Northpoint Technology – DBS Compatiblilty Test – Austin Test Area

Rx Site Location Log

Rx Site No. 28 p1

Set: 1/

Site Name: Mopac & Gaines Ranch Loop

Date / Time: 12/31/98 1:05pCST

Operator: Dw / MH / ME

GPS Receiver Reading at Site:

Time Read 1:17p CST

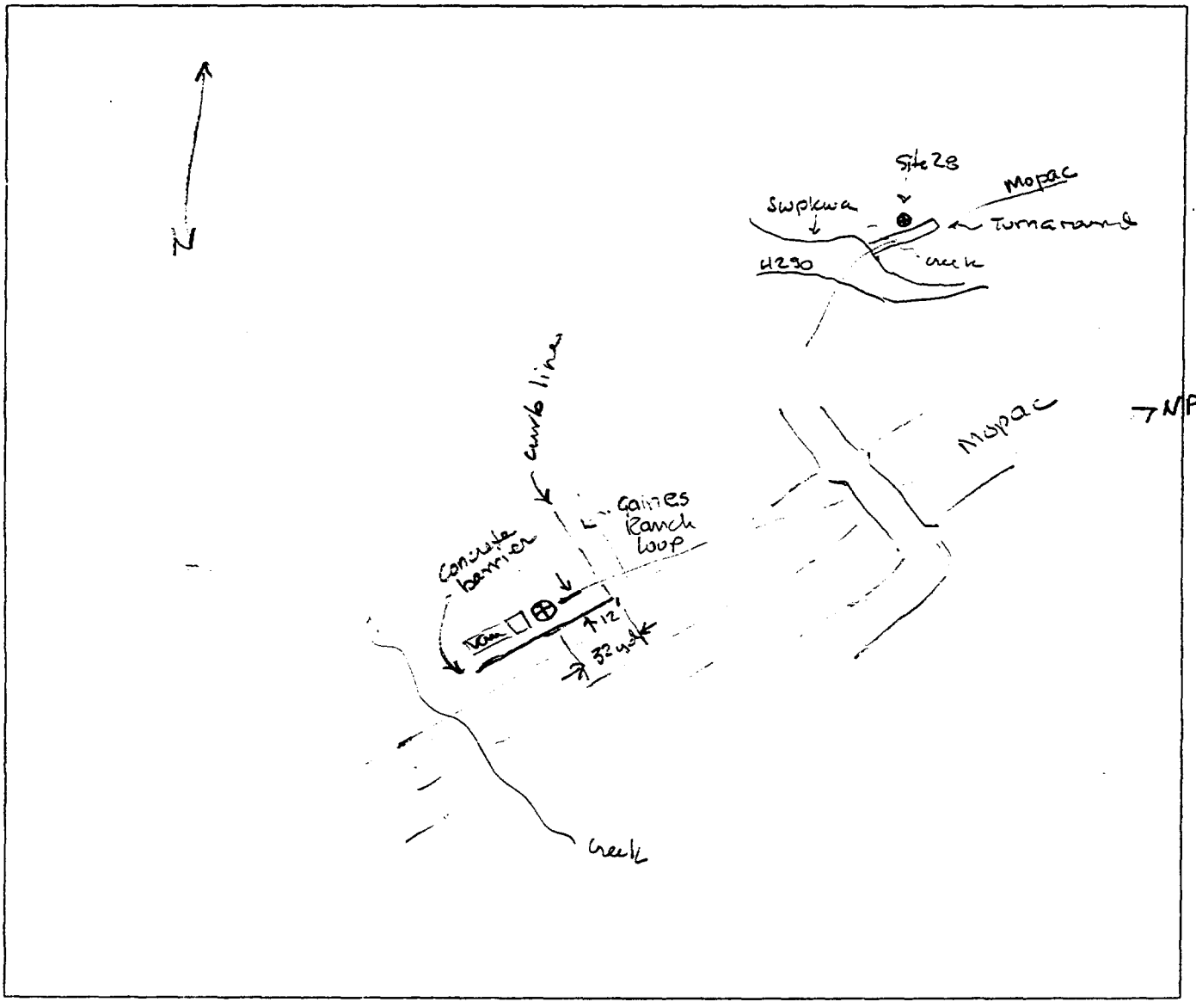
19:17:00

Lat: N 30 14 24.4

Lon: W 97 49 05.5

Elev: 695'

Map Sketch (show street reference and local benchmark features):



Northpoint Technology – DBS Compatiblilty Test – Austin Test Area

Rx Site Location Log

Rx Site No. 29 pl
Set: 1 / ___

Site Name: HEB 1st & Wm Cannon

Date / Time: 12/31/99 3:33p CST

Operator: [illegible] / MH / ME

GPS Receiver Reading at Site:

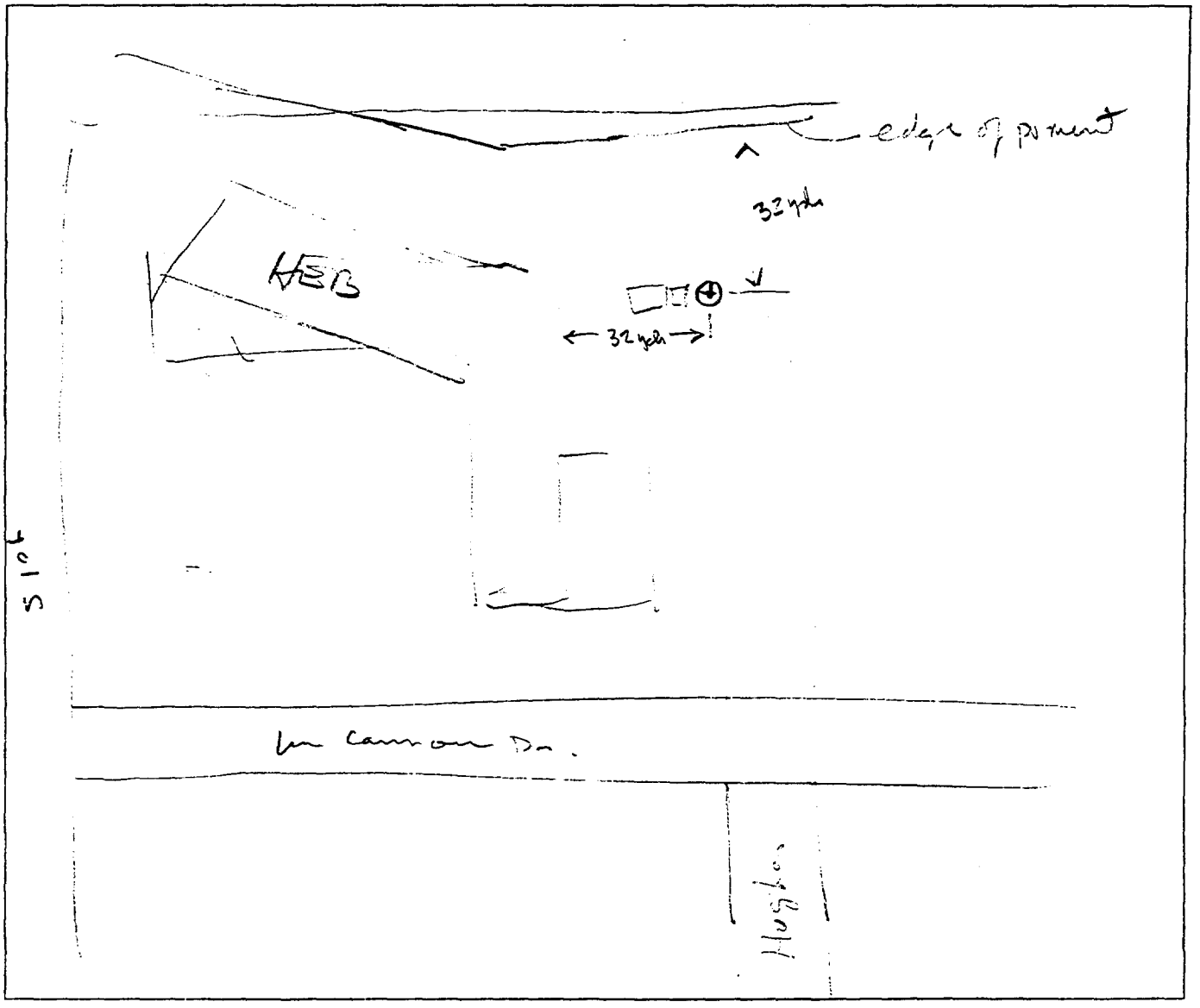
Time Read 3:34 p CST
21:34:00

Lat: N 30 11 49.3

Lon: W 97 47 04.3

Elev: 512'

Map Sketch (show street reference and local benchmark features):



C. Rx Condx Log

Note: This log describes the Rx system in use and is referenced by the Field Logs.

APPENDIX 1

Transmitter Logs

A. Tx Site Log
B. Tx Condx Log

This appendix contains the NP Tx Site Log (operation log) and the Tx Condx Log with and related configuration and calibration notes. The Tx Condx Log is referenced by the Field Logs. The supervisor and responsible party for the transmitter during this test work is Saleem Tawil of DCE.

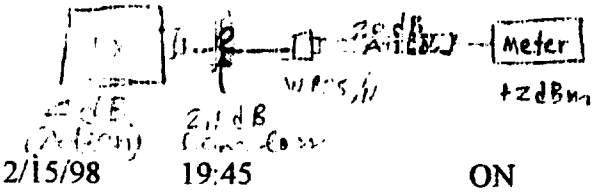
A. Tx Site Log

Tx Site Log

WA2XMY

Transmitter Log: FREQ. 12,470

DATE	TIME	TRANSMITTER	POWER
12/3/98	14:45	ON	+5dBm
12/3/98	22:20	OFF	
12/4/98	8:36	ON	+5dBm
12/4/98	11:03		+25dBm
12/4/98	11:04		+20dBm
12/4/98	11:05		+5dBm
12/4/98	17:49	OFF	
12/7/98	9:15	ON	+5dBm
12/8/98	15:34	OFF	
12/8/98	15:38	ON	+5dBm
12/9/98	15:35		+11dBm
12/9/98	15:37		+9dBm
12/9/98	15:39		+3dBm
12/9/98	15:41		+5dBm
12/9/98	15:47	OFF	
12/9/98	15:54	ON	+5dBm
12/9/98	16:31	OFF	
12/9/98	16:37	ON	+5dBm
12/10/98	5:10	OFF	
12/10/98	11:45	ON	+5dBm
12/10/98	11:47	OFF	
12/10/98	11:52	ON	+5dBm
12/10/98	12:08		+11dBm
12/10/98	12:10		+14dBm
12/10/98	12:12		+17dBm
12/10/98	12:13		+20dBm
12/10/98	12:14		+17dBm
12/10/98	12:15	FREQ.-12480	
12/10/98	12:17	" -12460	
12/10/98	12:18	" -12465	
12/10/98	12:21	" -12470	+5dBm
12/10/98	15:31	OFF	
12/15/98	12:45	CALIBRATED TRANSMITTER	



12/15/98	19:45	ON	+5dBm

WA2XMY

Transmitter Log: FREQ. 12.470

DATE	TIME	TRANSMITTER	POWER
12/17/98	17:20	OFF	
12/18/98	9:45	ON	+5dBm
12/18/98	19:25	OFF	
12/22/98	9:20	ON	+5dBm
12/24/98	13:29	OFF	
12/28/98	9:15	ON	+5dBm
12/28/98	16:44	OFF	
12/28/98	16:48	ON	+5dBm
12/31/98	15:47	OFF	

B. Tx Condx Log

Northpoint Technology – DBS Compatiblilty Test – Austin Test Area

Tx Condx Log

Tx Condx Ref. No. 2

Date / Time: 12/15/98 12:45pCST

Operator: D.R. Word & Saleem Tawil

NP Tx: Call - WA2XMY
Site Location: DCE office balcony at 111 Congress Ave. / Austin, TX.
Antenna Height: 270 ft. AGL.

Antenna Pan / Tilt Angles: 193° Az / 0° Tilt

Polarization: E-horizontal

Effected Radiated Power (ERP) 12.5 dBm EIRP

Modulaton Type QPSK – 8 MHz BW

Carrier Frequency 12.470 GHz.

Alt Two-frequency Set: (1) ~~_____~~ GHz.

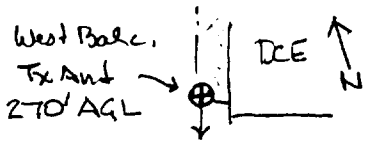
(2) ~~_____~~ GHz.

alternate test freq. only as stated in the Tx Site Log.

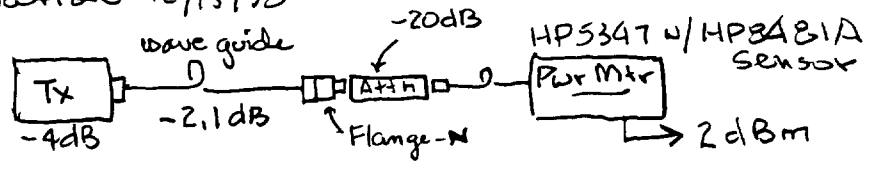
Enter other pertinent conditions, diagrams, etc. as applicable.

NOTE: (1) See att. Block Diagram for Tx configuration –

(2) mounting - DCE Balcony on Franklin Bldg - Austin TX
111 Congress Ave. / 2530

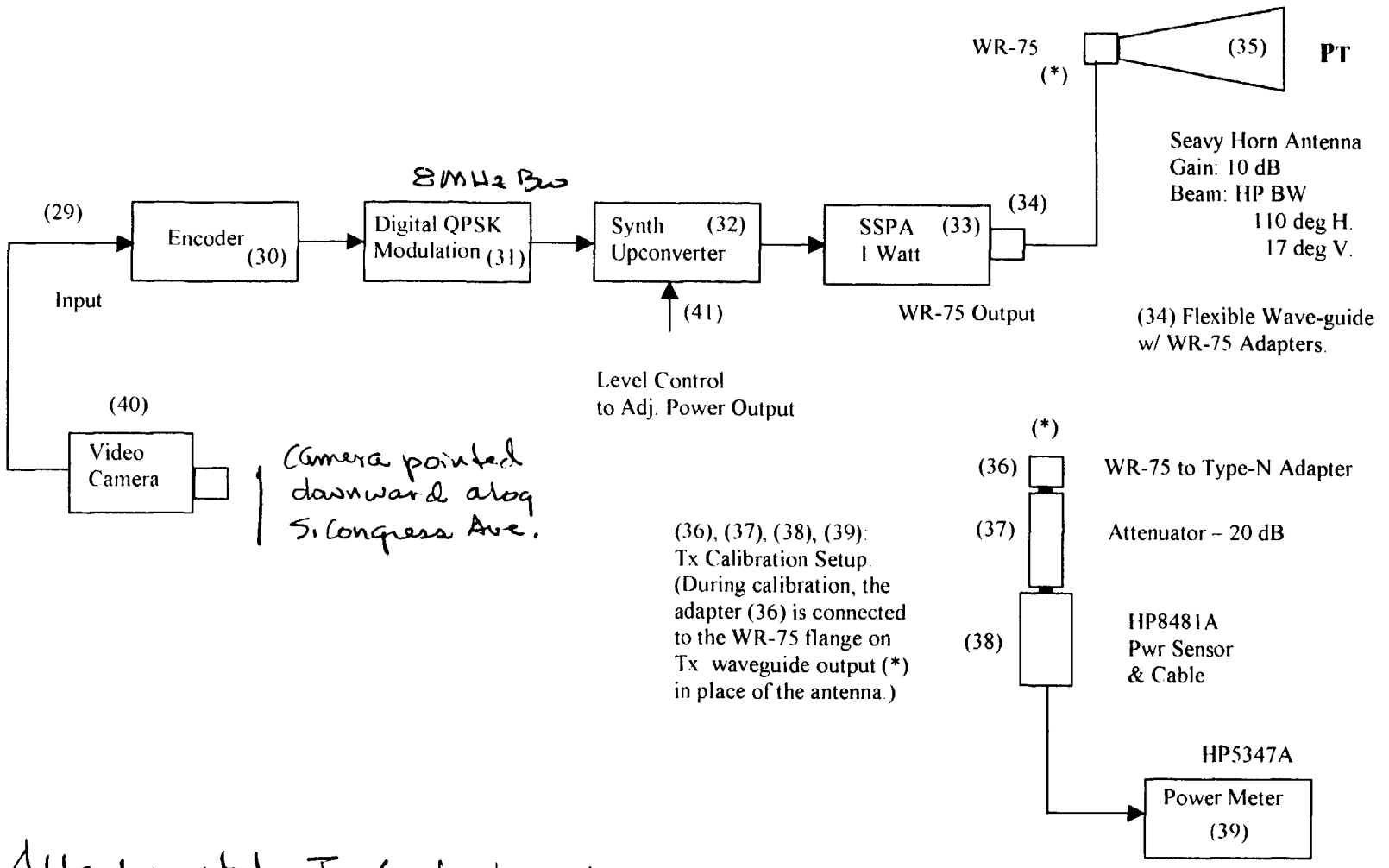


(3) calibration 12/15/98



(4) Tx Condx Ref #1 – (12/3/98 to 12/15/98) – same, except that on 12/15/98, Tx cal was checked & Antenna pointing was rechecked and adjusted very slightly.

15 Dec 98 DRW



Attachment to Tx Condx Log (Ref #2).

Northpoint Terrestrial Transmitter Block Diagram.

APPENDIX 2

Receiver Calibration Notes

A. Calibration of HP11500F Cable from Horn to LNA.
B. Summary of Test Set System Parameters.
C. DBS System Calibration Notes.
D. Echostar Transponder Loading Test

Note –

This appendix contains handwritten engineering notes related to calibration of the DBS Receiver System, using the pre-calibrated Test Set System with a precision horn antenna. The Test Set System (TS) and the DBS Receiver System are described in report Figure III-2 and Figure III-3, respectively. Components (8), (5), and (10) of the TS system, including the horn, the LNA, and the 40 foot coax cable, were calibrated by Professional Testing, Inc. (PTI) of Round Rock, TX, at the beginning of the subject field tests. The cable (9), HP11500F, between the horn antenna and the LNA, was calibrated by DRW, using the HP8563E Spectrum Analyzer and the HP83732B Synthesizer.

The calibration criterion applied is to express the received signal in terms of the equivalent output power of an isotropic antenna at the receiving site. The Rx system gain is determined from this isotropic reference signal to the measured system output as the Spectrum Analyzer (SA) reading. This system gain can then be applied to the SA data to determine the equivalent 'Isotropic' signal level at the receiver system input.

The engineering notes also show a calculation of the equivalent apertures for the TS and DBS systems. The aperture values can be applied to estimate the received signal in terms of the spatial power density of the received signal. The apertures are not specifically used in the report data presentations.

System Calibration Summary:

TS System Gain over Isotropic -- ao(dB) = 42.0 dB
DBS System Gain over Isotropic -- ax(dB) = 77.9 dB

DBS System Output Scaling to Isotropic Reference:

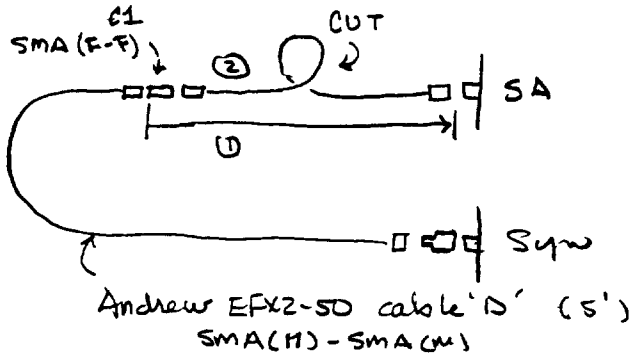
For Isotropic signal Psi and DBS System output Px, the Isotropic signal is determined as:

Psi = Px / ax OR Psi(dBm) = Px(dbm) – 77.9 dB.

A. Calibration of HP11500F Cable from Horn to LNA.

DRW/dce 1 | 15 Dec 98 [illegible]

Cal Cable - Horn to LNA - HP11500F - Ref DRW-HP1



* See Plots
① → +0.17 dB
② → -1.17 dB

Loss 1.34 dB

* After readings scattering over 0.5 dB - values based on avg. of several trys.

assume C1 [SMA(F-F) adapt] loss ~ 0.3 dB

⇒ assign to DRW-HP1 ⇒ -1.0 dB (insersion loss)

22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS
AMPAD

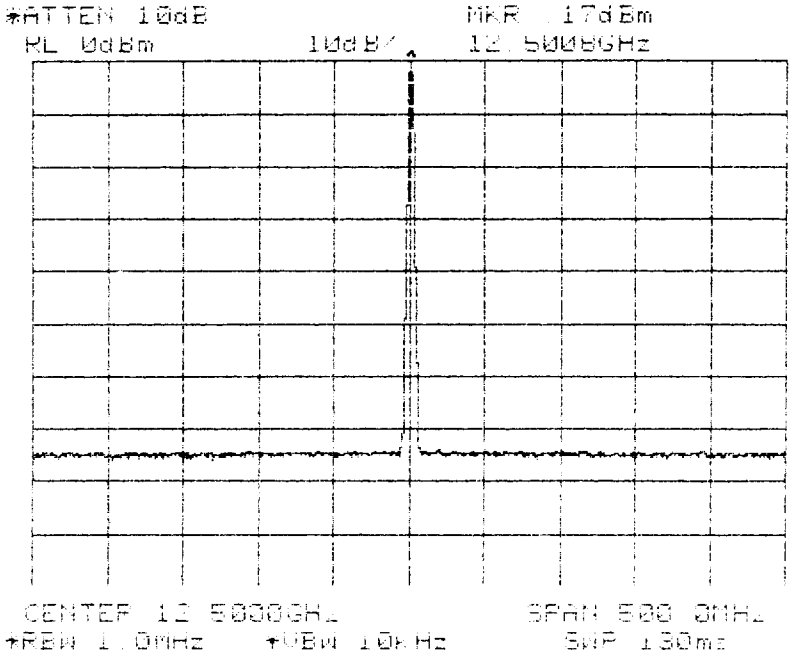
DRW/dce 1 15 Dec 98

DRW-HP1

Cal of Cable HP11500F from Telogy

Ref - DRW-HP1

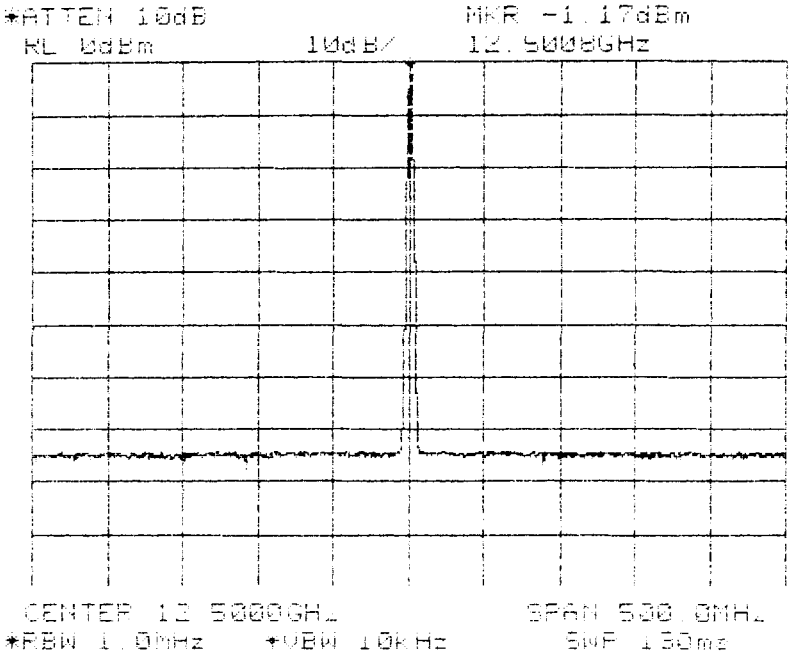
cont x ①



DRW/dce1 15 Dec 98

DRW-HP1

condx ②



B. Summary of Test Set System Parameters.

Calibration Sources:

Professional Testing, Inc. (PTI)
D.R.Word Associates (DRW)

Frequency for parameters listed – 12.5 GHz.

Horn Antenna (8) –	Scientific Atlanta -12-12 S/N 340 Linear polarization. w/ narda 4609 Flange to SMA(F) coax adapter Normal Op. Freq. – 12.4 –18.0 GHz Beam width (3 dB) – 9 deg H-plane / 10 deg E-plane	
	Measured Gain over Isotropic (PTI) -	+24.0 dBi
LNA (5) --	JCA Technology – JCA1218-F01 Op. Freq. – 12.0 – 18.0 GHz	
	Measured Gain (PTI) -	+25.0 dB
Cable (10) --	Andrew EFX2-50 – SMA(M)-SMA(M) – 40 ft. long.	
	Measured Gain (Loss) (PTI) -	- 6.0 dB
Cable (9) --	HP11500F – SMA(M)-SMA(M) – 6 ft. long.	
	Measured Gain (Loss) (DRW) -	- 1.0 dB

C. DBS System Calibration Notes.