Technical Service Bulletin 100203
Calibration of AGC System: DCX Paragon

The calibration of the AGC system is critical in maintaining transmitter forward output power and performance along with insuring the system control has the correct level going to it to allow for proper transmitter transfer in the event of a fault in a 1+1 transmitter system.

Procedure 100203: Calibration of AGC System: DCX Paragon	
Applicability	DCX Paragon transmitters with internal Sirius Exciter (61200010).
Prerequisites	Transmitter operating at full power. Technical Service Bulletin 100129 Calibration of HPA Power Sensors: DCX Paragon must be complete.
Equipment Required	Average power meter connected to precision directional coupler or known calibrated transmitter output meters. Digital Multi Meter
Comments	

1. Insure the transmitter is correctly operating at the 100% output level.
2. The AGC detector assembly (61200823) should be connected as shown on page 2 or drawing 61200010-050 schematic. See the portion included below. There are four connectors on this assembly:
    - RF Input
    - -20dB
    - Sys CTRL
    - AGC

    The RF Input is connected to the directional coupler forward port on the rear of the IOT output feeder.

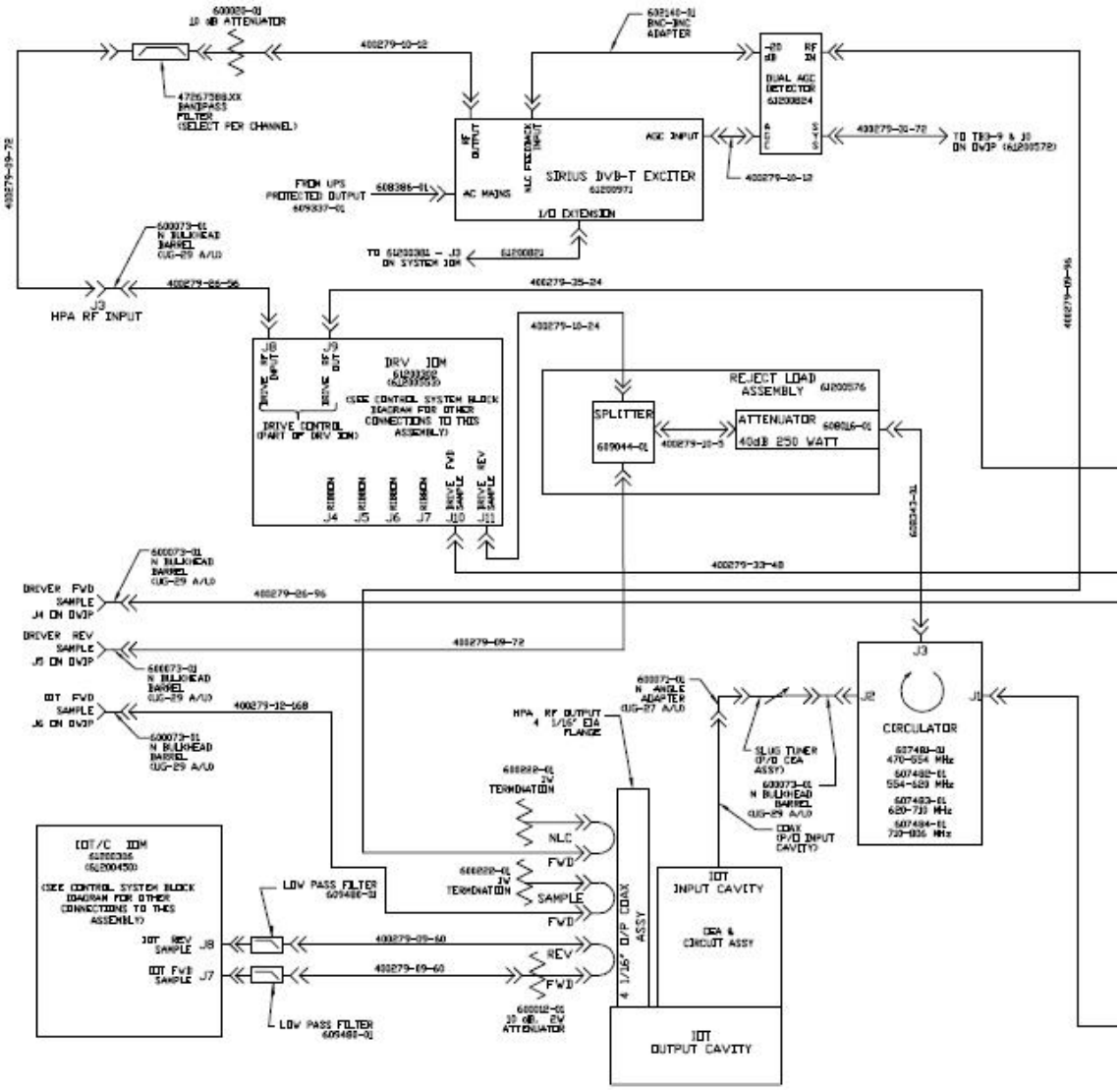
    The -20dBconnector connects to the FdB input on the back of the exciter with a BNC Male to Male connector. See picture below of the rear of the exciter.

    The Sys CTRL connector is connected via a coaxial cable to the terminal board TB3-9 and 10 on the OWIP.

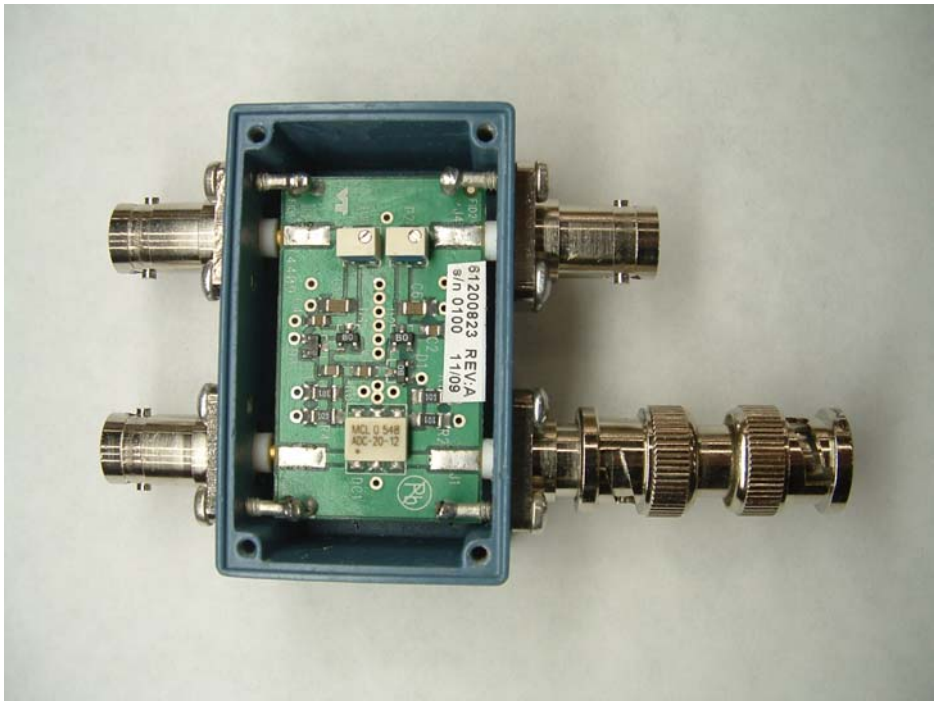
    The AGC connector is connected via a short BNC to BNC cable to the AGC input on the rear of the exciter. See picture below of the rear of the exciter.


SYS CTRL
AGC
61200823
REV A
RF IN
-20 dB


ASI OUT
I/O 2
RF
F
O
B
A
G
C
V
S
W
R
A
L
E


SIRIUS DVB-T EXCITER
I/O EXTENSION
AC MAINS
AGC INPUT
DUAL AGC DETECTOR
HPA RF INPUT
DRV IOM
DRIVE CONTROL
SPLITTER
ATTENUATOR
40dB 250 WATT
REJECT LOAD ASSEMBLY
CIRCULATOR
IOT INPUT CAVITY
IOT OUTPUT CAVITY
IOT/C IOM
LOW PASS FILTER
TERMINATION
SAMPLE
FWD
REV
NLC

3. There are two adjustments within this AGC Detector Assembly. These are shown in the picture below and are labeled P1 and P2. They are located at the top center of the PC board with P1 on the left and P2 on the right.



P1 is used to adjust the DC level that is sent to the SYSTEM CONTROL.

P2 is used to adjust the DC level that is used for the AGC system in the exciter.

4. Adjust the transmitter power output to 100% power using the manual gain controls and setup as outlined below from the Exciter Manual.

> ***AGC Settings***
> *Selecting F3 again (second press) will toggle the display to the AGC settings page:*
> ***Gain**: [Command] User can toggle between MGC and AGC modes.*
> ***Limiter**: [Command] this controls the "coarse" adjustment of the output level of the exciter. This should be adjusted to within 1dB of proper output level of the transmitter. It is adjustable in 1 dB steps with a range of 0dB (min attenuation / max output level) to 25dB (max attenuation / min output level).*
> *Note: The LIMITER does not "limit" the range of the AGC.*
> ***Attenuator**: [Command] this controls 2 functions on the exciter.*
> *1. This is used as a "fine adjust" for the exciter / transmitter output level. It can be adjusted in 0.01dB steps and should be initially set to 2dB. See below for setup process.*
> *2. The second thing this does is sets the "headroom" adjustment range of the AGC system. With this adjustment set to 0.00dB the AGC system has no "headroom" and will not raise the exciter output level to make up for gain changes (loss) in the system. With this set at the 1.5dB setting the AGC now has a "headroom" of 1dB. With this set at 2.5dB and higher the AGC has a "headroom" of 1.5dB. Any setting above 2.5dB does not increase the AGC system headroom beyond the 1.5dB maximum.*
> *Note: There is no adjustment to set the amount the AGC system can reduce the drive power as power reduction of any amount is safe for system operation.*

5. With the transmitter operating at full power in MANUAL GAIN CONTROL (MGC) mode on the exciter use a DMM (Digital Multi-Meter) to measure the voltage on the SYS CTRL connector from the center pin of the BNC connector to the shield of the BNC connector. The probes can be held on the associated pads on the PC board to make this measurement. While measuring this voltage adjust potentiometer P1 to set this level to 2.00VDC.
6. With the transmitter operating at full power in MANUAL GAIN CONTROL (MGC) mode on the exciter use a DMM (Digital Multi-Meter) to measure the voltage on the AGC connector from the center pin of the BNC connector to the shield of the BNC connector. The probes can be held on the associated pads on the PC board to make this measurement. While measuring this voltage adjust potentiometer P2 to set this level to 2.00VDC.
7. To place the transmitter in AGC mode, navigate to the AGC menu by pressing the F3 menu button two times. Once this has been done the screen on the exciter will look similar to the one below.

8. Using the key pad to the right of the LCD screen, highlight the SET REFERENCE virtual button on the screen and then press OK on the keypad. This will set the exciter reference point and this will be displayed on the screen next to the word Reference.
9. Using the keypad to the right of the LCD screen highlight the Gain menu word Manual and press OK.
10. Using the up or down arrow on the keypad to the right of the LCD screen change the gain menu setting from Manual to Auto and press OK. The transmitter power will decrease and then ramp up slowly until it reaches full power. Looking at the LCD screen the AGC Level and the Reference numbers should be the same or at least very close to each other in value. AGC setup procedure from the exciter manual is seen below for reference.

AGC Settings
Proper AGC Setup: *It is suggested at the time of transmitter setup the following procedure be used for adjustment of transmitter power output (TPO) level, and if desired, enabling the AGC system.*
1. Set the ATTENUATOR initially to 2.00dB.
2. Set the LIMITER initially to 25dB.
3. Turn the transmitter system on.
Local User Interface 24
SIRIUS DVB Digital Exciter User's Guide
4. Through the use of external fixed attenuator pads at the exciter output, and the use of the LIMITER adjustment, adjust the transmitter to as near full power as possible without exceeding full power (100%TPO).
5. The ATTENUATOR can be adjusted downward by <1.00dB (in as fine as 0.01dB steps) to accurately achieve 100% TPO.
6. Obtain and apply a detected RF sample (DC) from either the transmitter output or via the AGC feedback board that is at a DC level of ~2 volts. Apply this to the AGC connector on the back panel of the exciter. This should result in a reading of the AGC level of ~1500.
7. Highlight the "Set Reference" "button" on the AGC Settings menu page and press OK. This will adjust the Reference Level to match the value displayed as the AGC Level.
8. The AGC can now be enabled by switching from MANUAL to AUTO in the Gain section of this menu. When switched to AUTO the transmitter output power will be reduced and then ramp up to full 100% output power level. At this point the AGC system is regulating the transmitter output level.
Set Reference*: [Command] Sets and stores the AGC reference value; not used in MGC mode.*
AGC Level*: Displays AGC level; not used in MGC mode.*
Reference*: Displays AGC reference value; not used in MGC mode.*
Exciter Lvl*: Displays approximate exciter output level.*

11. Procedure complete.

At Comark, 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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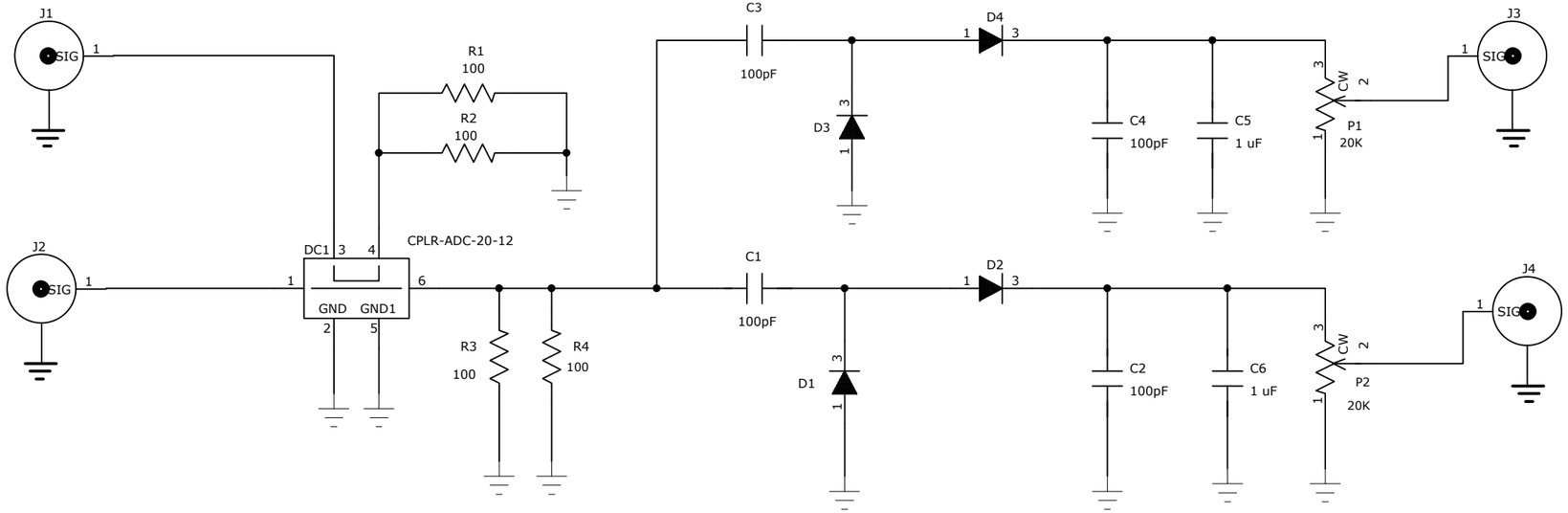

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A	~	~	~	~	~	ENGINEERING RELEASE

ISSUED:	F.STEFANIK	10/09/09
EDA:	~	~
ENGR:	F. STEFANIK	10/20/09
ENGR:	HSB	10/20/09
EDC:	DMT	10/20/09

PROJECT #: ~

ELECTRONIC FILE: 61200823-030A.sch

SCHEMATIC, DUAL AGC DETECTOR

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DOCUMENT NUMBER	DTC	SIZE	PAGE
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REV A