

## BAB VII

### KESIMPULAN DAN PENUTUP

#### VII.1. Kesimpulan

- a. Penerapan sistem SSL di Indonesia dapat dilakukan dengan dua alternatif, yaitu menggunakan dua buah satelit DBS sesuai rekomendasi WARC 77 atau dengan mengembangkan satelit Palapa generasi baru, yang telah dilengkapi dengan sistem DBS.
- b. Secara teknis (kualitas) dan operasional penggunaan sistem DBS sangat menguntungkan dibanding dengan sistem yang telah ada sekarang
- c. Penyebarluasan sistem informasi menjadi lebih fleksibel, baik untuk siaran pembangunan, pendidikan, dan hiburan.
- d. Dari segi ekonomi, pada tahap pengembangan pertama, diperlukan investasi biaya yang besar tetapi selanjutnya biaya akan relatif menjadi lebih murah, baik operasional atau pengembangan lebih lanjut.
- e. Dengan digunakannya sistem SSL informasi dapat cepat disampaikan.
- f. Sistem SSL dapat memperbaiki sistem penerimaan signal siaran di daerah-daerah terpencil.

## VII.2. Penutup

Demikian tugas akhir ini, saya susun agar dapat memberi gambaran bagi Bapak/Ibu serta rekan-rekan, tentang cara kerja dan aspek-aspek teknis dari SSSL yang teknologinya relatif baru dan masih terus dikembangkan.



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	D3	F3
<u>Receive Antenna</u>		
Polarization	RHC	LHC
Cross-Polarization		<-33 dB
Side Lobes		<-30 dB
HPBW (Circular)		0.7° x 0.7°
Gain		47.2 dB
Reflector Dimension		2 m Ø
Focal Length		1,5 m
Beam Pointing Error		0.2°
<u>Transmit Antenna</u>		
Polarization	LHC	RHC
Cross-Polarization (Boresight)	-40 dB	-33 dB
Side Lobes		-30 dB
HPBW (Elliptical)	1.62° x 0.72°	2.50° x 0.98°
Gain (11.9 GHz) *	44 dB;	40.8 dB;
Reflector Dimensions	2.7 m x 1.4 m	2.4 m x 0.9 m
Focal Length		1.5 m
Beam Pointing Error		< 0.1°
<u>S-Band Antenna</u>		
Polarization (Nominal)		RHC
Gain (within 30° around boresight)		-5 dB

TV-SAT TDF 1	TABLE 3:	MAIN ANTENNA CHARACTERISTICS
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D3

F3

Power Conditioning and Energy Storage

- Input DC power 4.7 kW max
- Available voltage 50 V<sub>DC</sub> ± 2 %
- Battery 28 Ni Cd Cells x 18 Ah
- Mass 80 kg

TT & C

- Number of TM Channels 512
  - Number of Telecommands 480 on/off + 36 Serial
- |                             | TC      | TM      | TC      | TM      |
|-----------------------------|---------|---------|---------|---------|
| - Frequencies Ku-Band (MHz) | 17307   | 11701   | 18090   | 12490   |
| S-Band (MHz)                | 2026,05 | 2200,24 | 2030,19 | 2204,73 |
- Mass 40 kg

AOCS

- Antenna pointing accuracy
  - Transmit antenna ≤ 0.05°
  - Receive antenna ≤ 0.2°
- Body pointing accuracy
  - Roll ≤ 0.21°
  - Pitch ≤ 0.13°
  - Yaw ≤ 0.81°
- Mass 48 kg

THERMAL CONTROL

- Heating Power 400 W (equinox)
- Temperature Channels 80
- Automatic Heaters 24 (redundant)
- Mass 76 kg

TV-SAT  
TDF 1

TABLE 5: MAIN SERVICE MODULE  
CHARACTERISTICS

Main Characteristics REPEATER	D	F
Input Signal Level Range		
Minimum	- 66 dBm	
Maximum	- 47 dBm	
Noise Figure		
at Minimum Input Level	9 dB	
at Maximum Input Level	10 dB	
Output Power Nominal		
Channel 9	-	185 W
Channel 10	152 W	-
Output Power (saturation)		
Channel 9	-	236 W
Channel 10	186 W	-
Power Consumption	1840 W	1960 W
Mass		110 kg

TV-SAT  
TDF 1

TABLE 4:

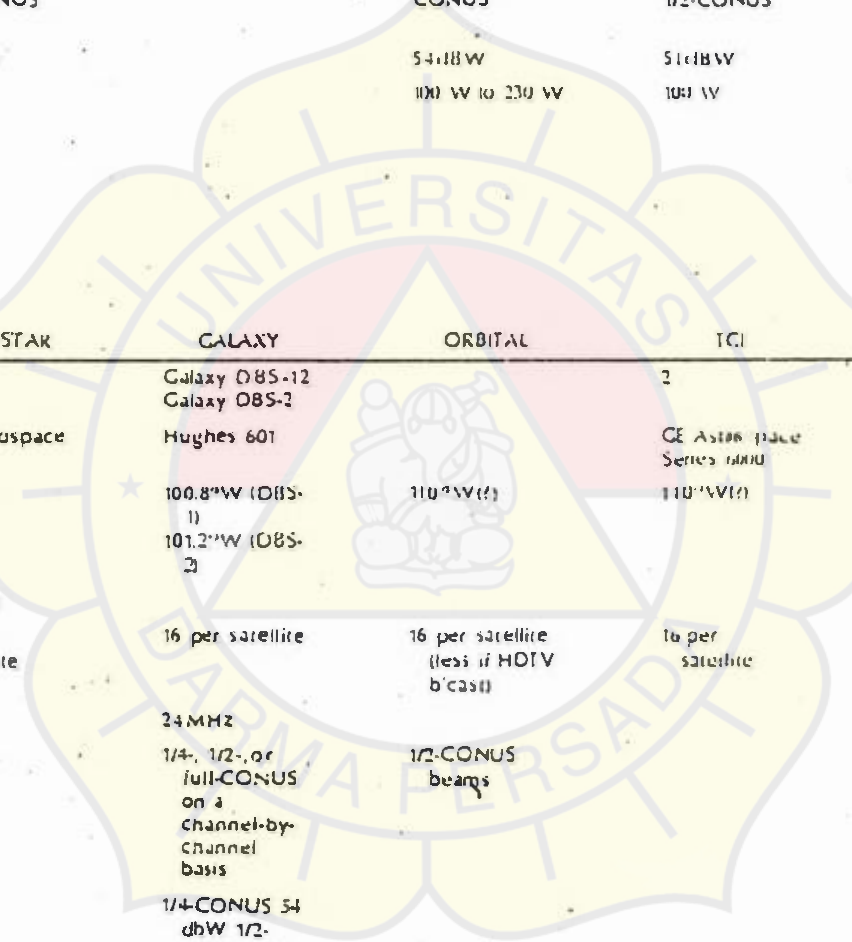
MAIN REPEATER  
CHARACTERISTICS





U.S. DBS Systems

SYSTEM	ACC	CONTINENTAL	DBSC	DIRECTSAT	DVS
satellite	ACC-1 ACC-2	2	2	2 in orbit 1 spare	STC 1 STC 2 DVS 1 DVS 2
us	GE Astrospac	GE Astrospac or Hughes	Ford		GE Astrospac (STC)HS 393 (DVS)
Orbital lots	110°W 119°W	61.5°W 110°W 148°W	101°W 148°W	101°W 148°W	119°W
life	7 years		7 years	10 years	10 years
Channels Requested	16 per satellite	16 at 61.5°W and 148°W 8 at 110°W	16	16 per satellite	STC 3 per satellite DVS 8 per satellite
bandwidth Coverage	24 MHz 1/2-CONUS		24 MHz CONUS	2 MHz 1/2-CONUS	27 MHz 1/2-CONUS or 1/4 CONUS
Min EIRP WTA	51 dbw 100 W		54 dBW 100 W to 230 W	51 dBW 100 W	54 dBW 200-230 W (STC) 230 W (DVS)
launch	1989? 1990				STC 1 1990 or Long March STC 2 1991 or 1992 Titan or Ariane DVS 1990s
SYSTEM	ECHOSTAR	GALAXY	ORBITAL	TCI	USDB
satellite	2	Galaxy DBS-12 Galaxy DBS-2		2	1
us	GE Astrospac	Hughes 601		GE Astrospac Series 6000	GE Astrospac
Orbital lots	61.5°W 148°W	100.8°W (DBS- 1) 101.2°W (DBS- 2)	110°W(?)	110°W(?)	110°W
life	10 years				
Channels	16 per satellite	16 per satellite	16 per satellite (less if HOTV b'cast)	16 per satellite	16
bandwidth Coverage		24 MHz 1/4-, 1/2-, or full-CONUS on a channel-by- channel basis	1/2-CONUS beams		
Min EIRP		1/4-CONUS 54 dbW 1/2- CONUS 51 dbW Full- CONUS 48 dbW			
WTA		100 W	100 W	100 W	
launch		1991?	1992 1993	1995 1998	1992



Japanese Direct Broadcast Satellites

System	BS-2b	BS-3
Operator	NHK #1/TSCJ #2	NHK, JSB #3/TSCJ
Prime contractor	Toshiba/CE	NEC /G2-Asirn
Launch year	Feb. 1985	1990
Launch vehicle	H-II	H-I
Orbit position	110 deg. E	110 deg. E
Design life	5 years	7 years
Stabilization	Three-axis	Three-axis
Mass		
at Launch	670 kg	1100 kg
In-orbit Mass	350 kg	550 kg
Solar array power at EDL	830 W	1100 W
Frequencies (down link)	11.7-12.2 GHz	11.7-12.2 GHz
Maximum power flux-density at the Earth's surface	-103 dBW/m <sup>2</sup> /27 MHz	-103 dBW/m <sup>2</sup> /27 MHz
Polarization	Circular	Circular
Beam coverage	Japan	Japan
Antenna gain	37 dB	37 dB
RF Power Output	100 W	120 W
Satellite EIRP	38 dBW	60 dBW
Satellite GT	6 dB/K	8 dB/K
Number of Transponders	2 plus 1 common redundancy	3 plus 3 each redundancy
Transponder bandwidth	27 MHz	27 MHz

NHK: Nihon Hoso Kyokai (Japan Broadcasting Corporation)  
 TSCJ: Telecommunications Satellite Corporation of Japan  
 JSB: Japan Satellite Broadcasting, Inc

European DBS Systems

SYSTEM	ASTRA	BSB	EIRESAT	EUROPE SAT (Provisional)	EUTELSAT II
Satellites	Astra 5 Astra 6 (spare)	BSB-1 BSB-2 plus 1 spare	1	2 plus 1 spare	F1, F2
Bus	GE Aerospace RCA 4000	Hughes HS 376	Hughes HS 393	Aerospaciale Spacebus 1008	
Orbital Slots	19°E 1°E	31°W	31°W	29°E (1) or 19°W (1) 36°E	F1: 3°E or 13°E F2:
Design Life	10 years	10 years	10 years		10 years
Frequencies (GHz)	Broadcast: 11.2-11.45 Feeder: 14.25-14.3	Broadcast: 11.7-12.06 Feeder: 17.3-12.06	Broadcast: 10.7-10.95 11.7-12.06 12.5-12.75 Feeder: 17.3-12.8; 18.9-19.5	Broadcast: 17.3-18.1 Feeder: 11.7-12.5	Broadcast: 10.9-11.2 11.45-11.7 12.5-12.75 Feeder: 14.0-14.5
Channels	16	5	50 or 10 or 29 Fixed	24	16
Bandwidth	26 MHz	27 MHz	27 MHz OBS 36 MHz Fixed		31, 36, and 72 MHz
Polarization	Linear	RMCP	DBS Circular Fixed Linear		Linear
EIRP	50-51 dBW	60 dBW (United, U.K.) 50 dBW (West Europe)	DBS 60 dBW (Ireland, U.K.) 50 dBW (West Europe) Fixed 47 dBW	55 dBW	Eurobeam: 39-46 dBW, Spotbeam: 46-52 dBW
Coverage	Western Europe (shaped Eurobeam)	U.K. with spillover (elliptical beam)	DBS elliptical beam: FSS shaped Eurobeam	From Iceland and Finland to Azores and Eastern Turkey	Shaped Eurobeam and Spotbeam

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