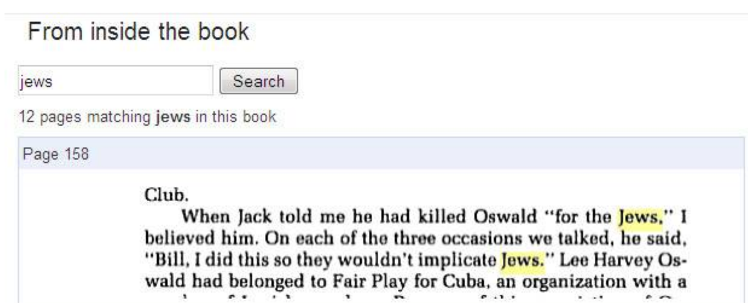
GBPPR 'Zine

Issue #115 / The Monthly Journal of the American Hacker / November 2013

"When Jack [Ruby] told me he had killed Oswald 'for the Jews,' I believed him. On each of the three occasions we talked, he said, 'Bill, I did this so they wouldn't implicate the Jews.' ... During our last visit, he handed me a note in which he reiterated his desire to protect American Jews from a pogrom that could occur because of anger over the assassination."

––– Quote from the 1994 autobiography *My Life As a Radical Lawyer*, (p.158) by Jewish attorney William Kuntsler, who was one of the few people to personally interview Jack Ruby (a Jewish mobster, born Jacob Rubenstein) after shooting Lee Harvey Oswald.

President John F. Kennedy wanted to reinstate U.S government–backed silver certificates (Executive Order 11110), bypassing the private Federal Reserve central bank and their ability to charge loan interest. Federal Reserve notes are not backed by anything other than debt, while silver certificates can be traded for hard goods. Guess who doesn't like that?



From inside the book

jews Search

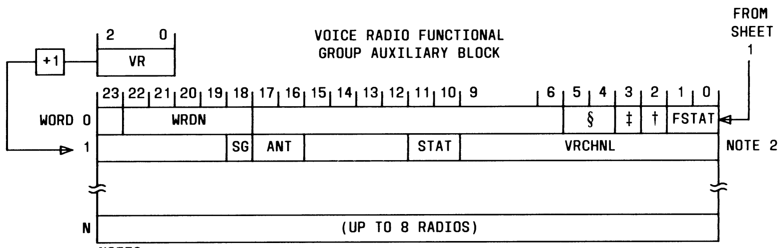
12 pages matching **jews** in this book

Page 158

Club.
When Jack told me he had killed Oswald "for the Jews," I believed him. On each of the three occasions we talked, he said, "Bill, I did this so they wouldn't implicate Jews." Lee Harvey Oswald had belonged to Fair Play for Cuba, an organization with a

(books.google.com/books?id=jcePAAAAMAAJ)
(www.john–f–kennedy.net/executiveorder11110.htm)

Table of Contents

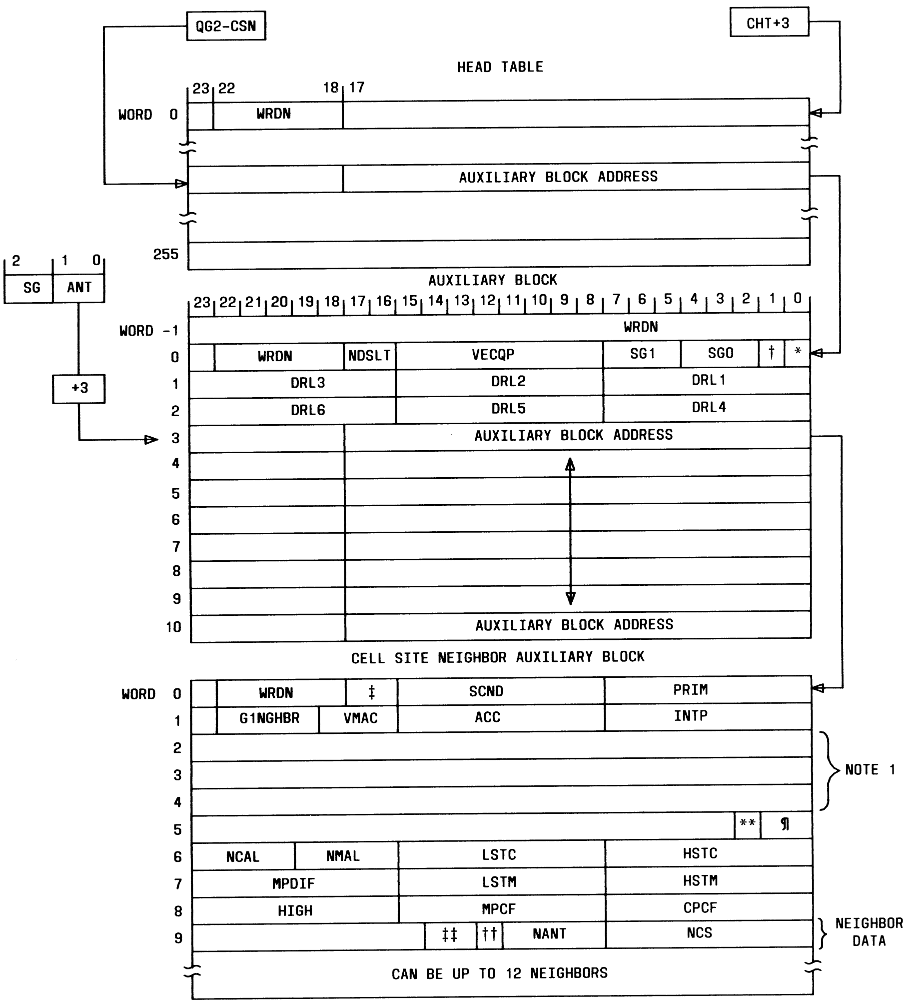


NOTES:
1. FOUR WORDS PER PHYSICAL ANTENNA FACE (0-3). 0 IS A OMNI ANTENNA.
2. ONE WORD PER RADIO.
* ANTS + VG ‡ VRGCT § MODEL

LEGEND:

AAFT – ACCESS ATTEMPT FAILURE THRESHOLD
AAST – ACCESS ATTEMPT SUCCESS THRESHOLD
AL – STATUS OF THE ALARM INTERFACE
ANT – ANTENNA NUMBER THE VOICE RADIO IS CONNECTED TO
ANTS – ANTENNA STATUS
BOGLC – BOG THRESHOLD FOR THE LOCATION RADIO FUNCTIONAL TEST
BOGRD – BOG THRESHOLD FOR THE ROUTINE DIAGNOSTICS
BOGSU – BOG THRESHOLD FOR THE SETUP RADIO FUNCTIONAL TESTS
DDTSU – DOTTING DETECTION THRESHOLD FOR THE SETUP RADIO TRANSMISSION
DDTVR – DOTTING DETECTION THRESHOLD FOR THE VOICE RADIO TRANSMISSION
FSTAT – STATUS OF THE ENTIRE FUNCTIONAL GROUP
LC0,LC1 – STATUS FIELDS FOR LOCATION RADIOS 0 AND 1 RESPECTIVELY
LCFTI – LOCATION RADIO FUNCTIONAL TEST INTERVAL
MI – STATUS OF THE MEASUREMENT INSTRUMENTS
MODEL – TYPE OF RADIO EQUIPMENT
REPL – RETURN LOSS VALUE FROM TEST GENERATOR
RF – STATUS FIELD FOR THE TEST RADIO
RFPC0, RFPC1 – RADIO FREQUENCY POWER CONTROL BITS
RG0,RG1 – STATUS FIELDS FOR REFERENCE GENERATORS 0 AND 1, RESPECTIVELY
RRL – RETURN LOSS VALUE FOR SIGNAL FROM TEST GENERATOR AND REFLECTED FROM ANTENNA AND ANTENNA CABLE SYSTEM
RSSIBD – RECEIVED SIGNAL STRENGTH INDICATOR
RVDT – REVERSE VOICE DATA TIME-OUT
SG – SERVER GROUP
STAT – STATUS OF THE VOICE RADIO
SIL – SYSTEM INTERFERENCE LEVEL THRESHOLD
SU0, SU1, SU2, SU3 – STATUS FIELDS FOR SETUP RADIOS 0 THROUGH 3, RESPECTIVELY
SUCHNL1,SUCHNL2,SUCHNL3 – SETUP CHANNEL NUMBER FOR SETUP RADIO 1 THROUGH 3, RESPECTIVELY
SUFTI – SETUP RADIO FUNCTIONAL TEST INTERVAL
SUTRL0,SUTRL1, SUTRL2,SUTRL3 – SETUP RADIO TRANSMIT RETURN LOSS THRESHOLDS
TODRD – TIME OF DAY INDICATOR FOR ROUTINE DIAGNOSTICS
TRL – TRANSMIT RETURN LOSS THRESHOLD
UBCHRT – POWER THRESHOLD OF AN INCOMING SIGNAL
VG – VOICE GROUP
VRCHNL – CHANNEL NUMBER THE RADIO IS TRANSMITTING ON
VRG – VOICE RADIO GROUP
VRGCT – VOICE RADIO GROUP CHANNEL TYPE
VRLTI – VOICE RADIO LOCATION TIME INTERVAL
VRP0,VRP1 – VOICE RADIO OUTPUT POWER FOR RADIOS 0 AND 1
WRDN – NUMBER OF WORDS IN THE AUXILIARY BLOCK
XVSU0,XVSU1,XVSU2,XVSU3 – TRANSMITTER OUTPUT VALUES FOR SETUP RADIOS 0 THROUGH 3

Fig. 26—Cell Master Equipage Translator (Sheet 2 of 2)



NOTE:
1. THESE 3 WORDS ARE ADDED TO ALLOW FOR GROWTH IN FUTURE GENERICS.
* LASTRY † CTYPE ‡ CNDLST § DPCI ¶ SGPAID ** NSG ‡‡ NSBGRP

Fig. 27—Cell Master Location Translator (Sheet 1 of 2)

LEGEND:

ACC - ACCESS CHANNEL THRESHOLD
ANT - ANTENNA FACE
CNDLST - NUMBER OF CELLS TO PUT ON CANDIDATE LIST
CPCF - CELL SITE POWER CONTROL FLAG
CTYPE - TYPE OF CELL
DPCI - DYNAMIC POWER CONTROL INDICATOR
DRL - LIST OF ALTERNATE CELL SITES THE MOBILE IS DIRECTED TO
GINGHBR - NUMBER OF NEIGHBOR CELLS IN GROUP 1
HIGH - VOICE CHANNEL SELECTION HIGH THRESHOLD
HSTC - HIGH SIGNAL STRENGTH FOR THE CELL SITE
HSTM - HIGH SIGNAL STRENGTH FOR THE MOBILE
INTP - INTERFERENCE PROTECTION THRESHOLD
LASTRY - ALTERNATE ACCESS INDICATOR
LSTC - LOW SIGNAL STRENGTH FOR THE CELL SITE
LSTM - LOW SIGNAL STRENGTH FOR THE MOBILE
MPCF - MOBILE POWER CONTROL FLAG
MPDIF - MAXIMUM POWER DIFFERENTIAL
NANT - INDICATES WHICH OF THE ANTENNAS OF THE NEIGHBOR CELL SITE ARE NEIGHBOR ANTENNAS
NCAL - NUMBER OF CELL SITE ATTENUATION LEVELS
NCS - CELL SITE NUMBER OF THE NEIGHBOR
NDSLT - NUMBER OF TIMES A SIGNAL LEVEL TRIGGER IS IGNORED DURING A DELAYED TRIGGER STATE
NMAL - NUMBER OF MOBILE ATTENUATION LEVELS
NSBGRP - SUBGROUP NUMBER FOR THE NEIGHBOR CELL
NSG - NEIGHBOR SERVER GROUP
PRIM - PRIMARY SIGNAL STRENGTH THRESHOLD
SCND - SECONDARY SIGNAL STRENGTH THRESHOLD
SGPAID - SERVER GROUP POWER AMPLIFIER IDENFIFIER
SG0 - SERVER GROUP 0
SG1 - SERVER GROUP 1
STF - SPEED TRENDING FLAG
VCEQP - INDICATES VOICE RADIO EQUIPPED FACES
VMAC - VOICE MOBILE ATTENUATION CODE
WRDN - NUMBER OF WORDS IN THE AUXILIARY BLOCK

Fig. 27—Cell Master Location Translator (Sheet 2 of 2)

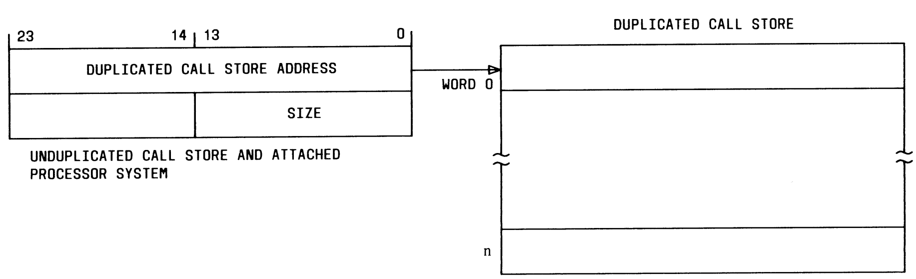


Fig. 28—Parameter Layout for the MTSO Feature

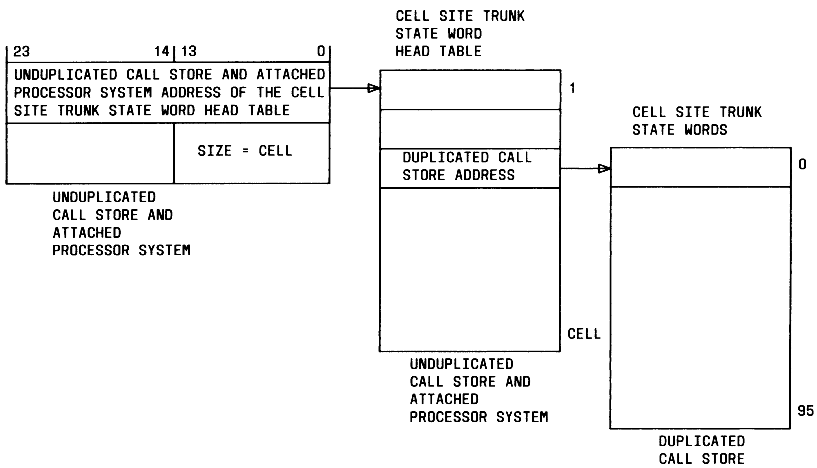


Fig. 29—Parameter Word QM2ACSTSW and Associated Call Store Option

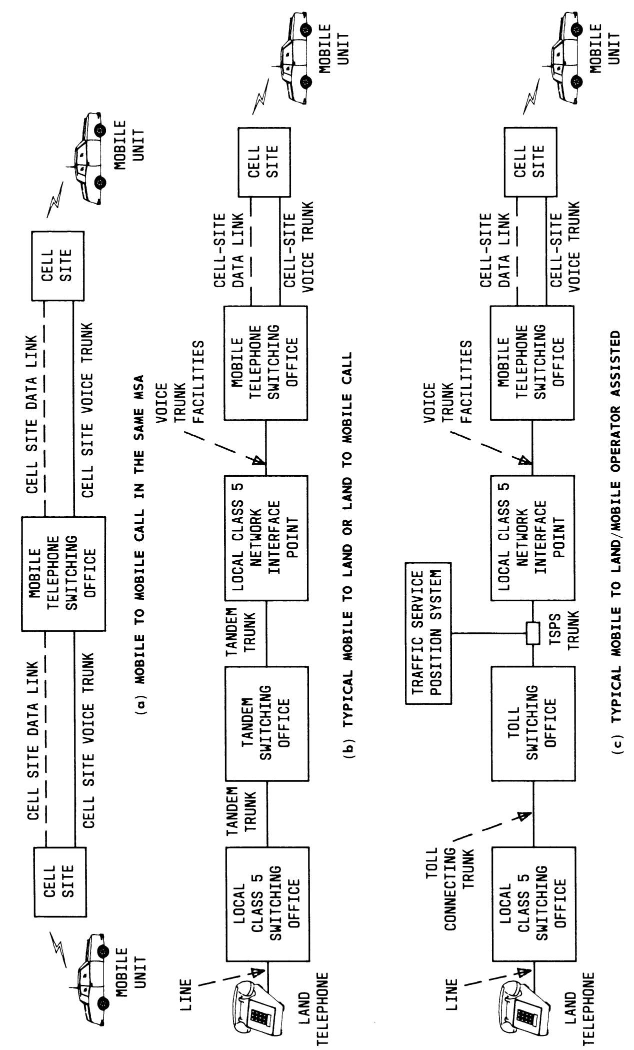


Fig. 30—Network Routing

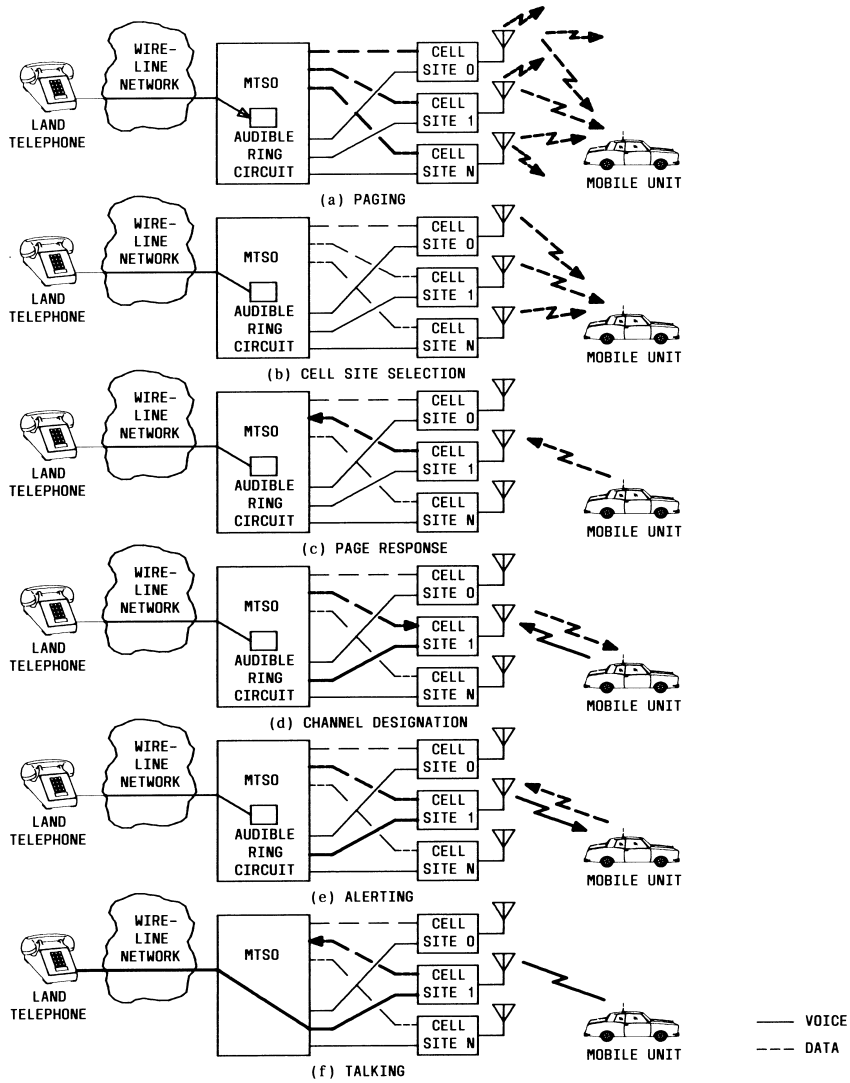


Fig. 31—Mobile-Completed Call Sequence

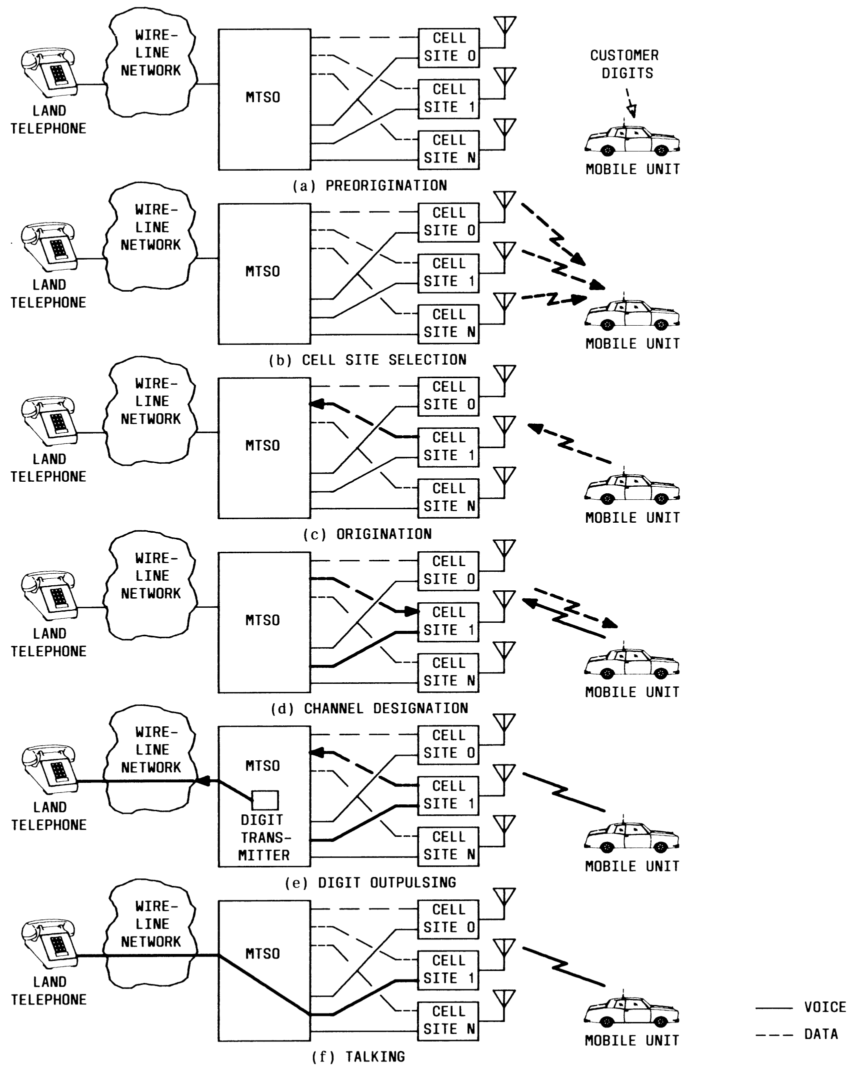


Fig. 32—Mobile-Originated Call Sequence

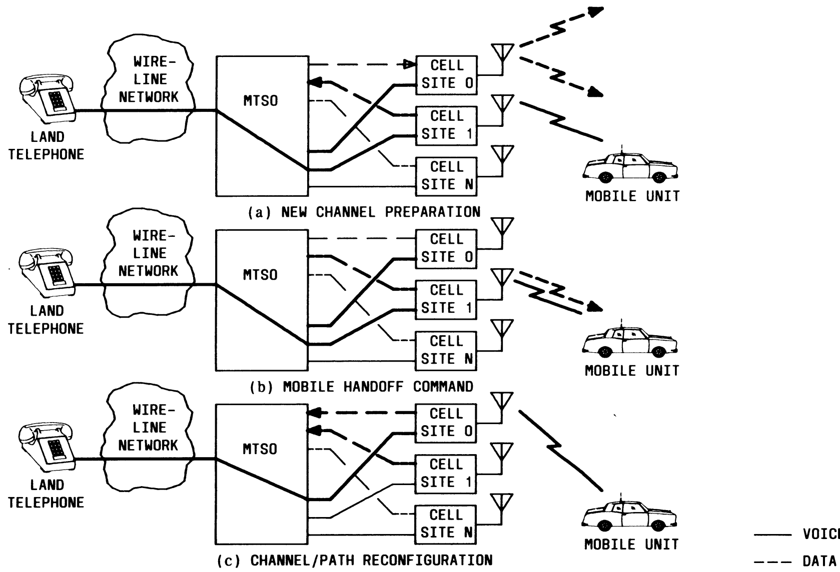


Fig. 33—Handoff Sequence

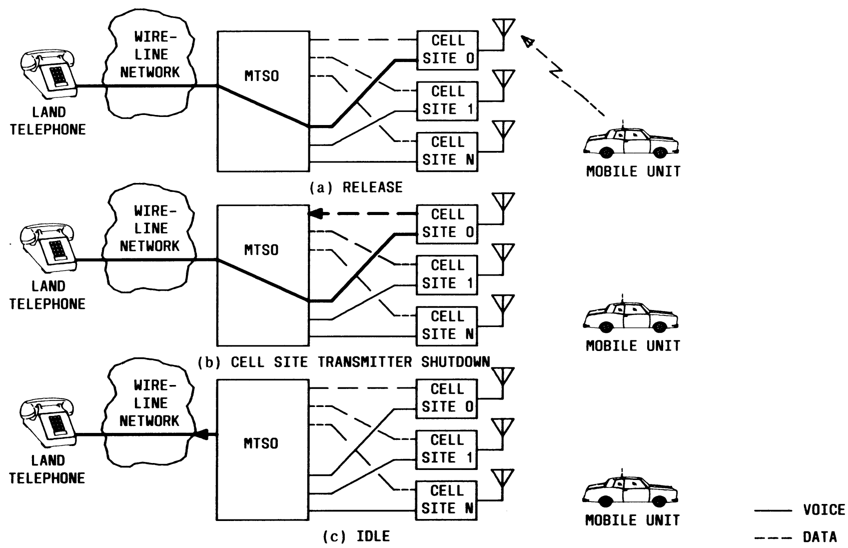


Fig. 34—Disconnect Sequence (Mobile Initiated)

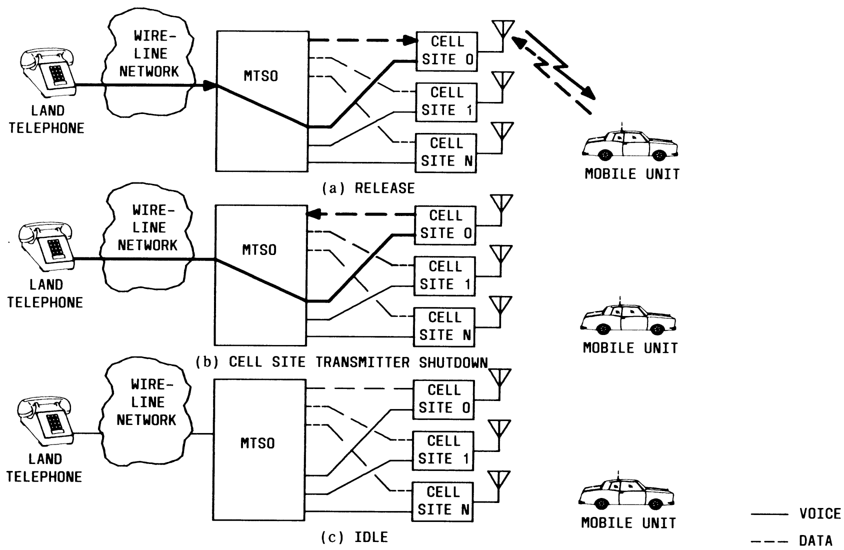


Fig. 35—Disconnect Sequence (System Initiated)

MTSO	STEPS	CELL SITE	MOBILE UNIT
	1	Transmits setup channel data on forward setup channel	
	2		Scans and locks on forward setup channel
Receives incoming call and performs translations	3		
Provides audible ring to calling party	4		
Sends paging message to paging sites	5		
	6	Reformats paging message	
	7	Sends paging message to mobile unit via forward setup channel	
	8		Detects page
	9		Scans and locks on reverse setup channel
	10		Seizes setup channel
	11		Acquires synch
	12		Sends service request
	13	Reformats service request	
	14	Performs directional location*	
	15	Sends service request and priority list to MTSO	
Selects voice channel	16		
Sends channel designation message to cell site	17		
	18	Reformats channel designation message	
	19	Sends channel designation message to mobile unit via forward setup channel	
	20		Tunes to voice channel
	21		Transmits SAT
	22	Detects SAT	
	23	Sends alert order	
	24	Sends alert order to mobile unit via blank-and-burst on voice channel	
	25		Alerts user
	26		Sends 10-kHz ST
	27	Detects 10-kHz ST	
	28	User answers	
	29	Stops sending 10-kHz ST	
	30	Detects absence of 10-kHz ST	
	31	Sends answer message to MTSO	
Receives answer message	32		
Removes audible ring and completes connection	33		

* Applies to directional cell site antenna only

Fig. 36—Call Sequence for Land-Originated Calls

MTSO	STEPS	CELL SITE	MOBILE UNIT
	1	Transmits setup channel data on forward setup channel	
	2		Scans and locks-on forward setup channel
	3		User initiates call
	4		Scans and locks-on reverse setup channel
	5		Seizes setup channel
	6		Acquires synch
	7		Sends service request
	8	Reformats service request	
	9	Performs directional location*	
	10	Sends service request and priority list to MTSO	
Selects voice channel	11		
Sends channel designation message to cell site	12		
	13	Reformats channel designation message	
	14	Sends channel designation message to mobile unit via forward setup channel	
	15		Tunes to voice channel
	16		Transmits SAT
	17	Detects SAT	
	18	Sends voice channel confirmation message to MTSO	
Detects off-hook	19		
Completes call through network	20		

* Applies to directional cell site antenna only

Fig. 37—Call Sequence for Mobile-Originated Calls

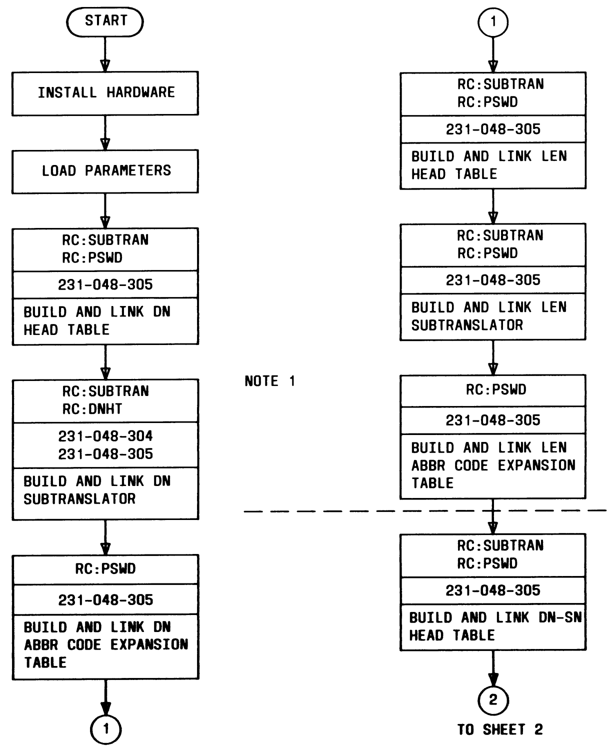


Fig. 38—Procedure for Adding the MTSO Feature (Sheet 1 of 4)

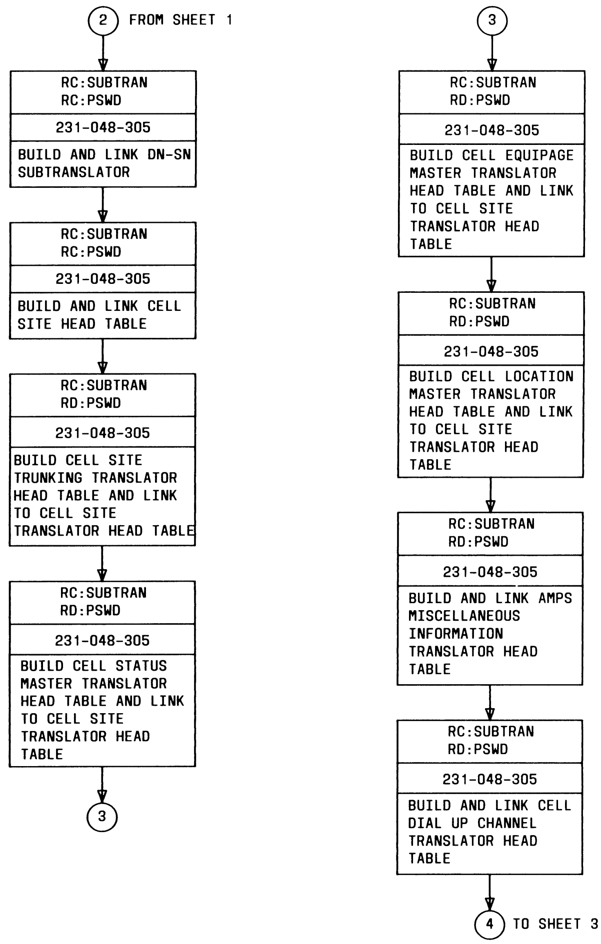


Fig. 38—Procedure for Adding the MTSO Feature (Sheet 2 of 4)

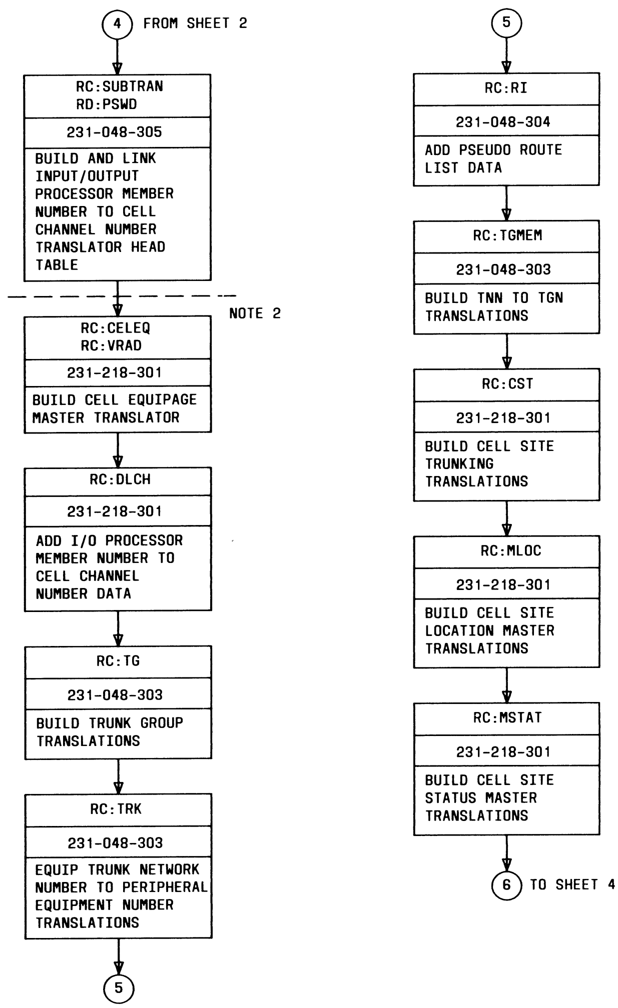
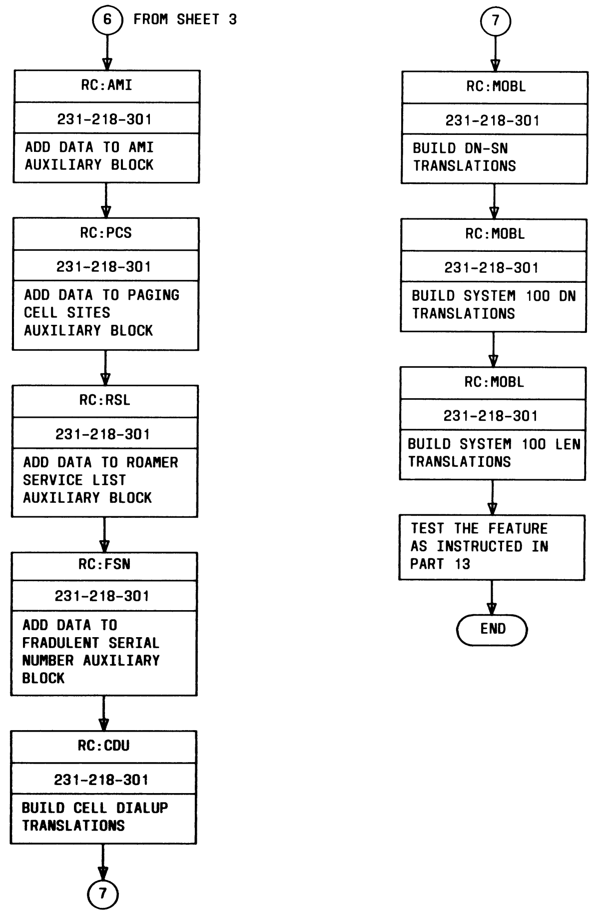


Fig. 38—Procedure for Adding the MTSO Feature (Sheet 3 of 4)



NOTES:
1. In a working office, all steps to this point would normally have been completed.
2. The following translation data input procedures must be done in the sequence shown.

Fig. 38—Procedure for Adding the MTSO Feature (Sheet 4 of 4)

TABLE A

GENERATED CONTROL PULSES FOR I/O PROCESSOR POLLING

PULSE SOURCE	OCTAL ADDRESS	PULSE SOURCE	OCTAL ADDRESS
PPU030 PPU031	00404001 00404002	PPU062 PPU063	01002004 01002010
PPU032 PPU033	00404004 00404010	PPU064 PPU065	01002020 01002040
PPU034 PPU035	00404020 00404040	PPU066 PPU067	01004001 01004002
PPU036 PPU037	01000101 01000102	PPU068 PPU069	01004004 01004010
PPU038 PPU039	01000104 01000110	PPU070 PPU071	01004020 01004040
PPU040 PPU041	01000120 01000140	PPU072 PPU073	02000101 02000102
PPU042 PPU043	01000201 01000202	PPU074 PPU075	02000104 02000110
PPU044 PPU045	01000204 01000210	PPU076 PPU077	02000120 02000140
PPU046 PPU047	01000220 01000240	PPU078 PPU079	02000201 02000202
PPU048 PPU049	01000401 01000402	PPU080 PPU081	02000204 02000210
PPU050 PPU051	01000404 01000410	PPU082 PPU083	02000220 02000240
PPU052 PPU053	01000420 01000440	PPU084 PPU085	02000401 02000402
PPU054 PPU055	01001004 01001002	PPU086 PPU087	02000404 02000410
PPU056 PPU057	01001004 01001010	PPU088 PPU089	02000420 02000440
PPU058 PPU059	01001020 01001040	PPU090 PPU091	02001001 02001002
PPU060 PPU061	01002001 01002002	PPU092 PPU093	02001004 02001010

TABLE B

INDEXING SCHEME FOR THE CELL MASTER LOCATION TRANSLATOR AUXILIARY BLOCK POINTER

LOGICAL ANTENNA FACE	ANTENNA FACE	SERVER GROUP
0	0	0
1	1	0
2	2	0
3	3	0
4	0	1
5	1	1
6	2	1
7	3	1

TABLE C

SET CARDS REQUIRED FOR MTSO

SET CARD	DEFINITION	TYPICAL VALUES	MINIMUM VALUES	MAXIMUM VAUES
CELL	Highest cell site member number	5-250	1	255
GCPH	Number of call processing hoppers for general use	—	150	—
IOS(II)	Defines one input-output unit selector	—	1	63
NMCR	Number of mobile call registers	50-2500	0	5000
NMHR	Number of mobile handoff registers	—	10	NMCR
NMOR	Number of mobile originating registers	5-250	0	2500
NRMR	Numer of roamer units allowed to access the system	500	50	—

TABLE D SUMMATION OF FEATURE GROUPS				
FEATURE GROUP	SET CARD	FEATURE PACKAGE	SET CARD	PROGRAM STORE WORDS (DECIMAL)
Advanced Mobile Phone Service (AMPS)	9S163	Advanced Mobile Phone Service (AMPS) Maintenance (AMPSMT)	9F163	57,824
Advanced Mobile Phone Service (AMPS)	9S164	Advanced Mobile Phone Service (AMPS) Common System (AMPSCM)	9F164	46,048
Advanced Mobile Phone Service (AMPS) Call Processing	9S165	Advanced Mobile Phone Service (AMPS) Call Processing (AMPSCP)	9F165	194,688
Advanced Mobile Phone Service (AMPS)	9S176	Advanced Mobile Phone Service (AMPS) Cell Generic (AMPSCG)	9F176	524,288
Attached Processor System	9SAPS	Attached Processor System	9F195	896
Carrier Interconnect	9SCARI	Carrier Interconnect	9F203	3140
Division of Revenue peg And usage Count	9SDRPC	Division of Revenue peg And usage Count	9FDRPC	1440
General Purpose Subroutines	9S157	General Purpose Subroutines	9F157	32
Manual Trunk Test Position	9S073	Manual Trunk Test Position	9F073	1984

TABLE E

NUMBER OF CELL SITES

SPECTRUM AVAILABLE	NUMBER OF USERS	AVERAGE NUMBER OF USERS PER CELL SITE	AVERAGE NUMBER OF CELL SITES
20 MHz	625,000	460	136
	100,000	460	220
30 MHz	62,500	830	95
	200,000	830	240

TABLE F

MTSO TERMINATIONS (NOTE)

TYPE OF FACILITY	BLOCKING PROBABILITY	NUMBER OF TRUNK GROUPS	NUMBER OF TRUNKS	SPECTRUM AVAILABLE	NUMBER OF SUBSCRIBERS
Cell Site Trunks	*2%	140	2,600	20 MHz	62,500
		75	2,200	30 MHz	(Generic 1.0)
		220	4,200	20 MHz	100,000
		240	7,000	30 MHz	200,000
Intra-MTSO Trunks	+1%	1	40	—	62,500

Note: The maximum quantity of these trunks is a function of traffic engineering discipline, blocking probability, number of trunk groups and spectrum available.

* Erland B with low day-to-day variations traffic engineering

† Poisson traffic engineering.

Tracking Generator for a HP8569 Spectrum Analyzer

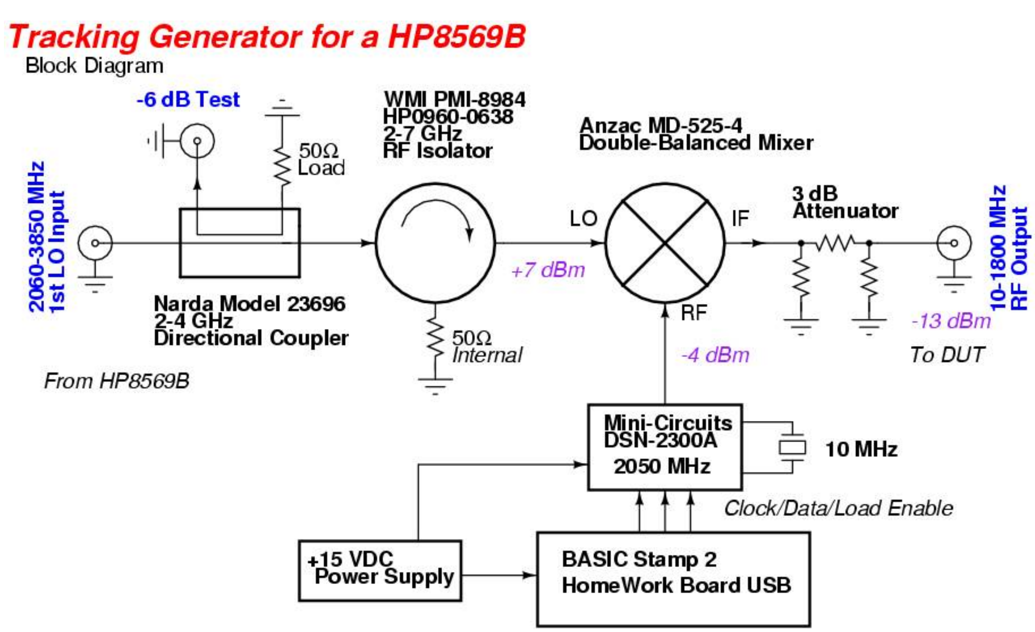
Overview

This is a project to construct a simple tracking generator add−on for a HP8569−series spectrum analyzer. A tracking generator is a device which can be used to turn a normal RF spectrum analyzer into a Scalar Network Analzyer (SNA). A SNA is used to measure the amplitude−vs−frequency properties of a Device Under Test (DUT). This tracking generator will allow the HP8569 to display magnitude of gain/loss only when operating in the 10−1800 MHz range. This is still very useful for testing RF cables, tuning RF filters or duplexers, aligning receiver IF stages, or even testing low−level RF amplifiers.

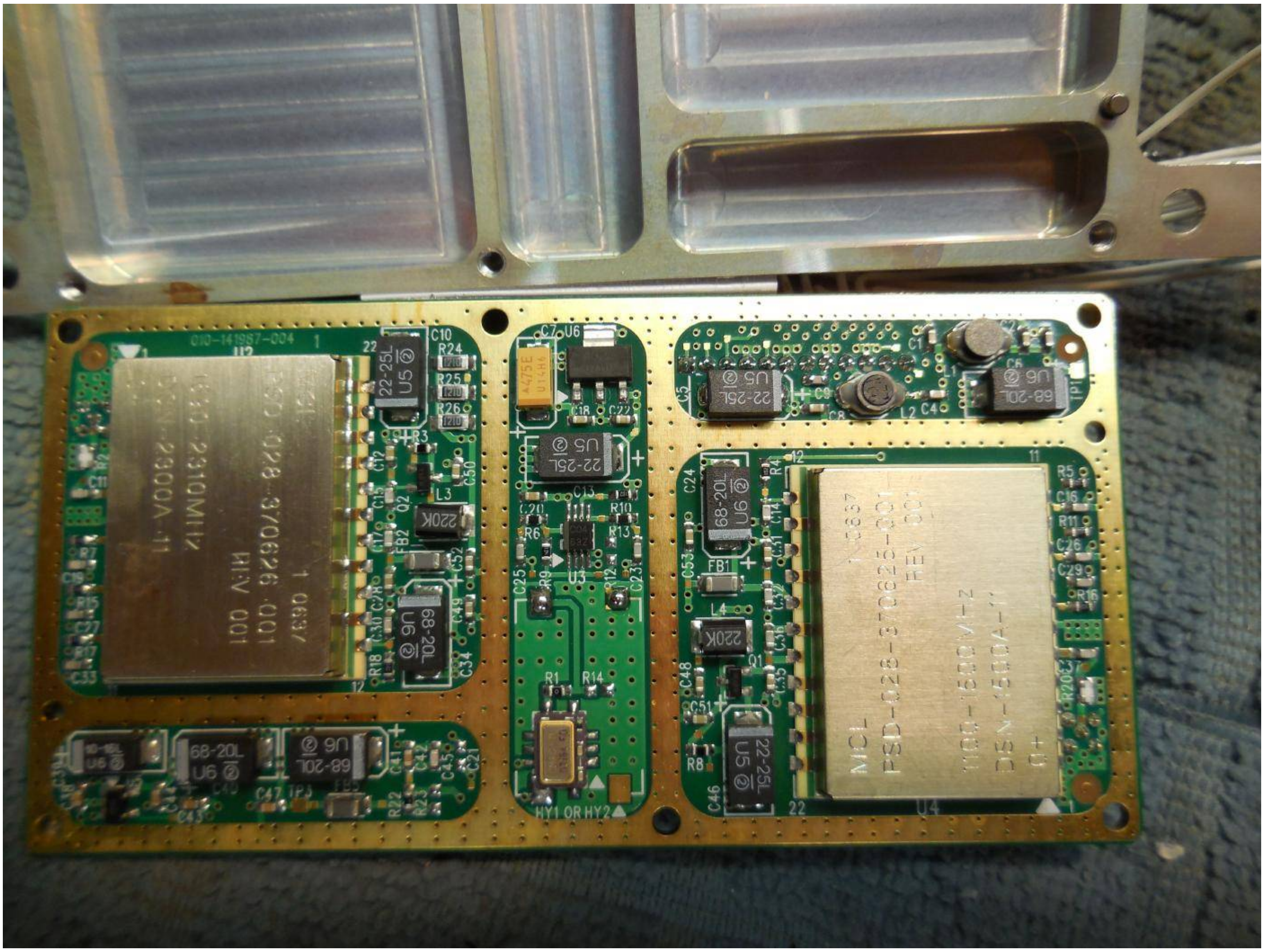
A tracking generator works by "tracking" the sweeping first Local Oscillator (LO) of a spectrum analyzer to generate a RF carrier at the *same* frequency which the spectrum analyzer is tuned to at that moment. You're essentially transmiting and receiving at the same time in order to plot the gain/loss magnitude of the device you're testing.

In the HP8569B, which will be used here, the first local oscillator sweeps between 2060−3850 MHz when on the 10−1800 MHz range. This LO is offset (positive) by the frequency of the first IF stage, which is 2050 MHz in the HP8569B. You can see that by mixing the sweeping 2060−3850 MHz first LO with a 2050 MHz carrier, you can generate a synchronized 10−1800 MHz sweeping output signal.

The 2050 MHz carrier will be generated by a Mini−Circuits DSN−2300A−1119+ frequency synthesizer. This is a handy all−in−one device which can generate a RF carrier between 1690−2310 MHz. The 2050 MHz RF carrier and the sweeping 2060−3850 MHz first LO will be mixed together using an Anzac MD−525−4 double−balanced mixer. The IF port of the Anzac MD−525 will have a 3 dB attenuator to help pad the output and to help provide a constant 50 ohm impedance for the other ports. A Western Microwave PMI−8984 peripheral mode RF isolator (2−7 GHz) is used on the 2060−3850 MHz first LO input to improve isolation between the tracking generator and the spectrum analyzer. This is optional, but very helpful to maintain dynamic range. A 6 dB directional coupler was also added to tap off the incoming LO signal to connect to a frequency counter. This is also optional.



Pictures & Construction Notes

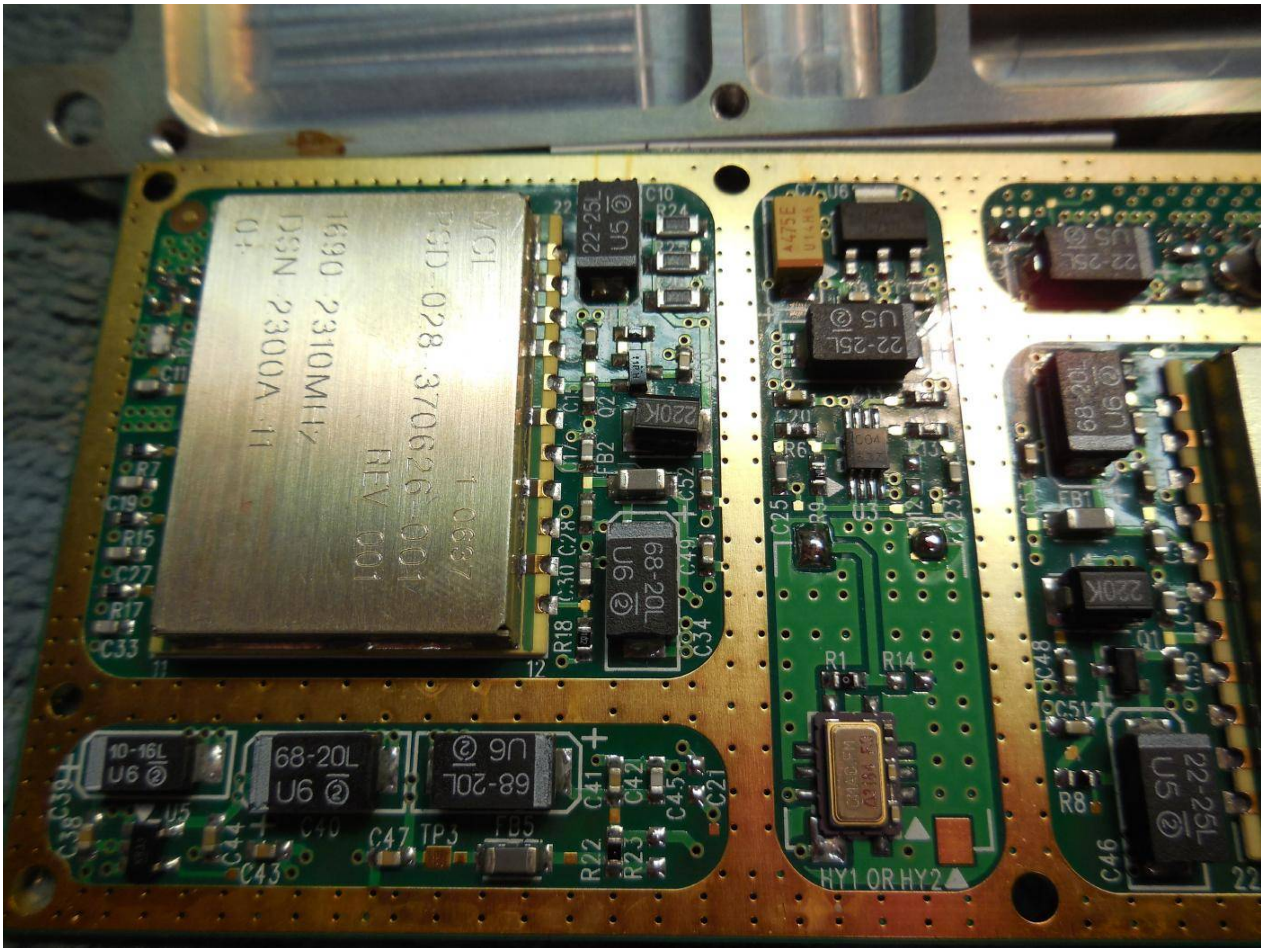


The Mini−Circuits DSN−2300A−1119+ frequency synthesizer used for this tracking generator is from an oscillator board I found on eBay. It has no markings other than "P/N: 131−141987−001 IF LO CARD."

It has two MMCX female connectors labeled "TX IF LO" and "RX IF LO."

This particular unit also has a Mini−Circuits DSN−1500A synthesizer for generating a signal between 1100−1500 MHz and an on−board 10 MHz clock oscillator.

Only the Mini−Circuits DSN−2300A−1119+ frequency synthesizer and the 10 MHz reference clock oscillator (3.3V CMOS) are needed.



This oscillator board has its own 10 MHz reference clock oscillator, as shown on the lower−right.

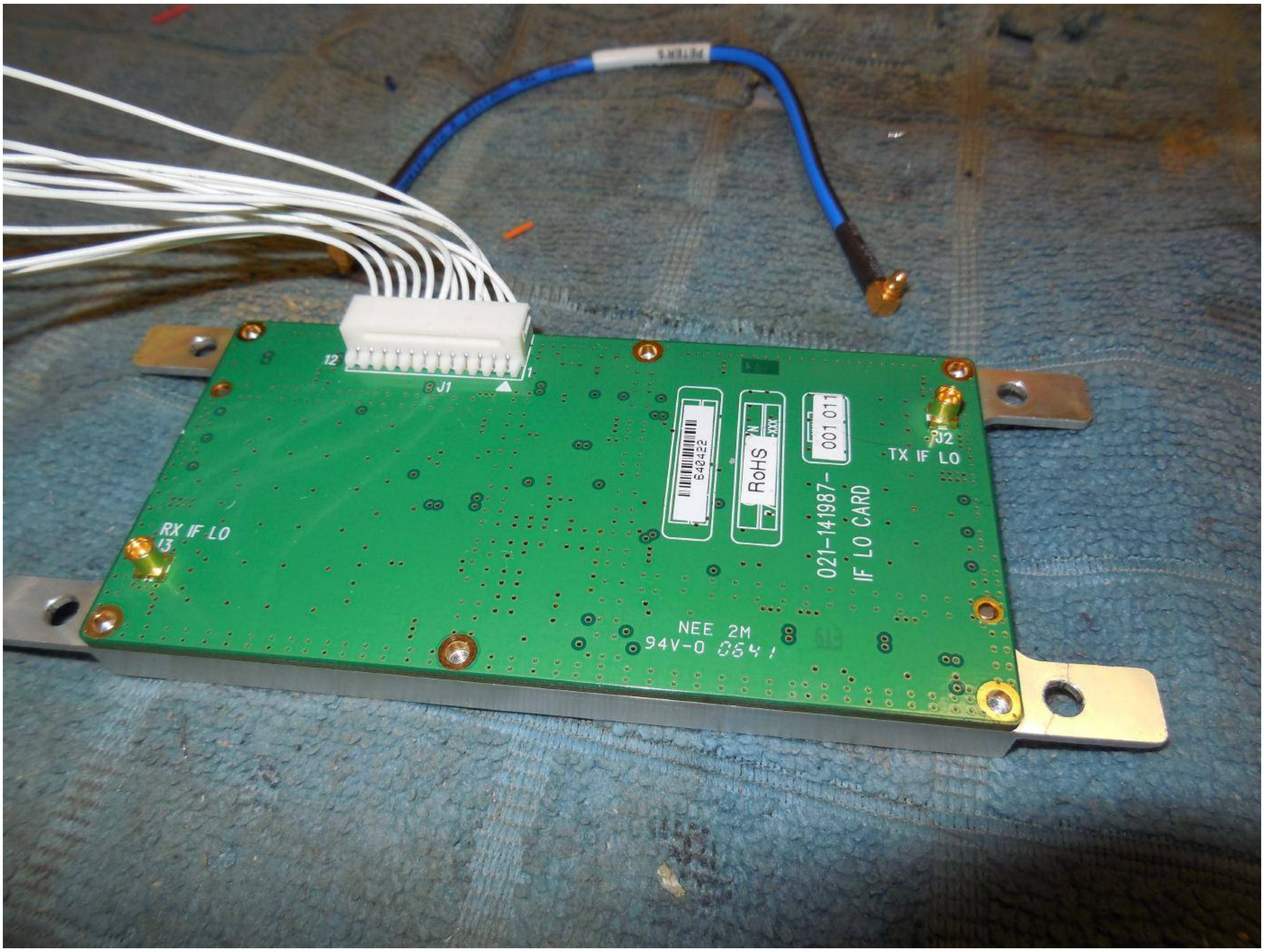
Any standard 10 MHz 3.3 volt CMOS clock oscillator will work. Frequency stability is only required on the narrow resolution bandwidths.

It doesn't appear possible to tweak this reference oscillator frequency, but the output frequency was very stable. Slightly tweaking the 2050 MHz carrier frequency (+/− 100 kHz) is handy because the center frequency of the IF filters in the spectrum analyzer can drift over time and you may have to "peak" the response during narrow resolution filter sweeps.

The final output frequency was 2049.998253 MHz (−1747 Hz) at −4.3 dBm.

The DSN−2300A−1119+ puts out around +6 dBm and there is an on−board 10 dB attenuator.

If you are using a stand−alone DSN−2300A−1119+, you should also add this 10 dB attenuator to get the RF power down to around −4 dBm.

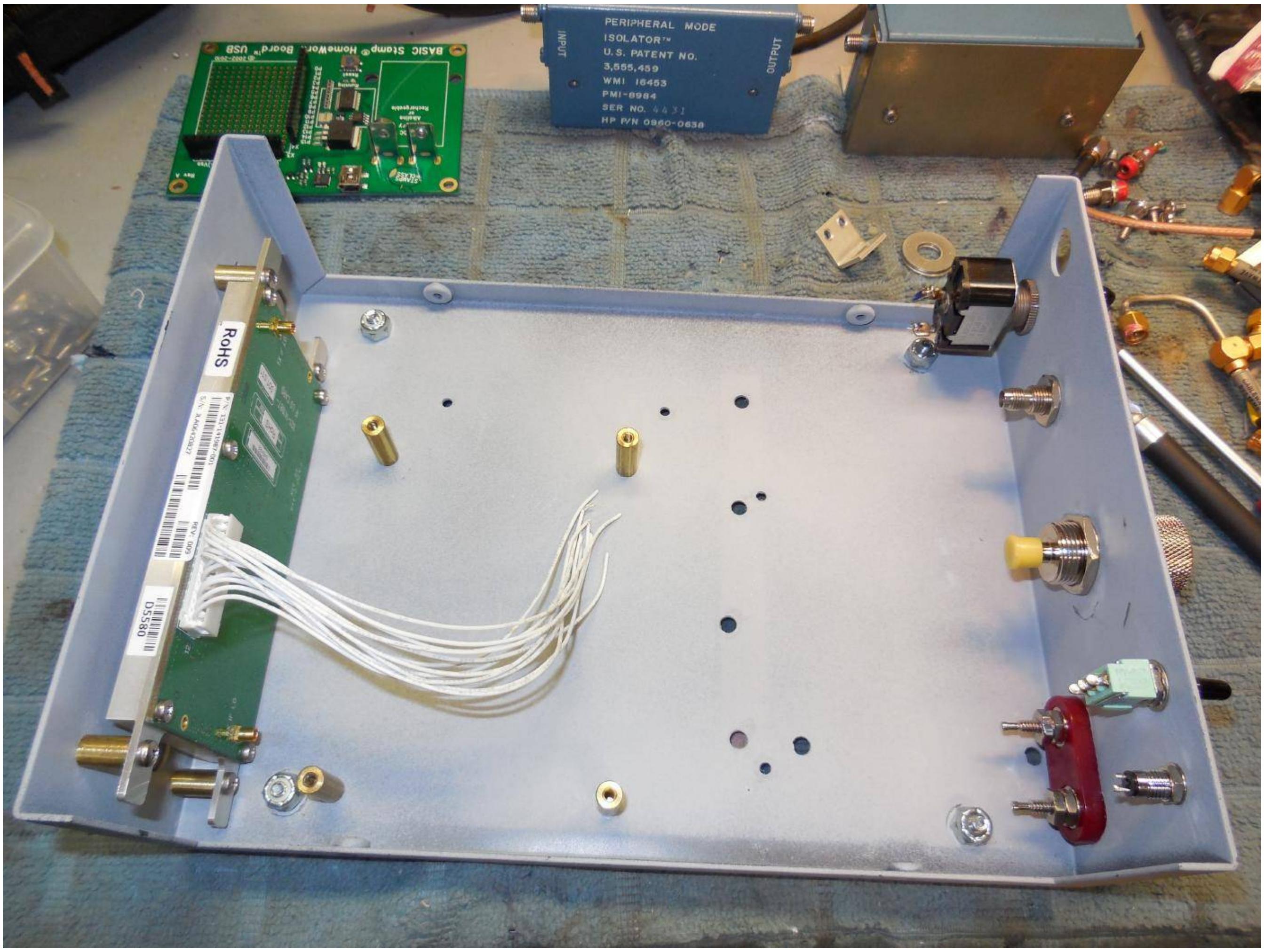


The oscillator board has a 12−pin header, connected via the white wires on the upper−left.

The pinout is as follows:

1. **TX LO Lock Alarm**
2. **TX LO Load Enable**
3. **Synthesizer Data**
4. **Ground**
5. **Synthesizer Clock**
6. **Ground**
7. **+5 VDC**
8. **Ground**
9. **+13.4 VDC**
10. **Ground**
11. **RX LO Load Enable**
12. **RX LO Lock Alarm**

The lock alarms are logic "high" on PLL lock, but are not used in this project.



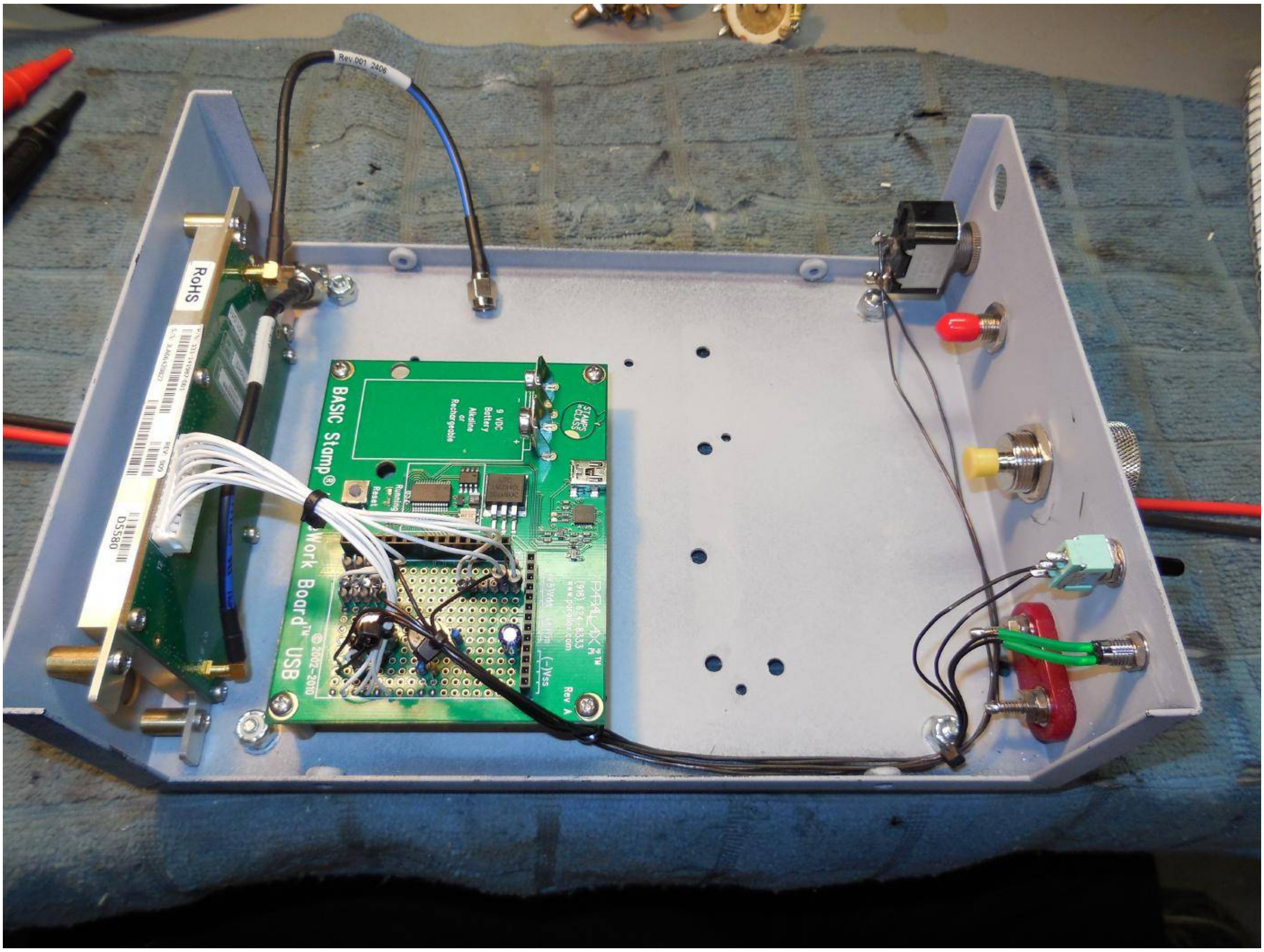
Placing the front–panel components in the case.

The oscillator board is mounted to the inside rear–panel using little standoffs.

A N female to SMA female bulkhead adapter is used for the main RF output signal.

SMA female bulkheads are used for the first LO input and −6 dB tap.

+15 VDC power is via the banana jacks.

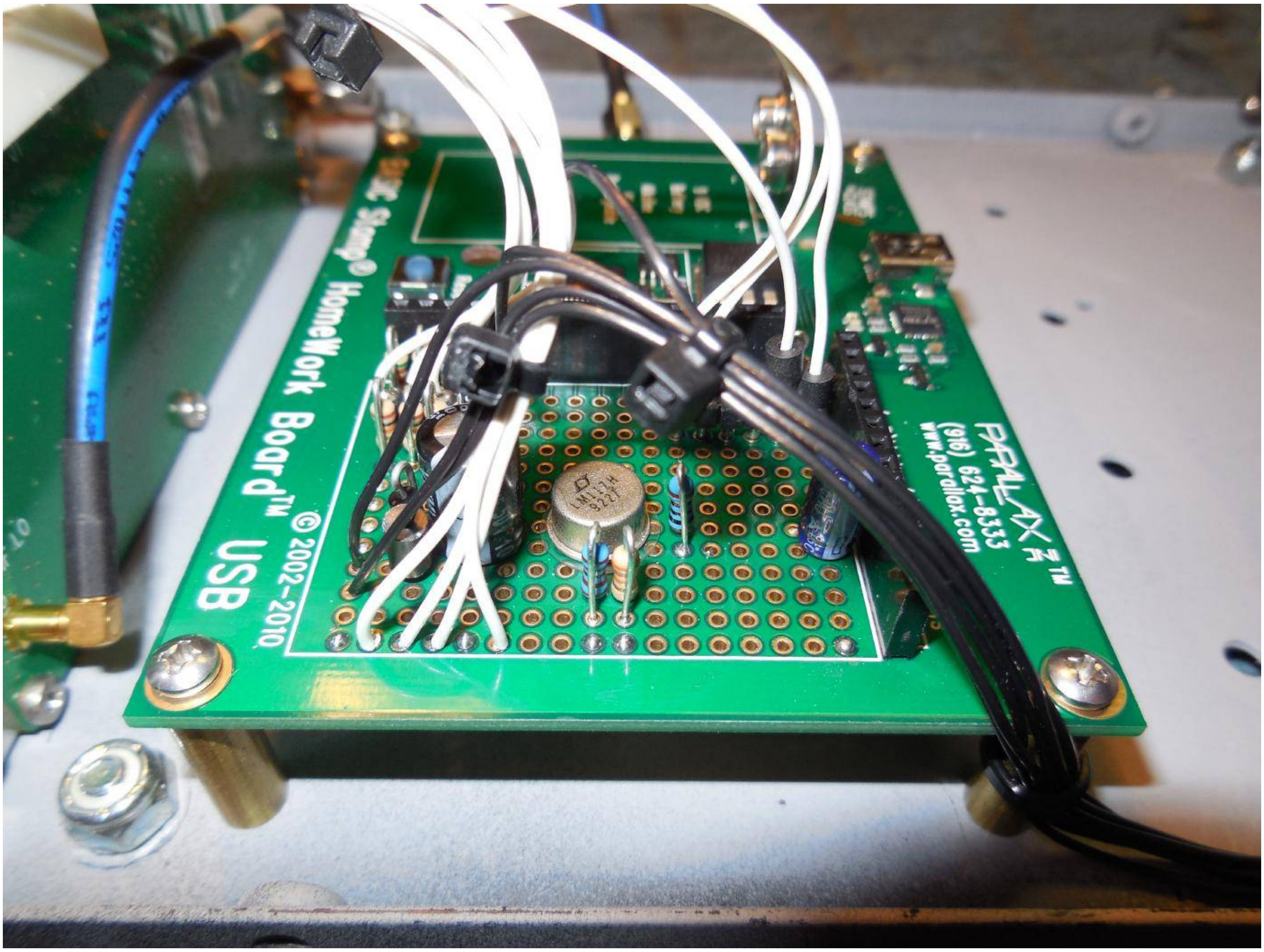


Adding the BASIC Stamp HomeWork Board USB.

Using a BASIC Stamp is a bit of overkill, but they are easy to program and you can now buy them at Radio Shack.

You can remove the HomeWork Board's stock breadboard with a razor blade and a little acetone.

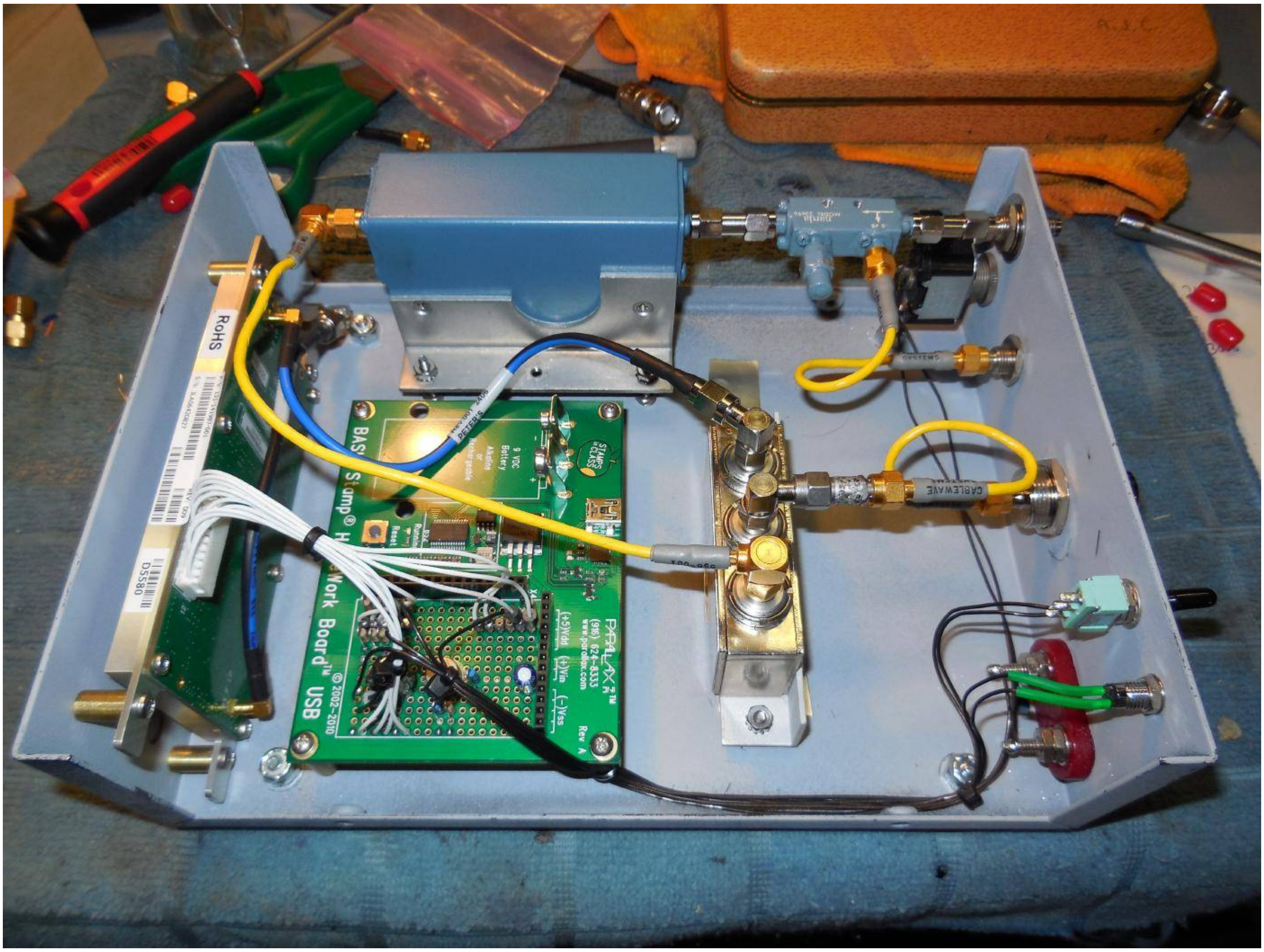
The BASIC Stamp HomeWork Board is designed to run from a 9 volt battery, but the on−board voltage regulator will allow operation from a higher voltage power supply.



Close−up view of the LM317/LM117 voltage regulator for the Mini−Circuits DSN−2300A−1119+ frequency synthesizer.

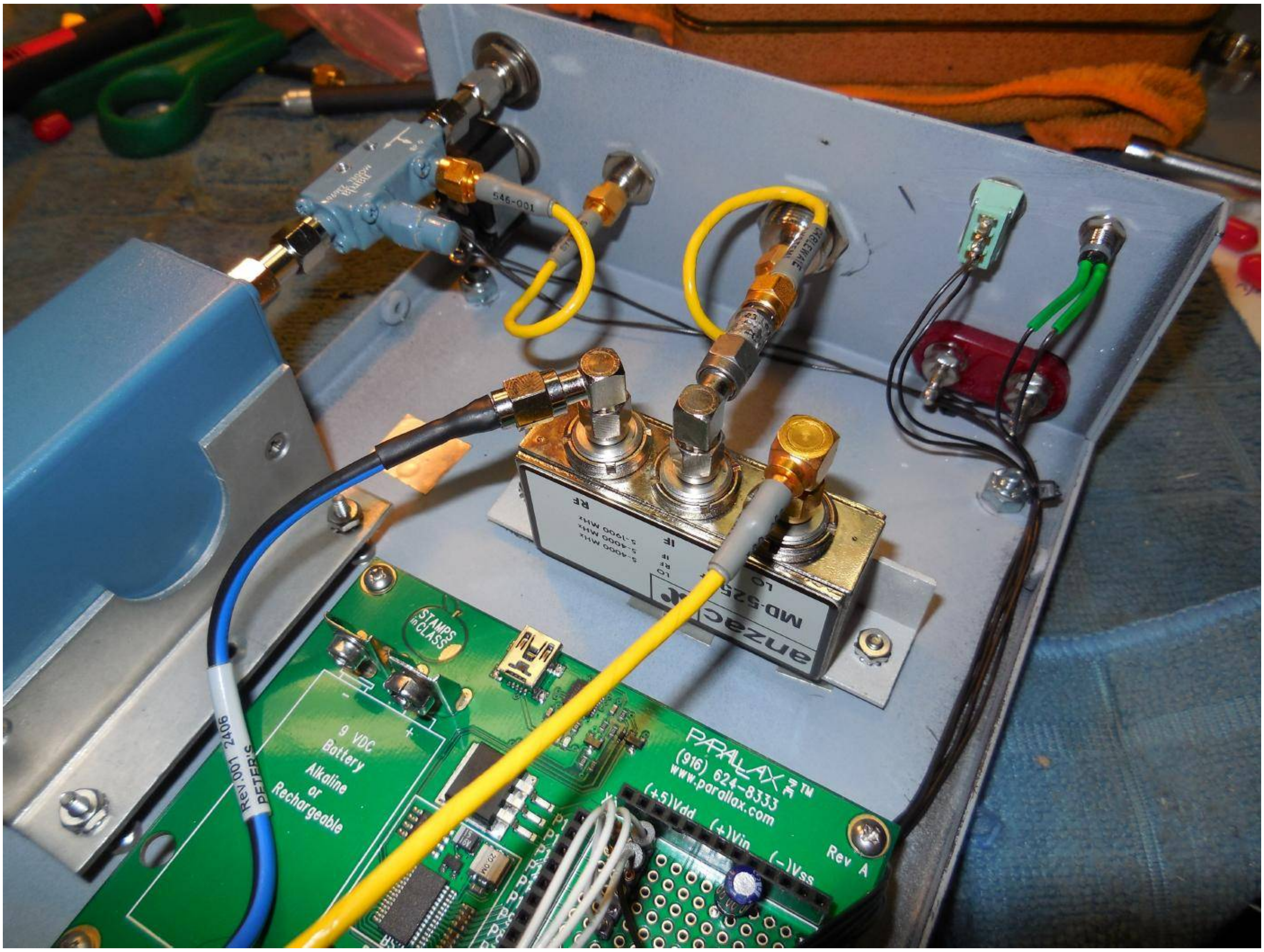
I also added 22 µF capacitors on the BASIC Stamp's +5 VDC line.

The resistors for the LM317/LM117 should be 1% metal−film.



Overview of the completed tracking generator.

The **1st LO Input** is along the top, via the directional coupler and isolator.



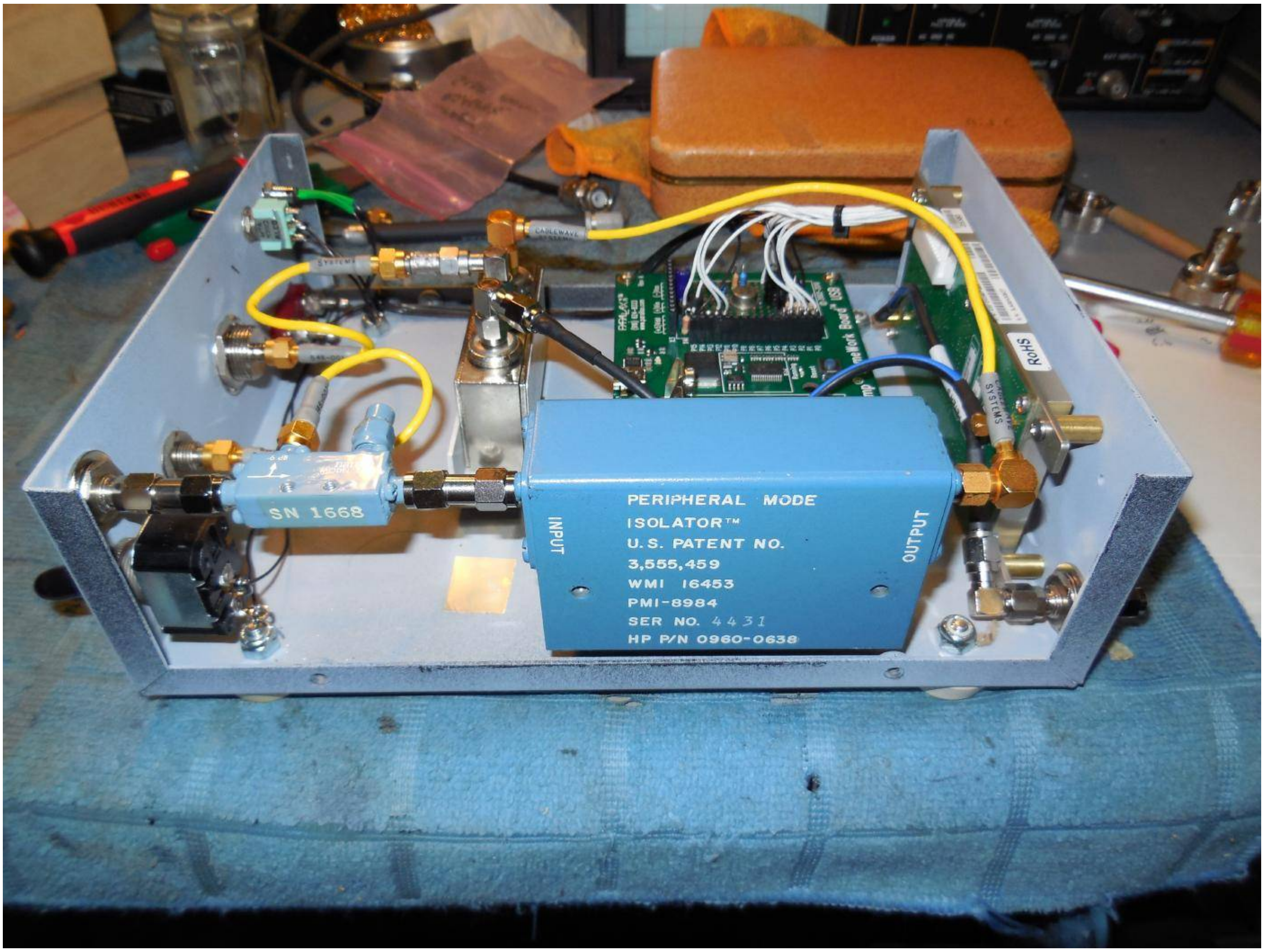
The key element in this tracking generator is a quality RF mixer which provides high isolation (40+ dB) between its LO/RF/IF ports.

Used here is an Anzac MD−525 double−balanced mixer. The frequency range of its ports are LO: 5−4000 MHz, RF: 5−4000 MHz, IF: 5−1900 MHz. LO power should be around +7 dBm.

The 2050 MHz RF input signal to the mixer (left SMA) will be around −4 dBm. This level is somewhat arbitrary, but should be at least 10 dB *lower* than the LO signal for maxiumum dynamic range and to avoid generating mixer compression artifacts.

A 3 dB attenuator is on the MD−525's IF output port (center SMA) to force the mixer and spectrum analyzer to both see a 50 ohm impedance over their entire frequency ranges.

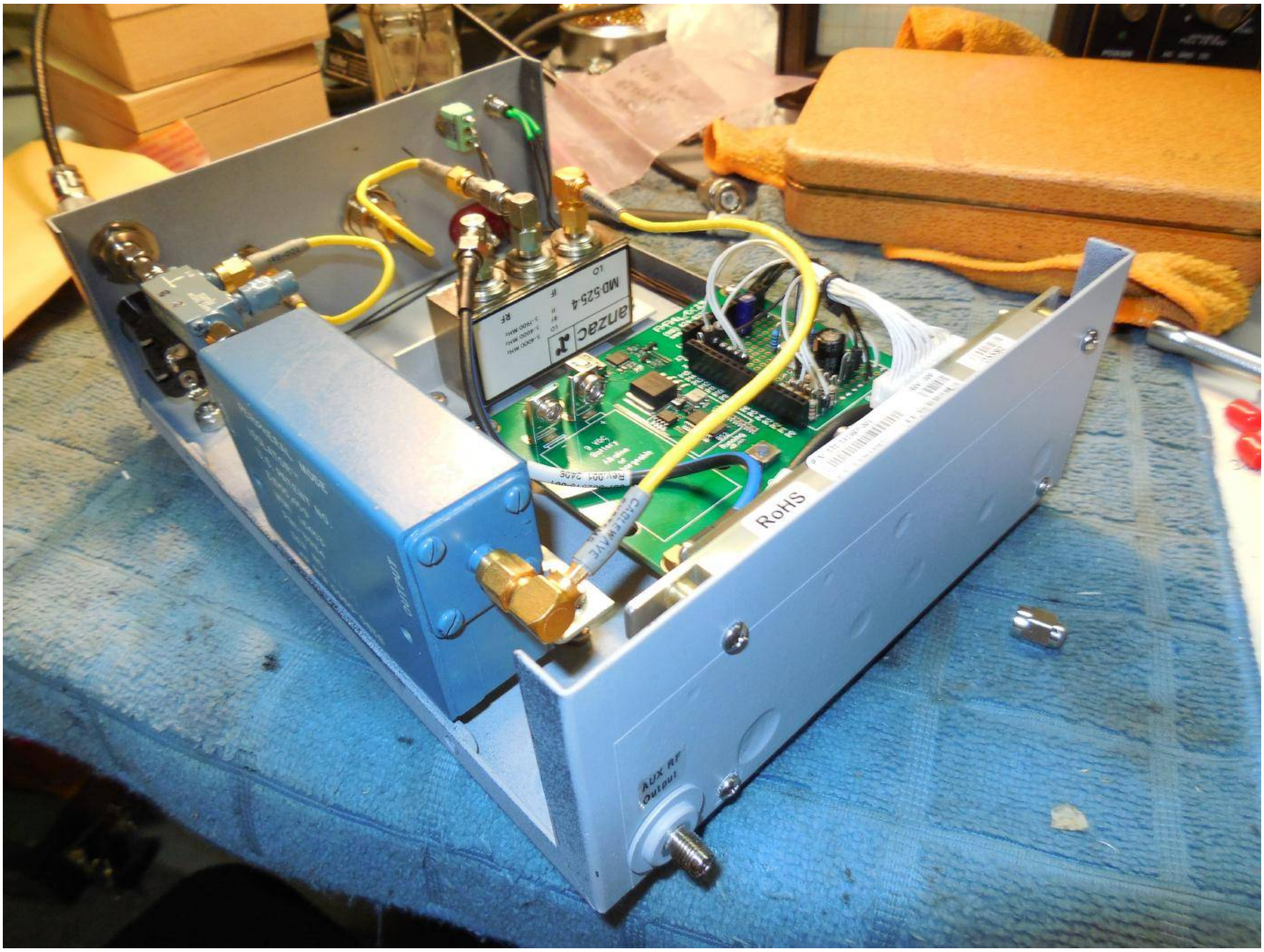
Ideally, there should also be a 2 GHz lowpass filter on the IF output to knock down any LO leakage and the harmonics, but we can get by without it for hobby use.



On the **1st LO Input** (left) is an optional Narda Model 23696 2–4 GHz 6 dB directional coupler. This can be used to monitor the input LO frequency via a frequency counter to get a more accurate analyzer frequency readout.

The large, blue rectangle device is the Western Microwave PMI–8984 peripheral mode 20 dB isolator (HP0960–0638) which operates over the 2–7 GHz range.

This is also optional, but very useful for isolating the tracking generator from the spectrum analyzer to avoid creating spurious response artifacts.



Auxiliary RF output SMA jack is on the rear.

This is an optional 1152 or 1250 MHz output at −4 dBm from the oscillator board.

Front–panel overview of the completed HP8569 Tracking Generator project.

+15 VDC input is via the banana jacks on the lower–left. The current draw is minimal.

The upper–left red LED lights when the BASIC Stamp program finishes running.

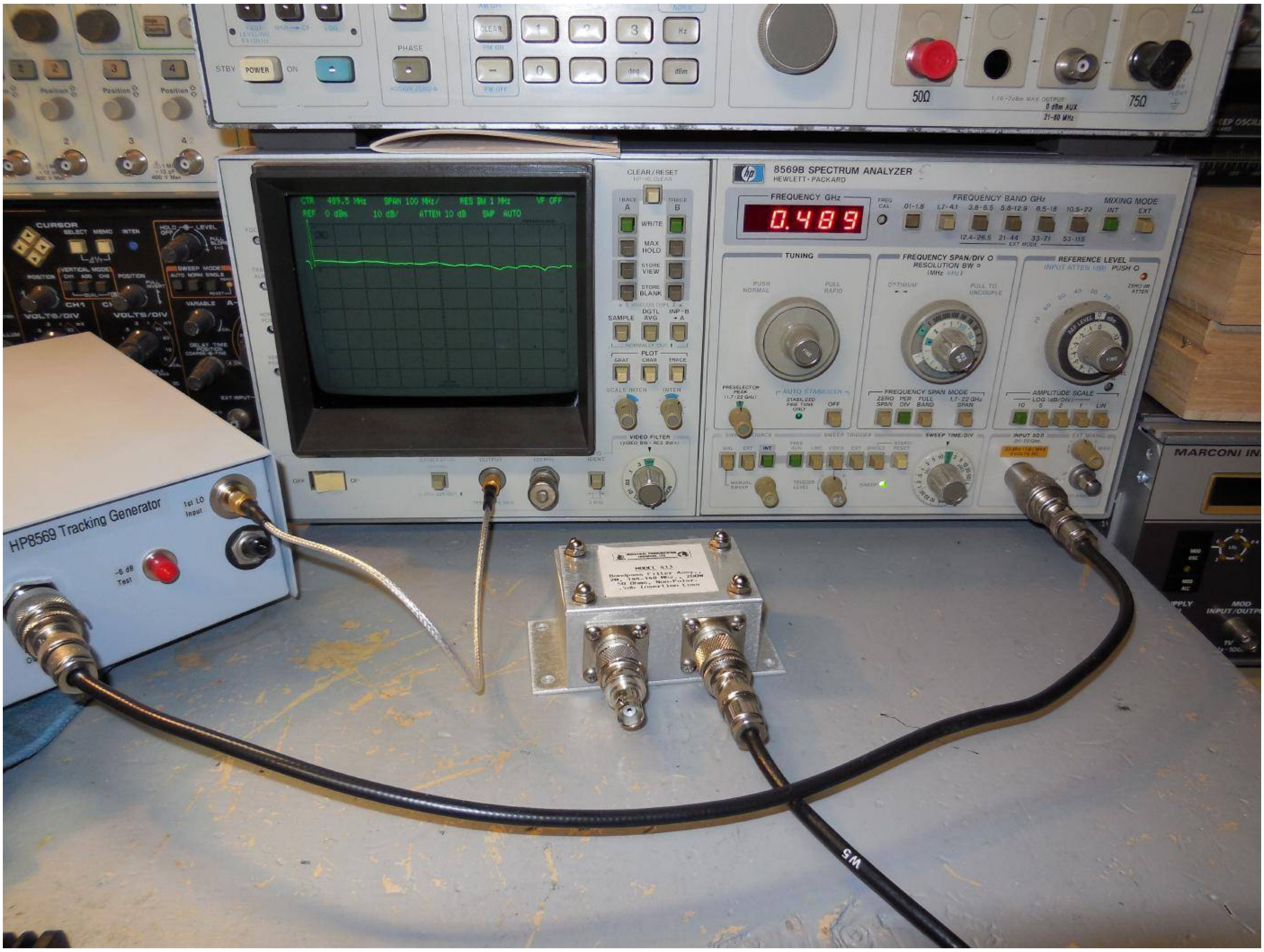
The **AUX RF A** / **AUX RF B** SPST switch selects the optional auxiliary RF output frequency.

The N jack in the middle is the sweeping **10–1800 MHz RF Output**.

The SMA jack next to the N connector is an optional **–6 dB Test** to measure the frequency of the first LO input.

The SMA jack on the upper–right is the **1st LO Input** from the HP8569.

The switch on the lower–right is for main power.



Baseline system response test.

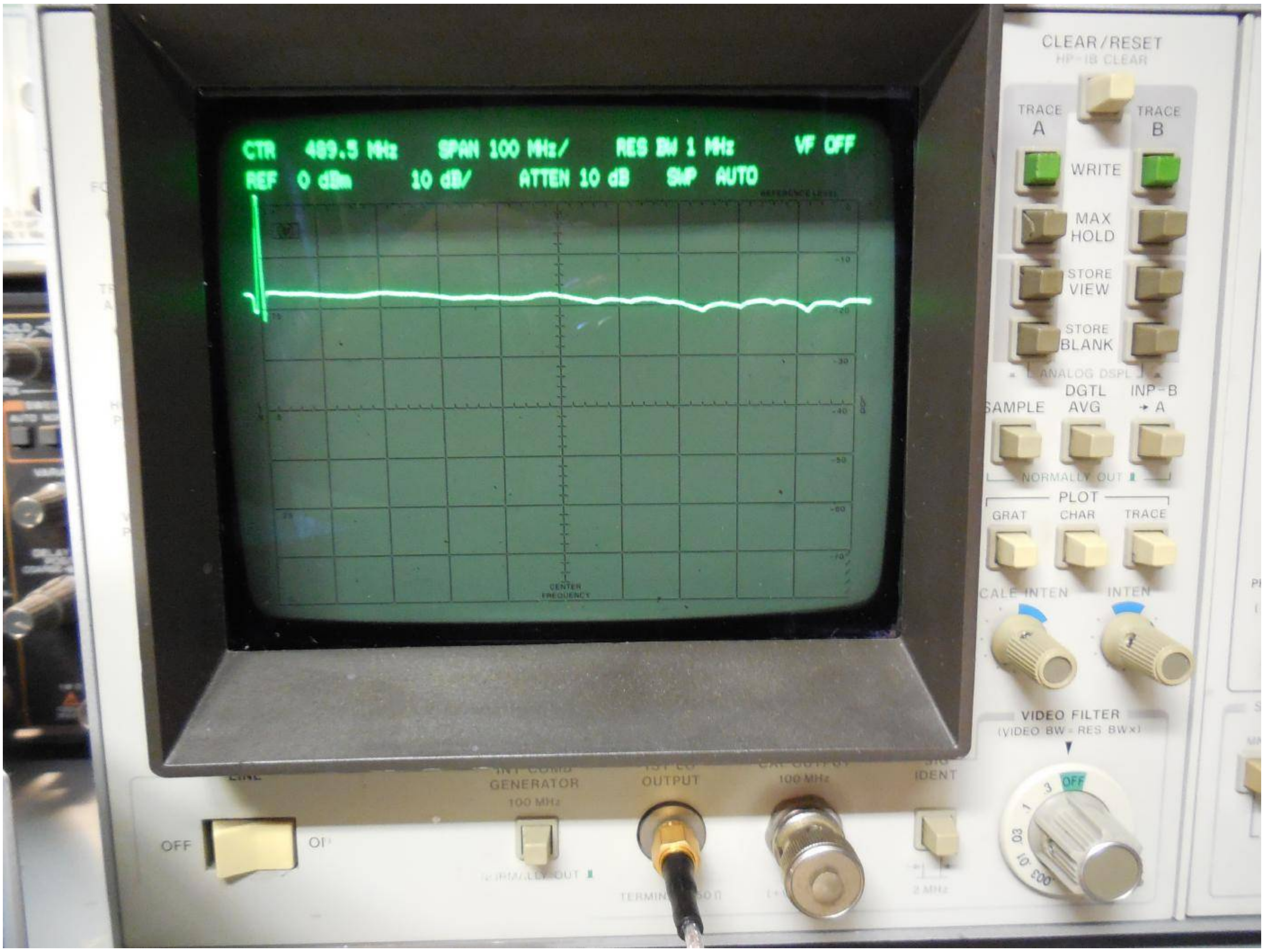
The RF output of the tracking generator is approximately −13 dBm (+/− 3 dB) over the 10−1800 MHz frequency range.

A straight−through coaxial cable is connected from the output of the tracking generator to the RF input of a HP8569B spectrum analyzer.

The **1st LO Output** SMA jack on the HP8569B is connected to the **1st LO Input** SMA jack on the tracking generator. This cable should be low−loss and well shielded to minimize RF leakage. The first LO on the HP8569B provides around +8 dBm of RF power.

The HP8569B is set to 0 dBm reference with 10 dB attenuation. The center frequency is around 500 MHz and the span is 100 MHz per horizontal division and 10 dB per vertical division. The "zero spur" is on the far−left.

Ideally, this response would be a perfectly straight line, but this requires the addition of a level−controlled output IF amplifier/attenuator which would increase the complexity of this project.



Close−up view of the baseline response.

This would represent an "ideal" connection with no loss.

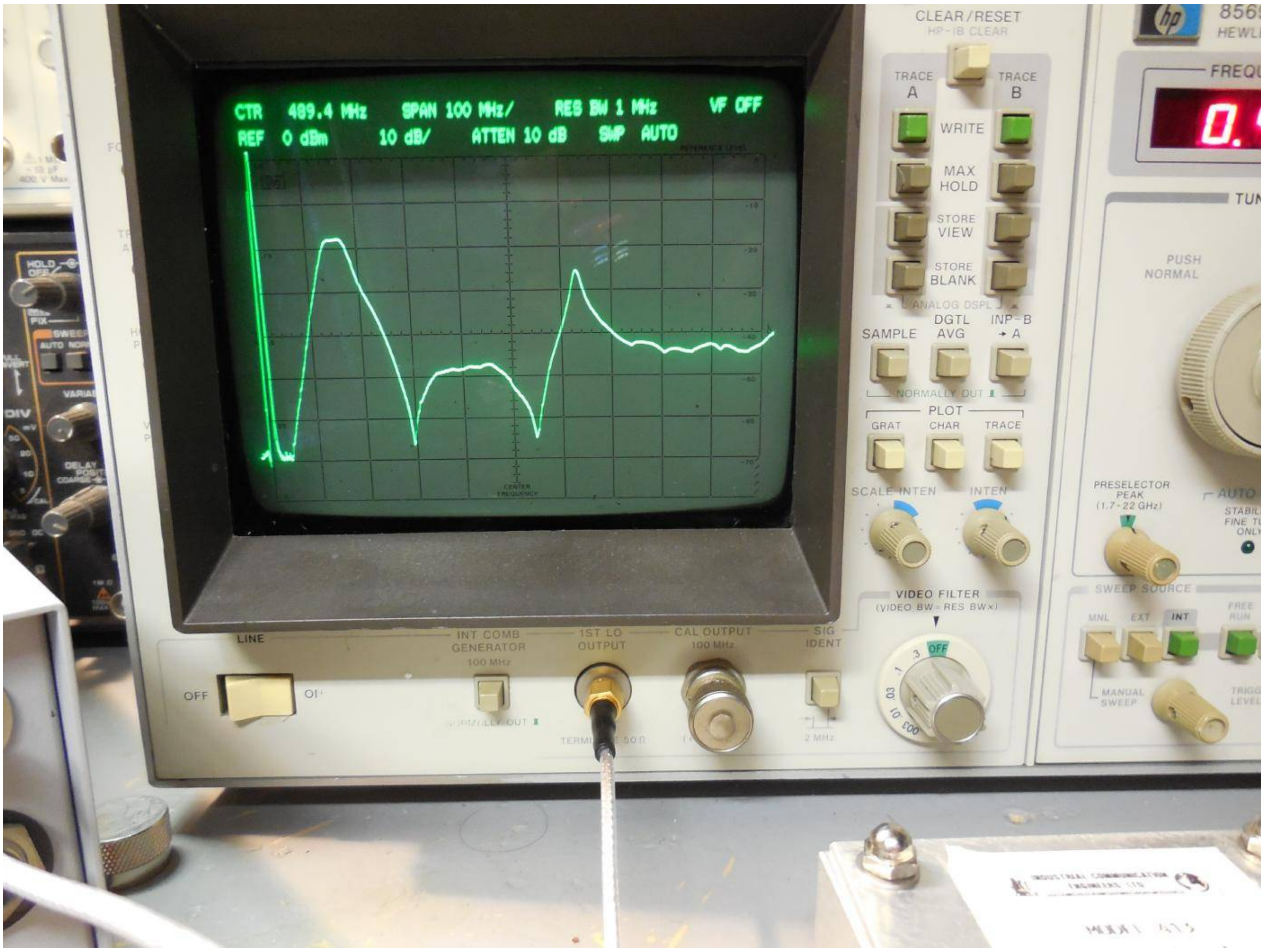
HP spectrum analyzers with an **INP−B−>A** function can "cancel out" any anomalies in the baseline system response.

Do this by first testing the baseline response with a high−quality, straight−through coaxial connection and storing the Trace B response by pressing **STORE BLANK**.

Connect the device to test then press the **INP−B−>A** button.

This "subtracts" the baseline response anomalies from the current input to show only the response of the DUT.

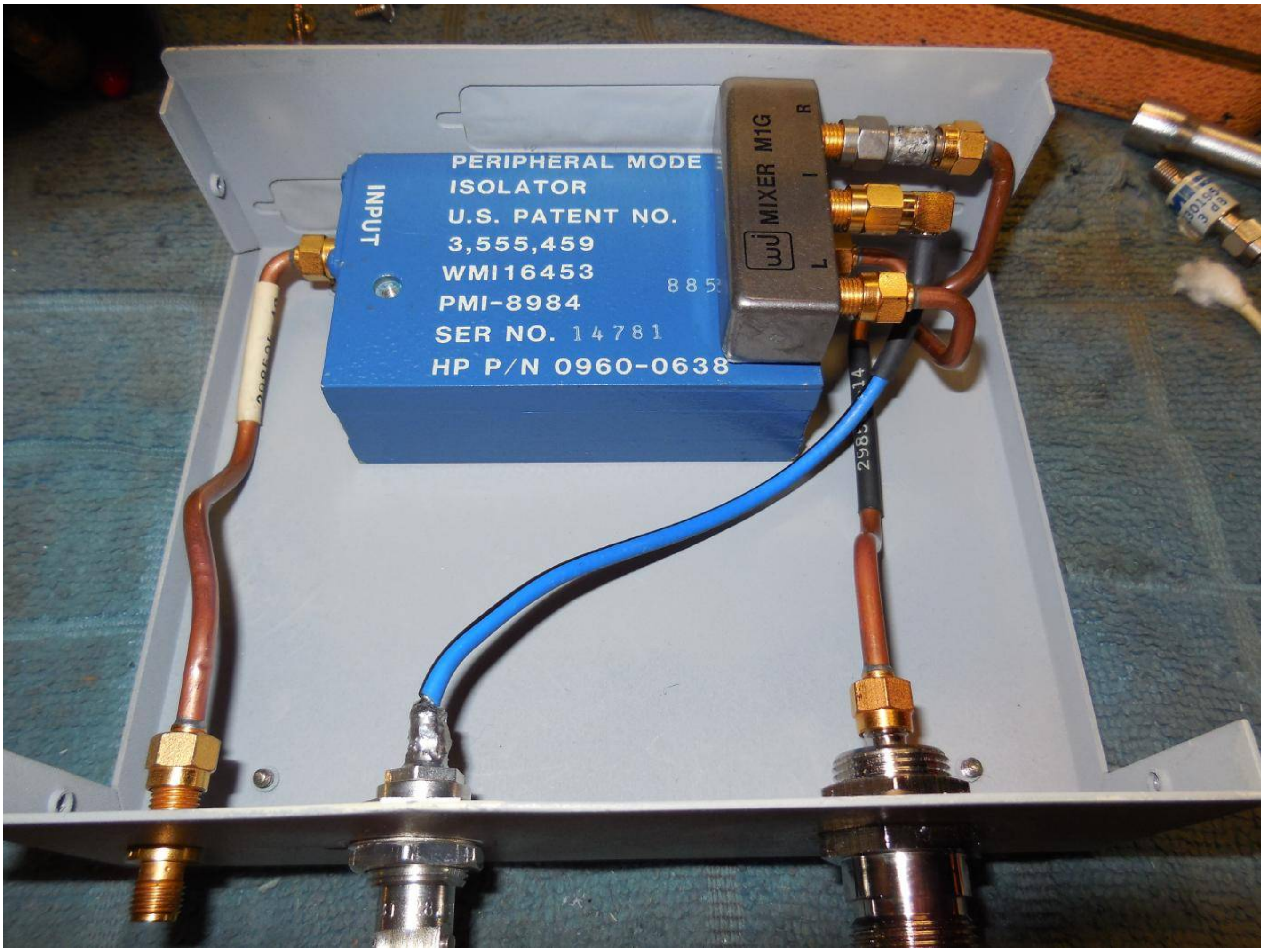
You'll need to redo this "cancelling" technique everytime you change the analyzer's display functions or swap out cables.



Testing a Industrial Communication Engineers, Ltd. Model 413 bandpass filter (144–148 MHz).

The center frequency is still around 500 MHz and the span is 100 MHz per horizontal division and 10 dB per vertical division.

The 3 dB points of this filter are around 110 and 170 MHz. The "spike" on the right is around 621 MHz.



Experimental tracking generator for the 1700–4100 MHz range.

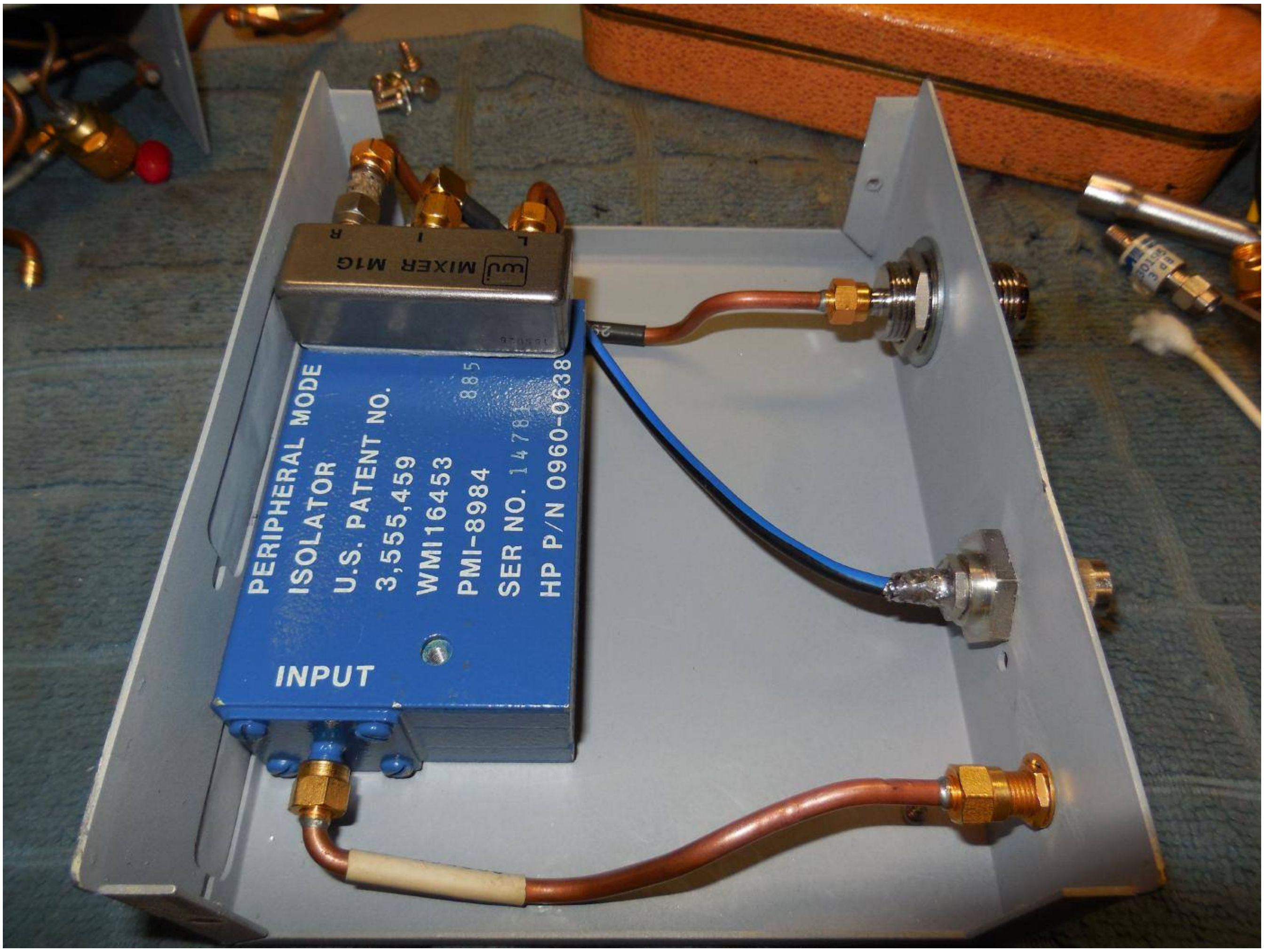
In this mode, the HP8569B's sweeping first LO signal (2021.4–4421.4 MHz) is mixed with an external 321.4 MHz signal to generate a tracking 1700–4100 MHz output.

The mixer is a Watkins–Johnson M1G double–balanced mixer. It requires +7 dBm of LO power and has around 40 dB of port isolation. The LO/RF ports can operate over the 1000–4200 MHz range.

The M1G's LO port has a Western Microwave PMI–8984 peripheral mode isolator on its input for additional isolation.

The M1G's IF port is used for the 321.4 MHz input, which is at around –4 dBm and is supplied via an external RF signal generator.

The RF port is then the sweeping 1700–4100 MHz output. There is a high–quality 3 dB attenuator on the RF port.

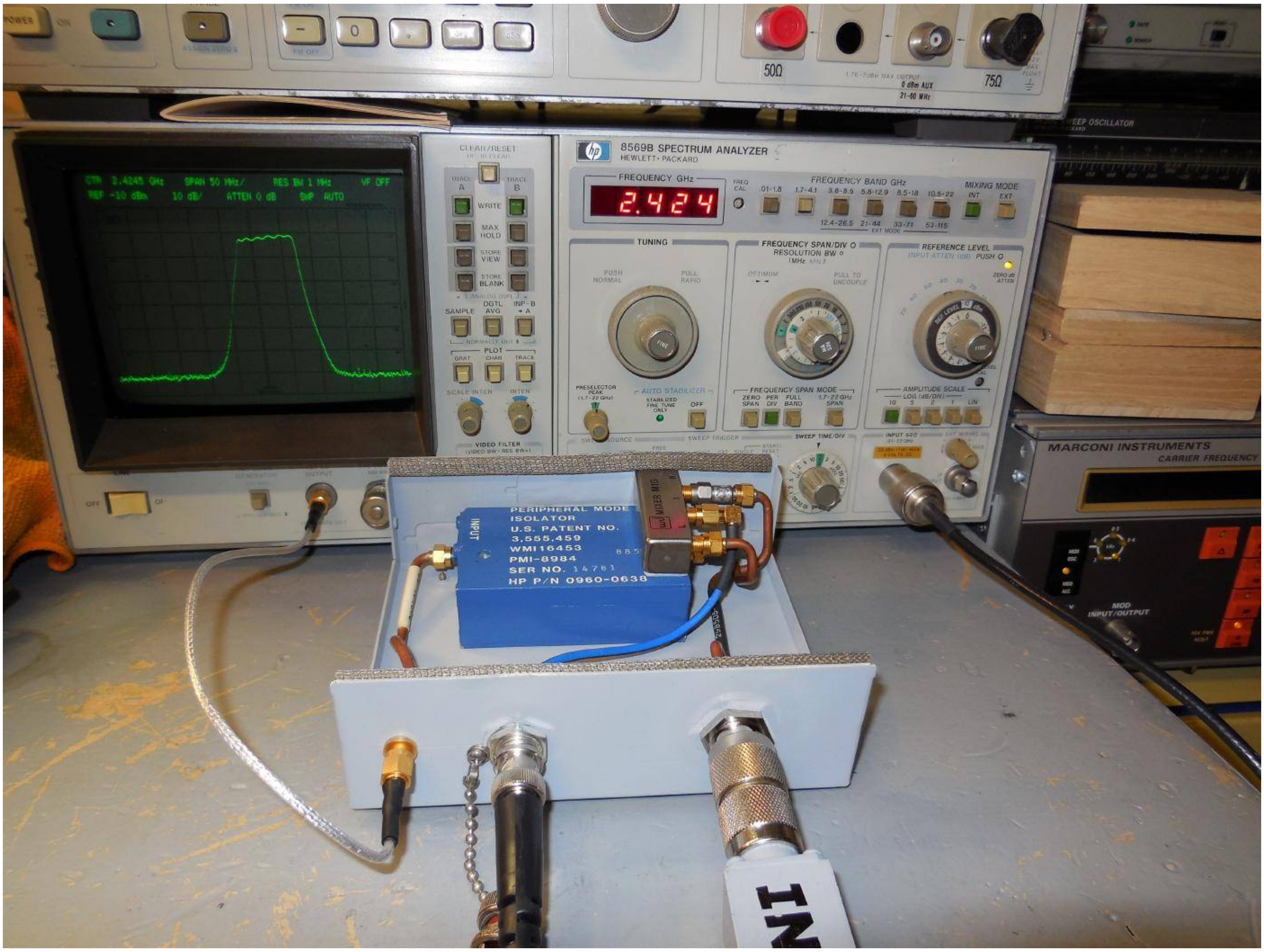


Alternate view.

The SMA jack is for the **1st LO Input**.

The BNC jack is for the **321.4 MHz Input**.

The N jack is for the sweeping **1700–4100 MHz Output**.



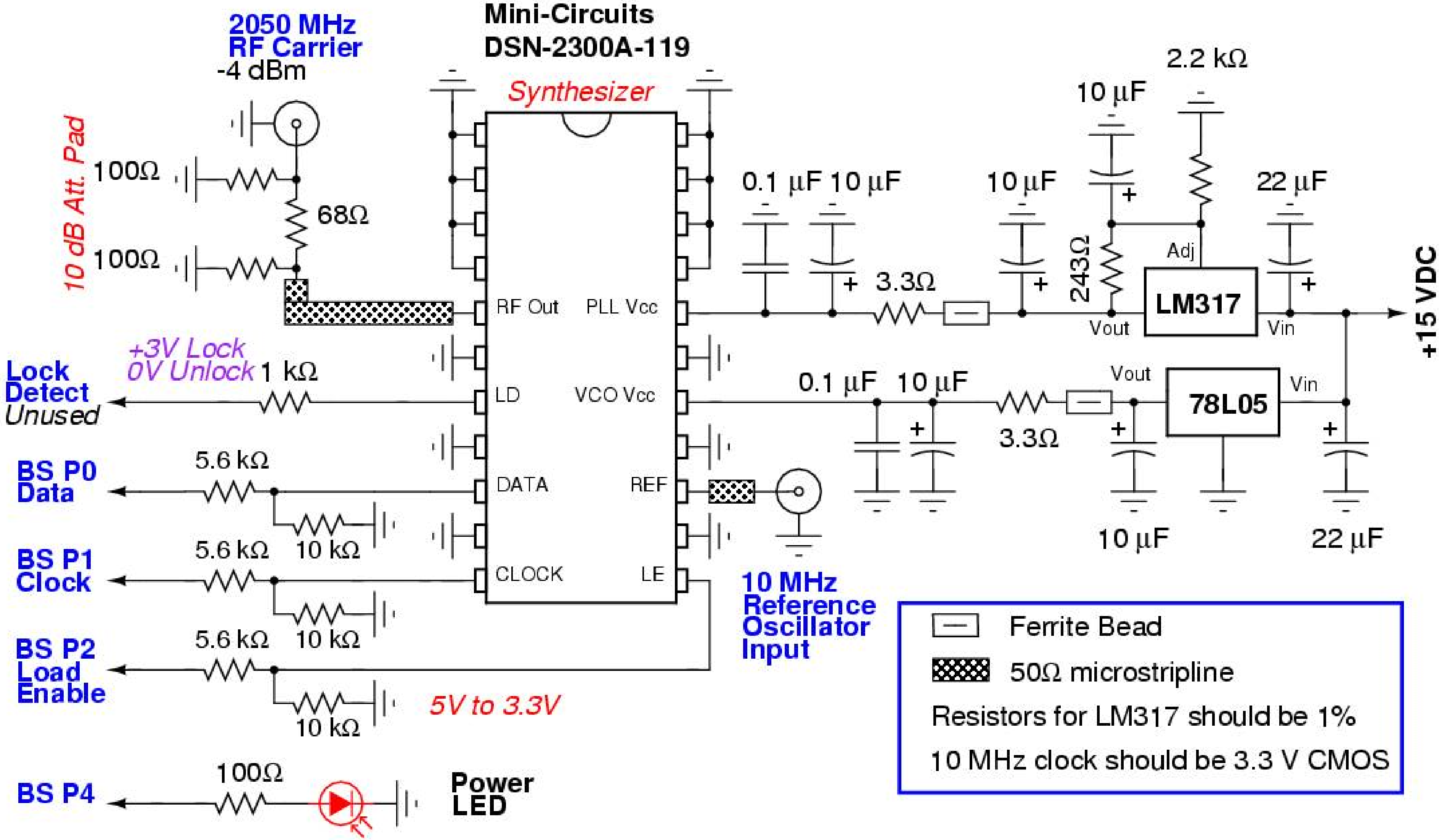
1700−4100 MHz tracking generator in operation.

Displayed is a sweep of a commercial 2.4 GHz bandpass filter.

The HP8569B's center frequency is around 2.424 GHz and the span is 50 MHz per horizontal division. Vertical span is 10 dB per division.

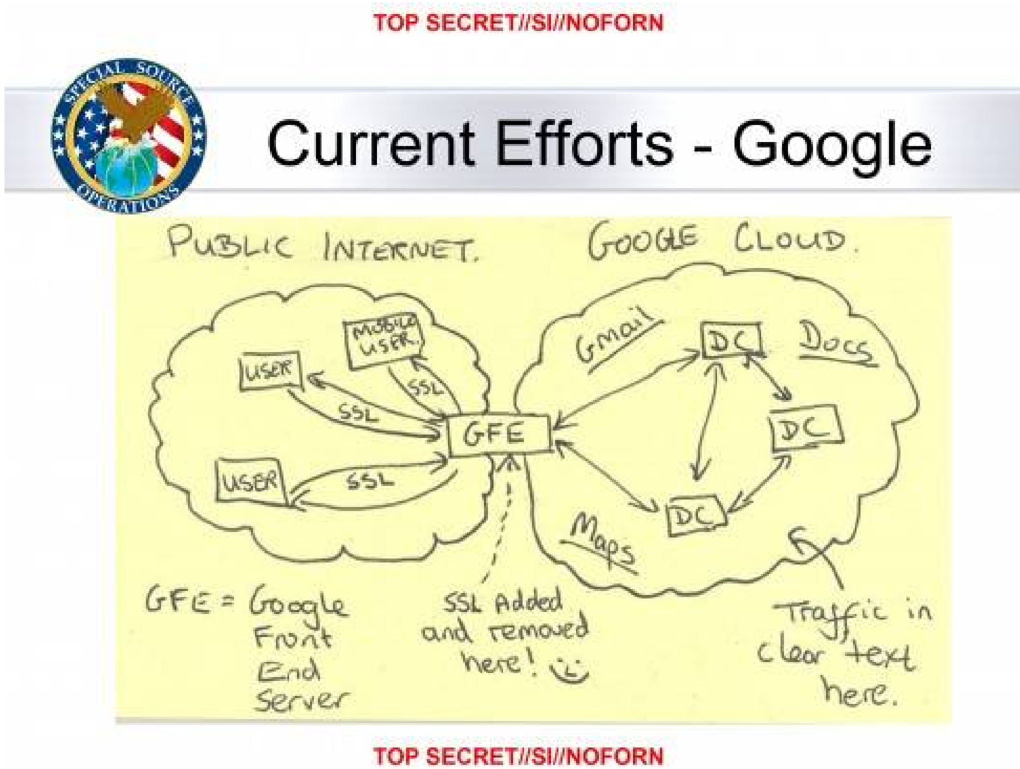
Tracking Generator for a HP8569B

2050 MHz RF Carrier



```
' Mini-Circuits DSN-2300A-1119 PLL Frequency Synthesizer Loader Code
' GBPPR HP8569B Tracking Generator / BASIC Stamp 2 / Version 1
'
' DSN-2300A-1119 Pin      BASIC Stamp Port
' ------------------      ----------------
' DATA (9)                P1
' CLK  (11)               P0
' LE   (12)               P2
'
' {$STAMP BS2}
' {$PBASIC 2.5}

IVAL1 VAR Word
IVAL2 VAR Byte

FVAL1 VAR Word
FVAL2 VAR Byte

RVAL1 VAR Word
RVAL2 VAR Byte

NVAL1 VAR Word
NVAL2 VAR Byte

IVAL1 = $9F80
IVAL2 = $13

FVAL1 = $9F80  ' Prescaler = /32
FVAL2 = $12

RVAL1 = $1000  ' R = 40    10 MHz / 40 = 250 kHz
RVAL2 = $A0

NVAL1 = $2100  ' N = 8200  B = 256  A = 8 for 2050 MHz
NVAL2 = $21

LOW 0  ' CLK
LOW 1  ' DATA
LOW 2  ' LE
LOW 4  ' LED

' Load Initial
SHIFTOUT 1,0,1,[IVAL1\16]
SHIFTOUT 1,0,1,[IVAL2]
PULSOUT 2,1  ' Bring LE high, then low
PAUSE 5
' Load Function
SHIFTOUT 1,0,1,[FVAL1\16]
SHIFTOUT 1,0,1,[FVAL2]
PULSOUT 2,1  ' Bring LE high, then low
PAUSE 5
' Load /R
SHIFTOUT 1,0,1,[RVAL1\16]
SHIFTOUT 1,0,1,[RVAL2]
PULSOUT 2,1  ' Bring LE high, then low
PAUSE 5
' Load /N
SHIFTOUT 1,0,1,[NVAL1\16]
SHIFTOUT 1,0,1,[NVAL2]
PULSOUT 2,1  ' Bring LE high, then low
PAUSE 5

HIGH 4  ' Light front-panel LED
END
```

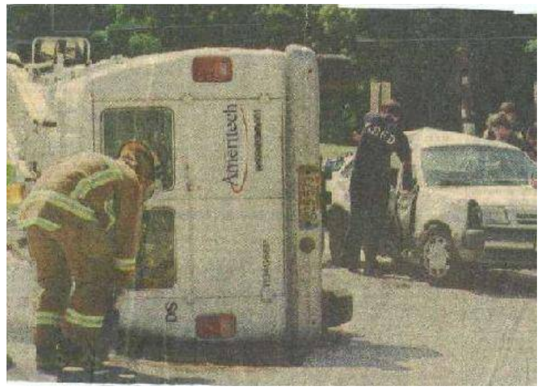
Bonus



They're laughting at you... literally!

Change!

End of Issue #115



Any Questions?

<u>Editorial and Rants</u>

Anna Dieter–Eckerdt, 6 and Abigail Robinson, 11

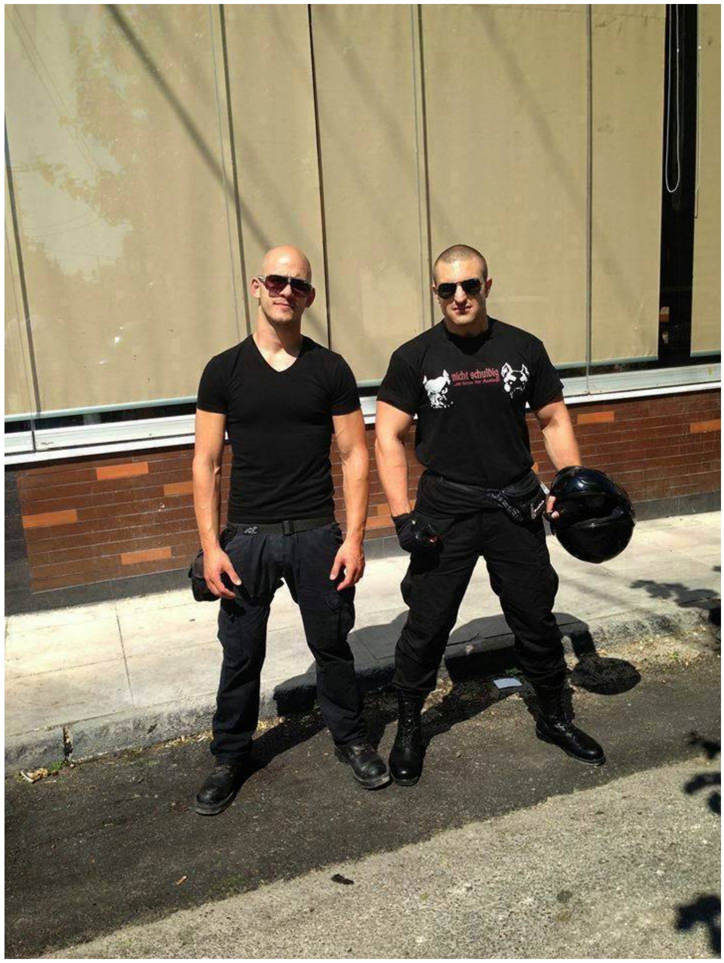
Spic Killers: Cinthya Garcia–Cisneros and Mario Echeverria

Didn't hear about this one, did you?

> Two beautiful White step–sisters were playing in a pile of leaves at their Hillboro, Oregon front yard last Sunday, when a speeding, careening car lost control and plowed into them. One died in the arms of a responding emergency firefighter at the scene (imagine how sad that was) and the other soon died at the hospital. At least one of the wetbacks in the car that sped away is an "undocumented immigrant," or what we should really call them – "a criminal."

(incogman.net/2013/10/wetbacks–kill–white–girls–in–hit–and–run/)
(www.stormfront.org/forum/t1001436/)

Guess the media doesn't want to cut into their Trayvon Martin coverage...



Didn't hear about this one, did you?

> Two young members of Golden Dawn, Kapelonis Manolis and Fountoulis Georgios, were murdered earlier tonight (Nov. 1, 2013) while safeguarding an event taking place inside the offices of the party in the northern suburbs of Athens. Alexandros Gerontas, father of a two−year−old, is fighting for his life in a hospital, and the doctors diagnose the situation as critical. Two black−clad people riding a motorcycle opened fire on the guard team of 7−8 persons that were on standing in front of the offices of Golden Dawn.
>
> Early information suggests that after using a MP−5, they moved in close and shot both in the head with 9 mm pistols. Golden Dawn members had nothing to defend themselves with, as the police in the previous week raided most Golden Dawn offices and arrested people for merely sticks of wood. Golden Dawn had notified the police of the event taking place and asked for police protection. None was given.
>
> It should be noted that even MPs of Golden Dawn have no police escort, after it was removed by a decision of the ministry. For the past month and a half, Golden Dawn has been the target of both a systematic terror campaign from the police, and also the extreme left.
>
> The Greek "anti−terrorist" squad was used against Golden Dawn − while the murderers walk free.