ANVS TROUBLESHOOTING

QUICK REFERENCE CARDS

THE DATA CONTAINED HEREIN IS INTENDED TO ASSIST TROUBLESHOOTING AND MAINTENANCE ONLY AND IS NOT A SUBSTITUTE FOR FORMAL "RETURN TO SERVICE" TESTING IN ACCORDANCE WITH PROPER BOMBARDIER AND/OR OPERATOR'S AIRCRAFT MAINTENANCE MANUALS AND/OR PROCEDURES. FOLLOWING IMPLEMENTATION OF APPROVED FAULT CORRECTING MAINTENANCE, THE AIRCRAFT'S "RETURN TO SERVICE" TESTING SHALL BE ACCOMPLISHED IN FULL ACCORDANCE WITH THE PROPER MANUALS AND PROCEDURES.

UltraQuiet cabin

INNOVATION THROUGH EXPERIENCE

Ultra ELECTRONICS

Issue 2 – Aug 2017

INNOVATION THROUGH EXPERIENCE

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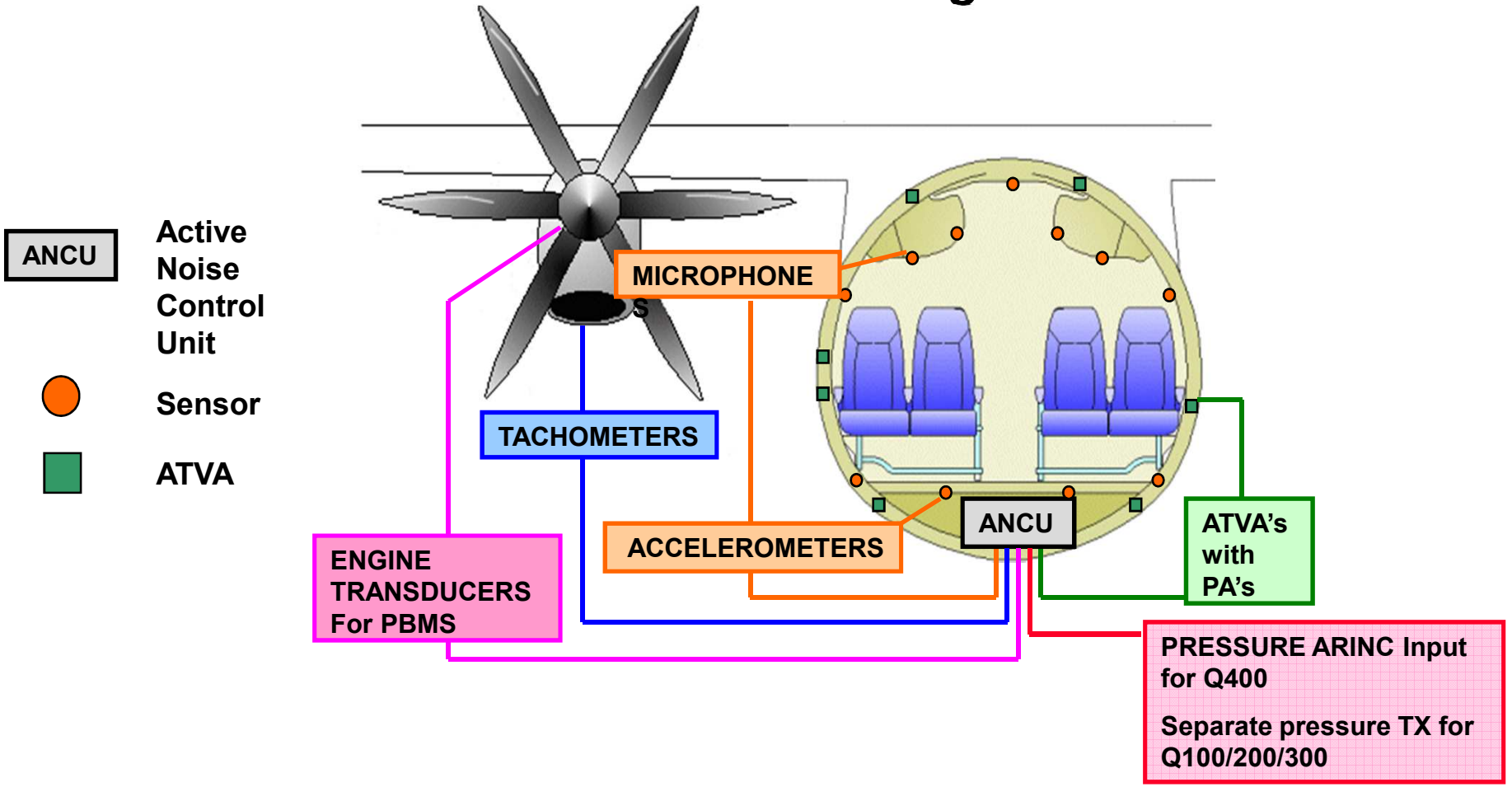
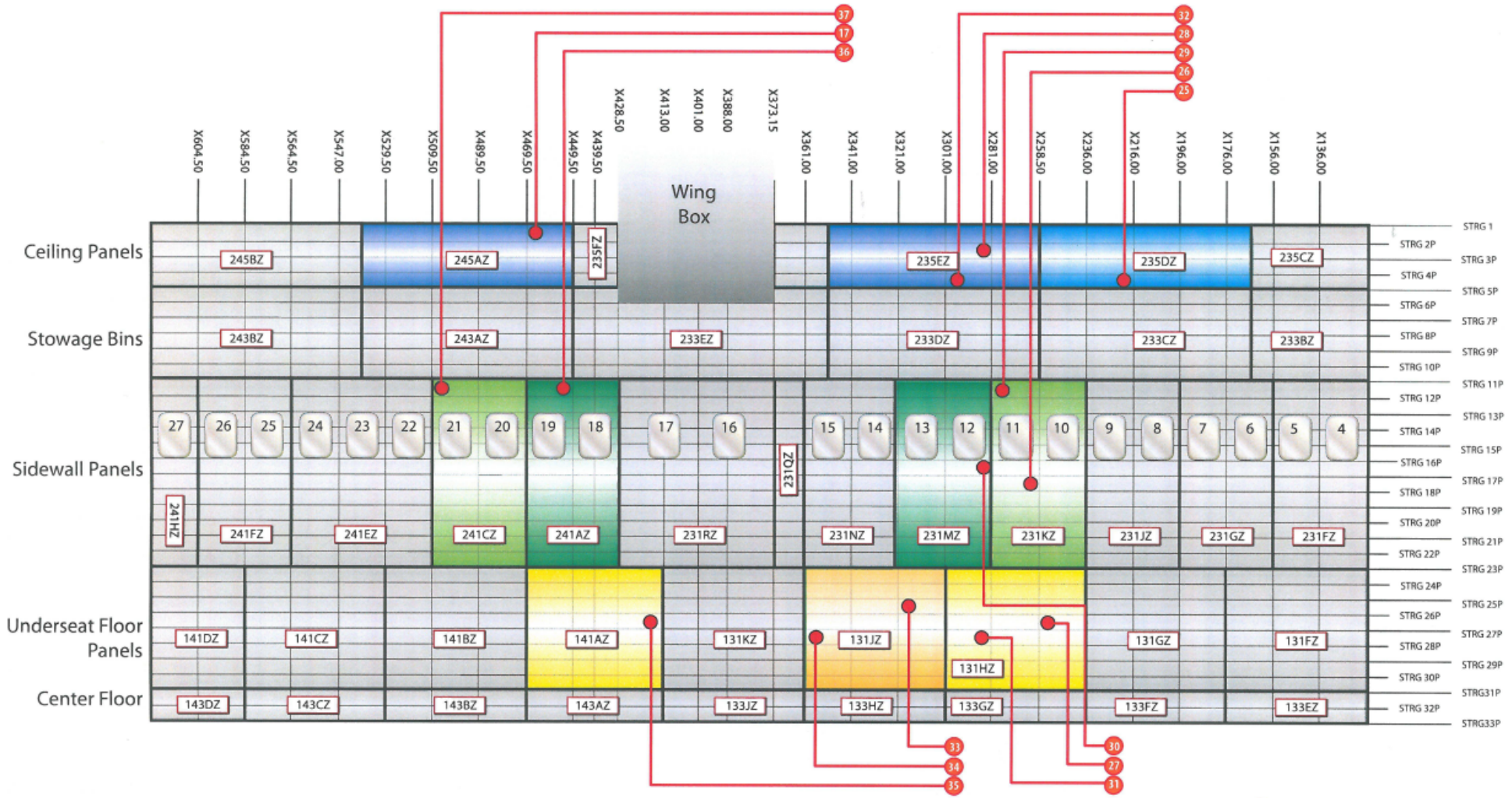


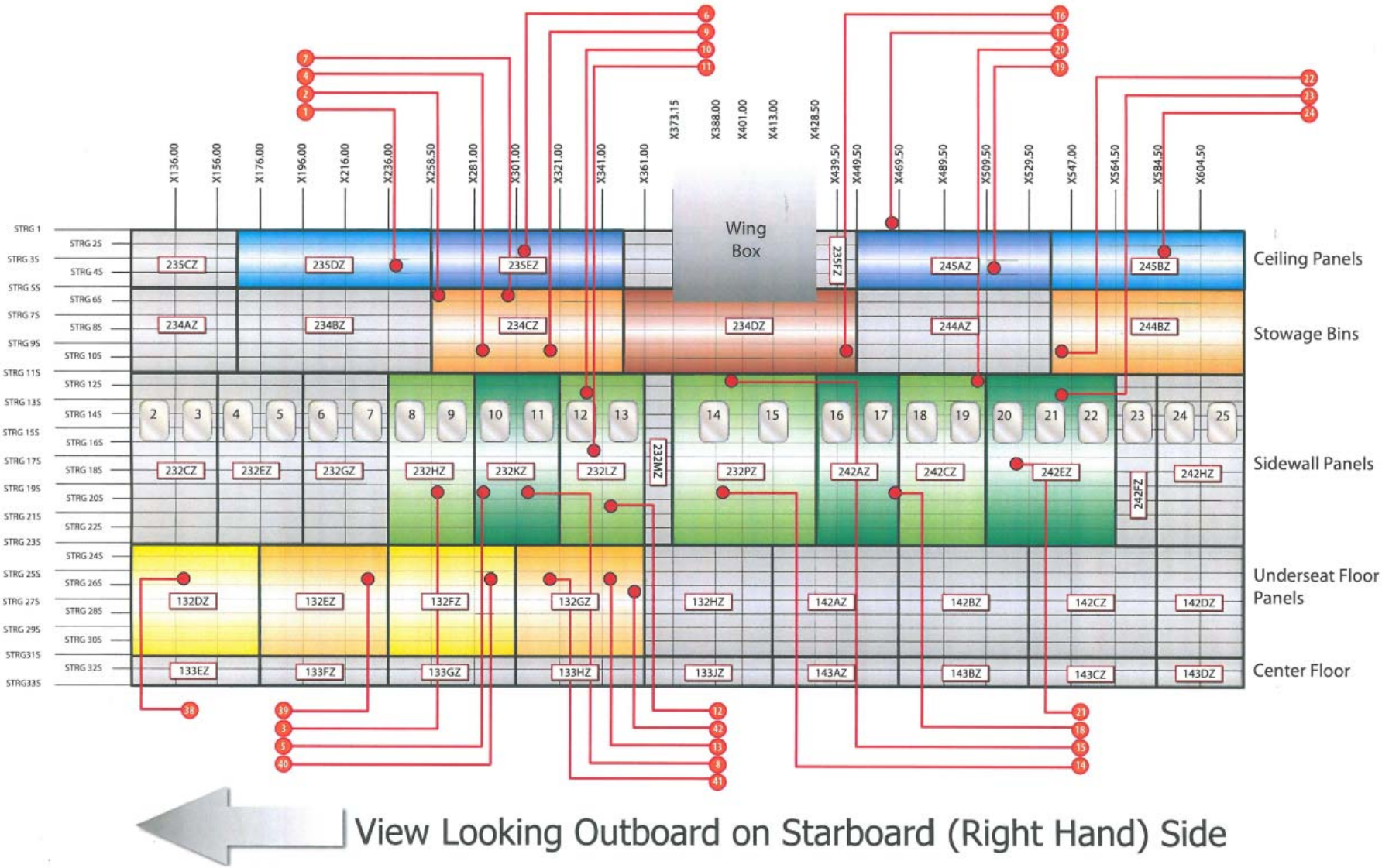
NVS SYSTEM - COMPONENTS

Active System Components

AIRCRAFT	DASH - 8 Q100	DASH - 8 Q200	DASH - 8 Q300	DASH - 8 Q400
CONTROLLER (ANCU)	1	1	1	1
SENSORS				
- MICROPHONES	72	72	72	80
- ACCELEROMETERS	N/A	N/A	N/A	4
ACTUATORS	36	36	40	42
POWER AMPLIFIERS	One per actuator	One per actuator	One per actuator	One per actuator
PRESSURE TRANSDUCER	1	1	1	N/A
POWER DISTRIBUTION BOX	1	1	1	1
PBMS ENGINE TRANSDUCER	Option	Option	Option	2



View Looking Outboard on Port (Left Hand) Side



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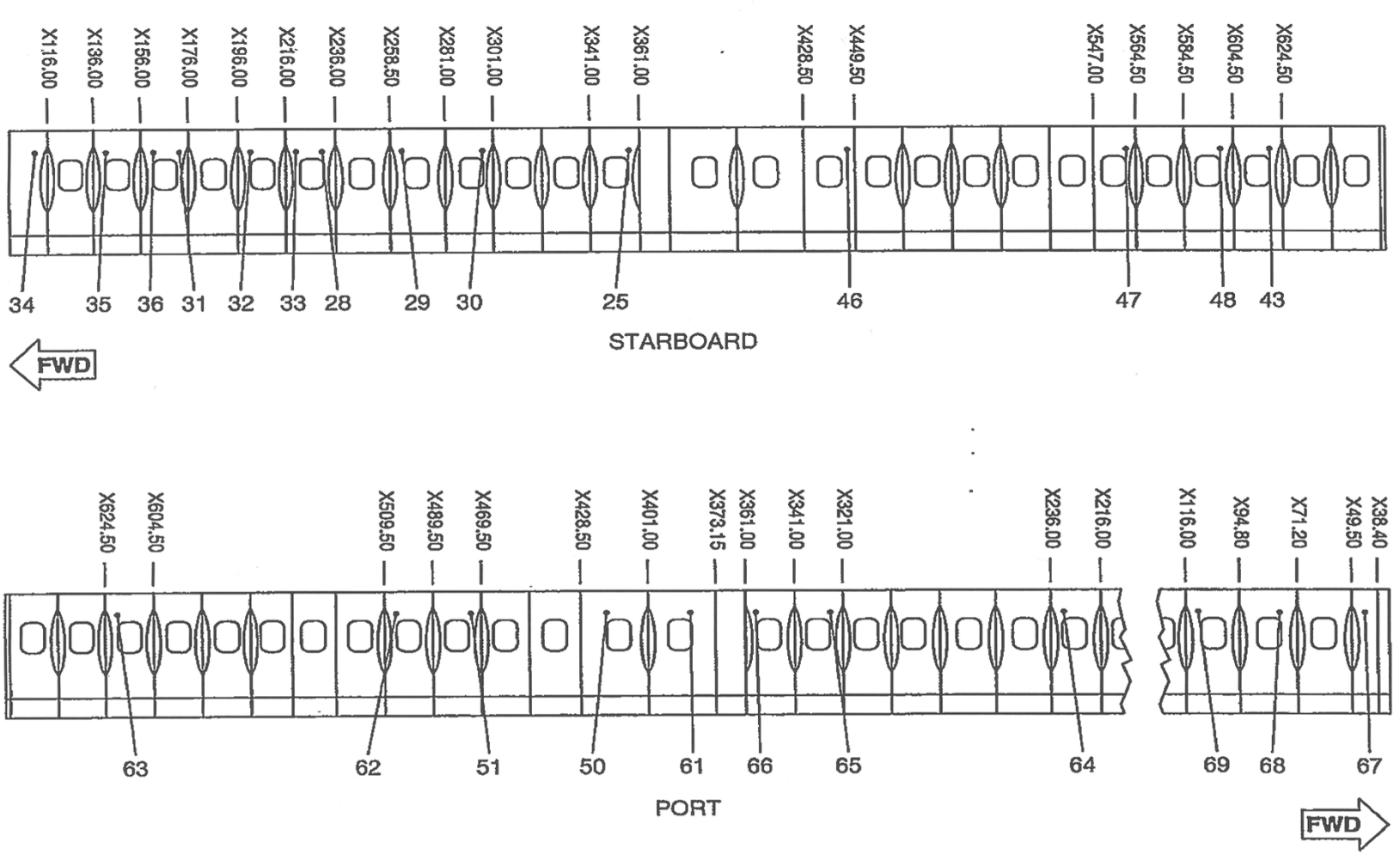
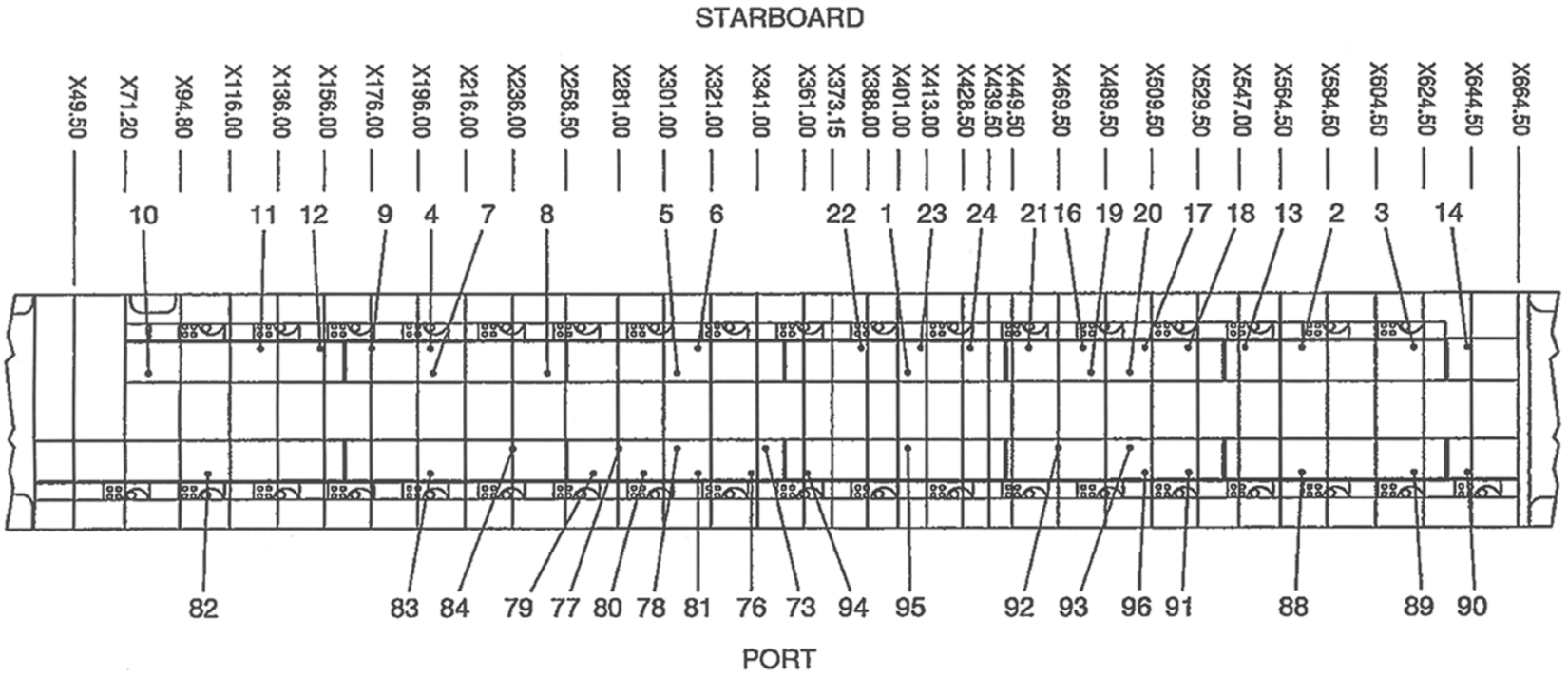
Wall Mic's (Q400)



Bin Mic's (Q400)



FWD

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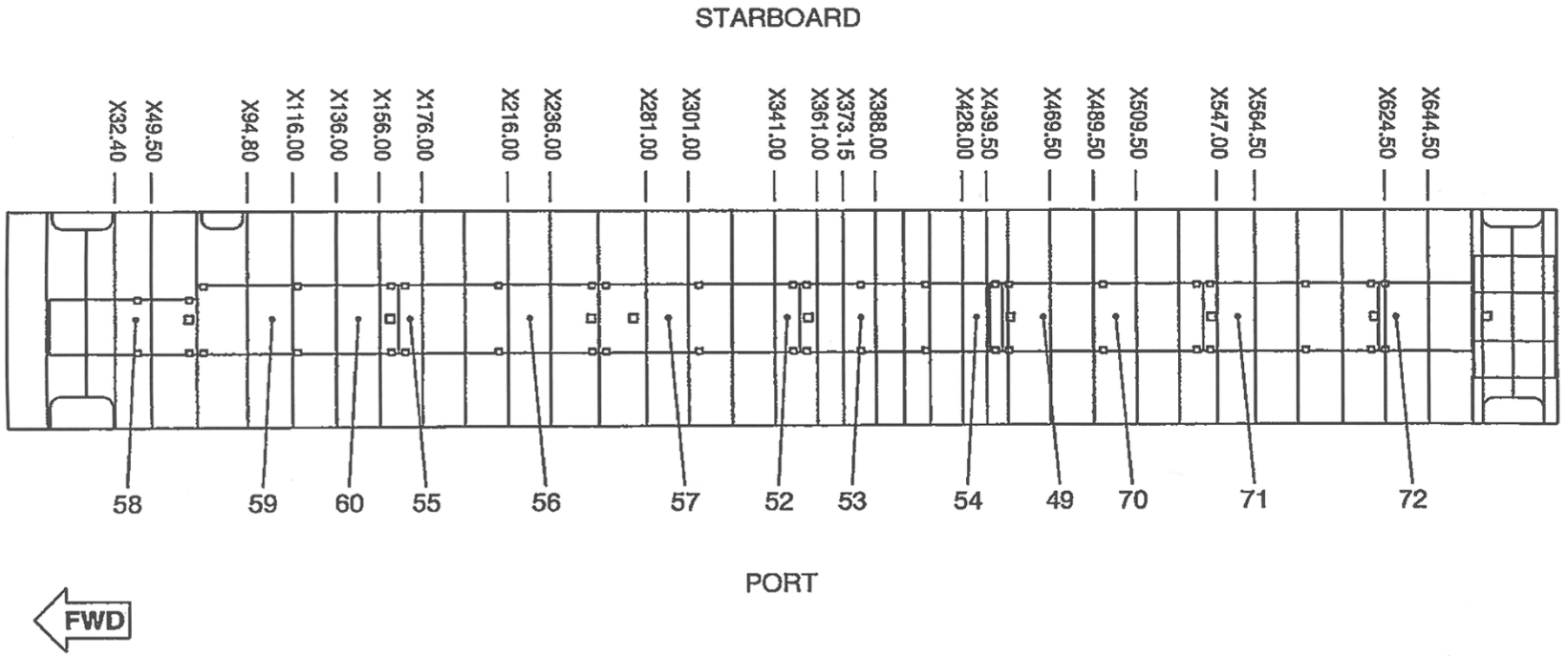
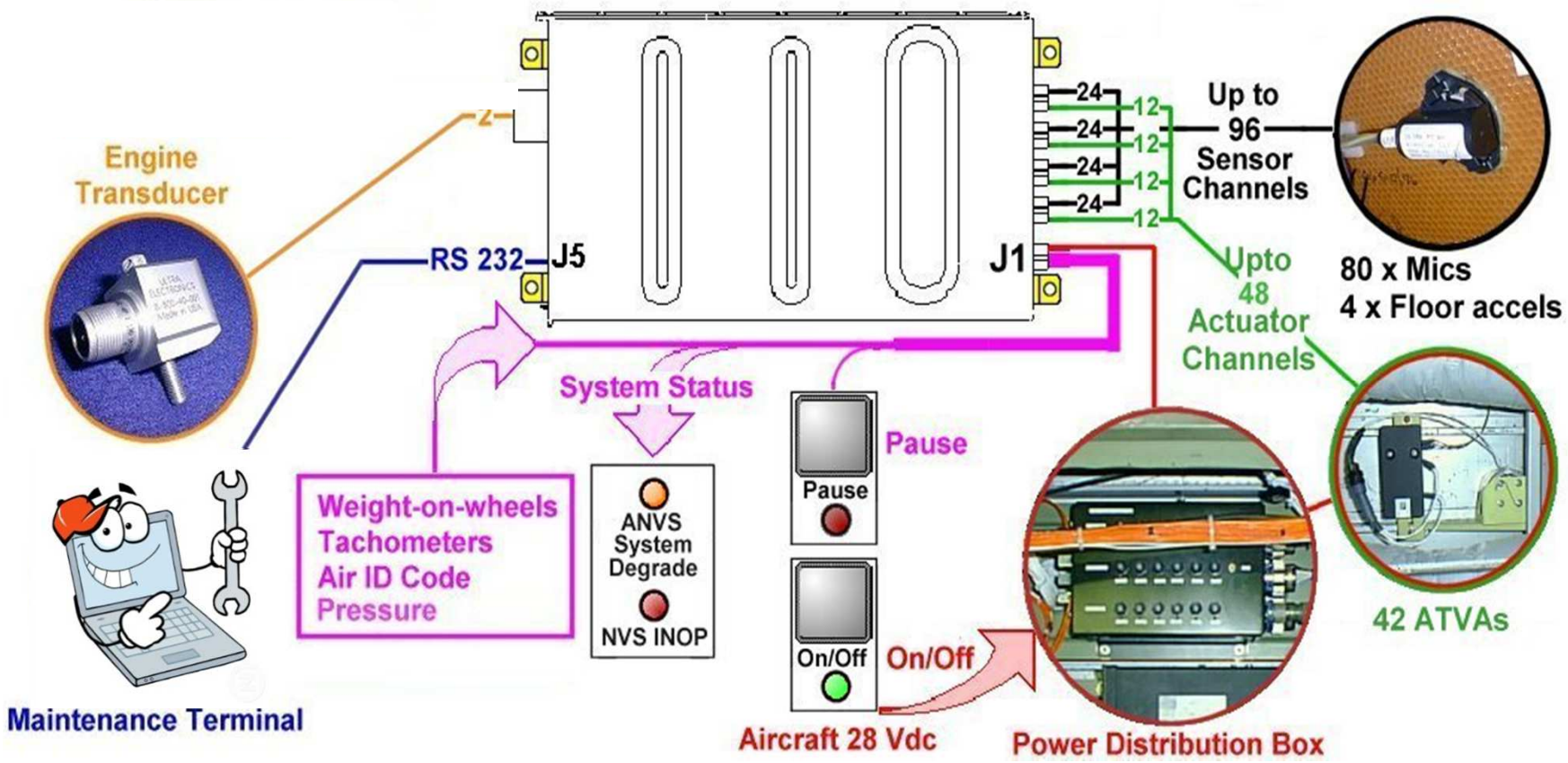
Ceiling Mic's (Q400)



NVS SYSTEM DIAGRAM

Typical Turbo-Prop System



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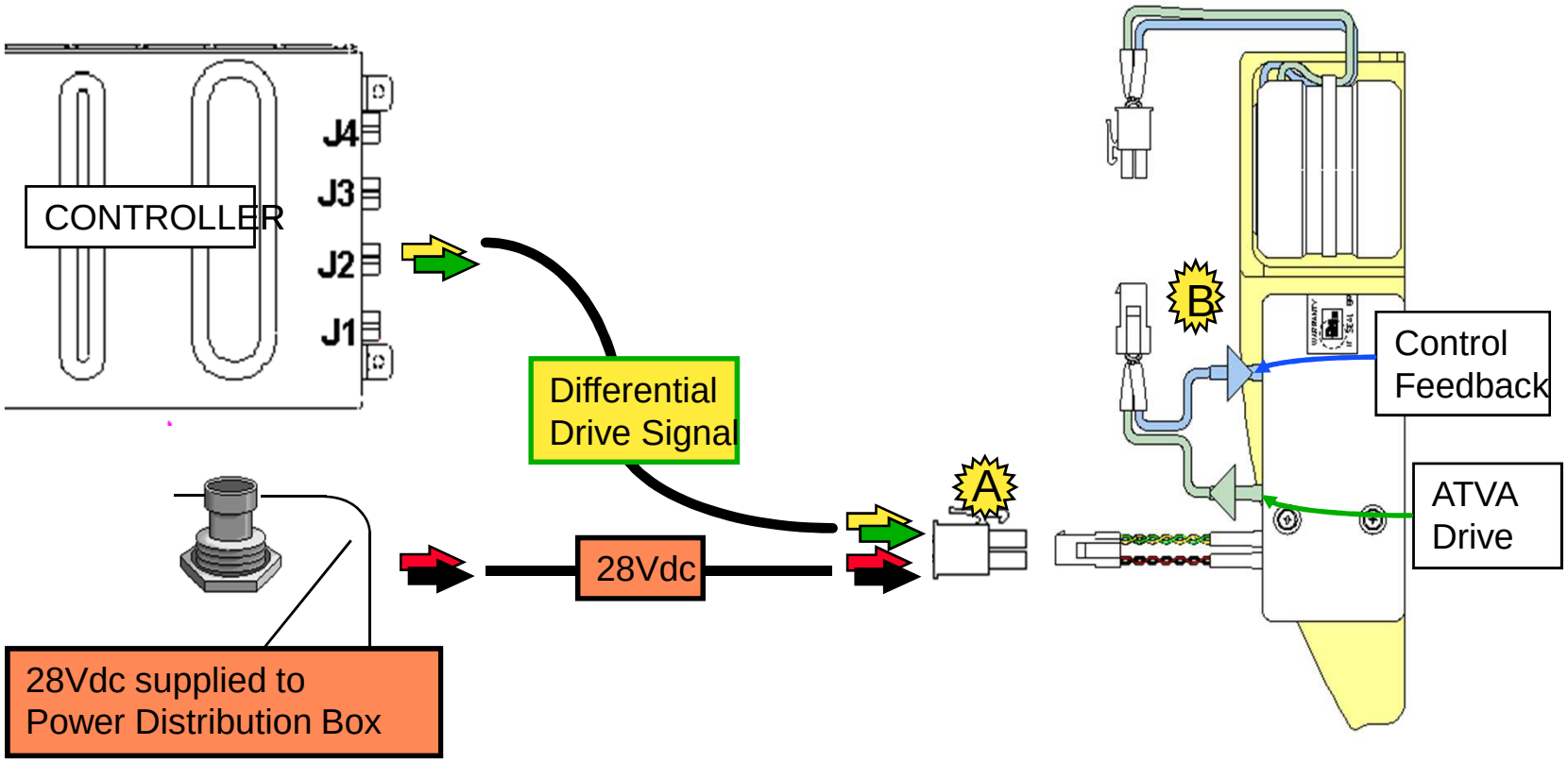
ATVA CHANNEL SCHEMATIC



FAILED ATVA CHANNELS
Verify PA Supply Voltage

- Switch the system ON, this supplies 28Vdc to all PA's.
- Use a DVM, to confirm the 28Vdc supply to the PA at A
  - Q400 pins 5+ve and 4-ve (pin 1 to left of main keyway reading anti-clockwise)
  - Q100/200/300 pins 4+ve and 3-ve (pin positions on the rear of the connector)
  - WARNING - DO NOT DISCONNECT A PA WITH THE POWER SET TO ON
- If the Supply Voltage is below 22Vdc,
  - Exit the Maintenance Session and switch the system OFF.
  - Check the Power Distribution Box for tripped Circuit Breakers and reset as necessary.
  - Switch the system ON and confirm the supply voltage at the Power Distribution Box, if the supply voltage is correct then there is a wiring fault from the Circuit Breaker to the connector A
    - Rectify the Wiring fault.
  - If the supply remains below 22Vdc there is an aircraft wiring or DC BUS fault.

FAILED ATVA CHANNELS

Verify ATVA Drive Signal

- **Use the Manual Actuator Test to drive the failed channel.**
- **Use a DVM or scope to confirm the differential ATVA Drive signal at** 

  - **Q400 pins 1+ve and 2-ve - 0.7 Vrms (+/- 10%) @ 85 Hz (type 832 controller) (pin 1 to left of main keyway reading anti-clockwise)**
  - **Q100/200/300 pins 1+ve and 2-ve - 1.0 Vrms (+/- 10%) @ 73Hz (type 830 controller) (pin positions on the rear of the connector)**
  - **Q100/200/300 – 1+ve and 2-ve 0.5 Vrms (+/-10%) @ 73 Hz (type 811 controller) (pin positions on the rear of the connector)**
- **If the Drive Signal is not correct confirm the Drive Signal at the Controller J2/3/4/6 connector.**
  - **If the correct Drive Signal is confirmed at the Controller then there is a wiring fault from the Controller to the connector at** 

    - **Rectify the Wiring fault.**
  - **If the correct Drive Signal is not confirmed at the Controller then there is a Controller channel fault. –**
    - **Replace the Controller**

FAILED ATVA CHANNELS

- *Verify PA Output Channel Voltages*
- **Reconnect the connector at** A
- **Use the Manual Actuator Test to drive the failed channel.**
- **Use a DVM (capable of reading RMS voltages at a frequency of approximately 35 KHz) or scope to confirm the differential ATVA Drive signal at** B
- **Type 029 PA (Q400) (pin 1 to right of main keyway reading clockwise)**
- **Pin 5+ve (OUTPUT HIGH) and pin 1-ve (FEEDBACK SCREEN) = 14V approx.**
- **Pin 6+ve (OUTPUT LOW) and pin 1-ve (FEEDBACK SCREEN) = 14V approx.**

FAILED ATVA CHANNELS

- *Verify PA Output Voltage*
- **Type 014 PA (Q1,2,300) (pin positions on the rear of the connector)**
- **Pin 3+ve (OUTPUT HIGH) and pin 2-ve (FEEDBACK SCREEN) = 14V approx.**
- **Pin 6+ve (OUTPUT LOW) and Connector B pin 2 (FEEDBACK SCREEN) = 14V approx.**
- **- WARNING CAUTION MUST BE EXERCISED WHEN CHECKING FOR PA OUTPUT VOLTAGES SO AS NOT TO SHORT BETWEEN THE CHANNELS.**
- **If one or both of the outputs is missing then the PA is at fault and requires replacing. (A short circuit ATVA would blow the PA output stage)**

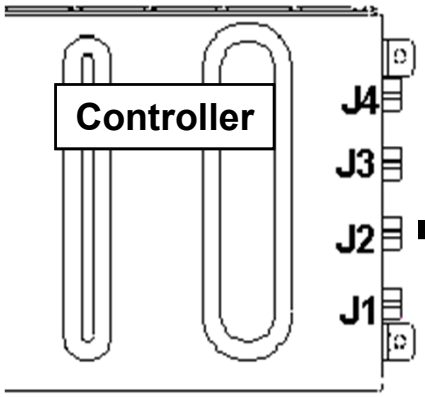
FAILED ATVA CHANNELS
ATVA or PA Faults

- **If the PA Supply Voltage and Output Voltage have been confirmed at connectors A B then the ATVA is at fault**
  - **Replace the ATVA first, (a short circuit ATVA would blow the PA output stage) and confirm channel operation using the Manual Actuator Test.**
  - **If channel operation is not confirmed replace the PA and confirm channel operation as above.**
  - **If there was no channel output then ATVAs or PA's may be slaved in to part confirm a repair before removing old units and wire locking.**
- **If an ATVA or PA is replaced there is no need to re-calibrate.**
- **An Automatic Actuator and Sensor Test must be completed to re-include the failed channel back into the system.**

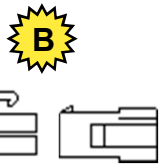
MICROPHONE CHANNEL SCHEMATIC

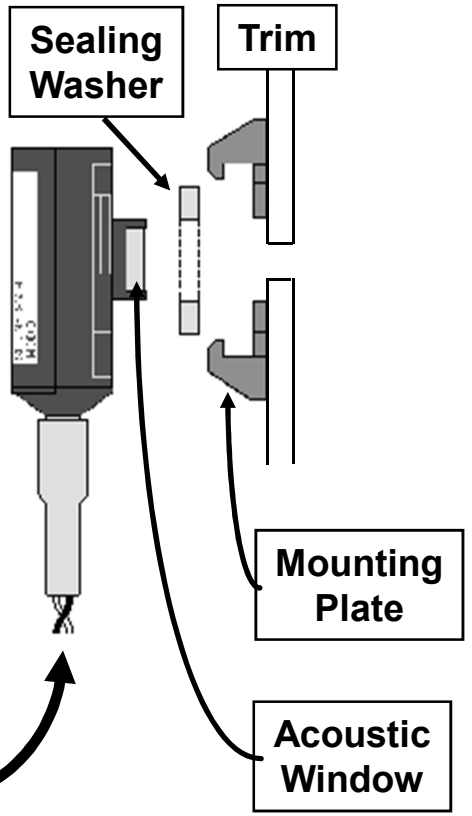
BIAS VOLTS	
STATE	83X
CONNECTED	15 -19
DISCONNECTED	25 - 28

Controller provides 22Vdc bias (type 811 controllers) or 28Vdc (type 83X controllers).
Microphone signal returns super-imposed on the same two wires.



First connector from Microphone Head





FAILED MIC. CHANNELS
Verify Controller DC Bias Voltage

- **Switch the system ON, the Controller supplies 22Vdc bias (type 811 controllers) or 28Vdc bias (type 83X controllers) to all Sensors.**
  - **(With the Sensor connected the bias volts will be 15 –19 Vdc)**
- **Use a DVM to confirm the Vdc bias at the first B connector from the Sensor.**
  - **WARNING - DO NOT DISCONNECT A SENSOR WITH THE POWER SET TO ON**
- **If the dc Bias Voltage is not correct,**
  - **Confirm the dc bias voltage at the Controller, if the dc Bias voltage is correct then there is a wiring fault from the Controller to the connector – B**
    - **Rectify the Wiring fault.**
  - **If the DC Bias is not correct then there is a Controller Channel Bias Failure.**
    - **Replace the Controller.**

FAILED MIC. CHANNELS
Physical Installation and Microphone Failures

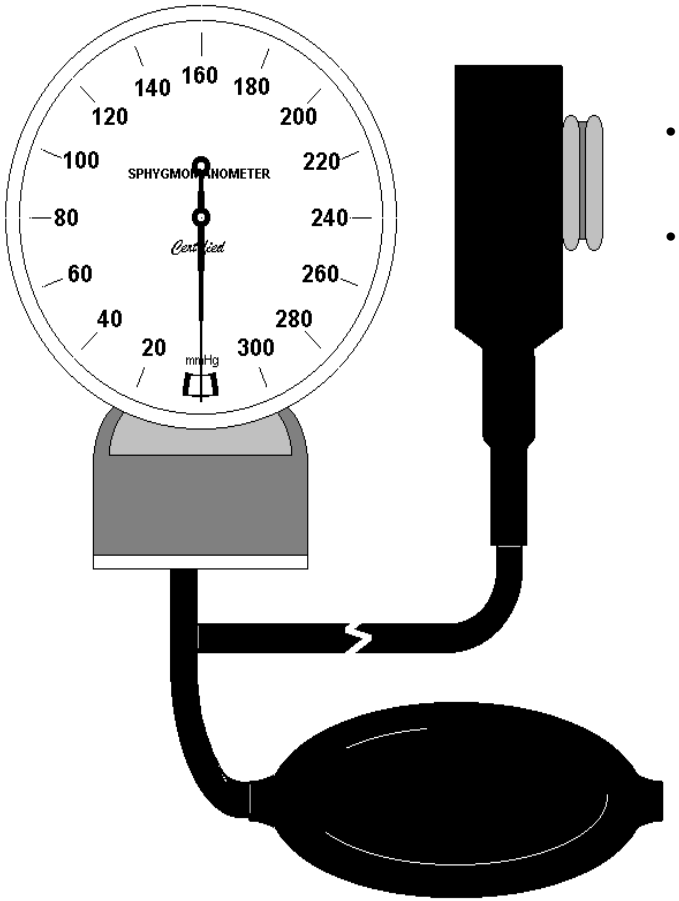
- **If the DC Bias is OK, check the following**
  - **Ensure the connector** B **pins are secured in their housing with good crimp joints.**
  - **Remove the microphone and check the trim panel through hole is not blocked. Clear any microphone trim hole blockages. (Never attempt to clear a microphone hole with the microphone fitted).**
- **Confirm the repair with the Automatic Actuator and Sensor Test. If the Channel fault remains,**
  - **Replace the microphone and confirm the repair with the Automatic Actuator and Sensor Test. (A new microphone can be slaved in at first to confirm the repair).**
  - **If the Channel fault remains there is an Controller channel conditioning fault. Replace the Controller and confirm the repair with the Automatic Actuator and Sensor Test.**

MICROPHONE LEAK FAILURES

- **IF A MICROPHONE REPEATEDLY FAILS DURING FLIGHT/ CALIBRATION OR THE FA REPEATEDLY REPORTS IT AS BEING NOISY IN THE CABIN BUT PASSES AN AUTOMATIC ACTUATOR AND SENSOR TEST THEN IT SHOULD BE SUSPECTED AS LEAKY.**
- **Using the leak test set check the reported failed microphone, or microphones in the area of a HOTSPOT, for leaks.**

MICROPHONE LEAK FAILURES

Confirming Leaks Using the Leak Test Set



- **Ref P/N 8-800-69-001**
- **Place the Manometer pressure pad over the suspect microphone trim hole.**
  - **Slowly pump the Manometer to a pressure of 50mmHg.**
  - **Never exceed 60mmHg or microphone damage will occur.**
  - **Release the pump and note the time it takes for the gauge to fall from 40 to 20mmHg.**
  - **0 - 10 secs Leaky microphone Over 10 secs Good Microphone**

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INNOVATION THROUGH EXPERIENCE

CONTROLLER INSTALLATION FAILURE BONDING

- **Poor electrical bonding will reduce the immunity of the NVS system to EMI (Electromagnetic Interference). EMI will induce unacceptable levels of noise which will cause a loss of system performance and possible system failures.**
  - **Measure the resistance between the Controller feet and the Aircraft chassis and ensure the reading meets the aircraft Electrical Bonding and Grounding of Aircraft Structures procedure for that aircraft.**
  - **If the resistance does not meet the grounding limits then clean the chassis and Controller mounting plate points.**

HOW TO GET AN EVENTLOG FROM THE CONTROLLER

- **Switch on the MT Terminal (laptop PC)**
- **WARNING: THE EVENTLOG GRABBER SOFTWARE MUST ONLY BE USED WITH THE MS WINDOWS OPERATING SYSTEM USED FOR THE VERSION OF MT830 MAINTENANCE TERMINAL INSTALLED. IF THE EVENTLOG GRABBER SOFTWARE IS RUN WITH ANY OTHER WINDOWS OPERATING SYSTEM THEN IRRECOVERABLE DAMAGE TO THE CONTROLLER MAY OCCUR**
- **2. Set the NVS system to on.**
- **3. To start the eventlog grabber software double click the desktop icon that was created during the installation process.**
  - **NOTE: The eventlog grabber software DOES NOT RUN FROM DOS.**
- **4. A DOS style window will open and communications with the controller will establish**

- **The eventlog grabber will prompt for a user name and aircraft name. Enter your name and the aircraft type and then click <OK>**
- **The eventlog grabber will prompt for a file name for the eventlog.**
- **The eventlog will be read from the controller.**
- **When the progress indicator reaches 100% the process is complete**
- **Click <OK> to continue. The eventlog grabber software will terminate automatically**

Notes

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