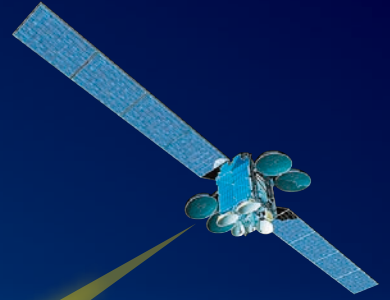


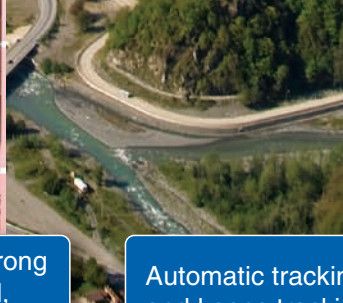
Helicopter Satellite Communications System (HSA)



Direct transmission from helicopter

- Burst modem synchronization through blade rotation
- Steady transmission everywhere without interruption from mountains or buildings
- 10Mbps high-definition video transmission*1

(*1) Transmission rate depends on the satellite conditions.



Newly developed lightweight parabolic antenna, strong FEC (LDPC) and H.264 codec enables high-speed, high-definition video transmission from the helicopter.

Automatic tracking system captures satellite instantly and keeps tracking while in flight or hovering.

Stable transmission technique (time diversity reception and intermittent transmission) avoids satellite signal blockage by blade rotation.

Entire system can be controlled from a ground station, including bandwidth assignment for multiple helicopters and bidirectional voice communication between helicopters and ground stations.

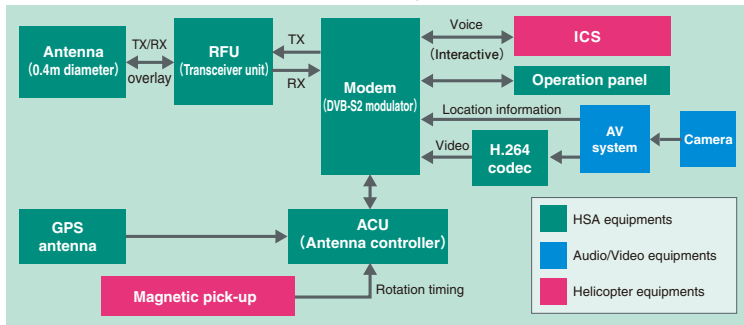
Helicopter Satellite Communications System (HSA)

Standard Specifications

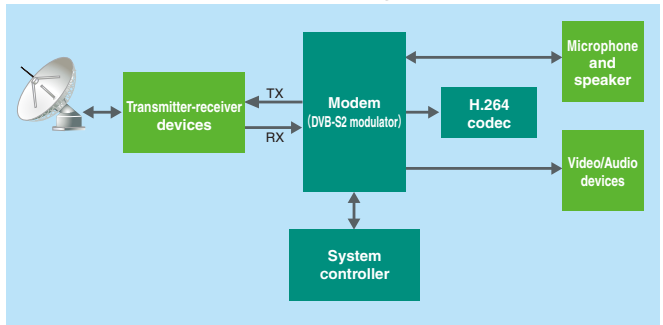
| Item | Description | | Remarks |
|--------------------------------------|---|-------------------------|---------------|
| System | | | |
| Operating Frequency | Transmission : 14.00~14.40GHz Reception : 12.25~12.75GHz | | |
| Function | Video transmission, interactive wireless call, data transmission | | |
| Transmission Method | Return link : Transmission timing synchronized with blade rotation Forward link : Time diversity | | |
| Career Assignment | PAMA method | | DAMA optional |
| Antenna & Transceiver | | | |
| Antenna | 0.4m ϕ parabolic antenna | | |
| Satellite Tracking System | Conical scan + Rate sensor | | |
| Polarization | Linear V/H or H/V selectable | | |
| EIRP | 45dBW standard | | |
| Modulation & Demodulation | | | |
| Modulation Method | Return link : BPSK or QPSK, Forward link : BPSK | | |
| Error Correction Method | LDPC | | |
| Transmission Rate* | Return link : 384kbps~10Mbps, Forward link : 16~64kbps | | |
| Operational Requirements | | | |
| Maximum Speed | 160kt | | |
| Maximum Altitude | 11000ft | | |
| Pitch Angle | $\pm 30^\circ$ | | |
| Bank Angle | $\pm 20^\circ$ | | |
| Others | | | |
| | Outdoor Equipment | Indoor Equipment | |
| Power Supply | 28VDC < 850W | | |
| Operating Temperature | -25°C~50°C | 0°C~40°C | |
| Dimensions(mm) | Antenna with redome : 600 ϕ x 560 Transmitter : 460 x 450 x 130 | 490 x 360 x 530 | |
| Weight(kg) | Approx. 30 | Approx. 20 | |

(*)Transmission rate depends on the satellite conditions.

Helicopter (HSA) Block Diagram

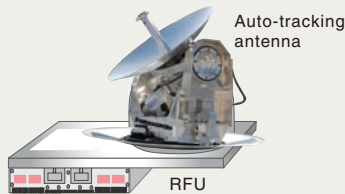


Ground Station Block Diagram



HSA System Equipment

Outdoor equipment



Indoor equipment



MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
http://www.mitsubishielectric.com

Contact:
Satellite Communications Marketing Dept.
Phone: +81-3-3218-3346
Email: iss.SNG@ny.MitsubishiElectric.co.jp