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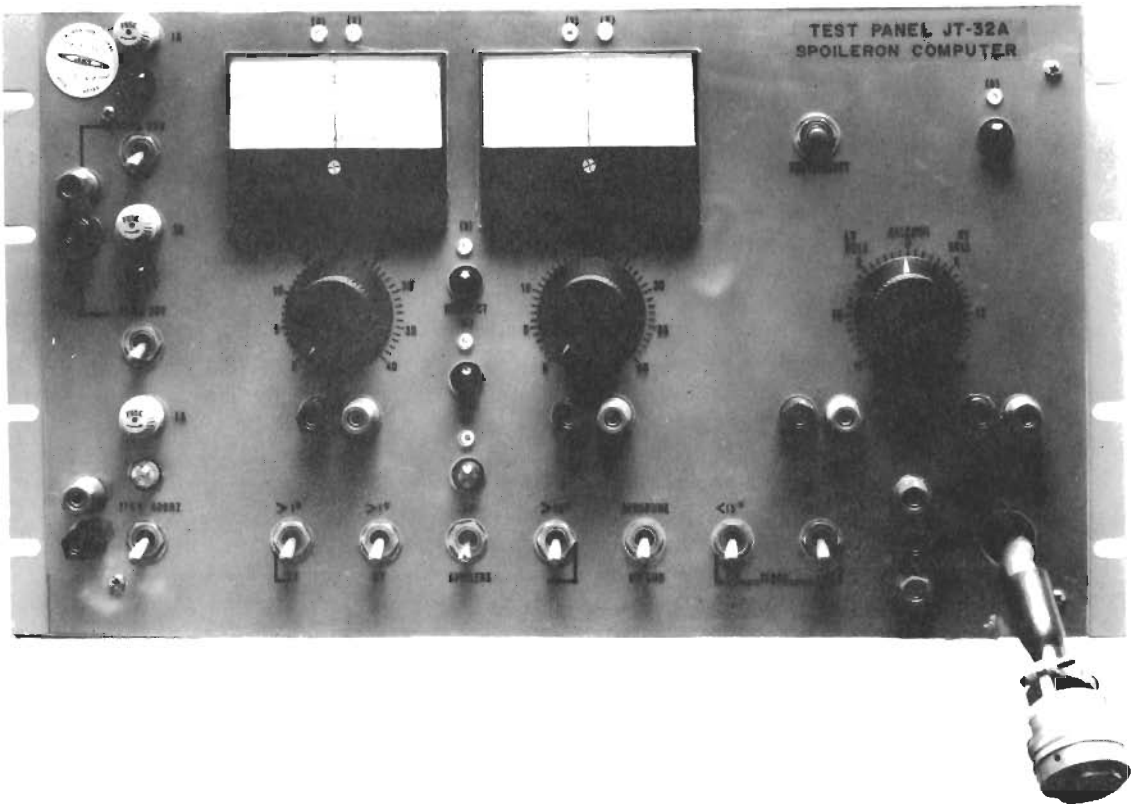
MODEL JT-32A

SPOILERON COMPUTER

TEST PANEL

Part No. 510-1017-01



INSTRUCTION MANUAL

JET ELECTRONICS AND TECHNOLOGY, INC.

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TP-293

SECTION I
GENERAL INFORMATION

1-1. INTRODUCTION

1-2. This manual provides instructions, installation, operation and principles of operation of the Jet Electronics and Technology, (J.E.T.) Inc., Model JT-32A Spoileron Computer Test Panel.

1-3. DESCRIPTION

1-4. The Model JT-32A Spoileron Computer Test Panel is designed to provide the electrical signals needed to check the performance of the Model SP-101A Spoileron Computer. The Test Panel is designed for "19 inch" rack mounting. Specifications for the Test Panel are listed in Table 1-1.

Table 1-1. General Specifications, JT-32A

Dimensions:	Width: 19 inches Height: 10.5 inches Depth: 10 inches
Capabilities:	Provides power, switching, lamps, meters, binding posts, test jacks and electrical signals to completely performance test the circuitry and logic of the Spoileron Computer Assembly. Simulates aircraft spoiler and aileron position (follow-up) signals, spoiler and flap position switches, squat switch, SPOILER TEST/RESET switch, AUG AIL light and SPOILER light.
Power Requirements:	28 Vdc, 5 amp, minimum. 115 V, 400 Hz, 1 amp, minimum.

1-5. ACCESSORIES

1-6. The Model JT-32A Test Panel is designed with wired-in dc power cable, ac power cable and test unit interconnecting cable.

SECTION II
PREPARATION FOR USE

2-1. INTRODUCTION

2-2. This section contains information on inspection and checkout of the J.E.T., Inc., Model JT-32A Spoileron Computer Test Panel.

2-3. When unpackaging, inspect the Test Panel for signs of damage in shipment. Make an operational check in accordance with paragraph 2-6 to determine if performance is satisfactory.

2-4. POWER REQUIREMENTS

2-5. The Test Panel is designed to operate from 28 Vdc and 115 Vac, 400 Hz, single phase, power sources.

2-6. OPERATIONAL CHECK

2-7. The Test Panel is ready for use as received from the factory. The following performance test can be made to determine if electrical damage was incurred during shipment.

a. Place Test Panel switches to the following positions:

Switch	Position
MAIN 28V S2	down
WARN 28V S1	down
115V 400HZ S3	down

b. Connect Test Panel dc power cable to a 28 Vdc power source, P3 to + and P4 to -.

c. Connect Test Panel ac power cable to an ac power source.

d. Place MAIN 28V power switch S2 to up (ON) position. MAIN 28V light DS2 shall illuminate. Place switch to down position, light shall extinguish.

e. Place WARN 28V power switch S1 to up (ON) position. WARN 28V light DS1 shall illuminate. Place switch to down position, light shall extinguish.

f. Place 115V 400 Hz power switch S3 to up (ON) position. 115V 400 Hz neon light DS3 shall illuminate. Place switch to down position, light shall extinguish.

SECTION III
OPERATING INSTRUCTIONS

3-1. INTRODUCTION

3-2. This section contains operating instructions for the J.E.T., Inc., Model JT-32A Spoileron Computer Test Panel. Figure 3-1 gives a functional description of each switch/control of the Test Panel.

3-3. GENERAL OPERATING INSTRUCTIONS

3-4. See the Model SP-101A Spoileron Computer Assembly Instruction Manual for testing instructions using the Model JT-32A Spoileron Computer Test Panel.

Figure 3-1 Reference No.	Designation	Function
1	WARN 28V	Switch (S1) connects 28 Vdc external power to Spoileron Computer failure warning circuitry.
2		Red light (DS1) illuminates when WARN 28V is on.
3	1A	One ampere fuse (F1) protects Spoileron Computer warning circuitry from drawing too much current.
4	LT SPOILER	Potentiometer (R1) permits simulating extention of left spoiler from between 0 degrees to 40 degrees.
5		Meter (M1) permits monitoring current to left spoiler hydraulic control valve simulator.
6	ENG	Green light (DS5) illuminates to indicate that Spoileron Computer logic is providing +28V power to the engage solenoid of the spoiler hydraulic system.

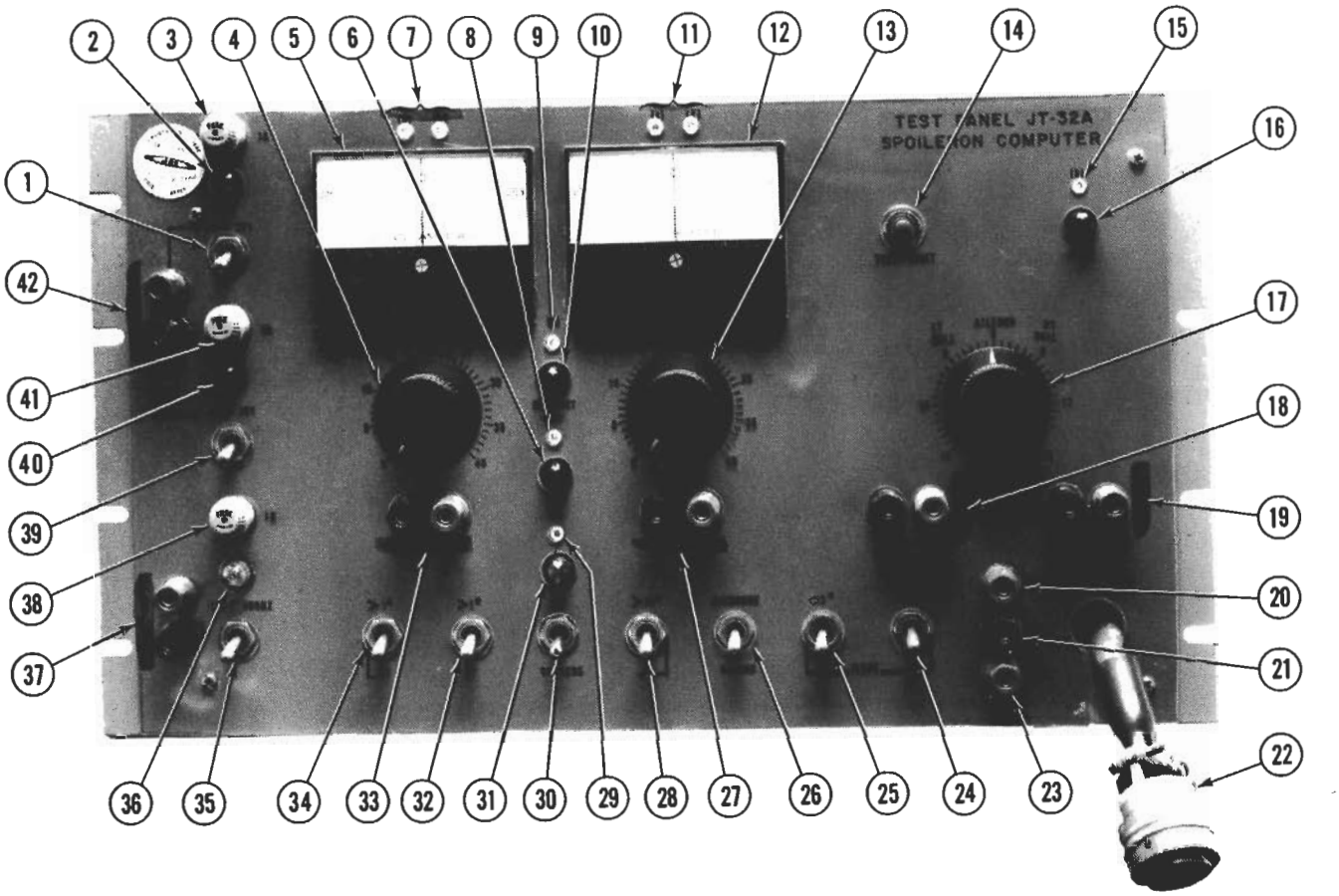


Figure 3-1. Model JT-32A Spoileron Computer Test Panel

Figure 3-1 Reference No.	Designation	Function
7	(a) (Z)	Test jacks (J1 and J2) for monitoring left spoiler servo valve dc voltage.
8	(i)	Test jack (J6) for monitoring ENG signal.
9	(h)	Test jack (J5) for monitoring restrict signal.
10	RESTRICT	Green light (DS4) illuminates to indicate that Spoileron Computer logic is providing 28 Vdc power to spoiler hydraulic system restrictor solenoid.
11	(X) (Y)	Test jacks (J3 and J4) for monitoring right spoiler servo valve dc voltage.
12		Meter (M2) permits monitoring current to right spoiler hydraulic control valve simulator.
13	RT SPOILER	Potentiometer (R2) permits simulating extension of right spoiler from between 0 degrees and 40 degrees.
14	TEST/RESET	Switch (S11) simulates aircraft SPOILERON TEST/RESET switch.

Figure 3-1 Reference No.	Designation	Function
15	(b)	Test jack (J7) for monitoring FAIL light signal.
16	FAIL	Red light (DS7) illuminates to indicate that Spoiler Computer logic is indicating that aileron augmentation mode is inoperative.
17	AILERON LT ROLL/RT ROLL	Dual potentiometer (R3 and R4) permits simulating aileron position (follow-up) output signals.
18	LT FU (CMD)	Binding posts (E9 and E10) for monitoring simulated left aileron position output signal.
19	RT FU (MON)	Binding posts (E11 and E12) for monitoring simulated right aileron position output signal.
20	26 V Ø	Binding post (E13) for monitoring 26 Vac in-phase signal from Spoileron Computer power supply.
21	GND	Binding post (E14) for monitoring 26 V Ø and 26 V Ø signals.
22	P1	Cable for interconnection of Test Panel to Spoileron Computer test unit.
23	26 V Ø	Binding post (E15) for monitoring 26 Vac out-of-phase signal from Spoileron Computer power supply.
24	FLAPS<25°	Switch (S10) simulates aircraft position switch which closes when flaps are down over 25°.
25	FLAPS<13°	Switch (S9) simulates aircraft position switch which opens when flaps are down over 13°.
26	AIRBORNE/ON GND	Switch (S8) simulates aircraft landing gear squat switch; closed on ground, open during flight.
27		Binding posts (E7 and E8) for monitoring simulated RT SPOILER position signal.
28	SPOILERS >15°	Switch (S7) simulates aircraft limit switch indicating that spoiler is extended over 15°.
29	(d)	Test jack (J8) for monitoring SPOILER UP light signal.
30	SPOILERS UP	Switch (S6) simulates aircraft SPOILER switch; UP is extended, down is retracted.
31		Yellow light (DS6) illuminates to indicate that right or left spoiler is extended over 1°.
32	RT >1°	Switch (S5) simulates aircraft right spoiler 1° position switch. Open when spoiler extended less than 1°, closed when extended 1° or greater.

Figure 3-1 Reference No.	Designation	Function
33		Binding posts (E5 and E6) for monitoring simulated LT SPOILER position signal.
34	LT >1°	Switch (S4) simulates aircraft left spoiler 1° position switch. Open when spoiler extended less than 1°, closed when extended 1° or greater.
35	115V 400HZ	Switch (S3) applies 115 V, 400 Hz power to Spoileron Computer.
36		Neon light (DS3) illuminates when 115 V, 400 Hz is on.
37		Binding posts (E3 and E4) for monitoring external 115 V, 400 Hz input power.
38		1 ampere fuse (F3) protects ac power circuitry.
39	MAIN 28V	Switch (S2) connects 28 Vdc external power to Spoileron Computer.
40		Red light (DS2) illuminates when MAIN 28V is on.
41		Binding posts (E1 red and E2 black) for monitoring external 28 Vdc input power.
42	5A	Five ampere fuse (F2) protects dc power circuitry.
43*		AC power cable for connection through connector P2 to standard 115 V, 400 Hz, single phase outlet.
44*		DC power cable for connection through connector P3 (red) to power supply + and connector P4 (black) to power supply -.

* Not shown

SECTION IV
PRINCIPLES OF OPERATION

4-1. The electrical circuits of the Model JT-32A Spoileron Computer Test Panel are shown in the detailed schematic in Figure 5-1. The electrical circuits consist basically of the spoiler position simulators, aileron position simulators, spoiler hydraulic system control valve simulators, switching and monitoring circuitry.

Spoiler Position Simulators

Stepdown transformers, T1 and T2, are supplied by 26 Vac from the Spoileron Computer power supply. The resistors in the circuits are selected so that the voltage outputs from potentiometers R1 (LT SPOILER) and R2 (RT SPOILER) are representative of the aircraft spoiler follow-up signals when operating into the Spoileron Computer load. The voltage across the load from the RT SPOILER is 0.8 $\pm$0.05 Vac at 0° and 3.2 $\pm$0.2 Vac at 40°. The voltage across the load from the LT SPOILER Is 0.8 $\pm$0.05 Vac at 0° and 4.8 $\pm$0.2 Vac at 40°.

Aileron Position Simulators

Isolation transformers, T3 and T4, are supplied by 26 Vac from the Spoileron Computer power supply. The resistors in the circuits are selected to provide voltage outputs from dual potentiometer R3 (LT ROLL AILERON) and R4 (RT ROLL AILERON) which are representative of the aircraft aileron follow-up signals when operating into the Spoileron Computer load. The voltage across the load from each simulator is less than 100 millivolts at 0° and 7.66 ±0.2 Vac at both 18° LT ROLL and RT ROLL.

Spoiler Hydraulic System Control Value Simulators

Coil L1 and resistor R5 simulate the load of the right spoiler hydraulic system control valve. Meter M2 in the circuit permits monitoring of the current being supplied through this circuit from the Spoileron Computer. An identical circuit of coil L2, resistor R6 and meter M1 simulates the left spoiler hydraulic system control valve.

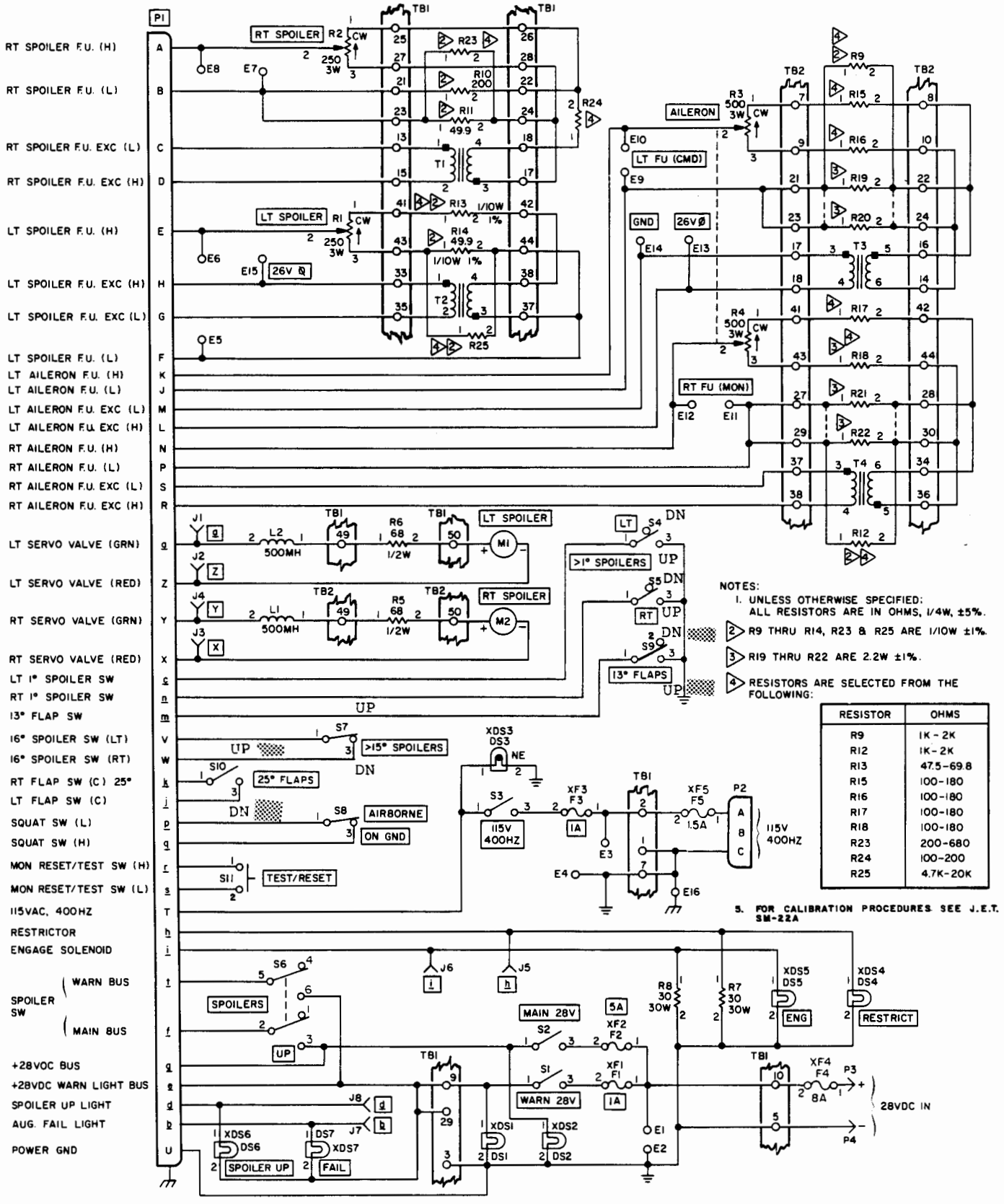
Switching and Monitoring

WARN 28V switch S1 controls the application of +28 Vdc to the Spoileron Computer failure warning circuitry. Light DS1 will illuminate to indicate WARN 28V is applied. MAIN 28V switch S2 controls the +28 Vdc primary power to the Spoileron Computer. Light DS2 will illuminate to indicate MAIN 28V is applied. 115V 400HZ switch S3 controls application of the 115 Vac power to the Spoileron Computer power supply. Neon light DS3 will illuminate to indicate 115V 400HZ is applied.

SPOILERS UP switch S6 simulates the aircraft SPOILER RET/EXT switch. TEST/RESET switch S11 simulates the aircraft SPOILERON TEST/RESET switch. 13° FLAPS switch S9 and 25° FLAPS switch S10 simulate the 13° and 25° position switches for the aircraft flaps, 1° SPOILERS switch S4 (LT) and switch S5 (RT), and 15° SPOILERS switch S7 simulate the 1° position and 15° limit switches for the aircraft ailerons. AIRBORNE/ON GND switch S8 simulates the aircraft squat switch.

RESTRICT light DS4, when illuminated, indicates that the Spoileron Computer is providing +28 Vdc power to the spoiler hydraulic system restrictor solenoid. ENG light DS5, when illuminated, indicates that the Spoileron Computer is providing +28 Vdc power to the spoiler hydraulic system engage solenoid. SPOILERS UP light DS6 simulates the aircraft SPOILER light. FAIL light DS7 simulates the AUG AIL light in the aircraft.

Binding posts and test jacks are provided for monitoring of input/output signals on the Test Panel.



RESISTOR	OHMS
R9	1K - 2K
R12	1K - 2K
R13	47.5 - 69.8
R15	100 - 180
R16	100 - 180
R17	100 - 180
R18	100 - 180
R23	200 - 680
R24	100 - 200
R25	4.7K - 20K

Figure 5-1 (Sheet 1). Model JT-32A Spoileron Computer Test Panel Schematic (Mod 0)

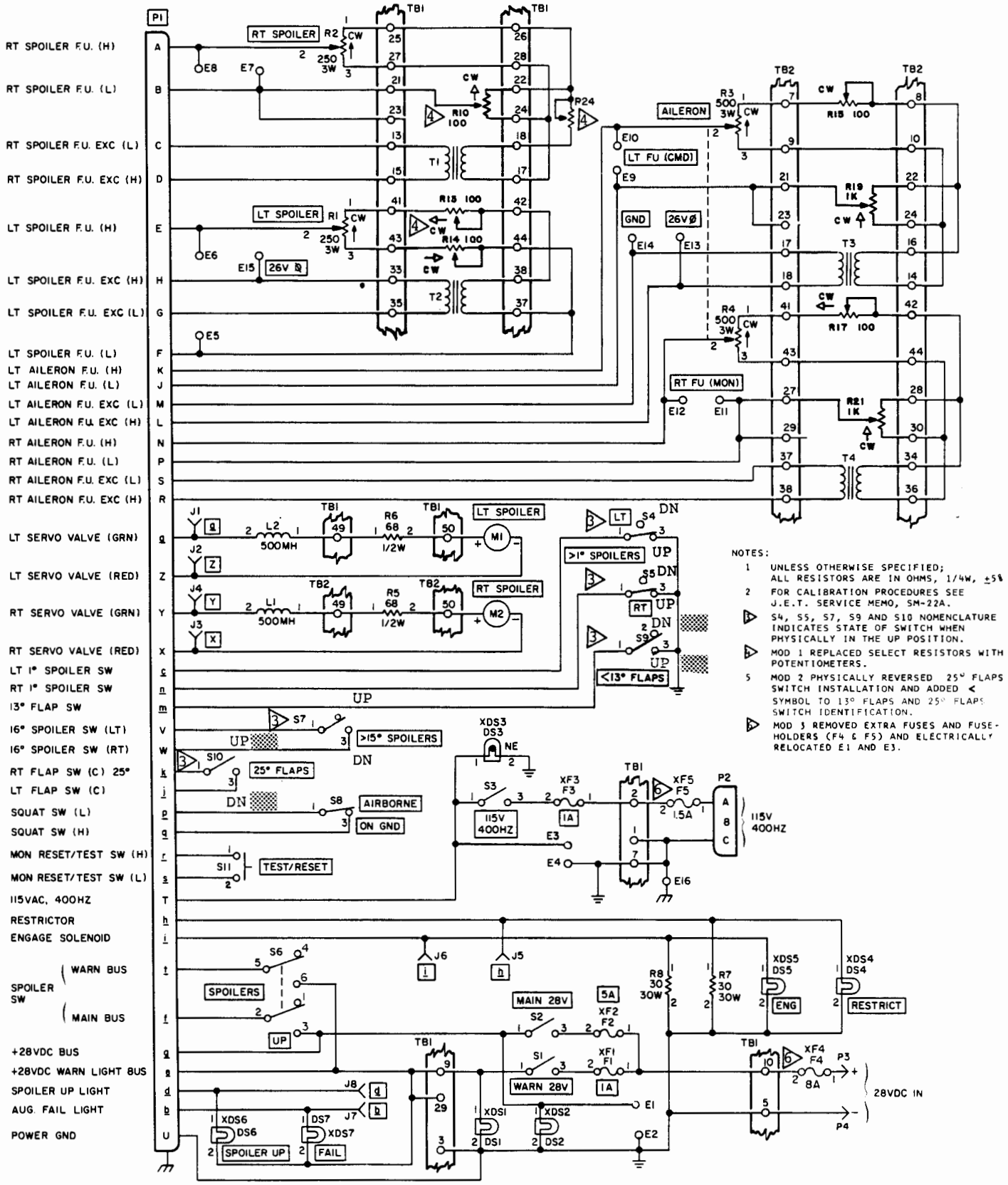


Figure 5-1 (Sheet 2). Model JT-32A Spoileron Computer Test Panel Schematic (Mod 3)