

REPAIR OF DTRM

1. **Nomenclature/ Part No/ GIG Number:/**

- (a) Nomenclature- Repair of DTRM
- (b) Part No- 1110D/MPR 1093W610001
- (c) GIG- 1589437

2. **Year of Procurement/ Source:**

- (a) Year of Procurement- 2014-15
- (b) Source- M/s ELTA, Israel

3. **Fleet/ Sub System/Wpn System:** Medium Power Radar (MPR) / Antenna

4. **Technical Applicability/ Broad Purpose:** Each DTRM is connected to two active antenna elements. Both are used for Transmitting/ Receiving signals to/from space. During transmission, a drive power weighted with the designed phase and amplification transferred to a radiating element. During reception, the returned signal from the target is received by the radiating element.

5. **Technical Specifications** (attach as separate sheets): Attached as annexure-3

6. **Publication Details** (attach as separate sheets): D-Level Maintenance Manual (13292) (can't be attached as confidential document)

7. **Photograph of Equipment:**



8. **Brief Description:**DTRM is a part of MPR. Each DTRM is connected to two active antenna elements. Both are used for Transmitting/ Receiving signals to/from

space. During transmission, a drive power weighted with the designed phase and amplification transferred to a radiating element. During reception, the returned signal from the target is received by the radiating element.

9. **Classification of Equipment-** LRU/Testers/ Ground Equipment/ Role Equipment (Electrical, Electronics, Mechanical, Software based etc.): LRU

10. **Previous Repair History:** Presently dependent on foreign OEM M/s ELTA, Israel

11. **Criticality (Priority I, II or III):** Priority II

12. **Requirement:** Repair

13. **Quantity Required (One time/ Annual):**30 per year

14. **Sample Availability:** Available

15. **Scale/ Deficiency: Scale**

16. If deficient - How deficiency is being plugged? N/A

17. **SPOC details item/ fleet wise:** SPE(ISC) 13 BRD, AF

18. **Draft QTS** with major testing requirement (If already designed): Yet to be prepared

19. **Any Other Relevant Information:** Nil

TECHNICAL SPECIFICATION

1. GIG No of Original Item : **1589437**
2. Item Nomenclature : **DTRM**
3. Major Assembly : **MPR**
4. Sub Assembly : **Antenna**
5. **Physical Specifications:**
 - (a) Product Dimensions (attach an illustration or sketch or Drawing as necessary): Card available at Radar Lab, 13 BRD AD for reference
 - (b) Length of cable : **NA**
 - (c) End connectors : **42 pin PS & control connector, ZX Connectors, ZX Adapters, BMA connectors**
6. **Material Specification:**
(As per original material needs)
 - (a) Type of material: **Body and cover:**
Material: AL6081-T851 or AL5052-H32 or Equivalent
Main Coat: Chemical conversion coating MIL-DTL-5541F, TYPE I or II Class 1A
Indicated Surfaces: Sulphuric acid anodization per MIL-A-B625F filled in a Nickel Acetate sealing

Marking: Name plate P/N & S/N indicated
ESD Caution standard label

Label: Marking on Body /covers production method
Engraving, characters height 3mm filled black colour.
 - (b) Specific characteristics of the material: } **As per sample &**
 - (c) Material Specifications, such as strength, } **applicable**
resistance, density, etc **MIL standards**
 - (d) Weight : **0.680 kg Max**
7. **Functional Specification:-**
Transmit Channel
 - (a) Frequency BW : **3100-3500 MHz**
 - (b) Input power range (Pin) : **16 to 22 dBm**
 - (c) Maximum input power (Pmax) : **24 dBm**
 - (d) Peak power output (Pout) : **49.5 dBm min**
 - (e) Output Return loss (to antenna) : **9 dBr min**
 - (f) Input return loss (from antenna) : **10 dBr min**
 - (g) Pulse width – RF : **1 to 300 µsec**
 - (h) PRF : **50 KHz**

- (j) Duty-cycle 1 (ETX width 4-100 μ sec) : 20%
- (k) Duty-cycle 1 (ETX width 4-100 μ sec) : 10%
- (m) Harmonic Rejection : 20 dBc
- (n) Spectral purity-in band (\pm 10MHz) : 80 dBc

Receive Channel

- (a) Frequency BW : 3100 to 3500 MHz
- (b) Nominal Gain : 19.5 to 28.5 dB
- (c) Gain flatness : \pm 2dB max
- (d) Noise Figure (at 25°C) : 4dB max
- (e) Isolation between Input to Output with DCA at max attenuation : 60dB min
- (f) Isolation between two receiving channels One is at off and one is on : 50dB
- (g) Isolation between two receiving channels both at on state : 40dB
- (h) Type of input & output connector(s) (use standard nomenclature & type specifications): **RF BMA Connectors & 42 pin PS/Control connector**
- (j) Function of the item with respect to input, output and item function:
It provides reception for two identical channels for received RF signals and provides filtration and amplification in the S-Band antenna.

DTRM CONNECTORS

SI No	Connector	Name	Frequency	I/O	Function
1.	J1	Control & DC supply	--	I/O	To interface with the GU for DTRM control and to the PS for operational voltages supply
2.	J2	RF in CH1	3100-3500MHz	I/O	To receive RF signal during reception from antenna
3.	J3	RF in CH2	3100-3500MHz	I/O	To receive RF signal during reception from antenna
4.	J4	RF out CH1	3100-3500MHz	I/O	To output RF signal during reception to the TRC
5.	J5	RF out CH2	3100-3500MHz	I/O	To output RF signal during reception to the TRC

Digital Controlled Attenuator (DCA)

Attenuation accuracy without calibration is as follows:

Attenuation Control (dB)	Actual attenuation (dB)
0.5	0.2 to 0.8
1.0	0.4 to 1.4
2.0	1.3 to 2.7
4.0	3.0 to 5.0
8.0	6.8 to 9.0
16.0	14.5 to 17.5
31.5	28 min

Digital Phase Shifter (DPS)

Phase shifter range : 0 to 354°
Phase shifter resolution: 5.6°
Phase shifter change : monotonously
Switching time : 0.5 µsec max
Phase shifter accuracy is as follows

Phase Control	Actual Phase
5.6°	4.0-8.5°
11.2°	8.7-13.7°
22.5°	20-25°
45°	39-51°
90°	86-96°
180°	173-187°
354°	+/- 15 °

Power Supply

Voltage	Range	Ripple	Max current
+34V	+ 0.5V	50mV	5.6 to 6.0 A at 20% duty cycle
+5.2 V Analog	+ 0.2 to -0.4V	40mV	1.0 A
-5.2V	+ 0.1V	40mV	0.1 A
+3.3V Digital	+ 0.3V	30mV	0.4 A
+7V	+ 0.3V	30mV	0.7 A at 20% duty cycle

8. **Environment Specification:**

- (a) Operating Temperature and altitude limits : -10°C to +55°C
(b) Humidity : 95% at 40°C


9. **Test Schedule for FT and Product Acceptance:**

- (a) **Functional Testing** : Functional testing at 13 BRD, AF (Radar Lab)
(b) **Field Trial and Endurance test:** Field trial will be carried out at any MPR field unit.

10. **Application Standards/ Product Specifications:** MIL-810B & applicable MIL standards

11. **Documentation:** Detailed rectification/repair report along with details of components changed during repair to be submitted by vendor.

12. **Testing program and procedure:** N/A


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