

Precorrections Procedure for Comark EXACT-V2 High End TV Exciter

The purpose of this Service Bulletin is to illustrate the basic operation of the EXACT-V2's Digital Adaptive Precorrections within the transmitter environment.

Prerequisites: The exciter firmware should be at least **Rev. s144** or higher. Please see **Technical Service Bulletin 201214** for more information.

The digital pre-correction feature consists of two types of corrections:

- Non-linear pre-correction compensation of the power amplifier distortion
- Linear pre-correction compensation of distortion due to the channel filter

Note: This procedure applies to an active on-air exciter.

1. After accessing the **Exciter GUI**, log in using the following account information:

Default IP Address Ex1: **192.168.0.209** Default IP Address Ex2: **192.168.0.210** Username: **Administrator**

Password: admin

	EXACT Ex1	- ATSC	Administrator	Log out Refresh Settings
Settings				
< Time & Date		Managem	ent - General	
⊖	nfo	1	- Test	A
- General	1110	0	- Test	
- SNMP	Equipment Name	EXACT Ex1	Test Mode Dis	abled
- Options	Туре	XTTR-VX2K-3002	- Miscellaneous	A Designed
- Files	S/N	00305		
- Password	Hard. Version	0100	Senai Speed 5760	0 bps
	Soft Version	142	Serial Protocol Stand	dard 🔹
• TProcess	OUL VERSION	143	Auto Logout Time 0	💼 min 🔩
• • Outputs - S	Standard —			
Clock & Synchro	Standard	ATSC 10	Firmware	Upgrade
Time & Date			Rebo	pot
	Control 1			
Refresh	Address	10 . 100 . 52 . 203		
Monitoring				
Management	Inputs	Process	Outputs	😑 Clock & Synchro
Inout				
Output		Total Bitrate : 19 255 kbit/s	RF Output	6
Alarm	ASI 1	Secondary Status	Stream : Data	Clock Synchro
	ASIZ	Total Bitrate : 19 255 kbit/s		
Temperature : 33°C		Active Source : ASI / SMPTE 2		



2. Locate the RF output couplers in the path before and after the mask filter for transmitter feed-back to the Exact-V2 exciter.

There are two SMA connectors, labeled FBA (Feed Back Amplifier) and FBF (Feed Back Filter), respectively.

The FBA signal should come from the transmitter output sample before the mask filter. This is used for non-linear (shoulder) correction.

The FBF signal should come from the transmitter output sample after the mask filter. This is used for linear (SNR) correction.

These signal levels should be in the range of -15dBm to -5 dBm.

Caution: Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.

To ensure you have the correct sample connected to the correct feedback input, disconnect the before mask filter sample and confirm the FBA Level is lost. Restore connection once this has been confirmed.



Select Outputs -> Precorrections on the side menu.



- 3. Crest Factor and Protection Clipping Parameter Setting:
 - a. The Crest Factor should be adjusted carefully if the user wishes to optimize the performances. Since Exact-V2 is performing a clever PAPR reduction that is less destructive for the signal compared to the amplifier clipping, the Crest Factor must be reduced as much as possible by Exact-V2 instead of the amplifier. For this purpose, the user can use the Crest Factor value monitored from the amplifier feedback signal as a starting point when neither CFR nor Non Linear Precorrections are applied. It is recommended to set the Crest Factor in the RF Output Parameter Menu about 1dB higher than the value that is monitored in the Precorrections Menu.

Select Outputs -> Precorrections on the side menu.



b. Once the Crest Factor has been set, the Protection clipping must also be set to an appropriate value. The Protection clipping limits the power peaks naturally generated by the Non Linear precorrections. A good initial value is 3 dB more than the initial Crest Factor value. Nevertheless, for amplifier sensitive to overdrive and/or to reflected power, it can be safe to set the Protection clipping to a value less than 3 dB above the CFR value.



- c. Select **Outputs -> RF Output Parameters** on the side menu.
 - i. Please select the appropriate RF Output Parameters from the following three options below. Match the transmitter and modulation to your application.

Note:	Good starting found below.	g parameters	for E-Com	oact ATSC	1.0 transmitters	s can be
			c			
– RF F	Parameters 🗕			ſ		
	Bandwidth	6 MHz	- 4			
	Channel	18 - 497000000 Hz	- 4			
	Center Frequency (ATSC 1.0)	497 000 000	+ Hz			
	Attenuation (ATSC 1.0)	0.0	🔹 dB 🔌 📃 -			
	Crest Factor	8.5	🔹 dB 🔨		÷	
	Crest Factor Optimization	0	÷ *			
	Protection Clipping	11.5	🔹 dB 🔌			
	Reverse Spectrum				E-Compact Transmitter	



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Note: G	ood starting	parameters an be found	for PARALLA below.	X ATSC 1.0 and ATSC 3.0
,			0	
– RF	Parameters 🗕			
	Bandwidth	6 MHz	• 4	2
	Channel	18 - 497000000 Hz		
	Center Frequency (ATSC 1.0)	497 000 000	▲ Hz 🔌	
	Attenuation (ATSC 1.0)	0.0	dB	
	Crest Factor	10.0	🔹 dB 🔨	
	Crest Factor Optimization	0	* *	
	Protection Clipping	13.0	🔹 dB 🔨	
	Reverse Spectrum			PARALLAX Transmitter

d. Select Apply.





- 4. Select **Outputs -> Precorrections** on the side menu.
- 5. Verify that **Enable Downconvertor** and **GAP** are checked under the Downconvertor Control and GAP sections, respectively.

	corrections are running, do	IOT CHECK OF UNCHECK GAP.
	EXACT Ex1 - ATSC	Administrator V Log out Refresh Settings Refresh Refresh Monitoring V
Settings < General	Output	te Dragorractions
 Management Inputs Process Outputs RF Output Parameters RF Output Control 	Downconverter Control Enable Downconverter Probes Sources MER/Shoulder FBA-Amplifier Feedback	- GAP GA
Precorrections Clock & Synchro Time & Date Power Measurements Redundancv Refresh	- Linear Precorrections	Non Linear Precorections

- 6. Make the following verifications and / or adjustments to the Non Linear Precorrections section found further down on the Precorrections screen:
 - a. Verify the FBA Level and FBA Sync. Icons are green.

	Stat	us	Stopp	ped		
	Elap	sed Time	00:00		hh:mm	
	FBA	Level C	5	FBA Sy	nc. 📃	
FBA Me	asur	ements				
MER		39.8	dB	Crest Factor / PAF	PR 9.8	dB
			dD	Dight Chouldon	67	dD

Note: If either FBA Level and / or FBA Sync. lights are not green, inspect feedback cabling condition and check for loose connections. It may also be necessary to add or reduce the amount of feedback attenuation to adjust the power levels into the correct range (-15 to -5 dBm).

Caution: Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.



- b. Verify that the Non Linear Precorrections check-box is checked.
- c. Verify that the Mode is set to **Single**.
- d. Set the Timer value between 3 to 8 minutes.
- e. Select Start.

econe	SCHOIN	`			
	Non Linea	r Precorrections			-
		Mode	Single	•	
		Timer	5	🗘 min 🔌	
	Survey	Thresholds			Θ
				dB	4
		Shoulders	40	🕂 dB 🔌 🗹	26 1
		Start		Reset	
		Status	Stopped		
		Elapsed Time	00:00	hh:mm	
		FBA Level		FBA Sync.	

After completing these steps, the Status changes to **Active** as the exciter performs the necessary precorrections and the **Elapsed Time** begins measuring the time that has passed since the start of the pre-correction process.

Status Active

When the precorrection period is complete, the Status changes to **Time Out**.





Make the following verifications and / or adjustments to the Linear Precorrections:
 a. Verify the FBF Level and FBF Sync. icons are green.

Status	Stopped	
Elapsed Time	00:00	hh:mm
FBF Level 🦲		FBF Sync.

Note: If either FBF Level and/or FBF Sync. lights are not green, inspect feedback cabling condition and check for loose connections. It may also be necessary to add or reduce the amount of feedback attenuation to adjust the power levels into the correct range (-15 to -5 dBm).

Caution: Damage to the exciter may occur if the maximum feedback input level of +5dBm is exceeded.

- b. Verify that the Linear Precorrections check-box is checked.
- c. Verify that the Mode is set to **DAP**.
- d. Set the Timer value between 5 to 8 minutes.
- e. Select Start.

– Linear Pre	ecorrections		
Linea	r Precorrections	1 🔨	
	Mode	DAP	• •
	Timer	5	🕂 min 🔍
	Start		Reset
	Status	Stopped	
	Elapsed Time	00:00	hh:mm
	FBF Level 🦲		FBF Sync.



After completing these steps, the Status changes to **Active** as the exciter performs the necessary precorrections and the Elapsed Time begins measuring the time that has passed since the start of the pre-correction process.

Status Active

When the precorrection period is complete, the Status changes to **Time Out**.

Status	Time out	
Elapsed Time	00:05	hh:mm

Note: Repeating both Non-linear and Linear pre-correction processes may provide slight additional performance improvements. If this is the first time preforming Linear precorrections or the first time the precorrections have been "Reset", it normally requires 2-3 iterations to obtain good MER results.



Note: Precorrection files can be saved for later use under Management Menu, Files.



Hitachi Kokusai Electric Comark LLC 104 Feeding Hills Road Southwick, MA 01077 U.S.A. (800) 345-9295 support@comarktv.com www.comarktv.com

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