Introduction of Maritime VSAT Antenna (Ku-Mate)

June 2011

Mitsubishi Electric Corporation

1 Ku-Mate

FEATURES:

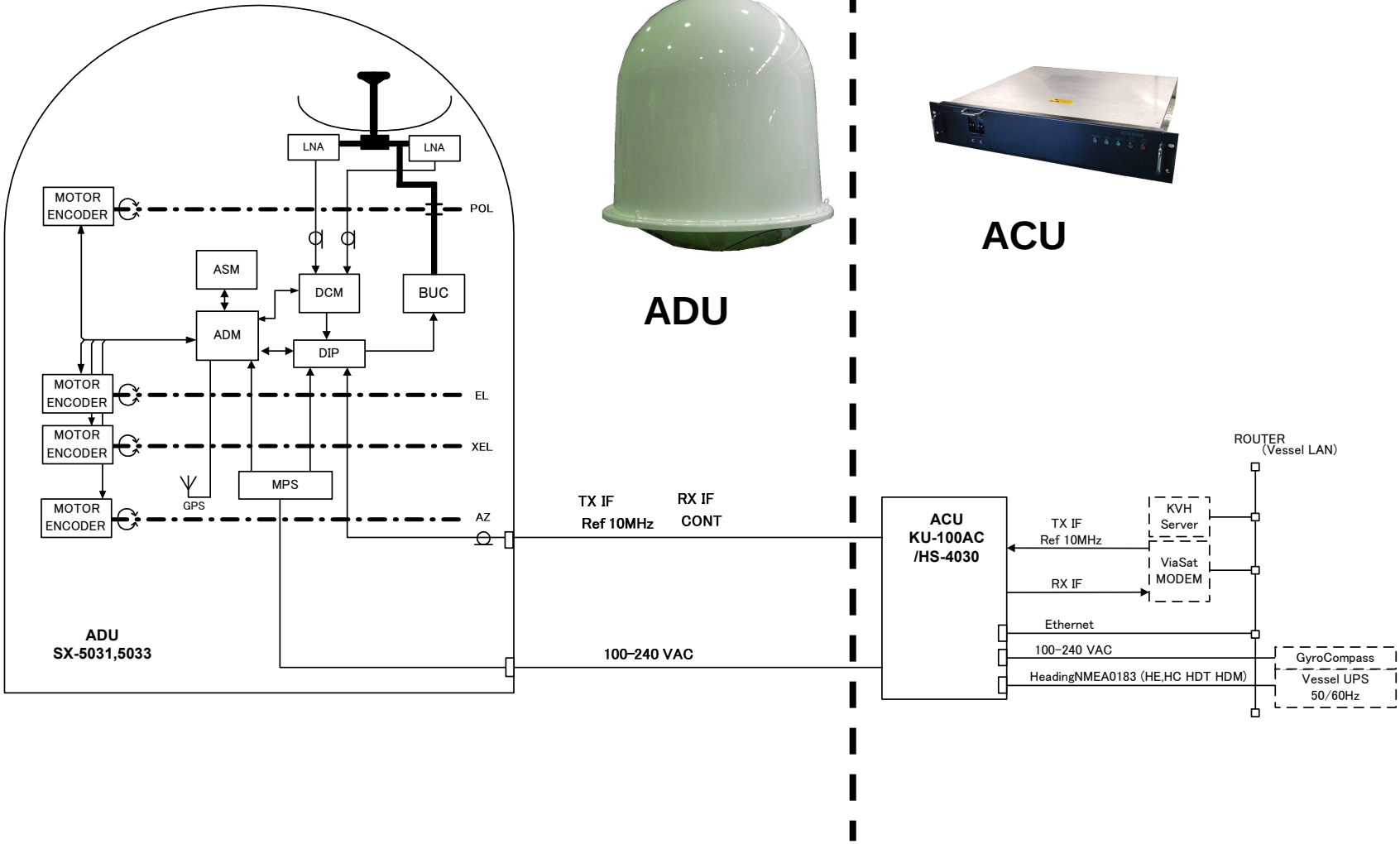
1. 1.0 meter dish with 8W Block up converter (BUC)
2. Eutelsat EESS 502 STANDARD M approved
3. Robust and reliable antenna control keeping satellite tracking error of ±0.2deg. compliant with ITU-R requirement under severe vessels motion and vibration condition
4. 3-axes stabilized mount for full hemispherical coverage at severe motion condition
5. Single IF cable between ADU and BDU multiplying Transmit, Receive and control signal
6. Quickly and easily replaceable components for easy maintenance
7. Easy to maintain and diagnosis by user-friendly PC based program
8. Compatible with MODEM of iDirect and KVH(ViaSat)

Above Deck

Below Deck

ADU

ACU



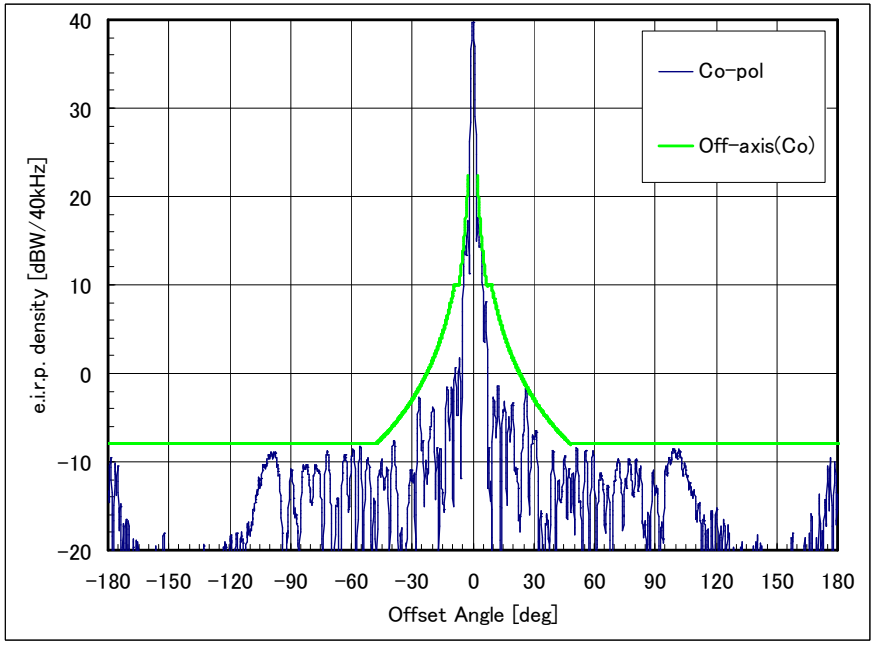
2. Major Performance

Item		1m Antenna
Antenna	Reflector Size	1m
	Radome Size	Approx. 1.60m(D) x 1.75m(H)
	Weight	Approx. 175kg
	Mount	3-axis servo control
RF/IF Frequency	Transmit	14.00 - 14.50 GHz / 950 - 1,450 MHz 13.75 - 14.50GHz /950-1,700MHz(option)
	Receive	10.95 - 12.75 GHz / 950 - 1,700 MHz
Polarization	Transmit	Linear
	Receive	Linear
Cross Polarization Discrimination	Transmit	>30dB
	Receive	>30dB
System EIRP		49.0dBW typ. @14.25GHz with 8W BUC
System G/T		18.4dB/K typ. @12.50GHz
Tracking	Method	Conical Scan + Rate Sensor
	Accuracy	+/- 0.2 deg. (o-p)
Gimbal Angle Coverage	Az	540 deg. (continuous)
	El	-25 to +115deg.
Wind Load	Average	40m / sec
	Maximum	60m / sec
Vessel Motion	Roll	+/-30deg/ 7sec
	Pitch	+/-10deg/ 5sec
	Yaw	+/- 4deg/ 20sec
	Turning Rate	+/- 6deg/sec
Vessel I/F	Navigation	Gyro Compass (NMEA0183)
Environmental Condition (*)	Temperature	-25 to +55 degC
	Damp-Heat	+40degC 93%RH 1cycle
Power Supply		100-240VAC 50/60Hz +/-5%

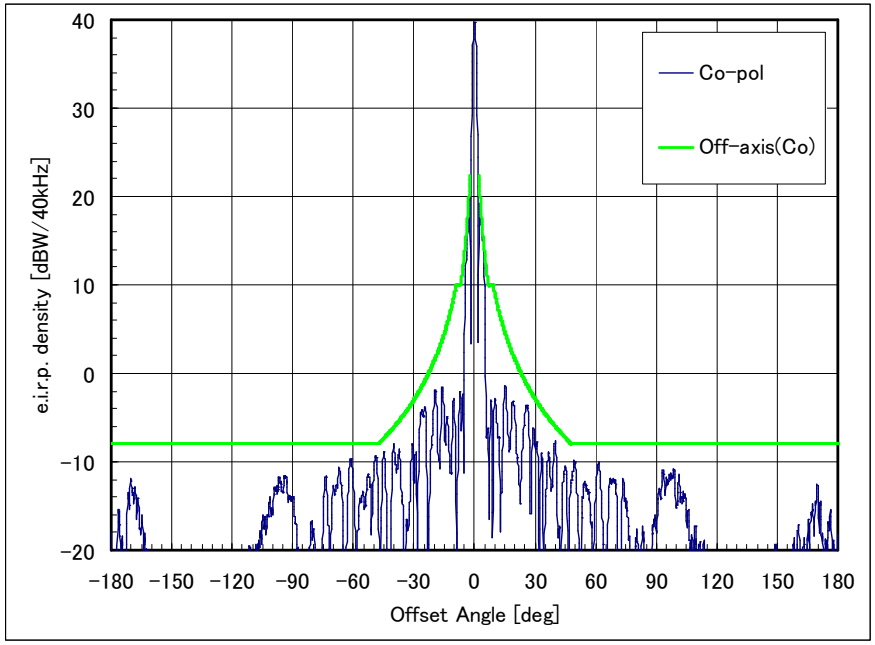
(*Note) Comply with IEC60945

Radiation Performance

Low side lobe radiation pattern,Eutelsat EESS 502 STANDARD M approved



Pattern freq.14.25GHz E-plane



Pattern freq.14.25GHz H-plane

Ku-Mate can transmit power density up to 39.7dBW/40kHz
due to well suppressed side lobe radiation pattern.
It enables Ku-Mate to transmit higher EIRP density than other competitor's VSAT !

Tracking Performance

Tracking performance test under specified motion condition

Fig.5.2-2 Tracking test

Under high elevation condition

Fig.5.2-3 Tracking test

Under low elevation condition

Repeated and accurate verification provide reliable tracking performance

Tracking Performance

Tracking Error performance under specified motion condition

Roll+−30deg.7sec, Pitch+−10deg./5sec, Yaw+−4deg./14sec

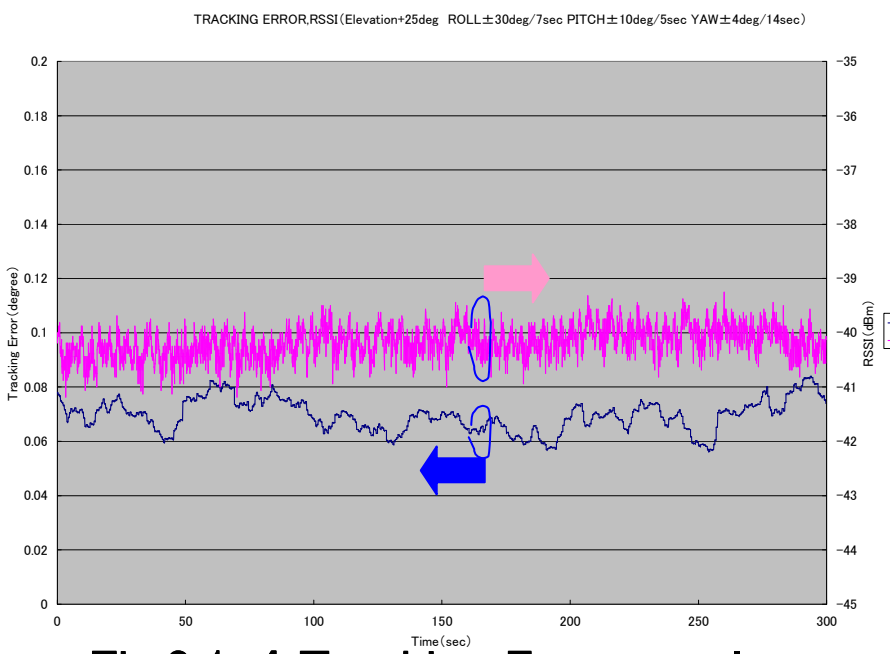


Fig.3.1−4 Tracking Error result

At Elevation angle 25deg.

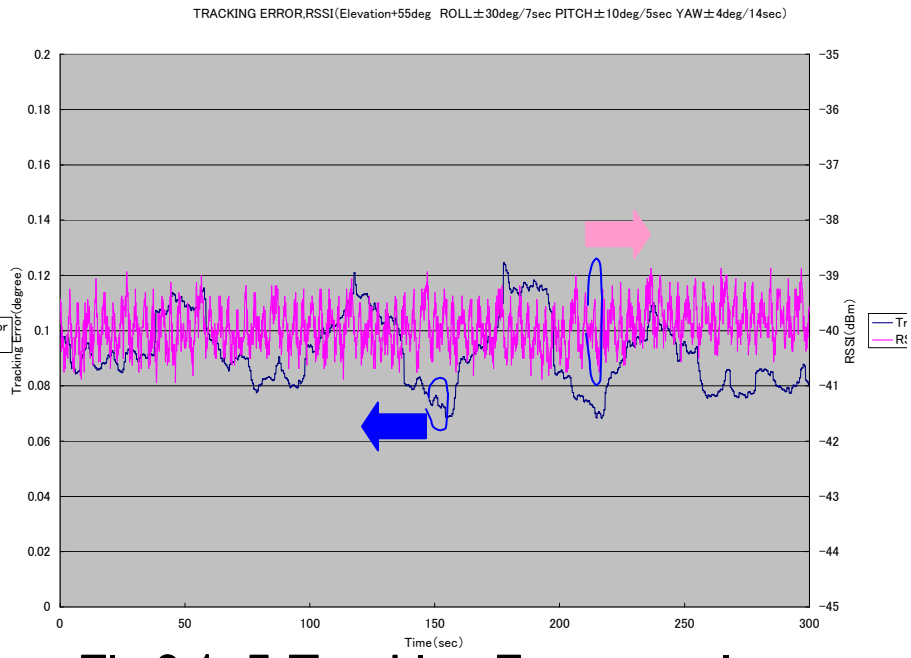
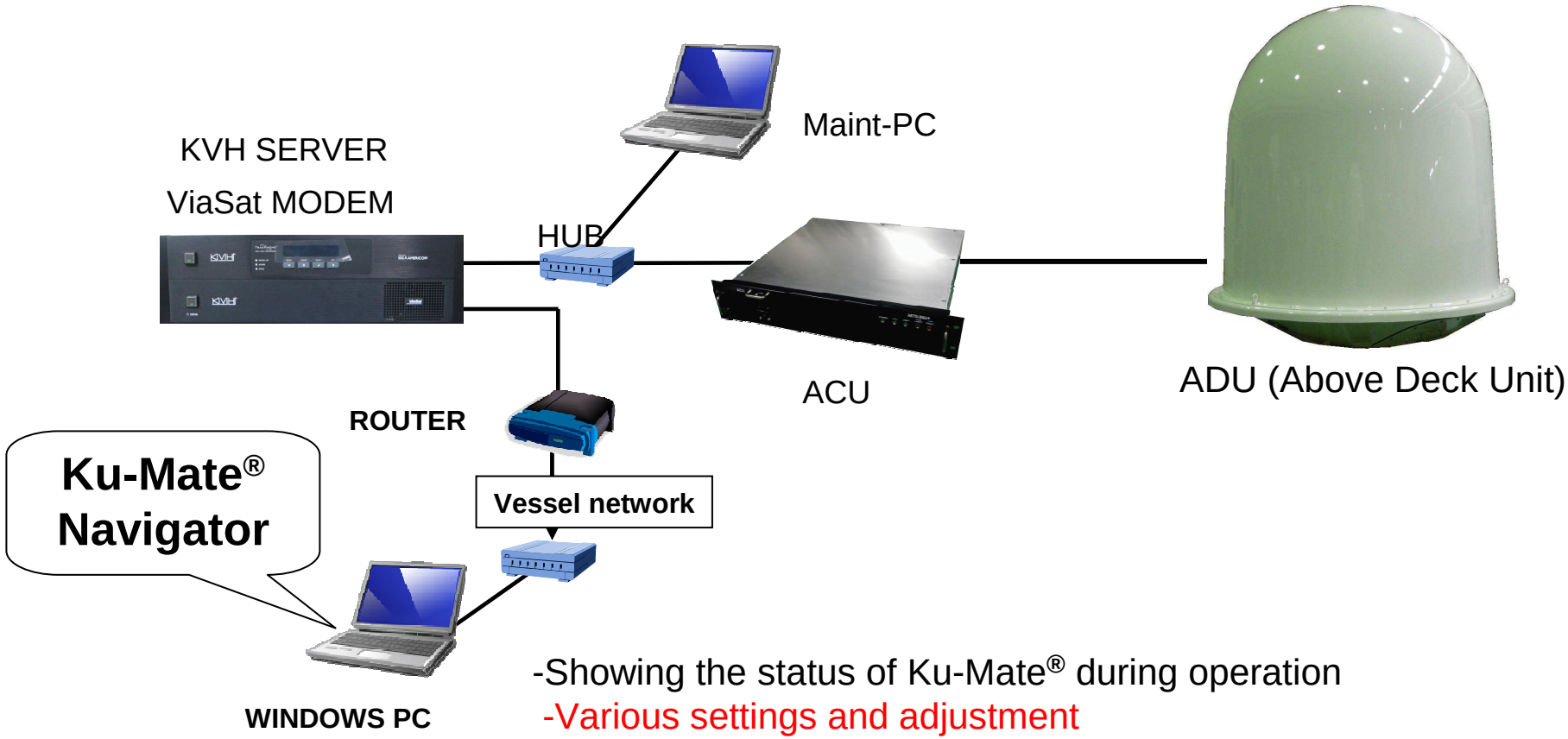


Fig.3.1−5 Tracking Error result

At Elevation angle 55deg.

Tracking error results show within the specification +-0.2degree

How to use Ku-Mate® Navigator



-Showing the status of Ku-Mate® during operation
-Various settings and adjustment
-Transfers necessary parameters
-The status can be stored to the PC every one(1) second

(Functions of Maintain Ku-Mate are written by red character.)

MELCO Future Product Plan

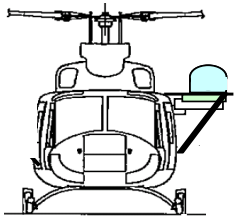
1. 1.2m class maritime VSAT
2. 0.6m class maritime VSAT

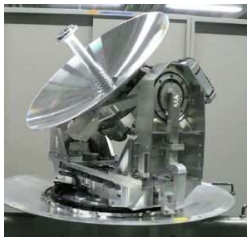
MELCO mobile satellite antenna Roadmap

MELCO has been developing variety kind of antennas for mobile,helisat system and vehicle mount terminal following Ku-Mate as shown below.

CBB Airborne
（2004～2006）

Ku-Mate®（2009）





HeliSat（2009）
(with 40cm antenna)

Vehicle mount SNG（2010）
(with 40cm antenna)

Maritime VSAT
with 1.26m antenna

Maritime VSAT
with 0.6m antenna

Under development

1.26m Antenna

1.26m Antenna

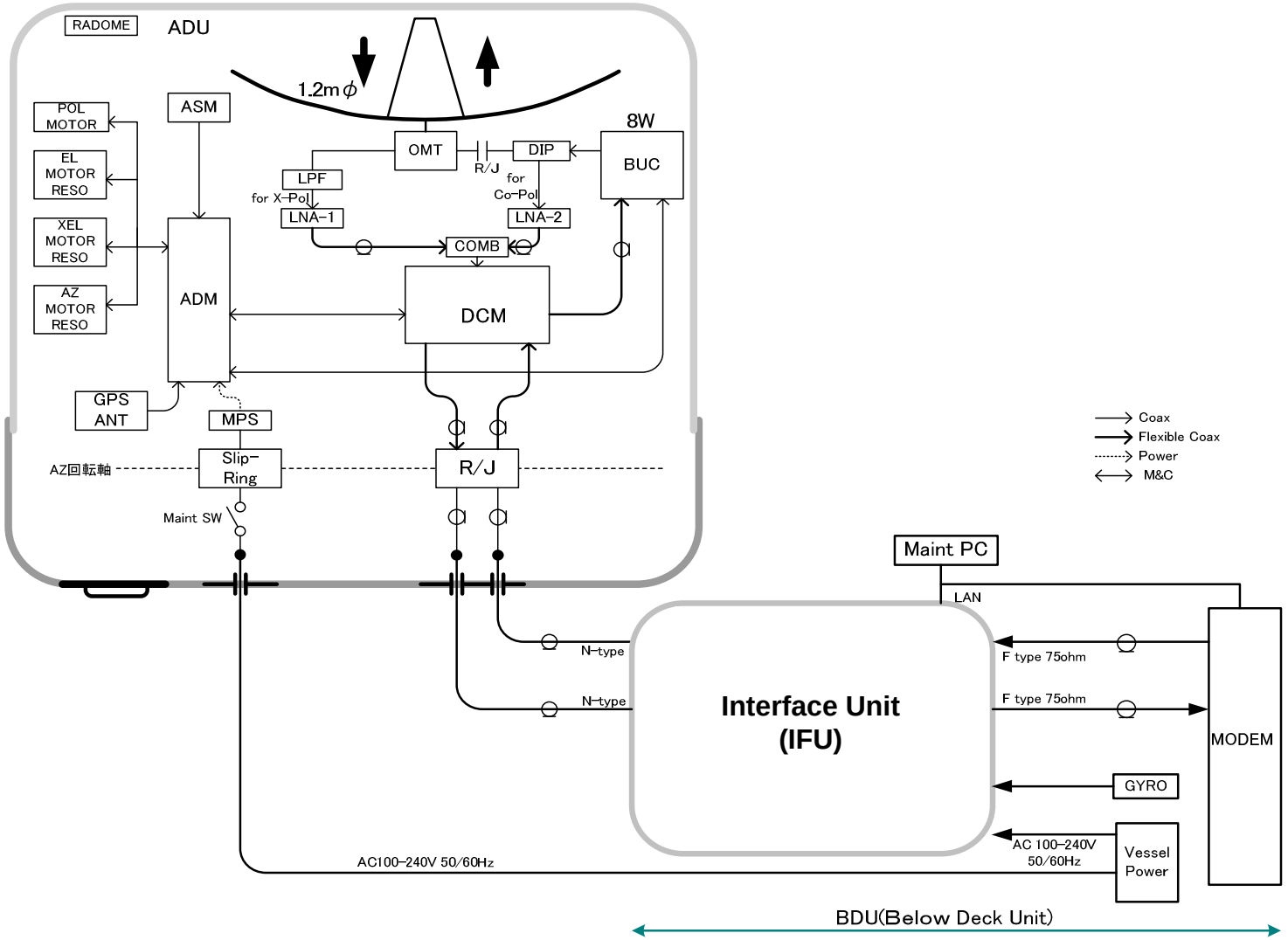
Features

- Higher antenna gain expands service area.
- Radome size and weight are kept the same size as those of current 1m antenna.
- Remote monitoring, remote software version up are available.

1.26m Antenna Block Diagram

Changes for the Better

NP-1098

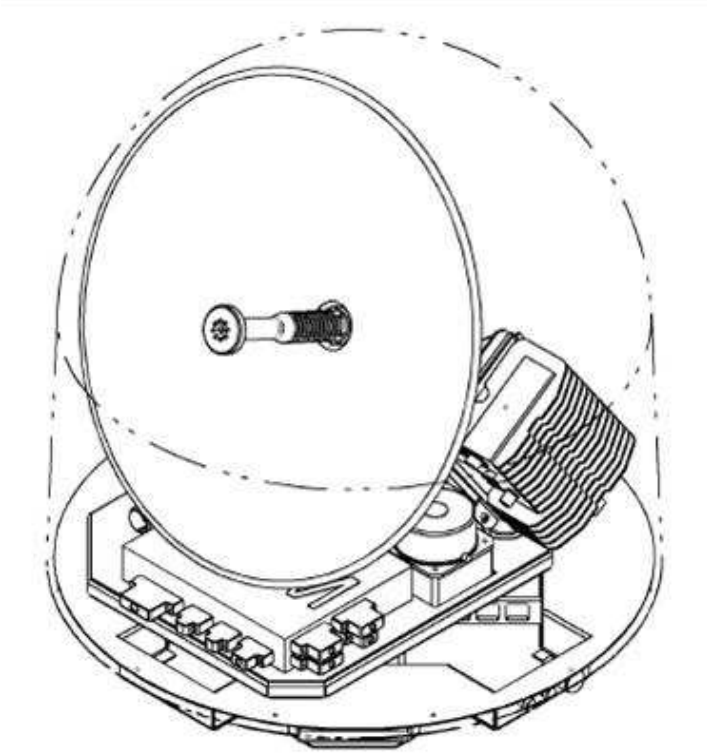


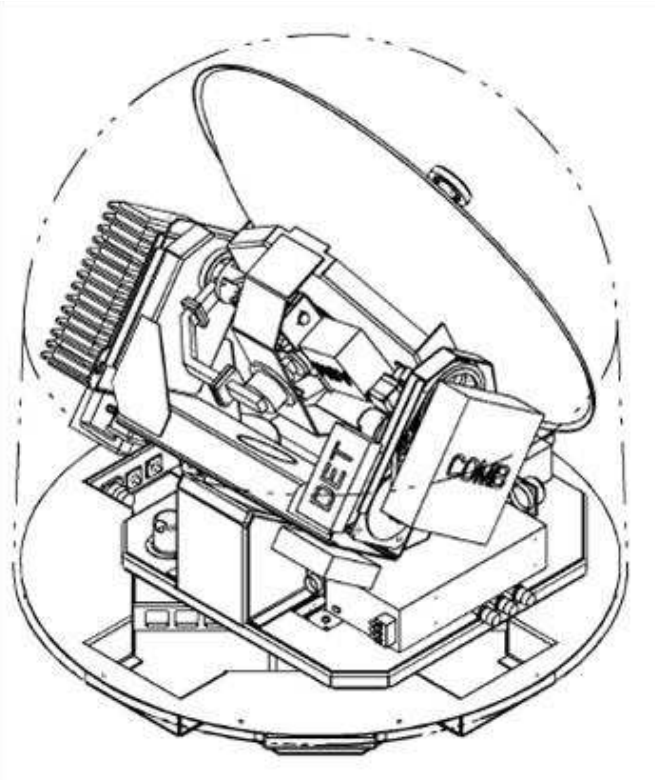
Major Performance of 1.26m Antenna

Item		1m Antenna
Antenna	Reflector Size	1.26m
	Radome Size	Approx. 1.60m(D) x 1.75m(H)
	Weight	Approx. 175kg
	Mount	3-axis servo control
RF/IF Frequency	Transmit	14.00 - 14.50 GHz / 950 - 1,450 MHz 13.75 - 14.50GHz /950-1,700MHz(option)
	Receive	10.7 - 12.75 GHz / 950 - 1,700 MHz
Polarization	Transmit	Linear
	Receive	Linear
Cross Polarization Discrimination	Transmit	>30dB
	Receive	>30dB
System EIRP		51.0dBW typ. @14.25GHz with 8W BUC
System G/T		20dB/K typ. @12.50GHz
Tracking	Method	Conical Scan + Rate Sensor
	Accuracy	+/- 0.2 deg. (o-p)
Gimbal Angle Coverage	Az	No-rewind
	El	-25 to +115deg.
Wind Load	Average	40m / sec
	Maximum	60m / sec
Vessel Motion	Roll	+/-30deg/ 7sec
	Pitch	+/-10deg/ 5sec
	Yaw	+/- 4deg/ 20sec
	Turning Rate	+/- 6deg/sec
Vessel I/F	Navigation	Gyro Compass (NMEA0183)
Environmental Condition (*)	Temperature	-25 to +55 degC
	Damp-Heat	+40degC 93%RH 1cycle
Power Supply		100-240VAC 50/60Hz +/-5%

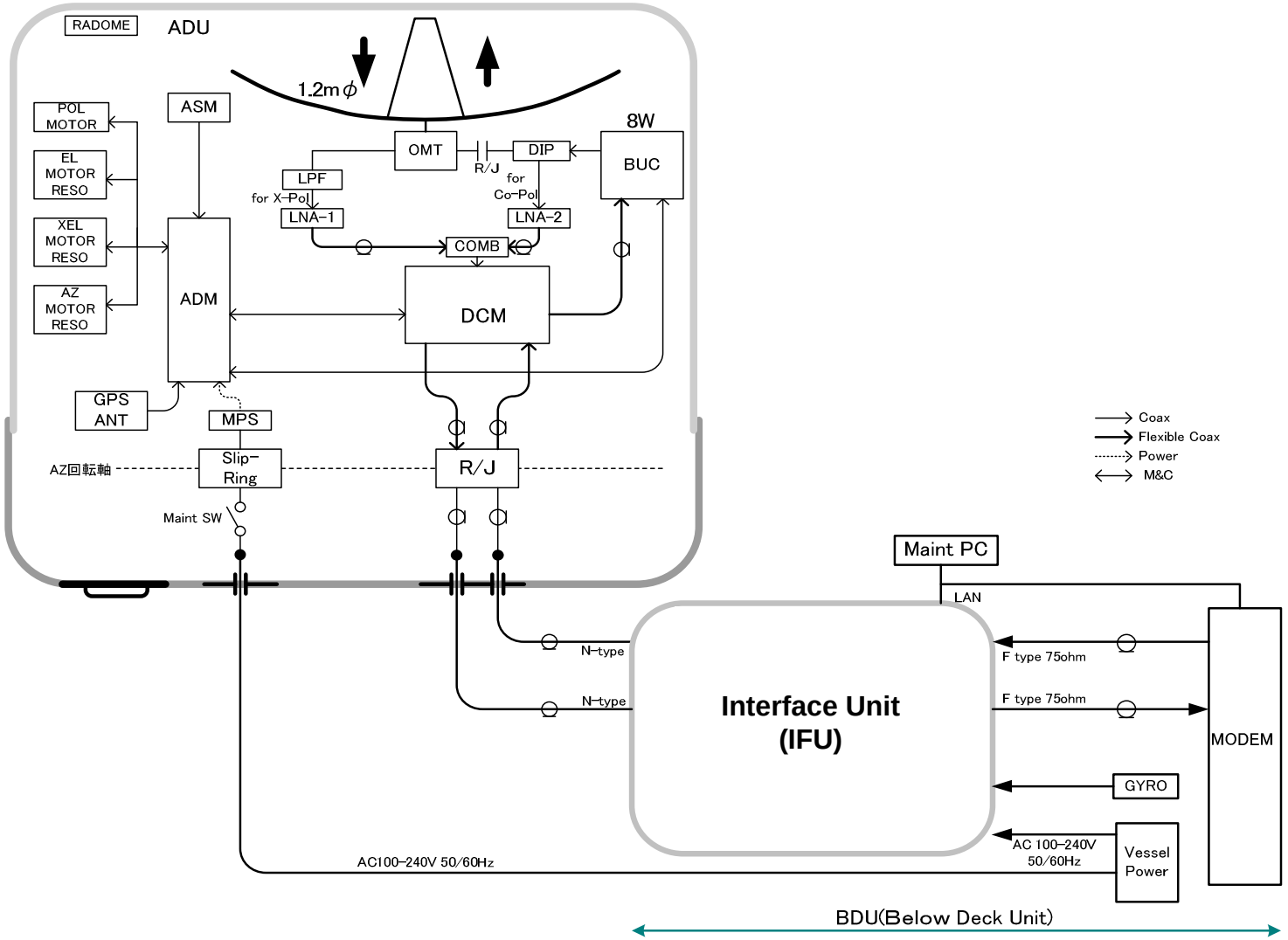
(*Note) Comply with IEC60945

0.6m Antenna





0.6m Block Diagram



Major Performance of 0.6m Antenna

Item		1m Antenna
Antenna	Reflector Size	0.6m
	Radome Size	Approx. 0.75m(D) x 0.85m(H)
	Weight	Approx. 70kg
	Mount	3-axis servo control
RF/IF Frequency	Transmit	14.00 - 14.50 GHz / 950 - 1,450 MHz 13.75 - 14.50GHz /950-1,700MHz(option)
	Receive	10.7 - 12.75 GHz / 950 - 1,700 MHz
Polarization	Transmit	Linear
	Receive	Linear
Cross Polarization Discrimination	Transmit	>30dB
	Receive	>30dB
System EIRP		39.0dBW typ. @14.25GHz with 8W BUC
System G/T		13.5dB/K typ. @12.0GHz
Tracking	Method	Conical Scan + Rate Sensor
	Accuracy	+/- 0.2 deg. (o-p)
Gimbal Angle Coverage	Az	No-rewind
	El	-15 to +105deg.
Wind Load	Average	40m / sec
	Maximum	60m / sec
Vessel Motion	Roll	+/-30deg/ 7sec
	Pitch	+/-10deg/ 5sec
	Yaw	+/- 4deg/ 20sec
	Turning Rate	+/- 6deg/sec
Vessel I/F	Navigation	Gyro Compass (NMEA0183)
Environmental Condition (*)	Temperature	-25 to +55 degC
	Damp-Heat	+40degC 93%RH 1cycle
Power Supply		100-240VAC 50/60Hz +/-5%

(*Note) Comply with IEC60945