

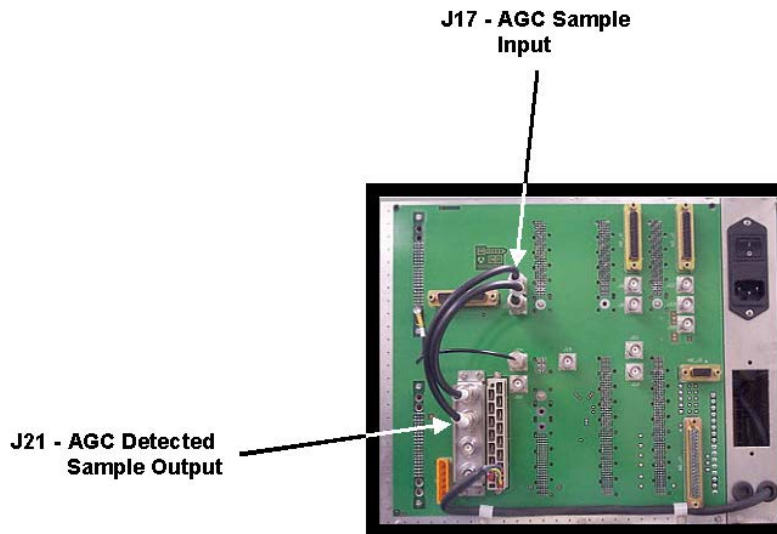
Technical Service Bulletin 040125

ADAPT Exciter AGC: DCX, DCX Paragon, and Advantage

All ADAPT exciters have a built-in AGC circuit. This circuit was not activated upon installation at many DCX and Advantage sites but may be activated after-the-fact by the end-user at any time. When implemented as described in this bulletin, the AGC provides a gain control loop around the exciter output only. The exciter maintains a constant power as various precorrection routines are executed, but the PA stage gain may still vary with temperature and AC mains voltage shifts.

Procedure 040125: ADAPT Exciter AGC Setup	
Applicability	All DCX, DCX Paragon, and Advantage transmitters.
Prerequisites	Transmitter operating at 100% power. ADAPT Control GUI connected to DAP module and communication established. Exciter in MGC mode.
Equipment Required	PC with ADAPT Control software, RS-232 null modem cable, Assortment of BNC attenuator pads such as Comark 453236-01 or equivalent, Digital Multimeter.
Comments	Basic procedure for activating exciter-only AGC in Advantage and DCX transmitters.

1. Inspect rear backplane of exciter for the presence a short BNC-coax jumper cable between connectors J21 and J17. Fashion and install a coax jumper cable if none exists.



NOTE: The AGC circuit requires at least +2V DC of rectified output sample at J17 to function properly. This level may be achieved by relocating all RF attenuator pads to the final exciter output at J23. This makes the final amplifier work harder, thereby increasing its detected output sample at J21.

2. Remove any attenuator pads from J15 and add them to attenuators already present at J23.

NOTE: If multiple attenuators are installed at J23, always place the lowest value attenuator first. This reduces the thermal stress on the attenuator pads.

3. Temporarily disconnect AGC sample input at J17 with transmitter operating at 100% nominal level. Verify that AGC sample level is greater than 2V using DC volts scale on digital multimeter and measuring from coax jumper center pin to connector shield.
4. Connect serial port from laptop PC comm port to RS-232 port on front of DAP module.
5. Launch ADAPT Control GUI Software (Version 2.0 or higher).
6. Select pull-down menu **Comm Ports** and select appropriate number comm port from selections.
7. Issue commands **Comm Ports > Open Link** to establish communication with DAP module. The words "ecco umberto calixtinus" or other text should appear in Received window at right of screen. If a stream of junk characters appears in Received window, issue commands **Comm Ports > Computer Baud** and **ADAPT Baud**. Ensure that both baud rates are set to 9600.
8. Issue commands **Get > CUDC > All** and record "MGC Level" value from readout.
9. Issue commands **Set > CUDC > AGC Level** and set AGC level variable to same value as was recorded for MGC level in previous step.
10. Adjust AGC potentiometer on front of CUDC module fully counterclockwise.
11. Place AGC/MGC switch on front of CUDC module in AGC position.
12. Issue command **Drive Commands > AGC Mode** to switch to AGC mode.
13. Adjust output power to 100% via AGC potentiometer on front of CUDC module.
14. Exciter will now automatically adjust *cag_level* (AGC level) variable instead of *cmg_level* (MGC level) variable each time a power raise or lower command is issued.

NOTE: It is typically necessary to add additional attenuator pads to J23 so as to ensure that the exciter have only 1dB of gain headroom while operating under normal AGC conditions (i.e. exciter operating at 1dB below its maximum possible power). This will ensure that the resulting transmitter overdrive will be limited to only 20% (+1dB) should the AGC sample cable be disconnected or the AGC fail to respond to a transient condition.

15. Limit exciter headroom to +1dB using procedure below:
 - a. While transmitter is operating at 100%, connect BNC RF cable from RF sample port on front of the ADAPT preamplifier to spectrum analyzer or average power meter.
 - b. Establish measurement reference on spectrum analyzer or average power meter of nominal RF sample level with transmitter operating at 100% power.

- c. Switch other exciter to the on-air position to maintain broadcast (where applicable).
 - d. Switch REM/LCL switch at top of user interface module in exciter to LCL position (as necessary) to force exciter on while in the non-selected (off-air) position.
 - e. Disconnect J23 (RF output) at rear of exciter, as a precaution.
 - f. Place exciter in AGC mode via ADAPT Control software or user interface module AGC OFF switch. Status light on CUDC should turn green.
 - g. Disconnect J17 (AGC input) at rear of exciter. With AGC feedback sample disconnected, exciter output power should rise to its maximum possible level. A jump in power of anywhere from +3 to +20 dB should be observed on spectrum analyzer or power meter.
 - h. Add BNC attenuators to J15 (CUDC output) at rear of exciter until max exciter power is only 1 dB above nominal 100% level recorded earlier.
 - i. Switch REM/LCL switch at top of user interface module in exciter to REM position to allow exciter to turn off while in the non-selected (off-air) position.
 - j. Reconnect J23 (RF output) at rear of exciter.
16. For permanent AGC operation, ensure that station remote control and user interface module are not commanding that AGC be deactivated. Otherwise, the next AC bump or other control event will send a fresh AGC disable command, thereby causing the exciter to revert to manual gain control mode.

NOTE: The AGC / MGC switch on the front of the CUDC module on creates the *possibility* of AGC when in the AGC position. With this switch in the AGC position, AGC mode may be activated in three different ways:

- Temporarily via commands issued in ADAPT Control.
- Via the AGC switch on the user interface module while in the LCL (local) mode.
- Via the station remote control interface while the user interface module is in the REM (remote) mode.

While the exciter is in AGC mode, any power raise/lower commands will automatically change the *cag_level* variable instead of the *cmg_level* variable, regardless of the origin of the commands (e.g. ADAPT Control, user interface module buttons, station remote control).

17. Procedure complete.

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Comark Communications
104 Feeding Hills Road
Southwick, MA 01077 U.S.A.
(800) 345-9295
<http://www.comarktv.com/>