E4445A-19 <u>S E R V I C E N O T E</u>

Supersedes: NONE

E4445A - PSA Series Spectrum Analyzer

Serial Numbers: US44020000 – US45309999 MY44020000 - MY45309999 SG44020000 - SG45309999

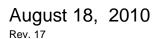
Internal Alignment Failures for PSA Series Spectrum Analyzers Manufactured Between January 2004 and February 2006 Caused by Low Power Output from A9A1 DRO on A9 Second LO Assembly

Parts Required: P/N	Description	
5086-1702	3.6 GHz Dielectric Resonator Oscillator	1

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:						
MODIFICATION RECOMMENDED						
ACTION CATEGORY:	X ON SPECIFIED FAILURE [[]] AGREEABLE TIME	STANDARDS LABOR: 1.0 Hours				
LOCATION CATEGORY:	[[]] CUSTOMER INSTALLABLE [[]] ON-SITE X SERVICE CENTER [[]] CHANNEL PARTNER	SERVICE [[]] RETURN INVENTORY: [[]] SCRAP [[]] SEE TEXT	USED X RETURN PARTS: [[]] SCRAP [[]] SEE TEXT			
AVAILABILITY: End of Support		NO CHARGE AVAILABLE UNTIL: September 1, 2011				
AUTHOR: KJL		PRODUCT LINE: 12				
ADDITIONAL INI	FORMATION:					

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Situation:

Our quality records for the serial number range listed above indicate a higher than normal incident of internal alignment failures due to low power output from the Second LO 3.6 GHz dielectric resonator oscillator (DRO) on the Second LO assembly. Instruments within this serial number range where manufactured between January 2004 and February 2006. The low power output is due to a filter drift issue on the A9A1 DRO causing the power output to drop over time until the Second LO amplifier on the A20 low band assembly is no longer able to compensate. A new tool has also been developed to allow Agilent service centers to read the DAC value corresponding to the Second LO amplifier gain on the low band assembly.

Solution/Action:

Verify the alignment failure by looking at the error queue for the error message "-340, Calibration failed, Align_2ND_LO_PWR". Press [System] <Show Errors> <Next Page>. Typically, when the Second LO power is too low, it will be the first failure listed in the alignment queue, which will be at the bottom the Second page of alignment errors (as shown below):

# Aglant 86:22:59 Dec 24, 2009	Show Errors	7 Aginat 86:21:12 Dec 24, 2889	Show Errors
Errör History. Dec 24.86:20 Dec 24.86:28 2	Prov Page	Error History +8, System, Alignments, Align All Nam, Needed Dec 24, 86:20 1	Prev Page
+9. System, Highmetes, Afign Hi Nov, Needed Dec 24 - 86:20 1 - 348, Calibration failed, ALDGN_MBIF_FRED_RESPONSE Dec 24 - 86:20 1	Next Page	-348, Calbranton falled, FLIGN_ATTEN, STEPS, 40 dB step Dec 24, 86220 1 148, System, Rignments, Flign AT Now, Needed Dec 24, 86230 1	Next Page
 System, Highwenns, Fign Al Now, Needed Dec 24, 06:20 -340, Calbringen faled, ALIGN_MBIF_STEP_GAINS Dec 24, 06:20 		-348, Calbraton Faled, MERSURE_COMB Dec 24, 86220 48, System, Régnaents, Align All Naie, Needed Dec 24, 86220	
He. System, Fligmmonts, Fligs All Nov, Needed Dec 24 - 06:20 -340, Coloratum faled, ALIGN_RF_ORD, PREMP		-346, Calibration Faled, 321MHZ_HMPL_CURVE Dec 24 8628 1 +8, System, Alignments, Filgn All Naw, Needed	
Dec 24 86:20 1 +8, System, Filgmments, Filgn Fil Nov, Needed Dec 24 86:20 1	Verbose SCPI On Off	Dec 24 06:20 1 -348, Calbration failed, IF_GRIN_CURVE Dec 24 06:20 1	Verbose SCPI
-340, Calbration failed, FLISN_MBIF_ROC_INFIGE Dec 24, 86:20, 1 +8, System, Fligmnests, Flign Fill Nov, Needed Dec 24, 86:20, 1		 System, Algoments, Flign All Nos, Needed Dec 24 (0620) -348. Calibration fields, PDCRPH_GRBNS Dec 24 (0620) 1 	
-348, Caldranon Faled, ALIGN, 8F.,GAIN Dec 24: 86:28 1 +9, System, Alignments, Rign Ali Nov, Needed		 System, Rignments, Align All Non, Needed Dec 24, 86:20 348, Calibration fieled, PLICN_2ND_L0_PMR 	Clear Error Queue
File Operation Status, C:\SCREN010.81F file saved		Calibration failed, ALIGN_RF_GAIN_PREAMP	

The failure can also be verified by running the internal Agilent No Trouble Found Software. The internal link to the software available to Agilent service centers is:

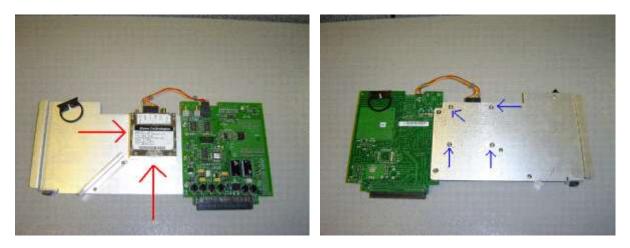
http://mktdev.soco.agilent.com/field/service/signal/psa/ntf

A value of +255 for the Second LO Power DAC Val will be returned if the analyzer is not able to set enough gain to the Second LO amplifier on the A20 low band assembly if the DRO power output is too low. The lower the DAC value reported is, the more gain the low band amplifier is using. When the low band amplifier is no longer able to provide enough gain, the DAC value rolls from 0 (most gain) to 255 (least gain), causing the internal alignments to fail.

Cal File/2nd LO Power DAC Check				
CHECK CAL FILE				Only Telay Check
NST ADDR SELECTION	O GPIB		🛞 LAN	
IOARD:	ADORESS: 10. 2		141.121.63.129	orm Only
SERIAL NUMBER	U\$44022208	File	141	
NST MODEL	E4440A	Index	3	
NRMWARE REV	A 11.16	Connon Checks	And L0 Custom	
WKEIM	MIN LIM 100			
CAL FILE VALUE	+3.90000000000000000E+00	STATUS	Invalid Flesult	
ND LO POWER DAC VAL	(1255)			

The failure can further be verified by directly measuring the power output from the A9A1 DRO on the A9 Second LO assembly. The instrument cover and top brace must be removed and the instrument powered up. The W15 cable connected to the Second LO must first be disconnected. Either a spectrum analyzer or power meter can be connected to the 3.6 GHz output of the Second LO to measure the power output level. New DRO's typically output +1 to +3 dBm of power; however, any output power above -2 dBm is normal. Whenever the power output is less than -5 dBm, the DRO is bad, and the amplifier on the A20 low band assembly is no longer able to compensate.

Replace just the DRO by removing it from the Second LO assembly and replacing it with a new one.



No adjustments are needed, since the Second LO Power Adjustment routine in the TME calibration software is only necessary to be run when the A20 low band assembly is replaced and not when the DRO or Second LO assembly is replaced.

The repair will take 1 hour in total.