

Mark IVB (UMQ-13). FAC: 1341

CATCODE: 149XX8

OPR: AFWA/A5/A8, MAJCOM/A3W

OCR: MAJCOM/A6

1.1. **Description.** MARK IVB (UMQ-13) is a 24/7 unmanned meteorological satellite (METSAT) direct readout (DRO) system. Four versions are fielded or in development. The legacy baseline system has a 17 ft geostationary and 10 ft dual polar/geostationary L-S band METSAT antennas, both domed. Depending on site obstructions, the 10 ft antenna may require a tower. Primary indoor processing equipment includes the satellite data acquisition system (SDAS), ingest data processor/server, maintenance computer, and network data server. Users worldwide access the network data server directly via NIPRNet common user communications using MARK IVB Forecaster Application Software (FAS), which also provides robust imagery analysis capability. SIPRNet users also employ FAS to access data re-hosted on Mirrored Data Servers (MDS) located at data centers. Six DRO systems located throughout the world provide global geostationary coverage and extensive polar coverage. The V1 upgrade (scheduled for initial operational capability in November 2009) adds X-Band and dual L- S band polar ingest capability by incorporating a domed 3-meter X-L-S band antenna mounted on a 20 ft tower, an X-band RF receiver and upgraded server H/W and S/W. It is being fielded at legacy MARK IVB sites. The V2 upgrade is a polar-only system with dual 3 ft or 4.6 ft (site selectable) L-S and 3-meter X-L-S band antennas, and indoor equipment common with the equivalent V1 suite (i.e., geostationary antenna indoor equipment is removed). The V3 upgrade, IOC TBD, is a polar-only system with a single 3 ft or 4.6-ft site selectable L-S band antenna and the required suite of common indoor equipment.

1.2. **Requirements Determination.** The MARK IVB provides real-time METSAT imagery and model input data that directly supports all DoD services' wartime mission execution, resource protection, and training missions worldwide; national agencies, and other U.S. Government agencies including the U.S. Forest Service and the NWS. Obtain further information through AFWA/A5/8 or MAJCOM/A3 weather staff.

1.3. **Scope Determination.** The geostationary antennas require an unobstructed equator-facing view to the site's primary and secondary assigned geostationary METSAT. The polar antennas require a 360-degree unobstructed view (5-degree elevation angle threshold, 0-degree objective). The indoor equipment requires a normal temperature controlled electronic equipment environment.

1.4. **Dimensions.** The legacy antenna equipment requires an approximately 46 m (150 ft) x 21 m (70 ft) fenced compound. The V1 requires an approximately 67 m (220 ft) x 21 m (70 ft) fenced compound. The V2 requires an approximately 40 m (130 ft) x 15 m (50 ft) fenced compound. The V3 requires an approximately 6.1 m (20 ft) x 6.1 m (20 ft) fenced compound.

1.5. **Design Considerations.**

1.5.1. **Communications Requirements.** One 12-strand dedicated single-mode fiber

optic cable is needed from the MARK IVB antenna location to the indoor equipment location. The site network server and the user computer hosting FAS software require common user access to NIPRNet. Classified data users and the MDS software host require common user access to SIPRNet. Additionally, the MDS host requires NIPRNet connectivity to MARK IVB site(s) and a TGS (or alternative cross-domain) path to the high side server provided by the MDS site.

1.5.2. Special Features. Site/facility security requires that only authorized personnel are granted physical access to antenna sites. Site/facility security requires that only authorized personnel with a need-to-know are granted physical access to computing facilities that house the MARK IVB indoor processing equipment which includes COMSEC equipment. The computing facility should be locked and alarmed with features sufficient to meet unattended COMSEC storage requirements. A fire suppression system is needed for the indoor equipment with a local and remote fire activation and alarm capability.

1.5.3. Power Requirements. MARK IVB power requirements are specified in **Table 1.1** below. The requirement for emergency power is determined under AFI 32-1063.

Table 1.1. MARK IVB Power Requirements.

Type	V-Ph-Hz	Rated A	kVA	kW	Comments
Tracking Antenna	208-3-50/60	30	10.81	8.65	
Pointing Antenna	208-3-50/60	30	10.81	8.65	
Racks (via UPS)	230-S-50	50	10	8	
Tracking Radome ECU	400-3-50	30		16.63	3 ton (36,000 BTU) cooling, 13 kW heater
Pointing Radome ECU	400-3-50	45		22.17	4 ton (48,000 BTU) cooling, 13 kW heater
Rack Room ECU	(site provided)			33.26	5 ton (60,000 BTU) cooling, 20 kW heater1
X-band Antenna	208/230-S-50/60	20	4.16	3.33	
X-band Radome ECU	(site provided)			16	3 ton (36,000 BTU) cooling, 10 kW heater1
Total rated kW				116.7	
Total rated kVA			145.88		
NOTES:					
1. May vary by site-representative values.					