Mixer Block S/N: _____

Preamps: _____ Reference Document: FEND-40.02.06.04-018-I-PRO

STEP	PROC	OPERATION	DATE	INITIALS
	4.1	**Mixer Body Preparation**		
1	4.1.1.A	Ensure halves have both been serialized and the serial numbers match.		
2	4.1.1.B	Inspect halves for damage and check dimensions.		
3	4.1.1.C	Micro-deburr all machined channels under microscope.		
4	4.1.1.D	Remove debris from all tapped holes.		
5	4.1.2	Clean halves.		
	4.2	**Gold Plating**		
6	4.2.B	Have mixer halves gold plated per NRAO procedure PAG-200 by plating lab.		
7	4.2.D	Inspect gold plating for bubbling/frosting.		
	4.3	**Mixer Construction**		
8	4.3.1	Ensure the two halves of the mixer body are clean.		
9	4.3.2.A	Install the quartz support posts in the middle four LO coupler slots in the lower half of mixer body using 3M Scotch-Weld 2216 B/A Gray epoxy.		
10	4.3.2.B	Cure epoxy at 80°C for 1.5 hours.		
11	4.3.2.C	Install four metal coupling probes centered on top of previously installed quartz posts using 3M Scotch-Weld 2216 B/A Gray epoxy.		
12	4.3.2.D	Cure epoxy at 80°C for 1.5 hours.		
13	4.3.3.A	Install waveguide loads in the upper half of the mixer block. In the terminal ends of each LO waveguide and the RF termination port using 3M Scotch-Weld 2216 B/A Gray epoxy.		
14	4.3.3.B	Ensure the waveguide loads are seated properly with the tip parallel with the inner floor of the waveguide and even with the outer mating surface of the block.		
15	4.3.3.C	Cure epoxy at 80°C for 1.5 hours.		

STEP	PROC	OPERATION	DATE	INITIALS
16	4.3.4.A	Install the 17mil x 17mil capacitor in the square milled pocket nearest the mixer chip with H20E conductive epoxy.		
17	4.3.4.B	Install the 12mil x 90mil alumina capacitor in the oblong pocket closest to the edge of the body with H20E conductive epoxy.		
18	4.3.4.C	Cure epoxy at 80°C for 1.5 hours.		
19		WIRE BOND PULL TEST Pull Results: _____ Wire Bonder: _____ Wire Manufacturer: _____ Wire Model#: _____ Wire Lot#: _____		
20	4.3.5	Prepare SIS mixer chips.		
21	4.3.6.A	Apply two small spots of H20E conductive epoxy on the mixer channel ledges approximately 20 mils and 35 mils back from the IF tuning circuit.		
22	4.3.6.B	Install one of the 0.7 x 20 mil bond wires on each of the ledges in each mixer channel 15 mils back from IF tuning circuit. Wire should be temporarily tacked in place by the existing epoxy.		
23	4.3.6.C	Paint the length of each of the 0.7 x 20 mil bond wires with a thin layer of H20E epoxy.		
24	4.3.6.D	Install the mixer chips quartz side up. Ensure the mixer chip butts against the waveguide wall at the end opposite the IF pad.		
25	4.3.6.E	Mate the two halves of the mixer block and torque the 2-56 x 0.5" SS screws to 0.7 N/M (5 in-lbs).		
26	4.3.6.F	Ensure the mixer chips are tight and the bond wires have not moved during assembly.		
27	4.3.6.G	Cure epoxy at 80°C for 2.5 hours.		
	4.4	**Integrate Mixer with Preamplifiers**		
28	4.4.1.A	Remove top lid of each amp and fit aluminum working lids over bottom lids.		
29	4.4.2.B	Attach amps to sides of mixer block, with two 2-56 x ¾" SS screws. Start screws, do not tighten.		
30	4.4.2.C	Install the opposite half of the mixer block, Snug amplifier attaching screws, do not tighten. Then remove mixer block half.		

STEP	PROC	OPERATION	DATE	INITIALS
31	4.4.3.A	Terminate the two bond wires coming from the IF pad to the mixer chips by bonding to the 17mil x 17mil capacitor.		
32	4.4.3.B	Place a 66 mil bond from the inside corner of the 17mil x 17mil capacitor to the closest corner of the 12mil x 90mil capacitor.		
33	4.4.3.C	Install a 30 mil bond wire from the closest corner of each alumina substrate to the center of the edge of the input substrate of each amp.		
34	4.4.4.A	Install nickel-plated magnetic pole pieces in their respective channels in mixer block.		
35	4.4.4.B	Install opposite half of mixer block. Secure with 2-56 x 0.5" SS screws torque to 0.7 N/M (5 in-lbs). Use vented screws where holes do not penetrate the block.		
36	4.4.4.C	Replace lids on amps and snug screws, do not tighten.		
37	4.4.4.D	Install additional two 2-56 x ¾" SS screws through amp lids. Torque all four screws to 0.7 N/M (5 in-lbs).		
38	4.4.4.E	Torque all screws in amp lids to 0.7 N/M (5 in-lbs).		
39	4.4.4.F	Remove aluminum working bottom lids, replace all 2-56 x 1/8" vented SS screws and torque to 0.7 N/M (5 in-lbs).		
	4.5	**Bench Test**		
40	4.5.C	Verify the drain current on each stage of the **LEFT** preamp. The first and second stage Id should read 17mA and the third stage 10mA. Stage 1 Id: _____ Stage 2 Id: _____ Stage 3 Id: _____		
41	4.5.E	Verify the IV curve as displayed on the oscilloscope has a 45° slope.		
42	4.5.I	Verify the mixer chip resistance is 80-110Ω Resistance: _____		
43	4.5.C	Verify the drain current on each stage of the **RIGHT** preamp. The first and second stage Id should read 17mA and the third stage 10mA. Stage 1 Id: _____ Stage 2 Id: _____ Stage 3 Id: _____		

STEP	PROC	OPERATION	DATE	INITIALS
44	4.5.E	Verify the IV curve as displayed on the oscilloscope has a 45° slope.		
45	4.5.I	Verify the mixer chip resistance is 80-110Ω Resistance: _____		
		END OF PROCEDURE		
Reference Document: FEND-40.02.06.04-018-I-PRO				

Change Record

Version	Date	Affected Section(s)	Reason/Initiation/Remarks
A01	2008-08-24	All	dfs: Initial draft