

**Request for Proposal
for
High Frequency Acoustic Source
WAS 5000 Amplifier Replacement &
Maintenance Components
for Satellite Test Acoustic Chamber**



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1. Overview of the project

- 1.1 Korea Aerospace Research Institute (hereinafter referred to as "KARI") is located at Daeduk Research Complex, 140 km south of Seoul.
- 1.2 KARI has a satellite assembly, integration and test center (hereinafter referred to as "AITC") as a research institutes for the purpose of the effective development of domestic & scientific satellites.
- 1.3 In the AITC, for the acoustic test, the high intensity acoustic chamber is operated and can generate the noise of 150dB OVSAAL.
- 1.4 This acoustic chamber uses the low frequency source(WAS-3000) and high frequency source (WAS-5000) to generate the acoustic noise.
- 1.5 The purpose of this project is to change the amplifier system of high frequency source of WAS-5000.
- 1.6 The supplier should show that the amplifier & cooling system are well operated with WAS-5000 modulator.
- 1.7 The supplier should submit the business showing of sales and installation records for high frequency acoustic source amplifier system of WAS 5000 or EPT 200.
- 1.8 The main undertakings of the project are to perform guarantee quality and training, installation and factory & site acceptance test etc.

2. Procedure of the project

The project shall be proceeded with five parts as follows:

- 1) Supply for amplifier system including cooling unit
- 2) Supply for maintenance component on WAS 5000 System
- 3) Factory acceptance test
- 4) Installation of amplifier system at KARI
- 5) KARI site acceptance test with acoustic modulator (WAS-5000)

3. Requisites of participants

3.1 The supply should submit the business showing of sales and installation records for high frequency acoustic source amplifier system for WAS 5000 or EPT 200.

4. Technical Requirements

For the acoustic facility, main components are :

- Reverberant chamber,
- GN2 supply & control system
- Acoustic horns & modulators
- Acoustic control system
- Monitoring & Safety system

Figure 1 shows a block diagram of a acoustic facility

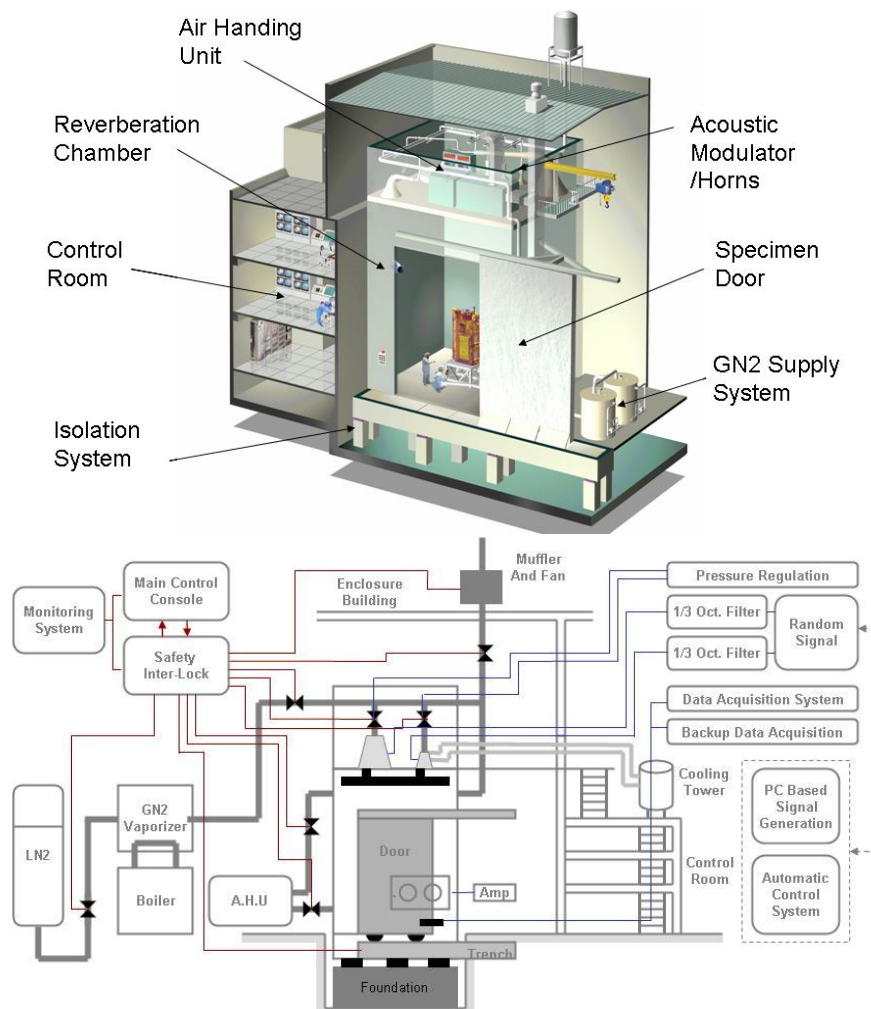


Figure 1 Block diagram of a acoustic facility

KARI acoustic chamber employ the two horns which have cutoff frequencies of 25Hz and 125Hz are employed for acoustic impedance matching. Two

type of modulators are used to generate the sound. One is the WAS-3000 which is used at 25Hz horns. The other is WAS-5000 which is used at 125 Hz.

Figure 2 shows the vibro-acoustic source of high frequency band(WAS-5000) which is installed at KARI.

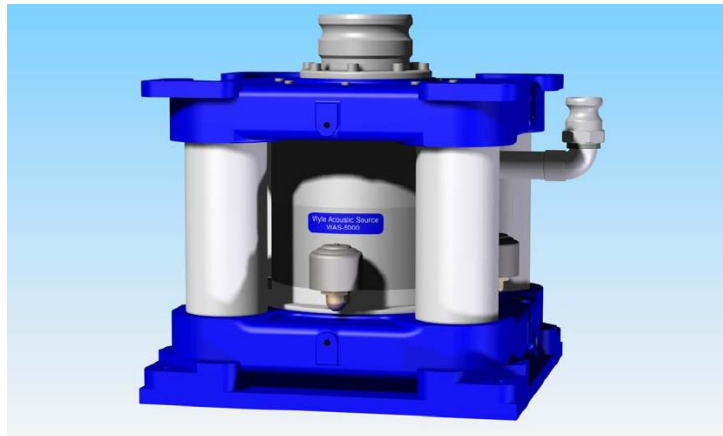


Figure 2 WAS-5000(High frequency vibro-acoustic modulator)

The purpose of this project is to change the old amplifier system including cooling unit and remote control panel for high frequency source (WAS-5000).

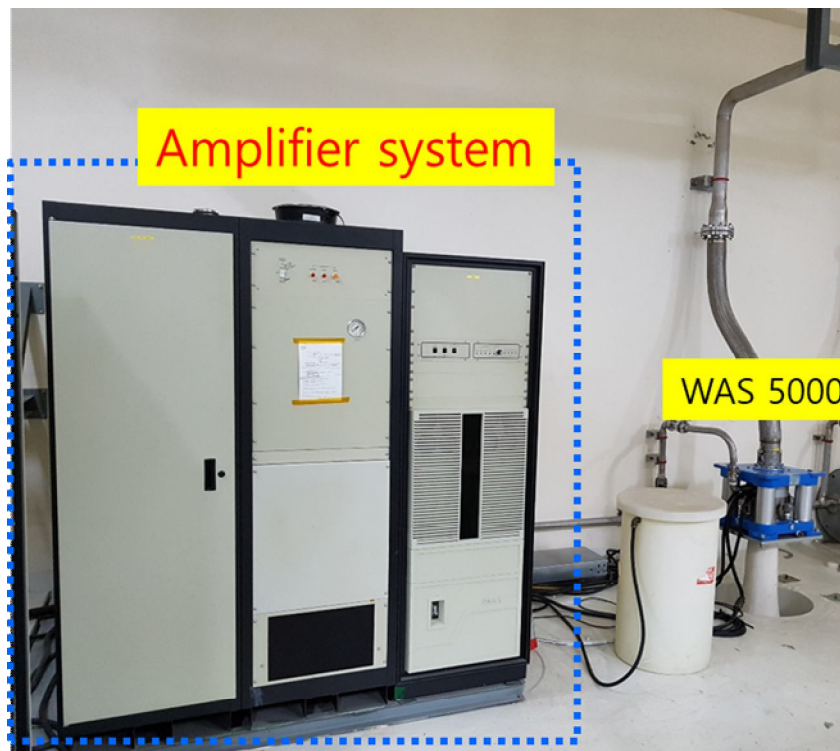


Figure 3 Amplifier system for WAS-5000

4.1 Supplier shall supply the amplifier system which is compatible for existing KARI WAS-5000 modulator. Amplifier system shall be composed of Amplifier, Remote control & Status monitoring assembly and Cooling unit including field supply.

4.2 Supplier shall supply the maintenance components for existing amplifier and WAS 5000 modulator, **which are specified at 4.12 & 4.13.**

4.3 Supplied amplifier & cooling unit system shall be operated with KARI WAS-5000 modulator

4.4 Supplier shall supply related engineering for installation and operation with WAS-5000 modulator.

4.5 In case of the need for disassembly on WAS 5000 modulator for maintenance during amplifier site installation, the supplier shall supply the related engineering service.

4.6 Supplier shall supply the documentation such as operating/installation/maintenance manuals, schematics, part lists and as-built drawings

4.7 The supplier shall meet the acoustic spectrum with KARI WAS-5000 modulator & KARI acoustic chamber system, which is specified in Table 1. Test tolerance is +/-2dB during KARI site acceptance test.

4.8 Amplifier specification

- Drive output for one or two WAS-5000 modulator.
- Volt amps : 12 kVA
- Current max : 100 Amps rms
- 100% air-cooled, 480V/240, 3Ø Input
- Drive and Over-Current protection for WAS-5000 modulator
- Efficient "Class-D" Direct-Coupled design, 100% air-cooled
- Frequency range: 5 Hz to 3 kHz
- Digital Display of Driver Coil Voltage and Current Frequency
Range: 5 Hz to 3000 Hz
- Includes P/N 501065 Current Sense Kit for Field Supply, Fixed
250A Trip Point, N.O./N.O. Dry-Contact Output

4.9 Specification of Remote control/Status Monitoring Assembly

- Remote Control of Amplifier Functions.

- LED Interlock Status Display:
 - ✓ Aux Connector Status Signals
 - ✓ PA Fuse
 - ✓ Power ON
 - ✓ Modulator Water Flow (red-green)
 - ✓ Modulator Water Pressure (red-green)
 - ✓ Modulator Water Temp. (red-green)
- Input Resistance: 10k ohm
- Real-time Digital Display of Amplifier Output Voltage and Current
- 60ft Cabling Included, with round, multiconductor screw-on MS plug connectors at each end.

4.10 Cooling Unit specification

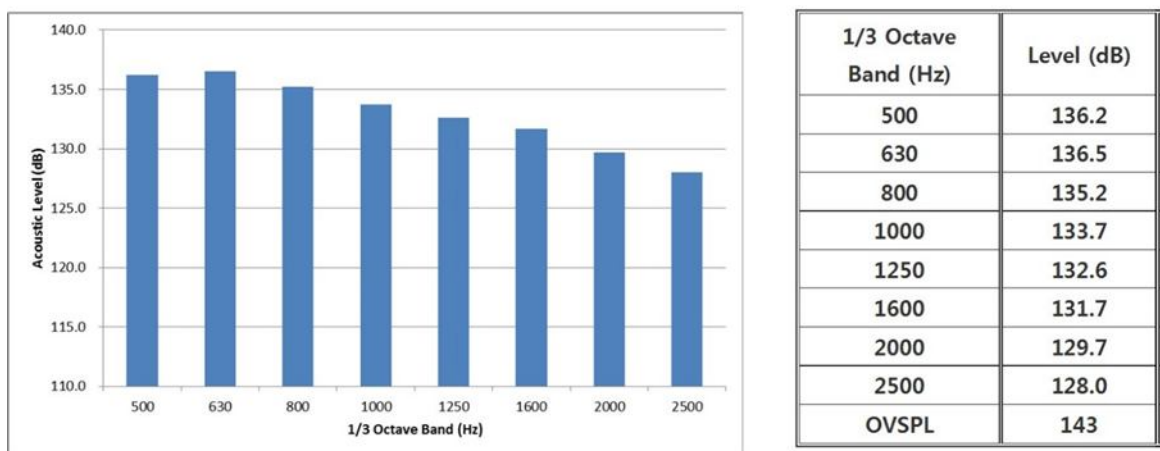
- Cooling and Field Supply for one WAS-5000 transducers
- Water-cooled, 480v/415, 3Ø Input, 50/60 Hz
- Current max : 100 Amps rms
- Digital indication of Flow and Pressure
- Digital Indication of Field Voltage and Current

4.11 Specification of Modulator [KARI WAS-5000]

- Acoustic power output : 10 kW
- Air flow rate for 10kW : 1,500 scfm
- Air pressure required at exhaust plenum housing : 30 psi

- Frequency response : 20 to 5000Hz (Maximum modulation up to 1250Hz)
- Drive circuit maximum current : 60 amp rms(sine), 40 amps rms (random)

Table 1. Required Acoustic Spectrum with KARI WAS-5000 modulator



4.12 Spare components for cooling unit for WAS 5000 amplifier

- SWITCH, FLOW, WATER, 1/2" PIPE, .25 GPM, BRASS **(2ea)**
- Flow Sensor, 1/8 Pipe, Water, 0.5-5.0SLM (0.132 1.32 GPM). **(3ea)**
- FILTER HOUSING, REINFORCED PLASTICACCEPTS 10" NOMINAL LENGTH FILTER, OVERALL DIM 5 1/8" X12 1/16", RATED AT 125 PSI MAX AT NORMAL TEMP,3/4 NPTIINLET & OUTLET, WITH MOUNTING BRACKET **(1ea)**
- FILTER, VISCOSE FIBER WOUND ON APOLYPROPYLENE MESH CORE, MICRON RATING 50-100, NOMINAL LENGTH 10" **(10ea)**
- VALVE, FLOAT, INLET, 1/8" NPT FEMALE **(1ea)**
- TRANSFORMER, STEPDOWN, 3KVA, SINGLEPHASE, 50/60 HZ, 240V (parallel)/(480/415V/380V (series) PRIM,/120V (parallel)/240V (series) SEC. **(1ea)**
- Motor-50 Carbonator Pump Motor, Split Phase Open Dripproof, HP 1/3, RPM 1425, Voltage 115 V, NEMA Frame 48Y, Service Factor

1.15, Frequency, 50 Hz, Mounting Cradle, Bearings Sleeve, Thermal Protection Automatic, Full Load Amps 5.6. **(1ea)**

4.13 Spare component for existing WAS-5000 modulaor

- Spray ring assembly for WAS-5000 modulator **(1ea)**