

ANTOD 202

TRANSMISSION PLAN FORM
FORM-1 TELECOMMUNICATION LINK BUDGET

Customer Name:

**C03A: USA,Hawaii: Honolulu (13
(8PSK, TPC FEC=0.75, RS=No) -**

From
to

USA,Hawaii: Honolulu
SOLOMON ISLANDS: Honiara

A. Satellite Characteristics

Parameter

1. Satellite name	Apstar-VI
2. Orbit location (deg.E)	134.00
3. Transponder number	C03A
4. Transponder gain step	35
4.1 Transponder Attenuation (dB)	14.5
5. Saturation EIRPS (dBw)	32.75
6. SFD (dBw/m ²)	-84.28
7. G/T (dB/k)	-4.38
8. Output backoff (dB)	2.50
9. Input backoff (dB)	5.50
10. Uplink frequency (MHz)	5945.00
11. Downlink frequency (MHz)	3720.00
12. Transponder bandwidth (MHz)	36.00

B. Earth Station Characteristics

1. Transmit Station Information

a. Antenna diameter (m)	13.00
b. Earth Station Location	USA,Hawaii: Honolulu
c. Longitude (deg.E)	-157.86
e. Latitude (deg.N)	21.31
f. Distance to satellite (km)	40395.59
g. Antenna elevation (deg)	11.80
h. Antenna azimuth (deg)	261.75
i. Feed loss (dB)	0.20
j. HPA to Feed waveguide loss (dB)	1.00
k. HPA type (KHPA or TWTA)	TWTA
l. HPA required output power(dBw)	18.93
l' HPA required output power (Watts)	78.18
l'' HPA required output power (Watts) (Including 1dB Backoff)	98.42
m. HPA Max output power (dBw)	30.00
m'' Margin of HPA Output power(dB)	11.07

n. Antenna efficiency (%)	60.00
o. Antenna Gain (dB)	55.94
p. Tracking capability	Manual
q. Antenna type	Fixed

2. Receive

a. Antenna diameter (meter)	4.50
b. E.S.Location	SOLOMON ISLANDS: Honiara
c. Longitude (deg. E)	159.95
d. Latitude (deg. N)	-9.43
e. Distance to satellite (km)	36624.47
f. Antenna elevation (deg)	57.91
g. Antenna azimuth (deg)	288.49
h. Antenna efficiency (%)	65.00
i. Antenna Gain (dB)	43.00
j. Receive system noise temp. (dBK)	19.48
k. System G/T (dB/k)	23.52
l. Tracking capability	Manual
m. Antenna type	Fixed

C. Misc Losses

1. Uplink rain Attn (dB) ITU P.618-8	2.87
2. Downlink rain Attn (dB) ITU P.618-8	0.37
3. Uplink path loss (dB)	200.06
4. Downlink path loss (dB)	195.14

D. Carrier Characteristics

1. Carrier type	Digital
2. Modulation technique	8PSK
3. Carrier info. rate (kbps)	29000.00
4. Reed Solomon	No
4.1 FEC Coding	TPC
5. FEC code rate	0.750
6. Carrier transmission rate (kbps)	38666.67
7. Overhead(%)	0.0%
8. Carrier noise bandwidth (kHz)	15466.67
9. Rolloff Factor (%)	40%
10. Carrier allocated bandwidth(kHz)	18044.44
11. Threshold Eb/N0 (dB)	6.80
12. Bit Error Rate Required	1x10e-8

E. Link budget

1. Uplink C/T	
a. Uplink EIRPE (dBw)	73.67
b. Uplink pass loss (dB)	200.06
c. Antenna point error (dB)	0.13
d. Gain of 1m ² antenna (dB/m ²)	36.93
e. Carrier PFD at satellite (dBw/m ²)	-92.45
f. Transponder SFD (dBw/m ²)	-84.28
g. Carrier input backoff (dB)	8.17
h. Satellite G/T (dB/k)	-4.38
i. Uplink C/T (dBw/k)	-133.76
2. Downlink C/T	
a. Saturation EIRPS (dBw)	32.75
b. Carrier output backoff (dB)	5.17
d. Carrier downlink EIRPS (dBw)	27.58
e. Downlink path loss (dB)	195.14
f. Receive antenna point error (dB)	0.13
g. Receive System G/T (dB/k)	23.52
h. Downlink C/T (dBw)	-144.54
3. C/T co-ch. interference (dBw/k)	-130.71
4. C/T IM interference (dBw/k)	-125.71
5. C/T adj. sat. interference (dBw/k)	-127.65
6. C/T and C/N total	
a. C/T total (dBw/k)	-145.18
b. Boltzmann's constant (dBw/k-Hz)	-228.60
c. Receive noise bandwidth (dB-Hz)	71.89
d. C/N total (dB)	11.53
e. Threshold Eb/N0 (dB)	6.80
f. Threshold C/N (dB)	9.53
g. Link margin (dB)	2.00

F. Off-axis emission EIRP density at 30

1. Transmit antenna diameter (m)	13.00
2. Carrier EIRPE (dBw)	73.67

3. Transmit antenna gain (dB)	55.94
4. Power at antenna feed (dBw)	17.93
5. Sidelobe envelope formula	$29-25*\log(q)$
6. Off-axis antenna gain (dB)	17.07
7. Off-axis EIRP density(dBw/4kHz)	-0.87
8. Off-axis EIRP criteria (dBw/4kHz)	$32-25*\log(q)$
9. Off-axis EIRP constraint (dBw/4kHz)	20.07
10. Margin (dB)	20.94

G. Summary

1. Occupied transponder power (dBw)	27.58
2. Percentage occupied transponder power(%)	54.05
3. Percentage occupied bandwidth(%)	50.12
4. Power equivalent bandwidth usage (kHz)	19457.59
5. Occupied bandwidth (kHz)	18044.44
6. Link margin (dB)	2.00
7. Total percentage occupied transponder power (%)	
8. Total percentage occupied bandwidth (%)	
9. Total power equivalent bandwidth usage (kHz)	
10. Total occupied bandwidth (kHz)	

10500kbps(8PSK, TPC FEC=0.8)

SOLOMON ISLANDS: Honiara

USA,Hawaii: Honolulu

Parameter

Apstar-VI

134.00

C03A

35

14.5

37.51

-78.30

-10.36

2.50

5.50

5945.00

3720.00

36.00

4.50

SOLOMON ISLANDS: Honiara

159.95

-9.43

36624.47

57.91

288.49

0.20

0.30

TWTA

19.68

92.85

116.90

20.00

0.32

60.00
46.73
Manual
Fixed

13.00
USA,Hawaii: Honolulu

-157.86
21.31
40395.59
11.80
261.75
65.00
52.22
21.42
30.80
Manual
Fixed

2.10
0.64
199.21
195.99

Digital
8PSK
10500.00
No
TPC
0.875
12000.00
0.0%
4800.00
40%
5600.00
7.20
1x10e-8

65.91
199.21
0.13
36.93
-98.60
-78.30
20.30
-10.36
-145.89

37.51
17.30
20.21
195.99
0.13
30.80
-145.75

-135.79

-131.79

-131.04

-149.19
-228.60
66.81
12.60
7.20
10.60
2.00

4.50
65.91

46.73
19.38
29-25*log(q)
17.07
5.66
32-25*log(q)
20.07
14.41

20.21
3.31
15.56
1192.52
5600.00
2.00
57.36
65.68
20650.10
23644.44