Center of the Box Pointing

▲ It is a good practice to point antennas when the satellite is at or near the center of the orbital box.

▲ The Center of the Box (COB) can be downloaded from https://extranet.ses.com/CentreOfBox/ for all SES satellites

▲ It is recommended to point 3.7 meter antennas as close to the COB as possible

▲ It is required to point 4.5 meter or larger antennas as close to the COB as possible

▲ A sample COB report is shown in the next slide and here is how to interpret them:

  • All times are in Coordinated Universal Time (UTC). To obtain Eastern Time, subtract 4 hour during Daylight Savings Time and subtract 5 hours during Eastern Standard Time from UTC.

  • The satellite travels through or near the COB twice a day. Each row in the report represents a COB or a close to COB event.

  • COB Events. In the report, the purple box highlights the start and end date and time when the satellite is in the COB. This would be the best time to point the antenna (within this time interval). In this example, September 22, 2020, between 18:29 and 20:45 UTC (14:29 and 16:45 EDT).

  • Near COB Events. There are days when the satellite does not cross the COB. The green box indicates the best date and time to point the antenna. In this case, September 28, 2020, at 6:54 UTC (2:54 EDT), in a windows of +/- 4 hours (22:54 to 6:54 EDT).

  • For the 3.7 meter antennas, the closest to the COB the better. However, avoid pointing the antenna if more than four (4) hours from a COB date and time.

```
! Title              RTEP S03                    SES proprietary and confidential                    23-Sep-2020 15:17
! Mid box
! Start date         2020/09/22 15:15:00
! End date           2020/10/07 15:15:00
! Ephemeris          Mixed
! Satellite          S03
! Window center      103.0 deg West
! Threshold          0.01 deg
! Stepsize           1.000 min
! Box type           Latitude / Longitude
!
!       Start              End            Event      S/C    Long    Ant  Opt  Thresh   Min angle    Date and time
!    Mid Box (UTC)     Mid Box (UTC)                        [deg]               [deg]    [deg]       of min angle
```

Start Mid Box (UTC)	End Mid Box (UTC)	Event	S/C	Long [deg]	Ant	Opt	Thresh [deg]	Min angle [deg]	Date and time of min angle
2020/09/22 18:29:00	2020/09/22 20:45:00	MID_BOX	S03	257.00	N/A	1	0.010	0.00287	2020/09/22 19:35:04
2020/09/23 04:49:00	2020/09/23 07:01:00	MID_BOX	S03	257.00	N/A	1	0.010	0.00217	2020/09/23 05:55:54
2020/09/23 18:17:00	2020/09/23 20:15:00	MID_BOX	S03	257.00	N/A	1	0.010	0.00574	2020/09/23 19:14:26
2020/09/24 05:18:00	2020/09/24 07:04:00	MID_BOX	S03	257.00	N/A	1	0.010	0.00628	2020/09/24 06:11:17
2020/09/24 18:18:00	2020/09/24 19:24:00	MID_BOX	S03	257.00	N/A	1	0.010	0.00884	2020/09/24 18:50:36
			S03	257.00	N/A	1	0.010	0.01023	2020/09/25 06:26:51
			S03	257.00	N/A	1	0.010	0.01163	2020/09/25 18:26:09
			S03	257.00	N/A	1	0.010	0.01376	2020/09/26 06:40:14
			S03	257.00	N/A	1	0.010	0.01377	2020/09/26 18:04:40
			S03	257.00	N/A	1	0.010	0.01668	2020/09/27 06:49:48
			S03	257.00	N/A	1	0.010	0.01526	2020/09/27 17:49:40
			S03	257.00	N/A	1	0.010	0.01891	2020/09/28 06:54:58
			S03	256.99	N/A	1	0.010	0.01631	2020/09/28 17:42:50
			S03	257.01	N/A	1	0.010	0.02041	2020/09/29 06:56:37
			S03	256.99	N/A	1	0.010	0.01721	2020/09/29 17:43:58
			S03	257.01	N/A	1	0.010	0.02128	2020/09/30 06:57:02
			S03	256.99	N/A	1	0.010	0.01811	2020/09/30 17:51:42
			S03	257.01	N/A	1	0.010	0.02168	2020/10/01 06:58:45
			S03	256.99	N/A	1	0.010	0.01905	2020/10/01 18:04:17
			S03	257.01	N/A	1	0.010	0.02184	2020/10/02 07:03:42
			S03	256.99	N/A	1	0.010	0.02000	2020/10/02 18:20:03

https://extranet.ses.com/CentreOfBox/

Pointing by Spectrum Analyzer

Satellite	Polarization	Beacon Frequency (MHz)
AMC-11	Vertical	4199.5
AMC-11	Horizontal	3700.5
SES-1	Vertical	4199.5
SES-1	Horizontal	3700.5
SES-3	Horizontal	4199.5
SES-3	Vertical	3700.5
SES-11	Horizontal	3701.5
SES-11	Vertical	4199.9

▲ Pointing the antenna with a spectrum analyzer is the preferred method.

▲ This table shows the frequency and polarization of the satellite beacons.

▲ The objective is to maximize the beacon C/N using a spectrum analyzer.

▲ Keep in consideration that when 5G filters are used, the low frequency beacon will be filtered by the 5G filter.

▲ When a 5G filter is used, the high frequency beacon should be used for pointing.

Pointing Using a Satellite Meter

Satellite	Transponder
SES-1	20
SES-3	19
SES-11	20
AMC-11	17
SES-2	23

▲ The other approach is to use a satellite meter tuned to a carrier on the satellite.

▲ The objective is to maximize the C/N or any other carrier parameter provided by the satellite meter.

▲ This table present the preferred carrier (transponder) to use for antenna pointing.

▲ There carriers have been selected because of their Adjacent Satellite Interference (ASI) environment and they should provide you with an unbiased pointing (not biased towards the East or West)

Satellite	XPR	Frequency (MHz)	Frequency (MHz)	Pol	Mod Type	Modulation	Coding Rate	Symbol Rate (Msps)
SES-1	20	1050	4100	Horizontal	DVB-S2	8PSK	R5/6	30
SES-3	19	1070	4080	Horizontal	DVB-S2	8PSK	R5/6	30
SES-11	20	1050	4100	Horizontal	DVB-S2	8PSK	R5/6	30
AMC-11	17	1110	4040	Vertical	DVB-S2	8PSK	R5/6	34.3
SES-2	23	974	4176	Horizontal	DVB-S	QPSK	R3/4	2.894