4.3.8   <u>POINTING ACCURACY/REPEATABILITY</u>   (EST Test Time - 30 minutes;
                                                    requires down time)

Purpose

This test checks the pointing accuracy and repeatability of
the antenna control system.

Description

In this test, two or more satellites are acquired from four
different directions. The actual position data is then
compared to the predict data to determine pointing accuracy
and repeatability.

4.3.8.1   Set the Corrective Step Threshold (CST) parameter to "2" at
the ACU. (If the received signal is bouncy, this number may
be increased to allow the system to park). Position antenna
to two or more satellites whose position is known within 0.01
degrees versus time. (Attach a copy of the predict data to
the test procedure). Approach each satellite from four (4)
directions by manually driving off approximately 0.5db and
using steptrack to repeak the signal. Record data.

SATELLITE	PREDICT AZ	EL	SIGNAL STRENGTH (RELATIVE)	ACTUAL AZ	EL	DIFFERENCE AZ	EL	TIME
F-6	248.17	9.60	O	248.17	9.60	-.01	O	1:26 GMT
			O	248.16	9.60	+.01	O	1.27 GMT
			O	248.17	9.60	O	O	1.32 GMT
			O	248.17	9.60	-.01	O	1.34 GMT
B. F-3	243.97	12.56	O	243.97	12.56	O	O	1.40 GMT
			0.1	243.97	12.57	O	O	1.55 GMT
			0.1	243.97	12.57	O	O	1.59 GMT
			0.1	243.97	12.57	O	O	2.01 GMT
C.								

SIZE	CODE IDENT	DRAWING NO.
A	33875	82-30008-000

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4.3.8.2   Use the DIFFERENCE figures to calculate the Beam Radial
          Error. (BRE)

$$\text{RMS AZ} = \sqrt{\dfrac{\sum\limits_{n=1}^{128} (AZ_n \cos EL_n)^2}{32}} = 0.008539$$

$$\text{RMS EL} = \sqrt{\dfrac{\sum\limits_{n=1}^{128} (EL_n)^2}{32}} = 0$$

$$\text{BRE} = \sqrt{(RMS_{AZ})^2 + (RMS_{EL})^2} = 0.008539$$

Pointing Accuracy = BRE = 0.008539 RMS

This pointing accuracy should be equal to or better than
the pointing accuracy obtained in the pre-modification test.

4.3.8.3   Use the DIFFERENCE figures to calculate the repeatability.

Calculate the mean of the four difference numbers for each
satellite.

SAT A F6   AZ mean .0075 EL mean O

SAT B F3   AZ mean O   EL mean O

SAT C   '   AZ mean _____ EL mean _____

Calculate the deviation AZd and ELd from the mean for each
difference number for each satellite.

	AZd	ELd
SAT A	.0025	0
	.0025	0
	.0075	0
	.0025	0

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	AZd	ELd
SAT B	O	O
	O	O
	O	O
	O	O
SAT C	—	—
	—	—
	—	—
	—	—

Use the deviation figure to calculate repeatability.

$$RMS\ AZ = \sqrt{\frac{\sum_{n=1}^{12} (AZ_n\ COS\ EL_n)^2}{3}}$$

$$RMS\ EL = \sqrt{\frac{\sum_{n=1}^{12} (EL_n)^2}{3}}$$

$$Repeatability = \sqrt{(RMS_{AZ})^2 + (RMS_{EL})^2}$$

4.3.9   <u>STEPTRACK TEST</u> (EST Test Time - 2 hours; requires down time)

Purpose

This test demonstrates the ability of the antenna control system to lock-on to a satellite signal, begin searching when signal drops below a predetermined level and then lock-on once again when signal level is restored. It also demonstrates the system's ability to track a satellite for a period of one hour dropping in and out of active track as required. The results of the test are then analyzed statistically to obtain a value for the tracking accuracy.

Description

Refer to Figure 4.

SIZE	CODE IDENT	DRAWING NO.
A	33875	82-30008-000

			SHEET 27
WANG ID. NO. 1873B	SCALE		

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