

DC Electrical System

Citation; Citation I

LH COCKPIT CB PANEL

4 RH CROSSOVER BUS

ANGLE-OF-ATTACK HEATER	RH ENGINE BLEED AIR
BATT TEMP WARNING	RH ENGINE ANTI-ICE
CABIN INFORMATION	RH FIRE DETECT
CABIN TEMP CONTROL	RH FIREWALL SHUTOFF
CENTER PANEL LIGHTS	RH THRUST REVERSER
CLOCK	RH TURN AND BANK
EL PANEL LIGHTS	RH PANEL LIGHTS
EMERGENCY PRESS	RH PITOT STATIC
FLIGHT HR/EQUIP COOL	WARNING LIGHTS 1
LDG GEAR WARNING	W/S BLEED AIR
LH IGNITION	W/S BLEED AIR TEMP
OVERSPEED WARN	SKID WARNING
PITCH TRIM	SPEEDBRAKE
RH ALT VIBRATOR	TELEPHONE
RH BOOST PUMP	

2 LH MAIN BUS EXTENSION

AC INVERTER NO. 1	LH PITOT STATIC (ANTI-ICING)
ANGLE-OF-ATTACK	LH START
CABIN DEFOG FAN	LH THRUST REVERSER
ENGINE	LH TURN AND BANK
SYNCHRONIZATION	NORM PRESSURIZATION
ENTERTAINMENT CENTER	NOSEWHEEL RPM
FLAP CONTROL	OUTSIDE AIR TEMPERATURE
FLAP MOTOR	OVERSPEED
GEAR CONTROL	RH CB PANEL
LH BUS NO. 1,2,3	RH IGNITION
LH BOOST PUMP	STANDBY GYRO
LH ENGINE (ANTI-ICE)	SURFACE DE-ICE
LH FIRE DETECT	WARNING LIGHTS 2
LH FIREWALL SHUTOFF	WINDSHIELD ALCOHOL
LH PANEL LIGHTS	

RH COCKPIT CB PANEL

6 EMERGENCY BUS (28V DC)

COMM 1	DIRECTIONAL GYRO 1
FLOODLIGHTS	NAV/RMI 2

5 LH CROSSOVER BUS

ADF 1	LH FUEL QTY
AUTOPILOT	LH ITT
AREA NAV	LH OIL PRESS
AUDIO 1	LH OIL TEMP
DIRECTIONAL GYRO 1	LH TURB SPEED
DME 1	NAV/RMI 1
FD 1	RADIO ALTIMETER
LH FAN SPEED	TRANSPONDER 1
LH FUEL FLOW	

3 RH MAIN BUS EXTENSION

AC INVERTER NO. 2	RADAR
AC WARNING	RH BUS NO. 1,2,3
ADF 2	RH FAN SPEED
ANTI-COLL	RH FUEL FLOW
AUDIO 2	RH FUEL QUANTITY
BEACON	RH ITT
COMM 2	RH OIL PRESSURE
COMM 3	RH OIL TEMPERATURE
DME 2	RH START
FD 2	RH TURBINE SPEED
NAV LIGHT	WING INSP
LH CB PANEL	TRANSPONDER 2

AC BUSES

ADF 1	HSI 1
ADF 2	HSI 2
ADI 1	RADAR
ADI 2	RADAR STAB
AIR DATA	RMI 1
AUTOPILOT	RMI 2
FD 1	V GYRO 1
FD 2	V GYRO 2

LH POWER JUNCTION BOX CIRCUIT BREAKERS

LH AMMETER	LH LANDING LIGHT
LH BOOST PUMP	LH WING ANTI-ICE J BOX
LH BUS SENSE	REFRESHMENT BAR
LH GENERATOR ANNUNCIATOR	OXYGEN/SEAT BELT CHIMES
LH GENERATOR POWER RELAY	SHAVER

RH POWER JUNCTION BOX CIRCUIT BREAKERS

BAGGAGE LIGHT	RH BUS SENSE
BATTERY VOLTAGE	RH GENERATOR ANNUNCIATOR
CABIN LIGHTS/TOILET	RH GENERATOR POWER RELAY
LH/RH START IGNITION	RH LANDING LIGHT
LH VOLTMETER	RH VOLTMETER
LOCATOR BEACON	RH WING ANTI-ICE J-BOX
RH AMMETER	TAIL CONE LIGHT
RH BOOST PUMP	

LH PRESS BLKHD CBs

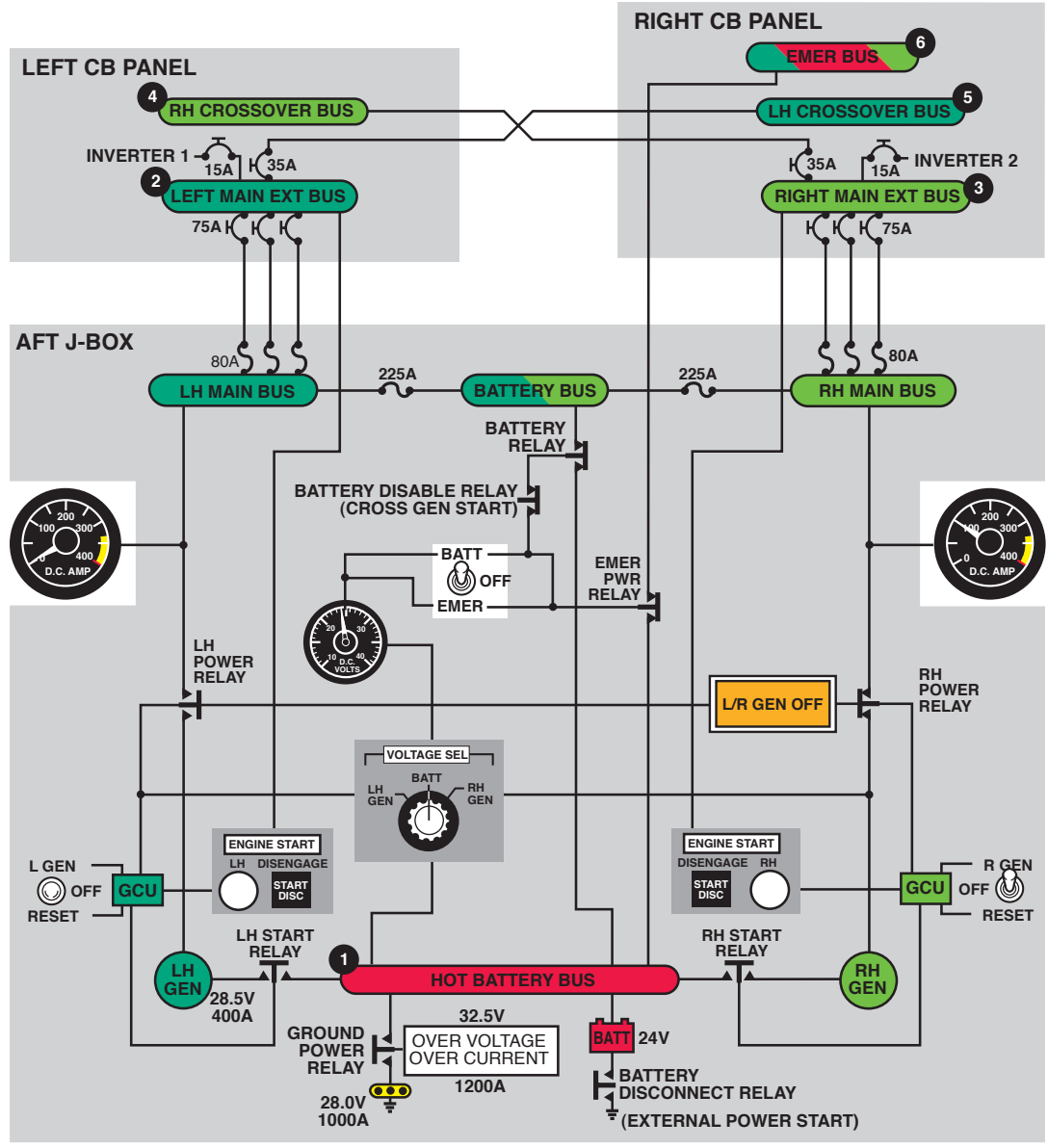
L WING ANTI-ICE (5)

1 HOT BATTERY BUS

BATTERY RELAY
EMERGENCY POWER RELAY
EMERGENCY LIGHTING BATTERY PACK
EMERGENCY LOCATOR BEACON (OPTIONAL)
EXIT LIGHTS
LH/RH NORMAL START IGNITION
NOSE AND TAIL BAGGAGE LIGHTS
TAIL CONE LIGHTS
VOLT METER (BATTERY SWITCH IN BATT OR EMER)

RH PRESS BLKHD CBs

R WING ANTI-ICE (5)



DC Electrical System

CII 002 to 626

LH COCKPIT CB PANEL

4 RH CROSSOVER BUS

ANGLE-OF-ATTACK HEATER	RH BOOST PUMP
BATT TEMP WARNING	RH ENGINE ANTI-ICE
CENTER PANEL LIGHTS	RH FIRE DETECT
CLOCK	RH FIREWALL SHUTOFF
EL PANEL LIGHTS	RH THRUST REVERSER
EMERGENCY PRESS	RH TURN AND BANK
ENGINE SYNC	RH PANEL LIGHTS
ENTERTAINMENT CENTER	RH PITOT STATIC
FLT/HR EQUIP COOL	SPEEDBRAKES
LDG GEAR WARNING	TEMP CONTROL
LH IGNITION	WARNING LIGHTS 1
NAV LIGHTS	WING INSPECTION LIGHT
PITCH TRIM	W/S BLEED AIR
RH ALT VIBRATOR	W/S BLEED AIR TEMP

2 LH MAIN BUS EXTENSION

AC INVERTER NO. 1	LH START
ANGLE-OF-ATTACK	LH TURN AND BANK
ANTI COLLISION	LH THRUST REVERSER
CABIN DEFOG FAN	NORM PRESSURIZATION
FLAP CONTROL	NOSEWHEEL RPM
FLAP MOTOR	OUTSIDE AIR TEMPERATURE
GEAR CONTROL	OVERSPEED WARN
LH BOOST PUMP	RH CB PANEL
LH BUS NO. 1,2,3	RH IGNITION
LH ENGINE ANTI-ICE	SKID CONTROL
LH FIRE DETECT	STANDBY GYRO
LH F/W SHUTOFF	SURFACE DE-ICE
LH PANEL LIGHTS	WARNING LIGHTS 2
LH PITOT STATIC	W/S ALCOHOL

LH POWER JUNCTION BOX CIRCUIT BREAKERS

EMER EXIT LIGHT	LH GEN ANN LIGHT	OXYGEN/SEAT BELT CHIMES
INDIRECT LIGHTS	LH GEN POWER RELAY	REFRESHMENT BAR
LH AMMETER	LH LANDING LIGHT	TAIL LIGHT
LH BOOST PUMP	LH START LIGHT	TAIL CONE LIGHT
LH BUS SENSE	LH VOLTMETER	

LH PRESS BLKHD CBs

L WING ANTI-ICE (5)

RH COCKPIT CB PANEL

6 EMERGENCY BUS (28V DC)

COMM 1
DG 2
FLOODLIGHTS
NAV 2

5 LH CROSSOVER BUS

ADF 1	LH ITT
AREA NAV	LH OIL PRESS
AUDIO 1	LH OIL TEMP
AUTOPILOT	LH TURB SPEED
DIRECTIONAL GYRO 1	NAV 1
DME 1	PHONE
FD 1	RADIO ALTIMETER
LH FAN SPEED	RMI 1
LH FUEL FLOW	TRANSPONDER 1
LH FUEL QTY	VLF/NAV

3 RH MAIN BUS EXTENSION

AC INVERTER NO. 2	RH FAN SPEED
AC SWITCH	RH FUEL FLOW
ADF 2	RH FUEL QUANTITY
AUDIO 2	RH ITT
COMM 2	RH OIL PRESSURE
COMM 3	RH OIL TEMPERATURE
DME 2	RH START
FD 2	RH TURBINE SPEED
LH CB PANEL	RMI 2
RADAR	TRANSPONDER 2
RH BUS NO. 1,2,3	

AC BUSES

AC MONITOR	FD 2
ADF 1	HSI 1
ADF 2	RADAR
ADI 1	RMI 1
AIR DATA	RMI 2
AUTOPILOT	V GYRO 1
FD 1	V GYRO 2

RH POWER JUNCTION BOX CIRCUIT BREAKERS

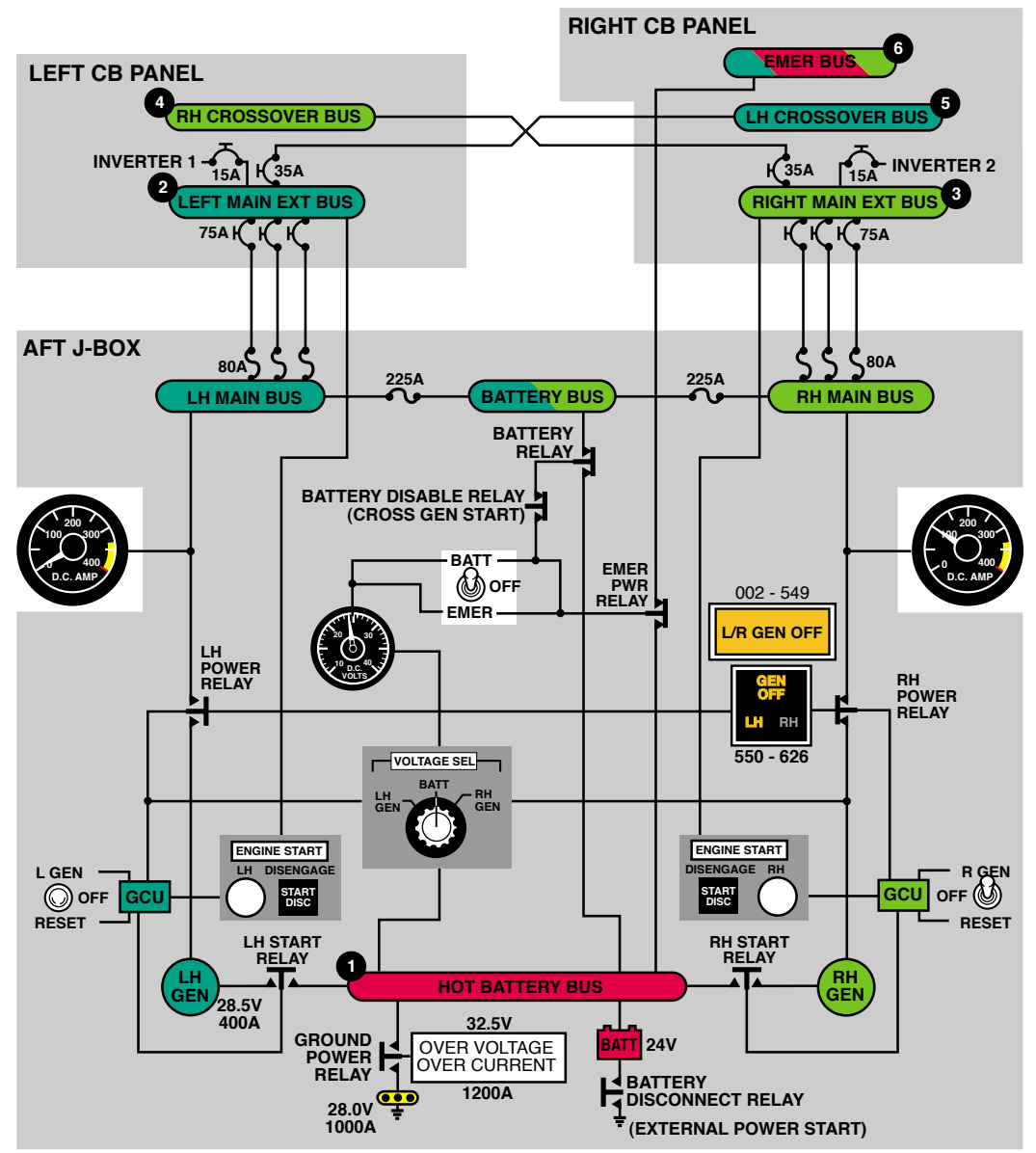
CABIN LIGHTS	RH BOOST PUMP	RH START LIGHT
IGNITION POWER	RH BUS SENSE	RH VOLTMETER
LOCATOR BEACON	RH EMERGENCY BUS	SHAVER/TOILET
RECOG LIGHTS	RH GEN ANN LIGHT	
RH AMMETER	RH GEN POWER RELAY	
RH BATTERY VOLTAGE	RH LANDING LIGHT	

RH PRESS BLKHD CBs

R WING ANTI-ICE (5)

1 HOT BATTERY BUS

BATTERY RELAY
EMERGENCY POWER RELAY
EMERGENCY LIGHTING BATTERY PACK
EMERGENCY LOCATOR BEACON (OPTIONAL)
EXIT LIGHTS
LH/RH NORMAL START IGNITION
NOSE AND TAIL BAGGAGE LIGHTS
TAIL CONE LIGHTS
VOLT METER (BATTERY SWITCH IN BATT OR EMER)



DC Electrical System

Unit 627 and subsequent

LH COCKPIT CB PANEL

4 RH CROSSOVER BUS

- CENTER PANEL LIGHT
- EMERGENCY PRESSURIZATION
- EQUIPMENT COOLING FAN
- FLIGHT HOUR METER
- LH BOOST PUMP
- LH FIRE DETECT
- LH FIREWALL SHUTOFF
- LH IGNITION
- OVERSPEED WARNING
- RH CLOCK
- RH ENGINE ANTI-ICE
- RH ALTIMETER VIBRATOR
- RH PANEL LIGHTS
- RH PITOT STATIC (ANTI-ICING)
- RH THRUST REVERSER
- SURFACE DE-ICE
- WARNING LIGHTS 2
- WINDSHIELD ALCOHOL

2 LH MAIN BUS EXTENSION

- AC INVERTER NO. 1
- ANGLE-OF-ATTACK
- ANGLE-OF-ATTACK HEATER
- ANTI-COLLISION LIGHT
- BATTERY TEMPERATURE
- CABIN DEFOG FAN & CABIN FAN
- CABIN TEMPERATURE CONTROL
- COCKPIT VOICE RECORDER
- EL PANEL LIGHTS
- ENGINE SYNCHRONIZATION
- FLAP CONTROL
- FLAP MOTOR
- FLIGHT RECORDER
- GEAR CONTROL
- LANDING GEAR WARNING
- LH BUS NO. 1,2,3
- LH CLOCK
- LH ENGINE ANTI-ICE
- LH FAN SPEED
- LH FUEL FLOW
- LH FUEL QUANTITY
- LH ITT
- LH OIL PRESSURE
- LH OIL TEMPERATURE
- LH PANEL LIGHTS
- LH PITOT/STATIC (ANTI-ICING)
- LH START
- LH THRUST REVERSER
- NAVIGATION LIGHTS
- NORMAL PRESSURIZATION
- NOSEWHEEL RPM
- OUTSIDE AIR TEMPERATURE
- PITCH TRIM
- RH BOOST PUMP
- RH CB PANEL
- RH FIRE DETECT
- RH FIREWALL SHUTOFF
- RH IGNITION
- ROTATING BEACON
- SKID CONTROL
- SPEEDBRAKE
- STANDBY GYRO HORIZON
- TRUE AIRSPEED HEATER
- WARNING LIGHT 1
- WINDSHIELD BLEED AIR
- WINDSHIELD BLEED AIR TEMP
- WING INSPECTION LIGHT

LH POWER JUNCTION BOX CIRCUIT BREAKERS

- AFT/FWD COMP LIGHT
- BAR
- EMER LIGHT
- ENTERTAINMENT CTR
- INDIRECT LIGHTS
- LH AMMETER
- LH ANNUNCIATOR
- LH BOOST PUMP
- LH BUS SENSE
- LH GENERATOR
- LH LANDING LIGHT
- LH REC LIGHT
- LH START LIGHT
- LH VOLT METER
- OXYGEN/SEAT BELT
- TAIL LIGHT

LH PRESS BLKHD CBs

- L WING ANTI-ICE (5)

1 HOT BATTERY BUS

- BATTERY RELAY
- EMERGENCY POWER RELAY
- EMERGENCY LIGHTING BATTERY PACK
- EMERGENCY LOCATOR BEACON (OPTIONAL)
- EXIT LIGHTS
- LH/RH NORMAL START IGNITION
- NOSE AND TAIL BAGGAGE LIGHTS
- TAIL CONE LIGHTS
- VOLT METER (BATTERY SWITCH IN BATT OR EMER)

RH COCKPIT CB PANEL

6 EMERGENCY BUS (28V DC)

- ADI 2 (SINGLE EFIS)
- AUDIO PANEL 1
- AUDIO PANEL 2
- COMM 1
- DIRECTIONAL GYRO 2
- FLOOD LIGHTS
- NAV 2
- RH COPILOT PITOT/STATIC (682+)

5 LH CROSSOVER BUS

- AC WARN
- ADF 1
- AFIS
- AUTOPILOT
- COMM 3
- DIRECTIONAL GYRO 1
- DME 1
- EADI 1
- EFIS 1
- EFIS 1 CONTROLLER
- EHSI
- FD 1
- FMS
- NAV 1
- RADAR ALTIMETER
- RMI 1
- TRANSPONDER 1
- VLF

3 RH MAIN BUS EXTENSION

- AC INVERTER NO. 2
- ADF 2
- COMM 2
- DME 2
- EFIS 2 (DUAL EFIS)
- EFIS 2 CONT (DUAL EFIS)
- EHSI 2 (DUAL EFIS)
- EADI 2
- FD 2
- LH CB PANEL
- MFD SYM GEN
- MFD DISPLAY
- PHONE
- RADAR
- RH BUS NO. 1,2,3
- RH FAN SPEED
- RH FUEL FLOW
- RH FUEL QUANTITY
- RH ITT
- RH OIL PRESSURE
- RH OIL TEMPERATURE
- RH START
- RH TURBINE SPEED
- RMI 2 (DUAL EFIS)
- TRUE AIRSPEED
- TRANSPONDER 2

AC BUSES

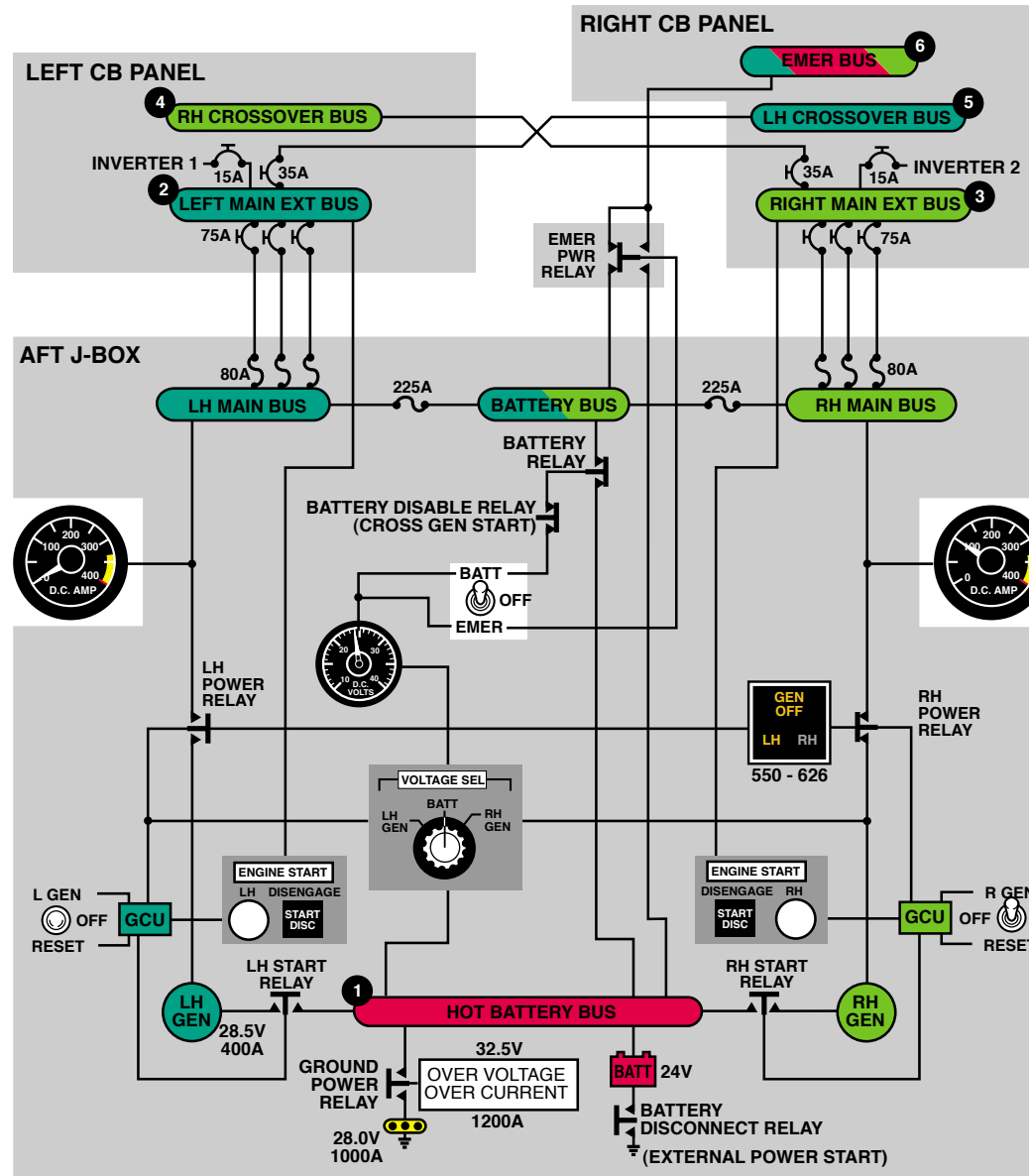
- ADI 1
- ADI 2
- AIR DATA
- AP
- EFIS 1/2
- FD 1
- FD 2
- GPWS
- HSI 1
- HSI 2
- NAV 1
- NAV 2
- RADAR
- RMI/ADF 1
- RMI/ADF 2
- V GYRO 1
- V GYRO 2

RH POWER JUNCTION BOX CIRCUIT BREAKERS

- BATTERY VOLTAGE
- CABIN LIGHTS
- ELT
- EMER POWER
- FLOOD COOLING
- IGNITION POWER
- RH AMMETER
- RH ANNUNCIATOR
- RH BOOST PUMP
- RH BUS SENSE
- RH GENERATOR
- RH LANDING LIGHT
- RH REC LIGHT
- RH START LIGHT
- RH VOLT METER
- RH WING INSP LIGHT
- TOILET/SHAVER

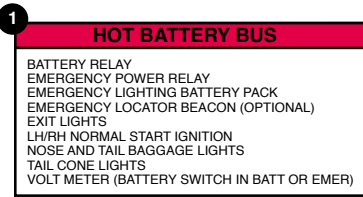
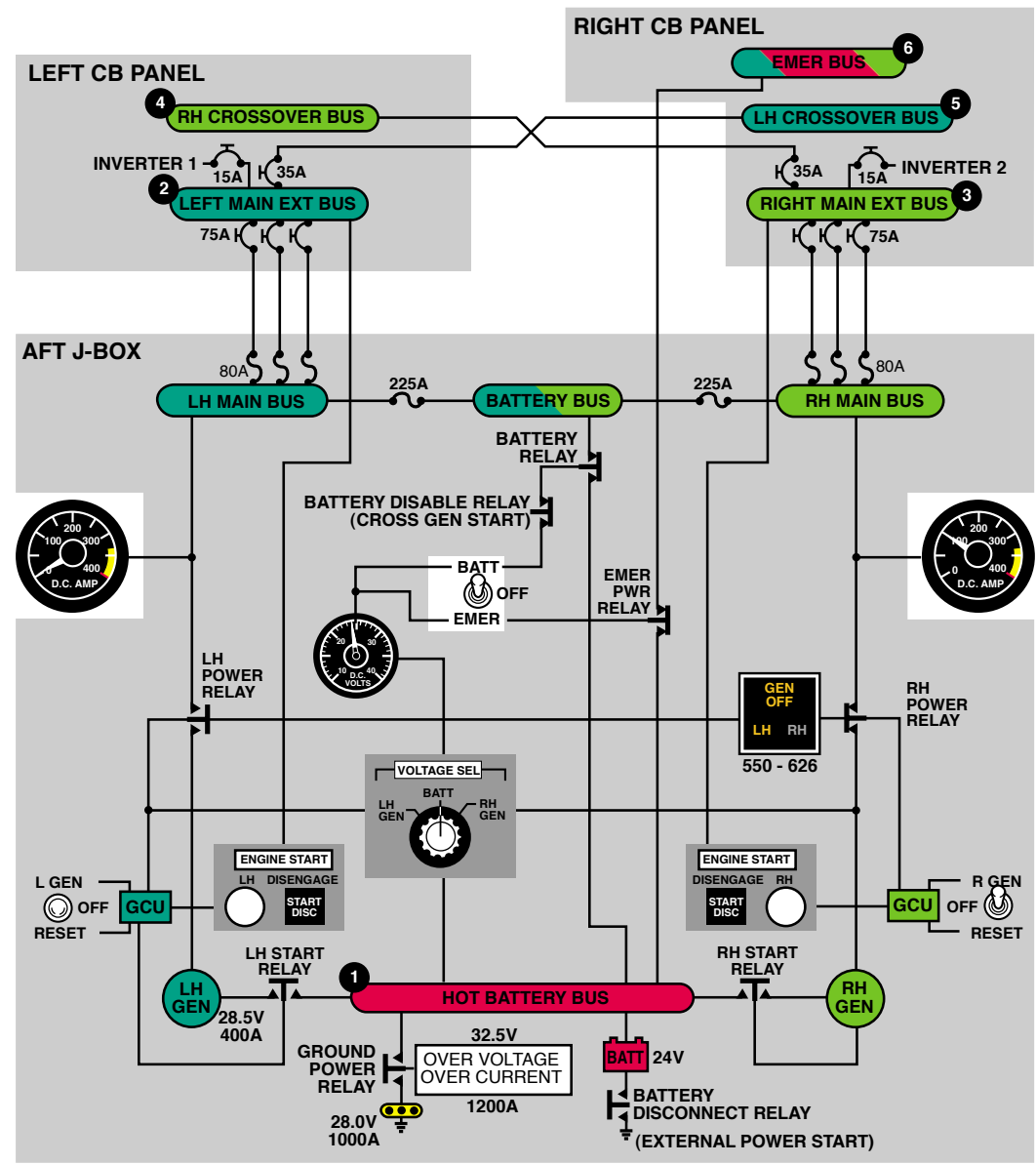
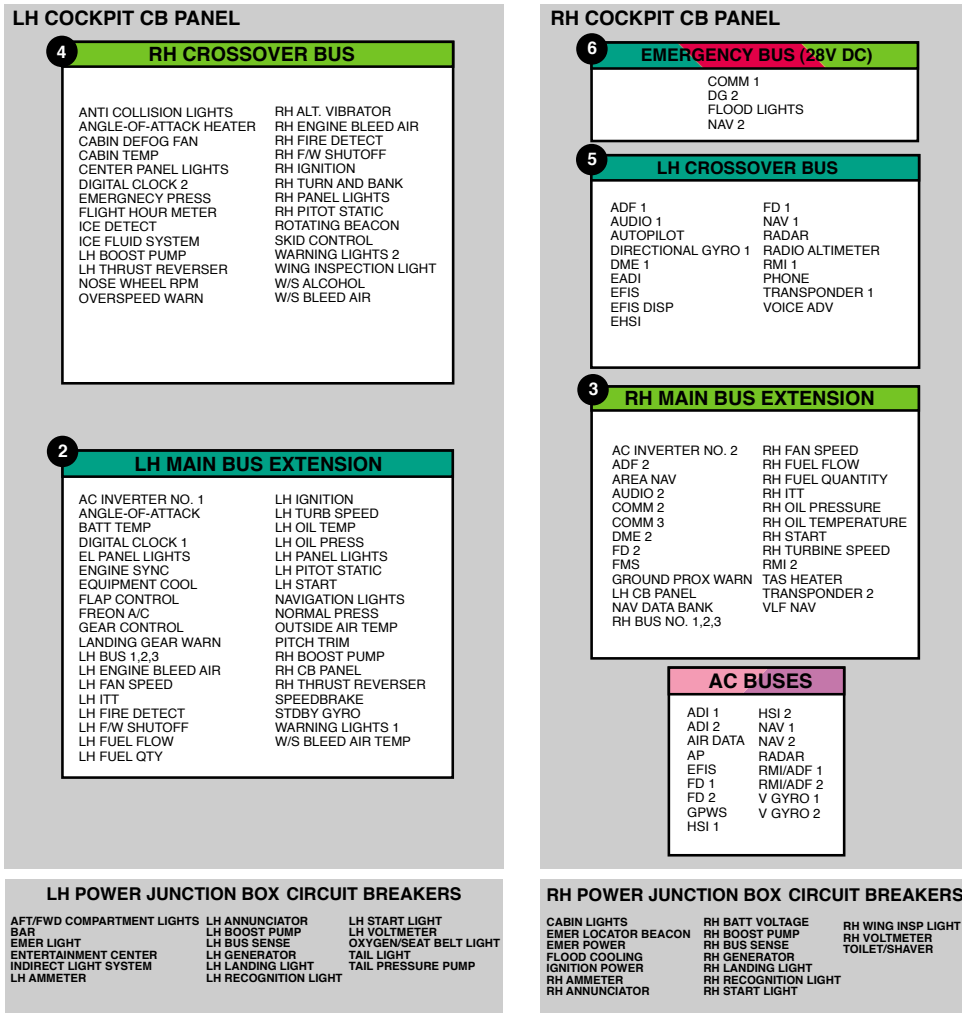
RH PRESS BLKHD CBs

- R WING ANTI-ICE (5)



DC Electrical System

SII



DC System

Aircraft electrical system power sources include:

- one 24V DC nickel-cadmium battery
- two engine-driven generators
- external power system.

Nine buses distribute power from the various DC power sources: Hot Battery, Battery, Emergency, Left and Right Main, Left and Right Main Bus Extension, and Left and Right Crossover.

Battery

Depending on the aircraft, battery capacity varies from a 39 amp-hour (AH) unit in the Citation to a 44AH unit in the late model Citation II.

With the battery switch in BATT, the battery relay closes to supply power from the Hot Battery bus to the Battery bus. From the Battery bus, power flows to the Left and Right Main buses. The Left and Right Main buses, in turn, power their Main Bus Extensions and Crossover buses.

The emergency battery relay also closes to supply Hot Battery bus power to the Emergency bus. Connecting a ground power unit with the switch in BATT allows external power to supply the Hot Battery, Battery, and Main buses (see External Power).

Placing the switch in the OFF position opens the relays; only the Hot Battery bus receives power. On **Citation II units 627 and subsequent**, if a generator is operating, power flows from the generator to the Battery bus and then to the Emergency bus through the emergency power relay.

Selecting the EMER position opens the battery relay and closes the emergency battery relay. Power flows from the Hot Battery bus to the Emergency bus only. The Battery and Main buses are unpowered.

On **Citation units 275 and subsequent, Citation II, and Citation SII**, the battery disconnect relay automatically opens during a ground power unit start to remove the battery from the electrical system and avoid cycling of the battery. The relay closes automatically at the end of the start cycle.

If battery temperature exceeds 145°F (63°C), a temperature sensor in the battery case illuminates the BATT O'HEAT/O'TEMP annunciator steadily; above 160°F (71°C), the annunciator flashes. An optional battery temperature gage provides continuous indication of battery temperature.

Starter/Generators

Two 30V DC, 400A or 300A (SII only) engine-driven starter/generators are the primary source of DC electrical power. During engine starting they function as starters. At the end of the start cycle, the generator control units (GCUs) enable the transition from starter to generator.

Each GCU provides:

- field weakening during engine start
- automatic starter shutoff
- voltage regulation at 28.5V DC
- generator load sharing (paralleling)
- overvoltage and ground fault protection.

With the generator switch in GEN, regulation, protection, and Main bus connection are automatic. When generator output is correct, the power relay closes to connect the generator to its Main bus. The Main buses, in turn, cross-tie through the Battery bus so that if one generator fails, the operating generator continues to power the entire electrical system.

If an overvoltage or feeder fault (short) occurs, the GCU opens the generator field relay to de-energize the generator and the power relay to disconnect the generator from its Main bus. The associated GEN OFF annunciator illuminates. Placing the generator switch in OFF also opens the power relay to disconnect the generator from its Main bus.

Momentarily holding the switch in RESET resets a generator field relay tripped from overvoltage, feeder fault, or when the ENG FIRE switch is pushed. Selecting RESET may also be necessary following a windmilling airstart.

External Power

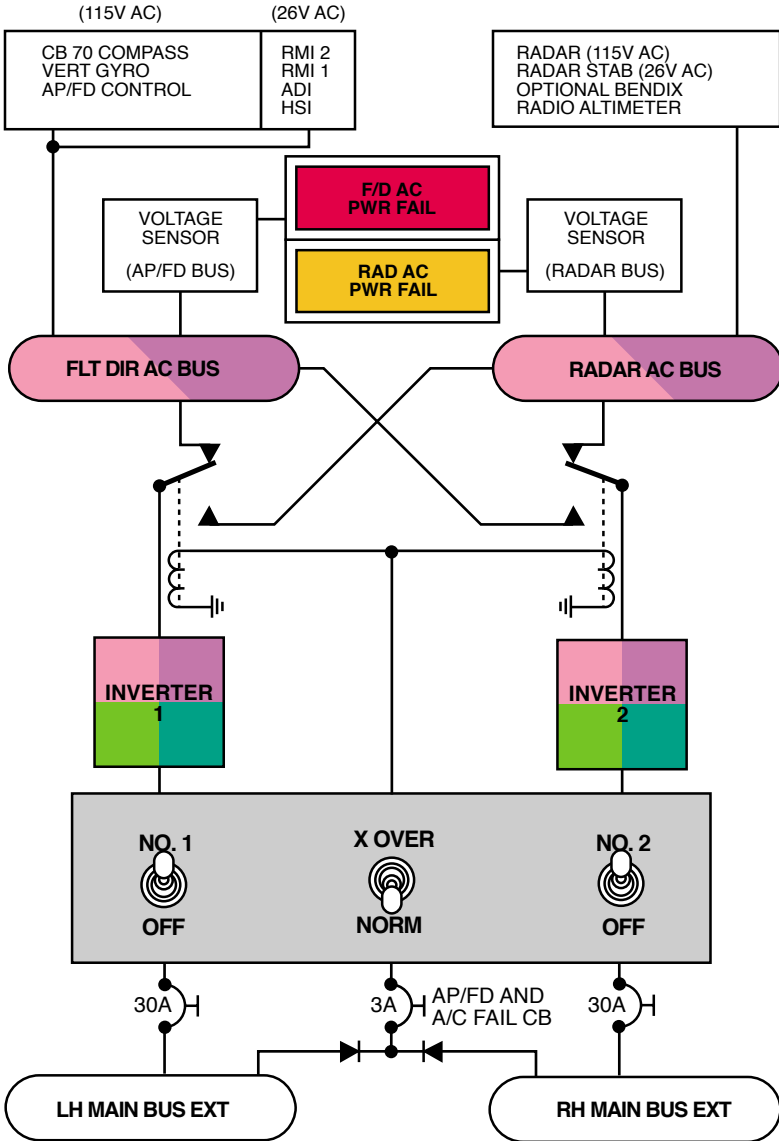
With an appropriately rated GPU connected, external power supplies the Hot Battery bus through the closed external power relay. With the battery switch in BATT, the Hot Battery bus supplies power to the Battery bus and Left and Right Main buses and the rest of the electrical system.

When a generator comes on-line and begins supplying power to the DC buses, the external power relay opens to disconnect external power.

An external power overvoltage/overcurrent sensor (except **Citation units 001 to 274**) protects the aircraft electrical system from overvoltage and overcurrent conditions. If GPU voltage exceeds 32.5V DC or current exceeds 1,200A, the sensor opens the external power disable relays to disconnect external power. Before external power can be reapplied, the overvoltage/overcurrent sensor must be reset by disconnecting the GPU from the aircraft.

AC Electrical System

Citation 001 to 274



AC System

Two static inverters convert 28V DC into 115V AC, 400 Hz three-phase power and 26V AC, 400 Hz, single-phase power for avionic equipment and other equipment requiring AC power. Inverter rating varies from 300VA to 750VA with aircraft model, unit number, and customer preference.

Three distinct AC distribution systems are employed:

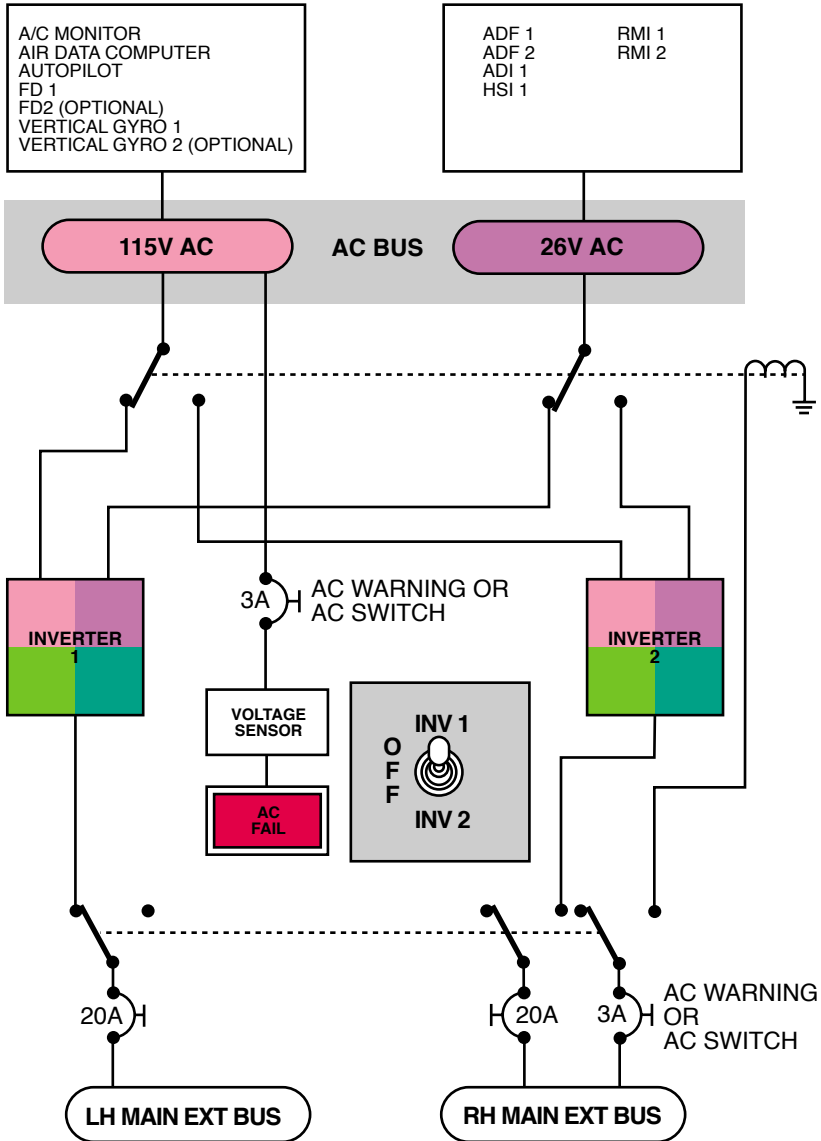
- dual inverters with separate flight director and radar AC buses system (**Citation units 001 to 274 only**)
- dual inverters with 115V and 26V AC buses (single bus system)
- dual inverters with split bus system.

Early Model Citations (Units 001 to 274)

With the inverter crossover switch in the NORM position and the inverter switches on, the No. 1 inverter supplies the flight director AC bus and the No. 2 inverter supplies the radar AC bus. If an inverter fails, placing the crossover switch in X OVER energizes relays to connect the No. 1 inverter to the radar bus and No. 2 inverter to the flight director bus. A voltage sensor for each AC bus illuminates its respective F/D AC PWR FAIL or RAD AC PWR FAIL annunciator when a bus loses power.

AC Electrical System

Single Bus



Single-Bus System

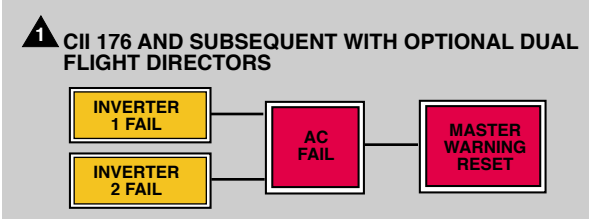
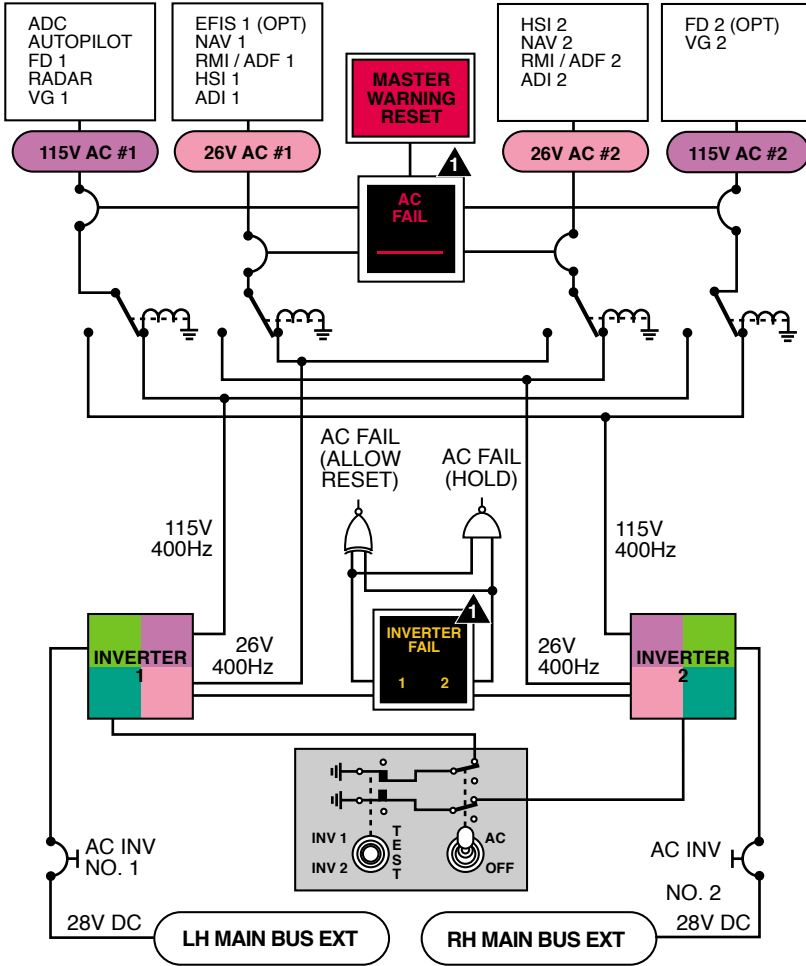
With DC power available, placing the inverter control switch in the INV 1 position turns the No. 1 inverter on. The inverter operates to supply 115V and 26V AC to the AC buses. If the No. 1 inverter fails, the AC FAIL annunciator illuminates and the buses lose power.

Placing the control switch in the INV 2 position turns the No. 2 inverter on and energizes switching relays. The relays close and route No. 2 inverter output to the AC buses. The AC FAIL annunciator extinguishes.

If 115V AC bus voltage is less than $90 \pm 5V$ or exceeds $125 \pm 5V$, the voltage sensor illuminates the AC FAIL annunciator.

AC Electrical System

Split Bus (CII 550 and subsequent; SII)



Split-Bus System

With DC power available and the inverter control switch in the AC position, 28V DC from the DC buses powers the No. 1 and No. 2 inverters. The inverters supply 115V and 26V AC to their respective buses.

If an inverter fails, its switching relays relax to connect the operating inverter to the failed inverter's buses. The associated INV FAIL annunciator illuminates. The AC FAIL annunciator also illuminates and triggers the MASTER WARNING lights. Resetting the MASTER WARNING lights extinguishes the AC FAIL annunciator.

The inverter test switch allows preflight testing of the inverter switching system. Placing the switch in the INV 1 or INV 2 position simulates an inverter failure by cutting its DC input. The inverter loses power, the INV FAIL and AC FAIL annunciators illuminate, the Master Warning lights flash, and the affected inverter's switching relays relax to connect the operating inverter output to the failed inverter's buses.

Electrical System

Power Source	Battery – 24V DC, 39 to 44AH (2) Starter/generators 30V DC (28.5V regulated) 400A max load (Citation I/II) 300A max load (Citation SII) GPU (28V DC, 800 to 1000A) (2) Inverters – 115V AC, 400 Hz and 26V AC, 400 Hz (inverter rating varies with A/C)
Distribution	DC Distribution Hot Battery bus Battery bus Emergency bus LH/RH Main DC buses LH/RH Main Bus Extensions LH/RH Crossover buses AC Distribution Citation 001 to 274 Flight Director and Radar AC buses Single bus systems 115V AC and 26V AC buses Split bus systems No. 1 115V AC and 26V AC buses No. 2 115V AC and 26V AC buses

Electrical System (cont.)

<p>Control</p>	<p>DC system BATT switch L/R GEN switches AC system Citation 001 to 274 No. 1/No. 2 inverter switches X OVER/NORM switch Single bus system INV 1/OFF/INV 2 switch Split bus system Avionic Power AC/OFF switch DC PWR to inverters INV 1/TEST/INV 2 switch</p>
<p>Monitor</p>	<p>Annunciators L/R GEN OFF BATT O'HEAT/BATT O'TEMP AC FAIL F/D AC PWR FAIL & RAD AC PWR FAIL INVERTER 1/2 FAIL Ammeters Voltmeter Battery temperature gage (if installed) Master warning</p>
<p>Protection</p>	<p>Circuit breakers Current limiters Generator control units (CGUs) External power overvoltage/ overcurrent sensor</p>

