Range Commanders Council

DATA REDUCTION AND COMPUTER GROUP

IRIG STANDARD 154-71
(Formerly 120-71)

IRIG STANDARDS FOR DISTRIBUTING RAW RADAR ANTENNA DATA

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IRIG STANDARD 154-71

IRIG STANDARD FOR DISTRIBUTING RAW RADAR ANTENNA DATA

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IRIG STANDARD FOR DISTRIBUTING RAW RADAR ANTENNA DATA

PURPOSE

This document defines a standard procedure for distributing raw radar antenna data from remote tracking sites via teletype.

APPLICATION

The standard procedure set forth herein is recommended, where applicable, for the interchange of raw radar antenna data among the National and Service Ranges and other ranges associated with IRIG.

LIMITATIONS

This standard does not apply to the distribution of vector acquisition data to remote tracking sites.

STANDARD REFERENCES AND PROCEDURES

1. Coordinate System—Raw radar antenna data are referred to a polar earth-fixed, non-inertial, site tangent coordinate system.

2. Teletype Message Format—The IRIG Raw Radar Antenna Data Format in Figure 1 is used for low speed teletype transmission (100 words per minute) of digital data. One message consists of 47 characters and is transmitted at the rate of one message every six seconds. Each message will be preceded by and ended by special characters representing "Start of Message" and "End of Message." Full details associated with each field of the format are shown in Figure 2.

3. Remote Tracking Site Constants Data—Figure 3 contains detailed constants data relative to the conversion of raw radar antenna data into engineering units and geodetic site coordinates information.

Figure 1

IRIG RAW RADAR ANTENNA DATA FORMAT

Line 1	JJ
Line 2-n	NSSXQHHMMSSAAAAAAAEEEEEEERRRRRRRRRRRRRRRRRR
Line n+1	#

Key:	JJ	=	Start of Message
	N	=	Data Type
	S	=	Remote Tracking Site Address
	X	=	Radar Type
	Q	=	On/Off Target Code
	H	=	Hours, Greenwich
	M	=	Minutes, Greenwich
	S	=	Seconds, Greenwich
	A	=	Azimuth
	E	=	Elevation
	R	=	Range
	$\dot{R}$	=	Range Rate
	#	=	End of Message

Figure 2

IRIG RAW RADAR ANTENNA DATA FORMAT DETAILS

Line No.	Character No.	Character	Note	Description
				Start of Message
1	1	J		Always the Same
	2	J		Always the Same
	3	↑		Figure Shift
	4	<		Carriage Return
	5	÷		Line Feed
	6	↓		Character Shift
				47 Character Message
2-(N)	1	÷		Line Feed
	2	↑		Figure Shift
	3	↑		Figure Shift
	4	N	1	Indicates Data Type
	5	S	2	Remote Tracking Site Address (Tens)
	6	S	2	Remote Tracking Site Address (Units)
	7	X	3	Indicates Radar Type
	8	Q		On/Off Track Code — On = 2; Off = 0
	9	H		Tens of Hours
	10	H		Units of Hours
	11	M		Tens of Minutes

Line No.	Character No.	Character	Note		
	12	M		Units of Minutes	
	13	S		Tens of Seconds	
	14	S		Units of Seconds	
	15	A	4	Azimuth Bits	21, 20, 19
	16	A		Azimuth Bits	18, 17, 16
	17	A		Azimuth Bits	15, 14, 13
	18	A		Azimuth Bits	12, 11, 10
	19	A		Azimuth Bits	9, 8, 7
	20	A		Azimuth Bits	6, 5, 4
	21	A		Azimuth Bits	3, 2, 1
	22	E	4	Elevation Bits	21, 20, 19
	23	E		Elevation Bits	18, 17, 16
	24	E		Elevation Bits	15, 14, 13
	25	E		Elevation Bits	12, 11, 10
	26	E		Elevation Bits	9, 8, 7
	27	E		Elevation Bits	6, 5, 4
	28	E		Elevation Bits	3, 2, 1
	29	R	4	Range Bits	27, 26, 25
	30	R		Range Bits	24, 23, 22
	31	R		Range Bits	21, 20, 19
	32	R		Range Bits	18, 17, 16
	33	R		Range Bits	15, 14, 13
	34	R		Range Bits	12, 11, 10
	35	R		Range Bits	9, 8, 7
	36	R		Range Bits	6, 5, 4
	37	R		Range Bits	3, 2, 1

Line No.	Character No.	Character	Note		
	38	$\dot{R}$	4	Range Rate Bits	27, 26, 25
	39	$\dot{R}$		Range Rate Bits	24, 23, 22
	40	$\dot{R}$		Range Rate Bits	21, 20, 19
	41	$\dot{R}$		Range Rate Bits	18, 17, 16
	42	$\dot{R}$		Range Rate Bits	15, 14, 13
	43	$\dot{R}$		Range Rate Bits	12, 11, 10
	44	$\dot{R}$		Range Rate Bits	9, 8, 7
	45	$\dot{R}$		Range Rate Bits	6, 5, 4
	46	$\dot{R}$		Range Rate Bits	3, 2, 1
	47			Carriage Return	
				End of Message	
(n+1)	1	$\overline{=}$		Line Feed	
	2	↑		Figure Shift	
	3	#		# Symbol	
	4	↓		Character Shift	

Note 1: This character may be varied through any of the figure characters at the option of the computer operator to meet specific documented requirements. Normally, however, this character is defined as follows:

Character 4	Data Type
2	Real Time Data
3	Simulated Data
7	Last Sample

Note 2: These characters are used to identify the remote tracking site from which the raw radar antenna data was derived. The remote tracking site addresses are assigned and controlled by SAMTEC (DOTS) for this IRIG Standard.

Note 3: This character may be varied through any of the figure characters at the option of the computer operator to meet specific documented requirements.

Note 4: See Figure 3 for Azimuth, Elevation, Range, and Range Rate Least Significant Bit weights. Range Rate Bit #27 represents Sign: 0 = increasing and 1 = decreasing.

FIGURE 3

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE (YDS SEC)	GEODETIC COORDINATES (Based on Fischer, 1960)			
			ELEV. & AZ. (MILS)	RANGE (YDS)		LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.XXXXXXXXXXXX	X XXXXXX	.XXXXX	XXX°XX'XX XXXX"	XXX° XX' XX.XXXX"	XXXX.XX	XXXX.XX
AIR FORCE EASTERN TEST RANGE									
Patrick AFB, FL 32925									
Cape Kennedy	AN/FPS-16 (S/N-11)		0.048828125	1.953125	N/A	28-28-54-0694	80-34-36.2102	-80.95	44.17
Ascension Island	AN/FPS-16 (S/N-14)		0.048828125	1.953125	N/A	(-)7-57-6.5477	14-24-44.6124	213.65	302.97
Range Measurement Lab	AN/FPS-16 (S/N-19)		0.048828125	1.953125	N/A	28.13-38.6320	80-36-22.7691	-79.22	46.85
Range Measurement Lab	AN/FPS-16 (S/N-43)		0.048828125	1.953125	N/A	26-36-56.4886	78-20-52.9075	-80.18	48.92
Pretoria, South Africa	AN/MPS-25 (S/N-5)		0.048821125	1.953125	N/A	(-)25-56-36.6257	(-)28-21-29.5952	5292.24	5196.86
Patrick AFB	AN/FPQ-6 (S/N-1)		0.006103515625	1.953125	N/A	28-13-35.2993	80-35-58.2106	-77.02	49.02
Antigua	AN/FPQ-6 (S/N-2)		0.006103515625	1.953125	N/A	17-8-37.7717	61-47-33.9426	13.13	138.78
Ascension	AN/TPQ-18 (S/N-1)		0.006103515625	1.953125	N/A	(-)7-58-23.0373	14-24.5.3384	322.04	411.34
Grand Turk	AN/TPQ-18 (S/N-2)		0.006103515625	1.953125	N/A	21-27-45.7842	71-7-56.1089	-44.34	118.11
Merritt Island	AN/TPQ-18 (S/N-3)		0.006103515625	1.953125	N/A	28-25-29.2132	80-39-52.6127	-88.68	36.91
T-AGM 20 USNS Redstone	AN/FPS-16 (S/N-49)		0.048828125	1.953125	N/A	As Assigned	As Assigned		

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB) ELEV & AZ. (MILS)	RANGE (YDS)	RANGE RATE (YDS/SEC)	GEODETIC COORDINATES Based on Clarke 1866 LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx° xx' xx xxxx	xxxx xx	xxxx.xx
AIR FORCE FLIGHT TEST CENTER									
Edwards AFB, CA 93523									
Edwards AFB	AN/FPS-16 (S/N-38)		0.048828125	1.000000	N/A	34-58-10.5952	117-55-45.8582		2703.08
Edwards AFB	AN/FPS-16 (S/N-41)		0.048828125	1.000000	N/A	34-58-13.6315	117-55-50.0201		2721.58
Edwards AFB	NIKE		0.097656250	1.953125	N/A	34-56-47.2421	117-54-37.6828		2561.10
Edwards AFB	AN/MPS-19C		0.097656244	1.220703	N/A	34-57-38.6066	117-54-38.3760		2663.95
Edwards AFB	AN/MPS-19S		0.097656244	1.220703	N/A	34-56-43.3456	117-54-44.9942		2570.30
Edwards AFB	NASA-1					34-56-59.313	117-53-11.524		2339.67
Ely, NV	Ely-C					39-18-31.231	115-05-08.168		9264.275
Ely, NV	Ely - CAPRI					39-18-31.130	115-05-09.802		9269.037
Beatty, NV	NASA-2					37-04-54.036	116-49-02.938		4964.3
Ely, NV	NASA-3					39-18-31.047	115-05-08.299		9257.7

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Clarke 1866)			
			ELEV. & AZ. (MILS)	RANGE (YDS)		LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.XXXXXXXXXXXX	X.XXXXXX	XXXXX	XXX°XX'XX.XXXX"	XXX° XX' XX XXXX"	XXXX.XX	XXXX.XX
AIR PROVING GROUND CENTER									
Eglin AFB, FL 32542									
Site A-20	AN/FPS-16 (S/N-17)		0.048828125	1.953125	N/A	30-25-17.063	86-47-52.912		93.23
Site A-20	AN/FPS-16 (S/N-20)		0.048828125	1.953125	N/A	30-25-17.064	86-47-53.558		93.18
Site A-20	AN/FPS-16 (S/N-31)		0.048828125	1.953125	N/A	30-25-17.062	86-47-52.272		91.38
Site A-20	AN/FPS-16 (S/N-42)		0.048828125	1.953125	N/A	30-25-16.570	86-47-52.434		77.41
Site D-3	AN/FPS-16 (S/N-23)		0.048828125	1.953125	N/A	29-40-31.400	85-20-48.516		43.06
Site D-3	AN/FPS-16 (S/N-27)		0.048828125	1.953125	N/A	29-40-30.991	85-20-48.058		44.86
Site D-4	AN/FPS-16 (S/N-32)		0.048828125	1.953125	N/A	28-11-19.217	82-47-38.693		42.88
Site D-4	AN/FPS-16 (S/N-39)		0.048828125	1.953125	N/A	28-11-19.683	82-47-39.065		42.90

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB) ELEV. & AZ (MILS)	LEAST SIGNIFICANT BIT (LSB) RANGE (YDS)	LEAST SIGNIFICANT BIT (LSB) RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Clarke 1866) LATITUDE (+ N)	GEODETIC COORDINATES (Based on Clarke 1866) LONGITUDE (+ W)	GEODETIC COORDINATES (Based on Clarke 1866) SPHEROID HEIGHT (FT)	GEODETIC COORDINATES (Based on Clarke 1866) MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx°xx'xx xxxx"	xxxx.xx	xxxx.xx
ELECTRONIC ENVIRONMENT TEST RANGE									
Ft Huachuca, AZ 85613									
Ft Huachuca	AN/FPS-16 (S/N-29)		0.0488266	0.500		31-34-15.246	110-22-12.551		4961.253
Ft Huachuca	Mod. II.V		0.0976551	0.488281		31-35-10.5841	110-21-48.3813		4719.752
Ft Huachuca	Mod. II.V		0.0976551	0.488281		Not Available	Not Available		
Oatman Mountain	AN/MPS-26 (S/N-6)		0.976551	1.00000		33-03-31.893	113-08-38.418		1737.146

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE (YDS/SEC)	GEODETIC COORDINATES			
			ELEV. & AZ. (MILS)	RANGE (YDS)		LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.XXXXXXXXXXXX	X.XXXXXX	XXXXX	XXX°XX'XX.XXXX"	XXX° XX' XX.XXXX"	XXXX.XX	XXXX.XX
FLEET COMPUTER PROGRAMMING CENTER									
San Diego, CA 92147									
FCPC	AN/SPS-30		Not Available	Not Available	N/A	32-42-1.25	117-14-55.58		360.0
FCPC	AN/SPS-43		Not Available	Not Available	N/A	32-42-0.75	117-14-56.00		360.0

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)			GEODETIC COORDINATES *			
			ELEV. & AZ. (MILS)	RANGE (YDS)	RANGE RATE (YDS/SEC)	LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x.xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx° xx' xx.xxxx"	xxxx.xx	xxxx.xx
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION									
Kauai	AN/FPS-16 (S/N-30)		0.048828125	1.953125	N/A	22-07-35.825	200-19-53.962		3789.55
Bermuda	AN/FPS-16 (S/N-34)		0.048828125	1.953125	N/A	32-20-52.208	295-20-44.694		65.13
Bermuda	AN/FPQ-6 (S/N-5)		0.006103515625	1.953125	N/A	32-20-51.705	295-20-44.905		69.23
Wallops Island	AN/FPS-16 (S/N-8)		0.048828125	1.953125	N/A	37-50-28.393	284-30-52.378		40.66
Wallops Island	AN/FPQ-6 (S/N-4)		0.006103515625	1.953125	0.03125	37-51-36.509	284-29-25.236		49.06
Carnaron	AN/FPQ-6 (S/N-4)		0.006103515625	1.953125	N/A	(-)24-53-50.755	113-42-57.764		160.77
Tananarive	Capri		0.048828125	1.953125	N/A	(-)19-00-00.991	47-18-54.191		4390.96
Wallops	AN/MPS-26		0.048828125	1.220703125	N/A	As Assigned	As Assigned		
T-AGM-19 USNS Vanguard	AN/FPS-16 (S/N-47)		0.048828125	1.953125	N/A	As Assigned	As Assigned		

*Based on Clarke 1866, exceptions - Carnaron is based on Hayford International 1910
- Tananarive is based on Hayford International 1910

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	♦ RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Clarke 1866)			
			ELEV. & AZ. (MILS)	RANGE (YDS)		LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x.xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx° xx' xx.xxxx"	xxxx.xx	xxxx.xx
NAVAL AIR TEST CENTER									
Patuxent River, MD									
Patuxent River	AN/M33		.04883	0.24414	600	38-17-48.887	76-22-34.449		35
Patuxent River	AN/M33		.04883	0.24414	600	38-17-50.407	76-22-34.079		26.20
Patuxent River	AN/MPS-19		.04883	0.24414	2800	38-17-49.187	76-22-35.054		35
Patuxent River	AN/MPS-19		.04883	0.24414	2800	38-17-49.877	76-22-35.581		26.01
Patuxent River	AN/MPS-26		.09766	1.000000	8000	38-17-49.926	76-22-35.328		35
Patuxent River	AN/MPS-26		.09766	1.000000	8000	38-17-51.116	76-22-33.940		25.89
Patuxent River	SCR-584		.04883	0.24414	Manual	38-17-52.141	76-22-34.103		25.66

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE	GEODETIC COORDINATES (Based on Fischer 1960)			
			ELEV. & AZ (MILS)	RANGE (YDS)	(YDS/SEC)	LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x.xxxxx	xxxxx	xxx°xx'xx.xxxx"	xxx°xx'xx.xxxx"	xxxx.xx	xxxx.xx
PACIFIC MISSILE RANGE									
Pt Mugu, CA 93041									
Pt Mugu	AN/FPS-16 (S/N-2)		0.00274658203125	1.0000000	N/A	34-07-17.7627	119-09-02.6212		41.32
Pt Mugu	AN/FPS-16 (S/N-3)		0.00274658203125	1.0000000	N/A	34-07-20.2121	119-09-08.7900		41.28
Pt Mugu	AN/FPS-16 (S/N-10)		0.00274658203125	1.0000000	N/A	34-07-21.5967	119-09-12.2764		41.17
Pt Mugu	AN/FPS-16 (S/N-24)		0.00274658203125	1.0000000	0.03125	34-07-22.9818	119-09-15.7641		41.18
Pt Mugu	AN/MPS-16 (S/N-3)		0.0054931640625	1.220703125	N/A	34-06-47.8925	119-07-19.7333		21.56
Pt Mugu	AN/MPS-16 (S/N-1)		0.0054931640625	1.220703125	N/A	34-06-48.1558	119-07-20.0448		20.72
Pt Mugu	AN/MPS-16 (S/N-4)		0.00274658203125	1.220703125	N/A	34-06-47.7777	119-07-19.3963		21.52
Pt Mugu	MOD II (S/N-23)		0.00274658203125	1.0000000	N/A	34-06-47.5631	119-07-16.0773		72.22
Pt Mugu	AN/FPQ-10 (S/N-5)		0.00274658203125	1.953125	N/A	34-06-46.7788	119-07-14.9957		72.60
			0.00140625	1.953125	N/A	34-06-46.7788	119-07-14.9957		72.60
Pt Mugu	AN/FPQ-10 (S/N-6)		0.00274658203125	1.953125	N/A	34-06-46.6527	119-07-16.4969		72.55
SNI	AN/FPS-16 (S/N-7)		0.00274658203125	1.0000000	N/A	33-14-49.7394	119-31-10.9605		930.05
SNI	AN/FPS-16 (S/N-13)		0.00274658203125	1.0000000	N/A	33-14-52.2873	119-31-13.2946		931.90
SNI	AN/FPS-16 (S/N-15)		0.00274658203125	1.953125	N/A	33-14-54.8352	119-31-15.6286		930.00
SNI	MOD II (S/N-12)		0.00274658203125	1.0000000	N/A	Not Available	Not Available		
SNI	AN/FPQ-10 (S/N-1)		0.00274658203125	1.953125	N/A	33-14-46.5444	119-31-08.1217		935.05
SNI	AN/FPQ-10 (S/N-4)		0.00274658203125	1.953125	N/A	33-14-47.1911	119-31-08.6250		935.98
Barsan	AN/MPS-26 (S/N-2)		0.00274658203125	1.220703125	N/A	22-01-32.0560	159-46-59.0867		29.60
Barsan	M-33 (S/N-689)		0.0439453125	2.0000000	N/A	22-01-30.4434	159-46-59.9275		29.40
Makaha	AN/FPQ-10 (S/N-2)		0.00274658203125	1.953125	N/A	22-08-04.3293	159-43-41.6469		1559.37
Makaha	AN/FPQ-10 (S/N-3)		0.00274658203125	1.953125	N/A	22-08-05.1624	159-43-41.5137		1544.85
Makaha	AN/FPQ-12		-XYZ OUTPUT ONLY-		N/A	22-08-06.7431	159-43-42.9511		1516.80

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB) ELEV. & AZ. (MILS)	LEAST SIGNIFICANT BIT (LSB) RANGE (YDS)	RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Fischer 1960) LATITUDE (+ N)	GEODETIC COORDINATES LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x.xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx°xx'xx.xxxx"	xxxx.xx	xxxx.xx
PACIFIC MISSILE RANGE (Cont)									
Pt Mugu, California									
Barsan	AN/MPS-26 (S/N-5)		0.00274658203125	1.220703125	N/A	22-01-31.1279	159-46-59.6072		29.52
Akau, JA	AN/MPS-25 (S/N-4)		0.00274658203125	1.0000000	N/A	16-45-36.0610	169-30-52.5275		22.45
Akau, JA	AN/MPS-25 (S/N-3)		0.00274658203125	1.0000000	N/A	16-45-36.6852	169-30-54.7195		25.34
Wheeling	AN/FPS-16 (S/N-46)		0.00274658203125	1.953125	N/A	As assigned	As Assigned		
Wheeling	AN/MPS-25 (S/N-2)		0.00274658203125	1.0000000	N/A	As Assigned	As assigned		

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB) ELEV. & AZ. (MILS)	RANGE (YDS)	RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Clarke 1866) LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx°xx'xx.xxxx"	xxxx xx	xxxx.xx
SANDIA CORPORATION									
Albuquerque, NM 87115									
Tonopah Test Range, NV	AN/MPS-25 (S/N-1)		0.0027465820	1.000000	N/A	37-44-26.1871	116-46-41.5499		6032.78
Tonopah Test Range, NV	M-33		0.0054931641	3.051758	N/A	37-47-09.6070	116-45-15.9866		5532.93
Barking Sands, Kauai	Nike Ajax		0.1953125	3.051758	N/A	16-43-53.9860	169-32-05.4040		17.05
Barking Sands, Kauai	Nike Ajax		0.1953125	3.051758	N/A	16-43-53.7570	169-32-07.0370		17.05
Johnston Atoll	Nike Ajax		0.1953125	3.051758	N/A	22-03-41.0507	159-46-53.4250		17.85
Johnston Atoll	Nike Ajax		0.1953125	3.051758	N/A	22-03-39.5483	159-46-53.9670		16.70

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB)		RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Fischer 1960)			
			ELEV. & AZ. (MILS)	RANGE (YDS)		LATITUDE (+ N)	LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
			.xxxxxxxxxxxx	x xxxxxx	.xxxxx	xxx°xx'xx.xxxx"	xxx°xx'xx.xxxx"	xxxx xx	xxxx.xx
SPACE AND MISSILE TEST CENTER									
Vandenberg AFB, CA 93437									
Tranquillon	AN/FPS-16 (S/N-18)		0.048828125	1.953125	N/A	34-34-58.4506	120-33-40.1517	2095.80	2170.11
Tranquillon	AN/FPS-16 (S/N-21)		0.048828125	1.953125	N/A	34-34-59.4945	120-33-38.5037	2095.90	2170.21
Point Pillar	AN/FPS-16 (S/N-5)		0.048828125	1.953125	N/A	37-29051.9825	122-29-53.8848	136.88	198.06
Point Pillar	AN/FPQ-6 (S/N-6)		0.006103515625	1.953125	0.03125	37-20-52.4985	122-20-57.3631	104.77	165.95
Vandenberg AFB	AN/TPQ-18 (S/N-5)		0.006103515625	1.953125	0.03125	34-39-57.6303	120-34-51.6978	329.11	403.51
T-AGM-6 USNS Watertown	CAPRI (S/N-1)		0.048828125	1.953125	N/A	As Assigned	As Assigned		
T-AGM-7 USNS Huntsville	CAPRI (S/N-2)		0.048828125	1.953125	N/A	As Assigned	As Assigned		

REMOTE TRACKING SITE CONSTANTS DATA

LOCATION	RADAR	ADDRESS	LEAST SIGNIFICANT BIT (LSB) ELEV & AZ (MILS)	LEAST SIGNIFICANT BIT (LSB) RANGE (YDS)	RANGE RATE (YDS/SEC)	GEODETIC COORDINATES (Based on Clarke 1866) LATITUDE (+ N)	GEODETIC COORDINATES LONGITUDE (+ W)	SPHEROID HEIGHT (FT)	MEAN SEA LEVEL (FT)
WHITE SANDS MISSILE RANGE			xxxxxxxxxxxx	x xxxxxx	xxxxx	xxx°xx'xx xxxx	xxx°xx'xx xxxx	xxxx xx	xxxx.xx
White Sands Missile Range, NM 88002									
R112 C Station	AN/FPS-16 (S/N-1)		0.048828125	1.000000	N/A	32-21-28.6149	106-22-12.8363		4048.40
R113 C Station	AN/FPS-16 (S/N-6)		0.048828125	1.953125	0.02	32-21-28.6233	106-22-09.3409		4049.20
R114 C Station	AN/FPS-16 (S/N-28)		0.048828125	1.000000	N/A	32-21-28.6308	106-22-05.8461		4047.17
R124 Phillips Hill	AN/FPS-16 (S/N-16)		0.048828125	1.000000	N/A	33-26-42.4099	106-07-53.5662		5326.81
R329 Talos	AN/FPS-16 (XN-3)		0.048828125	1.000000	N/A	32-24-20.5830	106-20-56.5646		4048.03
R122 Holloman	AN/FPS-16 (S/N-4)		0.048828125	1.000000	N/A	32-54-07.9523	106-05-55.0272		4148.49
R123 Holloman	AN/FPS-16 (S/N-9)		0.048828125	1.000000	0.02	32-54-04.9767	106-05-55.0398		4149.40
R125 Tularosa	AN/FPS-16 (S/N-40)		0.048828125	1.000000	N/A	33-05-45.7916	106-09-30.9405		4175.66
R127 Stallion	AN/FPS-16 (S/N-12)		0.048828125	1.000000	0.02	33-48-49.8277	106-39-30.3878		5025.01
R128 Stallion	AN/FPS-16 (S/N-22)		0.048828125	1.000000	N/A	33-48-46.8622	106-39-30.3754		5017.28
R280 Blanding	AN/MPS-25 (XN-1)		0.048828125	1.000000	N/A	37-31-28.668	109-35-25.565		5771.31
R281 Blanding	AN/MPS-25 (XN-2)		0.048828125	1.000000	N/A	37-31-27.288	109-35-28.803		5785.09
R218 Green River	AN/FPS-16 (S/N-26)		0.048828125	1.000000	N/A	38-58-44.452	110-06-42.076		4338.89
R219 Green River	AN/FPS-16 (S/N-33)		0.048828125	1.000000	N/A	38-58-44.008	110-06-37.146		4338.96

APG, HAFB, Ogden