

LSG 770-430-23 - LTA-8

ELECTRICAL POWER SUBSYSTEM

STUDY GUIDE

LUNAR MODULE

LTA-8

CONTRACT NAS 9-1100

EXHIBIT E; PARAGRAPH 3.7.4

TYPE III DOCUMENT

FOR TRAINING PURPOSES ONLY; IN
SUPPORT OF LTA-8 SUBSYSTEM BRIEFINGS

REFERENCE CF22/T21-67-T471

LM TRAINING SECTION
PRODUCT SUPPORT DEPARTMENT
GRUMMAN AIRCRAFT ENGINEERING CORPORATION
BETHPAGE, NEW YORK

AUGUST 1967

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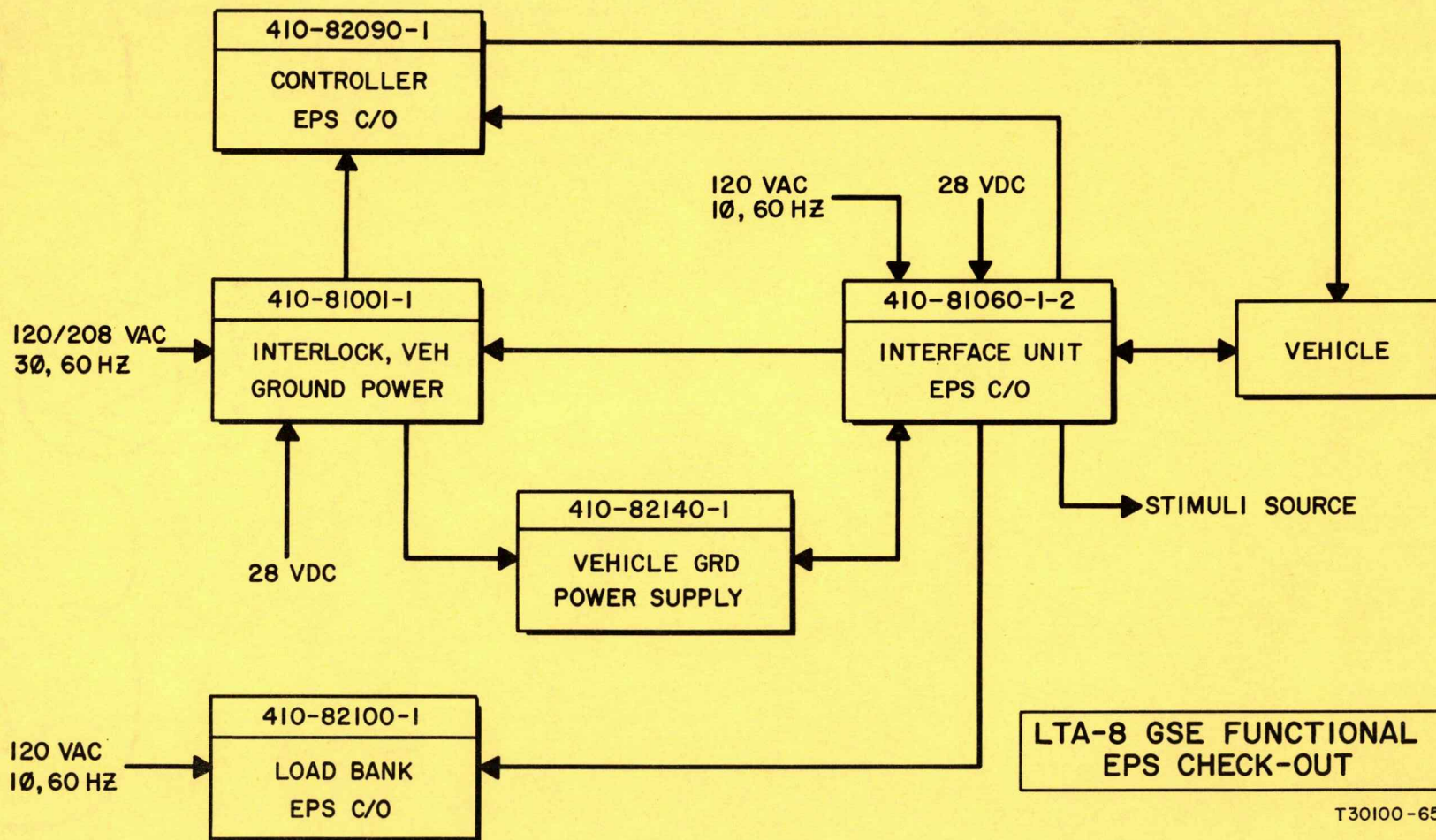
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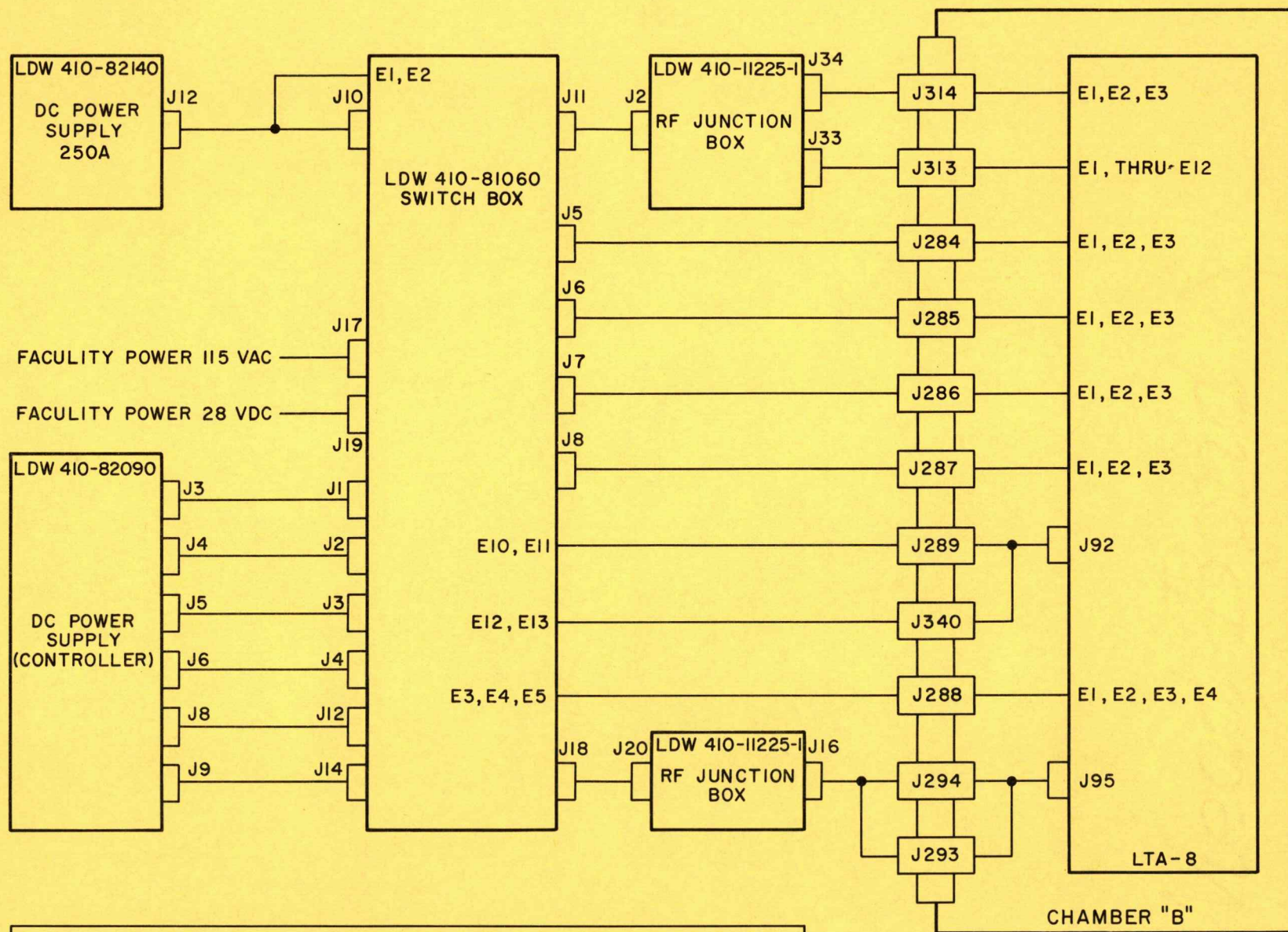
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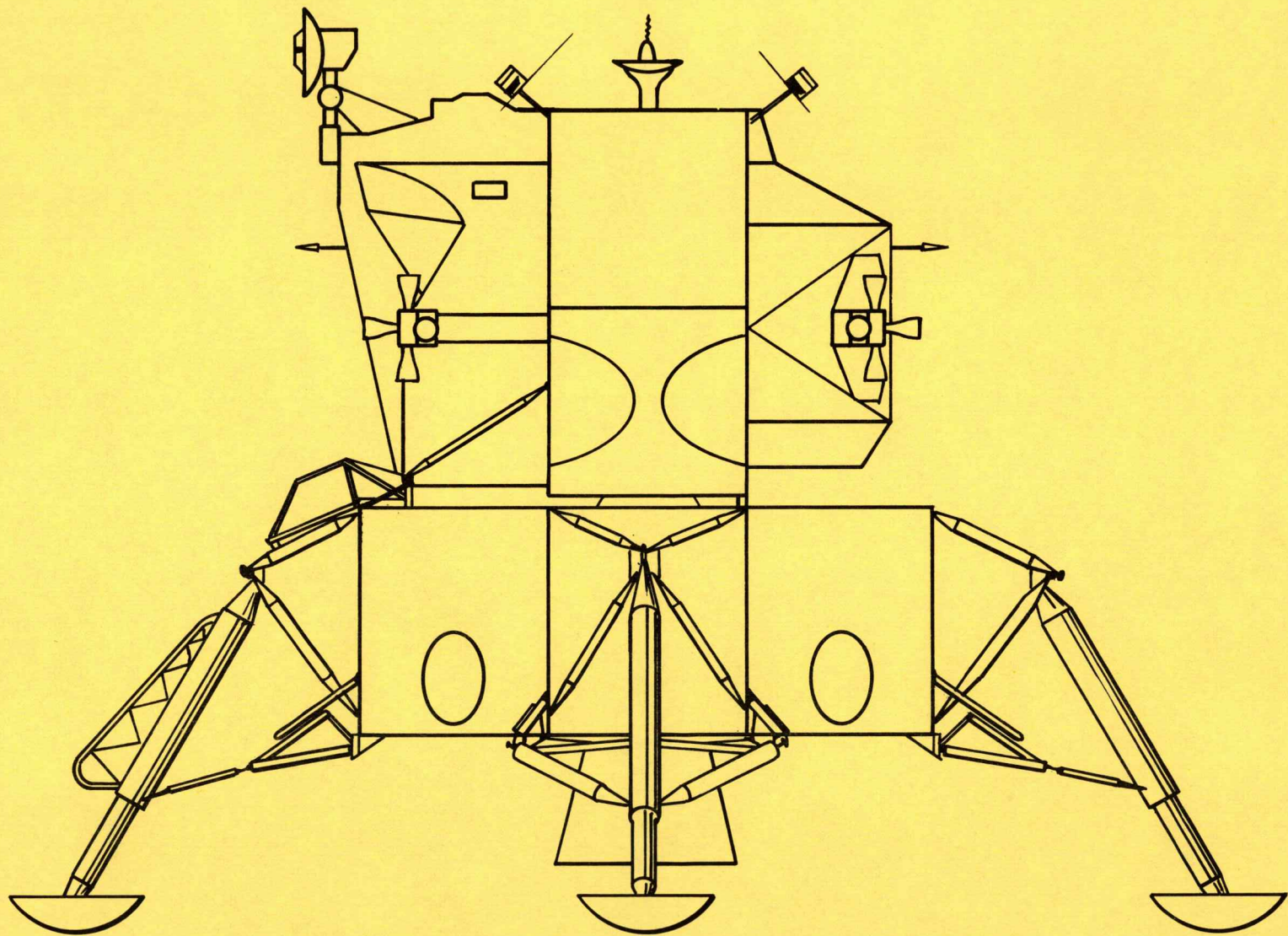
LTA-8 GSE FUNCTIONAL
EPS CHECK-OUT

T30100-65.1



LTA-8 MSC CHAMBER "B" GSE POWER SUPPLY

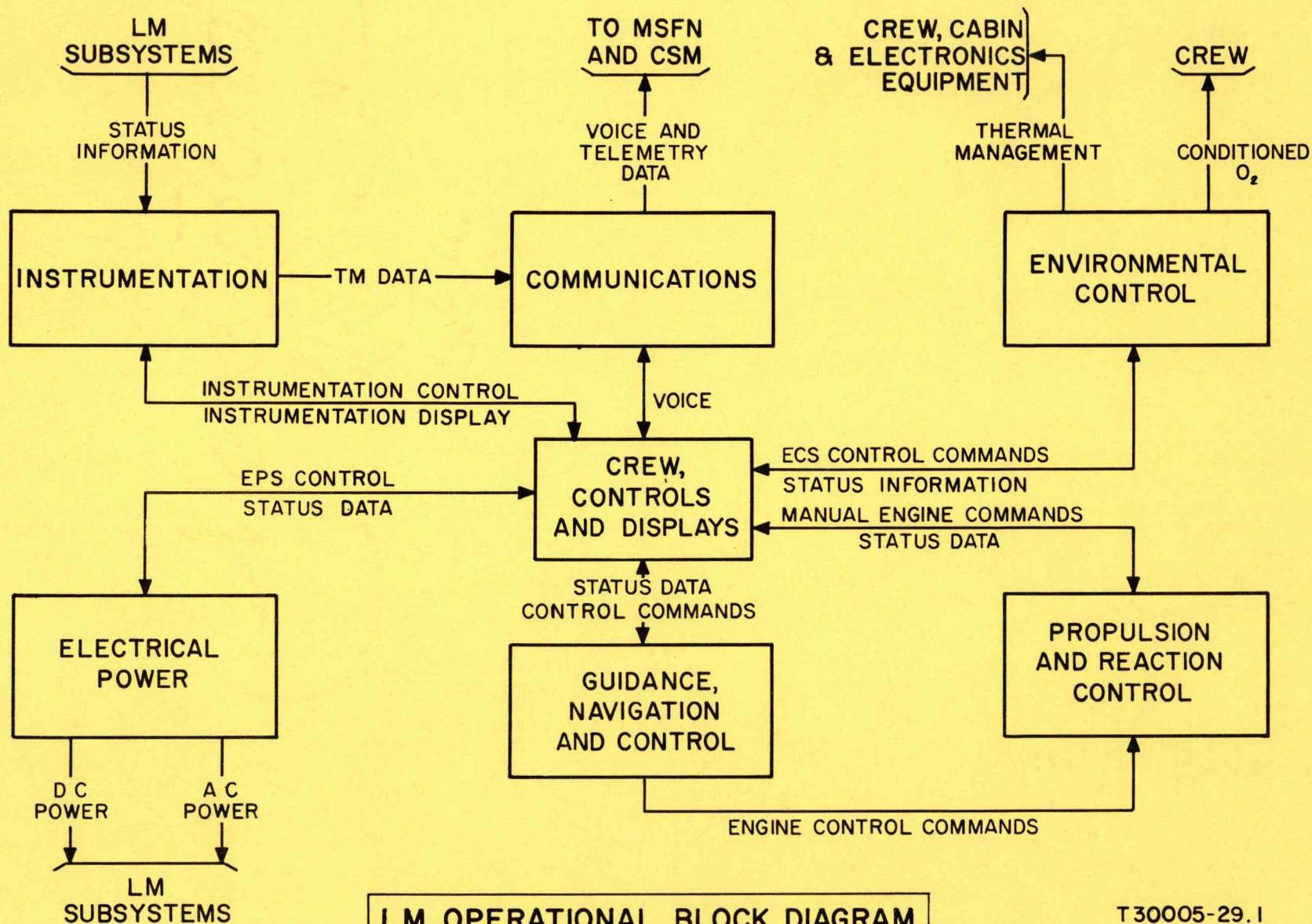
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LM CONFIGURATION

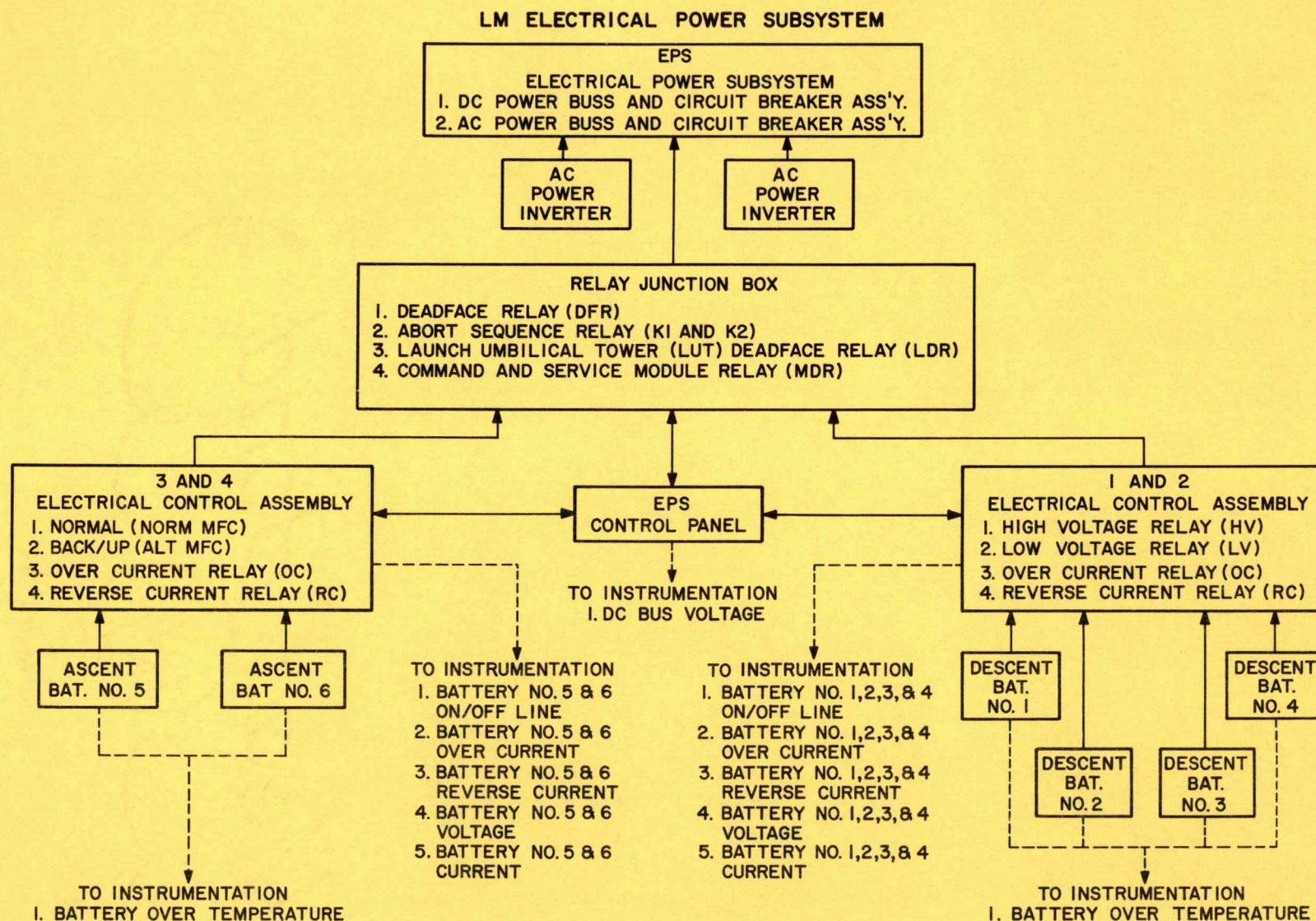
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ITA-8



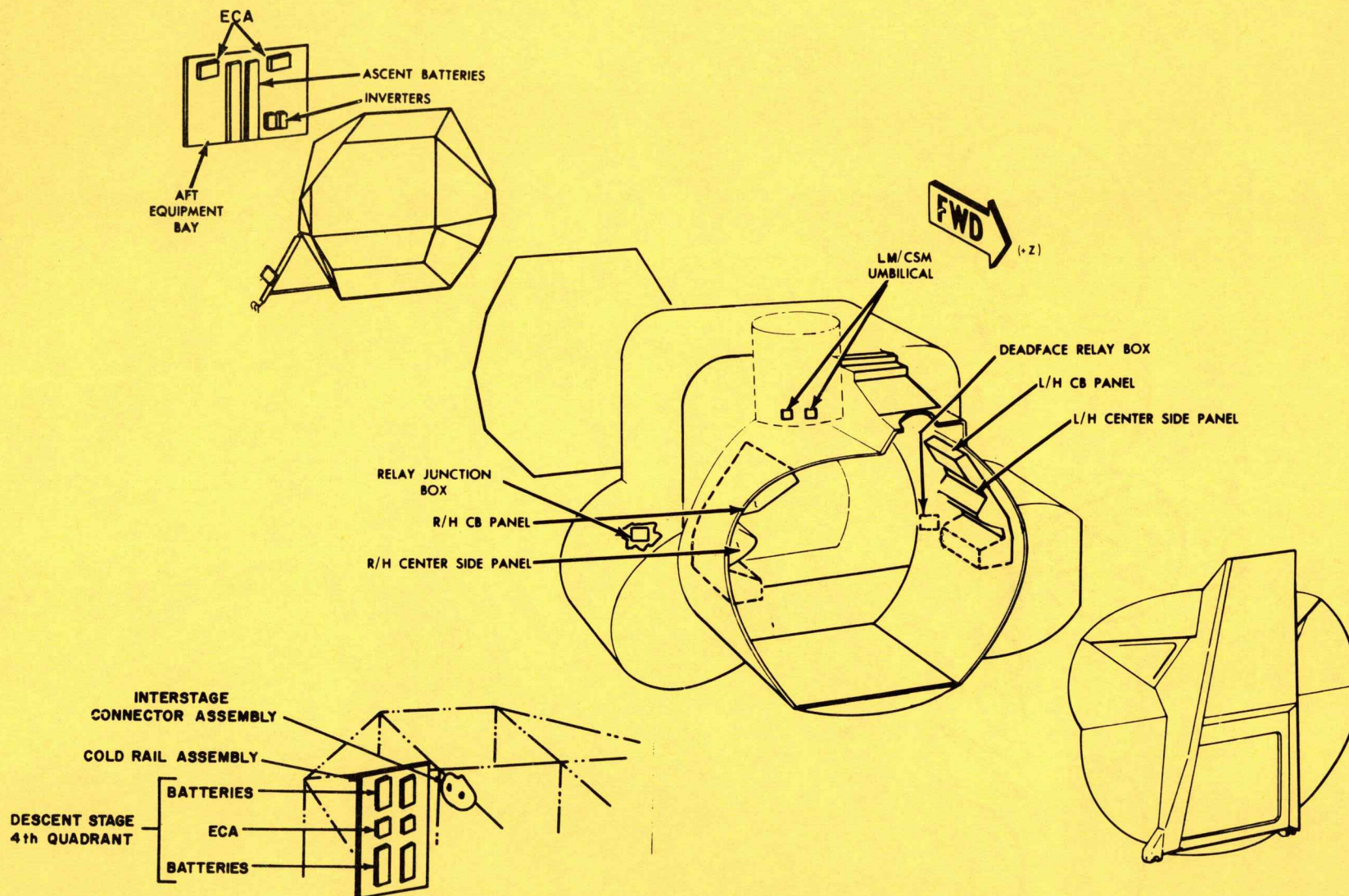
LM OPERATIONAL BLOCK DIAGRAM

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EPS FUNCTIONAL BLOCK DIAGRAM

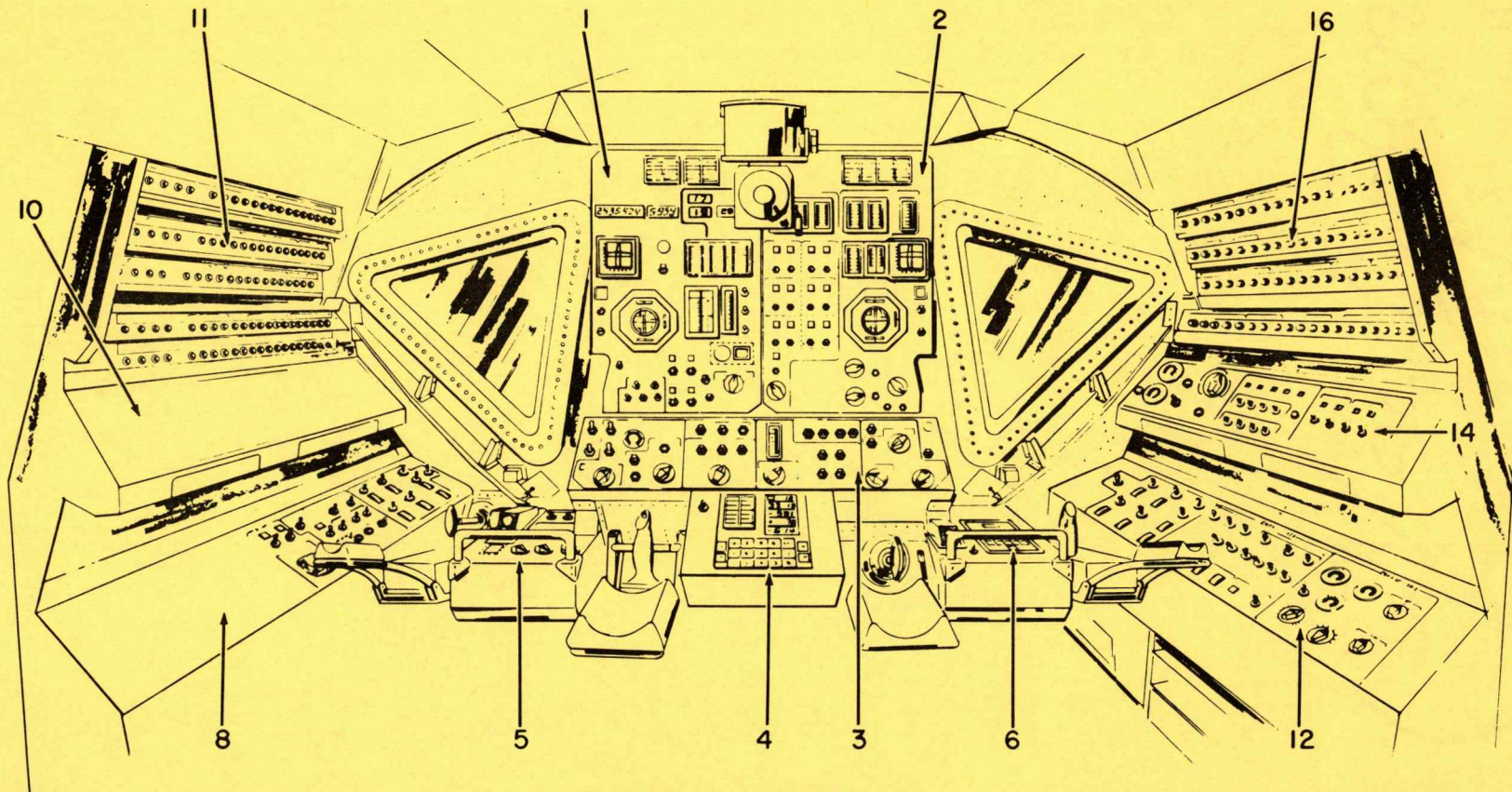
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EPS COMPONENT LOCATION

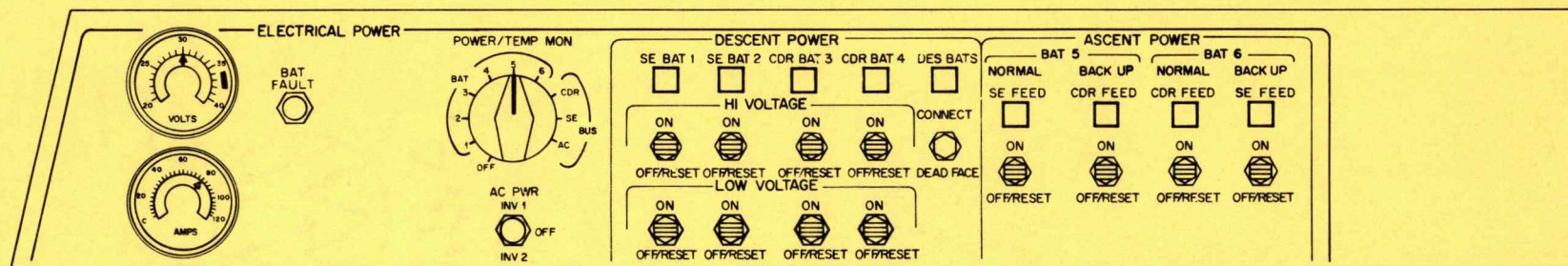
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ITA-8



LM DISPLAYS AND CONTROLS

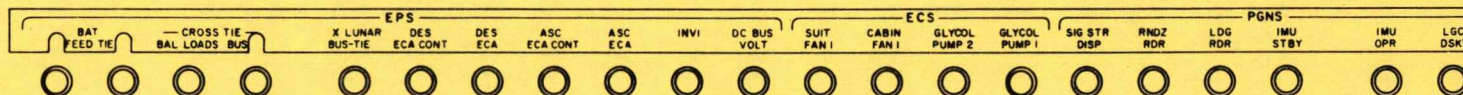
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PANEL XIV LTA-8

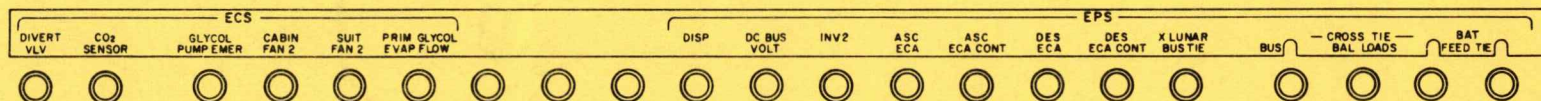
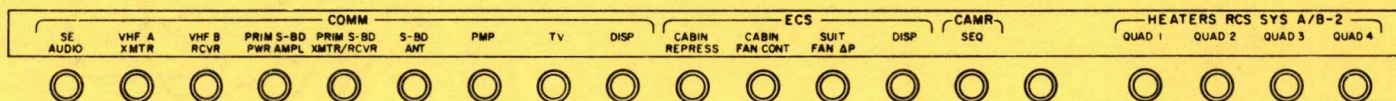
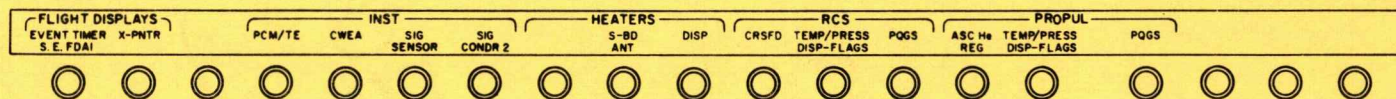
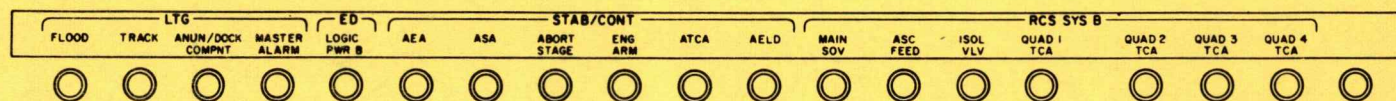
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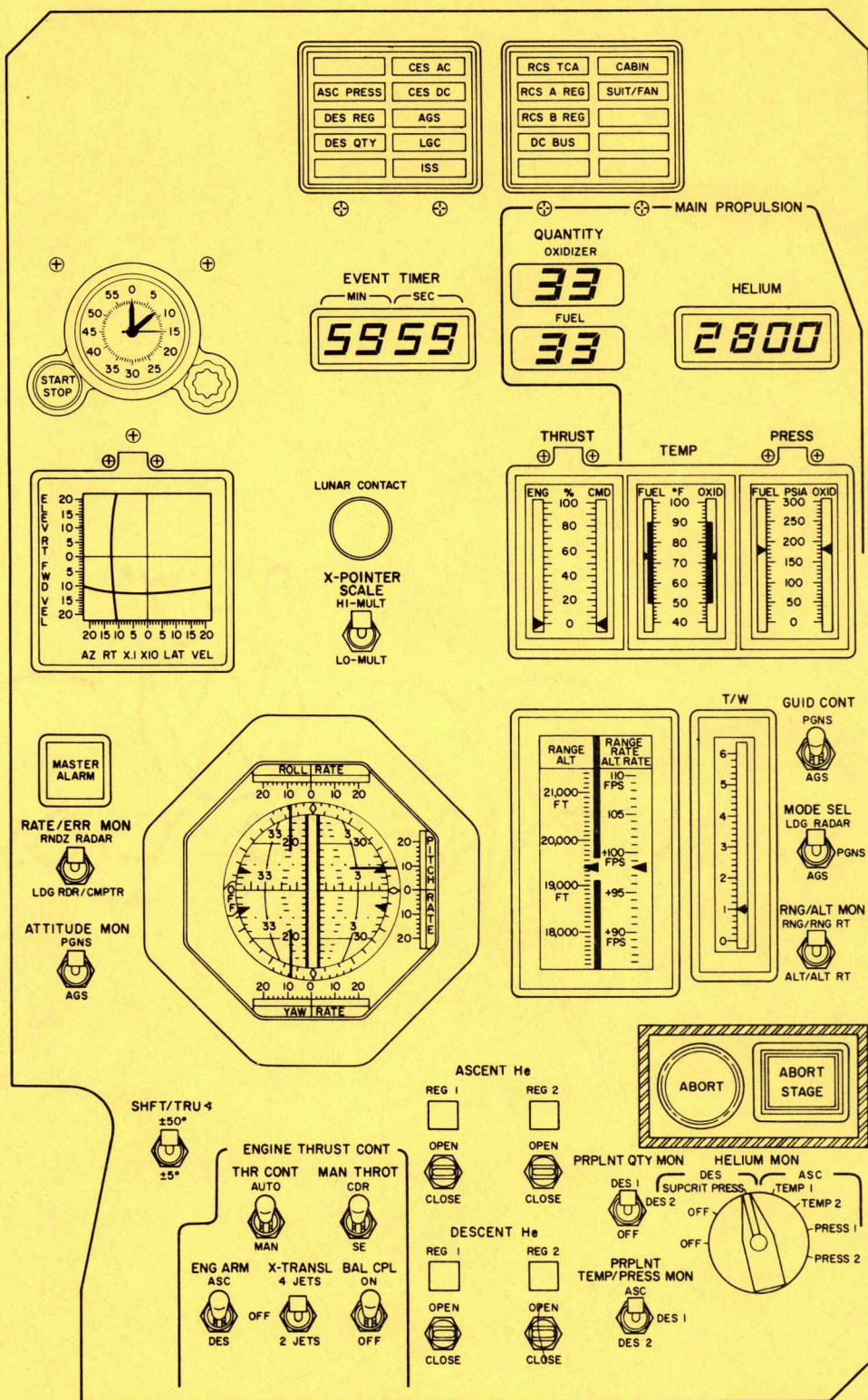
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ITA-8



PANEL XVI

T30900-95.1

PANEL I
LTA 8

T30900-108.1

REACTION CONTROL

QUANTITY
OXIDIZER

FUEL

TEMP

PRESS

SYSTEM A

MAIN SOV

OPEN

CLOSE

ASC FEED

OPEN

CLOSE

THRUSTER PAIR

QUAD 1

OPEN

CLOSE

QUAD 2

OPEN

CLOSE

QUAD 3

OPEN

CLOSE

QUAD 4

OPEN

CLOSE

SYSTEM B

MAIN SOV

OPEN

CLOSE

ASC FEED

OPEN

CLOSE

THRUSTER PAIR

QUAD 1

OPEN

CLOSE

QUAD 2

OPEN

CLOSE

QUAD 3

OPEN

CLOSE

QUAD 4

OPEN

CLOSE

ENVIRONMENTAL CONTROL

TEMP

PRESS

PART PRESS CO2

GLYCOL

TEMP

PRESS

QUANTITY

TEMP/PRESS MON

PRPLNT FUEL MANF

OXID MANF

CRSFD

OPEN

CLOSE

QTY TEST

ON

OFF

QTY MON

SYS A

OFF

SYSB

OFF

GLYCOL PUMP

SUIT FAN

CO2 H2O SEP

O2/H2O QTY MON

CW RESET DES

ASC 1

ASC 2

ASC HI REG	INVERTER		ECS
ASC QTY	BATTERY	RCS	O2 QTY
ENG GIMBAL	PNDZ RDR	HEATER	GLYCOL
	LDG RDR	C/W PWR	WATER QTY
PGNS	PREAMPS		

MASTER ALARM

RATE/ERR MON

RNDZ RADAR

LDG RDR CMPTR

ATTITUDE MON

PGNS

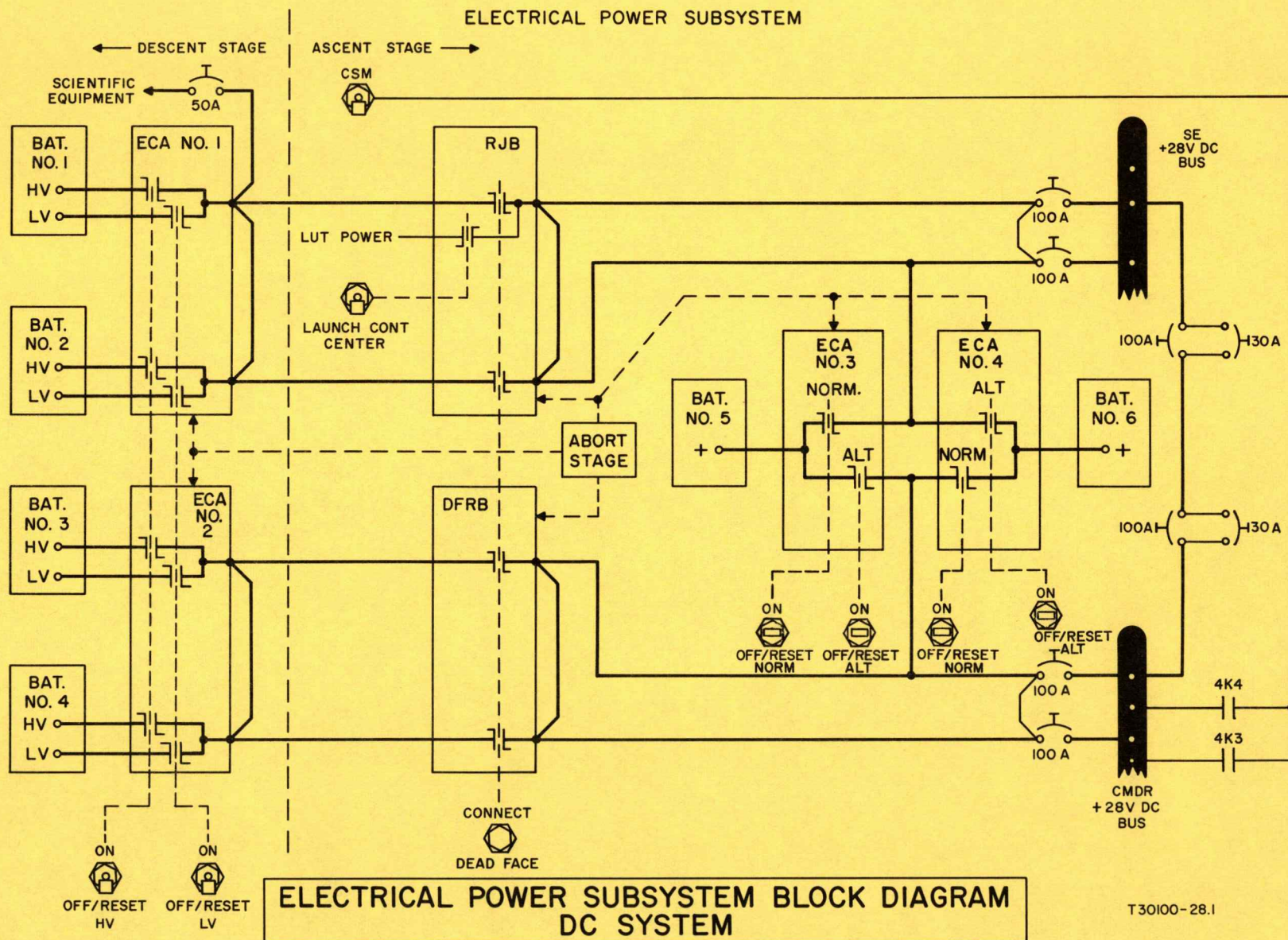
AGS

PANEL II
LTA-8

T30900-110.1

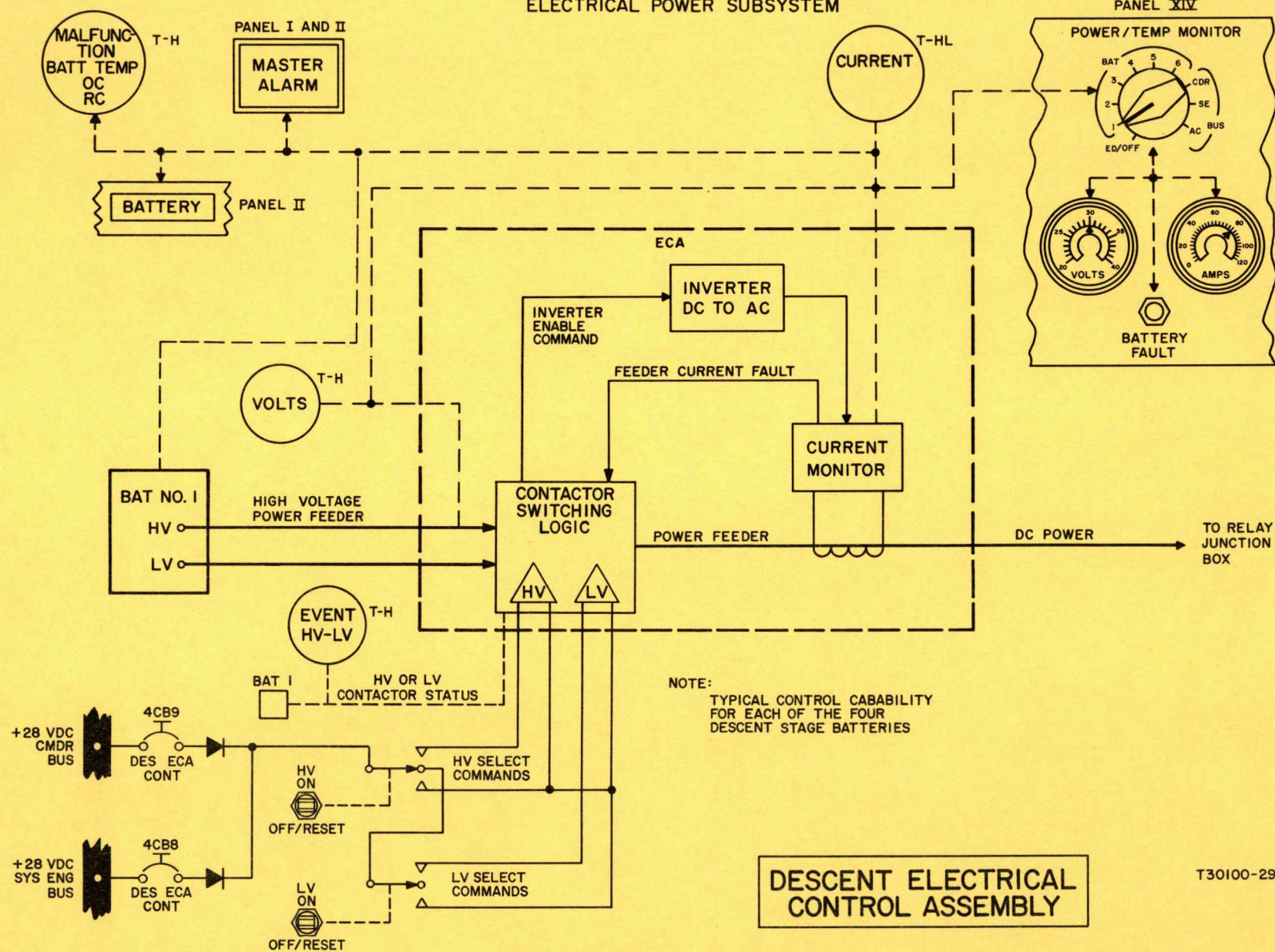
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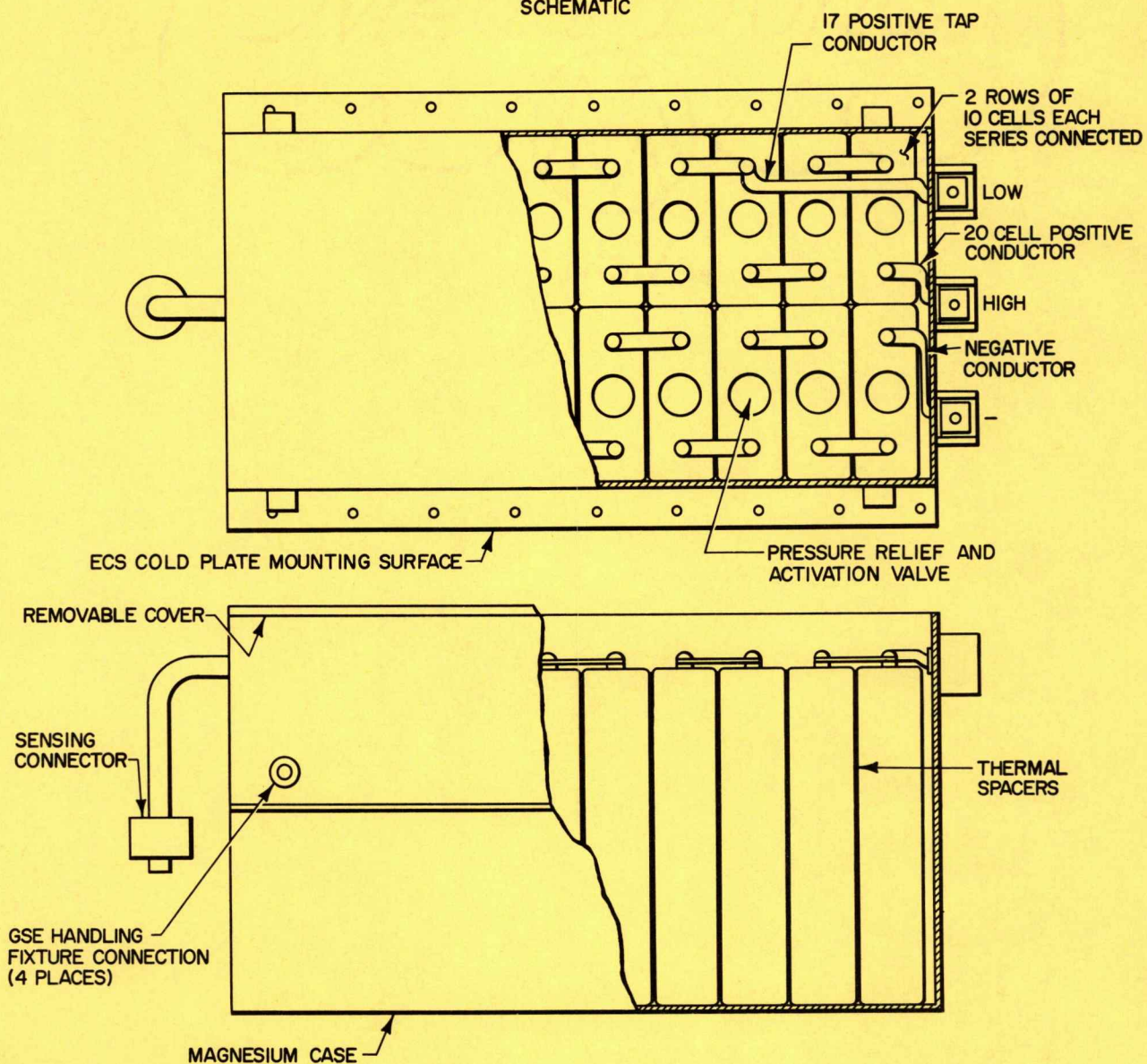
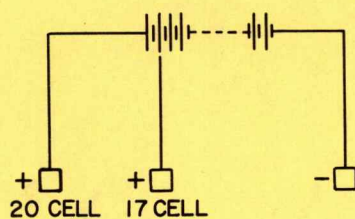
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ELECTRICAL POWER SUBSYSTEM



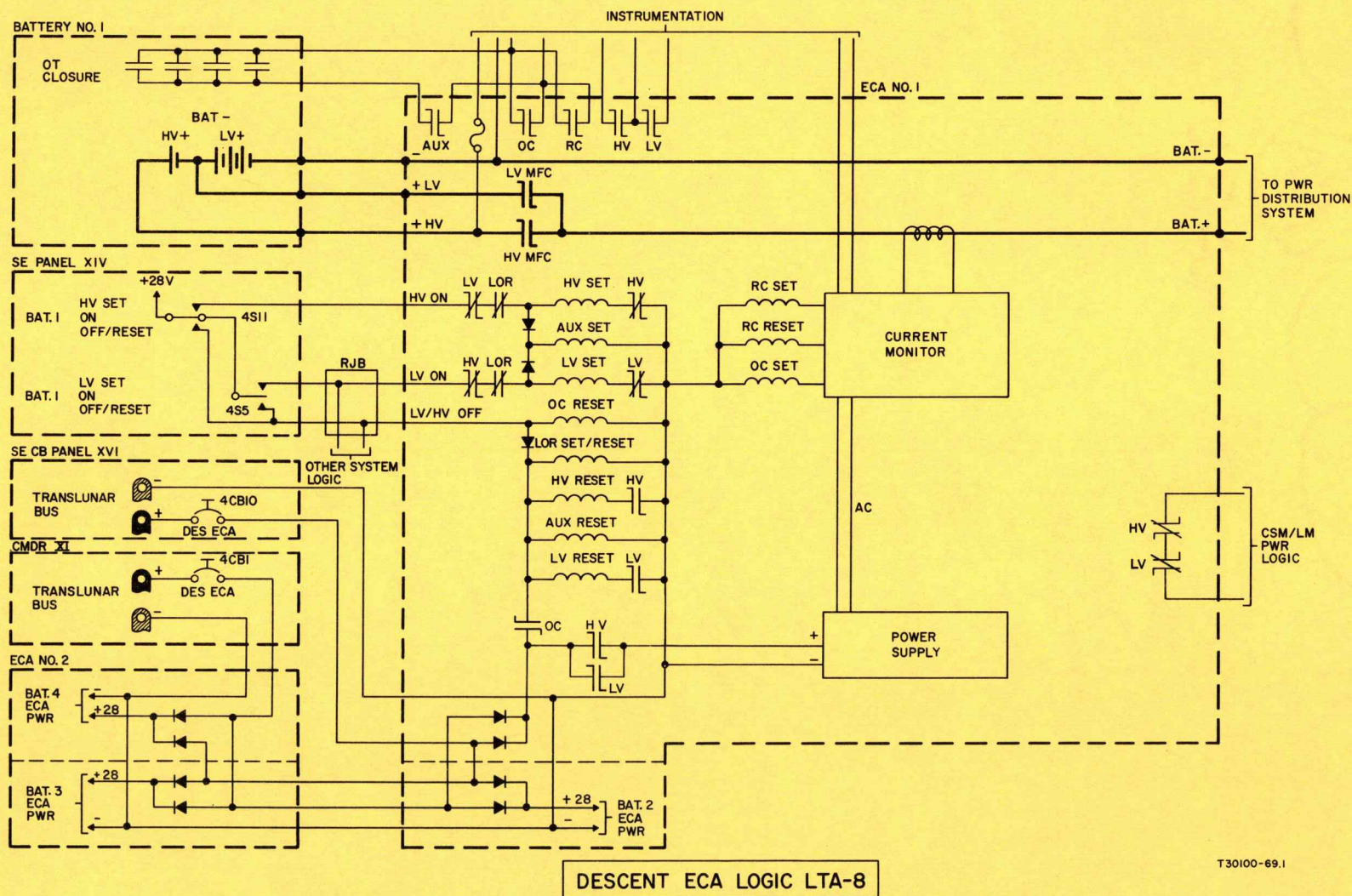
DESCENT ELECTRICAL
CONTROL ASSEMBLY

T30100-29.1



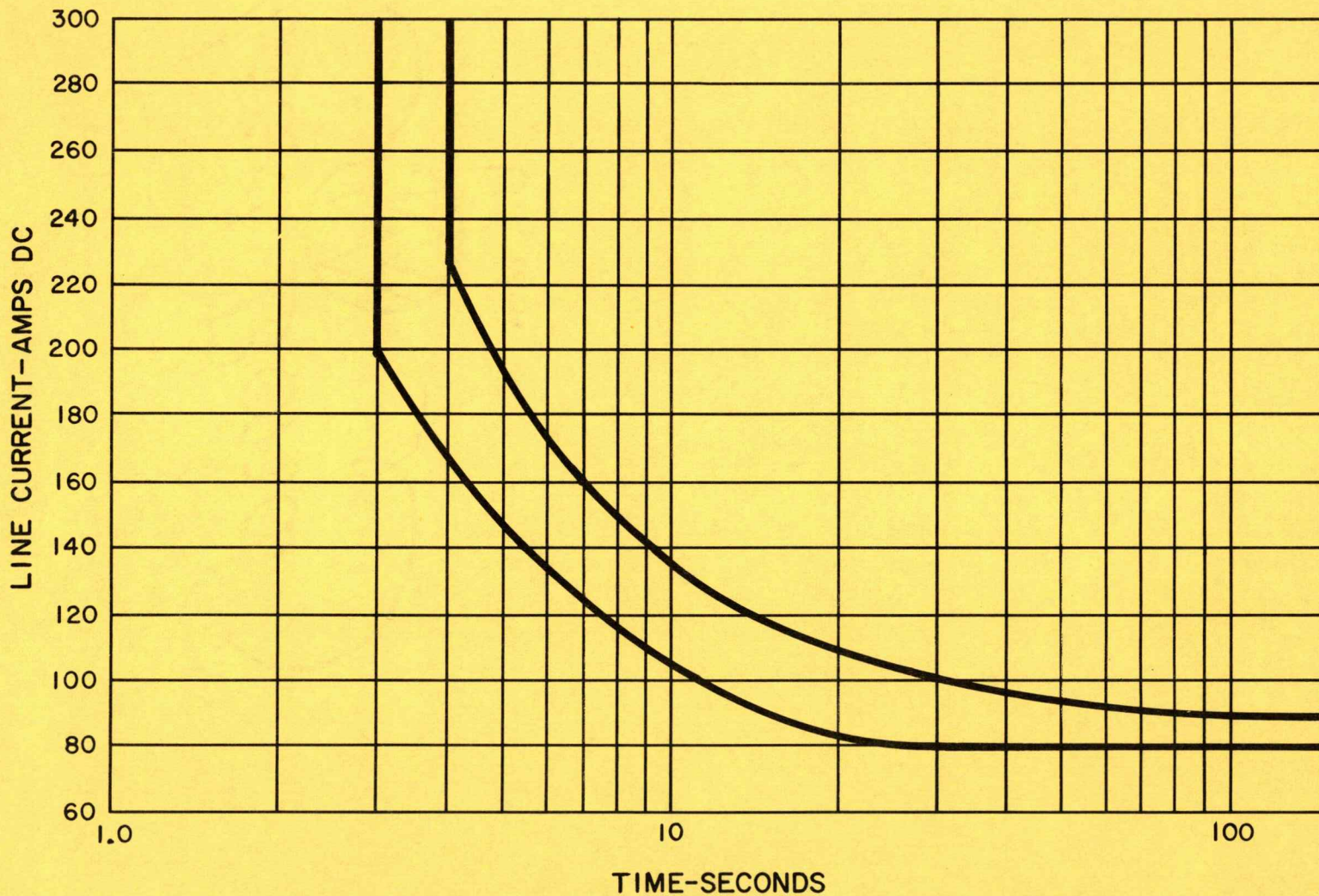
DESCENT BATTERY

T30100-24.1



T30100-69.1

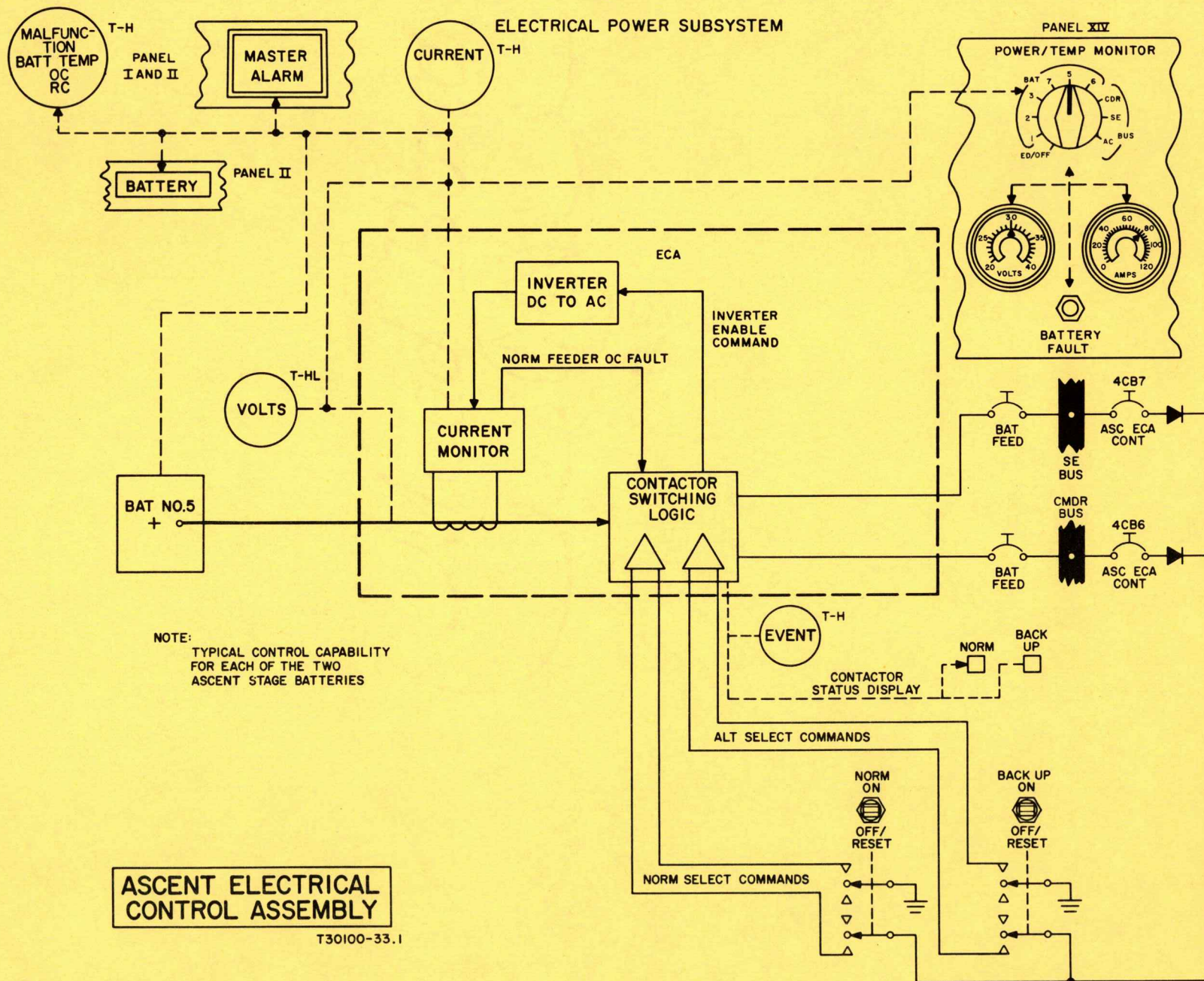
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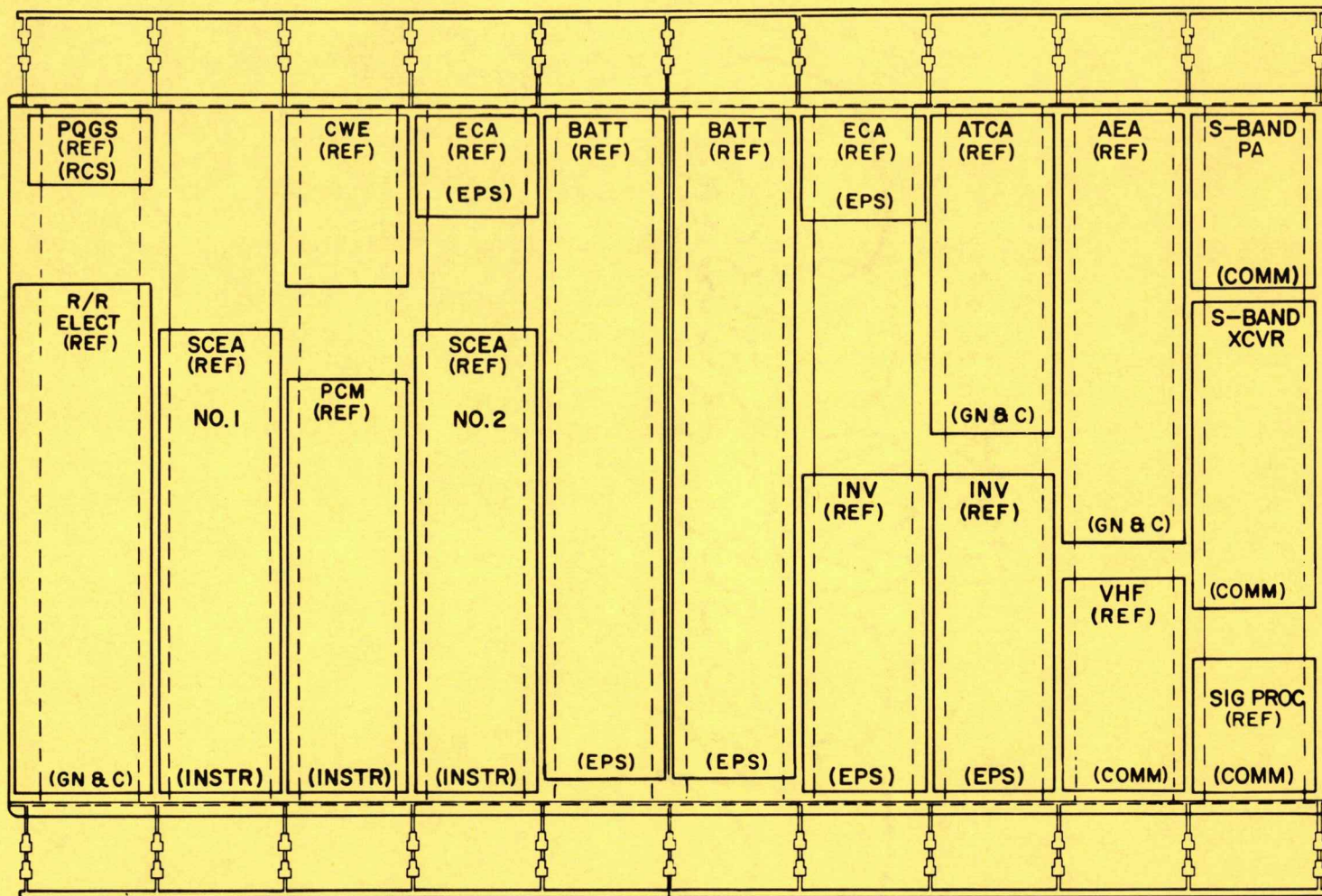


DESCENT ECA OVERCURRENT TRIP LIMITS
LTA-8

T30100-63.1

LTA-8





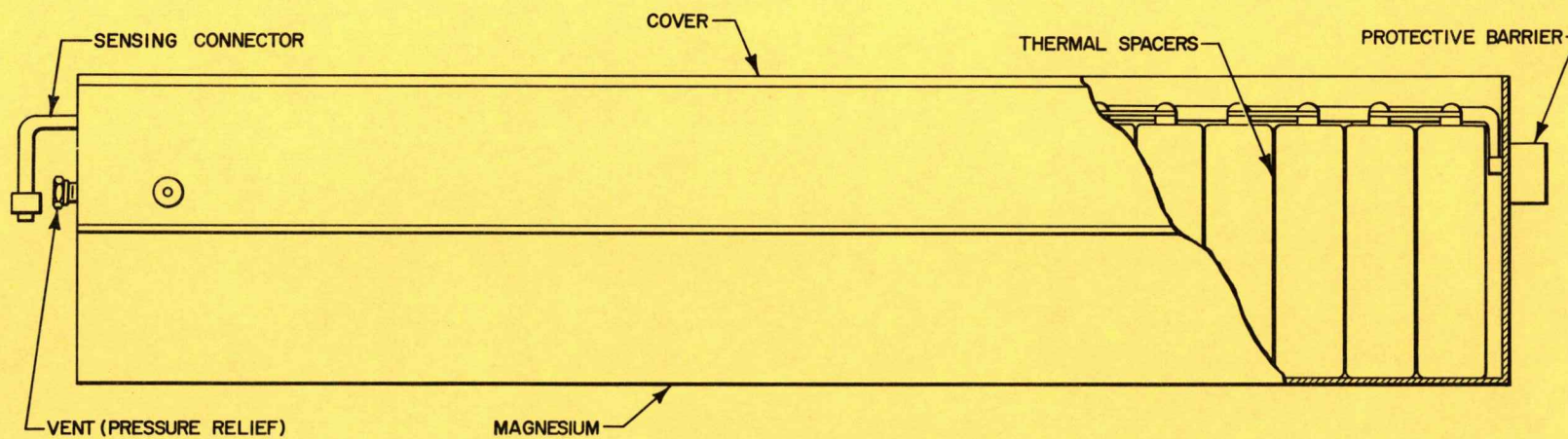
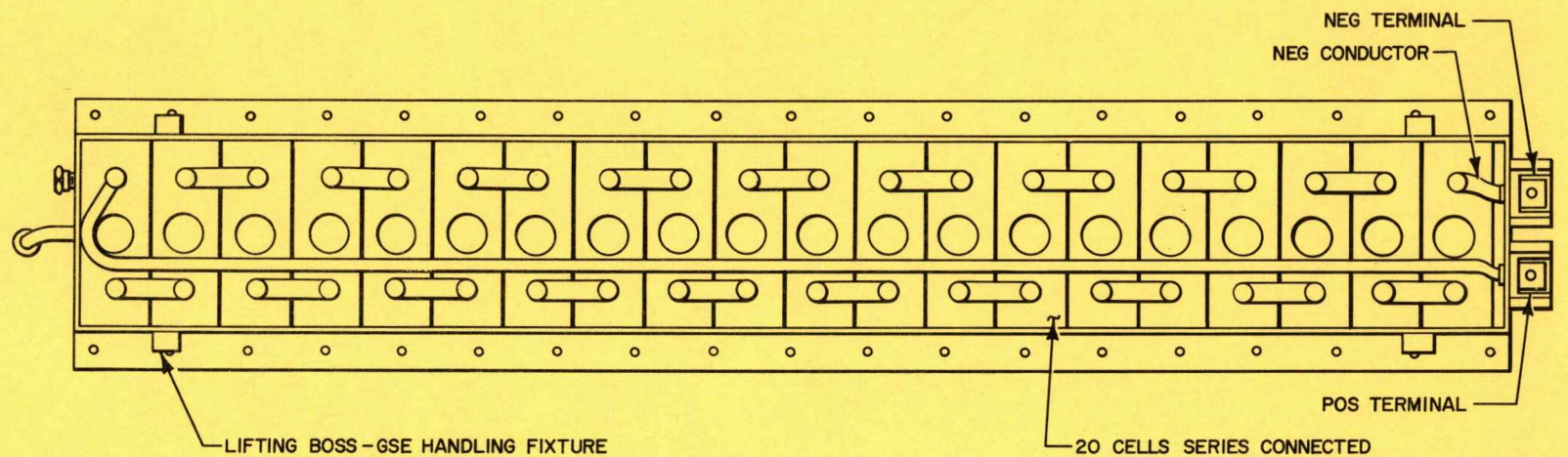
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VIEW LOOKING FWD

AFT EQUIPMENT BAY-ERA ARRANGEMENT

T 30100-61.1

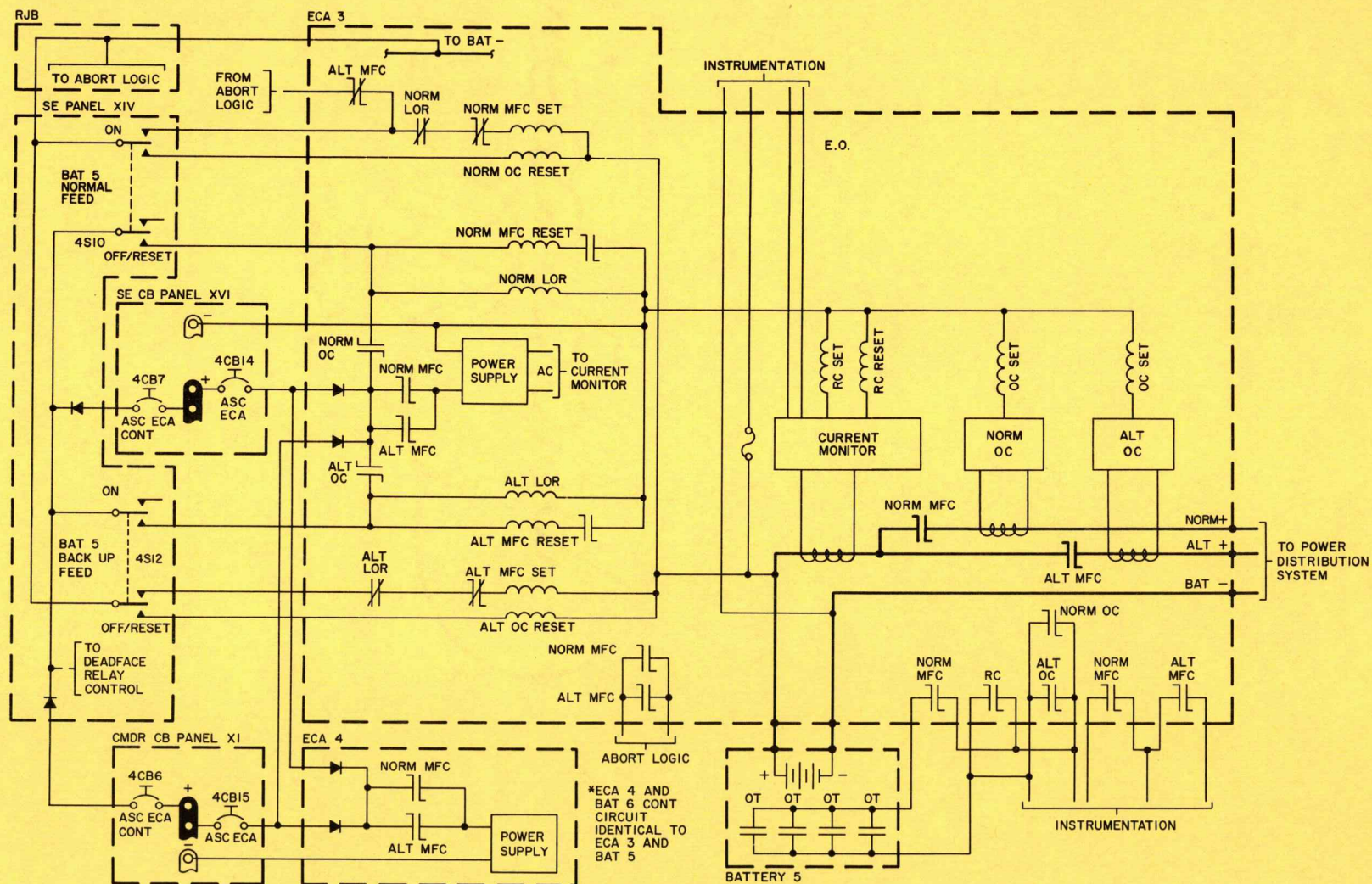
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EPS



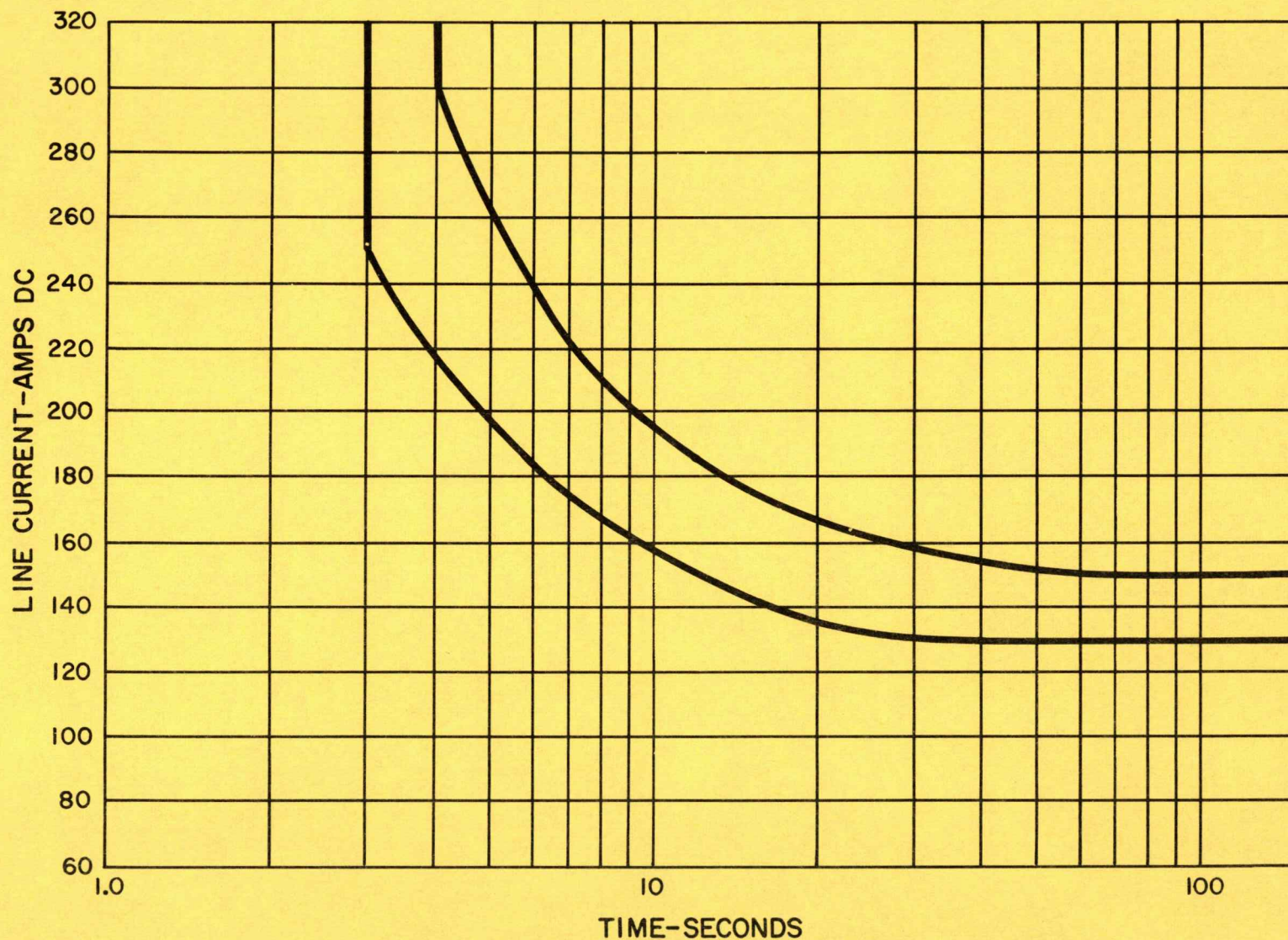
ASCENT BATTERY

T30100-25.1



ASCENT CONTROL AND ECA LOGIC LTA-8

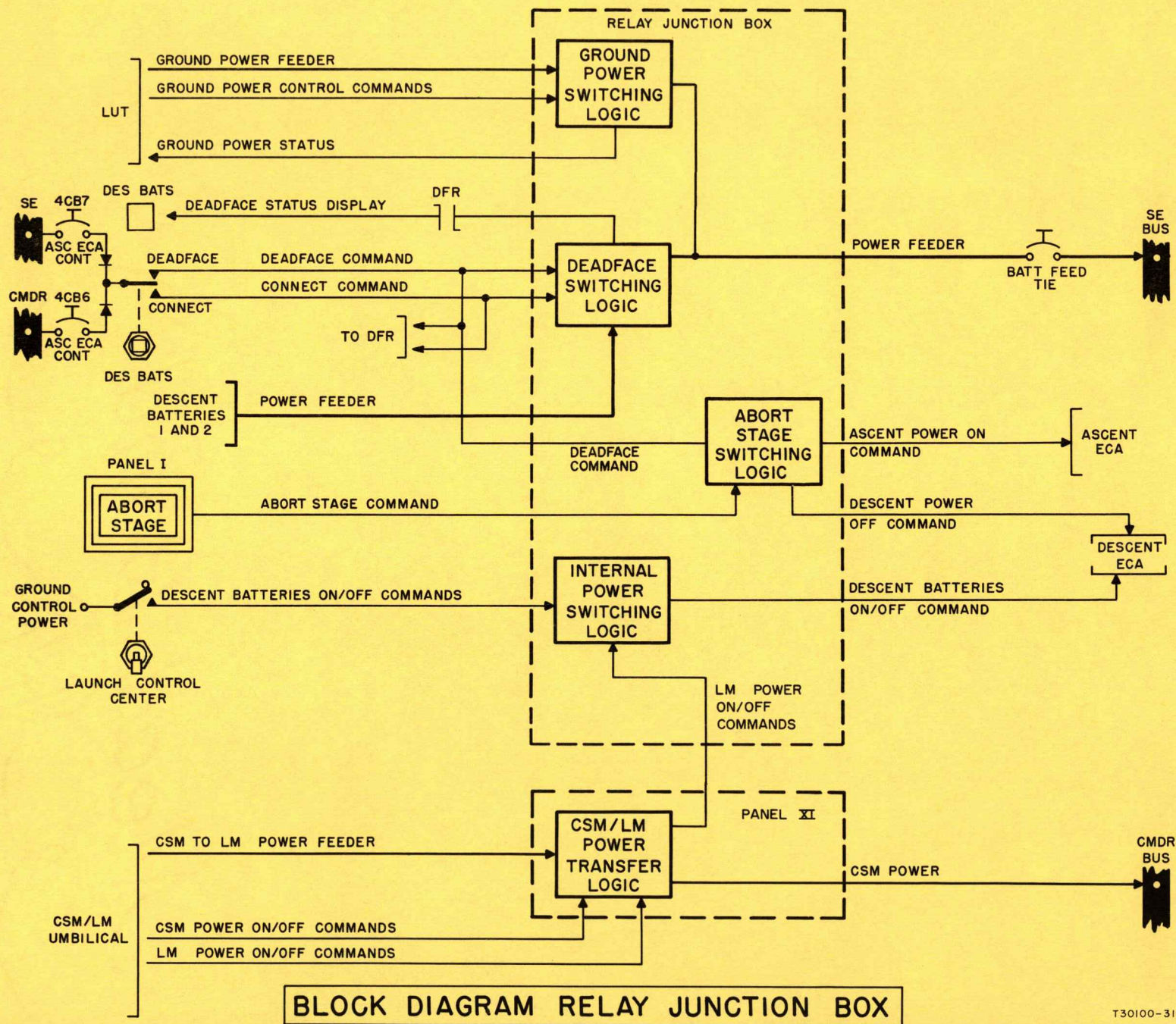
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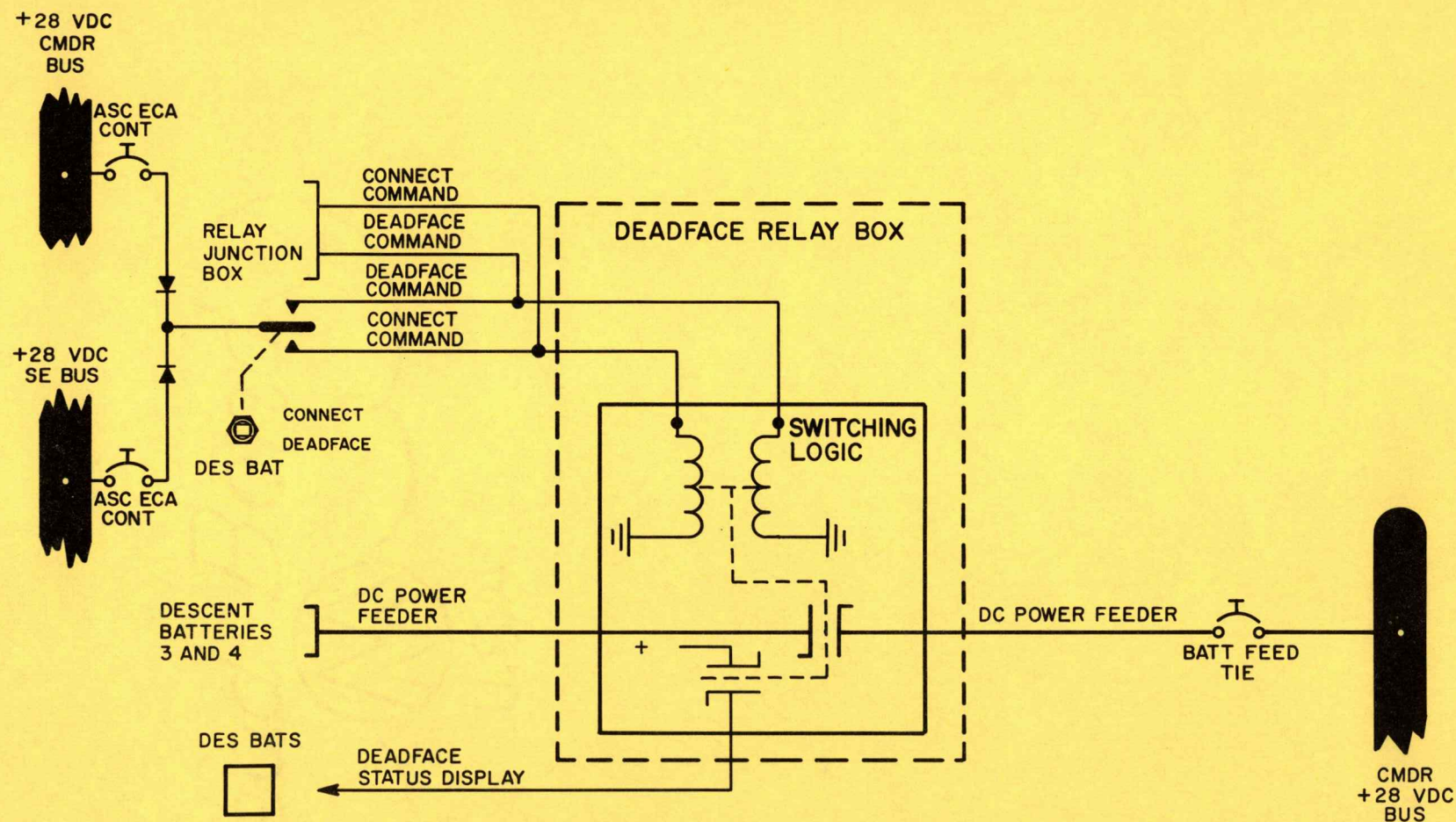
ASCENT ECA OVERCURRENT TRIP LIMITS
LTA-8

T 30100-64.1

LTA-8

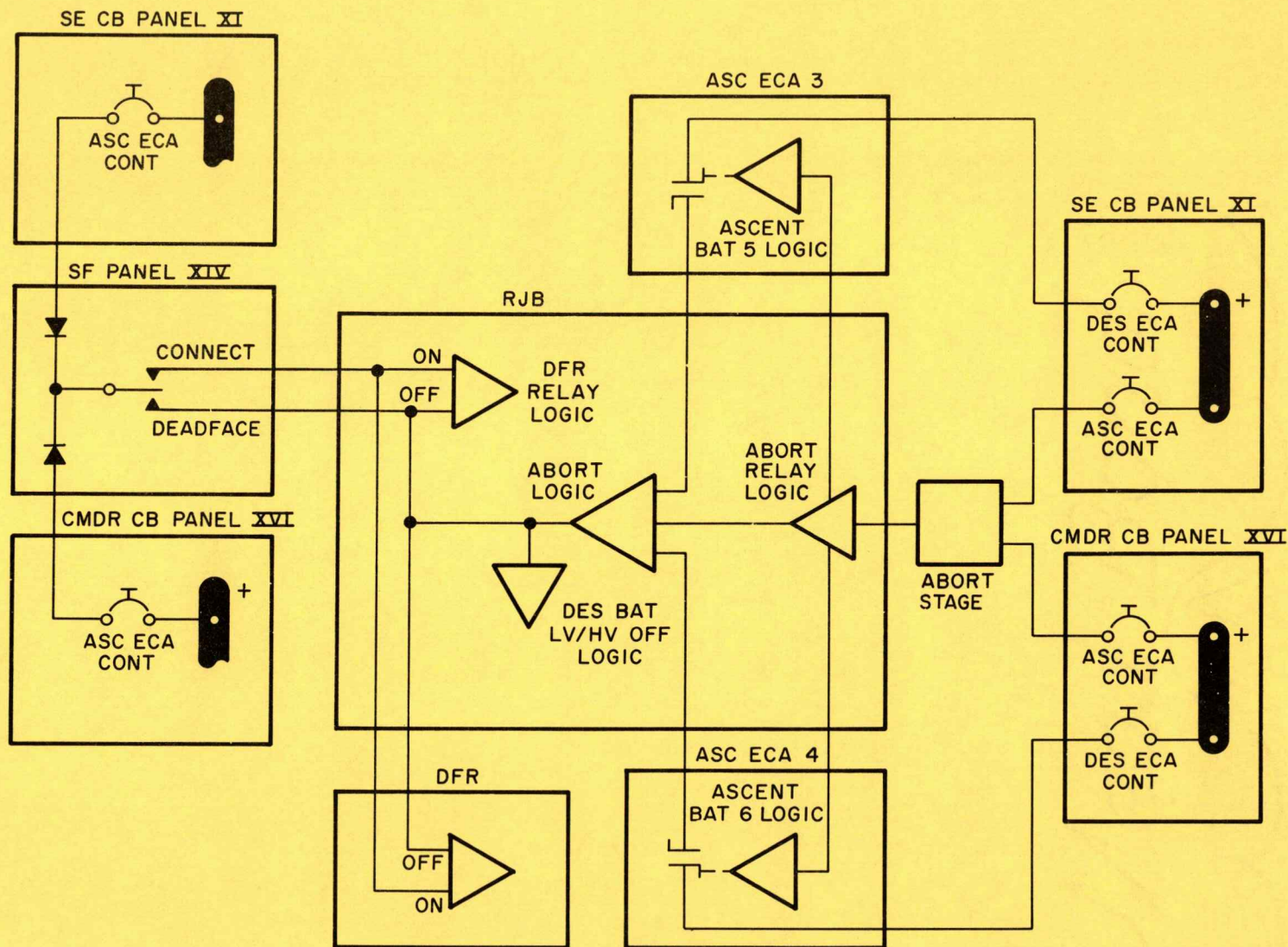


ELECTRICAL POWER SUBSYSTEM



DEADFACE RELAY BOX
FUNCTIONAL BLOCK DIAGRAM

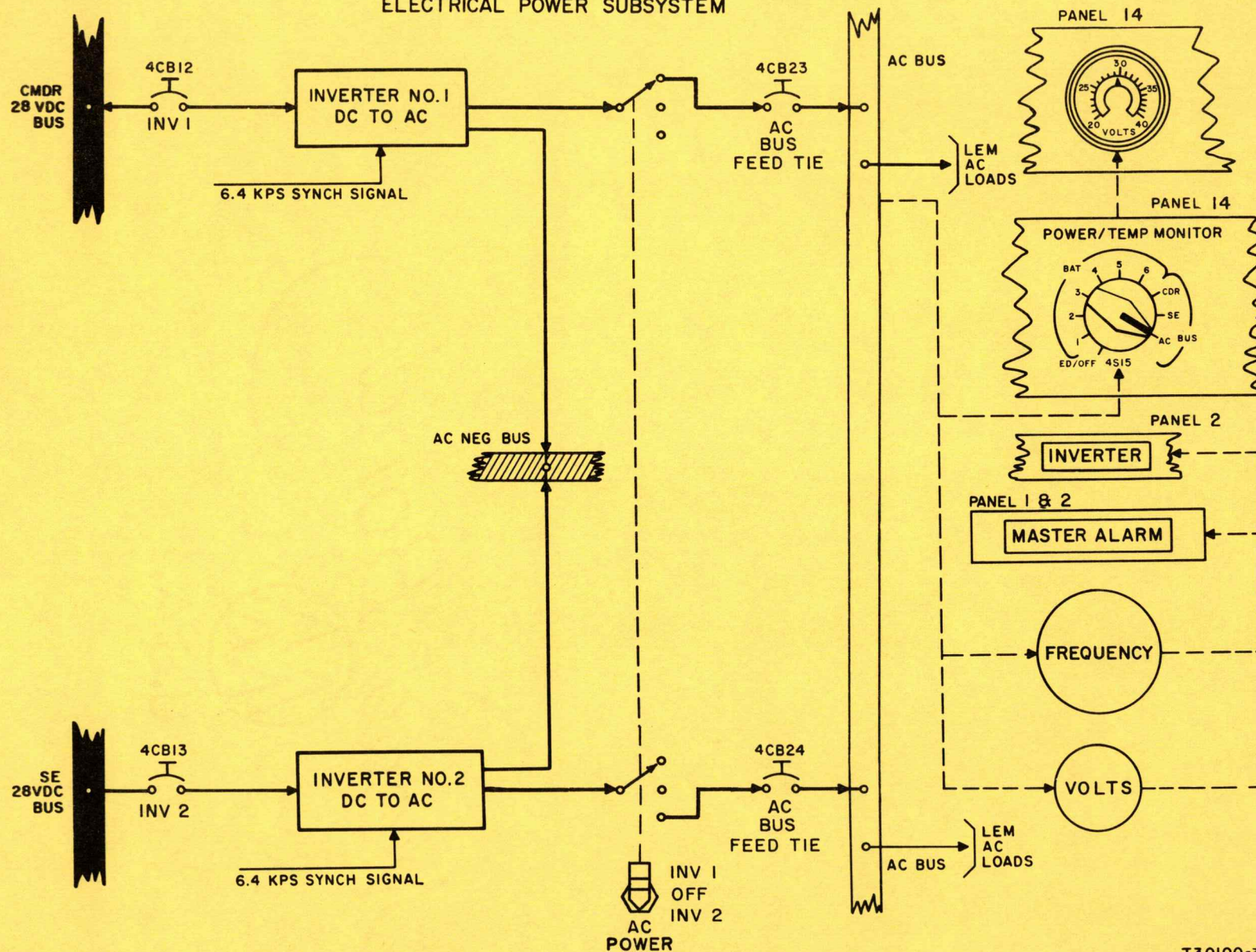
T30100-45.1



DEADFACE RELAY AND ABORT LOGIC

T30100-21.1

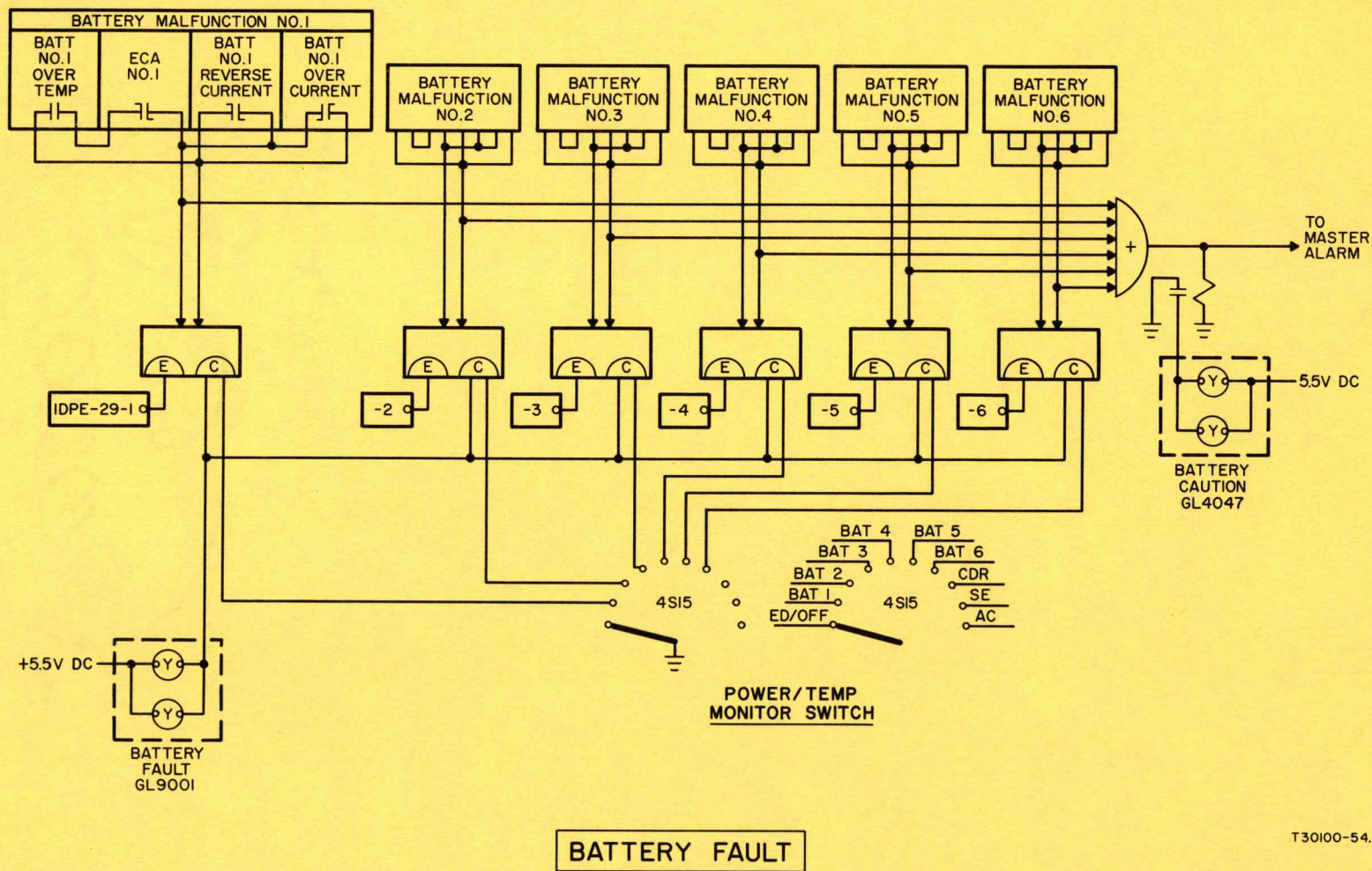
ELECTRICAL POWER SUBSYSTEM



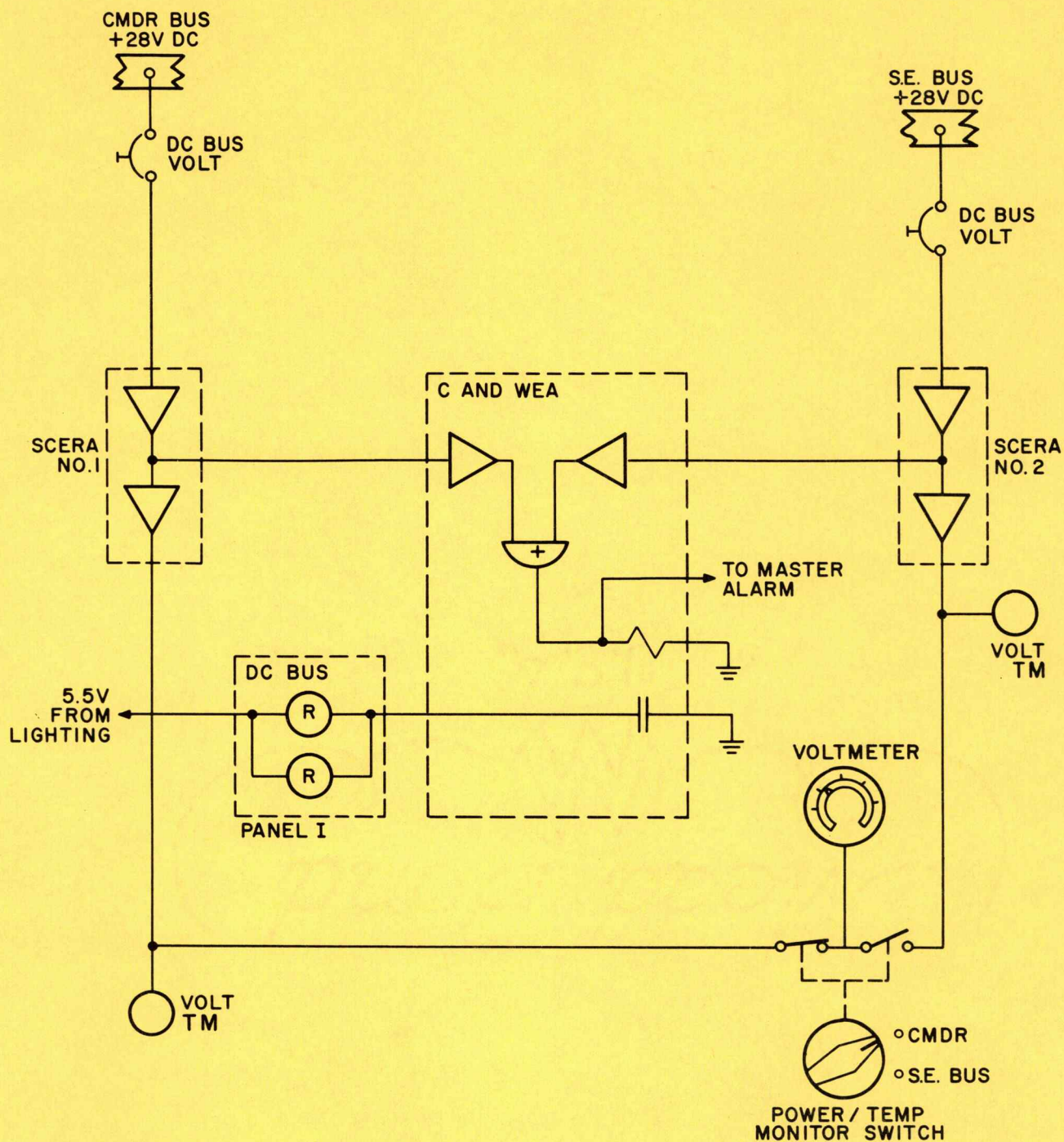
AC POWER DISTRIBUTION

T30100-32.1

LTA-8

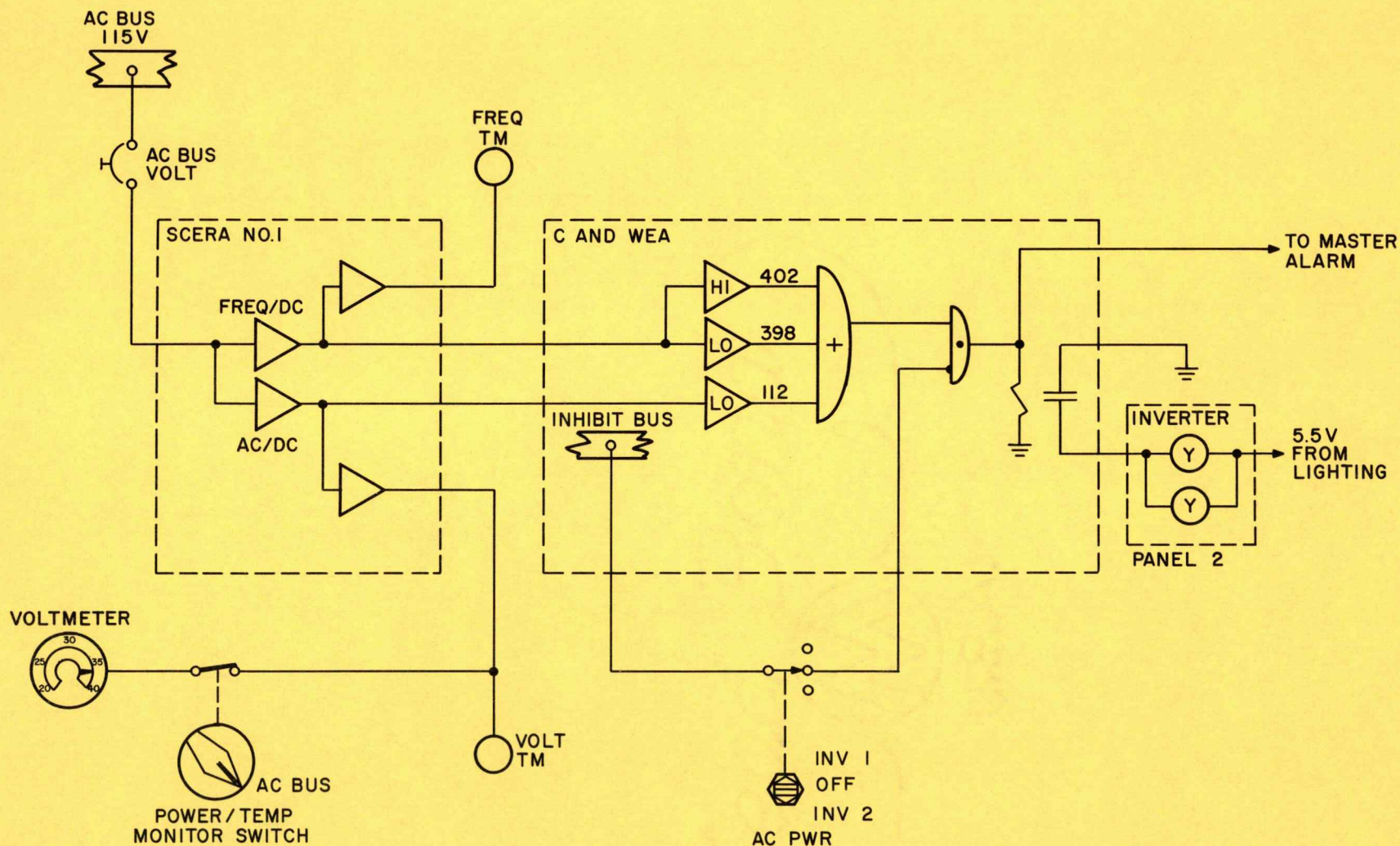


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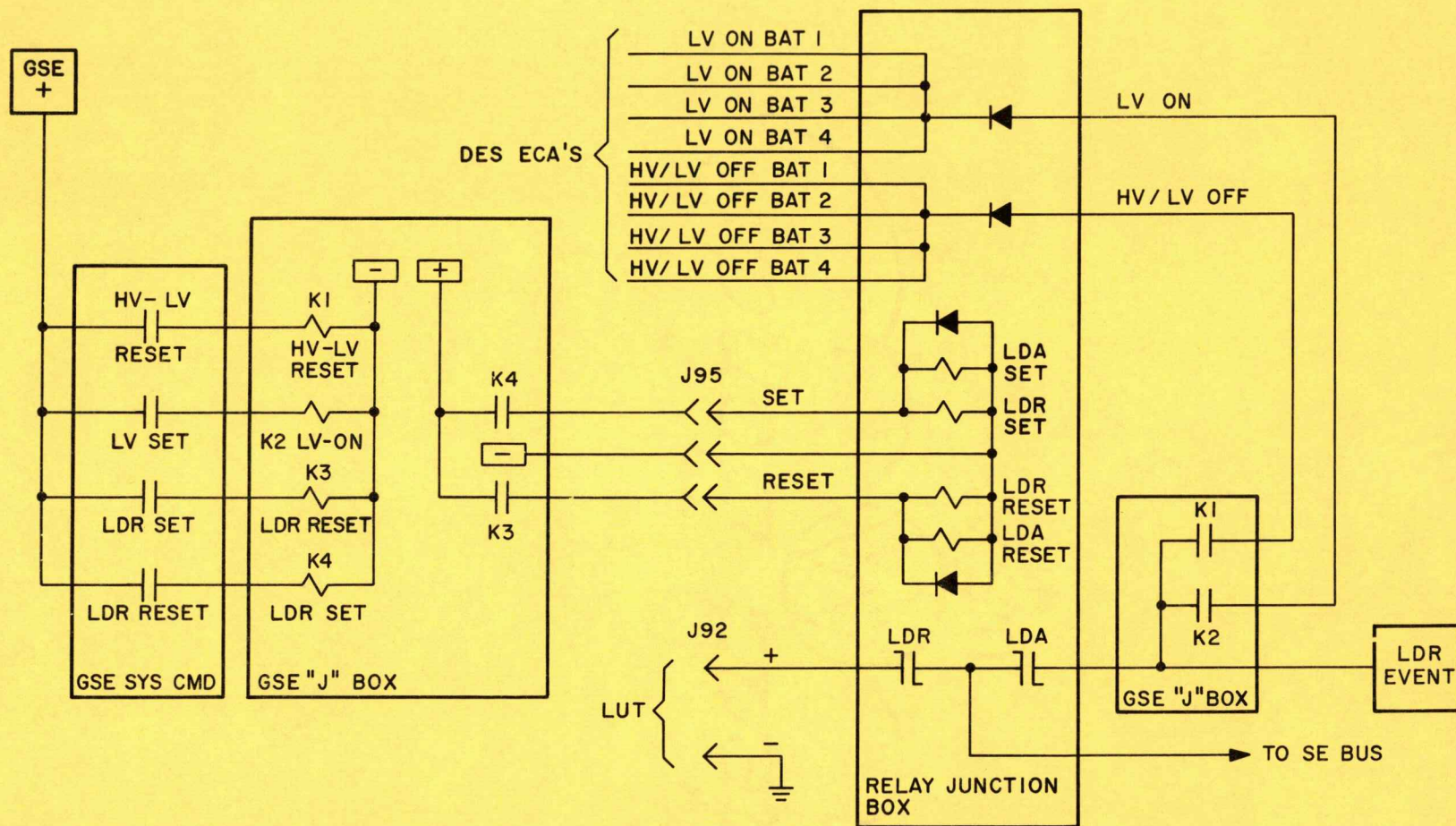
DC BUS MONITORING AND WARNING

T-30100-55.1



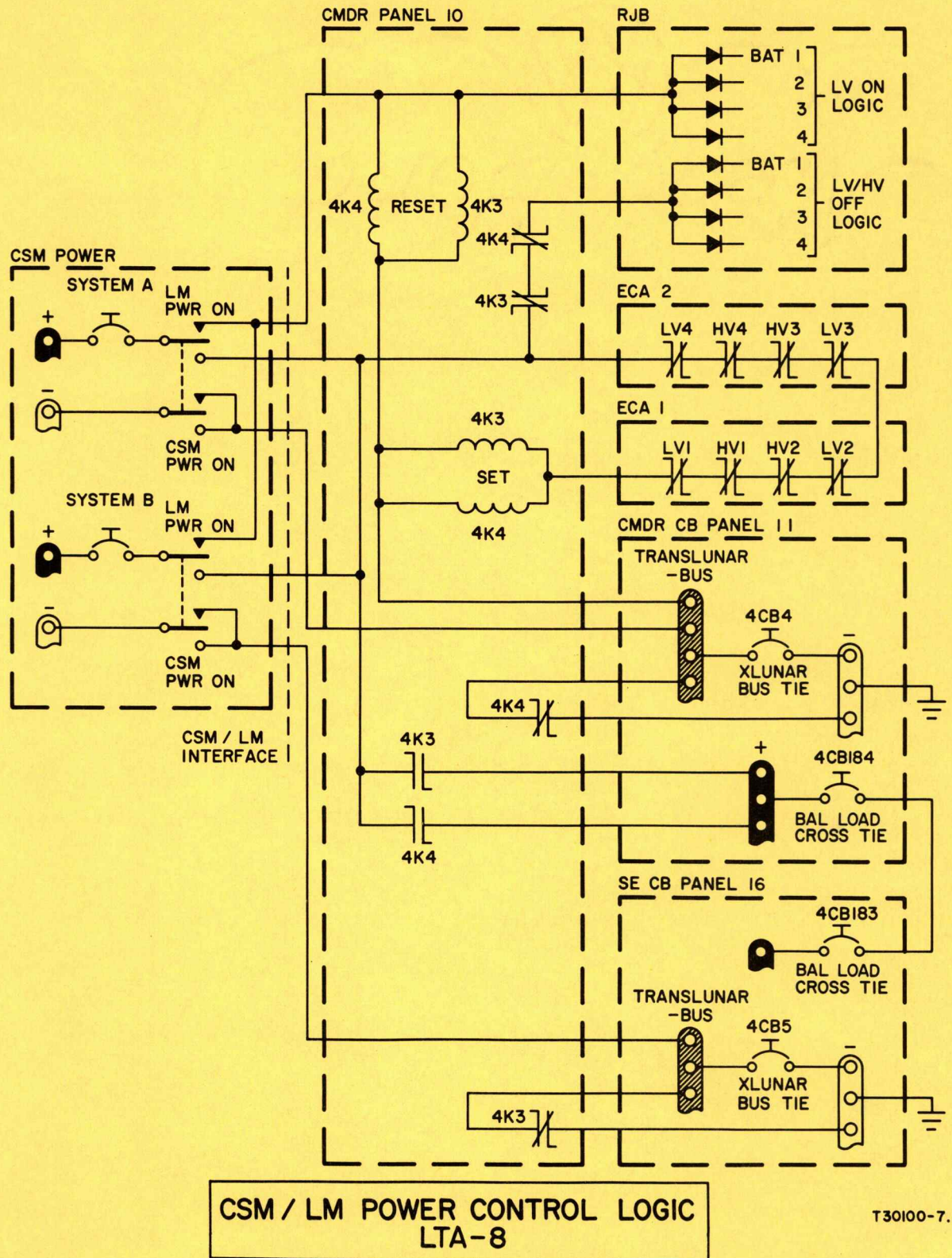
AC POWER MONITORING AND CAUTION

T30100-59.1



LUT CONTROL LOGIC

T30100-5.1



LTA-8 EPS DATA SHEET

A. DC Power

Descent Stage	46.9 KW-Hrs
Ascent Stage	17.8 KW-Hrs

B. Capacity Per Battery

Descent Battery	400 Amp Hrs
Ascent Battery	296 Amp Hrs

C. DC Bus Limits

Minimum	26.5 Volts
Nominal	28 Volts
Maximum	32.5 Volts

D. AC Power

1. Inverter Output

- a. Nominal - 350 Volt-Amps
- b. Maximum - 525 Volt-Amps for 10 Sec

2. Voltage - 115 ± 2 VRMS

- 3. Frequency - 400 ± 10 CPS Free Running
 400 ± 0.4 CPS Sync Mode

E. Battery Malfunction (Caution)

1. Overcurrent

- (a) Descent Battery - 80 to 90 Amps, ultimate trip. The higher the current, the quicker the trip. Minimum trip time for excessive high current, 3 to 4 sec.
- (b) Ascent Battery - 130 to 150 Amp, ultimate trip. The higher the current, the quicker the trip. Minimum trip time for excessive high current, 3 to 4 sec.

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LTA-8 EPS DATA SHEET (Cont.)

2. Reverse Current - 5 to 10 Amps reverse current for a duration of 4 to 6 sec or longer. Resets automatically if current flow returns to normal.
 3. Over-temperature - $145 \pm 5^{\circ}\text{F}$
Reset - $125 \pm 5^{\circ}\text{F}$
- F. DC Bus Malfunction (Warning)
1. Low Bus Voltage ≤ 26.5 Volts
- G. AC Inverter Malfunction (Caution)
1. Voltage ≤ 112 Volts AC
 2. Frequency ≤ 398 CPS
 3. Frequency ≥ 402 CPS
- H. Glycol Cooling
1. Descent Stage - Primary Loop
 2. Ascent Stage - Primary and Secondary Loops