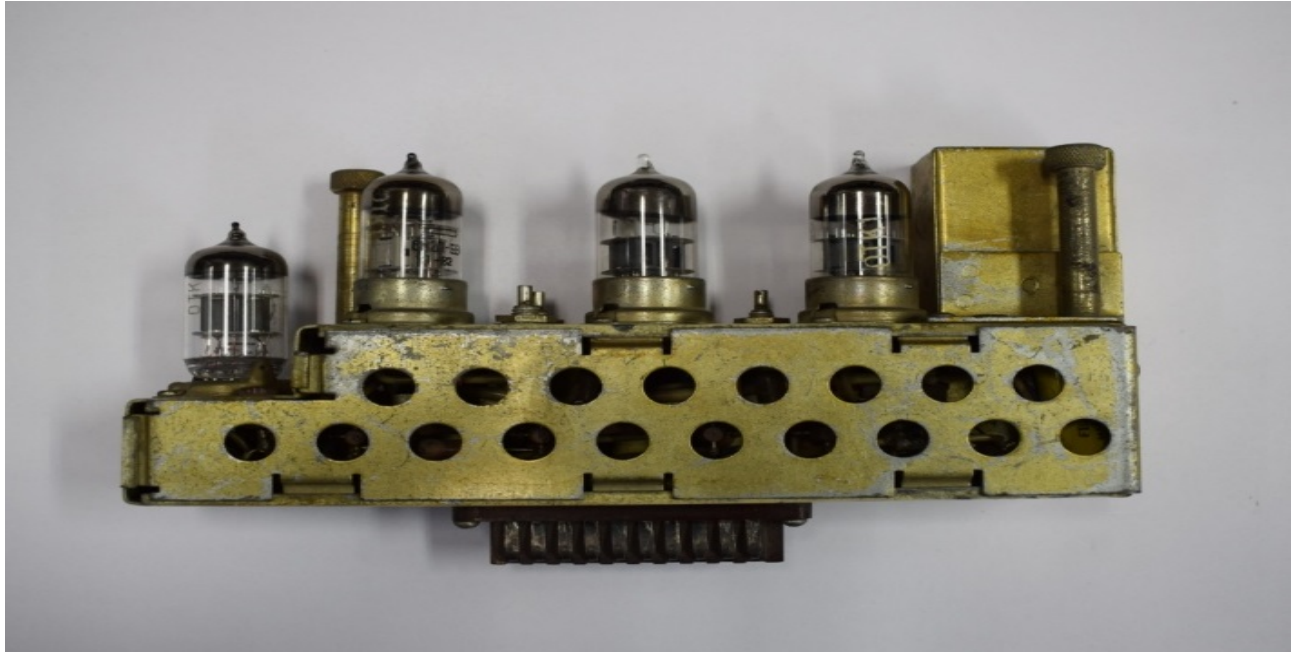


SOLID STATE DC AMPLIFIER: YA-25

<u>Ser No.</u>		<u>Remarks</u>			
1.	Nomenclature / Part No. / GIG No.	<u>Description</u>	<u>Major Assembly</u>	<u>Part No.</u>	<u>GIG No.</u>
		DC Amplifier YA-25	AKKORD Simulator Cabin	KB2.032.025SP	379663
2.	Year of procurement / Source	Not Available			
3.	Fleet / Subsystem / Weapon System	Pechora SAGW system / AKKORD			
4.	Technical applicability / Broad purpose	<p>(a) AKKORD system was designed for training and supervising the combat crew in Pechora anti-aircraft missile system and was inducted in IAF in 1970s. The AKKORD trainer generates various types of target profiles and simulates electronic countermeasures (ECMs) for imparting operational training to the combat crew.</p> <p>(b) At present, IAF is having a total of 08 AKKORD cabins for training. The AKKORD simulator incorporates 07 types of DC amplifiers viz YA-05, YA-06, YA-07, YA-08, YA-09, YA-10 and YA-25 to perform various mathematical operations like addition, subtraction, differentiation, integration, sign reversal etc to simulate targets and ECMs.</p> <p>(c) There are a total of 159 valve based DC amplifier unit used in each AKKORD cabins. The deviations in performance of these age old valve version DCAs is far from satisfaction. The generated targets are not stable and this ultimately leads to in-efficient and improper training for combat crew.</p>			
5.	Technical Specifications	As attached			
6.	Publication Details	EKD, TD & OI of AKKORD (KB1.409.000 TO2-a/c)			
7.	Photograph of equipment	As attached			
8.	Brief Description	<p>(a) DCA YA-25 is a part of ground equipment which is designed to operate as Resolving Amplifier in the AKKORD (5G98) trainer equipment. When used in conjunction with the external electric components, the DC amplifiers are used for a number of mathematical operations, such as addition, integration, multiplication by some constants, reproduction of some functions etc.</p> <p>(b) <u>Necessity of Indigenization.</u> Due to the aging effects, DCAs have developed certain undesirable problems such as:-</p>			

		<p>(i) <u>Unreliable during long operating hours</u>. Continuous operation of existing valve based DCA for more than 30 minutes leads to output being unstable/unreliable, which adversely affect the performance of entire programming (whereas in field units it is required to operate continuously for 2 to 3 hrs during training and categorization board).</p> <p>(ii) <u>Cumbersome tuning procedure</u>. The average tuning period is 30 minutes and also requires adequate warm-up of 30 minutes. Thus 1 hr is lost before commencement of every exercise.</p> <p>(iii) <u>Paucity of Spares</u>. There are no spares available for DCA. The modulator/de-modulator (Vibropack) used in DCA is a critical component and need to be procured from Russia.</p> <p>(iv) <u>Repair time vs serviceability</u>. There was no central repair agency for AKKORD Simulators. However in 2007, AFPMU has taken over the repair job and the equipment serviceability reduces equivalent to the time taken for repair.</p> <p>(c) <u>Tangible / Intangible Benefits</u>. The replacement of valve based DC Amplifiers with Solid state DC Amplifiers will not only enhance the serviceability state of AKKORD equipment but also help the organization in providing the training capability to the combat crews at field units for prolonged time. The indigenization of SDC Amplifiers will also reduce the financial burden of ex-chequer on repairing defective valve based DC Amplifiers.</p>
9.	Classification of equipment	Ground equipment
10.	Previous repair history	Qty-17 repaired in FY 2021-22.
11.	Criticality	Priority I
12.	Requirement	Indigenization
13.	Quantity required	25 (Annual)
14.	Sample Availability	Yes
15.	Scale Deficiency /	21 per equipment / Nil spare available
16.	SPOC details	SPE ISC, 7BRD, AF
17.	Draft QTS	As attached



BRIEF TECHNICAL SPECIFICATION

<u>Ser No.</u>	<u>Details</u>	<u>Remarks</u>
1.	Dimensions	20 cm (L) x 4 cm (W) x 10 cm (H) & Connector Base 1.1 cm (W) x 1.3 cm (H)
2.	Operating Temperature	+5°C to + 65°C
3.	Humidity	< 98% at 40°C
4.	Mechanical / Electrical parameter	Power supply input available are +300V, -300V, -150V and -450V DC.
5.	Amplifying input signal	Slow varying DC voltage < 2V
6.	Fitment Checks	Item to be fitted in the cabinet of AKKORD as per dimensions and connections.
7.	Functional Checks	Checks are carried out as per work sheet :- (a) Zero shift and Range of Zero Adjustment < 15mV. (b) Amplifier O/P voltage range $\pm 150V$ and $\pm 175V$. (c) O/P Voltage Drift < 35mV. (d) Hum component at amplifier

		<p>output<20mV.</p> <p>(e) <table border="1"> <thead> <tr> <th colspan="2">Current Drain</th> </tr> </thead> <tbody> <tr> <td>a.</td> <td>+300V 10mA</td> </tr> <tr> <td>b.</td> <td>-300V 9mA</td> </tr> <tr> <td>c.</td> <td>-450V 0.4mA</td> </tr> </tbody> </table></p> <p>(f) Integration check in AKKORD simulator coupled with YHK cabin.</p>	Current Drain		a.	+300V 10mA	b.	-300V 9mA	c.	-450V 0.4mA
Current Drain										
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QUALIFICATION TEST PROCEDURE

Item Details:- KB2.032.025.SP

GIG NO. : 379663

Description : DC Amplifier YA-25

Denomination : Ea

Major Assy : AKKORD SIMULATOR (5G-98)

Sub Assy : IA-21, IA-24

Reference Document/Manual:- EKD, TD & OI of AKKORD (KB1.409.000 TO2-a/c)

<u>Parameters / Attributes</u>	<u>Standard</u>	<u>Measured</u>	<u>Verified</u>
1. <u>Visual Inspection</u> (a) Appearance/Finishing. (b) Damage/ Deterioration	As per sample		
2. <u>Material Check</u> (a) Base Material (b) Specific treatment (c) Heat treatment (d) Case Hardening (e) Hardness Test (f) Tensile Test	As per sample		

3. <u>Protective Coating / Sealing</u> (a) Anti-corrosive Treatment (b) Paint & Varnish (c) Application of Grease / Oil (d) Sealing (e) Dia Internal (f) Thickness (g) Any other dimension	Yes Yes (Varnish) N/A As per sample N/A N/A Connector Base (Width=1.1 cm & Height=1.3 cm)		
(g) Elongation Test (h) Any other Test			

<p>4. <u>Fitment Check</u></p> <p>(a) Dimensional Accuracy</p> <p>(b) Compatibility of fasteners</p> <p>(c) Vibration Check</p> <p>(d) Shock Test</p>	<p>As per Sample</p>		
<p>5. <u>Functional Checks</u></p> <p>(a) Input Voltage</p> <p>(b) Input Current</p> <p>(c) Output Voltage</p> <p>(d) Output Current</p> <p>(e) Output Power</p> <p>(f) Resistance</p> <p>(g) Impedance</p> <p>(h) Endurance on Peak Output</p> <p>(j) Load Carrying Capacity</p> <p>(k) Load lifting Capacity</p> <p>(l) Endurance /braking Load</p> <p>(m) Deformation on Load</p> <p>(n) Any other check</p>	<p>+300V, -300V, -150V, -450V 400Hz</p> <p>N/A</p> <p>±150V at Rload= 20 KOhm and output voltage of ±175V at Rload= 50 KOhm</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>(i) HUM Component at amplifier output is 20mV.</p>		

	(ii) Current Drain Check is -450V=0.4mA, -300V=9mA, +300V=10mA		
6. <u>Environmental Checks</u>			
(a) Temperature Range	-10 ⁰ C to +65 ⁰ C		
(b) Humidity Range	98% at 40 ⁰ C		
(c) Microbial Limitation	N/A		
(d) Operating Medium Check	(+5 ⁰ C to 65 ⁰ C)		
(e) Endurance check in Medium	N/A		
7. <u>Contractual Obligations</u>			
(a) Guarantee/Warranty	01 Year		
(b) AMC	N/A		
(c) Free Repair/Serviceing	Yes		
(d) After Sale Service	N/A		

