

WARNING AND TEST ANNUNCIATOR PANEL

The annunciator panel is designed to provide the pilot with an easily interpreted display of both normal and abnormal system conditions, as well as a few annunciations which indicate normal system operation but, it is felt, require notification or a "reminder" to the pilot of operation of these systems. The seven "reminder" white lights will remain on until the input causing illumination has been cleared. Two red flashing MASTER WARNING RESET lights and two amber MASTER CAUTION RESET lights are used in conjunction with the panel to ensure rapid recognition of any red or amber annunciator lights. In addition, the master warning light will flash if both amber GEN OFF lights should illuminate. The annunciator panel lights are composed of liquid crystal (LCD) shutters and light emitting diodes (LEDs) and do not have replaceable bulbs.

All system light panels can be tested by placing the rotary TEST selector on the left instrument panel to the ANNU position. This will sequentially illuminate all lights and cause the master warning lights and master caution lights to flash. The warning lights are not resettable during test mode. The annunciator panel, the master warning and the master caution lights are all step dimmed by the NIGHT DIM (day/night) switch.

Master Warning Light

Illumination of a red annunciator panel annunciator will initially be in a flashing mode, and the master warning light will also flash. The red master warning light will remain flashing until reset, independent of the warning fault light operation, until acknowledged by being reset, at which time it will extinguish and the annunciator panel light will assume a steady illumination. If the fault clears, the fault light will extinguish. The master warning will flash when any master warning annunciation is interrupted and re-illuminated or a new (additional) master warning fault is detected.

The annunciator panel is powered from the main direct current (DC) busses through the WARN LTS 1 and 2 circuit breakers on the left cockpit circuit breaker panel. If power from either the WARN LTS 1 or WARN LTS 2 circuit breaker is lost while the opposite circuit is powered, the master warning light will illuminate in a steady mode and will not be resettable. In this mode if a new master warning annunciation occurs the master warning light will flash.

The master warning light can be reset by pressing either master warning light. Resetting the master warning rearms the respective system so that it will function should another failure occur.

Master Caution Light

The amber MASTER CAUTION RESET light will illuminate when an amber annunciator panel light illuminates. The amber annunciator panel lights illuminate in a flashing mode until the master caution is reset. The master caution light will illuminate again when any master caution annunciation is interrupted and re-illuminated, or a new master caution fault occurs when an annunciator was already illuminated. Resetting the master caution light is accomplished by pressing either light.

VERBAL OR TONE AUDIO WARNING SYSTEM

Airplane may be equipped with either a voice (verbal) or a tone audio warning system. If an optional verbal system is installed an attention tone will sound upon the illumination of a red annunciator panel light and illumination of the master warning light. Voice annunciations which are accompanied by illumination of a red annunciator panel light or engine fire lights, or dual generator failure (two amber lights), are preceded by an attention (beep-beep) tone. Airplanes which are not equipped with a voice system do not have the tone associated with annunciator panel lights.

On airplanes equipped with the voice system, those warnings which cause illumination of a red annunciator (BATT O'TEMP, CAB ALT 10000 FT, OIL PRESS WARN, LH or RH) will also simultaneously illuminate the MASTER WARNING. The failure of two generators (two amber annunciators) will also illuminate the MASTER WARNING. The attention tone will sound followed by the respective voice annunciation, i.e., "BATTERY OVERTEMP", "RIGHT (LEFT) ENGINE OIL PRESSURE", and "GENERATOR FAILURE", etc., which will be repeated continuously, separated by approximately two-second pauses, as long as the situation causing the annunciation exists, or until the MASTER WARNING is pressed. In the case of the dual generator failure, the visual annunciation is acknowledged by pressing the MASTER CAUTION light and the voice annunciation, which is caused by illumination of the second GEN OFF annunciator, is acknowledged by pressing the MASTER WARNING light.

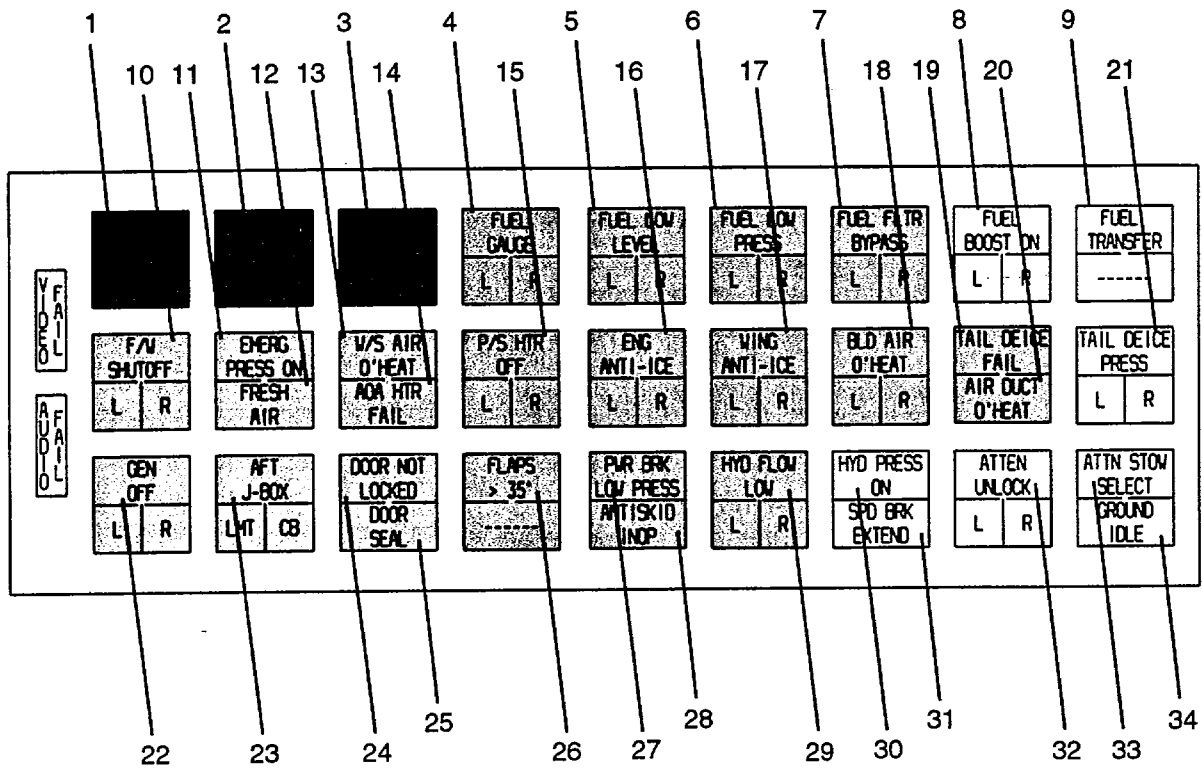
In the voice system, the voice annunciations "LEFT ENGINE FIRE" and "RIGHT ENGINE FIRE" have a counterpart visual annunciation in the respective fire warning lights located on either side of the annunciator panel. In the tone system there is no tone or any aural warning for an engine fire indication; only the engine fire lights. These vocal annunciations are preceded by an attention tone and are repeated only three times, with a delay interval of two seconds between announcements. In test mode there will be no repetition.

Overspeed annunciations have no visual counterpart warnings. The voice or tone warnings are continuous while the airspeed is above $V_{MO/MMO}$ on the copilot's airspeed indicator. There is no visual or other annunciation of an overspeed condition than the overspeed tone or voice warning and the red line on the airspeed indicator. When the airplane descends below the minimum altitude set on the radio altimeter (DCP selector only), the voice system will enunciate "MINIMUMS, MINIMUMS" and the tone system will provide a decision height (DH) tone. At the set decision height when "MINIMUMS, MINIMUMS" or the DH tone is heard, a white box will have appeared in the PFD at minimums +100 feet; at "MINIMUMS, MINIMUMS" (or DH tone); the amber letters MIN will also appear in the box. There is no attention tone with the verbal annunciation.

If the voice system is installed "ALTITUDE" will be heard 1000 feet prior to reaching a selected altitude which has been set in the upper right side of the electronic attitude director indicator (EADI) by the remote instrument controller on the pedestal, and will be heard again if the airplane deviates over 300 feet from that altitude. The amber ALT light on the copilot's altimeter will illuminate at the same time the voice warning is heard. If the tone system is installed, an altitude warning tone will be heard at the above times in place of the voice annunciation. AUTOPILOT DISCONNECT (voice system) or an autopilot disconnect tone (tone system) will be heard if the autopilot is disconnected by the autopilot trim/disconnect switch (AP TRIM DISC) or by system malfunction. The AP OFF light will illuminate for one second accompanying the AUTOPILOT DISCONNECT announcement or tone signal (tone system), or will remain illuminated, depending upon the cause of the disconnect.

A gear warning tone (tone system) or a voice system "LANDING GEAR" will be sounded and repeated at two-second intervals if the gear is not down and locked and a throttle is reduced to below 85% N_2 RPM when the copilot's airspeed indication is below 130 KIAS. Either warning can be silenced by the "HORN SILENCE" switch on the landing gear control panel if the flaps are at or above 15°. If the flaps are below 15° the warning cannot be silenced by the switch. An annunciator panel assembly, located on the rear of the annunciator panel box, selects either TONE or VOICE function.

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TYPICAL ANNUNCIATOR PANEL

1. **BATT O'TEMP >160°** The red battery overtemperature light will flash at temperatures over 145°F; both sections will flash at temperatures over 160°F. Light illumination also triggers the master warning system which will cause the MASTER WARNING to flash. Transition to illumination of >160° will also cause the MASTER WARNING to flash if it has been reset. If a voice system is installed, at 145°F an alert tone will sound followed by "BATTERY OVERTEMP," repeated until reset, and repeated again at 160°F.
2. **CABIN ALT** The red cabin altitude light advises that the cabin pressure altitude is above 10,000 feet. Illumination of the light also triggers the master warning system which will flash the MASTER WARNING. If the voice system is installed, the alert tone will sound followed by a "CABIN PRESSURE," voice warning which will repeat until reset.
3. **OIL PRESS WARN L R** The red oil pressure warning light advises that the oil pressure is below safe limits. The MASTER WARNING will flash, accompanied by a voice warning "left engine oil pressure" or "right engine oil pressure."
4. **FUEL GAUGE L R** The amber fuel gauge annunciator advises that the fuel gauging system has detected a gauging error. The MASTER CAUTION will illuminate.

Figure 2-27 Annunciator Panel and System Annunciators (Sheet 1 of 5)

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| 5. | FUEL
LOW LEVEL
L R | The amber fuel low level light advises that the fuel quantity in left and/or right tanks has reached a level below 185±15 pounds. MASTER CAUTION will illuminate but there is a four-second delay in illumination of it, as well as the annunciator, in order to avoid nuisance illuminations in flight in rough air and when taxiing over rough areas. |
| 6. | FUEL LOW
PRESS
L R | The amber fuel low pressure light advises that the fuel pressure is below normal limits in left and/or right systems. The MASTER CAUTION will illuminate. |
| 7. | FUEL FLTR
BYPASS
L R | The amber fuel filter bypass light advises that bypass of the left and/or right fuel filter is impending. The MASTER CAUTION will illuminate. |
| 8. | FUEL
BOOST ON
L R | The white fuel boost ON light advises that electric power has been applied to the left and/or right fuel boost pump. The MASTER CAUTION will illuminate. |
| 9. | FUEL
TRANSFER | The white fuel transfer annunciator indicates that the fuel transfer valve is in the transfer position. |
| 10. | F/W
SHUTOFF
L R | The amber firewall shutoff light advises that the left and/or right fuel and hydraulic shutoff valves are closed. The MASTER CAUTION will illuminate. |
| 11. | EMERG
PRESS ON | The amber emergency pressurization on annunciator indicates that the emergency position on the bleed air control has been selected. The MASTER CAUTION will illuminate. |
| 12. | FRESH
AIR | The amber fresh air annunciator indicates that the fresh air position on the bleed air control has been selected. The MASTER CAUTION will illuminate. |
| 13. | W/S AIR
O'HEAT | The amber windshield air overheat light advises that the windshield bleed air system temperature is above normal limits, or the system pressure is above 5 PSI, if the system is off, indicating a valve leak. The MASTER CAUTION will illuminate. |
| 14. | AOA HTR
FAIL | The amber angle-of-attack heater OFF light advises that the angle-of-attack computer has sensed a failure of the angle-of-attack vane heater, or the pitot static heat switch has been turned off. The MASTER CAUTION will illuminate. |
| 15. | P/S HTR
OFF
L R | The amber pitot/static heater OFF light advises that the left and/or right pitot or static heaters are not operating or have been turned off. The MASTER CAUTION will illuminate. |
| 16. | ENG
ANTI-ICE
L R | The amber engine anti-ice light advises that the left and/or right engine anti-ice has been turned on and the engine inlet duct temperature is below 220° F or the engine RPM has been reduced below 70% N ₂ for one minute or more. There is a 50-second delay after the annunciator illuminates before the MASTER CAUTION will illuminate. |

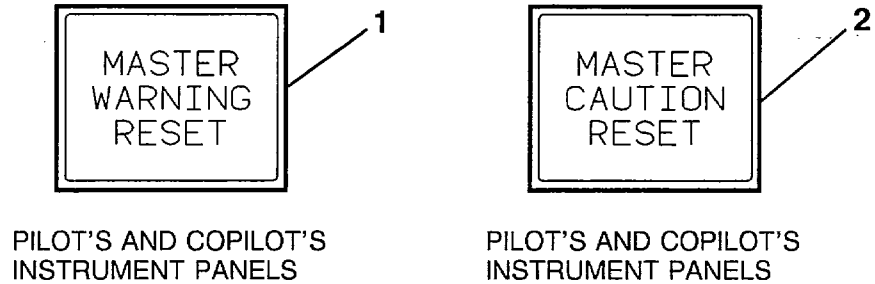
Figure 2-27. Annunciator Panel and System Annunciators (Sheet 2 of 5)

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| 17. | WING
ANTI-ICE
L R | The amber wing anti-ice light indicates that the left and/or right wing anti-ice has been turned on and that the temperature in the wing anti-ice duct is below 230°F, or that a wing overheat condition exists, or the engine RPM has been reduced below 70% N ₂ for one minute or more.. There is a 50-second delay after the annunciator illuminates before the MASTER CAUTION will illuminate. |
| 18. | BLD AIR
O'HEAT
L R | The amber bleed air overheat light indicates that the left or right bleed air supply out of the precooler is above normal temperature. The MASTER CAUTION will illuminate. |
| 19. | TAIL
DEICE FAIL
L R | The amber light flashes and the master caution illuminates steady if, after the system is selected on, the respective tail deice valve has a loss of voltage and/or the respective tail deice system has a loss of pressure during the 6-second on cycle time. Pressing the master caution will cause the flashing annunciator to change to steady on and the master caution to extinguish. |
| 20. | AIR DUCT
O'HEAT | The amber air duct overheat light advises that the ventilation duct temperature exceeds the 300°F thermal limit. The MASTER CAUTION will illuminate. |
| 21. | TAIL DEICE
PRESS
L R | The white tail deice fail light illuminates twice during the 18-second surface deice boot cycle, to indicate proper boot inflation pressure. |
| 22. | GEN
OFF
L R | The amber generator OFF light advises that left and/or right generator is not connected to the airplane bus. Illumination of both left and right lights will flash the MASTER WARNING as well as both GEN OFF lights. For a single generator failure the MASTER CAUTION will illuminate, accompanied by the voice warning "generator failure." |
| 23. | AFT
J-BOX
LMT CB | The amber aft J-box annunciator indicates that the crossfeed limiters or the start circuit breakers are open. The MASTER CAUTION will illuminate. |
| 24. | DOOR NOT
LOCKED | The amber door-not-locked light advises that the cabin door is not locked, or either of the forward baggage doors or the tailcone door are not key locked. The MASTER CAUTION will illuminate. |
| 25. | DOOR
SEAL | The amber annunciator indicates that the cabin door seal pressure has fallen below 5.5 PSI above cabin pressure. The MASTER CAUTION will illuminate. |
| 26. | FLAPS
> 35° | The annunciator and MASTER CAUTION will illuminate in flight or on the ground when either throttle is advanced past 85% N ₂ and the flaps are set beyond 35°. The annunciator will not illuminate on the ground if the throttle is set below 85% N ₂ and the flaps are beyond 35°. In flight, there is an eight second delay in illumination of the annunciator and the MASTER CAUTION in order to eliminate nuisance illuminations. |
| 27. | PWR BRK
LOW PRESS | The amber power brake low pressure light advises that the power brake hydraulic pressure is below normal. Indication is disabled when gear is retracted and for 7 to 9 seconds after selecting gear extension. The MASTER CAUTION will illuminate. |

Figure 2-27. Annunciator Panel and System Annunciators (Sheet 3 of 5)

- 28. ANTISKID INOP The amber antiskid inoperative light advises that antiskid braking capability is unavailable. The MASTER CAUTION will illuminate.
- 29. HYD FLOW LOW L R The amber hydraulic flow low annunciator indicates that hydraulic flow into the hydraulic manifold is below normal. A flow switch illuminates the respective annunciator at a decreasing flow rate of from 0.35 to 0.55 gallons per minute. The MASTER CAUTION will illuminate.
- 30. HYD PRESS ON The white hydraulic pressure ON light advises that the hydraulic system is pressurized.
- 31. SPD BRK EXTEND The white speed brake extend light advises that the left and right speed brakes are fully extended.
- 32. ATTEN UNLOCK L R The white attenuator unlock annunciator indicates that the left and/or right thrust attenuator is not stowed. In flight the MASTER CAUTION will illuminate after a one-second delay.
- 33. ATTN STOW SELECT The white annunciator indicates that the stow position has been selected on the thrust attenuator (STOW/AUTO/TEST) switch aft of the throttle quadrant. If selected in flight with flaps greater than 15°, or on the ground with power greater than 85%, it will trigger the MASTER CAUTION. The thrust attenuators will not operate.

Figure 2-27. Annunciator Panel and System Annunciators (Sheet 4 of 5)



CENTER INSTRUMENT PANEL

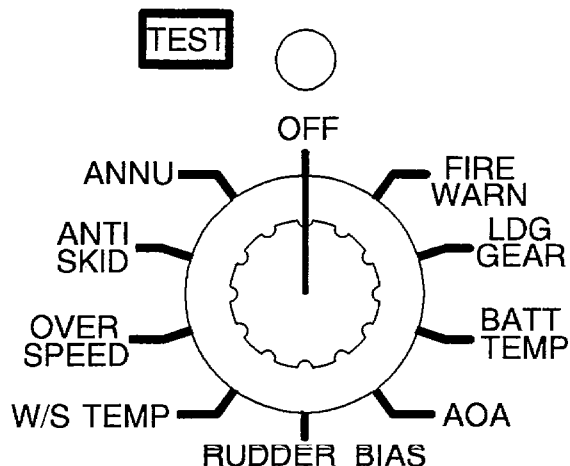
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1. **MASTER WARNING RESET** The red MASTER WARNING illuminates in a flashing mode with red annunciator panel lights and LH and RH GEN OFF (dual failure) amber annunciator panel lights. Refer to Master Warning Light under WARNING AND TEST, above, for light functions
2. **MASTER CAUTION RESET** The amber MASTER CAUTION light illuminates with amber annunciator panel lights and some separate amber annunciator lights. Refer to Master Caution Light under WARNING AND TEST, above, for light functions.

Figure 2-27. Annunciator Panel and System Annunciators (Sheet 5 of 5)

TEST SYSTEM

The test selector is located in the upper left corner of the pilot's switch panel and offers several positions of test. It will function only when the battery switch is in BATT. A red light above the test selector switch illuminates whenever the test selector switch is in any position but OFF.



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- OFF The red light will be off and the test system inoperative.
- FIRE WARN The engine fire lights on the fire tray will illuminate. The attention tone and voice annunciation "LEFT ENGINE FIRE/RIGHT ENGINE FIRE" will be heard (voice system only). Avionics power must be on or a headset must be worn to hear the audio warnings.
- LDG GEAR The three green safe lights and the red unlocked light on the landing gear control panel will illuminate, and the landing gear warning tone or the voice annunciation "LANDING GEAR" (voice system) will be heard. The voice announcement or tone may be silenced by pressing the horn silence button on landing gear panel if flap position is 15° or less. Avionics power must be on or a headset must be worn to hear the audio warnings.
- BATT TEMP The BATT O'TEMP and > 160° lights will flash showing circuit integrity. The MASTER WARNING light will illuminate. In the voice system the voice annunciation "BATTERY OVER TEMP" will be heard. Avionics power must be on or a headset must be worn to hear the audio warnings.
- AOA The stick shaker will operate. The angle-of-attack meter needle will go past the red area. The indexer red chevron light (optional) will flash on and off. Avionics power must be ON. The LAA on the PFD will not test.
- W/S TEMP The W/S AIR O'HEAT light will illuminate if LOW or HI is selected on the windshield bleed air switch. Both should be tested. The MASTER CAUTION light will illuminate after 4 seconds with the annunciator on.
- OVERSPEED The overspeed audio warning tone will sound. Avionics power must be on or a headset must be worn to hear the audio warnings.

Figure 2-28. Test Selector Switch (Sheet 1 of 2)

ANTISKID Initiates a self-test in the antiskid system. The ANTISKID INOP ANNUNCIATOR will illuminate and remain on for five seconds after the TEST switch is moved to OFF and will then extinguish if the system checks operational. If the system does not check operational, the light will remain illuminated. The MASTER CAUTION light will also illuminate when the ANTISKID annunciator illuminates.

ANNU While the ANNU position is selected, if a voice system is installed a voice annunciation "TEST" will be heard, if the avionics power is on or a headset is worn. All the annunciator panel lights will illuminate sequentially from top to bottom and the MASTER CAUTION and MASTER WARNING lights will illuminate. The MASTER CAUTION and MASTER WARNING cannot be reset when the TEST selector is in the ANNU position. The fan speed and turbine speed indicators will self-test. When the avionic power switch is ON, the autopilot/flight director mode selector panel lights, the KLN 900 APPROACH/MSG/WPT lights, and the EFIS lights will illuminate. The optional angle-of-attack indexer lights will illuminate in a steady mode. After removing the test switch from ANNU if all tests are successfully completed, if a voice system is installed, the voice announcement "READY" will be heard.

Figure 2-28. Test Selector Switch (Sheet 2 of 2)

Each time the system is powered up it will conduct the same self test as that induced by selection of ANNU on the TEST switch, except that it will not test the lighting of the annunciator legends and the TEST voice (voice system) will not be heard. Failure of the audio annunciator test in both types of system will be indicated by illumination of the AUDIO FAIL annunciator on the left side of the annunciator panel.

Failure of the visual annunciator test will be indicated by illumination of the VIDEO FAIL annunciator on the left side of the annunciator panel, and the MASTER WARNING and MASTER CAUTION lights will remain illuminated on steady. Pressing either of the master warning reset switches for 2 to 3 seconds will cause the annunciator to leave the test mode and resume operation until cause of the test failure can be determined.