Orchestra Control Module

Action Command/Parameter

Reference Guide

Table 1: RF-O! Action Commands (Sheet 1 of 21)

Command	Name	Version	Description	Example
a 62	Limited Self Diagnostics	1.0.0+	Performs a Limited Set of Tests on the RF-Orchestra. Will return a Pass or Fail result for each of the Tests. The Station must be reset immediately following the execution of this action command. *WARNING: This command intended for Lab/ Development use only!*	RFO FIPS: a 62 RFO FIPS: BEGINNING RFO SELF-DIAGNOSTIC: Hardware Version ID = 6 DIP switches: #1 OFF #2 OFF #3 OFF #4 OFF 10MHz input connected.....PASSED 16.8MHz Pendulum detected.....PASSED Pendulum Locked to UHSO.....PASSED Pendulum temperature = 49C.....HOT Exciter A+ = 14.39V.....PASSED Exciter 10V source = 10.18V.....PASSED Exciter Analog 5V = 5.06V.....PASSED Exciter Synthesizer 1 Lock.....PASSED Exciter Synthesizer 2 Lock.....PASSED Distributor Memory.....PASSED Modulator 1 Memory.....PASSED Modulator 2 Memory.....PASSED Collector Memory.....PASSED Wattmeter Voltage = 0.73V.....FAILED To perform the codec test you need to insert 5V and G into pins 5 an 4 (respectively) of J9. RFO SELF-DIAGNOSTIC.....FAILED RA 62 RFO FIPS:
a 65 x y z1 z2 z3 z4	PA EEPROM Write	1.0.0+	Writes to the Serial EEPROM on the PA specified by argument 'x'. Write the 4 byte region, using arguments 'z', specified in argument 'y'. x = P/A Number (range 1..4) y = EEPROM Region to be written in hex. z1,z2,z3,z4 = bytes to be written to the EEPROM in hex. *WARNING: This command intended for Lab/ Development use only!*	FO FIPS: a 65 1 1 0 0 0 0 RFO FIPS: RA 65 <<< PA EEPROM WRITE >>> PA 1 EEPROM Cell 0x01 = 0x00 0x00 0x00 0x00
a 66 x y	PA EEPROM Read	1.0.0+	Reads the 4 byte segment specified by argument 'y' Serial EEPROM from the P/A specified in argument 'x' x = P/A Number (range 1..4) y = EEPROM Region to be read in hex.	RFO FIPS: a 66 1 0x00 RFO FIPS: RA 66 <<< READ PA EEPROM >>> PA 1 EEPROM Cell 0x00 = 0x05 0x06 0x07 0x08

Table 1: RF-O! Action Commands (Sheet 2 of 21)

Command	Name	Version	Description	Example
a 67 x y ss aw pw	PA EEPOT Write	1.0.0+	Writes to the EEPOTs of the P/A's. x = PA number (range 1..4) y = phase/attenuation cell (range 0..3) ss = Stack Select (range 0..1) aw = Attenuation Wiper (range 0..FF hex) pw = Phase Wiper (range 0..FF hex) *NOTE: To reset the PA to the EEPROM settings type "a 67 x 0" where x is the PA number.* *WARNING: This command intended for Lab/ Development use only!*	RFO FIPS: a 67 ? RFO FIPS: RA 67 <<< PA EEPOT WRITE >>> Usage: A 67 x y ss aw pw x = PA Number (Maximum 4 for Current Configuration) y = Phase/Attenuation Cell (0..3) ss = Stack Select (0..1) aw = Attenuation Wiper (0..ff hex) pw = Phase Wiper (0..ff hex) RFO FIPS: a 67 1 0 0 AF 2F
a 68 v w x y z	Read PA A/D 01	1.0.0+	Reads the first of two A/D's on the P/A specified by argument 'v'. Will read the A/D channel specified by argument 'w'. Will read during 'x' modulation type 'y' number of times after a delay of 'z' seconds. v = P/A Number (range 1..4) w = A/D Channel (0x00-0x0B or 0x0C to return all Channels.) x = Modulation Type 0 = None 1 = FM Only 2 = FM and AM 3 = AM Only y = Repetitions z = Delay (Seconds)	RFO FIPS: a 68 1 c 1 1 0 RFO FIPS: RA 68 <<< READ PA DECK 01 A/D 01 >>> Reg 00: PDPA = 083 => 0.11 Amp(s) Reg 01: DPA = 096 => 1.77 Amp(s) Reg 02: OD = 020 => 5.50 Watt(s) Reg 03: FPA 1 A = 089 => 1.06 Amp(s) Reg 04: FPA 1 B = 087 => 1.24 Amp(s) Reg 05: FPA 2 A = 093 => 1.06 Amp(s) Reg 06: FPA 2 B = 093 => 1.24 Amp(s) Reg 07: FPA 3 A = 101 => 0.89 Amp(s) Reg 08: FPA 3 B = 095 => 1.42 Amp(s) Reg 09: Fwd = 036 => 25.91 Watt(s) Reg 0A: Rfltd = 002 => 0.51 Watt(s) Reg 0B: A/D Test = 128 => PASS (> 126) ==========

Table 1: RF-O! Action Commands (Sheet 3 of 21)

Command	Name	Version	Description	Example
a 69 v w x y z	Read PA A/D 02	1.0.0+	Reads the second of two A/D's on the P/A specified by argument 'v'. Will read the A/D channel specified by argument 'w'. Will read during 'x' modulation type 'y' number of times after a delay of 'z' seconds. v = P/A Number (range 1..4) w = A/D Channel (0x00-0x0B or 0x0C to return all Channels.) x = Modulation Type 0 = None 1 = FM Only 2 = FM and AM 3 = AM Only y = Repetitions z = Delay (Seconds)	`RFO FIPS: a 69 1 c 1 1 0` `RFO FIPS: RA 69` `<<< READ PA DECK 01 A/D 02 >>>` `Reg 00: 28 Vref = 195 => 28.60 Volt(s)` `Reg 01: 15 Vref = 196 => 14.98 Volt(s)` `Reg 02: PA Temp = 210 => 26.44 Deg(s) C` `Reg 03: Phase = 077 => 1.50 Volt(s)` `Reg 04: Atten = 173 => 3.37 Volt(s)` `Reg 05: N/A = 000` `Reg 06: N/A = 000` `Reg 07: N/A = 000` `Reg 08: N/A = 000` `Reg 09: N/A = 000` `Reg 0A: N/A = 000` `Reg 0B: A/D Test = 128 => PASS (> 126)` `==========`
a 70 x - OBSOLETED RFO 1.1.0	Exciter EEPOT Write	1.0.0 to 1.0.4	*Command Obsoleted.* *Write Exciter EEPOT Value*	`FIPS: a 70 40` `FIPS: RA 70` `--- Exciter eepot write data ---` `stack select = 0x00` `wiper 1 = 0x00` `wiper 0 = 0x40`

Table 1: RF-O! Action Commands (Sheet 4 of 21)

Command	Name	Version	Description	Example
a 71 x y	Calibrate Detector(s)	1.0.0+	Calibrate the Internal/External detector(s) x = detector 0 = internal 1 = external y = power value from Wattmeter (in watts) **Note:** This command is normally executed following the 'A 75' (Initialize Amplitude Alignment Parameters) command execution. Power Control must be DISABLED for this command to function (W 992 0). Station power must be transmitting between 190 and 210 watts to execute command. This is accomplished by incrementing/decrementing parameter 990 (K-factor) by 0.1 steps. **Note:** *This command can take up to 2 minutes to fully execute. The printing of the Output Report, shown in the example, will indicate completion of the command. Do not type any other FIPS commands while calibration is occurring.*	`RFO FIPS: a 71 0 210` `Please wait. Command in process...` `RA 71` `<<< CALIBRATE DETECTORS >>>` `========= Detector 0 Calibration =========` `0x00: 0x44 0x45 0x54 0x30 "DET0"` `0x01: 0x30 0x32 0x31 0x30 "0210"` `0x02: 0x32 0x2e 0x36 0x36 "2.66"` `0x03: 0x32 0x30 0x35 0x34 "2054"` `0x04: 0x44 0x45 0x54 0x30 "DET0"` `0x05: 0x44 0x45 0x54 0x30 "DET0"` `0x06: 0x44 0x45 0x54 0x30 "DET0"` `0x07: 0x44 0x45 0x54 0x30 "DET0"` `0x08: 0x44 0x45 0x54 0x30 "DET0"` `0x09: 0x44 0x45 0x54 0x30 "DET0"` `0x0a: 0x44 0x45 0x54 0x30 "DET0"` `0x0b: 0x44 0x45 0x54 0x30 "DET0"` `0x0c: 0x31 0x2e 0x30 0x2e "1.0."` `0x0d: 0x31 0x20 0x00 0x00 "1 .."` `0x0e: 0x30 0x30 0x30 0x31 "0001"` `0x0f: 0x43 0x48 0x4b 0x9e "CHK."` `0x3f: 0x43 0x48 0x4b 0x26 "CHK&"` `Calibration Factor = 1.011365` `==========`
a 72 y z1 z2 z3 z4	Exciter EEPROM Write	1.0.0+	Writes to the Serial EEPROM on the Exciter. Write the 4 byte region, using arguments 'z', specified in argument 'y'. y = EEPROM Region to be written in hex. z1,z2,z3,z4 = bytes to be written to the EEPROM in hex. *`WARNING: This command intended for Lab/ Development use only!`*	`RFO FIPS: a 72 0 44 45 54 30` `RFO FIPS: RA 72` `<<< WRITE EXCITER EEPROM >>>` `Exciter EEPROM Cell 0x00 = 0x44 0x45 0x54 0x30`

Table 1: RF-O! Action Commands (Sheet 5 of 21)

Command	Name	Version	Description	Example
a 73 y	Exciter EEPROM Read	1.0.0+	Reads the 4 byte segment of Exciter Serial EEPROM specified by argument 'y'. y = EEPROM Region to be read in hex (range 0..3f hex)	RFO FIPS: a 73 0 RFO FIPS: RA 73 <<< READ EXCITER EEPROM >>> Exciter EEPROM Cell 0x00 = 0x44 0x45 0x54 0x30
a 74	Txlin Carrier Null	1.1.0+	Null the carrier feedthru component of the center channel frequency.	RFO FIPS: a 74 Please wait. Command in process... RA 74 Carrier Null Complete. <<< CARRIER NULL TABLE >>> ---------- (Table Valid) --------- Txlin Register $12 Init 0x0c 0x04 0x08 Final --- 979 -385 -551 -382 -551 -382 980 -682 -351 -351 -701 -701 Vif ----- 0.16 0.16 0.16 ----- ===
a 75	Initialize Amplitude Alignment Parameters	1.1.0+	Initialize the Amplitude Alignment parameters to default values. The default *Phase Trng* is determined by the number of installed PA's. (1 PA = -10000, 2 PA = -14000) This command must be performed prior to Amplitude Alignment (A 76) or Wattmeter Calibration (A 71). Note: AM Amplitude alignment is derived from the FM alignment automatically by the software. Previous software had a parameter to specify AM vs. FM.	RFO FIPS: a 75 RFO FIPS: RA 75 <<< ALIGNMENT PARAMETER DEFAULT VALUES >>> K-Factor 990 = 0.408269 Fdback Atten 996 = 255 Phase Trng 982 = -10000 Txlin Reg2 954 = 84 Txlin Reg1 953 = 14 Txlin Atten 974 = 0 Mod Dev 2053 = 4800 FM Power Lvl 2054 = 28000 AM Pilot Pwr 2055 = 1600 AM Sdbd Pwr 2056 = 12426 ===

Table 1: RF-O! Action Commands (Sheet 6 of 21)

Command	Name	Version	Description	Example
a 76 x	Align the Station Power Amplitude	1.1.0+	Align the station power using the power meter as a reference. Key the station prior to running this command, with a single channel of FM modulation. (Use 'A 176 0 8 0 0 0 1 10 5 1). x = Current Power Reading (in watts) **Note:** Power Control (Parameter 992) must be DISABLED prior to running this command. **Note:** It is important that 'A 75' (Initialize Amplitude Alignment) be performed immediately prior to this command. **Note:** Previous software (prior to 1.2.0) had a parameter to specify AM vs. FM. AM power output is derived from FM alignment.	`RFO FIPS: a 76 82` `RFO FIPS: RA 76` `<<< ALIGNMENT PARAMETER VALUES >>>` `K-Factor 990 = 0.408269` `Fdback Atten 996 = 255` `Phase Trng 982 = -10000` `Txlin Reg2 954 = 0` `Txlin Reg1 953 = 14` `Txlin Atten 974 = 0` `Mod Dev 2053 = 4800` `FM Power Lvl 2054 = 28000` `AM Pilot Pwr 2055 = 1600` `AM Sdbd Pwr 2056 = 12426` `==========`
a 77 x	Subchannel Delay	1.0.0+	Set the subchannel simulcast delay. x = Subchannel Delay (0..9F hex - 125 microsecond increments)	**(if station is dekeyed)** `RFO FIPS: a 77 80` `RFO FIPS: RA 77` `<<< SUBCHANNEL DELAY >>>` `The Subchannel Delay is Set to 0x80.` **(if station is keyed)** `RFO FIPS: a 77 80` `RFO FIPS: RA 77` `<<< SUBCHANNEL DELAY >>>` `The Station Must be Dekeyed to Change the Subchannel Delay.` **(request format)** `RFO FIPS: a 77 ?` `RFO FIPS: RA 77` `<<< SUBCHANNEL DELAY >>>` `Usage: A 77 x` `x = Subchannel Delay (0..9F hex - in 125 Microsecond Increments)`

Table 1: RF-O! Action Commands (Sheet 7 of 21)

Command	Name	Version	Description	Example
a 79 x y	Read station power	1.0.0+	Reads the FM Power Level at the selected wattmeter/detector: x = Detector Selected 0 = Internal Forward 1 = Internal Reflected 2 = External Forward 3 = External Reflected y = Power Reading (optional) no arg = full power - zero reference 0 = zero reference reading 1 = full power reading **Note:** Due to the nature of AM modulation, the RFO does not monitor AM power output. The AM power output amplitude is determined by an algorithm based on the FM power output.	RFO FIPS: a 79 0 RFO FIPS: RA 79 <<< FM POWER OUTPUT READINGS >>> ========= INTERNAL FORWARD WATTMETER ========= Last Keyed FM Readings: Total Station Power: 105 Watts Total Wattmeter Voltage: +1.34 Volts Average FM Keyed Readings (over last 20 keyups): Power Per Subchannel: 101 Watts Calibration Factor: 1.009681 ---------- The Accuracy of This Meter is +- 10 %. ==========
a 80	Read All Wattmeters	1.1.0+	Displays the latest keyed FM power readings of all four wattmeter ports, as well as the number of subchannels active during the last key.	RFO FIPS: a 80 RFO FIPS: RA 80 <<< READ FM POWER OUTPUT >>> ========= RFO WATTMETER READINGS ========= Last Keyed FM Power Readings: Internal Forward: 95 watts Internal Reflected: 0 watts External Forward: 0 watts External Reflected: 92 watts Number of Subchannels: 1 ---------- The Accuracy of Each Meter is +- 10 %. ==========

Table 1: RF-O! Action Commands (Sheet 8 of 21)

Command	Name	Version	Description	Example
a 81	Read Exciter Temperature	1.1.0+	Displays the station temperature, at the exciter, in degrees Celsius. **Note:** Read parameter 1026 to determine the temperature at the OCM temperature sensor (Ambient Temperature).	RFO FIPS: a 81 RFO FIPS: RA 81 <<< EXCITER TEMPERATURE DATA >>> ---- One-Second Sample(s) ---- 00: 0x66 0x66 0x66 0x66 0x66 05: 0x66 0x66 0x66 0x66 0x66 10: 0x66 0x66 0x66 0x66 0x66 15: 0x66 0x66 0x66 0x66 0x66 20: 0x66 0x66 0x66 0x66 0x66 25: 0x66 0x66 0x66 0x66 0x66 30: 0x66 0x66 0x66 0x66 0x66 35: 0x66 0x66 0x66 0x66 0x66 40: 0x66 0x66 0x66 0x66 0x66 45: 0x66 0x66 0x66 0x66 0x66 50: 0x66 0x66 0x66 0x66 0x66 55: 0x66 0x66 0x66 0x66 0x66 ---------- Count = 34 ---- One-Minute Average(s) ---- 00: 0x66 0x66 0x66 0x66 0x66 ---------- Count = 01 Exciter Avg Temperature = 0x66 => 34.54 Degrees C ==========
a 82 **OBSOLETED** **RFO 1.2.0**	Read K-Factor	1.1.0-1.2.0	**Obsoleted Command.** Read the FM K-factor **Note:** Use 'R 990' or 'A 87 x' to display the current K-Factor while Power Control is disabled, or enabled, respectively.	**(prior to version 1.2.0)** RFO FIPS: RA 82 ---- FIPS K-Factor Read ---- parameter manager => 0.4083 shadow register => 0.0000 ========== **(Version 1.2.0+)** RFO FIPS: a 82 RFO FIPS: RA 82 ---- FIPS K-Factor Read ---- Obsolete Command - Read Parameter 990 for K-Factor.

Table 1: RF-O! Action Commands (Sheet 9 of 21)

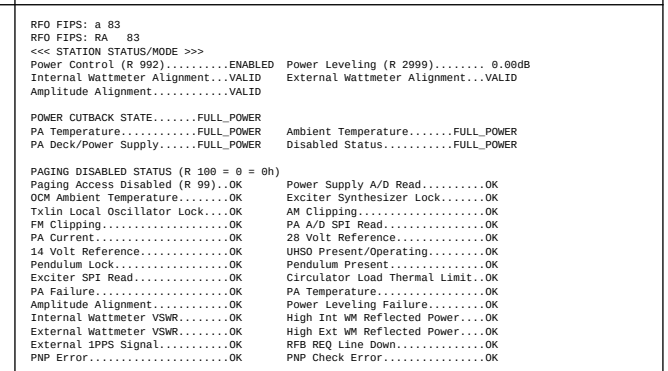
Command	Name	Version	Description	Example
a 83	Station Status	1.1.0+	Display the current status of the station. This command displays the current status of Power Control, Amplitude Alignment, Internal and External Wattmeter Alignment, Power Cutback State, Paging Disabled Status, and Power Leveling. **Note:** If any of the Alignments are INVALID, the RFO should be aligned or calibrated. **Note:** If the Power Leveling amount is greater than 0.5 dB or less than -0.5 dB, this tends to signal that the Amplitude Alignment is not accurate. If the Amplitude Alignment is accurate, then the Internal Wattmeter needs to be re-calibrated. **Note:** If any of the Disable Sources are ACTIVE, the transmitter will not key until the cause of the disable is cleared. Check the Alarm and Error Log (A 99 and A 104) for details on any active Disable Source. The transmitter can be temporarily disabled by writing parameter 99 to '1' (FIPS: w 99 1). It can then be enabled, if no other disable sources are ACTIVE, by writing it back to '0'.	

Table 1: RF-O! Action Commands (Sheet 10 of 21)

Command	Name	Version	Description	Example
a 84 v	P/A EEPROM Dump	1.0.0+	Reads and displays the values stored in the Power Amplifier Serial EEPROM specified by the parameter 'v'. v = P/A Number (range 1..4)	RFO FIPS: a 84 2 Please wait. Command in process... RA 84 <<< READ ENTIRE PA EEPROM >>> ---------- PA 02 EEPROM Cell(s) ---------- 0x00: 0x00 0x90 0x4d 0x00 0x00 0x00 0x00 0x00 "..M. ...." 0x02: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 ".... ...." 0x04: 0x30 0x30 0x30 0x30 0x30 0x00 0x00 0x00 "0000 0..." 0x06: 0x31 0x30 0x2e 0x30 0x30 0x00 0x00 0x00 "10.0 0..." 0x08: 0x31 0x33 0x2e 0x39 0x30 0x00 0x00 0x00 "13.9 0..." 0x0a: 0x30 0x30 0x30 0x30 0x30 0x00 0x00 0x00 "0000 0..." 0x0c: 0x30 0x2e 0x36 0x30 0x30 0x00 0x00 0x00 "0.60 0..." 0x0e: 0x31 0x31 0x2e 0x33 0x30 0x00 0x00 0x00 "11.3 0..." 0x10: 0x2d 0x2e 0x30 0x33 0x34 0x00 0x00 0x00 "-.03 4..." 0x12: 0x31 0x30 0x2e 0x39 0x38 0x00 0x00 0x00 "10.9 8..." 0x14: 0x33 0x38 0x2e 0x31 0x36 0x00 0x00 0x00 "38.1 6..." 0x16: 0x2e 0x30 0x35 0x37 0x34 0x00 0x00 0x00 ".057 4..." 0x18: 0x35 0x2e 0x32 0x35 0x38 0x00 0x00 0x00 "5.25 8..." 0x1a: 0x33 0x34 0x2e 0x34 0x34 0x00 0x00 0x00 "34.4 4..." 0x1c: 0x2e 0x32 0x34 0x37 0x31 0x00 0x00 0x00 ".247 1..." 0x1e: 0x35 0x2e 0x34 0x31 0x34 0x00 0x00 0x00 "5.41 4..." 0x20: 0x33 0x33 0x2e 0x37 0x35 0x00 0x00 0x00 "33.7 5..." 0x22: 0x31 0x2e 0x31 0x36 0x31 0x00 0x00 0x00 "1.16 1..." 0x24: 0x2d 0x32 0x2e 0x31 0x39 0x00 0x00 0x00 "-2.1 9..." 0x26: 0x33 0x31 0x2e 0x39 0x34 0x00 0x00 0x00 "31.9 4..." 0x28: 0x31 0x37 0x32 0x2e 0x36 0x00 0x00 0x00 "172. 6..." 0x2a: 0x2d 0x38 0x37 0x2e 0x32 0x00 0x00 0x00 "-87. 2..." 0x2c: 0x32 0x35 0x2e 0x33 0x35 0x00 0x00 0x00 "25.3 5..." 0x2e: 0x2d 0x33 0x2e 0x31 0x32 0x00 0x00 0x00 "-3.1 2..." 0x30: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 ".... ...." 0x32: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 ".... ...." 0x34: 0x30 0x31 0x34 0x31 0x32 0x32 0x36 0x2d "0141 226-" 0x36: 0x56 0x30 0x31 0x2e 0x30 0x31 0x00 0x00 "V01. 01.." 0x38: 0x43 0x4f 0x50 0x59 0x52 0x49 0x47 0x48 "COPY RIGH" 0x3a: 0x54 0x2c 0x4d 0x4f 0x54 0x4f 0x52 0x4f "T,MO TORO" 0x3c: 0x4c 0x41 0x2c 0x49 0x4e 0x43 0x2e 0x2c "LA,I NC.," 0x3e: 0x31 0x39 0x39 0x36 0x00 0x00 0x00 0x3c "1996 ...<" Calculated Checksum = 0xa8, Actual Checksum = 0x3c ==========

Table 1: RF-O! Action Commands (Sheet 11 of 21)

Command	Name	Version	Description	Example
a 85	Exciter EEPROM Dump	1.0.0+	Reads and displays the values stored in the Exciter Serial EEPROM. Note: The matching calculated and actual checksum verifies that at least one of the three alignments (Amplitude Alignment, Internal Wattmeter Calibration, External Wattmeter Calibration) has been completed successfully. It DOES NOT indicate that ALL have been completed successfully. Use 'A 83' to verify validity of alignment/calibrations.	RFO FIPS: a 85 Please wait. Command in process... RFO FIPS: RA 85 <<< READ ENTIRE EXCITER EEPROM >>> ------------------ Exciter EEPROM Cell(s) ------------------ 0x00: 0x44 0x45 0x54 0x30 0x30 0x32 0x31 0x30 "DET0 0210" 0x02: 0x32 0x2e 0x36 0x36 0x36 0x34 0x39 0x34 "2.66 6494" 0x04: 0x44 0x45 0x54 0x30 0x44 0x45 0x54 0x30 "DET0 DET0" 0x06: 0x44 0x45 0x54 0x30 0x44 0x45 0x54 0x30 "DET0 DET0" 0x08: 0x44 0x45 0x54 0x30 0x44 0x45 0x54 0x30 "DET0 DET0" 0x0a: 0x44 0x45 0x54 0x30 0x44 0x45 0x54 0x30 "DET0 DET0" 0x0c: 0x31 0x2e 0x30 0x2e 0x31 0x20 0x00 0x00 "1.0. 1 .." 0x0e: 0x30 0x30 0x30 0x31 0x43 0x48 0x4b 0xaa "0001 CHK." 0x10: 0x44 0x45 0x54 0x31 0x30 0x32 0x30 0x30 "DET1 0200" 0x12: 0x32 0x2e 0x32 0x33 0x36 0x30 0x37 0x33 "2.23 6073" 0x14: 0x44 0x45 0x54 0x31 0x44 0x45 0x54 0x31 "DET1 DET1" 0x16: 0x01 0x02 0x03 0x04 0x44 0x45 0x54 0x31 ".... DET1" 0x18: 0x44 0x45 0x54 0x31 0x44 0x45 0x54 0x31 "DET1 DET1" 0x1a: 0x44 0x45 0x54 0x31 0x44 0x45 0x54 0x31 "DET1 DET1" 0x1c: 0x39 0x37 0x30 0x38 0x31 0x31 0x00 0x00 "9708 11.." 0x1e: 0x30 0x30 0x30 0x31 0x43 0x48 0x4b 0xd0 "0001 CHK." 0x20: 0x41 0x47 0x4e 0x46 0x30 0x30 0x38 0x32 "AGNF 0082" 0x22: 0x30 0x30 0x30 0x45 0x30 0x30 0x30 0x30 "000E 0000" 0x24: 0x30 0x2e 0x34 0x30 0x38 0x32 0x36 0x39 "0.40 8269" 0x26: 0x30 0x30 0x46 0x46 0x31 0x32 0x43 0x30 "00FF 12C0" 0x28: 0x36 0x44 0x36 0x30 0x30 0x36 0x34 0x30 "6D60 0640" 0x2a: 0x33 0x30 0x38 0x41 0x30 0x30 0x30 0x30 "308A 0000" 0x2c: 0x31 0x2e 0x30 0x2e 0x31 0x20 0x00 0x00 "1.0. 1 .." 0x2e: 0x30 0x30 0x31 0x35 0x43 0x48 0x4b 0xc8 "0015 CHK." 0x30: 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 ".... ...." 0x32: 0x30 0x30 0x30 0x45 0x30 0x30 0x30 0x30 "000E 0000" 0x34: 0x30 0x2e 0x37 0x35 0x30 0x30 0x30 0x30 "0.75 0000" 0x36: 0x30 0x30 0x39 0x42 0x31 0x32 0x43 0x30 "009B 12C0" 0x38: 0x36 0x31 0x41 0x38 0x30 0x36 0x34 0x30 "61A8 0640" 0x3a: 0x33 0x30 0x38 0x41 0x41 0x47 0x4e 0x41 "308A AGNA" 0x3c: 0x31 0x2e 0x30 0x2e 0x31 0x20 0x00 0x00 "1.0. 1 .." 0x3e: 0x30 0x30 0x30 0x31 0x43 0x48 0x4b 0x3e "0001 CHK>" Calculated Checksum = 0x3e, Actual Checksum = 0x3e ==========

Table 1: RF-O! Action Commands (Sheet 12 of 21)

Command	Name	Version	Description	Example
a 87 x	Display the Set Power Level	1.1.0+	Read AM or FM Power Amplitude Alignment based on the current power setting and PA/Power Supply configuration. x = Modulation Type 0 = FM 1 = AM **Note:** These tables are only used by the RFO when Power Control is Enabled (w 992 1). When power control is disabled the values stored in parameters 990, 996, 982, 954, 953, 974, 2053, 2054, 2055, and 2056 are used to control the power output. By default, Power Control is Enabled upon reset (starting with RFO 1.2.0).	RFO FIPS: a 87 1 RFO FIPS: RA 87 <<< AM AMPLITUDE CONTROL PARAMETERS >>> Number of Subchannels Align 1 2 3 4 Power 150 69 69 0 0 K-Factor 990 1.000000 0.678233 0.959166 0.000000 0.000000 Fdback Atten 996 255 229 229 0 0 Phase Trng 982 -10000 -14000 -14000 0 0 Txlin Reg2 954 84 84 20 0 0 Txlin Reg1 953 14 14 14 0 0 Txlin Atten 974 0 0 0 0 0 Mod Dev 2053 4800 4800 4800 0 0 FM Power Lvl 2054 28000 28000 28000 0 0 AM Pilot Pwr 2055 1600 1600 1600 0 0 AM Sdbd Pwr 2056 12426 12426 12426 0 0 ========== RFO FIPS: a 87 0 RFO FIPS: RA 87 <<< FM AMPLITUDE CONTROL PARAMETERS >>> Number of Subchannels Align 1 2 3 4 Power 150 50 50 50 0 K-Factor 990 0.408269 0.235714 0.471428 0.707168 0.000000 Fdback Atten 996 255 255 255 255 0 Phase Trng 982 -10000 -14000 -14000 -14000 0 Txlin Reg2 954 84 84 20 20 0 Txlin Reg1 953 14 14 14 14 0 Txlin Atten 974 0 0 0 0 0 Mod Dev 2053 4800 4800 4800 4800 0 FM Power Lvl 2054 28000 28000 14000 9333 0 AM Pilot Pwr 2055 1600 1600 1600 1600 0 AM Sdbd Pwr 2056 12426 12426 12426 12426 0 ==========

Table 1: RF-O! Action Commands (Sheet 13 of 21)

Command	Name	Version	Description	Example
a 88 x y	Set Output Power	1.1.0+	Set AM or FM Output Power. For a single PA, 2 Power Supply Configuration, the Maximum AM Power Setting is 75 Watts. See the RFO! Linear Transmitter Power Chart for Maximum and Minimum settings for your particular configuration. x = Modulation Type 0 = FM (ReFLEX) 1 = AM (InFLEXion) y = User Requested Power Setting (watts)	RFO FIPS: a 88 ? RFO FIPS: RA 88 <<< SET POWER OUTPUT LEVEL >>> Usage: A 88 x y x = Modulation Type. 0=FM, 1=AM y = Desired Power Level Per Subchannel (watts). Valid FM Range for Current 2 PA Configuration is 25 - 290 Watts. Valid AM Range is 40 - 150 Watts. RFO FIPS: a 88 0 100 RFO FIPS: RA 88 <<< SET FM POWER OUTPUT >>> 2 PA Deck(s) Detected FM Modulation FM Power Level = 100 Watt(s) per Subchannel Subchannel(s) Minimum Maximum ------------------------------ 1 040 290 2 040 145 ---------- NOTE: This Configuration Will Allow The Transmitter to Key With 1 thru 2 FM Subchannels. All Other FM Key Requests Will Be Ignored. ========== RFO FIPS: a 88 1 65 RFO FIPS: RA 88 <<< SET AM POWER OUTPUT >>> 2 PA Deck(s) Detected AM Modulation AM Power Level = 65 Watt(s) per Subchannel Subchannel(s) Minimum Maximum ------------------------------ 1 065 150 2 040 075 ---------- NOTE: This Configuration Will Allow The Transmitter to Key With 1 thru 2 AM Subchannels. All Other AM Key Requests Will Be Ignored. ==========
a 89	Display Carrier Null Results	1.1.0+	Display the carrier null results. **Note:** Carrier Nulling must be performed via 'A 74' prior to using this command, for table value to be valid.	RFO FIPS: a 89 RFO FIPS: RA 89 <<< CARRIER NULL TABLE >>> ------- (Table Valid) -------- Txlin Register $12 $12 0x0c 0x04 0x08 0x00 ---------- 979 -551 -410 -551 -410 980 -301 -301 -710 -710 Vif 0.16 0.16 0.16 0.16 ==========

Table 1: RF-O! Action Commands (Sheet 14 of 21)

Command	Name	Version	Description	Example
a 90 x y z t u	Carrier Null Characterization	1.1.0+	Null the Carrier Feedthrough Component of the signal. x = parameter id (979 = i offset; 980 = q offset) y = Txlin register $12 value (0 ... 255) z = step count (minimum of 10) t = beginning offset (-3000 ... 3000) u = ending offset (-3000 ... 3000) **Note:** This was the original command used to null the carrier. Use command 'A 74' instead.	RFO FIPS: A 90 ? Please wait. Command in process... RA 90 <<< CARRIER NULL CHARACTERIZATION >>> Usage: A 90 x y z t u x = parameter ID: 979 for i offset, 980 for q offset. y = Txlin reg $12 value: 00 to ff. z = Step count: minimum 10. t = Beginning offset: -3000 to 3000. u = Ending offset: -3000 to 3000. Ending offset must be greater than beginning offset. See FIPS document for more information. ========== RFO FIPS: a 90 979 4 200 0 3000 Please wait. Command in process... RA 90 200 0 92 200 200 118 200 400 145 200 600 172 200 800 200 200 1000 217 200 1200 218 200 1400 218 200 1600 218 200 1800 218 200 2000 218 200 2200 218 200 2400 218 200 2600 218 200 2800 218 200 3000 218 RFO FIPS:
a 99	Read All Alarms	1.0.0+	Read all Alarms currently logged. The alarms logged here are a subset of those logged in the A 104 log. This Alarm log is typically reserved for alarms that immediately impact the operation of the station. This log is cleared by entering the 'A 103' command. **AL001** - Indicates that the Alarm is active and has been logged 001 time(s) since the last time the log was cleared. **OK000** - Indicates that an alarm was logged, but was cleared by the RFO software. The condition causing the alarm no longer exists.	RFO FIPS: a 99 RFO FIPS: RA 99 Reported Alarms --- AL001 - Alarm Occurred Due to OCM Reset. OK000 - Transmitter Disabled Due To High OCM Ambient Temperature. OK000 - Transmitter Disabled - (Check Disabled Status via FIPS: A 83).
a 103	Clear All Alarms	1.0.0+	Clear all logged Alarms. Clears all alarms displayed by 'a 99' command.	RFO FIPS: a 103 RFO FIPS:

Table 1: RF-O! Action Commands (Sheet 15 of 21)

Command	Name	Version	Description	Example
a 104	Read Error Log	1.0.0+	Returns the Error Log. Each error is returned in the format: **<Type><Action><Error Code><Caller><Line Num><Timestamp><Occurrences>** **Type** - helps determine which subsystem within the module is responsible for the error condition. The Type can take on values such as NVM, DSP,STATION_ERROR,GPS, etc.. **Action** - tells what action the error logging mechanism took when the error occurred. Action can be either RESET_STATION (fatal error, station was reset) or LOG_ERROR (non-fatal, error was logged, but station was not reset.) **Error Code** - used to identify individual errors. The tables in this document contain descriptions of each of the possible error codes. **Caller** - Used for software debugging. The Caller represents the software source code module which logged the error **Line Num** - Used for software debugging. The Line Num is the physical line number of the calling software source code module from where the error was logged. **Timestamp** - The time when the latest occurrence of the error was logged. During a reset and/or until the BCM locks GPS, the timestamp will contain the current value of the onboard clock, which starts timing from 1996/04/02.12:00:00 upon reset. If there is a BCM present and it locks GPS, the onboard clock will be set to the GPS Date/Time, which is GMT. **Occurrences** - the number of times the current combination of Type, Action, Error Code, Caller, and Line Num have occurred since the log was last cleared. Note that different Callers can log the same Error Code, in which case separate log entries will be made. Use 'A 111' to clear this log.	`RFO FIPS: a 104` `RFO FIPS:` `<STATION_ERROR> <LOG_ERROR> <S_RSR_SOFTWARE_WATCHDOG_RESET> <ROOT> <653>` `<1996/04/09.12:30:30> <1>`
a 110	Read Sware Log	1.0.0+	Returns the Software Error Log. These errors are usually directly related to the RFO's software operating system. Use 'A 113' to clear this log.	`RFO FIPS: a 110` `RFO FIPS:  <SWARE> <LOG_ERROR> <E_SRAM_READ_FAULT> <ERROR_LOG_HANDLER> <848>`

Table 1: RF-O! Action Commands (Sheet 16 of 21)

Command	Name	Version	Description	Example
a 111	Clear Error Log	1.0.0+	Clears the Error Log. Clears the errors displayed by the 'a 104' command.	
a 113	Clear Sware Log	1.0.0+	Clears the Software Error Log. Clears the errors displayed by the 'a 110' command.	
a 117	Station Reset	1.0.0+	Software Reset of the Station.	
a 154	Read Pendulum Warp Value	1.1.3+	Reads the Pendulum Warp Value directly from the Pendulum IC. Value is changed via parameter 185.	`RFO FIPS: a 154` `RFO FIPS: RA 154 110`
a 165 <freq>	Program Exciter Synthesizer 1	1.0.0+	Programs the First Synthesizer of the Exciter with <freq>. Must be in kHz. Ex. 929MHz = 929000.0kHz. *`WARNING: This command intended for Lab/ Development use only!`*	`RFO FIPS: a 165 929000` `RFO FIPS: RA  165` `<<< PROGRAM EXCITER SYNTHESIZER FREQUENCY >>>` `Synthesizer 1 Frequency is Set at 929000.000 kHz`
a 166	Read Exciter Synthesizer 1	1.0.0+	Returns the frequency last manually programmed into the First Synthesizer using the action command 165.	`RFO FIPS: a 166` `RFO FIPS: RA  166` `<<< READ SYNTHESIZER FREQUENCY >>>` `Synthesizer 1 Frequency is Set at 929000.000 kHz`
a 167 <freq>	Program Exciter Synthesizer 2	1.0.0+	Programs the Second Synthesizer of the Exciter with <freq>. Must be in kHz. Ex. 929MHz = 929000.0kHz. Note: This is only a temporary means of programming the Synthesizer! *`WARNING: This command intended for Lab/ Development use only!`*	`RFO FIPS: a 167 929000` `RFO FIPS: RA  167` `<<< PROGRAM EXCITER SYNTHESIZER FREQUENCY >>>` `Synthesizer 2 Frequency is Set at 929000.000 kHz`
a 168	Read Exciter Synthesizer 2	1.0.0+	Returns the frequency last manually programmed into the Second Synthesizer using the action command 167.	`RFO FIPS: a 168` `RFO FIPS: RA  168` `<<< READ SYNTHESIZER FREQUENCY >>>` `Synthesizer 2 Frequency is Set at 929000.000 kHz`

Table 1: RF-O! Action Commands (Sheet 17 of 21)

Command	Name	Version	Description	Example
a 171 <reg> <arg>	Set TXLIN Register	1.0.0+	Set the selected register in the TXLIN IC. <req> = 00 to 19 (hex) <arg> = 00 to ff (hex) *WARNING: This command intended for Lab/ Development use only!*	RFO FIPS: a 171 10 37 RFO FIPS: RA 171 <<< SET TXLIN REGISTER >>> Register 0x10 = 0x37 Calculated checksum = 0x07a9 Actual checksum = 0x07a9 RFO FIPS:
a 172	Read TXLIN	1.0.0+	Returns the current register settings in the TXLIN IC.	RFO FIPS: a 172 RFO FIPS: RA 172 <<< READ TXLIN IC >>> Reg 0x00: Invert I/Q = 0x16 Reg 0x01: ASW/PWRC = 0x0e Reg 0x02: LOA = 0x54 Reg 0x03: LON = 0x31 Reg 0x04: LOR = 0xf1 Reg 0x05: Interval A = 0x14 => 125.00 usec Reg 0x06: Interval B = 0x27 => 243.75 usec Reg 0x07: Interval C = 0x00 => 0.00 usec Reg 0x08: Interval D = 0xca => 1262.50 usec Reg 0x09: Interval E = 0xcc => 1275.00 usec Reg 0x0A: Interval F = 0x51 => 506.25 usec Reg 0x0B: Interval G = 0x7e => 787.50 usec Reg 0x0C: Interval H = 0xcb => 1268.75 usec Reg 0x0D: Interval I = 0x40 => 400.00 usec Reg 0x0E: Interval J = 0x20 => 200.00 usec Reg 0x0F: Interval K = 0xff => 1593.75 usec Reg 0x10: Interval L = 0x36 => 337.50 usec Reg 0x11: Interval M = 0x4d => 481.25 usec Reg 0x12: IQ Slew = 0x00 Reg 0x13: Pmode/DAC = 0x1f Reg 0x14: PDAC = 0x7f Reg 0x15: Ph/Lvl/Loop = 0x13 Reg 0x16: Attenuator = 0x00 Reg 0x17: Manual Sin = 0x00 Reg 0x18: Manual Cos = 0x00 Reg 0x19: Interval N = 0x10 => 100.00 usec Calculated Checksum = 0x07a8 Actual Checksum = 0x07a8 Information = 0x02 Attenuation = 0xff Sine = 0xfe Cosine = 0x96 ==========

Table 1: RF-O! Action Commands (Sheet 18 of 21)

Command	Name	Version	Description	Example
a 176 m p1 p2 p3 p4 1 b 5 1	Test Mode Start	1.1.1+	Key the station in test mode m = modulation type 0 = FM 1 = AM p = pattern (where p1 is for subchannel 1, p2 for subchannel 2, p3 for subchannel 3, and p4 for subchannel 4) 0 - No Pattern 1 - FM Big Comma 2 - FM Little comma 3 - FM Staircase 4-level 4 - FM Symbol A (10) 5 - FM Symbol B (11) 6 - FM Symbol C (01) 7 - FM Symbol D (00) 8 - FM Random 9 - FM Reserved 10 - AM 2-tone (400 Hz + 1 kHz) 11 - AM 1-tone (1.7 kHz) 12 - AM Female voice 13 - AM Male voice b = Number of Blocks per Frame (0..11) 11 Represents a Full Frame.	RFO FIPS: a 176 0 8 0 0 0 1 10 5 1 RFO FIPS: RA 176 <<< RFO TEST MODES >>> The Station is Keyed in Test Mode ... RFO FIPS: RFO FIPS: a 176 ? RFO FIPS: RA 176 <<< RFO TEST MODES >>> OCM Test Mode command syntax: A 176 m p p p p 1 b 5 1 | | | | | | | | | +- fsk level - 3200 sym/sec | | | | | | | | +---- bit speed - 6400 bits/sec | | | | | | | +------- # forward blocks (1 - 11) | | | | | | +---------- frame frequency | | | | +------------ subchannel 4 pattern (1-13) | | | +-------------- subchannel 3 pattern (1-13) | | +---------------- subchannel 2 pattern (1-13) | +------------------ subchannel 1 pattern (1-13) +-------------------- modulation mode (0 = FM, 1 = AM) Pattern options: 1 - FM Big Comma 2 - FM Little comma 3 - FM Staircase 4-level 4 - FM Symbol A (10) 5 - FM Symbol B (11) 6 - FM Symbol C (01) 7 - FM Symbol D (00) 8 - FM Random 9 - FM Reserved 10 - AM 2-Tone (400 Hz + 1 kHz) 11 - AM 1-Tone (1.7 kHz) 12 - AM Female Voice 13 - AM Male Voice
a 177	Test Mode Stop	1.1.1+	Exit Test Mode. Used to dekey the station, after keying with the 'A 176' command.	RFO FIPS: a 177 RFO FIPS: RA 177 The Station is Dekeyed.

Table 1: RF-O! Action Commands (Sheet 19 of 21)

Command	Name	Version	Description	Example
a 188 y	Exciter A/D Read	1.0.0+	Reads One or All Exciter A/D channels specified by argument 'y'. y = A/D Channel (0x00-0x0B or 0x0C to return all Channels.)	RFO FIPS: a 188 c RFO FIPS: RA 188 <<< READ EXCITER A/D >>> Reg 00: A+ (14V) = 108 => 14.20 Volt(s) Reg 01: Rect IF = 036 => 0.70 Volt(s) Reg 02: 10 V = 167 => 10.18 Volt(s) Reg 03: CHG Freq 1 = 003 => PASS (> 0) Reg 04: 5V Analog = 128 => 4.99 Volt(s) Reg 05: LO2 Lock 2 = 252 => PASS (> 200) Reg 06: LO2 Lock 1 = 252 => PASS (> 200) Reg 07: EX Temp = 113 => 40.48 Deg(s) C Reg 08: A/D Ref = 125 => 2.44 Volt(s) Reg 09: CHG Freq 2 = 003 => PASS (> 0) Reg 0A: Epot Wiper = 253 => 4.93 Volt(s) Reg 0B: A/D Test = 128 => PASS (> 126) ==========

Table 1: RF-O! Action Commands (Sheet 20 of 21)

Command	Name	Version	Description	Example
a 192 NNNN x	Enable Trace Mode Note: Enabling traces CAN affect station performance...use traces with caution. Be sure to turn off all unused traces. All traces will be turned off upon station reset.	1.0.0+	Enables a mode which will output the occurrence of certain events to the FIPS session. The arguments are: *NNNN x (Trace Enabled)* DIAG 1 - Diagnostic Error Log Trace SPIQ 1 - SPI Activity SHMI 1 - Power Supply Status SHMI 2 - Ambient Temperature Status SHMI 4 - P/A Temperature Status SHMI 8- Reserved SHMI 16 - USHO Present Debug SHMI 32- Pendulum Locked Debug SHMI 64 - Pendulum Present Debug SHMI 128 - Exciter Synth 1 Locked Debug SHMI 256 - Exciter Synth 2 Locked Debug DIDQ 1 - Start Time Error DIDQ 2 - Incomplete Frame Error DIDQ 4 - Modulation Type Error DIDQ 8 - Frequency Offset Error DIDQ 16 - Invalid Command Type DIDQ 32 - Control Command Format Error DIDQ 64 - Unexpected Symbol Command Error DIDQ 128 - Symbol Data Command Format Error DIDQ 256 - End of Command Error DIDQ 512 - Workahead Window Error DIDQ 1024 - Check Command Format Error DIDQ 2048 - Invalid Symbol Duration MPCM 16 - Remote Software Download Trace ITCM 1 - K Factor Trace ITCM 2 - Attenuation Level Trace ITCM 4 - Cutback Mode Trace ITCM 8 - PA Deck Trace ITCM 16 - Power Supply Trace ITCM 32 - Carrier Null Trace SPCQ 1 - Protocol Trace SPCQ 2 - Reserved SPCQ 4 - Reserved SPCQ 8 - DSP Flush Frame State Trace SPCQ 16 - Power Leveling Trace SPCQ 32 - VSWR Checking Trace SPCQ 64 - Wattmeter Trace SPCQ 128 - DSP Flush ID Trace RFCQ 1 - Control Command Trace RFCQ 2 - Check Command Trace M1HQ 1 - Modulation Parameters (Mod DSP 1) M2HQ 1 - Modulation Parameters (Mod DSP 2) COHQ 1 - Launch and Synthesizer Trace COHQ 2 - Peak to Average Trace	RFO FIPS: a 192 SPCQ 16 RFO FIPS: RA 192 RFO FIPS: a 192 SHMI 1 RFO FIPS: RA 192 RFO FIPS: <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.22 Volt(s) <SPCQ 16> LEVELING: Set=100 W Act=103 W Lvl Chg=-0.13 dB Total= 1.57 dB <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.24 Volt(s) <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.24 Volt(s) <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.22 Volt(s) <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.24 Volt(s) <SHMI 1> PS: PS1=left: PS2=right PS1=> 4.22 Volt(s): PS2=> 4.24 Volt(s)

Table 1: RF-O! Action Commands (Sheet 21 of 21)

Command	Name	Version	Description	Example
a 193 NNNN x	Disable Trace Mode	1.0.0+	Use Table above to disable traces previously enabled with an "a 192" command.	`RFO FIPS: a 193 RFCQ 1` `RFO FIPS: RA  193` `RFO FIPS:`
a 195 x x x x	Set Subchannel Frequency Offsets	1.0.0+	Set the subchannel frequency offsets for Test Modes. x = 0..3, 13..15 0 = 0 khz 1 = 6.25 khz, 13 = -18.75 khz 2 = 12.50 khz, 14 = -12.50 khz 3 = 18.75 khz, 15 = - 6.25 khz	`RFO FIPS: a 195 1 2 3 1` `RFO FIPS: RA  195` `<<< SET SUBCHANNEL FREQUENCY OFFSETS >>>` `Subchannel Frequency Offsets Set to: 1, 2, 3, 1` `For Subchannels 1 Through 4, Respectively.` `Where:` ` 13 = -18.75 kHz, 14 = -12.50 kHz, 15 = -6.25 kHz` `  0 =   0.00 kHz` `  1 =   6.25 kHz,  2 =  12.50 kHz,  3 = 18.75 kHz`
a 196 x	Set RF channel	1.0.0+	Set the RF Channel to use when keying in Test Modes. x = channel (range: 0..15) **Note:** RF Channels 0 through 15, are set to the Center Frequencies programmed in parameter 2000 through 2015, respectively.	`RFO FIPS: a 196 1` `RFO FIPS: RA  196` `RFO FIPS: RA  196` `<<< SET TEST CHANNEL >>>` `Test Channel Set to 1.` `RFO FIPS: a 196 ?` `RFO FIPS: RA  196` `<<< SET TEST CHANNEL >>>` ` Usage: A 196 x` ` x = RF Channel (0..15)`

Table 2: RF-O! Parameters (Sheet 1 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 99 **w 99 <arg>**	Paging Access Disable	1.0.0+	0	1	0	N/A	N/A	N/A	Paging Access Disable is used to locally disable the transmitter. If the transmitter is not already disabled, writing this parameter to '1' will cause the transmitter to cease transmission. The DISABLE LED will light, and the TX_OK output to the RFB will change to the "Not OK" state. To re-enable paging access, and there are no other disables active, write this parameter to '0'.(See also, A 83, or parameter 100)
r 100	Paging Disabled Status	1.2.0+	0	0xFFFFFFFF	0	n/a	Y	Y	Gives the current disabled status of the station. If the transmitter is disabled by the software, the value read will be a number other than 0. Each possible disable source is specified by a single bit. (See Table 3:Paging Disabled Bit Definitions (R 100) for a detailed description of each of the Paging Disabled Status bits).
r 136 **w 136 <arg>**	FIPS Inactivity Timer	1.0.0+	60	3600	300	sec	Y	Y	Return/Set the Inactivity Timer which will cause the host to exit FIPS if no keystrokes are recorded during the elapsed time in this parameter.

Table 2: RF-O! Parameters (Sheet 2 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 140 **w 140 <arg>**	FIPS Baud Rate	1.0.0+	1	8	4	N/A	Y	Y	Return/Set the Communication Data Rate of the FIPS Port. The following arguments apply: 1 = 1200 bps 2 = 2400 bps 3 = 4800 bps 4 = 9600 bps 5 = 19200 bps 6 = 38400 bps 7 = 57600 bps 8 = 115200 bps Reset RFO after "w 140 <arg>". New FIPS baud rate will only be started after reset.
r 141 **w 141 <arg>**	Internal Wattmeter Forward Power Minimum Limit	1.0.0+	0	600	0	Watts	Y	Y	Return/Set the Internal Wattmeter Forward Power Minimum Limit.
r 142 **w 142 <arg>**	Internal Wattmeter Forward Power Maximum Limit	1.0.0+	0	600	600	Watts	Y	Y	Return/Set the Internal Wattmeter Forward Power Maximum Limit.
r 143 **w 143 <arg>**	Internal Wattmeter Reflected Power Limit	1.0.0+	0	600	600	Watts	Y	Y	Return/Set the External Wattmeter Reflected Power Limit.
r 144 **w 144 <arg>**	External Wattmeter Forward Power Minimum Limit	1.0.0+	0	600	0	Watts	Y	Y	Return/Set the External Wattmeter Reflected Power Limit.
r 145 **w 145 <arg>**	External Wattmeter Forward Power Maximum Limit	1.0.0+	0	600	600	Watts	Y	Y	Return/Set the External Forward Power.

Table 2: RF-O! Parameters (Sheet 3 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 146 **w 146 <arg>**	External Wattmeter Reflected Power Limit	1.0.0+	0	600	600	Watts	Y	Y	Return/Set the External Reflected Power.
r 148	Active Application Software Version	1.0.0+	N/A	N/A	N/A	N/A	N/A	N/A	Return the Active Application Software Version.
r 152	Dormant Application Software Version	1.0.0+	N/A	N/A	N/A	N/A	N/A	N/A	Return the Software Version of the Bank which is not selected using command 'r 901'
r 155 **w 155**	Hardware Serial Number	1.2.2+	N/A	N/A	None	None	N	N	Storage String for serial number. Eight alpha-numeric characters max. length.
r 185 **w 185 <arg>**	Pendulum Warp	1.0.0+	0	215	110	N/A	Y	Y	Programs the Pendulum IC with the Warping value specified in this parameter on power-up. *WARNING: This parameter intended for Lab/Development use only!*
r 707 **w 707 <arg>**	User Password	1.0.0+	N/A	N/A	"6000"	N/A	N	Y	Return/Set the Password used to enter FIPS mode.
r 710 **w 710 <arg>**	Xilinx Type	1.0.0+	1	4	4	N/A	N	N	Return/Set the model of the FPLD on the RFO. *WARNING: This parameter intended for Lab/Development use only!*
r 901 **w 901 <arg>**	Active Flash Bank	1.0.0+	1	2	1	N/A	N	N	Return/Set the Application Bank which currently used (read). Writing to this parameter will take effect on the next station reset.

Table 2: RF-O! Parameters (Sheet 4 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 902 **w 902 <arg>**	One Pulse Per Second Window Size	1.0.0+	1	5	5	N/A	N	N	Return/Set the 1 PPS Simulcast Window Size. Arg Window Size(nanosec) 1 480 2 950 3 1900 4 3810 5 7620 *WARNING: This parameter intended for Lab/Development use only!*
r 951	IF Frequency	1.0.0+	70000	225000	107400	KHz	Y	Y	Return the IF Frequency used in programming the Exciter Synthesizers. *WARNING: This parameter intended for Lab/Development use only!*
r 953 **w 953 <arg>**	Exciter Attenuator (Txlin Register 01)	1.0.0+	0	255	14	N/A	N	Y	Return/Set the value of Exciter IC Attenuator level. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 5 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 954 **w 954 x**	Txlin 6 dB Attenuator (Txlin Register 02)	1.2.0+	0	0xFF (255)	0x54 (84)	bit field	Y	Y	Return/Set the value of Txlin 6dB Attenuator. This value should be set to one of two values; 0x10 or 0x54. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.**
r 974 **w 974 <arg>**	Attenuator Level (Txlin Register 22)	1.0.0+	0	255	255	N/A	N	Y	Return/Set the value of Txlin Register 22 (also called the 10db Attenuator). This parameter is currently used to control station power output. A high value will result in a lower power output and a lower value will result in higher power output. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.**
r 979 **w 979 <arg>**	I Offset	1.0.0+	-3000	3000	0	N/A	N	N	Return/Set the parameter used by the Collector DSP to modify the IQ data stream. *WARNING: This parameter intended for Lab/Development use only!*
r 980 **w 980 <arg>**	Q Offset	1.0.0+	-3000	3000	0	N/A	N	N	Return/Set the parameter used by the Collector DSP to modify the IQ data stream. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 6 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 981 **w 981 <arg>**	IQ Balance	1.0.0+	-5.0	5.0	0.00	N/A	N	N	Return/Set the parameter used by the Collector DSP to modify the IQ data stream. *WARNING: This parameter intended for Lab/Development use only!*
r 982 **w 982 <arg>**	Phase Training Scale	1.0.0+	-32767	-5000	-10000 (Single PA system)	N/A	N	N	Return/Set the parameter used by the Collector DSP to scale the amplitude of the training waveform sent to the Txlin on the Exciter. This parameter should be set according to the number of PA's installed in the transmitter: Single PA: Param 982 = -10000 Two PA's: Param 982 = -14000 **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*
r 990 **w 990 <arg>**	K Factor	1.0.0+	0.0	1.0	1.0	N/A	N	Y	Return/Set the parameter used as a fine power level scaling in the Collector DSP. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 7 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 991 **w 991 <arg>**	Spectrum Invert	1.0.0+	0	1	1	N/A	Y	Y	Return/Set the parameter used by the Collector DSP to modify the IQ data stream. *WARNING: This parameter intended for Lab/Development use only!*
r 992 **w 992 <arg>**	Power Control Enable	1.1.0+	0	1	0	N/A	N	Y	Return/Set the value of Power Control Enable=1/Disable=0. **Note: If Power Control is ENABLED, changes to certain parameters will NOT take effect until Power Control is DISABLED. These parameters include 953, 954, 974, 982, 990, 996, 2053, 2054, 2055, 2056.** *WARNING: This parameter intended for Lab/Development use only!*
r 993	Power Amplifier Deck Configured	1.0.0+	0	4	(dependent on number of operational PA's)	N/A	N/A	N/A	Number of operational PA decks detected by the RFO software.
r 994	FM Power Output	1.0.0+	32	500	75	Watts	N	Y	Returns the current FM Power Output setting. This value is modified using the 'A 88 0' command.
r 995	AM Power Output	1.0.0+	32	300	75	Watts	N	Y	Returns the current AM Power Output setting. This value is modified using the 'A 88 1' command.

Table 2: RF-O! Parameters (Sheet 8 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 996 **w 996 <arg>**	Exciter Feedback Attenuation	1.0.0+	0 *(Do not set below 36!)*	255	255	N/A	Y	Y	Power Output Control Parameter **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: Do not set below 36 to avoid PA damage. This parameter intended for Lab/Development use only!*
r 997 **w 997**	Power Leveling Enable	1.2.5+	0	1	1	N/A	Y	Y	Return/Set the value of Power Leveling Enable=1/Disable=0. Note: Power Control (parameter 992) must also be enabled for Power Leveling to be performed
r 1023 **w 1023 x**	Number of Power Amplifiers Installed in Station	1.2.0+	0	4	1	Units	Y	Y	This number must match the number of PA's installed in the RFO. This number is used by the RFO software to determine the power cutback based on number of operational PA decks.
r 1024 **w 1024 x**	PA vs. Ambient Temp Shutdown Offset	1.2.0+	10	45	45	Deg C	Y	Y	This parameter defines the number of degrees over the current Ambient temperature at which the transmitter will be shutdown.
r 1025 **w 1025 <arg>**	PA vs Ambient Temp 3dB Cutback Offset	1.0.0+	10	30	30	C	N	Y	If a Power Amplifiers operating temperature exceeds the ambient temperature plus this parameter, a Power Amplifier Overtemperature Alarm will be issued and the transmitter will cutback by 3 dB.
r 1026	Current Ambient Temperature	1.0.0+	-50	140	30	C	N/A	N/A	This is the current ambient temperature at the front of the RF-Orchestra.

Table 2: RF-O! Parameters (Sheet 9 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1027 **w 1027 <arg>**	1PA/2PS Acceptable Current Difference	1.0.0+	0	50	10	Amps	N	Y	Used to determine a Power Supply failure on a 1PA/2PS Station. This is the measured current difference threshold between Power Supplies before a failure alarm is issued.
r 1028 **w 1028 <arg>**	Ambient Temperature Sensor Voltage Calibration	1.0.0+	0.00	5.00	2.98	VDC	N	Y	This is the voltage value used in calibrating the stations ambient temperature sensor.
r 1029 **w 1029 <arg>**	Ambient Temperature Sensor Temperature Calibration	1.0.0+	-30.00	70.00	25.00	C	N	Y	This is the temperature value used in calibrating the stations ambient temperature sensor.
r 1030 **w 1030 x**	Check Circulator Load Thermal Switch	1.2.0+	0	1	1	n/a	Y	Y	This parameter allows enabling/disabling the check of the circulator load thermal limit. By default checking is enabled (1). In certain instances in the field an RFO may not have a circulator load thermal switch installed, in which case, this parameter should be set to disabled (0).
r 1100 **w 1100 <arg>**	Peak-to-Average High Soft Threshold 1 Subchannels	1.0.0+	-32768	32767	739	N/A	Y	Y	Return/Set the value of Peak-to-Average High Soft Threshold 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1101 **w 1101 <arg>**	Peak-to-Average Soft Threshold Constant 1 Subchannel	1.0.0+	-32768	32767	82	N/A	Y	Y	Return/Set the value of Peak-to-Average Soft Threshold Constant 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 10 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1102 **w 1102 <arg>**	Peak-to-Average Low Soft Threshold 1 Subchannel	1.0.0+	-32768	32767	32767	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Soft Threshold 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1103 **w 1103 <arg>**	Peak-to-Average High Control Signal 1 Subchannel	1.0.0+	-32768	32767	-3277	N/A	Y	Y	Return/Set the value of Peak-to-Average High Control Signal 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1104 **w 1104 <arg>**	Peak-to-Average Low Control Signal 1 Subchannel	1.0.0+	-32768	32767	821	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Control Signal 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1105 **w 1105 <arg>**	Peak-to-Average Hard Fold Level 1 Subchannel	1.0.0+	-32768	32767	1277	N/A	Y	Y	Return/Set the value of Peak-to-Average Hard Fold Level 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1106 **w 1106 <arg>**	Peak-to-Average Feedback Constant 1 Subchannel	1.0.0+	-32768	32767	3277	N/A	Y	Y	Return/Set the value of Peak-to-Average Feedback Constant 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 11 of 30)

Command	Name	Version	Lower	Upper	Default			
r 1107 **w 1107 <arg>**	Peak-to-Average Nominal Average to Peak 1 Subchannel	1.0.0+	-32768	32767	5193	N/A	Y	Y	Return/Set the value of Peak-to-Average Nominal Average to Peak 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1108 **w 1108 <arg>**	Peak-to-Average Average to Peak Scale 1 Subchannel	1.0.0+	-32768	32767	2554	N/A	Y	Y	Return/Set the value of Peak-to-Average Average to Peak Scale 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1109 **w 1109 <arg>**	Peak-to-Average Output Scale 1 Subchannel	1.0.0+	-32768	32767	2	N/A	Y	Y	Return/Set the value of Peak-to-Average Output Scale 1 Subchannel. *WARNING: This parameter intended for Lab/Development use only!*
r 1110 **w 1110 <arg>**	Peak-to-Average High Soft Threshold 2 Subchannels	1.0.0+	-32768	32767	739	N/A	Y	Y	Return/Set the value of Peak-to-Average High Soft Threshold 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1111 **w 1111 <arg>**	Peak-to-Average Soft Threshold Constant 2 Subchannels	1.0.0+	-32768	32767	82	N/A	Y	Y	Return/Set the value of Peak-to-Average Soft Threshold Constant 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 12 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1112 **w 1112 <arg>**	Peak-to-Average Low Soft Threshold 2 Subchannels	1.0.0+	-32768	32767	32767	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Soft Threshold 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1113 **w 1113 <arg>**	Peak-to-Average High Control Signal 2 Subchannels	1.0.0+	-32768	32767	-3277	N/A	Y	Y	Return/Set the value of Peak-to-Average High Control Signal 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1114 **w 1114 <arg>**	Peak-to-Average Low Control Signal 2 Subchannels	1.0.0+	-32768	32767	821	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Control Signal 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1115 **w 1115 <arg>**	Peak-to-Average Hard Fold Level 2 Subchannels	1.0.0+	-32768	32767	1277	N/A	Y	Y	Return/Set the value of Peak-to-Average Hard Fold Level 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1116 **w 1116 <arg>**	Peak-to-Average Feedback Constant 2 Subchannels	1.0.0+	-32768	32767	3277	N/A	Y	Y	Return/Set the value of Peak-to-Average Feedback Constant 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 13 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1117 **w 1117 <arg>**	Peak-to-Average Nominal Average to Peak 2 Subchannels	1.0.0+	-32768	32767	5193	N/A	Y	Y	Return/Set the value of Peak-to-Average Nominal Average to Peak 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1118 **w 1118 <arg>**	Peak-to-Average Average to Peak Scale 2 Subchannels	1.0.0+	-32768	32767	2554	N/A	Y	Y	Return/Set the value of Peak-to-Average Average to Peak Scale 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1119 **w 1119 <arg>**	Peak-to-Average Output Scale 2 Subchannels	1.0.0+	-32768	32767	2	N/A	Y	Y	Return/Set the value of Peak-to-Average Output Scale 2 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1120 **w 1120 <arg>**	Peak-to-Average High Soft Threshold 3 Subchannels	1.0.0+	-32768	32767	739	N/A	Y	Y	Return/Set the value of Peak-to-Average High Soft Threshold 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1121 **w 1121 <arg>**	Peak-to-Average Soft Threshold Constant 3 Subchannels	1.0.0+	-32768	32767	82	N/A	Y	Y	Return/Set the value of Peak-to-Average Soft Threshold Constant 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 14 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1122 **w 1122 <arg>**	Peak-to-Average Low Soft Threshold 3 Subchannels	1.0.0+	-32768	32767	32767	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Soft Threshold 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1123 **w 1123 <arg>**	Peak-to-Average High Control Signal 3 Subchannels	1.0.0+	-32768	32767	-3277	N/A	Y	Y	Return/Set the value of Peak-to-Average High Control Signal 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1124 **w 1124 <arg>**	Peak-to-Average Low Control Signal 3 Subchannels	1.0.0+	-32768	32767	821	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Control Signal 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1125 **w 1125 <arg>**	Peak-to-Average Hard Fold Level 3 Subchannels	1.0.0+	-32768	32767	1277	N/A	Y	Y	Return/Set the value of Peak-to-Average Hard Fold Level 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1126 **w 1126 <arg>**	Peak-to-Average Feedback Constant 3 Subchannels	1.0.0+	-32768	32767	3277	N/A	Y	Y	Return/Set the value of Peak-to-Average Feedback Constant 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 15 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1127 **w 1127 <arg>**	Peak-to-Average Nominal Average to Peak 3 Subchannels	1.0.0+	-32768	32767	5193	N/A	Y	Y	Return/Set the value of Peak-to-Average Nominal Average to Peak 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1128 **w 1128 <arg>**	Peak-to-Average Average to Peak Scale 3 Subchannels	1.0.0+	-32768	32767	2554	N/A	Y	Y	Return/Set the value of Peak-to-Average Average to Peak Scale 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1129 **w 1129 <arg>**	Peak-to-Average Output Scale 3 Subchannels	1.0.0+	-32768	32767	2	N/A	Y	Y	Return/Set the value of Peak-to-Average Output Scale 3 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1130 **w 1130 <arg>**	Peak-to-Average High Soft Threshold 4 Subchannels	1.0.0+	-32768	32767	739	N/A	Y	Y	Return/Set the value of Peak-to-Average High Soft Threshold 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1131 **w 1131 <arg>**	Peak-to-Average Soft Threshold Constant 4 Subchannels	1.0.0+	-32768	32767	82	N/A	Y	Y	Return/Set the value of Peak-to-Average Soft Threshold Constant 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 16 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1132 **w 1132 <arg>**	Peak-to-Average Low Soft Threshold 4 Subchannels	1.0.0+	-32768	32767	32767	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Soft Threshold 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1133 **w 1133 <arg>**	Peak-to-Average High Control Signal 4 Subchannels	1.0.0+	-32768	32767	-3277	N/A	Y	Y	Return/Set the value of Peak-to-Average High Control Signal 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1134 **w 1134 <arg>**	Peak-to-Average Low Control Signal 4 Subchannels	1.0.0+	-32768	32767	821	N/A	Y	Y	Return/Set the value of Peak-to-Average Low Control Signal 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1135 **w 1135 <arg>**	Peak-to-Average Hard Fold Level 4 Subchannels	1.0.0+	-32768	32767	1277	N/A	Y	Y	Return/Set the value of Peak-to-Average Hard Fold Level 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1136 **w 1136 <arg>**	Peak-to-Average Feedback Constant 4 Subchannels	1.0.0+	-32768	32767	3277	N/A	Y	Y	Return/Set the value of Peak-to-Average Feedback Constant 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 17 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 1137 **w 1137 <arg>**	Peak-to-Average Nominal Average to Peak 4 Subchannels	1.0.0+	-32768	32767	5193	N/A	Y	Y	Return/Set the value of Peak-to-Average Nominal Average to Peak 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1138 **w 1138 <arg>**	Peak-to-Average Average to Peak Scale 4 Subchannels	1.0.0+	-32768	32767	2554	N/A	Y	Y	Return/Set the value of Peak-to-Average Average to Peak Scale 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 1139 **w 1139 <arg>**	Peak-to-Average Output Scale 4 Subchannels	1.0.0+	-32768	32767	2	N/A	Y	Y	Return/Set the value of Peak-to-Average Output Scale 4 Subchannels. *WARNING: This parameter intended for Lab/Development use only!*
r 2000 **w 2000 <arg>**	Center Frequency 1	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 1st entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2001 **w 2001 <arg>**	Center Frequency 2	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 2nd entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*

Table 2: RF-O! Parameters (Sheet 18 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2002 **w 2002 <arg>**	Center Frequency 3	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 3rd entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2003 **w 2003 <arg>**	Center Frequency 4	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 4th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2004 **w 2004 <arg>**	Center Frequency 5	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 5th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2005 **w 2005 <arg>**	Center Frequency 6	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 6th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2006 **w 2006 <arg>**	Center Frequency 7	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 7th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2007 **w 2007 <arg>**	Center Frequency 8	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 8th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*

Table 2: RF-O! Parameters (Sheet 19 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2008 **w 2008 <arg>**	Center Frequency 9	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 9th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2009 **w 2009 <arg>**	Center Frequency 10	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 10th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2010 **w 2010 <arg>**	Center Frequency 11	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 11th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2011 **w 2011 <arg>**	Center Frequency 12	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 12th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2012 **w 2012 <arg>**	Center Frequency 13	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 13th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2013 **w 2013 <arg>**	Center Frequency 14	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 14th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*

Table 2: RF-O! Parameters (Sheet 20 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2014 **w 2014 <arg>**	Center Frequency 15	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 15th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2015 **w 2015 <arg>**	Center Frequency 16	1.0.0+	928000.0	941000.0	929000.0	kHz	N	Y	Return/Set the Center Frequency for the 16th entry in the PnP Channel Table. *Note: This parameter may only be in a multiple of 5 KHz or 6.25 KHz.*
r 2016 **w 2016 <arg>**	Lower Bound 1	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 1 to the Lower Bound.
r 2017 **w 2017 <arg>**	Lower Bound 2	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 2 to the Lower Bound.
r 2018 **w 2018 <arg>**	Lower Bound 3	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 3 to the Lower Bound.
r 2019 **w 2019 <arg>**	Lower Bound 4	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 4 to the Lower Bound.
r 2020 **w 2020 <arg>**	Lower Bound 5	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 5 to the Lower Bound.
r 2021 **w 2021 <arg>**	Lower Bound 6	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 6 to the Lower Bound.
r 2022 **w 2022 <arg>**	Lower Bound 7	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 7 to the Lower Bound.

Table 2: RF-O! Parameters (Sheet 21 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2023 **w 2023 <arg>**	Lower Bound 8	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 8 to the Lower Bound.
r 2024 **w 2024 <arg>**	Lower Bound 9	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 9 to the Lower Bound.
r 2025 **w 2025 <arg>**	Lower Bound 10	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 10 to the Lower Bound.
r 2026 **w 2026 <arg>**	Lower Bound 11	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 11 to the Lower Bound.
r 2027 **w 2027 <arg>**	Lower Bound 12	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 12 to the Lower Bound.
r 2028 **w 2028 <arg>**	Lower Bound 13	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 13to the Lower Bound.
r 2029 **w 2029 <arg>**	Lower Bound 14	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 14 to the Lower Bound.
r 2030 **w 2030 <arg>**	Lower Bound 15	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 15 to the Lower Bound.
r 2031 **w 2031 <arg>**	Lower Bound 16	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 16 to the Lower Bound.
r 2032 **w 2032 <arg>**	Upper Bound 1	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 1 to the Upper Bound.

Table 2: RF-O! Parameters (Sheet 22 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2033 **w 2033 <arg>**	Upper Bound 2	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 2 to the Upper Bound.
r 2034 **w 2034 <arg>**	Upper Bound 3	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 3 to the Upper Bound.
r 2035 **w 2035 <arg>**	Upper Bound 4	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 4 to the Upper Bound.
r 2036 **w 2036 <arg>**	Upper Bound 5	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 5 to the Upper Bound.
r 2037 **w 2037 <arg>**	Upper Bound 6	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 6 to the Upper Bound.
r 2038 **w 2038 <arg>**	Upper Bound 7	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 7 to the Upper Bound.
r 2039 **w 2039 <arg>**	Upper Bound 8	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 8 to the Upper Bound.
r 2040 **w 2040 <arg>**	Upper Bound 9	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 9 to the Upper Bound.
r 2041 **w 2041 <arg>**	Upper Bound 10	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 10 to the Upper Bound.
r 2042 **w 2042 <arg>**	Upper Bound 11	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 11 to the Upper Bound.

Table 2: RF-O! Parameters (Sheet 23 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2043 **w 2043 <arg>**	Upper Bound 12	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 12 to the Upper Bound.
r 2044 **w 2044 <arg>**	Upper Bound 13	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 13 to the Upper Bound.
r 2045 **w 2045 <arg>**	Upper Bound 14	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 14 to the Upper Bound.
r 2046 **w 2046 <arg>**	Upper Bound 15	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 15 to the Upper Bound.
r 2047 **w 2047 <arg>**	Upper Bound 16	1.0.0+	0.0	50.0	25.0	kHz	Y	Y	Return/Set the distance from the Center Frequency 16 to the Upper Bound.
r 2048 **w 2048 <arg>**	Synthesizer Programming Retries	1.0.0+	0	255	1	N/A	Y	Y	Return/Set the number of times the Host attempt to reprogram the Exciter Synthesizer if a Lock Failure occurs. *WARNING: This parameter intended for Lab/Development use only!*
r 2049 **w 2049 <arg>**	Simulcast Launch Delay	1.0.0+	0	8000	0	5 us	N	Y	Return/Set the Simulcast Launch Delay time added to the Launch Time when Simulcasting is enabled. The current range allows for 0 to 40ms of launch delay, with each count = 5 us.
r 2050 **w 2050 <arg>**	Simulcast Frequency Offset	1.0.0+	0	90	0	Hz	N	Y	Return/Set the Simulcast Frequency Offset added to the selected Center Frequency when calculating Modulation parameters when Simulcasting is enabled.

Table 2: RF-O! Parameters (Sheet 24 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2051 **w 2051 <arg>**	Synthesizer Adapt Time	1.0.0+	0	100000	30000	us	Y	Y	Return/Set the time that the Synthesizer Adapt Line is pulled low after Synthesizer programming to accelerate the lock time. *WARNING: This parameter intended for Lab/Development use only!*
r 2052 **w 2052 <arg>**	Modulation Angle/Deviation Multiplier	1.0.0+	0	360	349.52533	N/A	Y	Y	Return/Set the constant used in calculating Modulation Angle and Deviation. Used by the Modulator DSP's. *WARNING: This parameter intended for Lab/Development use only!*
r 2053 **w 2053 <arg>**	Maximum Modulation Deviation	1.0.0+	0	6400	4800	Hz	Y	Y	Return/Set the Maximum Deviation Level allowed. Used by the Modulator DSP's. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.**
r 2054 **w 2054 <arg>**	Modulation FM Power	1.0.0+	0	32767	11680	N/A	Y	Y	Return/Set the Power Level used in FM modulation. Used by the Modulator DSP's. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 25 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2055 **w 2055 <arg>**	Modulation AM Pilot Power	1.0.0+	0	32767	1600	N/A	Y	Y	Return/Set the Pilot Power Level used in AM modulation. Used by the Modulator DSP's. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*
r 2056 **w 2056 <arg>**	Modulation AM Sideband Power	1.0.0+	0	32767	12426	N/A	Y	Y	Return/Set the Sideband Power Level used in AM modulation. Used by the Modulator DSP's. **Note: If Power Control is ENABLED, changes to this parameter will NOT take effect until Power Control is DISABLED.** *WARNING: This parameter intended for Lab/Development use only!*
r 2057 **w 2057 <arg>**	Frequency Change Delay	1.0.0+	0	2147483647 (0x7fffffff)	0	us	Y	Y	The time required to change to another channel center frequency. *WARNING: This parameter intended for Lab/Development use only!*
r 2058 **w 2058 <arg>**	Minimum Workahead Time	1.0.0+	0	1000000	50000	us	Y	Y	The minimum time between when a command is fully sent to the transmitter and its start time. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 26 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2059 **w 2059 <arg>**	Workahead Window Width	1.0.0+	50000	500000	50000	us	Y	Y	The time between the earliest and latest time that the controller may finish sending a command to the transmitter, in microseconds. *WARNING: This parameter intended for Lab/Development use only!*
r 2060 **w 2060 <arg>**	Keyup Time	1.0.0+	0	2147483647 (0x7fffffff)	0	us	Y	Y	This value is read from the Collector DSP on startup. It is stored in parameter memory on startup for fast access and to support the Distributor DSP. *WARNING: This parameter intended for Lab/Development use only!*
r 2061 **w 2061 <arg>**	Mode Mixture Code	1.0.0+	0	4294967295 (0xffffffff)	0	N/A	Y	Y	Bit array that indicates which modulation modes permits simultaneous transmission of additional modes of different type. *WARNING: This parameter intended for Lab/Development use only!*
r 2100 **w 2100 <arg>**	Offset From Center Frequency Index 0	1.0.0+	-50000	50000	0	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 0. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 27 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2101 **w 2101 <arg>**	Offset From Center Frequency Index 1	1.0.0+	-50000	50000	6250	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 1. *WARNING: This parameter intended for Lab/Development use only!*
r 2102 **w 2102 <arg>**	Offset From Center Frequency Index 2	1.0.0+	-50000	50000	12500	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 2. *WARNING: This parameter intended for Lab/Development use only!*
r 2103 **w 2103 <arg>**	Offset From Center Frequency Index 3	1.0.0+	-50000	50000	18750	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 3. *WARNING: This parameter intended for Lab/Development use only!*
r 2104 **w 2104 <arg>**	Offset From Center Frequency Index 4	1.0.0+	-50000	50000	25000	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 4. *WARNING: This parameter intended for Lab/Development use only!*
r 2105 **w 2105 <arg>**	Offset From Center Frequency Index 5	1.0.0+	-50000	50000	31250	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 5. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 28 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2106 **w 2106 <arg>**	Offset From Center Frequency Index 6	1.0.0+	-50000	50000	37500	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 6. *WARNING: This parameter intended for Lab/Development use only!*
r 2107 **w 2107 <arg>**	Offset From Center Frequency Index 7	1.0.0+	-50000	50000	43750	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 7. *WARNING: This parameter intended for Lab/Development use only!*
r 2108 **w 2108 <arg>**	Offset From Center Frequency Index 8	1.0.0+	-50000	50000	0	N/A	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 8. Defined in PnP Document as INVALID. *WARNING: This parameter intended for Lab/Development use only!*
r 2109 **w 2109 <arg>**	Offset From Center Frequency Index 9	1.0.0+	-50000	50000	-43750	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 9. *WARNING: This parameter intended for Lab/Development use only!*
r 2110 **w 2110 <arg>**	Offset From Center Frequency Index 10	1.0.0+	-50000	50000	-37500	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 10. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 29 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2111 **w 2111 <arg>**	Offset From Center Frequency Index 11	1.0.0+	-50000	50000	-31250	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 11. *WARNING: This parameter intended for Lab/Development use only!*
r 2112 **w 2112 <arg>**	Offset From Center Frequency Index 12	1.0.0+	-50000	50000	-25000	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 12. *WARNING: This parameter intended for Lab/Development use only!*
r 2113 **w 2113 <arg>**	Offset From Center Frequency Index 13	1.0.0+	-50000	50000	-18750	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 13. *WARNING: This parameter intended for Lab/Development use only!*
r 2114 **w 2114 <arg>**	Offset From Center Frequency Index 14	1.0.0+	-50000	50000	-12500	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 14. *WARNING: This parameter intended for Lab/Development use only!*
r 2115 **w 2115 <arg>**	Offset From Center Frequency Index 15	1.0.0+	-50000	50000	-6250	Hz	Y	Y	Plug-and-Play Control Command Offset From Center Frequency Index 15. *WARNING: This parameter intended for Lab/Development use only!*

Table 2: RF-O! Parameters (Sheet 30 of 30)

Command	Name	Version	Lower	Upper	Default	Units	Reset With DIP 2	Reset With DIP 1 & DIP 2	Description
r 2999	Power Leveling Cutback Amount	1.2.0	-4.00	4.00	0	dB	n/a	n/a	This parameter keeps track of the current power leveling amount. When Power Control is enabled, power leveling is automatically enabled. Typically, this value should remain between -0.5 and 0.5. If this value is outside of this range, possibly the Amplitude Alignment and/or the Internal Wattmeter Calibration is faulty. **This value is set to 0 upon OCM reset**.
r 3000	Power Cutback	1.2.0+	0	10.0	0	dB	n/a	n/a	This parameter maintains the current cutback amount of the station in dB. If the station is shutdown or disabled, this value is ignored by the RFO software. Use A 83 to see the actual station status.**This value is set to 0 upon OCM reset**.
r 3001 **w 3001 x**	Ambient Temperature Power Derate Start	1.2.0+	30	80	45	Deg C	Y	Y	This defines the ambient temperature of the station at which point the power control software starts to derate (decrease) the power output.
r 3002 **w 3002 x**	Ambient Temperature Power Shutdown	1.2.0+	30	80	60	Deg C	Y	Y	This defines the ambient temperature of the station at which point the power control software disables/shutsdown the station.
w 3003 **r 3003 x**	Ambient Temperature Derate Maximum Cutback	1.2.0+	0	10.00	3.0	dB	Y	Y	This defines the amount of cutback the station will linearly derate while the ambient temperature is between the values of parameters 3001 and 3002.

Table 3: Paging Disabled Bit Definitions (R 100)

Disable Source	Bit		Description
	hex	decimal	
Paging Access Disabled	00000001	1	Parameter 99 is Set to 1 by User. Write parameter 99 to 0 to clear this disable source.
PA Power Supply A/D Read Fail	00000002	2	An attempt to read the Power Supply A/D Converter on one of the PA's by the RFO software failed, or the A/D Test voltage was not within the valid range. Check for proper installation of PA's.
OCM Ambient Temp High	00000004	4	The Ambient Temperature read on the OCM is greater than the Ambient Temperature Shutdown threshold, which is stored in parameter 3002 (in degrees celsius). Verify that the OCM temperature sensor has been calibrated correctly. Parameters 1026 displays the current OCM ambient temperature. Parameters 1028 and 1029, are used to calibrate the temperature. (Power Control must be Enabled for this disable source to cause the transmitter to shutdown)
Exciter Not Locked	00000008	8	One, or both, of the 2 synthesizers on the Exciter is not locked. Check for proper exciter installation, PnP cable connection, Pendulum, or UHSO alarms.
Txlin Not Locked	00000010	16	The 236 MHz (IF) Synthesizer on the Txlin is not locked.
AM Clipping Detected	00000020	32	Clipping has occurred on 3 consecutive Voice transmissions. Power Control must be Enabled (parameter 992 set to 1) for this disable source to cause the transmitter to shutdown.

Table 3: Paging Disabled Bit Definitions (R 100)

Disable Source	Bit		Description
	hex	decimal	
FM Clipping Detected	00000040	64	Clipping was detected by the Txlin IC during an FM transmission. Power Control must be Enabled (parameter 992 set to 1) for this disable source to cause the transmitter to shutdown.
PA A/D Read Fail	00000080	128	The RFO was unable to read one of the PA's A/D converters. Check "A 99" or "A 104" log to determine specific PA having the problem.
PA Current Out of Range	00000100	256	NOT CURRENTLY SUPPORTED
28V Reference Out of Range	00000200	512	NOT CURRENTLY SUPPORTED
14V Reference Out of Range	00000400	1024	NOT CURRENTLY SUPPORTED
UHSO Failure	00000800	2048	The Ultra-High Stability Reference Oscillator Has Not Been Detected.
Pendulum Not Locked	00001000	4096	16.8MHz Pendulum Reference Not Phase Locked.
Pendulum Not Detected	00002000	8192	16.8MHz Pendulum Reference Not Detected.
Exciter SPI Read Fail	00004000	16384	Failed to Read the Exciter A to D Converter.
High Internal WM Reflected Power	00008000	32768	An Internal Wattmeter Reflected Power reading (per subchannel), read during FM keying, was above the level indicated by parameter 143 (in Watts). NOTE: It is the user's responsibility to assure that this parameter is set to the correct value based on the desired FM power output.

Table 3: Paging Disabled Bit Definitions (R 100)

Disable Source	Bit		Description
	hex	decimal	
Circulator Load Temp Exceeded	00010000	65536	The RFO has detected that the Circulator Load Thermal Switch, which is connected to the RFO backplane at J12, has triggered. Parameter 1030 must be set to 1 for this feature to work. By default 1030 is set to 1 (Enabled).
PA Failure(s)	00020000	131072	The number of PA failures was high enough that the transmitter was unable to continue paging.
PA Shutdown Temp Exceeded	00040000	262144	The difference between any one of the installed PA's and the Ambient Temperature is greater than the number of degrees Celsius specified in parameter 1024. Read parameter 1026 to see current ambient temperature, as read on the OCM board.
Amplitude Alignment Bad	00080000	524288	At power up, it was determined that the Amplitude Alignment values within the Exciter EEPROM are not valid. Power Control is automatically disabled when this alarm occurs. Amplitude alignment (A 76) must be performed prior to enabling power control. This disable is cleared once Amplitude Alignment is successfully performed.
Power Leveling Out of Range	00100000	1048576	The automatic power leveling feature of Power Control, attempted to level the power by more than 3.0 dB or less than -3.0 dB. This disable signals that the amplitude alignment and/or wattmeter alignment is possibly not correct.
High Internal Wattmeter VSWR	00200000	2097152	The Voltage Standing Wave Ration (VSWR) read at the Internal Wattmeter is greater than 3.0. That is, the Reflected Power Reading is more than one fourth that of the Forward Power Reading. Check for loose RF connections.

Table 3: Paging Disabled Bit Definitions (R 100)

Disable Source	Bit		Description
	hex	decimal	
High External Wattmeter VSWR	00400000	4194304	The Voltage Standing Wave Ration (VSWR) read at the Internal Wattmeter is greater than 3.0. That is the Reflected Power Reading is more than one fourth that of the Forward Power Reading. Check for loose RF connections.
High External Reflected Power	00800000	8388608	An External Wattmeter Reflected Power reading (per subchannel), read during FM keying, was above the level indicated by parameter 146 (in Watts). NOTE: It is the user's responsibility to assure that this parameter is set to the correct value based on the desired FM power output.
1 Pulse-Per-Second	01000000	16777216	The 1 PPS signal from the RFB is either lost, or outside of the acceptable timing window. Possible loss of GPS, or Reference Module.
RFB Request Down	02000000	33554432	The signal indicating that the RFB is operating properly has been lost. The RFB power is off, or possible PnP cable disconnection.

Table 3: Paging Disabled Bit Definitions (R 100)

Disable Source	Bit		Description
	hex	decimal	
Plug-N-Play Error	04000000	67108864	An error has been detected by the Distributor DSP. This Disable stays active for approximately 1.9 seconds when an error on the Plug-N-Play interface between the RFO and RFB has been detected. The errors that contribute to this disable are designated by an error source of ROUTE_MSG_FROM_DIST_DSP in the "A 104" error log. These include E_START_TIME_ERROR, E_UNEXPECTED_SYMBOL_COMMAND_ERROR, and E_WORK_AHEAD_WINDOW_ERROR, to name a few. (See "RF-O! Error/Alarm Code Descriptions" document for all Plug-N-Play Errors)
Check Command Error	08000000	134217728	The transmitter has been disabled because the RFO has detected that the key state (either keyed or dekeyed) or the current channel number is not consistent with what the RFB expects. The transmitter is only disabled temporarily to allow the RFO and RFB to resynchronize.