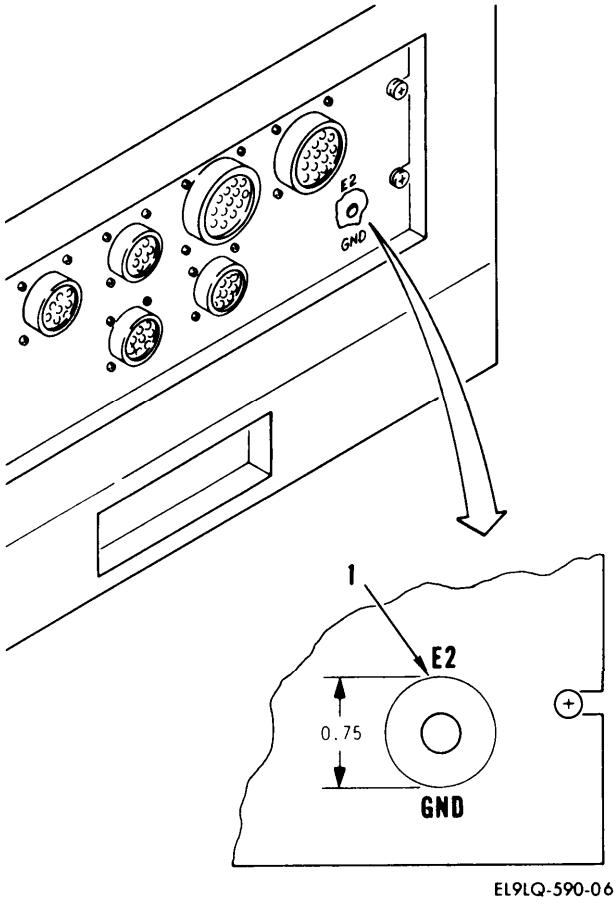
CAUTION

Do not allow cleaning materials to touch painted markings, such as E2 and GND as shown. Markings could become unreadable.

NOTE

- This procedure is used to prepare a low-resistance bonding surface of less than one ohm to be used for installation of a ground lead.
- Do not remove any more metal surface than is necessary to achieve a smooth bonding surface.

a. On bonding surface (1), use emery paper and sand bonding surface until metal is bare, at least 0.75 inch diameter around the ground hole.



EL9LQ-590-06

WARNING

TRICHLOROTRIFLUOROETHANE

- TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: LET IT GET ON SKIN, OR BREATHE VAPORS.
- DO: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES, RUBBER GLOVES, AND RUBBER APRON.
- IF IT CONTACTS SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

b. Using cheesecloth pad and trichlorotrifluoroethane, clean bonding surface (1).

c. Let bonding surface air dry.

WARNING

CHEMICAL FILM

- TOXIC, IRRITATING, CAUSTIC. CAN CAUSE EYE DAMAGE.
- DON'T: LET IT GET ON YOUR SKIN.
- DO: USE IN WELL-VENTILATED AREA. CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES, RUBBER GLOVES, AND RUBBER APRON.
- IF IT CONTACTS SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.

NOTE

Chemical film has a minimum resistance effect on electrical bonding surfaces when applied sparingly and evenly across the surface.

d. Using an artist brush, apply a thin coat of chemical film over bonding surface.

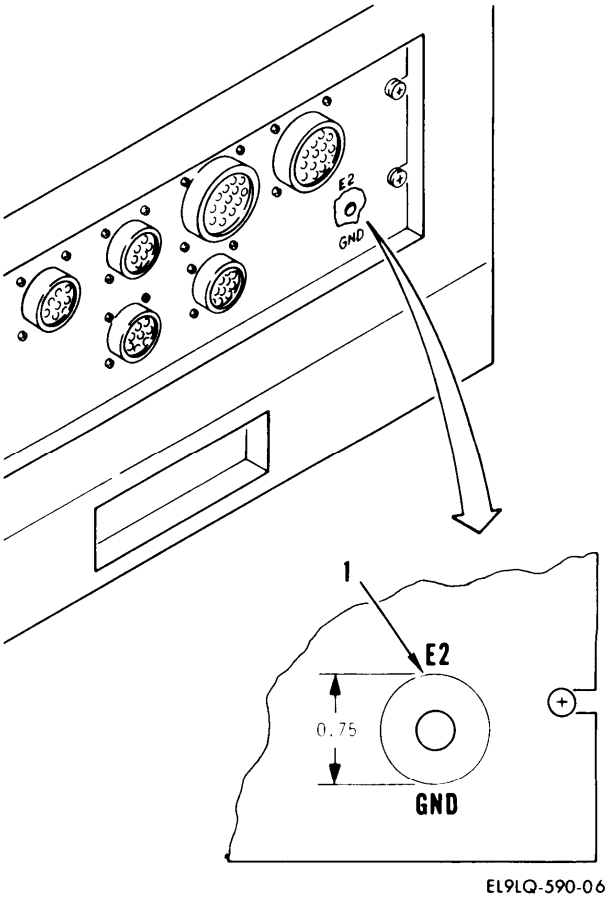
NOTE

The drying time for chemical film will depend on amount applied. Allow a minimum drying time of 5 minutes.

e. Allow treated bonding surface (1) to dry.

f. Using cheesecloth pad and distilled water, wipe across bonding surface one time. If streaking occurs, continue to wipe until streaks are gone.

g. Allow treated bonding surface to dry.

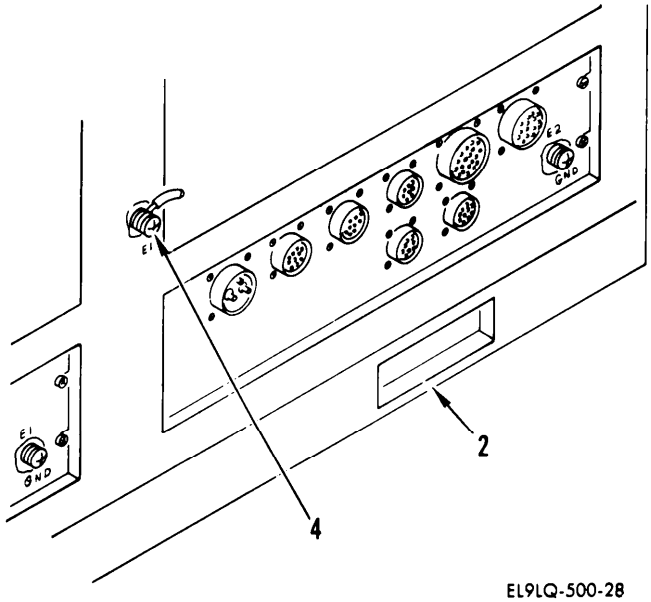


EL9LQ-590-06

h. Using hard bristle brush, clean zinc chromate primer residue from hardware.

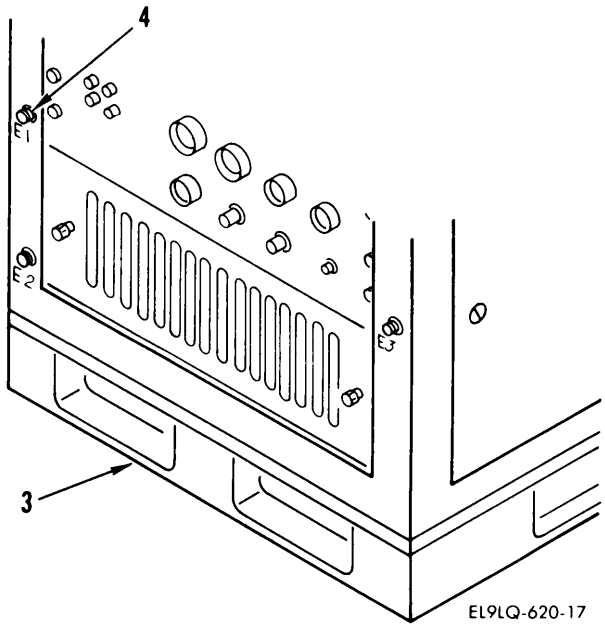
i. Using cheesecloth pad and trichlorotrifluoroethane, clean hardware.

j. Install and prime ground lead and attaching hardware as specified in the appropriate maintenance task. See list below for electronic station cabinet (2) and test console test bench cabinet (3) assembly maintenance task hardware installation paragraph number.



EL9LQ-500-28

Cabinet	Cabinet Ground Terminal Number	TO Assembly Ground Terminal Number	Maintenance Task Paragraph Number
2	E1	-	-
	E2	A3E2	2-30
	E2	A4E1	2-32
	E2	A10E1	2-39
	E3		-
	E4	A1E1	2-26
	E4	A2E1	2-28
	E4	A7E1	2-38
	E4	A9E1	2-37
	E5	A12E1	2-34
	E6	A6E1	2-34
	E7	-	-
	E8	-	-
3	E1	-	-
	E2	-	-
	E3	A14E1	2-62
	E3	A15E1	2-63
	E4	A1E1	2-43
	E5	A8E1	2-52
	E6	A5E1	2-47
	E6	A12E1	2-58
	E7	A4E1	5-33
	E7	A6E1	2-48
	E7	A11E1	2-56
	E8	A3E1	2-46



EL9LQ-620-17

k. Use digital multimeter and check for resistance of no more than one ohm between ground lead and cabinet El ground terminal (4).

END OF TASK

2. STRUCTURE AND HARDWARE CORROSION CONTROL

NOTE

This procedure is used to clean the structure and mounting hardware containing zinc chromate primer.

a. Using emery paper, cheesecloth pad, and pipe cleaner, loosen and remove residue from structure and threaded insert.

WARNING

TRICHLOROTRIFLUOROETHANE

- TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: LET IT GET ON SKIN, OR BREATHE VAPORS.
- DO: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES, RUBBER GLOVES, AND RUBBER APRON.
- IF IT CONTACTS SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

b. Using cheesecloth pad, pipe cleaner, and trichlorotrifluoroethane, clean structure and threaded insert.

c. Insert a clean pipe cleaner in threaded insert and verify cleanness.

d. Using hard bristle brush, clean zinc chromate primer residue from hardware.

e. Using cheesecloth pad and trichlorotrifluoroethane, clean hardware.

f. Install and prime hardware as specified in the appropriate maintenance task.

END OF TASK

2-20. PAINT TOUCH-UP AND MARKING DATA 2-20

1. The EETF TADS/PNVS Augmentation Equipment has a durable, baked on paint finish that will minimize the need for paint touch-up. If paint touch-up is necessary, refer to painting procedures referenced in TB-746-93-2 and other U.S. Army standard painting directives. The following list identifies the equipment and applicable touch-up materials used.

Equipment	Material	Color	Color No.	Item No. (Appendix C)
Electronic station cabinet	Equipment enamel	Light gray	26307	17
	Zinc chromate primer	Yellow (CMPSN G)	-	39
Dayside test bench cabinet	Semigloss alkyd enamel	Light gray	26307	18
	Zinc chromate primer	Yellow (CMPSN L)	-	40
	Zinc chromate primer	Yellow (CMPSN G)	-	39
Test console test bench cabinet	Equipment enamel	Light gray	26307	17
	Zinc chromate primer	Yellow (CMPSN G)	-	39
Nightside cabinet assembly	Semigloss alkyd enamel	Light gray	26307	18
	Semigloss alkyd enamel	Gray	26492	19
	Zinc chromate primer	Yellow (CMPSN G)	-	39
	Zinc chromate primer	Yellow (CMPSN L)		40

2. This paragraph provides marking data instructions for application of alphanumeric characters on panels and cabinet structure. For marking of parts and electronic items, refer to MIS-20238 and for types of synthetic resin enamels, refer to MIS-19916. These documents are Department of U.S. Army documents (U.S. Army Missile Command, Redstone Arsenal, AL 35809). The following materials are used for marking:

Material	Specification	Color	Item No. (Appendix C)
Synthetic resin enamel	Form 1, type 1	Black	20
Synthetic resin enamel	Form 1, type 2	White	22
Synthetic resin enamel	Form 2, type 1	Black	21
Synthetic resin enamel	Form 2, type 2	White	23

2-21. ELECTROSTATIC DISCHARGE SENSITIVE CIRCUIT CARD ASSEMBLY HANDLING 2-21

This task covers handling of circuit card assemblies (CCAs) that contain electrostatic discharge sensitive (ESDS) devices.

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

NOTE

- Refer to DOD-STD-1686 and DOD-HDBK-263 for information and instructions for handling ESDS CCAs.
- Refer to the list at the end of this paragraph for identification of assemblies that contain electrostatic discharge sensitive devices used in this equipment.

REMOVAL

1. Before removing an ESDS CCA, do the following:
   a. Put on conductive wrist strap.
   b. Ground conductive wrist strap in a location that will allow access to assembly that requires CCA removal/replacement.

2-21. ELECTROSTATIC DISCHARGE SENSITIVE CIRCUIT CARD ASSEMBLY HANDLING (cont) 2-21

CAUTION

- Do not remove CCA until you are properly grounded.
- Do not touch CCA contacts or connector.
- Components can be damaged by an electrostatic charge or discharge through its conductors.

2. When appropriate maintenance task specifies removal, immediately place ESDA CCA in an electrostatic shielding bag or on a conductive workbench mat.

3. Continue the above handling technique until the ESDA CCA is installed or packaged.

INSTALLATION

4. Install ESDS CCA, when required using the above handling technique.

ASSEMBLIES THAT CONTAIN ESDS DEVICES

Reference Designation	CCA slot Location	Nomenclature	Part Number
Electronic Station			
1A11		Digital computer assembly	13231746
1A11A1		Control store	12205A
AZ		Sequencer	12201A
A3		Data path	12202A
A4		Cache control	12203A
A5		Memory controller	12204A
A6		Memory	12221A
A7/A11		HP-IB interface	12009A
A8		Asynchronous serial interface	120056/002
A9		IEEE interface	13081742
A10		Priority jumper	12012A
A12		Parallel interface card	13081742
A12		Parallel interface card	13081431
A13		Buffer	13081483
Dayside Test Bench			
2A1A3A2A4		Video preamplifier subassy CCA	13078270
2A1A6		High voltage control subassy CCA	13079722
Test Console Test Bench			
2A2A1		Programmable digitizer	7612D
2A2A1A56		IEEE-488 interface CCA	6289-01

2-21. ELECTROSTATIC DISCHARGE SENSITIVE CIRCUIT CARD ASSEMBLY HANDLING (cont) 2-21

ASSEMBLIES THAT CONTAIN ESDS DEVICES - continued

Reference Designation	CCA slot Location	Nomenclature	Part Number
2A2A6		Multiprogrammer assembly	13081880
	400	Digital input CCA	13083412
	401A	Digital input CCA	13083412
	402B	Digital input CCA	13083412
	403C	Digital input CCA	13083412
	404D	Digital input CCA	13083412
	405E	Digital input CCA	13083412
	406F	Digital output CCA	69331B
	407G	Digital output CCA	69331B
	408H	Digital output CCA	69331B
	409I	Digital output CCA	69331B
	41OJ	Digital output CCA	69311B
	412L	D/A converter CCA	69322A
	413M	D/A converter CCA	69322A
2A2A7	A6A5	FIFO CCA	13082717-19
	A6A1O	Programmable pulse generator CCA	13081471-19
2A2A1O		Matrix switch assembly	13081925
	Control	Quadrant control card	94140B
	1 thru 16	Matrix relay cards	94140A
2A2A11		Multiprogrammer extender assembly	13081879
	400	Output readback CCA	69433A
	401A	Output readback CCA	69433A
	402B	Output readback CCA	69433A
	403C	Output readback CCA	69433A
	408H	Output readback CCA	69433A
	4091	Output readback CCA	69433A
2A2A12		Switch controller assembly	13081427-1
		Switch controller assembly	13081427-2
2A2A12A1	Al	Main control card	
2A2A12A2	A2	Self-test card	
2A2A13		Analog to digital converter assembly	13081746
	J1	Sample and hold CCA	AC280
	J4	Hi-level mux CCA	AC4720
	J5	Mux CCA	AC4060
	J6	Mux CCA	AC4060
	J7	Hi-level MUX CCA	AC4720
	J8	Hi-level MUX CCA	AC4720
	J17	Dual terminator CCA	AC333
	J18	Dual terminator CCA	AC333
	J73	Signal processor CCA	AC262
	J74	A/D converter CCA	AC8016-2D
	J75	Computer interface assembly (CCA)	13082276-2
	J76	Computer interface assembly (CCA)	13082276-3
	J77	Computer interface assembly (CCA)	AC471-1B

END OF TASK

2-22. CLEANING

This task covers cleaning of:

Para	Item
1.	Equipment/cabinets
2.	Optical surfaces
2.1.	Mirrors
3.	Air filter

INITIAL SETUP

Tools

Goggles
Vacuum cleaner

Materials (appendix C)

Acetone (Item 1)
Alconox, liquid (Item 1.1)
Duster, aerosol (Item 16.1)
Methyl alcohol (Item 5)
Brush, artists (Item 8)
Lint-free cloth (Item 13)
Soft cloth (Item 14)
Detergent (Item 16)
Finger cots (Item 25)
Lens paper (Item 36)
Shield, nose-mouth (Item 42)
Water, distilled (Item 49)

Personnel Required

39B ATE Repairer

Euuipment Condition

Power removed (para 2-24.1)

1. EQUIPMENT/CABINETS

a. Use a vacuum cleaner with a soft brush attachment and clean the equipment.

WARNING

DO NOT ATTEMPT TO CLEAN ELECTRICAL EQUIPMENT WITH POWER APPLIED. SUCH ACTION MAY RESULT IN DEATH SHOCK TO PERSONNEL AND POSSIBLE DAMAGE TO EQUIPMENT.

NOTE

Use cleaning solution sparingly and immediately remove any surplus that may accumulate during cleaning.

b. Using a mild detergent mixed with water, dampen a soft cloth and clean equipment.

c. Use a lint-free cloth and remove any film residue.

END OF TASK

2. OPTICAL SURFACES

CAUTION

- Clean only when necessary. Never touch optic surfaces with bare fingers.
- Never wipe dry optics with dry lens tissue. Use new clean moistened lens tissue when cleaning optical surfaces. Never wipe more than one time with the same lens tissue.
- Always use clean, rubber finger cots on your fingertips to prevent fingerprints on optics.
- Avoid talking over the optical surface or wear a nose-mouth shield to prevent contamination of the optical surface.

a. Using a clean artists brush carefully dust away loose matter from optical surface.

WARNING

METHYL ALCOHOL

- FLAMMABLE, TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: USE NEAR FLAMES OR SPARKS, LET IT GET ON SKIN, OR BREATHE VAPORS.
- Do: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES.
- IF IT CONTACTS SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

b. Using a methyl alcohol moistened folded (four folds) lens tissue, wipe optical surface in one direction with one wipe. Use new methyl alcohol moistened lens tissue for each additional wipe.

WARNING

ACETONE

- FLAMMABLE, TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: USE NEAR FLAMES OR SPARKS. LET IT GET ON SKIN OR BREATHE VAPORS.
- Do: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES.
- IF IT CONTACTS THE SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

c. Using an acetone moistened folded (four folds) lens tissue wipe optical surface in one direction with one wipe. Use new acetone moistened folded lens tissue for each additional wipe.

END OF TASK

2.1 MIRRORS

a. Remove cabinet rear panel (para 2-41).

b. Inspect each mirror surface using a flashlight and determine extent and nature of surface contamination.

WARNING

- TOXIC, NOXIOUS, IRRITATING. CAN CAUSE BREATHING PROBLEMS.
- DON'T: USE MORE THAN ONE 16 02 CAN OF AEROSOL DUSTER IN A 30 MINUTE PERIOD WITHOUT VENTILATING VAN AIRSPACE.

c. Starting at top mirror and progressing down, blow off each mirror's surface using aerosol duster.

CAUTION

- Clean only when necessary. Never touch optic surfaces with bare fingers.
- Never wipe dry mirrors with dry lens tissue. Use new clean moistened lens tissue when cleaning mirror surfaces.
- Never wipe more than one time with the same lens tissue.
- Always use clean, rubber finger cots on your fingertips to prevent fingerprints on mirror surfaces.
- Avoid talking over the mirror surfaces or wear a nose-mouth shield to prevent contamination of the mirror surface.

WARNING

METHYL ALCOHOL

- FLAMMABLE, TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: USE NEAR FLAMES OR SPARKS, LET IT GET ON SKIN, OR BREATHE VAPORS.
- Do: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NOT USING. WEAR ACID-TYPE SAFETY GOGGLES.
- IF IT CONTACTS SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

d. Using a lens tissue moistened with methyl alcohol and folded (four folds), wipe mirror surface in one direction with one wipe. Use new lens tissue moistened with methyl alcohol for each additional wipe.

WARNING

ACETONE

- FLAMMABLE, TOXIC, IRRITATING. CAN CAUSE BREATHING PROBLEMS, EYE DAMAGE.
- DON'T: USE NEAR FLAMES OR SPARKS. LET IT GET ON SKIN OR BREATHE VAPORS.
- Do: USE IN WELL-VENTILATED AREA, CLOSE CONTAINERS WHEN NO-I USING. WEAR ACID-TYPE SAFETY GOGGLES.
- IF IT CONTACTS THE SKIN OR EYES, WASH AFFECTED AREAS WITH RUNNING WATER. GET MEDICAL HELP AT ONCE.
- IF YOU EXPERIENCE ANY BREATHING PROBLEMS, GET TO FRESH AIR AT ONCE.

e. Using a lens tissue moistened with acetone and folded (four folds), wipe mirror surface in one direction with one wipe. Use new lens tissue moistened with acetone folded for each additional wipe.

f. If an area or spot resists cleaning using methyl alcohol and acetone, place a few drops of alconox in distilled water. Saturate a small piece of lens tissue slightly larger than the spot or contaminated area in the alconox solution and lay it over spot or area for approximately 1 minute. If the area or spot is still not clean, place a few drops of the alconox solution on a cotton swab. Use a dabbing motion or slight wiping motion with almost no pressure until spot or area is clean. Before the alconox solution has dried, repeat steps d and e above to prevent leaving a stain of alconox.

g. Blow any remaining dust or lint from mirror surfaces using aerosol duster.

h. Install cabinet rear panel (para 2-41).

END OF TASK

3. AIR FILTERS

This procedure is for cleaning three different type air filters (filter) used in this equipment.

Type Filter	Used On
Frame with aluminum mesh	Electronic Station (para 2-34) and Test Console Test Bench (para 2-63)
Frame with aluminum mesh and gasket	Optical Signal Analyzer (para 5-12) and Indirect View Display (para 5-26)
Foam	Electronic Station (para 2-39 and 2-40)

a. Use vacuum cleaner and remove loose dirt from filter.

NOTE

Do steps b, c, and d below only if evidence of dirt remains.

b. Clean filter using water and mild detergent.

c. Rinse filter thoroughly with clean water.

d. Allow filter to dry completely.

e. Inspect filter for gasket damage (if applicable), and for dryness.

END OF TASK

2-23. FUSE REQUIREMENTS SUMMARY 2-23

This task provides a summary of location and value of all fuses used in EETF TADS/PNVS Augmentation Equipment. Specific maintenance tasks, as listed on the fuse matrix below, provide detailed instructions for replacement of each fuse.

FUSE MATRIX

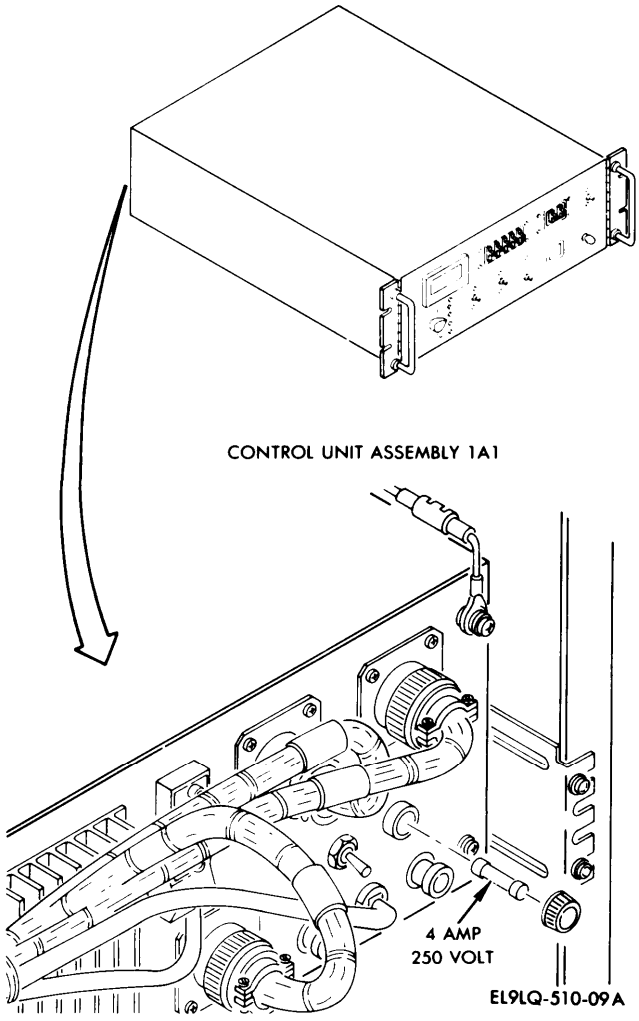
Reference Designation	Location	Fuse Value	Main Task Para Ref
1A1	Rear panel	4a 250v (slow blow)	2-26.1
1A1(Alt)	Rear panel	4a 250v	2-27
1A2	Rear panel	1a 250v (slow blow)	2-29
1A2	Interface board	0.062a 250v (slow blow)	2-29
1A2A1	CCA	0.125a 250v (slow blow)	2-29
1A2A2	CCA	0.125a 250v (slow blow)	2-29
1A2A3	CCA	0.125a 250v (slow blow)	2-29
1A2A4	CCA	0.125a 250v (slow blow)	2-29
1A4PS1	Terminal board	5a 250v	2-33
1A4PS2	Terminal board	5a 250v	2-33
1A4PS3	Terminal board	5a 250v	2-33
1A4PS4	Terminal board	5a 250v	2-33
1A4PS4	Chassis	15a 32v	2-33
1A7	Rear panel	3a 250v	2-36
1A9A1	Rear panel	0.25a 250v	2-38
1A9A2	Rear panel	0.25a 250v	2-38
1A10	Rear panel, F1	10a 250v	2-38.2
	Chassis F2, F3	15a 250v	2-38.2
	CCA, F630	25a 32v	2-38.2
	CCA, F640	8a 250v	2-38.2
	CCA, F660	3a 250v	2-38.2
2A2A1	Rear panel	8a 250v	2-44
2A2A6	CCA, A1F1	1a 250v	2-49
	A1F2	1a 250v	2-49
	A2F1	0.25a 250v	2-49
	A2F2	0.25a 250v	2-49
	A3F1	0.25a 250v	2-49
	A3F2	0.25a 250v	2-49
	A4F1	0.25a 250v	2-49
	A4F2	0.25a 250v	2-49
2A2A6	Rear panel, F1	4a 250v (slow blow)	2-49
2A2A6	Rear panel, F2	10a 250v	2-49
2A2A6	Rear panel; F3	0.75a 250v	2-49

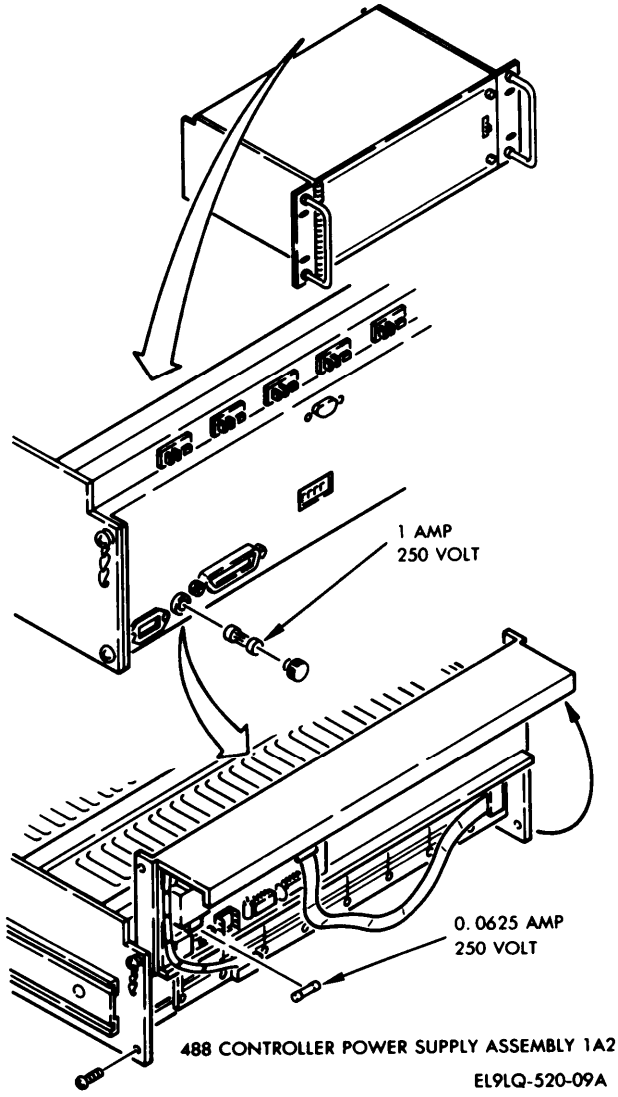
FUSE MATRIX (cont)

Reference Designation	Location	Fuse Value	Main Task Para Ref
2A2A8	Rear panel	0.25a 250v (slow blow)	2-53
2A2A10	CCA	0.25a 250v	2-55
2A2A10	CCA	0.25a 250v	2-55
2A2A10	CCA	0.25a 250v	2-55
2A2A10	CCA	0.25a 250v	2-55
2A2A11	Rear panel, F1	4a 250v	2-57
2A2A11	Rear panel, F2	10a 250v	2-57
2A2A11	Rear panel, F3	0.75a 250v	2-57
2A2A12	Rear panel	4a 250v	2-59
2A2A12	CCA (2)	0.25a 250v	2-59
2A2A13	Rear panel, F1	1.5a 250v (slow blow)	2-61

2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

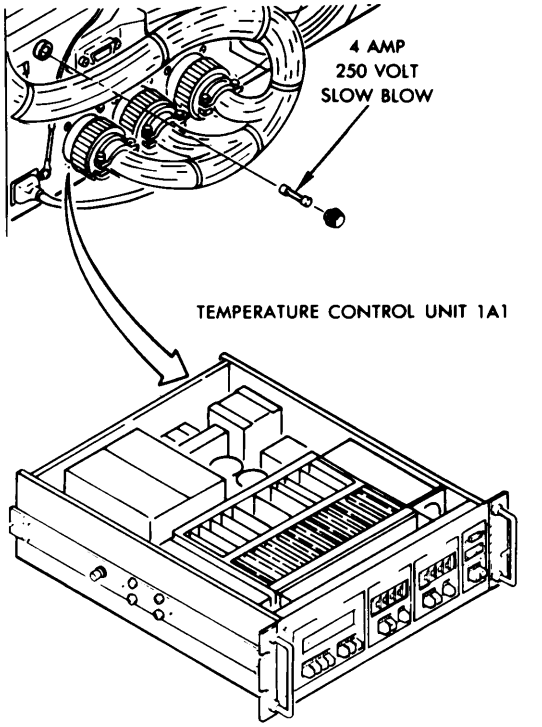
ELECTRONIC STATION





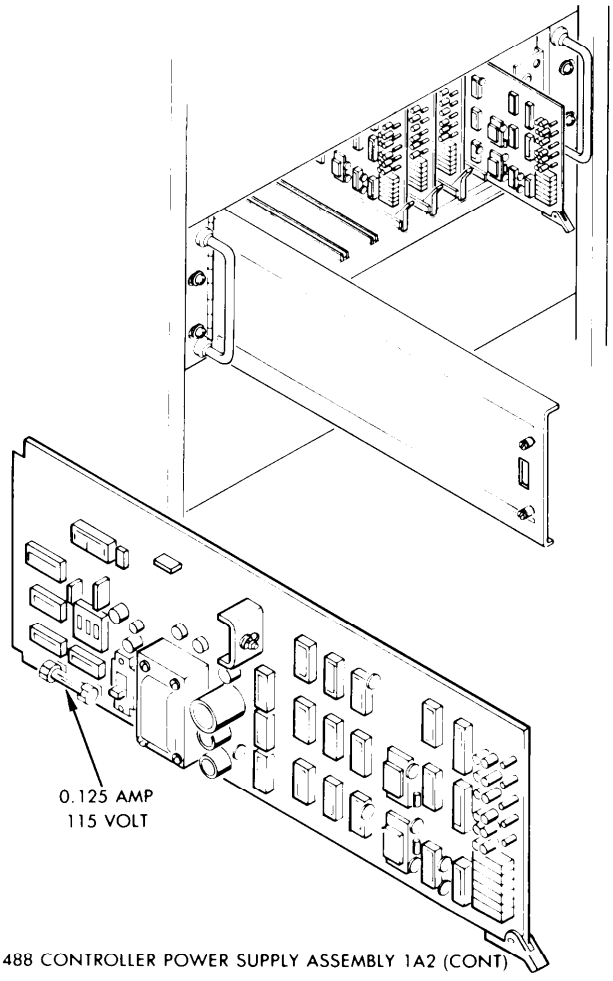
2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

ELECTRONIC STATION



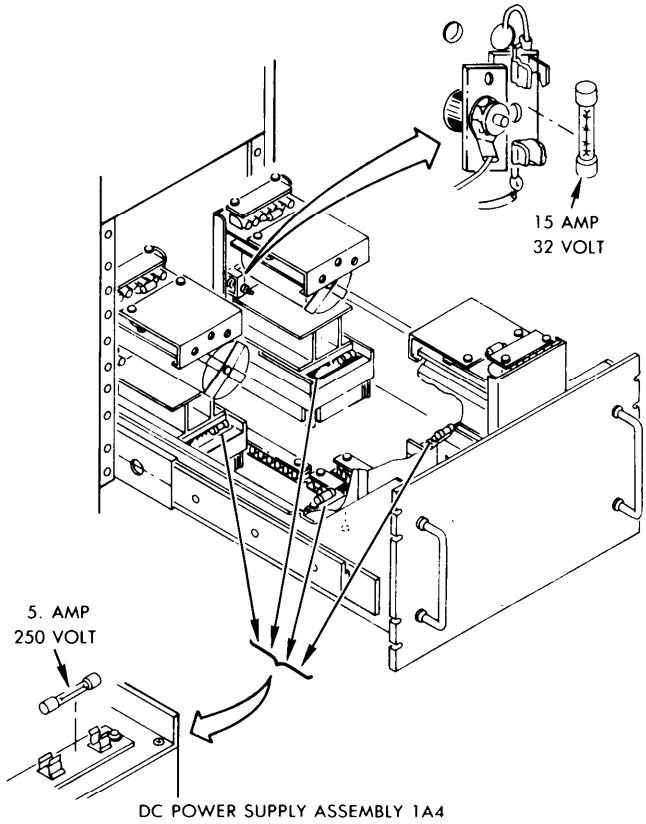
2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

ELECTRONIC STATION (cont)



488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2 (CONT)

EL9LQ-521-12

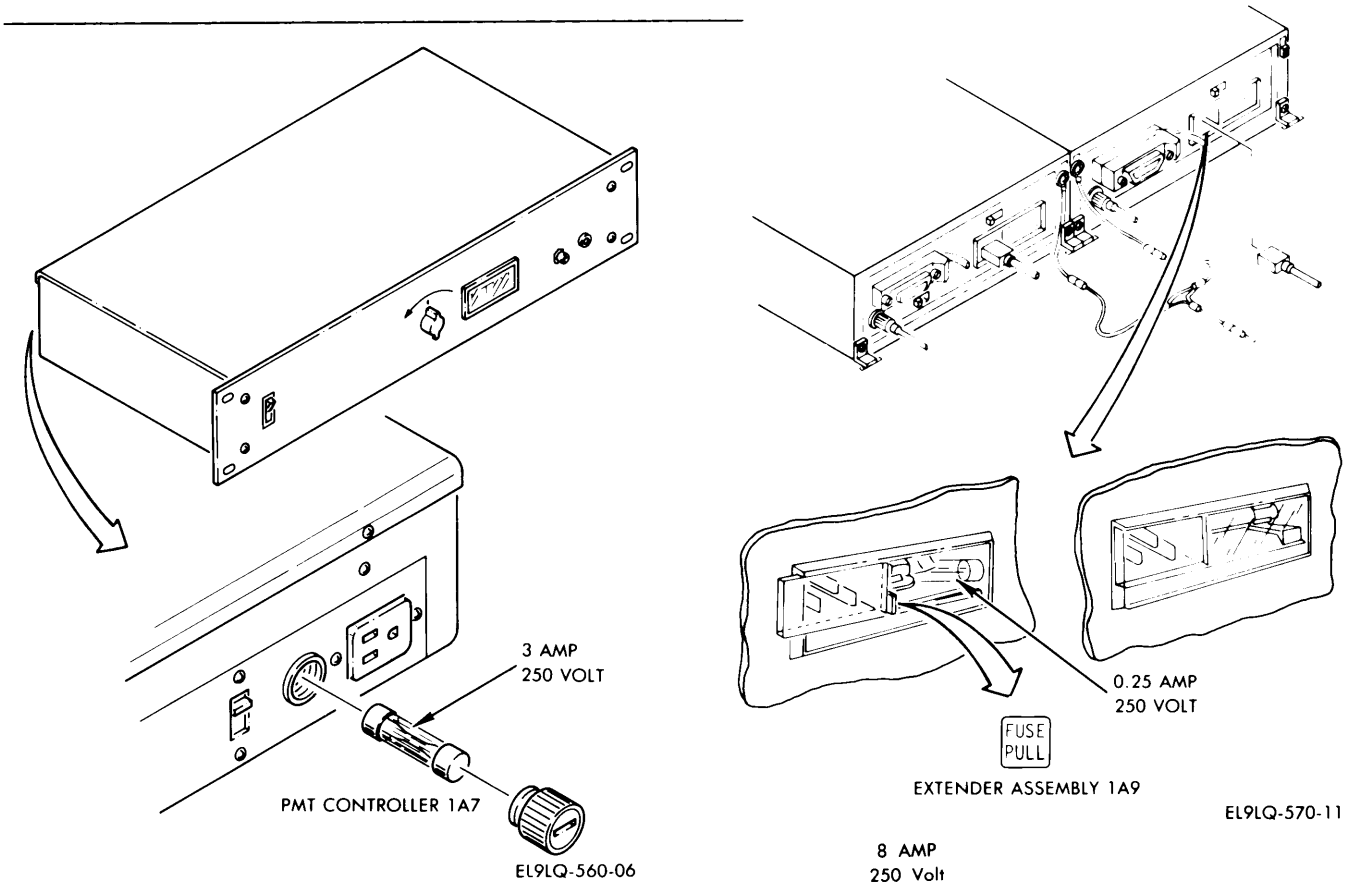


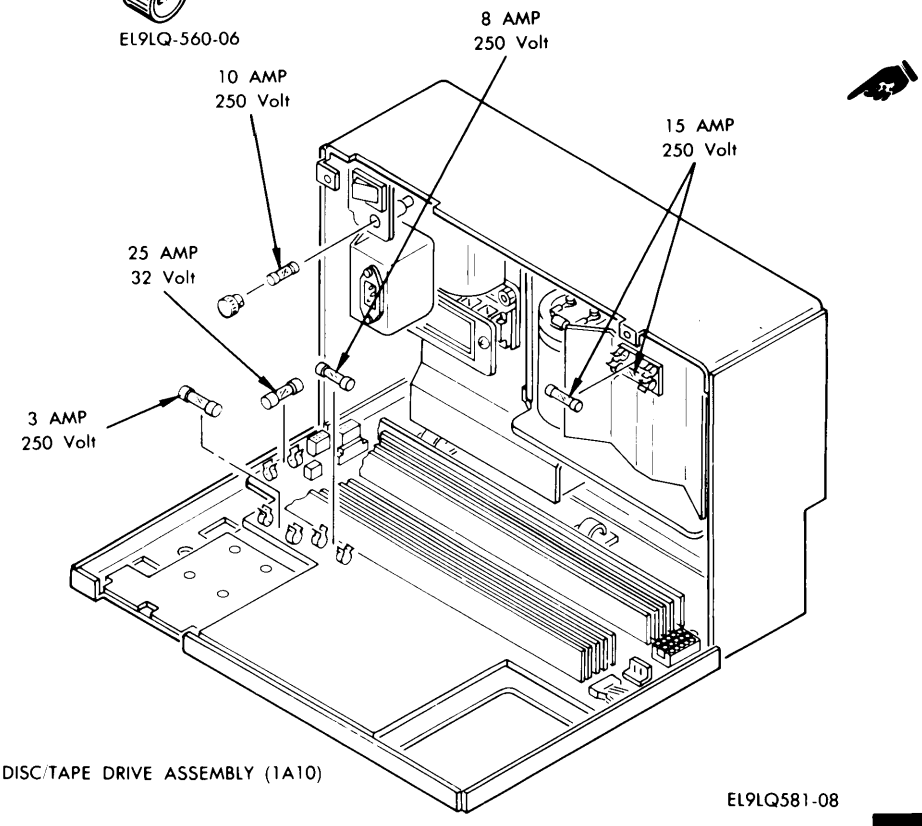
DC POWER SUPPLY ASSEMBLY 1A4

EL9LQ-540-28

2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

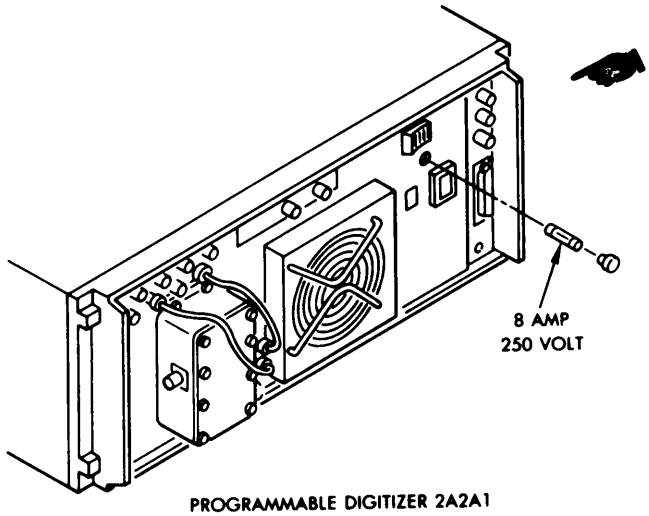
ELECTRONIC STATION (cont)





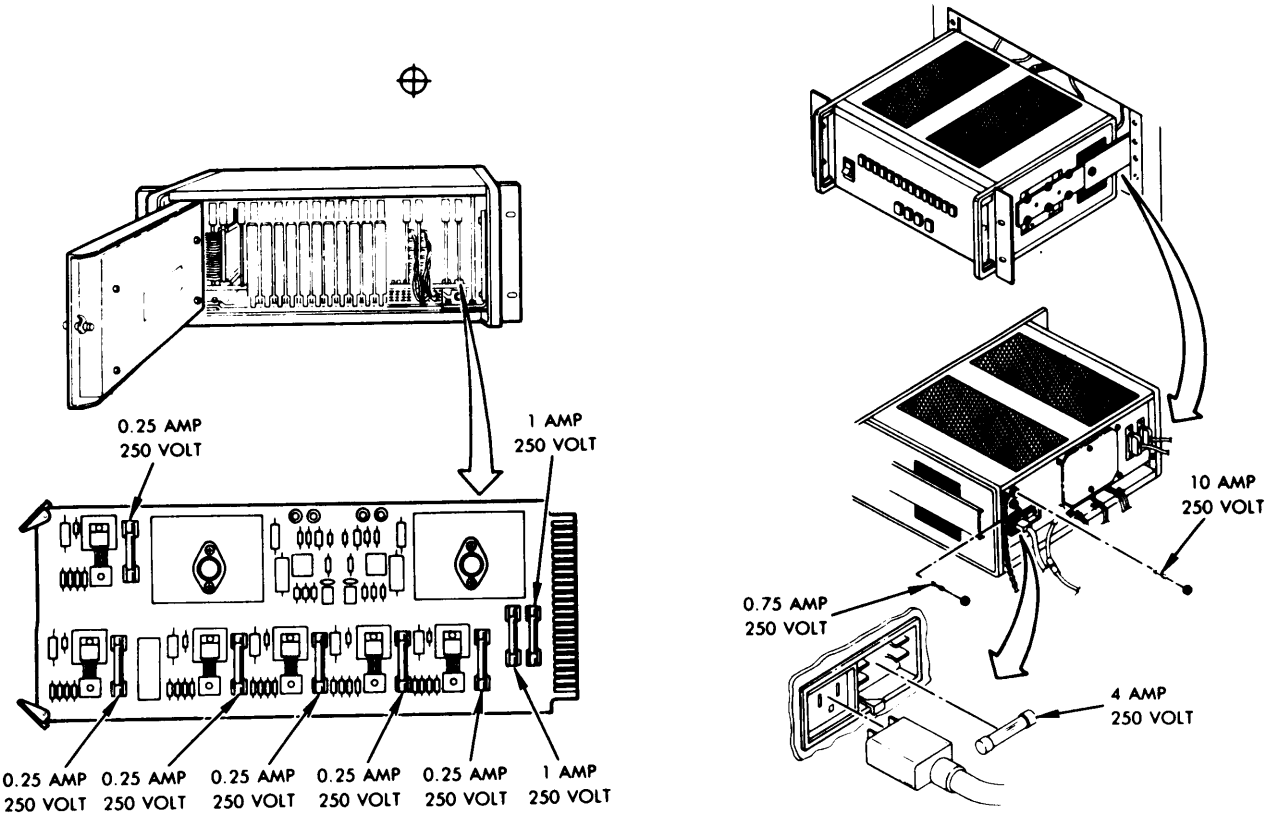
2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

TEST CONSOLE TEST BENCH



PROGRAMMABLE DIGITIZER 2A2A1

EL9LQ-621-27

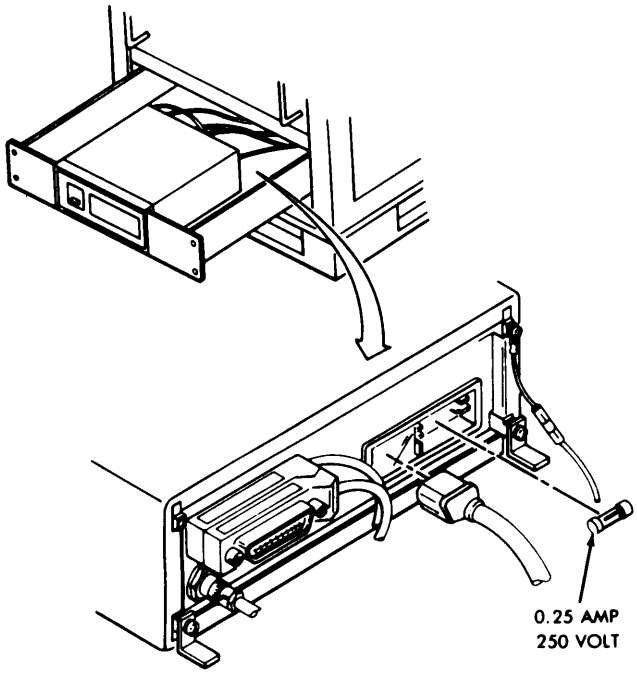


EL9LQ-626-13A

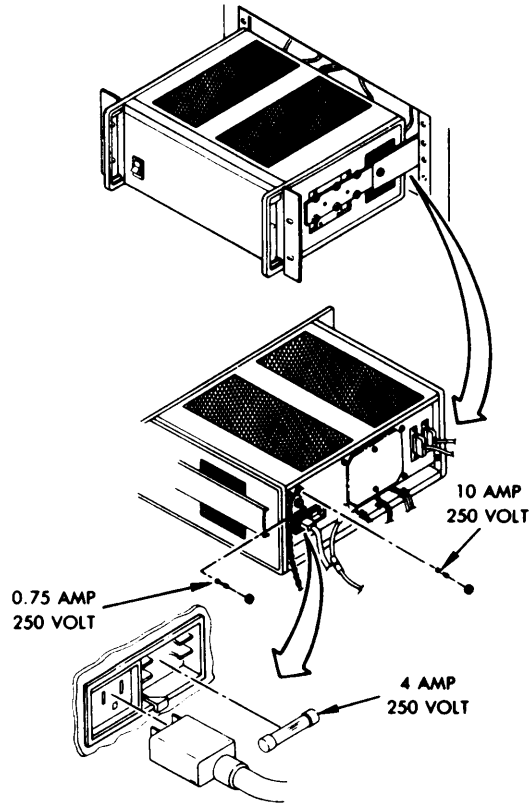
MULTIPROGRAMMER ASSEMBLY 2A2A6

2-23. FUSE REQUIREMENTS SUMMARY (cont) 2-23

TEST CONSOLE TEST BENCH (cont)

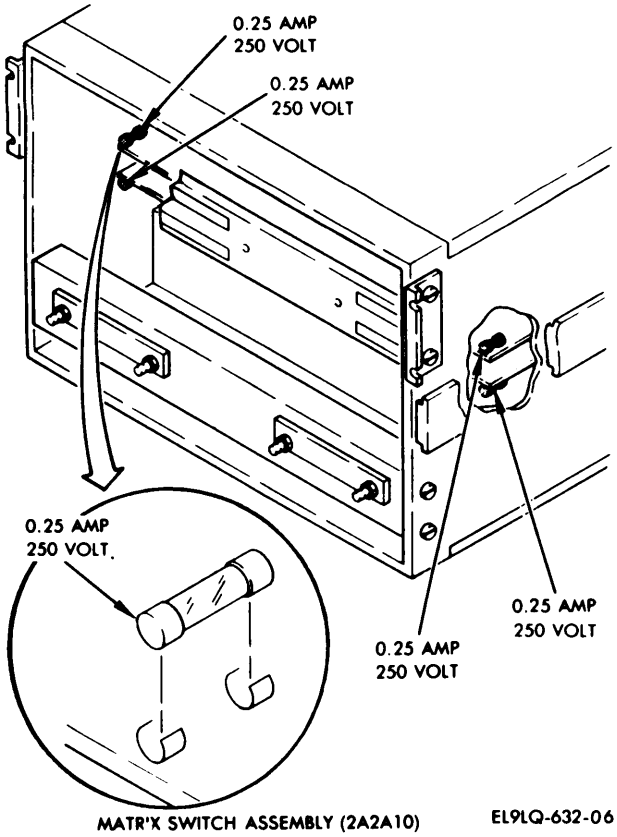


EXTENDER ASSEMBLY (2A2A8) EL9LQ-628-07



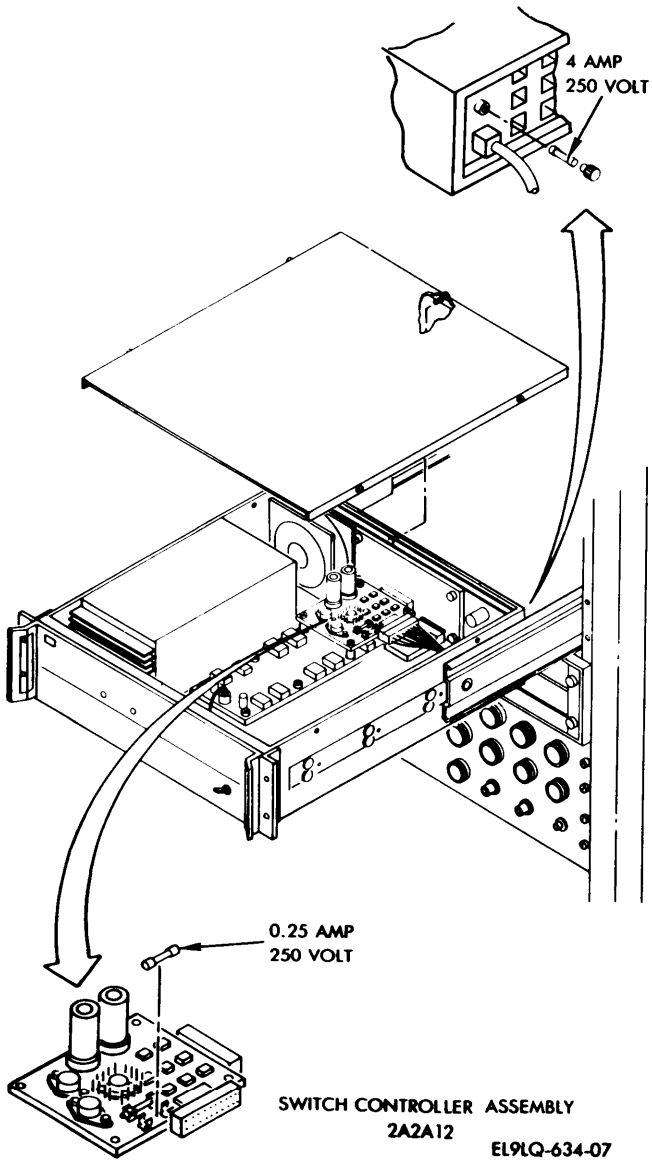
MULTIPROGRAMMER EXTENDER ASSEMBLY 2A2A11

EL9LQ-626-11

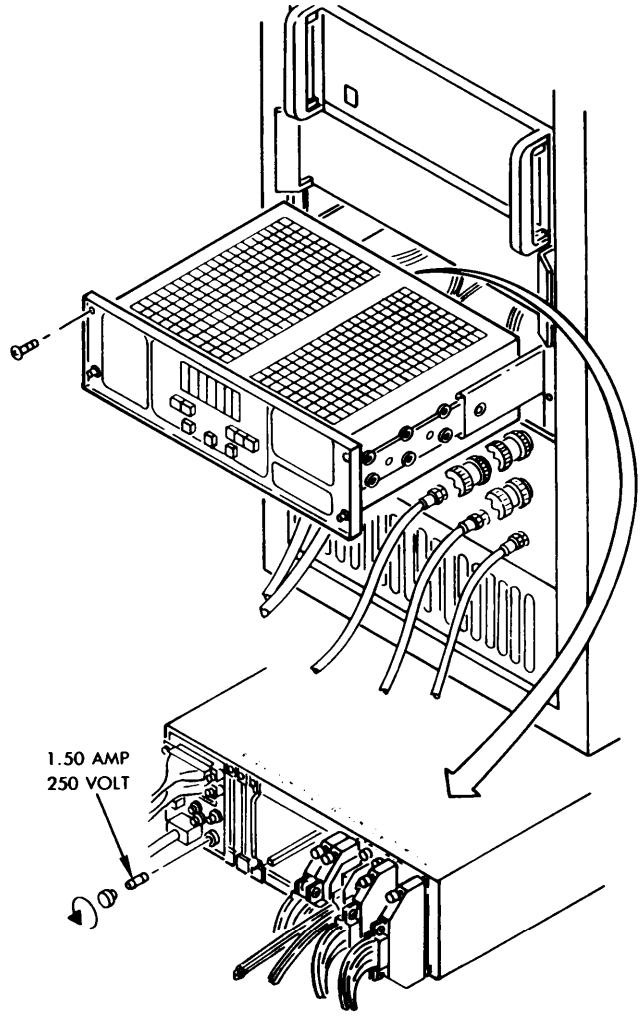


MATR'X SWITCH ASSEMBLY (2A2A10) EL9LQ-632-06

TEST CONSOLE TEST BENCH (cont)



SWITCH CONTROLLER ASSEMBLY
2A2A12
EL9LQ-634-07



ANALOG TO DIGITAL CONVERTER ASSEMBLY (2A2A13)
EL9LQ-635-10

2-24. SWITCH SETTING REQUIREMENTS SUMMARY 2-24

SWITCH SETTING MATRIX

This task provides a summary of switch settings required to ensure that the EETF TADS/PNVS Augmentation Equipment will function properly. This summary includes not only external switches, but also covers address selector switches located on circuit card assemblies inside the equipment. The specific maintenance tasks for each assembly provide detailed instructions for each switch setting as maintenance functions are accomplished.

Reference Designation	Location	Address Selector Switch										Other Switches	Maint Task Para Ref
		1	2	3	4	5	6	7	8	9	10		
1A1	Rear panel	0	0	0	1	1	-	-	-	-	-		2-25.1
1A1A10	CCA (S1)	C	0	0	0	C	0	0	0	-	-		2-26.1
1A1A10	CCA (S2)	C	C	C	C	-	-	-	-	-	-		2-26.1
1A1A10	CCA (S3)	POSN 0 thru F - Set to 0											2-26.1
1A2	Interface											115	2-28
1A2	Rear panel	C	C	0	C	C	0	-	-	-	-		2-28
1A2A1	CCA	ON	ON	ON	-	-	-	-	-	-	-		2-29
1A2A2	CCA	OFF	ON	ON	-	-	-	-	-	-	-		2-29
1A2A3	CCA	ON	OFF	ON	-	-	-	-	-	-	-		2-29
1A2A4	CCA	OFF	OFF	ON	-	-	-	-	-	-	-		2-29
1A7	Rear panel											115	2-35
1A9	CCA											R	2-38
1A9	CCA											COAX	2-38
1A9	CCA	OFF	OFF	OFF	OFF	OFF	OFF	-	-	-	-		2-38
1A9A1	Rear panel											Master,Normal	2-38
1A9A2	Rear panel											Slave,Normal	2-38
1A10	Rear panel	Ø	1	Ø	-	-	-	-	-	-	-		2-38.1
1A11A1	CCA (U1)	C	C	C	0	0	0	C	0	-	-		2-39.1
1A11A1	CCA (U0201)	0	0	C	C	C	C	C	C	0	C		2-39.1
1A11A2	CCA (U0204)	C	C	C	C	C	-	-	-	-	-		2-39.1
1A11A3	CCA (U0101)	0	0	0	C	C	0	C	C	-	-		2-39.1
1A11A7	CCA (U1)	0	0	C	0	C	0	0	0	-	-		2-39.1
1A11A7	CCA (U1 44)	0	C	C	C	C	C	0	C	-	-		2-39.1
1A11A8	CCA (U1)	C	C	C	0	C	C	C	C	-	-		2-39.1
1A11A8	CCA (U21)	0	0	0	0	C	C	C	C	-	-		2-39.1
1A11A9	CCA (U1)	C	0	C	0	0	C	C	C	-	-		2-39.1
1A11A11	CCA (U1)	0	0	C	0	0	0	C	C	-	-		2-39.1
1A11A11	CCA (U16)	0	C	C	C	C	C	C	0	-	-		2-39.1
1A11A12	CCA (U1)	0	C	0	C	C	C	C	C	-	-		2-39.1
1A11A13	CCA (U1)	C	C	C	0	0	0	0	0	-	-		2-39.1
2A1A2A3	Ctrl panel											OPEN,10,SCOPE	2-41.1
2A1A2A3	Attenuator											Per cal. sticker	2-41.1
2A2A1	CCA	1	1	1	1	Ø	-	-	-	-	-		2-43
2A2A1	CCA	1	1	1	1	Ø	-	-	-	-	-		2-43
2A2A8	Rear panel											Slave, Normal	2-53
2A2A12	Rear panel	0	0	C	C	C	C	C	-	-	-		2-58
2A2A15	Right side											HI (up)	2-63

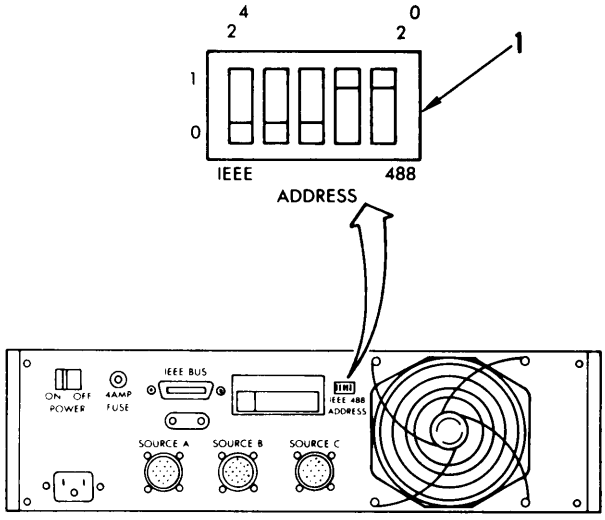
C = closed 0 = open 1 = on Ø = off

ELECTRONIC STATION

TEMPERATURE CONTROL UNIT 1A1

Item	Code Select							
	1	2	3	4	5	6	7	8
1	Ø	Ø	Ø	1	1			
2	C	0	0	0	C	0	0	0
3	C	C	C	0				
4	POSITIONS Ø THRU F - SET TO Ø							

C = closed 0 = open 1 = on Ø = off

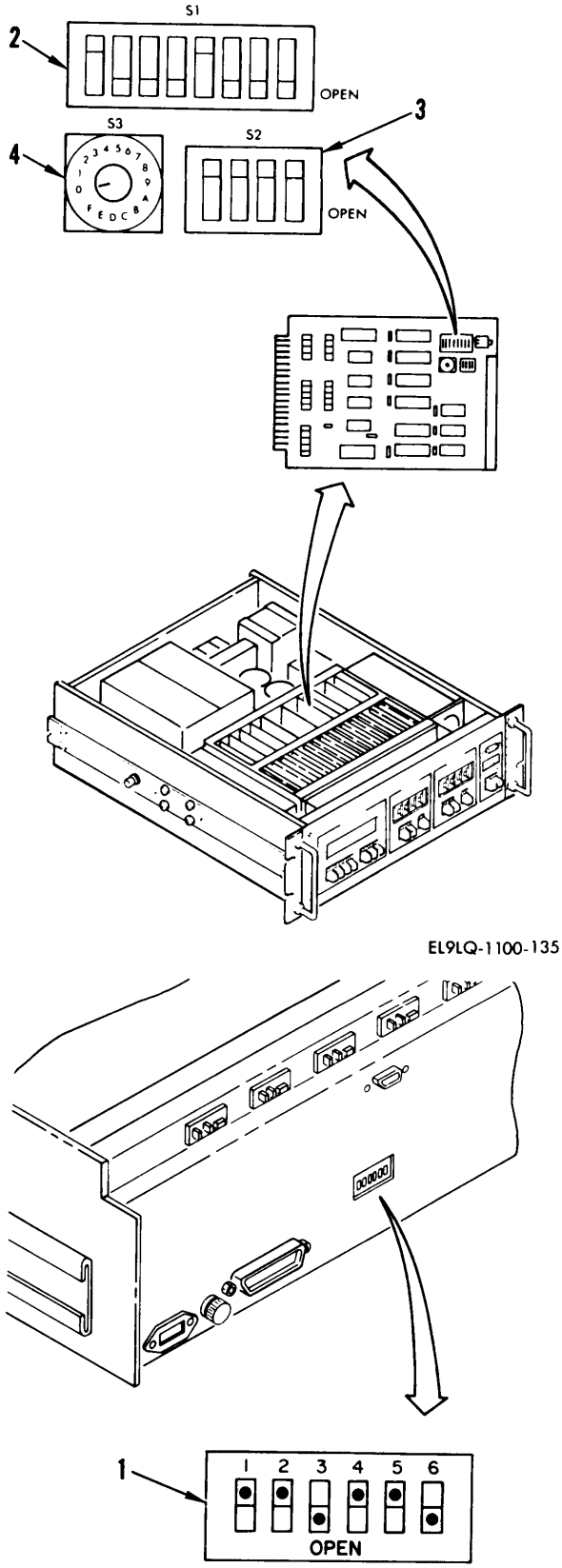


EL9LQ-1100-134

488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2

Item	Code Select					
	1	2	3	4	5	6
1	C	C	0	C	C	0

C = closed 0 = open



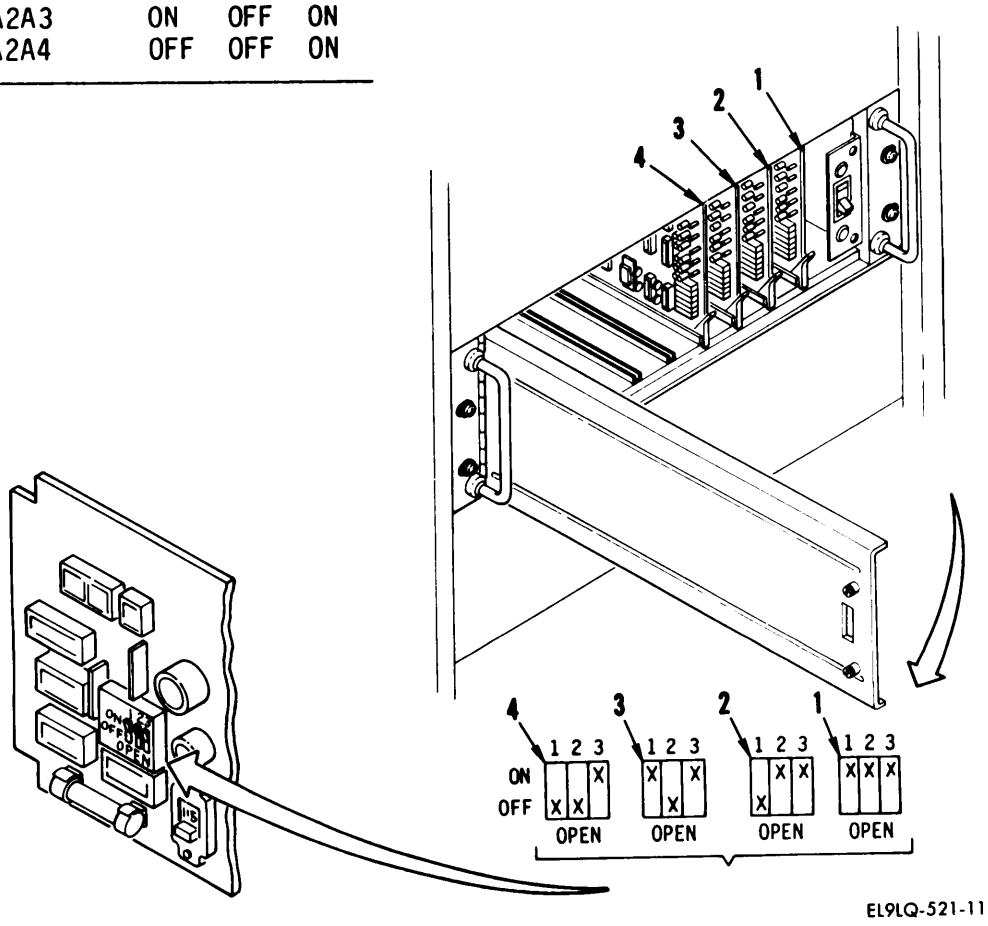
EL9LQ-1100-135

EL9LQ-520-08

ELECTRONIC STATION (cont)

488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2 (cont)

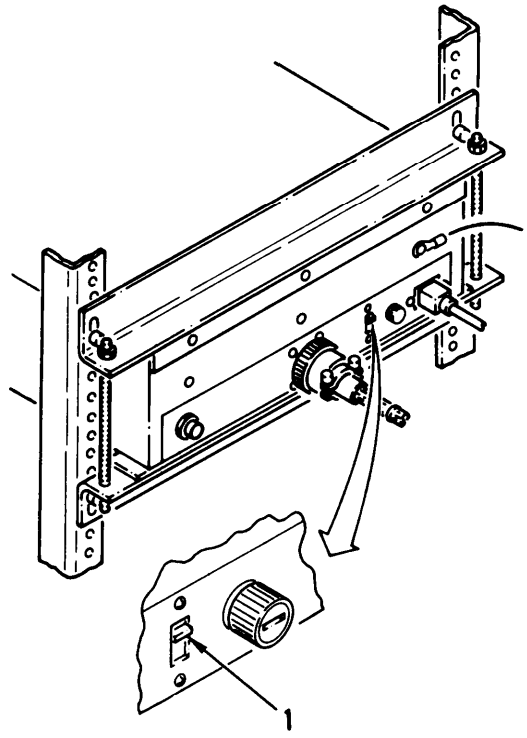
Item	Reference Designation	Code Select 1	2	3
1	1A2A1	ON	ON	ON
2	1A2A2	OFF	ON	ON
3	1A2A3	ON	OFF	ON
4	1A2A4	OFF	OFF	ON



ELECTRONIC STATION (cont)

PMT CONTROLLER 1A7

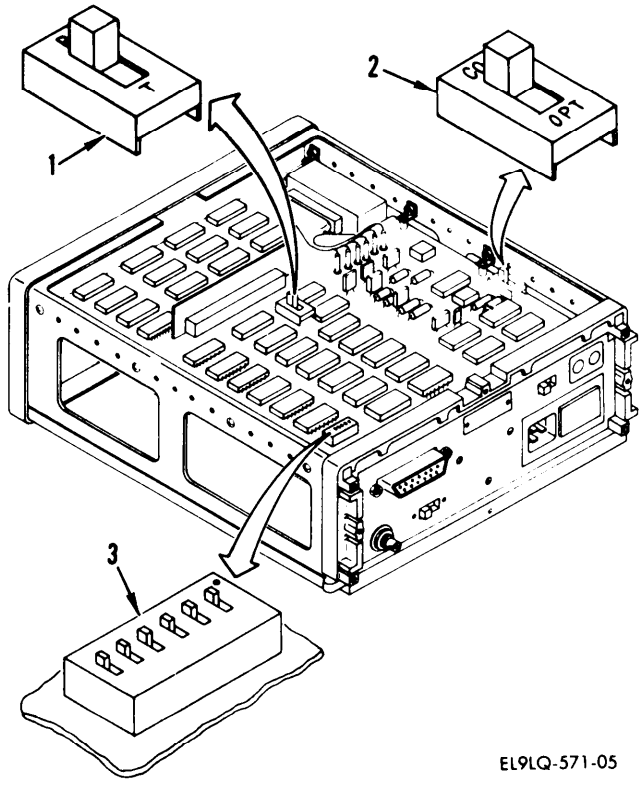
Item	Switch Position
1	115



EL9LQ-560-05

EXTENDER ASSEMBLY 1A9

Item	Switch Position
1	R
2	COAX
3	All switches off



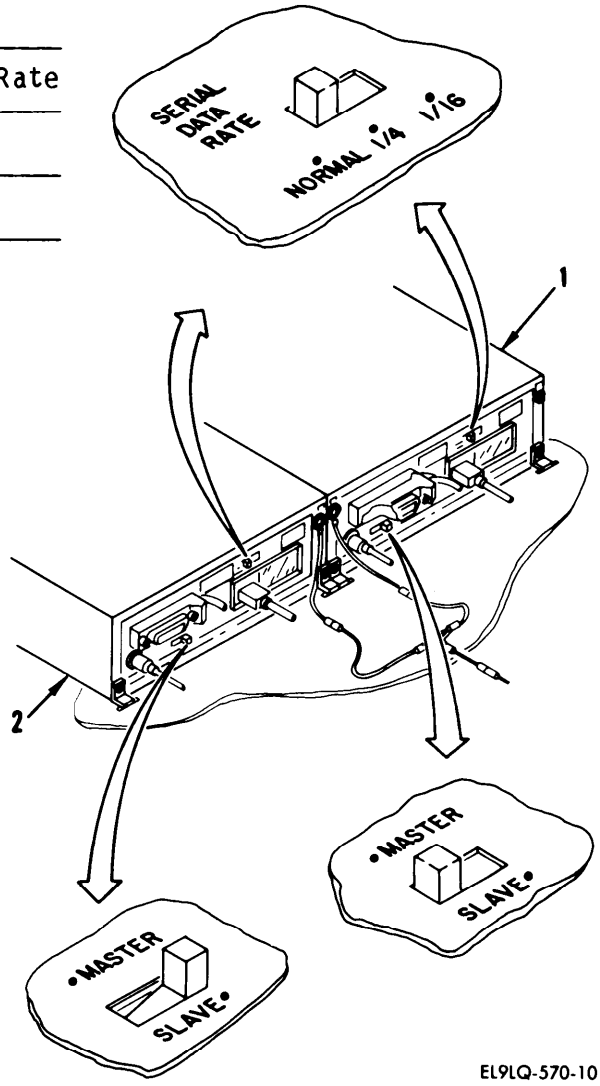
EL9LQ-571-05

2-24. SWITCH SETTING REQUIREMENTS SUMMARY (cont) 2-24

ELECTRONIC STATION (cont)

EXTENDER ASSEMBLY 1A9 (cont)

Item	Reference Designation	Switch position	
		Master/Slave	Serial Data Rate
1	1A9A1	Master	Normal
2	1A9A2	Slave	Normal

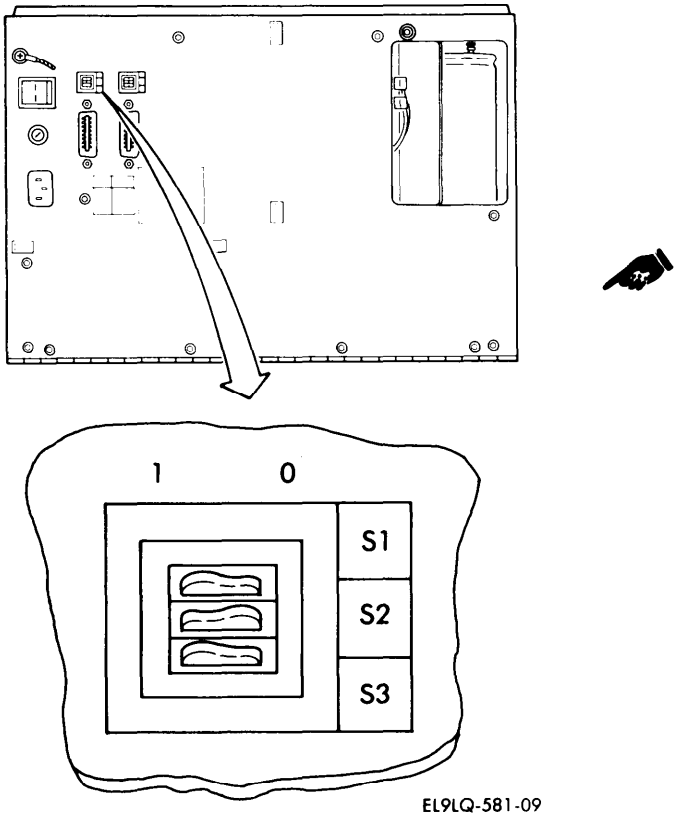


EL9LQ-570-10

2-24. SWITCH SETTING REQUIREMENTS SUMMARY (cont) 2-24

ELECTRONIC STATION (cont)

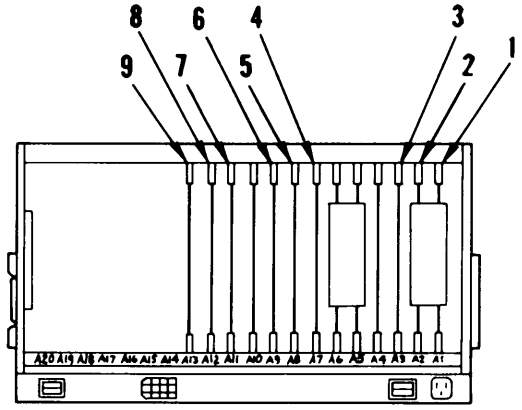
DISC/TAPE DRIVE ASSEMBLY 1A10



2-24. SWITCH SETTING REQUIREMENTS SUMMARY (cont) 2-24

ELECTRONIC STATION (cont)

DIGITAL COMPUTER ASSEMBLY 1A11



EL9LQ-580-69

CIRCUIT CARD ASSEMBLY - ADDRESS SELECTOR SWITCH MATRIX

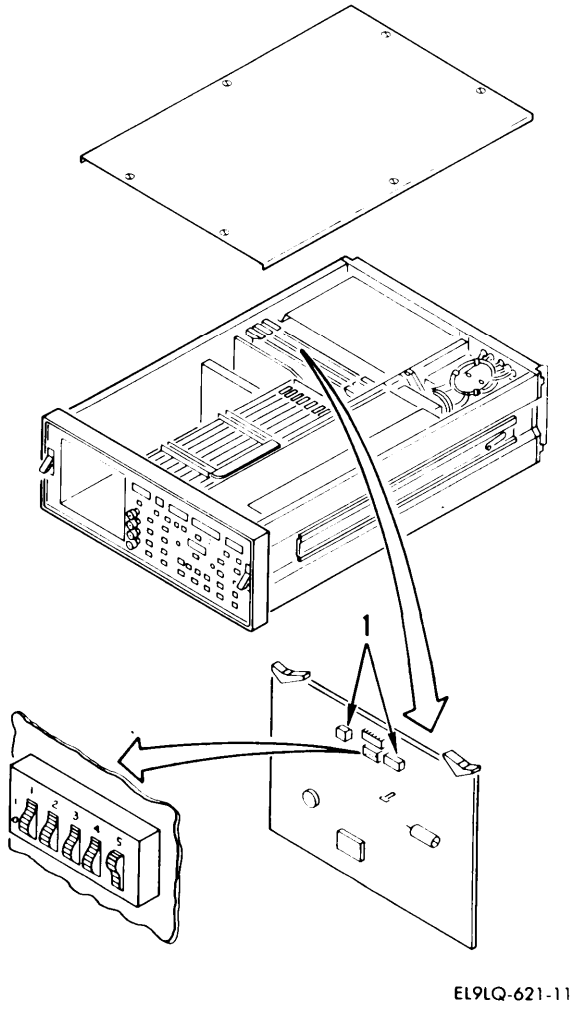
Item	CCA	NOMENCLATURE	SWITCH CODE SELECT									
			1	2	3	4	5	6	7	8	9	10
1	A1	Control Store (U1)	C	C	C	O	O	O	C	O	-	-
1	A1	Control Store (U0201)	O	O	C	C	C	C	C	C	O	C
2	A2	Sequencer (U0204)	C	C	C	C	C	-	-	-	-	-
3	A3	Data Path (U0101)	O	O	O	C	C	O	C	C	-	-
4	A7	HPIB (U1)	O	O	C	O	C	O	O	O	-	-
4	A7	HPIB (U144)	O	C	C	C	C	C	O	C	-	-
5	A8	ASIC (U1)	C	C	C	O	C	C	C	C	-	-
5	A8	ASIC (U21)	O	O	O	O	C	C	C	C	-	-
6	A9	IEEE Interface (U1)	C	O	C	O	O	C	C	C	-	-
7	A11	HPIB (U1)	O	O	C	O	O	O	C	C	-	-
7	A11	HPIB (U16)	O	C	C	C	C	C	C	O	-	-
8	A12	Parallel Interface (U1)	O	C	O	C	C	C	C	C	-	-
9	A13	Buffer (U1)	C	C	C	O	O	O	O	O	-	-

C = Closed
O = Open

2-24. SWITCH SETTING REQUIREMENTS SUMMARY (cont) 2-24

TEST CONSOLE TEST BENCH

PROGRAMMABLE DIGITIZER ASSEMBLY 2A2A1



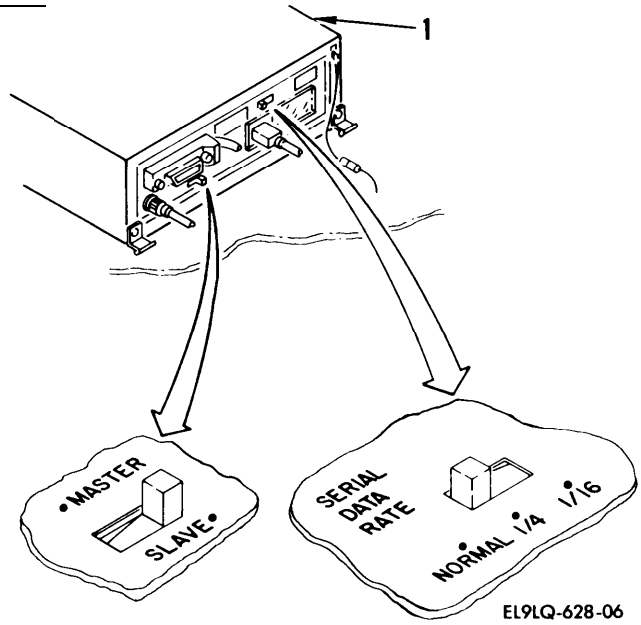
EL9LQ-621-11

2-24. SWITCH SETTING REQUIREMENTS SUMMARY (cont) 2-24

TEST CONSOLE TEST BENCH (cont)

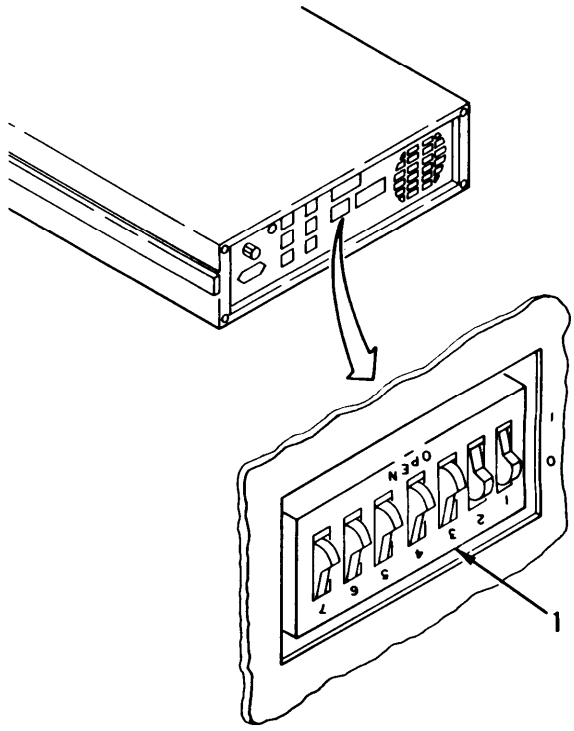
EXTENDER ASSEMBLY 2A2A8

Item	Switch Position	
	Master/Slave	Serial Data Rate
1	Slave	Normal



SWITCH CONTROLLER ASSEMBLY 2A2A12

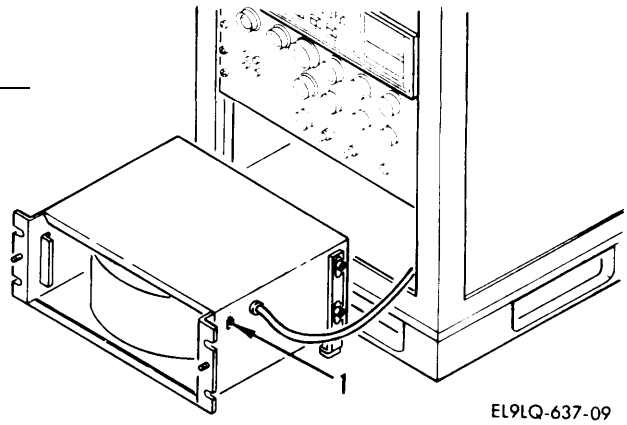
Item	Switch	Position
1	1	**OPEN**
	2	**OPEN**
	3	(Closed)
	4	(Closed)
	5	(Closed)
	6	(Closed)
	7	(Closed)



TEST CONSOLE TEST BENCH (cont)

BLOWER ASSEMBLY 2A2A15

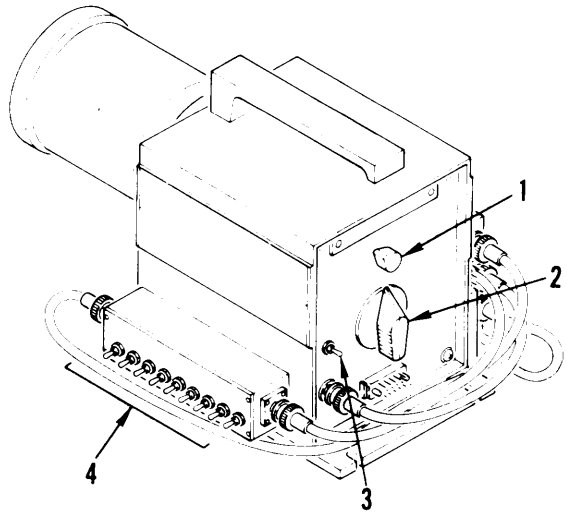
Item	Switch Position
1	HI (up)



EL9LQ-637-09

RADIOMETER ASSEMBLY 2A1A2A3

Item	Switch Position
1	OPEN
2	10
3	SCOPE
4	Per calibration sticker



EL9LQ-611-80

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2-24.1 POWER REMOVAL FOR MAINTENANCE

INITIAL SETUP

Personnel Required

396 ATE Repairer

References

TM 11-6625-3085-12

FOLLOWUP

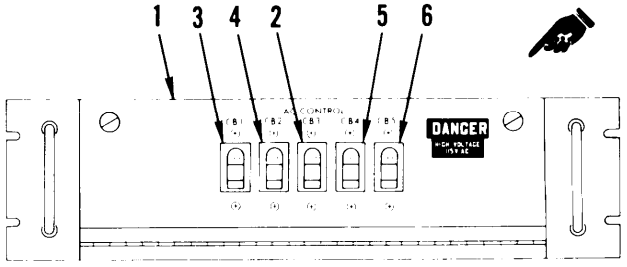
Power on (TM 11-6625-3085-12)
Run E/O bench self-test (para 2-12)

a. This procedure is used to remove electrical power from E/O bench and electronic station before doing maintenance.

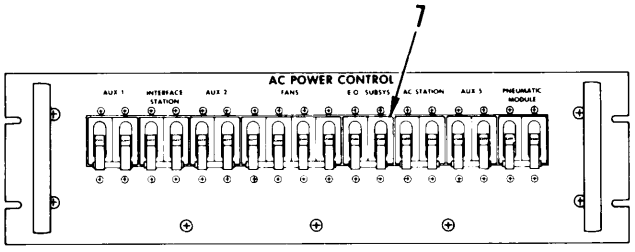
(1) On electronic station AC CONTROL panel assembly 1A5 (1), set CB3 (2) to OFF.

(2) On AC CONTROL panel assembly 1A5, set CB1 (3), CB2 (4), CB4 (5), and CB5 (6) to OFF.

(3) On AN/USM-410 AC STATION, AC POWER CONTROL panel set E/O SUBSYS circuit breaker (7) to OFF.
(Refer to TM 11-6625-3085-12.)



EL9LQ-599-40A



EL9LQ-599-53

END OF TASK

Section VII. ELECTRONIC STATION MAINTENANCE PROCEDURES

2-25. ELECTRONIC STATION CABINET REPAIR 2-25

This task covers replacement of:

Para	Item	Para	Item
1.	Blank panel	3.	Cable carrier
2.	Drawer slide	4.	Door handle

INITIAL SETUP

Personnel Required

39B ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions Power removed (para 2-24.1)
Electronic station positioned for maintenance (required for para 3 and 4 only) (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (required for para 3 and 4 only) (TM 11-6625-3085-12)

1. BLANK PANEL REPLACEMENT

REMOVAL

a. On electronic station (l), locate desired blank panel (2 thru 11).

NOTE

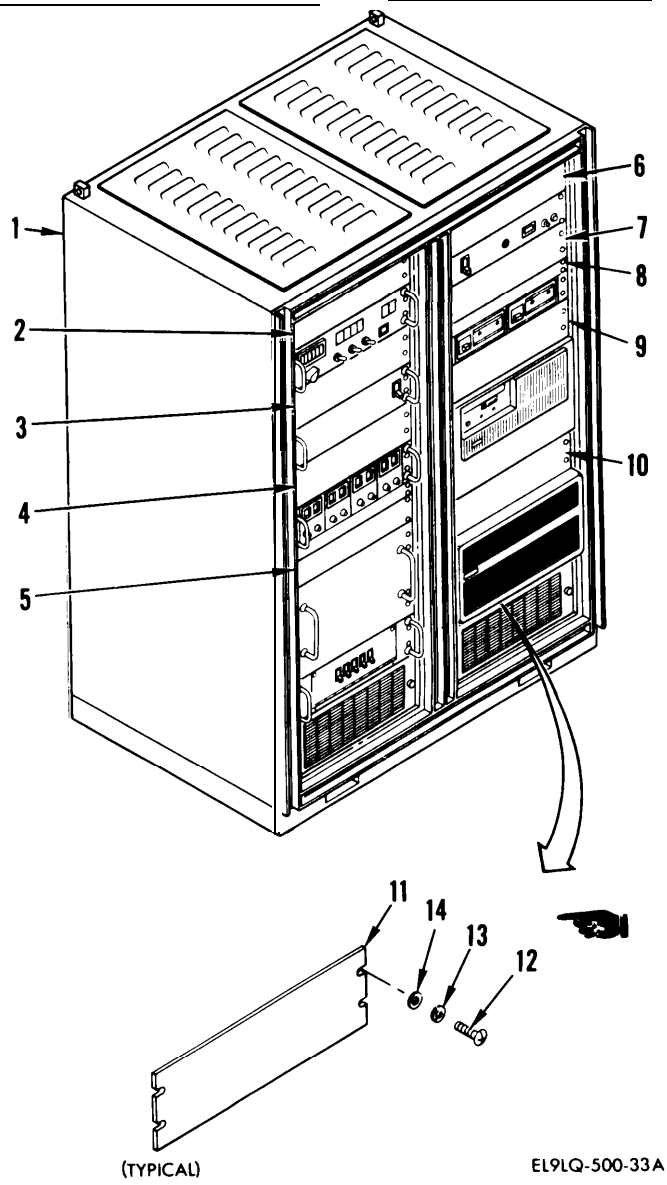
Quantity of mounting hardware (screws, nuts, and washers) will vary with the panel size.

b. Remove screws (12), lockwashers (13), and washers (14). Remove blank panel.

INSTALLATION

c. Install in reverse order of removal.

END OF TASK



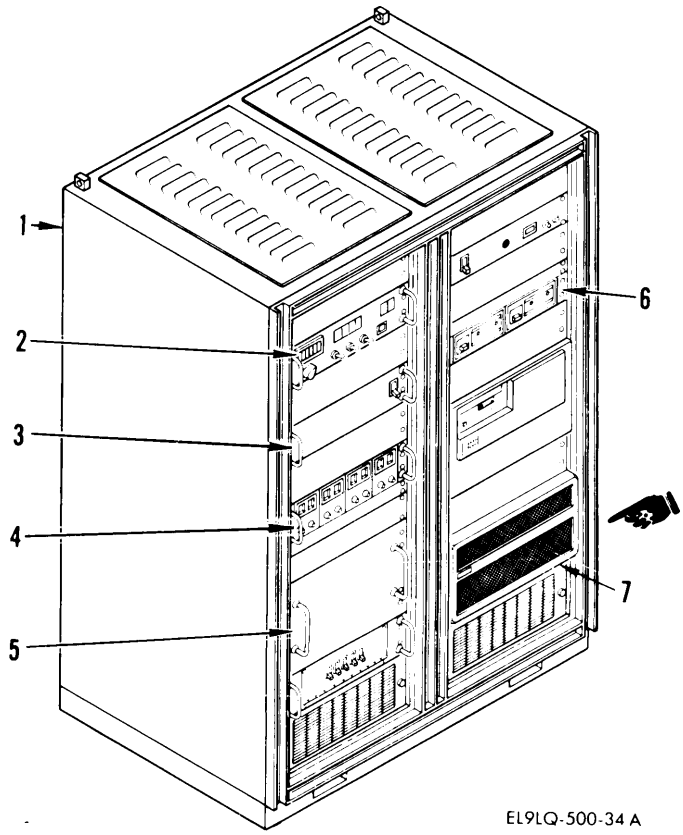
2. DRAWER SLIDE REPLACEMENT

REMOVAL

NOTE

Electronic station (1) uses various sized drawer slide assemblies that consist of slide tracts mounted to cabinet frame and slides mounted to each electronic assembly. The following listing identifies all of the electronic station assemblies that are slide mounted.

Item	Assembly	Ref Des	Para Ref
2	Control unit assembly	1A1	2-26
3	488 controller power supply assembly	1A2	2-28
4	Programmable power supply assembly	1A3	2-30
5	DC power supply assembly	1A4	2-32
6	Extender assembly	1A9	2-38
7	Digital computer assembly	1A11	2-40



NOTE

This procedure is used to replace the defective section of either left or right slide. This includes either its slide track mounted to the frame or the slide mounted to the assembly.

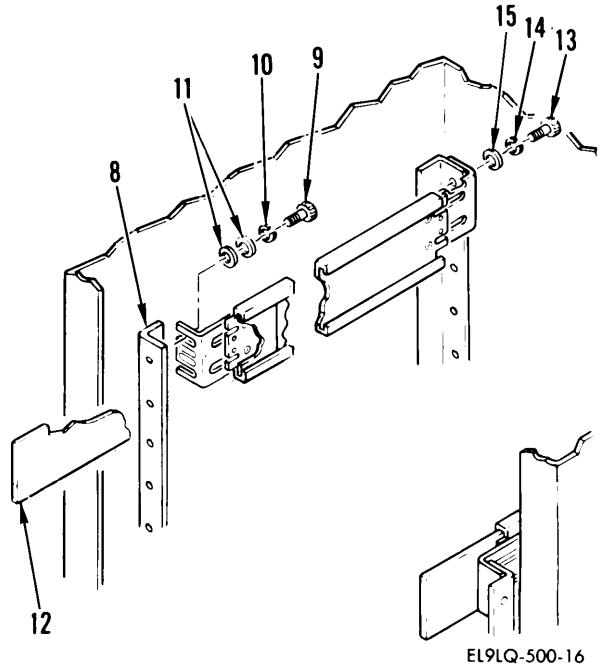
a. Remove assembly (2 thru 7) containing defective slide assembly as listed above.

NOTE

For replacement of slide track or cabinet frame, do steps b and c below. For replacement of slide on an electric assembly, do step d.

b. For defective slide track on bay cabinet frame (8), remove two screws (9), lockwashers (10), and four washers (11) from rear of left or right slide track (12).

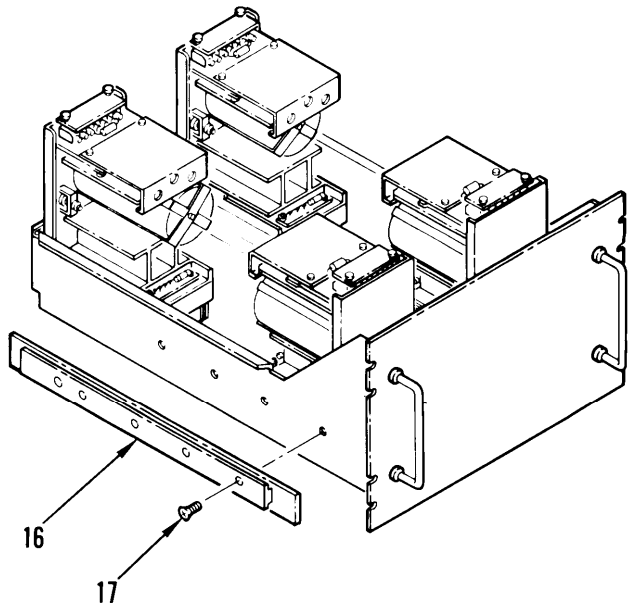
c. Remove two screws (13), lockwashers (14), and washers (15) from front of slide track (12). Remove slide track.



EL9LQ-500-16

d. For defective slide on an assembly, remove left or right defective slide (16) by removing attaching screws (17) as shown below:

Assembly	No. of Attaching Screws
1A1	4
1A2	3
1A3	3
1A4	4
1A9	2
1A11	2



EL9LQ-500-17

INSTALLATION

e. Install in reverse order of removal.

END OF TASK

3. CABLE CARRIER REPLACEMENT

REMOVAL

NOTE

Electronic station uses seven identical cable carriers (l). Mounting of one cable carrier is typical for all.

a. Open left or right rear cabinet door.

b. On cable carrier (1), do the following, as required:

(1) Clip lacing tape (2).

(2) Remove screws (3), washers (4), lockwashers (5), nuts (6), cables (7), and cable clamps (8).

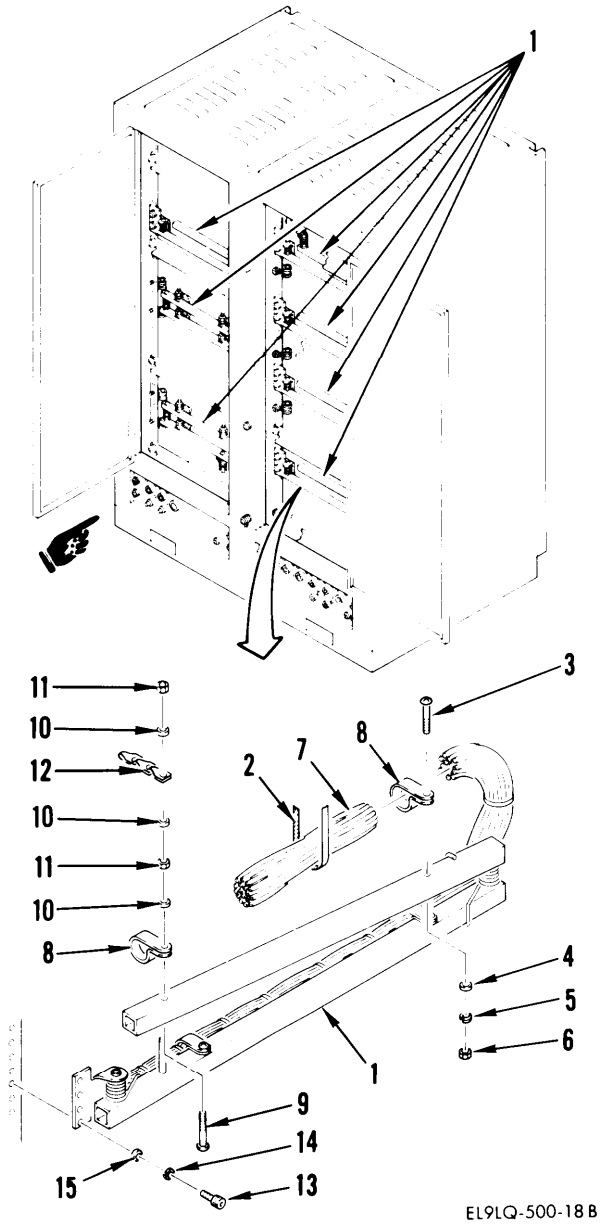
(3) Remove screw (9), three washers (10), two nuts (11), cable clamp (8), and cable chain (12).

c. Remove two screws (13), lockwashers (14), washers (15), and defective cable carrier (1).

INSTALLATION

d. Install in reverse order of removal.

END OF TASK



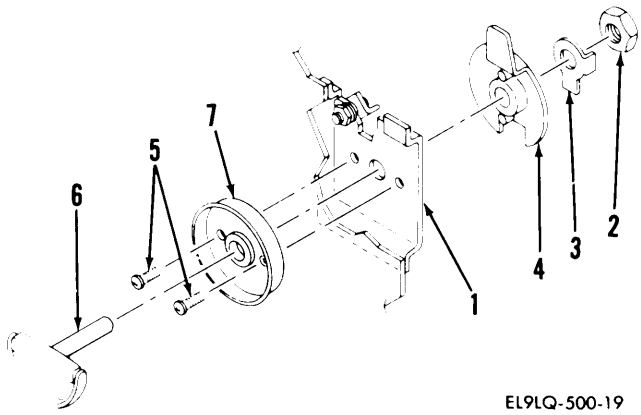
EL9LQ-500-18 B

4. DOOR HANDLE REPLACEMENT

REMOVAL

a. Open left or right rear cabinet door.

b. On door brace (l), remove nut (2), lock plate (3), door lock (4), screws (5), handle (6), and plate (7).



INSTALLATION

c. Install in reverse order of removal.

END OF TASK

2-25.1 TEMPERATURE CONTROL UNIT 1A1 REPLACEMENT 2-25.1

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Calibrate in accordance with TB 11-6625-3161-50
Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

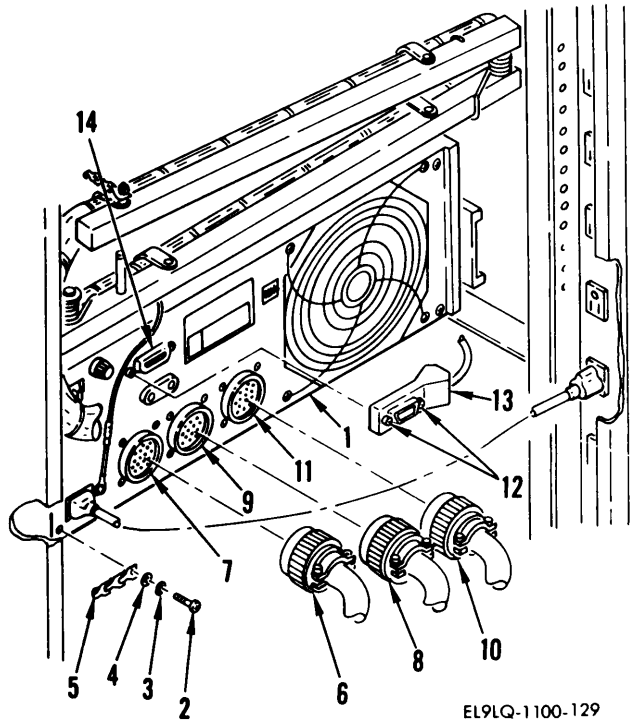
1. On rear of electronic station, open right rear cabinet door for access to rear panel of temperature control unit (l).

2. Remove screw (2), lockwasher (3), washer (4), and chain (5).

3. On rear panel of temperature control unit, disconnect the following connectors:

   P1 (6) from SOURCE A (7)
   P2 (8) from SOURCE B (9)
   P3 (10) from SOURCE C (11)

4. Loosen two screws (12) and disconnect connector P1 (13) from IEEE BUS (14).



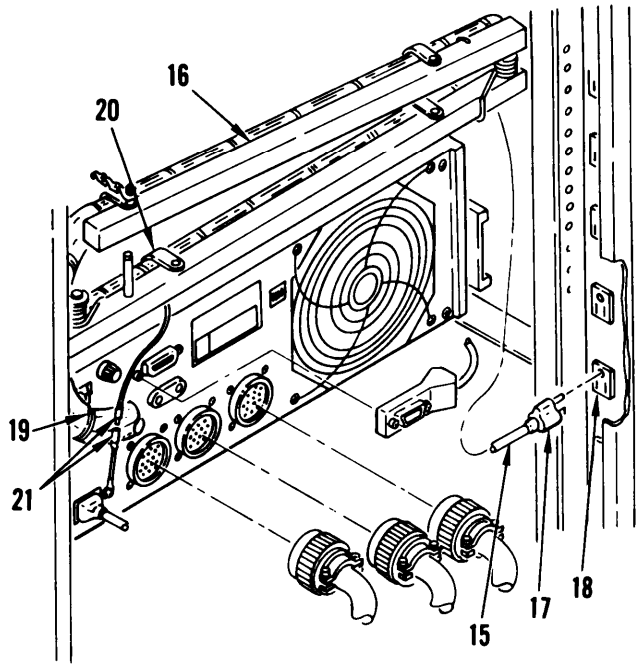
NOTE

The 115 vac power cord (15) is secured to cable carrier assembly (16).

5. Disconnect connector P1 (17) from receptacle J1 (18) and cut away lacing tape (19) and remove cable clamps (20) holding power cord to cable carrier assembly (16).

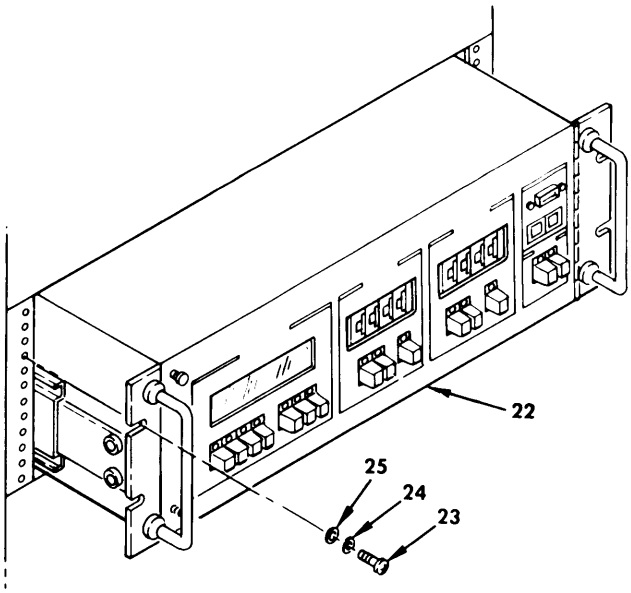
6. Disconnect ground lead (21).

7. Close right rear cabinet door and slide electronic station back in one-half way to allow for clearance to remove control unit assembly.



EL9LQ-1100-130

8. On front panel of temperature control unit (22), remove four screws (23), lockwashers (24), and washers (25), and pull out temperature control unit.



EL9LQ-1100-131

WARNING

HEAVY OBJECT

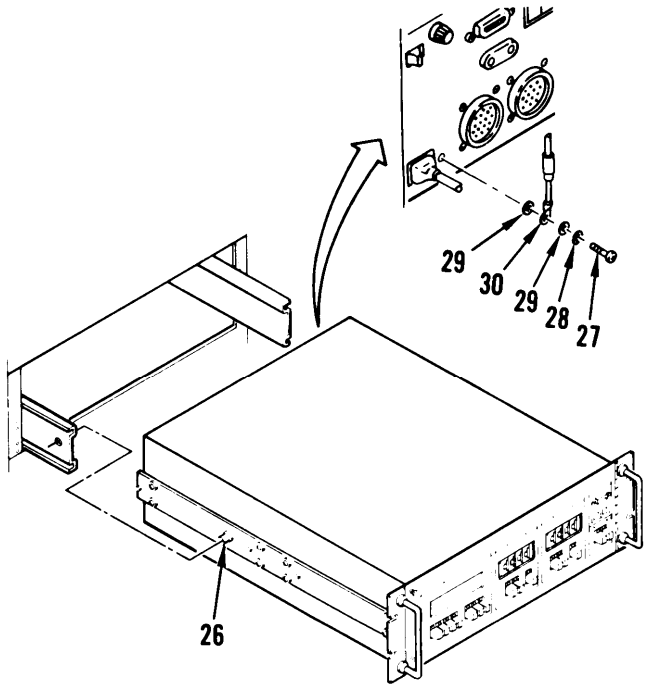
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

9. Using two persons, depress two slide locks (26) and remove control unit assembly.

NOTE

If temperature control unit is to be replaced, ground lead will have to be moved to replacement assembly as required below. If the same temperature control unit is to be reinstalled, omit steps 10 through 15 and proceed to step 16.

10. Remove screw (27), lockwasher (28), two washers (29), and ground lead (30) from temperature control unit. Reinstall screw (27).



EL9LQ-1100-132

INSTALLATION

11. Remove screw (27) from upper right hand corner of rear panel.

12. Prepare surface and hardware (27 thru 30) for application of zinc chromate primer (para 2-19).

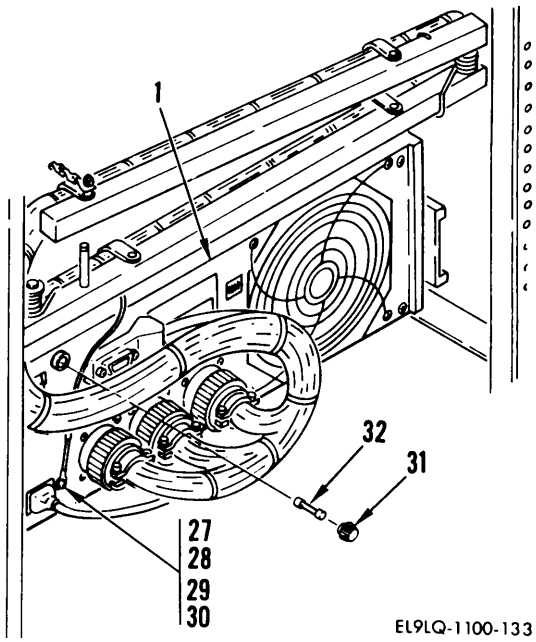
13. Install ground lead (30) using screw (27), lockwasher (28), and two washers (29).

14. Apply thin coat of zinc chromate primer over bonded area and hardware (27 thru 30).

15. On temperature control unit (1), remove fuseholder cap (31) and fuse (32), verify fuse rating and re-install fuse and fuseholder cap.

16. Install temperature control unit in reverse order of removal, starting with step 9.

END OF TASK



2-26. CONTROL UNIT ASSEMBLY 1A1 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

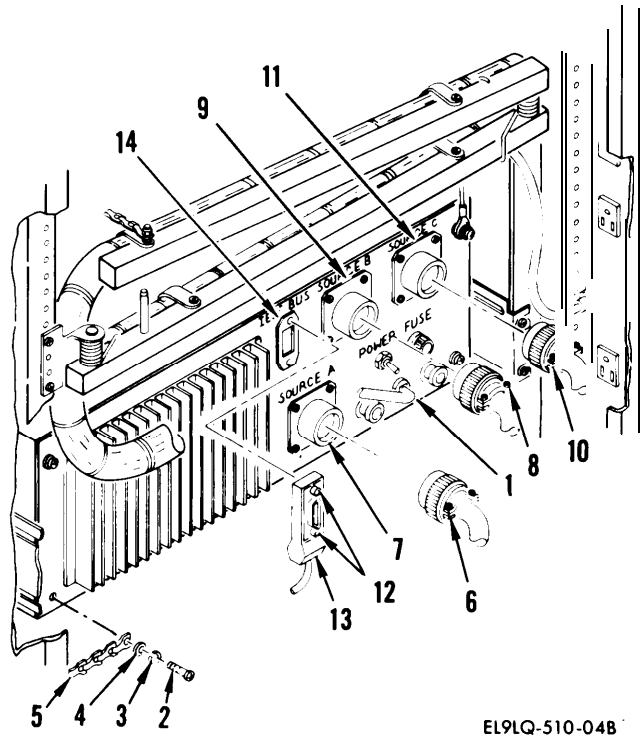
Calibrate in accordance with TB 11-6625-3161-50
Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

1. On rear of electronic station, open right rear cabinet door for access to rear panel of control unit assembly (1).
2. Remove screw (2), lockwasher (3), washer (4), and chain (5).
3. On rear panel of control unit assembly, disconnect the following connectors:

   P1 (6) from SOURCE A (7)
   P2 (8) from SOURCE B (9)
   P3 (10) from SOURCE C (11)

4. Loosen two screws (12) and disconnect connector P1 (13) from IEEE BUS (14).



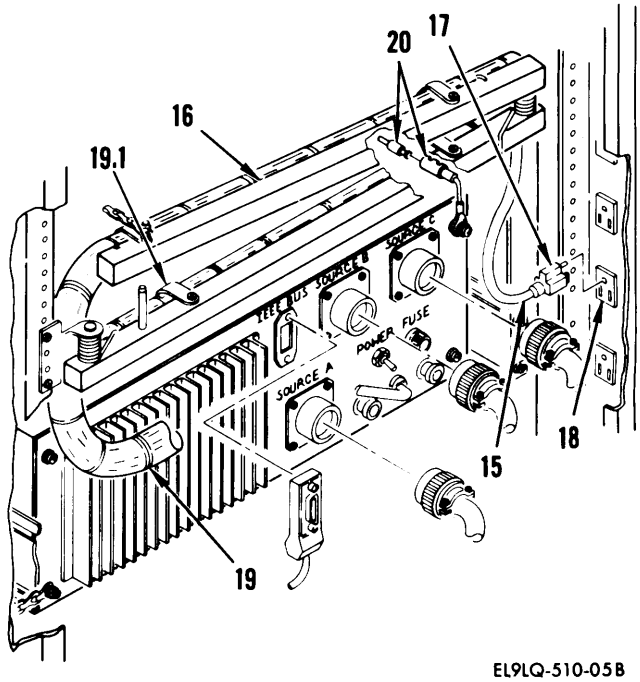
NOTE

The 115 vac power cord (15) is secured to cable carrier assembly (16).

5. Disconnect connector P1 (17) from receptacle J1 (18) and cut away lacing tape (19) and remove cable clamps (19.1) holding power cord to cable carrier assembly (16).

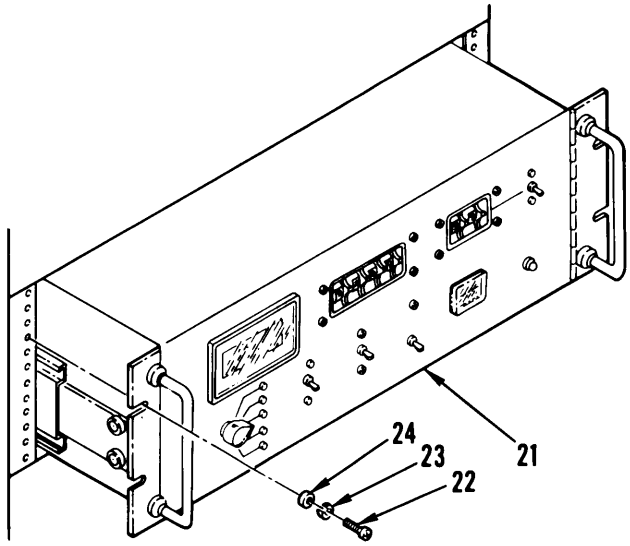
6. Disconnect ground lead (20).

7. Close right rear cabinet door and slide electronic station back in one-half way to allow for clearance to remove control unit assembly.



EL9LQ-510-05B

8. On front panel of control unit assembly (21), remove four screws (22), lockwashers (23), and washers (24), and pull out control unit assembly.



EL9LQ-500-06

WARNING

HEAVY OBJECT

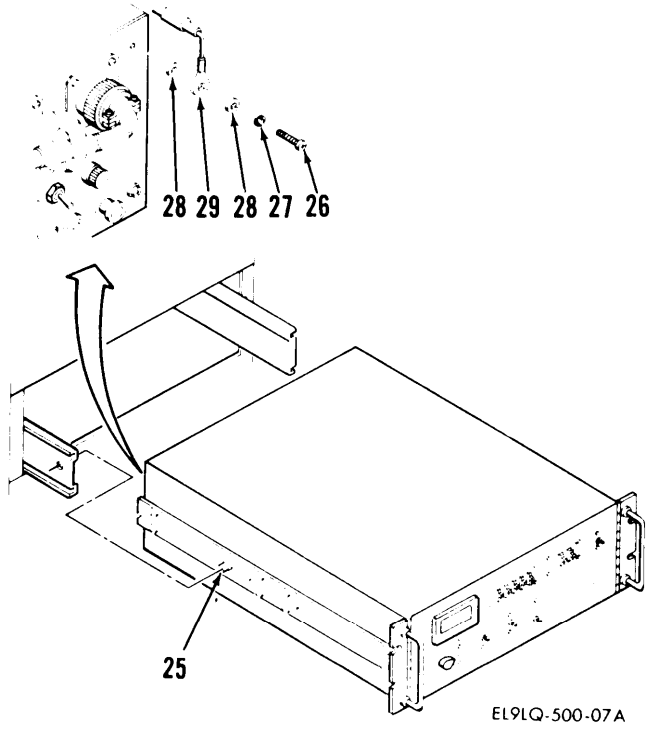
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

9. Using two persons, depress two slide locks (25) and remove control unit assembly.

NOTE

If control unit assembly is to be replaced, ground lead will have to be moved to replacement assembly as required below. If the same control unit assembly is to be reinstalled, omit steps 10 through 15 and proceed to step 16.

10. Remove screw (26), lockwasher (27), two washers (28), and ground lead (29) from control unit assembly. Reinstall screw (26).



INSTALLATION

11. Remove screw (26) from upper right hand corner of rear panel.

12. Prepare surface and hardware (26 thru 29) for application of zinc chromate primer (para 2-19).

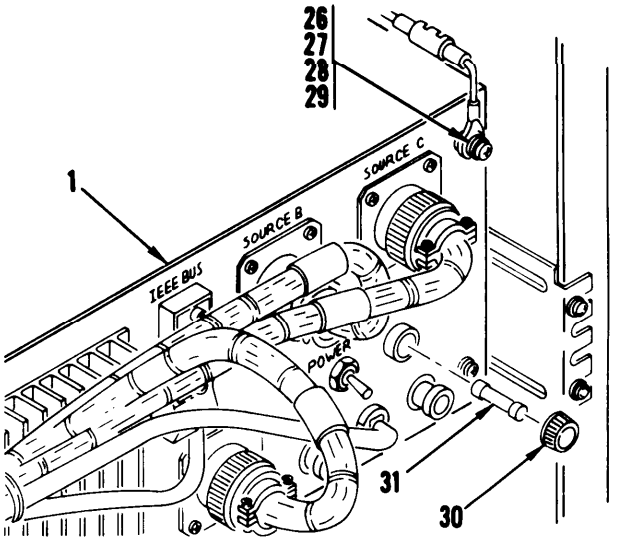
13. Install ground lead (29) using screw (26), lockwasher (27), and two washers (28).

14. Apply thin coat of zinc chromate primer over bonded area and hardware (26 thru 29).

15. On control unit assembly (1), remove fuseholder cap (30) and fuse (31), verify fuse rating and reinstall fuse and fuseholder cap.

16. Install control unit assembly in reverse order of removal, starting with step 9.

END OF TASK



EL9LQ-510-06

2-26.1 TEMPERATURE CONTROL UNIT 1A1 REPAIR 2-26.1

This task covers replacement of fuse.

INITIAL SETUP

Personnel Required

396 ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

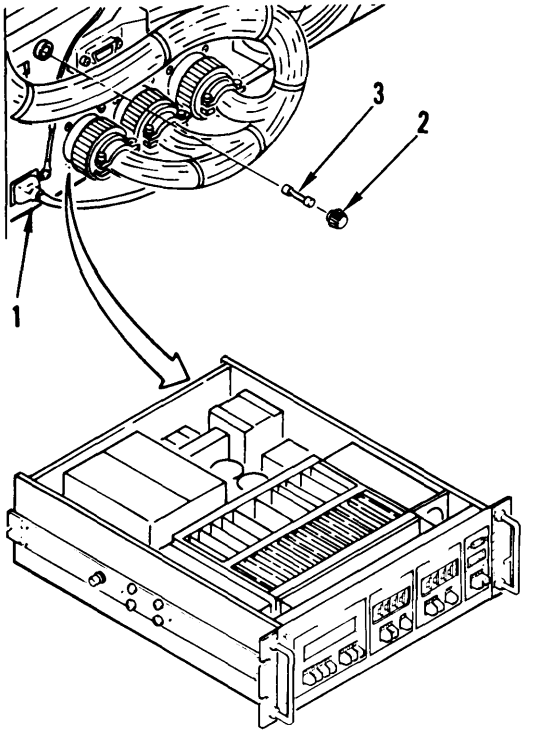
REMOVAL

1. On rear of electronic station open right rear cabinet door for access to rear panel of temperature control unit (1).
2. On rear panel of temperature control unit, remove fuseholder cap (2) and fuse (3).

INSTALLATION

3. Obtain replacement fuse (3).
4. Install in reverse order of removal.

END OF TASK



EL9LQ-1100-137

2-27. CONTROL UNIT ASSEMBLY 1A1 REPAIR 2-27

This task covers replacement of fuse.

INITIAL SETUP

Personnel Required

39B ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

1. On rear of electronic station open right rear cabinet door for access to rear panel of control unit assembly (1).

2. On rear panel of control unit assembly, remove fuseholder cap (2) and fuse (3).

INSTALLATION

3. Obtain replacement fuse (3).

4. Install in reverse order of removal.

END OF TASK

2-28. 488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2 REPLACEMENT 2-28

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

Equipment Condition

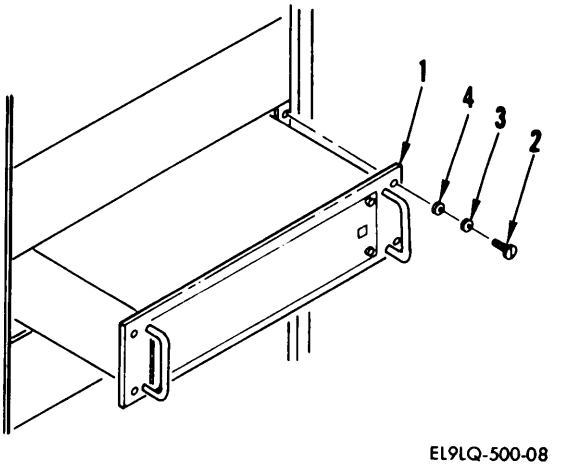
Power removed (para 2-24.1)

REMOVAL

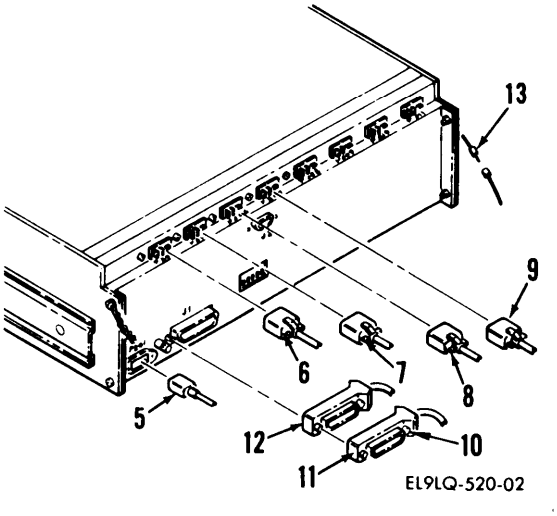
1. Remove blank panel (para 2-25, blank panel 3).
2. On front panel of 488 controller power supply assembly (1), remove four screws (2), lockwashers (3), and washers (4), and pull out 488 controller power supply assembly.
3. On rear panel of 488 controller power supply assembly, disconnect the following connectors:

   115 vac connector (5) from P201
   1W2 P304 (6) from J304
   1W2 P305 (7) from J305
   1W2 P306 (8) from J306
   1W2 P307 (9) from J307

4. Loosen two screws (10) and disconnect top stacked bus connector HP10833C (11).
5. Loosen two screws and disconnect bottom stacked bus connector HP10833B (12).
6. Disconnect ground lead (13) from 488 controller power supply assembly.



EL9LQ-500-08

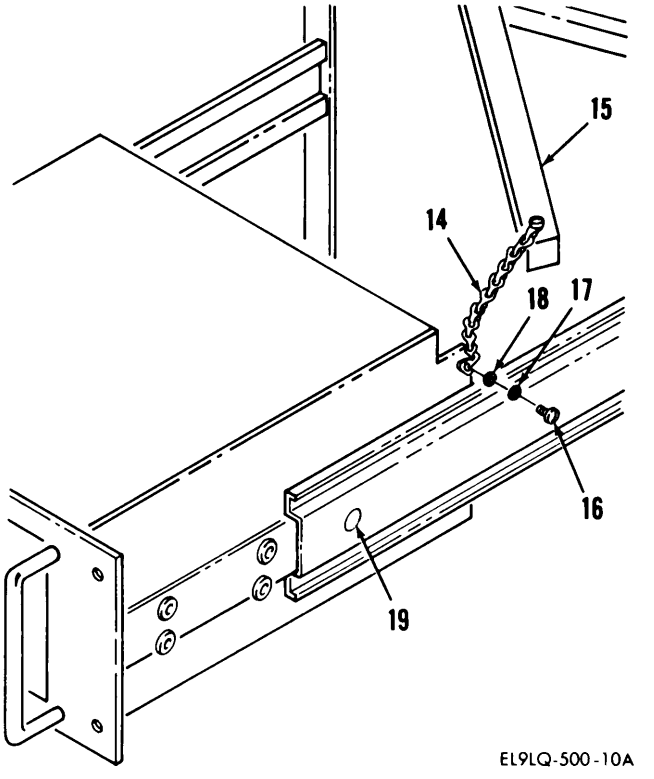


EL9LQ-520-02

NOTE

Chain (14) attached to 488 controller power supply assembly has spring tension applied when assembly is open.

7. Pull forward on front section of cable carrier (15) and remove screw (16), lockwasher (17), washer (18), and chain (14). Reposition cable carrier (15).



EL9LQ-500-10A

WARNING

HEAVY OBJECT

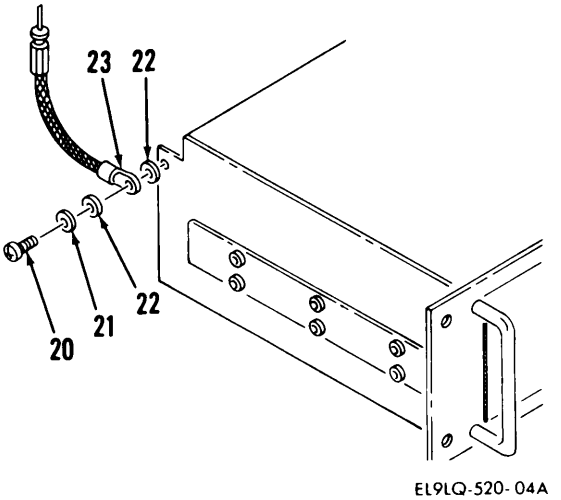
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

8. Using two persons, depress two slide locks (19) and remove 488 controller power supply assembly.

NOTE

If the 488 controller power supply assembly is to be replaced, ground lead will have to be moved to replacement assembly as required below. If the same 488 controller power supply assembly is to be reinstalled, omit steps 9 thru 17 and proceed to step 18.

9. Remove screw (20), lockwasher (21), two washers (22), and ground lead (23).



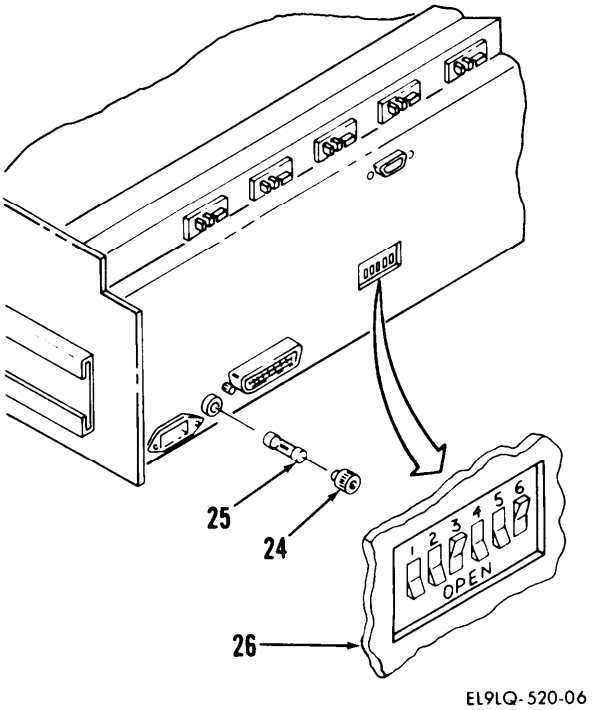
EL9LQ-520-04A

INSTALLATION

10. On rear panel of replacement 488 controller power supply assembly, remove fuseholder cap (24) and fuse (25), verify fuse rating. Reinstall fuse and fuseholder cap.

11. Position code select switch (26). Switch position 1, 2, 4, and 5 - CLOSED (up), and switch position 3 and 6 - OPEN.

12. On front panel loosen two screws (27) and swing open panel door (28).



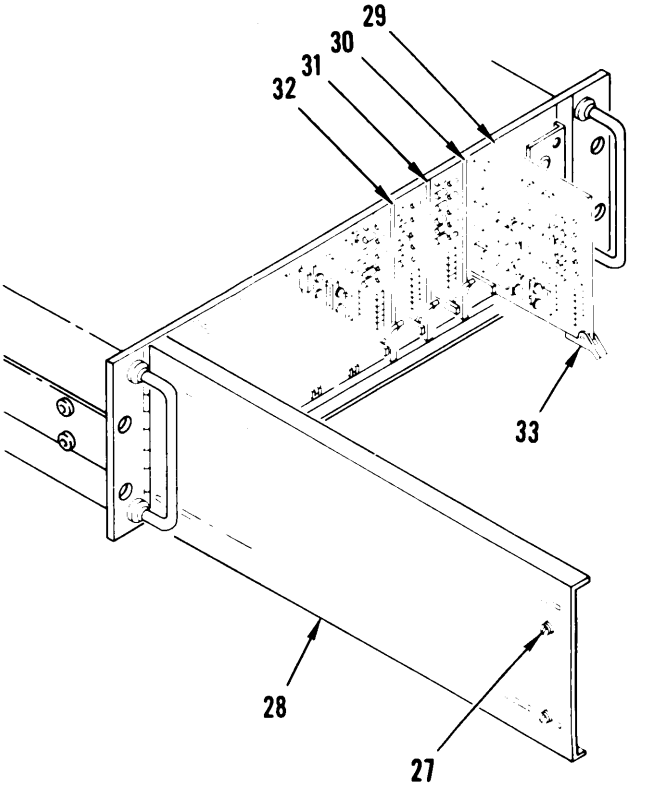
EL9LQ-520-06

13. Do the following procedures on each of four programmer cards (29 thru 32):

CAUTION

Use care when removing and installing programmer cards. Careless handling may cause damage to tracks and components.

a. Pull down on thumb lever (33) and remove programmer card by pulling straight out.



EL9LQ-521-13

b. On programmer card, verify fuse (34) rating.

c. Position 115/230 vac select switch (35) to 115.

NOTE

Three position code for code select switch is dependent on which position programmer card (29, 30, 31, and 32) is installed.

d. position code select switch (36) as shown below.

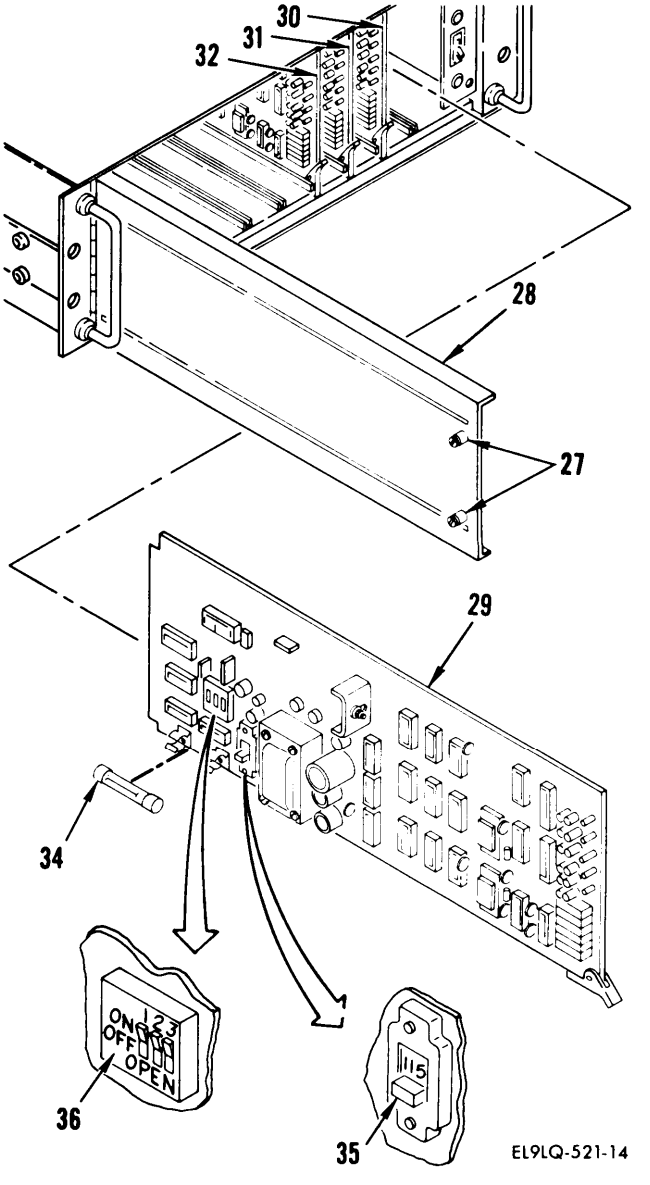
Item	Programmer Card	Code Select		
		1	2	3
29	A1	ON	ON	ON
30	A2	OFF	ON	ON
31	A3	ON	OFF	ON
32	A4	OFF	OFF	ON

CAUTION

Use care when removing and installing programmer cards. Careless handling may cause damage to tracks and components.

e. Install programmer card.

14. Close panel door (28) and tighten two screws (27).

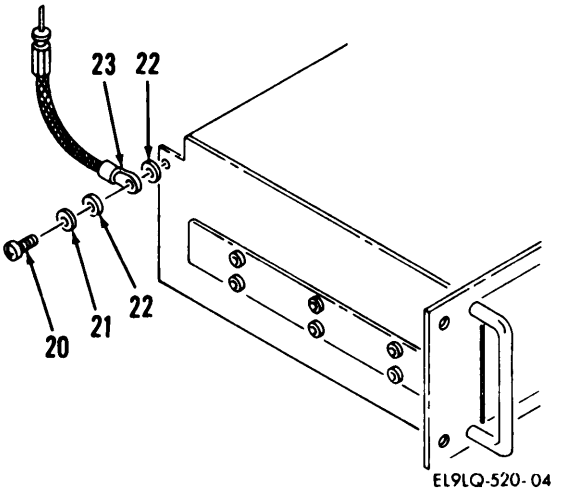


15. Prepare surface and hardware (20 thru 23) for application of zinc chromate primer (para 2-19).

16. Install ground lead (23) using screw (20), lockwasher (21), and two washers (22).

17. Apply a thin coat of zinc chromate primer over bonded area and hardware (20 thru 23).

18. Install 488 controller power supply assembly in reverse order of removal, starting with step 8.



END OF TASK

2-29. 488 CONTROLLER POWER SUPPLY ASSEMBLY 1A2 REPAIR

This task covers replacement of:

Para	Item
1.	Fuse 1A2F201
2.	Fuses 1A2A1F1 through 1A2A4F1
2.1	Interface board fuse F1
3.	Programmer cards 1A2A1 through 1A2A4

INITIAL SETUP

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE 1A2F201 REPLACEMENT

REMOVAL

a. Remove blank panel (para 2-25, blank panel 3).

b. On front panel of 488 controller power supply assembly (1), remove four screws (2), lockwashers (3), and washers (4), and pull out 488 controller power supply assembly.

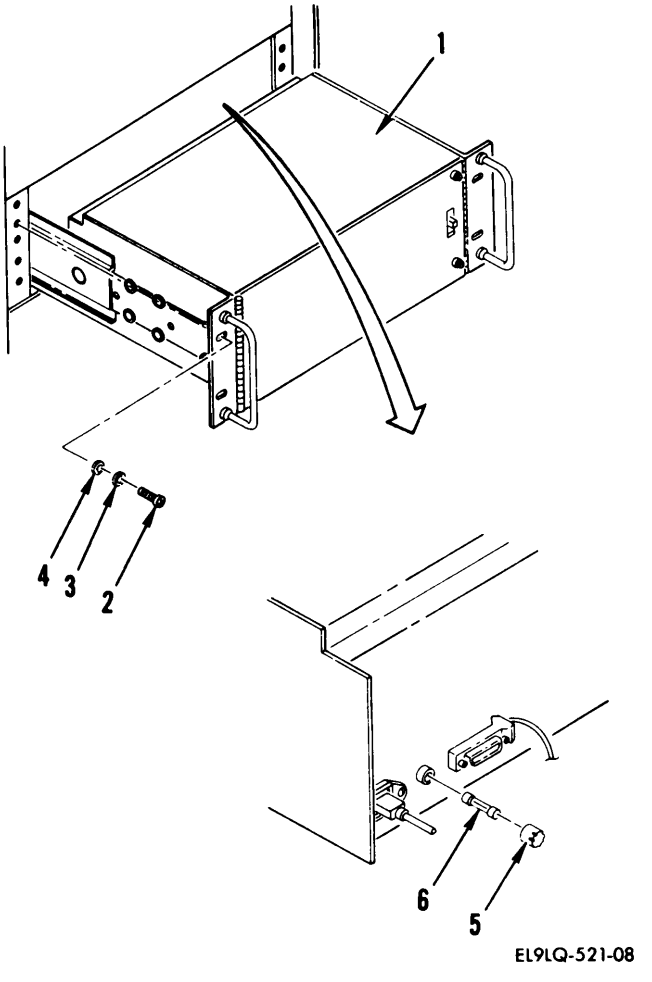
c. On rear panel of 488 controller power supply assembly, remove fuseholder cap (5) and fuse (6).

INSTALLATION

d. Obtain replacement fuse.

e. Install in reverse order of removal.

END OF TASK



EL9LQ-521-08

2. FUSE 1A2A1F1 THROUGH 1A2A4F1 REPLACEMENT

NOTE

This procedure is used to replace the fuse on any of four programmer cards.

REMOVAL

a. On front of 488 controller power supply assembly (1), loosen two screws (2) and open panel door (3).

b. Locate programmer card (4 thru 7) with defective fuse (8).

Item	Programmer Card
4	A1
5	A2
6	A3
7	A4

CAUTION

Use care when removing programmer card. Careless handling may cause damage to tracks and components.

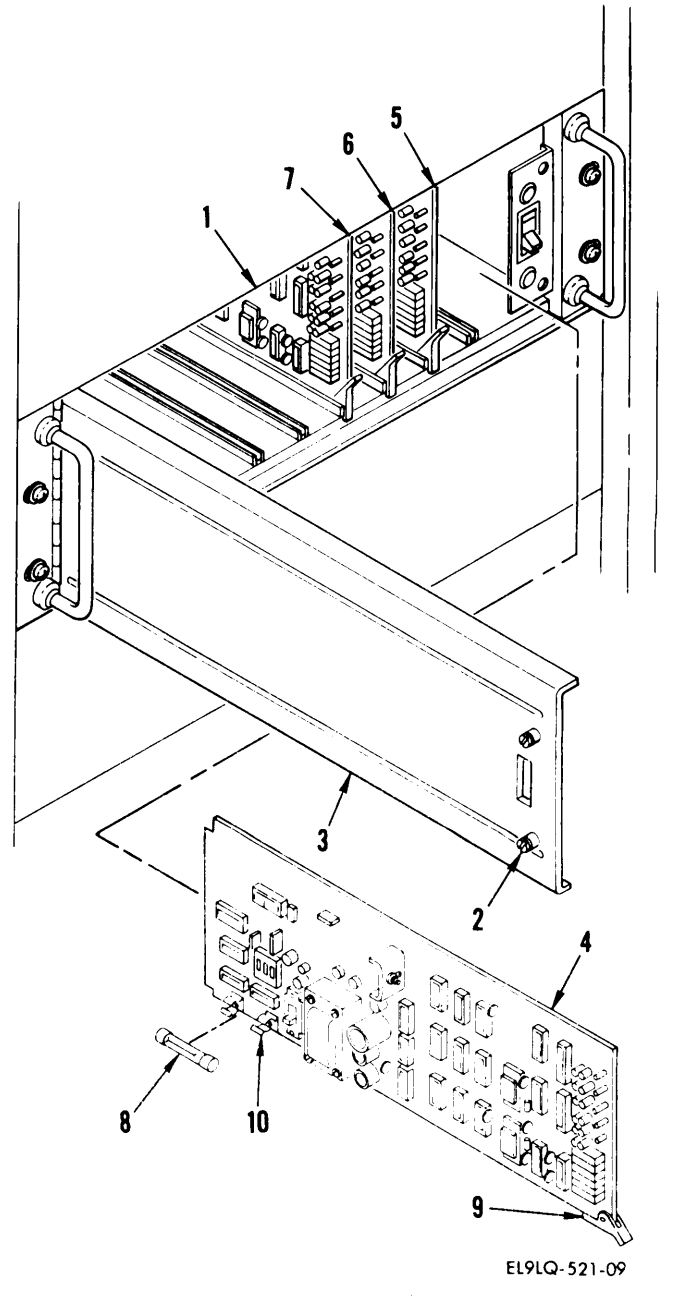
c. Pull down on thumb lever (9) and remove programmer card by pulling straight out.

d. Remove fuse from fuseholder (10).

INSTALLATION

e. Obtain replacement fuse.

f. Install in reverse order of removal.



END OF TASK

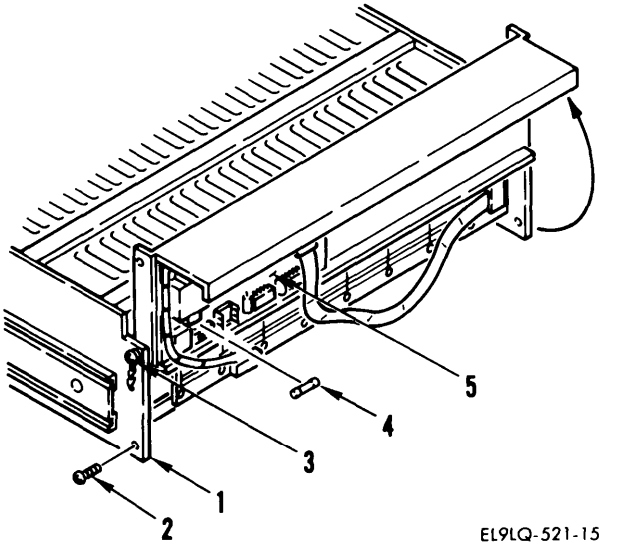
2.1 INTERFACE BOARD FUSE F1
REPLACEMENT

REMOVAL

a. Remove 488 controller power supply 1A2 (para 2-28).

b. On rear panel of 488 controller power supply assembly (1), remove two screws (2) and loosen two screws (3).

c. Rotate rear panel up to access fuse F1 (4) on interface board (5). Remove fuse.



EL9LQ-521-15

INSTALLATION

d. Install replacement fuse in reverse order of removal.

END OF TASK

3. PROGRAMMER CARDS 1A2A1 THROUGH 1A2A4 REPLACEMENT

NOTE

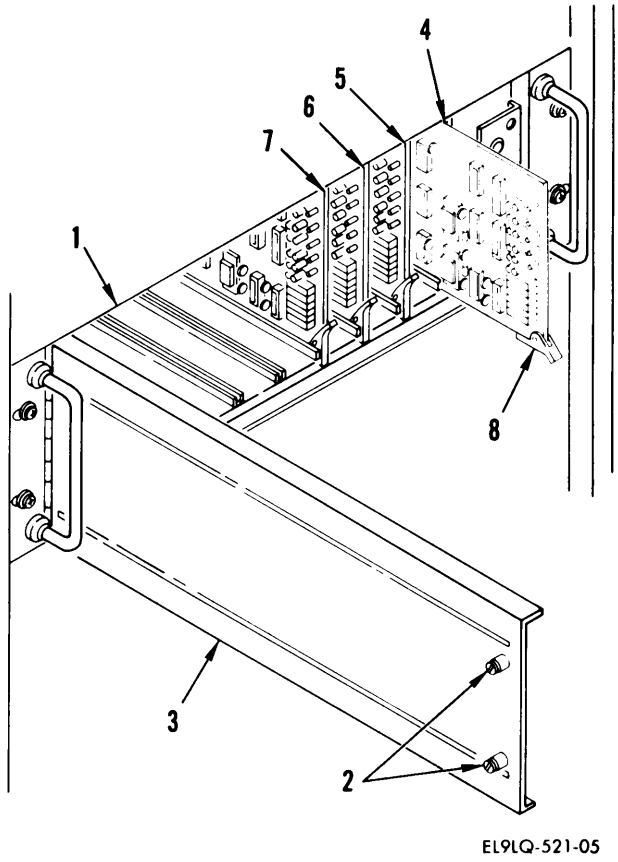
This procedure is used to replace any of four programmer cards contained in the 488 controller power supply assembly.

REMOVAL

a. On front panel of 488 controller power supply assembly (1), loosen two screws (2), and open panel door (3).

b. Locate failed programmer card.

Item	Programmer Card
4	A1
5	A2
6	A3
7	A4



EL9LQ-521-05

CAUTION

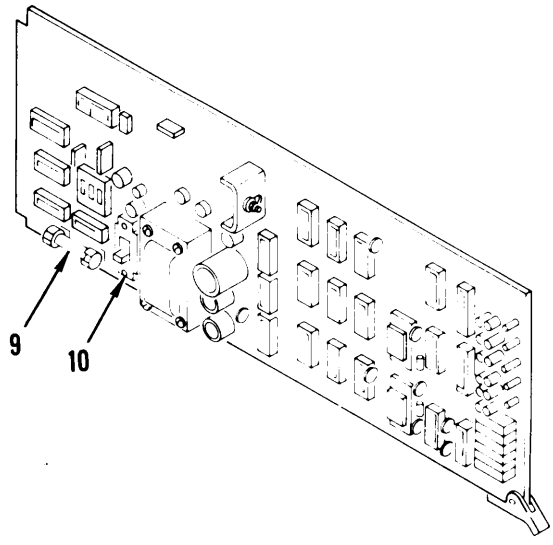
Use care when removing programmer card. Careless handling may cause damage to tracks and components.

c. Pull down on thumb lever (8) and remove programmer card (4, 5, 6, or 7) by pulling straight out.

INSTALLATION

d. On replacement programmer card verify fuse (9) rating.

e. Position 115/230 vac select switch (10) to 115.



EL9LQ-521-06

NOTE

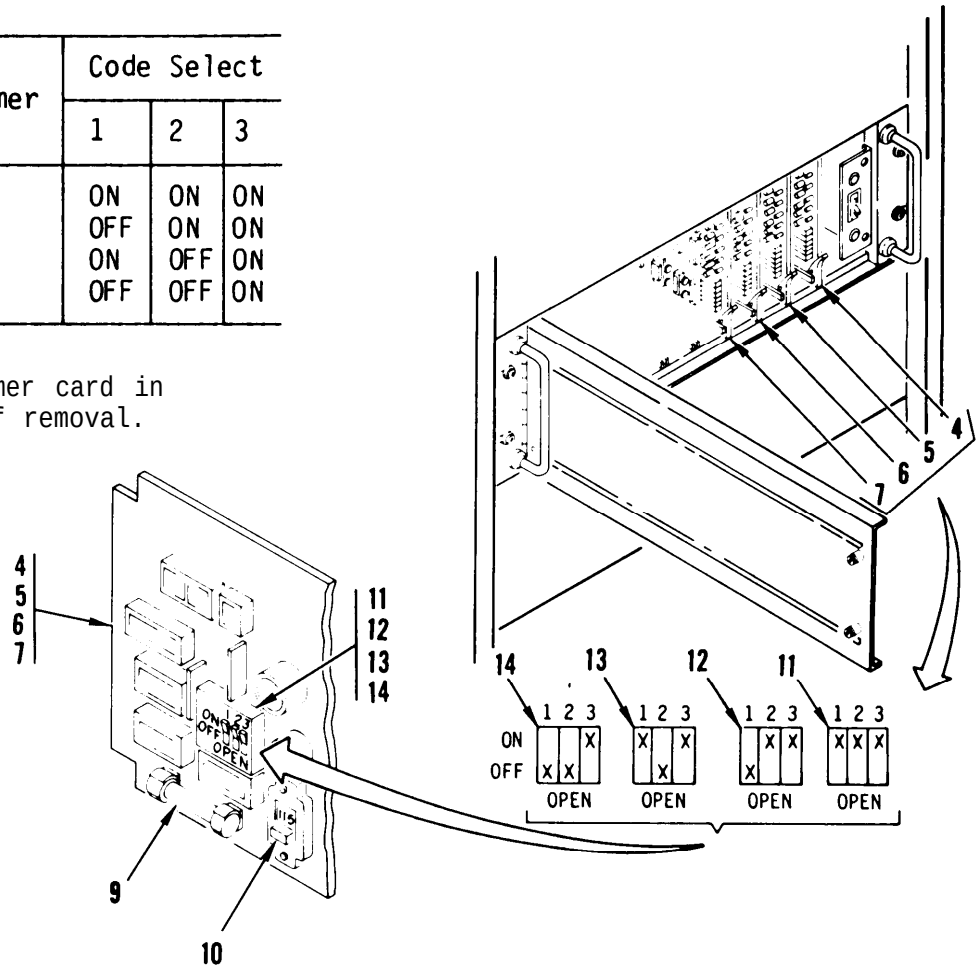
Three position code for code select switch is dependent on which position programmer card (4, 5, 6, and 7) is installed.

f. Position code select switches (11, 12, 13, and 14) as shown.

Item	Programmer Card	Code Select 1	2	3
4/11	A1	ON	ON	ON
5/12	A2	OFF	ON	ON
6/13	A3	ON	OFF	ON
7/14	A4	OFF	OFF	ON

g. Install programmer card in reverse order of removal.

END OF TASK



2-30. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3 REPLACEMENT

INITIAL SETUP

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Condition

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

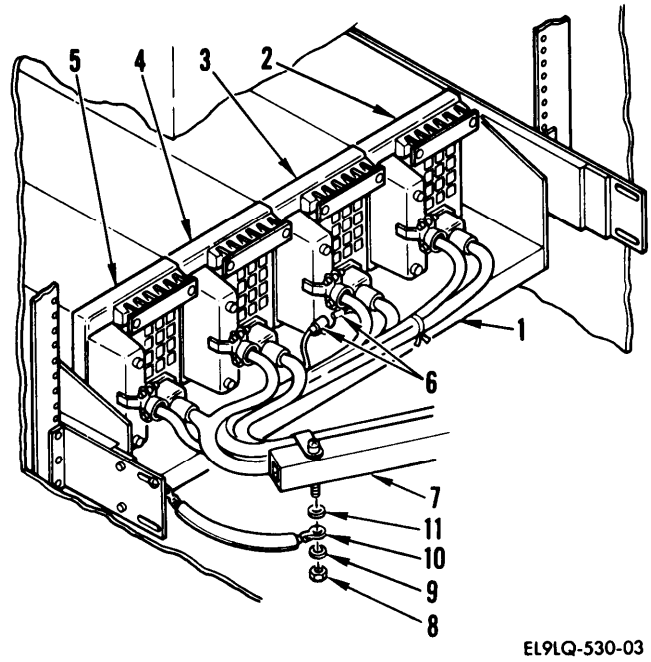
REMOVAL

1. Open right rear cabinet door for access to rear of programmable power supply assembly (1).

NOTE

The programmable power supply assembly contains four power supplies (2 thru 5) as shown.

Item	Power supply	Voltage Value
2	1A3PS1	0-36 vdc
3	1A3PS2	0-36 vdc
4	1A3PS3	0-75 vdc
5	1A3PS4	0-75 vdc



EL9LQ-530-03

2. Disconnect ground lead (6) as shown.

3. On cable carrier (7), remove nut (8), washer (9), chain (10), and washer (11).

4. On each power supply (2 thru 5), do the following steps:

   a. Disconnect 115 vac connector (12).

   b. Loosen two screws (13) and disconnect connector (14).

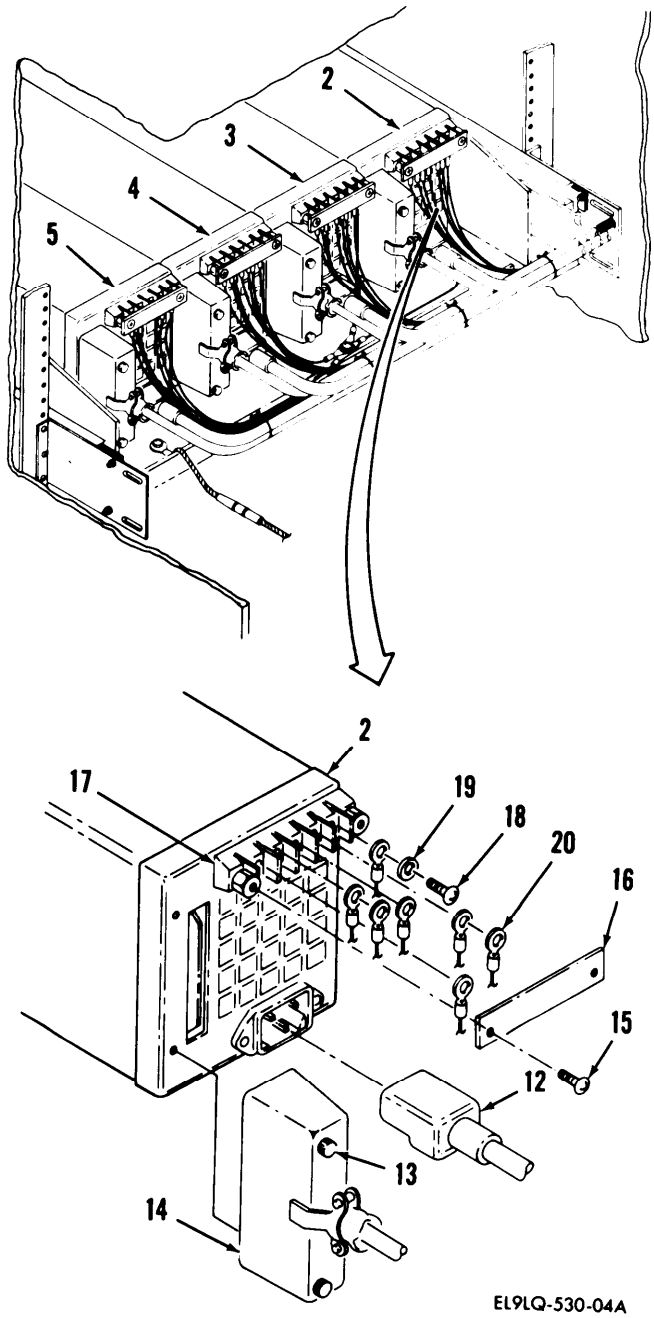
   c. Remove two terminal board cover screws (15) and cover (16).

NOTE

Refer to cable/terminal board wire connection chart for wire location. Removal of ground wire is not required.

Cable/Terminal Board Wire Connection Chart

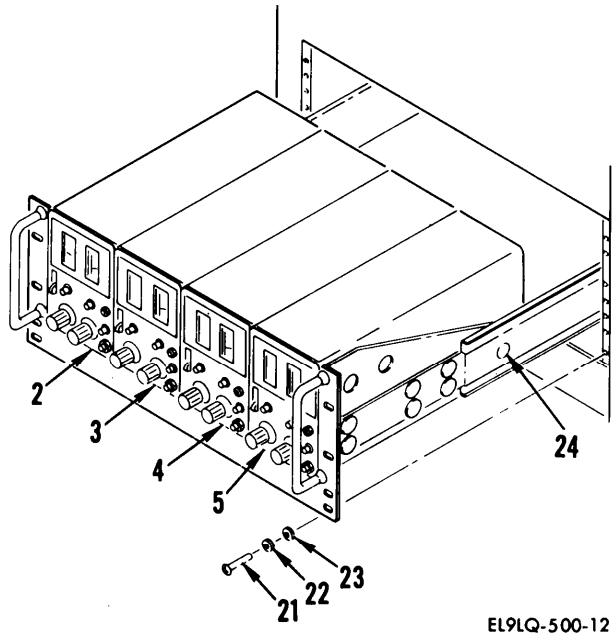
From	To	From	To
1W6 E1	PS4TB1 + out	1W6 E9	PS2TB1 + out
E1	PS4TB1 + out	E9	PS2TB1 + out
E2	PS4TB1 + S	E10	PS2TB1 + S
Ground	PS4TB1 GND	Ground	PS2TB1 GND
E3	PS4TB1 - out	E11	PS2TB1 - out
E3	PS4TB1 - out	E11	PS2TB1 - out
E4	PS4TB1 - S	E12	PS2TB1 - S
E5	PS3TB1 + out	E13	PS1TB1 + out
E5	PS3TB1 + out	E13	PS1TB1 + out
E6	PS3TB1 + S	E14	PS1TB1 + S
Ground	PS3TB1 GND	Ground	PS1TB1 GND
E7	PS3TB1 - out	E15	PS1TB1 - out
E7	PS3TB1 - out	E15	PS1TB1 - out
E8	PS3TB1 - S	E16	PS1TB1 - S



   d. On terminal board (17), tag wires and remove screws (18); washers (19), and wires (20) from each terminal.

   e. Cut lacing tape as required to free ground wires from cable.

5. On front panel of programmable power supply assembly, remove eight screws (21), lockwashers (22), and washers (23). Pull out programmable power supply assembly.



WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

6. Using two persons, release two slide locks (24) and remove programmable power supply assembly.

INSTALLATION

7. Install in reverse order of removal.

END OF TASK

2-31. PROGRAMMABLE POWER SUPPLY ASSEMBLY 1A3 REPAIR

This task covers replacement of:

Para	Item
1.	Power supply 1A3PS1 through 1A3PS4
2.	Ground lead

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 40)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer

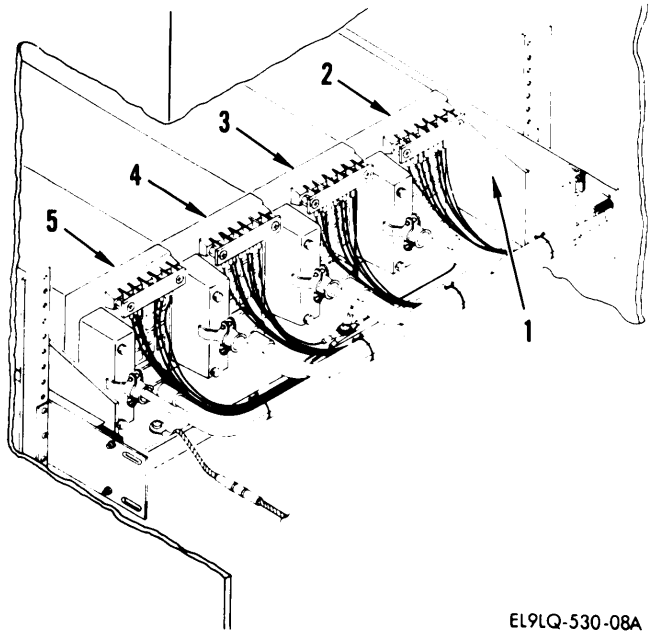
Equipment Condition

Power removed (para 2-24.1)

1. POWER SUPPLY 1A3PS1 THROUGH 1A3PS4 REPLACEMENT

NOTE

- This procedure is used to replace any of four power supplies contained in programmable power supply assembly.
- The programmable power supply assembly (1) contains four power supplies (2 thru 5) as shown.

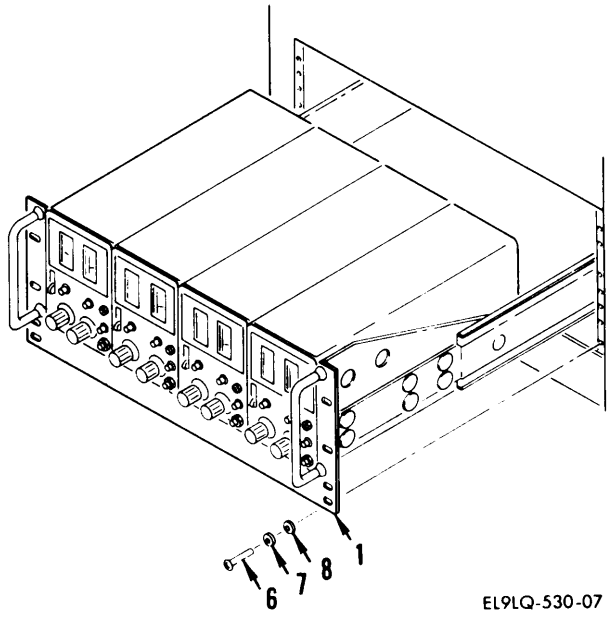


EL9LQ-530-08A

REMOVAL

Item	Reference Designation	Voltage Value
2	1A3PS1	0-36 vdc
3	1A3PS2	0-36 vdc
4	1A3PS3	0-75 vdc
5	1A3PS4	0-75 vdc

a. On front panel of programmable power supply assembly (1), remove eight screws (6), lockwashers (7), and washers (8). Pull out programmable power supply assembly.



b. On rear panel of failed power supply, do the following steps.

(1) Disconnect 115 vac connector (9).

(2) Loosen two connector screws (10) and disconnect connector (11).

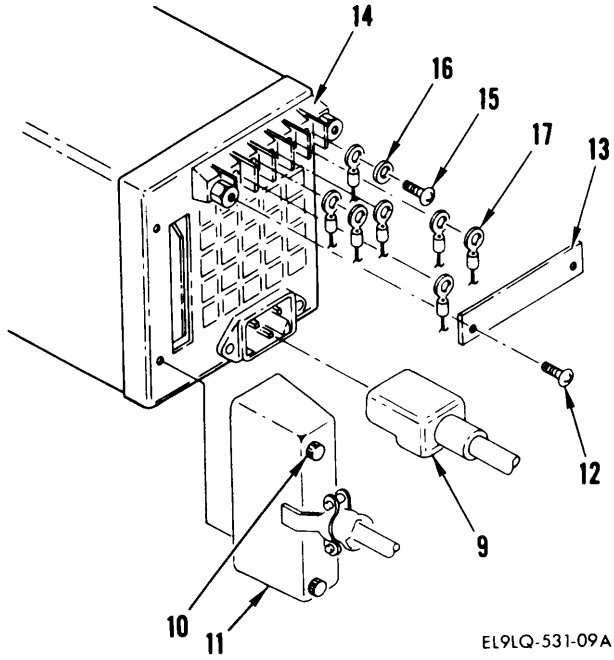
(3) Remove two terminal board cover screws (12) and cover (13).

NOTE

Refer to cable/terminal board wire connection chart for wire location.

Cable/Terminal Board Wire Connection Chart

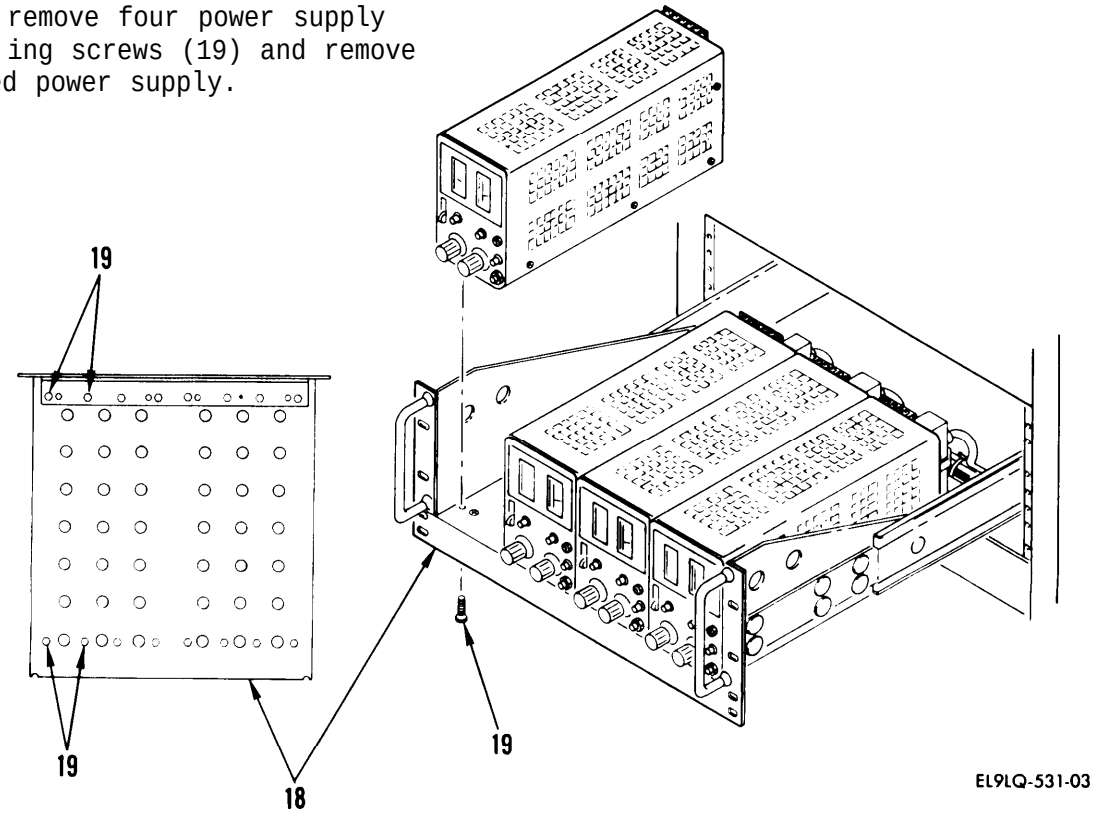
From	To	From	To
1W6 E1	PS4TB1 + out	1W6 E9	PS2TB1 + out
E1	PS4TB1 + out	E9	PS2TB1 + out
E2	PS4TB1 + S	E10	PS2TB1 + S
Ground	PS4TB1 GND	Ground	PS2TB1 GND
E3	PS4TB1 - out	E11	PS2TB1 - out
E3	PS4TB1 - out	E11	PS2TB1 - out
E4	PS4TB1 - S	E12	PS2TB1 - S
E5	PS3TB1 + out	E13	PS1TB1 + out
E5	PS3TB1 + out	E13	PS1TB1 + out
E6	PS3TB1 + S	E14	PS1TB1 + S
Ground	PS3TB1 GND	Ground	PS1TB1 GND
E7	PS3TB1 - out	E15	PS1TB1 - out
E7	PS3TB1 - out	E15	PS1B1 - out
E8	PS3TB1 - S	E16	PS1TB1 - S



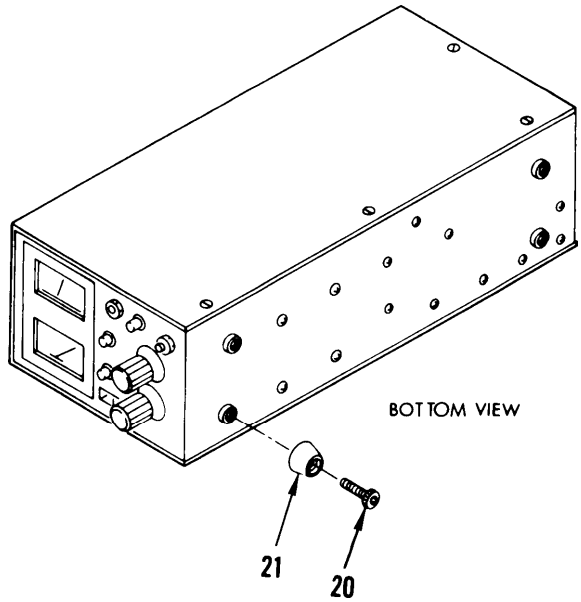
(4) On terminal board (14), tag wires and remove screw (15), washer (16), and wires (17) from each terminal.

(5) Install terminal board cover (13) using two screws (12).

c. Under base plate (18) of assembly, remove four power supply mounting screws (19) and remove failed power supply.



d. Remove four screws (20) and foot pads (21) from replacement power supply and install on failed power supply.



INSTALLATION

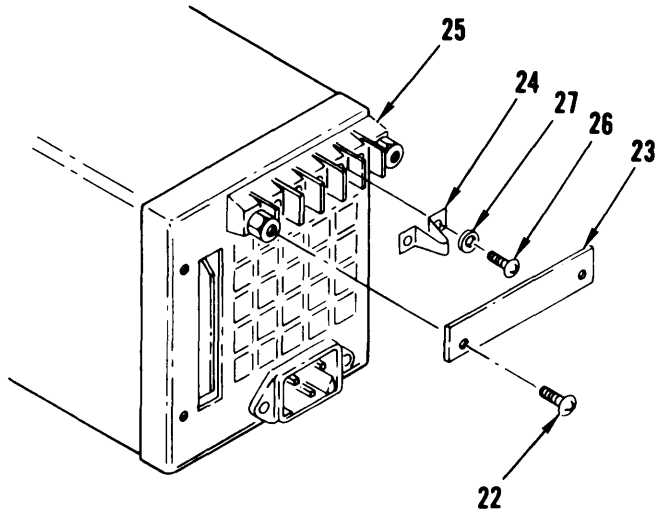
e. Remove two terminal board cover screws (22) and cover (23).

NOTE

Two jumper links (24) may be in place on replacement power supply terminal board (25) but are not used. Do step f below if jumper links are installed.

f. Remove two screws (26) and washers (27), and jumper link (24) from terminals 4 and 5, and reinstall screws and washer. Repeat for jumper link connected between terminals 1 and 2. Install jumper links on defective power supply assembly.

g. Install replacement power supply assembly in reverse order of removal starting with step c.



EL9LQ-531-02A

END OF TASK

2. GROUND LEAD REPLACEMENT

NOTE

This procedure is used to replace any of four ground leads contained in the programmable power supply assembly.

REMOVAL

a. Open right rear cabinet door for access to rear of programmable power supply assembly (1).

b. On rear panel of power supply (2 thru 5) containing ground lead to be replaced, remove two terminal board cover screws (6) and cover (7).

c. On terminal board (terminal 3), remove screw (8), washer (9), and ground lead (10).

d. Remove screw (11), lockwasher (12), three washers (13), four ground leads (14), and nut (15). Discard defective ground lead (14).

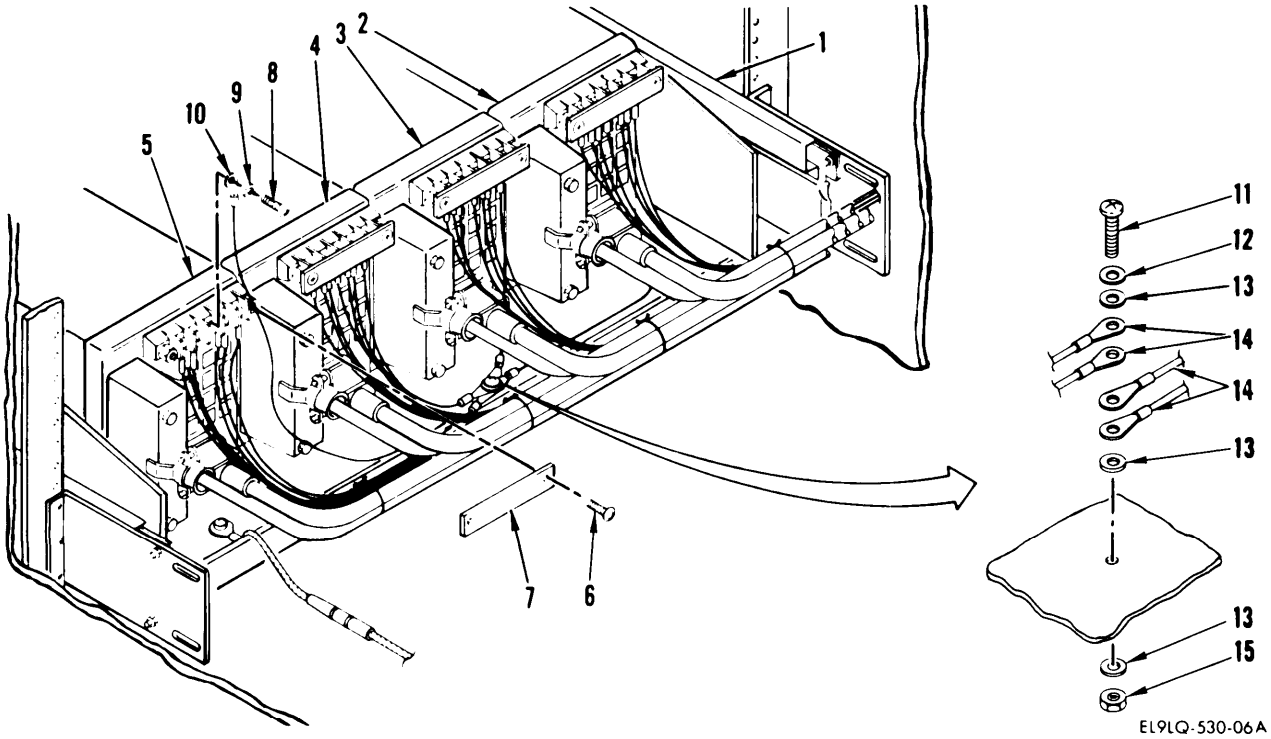
INSTALLATION

e. Prepare surface, new ground lead (14), and hardware (11, 12, 13, and 15) for application of zinc chromate primer (para 2-19).

f. Install new ground lead (14) and hardware (11, 12, 13, and 15) as shown.

g. Apply thin coat of zinc chromate primer over bonded area and hardware (11 thru 15).

h. Install programmable power supply assembly in reverse order of removal.



END OF TASK

2-32. DC POWER SUPPLY ASSEMBLY 1A4 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 40)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

396 ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

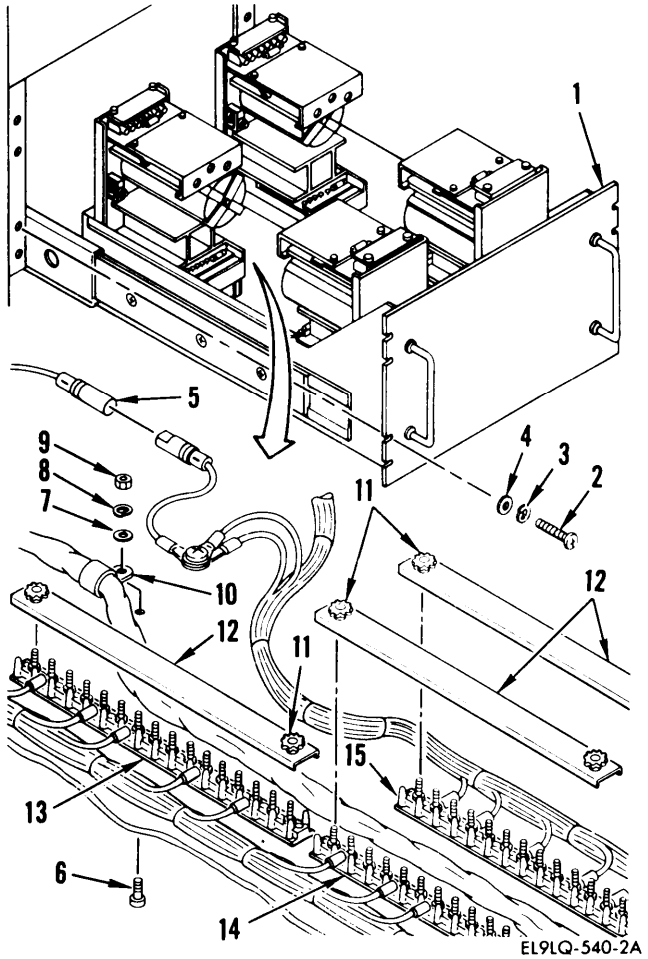
Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

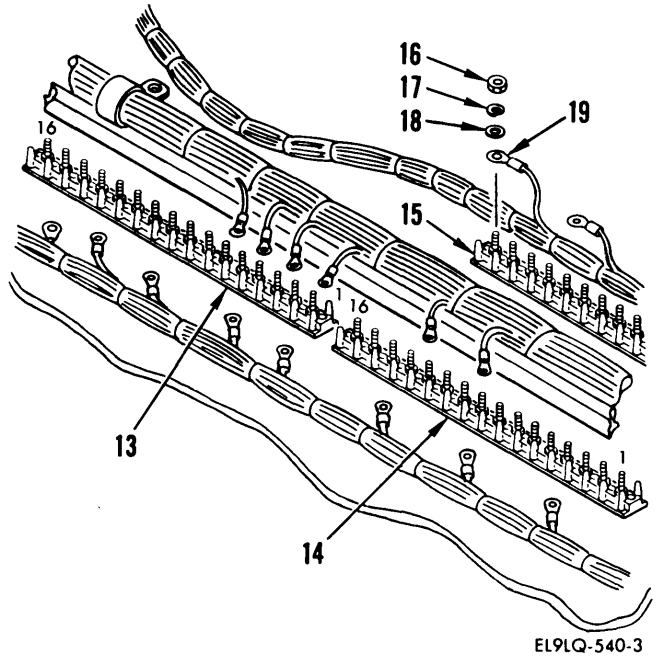
REMOVAL

1. On front panel of dc power supply assembly (1), remove eight screws (2), lockwashers (3), and washers (4). Pull out dc power supply drawer assembly.
2. Disconnect ground lead (5).
3. Remove screw (6), washer (7), lockwasher (8), nut (9), and clamp (10).
4. Loosen two nuts (11) and remove cover (12) from each terminal board TB1 (13), TB3 (14), and TB2 (15).



5. Tag wires and remove nut (16), lock-washers (17), washers (18), and all wires (19) from terminal boards TB1 (13), TB3 (14), and TB2 (15) as shown.

5.1 Cut lacing tape as required to free power supply ground leads from cable bundle.

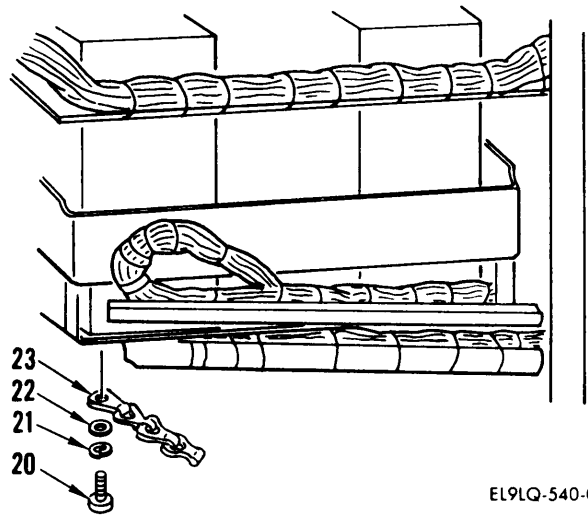


Cable/Terminal Board Wire Connection Chart

Wire No.	To	Wire No.	To	Wire No.	To
1	TB1-1	25	TB2-2	9	TB3-1
W5E1	1	28	2	W5E13	1
W5E2	1	W24E1	2	W5E14	1
2	2	24	3	10	2
W5E3	2	27	3	W5E15	2
3	3	W24E2	3	11	3
W5E4	3	23	4	W5E16	3
W5E5	3	26	4	W5E17	3
4	4	29	4	12	4
W5E6	4	W24E3	4	W5E18	4
5	11	17	6	13	11
W5E7	11	20	6	W5E19	11
W5E8	11	30	6	14	12
6	12	W23E3	6	W5E20	12
W5E9	12	18	7	15	13
7	13	21	7	W5E21	13
W5E10	13	W23E2	7	16	14
W5E11	13	19	8	W5E22	14
8	14	22	8	W2E1 Thru	
W5E12	14	W23E1	8	W2E12	Not Used

6. Open right rear cabinet door for access to rear panel of the dc power supply assembly.

7. Push in dc power supply assembly and remove screw (20), lockwasher (21), washer (22), and chain (23).



EL9LQ-540-04

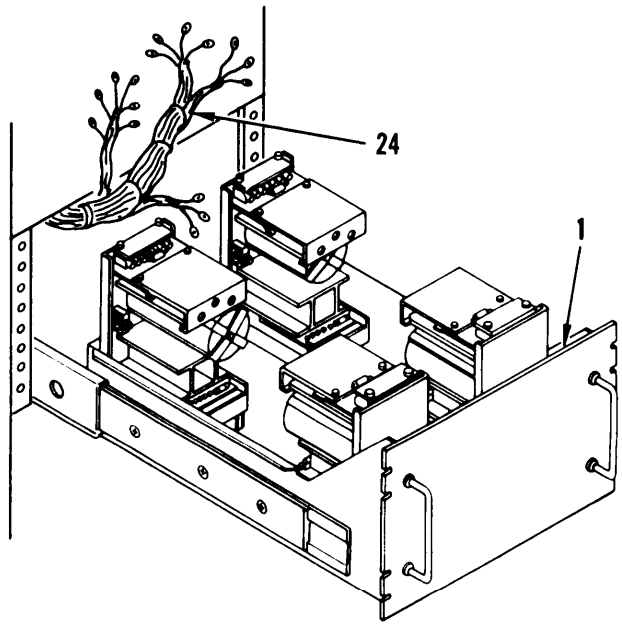
8. Pull out dc power supply assembly (1).

CAUTION

Use care when separating cable assemblies from the assembly to avoid damage.

9. Position W5, W23, W24, and W32 cable assemblies (24) clear of dc power supply assembly.

9.1 Close rear cabinet door and push electronic station to operational position to allow removal of dc power supply assembly.



EL9LQ-540-05

WARNING

HEAVY OBJECT

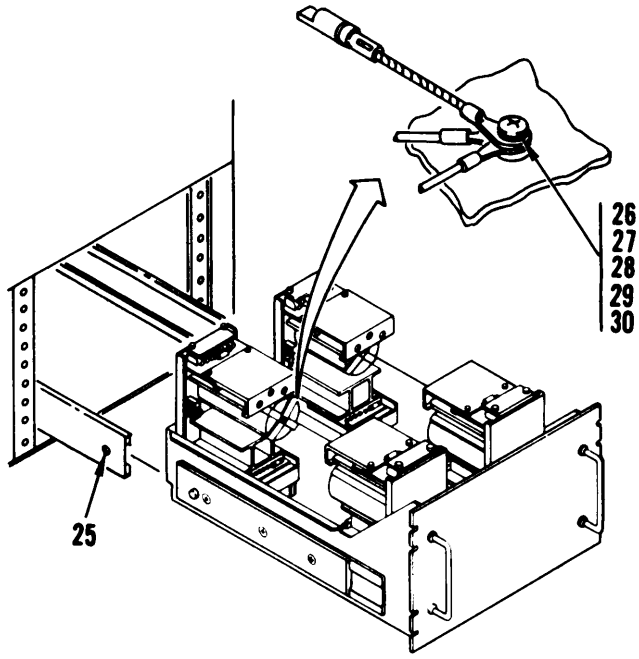
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

10. Using two persons, release two slide locks (25) and remove dc power supply assembly.

NOTE

If the ground seal between the chassis and ground lead is disturbed, do steps listed below. If not disturbed, omit steps 11 through 14 and proceed to step 15.

11. Remove screw (26), lockwasher (27), three ground terminal lugs (28), washers (29), and nut (30).



EL9LQ-540-06

INSTALLATION

12. Prepare surface and hardware (26 thru 30) for application of zinc chromate primer (para 2-19).

13. Install screw (26), lockwasher (27), three ground terminal lugs (28), washers (29), and nut (30).

14. Apply a thin coat of zinc chromate primer over bonded area and hardware (26 thru 30).

15. Install dc power supply assembly in reverse order of removal, starting with step 10.

END OF TASK

2-33. DC POWER SUPPLY ASSEMBLY 1A4 REPAIR 2-33

This task covers replacement of:

Para	Item
1.	Fuse F1 or F2
2.	Power supply 1A4PS1 through 1A4PS4
3.	Terminal board 1A4TB1 through 1A4TB3
4.	Capacitor 1A4C1 through 1A4C4

INITIAL SETUP

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE F1 OR F2 REPLACEMENT

NOTE

This procedure is used to replace F1 or F2 contained in dc power supply assembly.

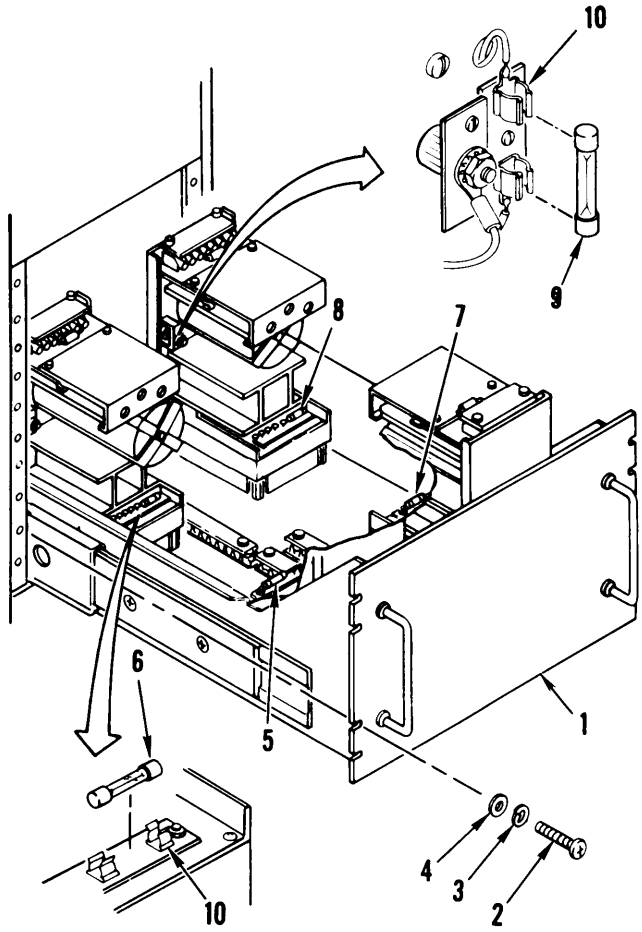
REMOVAL

a. On front panel of dc power supply assembly (1), remove eight screws (2), lockwashers (3), and washers (4), and pull out dc power supply assembly.

b. Locate failed fuse (5 thru 9).

Item	Reference Designation
5	1A4PS1F1
6	1A4PS2F1
7	1A4PS3F1
8	1A4PS4F1
9	1A4PS4F2

c. Remove fuse from fuseholder (10) and discard fuse.



EL9LQ-540-19

INSTALLATION

d. Install in reverse order of removal.

END OF TASK

2. POWER SUPPLY 1A4PS1 THROUGH 1A4PS4 REPLACEMENT

NOTE

This procedure is used to replace any of four power supplies contained in dc power supply assembly.

REMOVAL

a. On front panel of dc power supply assembly (1), remove eight screws (2), lockwashers (3), and washers (4), and pull out dc power supply assembly.

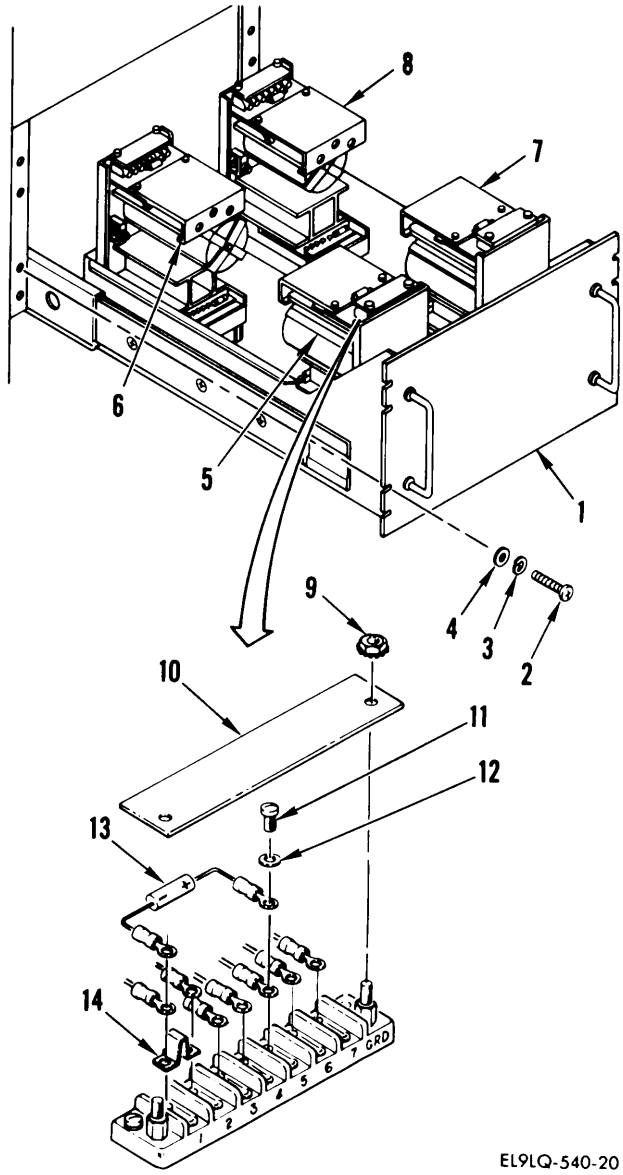
b. Locate failed power supply (5 thru 8).

Item	Power Supply	Voltage Value
5	1A4PS1	+28 vdc
6	1A4PS2	+15 vdc
7	1A4PS3	-15 vdc
8	1A4PS4	+5 vdc

c. Remove two terminal board cover nuts (9) and terminal board cover (10).

NOTE

Reference designation TB1 is the same for all four dc power supply terminal boards.



d. Remove seven screws (11) and lockwashers (12) from terminal board connections TB1-1, -2, -3, -4, -5, -6, and -7.

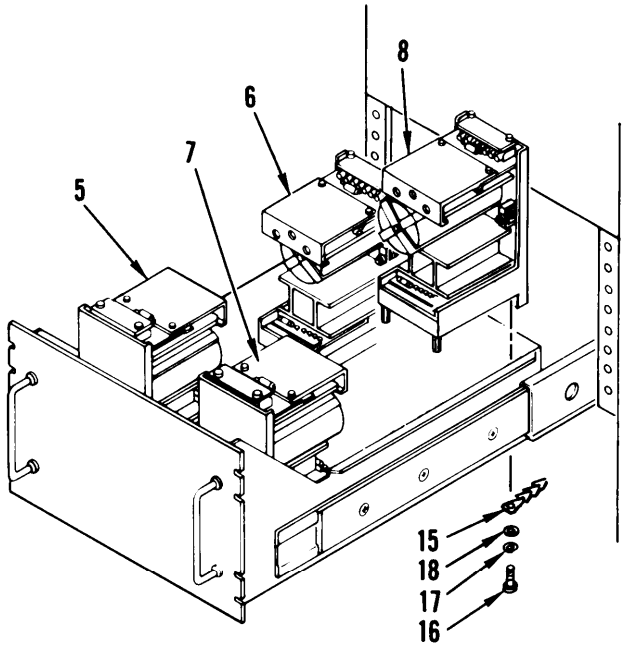
e. Remove capacitor (13) and jumper link (14).

NOTE

On 5 vdc power supply 1A4PS4 (8), a chain (15) is attached to one of its four mounting screws (16).

f. Remove four screws (16), lockwashers (17), and washers (18). Also remove chain (15) when removing power supply 1A4PS4.

g. Remove failed dc power supply (5, 6, 7, or 8).



EL9LQ-540-10

INSTALLATION

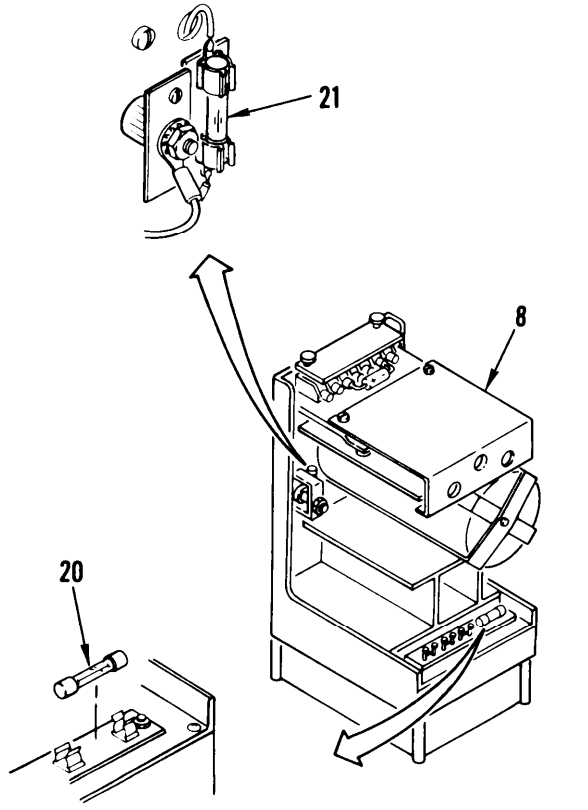
h. On replacement power supply, verify fuse (20) rating.

NOTE

The 5 vdc power supply (8) also contains another fuse F2 (21).

i. Verify fuse rating.

j. Install replacement power supply (5, 6, 7, or 8) in dc power supply assembly using four screws (16), lockwashers (17), and washers (18). Include chain (15) when installing power supply 1A4PS4 (8).



EL9LQ-540-11

k. Remove two terminal board cover nuts (9) and remove terminal board cover (10).

l. Remove screws (11) and lockwashers (12) from terminal board contacts TB1-1, -2, -3, -4, -5, -6, and -7.

NOTE

The jumper link (14) for power supplies PS1, PS2, and PS4 is connected differently than PS3.

m. For replacement of PS1 (5), PS2 (6), or PS4 (8), place jumper link between terminal board contacts TB1-1 and TB1-2. For replacement of PS3 (7), place jumper link on terminal board contacts TB1-4 and TB1-5.

CAUTION

Ensure correct polarity is observed when installing capacitor to prevent damage to electronic station.

NOTE

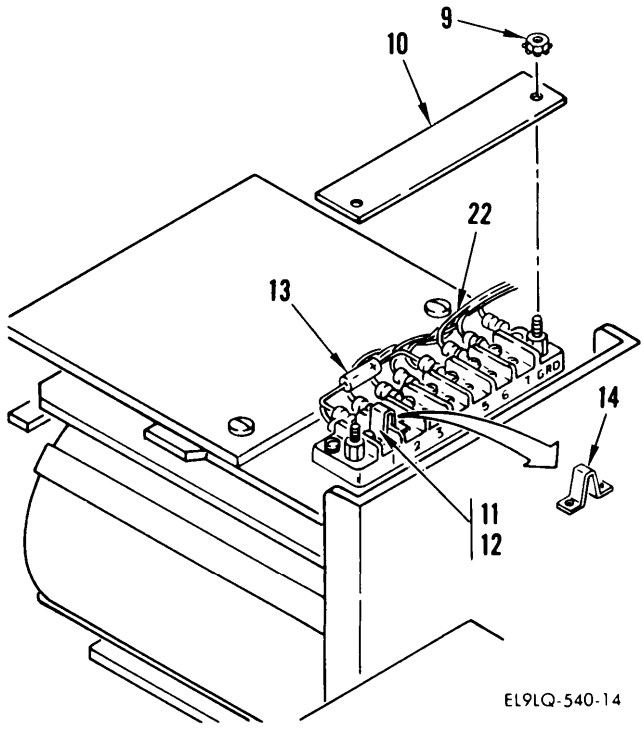
Refer to wire location chart below as required when connecting wires.

n. Install capacitor (13) negative lead and wire, using lockwasher (11), and screw (12) on TB1-1.

o. Install capacitor positive lead and wire, using lockwasher (11) and screw (12) on TB1-5.

p. Install remaining wires, using lockwashers (11) and screws (12) on TB1-1, -2, -3, -4, -5, -6, and -7.

q. Position terminal board cover (10) on TB1 and secure with two nuts (9).



Cable/Terminal Board Wire Location Chart

Wire No.	To	Wire No.	To
16	PS1TB1-1	12	PS3TB1-1
15	2	11	2
26	3	23	3
13	4	9	4
14	5	10	5
28	6	25	6
27	7	24	7
8	PS2TB1-1	4	PS4TB1-1
7	2	3	2
20	3	17	3
5	4	1	4
6	5	2	5
22	6	19	6
21	7	18	7

r. Push in dc power supply assembly and secure with eight screws, lockwashers, and washers.

END OF TASK

3. TERMINAL BOARD 1A4TB1 THROUGH 1A4TB3 REPLACEMENT

NOTE

This procedure is used to replace any of three terminal boards used in dc power supply assembly.

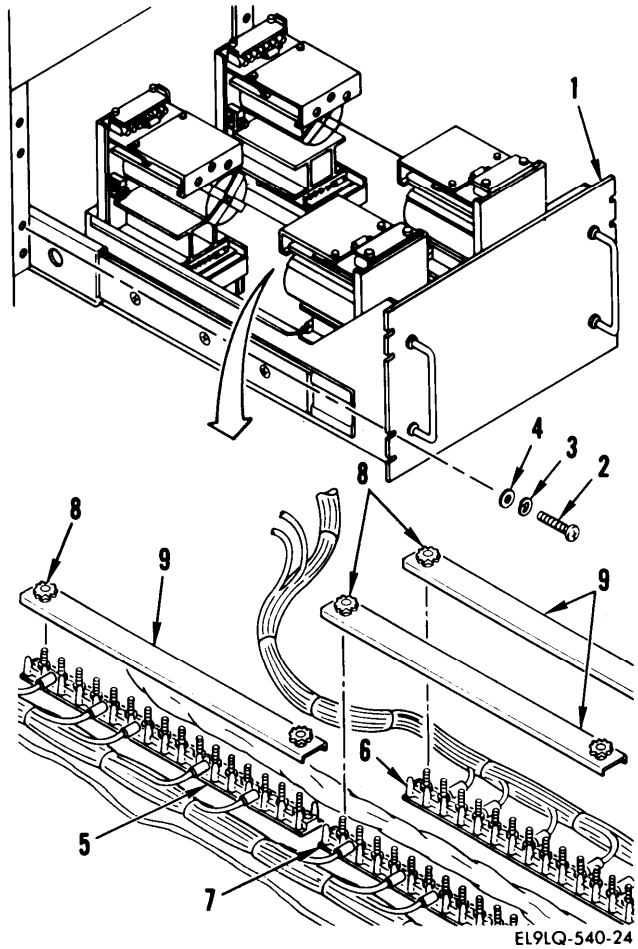
REMOVAL

a. On front panel of dc power supply assembly (1), remove eight screws (2), lockwashers (3), and washers (4), and pull out dc power supply assembly.

b. Locate defective terminal board (5 thru 7).

Item	Terminal Board
5	1A4TB1
6	1A4TB2
7	1A4TB3

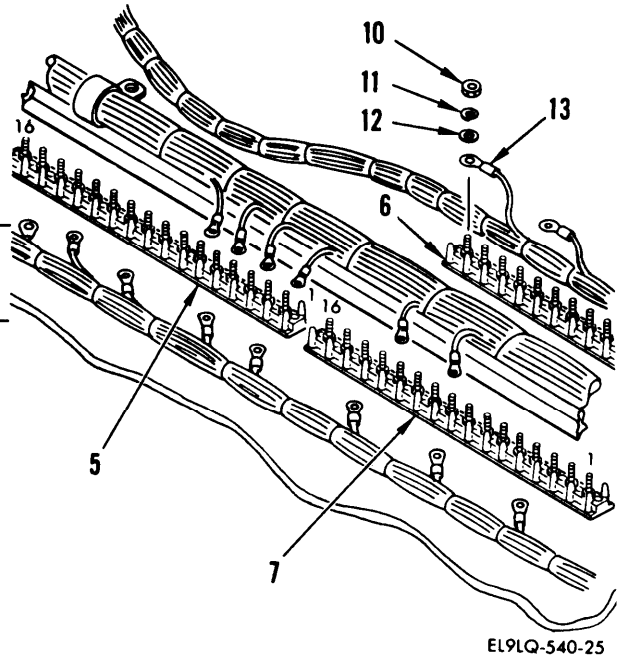
c. Loosen two nuts (8) and remove cover (9) from terminal board (5, 6, or 7).



d. Tag wires and remove nut (10). lockwashers (11), washers (12), and all wires (13) from terminal board (5, 6, or 7).

Cable/Terminal Board Wire Connection Chart

Wire No.	To	Wire No.	To	Wire No.	To
1	TB1-1	25	TB2-2	9	TB3-1
W5E1	1	28	2	W5E13	1
W5E2	1	W24E1	2	W5E14	1
2	2	24	3	10	2
W5E3	2	27	3	W5E15	2
3	3	W24E2	3	11	3
W5E4	3	23	4	W5E16	3
W5E5	3	26	4	W5E17	3
4	4	29	4	12	4
W5E6	4	W24E3	4	W5E18	4
5	11	17	6	13	11
W5E7	11	20	6	W5E19	11
W5E8	11	30	6	14	12
6	12	W23E3	6	W5E20	12
W5E9	12	18	7	15	13
7	13	21	7	W5E21	13
W5E10	13	W23E2	7	16	14
W5E11	13	19	8	W5E22	14
8	14	22	8	W2E1 Thru	
W5E12	14	W23E1	8	W2E12	Not Used



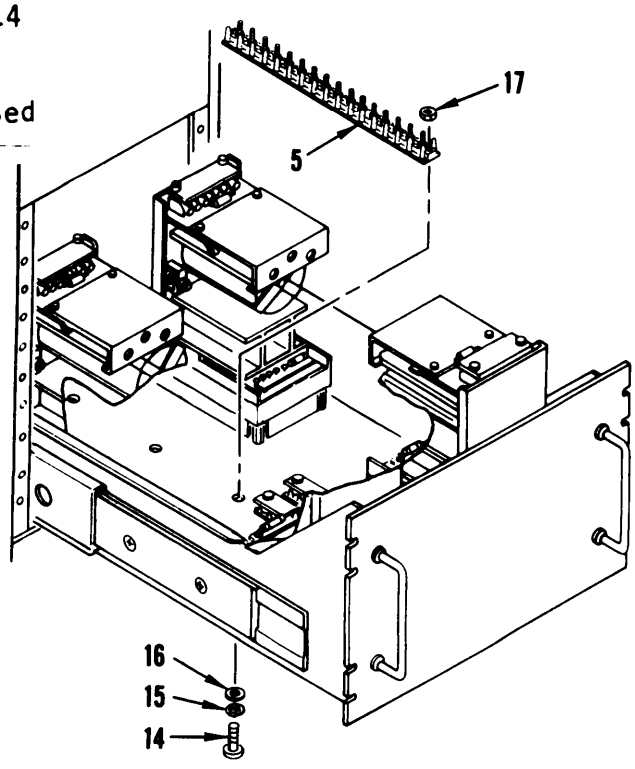
EL9LQ-540-25

e. Remove three screws (14), lockwashers (15), washers (16), and nuts (17), and remove terminal board.

INSTALLATION

f. Install terminal board in reverse order of removal.

END OF TASK



EL9LQ-540-21

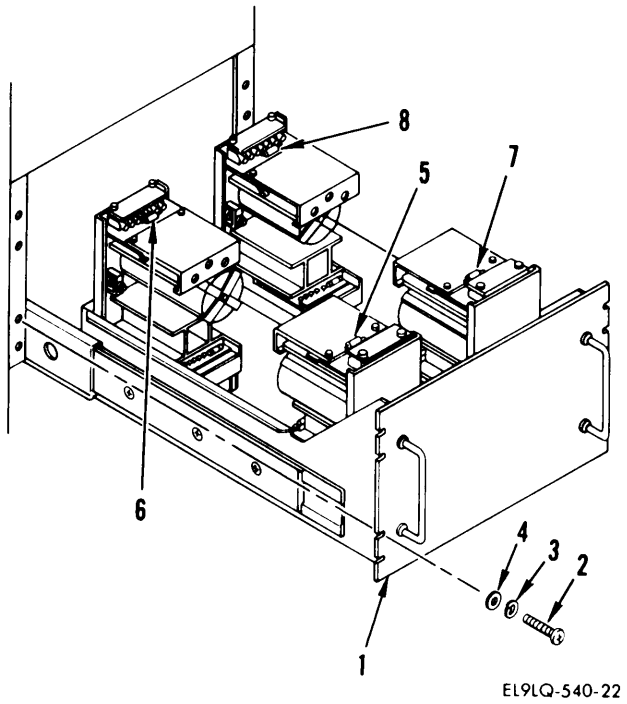
4. CAPACITOR 1A4C1 THROUGH 1A4C4 REPLACEMENT

NOTE

This procedure is used to replace any of four capacitors used in dc power supply assembly.

REMOVAL

a. On front panel of dc power supply assembly (1), remove eight screws (2), lockwashers (3), and washers (4); and pull out de-power supply assembly.



EL9LQ-540-22

NOTE

Capacitor (5) used on power supply 1A4PS1 is not interchangeable with other capacitors (6, 7, or 8).

b. Locate failed capacitor (5 thru 8).

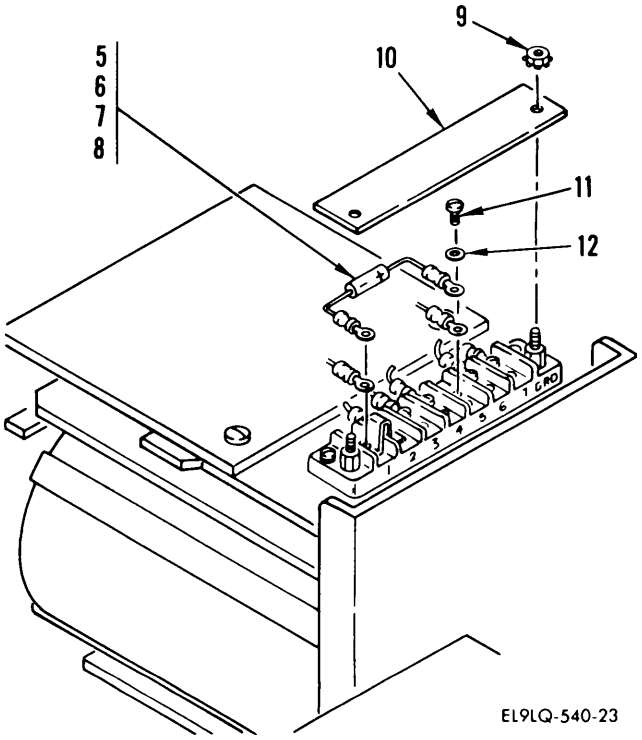
Item	Capacitor
5	1A4C1
6	1A4C2
7	1A4C3
8	1A4C4

c. Remove two terminal board cover nuts (9) and terminal board cover (10).

NOTE

Note polarity of capacitor for correct installation.

d. Tag wires and remove two screws (11), lockwashers (12), and capacitor.



EL9LQ-540-23

INSTALLATION

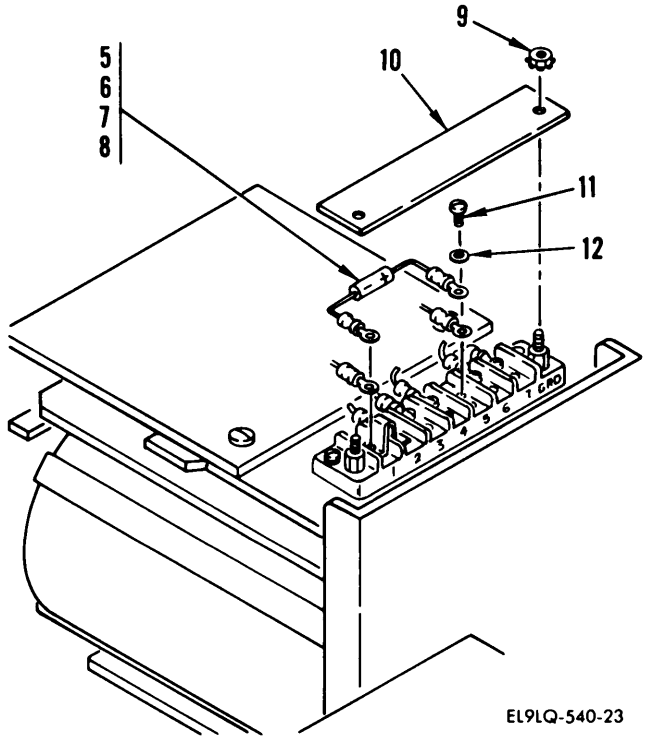
CAUTION

Ensure correct polarity is observed when installing capacitor (5, 6, 7, or 8) to prevent damage to electronic station.

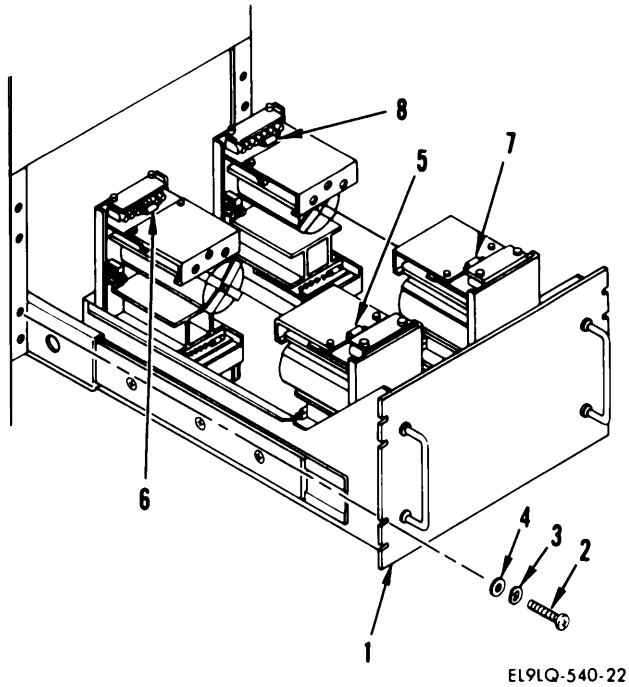
e. Install capacitor negative lead, wire, lockwasher (12) and screw (11) on TB1-1.

f. Install capacitor positive lead, wire, using lockwasher (12) and screw (11) on TB1-5.

g. Position terminal board cover (10) on TB1 and secure with two nuts (9).



h. Push in dc power supply assembly and secure with eight screws (2), lockwashers (3), and washers (4).



END OF TASK

2-34. BLOWER ASSEMBLY 1A6 OR 1A12 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3081-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

NOTE

This procedure is used to replace blower assembly 1A6 or 1A12. Blower assembly 1A6 is shown.

1. Open right rear cabinet door (1) for access to blower assembly 1A6 (2) or left rear cabinet door (3) for access to blower assembly 1A12 (4).

NOTE

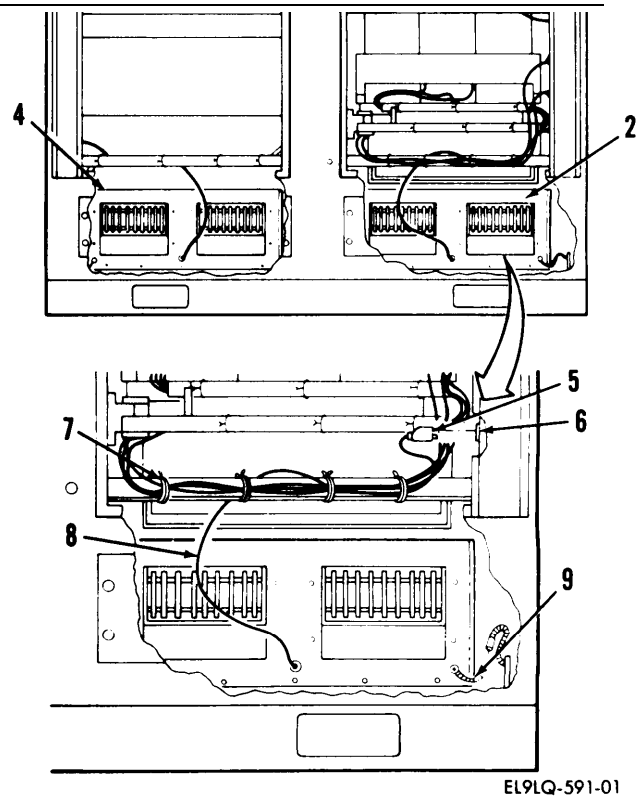
For replacement of blower assembly 1A12, omit steps 2 and 6.

2. Pull out dc power supply assembly (para 2-32).

3. Disconnect 115 vac plug P1 (5) from receptacle J1 (6).

4. Clip lacing tape (7) and separate blower assembly cable (8) from rest of cables.

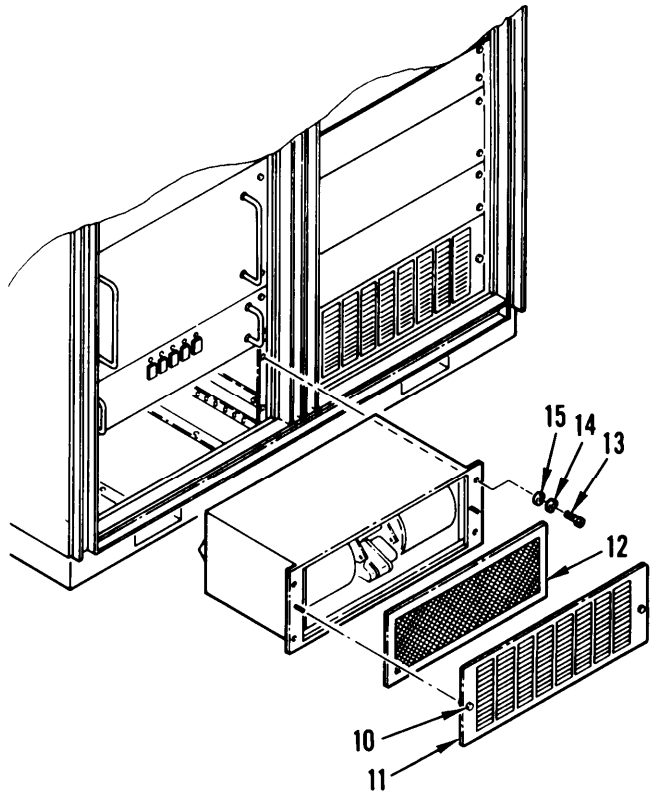
5. Disconnect ground lead (9).



6. Push dc power supply assembly into cabinet.

7. On front of blower assembly, loosen two nuts (10), and remove grill (11) and filter (12).

8. Remove four screws (13), lockwashers (14), and washers (15), and remove blower assembly.



EL9LQ-591-02

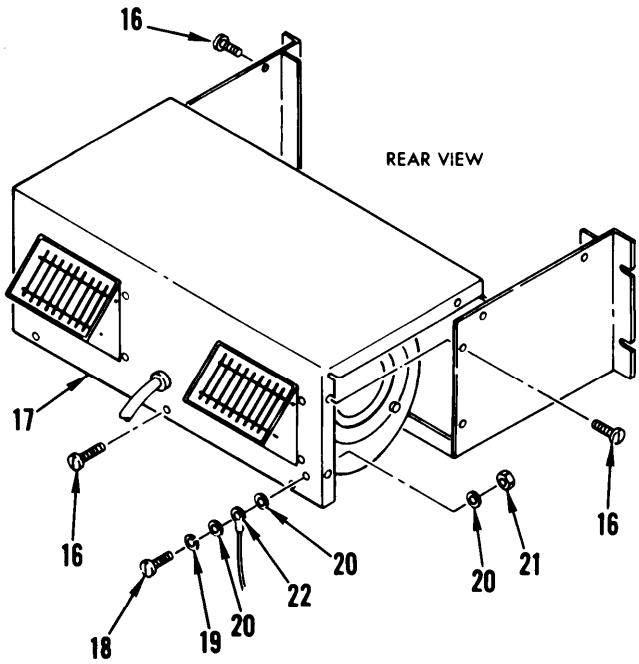
NOTE

If blower assembly is to be replaced, ground lead will have to be moved to the replacement assembly. If the same blower assembly is to be reinstalled, omit steps 9 through 16 and proceed to step 17.

9. On blower assembly, remove 11 screws (16) and separate blower assembly housing (17).

10. Remove screw (18), lockwasher (19), three washers (20), nut (21), and ground lead (22).

11. Close up blower assembly housing (17) using 11 screws (16).



INSTALLATION

12. On replacement blower assembly, remove 11 screws (16) and separate blower assembly housing (17).

13. Prepare surface and hardware (18 thru 22) for application of zinc chromate primer (para 2-19).

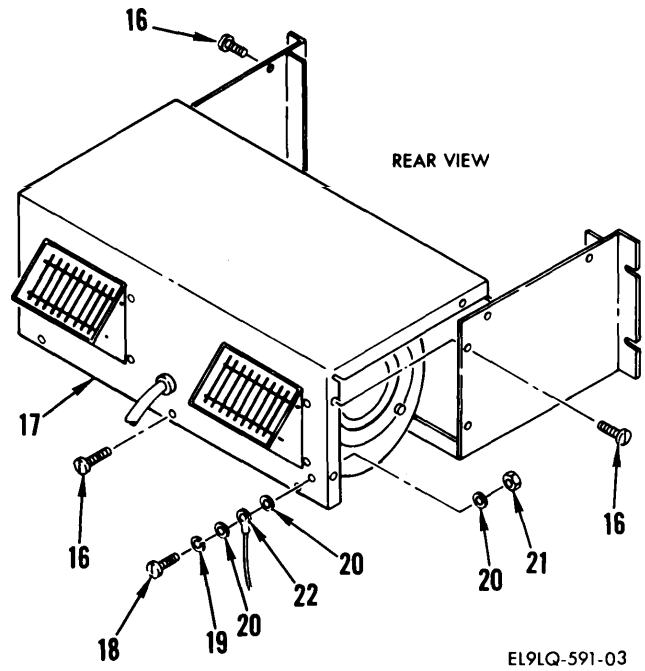
14. Install ground lead (22) using washers (20), lockwasher (19), screw (18), and nut (21).

15. Apply a thin coat of zinc chromate primer over bonded area and hardware (18 thru 22).

16. Close up blower assembly housing (17) using 11 screws (16).

17. Inspect filter for defects and cleanness (para 2-22).

18. Install blower assembly in reverse order of removal beginning with step 8.



END OF TASK

2-35. PMT CONTROLLER 1A7 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 39)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)
Blank panel below PMT controller removed (para 2-25)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)
Blank panel installation (para 2-25)

REMOVAL

1. Open left rear cabinet door.

2. On PMT controller (1), disconnect the following connectors:

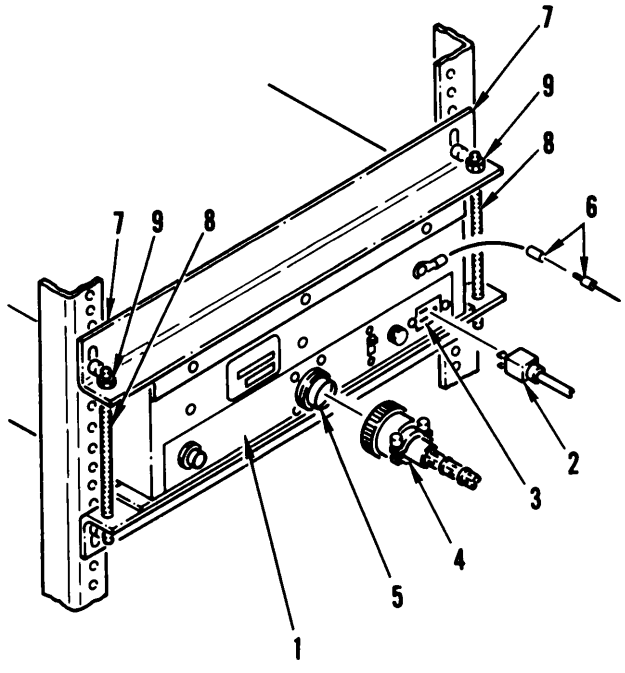
   115 vac plug (2) from receptacle (3)
   P1 (4) from 1A7J1 (5)

3. Disconnect ground lead (6).

NOTE

Top bracket (7) needs to be loosened, but not removed, to allow PMT controller removal clearance.

4. On each stud (8), loosen top nut (9), approximately five turns counterclockwise.



EL9LQ-560-07A

CAUTION

After panel screws are removed, PMT controller is free of all holding devices. Support PMT controller during removal of screws.

5. Support PMT controller (10) and remove four screws (11), lockwashers (12), washers (13), and remove PMT controller.

NOTE

If PMT controller is to be replaced, ground lead will have to be moved to the replacement assembly. If the same PMT controller is to be reinstalled, omit steps 6 through 11 and proceed to step 12.

6. Remove screw (14), lockwasher (15), two washers (16), and ground lead (6).

INSTALLATION

7. Prepare surface and hardware (6, 14, 15, and 16) for application of zinc chromate primer (para 2-19).

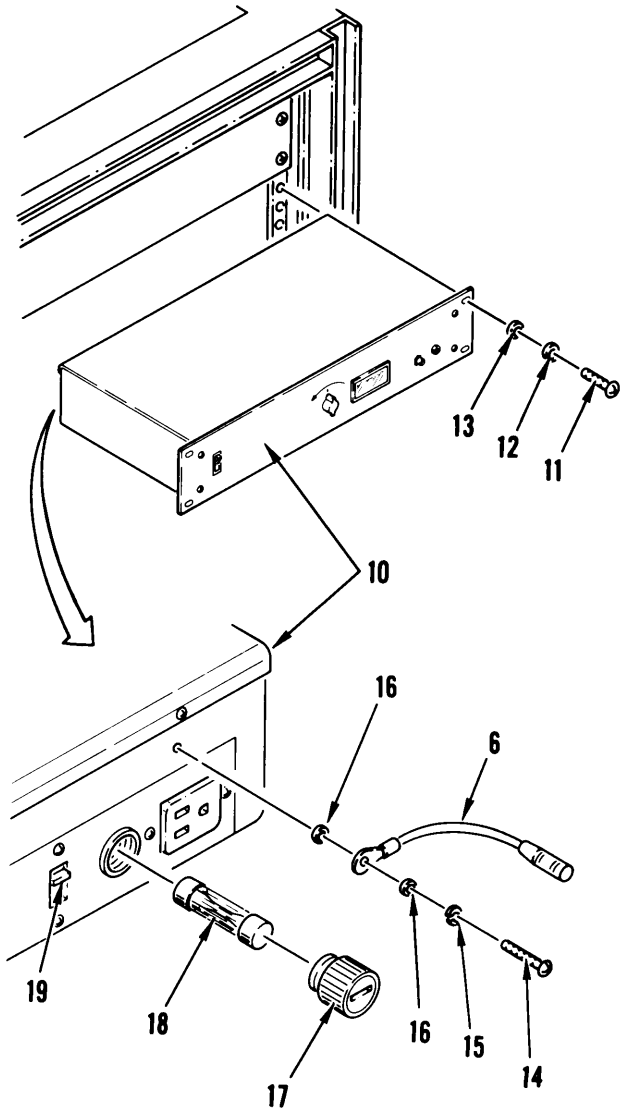
8. Install ground lead (6) using screw (14), lockwasher (15), and two washers (16).

9. Apply a thin coat of zinc chromate primer over bonded area and hardware (6, 14, 15, and 16).

10. Remove fuseholder cap (17) and fuse (18), verify fuse rating and reinstall fuse and fuseholder cap.

11. Position 115/230 vac select switch (19) to 115.

12. Install PMT controller in reverse order of removal starting with step 5.



EL9LQ-560-08

END OF TASK

2-36. PMT CONTROLLER 1A7 REPAIR 2-36

This task covers replacement of fuse.

INITIAL SETUP

Personnel Required

39B ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3085-12)

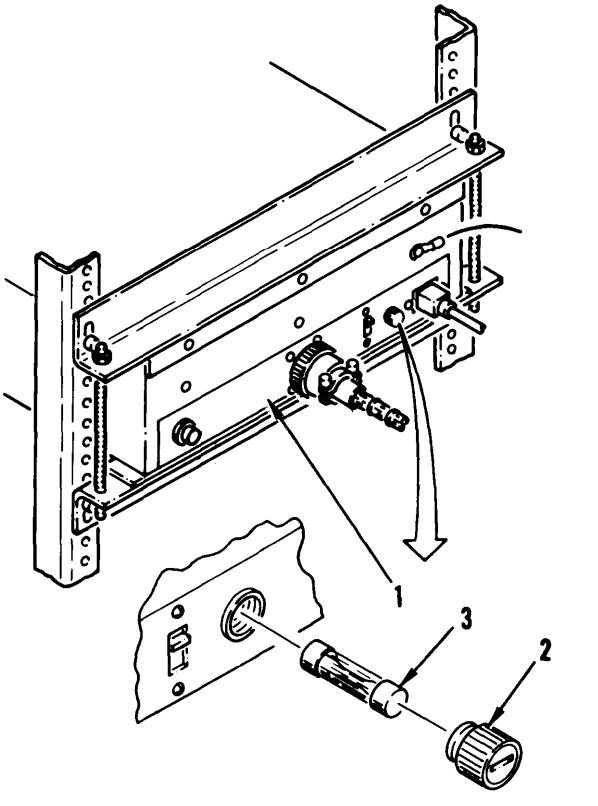
REMOVAL

1. Open left rear cabinet door.
2. On PMT controller (2), remove fuse-holder cap (2) and fuse (3).

INSTALLATION

3. Obtain replacement fuse.
4. Install in reverse order of removal.

END OF TASK



EL9LQ-560-09

2-37. EXTENDER ASSEMBLY 1A9 REPLACEMENT

INITIAL SETUP

Personnel Required

39B ATE Repairer
One assistant

Equipment Condition

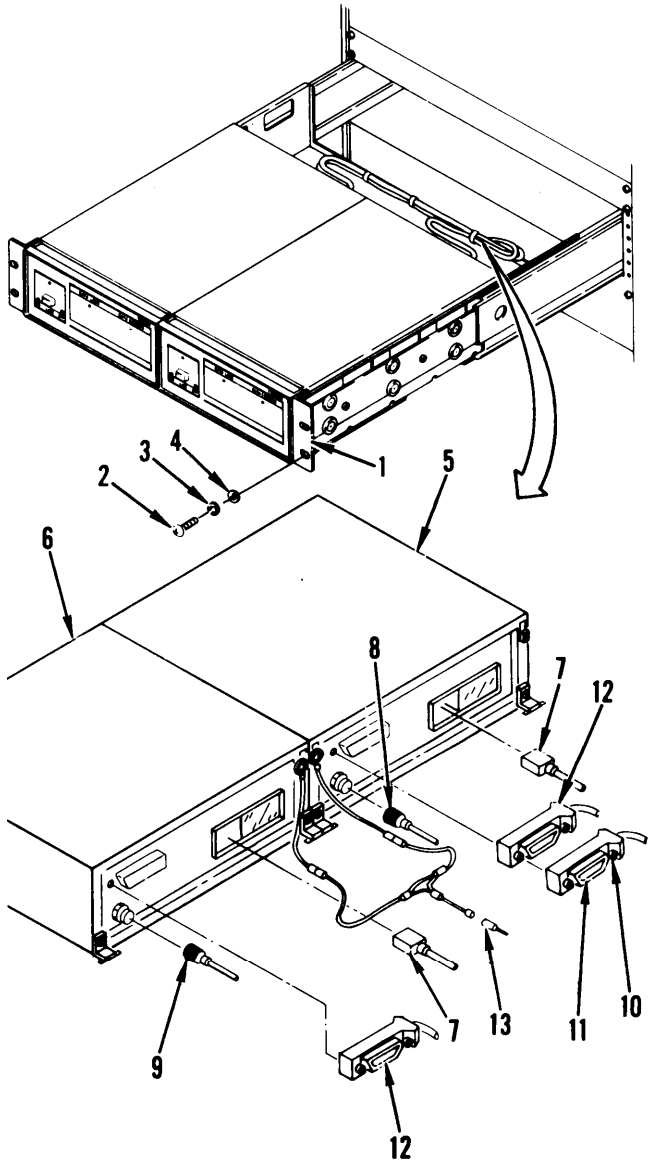
Power removed (para 2-24.1)

REMOVAL

1. On front panel of extender assembly (1), remove four screws (2), lockwashers (3), and washers (4). Pull out extender assembly.
2. Remove blank panel above extender.
3. On extenders A1 (5) and A2 (6), disconnect the following connectors:

   115 vac connector (7)
   P2 (8) from A1J1
   P2 (9) from A2J1

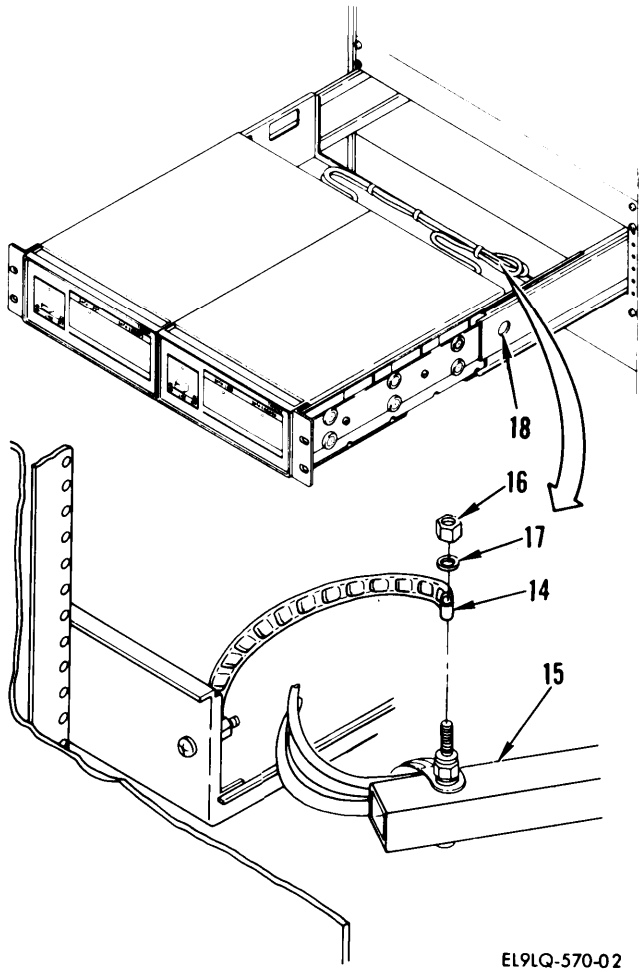
4. On A1, loosen two screws (10) and disconnect top stacked bus connector (11).
5. On A1 and A2, repeat step 4 for bus connector (12).
6. Disconnect ground lead (13).



NOTE

Chain (14) has spring tension when extender assembly is open.

7. Hold cable carrier arm (15) and remove nut (16), washer (17), and chain (14). Reposition cable carrier arm.



EL9LQ-570-02

WARNING

HEAVY OBJECT

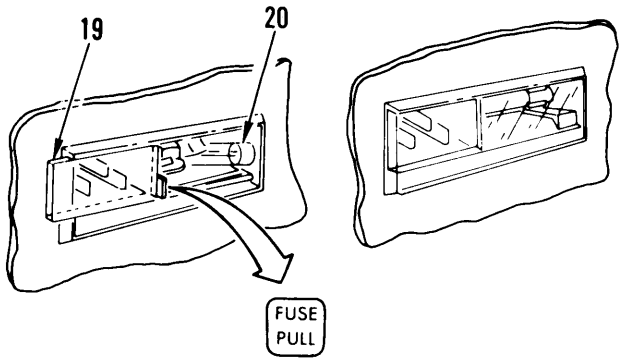
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

8. Using two persons, depress two slide locks (18) and remove extender assembly.

INSTALLATION

9. On rear panel of extenders 1A9A1 and 1A9A2, slide fuse cover (19) to left, pull FUSE PULL tab, remove fuse (20), verify rating and reinstall.

10. On extender 1A9A1 (21), set the following switches:



EL9LQ-570-12

10. On extender 1A9A1 (21), set the following switches:

    a. MASTER/SLAVE to MASTER

    b. SERIAL DATA RATE to NORMAL

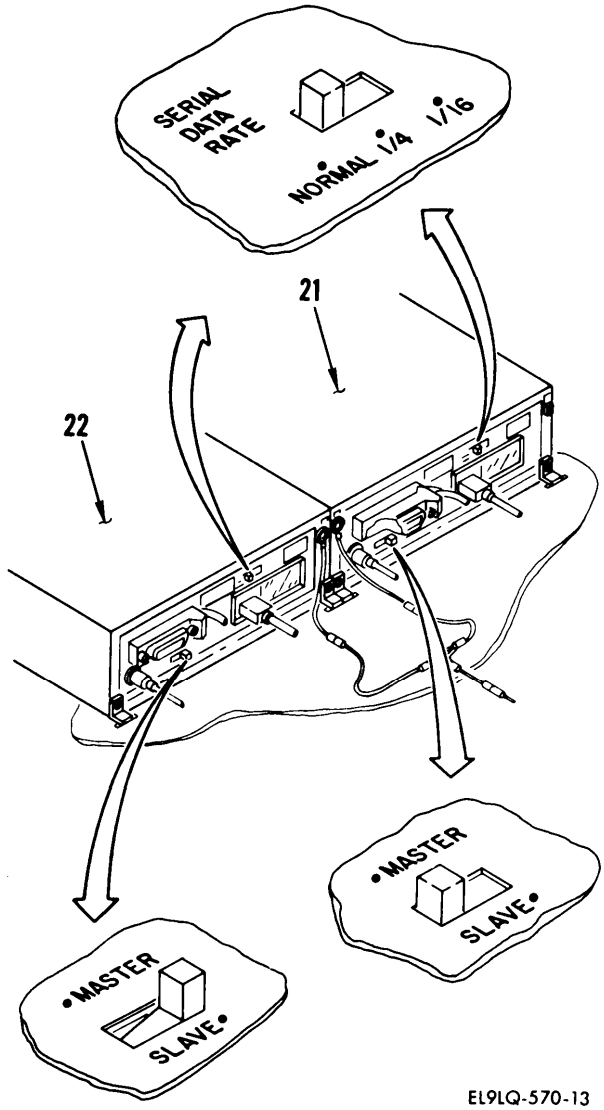
11. On extender 1A9A2 (22), set the following switches:

    a. MASTER/SLAVE to SLAVE

    b. SERIAL DATA RATE to NORMAL

12. Install extender assembly in reverse order of removal starting with step 8.

END OF TASK



EL9LQ-570-13

2-38. EXTENDER ASSEMBLY 1A9 REPAIR

This task covers replacement of:

Para	Item
1.	Fuse
2.	HP-IB extender 1A9A1 or 1A9A2

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE REPLACEMENT

REMOVAL

a. On front panel of extender assembly (1), remove four screws (2), lockwashers (3), and washers (4), and pull out extender assembly.

b. On rear panel, remove 115 vac connector (5) and slide fuse cover (6) to left.

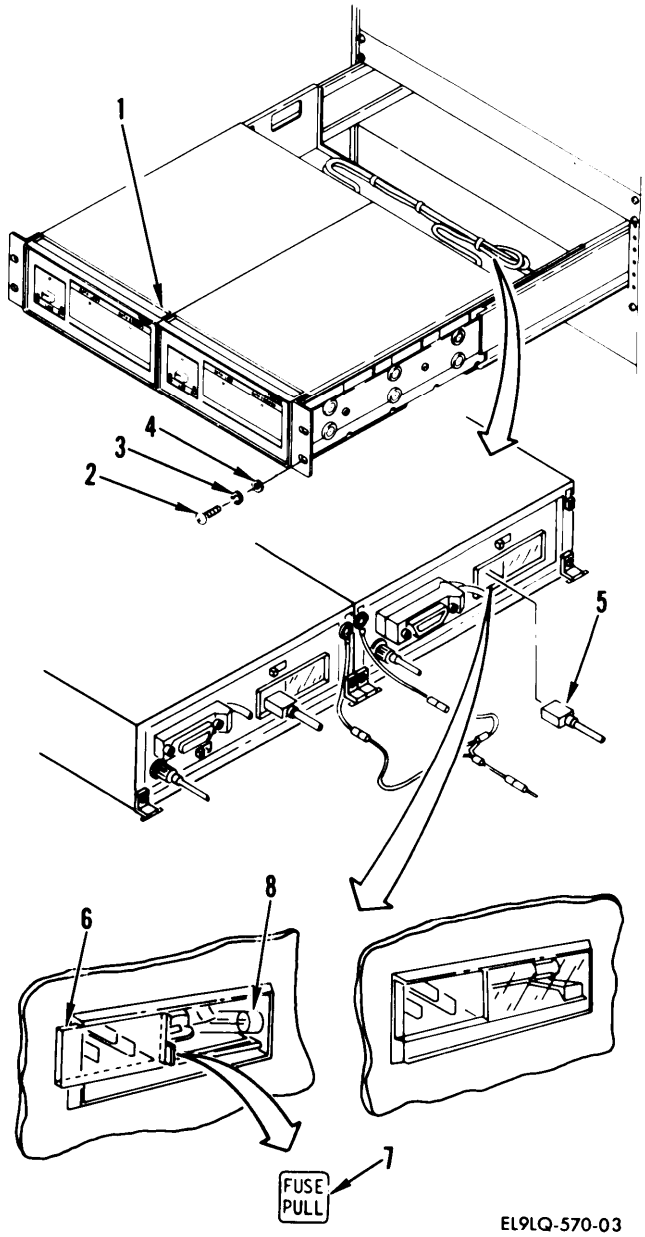
c. Pull FUSE PULL tab (7) and remove defective fuse (8).

INSTALLATION

d. Verify replacement fuse rating.

e. Install in reverse order of removal.

END OF TASK



EL9LQ-570-03

2. HP-IB EXTENDER 1A9A1 OR 1A9A2 REPLACEMENT

NOTE

This procedure is used to replace either extender 1A9A1 (1) or 1A9A2 (2).

REMOVAL

a. on front panel of extender assembly, remove four screws (3), lockwashers (4), and washers (5), and pull out extender assembly.

b. On A1, disconnect the following connectors:

(1) 115 vac connector (6)
(2) P2 (7) from A1J1

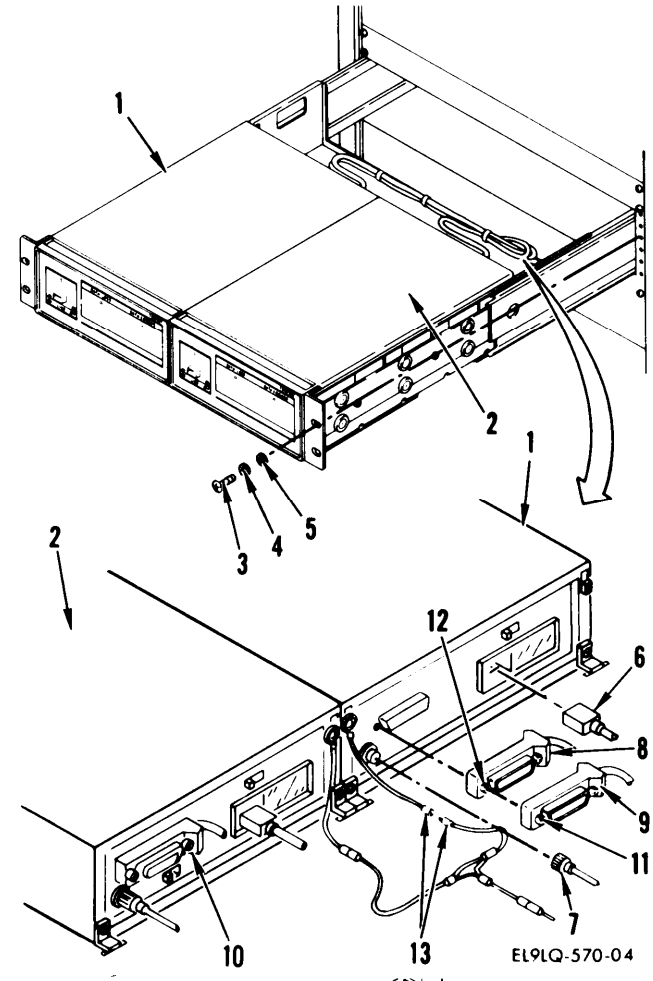
NOTE

Two stacked bus connectors (8 and 9) connect to 1A9A1 and one stacked bus connector (10) to 1A9A2.

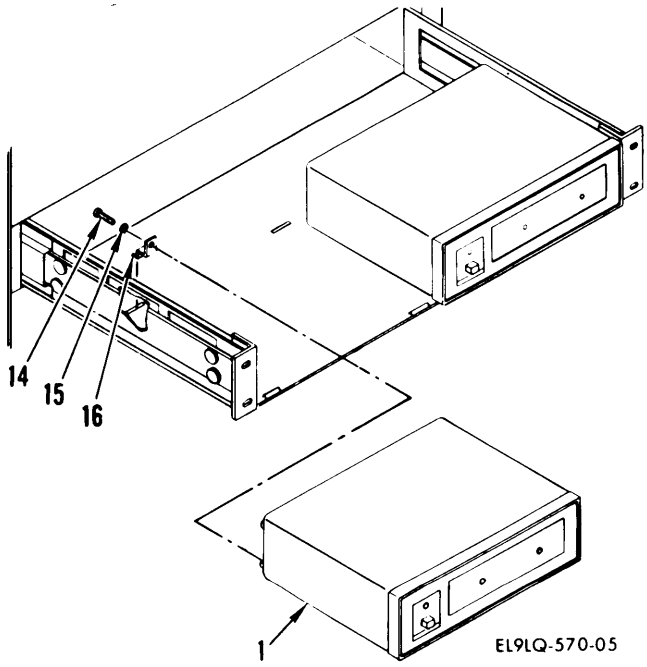
(3) Loosen two screws (11) and disconnect top stacked bus connector (9). Loosen two screws (12) and disconnect bottom stacked bus connector (8).

c. Disconnect ground lead (13) as shown.

d. Remove two screws (14), washers (15), and brackets (16), and pull extender straight out.



EL9LQ-570-04



EL9LQ-570-05

NOTE

If extender is to be replaced, ground lead will have to be moved to replacement unit. If the same unit is to be installed, omit steps e through l and proceed to step m.

e. Remove screw (17), lockwasher (18), washers (19), and ground lead (20).

INSTALLATION

f. On top cover of replacement extender, loosen screw (21) and slide cover (22) off.

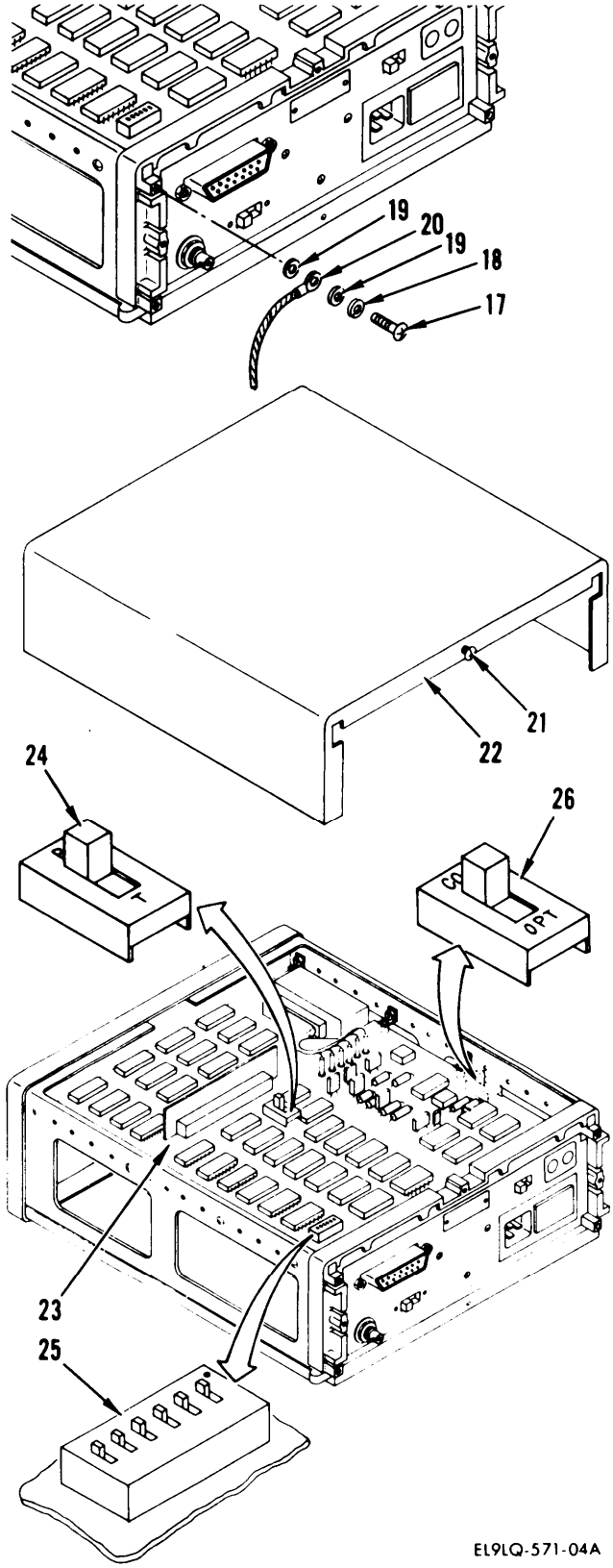
g. On board assembly (23), set the following switches:

(1) Run/test switch (24) to R (run).

(2) Address test switch (25), switches toward black dot.

(3) COAX/OPT switch (26) to COAX.

h. Slide top cover on and tighten screw (21).

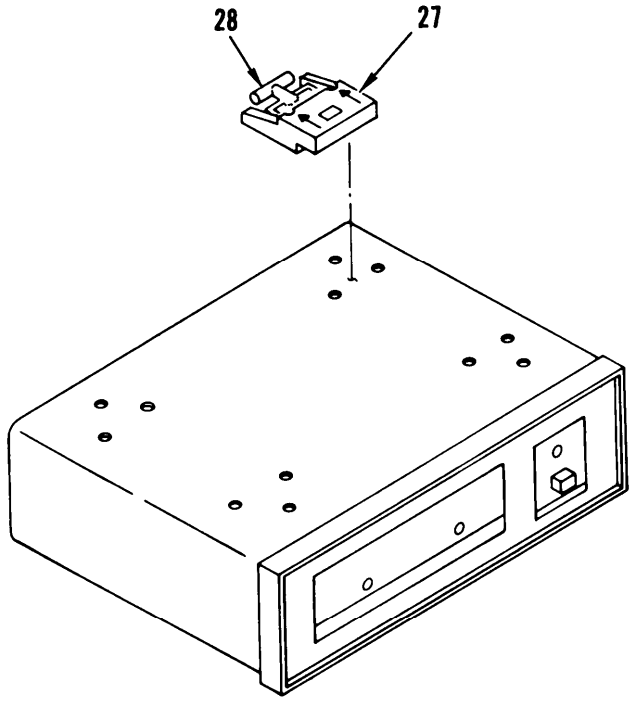


NOTE

The foot pads are not used when the extender is installed. They should be shifted from the replacement unit to the failed unit.

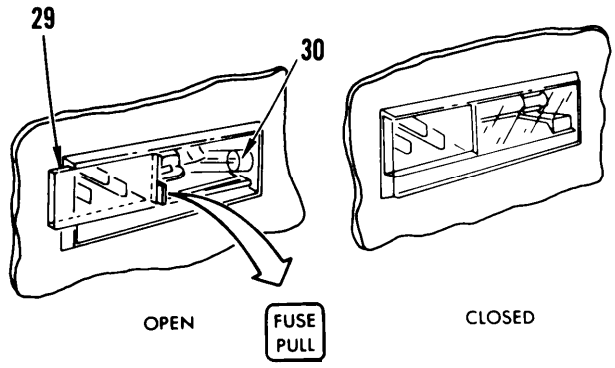
i. On each of four foot pads (27), lift tab (28), slide footpad in direction of arrow, and lift off.

j. Install foot pads on failed extender.



EL9LQ-570-06

k. Slide fuse cover (29) to left, pull FUSE PULL tab, remove fuse (30), verify rating, and reinstall.



EL9LQ-570-08

l. On replacement extender, install two washers (19), lockwasher (18), ground lead (20), and screw (17).

m. On extender 1A9A1 (31), set the following switches:

(1) MASTER/SLAVE to MASTER

(2) SERIAL DATA RATE to NORMAL

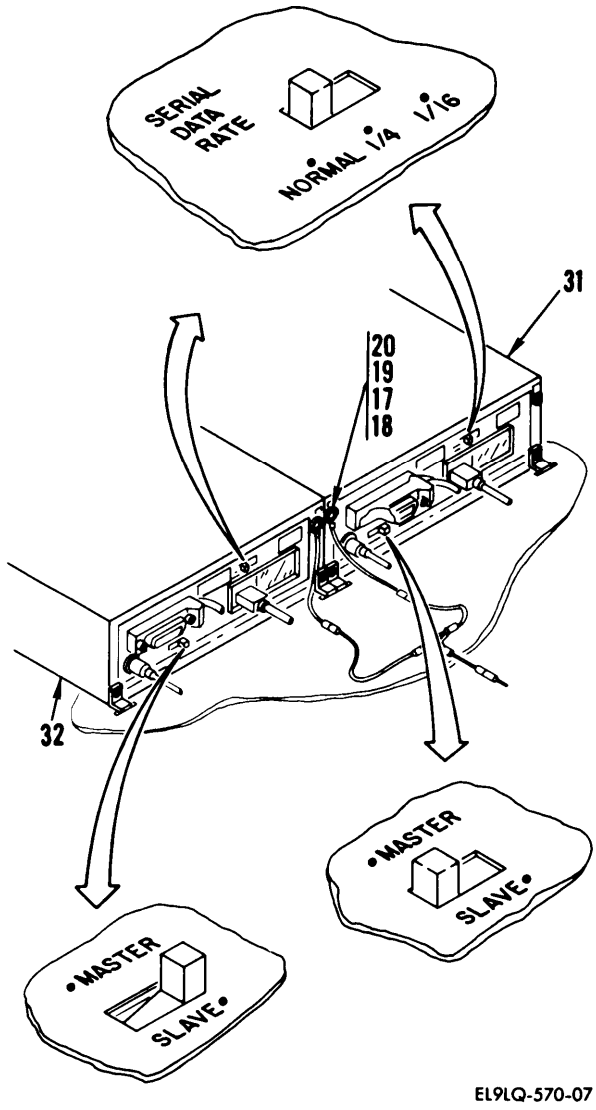
n. On extender 1A9A2 (32), set the following switches:

(1) MASTER/SLAVE to SLAVE

(2) SERIAL DATA RATE to NORMAL

o. Install extender assembly in reverse order of removal starting with step 2d.

END OF TASK



EL9LQ-570-07

2-38.1 DISC/TAPE DRIVE ASSEMBLY 1A10 REPLACEMENT 2-38.1

INITIAL SETUP

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Tools and Special Tools

T15 star driver
Torque wrench, in-lb
Chassis lift, 2397418-501

Equipment Condition

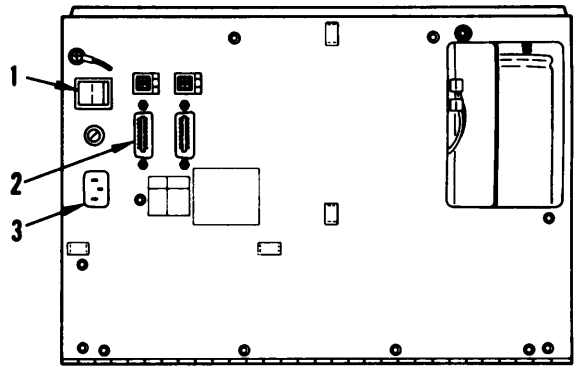
Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Cassette loading (para 2-38.2)
Electronic station positioned for operation (TM 11-6625-3085-12)

REMOVAL

1. Open left rear cabinet door of electronic station to gain access to disc/tape drive assembly.
2. Set LINE ON/OFF switch (1) to OFF.
3. Disconnect 115 vac connector (3).
4. Disconnect HP12009-60014 P2 from 1A10J2 (2).



EL9LQ-581-03

5. Remove screw (12), lockwasher (13), washer (14), ground lead (15), and washer (16).

6. At rear of unit, remove chain connecting cable tray to disc drive by removing screw and chain from disc drive.

7. Remove front panel (4) by grasping and pulling panel off.

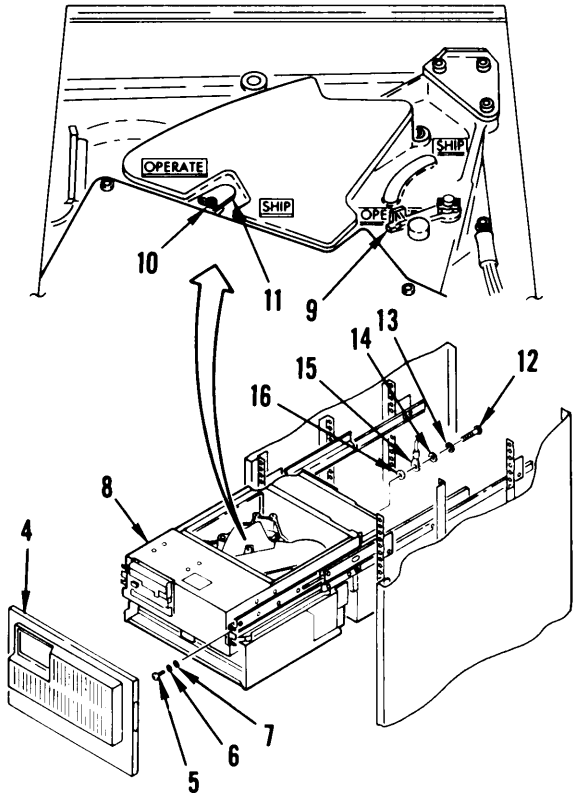
8. Remove four screws (5), lockwashers (6), and washers (7).

9. Pull out disc/tape drive (8) assembly until slide assemblies lock in place.

10. Lock actuator by moving actuator lock lever (9) to SHIP.

11. Loosen screw (10) using 115 star driver and move spindle lock lever (11) to SHIP.

12. Tighten screw (10) to 20 in-lb.



EL9LQ-581-04

WARNING

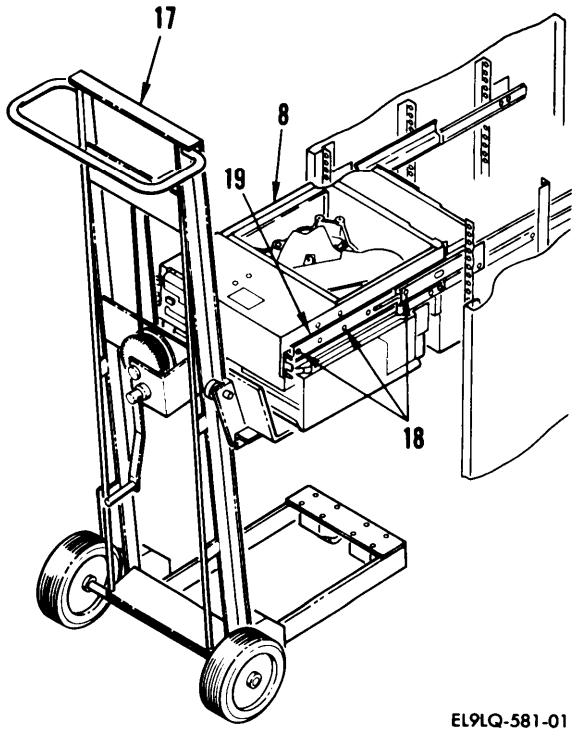
UNIT WEIGHS APPROXIMATELY 148 POUNDS. UNIT MUST BE SUPPORTED WHEN REMOVING MOUNTING HARDWARE.

13. Position chassis lift (17) under disc/tape drive (8) and raise hoist until drive weight is supported by chassis lift.

14. Remove three screws (18) on each side of the disc/tape drive securing slides to drive assembly.

15. Use chassis lift and raise drive assembly off of slide rails (19). Ensure unit has been raised above guide pins of slide rails.

16. Retract slides into cabinet.



EL9LQ-581-01

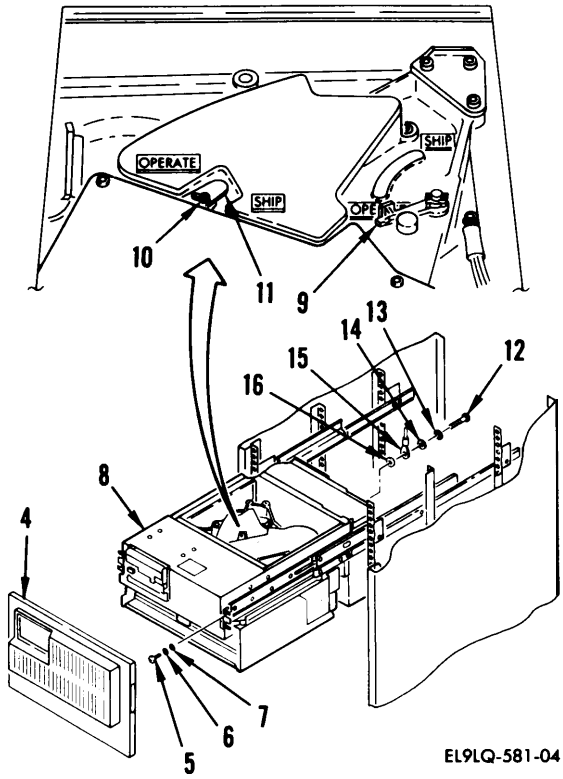
WARNING

HEAVY OBJECT

- UNIT WEIGHS APPROXIMATELY 148 POUNDS.
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

17. Using a minimum of two persons, lift and position disc/tape drive assembly onto a suitable working surface.

18. Install front panel.



INSTALLATION

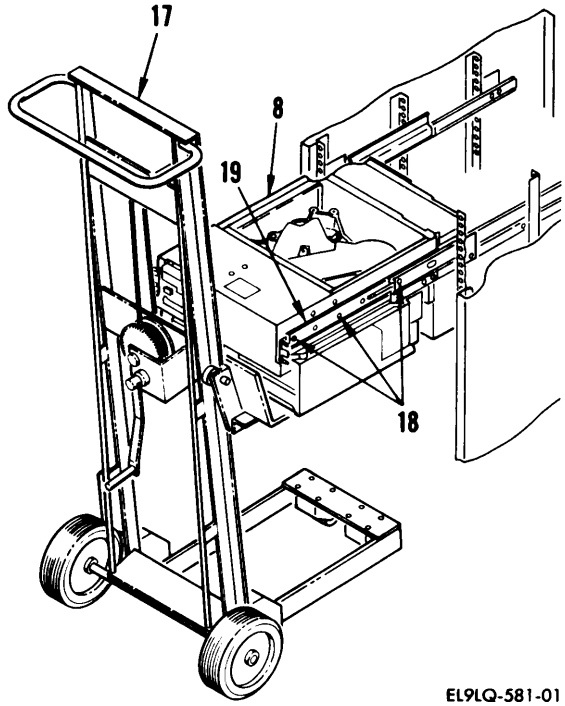
19. Remove front panel (4) by grasping and pulling panel off.

WARNING

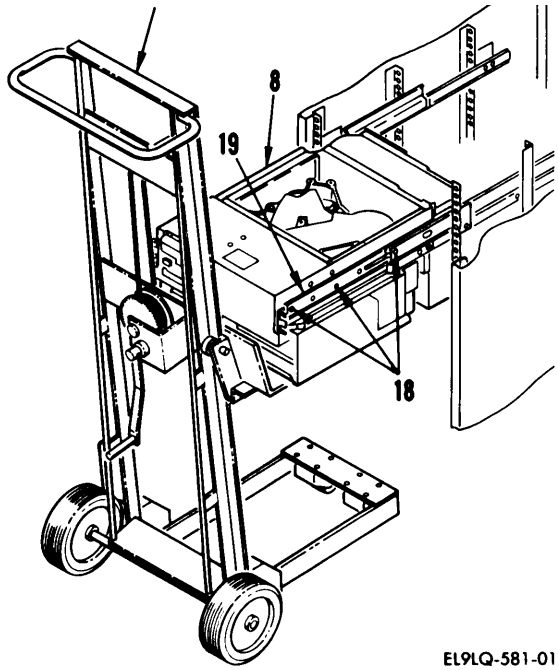
HEAVY OBJECT

- UNIT WEIGHS APPROXIMATELY 148 POUNDS.
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

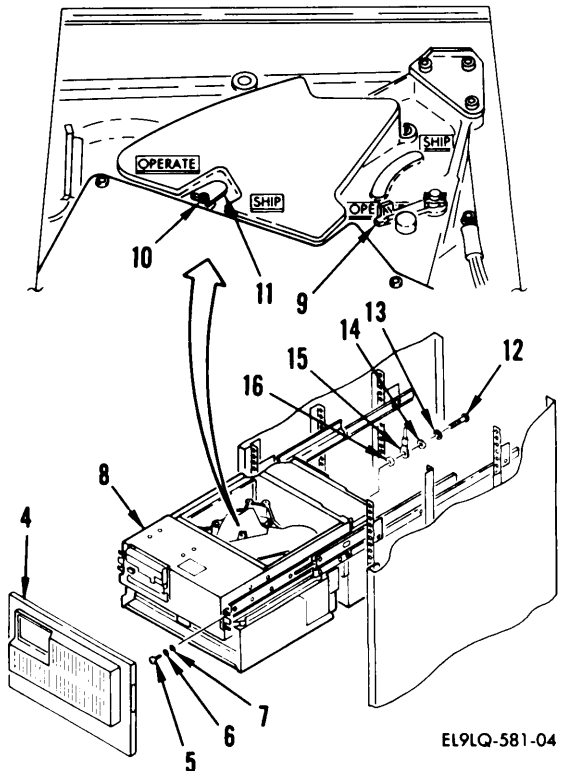
20. Using an adequate number of people, lift and position disc/tape drive assembly onto chassis lift.



21. Position chassis lift (17) with disc/tape drive (8) in front of electronic station.
22. Raise disc/tape drive assembly above slide rails (19). Ensure drive assembly is high enough so that slide rails can be extended.
23. Extend slides (19) out of electronic station.
24. Aline slide rail guide pins to disc/tape drive and lower disc/tape drive onto slide rails.
25. Install screws (18) to secure slide rails to disc/tape drive assembly.



26. Unlock actuator by moving actuator lever (9) to OPERATE.
27. Loosen screw (10) and move spindle lock lever (11) to OPERATE.
28. Tighten screw (10) to 20 in-lb.
29. Push disc/tape drive assembly (8) into cabinet and install four screws (5), lockwashers (6), and washers (7).
30. Install front panel (4).
31. Install chain with screw and washer.
32. Prepare surface and hardware (12 thru 16) for application of zinc chromate primer (para 2-19).
33. Install ground lead (15) with washers (16 and 14), lockwasher (13), and screw (12).



34. Connect 115 vac connector (3).

35. Connect HP12009-60014 P2 to 1A1OJ2 (2).

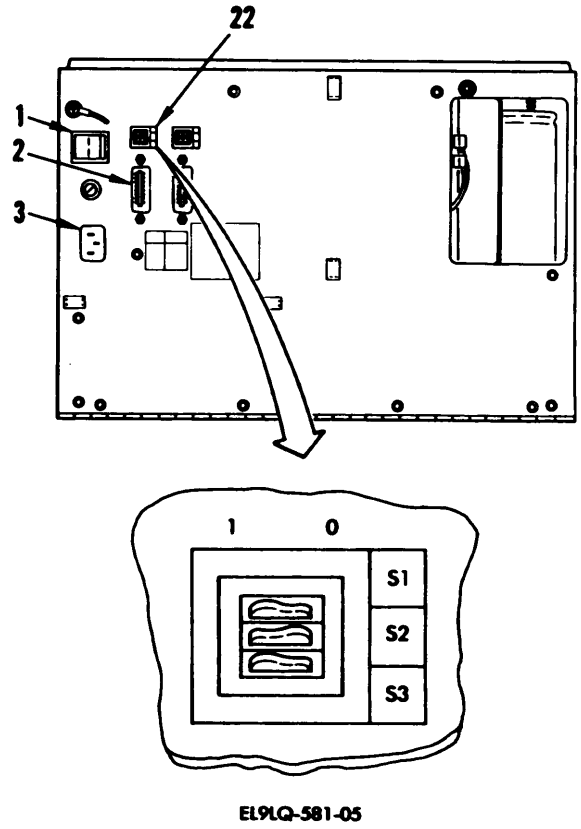
36. Set HPIB disc address switch (22) as follows:

    S 1 = 0
    S 2 = 1
    S 3 = 0

37. Set LINE ON/OFF switch (1) to ON.

38. Close cabinet door.

END OF TASK



EL9LQ-581-05

2-38.2 DISC/TAPE DRIVE 1A10 CASSETTE LOADING 2-38.2

INITIAL SETUP

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Condition

Power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

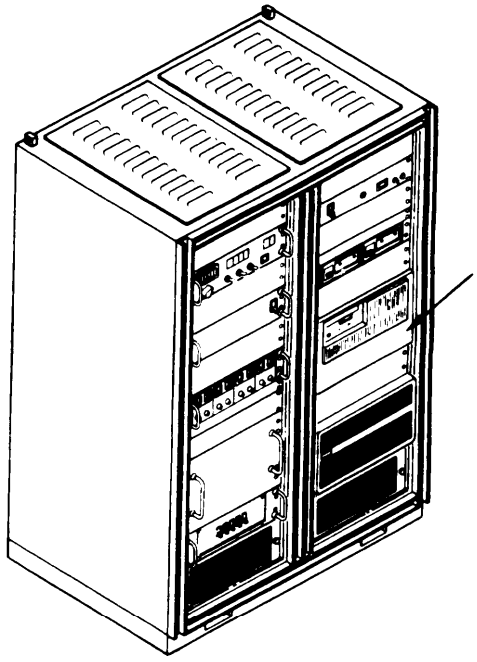
Electronic station positioned for operation (TM 11-6625-3085-12)

NOTE

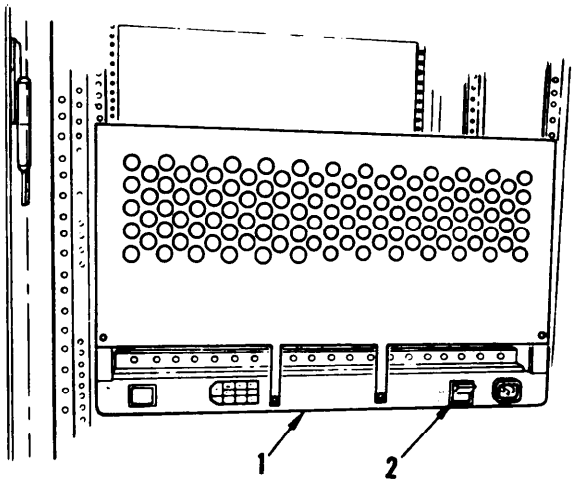
Perform this procedure whenever the disc/tape drive assembly 1A10 has been replaced, or the software program has been updated, damaged, or suspected of being faulty.

1. Open left rear cabinet door of electronic station to gain access to digital computer assembly (1).
2. Set LINE ON/OFF switch (2) to OFF.
3. Remove front panel 3) by grasping and pulling panel off.
4. At control station - control panel, push in and rotate station power key switch to ON (TM 11-6625-3085-12).

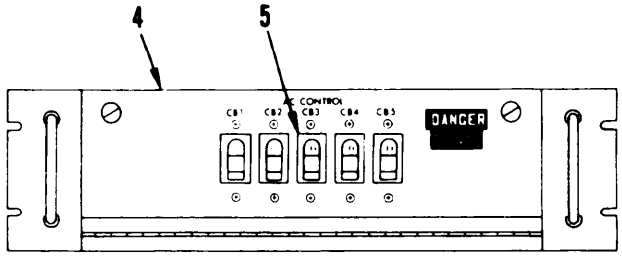
4.1 On AC station - AC power control panel, set circuit breaker E/O SUBSYS to ON (TM 11-6625-3085-12).



EL9LQ-581-10



EL9LQ-580-70



EL9LQ-599-71

4.2 On AC CONTROL panel (4), set CB1, CB2, CB4, and CB5 to ON. Then set CB3 (5) to ON.

5. On tape cartridge (6) set safe screw (7) to SAFE.

NOTE

During the following steps, the tape cartridge is inserted into the tape drive. This starts an automatiac tape conditioning sequence and internal self-test.

6. Insert tape cartridge (6) into tape drive (8) until a click is heard.

7. BUSY indicator (9) is lit intermittently during tape conditioning sequence and self-test (approximately 1-2 minutes).

8. Upon completion of self-test, BUSY Indicator (9) will go out and status readout (10) will display a P.

NOTE

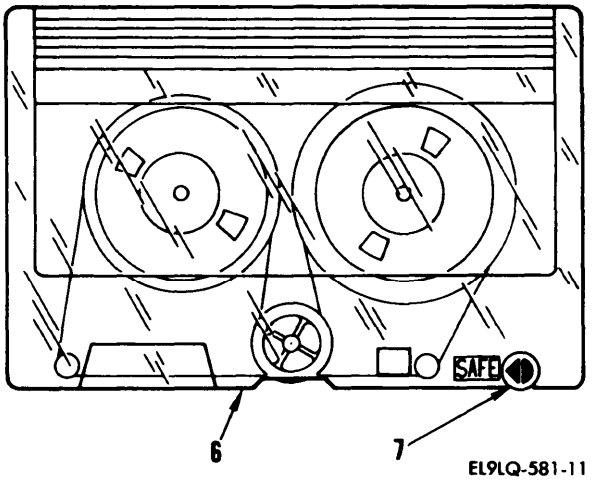
Data stored on the cassette tape will be copied onto the disc during the following step. Loading process takes approximately 30 to 45 minutes.

9. Toggle RESTORE TAPE to DISC switch (11). When BUSY indicator (9) begins to flicker, toggle RESTORE TAPE to DISC switch (11) again.

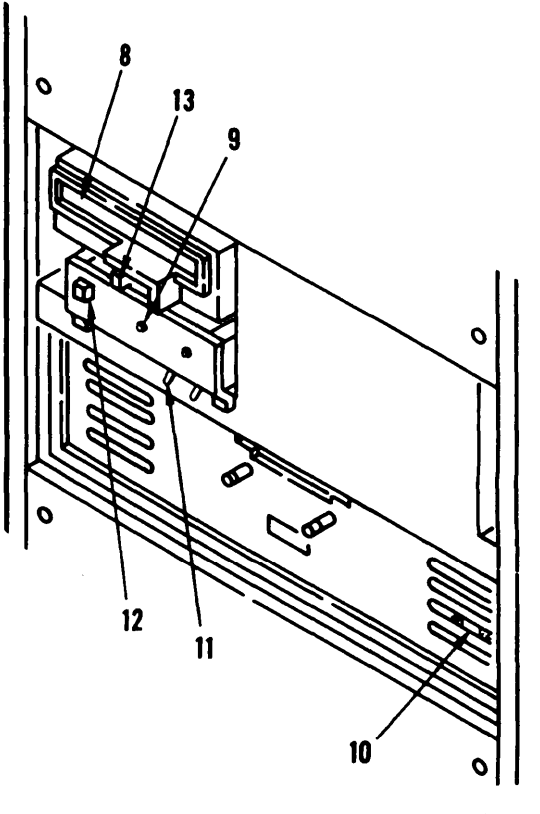
CAUTION

Do not attempt to remove tape cartridge until tape cartridge unloading sequence is completed.

10. Press UNLOAD switch (12). BUSY indicator (9) will be lit while tape is rewinding.



EL9LQ-581-11



EL9LQ-581-12

CAUTION

Do not use excessive force on EJECT lever.

11. When BUSY indicator (9) goes out, move EJECT lever (13) to right.

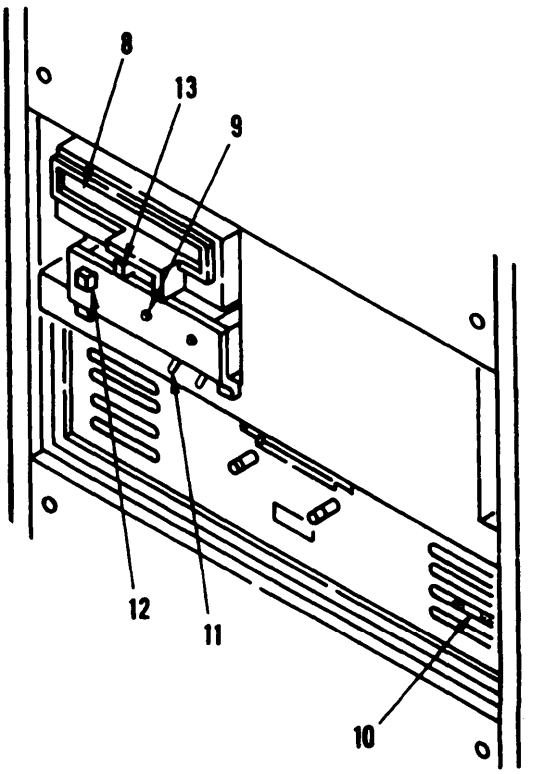
12. Tape cartridge will eject. Remove and store.

13. Install front panel.

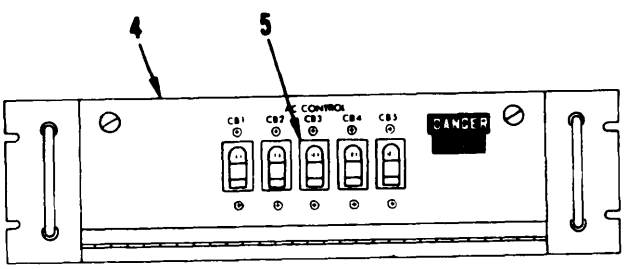
14. On AC CONTROL panel (4) set CB3 (5) to OFF.

15. On digital computer (1) set LINE ON/OFF switch (2) to ON.

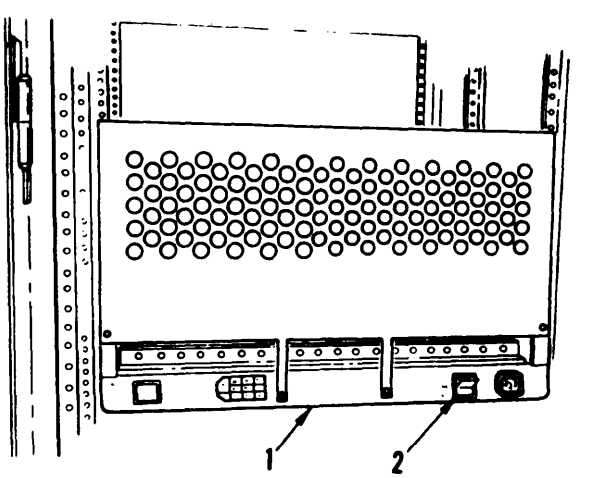
END OF TASK



EL9LQ-581-12



EL9LQ-599-71



EL9LQ-580-70

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2-39. DELETED 2-39

2-39.1 DIGITAL COMPUTER ASSEMBLY 1A11 REPLACEMENT

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)
Lacing tape (Item 44)

Personnel Required

39B ATE Repairer
One assistant

References

TM 11-6625-3085-12

Equipment Conditions

power removed (para 2-24.1)
Electronic station positioned for maintenance (TM 11-6625-3085-12)

FOLLOWUP

Electronic station positioned for operation (TM 11-6625-3081-12)

REMOVAL

1. Open left rear cabinet door of electronic station to gain access to digital computer assembly (1).
2. Set LINE ON/OFF switch (2) to OFF.
3. Disconnect 115 vac connector (3).

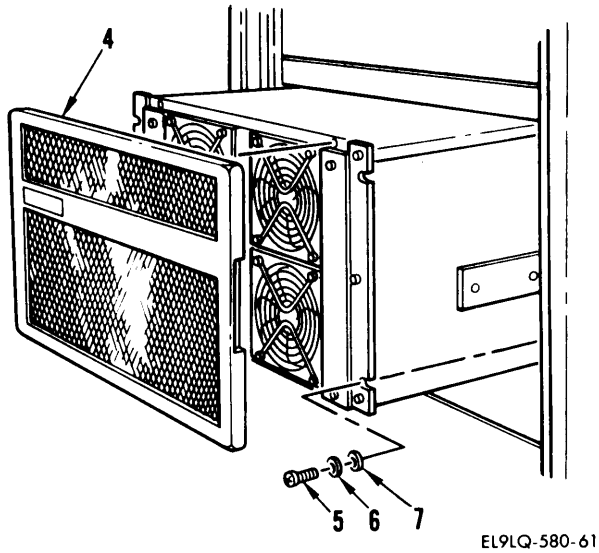
NOTE

Front panel is secured by pressure fittings. Panel may require an extreme pulling force to remove.

4. Remove front panel (4) by grasping and pulling bottom edge away from computer.

5. Remove four screws (5), lockwashers (6), and washers (7); partially extend computer assembly, to access hardware from rear of cabinet.

6. Remove four screws (8); remove rear panel (9) from digital computer.



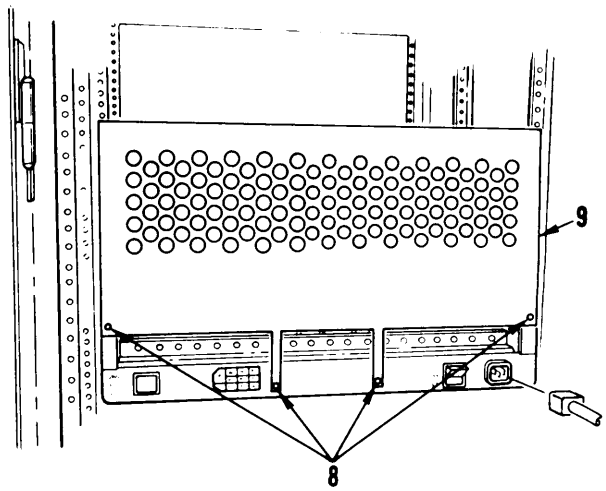
EL9LQ-580-61

NOTE

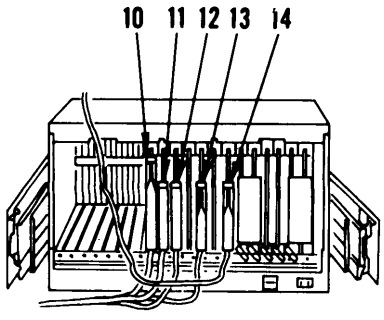
Note position of I/0 connectors before removal. Connectors can be installed on the wrong I/0 circuit card assembly.

7. Disconnect the following connectors:

W7 P3 (10) from A13J1
W7 P2 (11) from A12J1
HPIB P2 (12) from A11J1
W9 P2 (13) from A9J1
HPIB P1 (14) from A7J1



EL9LQ-580-62



EL9LQ-580-54

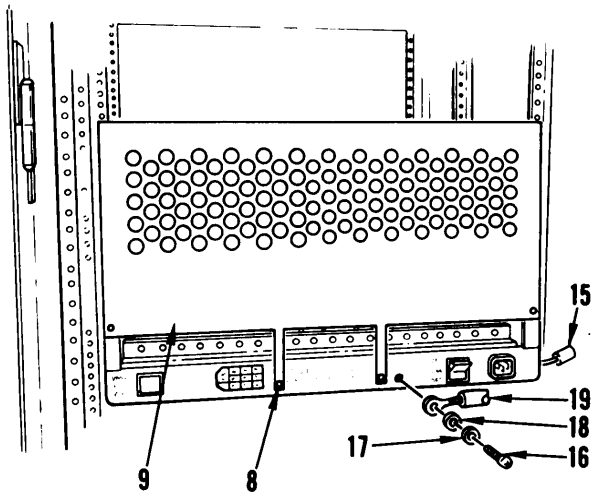
8. Disconnect ground lead (15) by pulling pigtail connector apart.

9. Install rear panel (9) with screws (8).

10. Remove screw (16), lockwasher (17), washer (18), and chain (19).

11. Slide digital computer assembly to the open locked position.

12. Install cover (4).



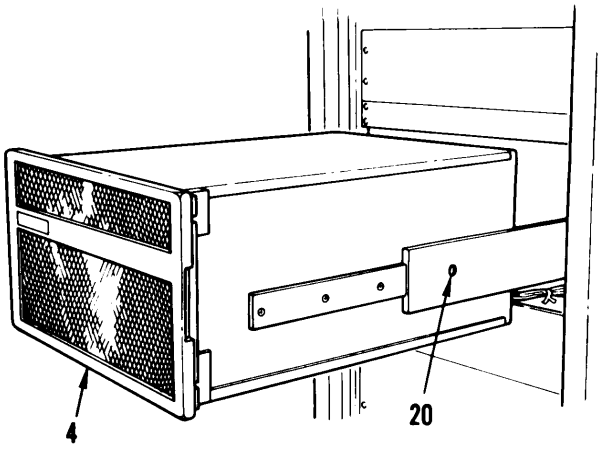
EL9LQ-580-52

WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

13. Using two persons, depress two slide locks (20) and remove computer assembly.



EL9LQ-580-55

INSTALLATION

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

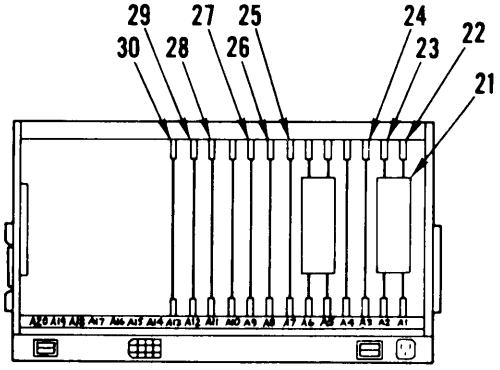
14. Comply with ESD procedures when handling CCAs (para 2-19).

15. Remove frontplane (21) from CCAs A1 and A2 (22 and 23).

CAUTION

CCAs must be installed with their component side to the right. Ensure components are facing to the right when installing CCAs.

16. Set address select switches per address selector switch matrix by removing each CCA, set address select switches as required, and installing CCA back into original slot.



EL9LQ-580-56

ADDRESS SELECTOR SWITCH MATRIX FOR COMPUTER ASSEMBLY 13231746

CCA	ITEM	NOMENCLATURE	SWITCH CODE SELECT									
			1	2	3	4	5	6	7	8	9	10
A1	22	Control Store (U1)	C	C	C	O	O	O	C	O	-	-
A1	22	Control Store (U0201)	O	O	C	C	C	C	C	C	O	C
A2	23	Sequencer (U0204)	C	C	C	C	C	-	-	-	-	-
A3	24	Data Path (U0101)	O	O	O	C	C	O	C	C	-	-
A7	25	HPIB (U1)	O	O	C	O	C	O	O	O	-	-
A7	25	HPIB (U144)	O	C	C	C	C	C	O	C	-	-
A8	26	ASIC (U1)	C	C	C	O	C	C	C	C	-	-
A8	26	ASIC (U21)	O	O	O	O	C	C	C	C	-	-
A9	27	IEEE Interface (U1)	C	O	C	O	O	C	C	C	-	-
A11	28	HPIB (U1)	O	O	C	O	O	O	C	C	-	-
A11	28	HPIB (U16)	O	C	C	C	C	C	C	O	-	-
A12	29	Parallel Interface (U1)	O	C	O	C	C	C	C	C	-	-
A13	30	Buffer (U1)	C	C	C	O	O	O	O	O	-	-

C = Closed
O = Open

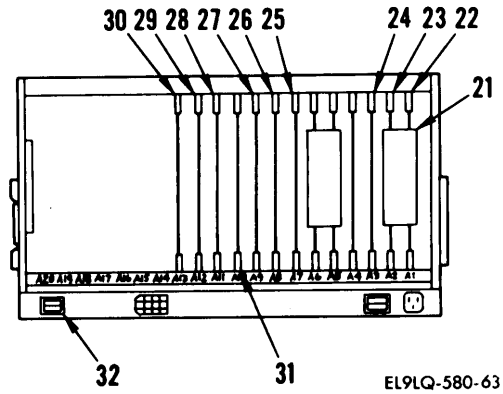
17. Install frontplane (21) onto CCAs A1 and A2 (22 and 23).

18. Ensure priority jumper CCA A10 (31) is installed.

19. Install rear panel.

20. Set BACKUP ENABLE DISABLE switch (32) to DISABLE.

21. Extend slides (33) from bench.



EL9LQ-580-63

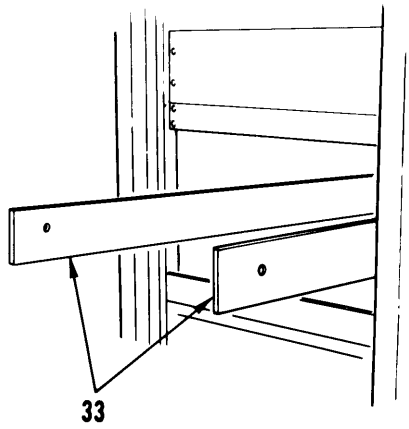
WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

22. Position computer onto slides (33) and lock into position.

23. Partially slide computer into electronic station so that back panel is accessible from rear.



EL9LQ-580-57

24. Remove rear panel (9) by removing screws (8).

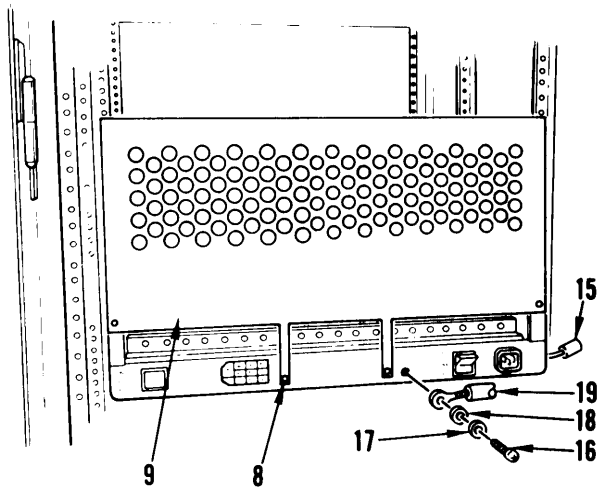
25. Connect the following connectors:

W7	P3 (10)	to A13 (30) J1
W7	P2 (11)	to A12 (29) J1
HPIB	P2 (12)	to A11 (28) J1
W9	P2 (13)	to A9 (27) J1
HPIB	P1 (14)	to A7 (25) J1

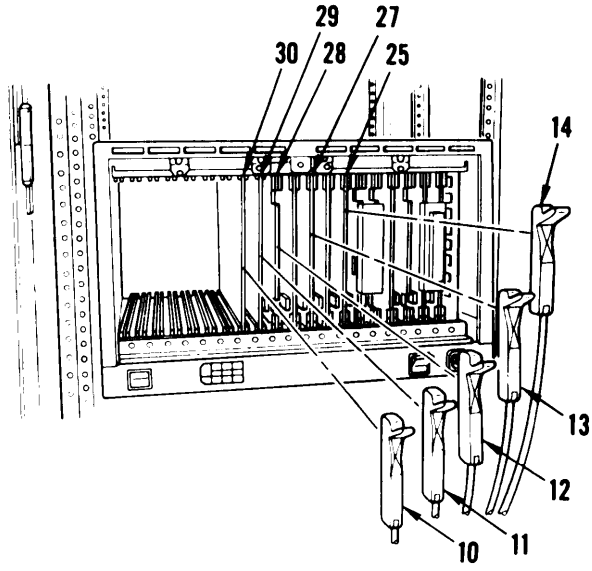
26. Install chain (19), washer (18), lockwasher (17), and screw (16).

27. Connect ground lead (15).

28. Install rear panel (9).



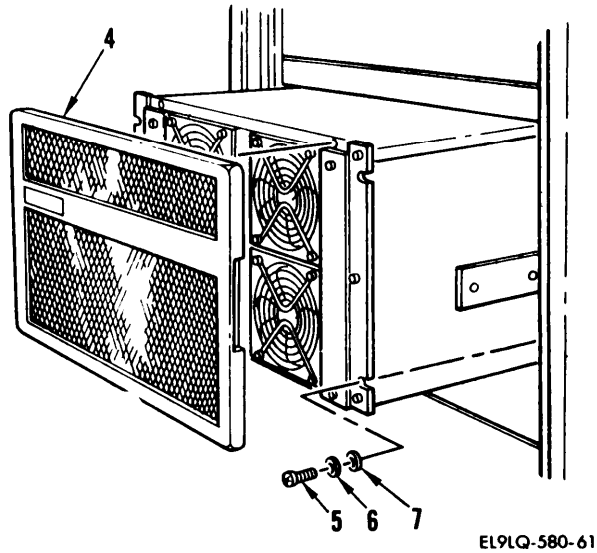
EL9LQ-580-52



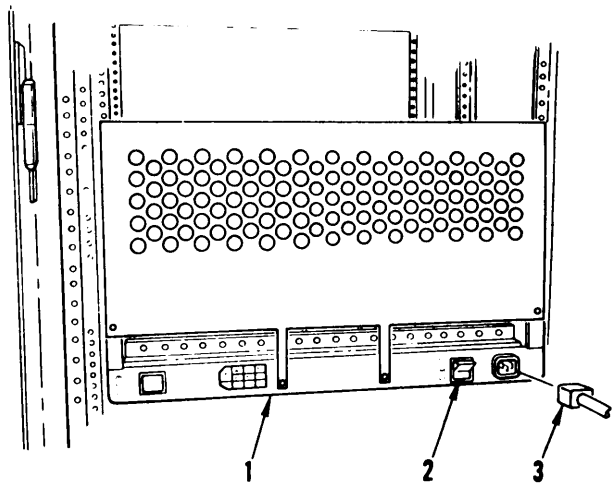
EL9LQ-580-68

29. Remove front panel (4) and slide computer into bench.
30. Install washers (7), lockwashers (6), and four screws (5).
31. Install front cover (4).
32. Connect 115 vac connector (3).
33. Set LINE ON/OFF switch (2) to ON.
34. Close rear door.

END OF TASK



EL9LQ-580-61



EL9LQ-580-53

2-40. DIGITAL COMPUTER ASSEMBLY 1A11 REPAIR 2-40

This task covers replacement of:

Para	Item
1.	Air filter
2.	Fan
3.	Power supply
4.	Deleted
4.1	Circuit card assembly (CCA)
5.	Cable assembly HP 12009-60007

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)
Lacing tape (Item 44)

Personnel Required

39B ATE Repairer

References

TM 11-6625-3085-12

Equipment Conditions

power removed (para 2-24.1)
Electronic station positioned for maintenance (required for para 4 and 5 only) (TM 11-6625-3085-12)

FOLLOWUP

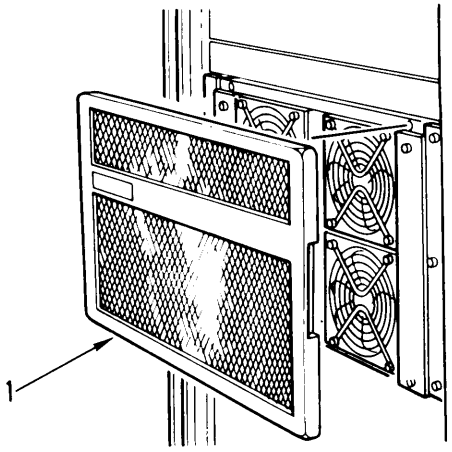
Electronic station positioned for operation (required for para 4 and 5 only) (TM 11-6625-3085-12)

1. AIR FILTER REPLACEMENT

REMOVAL

a. On front of digital computer assembly, grasp bottom edge of panel (1) and pull panel away.

b. Set panel, backside up, on flat surface.



EL9LQ-580-34

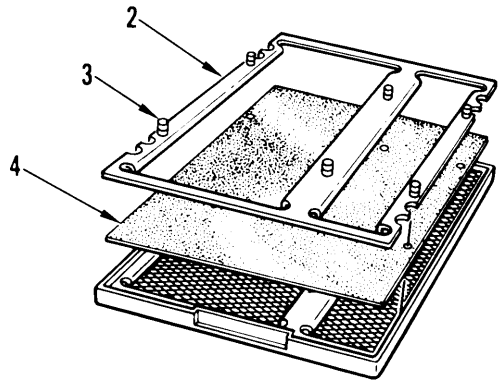
c. Push down on frame (2) and release six push-pull fasteners (3).

d. Separate frame from cover and remove air filter (4).

INSTALLATION

e. Install air filter in reverse order of removal.

END OF TASK



EL9LQ-580-35

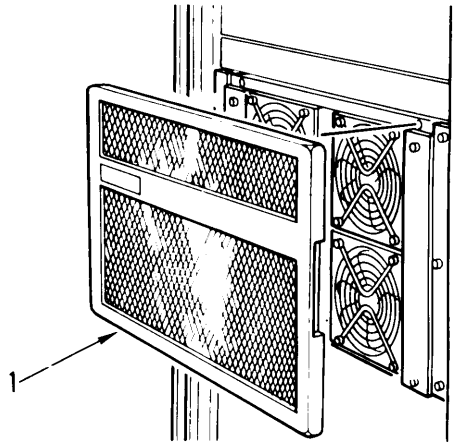
2. FAN REPLACEMENT

REMOVAL

a. On front of digital computer assembly, grasp bottom edge of panel (1) and pull the panel away.

b. On defective fan (2, 3, 4, or 5), remove four screws (7), lockwashers (8), washers (9), fan guard (10), and fan.

c. Disconnect fan power plug (6).

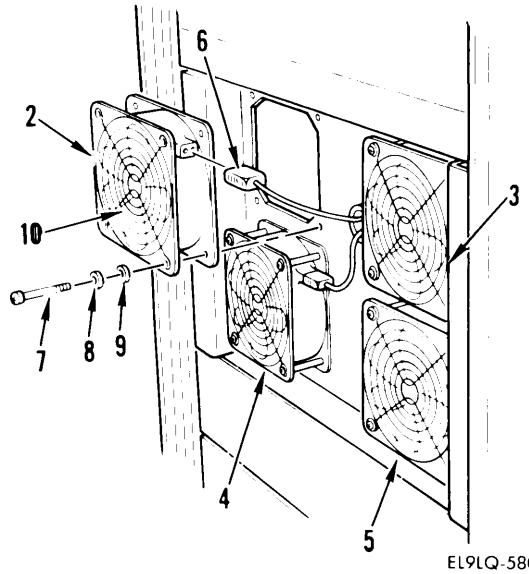


EL9LQ-580-34

INSTALLATION

d. Install fan in reverse order of removal.

END OF TASK

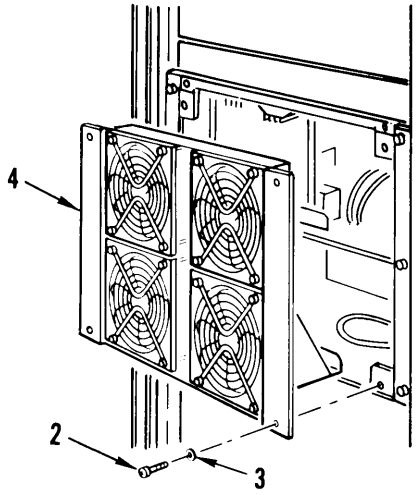


EL9LQ-580-36

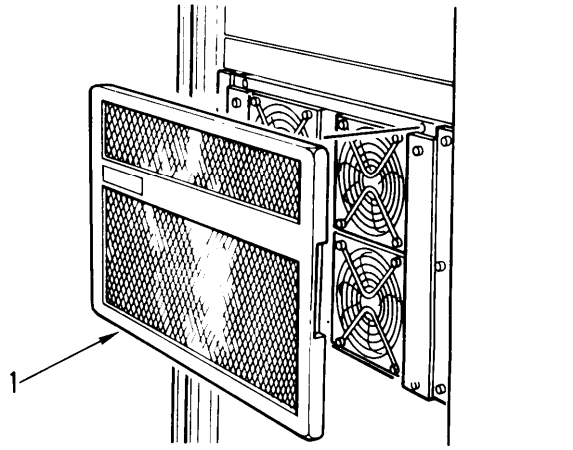
3. POWER SUPPLY REPLACEMENT

REMOVAL

a. On front of digital computer assembly, grasp bottom edge of panel and pull panel (1) away.

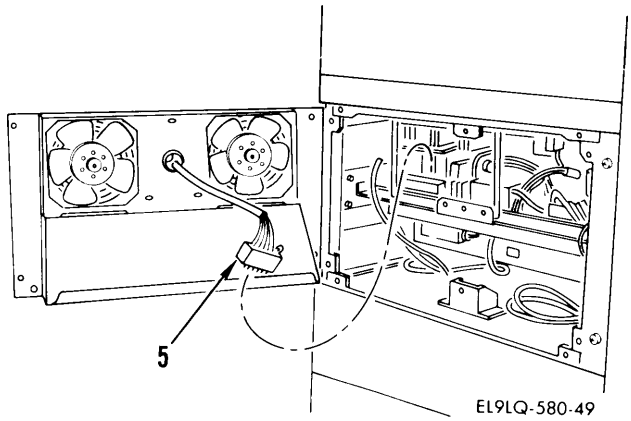


EL9LQ-580-47



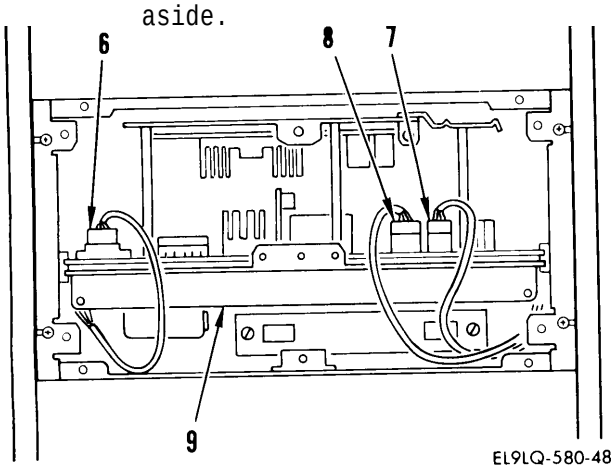
EL9LQ-580-3

b. Remove 11 screws (2) and washers (3) securing fan panel (4) to computer chassis.



EL9LQ-580-49

c. Pull fan panel away from computer and disconnect fan cable connector (5). Set fan panel aside.



EL9LQ-580-48

d. Disconnect line filter cable connector (5), backup battery cable connector (7), and test cable connector (8).

e. pull power supply (9) straight out of card guides.

INSTALLATION

f. Install power supply in reverse order of removal.

END OF TASK

4. DELETED

4.1 CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

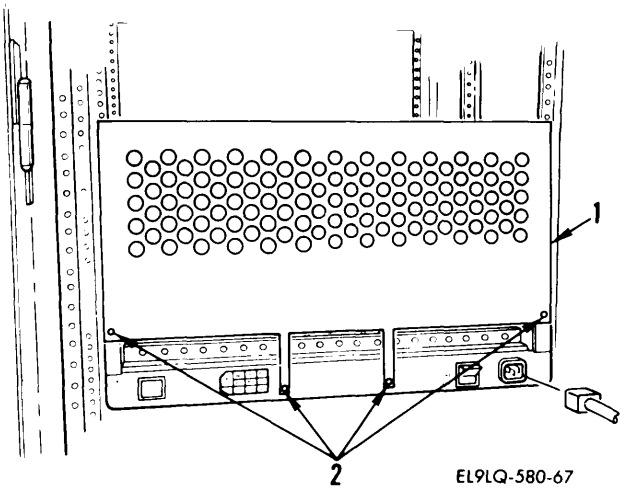
NOTE

This procedure is used to replace any of 13 CCAs contained in digital computer assembly 1A11.

REMOVAL

a. Open left rear cabinet door,

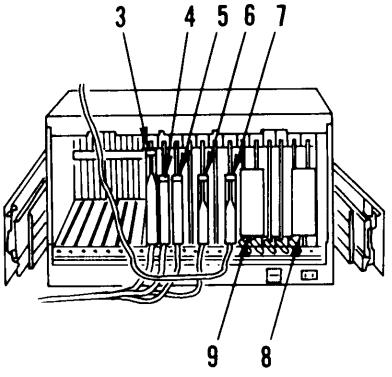
b. Remove rear panel (1) by removing four screws (2).



c. If CCA has connector (3, 4, 5, 6, or 7) installed, disconnect connector.

d. If removing CCA A1 or A2, remove frontplane (8).

e. If removing CCA A5 or A6, remove frontplane (9).



EL9LQ-580-66

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

f. Comply with ESD procedures for CCAs (para 2-21).

g. On CCA, loosen screw and move retainer clear of CCA; release two thumb levers and remove CCA by pulling CCA straight out.

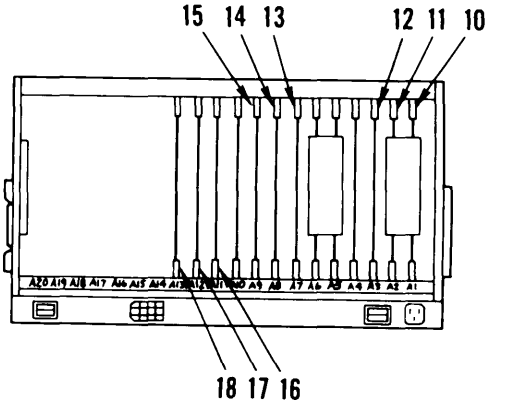
INSTALLATION

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

h. Comply with ESD procedures for CCAs (para 2-21).

i. If required, set address select switches per address selector switch matrix.



EL9LQ-580-64

ADDRESS SELECTOR SWITCH MATRIX FOR COMPUTER ASSEMBLY 13231746

CCA	ITEM	NOMENCLATURE	SWITCH CODE SELECT									
			1	2	3	4	5	6	7	8	9	10
A1	10	Control Store (U1)	C	C	C	O	O	O	C	O	-	-
A1	10	Control Store (U0201)	O	O	C	C	C	C	C	C	O	C
A2	11	Sequencer (U0204)	C	C	C	C	C	-	-	-	-	-
A3	12	Data Path (U0101)	O	O	O	C	C	O	C	C	-	-
A7	13	HPIB (U1)	O	O	C	O	C	O	O	O	-	-
A7	13	HPIB (U144)	O	C	C	C	C	C	O	C	-	-
A8	14	ASIC (U1)	C	C	C	O	C	C	C	C	-	-
A8	14	ASIC (U21)	O	O	O	O	C	C	C	C	-	-
A9	15	IEEE Interface (U1)	C	O	C	O	O	C	C	C	-	-
A11	16	HPIB (U1)	O	O	C	O	O	O	C	C	-	-
A11	16	HPIB (U16)	O	C	C	C	C	C	C	O	-	-
A12	17	Parallel Interface (U1)	O	C	O	C	C	C	C	C	-	-
A13	18	Buffer (U1)	C	C	C	O	O	O	O	O	-	-

C = Closed
O = Open

j. Position CCA in line with card guides, insert CCA and Secure with thumb levers, retainer, and retainer screw.

NOTE

Cable connectors are connected to CCAs A7, A9, A11, A12, and A13.

k. Ensure the following connectors are installed:

W7	P3 (3)	to A13 (17) J1
W7	P2 (4)	to A12 (16) J1
HPIB	P2 (5)	to A11 (15) J1
WP	P2 (6)	to A9 (14) J1
HPIB	P1 (7)	to A7 (12) J1

l. If CCA A1 or A2 were replaced, install frontplane (8).

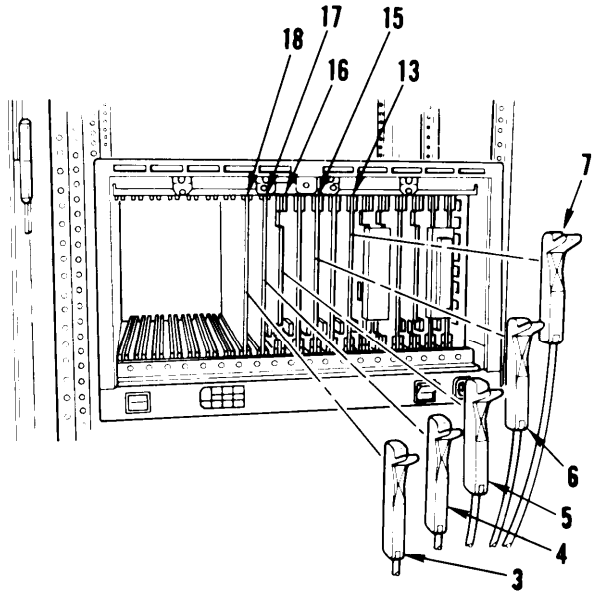
m. If CCA A5 or A6 were replaced, install frontplane (9).

n. Ensure priority jumper CCA A10 (19) is installed.

o. Install rear panel.

p. Close cabinet door.

END OF TASK



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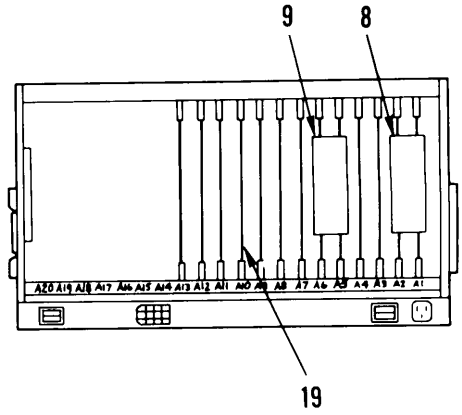


EL9LQ-580-65

5. CABLE ASSEMBLY HP 12009-60007 REPLACEMENT

REMOVAL

a. Open left rear cabinet door.

b. On rear panel of digital computer assembly (1), loosen two screws (2) and swing open left (3) and right (4) panel doors.

c. Disconnect the following connectors:

P2 (5) from A3J1
HP-IB connector (6) from A6J2
P1 (7) from A5J1
P3 (8) from A11J1

d. Close right and left panel doors.

e. Remove HP 12009-60007 cable assembly (9), by doing the following steps:

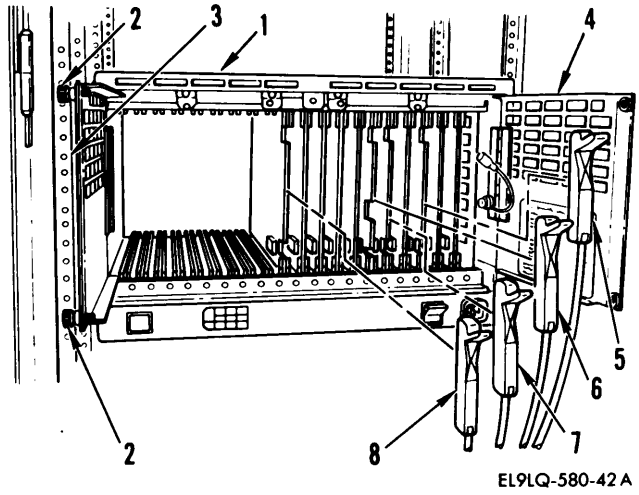
(1) On cabinet structure (10), remove screw (11), lockwasher (12), washer (13), and clamp (14).

(2) On cable carrier (15), remove screws (16), lockwasher (17), washers (18), clamps (19), and nuts (20).

(3) Clip lacing tape (21) and separate HP 12009-60007 cable assembly from rest of cables (22).

(4) Clip lacing tape (21) from connector bundle and remove protective covering (23).

(5) Loosen two screws (24), disconnect connector P1 (25) from connector J1 (26), and remove HP 12009-60007 cable assembly.



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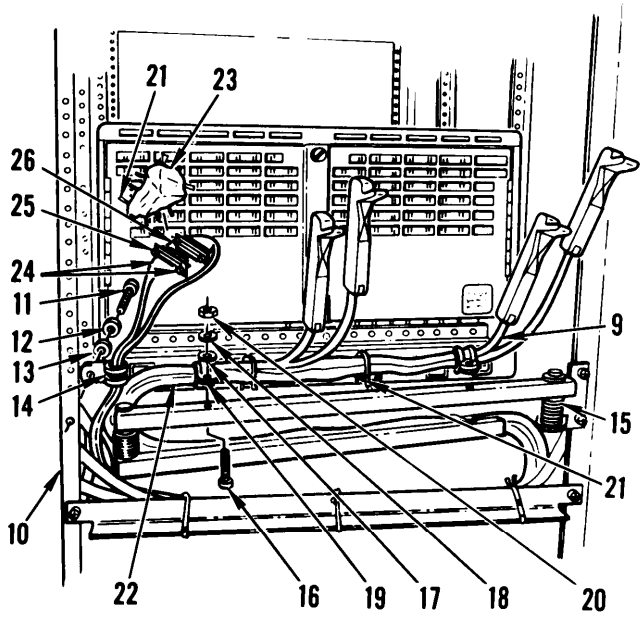


EL9LQ-580-41

INSTALLATION

f. Install cable assembly in reverse order of removal.

END OF TASK

Section VIII. DAYSIDE TEST BENCH 2A1 MAINTENANCE PROCEDURES

2-41. DAYSIDE TEST BENCH CABINET REPAIR 2-41

This task cover replacement of:

Para	Item
1.	Panels
2.	Access plates
3.	Inner module indicating desiccator
4.	Optical signal analyzer indicating desiccator
5.	Laser cover assembly lamp

INITIAL SETUP

Material (appendix C)

Desiccant (Item 15)

Personnel Required

39B ATE Repairer

Equipment Condition

power removed (para 2-24.1)

1. PANELS REPLACEMENT

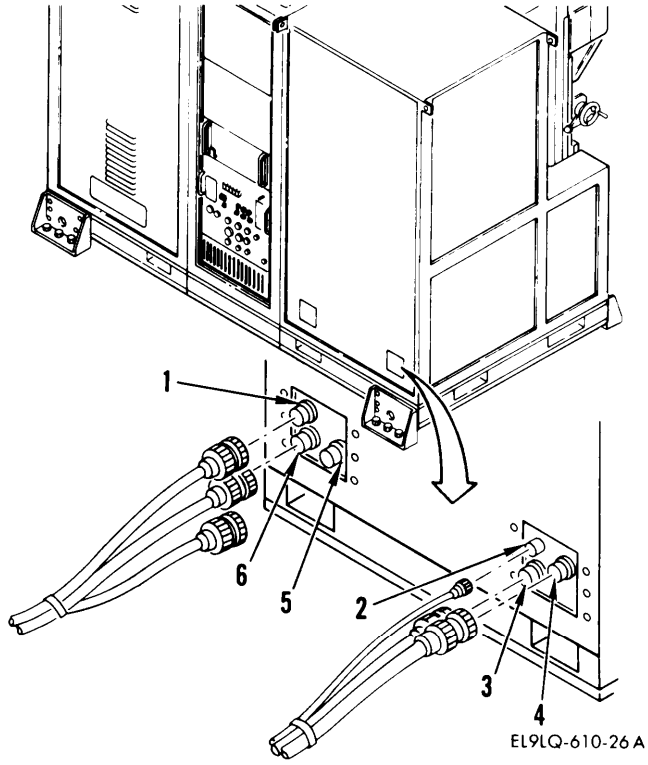
NOTE

This procedure is for removal of all nine cabinet panels. Do only steps necessary to remove desired panels.

REMOVAL

a. Disconnect the following connectors from rear of cabinet:

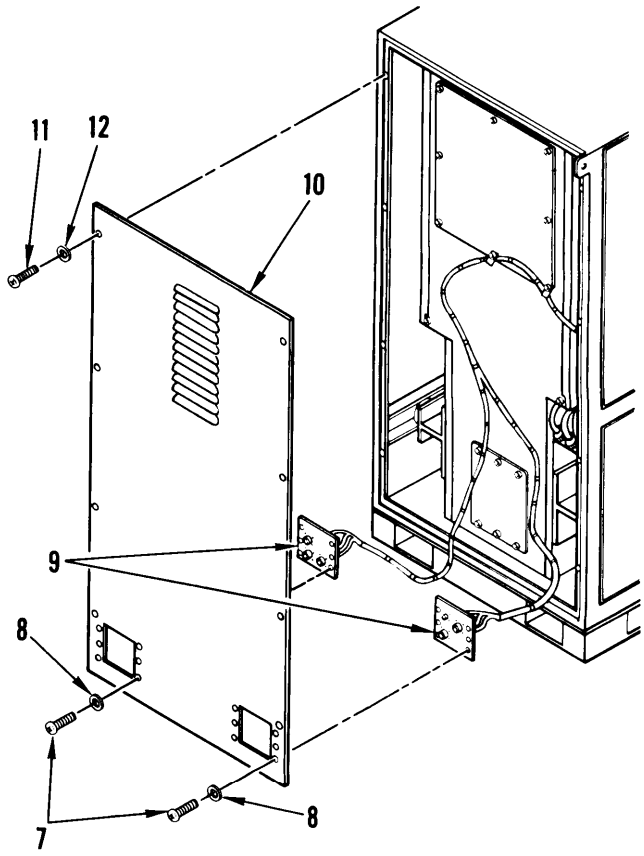
W29P1 from connector J2 (1)
W24P1 from connector J6 (2)
W28P2 from connector J1 (3)
W27P2 from connector J3 (4)
W6P2 from connector J5 (5)
W30P2 from connector J4 (6)



EL9LQ-610-26A

b. Remove 12 screws (7) and washers (8) securing cable entry panels (9) to rear panel (10).

c. Remove eight screws (11) and washers (12) securing rear panel to cabinet. Remove rear panel (10).



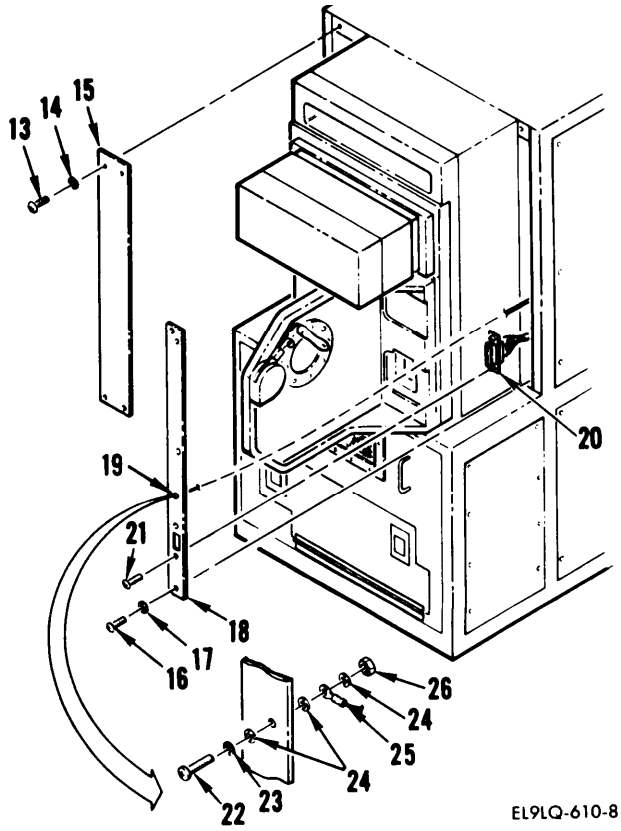
EL9LQ-610-7

d. Remove four screws (13) and washers (14) securing upper left panel (15) to front of cabinet. Remove panel.

e. Remove four screws (16) and washers (17) securing upper right panel (18) to front of cabinet. Pull panel away from cabinet to gain access to wire terminal E4 (19) and connector 2A1W45-J1 (20).

f. Remove two screws (21) securing connector 2A1W45-J1 to panel.

g. Remove screw (22), lockwasher (23), three washers (24), wire (25), and nut (26). Remove panel.



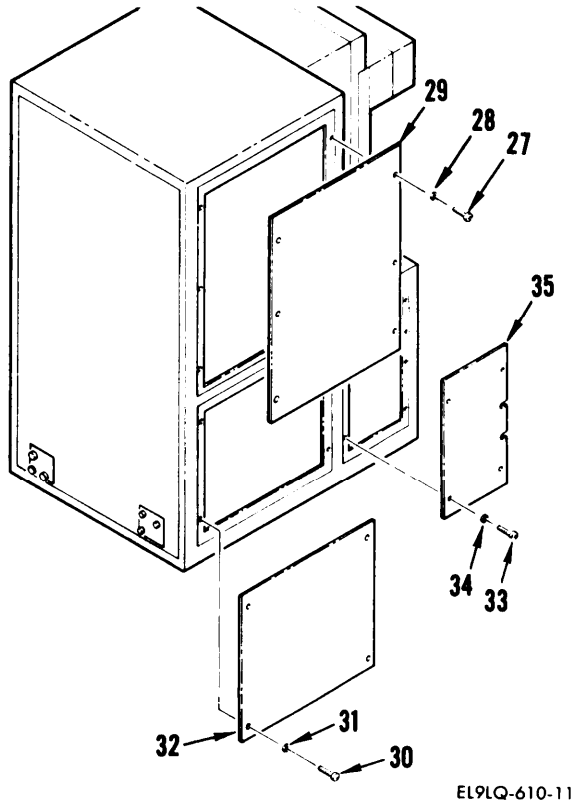
EL9LQ-610-8

h. Remove six screws (27) and washers (28) securing upper panel (29) to left side of cabinet. Remove panel.

i. Remove four screws (30) and washers (31) securing lower rear panel (32) to left side of cabinet. Remove panel.

j. Remove four screws (33) and washers (34) securing lower front panel (35) to left side of cabinet. Remove panel.

k. Remove dayside test bench (para 5-9).



EL9LQ-610-11

l. Remove six screws (36) and washers (37) securing upper panel (38) to right side of cabinet. Remove panel.

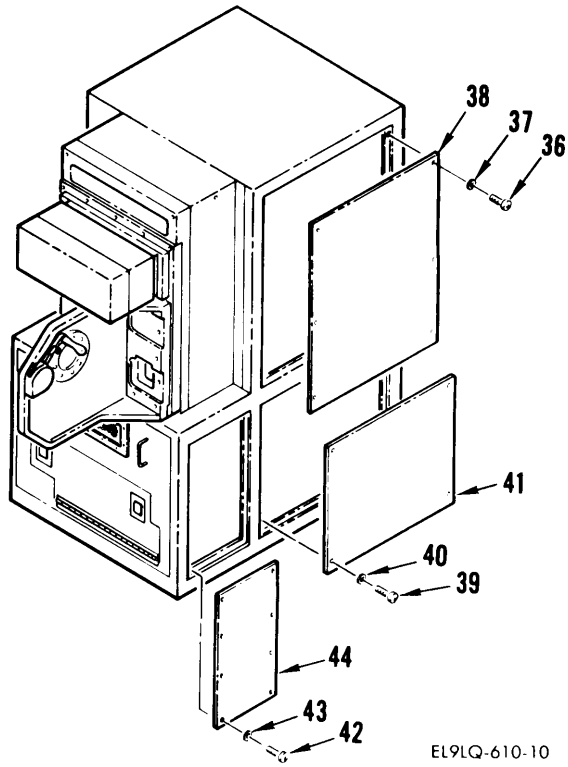
m. Remove four screws (39) and washers (40) securing lower rear panel (41) to right side of cabinet. Remove panel.

n. Remove four screws (42) and washers (43) securing lower front panel (44) to right side of cabinet. Remove panel.

INSTALLATION

o. Install panel in reverse order of removal.

END OF TASK



2. ACCESS PLATES REPLACEMENT

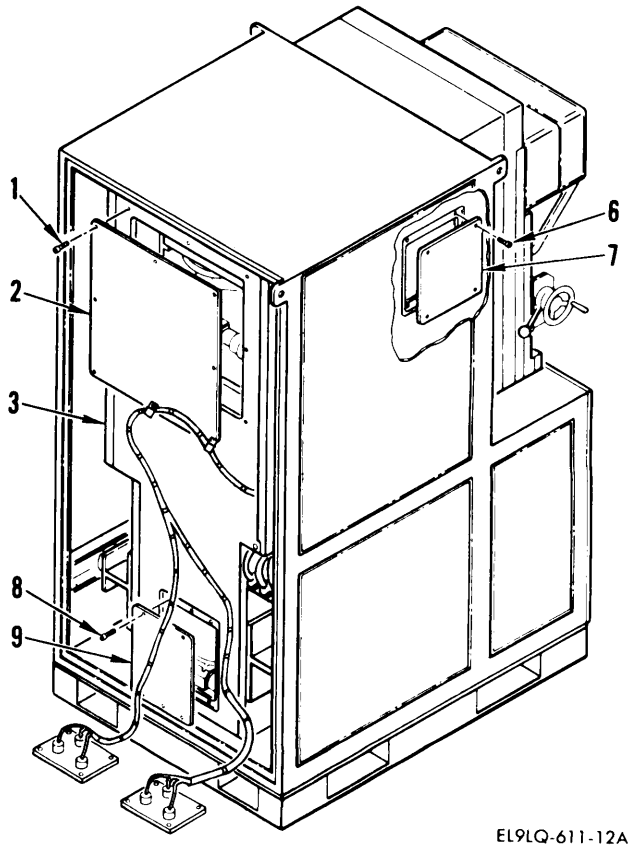
NOTE

- This procedure is for removal of all four access plates. Do only steps necessary to remove desired plates.
- To remove access plates on side and back of inner module, it is necessary to first remove cabinet panels. Refer to 1 above.

REMOVAL

a. Remove eight screws (1) and two cable clamps securing upper access plate (2) to rear of inner module (3). Remove plate.

b. Deleted.



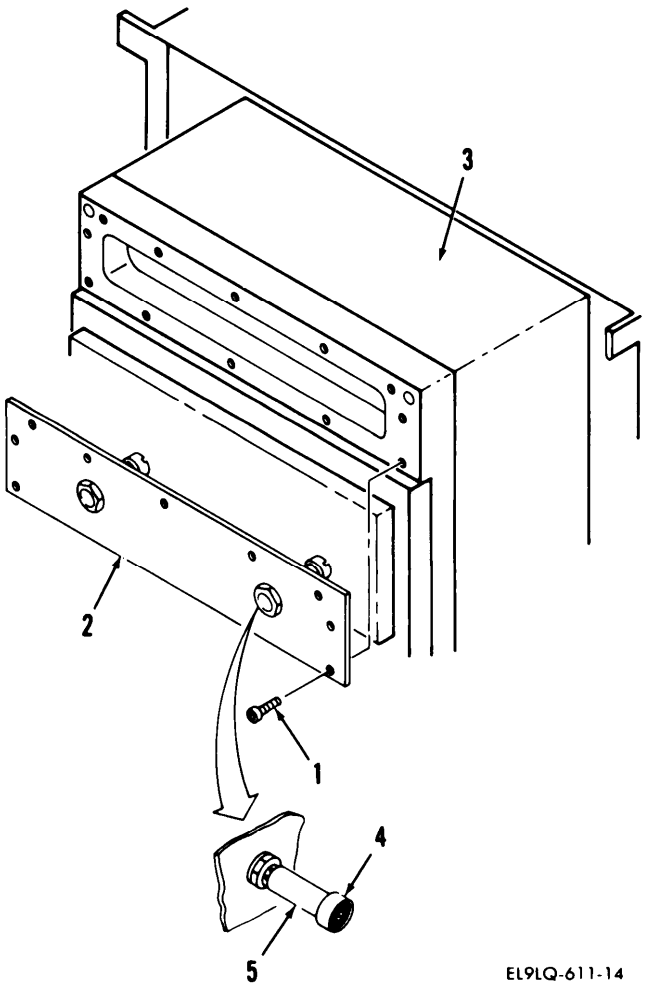
c. Remove four screws (6) securing access plate (7) to left side of inner module. Remove plate.

d. Remove six screws (8) securing lower access plate (9) to rear of inner module. Remove plate.

INSTALLATION

e. Install in reverse order of removal.

END OF TASK



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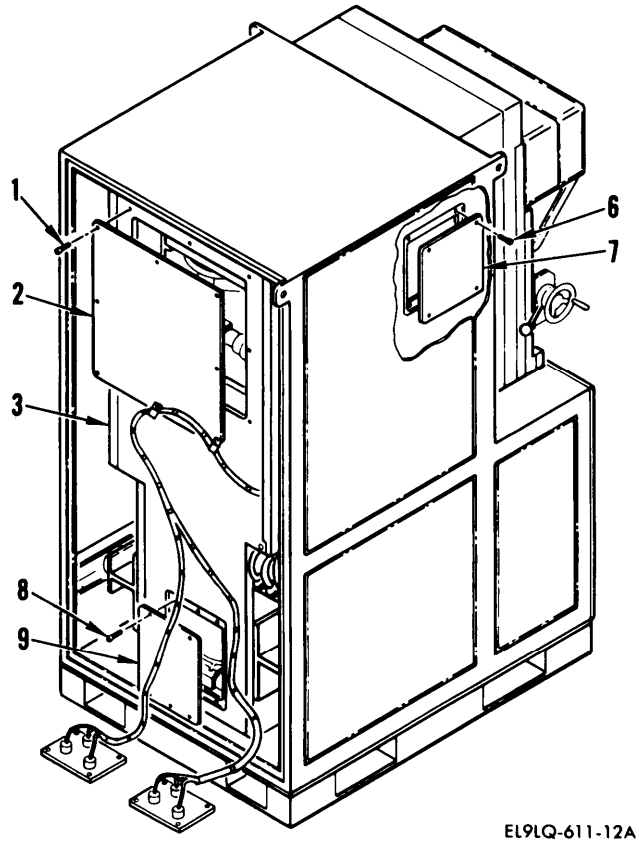

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3. INNER MODULE INDICATING DESICCATOR REPLACEMENT

REMOVAL

a. Remove 12 screws (1) that secure front access plate (2) to inner module (3).

b. Remove front access plate and place on work bench.

co Remove end cap (4) with paper filter from desiccators (5).

d. Remove desiccant from desiccators.

INSTALLATION

e. Install in reverse order of removal.

END OF TASK

4. OPTICAL SIGNAL ANALYZER INDICATING DESICCATOR REPLACEMENT

REMOVAL

a. Open optical signal analyzer access door (1) and locate indicating desiccator (2).

b. Remove four screws (3) and washers (4) that secure desiccator plate (5) to analyzer mounting plate assembly.

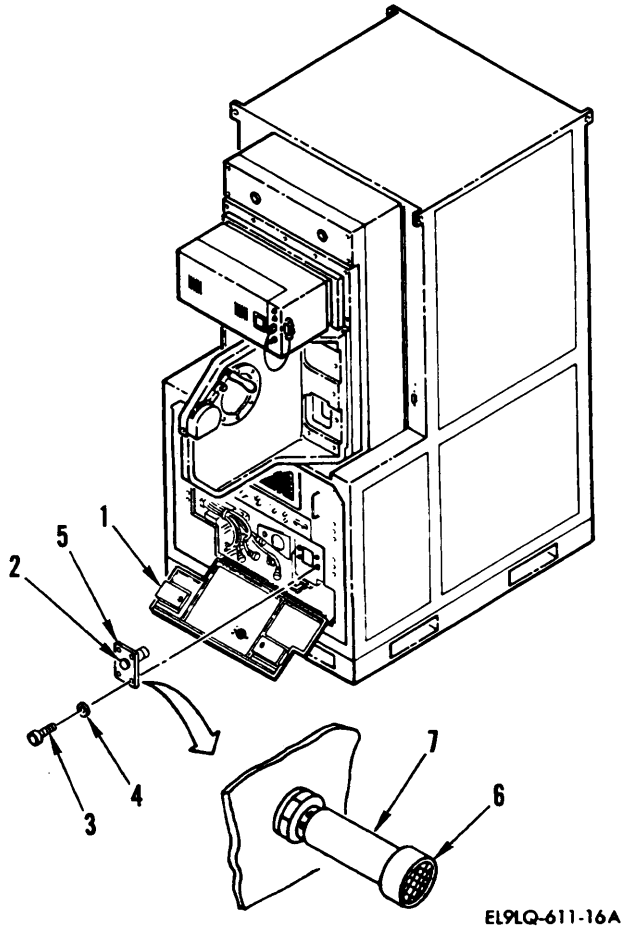
c. Remove desiccator plate and place on work bench.

d. Remove end cap (6) with paper filter from desiccator (7) and remove desiccant.

INSTALLATION

e. Install in reverse order of removal.

END OF TASK



5. LASER COVER ASSEMBLY LAMP REPLACEMENT

REMOVAL

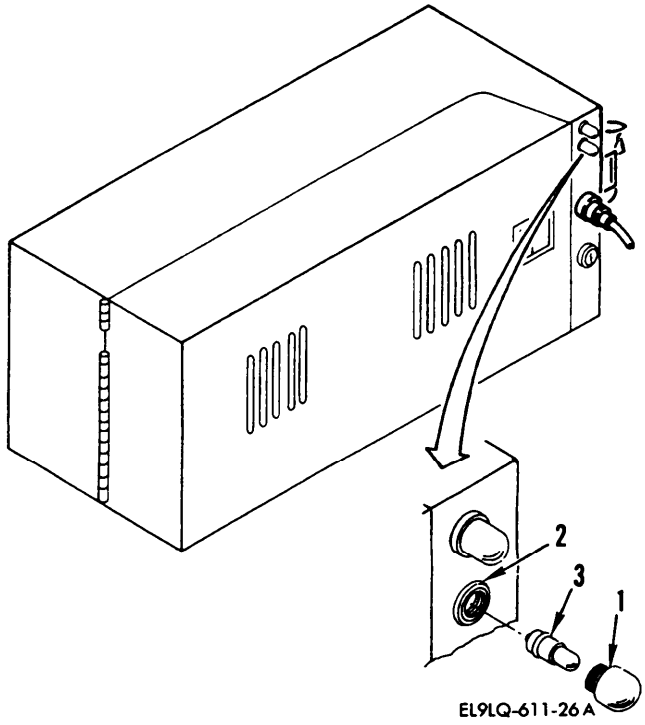
a. Turn indicator light lens (1) counterclockwise and remove from lampholder (2).

b. Pry lamp (3) out of lens.

INSTALLATION

c. Install in reverse order of removal.

END OF TASK



2-41.1 RADIOMETER ASSEMBLY 2A1A2A3 REPLACEMENT

INITIAL SETUP

Personnel Required

39B ATE Repairer assistant
One assistant

Tools Required

5/32-in hex head ball driver

Equipment Conditions

Cabinet rear panel removed (para 2-41)
Inner module rear access plate removed (para 2-41)
Left side upper panel removed (para 2-41)
Left side access panel removed (para 2-41)
Upper left front panel removed (para 2-41)

REMOVAL

CAUTION

Use special care when working near optical surfaces. Avoid touching or contaminating optical surfaces.

1. Place cardboard over opening (1) to protect mirrors from falling objects.

2. Disconnect the following cables:

Key No.	Cable	From
(2)	2A1A2W40P5	2A1A2A3J2
(3)	2A1A2W40P13	2A1A2A3J3
(4)	2A1A2A3W22P2	2A1A2A3S2-C

CAUTION

Grasp radiometer firmly while removing mounting screws to prevent it from falling into optics cavity.

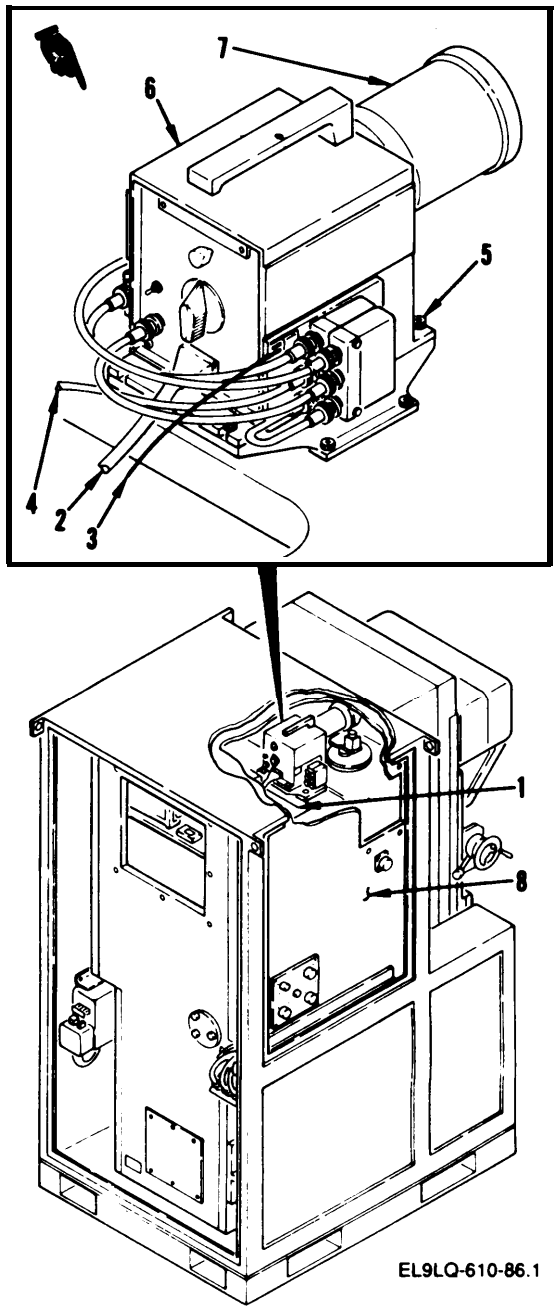
3. Remove four capscrews (5).

4. Rotate radiometer (6) so narrow beam adapter (7) is facing side panel (8).

5. Rotate narrow beam adapter counterclockwise and remove from radiometer.

6. Remove radiometer through side panel.

7. Replace narrow beam adapter onto radiometer. Rotate it clockwise until snug.



INSTALLATION

CAUTION

Use special care to prevent accidental change of attenuation switch positions during installation. Failure to have attenuation switches set correctly could cause erroneous test results.

8. Install radiometer in reverse order of removal.

9. Ensure that the external switches are set to the positions indicated:

Switch	Position
EXTERNAL LOAD RESISTANCE	OPEN
APERATURE MULTIPLIER	10
INDICATOR/SCOPE	SCOPE

END OF TASK

Section IX. TEST CONSOLE TEST BENCH 2A2 MAINTENANCE PROCEDURES

2-42. TEST CONSOLE TEST BENCH CABINET REPAIR 2-42

INITIAL SETUP

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

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2-42. TEST CONSOLE TEST BENCH CABINET REPAIR (cont)

NOTE

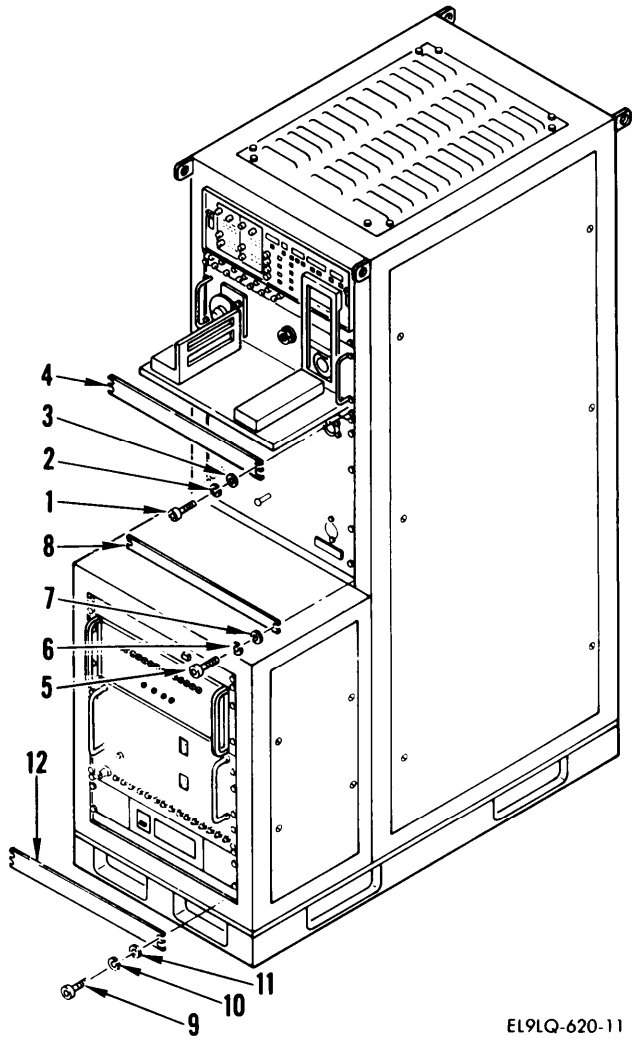
- This procedure is for removal of all panels. Perform only the steps necessary to remove desired panels.
- To remove side panels, it is necessary to move Dayside Test Bench (para 5-9) and Nightside Test Bench (para 5-36) away from Test Console Test Bench.

REMOVAL

1. Remove four screws (1), lockwashers (2), and washers (3) securing panel (4) to cabinet.

2. Remove two screws (5), lockwashers (6), and washers (7) securing panel (8) to cabinet.

3. Remove four screws (9), lockwashers (10), and washers (11) securing panel (12) to cabinet.



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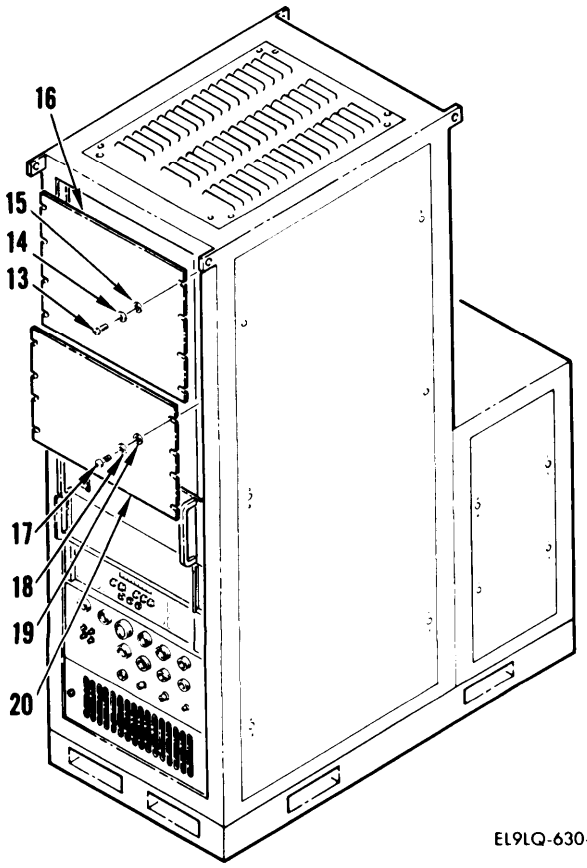

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4. Remove eight screws (13), lockwashers (14), and washers (15) securing panel (16) to cabinet. Remove panel.

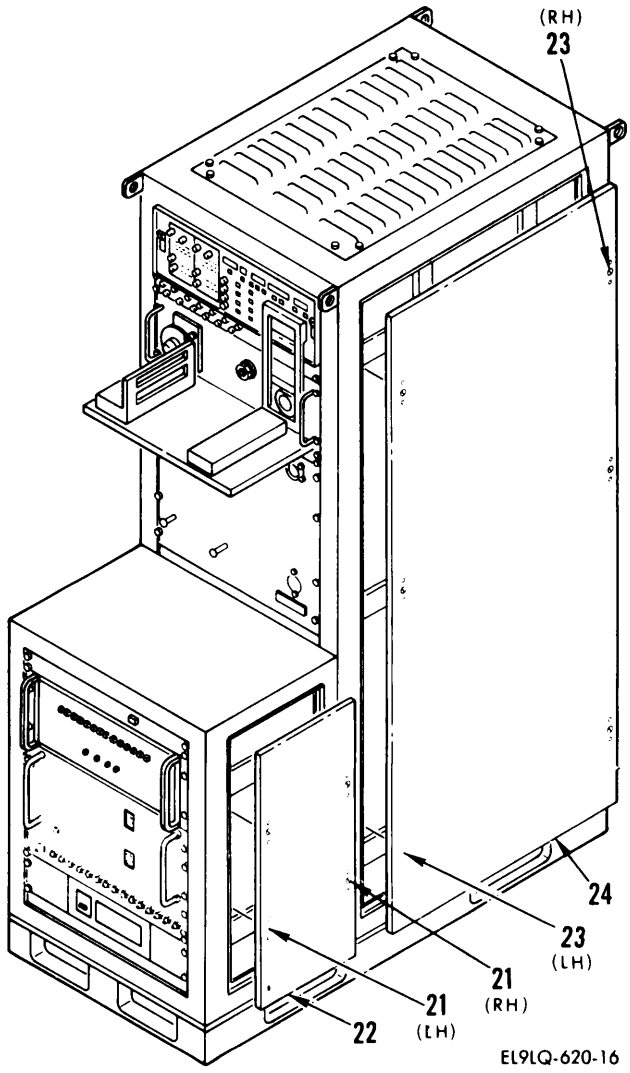
5. Remove eight screws (17), lockwashers (18), and washers (19) securing panel (20) to cabinet. Remove panel.

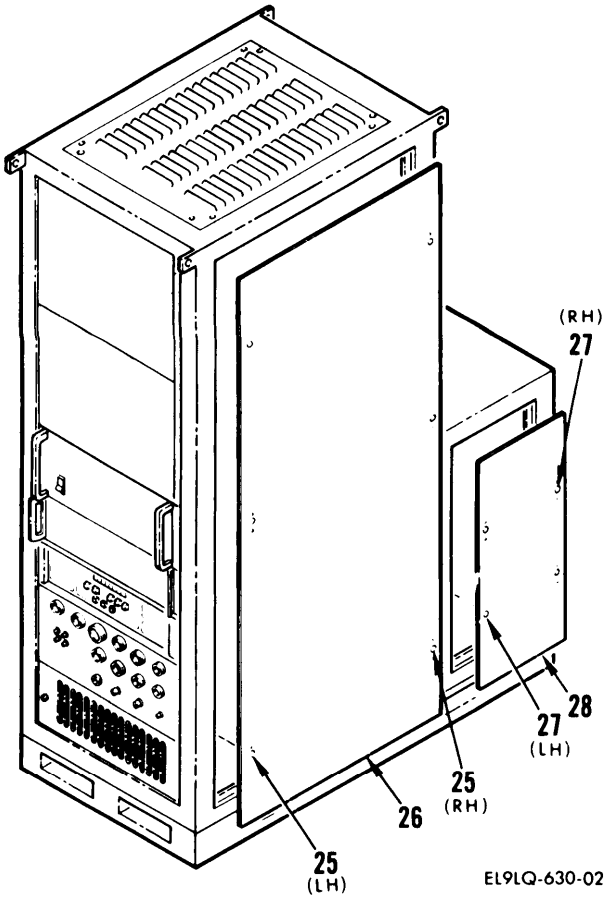
NOTE

The left screws on each of four side panels have left hand threads and must be turned CW to loosen.

6. Loosen four screws (21) securing panel (22) to cabinet. Remove panel.

7. Loosen six screws (23) securing panel (24) to cabinet. Remove panel.





8. Loosen six screws (25) securing panel (26) to cabinet. Remove panel.

9. Loosen four screws (27) securing panel (28) to cabinet. Remove panel.

INSTALLATION

10. Install in reverse order of removal.

END OF TASK

2-42.1 TEST CONSOLE TEST BENCH TABLE EXTENSION AND BRACKET REPLACEMENT

INITIAL SETUP

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (Para 2-24.1)

REMOVAL

1. Remove two self-locking pins (1).
2. Remove two cotter pins (3), washers (4), and pins (5); remove table extension (2).
3. Remove four screws (6), washers (7), and remove brackets (8).
4. Remove four screws (9) and washers (10); remove two brackets (11).

INSTALLATION

5. Install table extension in reverse order of removal.

END OF TASK

2-43. PROGRAMMABLE DIGITIZER ASSEMBLY 2A2A1 REPLACEMENT 2-43

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

39B ATE Repairer
One assistant

Equipment Conditions

Power removed (para 2-24.1)
Optical signal generator removed (para 2-46)
Top rear access panel removed (para 2-42)

FOLLOWUP

Optical signal generator installation (para 2-46)
Top rear access panel installation (para 2-42)

REMOVAL

NOTE

Programmable amplifiers and programmable digitizer must be replaced as a matched set due to calibration requirements.

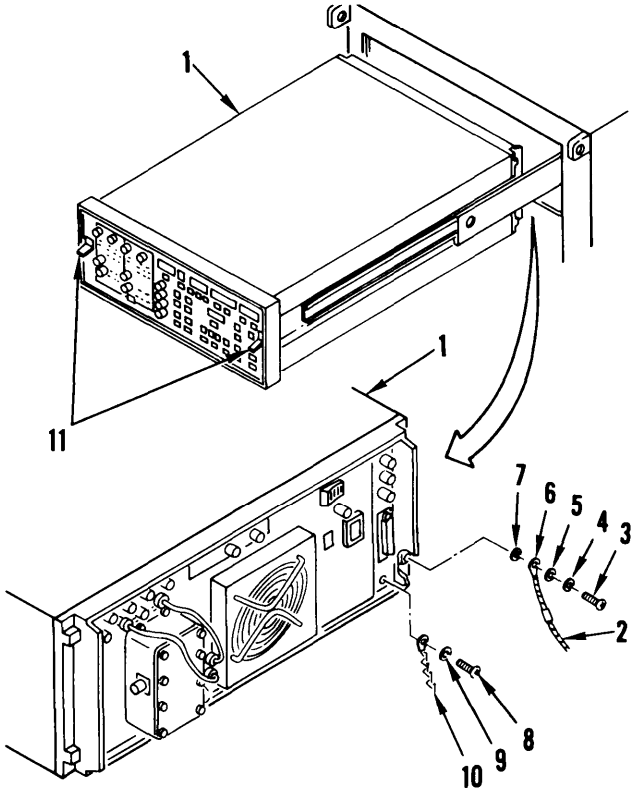
1. On rear panel of programmable digitizer (1), disconnect all cables.

NOTE

If the programmable digitizer is to be replaced, the ground lead will have to be moved to the replacement assembly. If the same programmable digitizer is installed, use ground lead quick disconnect and omit step 3, 8 and 8.1.

2. Disconnect quick disconnect ground lead (2).

3. Remove screw (3), lockwasher (4), washer (5), ground lead (6), and washer (7).



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4. Remove screw (8), lockwasher (9), and chain (10).

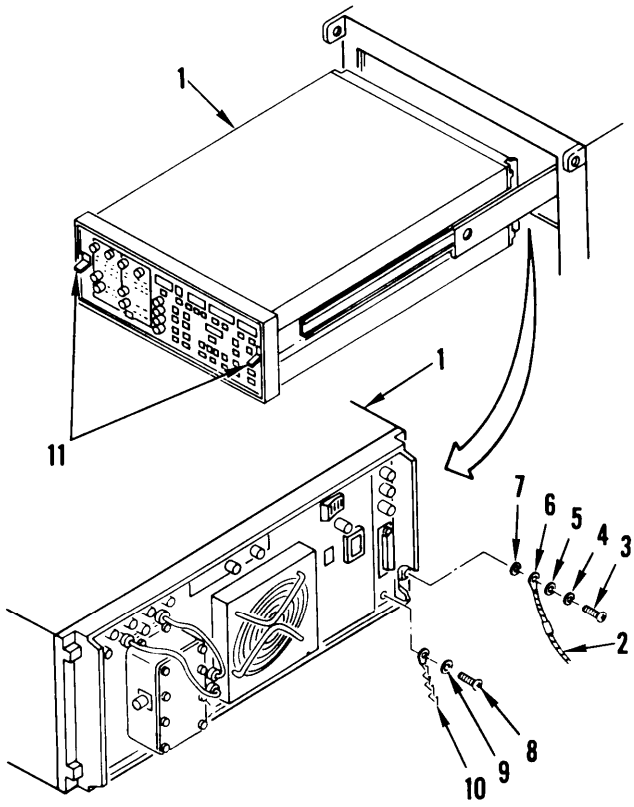
5. Lift two lock levers (11) and Pull out programmable digitizer assembly (1).

6. Deleted.

WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.



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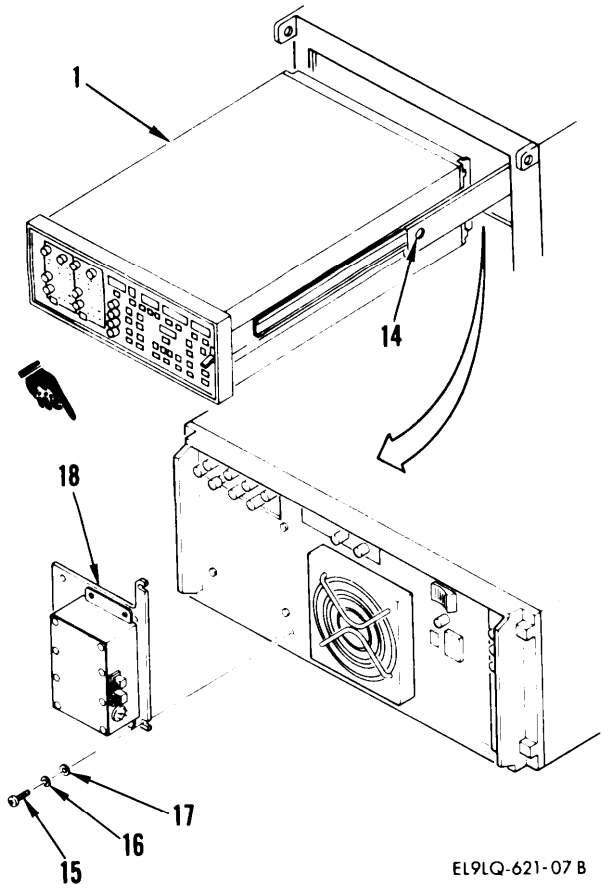

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7. Using a person on each side of programmable digitizer assembly, depress slide locks (14) and carefully remove programmable digitizer from slide.

8. Remove three screws (15), washers (16), lockwashers (17) and mounting plate (18).

INSTALLATION

NOTE

Before installing replacement unit, address selector switches must be checked for proper setting.

9. Loosen six screws (19) and remove cover (20).

10. Remove two screws (21) and plate (22).

CAUTION

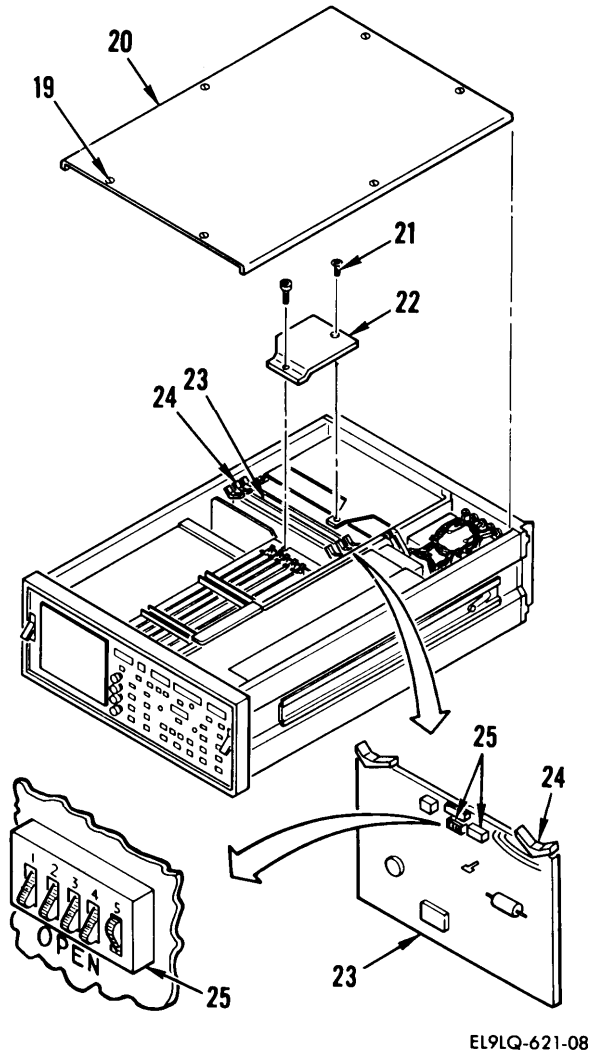
This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies

11. Comply with ESD procedures for CCAs (para 2-21).

12. Lift circuit card assembly (23) far enough to access address selector switches (25) by pulling tabs (24).

13. Locate two address selector switches (25). Set switches as follows:

Switch	Position
1	closed
2	closed
3	closed
4	closed
5	OPEN



14. Install circuit card assembly (23).

15. Install plate (22) with two screws (21).

16. Install cover (20) and tighten six screws (19).

17. Install programmable digitizer assembly in reverse order of removal. Connect cables as listed below:

W21P3	to	EXTERNAL CLOCK IN
W10P1	to	EXTERNAL CLOCK OUT
W22P4	to	RT. TRIGGER IN
W27P2	to	4
P4	to	IEEE 488 BUSS
W28P2	to	3
W17P3	to	J1
W20P4	to	J2
W22P2	to	J3
W21P1	to	J4
W27P1	to	Y
W28P1	to	x
115 vac	to	cord

END OF TASK

2-44. PROGRAMABLE DIGITIZER 2A2A1 REPAIR 2-44

This task covers fuse replacement.

INITIAL SETUP

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

FUSE REPLACEMENT

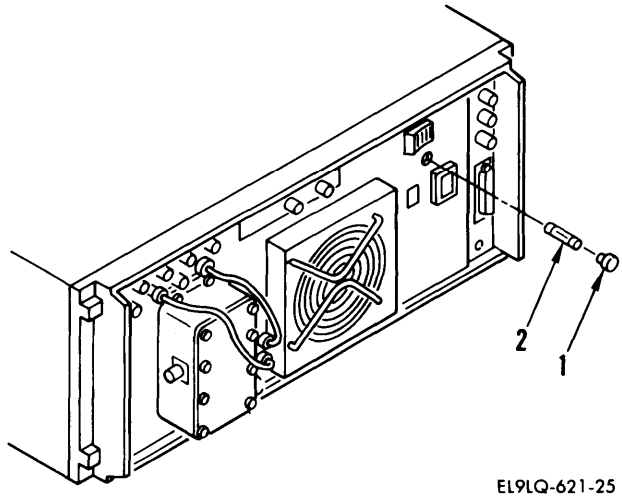
REMOVAL

a. Remove upper rear access panel (para 2-42).

b. Remove fuse holder (1) and defective fuse (2).

INSTALLATION

c. Install in reverse order of removal.



EL9LQ-621-25

END OF TASK

2-45. INTERFACE ASSEMBLY 2A2A1A1 REPLACEMENT

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Conditions

Power removed (para 2-24.1)
Top rear access panel removed (para 2-42)

FOLLOWUP

Top rear access panel installation (para 2-42)

REMOVAL

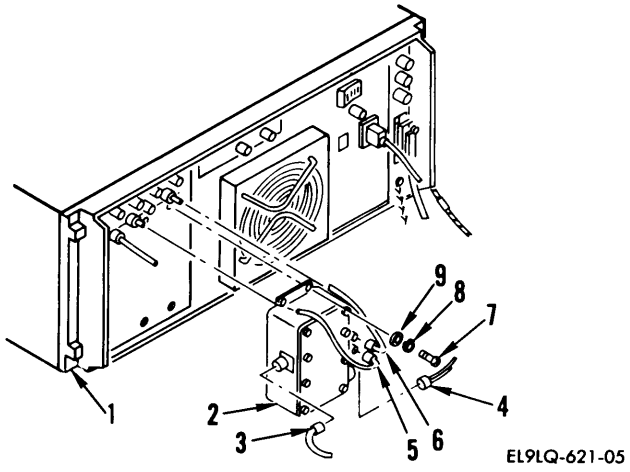
1. On rear panel of programmable digitizer (1), disconnect the following cables from interface assembly (2):

   W17P3 from J1 (3)
   W20P4 from J2 (4)
   W22P2 from J3 (5)
   W21P1 from J4 (6)

2. Remove four screws (7), lockwashers (8), washers (9), and interface assembly.

INSTALLATION

3. Install in reverse order of removal.



END OF TASK

2-46. OPTICAL SIGNAL GENERATOR (OSG) ASSEMBLY 2A2A3 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper (Item 35)
Zinc chromate primer (Item 40)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer
One assistant

Equipment Conditions

Power removed (para 2-24.1)
Blank panel beneath OSG removed (para 2-42)
Top rear access panel removed (para 2-42)

FOLLOWUP

Blank panel beneath OSG installation (para 2-42)
Top rear access panel installation (para 2-42)

REMOVAL

1. On rear panel of OSG (1), disconnect the following cables:

   W13P2 from J1 (2)
   W17P2 from J2 (3)

   NOTE

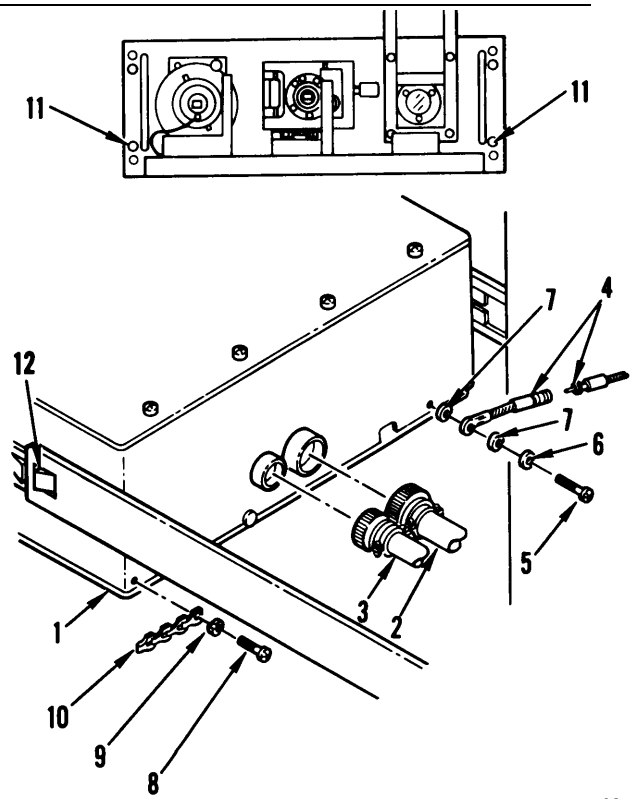
   If the OSG is to be replaced, the ground lead will have to be moved to the replacement assembly. If the same OSG is installed, use ground lead quick disconnect and omit steps 3, 7, and 9.

2. Disconnect ground lead quick disconnect (4).

3. Remove screw (5), lockwasher (6), two washers (7), and ground lead (4).

4. Remove screw (8), lockwasher (9), and chain (10).

5. Loosen four captive screws (11) on front of OSG (1) and pull out OSG.



EL9LQ-623-02A

WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

6. Using a person or each side of OSG, depress slide locks (12) and remove OSG.

INSTALLATION

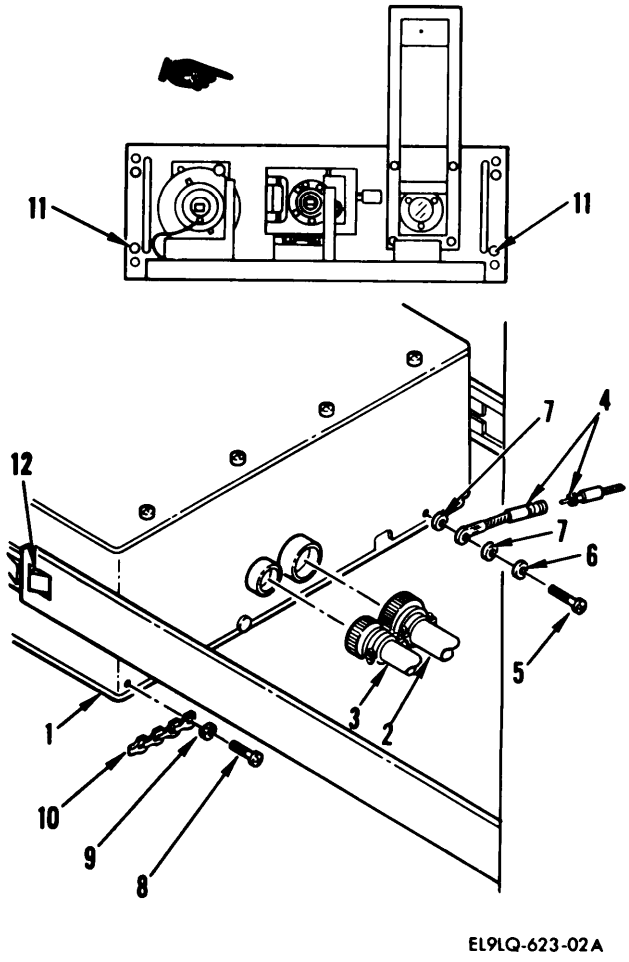
7. prepare surface and hardware (4 thru 7) for application of zinc chromate primer (para 2-19).

CAUTION

Be sure not to pinch cables when pushing OSG in on slides.

8. Install OSG in reverse order of removal.

9. Apply thin coat of zinc chromate primer over bonded area and hardware (4 thru 7).



EL9LQ-623-02A

END OF TASK

2-47. DELETED 2-47

2-48. MULTIPROGRAMMER ASSEMBLY 2A2A6 REPLACEMENT

INITIAL SETUP

Tools

Goggles
Rubber apron
Conductive wrist strap
Conductive work bench mat

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 40)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

396 ATE Repairer
One assistant

Equipment Condition

Power removed (para 2-24.1)

REMOVAL

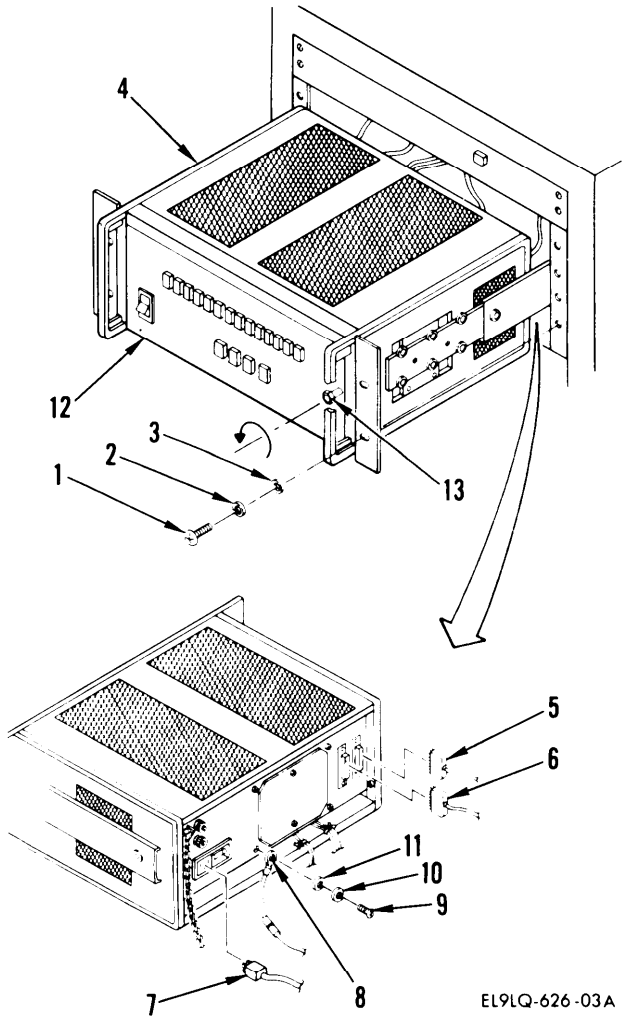
1. Remove four screws (1), lockwashers (2), washers (3), and pull out multiprogrammer assembly (4).
2. On rear panel of multiprogrammer assembly, disconnect the following cables:

   W7P3 from DATA IN J1 (5)
   W25P3 from DATA OUT J2 (6)
   115 vac cord (7)

   NOTE

   If the multiprogrammer assembly is to be replaced the ground lead will have to be moved to the replacement assembly. If the same multiprogrammer is installed use ground lead quick disconnect and omit steps 4, 25, 26, and 27.

3. Disconnect quick disconnect ground lead (8).
4. Remove screw (9), lockwasher (10), washer (11), and ground lead (8).
5. Open front access door (12) by turning screwlock (13) counterclockwise.



2-48. MULTIPROGRAMMER ASSEMBLY 2A2A6 REPLACEMENT (cont) 2-48

6. Loosen four screws (14) and remove lower panel (15) to allow removal of circuit card connectors.

7. Disconnect 11 circuit card assembly (CCA) connectors (16) and remove from rear of multiprogrammer.

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use precautionary procedures when touching, removing or inserting circuit card assemblies.

8. Comply with ESD procedures for CCAs (para 2-21).

9. Slide out two CCAs (17) to access terminal boards.

10. Tag wires and remove five screws (18) and wires (19) from each CCA terminal board.

11. Slide two CCAs (17) into multiprogrammer assembly.

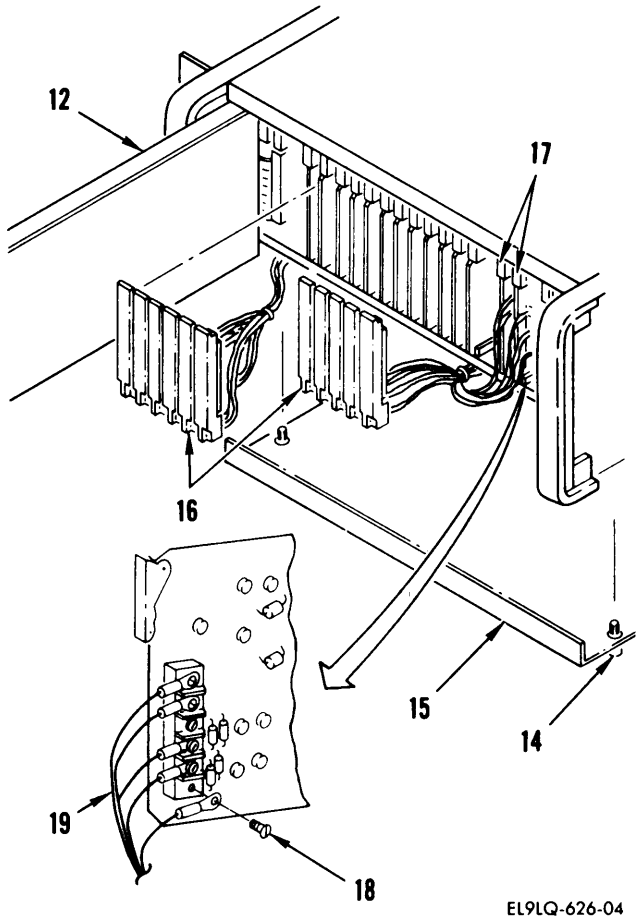
12. Close access door (12).

13. Remove nut (20), lockwasher (21), washer (22), and chain (23) from multiprogrammer assembly.

14. Depress slide locks (24) and remove multiprogrammer assembly.

INSTALLATION

15. Lift multiprogrammer assembly (4) onto slides and push in until slide locks (24) snap into place.



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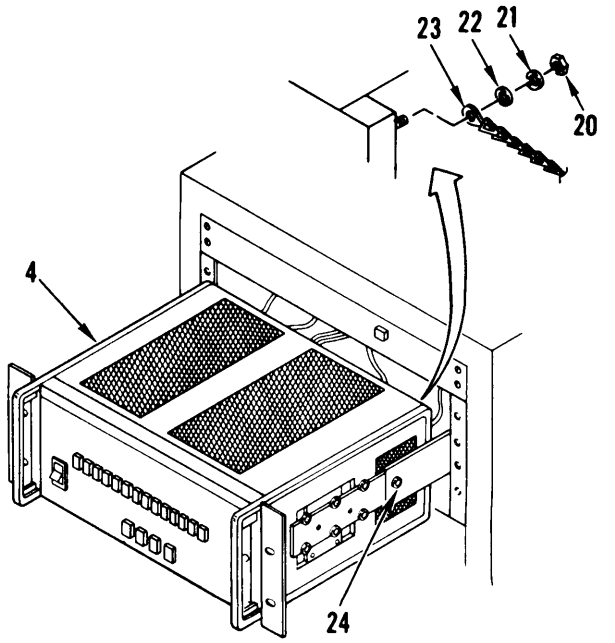

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2-48. MULTIPROGRAMMER ASSEMBLY 2A2A6 REPLACEMENT (cont)

16. Install chain (23), washer (22), lockwasher (21), and chain nut (20).

17. Open access door (12) and insert 11 CCA connectors (16) under multiprogrammer assembly to front panel.

18. On front panel, connect the following connectors:

Connector		CCA/Slot
W8P1	to	400
W8P2	to	401A
W8P3	to	402B
W8P4	to	403C
W8P6	to	4040
W8P7	to	405E
W9P5	to	406F
W9P6	to	407G
W9P7	to	408H
W9P8	to	409 I
W9P9	to	410J

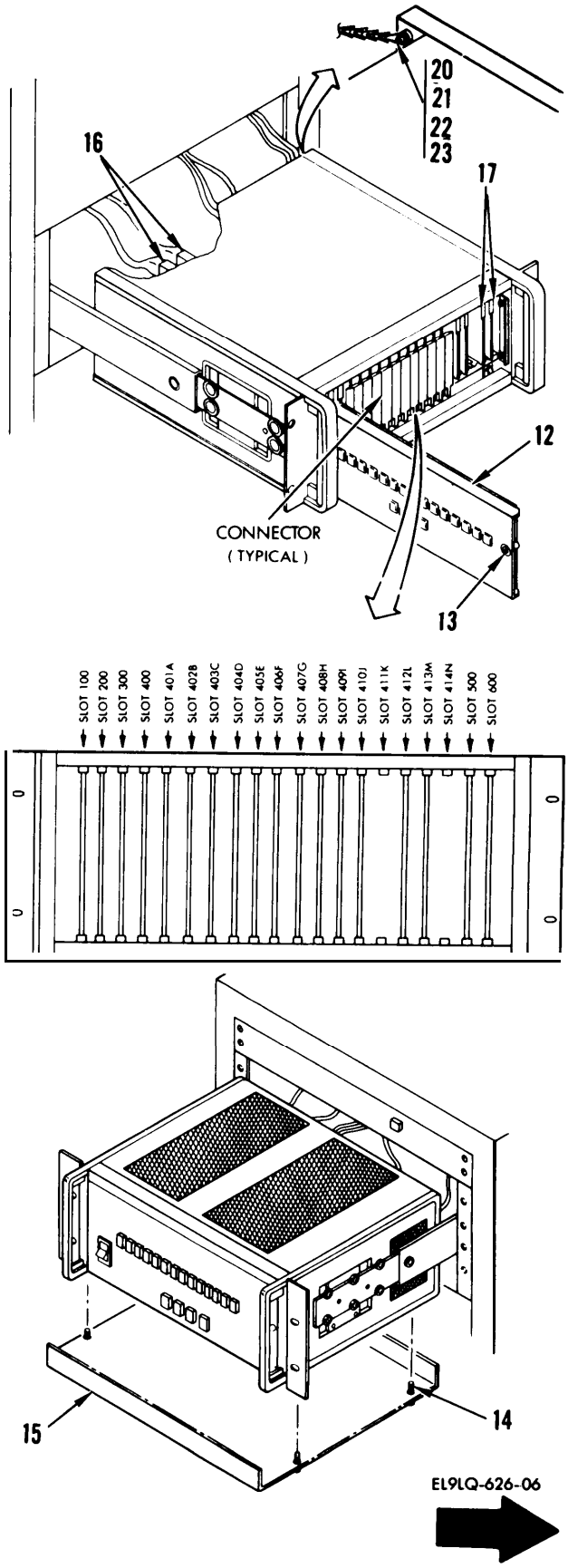
19. Use assistant to pull on cable carrier to provide slack while installing wires.

20. On two CCAs (17), connect the following wires:

Wire		CCA/Slot
W9E1	to	Terminal A 412L
W9E2	to	Terminal B 412L
W9E3	to	Terminal D 412L
W9E4	to	Terminal E 412L
W9E5	to	Terminal F 412L
W9E6	to	Terminal A 413M
W9E7	to	Terminal B 413M
W9E8	to	Terminal D 413M
W9E9	to	Terminal E 413M
W9E10	to	Terminal F 413M

21. Close access door (12) and turn screwlock (13) clockwise.

22. Install lower panel (15) and tighten four screws (14).



23. On rear panel of multiprogramner assembly, connect the following connectors:

    W7P3 to DATA IN J1 (5)
    W25P3 to DATA OUT J2 (6)
    115 vac cord (7)

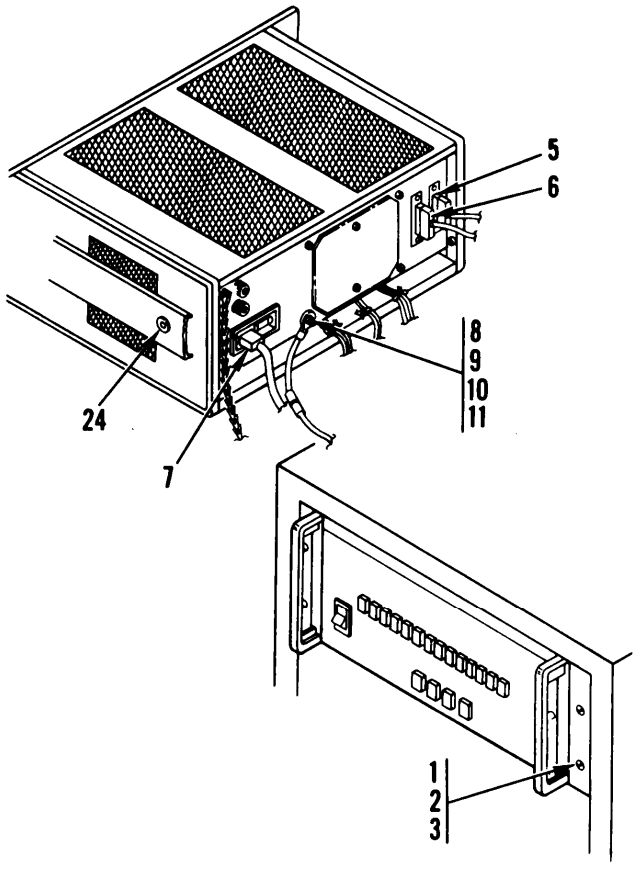
24. Prepare surface and hardware (8 thru 11) for application of zinc chromate primer (para 2-19).

25. Install ground lead (8) using screw (9), lockwasher (10), and washer (11).

26. Apply thin coat of zinc chromate primer over bonded area and hardware (8 thru 11).

27. Depress slide locks (24) and push multiprogrammer assembly into cabinet.

28. Install four screws (1), lockwashers (2), and washers (3).



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END OF TASK

2-49. MULTIPROGRAMMER ASSEMBLY 2A2A6 REPAIR

This task covers replacement of:

Para	Item
1.	Fuse
2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Personnel Required

39B ATE Repairer
One assistant

Equipment Condition

power removed (para 2-24.1)

1. FUSE REPLACEMENT

NOTE

To replace fuses F1, F2 or F3 located on rear panel refer to a below. To replace fuses located on VOLT REG CCA refer to b below.

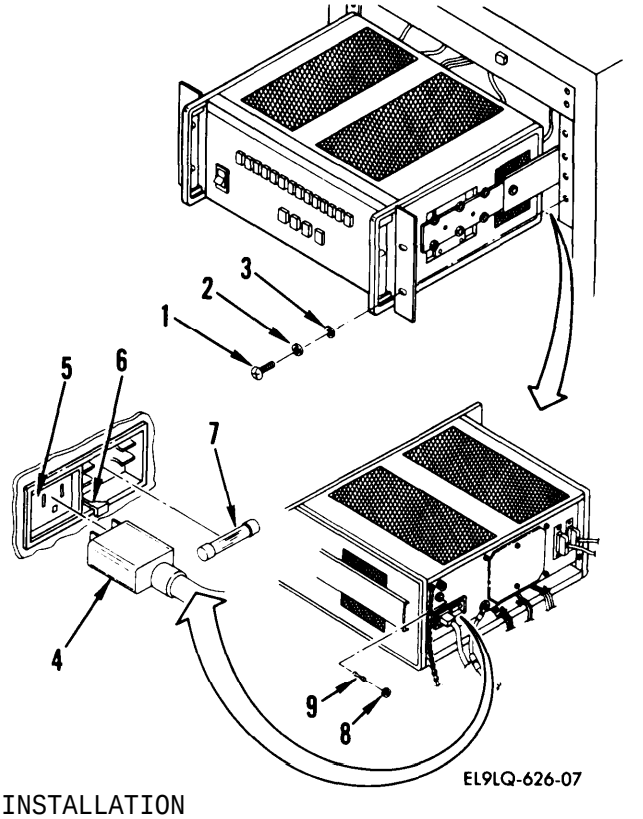
a. Fuse, F1, F2 or F3 replacement.

REMOVAL

(1) Remove four screws (l), lockwasher (2), washers (3), and pull out multiprogranmer assembly.

(2) To remove fuse F1 (7), disconnect ac power cord (4), slide fuse cover (5) to left, and pull FUSE PULL tab (6). Discard defective fuse (7).

(3) To remove fuse F2 or F3, locate and remove fuseholder cap (8). Remove defective fuse (9).



INSTALLATION

(4) Install replacement fuse in reverse order of removal.

b. VOLT REG CCA fuse replacement.

REMOVAL

(1) On multiprogrammer assembly (1) open door (2) and remove VOLT REG CCA (3) from slot 600.

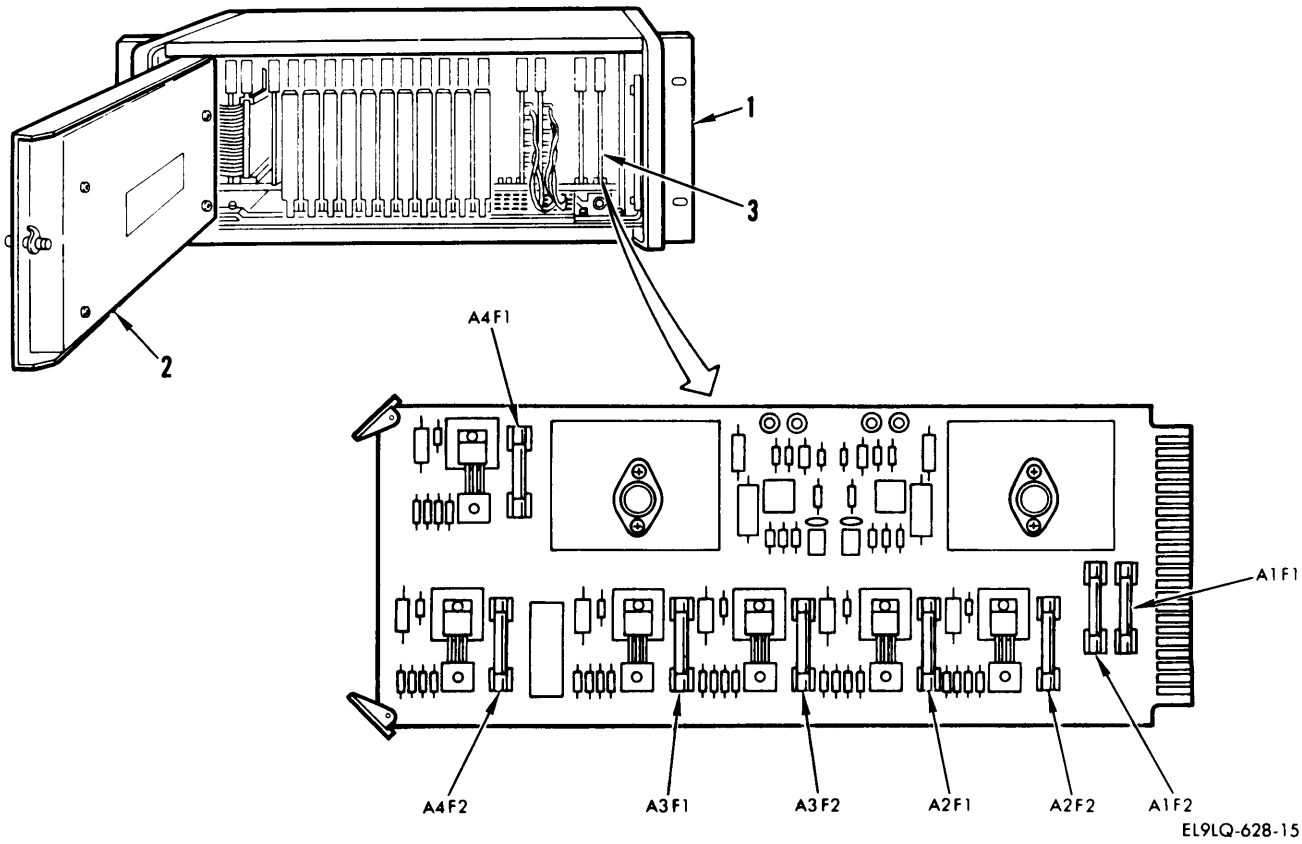
(2) Locate defective fuse and remove.

INSTALLATION

(3) Determine replacement fuse from list below:

Fuse Location	Fuse Value
A1F1	1a 250V
A1F2	1a 250v
A2F1	0.25a 250V
A2F2	0.25a 250V
A3F1	0.25a 250V
A3F2	0.25a 250V
A4F1	0.25a 250V
A4F2	0.25a 250V

(4) Install fuse and CCA in reverse order of removal.

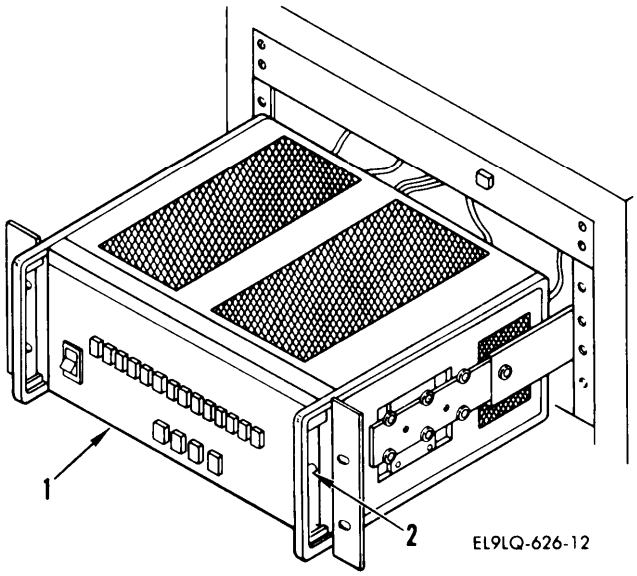


END OF TASK

2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

NOTE

This procedure is used to replace any of 17 CCAs in multiprogrammer assembly.



REMOVAL

a. Open access door (1) on multiprogrammer assembly by turning screw lock (2) counterclockwise.

b. Replace CCA as required using procedure identified from the following list:

ITEM	CCA	CCA No.	Slot No.	Connector	Reference
3	STANDARD INPUT	06940-60031	100		c
5	REMOTE/LOCAL	06940-60025	200	Ribbon harness	d
6	LOGIC & TIMING	5060-2689	300		e
8	DIGITAL INPUT	13083412	400	W8P1	f
8	DIGITAL INPUT	13083412	401 A	W8P2	f
8	DIGITAL INPUT	13083412	402 B	W8P3	f
8	DIGITAL INPUT	13083412	403 c	W8P4	f
8	DIGITAL INPUT	13083412	404 D	W8P6	f
8	DIGITAL INPUT	13083412	405 E	W8P7	f
8	DIGITAL OUTPUT	69331B	406 F	W9P5	f
8	DIGITAL OUTPUT	69331B	407 G	W9P6	f
8	DIGITAL OUTPUT	69331B	408 H	W9P7	f
8	DIGITAL OUTPUT	69331B	409 I	W9P8	f
8	DIGITAL OUTPUT	69331B	410 J	W9P9	f
		BLANK	411 K		
9	QUAD D/A	69322A	412L-A	W9E1	g
			B	W9E2	
			D	W9E3	
			E	W9E4	
			F	W9E5	
9	QUAD D/A	69322A	413M-A	W9E6	g
			B	W9E7	
			D	W9E8	
			E	W9E9	
			F	W9E10	
	BLANK	414 N			
12	UNIT SELECT	06940-60026	500		h
12	VOLTAGE REG	HP 69351 C	600		h

c. STANDARD INPUT CCA (3) replacement.

(1) Remove ribbon connector (4) from REMOTE/LOCAL CCA (5) and rear of access door (1).

(2) Pull CCA (3) straight out.

NOTE

REMOTE/LOCAL CCA (5) and LOGIC & TIMING CCA (6) are connected by a ribbon harness and must be removed at the same time.

d. REMOTE/LOCAL CCA (5) replacement.

(1) Remove ribbon connector (4) from CCA (5).

(2) Pull CCA (5) and CCA (6) straight out at same time.

(3) Disconnect ribbon connector between CCA (5) and CCA (6).

e. LOGIC & TIMING CCA (6) replacement.

(1) Remove connector (7).

(2) Pull CCA (6) and CCA (5) straight out at same time.

(3) Disconnect ribbon connector between CCA (5) and CCA (6).

f. DIGITAL INPUT OR DIGITAL OUTPUT CCA (8) replacement.

CAUTION

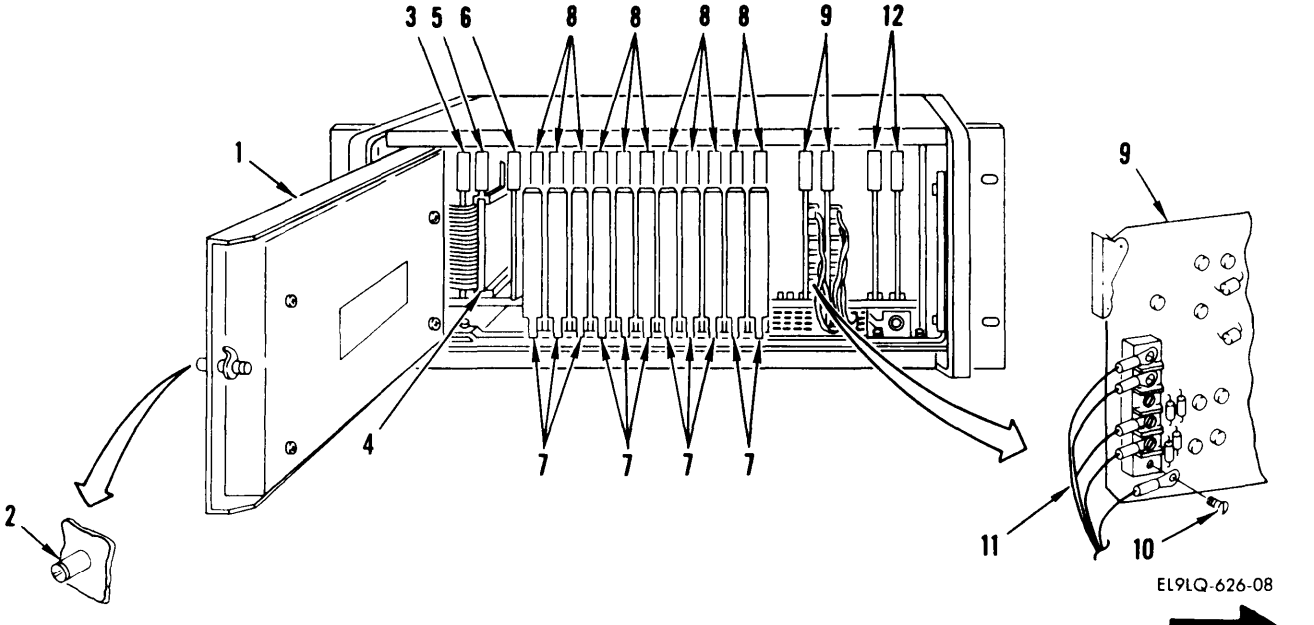
This equipment contains parts and assemblies sensitive to, damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting, circuit card assemblies.

NOTE

This procedure is used to replace any of five DIGITAL INPUT CCAs or any of five DIGITAL OUTPUT CCAs.

(1) Comply with ESD procedures for CCAs (para 2-21).

(2) Remove connector (7) from CCA (8) being replaced.



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CAUTION

When removing certain CCAs, connector on right of CCA to be replaced must also be removed to avoid damaging components.

(3) Remove connector (7) from CCA to immediate right of CCA being replaced.

(4) Pull CCA straight out.

g. QUAD D/A CCA (9) replacement.

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting, circuit card assemblies.

NOTE

This procedure is used to replace either of two QUAD D/A CCAs.

(1) Comply with ESD procedures for CCAs (para 2-21).

(2) Slide CCA (9) out to access terminal screws (10).

(3) Tag wires (11) and remove screws (10).

(4) Pull CCA (9) straight out.

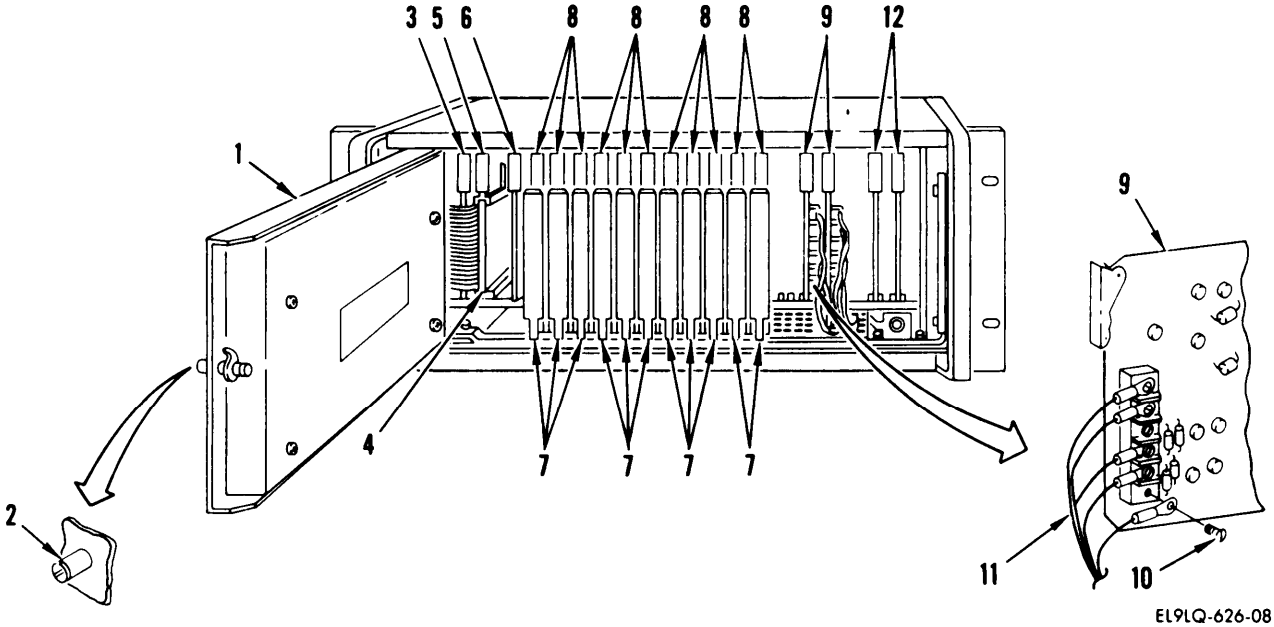
h. UNIT SELECT/VOLTAGE REG CCA (12) replacement.

To remove either CCA (12), pull CCA straight out.

INSTALLATION

i. Install replacement CCA in reverse order of removal.

END OF TASK



2-50. ELECTRONICS DRAWER ASSEMBLY 2A2A7 REPLACEMENT 2-50

INITIAL SETUP

Materials (appendix C)

Lacing tape (Item 44)

Personnel Required

39B ATE repairer
One assistant

Equipment Condition

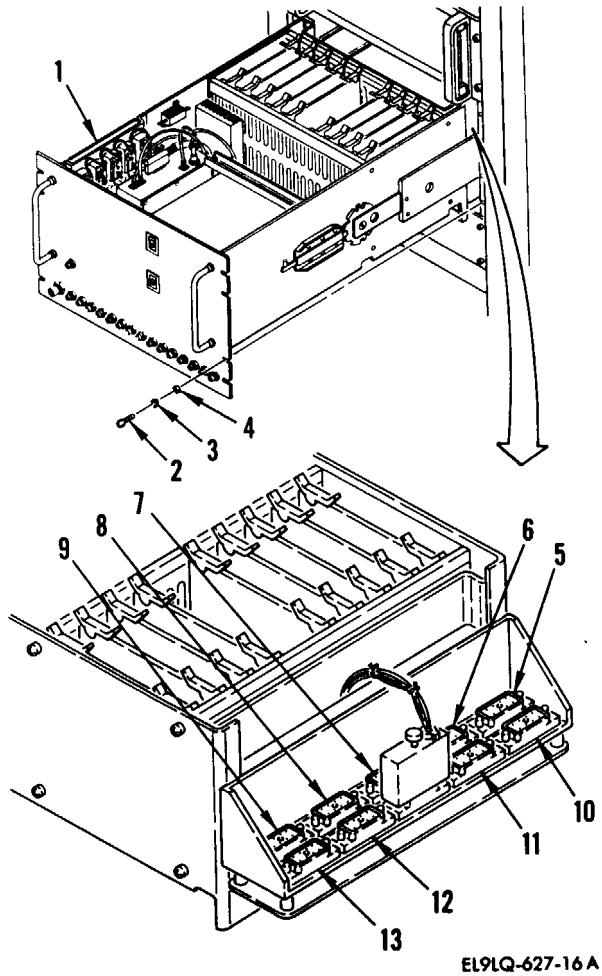
Power removed (para 2-24.1)

REMOVAL

1. On electronics drawer assembly (1), remove eight screws (2), lockwashers (3), washers (4), and pull out electronics drawer.

2. On rear of electronics drawer assembly, disconnect the following connectors:

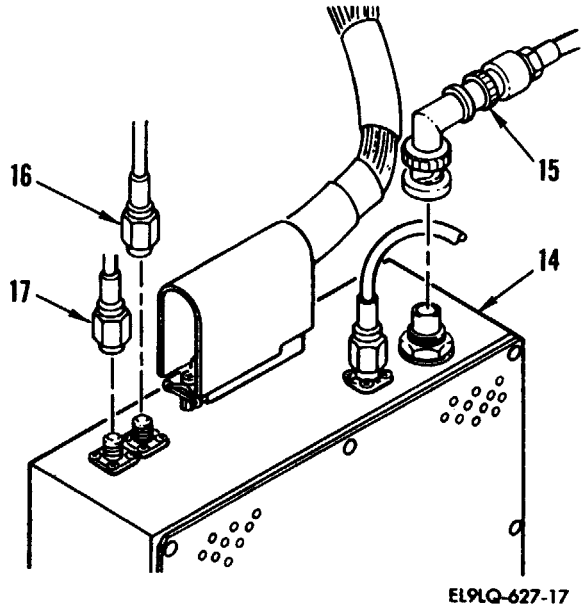
   W7P4 from J1 (5)
   W5P1 from J2 (6)
   W11P1 from J3 (7)
   W13P1 from J4 (8)
   W8P5 from J5 (9)
   W17P1 from J6 (10)
   W14P1 from J7 (11)
   W1P5 from J9 (12)
   W9P4 from J10 (13)



2-50. ELECTRONICS DRAWER ASSEMBLY 2A2A7 REPLACEMENT (cont) 2-50

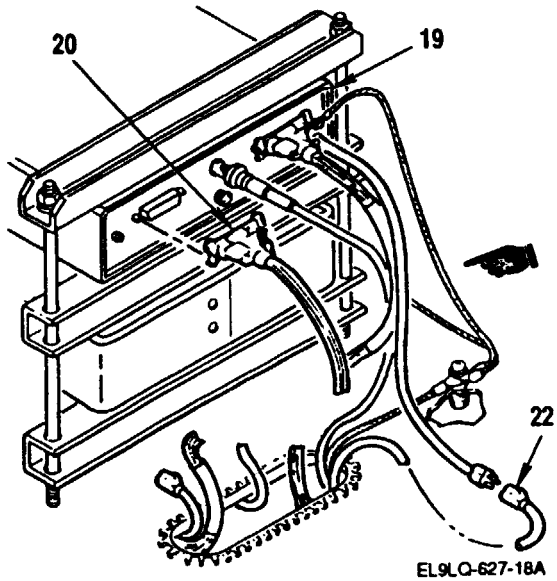
3. On video signal generator A1 (14), disconnect the following connectors:

   W10P2 from J1 (15)
   W16P3 from J4 (16)
   W30P1 from J5 (17)



4. On camera head control unit A3 (19), disconnect the following connectors:

   W24P1 from REMOTE SENSOR INTERFACE A3J1 (20)
   115 vac cord from A3 (22)



2-50. ELECTRONICS DRAWER ASSEMBLY 2A2A7 REPLACEMENT (cont) 2-50

5. On bottom of electronics drawer assembly, remove three screws (24), lockwashers (25), washers (26), and cable clamps (27).

6. Cut lacing tape as required and remove the following cables from electronics drawer assembly:

115 vac cords	(28)
W15P1	(29)
W24P1	(30)
W10P2	(31)
W16P3	(32)
W30P1	(33)

6.1 Remove CCA A8 and A9 from electronics drawer (para 2-51).

7. Locate ground lead (34) between CCA A8 and A9. Remove nut (35), lockwasher (36), washer (37), screw (38), and ground lead (34).

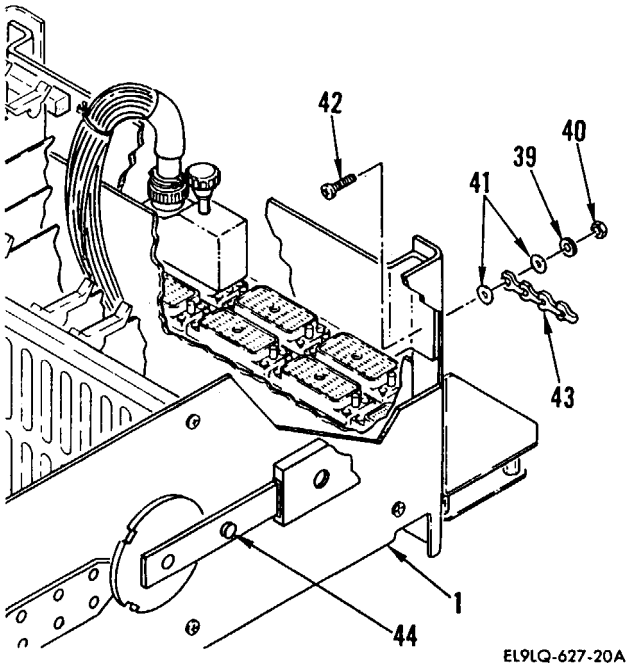
8. Remove nut (39), lockwashers (40), two washers (41), screw (42), and chain (43).

WARNING

HEAVY OBJECT

- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE .

9. Using a person on each side of electronics drawer assembly (1), depress slide locks (44) and remove electronics drawer assembly from cabinet.



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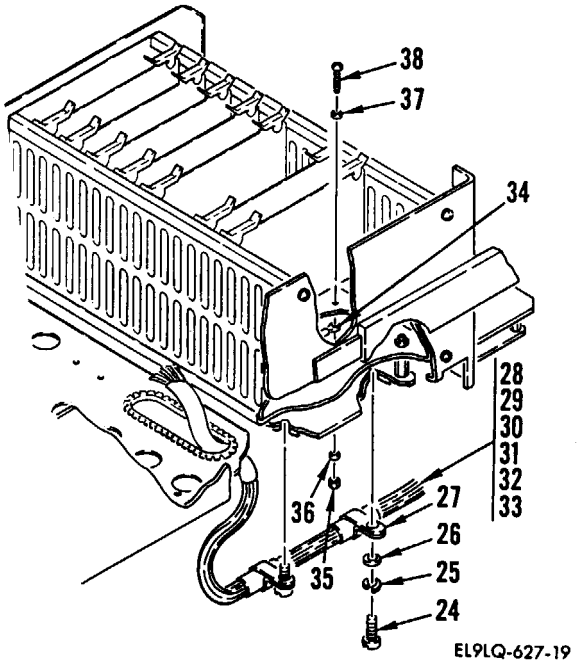

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INSTALLATION

10. Install in reverse order of removal.

END OF TASK

2-51. ELECTRONICS DRAWER ASSEMBLY 2A2A7 REPAIR 2-51

This task covers replacement of:

Para	Item	Para	Item
1.	Camera head control unit A3	2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. CAMERA HEAD CONTROL UNIT A3 REPLACEMENT

NOTE

Camera head control unit A3 and internal camera 2A1A2A1A1A15 (paragraph 5-20.1, camera/bracket assembly replacement) are a matched set and must be replaced at the same time.

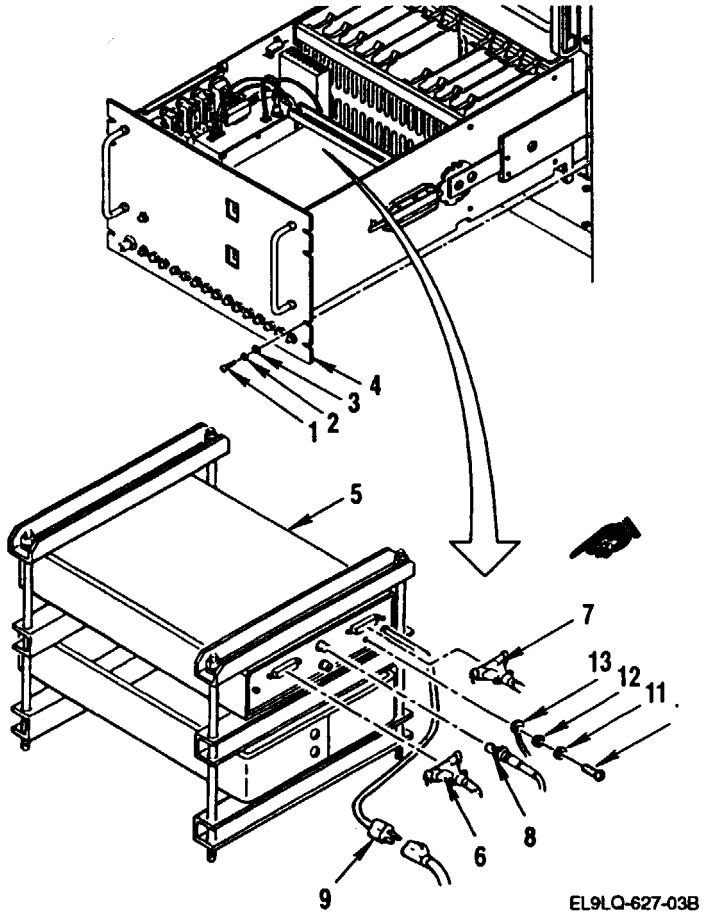
REMOVAL

a. Remove eight screws (1), lockwashers (2), washers (3), and pull out electronics drawer assembly (4).

b. On rear panel of camera head control unit A3 (5), disconnect the following cables:

W24P1 from REMOTE SENSOR INTERFACE A3J1 (6)
W3P3 from OPTOMATION INTERFACE A3J4 (7)
W2P1 from VIDEO OUT A3J3 (8)
115 vac cord (9)

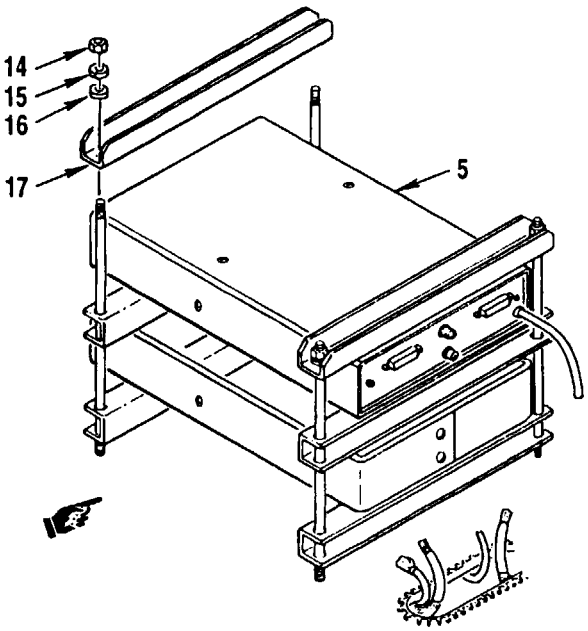
c. Remove screw (10), lockwasher washer (12), and ground lead (13).



2-51. ELECTRONICS DRAWER ASSEMBLY 2A2A7 REPAIR (cont) 2-51

d. Remove four nuts (14), lockwashers (15), washers (16), and two brackets (17).

e. Remove camera head control unit A3 (5) from electronics drawer assembly.



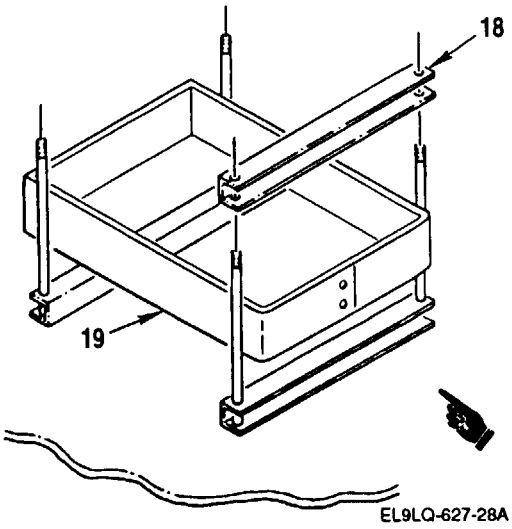
EL9LQ-627-04A

NOTE

Removal is complete for camera head control unit A3. Perform steps f and g only if removing controller spacer assembly.

f. Remove two brackets (18).

g. Remove controller spacer assembly (19).



EL9LQ-627-28A

INSTALLATION

h. Install in reverse order of removal.

END OF TASK

2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

NOTE

This procedure is used to replace any of nine CCAS in electronics drawer assembly.

REMOVAL

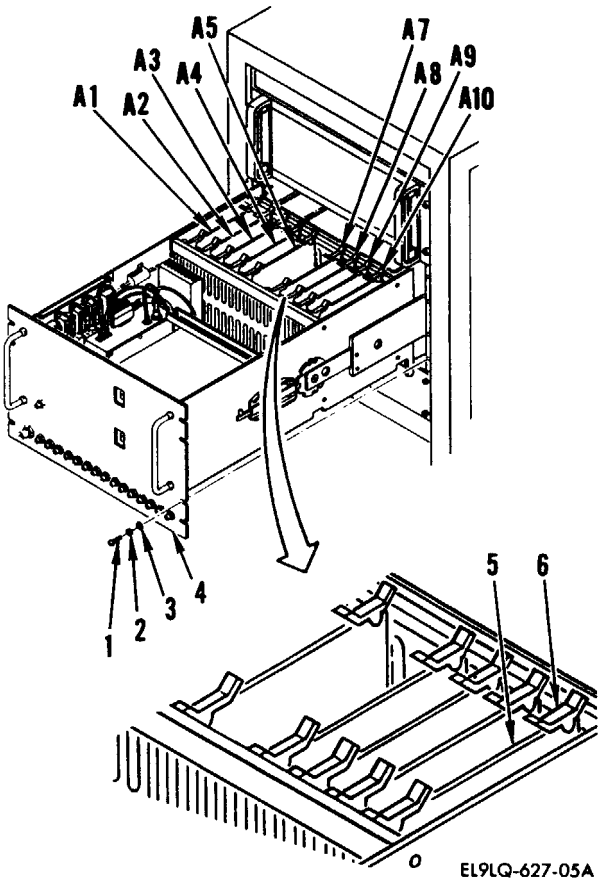
a. Remove eight screws (1), lock-washers (2), washers (3), and pull out electronics drawer assembly (4).

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

a.1 Comply with ESD Procedures for CCAs (para 2-21).

b. To remove any CCA (5), lift two levers (6) at same time and pull CCA straight out. Refer to list below for CCA location.



CCA No.	Slot
13082741	A6A1
13082735	A6A2
13082732	A6A3
13082738	A6A4
13082717-19	A6A5
Blank	A6A6
13082714	A6A7
13083050-19	A6A8
13231595	A6A9
13081471-19	A6A10
Blank	A6A11, A12, A13

INSTALLATION

c. Install in reverse order of removal.

END OF TASK

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2-52. EXTENDER ASSEMBLY 2A2A8 REPLACEMENT 2-52

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

REMOVAL

1. Remove four screws (1), lockwashers (2), washers (3), and pull out extender assembly (4).
2. On rear panel, disconnect the following connectors:

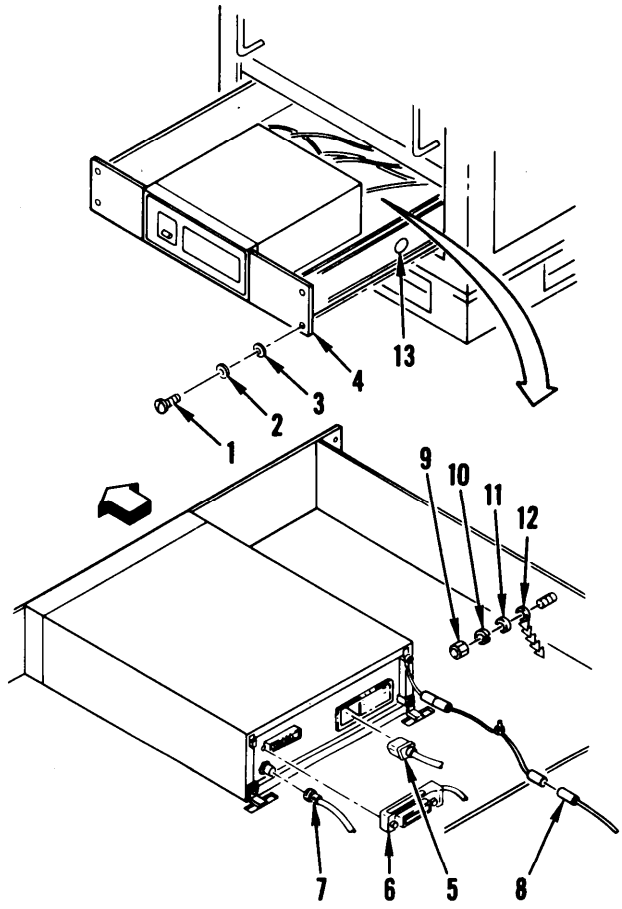
115 vac cord	(5)
HP 10833C P1 from HP-IB	(6)
W4P1 from coax	(7)
Ground lead	(8)

3. Remove nut (9), lockwasher (10), washer (11), and chain (12).
4. Depress slide locks (13) and remove extender assembly.

INSTALLATION

5. Install in reverse order of removal.

END OF TASK



EL9LQ-628-01A

2-53. EXTENDER ASSEMBLY 2A2A8 REPAIR

This task covers replacement of:

Para	Item
1.	Fuse
2.	HP-IB Extender

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE REPLACEMENT

REMOVAL

a. Remove four screws (1), lock-washers (2), washers (3), and pull out drawer (4) on slide extensions.

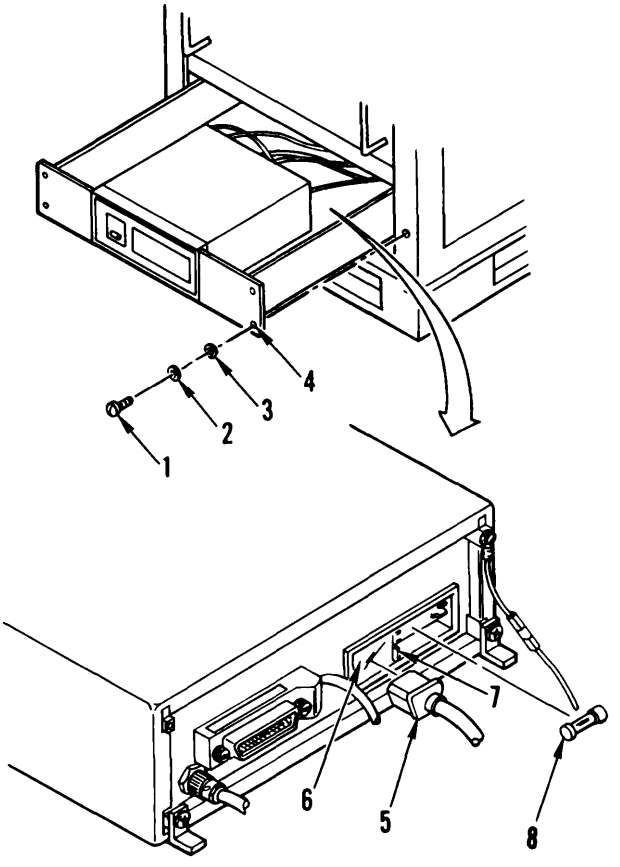
b. On rear panel, remove ac power cord (5) and slide fuse cover (6) to left.

c. Pull FUSE PULL tab (7) to remove defective fuse (8).

INSTALLATION

d. Install in reverse order of removal.

END OF TASK



EL9LQ-628-02

2. HP-IB EXTENDER REPLACEMENT

REMOVAL

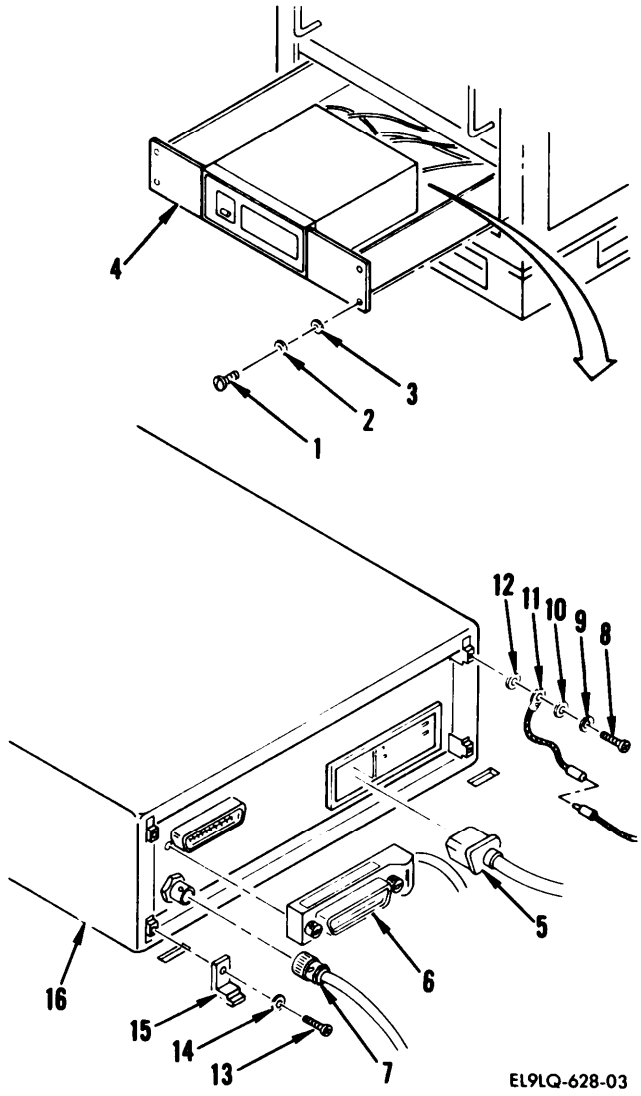
a. Remove four screws (1), lockwashers (2), washers (3), and pull out extender assembly (4).

b. On rear panel, disconnect the following connectors:

115 vac cord	(5)
HP10833C P1 from HP-IB	(6)
W4P1 from coax	(7)

c. Remove screw (8), lockwasher (9), washer (10), ground lead (11), and washer (12).

d. Remove two screws (13), washers (14), brackets (15), and slide HP-IB extender (16) out.



INSTALLATION

e. On top cover of replacement extender, loosen screw (17) and slide cover (18) off.

f. On board assembly (19), set the following switches:

(1) Run/test switch (20) to R (run).

(2) Address test switch (21) switches down towards black dot.

(3) COAX/(PT switch (22) to COAX.

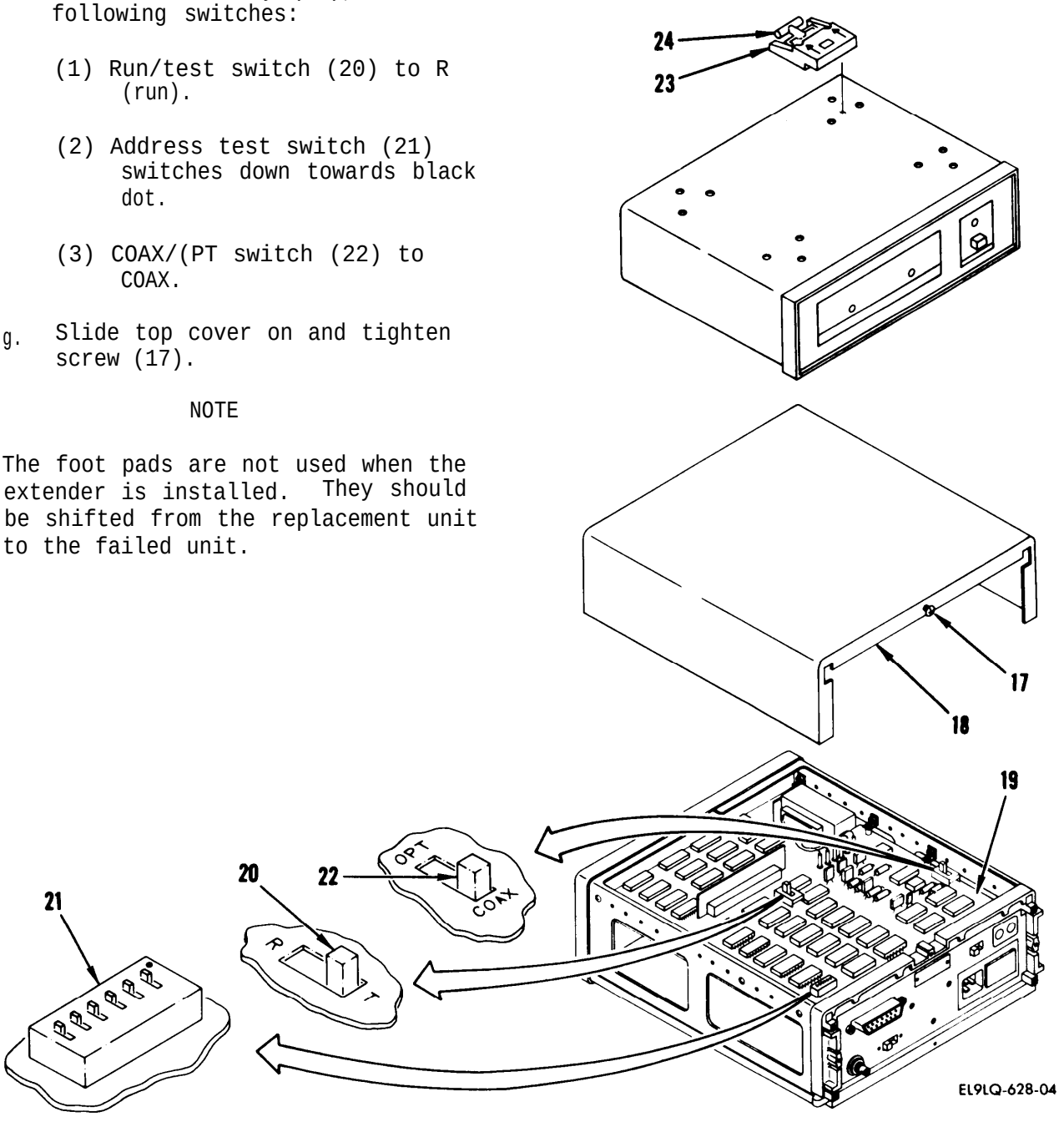
g. Slide top cover on and tighten screw (17).

NOTE

The foot pads are not used when the extender is installed. They should be shifted from the replacement unit to the failed unit.

h. On each of four foot pads (23), lift tab (24), slide foot Pad in direction of arrow, and lift off.

i. Install foot pads on failed extender.



j. Slide fuse cover (25) to left, pull FUSE PULL tab, remove fuse (26), verify rating O.25a 250v, and reinstall.

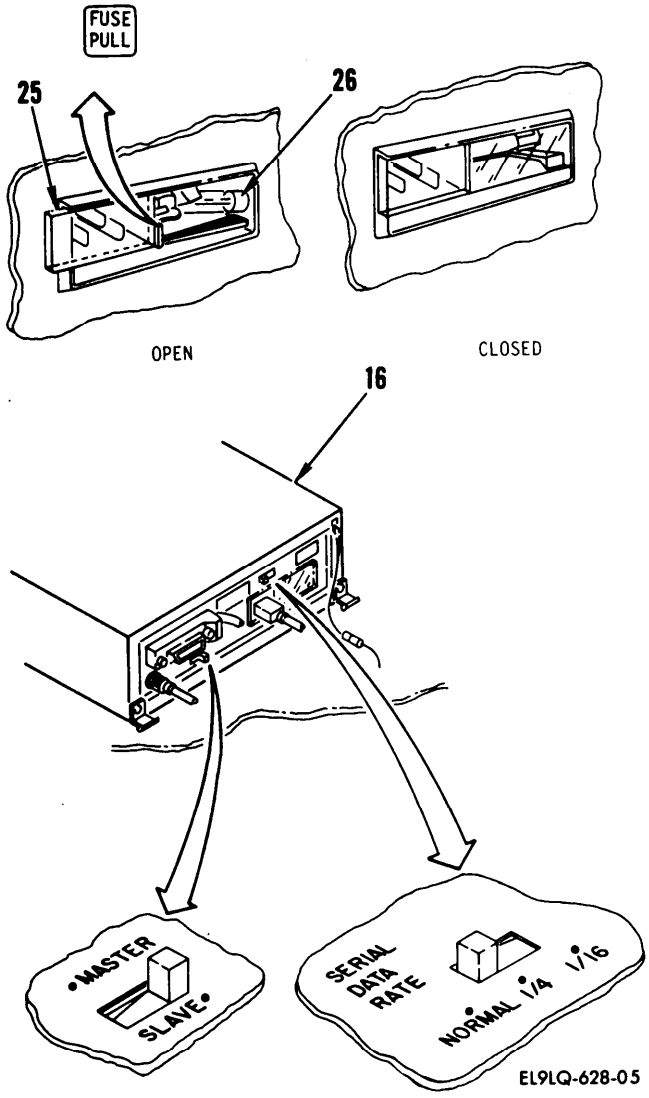
k. On rear panel of extender (16), set the following switches:

(1) MASTER/SLAVE to SLAVE

(2) SERIAL DATA RATE to NORMAL

l. Install extender assembly in reverse order of removal.

END OF TASK



2-54. MATRIX WITCH ASSEMBLY 2A2A10 REPLACEMENT 2-54

INITIAL SETUP

Materials (appendix C)

Lacing tape (Item 43)

Personnel Required

396 ATE Repairer
One assistant

Equipment Conditions

power removed (para 2-24.1)
Front access panel above test adapter panel and rear access panel 2A2A10 removed (para 2-42)

FOLLOWUP

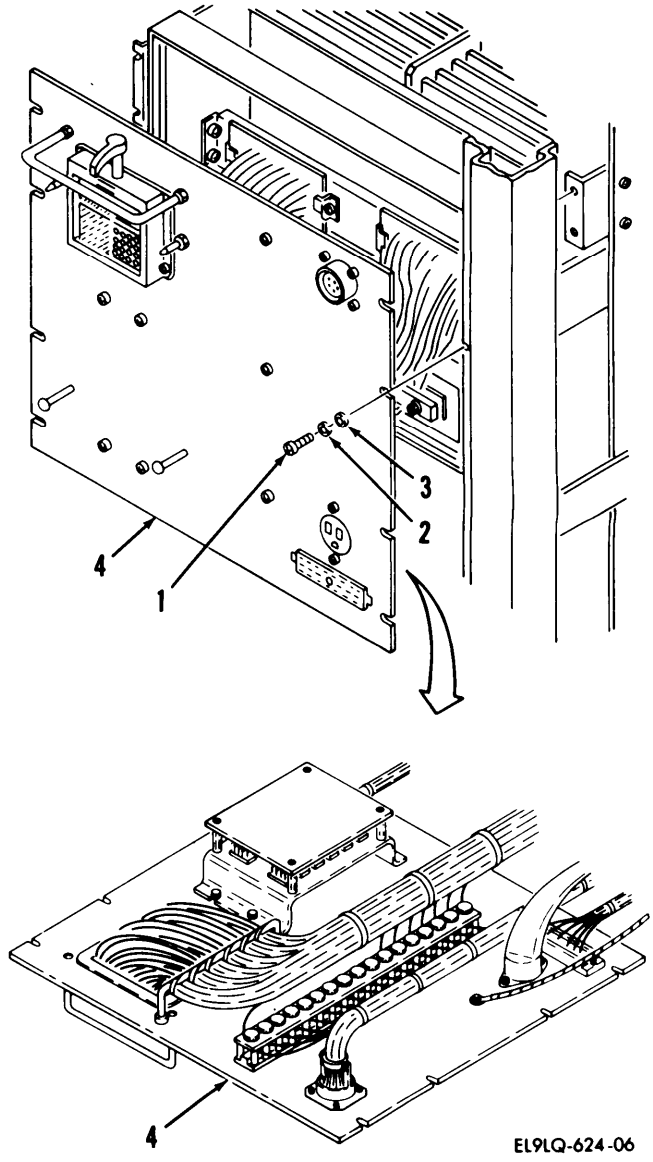
Front and rear access panel 2A2A10 installation (para 2-42)

REMOVAL

NOTE

Panel will drop slightly when screws are removed. Do not allow screws or washers to fall inside during removal.

1. Remove eight screws (1), lockwasher (2), washers (3), and lower test adapter panel assembly (4).



2-54. MATRIX SWITCH ASSEMBLY 2A2A10 REPLACEMENT (cont) 2-54

2. On matrix switch assembly (5), remove four nuts (6), washers (7), and two clamps (8).

3. Deleted.

NOTE

Direction of connector should be noted and tagged for correct reinstallation.

4. Disconnect connector W11J7 (13) from A2A10J1 on matrix switch assembly.

NOTE

On some models there may be eight screws (Item 9).

5. Remove four screws (9), lockwashers (10), washers (11), and clamps (12) and disconnect the following connectors:

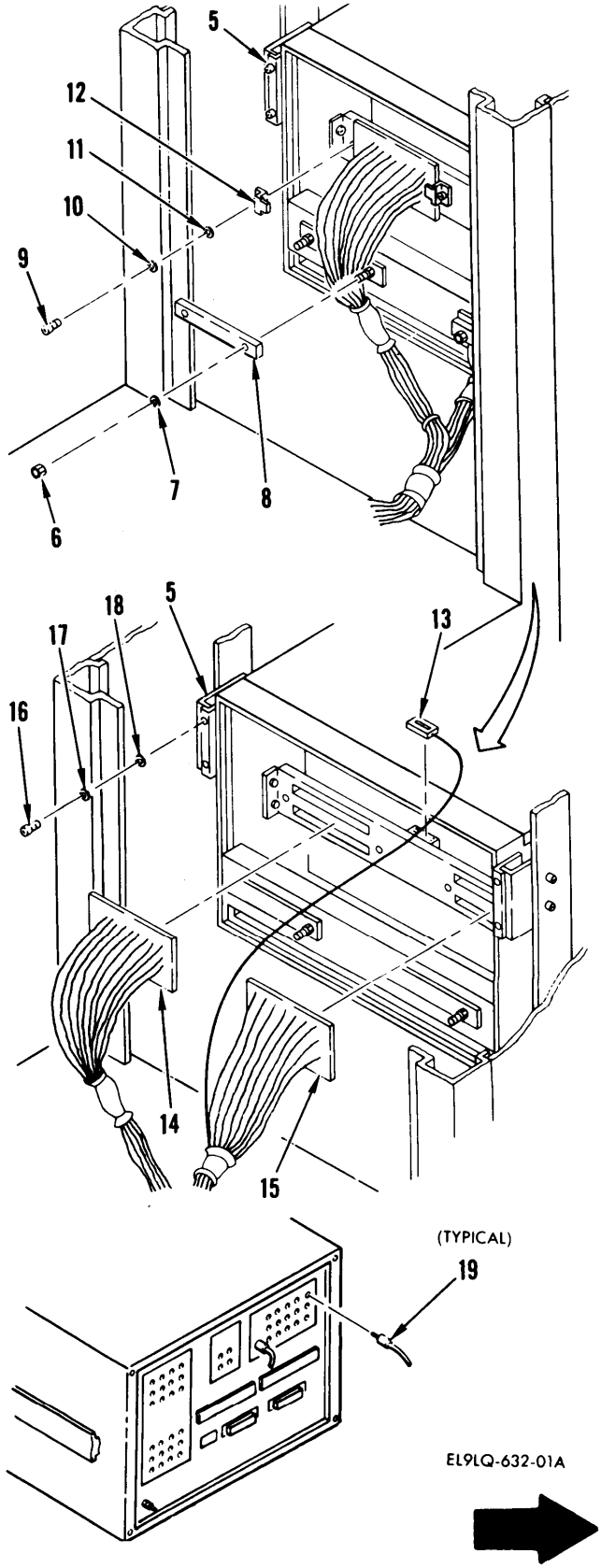
W11J2-J3 from Quad 2-3 (14)
W11J4-J5 from Quad 1-4 (15)

6. Remove four screws (16), lockwashers (17), and washers (18).

6.1. Move matrix switch assembly forward 4-6 inches.

7. On rear panel of matrix switch assembly, disconnect the following connectors (19, typical):

W11P9 from MATRIX 1
W11P10 from MATRIX 2
W11P11 from MATRIX 3
W11P12 from MATRIX 4
W11P7 from MATRIX 5
W11P8 from MATRIX 6
W11P13 from MATRIX 7
W11P14 from MATRIX 8
W11P15 from MATRIX 9
W11P16 from MATRIX 10
W19P3 from MATRIX 11
W19P4 from MATRIX 12
W19P5 from MATRIX 13
W19P6 from MATRIX 14
W19P7 from MATRIX 15
Coax ground cable from MATRIX 16.



8. Disconnect HP 09412-61604 P2 from SWITCH CONTROL 1 (20).

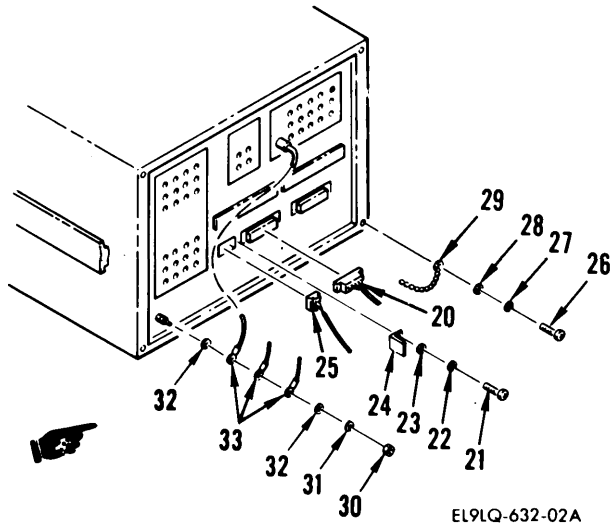
9. Remove screw (21), lockwasher (22), washer (23), bracket (24), and disconnect HP 09416-61603 P2 from DC POWER (25).

10. Remove screw (26), lockwasher (27), washer (28), and chain (29).

11. Remove nut (30), lockwasher (31), two washers (32), and three terminals (33).

12. Deleted.

13. Pull out matrix switch assembly.



EL9LQ-632-02A

WARNING

HEAVY OBJECT

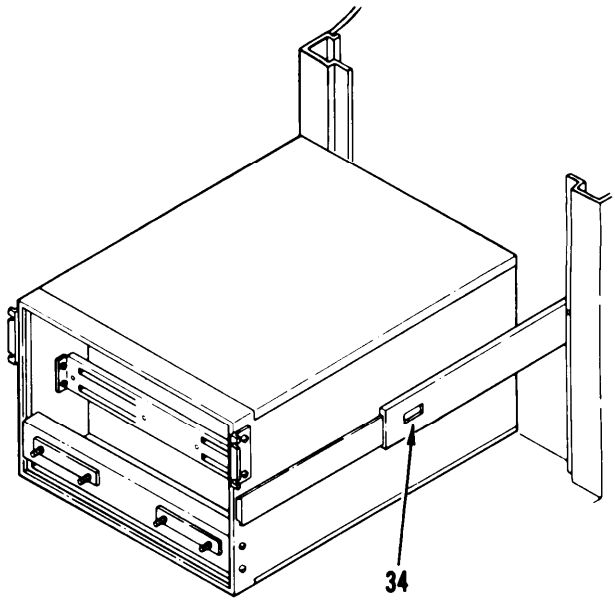
- EXCESSIVE STRAIN CAN CAUSE SERIOUS INJURY.
- DON'T: ATTEMPT TO LIFT OR CARRY HEAVY OBJECTS ALONE.
- DO: GET HELP FOR LIFTING OR CARRYING OBJECTS WEIGHING MORE THAN 35 POUNDS.
- IF YOU EXPERIENCE A SUDDEN PAIN WHILE LIFTING OR DISCOMFORT AFTER LIFTING, GET MEDICAL HELP AT ONCE.

14. Using a person on each side of matrix switch assembly, depress slide locks (34) and remove matrix switch assembly.

INSTALLATION

15. Install matrix switch assembly in reverse order of removal.

END OF TASK



EL9LQ-632-05

2-55. MATRIX SWITCH ASSEMBLY 2A2A10 REPAIR

This task covers replacement of:

Para	Item
1.	Fuse
2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)
Matrix switch assembly removed, paragraph 2 only (para 2-54)

FOLLOWUP

Matrix switch assembly installation (para 2-54)

1. FUSE REPLACEMENT

NOTE

This procedure is used to replace any of four fuses in matrix switch assembly.

REMOVAL

a. Refer to paragraph 2-54 and do steps 1 through 6, and 11.

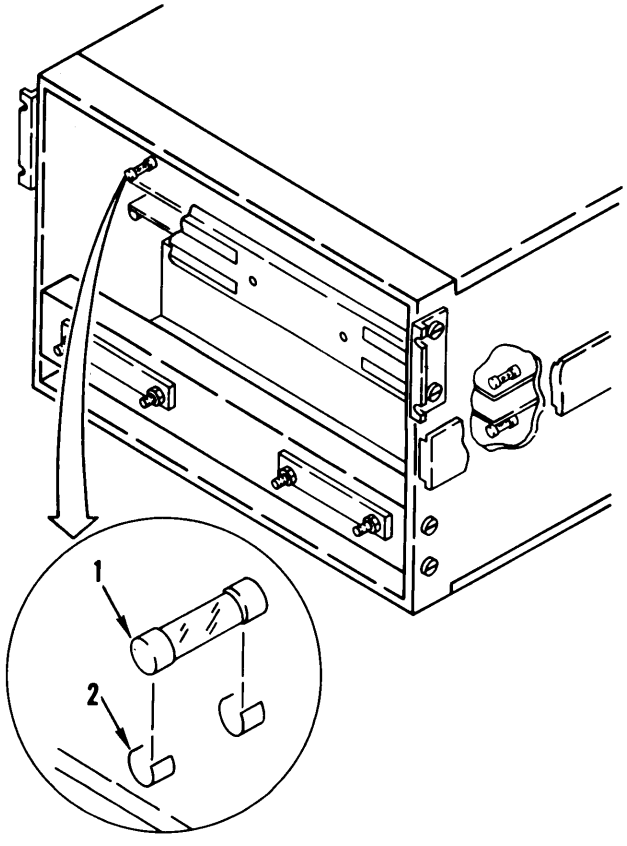
b. Pull defective fuse (1) from fuseholder (2).

INSTALLATION

c. Install replacement fuse (1) into fuseholder (2).

d. Perform step a above in reverse order.

END OF TASK



EL9LQ-632-3

2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

NOTE

This procedure is used to replace any of 68 CCAs in matrix switch assembly.

REMOVAL

a. To remove top or bottom access cover (1), loosen screw (2) and slide cover towards rear, then lift off. Refer to list below for CCA location.

CCA No.	slot	Quadrant
HP94140B	CONTROL	1, 2, 3, 4
HP94140A	1 thru 16	1, 2, 3, 4
Blank	17	1, 2, 3, 4

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

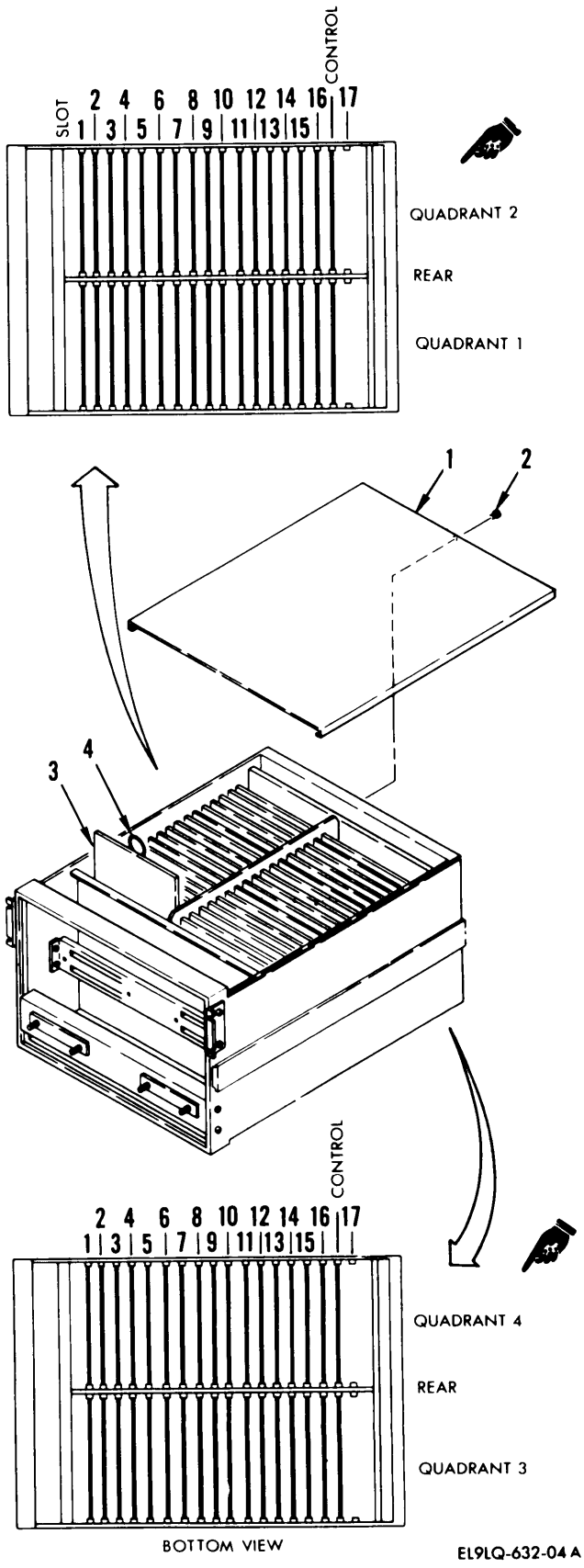
b. Comply with ESD procedures for CCAs (para 2-21).

c. To remove any CCA (3), pull straight up using ring tab (4).

INSTALLATION

d. Install CCA in reverse order of removal. Refer to list above for CCA location.

END OF TASK



2-56. MULTIPROGRAMMER EXTENDER ASSEMBLY 2A2A11 REPLACEMENT 2-56

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 40)
Lacing tape (Item 44)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

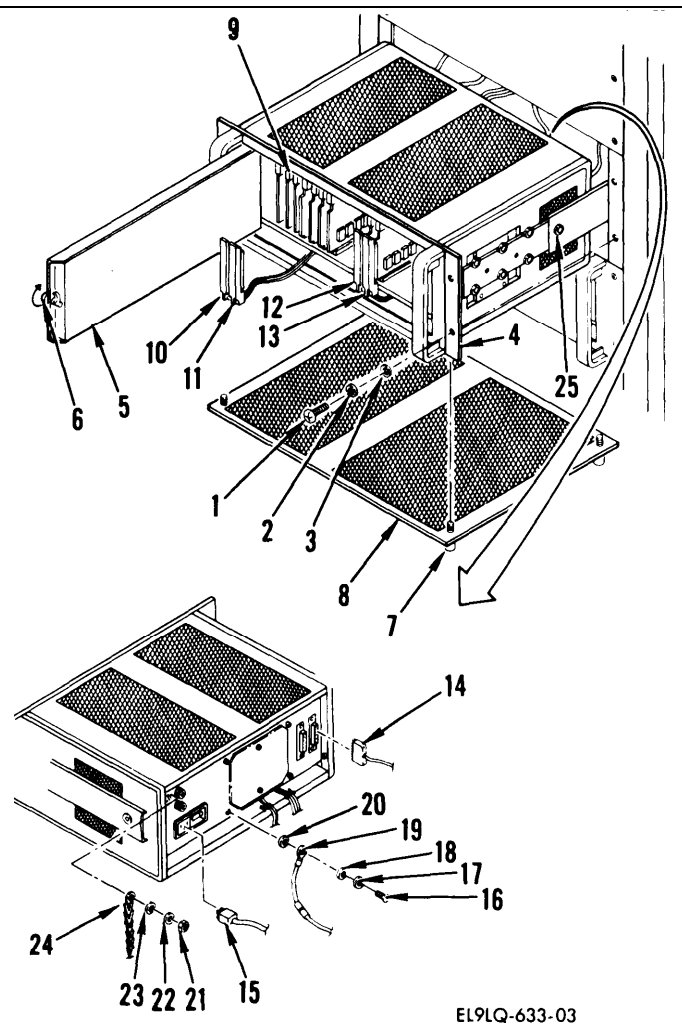
REMOVAL

1. Remove four screws (1), lockwashers (2), and washers (3).
2. Pull out multiprogrammer extender assembly (4).
3. Open front access door (5) by turning screwlock (6) counterclockwise.
4. Loosen four screws (7) and remove lower panel (8) to allow removal of circuit card connectors.
5. Disconnect the following connectors from CCAs (9):

   W11P3 from CCA slot 400 (10)
   W11P4 from CCA slot 401A (11)
   W11P5 from CCA slot 408H (12)
   W11P6 from CCA slot 4091 (13)

6. Secure CCA connectors so they do not interfere with removal of multiprogrammer extender.
7. On rear panel of multiprogrammer extender, disconnect the following cables:

   W25P4 from DATA INPUT J1 (14)
   115 vac cord (15)



EL9LQ-633-03

NOTE

If the multiprogrammer extender is to be replaced, the ground lead will have to be moved to the replacement assembly. If the same multiprogrammer extender is installed, use ground lead disconnect and omit steps 8, 11, and 13.

8. Remove screw (16), lockwasher (17), washer (18), ground lead (19), and washer (20).

9. Remove nut (21), lockwasher (22), washer (23), and chain (24).

10• Close access door (5). depress slide locks (25) and remove-multiprogrammer extender assembly.

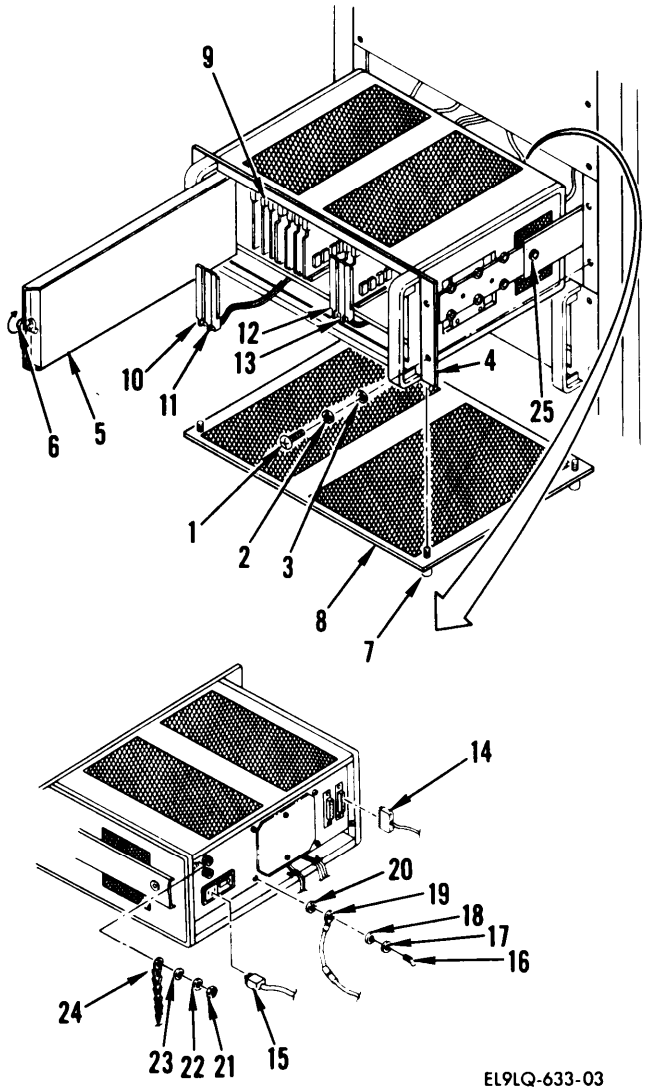
INSTALLATION

11. Prepare surfaces and hardware (16 thru 20) for application of zinc chromate primer (para 2-19).

12. Install in reverse order of removal.

13. Apply thin coat of zinc chromate primer over bonded area and hardware (16 thru 20).

END OF TASK



2-57. MULTIPROGRAMMER EXTENDER ASSEMBLY 2A2A11 REPAIR 2-57

This task covers replacement of:

Para	Item	Para	Item
1.	Fuse	2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE REPLACEMENT

NOTE

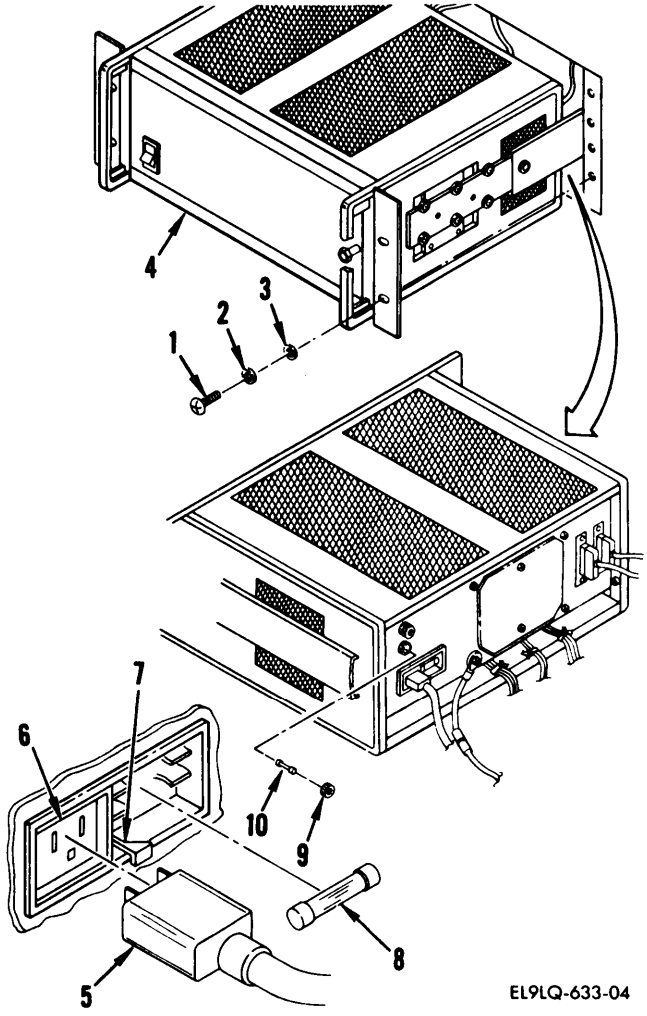
This procedure is used to replace any of three fuses in multiprogrammer extender assembly.

REMOVAL

a. Remove four screws (1), lockwashers (2), washers (3), and pull out multiprogrammer extender assembly (4).

b. To remove fuse F1, disconnect AC power cord (5), slide fuse cover (6) to left, and pull FUSE PULL tab (7). Discard defective fuse (8).

c. To remove fuse F2 or F3, locate fuseholder cap (9) and remove from rear panel by turning counterclockwise. Remove defective fuse (10).



INSTALLATION

d. Install in reverse order of removal.

END OF TASK

2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

NOTE

This procedure is used to replace any of nine CCAs in multiprogrammer extender assembly.

REMOVAL

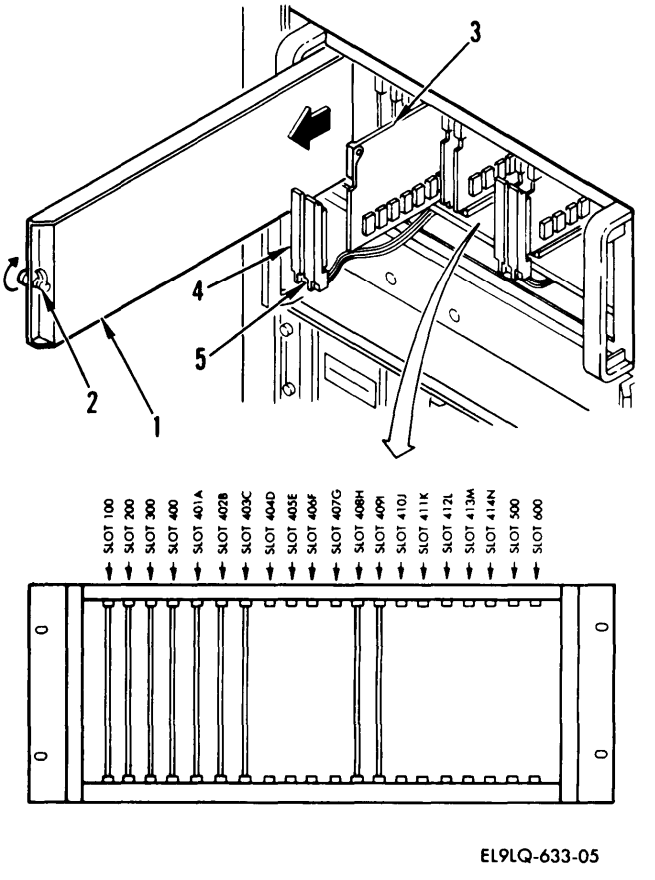
a. Open access door (1) on multiprogrammer extender assembly by turning screwlock (2) counterclockwise.

CAUTION

- When removing a CCA, connector on right of CCA to be replaced must also be removed to avoid damaging CCA components.
- CCAs in slots 200 and 300 must be removed together. After removal they may be disconnected by removing the ribbon connector between them.
- This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

b. Comply with ESD procedures for CCAs (para 2-21).

c. To remove any of nine CCAs (3), remove connector (4), and connector to right (5), then pull out CCA. Refer to list below for CCA location.



EL9LQ-633-05

CCA No.	Slot No.
06941-60026	100
06941-60025	200
5060-2689	300
HP 69433A	400
HP 69433A	401A
HP 69433A	402B
HP 69433A	403C
HP 69433A	408H
HP 69433A	409I

INSTALLATION

d. Install CCA in reverse order of removal.

END OF TASK

2-58. SWITCH CONTROLLER ASSEMBLY 2A2A12 REPLACEMENT 2-58

INITIAL SETUP

Tools

Goggles
Rubber apron

Materials (appendix C)

Artist brush (Item 8)
Cheesecloth pad (Item 11)
Chemical film (Item 12)
Rubber gloves (Item 26)
Emery paper, 400 grit (Item 35)
Zinc chromate primer (Item 40)
Trichlorotrifluoroethane (Item 48)

Personnel Required

39B ATE Repairer

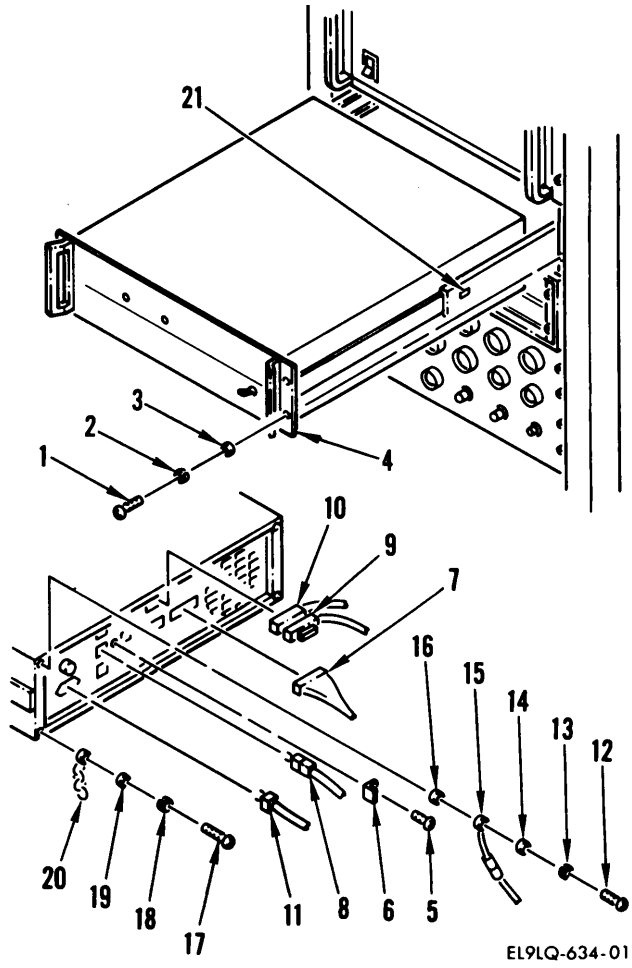
Equipment Condition

Power removed (para 2-24.1)

REMOVAL

1. Remove four screws (1), lockwashers (2), washers (3), and pull out switch controller assembly (4).
2. Remove screw (5) and protective plate (6).
3. On rear panel of switch controller assembly, disconnect the following cables:

   HP 09412-61604 P1 from SWITCH CONTROL (7)
   HP 09412-61603 P1 from J3 MAIN POWER (8)
   HP 10833B P2 from HP-IB (9)
   HP 10833C P1 from HP-IB (10)
   115 vac power cord (11)



NOTE

If the switch controller assembly is to be replaced, the ground lead will have to be moved to the replacement assembly. If the same switch controller is installed, use ground lead quick disconnect and omit steps 4, 8, and 10.

4. Remove screw (12), lockwasher (13), washer (14), ground lead (15), and washer (16).

5. Remove screw (17), lockwasher (18), washer (19), and chain (20).

6. Depress slide locks (21) and remove switch controller assembly.

INSTALLATION

7. Prior to installation of switch controller assembly, set address switch (22) on rear panel as shown.

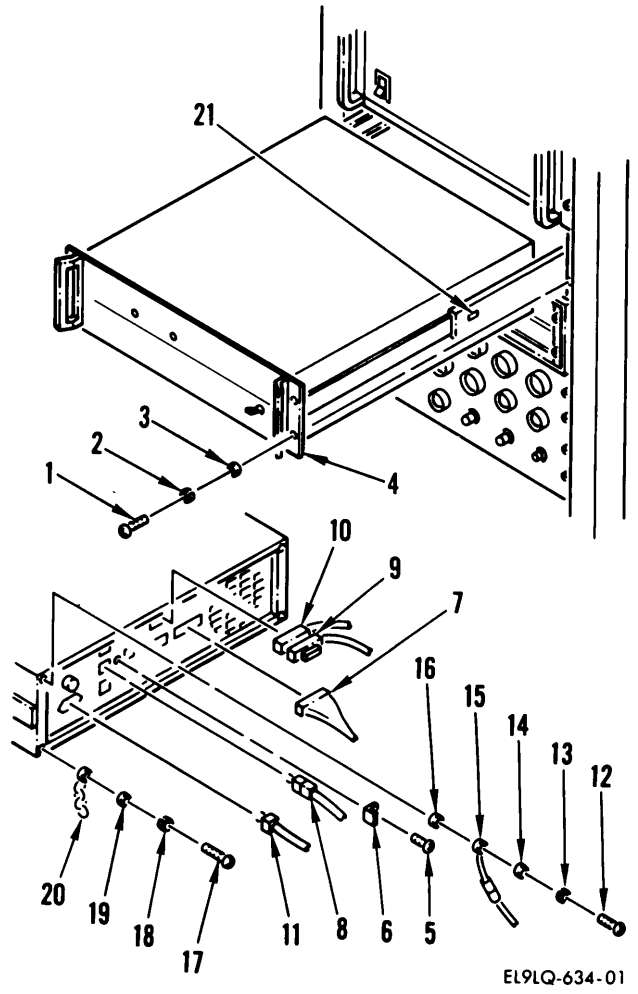
Switch	Position
1	OPEN
2	OPEN
3	Closed
4	Closed
5	Closed
6	Closed
7	Closed

8. Prepare surface and hardware (12 thru 16) for application of zinc chromate primer (para 2-19).

9. Install switch controller assembly in reverse order of removal.

10. Apply thin coat of zinc chromate primer over bonded area and hardware (12 thru 16).

END OF TASK



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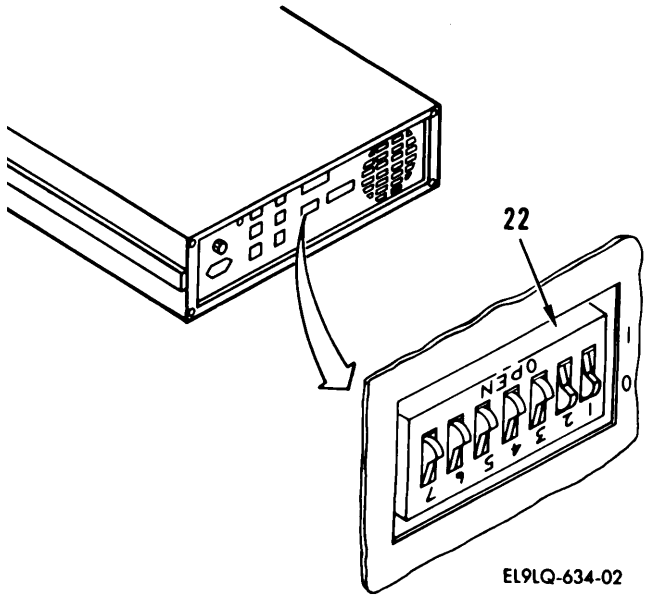


EL9LQ-634-02

2-59. SWITCH CONTROLLER ASSEMBLY 2A2A12 REPAIR 2-59

This task covers replacement of:

Para	Item
1.	Fuse
2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE REPLACEMENT

NOTE

This procedure is used to replace any of three fuses in switch controller assembly.

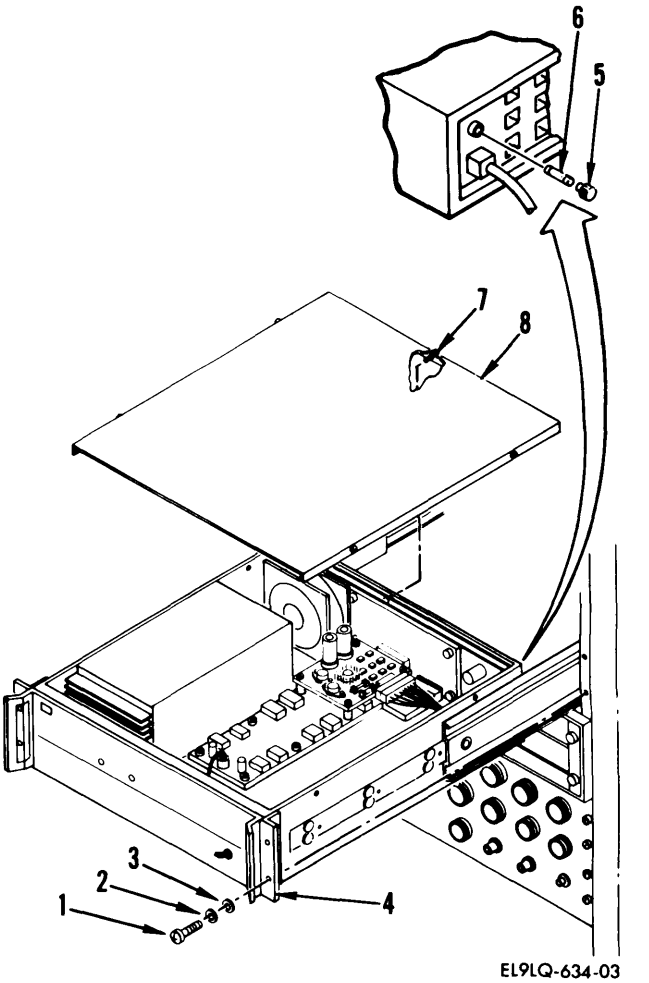
REMOVAL

a. Remove four screws (1), lockwashers (2), washers (3), and pull out switch controller assembly (4).

b. Remove fuse on rear panel of switch controller assembly as follows:

(1) On rear panel, locate fuseholder cap (5) and remove by turning counterclockwise.

(2) Remove defective fuse (6).



c. Remove either of two fuses on internal CCA A2 as follows:

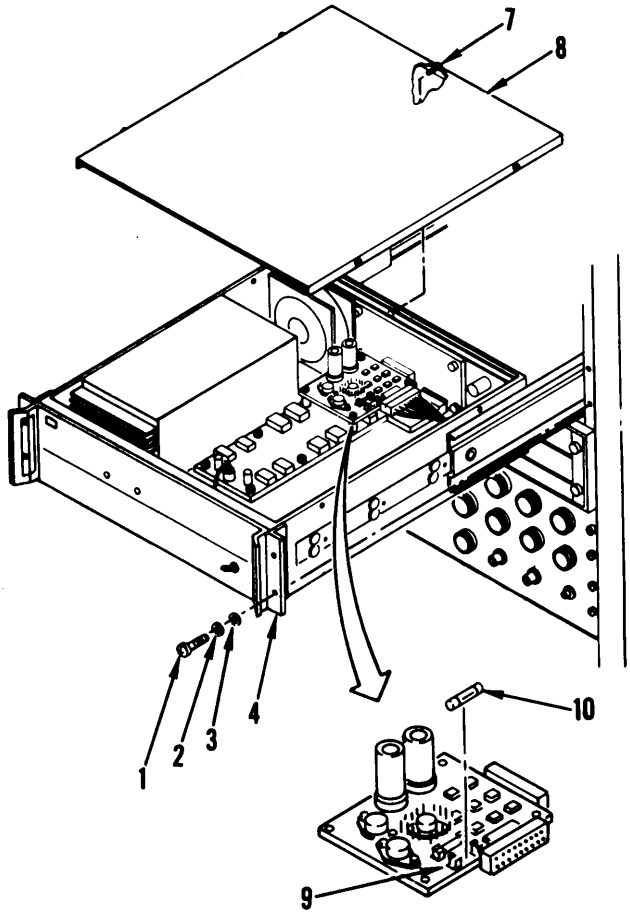
(1) Loosen screw (7), slide cover (8) to rear and lift off.

(2) Locate two fuseholders (9) and remove defective fuse (10).

INSTALLATION

d. Install in reverse order of removal.

END OF TASK



EL9LQ-634-08

2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

NOTE

This procedure is used to replace either of two CCAs in switch controller assembly.

REMOVAL

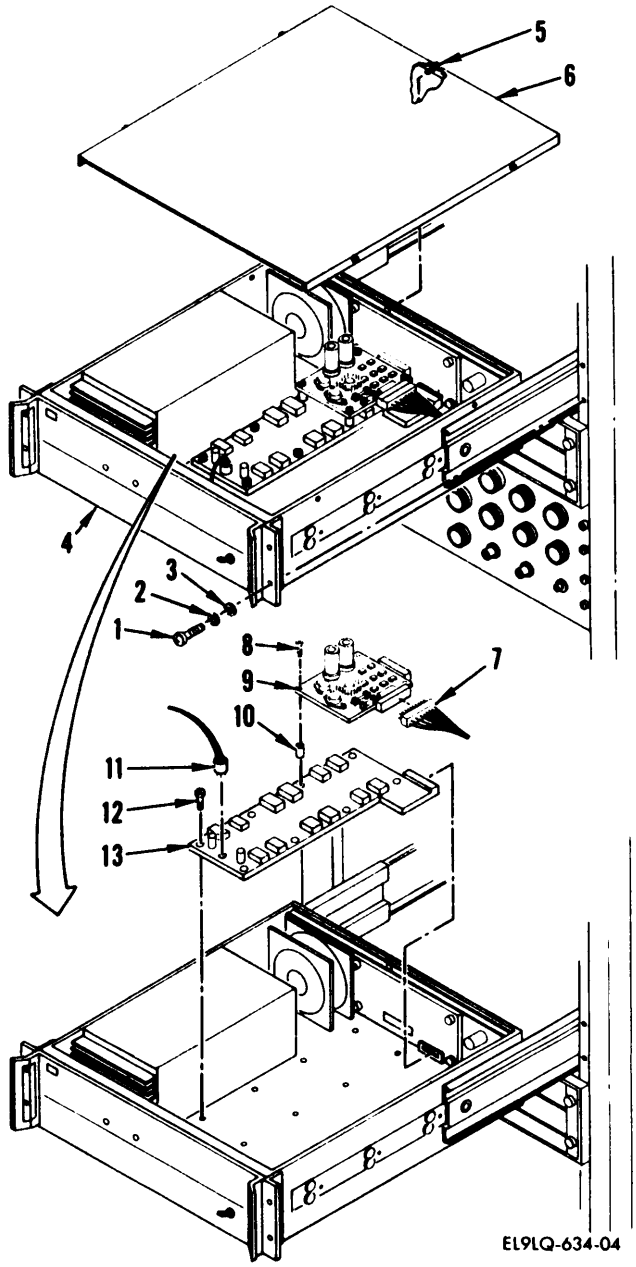
a. Remove four screws (1), lockwashers (2), washers (3), and pull out switch controller assembly (4).

b. Loosen screw (5), slide cover (6) to rear and lift off.

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

c. Comply with ESD procedures for CCAs (para 2-21).



d. Circuit card assembly A1 removal.

(1) Remove connector (7) and four screws (8).

(2) Carefully remove CCA A2 (9) from motherboard at rear to avoid damaging components, and remove four spacers (10)

(3) Disconnect connector (11).

(4) Remove four screws (12) and carefully remove CCA A1 (13) from motherboard at rear to avoid damaging components.

e. Circuit card assembly A2 removal.

(1) Remove connector (7) and screws (8).

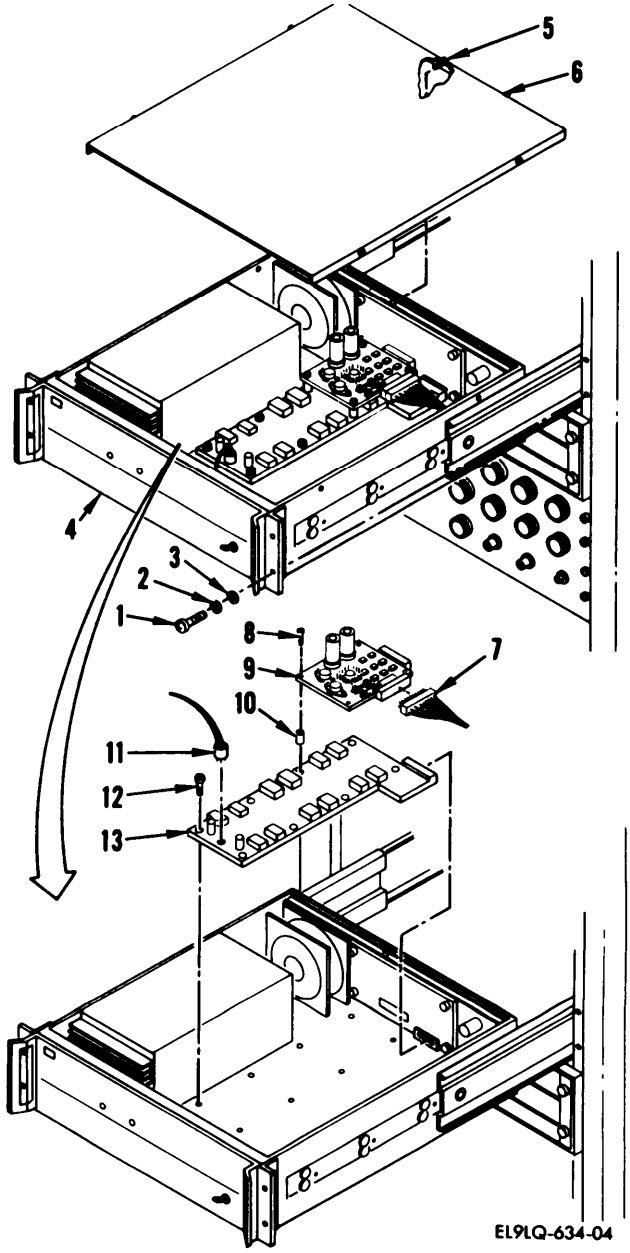
(2) Carefully remove CCA A2 (9) from motherboard at rear to avoid damaging components.

(3) Retain four spacers (10) for reuse.

INSTALLATION

f. Install CCA in reverse order of removal.

END OF TASK



2-60. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 REPLACEMENT

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Personnel Required

396 ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

REMOVAL

1. Remove two screws (1) and pull out analog to digital converter assembly (2).

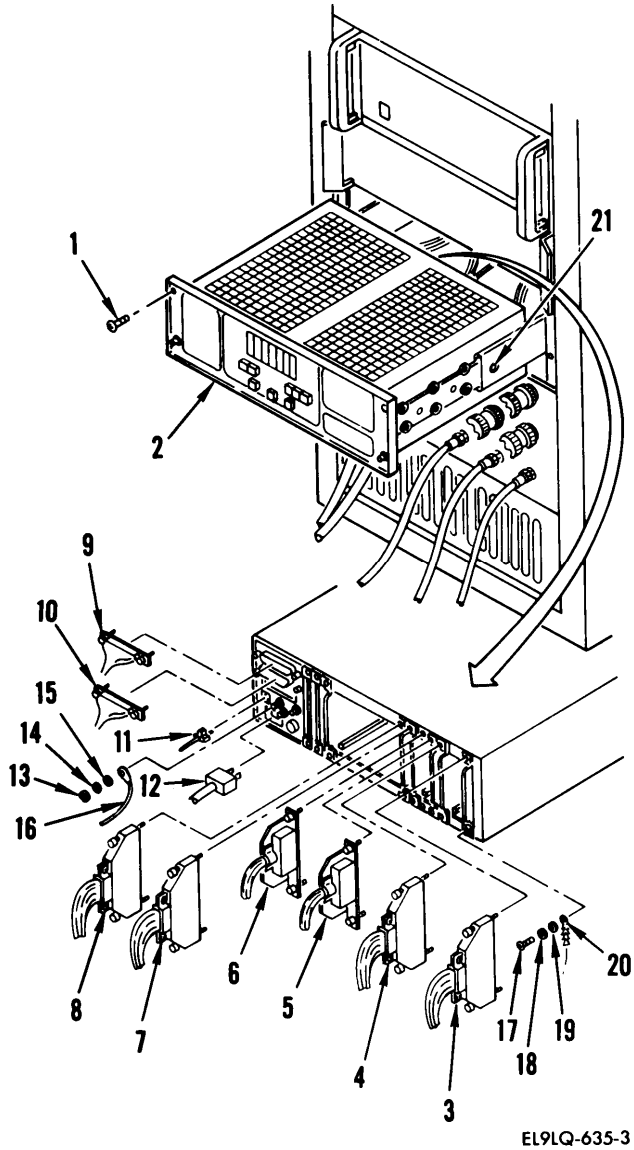
CAUTION

This equipment contains parts and assemblies sensitive to electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

NOTE

Direction of connectors should be noted before removing, as they can be installed upside down. Be careful not to remove CCAs when disconnecting connectors.

2. Comply with ESD procedures for CCAs (para 2-21).



EL9LQ-635-3

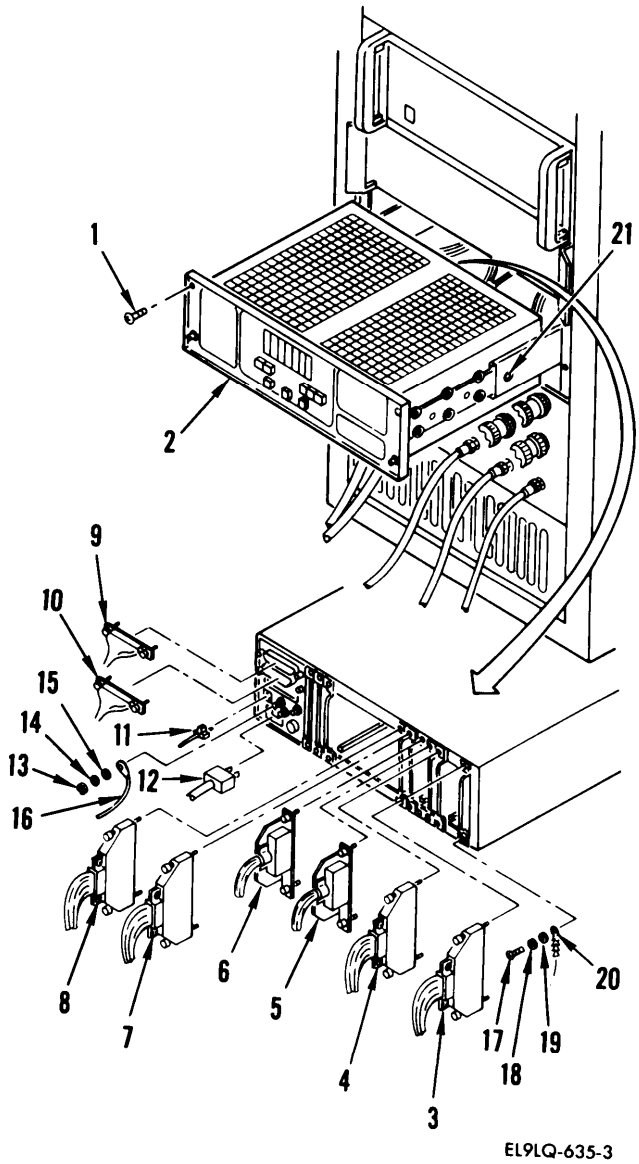
3. On rear panel of analog to digital converter assembly, disconnect the following cables:

W19P2	from J1	(3)
W1P1	from J4	(4)
W1P4	from J5	(5)
W1P6	from J6	(6)
W1P2	from J7	(7)
W1P3	from J8	(8)
W7P1	from J19	(9)
W7P2	from J20	(10)
W19P1	from J28	(11)
AC cord	from J29	(12)

4. Remove two nuts (13), lockwasher (14), washers (15), and ground lead (16).

5. Remove screw (17), lockwasher (18), washer (19), and chain (20).

6. Depress slide locks (21) and remove analog to digital converter assembly.



INSTALLATION

CAUTION

Intermittent Operation

Ensure that ground lug, PWR RTN, SIG RTN, and CHASSIS RTN straps are tightened securely.

7. Install in reverse order of removal.

END OF TASK

2-61. ANALOG TO DIGITAL CONVERTER ASSEMBLY 2A2A13 REPAIR 2-61

This task covers replacement of:

Para	Item
1.	Fuse
2.	Circuit card assembly (CCA)

INITIAL SETUP

Tools

Conductive wrist strap
Conductive workbench mat

Materials (appendix C)

Electrostatic shielding bag (Item 7)

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. FUSE REPLACEMENT

REMOVAL

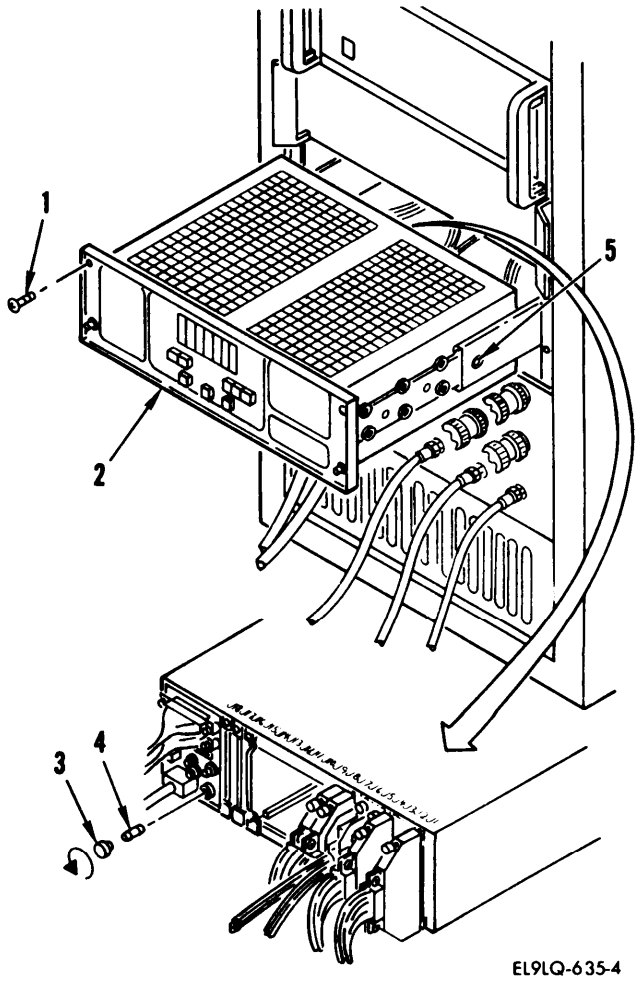
a. Remove two screws (1) and pull out analog to digital converter assembly (2).

b. On rear panel, locate fuseholder cap (3) and remove fuse (4).

INSTALLATION

c. Install in reverse order of removal.

END OF TASK



2. CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT

CAUTION

This equipment contains parts and assemblies sensitive to damage by electrostatic discharge (ESD). Use ESD precautionary procedures when touching, removing, or inserting circuit card assemblies.

NOTE

This procedure is used for replacing 14 analog to digital converter assembly CCAs as applicable.

REMOVAL

NOTE

To remove internal CCAs do steps a, e, and f. To remove CCAs from rear card cage do steps b, c, and d.

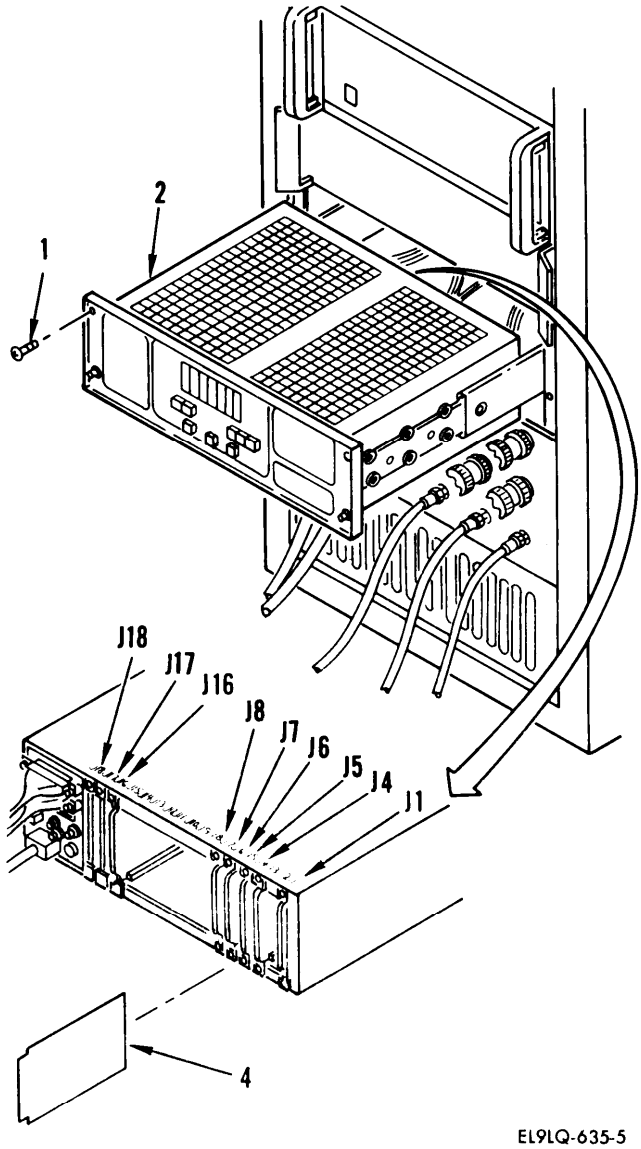
a. Remove two screws (1) and pull out drawer (2) on slide extensions.

b. Remove analog to digital converter assembly (para 2-60).

c. Comply with static sensitive handling procedures for CCAs (para 2-21).

CAUTION

CCAs in slots J17 and J18 are connected by a ribbon cable and must be removed together to avoid damaging CCAs.



EL9LQ-635-5

d. To remove CCA from rear card cage (slots J1 thru J18), pull CCA (4) straight out. Refer to list below for CCA location.

CCA No.	Slot
AC 4720	J4, J7, J8
AC 4060	J5, J6
AC 280	J1
AC 333-1	J17
AC 333-2	J18

e. To remove internal CCA (slots J73 through J77), loosen six captive screws (5) and remove cover (6). Refer to list below for CCA location.

CCA No.	Slot
13082276-2	J75
13082276-3	J76
AC 471-16	J77
AC 8016-2D	J74
AC 262	J73

f. Pull CCA (7) straight up and, if required, disconnect connector (8).

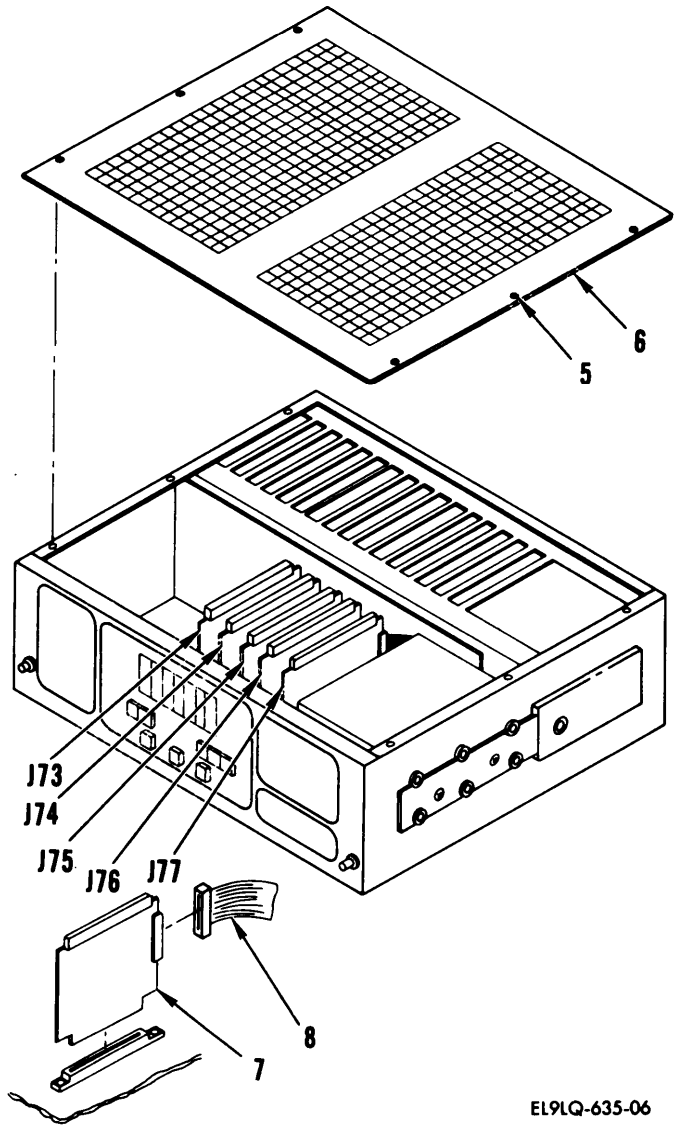
INSTALLATION

CAUTION

Ensure arrows on ribbon connector (8) and card (7) line up when connecting them together. Installing connectors incorrectly may cause equipment damage.

g. Install in reverse order of removal.

END OF TASK



2-62. CABLE ENTRY PANEL 2A2A14 REPAIR

This task covers replacement of terminal board assembly 2A2A14TB1.

INITIAL SETUP

Personnel Required

39B ATE Repairer

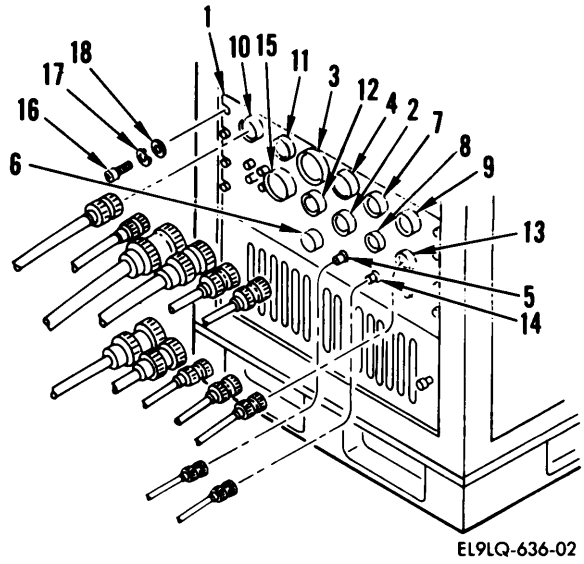
Equipment Condition

Power removed (para 2-24.1)

REMOVAL

1. On cable entry panel (1), disconnect the following connectors:

W2P2	from	J1	(2)
W3P2	from	J2	(3)
W5P2	from	J3	(4)
W9P2	from	J4	(5)
W7P2	from	J5	(6)
W27P1	from	J6	(7)
W29P2	from	J7	(8)
W28P2	from	J8	(9)
W8P2	from	J9	(10)
W12P1	from	J10	(11)
W4P2	from	J11	(12)
W30P1	from	J12	(13)
W24P1	from	J13	(14)
W14P2	from	J14	(15)



2. Remove eight screws (16), lockwashers (17), and washers (18).

3. Pull out cable entry panel (1) and remove three screws (19), washers (20), lockwasher (21), nuts (22), and remove terminal board TB1 (23).

4. Loosen two nuts (24) and remove terminal board cover (25).

5. Remove 16 nuts (26), washers (27), lockwashers (28), and tag and remove all leads (29) from terminal board (23). Remove five links (30). Retain hardware (26 thru 30) for reinstallation.

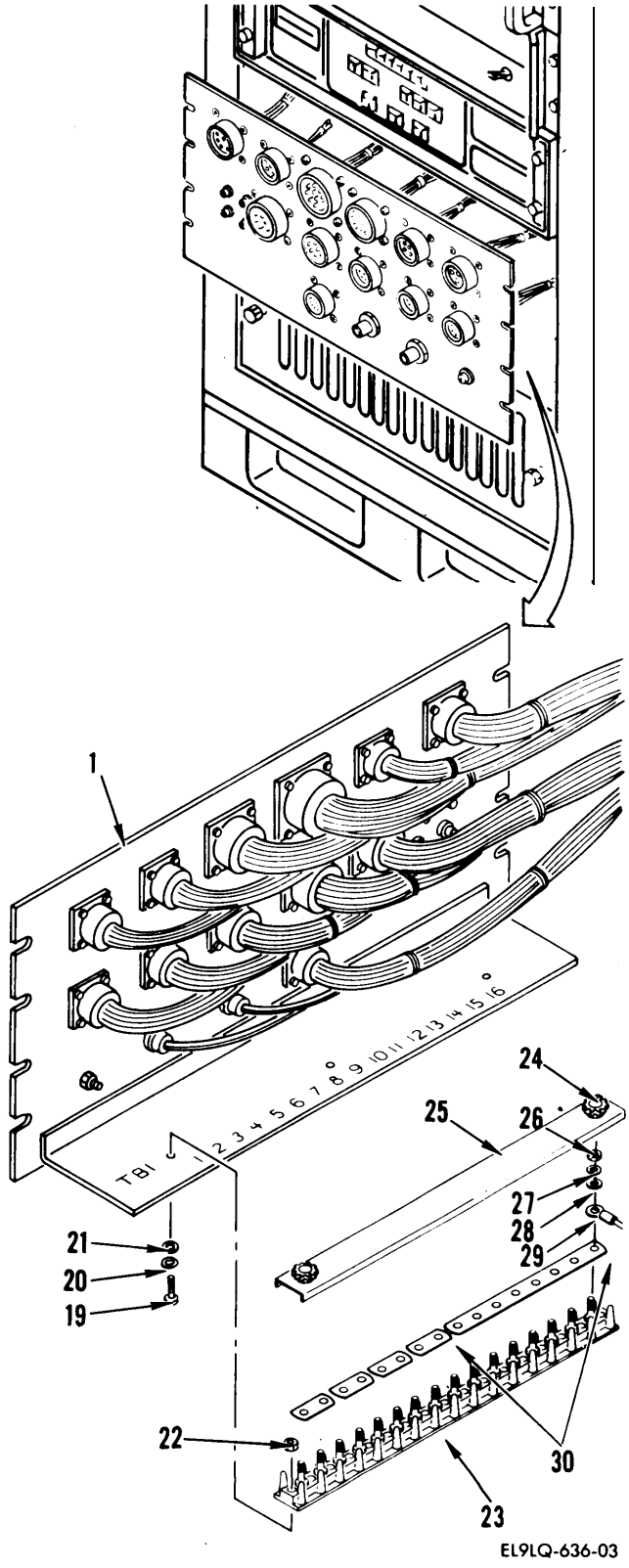
INSTALLATION

6. Install in reverse order of removal. Refer to wire list below for terminal board connections.

Terminal Board Wire List

From	To
W20E1	TB1-1
W3E1	TB1-1
W13E1	TB1-1
W13E6	TB1-1
W14E5	TB1-2
W3E2	TB1-2
W17E14	TB1-2
W17E16	TB1-2
W17E6	TB1-3
W13E2	TB1-3
W3E7	TB1-3
W14E8	TB1-4
W3E10	TB1-5
W17E8	TB1-5
W13E3	TB1-5
W14E7	TB1-6
W20E3	TB1-6
W3E19	TB1-7
W17E10	TB1-7
W17E11	TB1-7
W17E22	TB1-8

From	To
W17E23	TB1-8
W3E4	TB1-9
W3E5	TB1-9
W17E7	TB1-9
W3E10	TB1-10
W14E10	TB1-10
W3E13	TB1-11
W17E3	TB1-11
W17E9	TB1-11
W3E21	TB1-12
W8E2	TB1-12
W13E2	TB1-13
W20E7	TB1-13
W17E24	TB1-14
W9E11	TB1-14
W1E1	TB1-14
W17E19	TB1-15
W9E14	TB1-15
W8E6	TB1-16
W9E17	TB1-16
W13E4	TB1-16



END OF TASK

2-63. BLOWER ASSEMBLY 2A2A15 REPLACEMENT

INITIAL SETUP

Personnel Required

39B ATE Repairer
One assistant

Equipment Condition

Power removed (para 2-24.1)

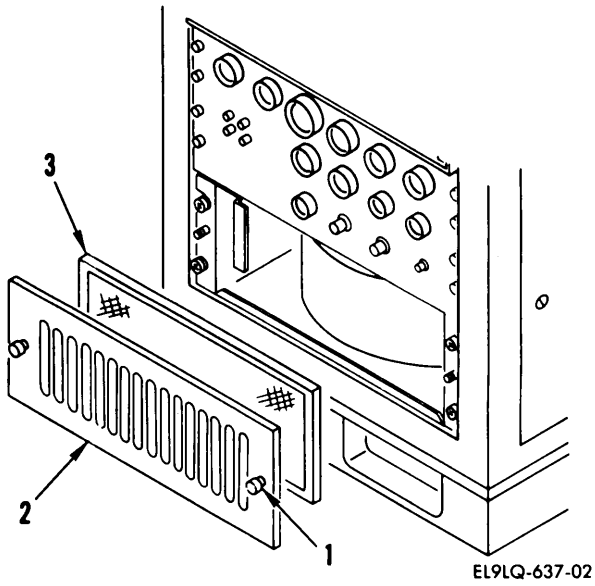
REMOVAL

1. Disconnect all cables from cable entry panel A14.
2. On rear of test console test bench, loosen two captive nuts (l), and remove cover (2) and filter (3).
3. Remove four screws (4), lockwashers (5), and washers (6).

CAUTION

Be sure to disconnect ac cord from ac plug mold to avoid damaging cord.

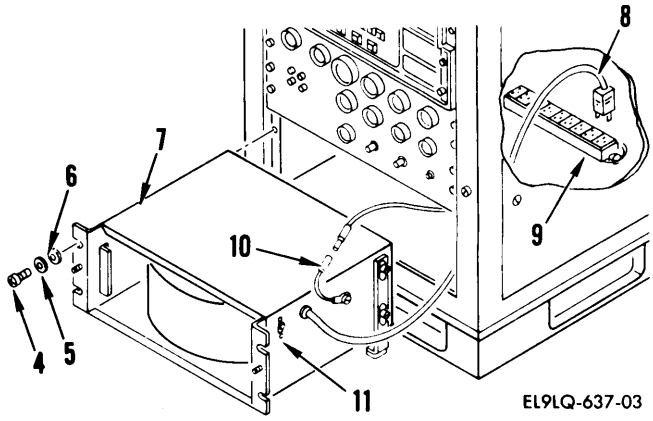
4. Pull blower assembly (7) from cabinet and disconnect ac power cord (8) from plug mold (9).
5. Pull blower assembly one-half way out and disconnect ground lead (10).



EL9LQ-637-02

INSTALLATION

6. Inspect filter for defects and cleaness (para 2-22).
7. Set blower switch (11) to HI (up) position before installing.
8. Install blower assembly in reverse order of removal.
9. Connect all cables to cable entry panel A14 (para 5-5).



EL9LQ-637-03

END OF TASK

Section X. NIGHTSIDE TEST BENCH 2A3 MAINTENANCE PROCEDURES

2-64. NIGHTSIDE TEST BENCH CABINET REPAIR 2-64

This task covers replacement of:

Para	Item	Para	Item
1.	Panels	2.	Access covers

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. PANELS REPLACEMENT

NOTE

- This procedure is for removal of all panels. Perform only the steps necessary to remove desired panels.
- To remove panels on left side of cabinet, it is necessary to move nightside test bench away from test console test bench (para 5-36).

REMOVAL

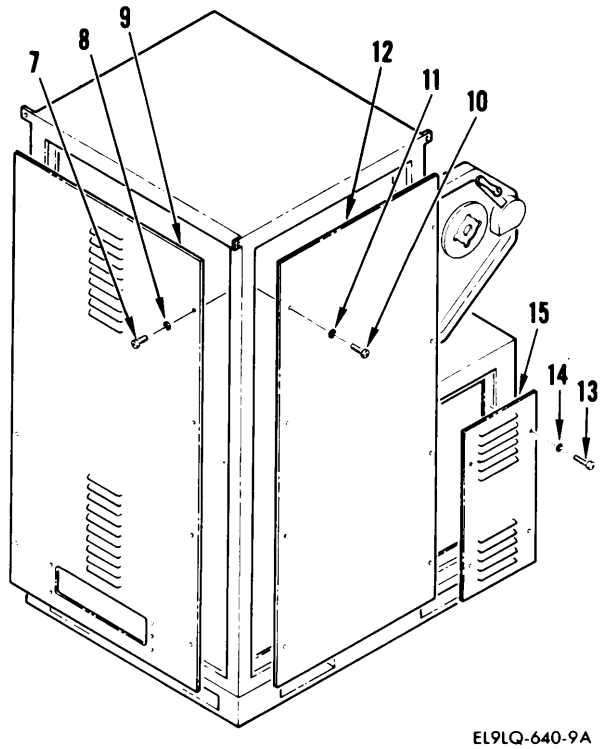
a. On rear of nightside test bench cable entry panel (1), disconnect the following cables:

W8P1 from connector J1 (2)
W12P2 from connector J2 (3)
W1P2 from connector J3 (4)
W1OP2 from connector J4 (5)
W11P2 from connector J5 (6)

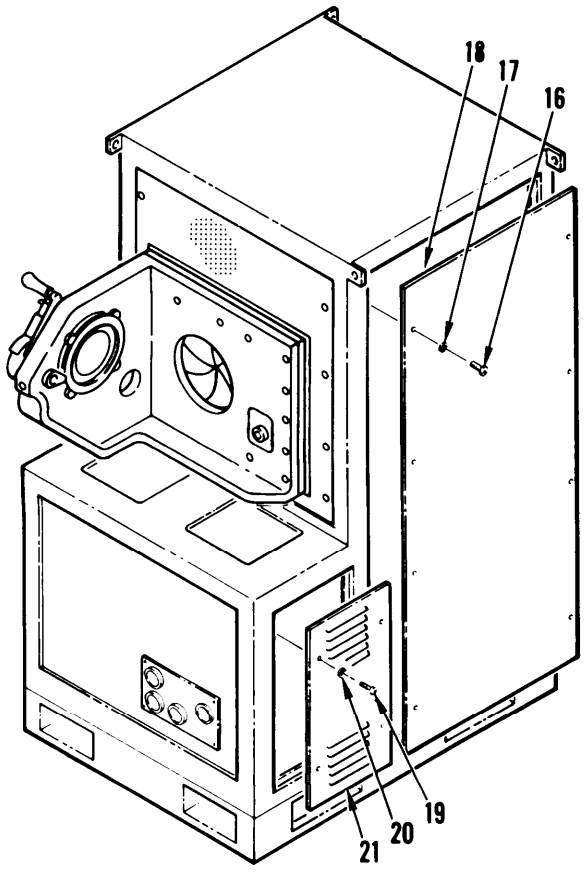
b. Remove eight screws (7) and washers (8) securing rear panel (9) to cabinet. Remove rear panel.

c. Remove eight screws (10) and washers (11) securing left panel (12) to cabinet. Remove left panel.

d. Remove four screws (13) and washers (14) securing left front panel (15) to cabinet. Remove left front panel.



EL9LQ-640-9A



EL9LQ-640-8A

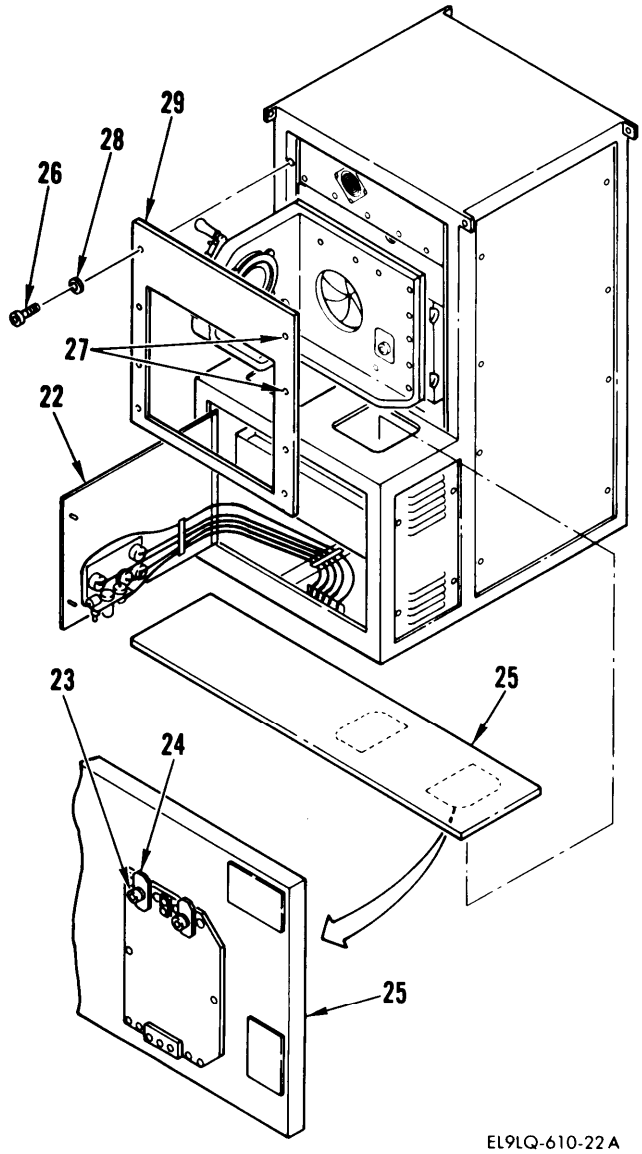
e. Remove eight screws (16) and washers (17) securing right panel (18) to cabinet. Remove right panel.

f. Remove four screws (19) and washers (20) securing right front panel (21) to cabinet. Remove right front panel.

g. On front of nightside test bench, open access door (22).

h. On underside of nightside test bench, loosen four screws (23), rotate four retainers (24), and remove bench top (25).

i. Remove six long screws (26), two short screws (27), and washers (28) securing front panel (29) to cabinet. Remove front panel.



WARNING

TO PREVENT INJURY TO PERSONNEL, PNEUMATIC PRESSURE SHOULD BE OFF AND SYSTEM BLED DOWN PRIOR TO DISCONNECTING PNEUMATIC LINES.

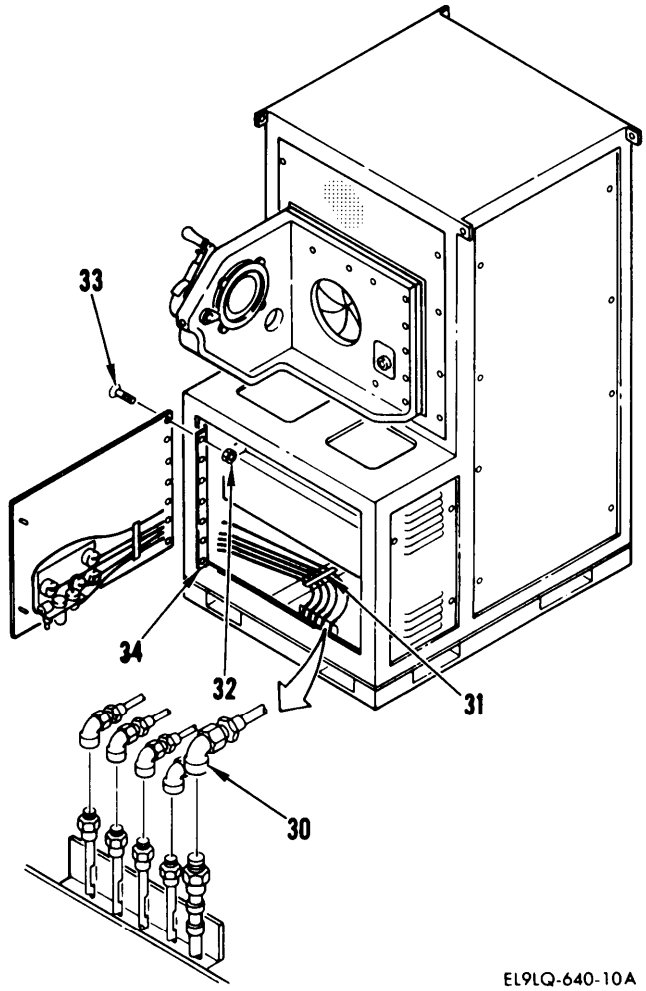
j. Disconnect five pneumatic lines (30). Release lines from retainer (31) in bottom of cabinet.

k. Remove seven nuts (32) and screws (33) securing access door to hinge (34). Remove access door.

INSTALLATION

l. Install panels in reverse order of removal.

END OF TASK



2. ACCESS COVERS REPLACEMENT

NOTE

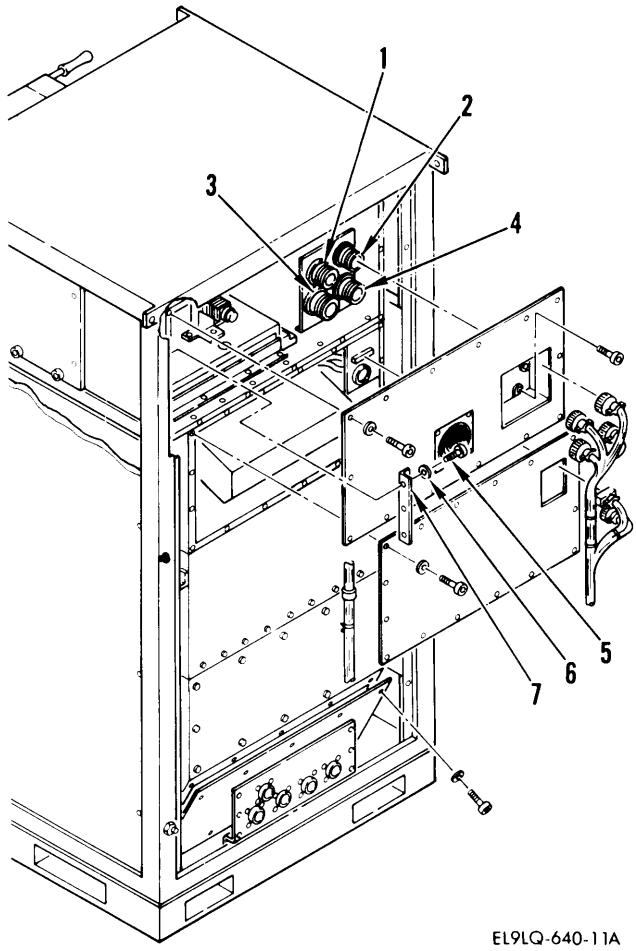
- This procedure is for removal of all access covers. Perform only steps necessary to remove desired covers.
- To remove access covers, it is necessary to first remove cabinet panels. Refer to 1 above as required.

REMOVAL

a. Disconnect the following cables:

2A3A1W4P1 from connector J1 (1)
2A3A1W4P3 from connector J2 (2)
2A3A1W1P1 from connector J3 (3)
2A3A1W2P1 from connector J4 (4)

b. Remove three screws (5), washers (6), and bracket (7).



c. Remove 14 screws (8) and washers (9). Note location of large screws.

d. Remove six screws (10) from A3A1A15 connector bracket (11) and remove access cover (12).

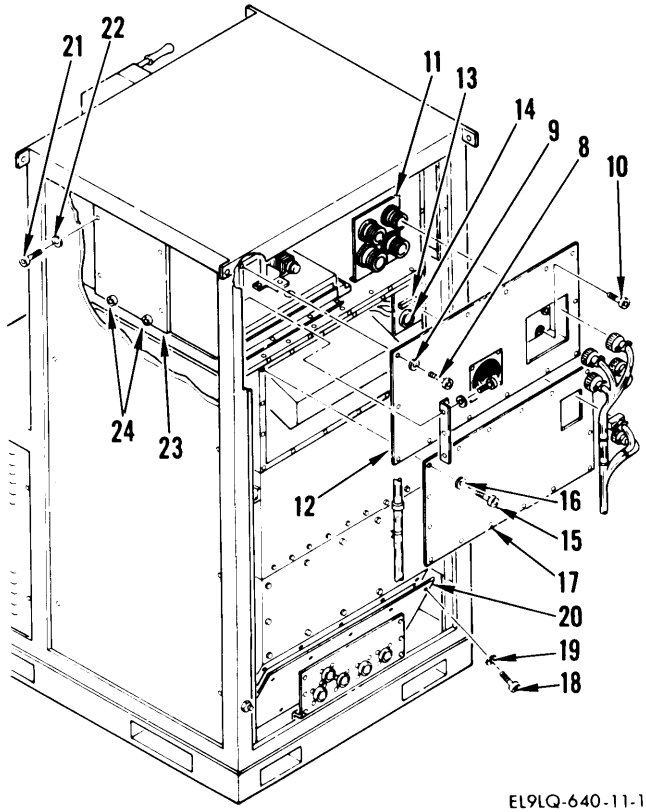
e. Disconnect the following cables:

2A3A1W4P2 from connector J1 (13)
2A3A1W3P1 from connector J2 (14)

f. Remove 16 screws (15), washers (16), and access cover (17).

g. Remove 12 screws (18), washers (19), and access cover (20).

h. Remove eight screws (21), washers (22), and access cover (23). Note location of two short screws (24).



EL9LQ-640-11-1

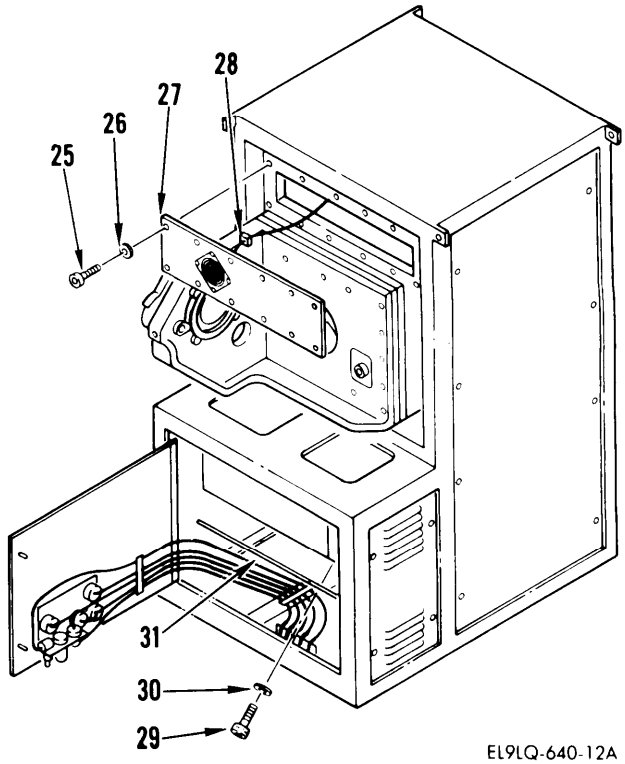
i. Remove 12 screws (25), washers (26), and pull out access cover (27) and disconnect connector W6P16 from fan connector P1 (28).

j. Remove 14 screws (29), washers (30), and access cover (31).

INSTALLATION

k. Install access cover in reverse order of removal.

END OF TASK



EL9LQ-640-12A

2-64.1 TABLE EXTENSION AND BRACKET REPLACEMENT 2-64.1

INITIAL SETUP

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

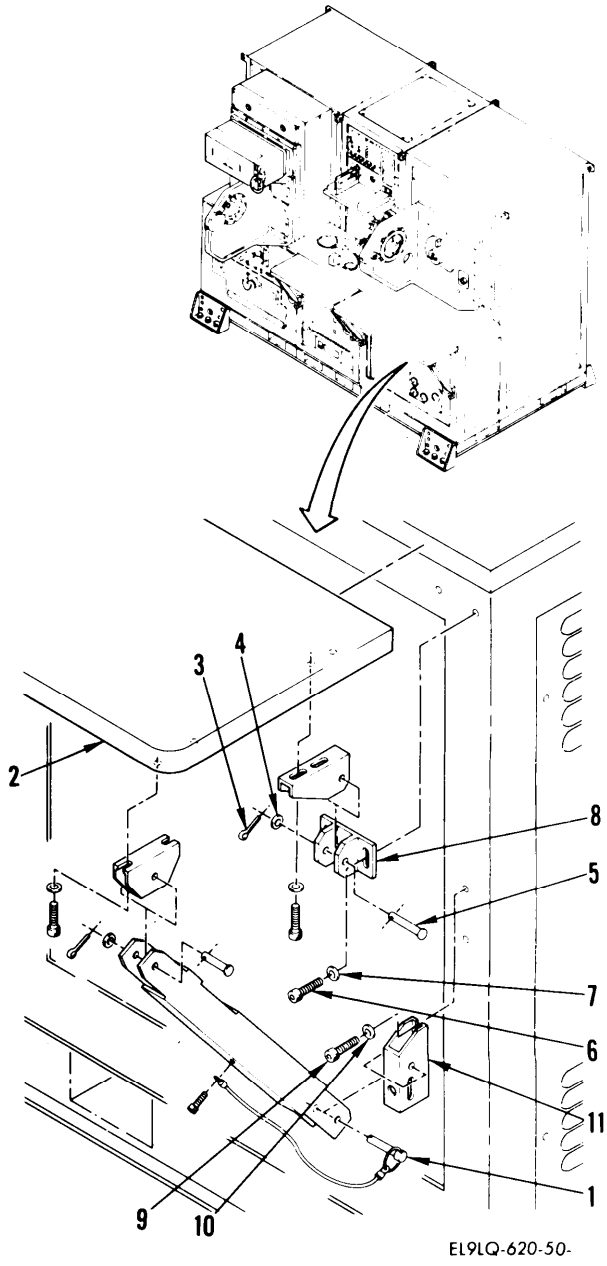
REMOVAL

1. Remove two self-locking pins (1).
2. Remove two cotter pins (3), washers (4), and pins (5); remove table extension (2).
3. Remove four screws (6), washers (7), and remove brackets (8).
4. Remove four screws (9) and washers (10); remove two brackets (11).

REMOVAL

5. Install table extension in reverse order of removal.

END OF TASK



Section XI. TEST PROGRAM SETS MAINTENANCE PROCEDURES

2-65. MAJOR TEST ADAPTER REPLACEMENT 2-65

This task covers major test adapter replacement from:

Para	Item	Para	Item
1.	AN/USM-410	2.	Test console test bench

INITIAL SETUP

Personnel Required

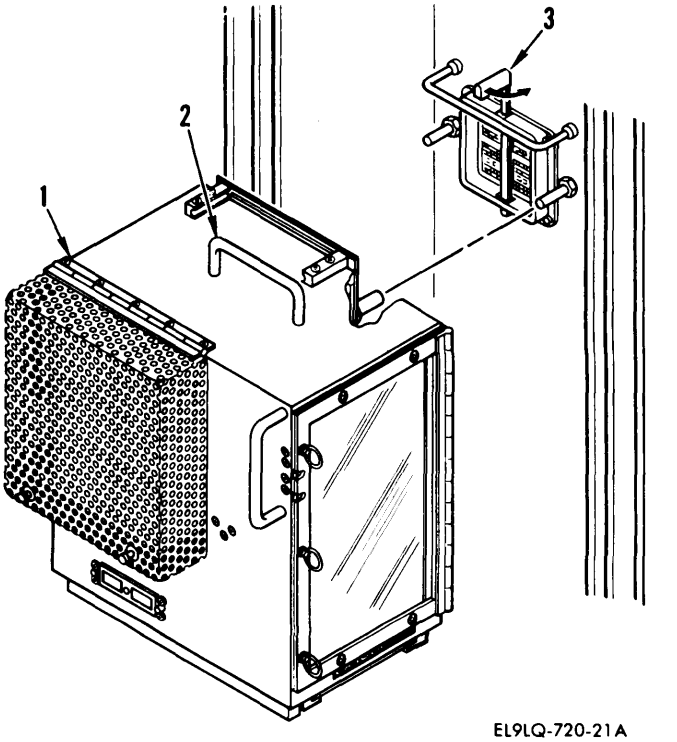
39B ATE Repairer

1. MAJOR TEST ADAPTER REPLACEMENT FROM AN/USM-410

REMOVAL

a. On major test adapter (1), hold handle (2) and on equate, rotate connector J1 handle (3) 1/4 turn counterclockwise.

b. Pull major test adapter straight out and remove.



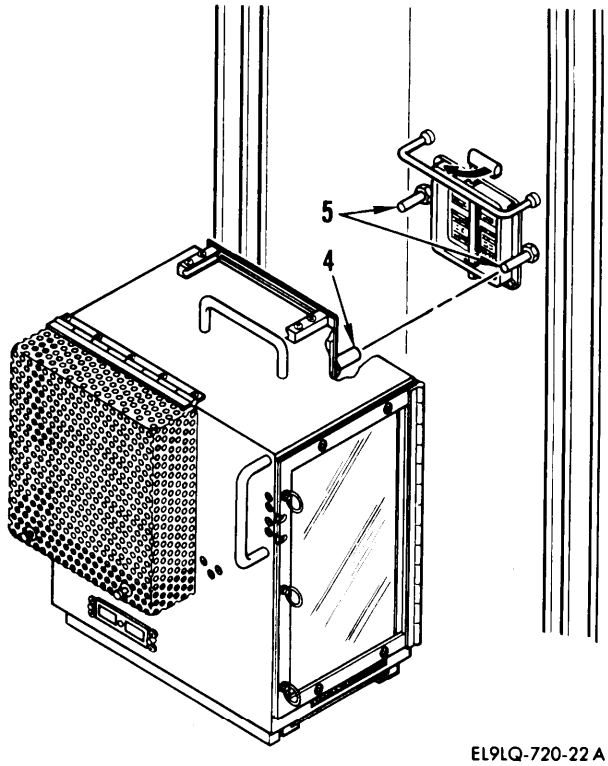
EL9LQ-720-21A

INSTALLATION

c. On major test adapter, hold handle and align two guide pins (4) with two guide pins (5) on AN/USM-410.

d. On AN/USM-410, rotate connector J1 handle 1/4 turn clockwise.

END OF TASK



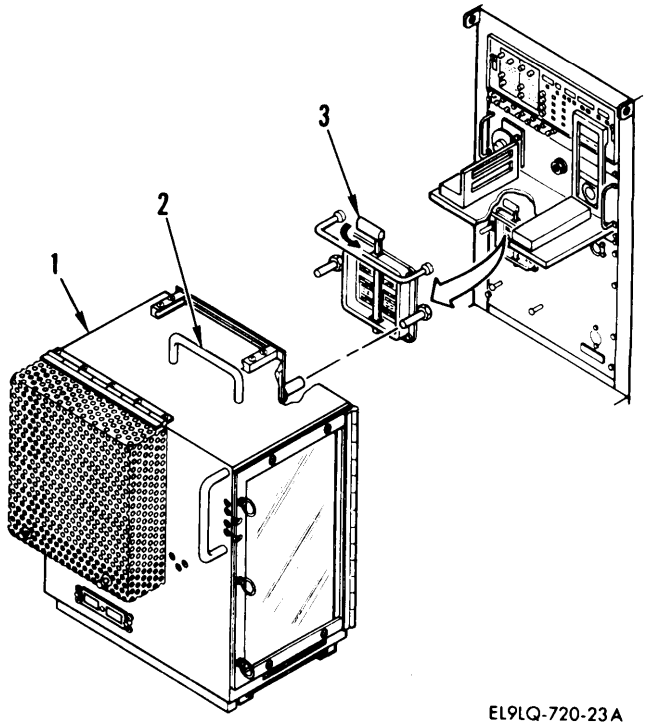
EL9LQ-720-22A

2. MAJOR TEST ADAPTER REPLACEMENT FROM TEST CONSOLE TEST BENCH

REMOVAL

a. On major test adapter (1), hold handle (2) and on test console test bench, rotate connector J1 handle (3) 1/4 turn counterclockwise.

b. Pull major test adapter straight out and remove.



EL9LQ-720-23A

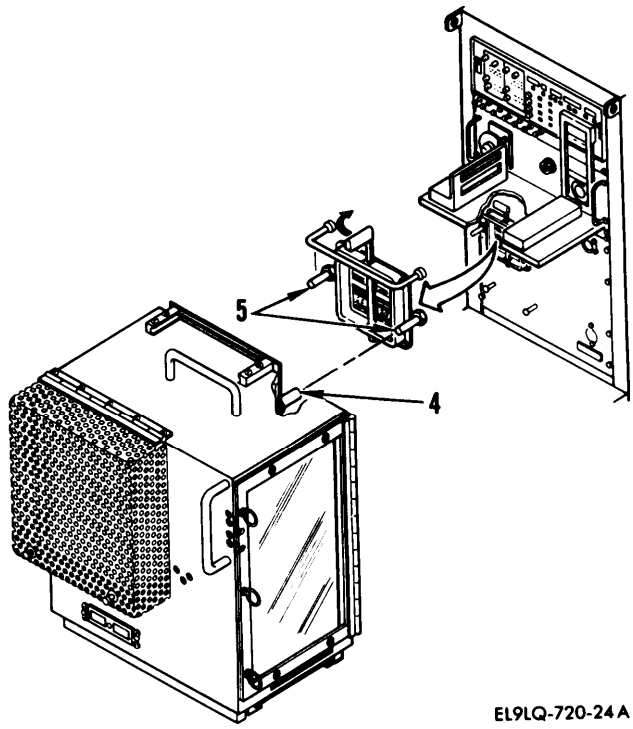
2-65. MAJOR TEST ADAPTER REPLACEMENT (cont) 2-65

INSTALLATION

c. On major test adapter, hold handle and aline two guide pins (4) with two guide pins (5) on test console test bench.

d. On test console test bench, rotate connector J1 handle 1/4 turn clockwise.

END OF TASK



EL9LQ-720-24A

2-66. TEST FIXTURE REPLACEMENT 2-66

Test fixtures are removed and installed as required by data displayed on video display terminal for the TPS in use.

2-67. TPS CABLE ASSEMBLY REPLACEMENT 2-67

CAUTION

When connecting zero-force connectors to equipment, ensure that male connector is seated squarely onto female connector. Do not apply uneven pressure. When turning locking lever, discontinue if resistance is felt, and inspect connectors for bent pins.

Cables are removed and installed as required by data displayed on video display terminal for the TPS in use.

2-68. SELF-TEST CONNECTOR REPLACEMENT 2-68

Self-test connectors are removed and installed as required by data displayed on video display terminal for the TPS in use.

2-69. PERSONALITY CIRCUIT CARD ASSEMBLY REPLACEMENT 2-69

INITIAL SETUP

Personnel Required

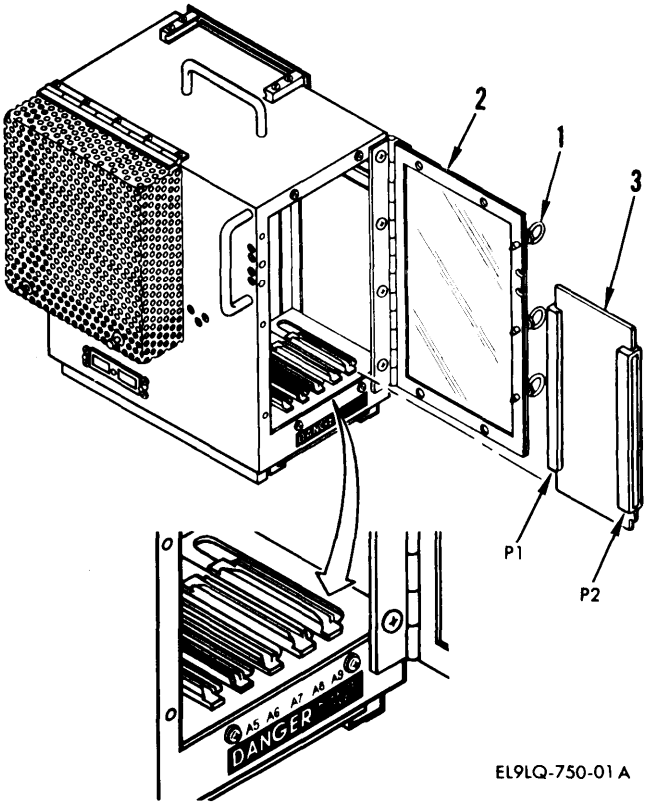
396 ATE Repairer

REMOVAL

1. On major test adapter, rotate three turnlock fasteners (1) counterclockwise and open the circuit card cover assembly (2).
2. Slide personality circuit card assembly (3) out of major test adapter.

INSTALLATION

3. Install personality circuit card assembly connector P1 side or connector P2 side in any one of card slots A5 thru A9 according to display on VDT. The following is a supplementary listing of personality circuit card assemblies, UUT numbers, TPS control numbers, nomenclature, and card slots
4. Close circuit card cover assembly and rotate turnlock fasteners clockwise.



END OF TASK

Section XII. PREPARATION FOR STORAGE OR SHIPMENT

2-70. GENERAL 2-70

Preparation for storage or shipment of EETF TADS PNVS Augmentation Equipment (assemblies/subassemblies) should be done per Department of Defense (DOD) standards. There are no special handling procedures for the assemblies/subassemblies except for electrostatic discharge sensitive (ESDS) circuit card assemblies (CCAs) as identified in the following paragraph.

When the EETF is moved, the electro-optical test bench set must be secured by transport retainer brackets. Procedures for positioning these brackets are provided in paragraph 2-72.

2-71. SPECIAL PACKAGING PROCEDURES - ASSEMBLIES THAT CONTAIN ESDS DEVICES 2-71

This paragraph provides information for specific packaging of ESDS CCAs. These CCAs contain devices that are sensitive to damage by electrostatic discharge (ESD). Maintenance, shop handling, and initial packaging instructions for ESDS CCAs are contained in paragraph 2-21. Refer to DOD-STD-1686 for information that covers packaging ESDS device symbol marking, and standard ESDS warnings. The following list identifies the ESDS CCAs used in this equipment. Be sure that they are handled, packaged, and shipped properly.

2-71. SPECIAL PACKAGING PROCEDURES - ASSEMBLIES THAT CONTAIN ESDS DEVICES (cont)

Electronic Station 13082701-29

Reference Designation	Nomenclature	Part Number
1A11	Digital Computer Assembly	13231746
1A11A1	Asynchronous Serial Interface	12205A
1A11A2	Sequencer	12201A
1A11A3	Data Path	12202A
1A11A4	Cache Control	12203A
1A11A5	Memory Controller	12204A
1A11A6	Memory	12221A
1A11A7/A11	HP-IB Interface	12009A
1A11A8	ASIC	12005B/002
1A11A9	IEEE Interface CCA	13081742
1A11A10	Priority Jumper	12012A
1A11A12	Parallel Interface Card	13081742
1A11A13	Buffer	13081483

ESD label on chassis warning of ESDS devices within unit.

2-71. SPECIAL PACKAGING PROCEDURES - ASSEMBLIES THAT CONTAIN ESDS DEVICES (cont) 2-71

Test Console Test Bench

Reference Designation	CCA Slot/ Location	Nomenclature	Part Number
2A2A1		Programmable Digitizer	7612D
2A2A1A56		IEEE-488 Interface CCA	6289-01
2A2A6		Multiprogrammer Assembly	13081880
	400	Digital Input CCA	13083412
	401A	Digital Input CCA	13083412
	402B	Digital Input CCA	13083412
	403C	Digital Input CCA	13083412
	404D	Digital Input CCA	13083412
	405E	Digital Input CCA	13083412
	406F	Digital Output CCA	69331B
	407G	Digital Output CCA	69331B
	408H	Digital Output CCA	69331B
	409I	Digital Output CCA	69331B
	41OJ	Digital Output CCA	69331B
	412L	D/A Converter CCA	69322A
	413M	D/A Converter CCA	69322A
2A2A7	A6A5	FIFO CCA	13082717-19
	A6A1O	Programmable Pulse Generator CCA	13081471-19
2A2A1O		Matrix Switch Assembly	13081925
	Control	Quadrant Control Card	94140B
	1 thru 16	Matrix Relay Cards	94140A
2A2A11		Multiprogrammer Extender Assembly	13081879
	400	Output Readback CCA	69433A
	401A	Output Readback CCA	69433A
	402B	Output Readback CCA	69433A
	403C	Output Readback CCA	69433A
	408H	Output Readback CCA	69433A
	409I	Output Readback CCA	69433A
2A2A12		Switch Controller Assembly	13081427
2A2A12A1	A1	Main Control Card	
2A2A12A2	A2	Self-Test Card	
2A2A13		Analog to Digital Converter Assembly	13081746
	J1	Sample and Hold CCA	AC280
	J4	Hi-Level MUX CCA	AC4720
	J5	MUX CCA	AC4060
	J6	MUX CCA	AC4060
	J7	Hi-Level MUX CCA	AC4720
	J8	Hi-Level MUX CCA	AC4720
	J17	Dual Terminator CCA	AC333
	J18	Dual Terminator CCA	AC333
	J73	Signal Processor CCA	AC262
	J74	A/D Converter CCA	AC8016-2D
	J75	Computer Interface Assembly (CCA)	13082276-2
	J76	Computer Interface Assembly (CCA)	13082276-3
	J77	Computer Interface Assembly (CCA)	AC471-1B

END OF TASK

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2-72. TRANSPORT RETAINER PROCEDURES

This task covers:

Para	Item
1.	Preparation for operation
2.	Preparation for transport

INITIAL SETUP

Tools and Special Tools

Torque wrench

Personnel Required

39B ATE Repairer

Equipment Condition

Power removed (para 2-24.1)

1. PREPARATION FOR OPERATION

a. On four retainer brackets (1) remove 24 screws (2) and washers (3).

b. Remove eight screws (4), lockwashers (5), washers (6), and four protective cups (7).

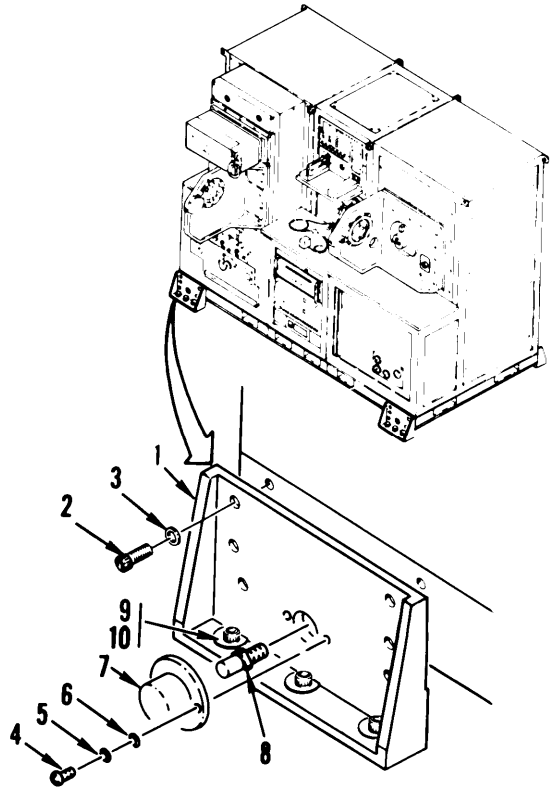
c. Remove stud (8).

d. Loosen 12 screws (9) and position flats on washers (10) toward bench and slide retainer brackets away from bench.

e. Torque 12 screws (9) to 50 ft-lb.

f. Install stud (8).

g. Install four protective cups with eight screws (4), lockwashers (5), and washers (6). (7)



EL9LQ-600-08A

END OF TASK

2. PREPARATION FOR TRANSPORT

a. On four retainer brackets (1) remove eight screws (2), lock-washers (3), washers (4), and protective cups (5).

b. Remove four studs (6).

c. On four retainer brackets (1) loosen 12 screws (7) and slide retainer brackets against bench.

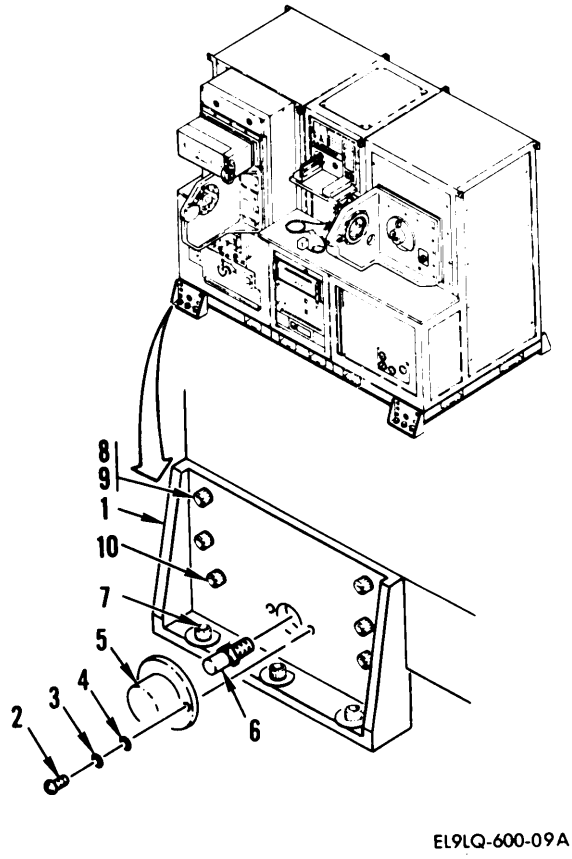
d. Install 16 screws (8) and washers (9), torque to 35 ft-lb.

e. Torque 12 screws (7) to 50 ft-lb.

f. Install remaining screws (10) and torque to 35 ft-lb.

g. Install four studs (6).

h. Install four protective cups (5) with eight screws (2), lock-washers (3), and washers (4)0



EL9LQ-600-09A

END OF TASK

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2-73. DISC/TAPE DRIVE STORAGE AND SHIPMENT PROCEDURES 2-73

This task covers:

Para	Item	Para	Item
1.	Preparation for operation	2.	Preparation for shipment or storage

INITIAL SETUP

Personnel Required

396 ATE Repairer

Tools and Special Tools

T15 star driver
Torque wrench, in-lb

Equipment Condition

Power removed (para 2-24.1)

1. PREPARATION FOR OPERATION

a. Remove front panel (1) from disc/tape drive assembly by grasping sides and pulling cover off.

b. Remove four screws (2), lockwashers (3), and washers (4).

c. Pull out disc drive assembly until actuator lock and spindle lock are accessible.

d. Unlock actuator by moving actuator lock lever (5) to OPERATE.

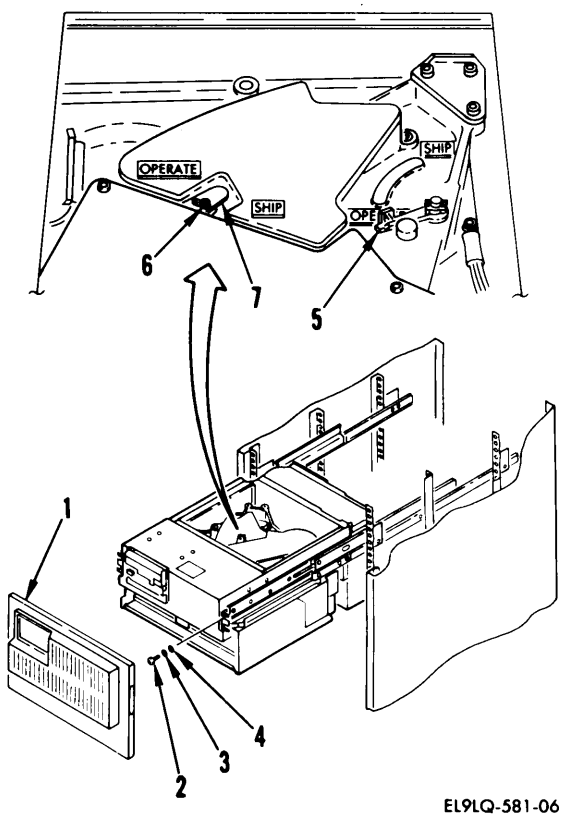
e. Loosen screw (6) and move spindle lock lever (7) to OPERATE.

f. Tighten screw (6) to 20 in-lb.

g. Slide disc/tape drive assembly into cabinet.

h. Install four washers (4), lockwashers (3), and screws (2).

i. Install front panel (1).



END OF TASK

2. PREPARATION FOR SHIPMENT OR STORAGE

a. Remove front panel (1) from disc/tape drive assembly by grasping sides and pulling cover off.

b. Remove four screws (2), lockwashers (3), and washers (4).

c. Pull out disc drive assembly until actuator lock and spindle lock are accessible.

d. Lock actuator by moving actuator lock lever (5) to SHIP.

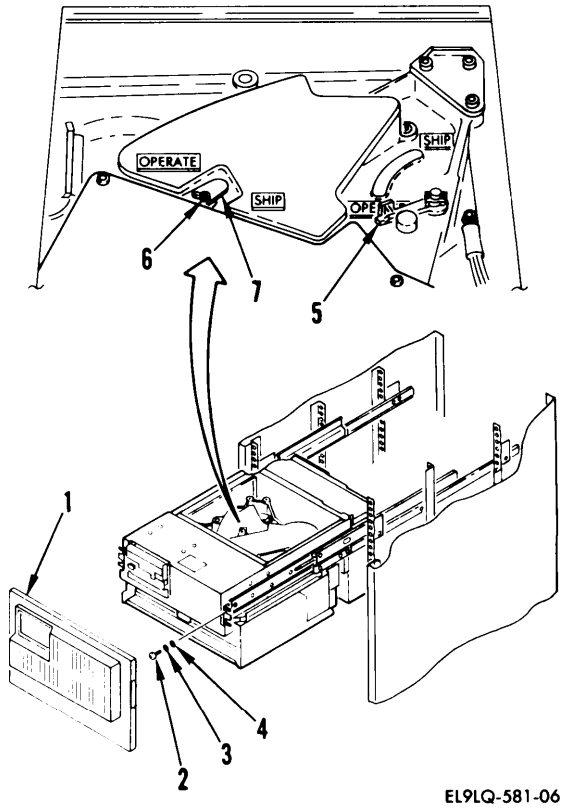
e. Loosen screw (6) and move spindle lock lever (7) to SHIP.

f. Tighten screw (6) to 20 in-lb.

g. Slide disc/tape drive assembly into cabinet.

h. Install four washers (4), lockwashers (3), and screws (2).

i. Install front panel (1).



EL9LQ-581-06

END OF TASK

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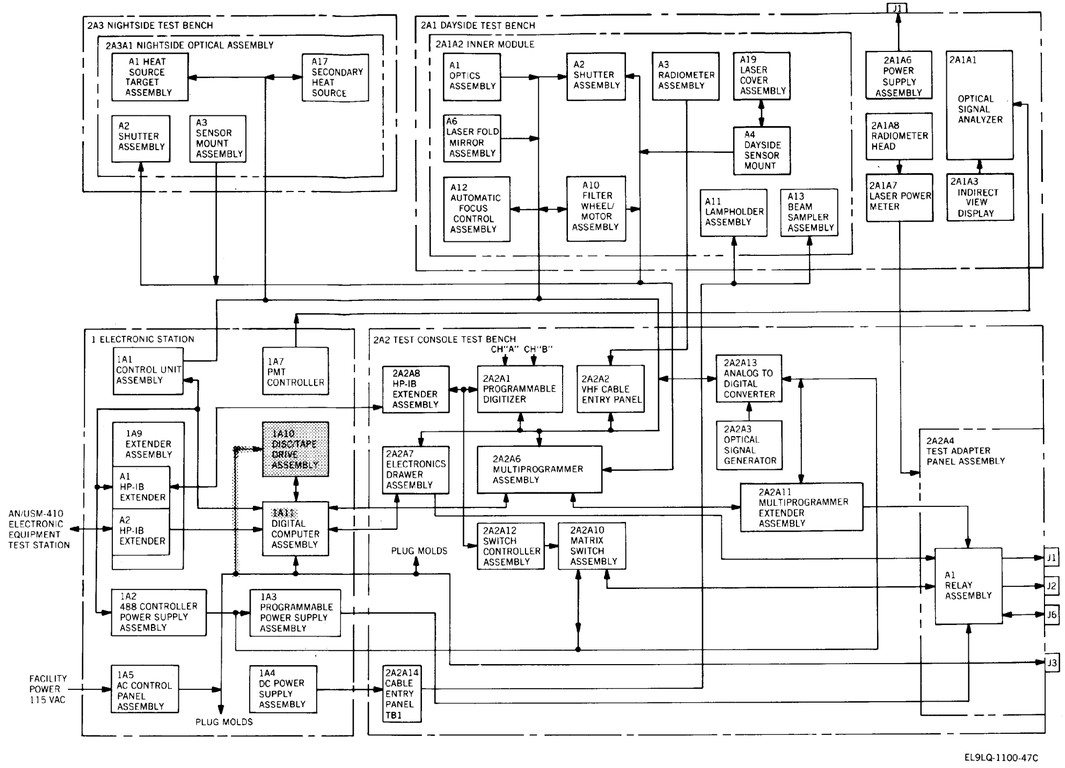


Figure FO-1. EETF TADS/PNVS Augmentation Equipment Block Diagram

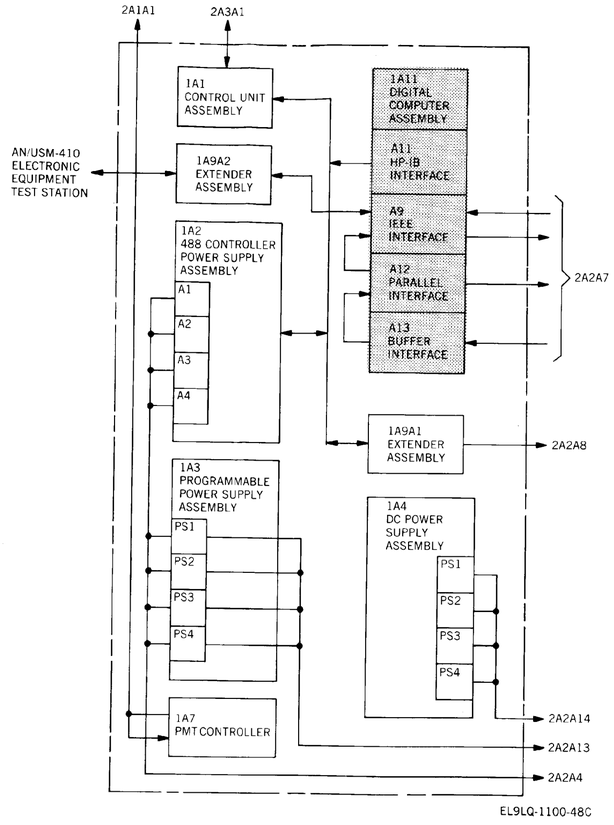


Figure FO-2. Electronic Station Block Diagram

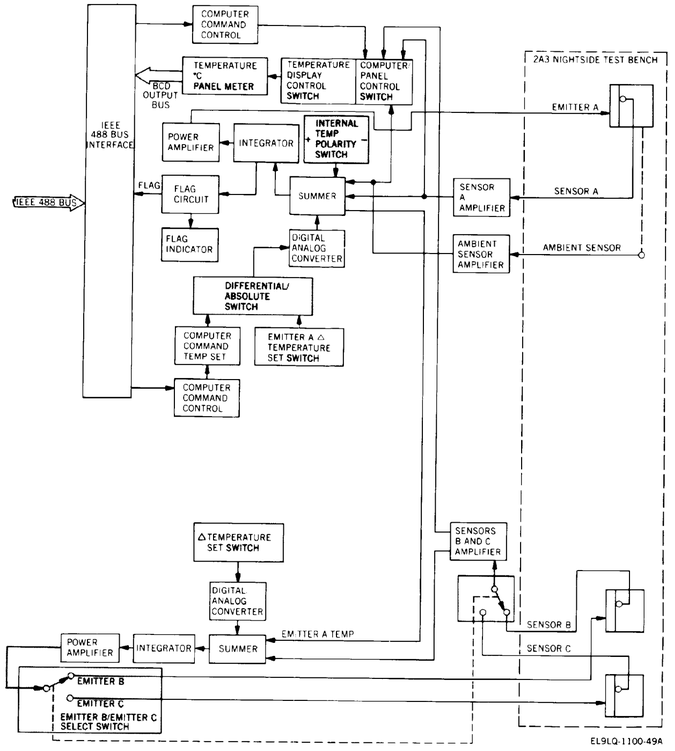
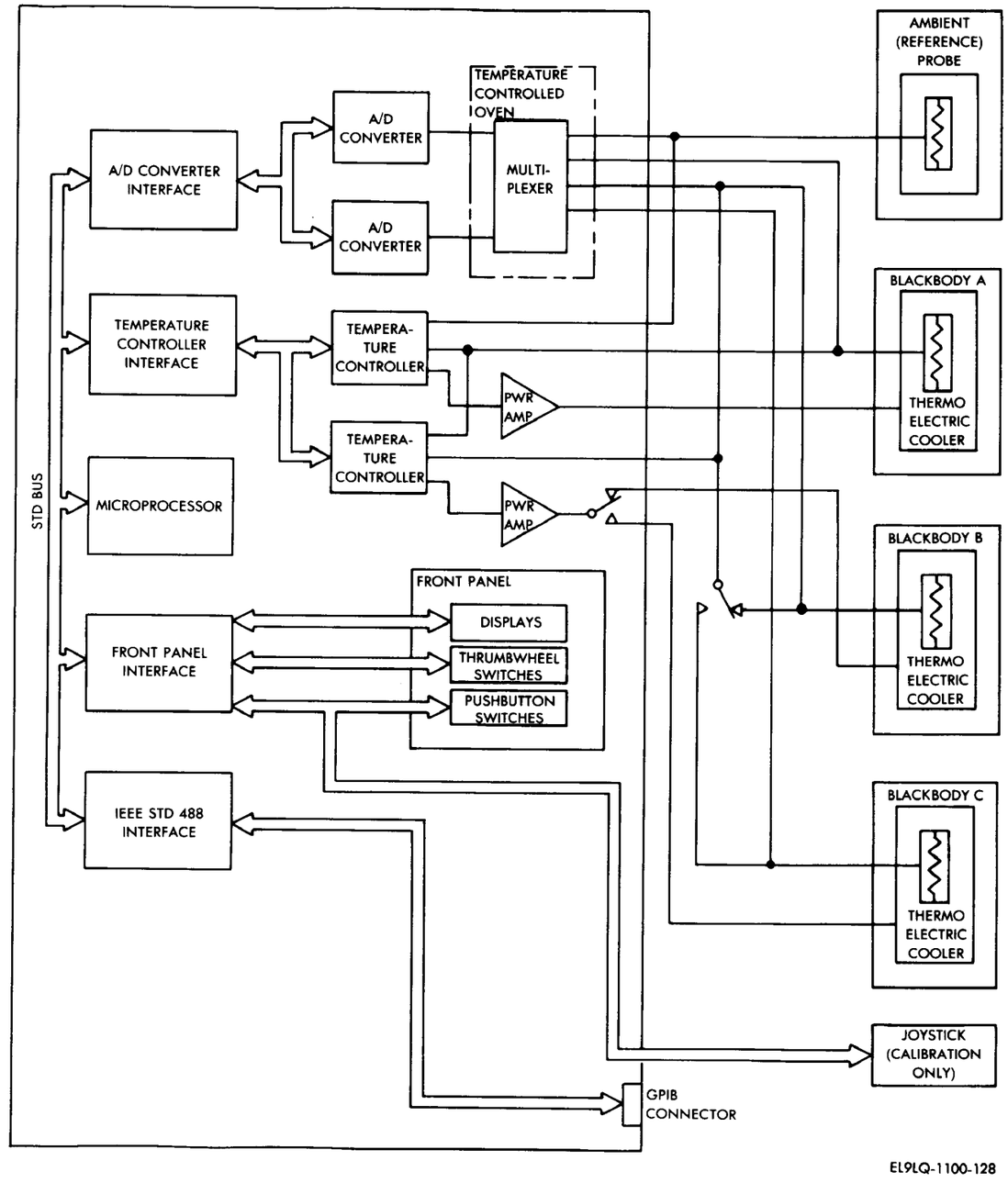


Figure FO-3. Control Unit Assembly Block Diagram



FO-3.1. Temperature Control Unit 1A1 Block Diagram

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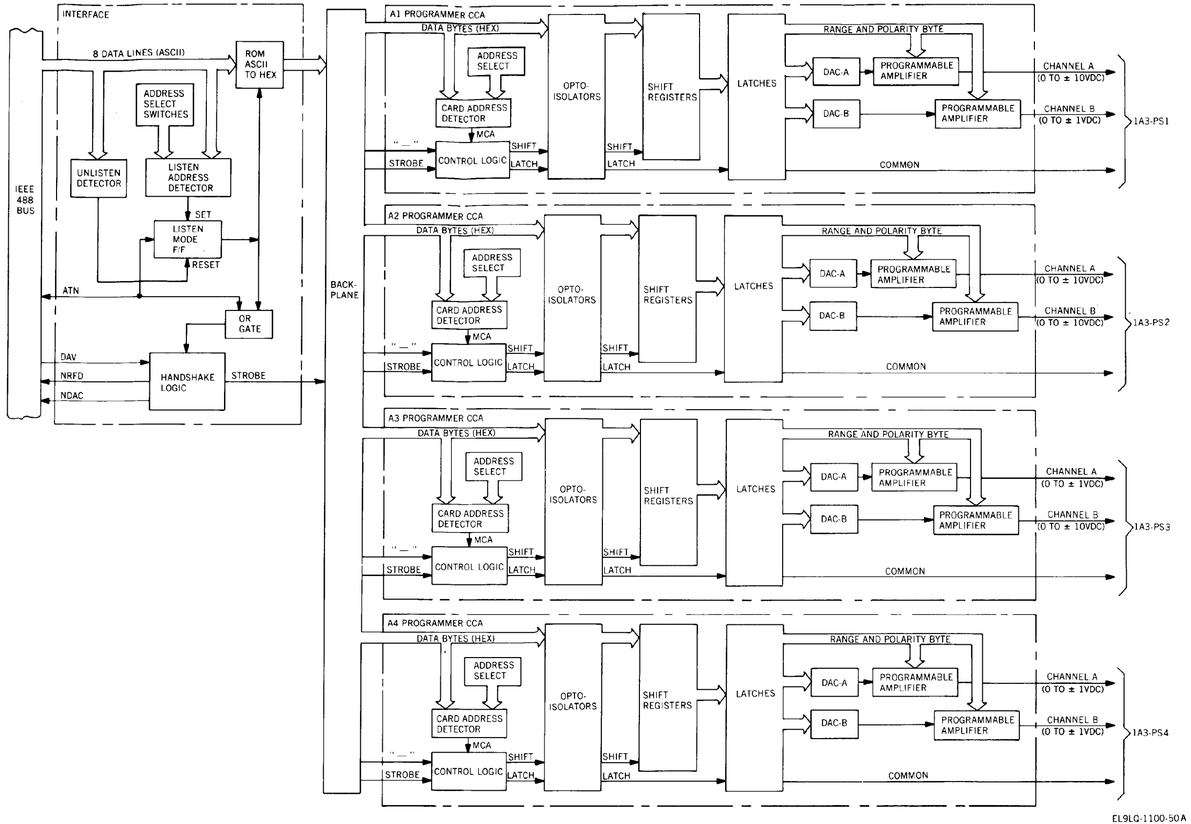

EL9LG-1100-50A

Figure FO-4. 488 Controller Power Supply Assembly 1A2 Block Diagram

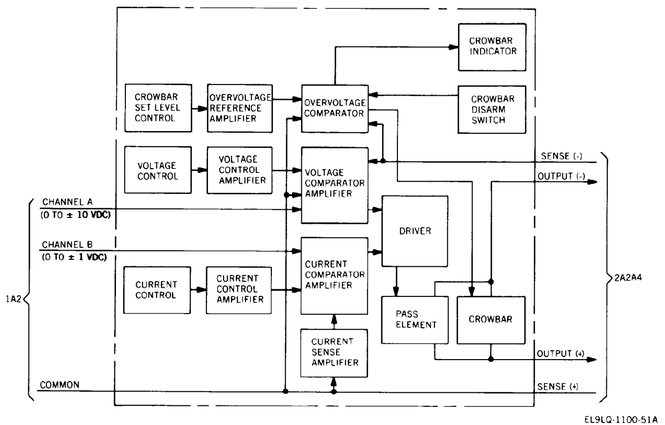

Figure FO-5. Programmable Power Supply Assembly 1A3 Block Diagram

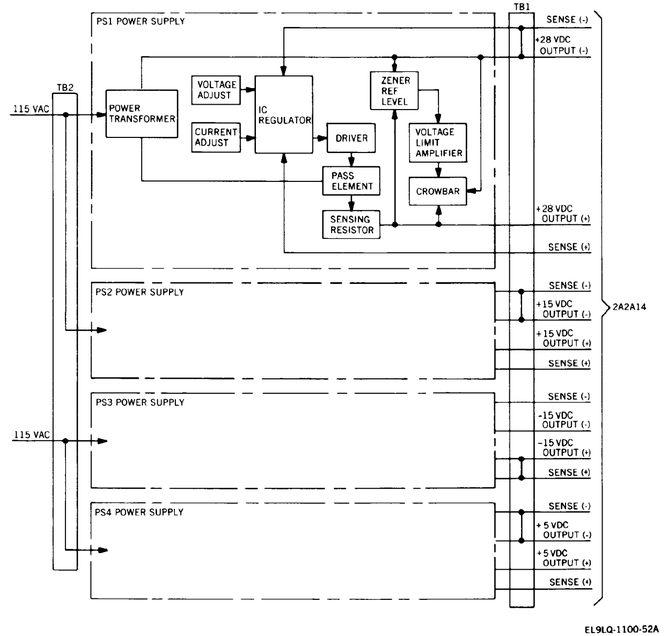

Figure FO-6. DC Power Supply Assembly 1A4 Block Diagram

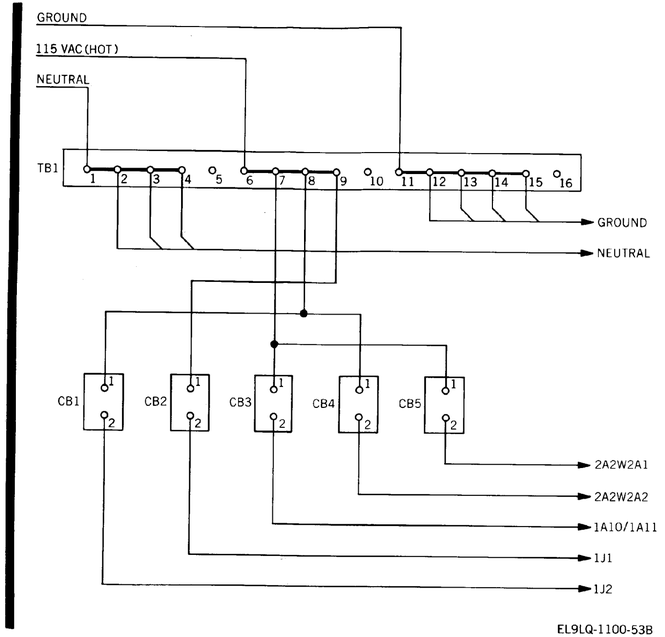

Figure FO-7. AC Control Panel Assembly 1A5 Block Diagram

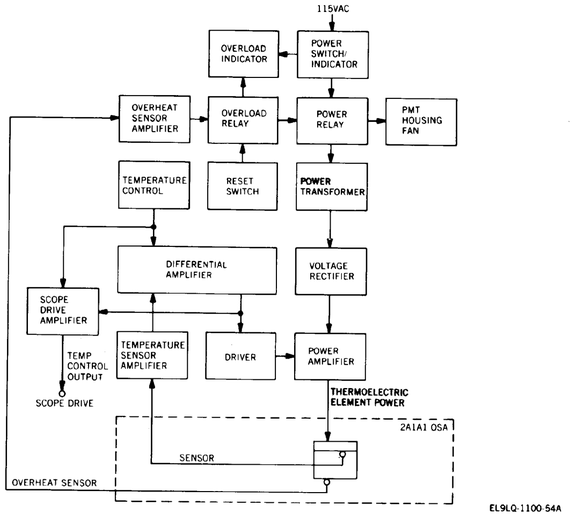

Figure FO-8. PMT Controller 1A7 Block Diagram

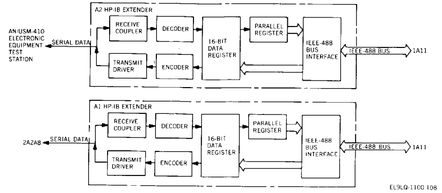

Figure FO-9.1 Extender Assembly 1A9 Block Diagram

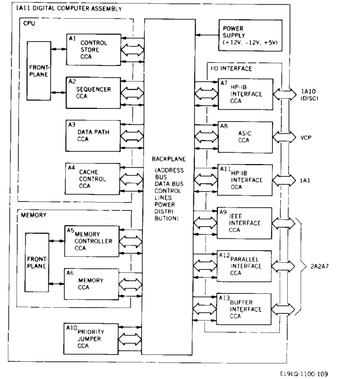

Figure FO-10.1. Digital Computer Assembly 1A11 Block Diagram

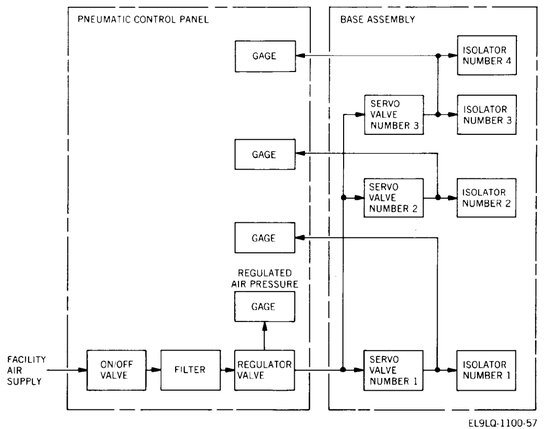

Figure FO-11. Pneumatic Leveling and Isolation System Block Diagram

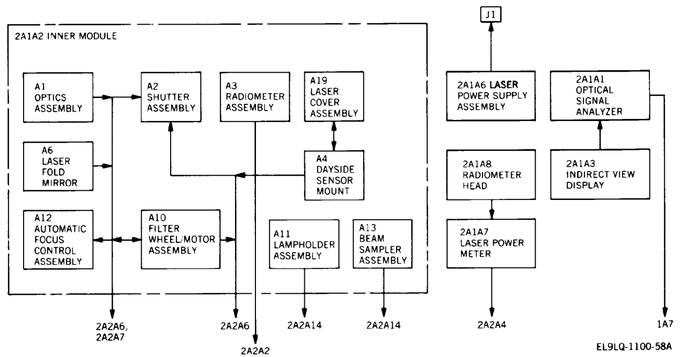

Figure FO-12. Dayside Test Bench 2A1 Block Diagram

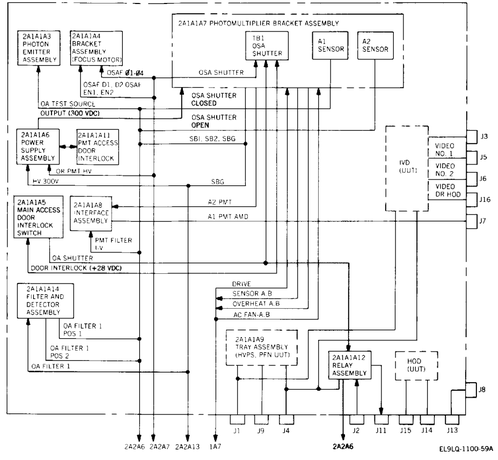

Figure FO-13. Optical Signal Analyzer 2A1A1 Block Diagram

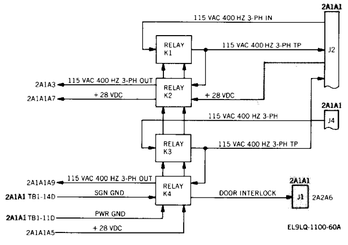

Figure FO-14. Relay Assembly 2A1A1A12 Block Diagram

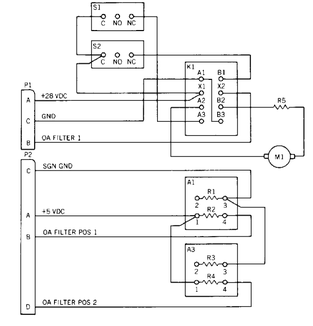

Figure FO-15. Filter and Detector Assembly 2A1A1A14 Wiring Diagram

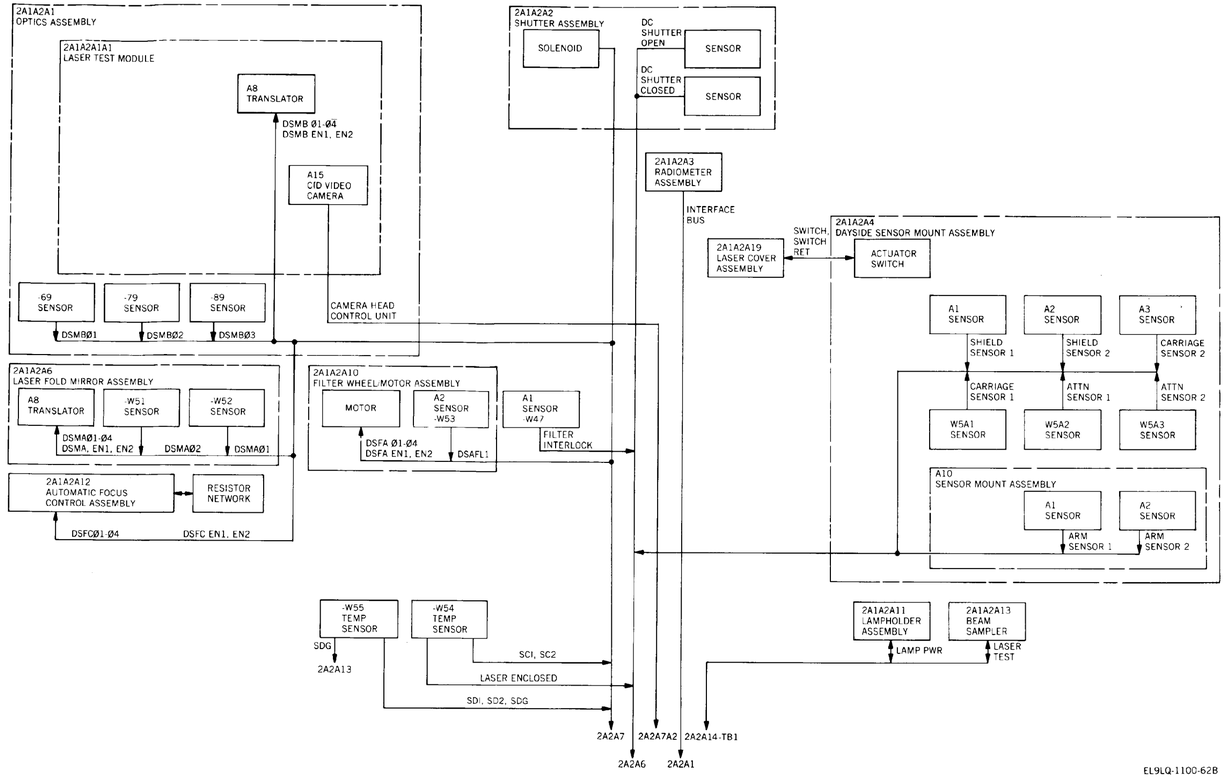

Figure FO-16. Inner Module 2A1A2 Block Diagram

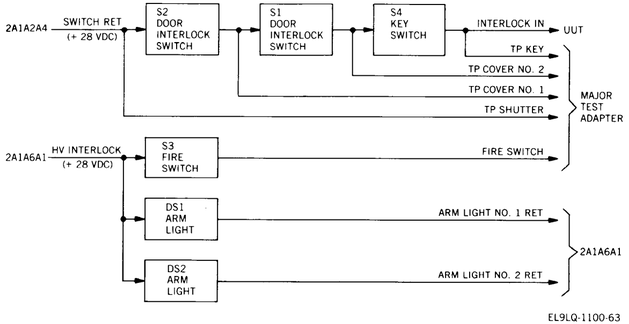

Figure FO-17. Laser Cover Assembly 2A1A2A19 Block Diagram

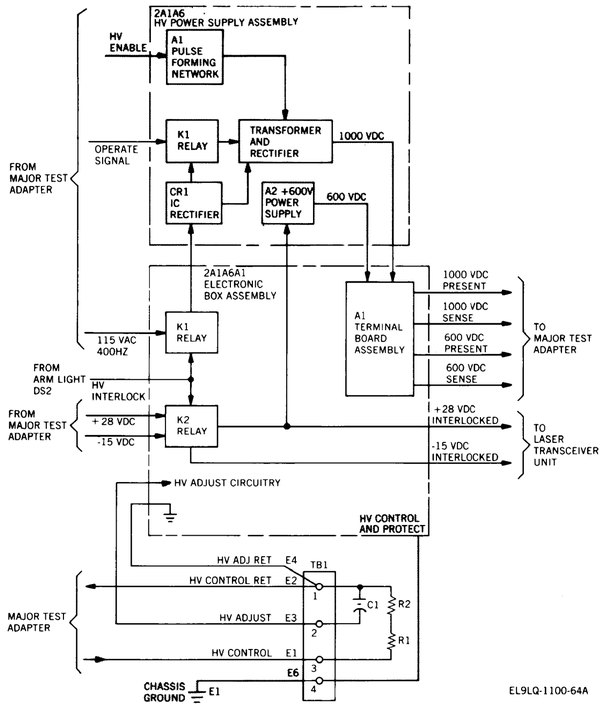

Figure FO-18. Laser Power Supply Assembly 2A1A6 Block Diagram

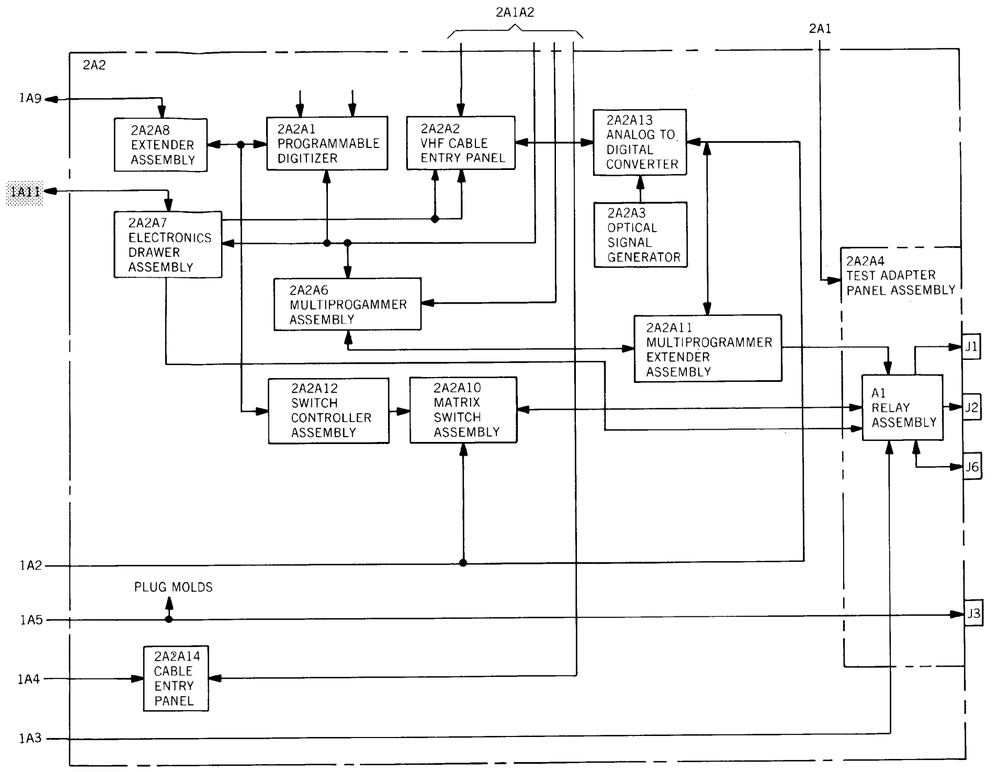

Figure FO-19. Test Console Test Bench 2A2 Block Diagram

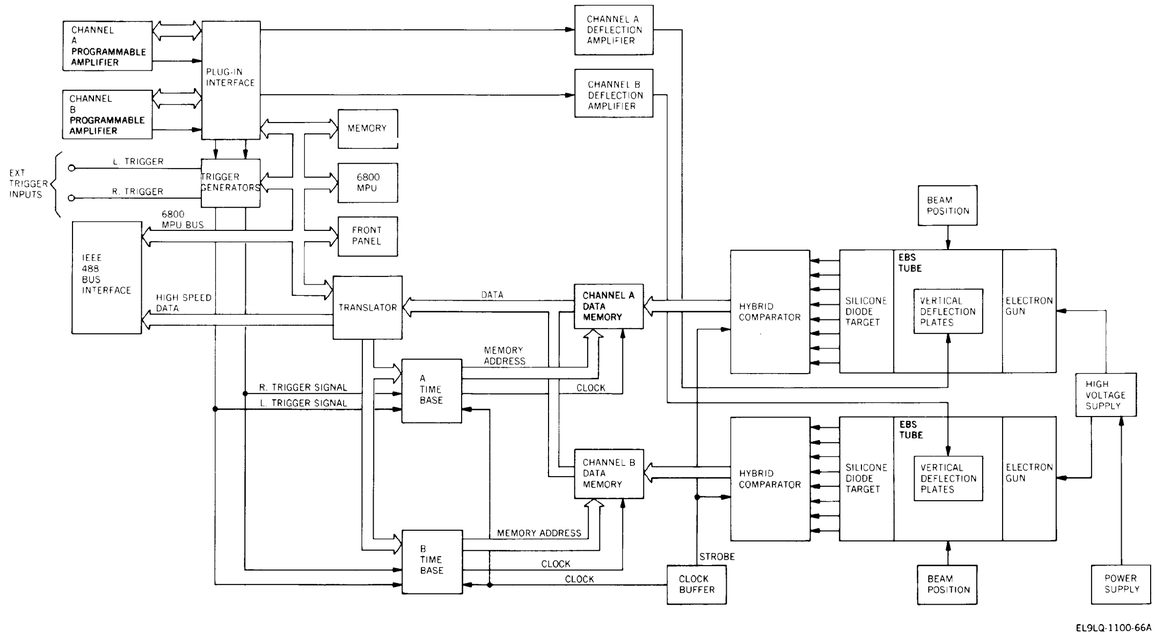

Figure FO-20. Programmable Digitizer 2A2A1 Block Diagram

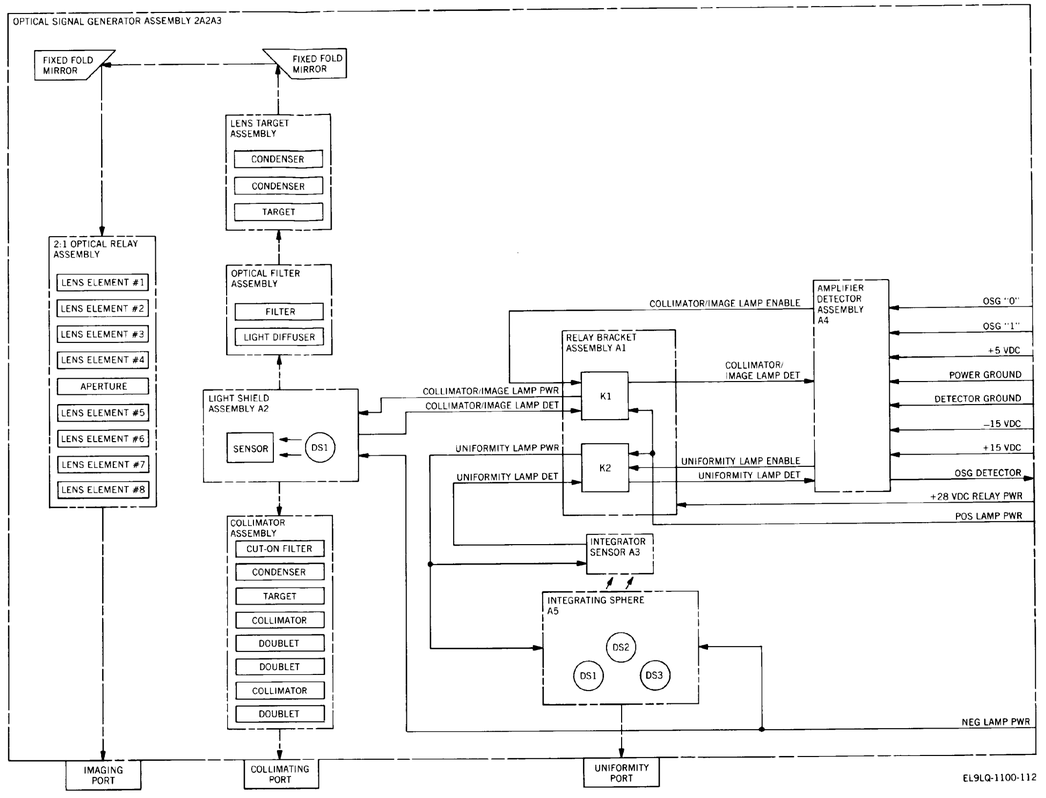

Figure FO-21. Optical Signal Generator 2A2A3 Block Diagram

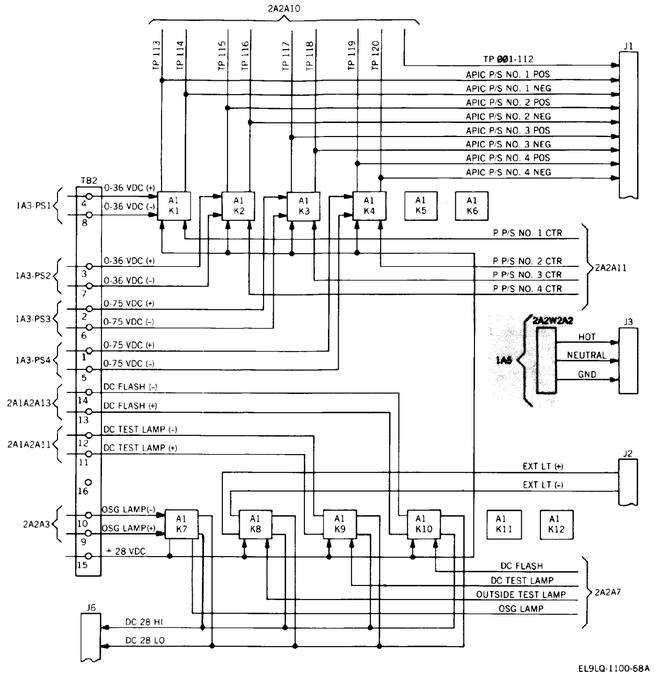

Figure FO-22. Test Adapter Panel Assembly 2A2A4 Block Diagram

Figure FO-23. Deleted

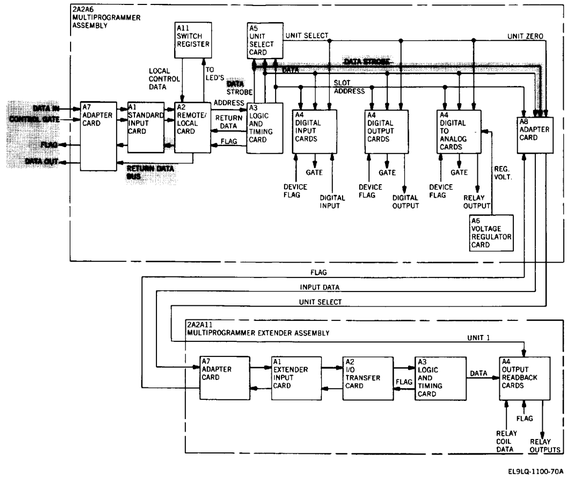

Figure FO-24. Multiprogrammer Assembly 2A2A6 and Multiprogrammer Extender Assembly 2A2A11 Block Diagram

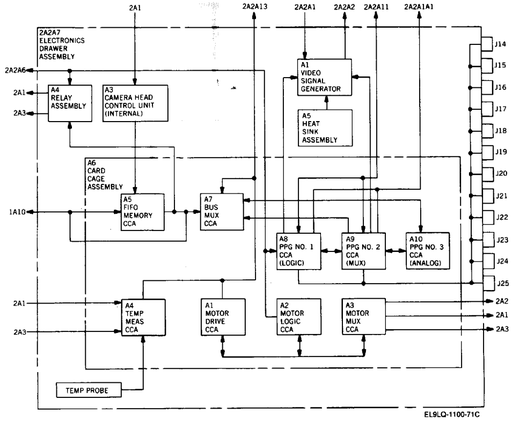

Figure FO-25. Electronics Drawer Assembly 2A2A7 Block Diagram

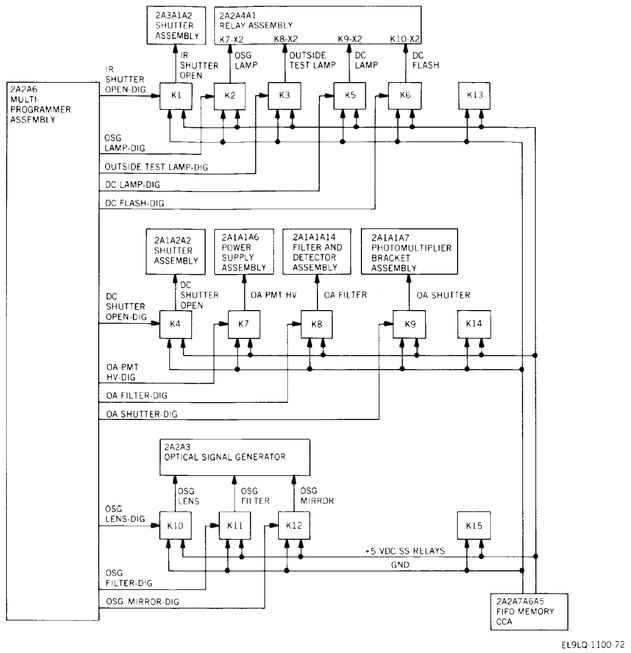

Figure FO-26. Relay Assembly 2A2A7A4 Block Diagram

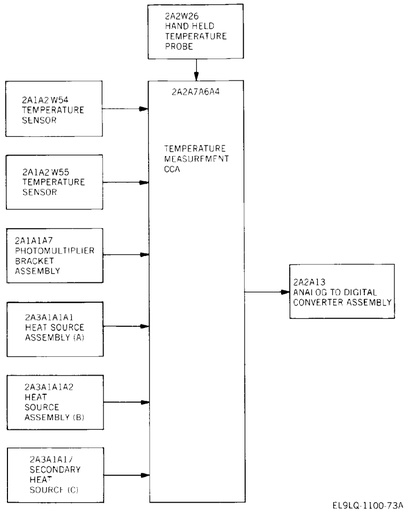

Figure FO-27. Temperature Measurement Block Diagram

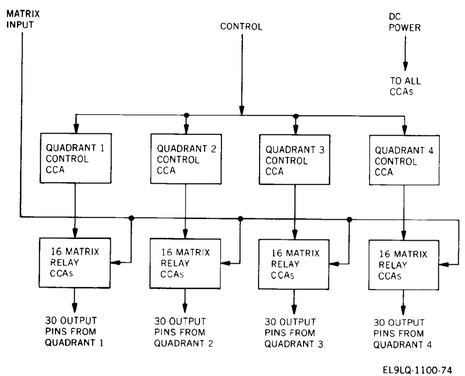

Figure FO-28. **Matrix Switch Assembly 2A2A10 Block Diagram**

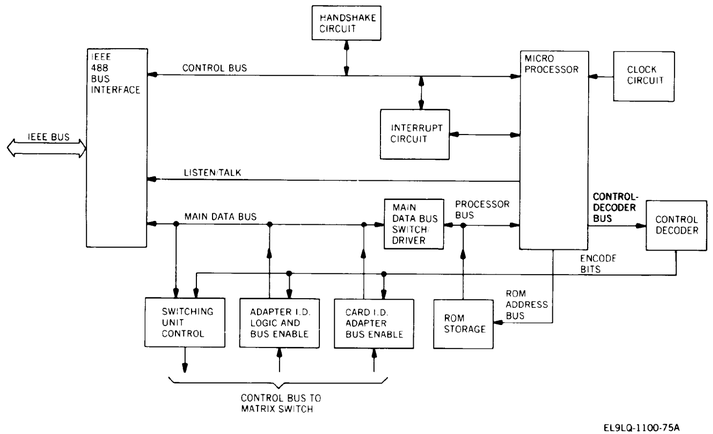

Figure FO-29. Switch Controller Assembly 2A2A12 Block Diagram

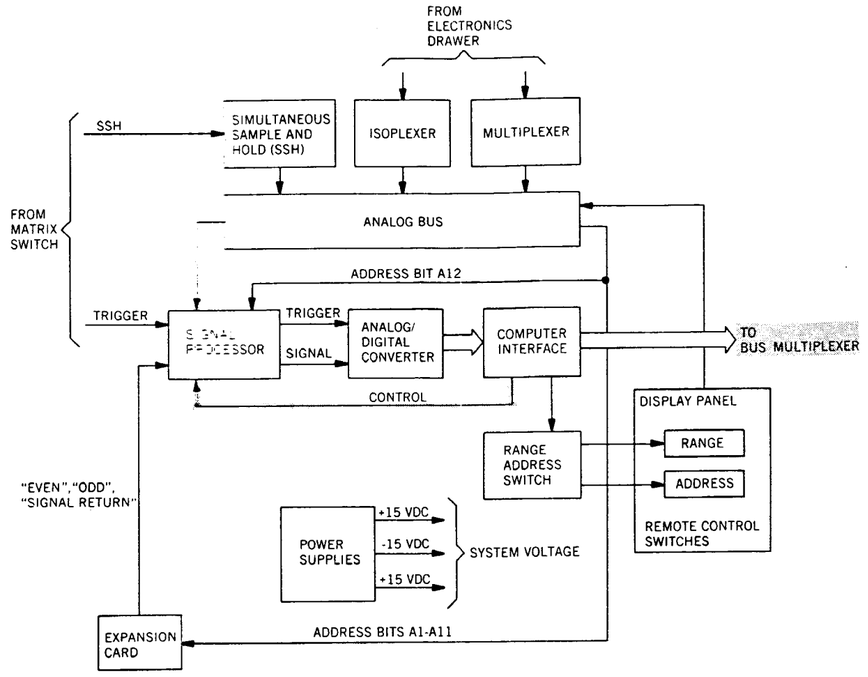

Figure FO-30. Analog to Digital Converter Assembly 2A2A13 Block Diagram

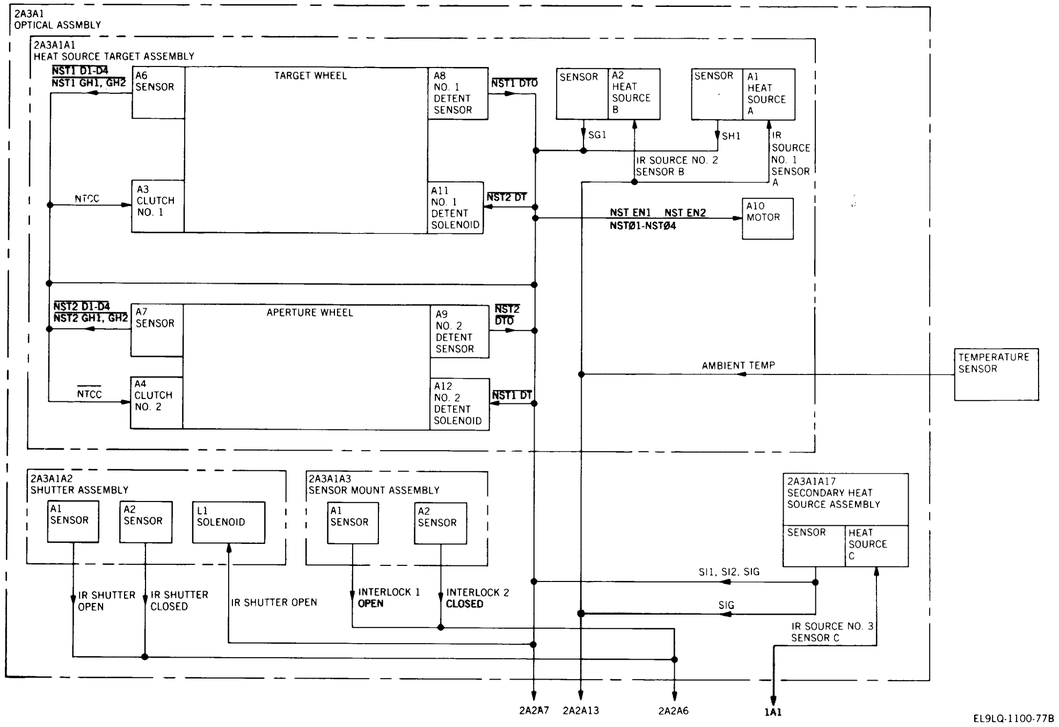

Figure FO-31. Nightside Test Bench 2A3 Block Diagram

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JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

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R. L. DILWORTH
Brigadier General, United States Army
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TM 11-6625-3081-23-1		ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

BE EXACT . PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	
5-111	5-26			Subparagraph 3. step b. states "Remove six screws (1) . . .". The quantity should be eight.
5-189	5-40			Step 9 states "Remove four screws (24), washers (25), . . .". There are two additional washers that should be in the illustration; one under the screw (24) and one under the spacer (26).

SAMPLE

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REVERSE OF DA FORM 2028-2

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS MANUAL?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-3081-23-1	1 FEBRUARY 1986	ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

BE EXACT...PIN POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

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DA FORM 1 APR 78 2028-2

REPLACES DA FORM 2028 2 (TEST) 1 AUG 74 WHICH WILL BE USED UNTIL EXHAUSTED

P S – IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR MANUAL "FIND," MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

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DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
U.S. Army Aviation Systems
ATTN: AMSAV-MMD
4300 Goodfellow Blvd
St. Louis, MO 63120-1798

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DA FORM 1 JUL 79 2028-2

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REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2, 1 Nov 80

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U S ARMY AVIATION SYSTEMS COMMAND
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FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
CDR, 1st Br, 65th ADA
ATTN: SP4 J. Brown
Key West, FL 33040

DATE SENT
10 Jun 79

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-1430-550-34-1	7 Sep 72 .	Unit of Radar Set AN/MPQ-50 Tested at the HFC

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
9-19		9-5	
21-2	step 1C	21-2	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SP4 J.T. Brown, Jr.

SIGN HERE
SP4 James Brown, Jr.

TEAR ALONG PERFORATED LINE

DA FORM 2 JUL 79 2028-2 REPLACES DA FORM 2028-2, 1 APR 78 WHICH WILL BE USED UNTIL EXHAUSTED
AMSAV M Overprint 3, 1 Mar 91

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TM 11-6625-3081-23-1	1 FEB 86	ELECTRONIC EQUIPMENT TEST FACILITY TADS/PNVS AUGMENTATION EQUIPMENT

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PIN: 061390-020