ORIGINAL

In the Matter of:

Amendment of Parts 73 and 74 of the)
Commission's Rules to Establish Rules for Digital)
Low Power Television, Television Translator, and) MB Docket No. 03-185
Television Booster Stations and to Amend Rules)
For digital Class A Television Stations)

EX PARTE OR LATE FILED

NOTICE OF PROPOSED RULEMAKING

Adopted: August 6, 2003 **Released: August 29, 2003**

SupplementalReply Comments of:

Riverton Fremont TV Club, Inc
Darwin Hillberry, President
PO Box 628
Riverton, WY 82501

RE: Riverton Fremont TV Club, Inc hereby submits these *supplemental* comments in response to MB Docket No. 03-185 Regarding Interference from UHF Digital Low Power Television, Television Translator, and Television Booster Stations to GPS Receivers, as raised by the U.S. GPS Industry Council

The attached statement from Riverton Fremont TV Club, Inc, regarding possible interference to the GPS from TV Translator Stations, as put forth by the U. S. GPS Industry Council, is being filed with the Commission. The original and one copy of this letter and the accompanying statement are being provided for inclusion in the file of the reference proceeding.

Please address any questions you may have to the undersigned at (307) 856-3322.

Respectfully submitted,

Darwin Hillberry
President

No. of Copies rec'd 0+1
List ABCDE

1 June, 2004

The following tests were made to evaluate the proposed absolute level of out of band emission, generated by a braodcast DTV Translator Station, as stated in the U.S. GPS Industry Council's ex parte presentation.

In the filings in MB Docket # 03-185, the 2 masks were defined as far as adjacent channel splatter, the filters used for the 2 masks were not tested for emissions of the second and third harmonics, in the frequencies from 1 GHz to 2 GHz.

The results of the following tests are compared to the U.S. GPS Industry Council's Table 10 (below). Using Sgrignoli's level of –76 Then adding a – 35dB for the proposed GPS Council limit, = 110 dB from the table.

Table 10

Comparison of Recommended OOBE Limits with Sgrignoli

Tower height (meter)	Transmitter Power (watts)	Transmitter Power "XP" (dBW)	Recommended OOBE limit "LIM" (dBW/500 kHz)	Sgrignoli Limit "SL" (dB)	Added Attenuation to Protect GPS[8] (dB)
200	15,000	43.9	-63	-76	-30.9
30	100	22.1	-89	-76	-35.1

The out of band emission measurements were made on a TTC Model XL20, a 20 Watt NTSC Translator at 25% of it's rated power; i.e. 5 Watts 8VSB Digital. (This is a Translator that is in wide use and will be converted to DTV in the field. These Translators are very easy to convert to DTV with a DTV Processor or a Regenerator.) For test set-up and calibrations see **Figures 1 through 3.1**. This Translator was taken out of NTSC Service, the only adjustments were to the bias fo the driver and output amplifiers, for the 8VSB DTV Signal. This Translator has an internal 3 pole filter to meet the less stringent mask. The second and third harmonics out of this translator are below the 110 dB as proposed in the Table **(see Figures 4 through 11)**. All of the out of band emissions tests were below the noise floor at the HP 8590A Spectrum Analyzer, leaving a margin 6 dB or more beyond the 110 dB from Table 10. The tests prove that this particular model of Translator can meet the standard, if properly adjusted.

We believe the Commission should require a low pass filter for all TV Translator Stations, along with the required mask filter. The addition of a low pass filter would provide an additional 50 dB of attenuation above 1 GHz to provide assurance that there would be no out of band emissions. These low pass filters cost $150.00. This filter is rated at 150 Watts. **With the addition of the low pass filter, the Translator operator should not be required to make any out of band emission tests**. This low pass filter should have a red label stating **"WARNING! DO NOT REMOVE GPS FILTER!"**.

I have installed and repaired TV Translators in most of the Rocky Mountain States. To my best estimate, 95% of the Translators are from 20 to 100 Watts NTSC, so 25% of the rated NTSC power is 5 to 25 Watts average DTV Power. With a low pass filter, the out of band emissions

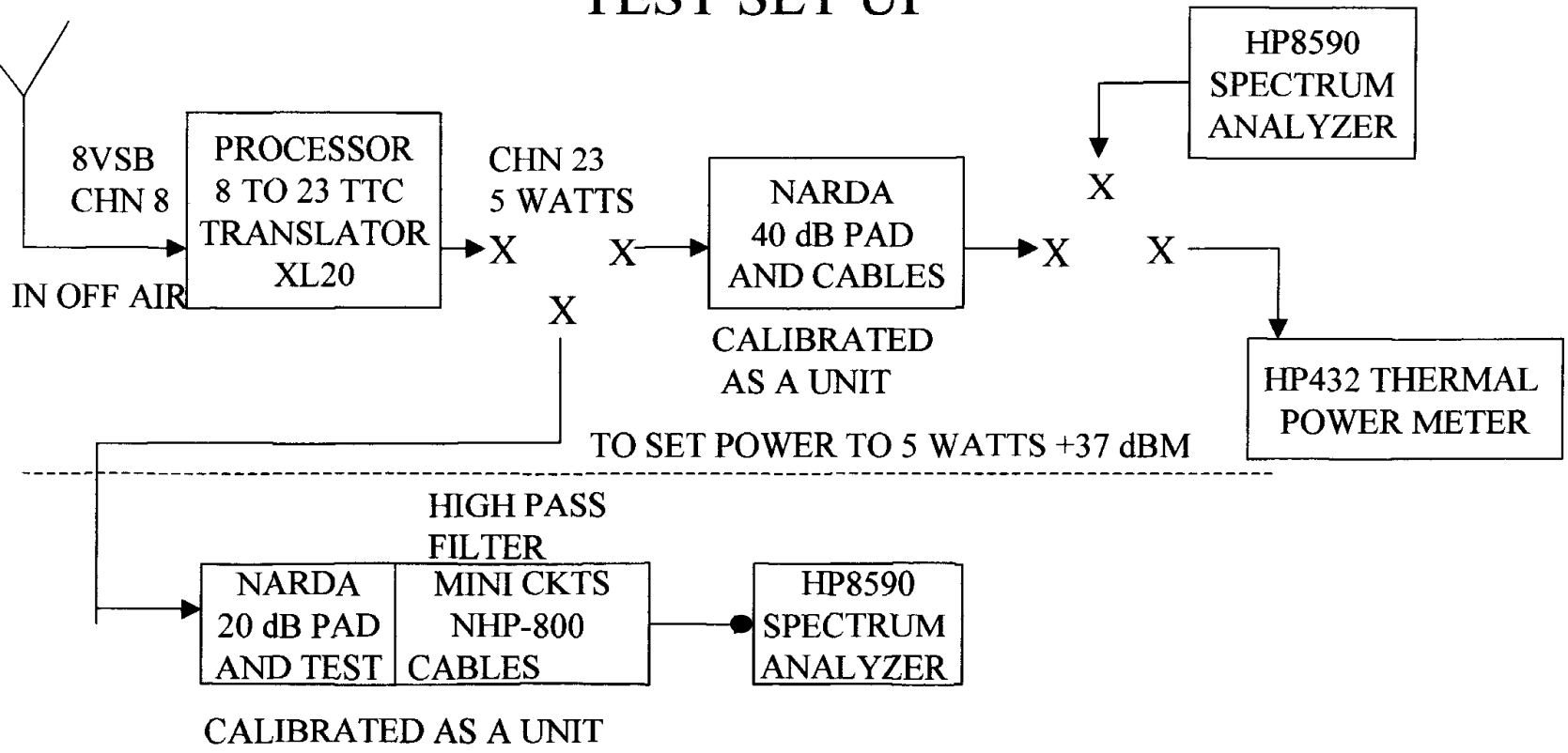
will be far below the 110 dB. With the antenna gains up to 13 dB, the ERP would be 500 Watts less the transmission line loss. The Translator used for these tests is operated at 5 Watts of 8VSB DTV on the test bench. When installed as an operating station with an antenna power gain of 13 dB, would have ERP of less than 100 Watts after the line loss is added in. At this level of in band power, the harmonic level ouput above 1 GHz is very low since the in band power is so low. Most Translator Station antennas are mounted on poles or towers ranging from 20 to 100 feet. Almost all of the Translator sites in rural areas, usually on mountain tops or high ridges, some distance from the communities they are covering.

If the Commission will accept the low pass filter, using the U.S. GPS Industry Council's proposals, it will protect the GPS System and all other users above 1 GHz. This will also lower the noise floor at the Translator Sites.

Respectfully submitted.

TABLE OF CONTENTS FOR FIGURES

TEST SET UP



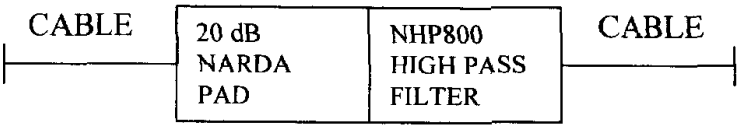
SET UP FOR HARMONIC TESTS

* TTC XL20 SN 6907-5908-006
* HP SPECTRUM ANALYZER #8590 SN 2713A01471
* HP POWER METER #432A SN 1848A26841
* MINI CIRCUITS HIGH PASS FILTER NHP-800 SN 10330
* NARDA 30 dB #766-30 AND MINI CIRCUITS 10 dB #UNAT-10
* NARDA 20dB ATTENUATOR #768-20SP

FIGURE 1

CALIBRATION CHART

EQUIPMENT TESTED AS A COMPLETE UNIT



NARDA 20 Db Pad	MINI CKTS HIGH PASS
#768-20SP	FILTER # NHP-800
DC TO 19.8 GHz	SN 10330

Channel 23 at 527 MHz = -20.7 dB

At harmonics of Channel 23:

Second harmonics = 1048 to 1060 MHz = - 21.5 dB
Third harmonics = 1570 to 1590 MHz = - 22.1 dB

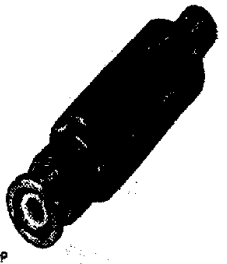
GPS Frequencies:

1164 to 1188 MHz = -21.5 dB
1215 to 1240 MHz = - 21.7 dB
1559 to 1610 MHz = - 22.1 dB

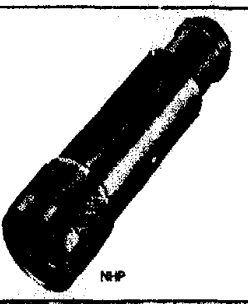
Total Calibration of the Test Setup:

.5 GHz = - 20.7 dB
1 GHz = - 21.5 dB
1.1 GHz = - 21.6 dB
1.2 GHz = - 21.7 dB
1.3 GHz = - 21.8 dB
1.4 GHz = - 21.9 dB
1.5 GHz = - 22.0 dB
1.6 GHz = - 22.1 dB

FIGURE 2



BHP



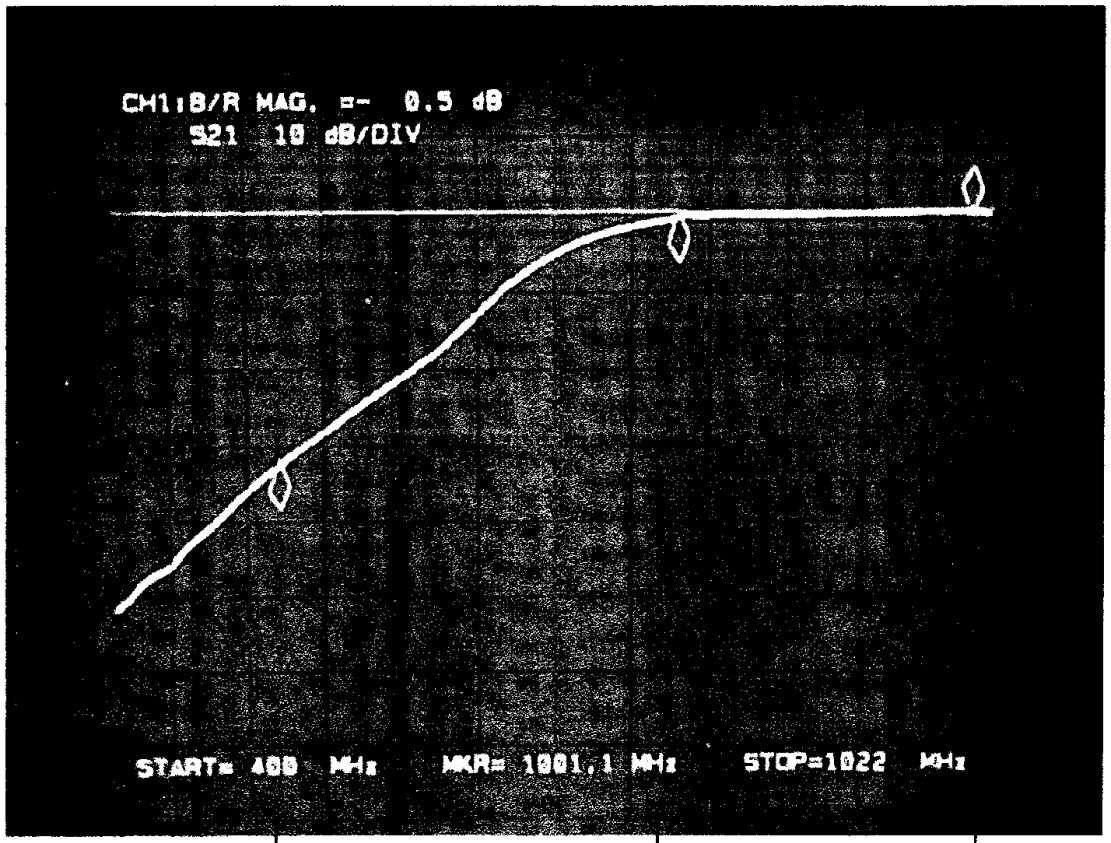
NHP

SHP

BHP-25	DC-13	13-19	25	27.5-200	18:1	1.7:1	8-26	FF55	-	38.95
BHP-50	DC-20	20-26	37	41-200	17:1	1.5:1	8-26	FF55	-	38.95
BHP-100	DC-40	40-55	82	90-400	17:1	1.5:1	8-26	FF55	-	38.95
BHP-150	DC-70	70-95	120	133-600	17:1	1.8:1	8-27	FF55	-	38.95
BHP-175	DC-70	70-105	140	160-800	17:1	1.5:1	8-27	FF55	-	38.95
BHP-200	DC-90	90-116	164	185-800	17:1	1.6:1	8-27	FF55	-	38.95
BHP-250	DC-100	100-150	205	225-1200	17:1	1.3:1	8-28	FF55	-	38.95
BHP-300	DC-145	145-190	245	290-1200	17:1	1.7:1	8-28	FF55	-	38.95
BHP-400	DC-210	210-290	360	395-1600	17:1	1.7:1	8-28	FF55	-	38.95
BHP-500	DC-280	280-365	454	500-1600	17:1	1.9:1	8-29	FF55	-	38.95
BHP-600	DC-350	350-440	545	600-1600	17:1	2.0:1	8-29	FF55	-	38.95
BHP-700	DC-400	400-520	640	700-1800	17:1	1.6:1	8-29	FF55	-	38.95
BHP-800	DC-445	445-570	710	780-2000	17:1	2.1:1	8-30	FF55	-	38.95
BHP-900	DC-520	520-660	820	910-2300	17:1	1.8:1	8-30	FF55	-	38.95
BHP-1000	DC-550	550-720	900	1000-2200	17:1	1.9:1	8-30	FF55	-	38.95
NHP-25	DC-13	13-19	25	27.5-200	18:1	1.7:1	8-26	FF57	-	39.95
NHP-50	DC-20	20-26	37	41-200	17:1	1.5:1	8-26	FF57	-	39.95
NHP-100	DC-40	40-55	82	90-400	17:1	1.5:1	8-26	FF57	-	39.95
NHP-150	DC-70	70-95	120	133-600	17:1	1.8:1	8-27	FF57	-	39.95
NHP-175	DC-70	70-105	140	160-800	17:1	1.5:1	8-27	FF57	-	39.95
NHP-200	DC-90	90-116	164	185-800	17:1	1.6:1	8-27	FF57	-	39.95
NHP-250	DC-100	100-150	205	225-1200	17:1	1.3:1	8-28	FF57	-	39.95
NHP-300	DC-145	145-190	245	290-1200	17:1	1.7:1	8-28	FF57	-	39.95
NHP-400	DC-210	210-290	360	395-1600	17:1	1.7:1	8-28	FF57	-	39.95
NHP-500	DC-280	280-365	454	500-1600	17:1	1.9:1	8-29	FF57	-	39.95
NHP-600	DC-350	350-440	545	600-1600	17:1	2.0:1	8-29	FF57	-	39.95
NHP-700	DC-400	400-520	640	700-1800	17:1	1.6:1	8-29	FF57	-	39.95
NHP-800	DC-445	445-570	710	780-2000	17:1	2.1:1	8-30	FF57	-	39.95
NHP-900	DC-520	520-660	820	910-2300	17:1	1.8:1	8-30	FF57	-	39.95
NHP-1000	DC-550	550-720	900	1000-2200	17:1	1.9:1	8-30	FF57	-	39.95
SHP-25	DC-13	13-19	25	27.5-200	18:1	1.7:1	8-26	FF99	-	38.95
SHP-50	DC-20	20-26	37	41-200	17:1	1.5:1	8-26	FF99	-	38.95
SHP-100	DC-40	40-55	82	90-400	17:1	1.5:1	8-26	FF99	-	38.95
SHP-150	DC-70	70-95	120	133-600	17:1	1.8:1	8-27	FF99	-	38.95
SHP-175	DC-70	70-105	140	160-800	17:1	1.5:1	8-27	FF99	-	38.95
SHP-200	DC-90	90-116	164	185-800	17:1	1.6:1	8-27	FF99	-	38.95
SHP-250	DC-100	100-150	205	225-1200	17:1	1.3:1	8-28	FF99	-	38.95
SHP-300	DC-145	145-190	245	290-1200	17:1	1.7:1	8-28	FF99	-	38.95
SHP-400	DC-210	210-290	360	395-1600	17:1	1.7:1	8-28	FF99	-	38.95
SHP-500	DC-280	280-365	454	500-1600	17:1	1.9:1	8-29	FF99	-	38.95
SHP-600	DC-350	350-440	545	600-1600	17:1	2.0:1	8-29	FF99	-	38.95
SHP-700	DC-400	400-520	640	700-1800	17:1	1.6:1	8-29	FF99	-	38.95
SHP-800	DC-445	445-570	710	780-2000	17:1	2.1:1	8-30	FF99	-	38.95
SHP-900	DC-520	520-660	820	910-2300	17:1	1.8:1	8-30	FF99	-	38.95
SHP-1000	DC-550	550-720	900	1000-2200	17:1	1.9:1	8-30	FF99	-	38.95

FIGURE 3

SWEEP PATTERN OF THE NHP-800 HIGH PASS FILTER



CHN 23 -34.5 dB
@ 527 MHz

825 MHz
-2dB

1 GHz
-.5 dB

As Measured on the HP 8505A Network Analyzer
SN 2411A02601 OPT 005

FIGURE 3.1

EMR CORPORATION PERFORMANCE PLOT RECORD

DATE 5-6-04 JOB REFERENCE Riverton Radio & TV PRODUCT MODEL 455016

TECHNICIAN Kahtan Al-Hashimi SERIAL NUMBER 040506-002

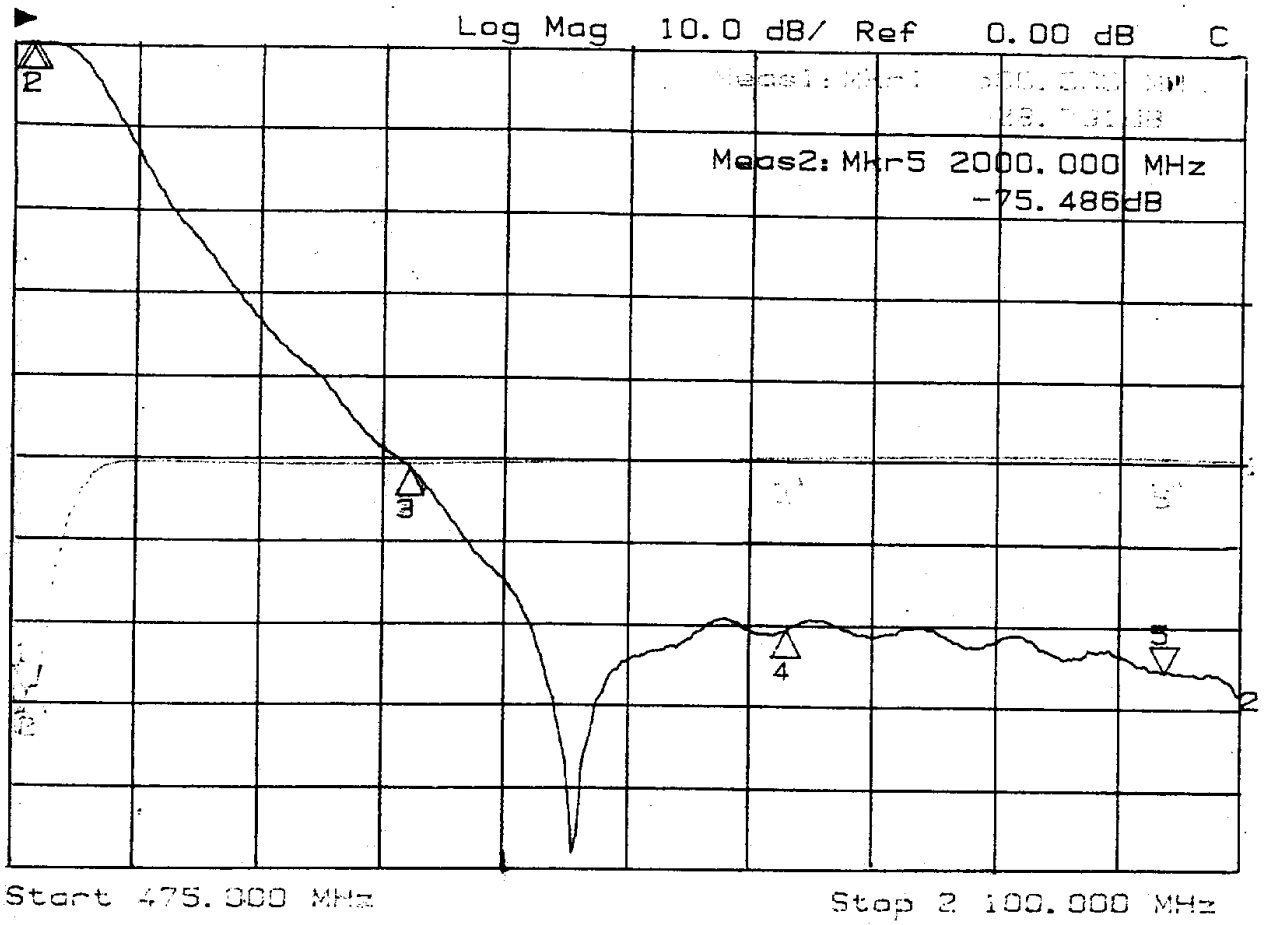
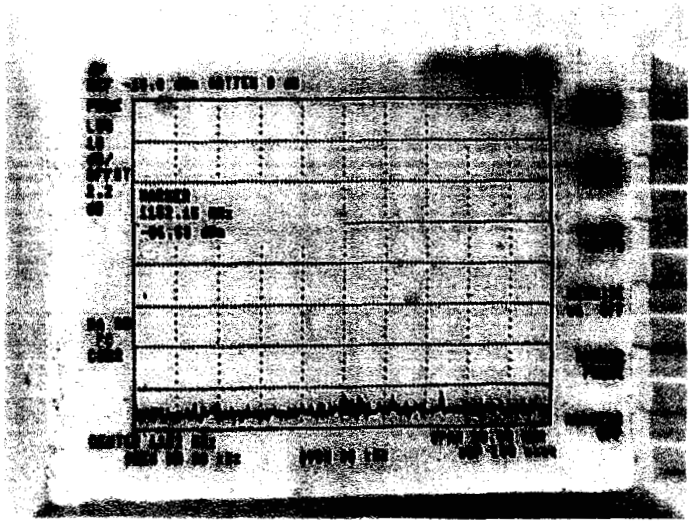


FIGURE 4

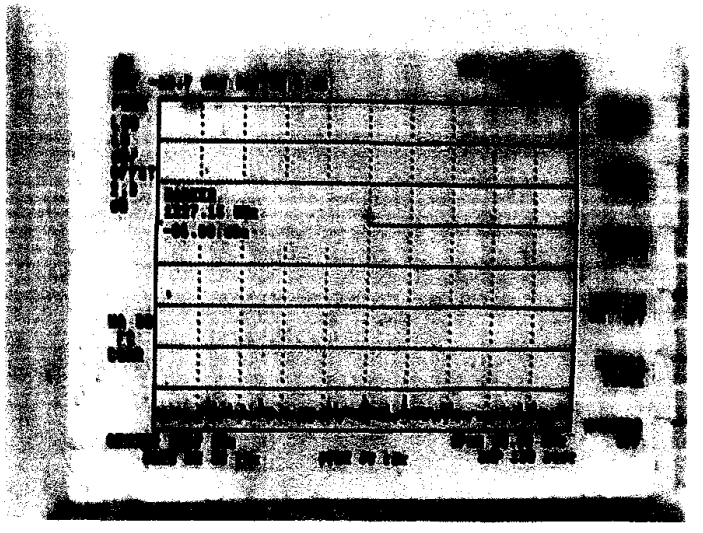
TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



Measurement of GPS Band 1164 MHz to 1188 MHz.
Analyzer frequency set at 1152 MHz, span 60 Mhz. , 6 MHz/DIV
90 dB = 1 Meg a Watt
-(+ 37) dB = 5 Watt Translator
53 dB below 1 Mega Watt
- 86.58 spectrum Analyzer Reading Below 5 Watts
- 139.58 Below 1 Mega Watt
+21.5 Pad and NHP-800 (To Protect Input of Spectrum Anlz)
-118.08 Below 1 Mega Watt
-110 from Table 10
8.08 dB
This exceeds the GPS Standard by 8.08 dB

FIGURE 5

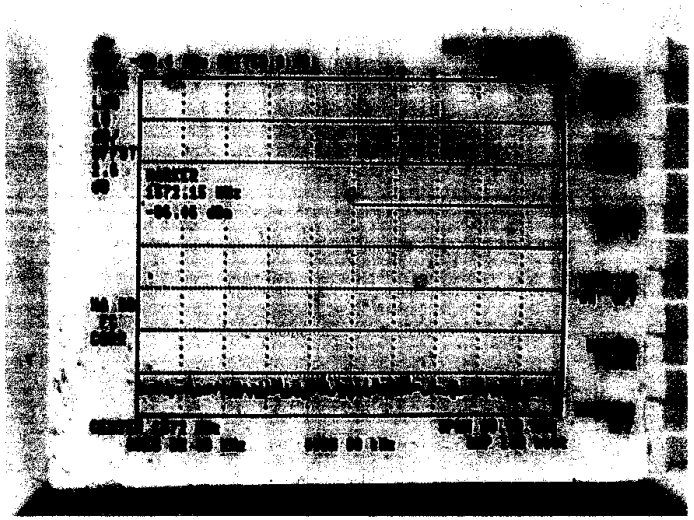
TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



Measurement of GPS Band at 1215 MHz to 1240 MHz.
Analyzer frequency set at 1227 MHz, span 60 Mhz. , 6 MHz/DIV
90 dB = 1 Meg a Watt
- (±37) dB = 5 Watt Translator
53 dB below 1 Mega Watt
- 86 spectrum Analyzer Reading Below 5 Watts
- 139 below 1 Mega Watt
+21.7 Pad and NHP-800(To Protect Input of the Spectrum Anlz)
- 117.3 below 1 Mega Watt
-110 from Table 10
7.3 dB
This exceeds the GPS Standard by 7.3 dB

Figure 6

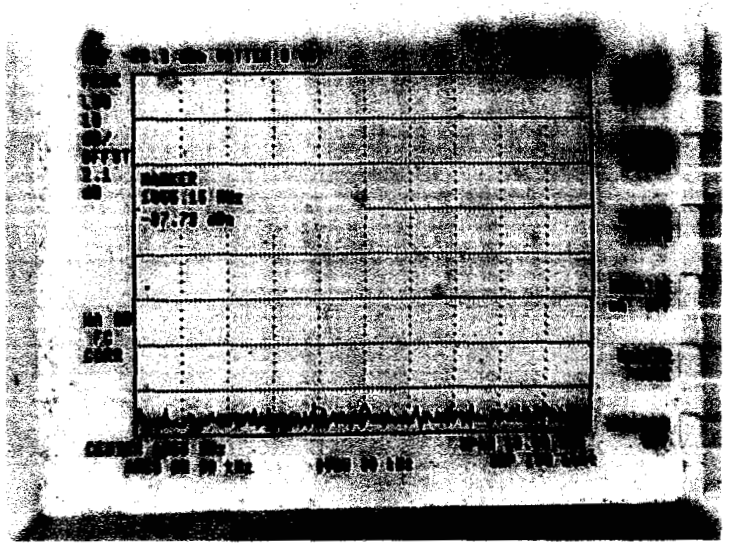
TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



Measurement of GPS Band at 1559 MHz to 1610 MHz.
Analyzer frequency set at 1572 MHz, span 60 Mhz. , 6 MHz/DIV
90 dB = 1 Meg a Watt
-(+ 37 dB) = 5 Watt Translator
53 dB below 1 Mega Watt
- 86.46 spectrum Analyzer Reading Below 5 Watts
- 139.46 below 1 Mega Watt
+22.1 Pad and NHP-800 (To Protect Input of Spectrum Anlz)
-117.36 below 1 Mega Watt
-110 from Table 10
7.36 dB
This exceeds the GPS Standard by 7.36 dB

FIGURE 7

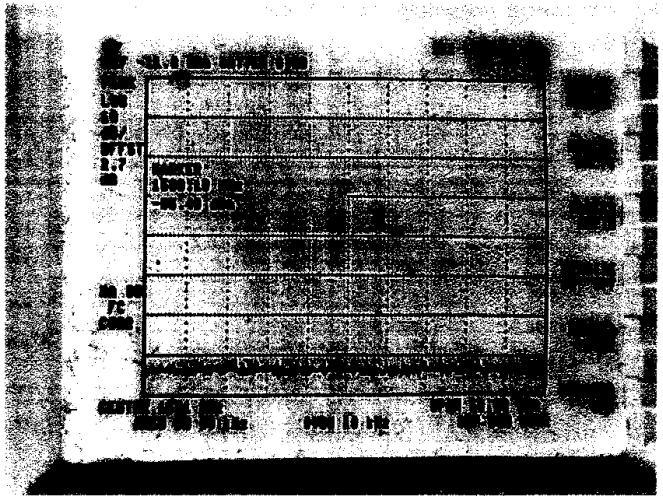
TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



Second Harmonic of Channel 23 = 1048 MHz to 1060 MHz
Analyzer frequency set at 1055 MHz, span 60 Mhz. , 6 MHz/DIV
90 dB = 1 Meg a Watt
-(+ 37 dB) = 5 Watt Translator
53 dB below 1 Mega Watt
- 87.73 spectrum Analyzer Reading Below 5 Watts
- 140.73 below 1 Mega Watt
+21.5 Pad and NHP-800 (To Protect Input of Spectrum Anlz)
- 119.23 below 1 Mega Watt
-110 from Table 10
9.23 dB
This exceeds the GPS Standard by 9.23 dB

FIGURE 8

TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



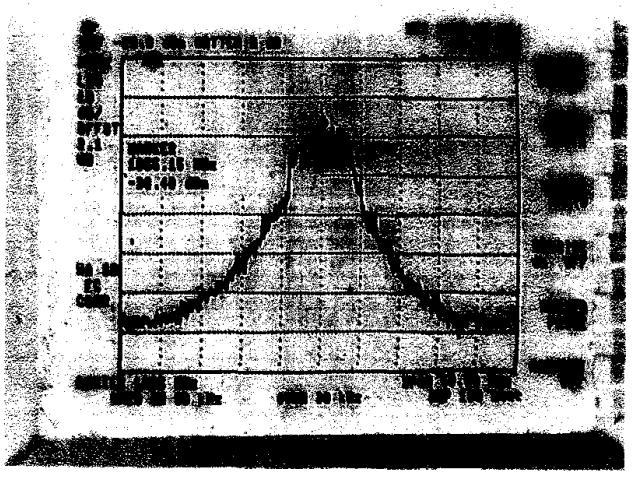
Third Harmonic of Channel 23 = 1572 MHz to 1590 MHz
Analyzer frequency set at 1581 MHz, span 60 Mhz. , 6 MHz/DIV
This Harmonic falls in the GPS Band

90 dB = 1 Meg a Watt
-(+ 37 dB) = 5 Watt Translator
53 dB below 1 Mega Watt
- 85.40 spectrum Analyzer Reading Below 5 Watts
- 138.4 below 1 Mega Watt
*22.1 Pad and NHP-800 (To Protect Input of Spectrum Anlz)
-116.3 below 1 Mega Watt
-110 from Table 10
6.3 dB

This exceeds the GPS Standard by 6.3 dB

FIGURE 9

TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



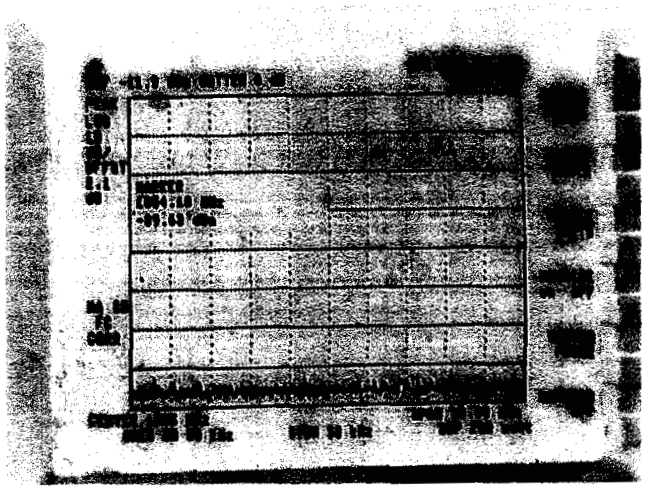
Second Harmonic of Channel 23 = 1048 MHz to 1060 MHz
Analyzer frequency set at 1055 MHz, span 60 Mhz. , 6 MHz/DIV
With 3-Pole Filter Removed (No Filtering)

90 dB = 1 Meg a Watt
-(+ 37 dB) = 5 Watt Translator
53 dB below 1 Mega Watt
- 38.4 spectrum Analyzer Reading Below 5 Watts
- 91.4 below 1 Mega Watt
+21.5 Pad and NHP-800 (To Protect Input of Spectrum Anlz)
- 69.9 below 1 Mega Watt
-110 from Table 10
-40.1 dB

Requires 40.1 dB of Filtering to meet the Standard

FIGURE 10

TTC XL20 TRANSLATOR @ 5 WATTS DIGITAL



Second Harmonic of Channel 23 = 1048 MHz to 1060 MHz
Analyzer frequency set at 1055 MHz, span 60 Mhz. , 6 MHz/DIV
Without 3-Pole Filter, With EMR #4550/L Low Pass Filter

90 dB = 1 Meg a Watt
-(+ 37 dB) = 5 Watt Translator
53 dB below 1 Mega Watt
- 89.63 spectrum Analyzer Reading Below 5 Watts
- 142.63 below 1 Mega Watt
+21.5 Pad and NHP-800To Protect Input of Spectrum Anlz)
-121.13 below 1 Mega Watt
-110 from Table 10
-11.13 dB

This exceeds the GPS Standard by 11.13 dB

FIGURE 11