PROCEDURE FOR

ASSEMBLY OF THE MINI ANALOG TRANSMITTER

DOCUMENT NO.: **SOP-XXXX**
REVISION NO.: **A**
SUPERSEDES: A

REV.	*SUMMARY OF CHANGE*	*ECO #*
A	Initial 1-05-03	

PREPARED BY:

DEPT: QUALITY SIGNATURE:_____ DATE:_____

GENERAL MANAGER: SIGNATURE:_____ DATE:_____

OTHER APPROVALS:

DEPT: MANUFACTURING SIGNATURE:_____ DATE:_____

DEPT: MATERIALS SIGNATURE:_____ DATE:_____

DEPT: ENGINEERING SIGNATURE:_____ DATE:_____

1) PURPOSE

The purpose of this procedure is to describe the activities involved in the preparation, assembly, quality, and test procedures related to the assembly and test of the Mini Analog transmitter.

2) SCOPE

This procedure supports all documents, which are part of the instructions required to produce the Mini Analog transmitter.

3) REFERENCES

IPC-A-610 Revision C, Supersedes Revision B December 1994
Procedure for Document Control QP-0502
ISO 9002 Standard

4) DEFINITIONS

Controlled Copy	Copy of a document intended for a restricted number of persons. This copy must be logged and kept up to date. This copy is stamped "CONTROLLED COPY" in red ink and is signed by the DCC.
Distribution List	A list of people for a controlled document who are authorized to have a copy of that particular document.
DCC	Acronym for Document Control Coordinator. The person responsible for processing ECO's (engineering change order), for distributing controlled and uncontrolled copies of documents, for maintaining records and pertinent data bases, and for maintaining master copies of controlled documents.
Procedure	Document defining the purpose and scope of an activity and outlining how and by whom the activity shall be properly carried out.
Process Owner	Person who has prime ownership for a process covered by a procedure. This person is responsible for the preparation and subsequent revisions of the procedure in accordance with the requirements of this procedure and the Procedure for Document Control SOP-0000 and for obtaining the necessary approval for its use.
Service Loop	Loop of excess wire used for future repair.
ECN	Acronym for Engineering Change Notice.
PWA	Printed Wiring Assembly

5) TOOLING / EQUIPMENT REQUIRED

Soldering iron
Solder
Tweezers
Voltage Meter

Oscilloscope
Spectrum Analyzer

Ball Point Pen
Label Maker

VBLAST-2400_RX-AV (Receiver)

Small Flat Blade Screwdriver
Diagonal Cutters
Flashlight Charger

6) PARTS:

ITM	DESCRIPTION	K&A PART NUMBER	QTY REQURIED	UNITS
1	Antenna	FM-TX-0042	1	Ea
2	Antenna Cable	RG-178	4	In
3	Eyelet, 3/32 x .219	Mouser 534-37	1	Ea
4	Brass Box w/Lid		1	Ea
5	Warranty Decal		1	Ea
6	Serial Number label		1	Ea
7	Wire 28 AWG Tfe Yel		3”	Ea
8	Wire 28 AWG Tfe Wht		3”	Ea
9	Wire 28 AWG Tfe Blk		3”	Ea
10	Wire 28 AWG Tfe Red		3”	Ea
11	Wire 28 AWG Tfe Violet		3”	Ea
12	J2 Single Row Header		1	Ea
13	J1 dbl Row 2mm Header		1	Ea
14	Corner Pin		3	Ea
15	PA PWA	FM-TX-S-1000-06	1	Ea
16	Synthesizer PWA	AV-TX-S-9010-004	1	Ea

7) PROCEDURE:

CAUTION: PLEASE READ EACH STEP BEFORE COMPLETEING THE OPERATIONS SPECIFIED.

7.1 PWA Test – Power Amplifier

7.1.1 Set both pots, R1 & R4 fully counter clockwise.
7.1.2 Set bench supply for 5 Volts +/- 50mV with the current limit to set to1.5 Amp. Switch off power supply.
7.1.3 Connect power supply + to J1-2, ground to J1-3. See Figure 1.
7.1.4 Turn on power supply. Measure current it should be <15mA (typical 11.5mA)
7.1.5 Check negative bias voltage at RMPA pins 10&11. It should be –1.25 VDC +/- 100mV.
7.1.6 Adjust drive pot, R1, fully clockwise. The current measured in step 4 should increase at least 10mA. Set the drive pot, R1, fully counterclockwise.
7.1.7 Adjust the bias pot, R4, until a reading of at least 500mA can be obtained then set to 100mA.

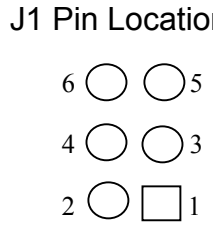

Figure 1

7.2 PWA Test – Synthesizer

7.2.1 Set bench supply for 5 Volts current limit to .5 Amps. Switch off power supply.
7.2.2 Connect power supply + to J1-2, ground to J1-3.
7.2.3 Turn on power supply. Measure current it should be 26.5mA +/- 2mA. Unit should operate on Channel 1 with switches closed, Channel 2 with switches open. **Set both switches Open (OFF) when done.**

7.2.4 Set Audio generator for 1 KHz frequency 0 volts out. Connect generator to J1-4. Attach probe from Spectrum Analyzer to J2-2. Set spectrum analyzer to 2.468 GHz, 40MHz span. Verify that there is a signal (sound Subcarrier). Set analyzer to 1MHz span. Adjust C21to check the minimum/maximum adjustment range of 2.468 GHz +/- 300KHz. Set the sound subcarrier to 2.468 GHz +/- 100KHz.

7.2.5 Set spectrum analyzer span to 40MHz. The sound subcarrier should not exceed –18dBc. (Typically -20 to –23dBc.) Measurement is difference between subcarrier and the highest peaked dBc. See figure 2 for an example of the Analyzer screen.

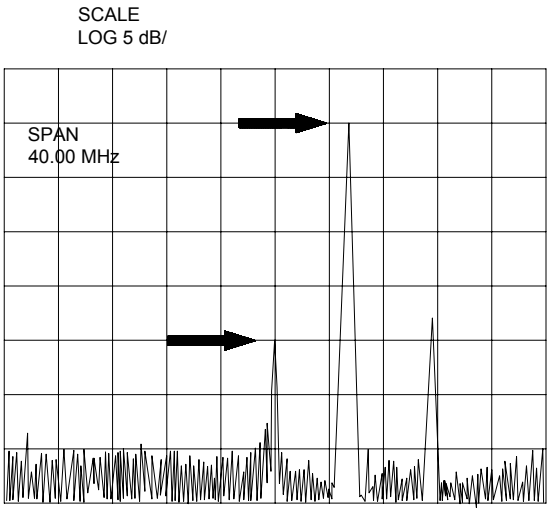

Figure 2

7.2.6 Connect 1KHz audio at 2Vp-p to J1-4 (see figure 1). Connect an oscilloscope to the calibration receiver audio output. Measure the audio output at the calibration receiver using the oscilloscope; it should be 2Vp-p +/- 200mV. Verify that the receive audio is undistorted.

7.2.7 Connect a 1Vp-p video source to J1-1 (see figure 1). Connect an oscilloscope to the calibration receiver video output.

7.2.8 Using the calibration receiver, adjust the video adjustment pot, R11, for set for 1.1 Vp-p at the receiver output using the oscilloscope.

7.3 Assembly of the transmitter.

7.3.1 Stack the two PWA's using pins at J1, J2, and 3 corner pins. See figure 3

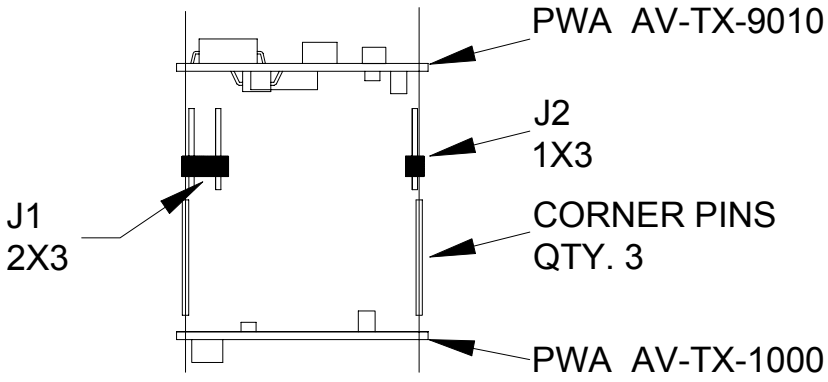

Figure 3

7.3.2 Attach 4 wires to the exposed side of the Power Supply (AV-TX-1000) PWA. Wires should be attached to the J1 Pin Location on the bottom of the PA Assembly and routed away from the board.

J1-1 Video	Yellow 28 Awg	Length 3”
J1-2 Power	Red 28 Awg	Length 3”
J1-3 Ground	Black 28 Awg	Length 3”
J1-4 Audio	White 28 Awg	Length 3”
J1-6 Low CH1 / Open CH2		

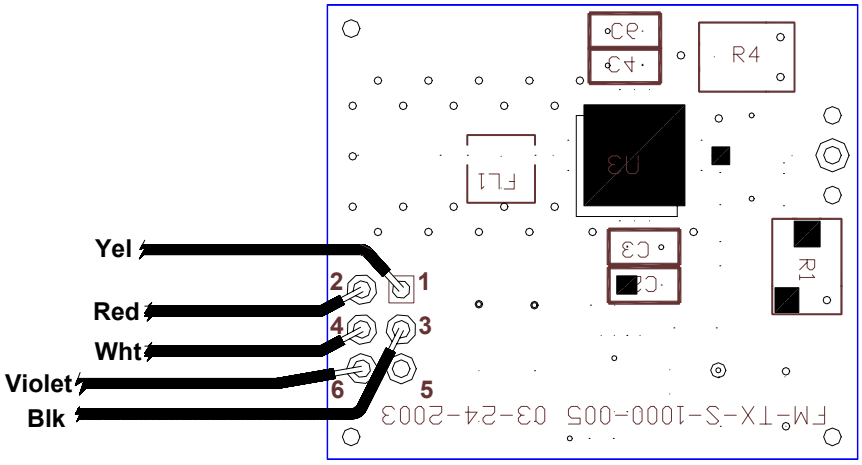

Figure 4: Top View Wire Layout

7.3.3 Attach antenna cable to PWA.

K&A WIRELESS, LLC A subsidiary of ASSA Industries, LLC	**ASSEMBLY OF THE MINI ANALOG TRANSMITTER**	**Origination Date: 6/10/03**
Class: K&A Wireless, Internal Use Only	**PROCEDURE SOP-XXXX**	**REVISION: A**

Notes:
1. Each step on this traveler must be completed and initial by the responsible person prior to moving on to the next step.
2. It is the operator's responsibility to verify with document control proper document revisions are used.
3. If it becomes necessary to rework after test, log cause and repair on the back of the traveler. Assembly foreman must initial. Continue next operation.
4. The Quality Representative or a designated backup operator must complete inspection operations.

Unit Serial Number (See Step 15) :_____

Op#	OPERATION	OPERATION DESCRIPTION	COMP BY	DATE
05	PWA TEST - Power Amplifier (FM-TX-S-1000-006)	See Page 3 Section 7.1		
10	PWA TEST - Synthesizer (AV-TX-S-9010-004)	See Page 3 Section 7.2		
15	Assembly	Stack the two boards using Pins at J1, J2, and 3 corners. Tag unit with Serial Number. Record Serial Number on the front page of traveler		
20	Add Wires			
25	Install Antenna Cable to PWA			
30	Inspect Workmanship per IPC-610C			
35	Test – Record Power and Current and other test data Also	A) Max Power/Current _____mW _____mA B) Unit current @ 350 mW Power _____mA C) Channel Change Check ☐ D) Video Modulation Check 1V p-p ☐		
40	Temperature Cold/Hot Soak. Record data. Cold 2 hr minimum Hot 12 hr minimum	Cold: Date In:_____ Time In:_____ Date Out:_____ Time Out: _____ Tot Hrs.___ Hot: Date In:_____ Time In:_____ Date Out:_____ Time Out: _____ Tot Hrs.: ___		
45	Test	Verify unit powers up, Record Current _____mA		
50	Channel Select Switch "OFF"	Verify both slide switches on the Channel Select switch are "OFF"		
55	Install into Brass Box	Do Not solder Lid at this time		
60	Set Power Level with Brass Lid; Record Power and Supply Current	350 mW Power: _____ 350 mW (+/- 7mW) Supply Current: _____mA (260 to 320mA)		
70	Serialize Unit	S/N Label should be located on the antenna side of the box.		
75	Final Test – Record Power and Current and other test data	A) Unit Power _____mW E) Sound Subcarrier Check _____dBc B) Unit Current _____mA F) Set sound subcarrier frequency +/- 25KHz C) Video Modulation Check 1V p-p OK ☐ _____ D) Sound Modulation Check OK ☐ G) Picture Quality Check OK ☐		
80	Install Antenna			
85	Attach warranty label			

90	Cut wires to 1.25" +/- .125"			
95	Final Inspect	Review wire lengths and overall traveler data. Verify S/N match traveler		