

**Los Angeles, CA ESV Interference
Analysis
Prepared for Intelsat**

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Section 1: ESV Parameters

An interference analysis to determine the interference potential from of a C-band Earth Station onboard Vessel (ESV) has been performed for the Los Angeles, CA area. The analysis considers a port-side location in Los Angeles and the ESV approach route out to a distance 200 km from the shoreline. The Earth Station operating parameters are shown in Table 1 below. Table 2 below lists the breakpoints of the ESV approach route, as shown in Figure 1 below:

SATELLITE EARTH STATION FREQUENCY COORDINATION DATA		
Company	INTELSAT ESV	
Earth Station Name, State	LOS ANGELES, CA	
Latitude (DMS) (NAD83)	33 44 56.0 N	
Longitude (DMS) (NAD83)	118 16 31.0 W	
Ground Elevation AMSL (Ft/m)	0.00 / 0.00	
Antenna Centerline AGL (Ft/m)	80.00 / 24.38	
Transmit Antenna Type:	FCC32	FCC Reference
		32-25LOG(THETA)
6.0 GHz Gain (dBi) / Diameter (m)	35.0 / 1.2	
3 dB / 15 dB Half Beamwidth	0.73 / 1.73	
Operating Mode	TRANSMIT ONLY	
Modulation	DIGITAL	
Emission / Transmit Band (MHz)	614KG7D / 5925.0000 - 6425.0000	
Max. Available RF Power (dBW) / 4 kHz	-10.90	
(dBW) / MHz	13.10	
Max. EIRP (dBW) / 4 kHz	24.10	
(dBW) / MHz	46.00	
Max permissible Interference Power		
6.0 GHz, 20% (dBW/4 kHz)	-154.0	
6.0 GHz, 0.0025% (dBW/4 kHz)	-131.0	
Range of Satellite Arc (Geostationary)		
Degrees Longitude	186.0 W / 186.0 W	
Azimuth Range (Min/Max)	257.2 / 257.2	
Corresponding Elevation Angles	9.8 / 9.8	
Radio Climate	B	
Rain Zone	4	

Table 1 - Los Angeles Earth Station Data Sheet

Table 2 - Los Angeles ESV Route Break Points

Los Angeles/Long Beach California Route Breakpoints
(ddmmss.s)

Point Name	latitude	longitude
LA Pier	334456	1181631
Break PT 1	334449	1181619
Break PT 2	334423	1181638
Break PT 3	334319	1181611
Break PT 4	334238	1181452
Break PT 5	334125	1181420
Break PT 6	333913	1181733
Break Pt NE	334500	1211500
Break Pt SE	322000	1180000

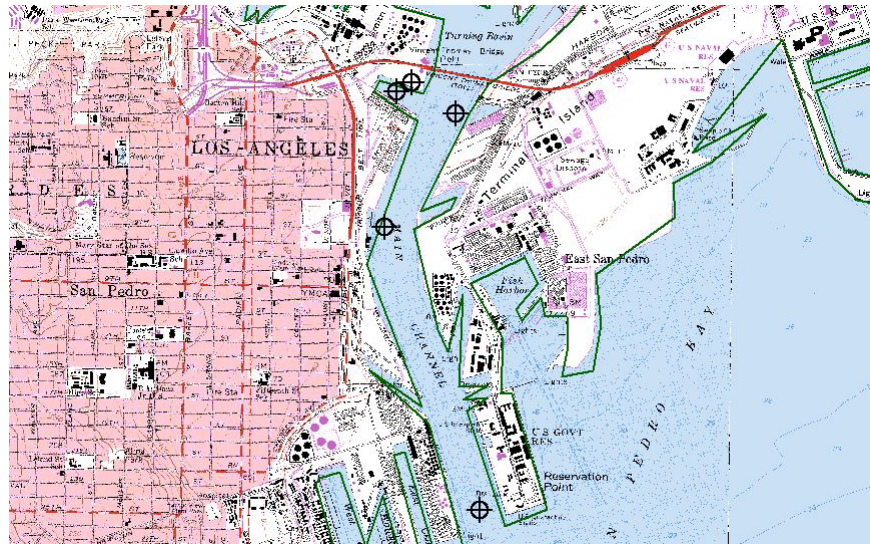


Figure 1a - Los Angeles ESV Route

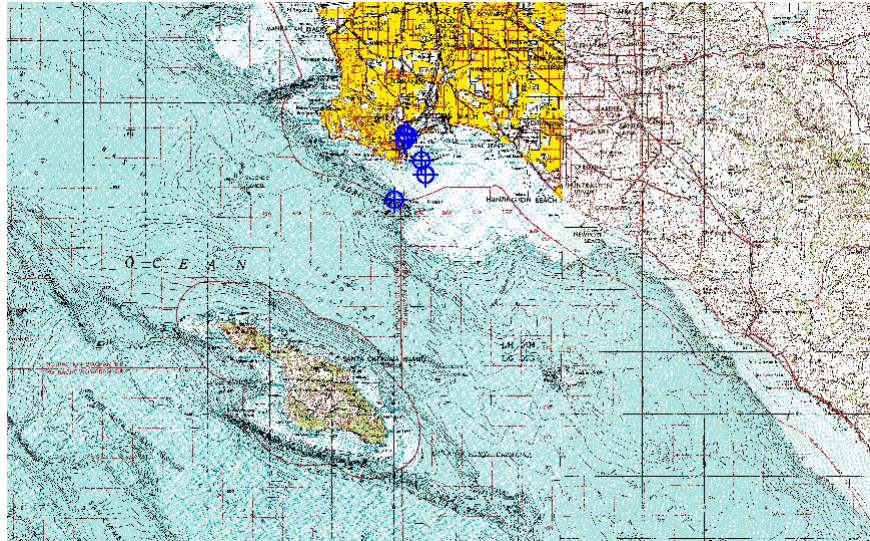


Figure 1b - Los Angeles ESV Route

Section 3: The Critical Contour Point Technique

The Critical Contour Point (CCP) Technique has been developed to assist in the determination of interference from an ESV. The technique involves calculating the interference from all points along the route of the ESV and determining which point produces the worst case interference into a victim microwave receiver. The worst case interference level is then calculated for this point. If the calculated interference exceeds the maximum long-term permissible level of interference, which is shown in Table 1 above, then the licensed or coordinated receive frequencies for that site must be avoided in order to preclude interference.

The following section is excerpted from ITU-R SF 1649, which describes the CCP in more detail:

For any interference exposure of a particular FS receiver from an ESV terminal on a moving ship, there are three position-related variables in the calculation:

- propagation loss exceeded for all but a percentage of time. This loss depends on the length of the interference path, the Radio-Climatic Zones and may include the effects of any blockage that may exist on the interference path;
- FS receiver antenna gain; and
- ESV antenna horizon gain.

For every point within the operating contour as defined by the deep-draft channel (see Fig. 2), each of these three factors can be readily determined.

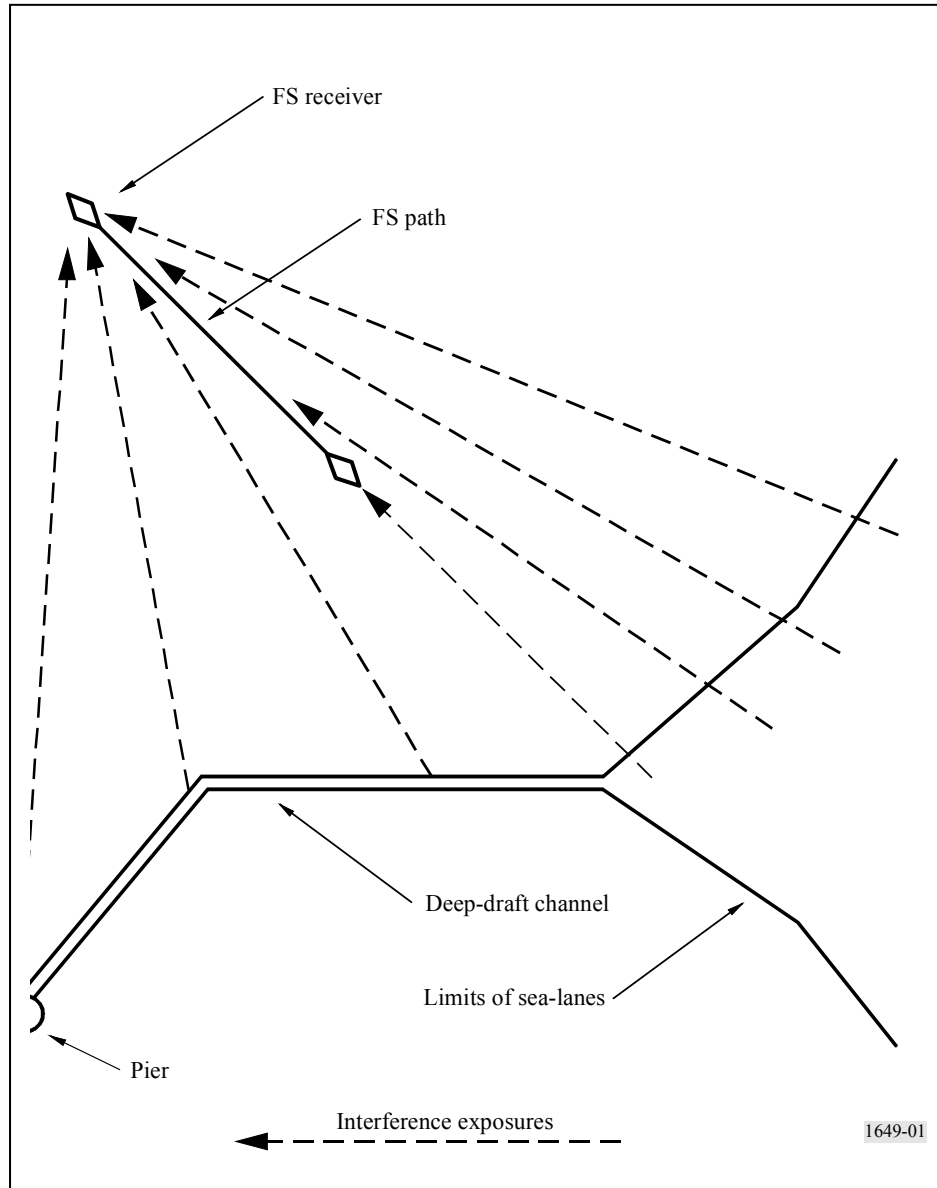


Figure 2 - Basic Interference Geometry

For the purpose of evaluating the potential interference the operating contour is approximated by a set of straight-line segments. The identification of the CCPs depends on the position and alignment of the FS path with respect to the operating contour, and several cases need to be distinguished. In those cases where the azimuth of the main beam axis of the FS antenna does not intersect with any portion of the operating area of the ESV, the critical contour points are the points along the operating contour where the contour changes direction or reaches the off-shore limit beyond which coordination is not required. In those cases where the azimuth of the main beam axis of the FS antenna intersects the operating contour it is necessary to augment and/or modify the number of CCPs. In any event, the same CCPs should be used to consider both the long-term and the short-term interference to any FS station under consideration. Interference from in-motion ESV operations to any FS receiver within the area where the potential interference from the ESV needs to be evaluated is assessed by consideration of the operation at each of the CCPs for each receiver using propagation loss models such as those given in Recommendation ITU-R P.452. The goal of this assessment is the identification of frequencies that can be used for in-motion ESV operations without causing unacceptable levels of interference to FS stations. For the identification of the CCPs with respect to a specific FS receiver, the following three cases need to be distinguished:

Case 1: In this case the main beam axis of the FS receiving antenna does not intersect any portion of the operating contour. The only CCPs required for this case are the points where the operating contour of the ESV changes direction.

Case 2: In this case, the main beam of the FS antenna (within 10 dB of the maximum antenna gain) lies entirely within one segment of the operating contour. The points on the operating contour where the antenna gain is 10 dB below the maximum, determine two additional CCPs. The segment of the operating contour between these two CCPs contains the natural intersection point (NIP), the point where the main beam axis of the FS antenna intersects the operating contour. The NIP is always taken as a CCP.

Case 3: In this case, the NIP is close enough to one of the points where the operating contour changes direction that the main beam of the FS antenna extends over more than one segment of the operating contour. This case is most likely to arise when the NIP is close to one of the points where the operating contour of the ESV changes direction. The intersection of the operating contour with the antenna 10 dB points determine two additional CCPs as in Case 2; however, in this case the original point within the main beam does not need to be considered as a CCP.

A further possibility: If there is a point on the operating contour of an ESV from which the maximum horizon gain of the ESV antenna is directed toward a FS receiver, that point on the contour may be identified as an additional CCP for that FS receiver regardless of which of the three cases applies.

Section 4 - Interference Results

Table 3 below summarizes the worst-case interference cases for the ESV route into the Los Angeles, CA port. A complete summary of all cases is shown in Appendix A.

Table 3 - Summary of ESV Route Interference Cases

Case #		Int. Margin (dB)	Dist (km)	Victim Receiver	ST	Terrestrial Transmitter	ST	Licensee
724	-2	46.4	9.6	SAN PEDRO	CA	DAKIN 2	CA	Pacific Bell Telephone Company
399	-2	46.4	9.6	SAN PEDRO	CA	DAKIN 2	CA	Pacific Bell Telephone Company
706	-2	44.9	9.6	SAN PEDRO	CA	DAKIN 2	CA	Pacific Bell Telephone Company
237	-1	37.4	30.9	BLACK JACK	CA	EAV	CA	Los Angeles County FCC Licensing Section
271	-1	36.0	24.9	N DOMINGUEZ	CA	SAN PEDRO	CA	Los Angeles SMSA Ltd. Partnership
237	-2	36.0	35.1	EAV	CA	BLACK JACK	CA	Los Angeles County FCC Licensing Section
706	-1	34.9	34.1	DAKIN 2	CA	SAN PEDRO	CA	Pacific Bell Telephone Company
513	-2	33.7	24.9	N DOMINGUEZ	CA	SAN PEDRO	CA	Los Angeles SMSA Ltd. Partnership
724	-1	33.3	34.1	DAKIN 2	CA	SAN PEDRO	CA	Pacific Bell Telephone Company
399	-1	33.3	34.1	DAKIN 2	CA	SAN PEDRO	CA	Pacific Bell Telephone Company
151	-2	32.0	50.4	LA MTSO	CA	CABRINI	CA	Los Angeles SMSA Ltd. Partnership
17	-2	32.0	50.4	LA MTSO	CA	CABRINI	CA	Los Angeles SMSA Ltd. Partnership
141	-2	30.9	35.1	EAV	CA	CCB	CA	Los Angeles County FCC Licensing Section
198	-1	30.5	5.7	PALOS VERDE	CA	ANAHEIM	CA	Southern California Gas Company
162	-2	30.4	61.4	FLINT PEAK	CA	SAN PEDRO	CA	Los Angeles County FCC Licensing Section
541	-2	30.1	56.2	ALH	CA	EAV	CA	Los Angeles County FCC Licensing Section
436	-2	30.1	56.2	ALH	CA	EAV	CA	Los Angeles County FCC Licensing Section
322	-2	29.9	57.5	MDI	CA	EAV	CA	Los Angeles County FCC Licensing Section
601	-1	29.9	75.2	VENTURA PR	CA	MANDALAY SU	CA	Southern California Edison Company
726	-1	29.7	65.5	SAN CLEM IS	CA	DAKIN 2	CA	Pacific Bell Telephone Company
398	-1	29.6	65.5	SAN CLEM IS	CA	DAKIN 2	CA	Pacific Bell Telephone Company
668	-1	29.0	79.4	BIG MTN	CA	CASTRO PEAK	CA	Oxnard Ventura Simi Limited Partnership
272	-2	29.0	79.4	BIG MTN	CA	CASTRO PEAK	CA	Oxnard Ventura Simi Limited Partnership
749	-2	29.0	79.4	BIG MTN	CA	CASTRO PEAK	CA	Oxnard Ventura Simi Limited Partnership
198	-2	28.2	36.2	ANAHEIM	CA	PALOS VERDE	CA	Southern California Gas Company
600	-2	28.2	91.8	VENTURA PR	CA	VENTURA	CA	Southern California Edison Company
435	-2	28.0	50.9	EAV	CA	ROLLING HILL	CA	Los Angeles County FCC Licensing Section
323	-2	28.0	50.9	EAV	CA	ROLLING HILL	CA	Los Angeles County FCC Licensing Section
670	-1	27.8	54.2	SEPULVEDA I	CA	MARINA MTSO	CA	Los Angeles SMSA Ltd. Partnership
755	-2	27.8	68.3	FULLERTON	CA	SIGNAL HILL	CA	Los Angeles SMSA Ltd. Partnership
444	-2	27.1	82.4	LAKE MATHEW	CA	PLEASANTS PE	CA	METROPOLITAN WATER DIST OF SO CALIFORNIA
669	-2	27.1	78.1	OAT MTN	CA	SEPULVEDA I	CA	Los Angeles SMSA Ltd. Partnership
239	-1	27.1	74.0	OAT MTN	CA	TOPANGA PK	CA	Los Angeles County FCC Licensing Section
378	-1	27.0	60.3	DIAMOND BAR	CA	FULLERTON	CA	Los Angeles SMSA Ltd. Partnership
712	-2	26.9	72.6	29 OAT MTN	CA	76 NORTH RD	CA	Southern California Gas Company
783	-2	26.6	118.7	RUNNING SPGS	CA	SAN BERNARDI	CA	Verizon California Inc.
782	-2	26.6	118.7	RUNNING SPGS	CA	SAN BERNARDI	CA	Verizon California Inc.
200	-1	26.5	49.0	LOMA RIDGE	CA	GARDEN GROVE	CA	ORANGE COUNTY GSA COMMUNICATIONS DIV
377	-2	26.0	78.7	SANTIAGO PK	CA	LAGUNA BEACH	CA	Los Angeles SMSA Ltd. Partnership
727	-2	25.2	99.3	SOUTH MTN	CA	CASTRO PEAK	CA	Oxnard Ventura Simi Limited Partnership
548	-2	25.2	99.3	SOUTH MTN	CA	CASTRO PEAK	CA	Oxnard Ventura Simi Limited Partnership
449	-1	25.2	115.8	MT WILSON	CA	SUNSET	CA	TV MICROWAVES CO
260	-2	25.0	128.0	PALOMAR MTN	CA	ENCINA	CA	San Diego Gas & Electric Company
604	-2	24.9	94.4	SOUTH MTN	CA	OXNARD MAIN	CA	Verizon California Inc.
52	-2	24.9	94.4	SOUTH MTN	CA	OXNARD MAIN	CA	Verizon California Inc.

Section 5 - Summary of Results

The detailed interference calculation data is included in the attached Appendix A. It contains licensee and frequency information for each path. There are many potential interference cases for this ESV Route and Port. The clearable spectrum for this ESV Route and in Port is:

Clearable Spectrum

5925.0 - 5930.2 MHz

6167.2 - 6182.7 MHz

6419.8 - 6425.0 MHz

This is the so-called "4 percent solution" since it represents roughly 4% of the 500 MHz 6 GHz C-band spectrum available. It is available due to the fact that standard microwave frequency plans generally do not encumber these small portions of the band.

APPENDIX A - ANALYSIS RESULT TABLES

Case #		Interference Level (dBW/4k Hz)	Interference Margin (dB)	CCP Lat	CCP Lon	Dist (mi)	Disc Angle (deg.)	Victim Receiver	state	Terrestrial Transmitter	state	Licensee	Emission Designator
724	-2	-107.6	46.4	33.654	118.301	9.6	0	SAN PEDRO	CA	DAKIN 2	CA	Pacific	30M0D7W
399	-2	-107.6	46.4	33.654	118.301	9.6	0	SAN PEDRO	CA	DAKIN 2	CA	Pacific	30M0D7W
706	-2	-109.1	44.9	33.654	118.301	9.6	0	SAN PEDRO	CA	DAKIN 2	CA	Pacific	30M0D7W
237	-1	-116.6	37.4	33.6543	118.309	30.9	0	BLACK JACK	CA	EAV	CA	Los Angeles	10M0D7W
271	-1	-118.0	36.0	33.6549	118.322	24.9	0	N DOMINGUEZ	CA	SAN PEDRO	CA	Los Angeles	30M0D7W
237	-2	-118.0	36.0	33.7489	118.275	35.1	359.924	EAV	CA	BLACK JACK	CA	Los Angeles	10M0D7W
706	-1	-119.1	34.9	33.654	118.301	34.1	0	DAKIN 2	CA	SAN PEDRO	CA	Pacific	30M0D7W
513	-2	-120.3	33.7	33.6549	118.322	24.9	0	N DOMINGUEZ	CA	SAN PEDRO	CA	Los Angeles	30M0D7W
724	-1	-120.7	33.3	33.654	118.301	34.1	0	DAKIN 2	CA	SAN PEDRO	CA	Pacific	30M0D7W
399	-1	-120.7	33.3	33.654	118.301	34.1	0	DAKIN 2	CA	SAN PEDRO	CA	Pacific	30M0D7W
151	-2	-122.0	32.0	33.664	118.532	50.4	0	LA MTSO	CA	CABRINI	CA	Los Angeles	30M0D7W
17	-2	-122.0	32.0	33.664	118.532	50.4	0	LA MTSO	CA	CABRINI	CA	Los Angeles	30M0A7W
141	-2	-123.1	30.9	33.7489	118.275	35.1	359.906	EAV	CA	CCB	CA	Los Angeles	30M0D7W
198	-1	-123.5	30.5	33.7489	118.275	5.7	6.9776	PALOS VERDES	CA	ANAHEIM	CA	Southern	30M0D7W
162	-2	-123.6	30.4	33.6617	118.477	61.4	0	FLINT PEBBLE	CA	SAN PEDRO	CA	Los Angeles	10M0D7W
541	-2	-123.9	30.1	33.6619	118.481	56.2	0	ALH	CA	EAV	CA	Los Angeles	10M0D7W
436	-2	-123.9	30.1	33.6619	118.481	56.2	0	ALH	CA	EAV	CA	Los Angeles	10M0D7W
322	-2	-124.1	29.9	33.747	118.272	57.5	0	MDI	CA	EAV	CA	Los Angeles	10M0D7W
601	-1	-124.1	29.9	33.7041	119.575	75.2	0	VENTURA	CA	MANDALAY	CA	Southern	30M0D7W
726	-1	-124.3	29.7	33.52	118.263	65.5	0	SAN CLEMENTE	CA	DAKIN 2	CA	Pacific	30M0D7W
398	-1	-124.4	29.6	33.52	118.263	65.5	0	SAN CLEMENTE	CA	DAKIN 2	CA	Pacific	10M0D7W
668	-1	-125.0	29.0	33.6686	118.64	79.4	0	BIG MTN	CA	CASTRO BLVD	CA	Oxnard Valley	10M0D7W
272	-2	-125.0	29.0	33.6686	118.64	79.4	0	BIG MTN	CA	CASTRO BLVD	CA	Oxnard Valley	30M0D7W
749	-2	-125.0	29.0	33.6686	118.641	79.4	0	BIG MTN	CA	CASTRO BLVD	CA	Oxnard Valley	30M0D7W
198	-2	-125.8	28.2	33.7489	118.275	36.2	358.905	ANAHEIM	CA	PALOS VERDES	CA	Southern	30M0D7W
600	-2	-125.8	28.2	33.6648	118.549	91.8	0	VENTURA	CA	VENTURA	CA	Southern	30M0D7W
435	-2	-126.0	28.0	33.6607	118.454	50.9	0	EAV	CA	ROLLING	CA	Los Angeles	10M0D7W
323	-2	-126.0	28.0	33.6607	118.454	50.9	0	EAV	CA	ROLLING	CA	Los Angeles	10M0D7W
670	-1	-126.2	27.8	33.6676	118.272	54.2	0	SEPULVEDA	CA	MARINA MESA	CA	Los Angeles	30M0D7W
755	-2	-126.2	27.8	33.6692	118.655	68.3	0	FULLERTON	CA	SIGNAL HILL	CA	Los Angeles	30M0D7W
444	-2	-126.9	27.1	33.5514	118.27	82.4	0	LAKE MATTHEW	CA	PLEASANT HILL	CA	METROPOLITAN	30M0D7W

669	-2	-126.9	27.1	33.6693	118.27	78.1	0	OAT MTN	CA	SEPULVED	CA	Los Ange	30M0D7W
239	-1	-126.9	27.1	33.6737	118.763	74.0	0	OAT MTN	CA	TOPANGA	CA	Los Ange	10M0D7W
378	-1	-127.0	27.0	33.5513	118.27	60.3	0	DIAMOND	CA	FULLERTON	CA	Los Ange	30M0D7W
712	-2	-127.1	26.9	33.6656	118.568	72.6	0	29 OAT M	CA	76 NORTH	CA	Southern	30M0D7W
783	-2	-127.4	26.6	33.7107	118.248	118.7	0	RUNNING	CA	SAN BERN	CA	Verizon	30M0D7W
782	-2	-127.4	26.6	33.7107	118.248	118.7	0	RUNNING	CA	SAN BERN	CA	Verizon	30M0D7W
200	-1	-127.5	26.5	33.7489	118.275	49.0	359.171	LOMA RIE	CA	GARDEN G	CA	ORANGE C	30M0D7W
377	-2	-128.0	26.0	33.2824	118.209	78.7	0	SANTIAGO	CA	LAGUNA F	CA	Los Ange	2M50D7W
727	-2	-128.8	25.2	33.6552	118.328	99.3	0	SOUTH MT	CA	CASTRO F	CA	Oxnard V	30M0D7W
548	-2	-128.8	25.2	33.6551	118.327	99.3	0	SOUTH MT	CA	CASTRO F	CA	Oxnard V	30M0D7W
449	-1	-128.8	25.2	33.6885	119.14	115.8	0	MT WILSON	CA	SUNSET	CA	TV MICRO	
260	-2	-129.0	25.0	32.8538	118.114	128.0	0	PALOMAR	CA	ENCINA	CA	San Diego	30M0D7W
604	-2	-129.1	24.9	33.709	119.721	94.4	0	SOUTH MT	CA	OXNARD M	CA	Verizon	30M0D7W
52	-2	-129.1	24.9	33.709	119.721	94.4	0	SOUTH MT	CA	OXNARD M	CA	Verizon	30M0D9W
390	-1	-129.3	24.7	33.4788	118.253	104.4	0	COLTON	CA	SIERRA F	CA	Los Ange	30M0D7W
389	-1	-129.3	24.7	33.4788	118.253	104.4	0	COLTON	CA	SIERRA F	CA	Los Ange	30M0D7W
126	-1	-129.5	24.5	33.7489	118.275	86.8	359.588	FROST PE	CA	COLLEGE	CA	Southern	30M0D7W
545	-2	-129.6	24.4	33.7182	120.012	100.1	0	SANTA CI	CA	SANTA CI	CA	Southern	F8W
270	-1	-129.6	24.4	33.403	118.236	108.9	0	COLTON	CA	SIERRA F	CA	Union Pa	10M0D7W
441	-1	-129.7	24.3	33.2985	118.213	96.5	0	SN MARCO	CA	ENCINA F	CA	SAN DIEGO	30M0D7W
188	-1	-129.7	24.3	33.6786	118.885	68.9	0	76 NORTH	CA	41 SADDI	CA	Southern	30M0D7W
258	-2	-129.8	24.2	32.6044	118.059	111.2	0	MT WOODS	CA	PENASQUI	CA	San Diego	30M0D7W
459	-2	-129.8	24.2	32.7377	118.089	99.4	0	SN MARCO	CA	ENCINA F	CA	SAN DIEGO	30M0D7W
158	-2	-130.0	24.0	33.2319	118.198	128.4	0	HEMET	CA	ELSINORE	CA	RIVERSIDE	30M0D7W
259	-1	-130.0	24.0	33.4492	118.247	128.4	0	MT WOODS	CA	ENCINA	CA	San Diego	30M0D7W
615	-1	-130.1	23.9	33.6797	118.912	85.2	0	FLINT PR	CA	LA MED C	CA	NextWeb,	30M0D7W
647	-2	-130.1	23.9	32.8921	118.123	106.0	0	SANTIAGO	CA	DANA HIL	CA	Los Ange	2M50D7W
818	-2	-130.1	23.9	33.6952	119.323	130.0	0	SPECTRAS	CA	OPPENHEI	CA	Western	25M0D9W
446	-2	-130.2	23.8	33.6873	119.11	113.5	0	KJLA TRN	CA	KJLA STU	CA	TV MICRO	25M0D9W
139	-1	-130.2	23.8	33.6868	119.095	92.7	0	DOWNEY I	CA	CCB	CA	Los Ange	30M0D7W
597	-2	-130.4	23.6	33.6701	118.676	123.0	0	BAILEY S	CA	BAILEY F	CA	Southern	F8W
197	-1	-130.5	23.5	33.1818	118.187	120.2	0	SUNSET F	CA	ANAHEIM	CA	Southern	30M0D7W
688	-1	-130.5	23.5	32.3428	118.002	112.9	0	OTAY MTN	CA	SN YSIDE	CA	SAN DIEGO	30M0D7W
208	-1	-130.6	23.4	33.5666	118.273	136.5	0	DETENTIC	CA	PLEASANT	CA	METROPOI	30M0D7W
251	-2	-130.6	23.4	32.8922	118.123	106.0	0	SANTIAGO	CA	DANA HIL	CA	Los Ange	2M50D7W
599	-1	-130.7	23.3	33.6704	118.683	103.5	0	RINCON F	CA	MANDALAY	CA	Southern	30M0D7W

722	-1	-130.7	23.3	33.6912	119.212	135.4	0	PALMDALE	CA	MAGIC MT	CA	Los Ange	30M0D7W
729	-2	-130.7	23.3	33.3687	118.229	104.4	0	SAN MARC	CA	OCEANSID	CA	Verizon	30M0D7W
728	-2	-130.7	23.3	33.3688	118.229	104.4	0	SAN MARC	CA	OCEANSID	CA	Verizon	30M0D7W
192	-2	-130.7	23.3	33.6792	118.9	102.1	0	YORBA LI	CA	FULLERTON	CA	Los Ange	30M0D7W
60	-1	-130.8	23.2	33.7008	119.48	149.1	0	TEPUSQUE	CA	BROADCAST	CA	M.U.T. I	30M0F8W
59	-1	-130.8	23.2	33.7008	119.48	149.1	0	TEPUSQUE	CA	BROADCAST	CA	M.U.T. I	30M0D7W
479	-1	-131.2	22.8	33.6867	119.093	130.8	0	JOHNSTON	CA	GARVEY F	CA	METROPOI	30M0D7W
319	-1	-131.3	22.7	32.4786	118.032	154.5	0	BACHELOF	CA	LAKE SKI	CA	METROPOI	30M0D7W
542	-1	-131.5	22.5	33.6759	118.26	135.0	0	GORMAN	CA	OAT MTN	CA	Los Ange	10M0D7W
181	-1	-131.5	22.5	33.2933	118.212	150.6	0	LYONS PE	CA	COWLES M	CA	SAN DIEG	30M0D7W
317	-2	-131.7	22.3	33.3687	118.229	104.4	0	SAN MARC	CA	OCEANSID	CA	Verizon	5M00D7W
764	-2	-131.7	22.3	33.6459	118.291	105.8	0	VALLEY S	CA	SANTIAGO	CA	Southern	30M0D7W
649	-1	-131.8	22.2	33.3341	118.221	105.7	0	SUN CITY	CA	ELSINORE	CA	Los Ange	30M0D7W
464	-1	-131.8	22.2	33.6628	118.503	141.0	0	HEAPS PE	CA	RIALTO	CA	San Bern	30M0D7W
520	-2	-132.1	21.9	32.7681	118.095	108.8	0	SAN MIGU	CA	AVIATION	CA	Verizon	30M0D7W
213	-2	-132.2	21.8	33.6941	119.293	134.8	0	MT MCDII	CA	OAT MTN	CA	Los Ange	30M0D7W
217	-2	-132.2	21.8	32.9989	118.146	109.9	0	MT WOODS	CA	RANCHO E	CA	Southern	30M0D7W
447	-1	-132.2	21.8	33.6952	119.322	130.2	0	KAZA-TV	CA	KAZA-TV	CA	TV MICRO	25M0F8W
687	-2	-132.3	21.7	33.0476	118.157	108.4	0	COWLES M	CA	PRIMARY	CA	SAN DIEG	30M0D7W
696	-1	-132.4	21.6	32.9846	118.143	157.5	0	BANNING	CA	ELSINORE	CA	Los Ange	30M0D7W
662	-1	-132.4	21.6	33.6995	119.443	144.3	0	MT MCDII	CA	OAT MTN	CA	LOS ANGE	30M0D7W
640	-1	-132.6	21.4	33.395	118.235	125.0	0	BAILEY F	CA	STAGECOA	CA	Southern	30M0D7W
276	-1	-132.7	21.3	33.0476	118.157	108.4	0	COWLES M	CA	PRIMARY	CA	SAN DIEG	30M0D7W
395	-2	-132.7	21.3	33.6912	119.212	135.4	0	PALMDALE	CA	MAGIC MT	CA	Los Ange	30M0D7W
645	-2	-132.7	21.3	32.7984	118.102	114.2	0	SANTIAGO	CA	DANA HAF	CA	Los Ange	2M50D7W
812	-1	-132.7	21.3	32.6348	118.066	147.6	0	JULIAN T	CA	SNDGCA-C	CA	Cingular	30M0D7W
379	-2	-133.0	21.0	33.4956	118.257	120.7	0	BLACK MT	CA	ENCINITA	CA	Verizon	10M0D7W
802	-1	-133.2	20.8	33.6215	118.285	125.8	0	HEAPS PR	CA	MIRA LOM	CA	Southern	30M0D7W
211	-2	-133.2	20.8	32.5393	118.045	124.5	0	FALBROOK	CA	OCEANSID	CA	New Cing	5M00D7W
187	-1	-133.2	20.8	33.6685	118.637	152.0	0	12 DBL M	CA	29 OAT M	CA	Southern	30M0D7W
793	-1	-133.3	20.7	33.5321	118.265	123.0	0	STRAWBEF	CA	MIRA LOM	CA	Southern	30M0D7W
628	-1	-133.3	20.7	33.5321	118.265	123.0	0	STRAWBEF	CA	MIRA LOM	CA	Southern	30M0D7W
8	-2	-133.3	20.7	33.7451	118.273	151.6	0	WHITEWAT	CA	MT DAVIS	CA	Verizon	30M0F7W
492	-1	-133.3	20.7	33.6767	118.837	112.4	0	HAUSER	CA	AQUA DUI	CA	NEXTEL C	4M94D7W
794	-1	-133.3	20.7	33.2393	118.2	136.8	0	BAILEY F	CA	MIRA LOM	CA	Southern	30M0D7W
667	-2	-133.3	20.7	33.6903	118.239	109.0	0.65218	DT LANCA	CA	PALMDALE	CA	New Cing	30M0D7W

560	-1	-133.4	20.6	33.7356	118.275	143.1	0	MARION F	CA	HEMET CC	CA	Southern	30M0D7W
698	-1	-133.4	20.6	32.3332	118	160.6	0.42877	STEVENSC	CA	SAN MIGU	CA	Verizon	30M0D7W
725	-1	-133.5	20.5	33.2393	118.2	136.8	0	BAILEY F	CA	MIRA LOM	CA	Southern	30M0D7W
786	-1	-133.5	20.5	32.3332	118	160.5	0.47264	STEVENSC	CA	SAN MIGU	CA	Verizon	30M0D7W
780	-2	-133.9	20.1	33.4519	118.247	142.4	0	LAKEVIEW	CA	RUNNING	CA	Verizon	30M0D7W
176	-2	-134.0	20.0	33.0091	118.149	146.0	0	NORTH PE	CA	MT WOODS	CA	SAN DIEG	30M0D7W
721	-2	-134.2	19.8	33.3916	118.234	125.2	0	WOODSON	CA	OLIVENHA	CA	Verizon	5M00D7W
351	-2	-134.2	19.8	33.3916	118.234	125.2	0	WOODSON	CA	OLIVENHA	CA	Verizon	2M50D7W
660	-2	-134.3	19.7	33.677	118.258	132.2	0	RINCON	CA	OXNARD F	CA	New Cing	30M0D7W
746	-1	-134.4	19.6	32.849	118.113	107.2	0	LOMA RII	CA	SIGNAL F	CA	ORANGE C	30M0D7W
723	-2	-134.4	19.6	33.6555	118.336	100.1	0	OXNARD F	CA	OXNARD F	CA	New Cing	30M0D7W
212	-2	-134.4	19.6	32.5004	118.037	143.1	0	MT PALOM	CA	HUBBARD	CA	New Cing	5M00D7W
814	-1	-134.4	19.6	33.2393	118.2	136.8	0	BAILEY F	CA	MIRA LOM	CA	Southern	30M0D7W
813	-1	-134.4	19.6	33.2393	118.2	136.8	0	BAILEY F	CA	MIRA LOM	CA	Southern	30M0D7W
803	-1	-134.7	19.3	33.6678	118.62	150.6	0	HEAPS PR	CA	RANCHO V	CA	Southern	30M0D7W
789	-2	-134.7	19.3	32.4996	118.036	142.2	0	SANTIAGO	CA	SAN CLEM	CA	Los Ange	5M00D7W
180	-1	-134.9	19.1	32.4642	118.029	139.5	0	LOS PINO	CA	LYONS PE	CA	SAN DIEG	30M0D7W
419	-1	-135.0	19.0	33.5045	118.259	152.4	0	SAN MIGU	CA	SD MTSO	CA	Verizon	30M0D7W
385	-1	-135.0	19.0	33.5045	118.259	152.4	0	SAN MIGU	CA	SD MTSO	CA	Verizon	30M0D7W
557	-1	-135.1	18.9	33.4927	118.256	153.1	0	BERTHA F	CA	SNOW VAL	CA	Los Ange	5M00D7W
553	-1	-135.1	18.9	33.4927	118.256	153.1	0	BERTHA F	CA	SNOW VAL	CA	Los Ange	30M0D7W
500	-1	-135.1	18.9	32.8349	118.11	153.9	0	HEMET	CA	SUN CITY	CA	Los Ange	10M0D7W
644	-1	-135.1	18.9	32.8346	118.11	153.9	0	HEMET	CA	SUN CITY	CA	Los Ange	30M0D7W
156	-1	-135.2	18.8	33.6893	119.162	146.5	0	LANCASTE	CA	MT MCDII	CA	Los Ange	30M0D7W
533	-1	-135.2	18.8	33.7254	120.254	155.2	0	ARROYO C	CA	LOMPOC	CA	GTE Mobi	30M0D7W
665	-2	-135.4	18.6	33.6637	118.524	155.0	0	VICTORVI	CA	MOUNTAIN	CA	Los Ange	2M50D7W
427	-2	-135.4	18.6	32.9922	118.145	141.8	0	MT LUKEN	CA	LOSANGEI	CA	Californ	10M0D7W
61	-1	-135.4	18.6	33.7443	120.996	128.1	0	VANDENBE	CA	VANDENBE	CA	American	
252	-1	-135.5	18.5	33.6761	118.824	141.9	0	SANTA YN	CA	GOLETA M	CA	New Cing	10M0D7W
381	-1	-135.5	18.5	33.0065	118.148	146.0	0	NORTH PE	CA	WOODSON	CA	Verizon	3M75D7W
713	-1	-135.6	18.4	33.6888	119.149	144.8	0	SUNSET F	CA	S ORANGE	CA	Southern	30M0D7W
202	-1	-135.6	18.4	33.6888	119.149	144.8	0	SUNSET F	CA	S ORANGE	CA	Southern	30M0D7W
142	-1	-135.7	18.3	32.817	118.106	137.9	0	CRIMINAL	CA	CCB	CA	Los Ange	30M0D7W
593	-2	-135.8	18.2	33.4567	118.248	144.4	0	CM-510-C	CA	CM-191-M	CA	Omnipoir	30M0D7W
532	-1	-137.2	16.8	33.7254	120.254	155.2	0	ARROYO C	CA	LOMPOC	CA	GTE Mobi	30M0D7W
288	-1	-139.0	15.0	33.7489	118.275	140.2	358.601	CAHUILLA	CA	ELSINORE	CA	Los Ange	2M50D7W

513	-1	-139.9	14.1	33.7323	118.274	3.3	60.711	SAN PEDR	CA	N DOMING	CA	Los Ange	30M0D7W
271	-2	-139.9	14.1	33.7323	118.274	3.3	60.711	SAN PEDR	CA	N DOMING	CA	Los Ange	30M0D7W
524	-1	-150.1	3.9	33.5769	118.275	111.7	0	LAKE SKI	CA	LAKE SKI	CA	METROPOI	30M0D7W
592	-1	-152.9	1.1	33.654	118.303	153.8	0	PASTORIA	CA	PASTORIA	CA	Southern	30M0D7W
672	-1	-152.9	1.1	33.6574	118.287	153.9	0	CREEKSID	CA	PASTORIA	CA	Southern	30M0D7W
193	-2	-153.6	0.4	33.7489	118.275	57.7	356.709	BOLERO E	CA	GRAND AV	CA	ORANGE C	30M0D7W
661	-2	-154.2	-0.2	33.7469	118.272	137.1	356.331	BLACK MT	CA	SDGENCIN	CA	New Cinc	30M0D7W
109	-2	-154.2	-0.2	33.7469	118.272	137.1	356.331	BLACK MT	CA	SDGENCIN	CA	New Cinc	30M0D9W
277	-1	-154.3	-0.3	32.4955	118.035	92.7	0	PRIMARY	CA	TMC	CA	SAN DIEG	30M0D7W

Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Start	Stop
5945.2	H	6004.5	H	6063.8	H	6123.1	H	0	0	0	0	0	0	0	0	5925	5930.2
5945.2	H	6034.15	H	6123.1	V	0	0	0	0	0	0	0	0	0	0	5925	5930.2
5945.2	H	6004.5	H	6034.15	V	6063.8	H	6123.1	H	6152.75	V	0	0	0	0	5925	5930.2
6142.87	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6127.87
6226.89	G	6286.19	G	6315.84	V	6345.49	G	0	0	0	0	0	0	0	0	5925	6211.89
6394.91	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6379.91
6197.24	V	6256.54	V	6286.19	H	6315.84	V	6375.14	V	6404.79	H	0	0	0	0	5925	6182.24
6345.49	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6330.49
6197.24	V	6256.54	V	6315.84	V	6375.14	V	0	0	0	0	0	0	0	0	5925	6182.24
6197.24	H	6286.19	H	6375.14	V	0	0	0	0	0	0	0	0	0	0	5925	6182.24
6197.24	U	6256.54	U	6375.14	H	6404.79	U	0	0	0	0	0	0	0	0	5925	6182.24
6286.19	H	6345.49	V	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
6093.45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6078.45
6315.84	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6305.96	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6290.96
5994.62	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5979.62
5994.62	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5979.62
5964.97	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5949.97
6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
5974.85	H	6093.45	H	0	0	0	0	0	0	0	0	0	0	0	0	5925	5959.85
5974.85	H	6093.45	H	0	0	0	0	0	0	0	0	0	0	0	0	5925	5959.85
5945.2	H	6004.5	H	6034.15	V	6063.8	H	6093.45	V	6123.1	H	6152.75	V	0	0	5925	5930.2
5945.2	U	5974.85	H	6004.5	U	6034.15	G	6063.8	U	6093.45	G	6123.1	U	6152.75	G	5925	5930.2
5974.85	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5959.85
6063.8	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6048.8
6034.15	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6019.15
6256.54	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54
6256.54	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54
6256.54	U	6286.19	G	6315.84	U	6345.49	H	0	0	0	0	0	0	0	0	5925	6241.54
5945.2	G	5974.85	U	6004.5	G	6034.15	U	6093.45	V	0	0	0	0	0	0	5925	5930.2
6256.54	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54

[illegible]

5974.85	H	6004.5	V	6034.15	H	6093.45	H	0	0	0	0	0	0	0	0	5925	5959.85
6004.5	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5989.5
6004.5	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5989.5
6197.24	G	6226.89	U	6256.54	G	6286.19	U	6315.84	H	6345.49	U	6375.14	H	6404.79	U	5925	6182.24
6093.45	H	6152.75	H	0	0	0	0	0	0	0	0	0	0	0	0	5925	6078.45
5945.2	V	5974.85	G	6004.5	V	6034.15	G	6063.8	V	6093.45	G	6123.1	V	0	0	5925	5930.2
5945.2	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6197.24	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6182.24
6197.24	H	6226.89	U	6315.84	G	0	0	0	0	0	0	0	0	0	0	5925	6182.24
6152.75	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6137.75
6165.1	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6162.6
6256.54	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54
5945.2	G	5974.85	U	6004.5	H	6034.15	U	0	0	0	0	0	0	0	0	5925	5930.2
6404.79	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
6197.24	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6182.24
6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
6034.15	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6019.15
6004.5	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5989.5
6093.45	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6078.45
5945.2	V	6093.45	H	0	0	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6315.84	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6286.19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
6004.5	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	5989.5
5945.2	V	5974.85	G	6004.5	U	6034.15	G	6063.8	U	0	0	0	0	0	0	5925	5930.2
6171.88	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6156.88
6152.75	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6137.75
6345.49	H	6404.79	G	0	0	0	0	0	0	0	0	0	0	0	0	5925	6330.49
6197.24	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6182.24
6377.61	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6362.61
6345.49	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6330.49
6315.84	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6315.84	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
5945.2	H	6004.5	H	6123.1	H	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6135.45	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6120.45
6404.79	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19

6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
5945.2	H	5974.85	U	0	0	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6404.79	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
5945.2	H	5974.85	U	6004.5	G	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6256.54	H	6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54
6315.84	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6145.34	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6130.34
6169.38	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6154.38
6197.24	V	6226.89	H	6256.54	V	6315.84	V	6345.49	H	0	0	0	0	0	0	5925	6182.24
6226.89	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6211.89
6286.19	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
6417.14	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6402.14
6404.79	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
6404.79	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
6315.84	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6150.28	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6135.28
6375.14	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6360.14
6226.89	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6211.89
6286.19	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6271.19
6110.75	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6095.75
5945.2	H	6004.5	G	6063.8	G	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6315.84	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6345.49	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6330.49
6226.89	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6211.89
6315.84	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6300.84
6171.88	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6156.88
6197.24	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6182.24
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	-15
5945.2	H	6004.5	G	0	0	0	0	0	0	0	0	0	0	0	0	5925	5930.2
6373.29	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6358.29
6034.15	V	6123.1	V	0	0	0	0	0	0	0	0	0	0	0	0	5925	6019.15
6123.1	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6108.1
6256.54	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6241.54
6123.1	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6108.1
6404.79	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6389.79
6171.88	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5925	6156.88