Technical Service Bulletin 040123
Interlock Check Procedure: DCX Paragon

It is very important to regularly check the proper functioning on the transmitter interlock circuits. This is especially true for mechanical switches, such as airflow sensors and flow meters, which may become stuck over time. The interlock check procedure contained in this bulletin is preliminary. Comark invites all DCX Paragon users to send in any suggestions or corrections to this procedure to swikcsfeedback@Comarktv.com

Procedure 040123: Interlock Check Procedure: DCX Paragon	
Applicability	DCX Paragon transmitters.
Prerequisites	Transmitter in HPA STANDBY mode unless otherwise specified.
Equipment Required	None.
Comments	Should be performed on a regular basis as part of maintenance cycle.

1. Press and hold DISPLAY test button on HPA control panel. All indicators (LEDs) on user interface panel will illuminate in a flashing sequence of red, amber, and green. As button is depressed, observe all indicators and verify that all colors are operating correctly. Release DISPLAY button.

2. With HPA in STOP mode, turn off power to 480/120-208 step-down transformer via AC panel breaker CB1. Control system UPS should beep and switch to internal battery power, thereby keeping control system alive. AC MAINS alarm LED should light on HPA control panel. A communications error alarm will also result as focus supply and filament / bias / ion supplies loose power and communications. Return CB1 to ON position.

3. Place amplifier cabinet in STANDBY mode. Turn off cabinet fan via AC panel CABINET FAN breaker CB7. Allow fan to "spin down" and airflow to drop off. CABINET AIRFLOW alarm should light. Return breaker CB7 to ON position.

4. Turn off cavity blower via AC panel CAVITY BLOWER breaker CB2. Allow blower to "spin down" and air pressure to drop off. CAVITY AIR alarm should light. Return breaker CB2 to ON position.

5. Open interlock key switch Transfer / Operate Key. CABINET INTERLOCK alarm should light. LCD screen should display KEY SW OPEN message.

6. Move ground switch handle from OPERATE to GROUND position. LCD screen should display GROUND SW OPEN message. Transfer key used in previous step to empty lock cylinder and lock ground switch in grounded position.

7. Pull (outdoor) safety disconnect switch for 480 VAC feed to high voltage power supply (HVPS) primaries as safety precaution. Lock and tag out safety disconnect according to station safety procedures.

8. Using HVPS / IOT key, open front door to HVPS. CABINET INTERLOCK alarm should already be lit. LCD screen should display HVPS DOOR ILOCK message. Close front door to supply.

9. Open front door to HVPS. Remove HVPS ground hook from its holder. Close front door to HVPS. CABINET INTERLOCK alarm should already be lit. LCD screen should display HVPS DOOR ILOCK message. Open door and replace ground hook in holder. Close HVPS door.

10. Open HVPS door and disconnect wire to HVPS oil level switch. Close HVPS door. CABINET INTERLOCK alarm should already be lit. LCD screen should display HVPS DOOR ILOCK message. Re-open door and replace wire. Close HVPS door, lock door, and return key to HPA ground switch. Return 480 VAC safety disconnect switch to ON position.

11. Open right-hand HPA cabinet door, lower tube ramp, and use HVPS / IOT key to open door covering front of IOT. LCD screen should display HV SKIRT ILOCK message. Close IOT skirt door, lock door, and return key to ground switch. Stow tube ramp and shut IOT cabinet door.

12. Using HV Compartment Key from ground switch, unlock high voltage compartment doors and gain access to HV compartment. With left hand door open, LCD screen should display HV DOOR ILOCK message.

13. Remove HPA ground hook from its holder. GROUND PROBE INTERLOCK alarm should light. LCD screen should display GROUND PROBE ILOCK message. Replace HPA ground hook.

14. Move white HV connection "handle" on floor of high voltage compartment from connected (rear) to isolated (front) position. HIGH VOLTAGE status green LEDs on HPA control panel should change from CONNECTED to ISOLATED. Note that when connector "handle" is not in either position, both CONNECTED and ISOLATED LEDs should flash RED. Return "handle" to original position. Close and lock high voltage compartment. Return key to ground switch.

15. Turn off filament / bias / ion supply via AC panel FILAMENT BIAS ION breaker CB8. Communications Error alarm should light on front panel. LCD screen should display FBI FIBER COMMS message. Return CB8 to ON position.

16. Turn off focus supply via AC panel FOCUS breaker CB9. Communications Error alarm should light on front panel. LCD screen should display FOCUS 1 FIBER COMMS message. Return CB9 to ON position.

17. Optional: The 30-minute "Filament Without Beam" timer can be tested by allowing HPA to achieve STANDBY MODE and then NOT proceeding to BEAM or RF MODE within thirty minutes. Timer count down will be displayed on LCD screen. When timer reaches zero, HPA should automatically return to STOP mode.

18. Reduce secondary coolant flow to internal heat exchanger by slowly closing ball valve in rear of HPA cabinet. COOLANT alarm should light as threshold of ~ 10 GPM is crossed. Reset flow rate to previous level. Reset alarm with RESET button.

19. Reduce primary coolant flow to IOT collector by slowly closing ball valve in rear of HPA cabinet. COOLANT alarm should light as threshold of ~10 GPM is crossed. Reset flow rate to previous level. Reset alarm with RESET button.

20. Reduce anode coolant flow to IOT collector by slowly opening ball valve in rear of HPA cabinet on secondary (water /glycol) lines. COOLANT alarm should light as threshold of ~1 GPM is crossed. Reset flow rate to previous level. Reset alarm with RESET button.

21. Turn off focus supply via AC panel FOCUS breaker CB9. Disconnect focus supply connector to IOT magnet cart. LCD screen should display FOCUS INTERLOCK OPEN message. Reconnect focus connector to IOT magnet cart. Return CB9 to ON position.

22. Open input cavity lid (where applicable). LCD screen should display FOCUS INTERLOCK OPEN message. Replace input cavity lid.

23. Disconnect primary cavity arc detector cable. ARC DETECTOR 1 alarm should light. LCD screen should display ARC DETECTOR 1 ILOCK message. Reconnect cable. Reset alarm with RESET button.

24. Disconnect secondary cavity arc detector cable. ARC DETECTOR 2 alarm should light. LCD screen should display ARC DETECTOR 2 ILOCK message. Reconnect cable. Reset alarm with RESET button.

25. Reset all faults by pressing RESET button.

26. Activate high voltage by pressing BEAM mode button. Allow filament warm-up cycle to complete, as necessary.

27. With HPA in BEAM mode, press ARC DETECT button on HPA control panel (TEST FUNCTIONS keypad). ARC DETECTOR 1 and /or ARC DETECTOR 2 alarm(s) should be reported and HPA should drop to STANDBY mode. Which arc detector alarms first is dependent on photocell response time. Arc detector cables may be swapped between primary and secondary cavities to ensure that other channel is working properly. Return cables to original positions before returning to operation.

28. Place amplifier cabinet back in STANDBY mode. Turn CB4 HVPS circuit breaker on AC distribution panel to OFF position. Press BEAM button on control panel. Beam contactor should engage, then disengage after ~10 seconds. HV FAULT alarm LED should light on control panel. Return CB4 HVPS circuit breaker to ON position. Reset alarm with RESET button.

29. To test Soft Arc Technology ^{TM} circuit (part I), with HPA still in STANDBY mode, press HV FAULT TEST button. LCD screen should display HV ARC TEST PASSED message.

30. To test Soft Arc Technology ^{TM} circuit (part II), place HPA in BEAM mode. Press HV FAULT TEST button. HPA should drop to STANDBY mode and HV FAULT alarm should light on control panel. Additionally, LCD screen should display a message of CATHODE ARC and/or any X COLLECTOR ARC.

31. Place amplifier cabinet in RF mode and set output power to 100%. Test reverse power alarm by disconnecting forward power sample cable and associated attenuator from directional coupler on IOT output stack (around rear). Removal of forward port termination (pad) will cause reverse power sample to increase in level. HPA should drop

to BEAM mode and REVERSE POWER alarm should light. Reconnect forward power sample cable and attenuator to directional coupler. Reset alarm with RESET button.

32. Activate auto restart function by pressing AUTO RESTART until green ENABLED LED is lit.

33. Simulate a fault by pressing HV FAULT test function button.

34. High voltage should be interrupted, but automatically return after approximately two seconds.

35. Simulate fault with HV FAULT test function three more times. After each fault, next fault counter LED should light. After fourth fault, high voltage should not automatically return and AUTO RESTART status should change to DISABLED state with red DISABLED indication.

36. Press RESET to clear all stored faults and return to BEAM ON condition. Green auto restart ENABLED light should be lit.

37. Repeat test of auto restart function by simulating four more faults with ARC DETECTOR test function.

38. Procedure complete.

At Comark Broadcast and Multimedia, we are constantly striving to improve the satisfaction of both our new and existing customers. Please do not hesitate to contact Comark Customer Service with any questions you may have concerning the contents of this service bulletin.

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