

FIG. #1

FIG 1: OLD RECEIVER

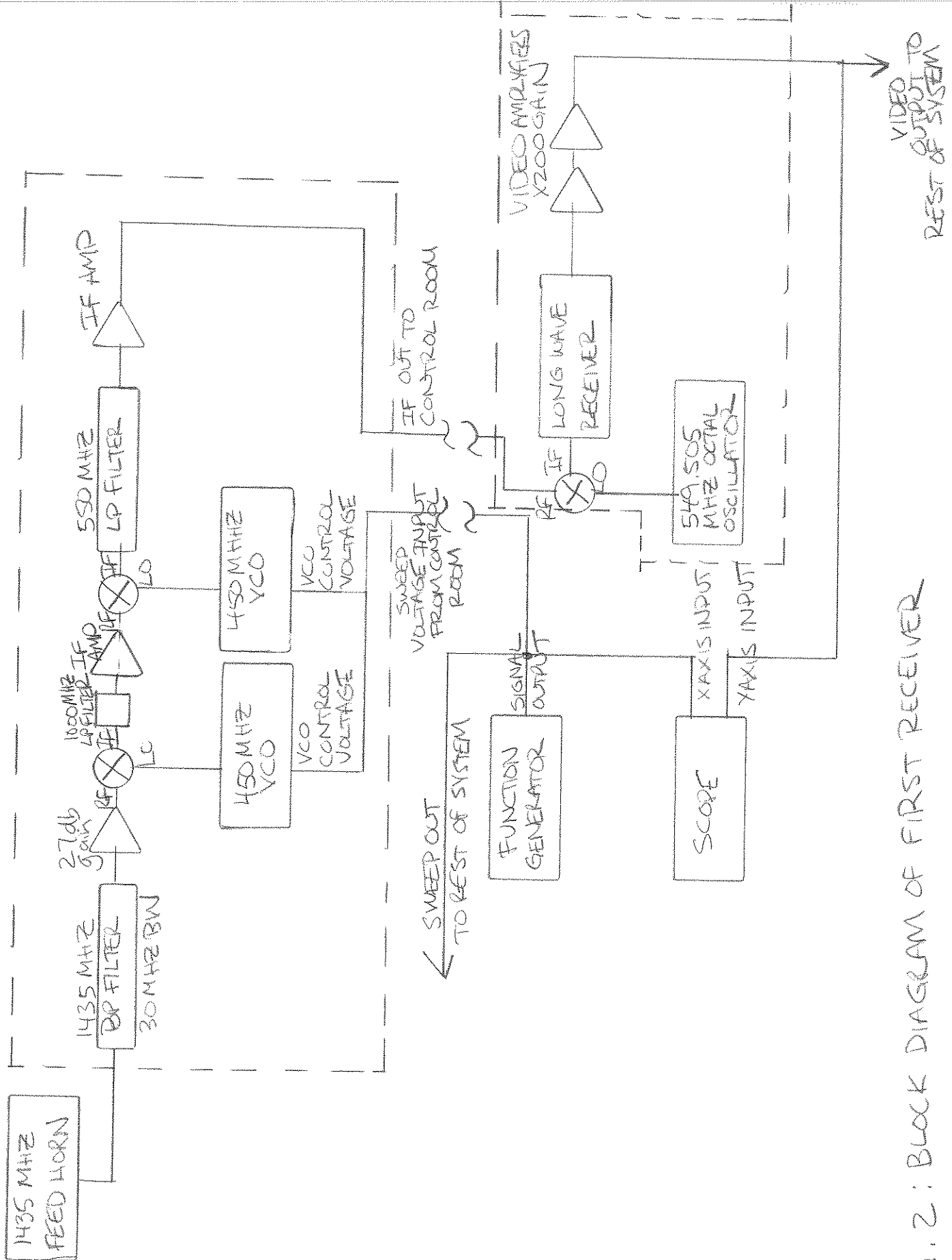


FIG. #2

FIG. 2 : BLOCK DIAGRAM OF FIRST RECEIVER

37269B

MODEL:
DEVICE ID:

DATE: 08/23/96
OPERATOR:

17:18 Page 1

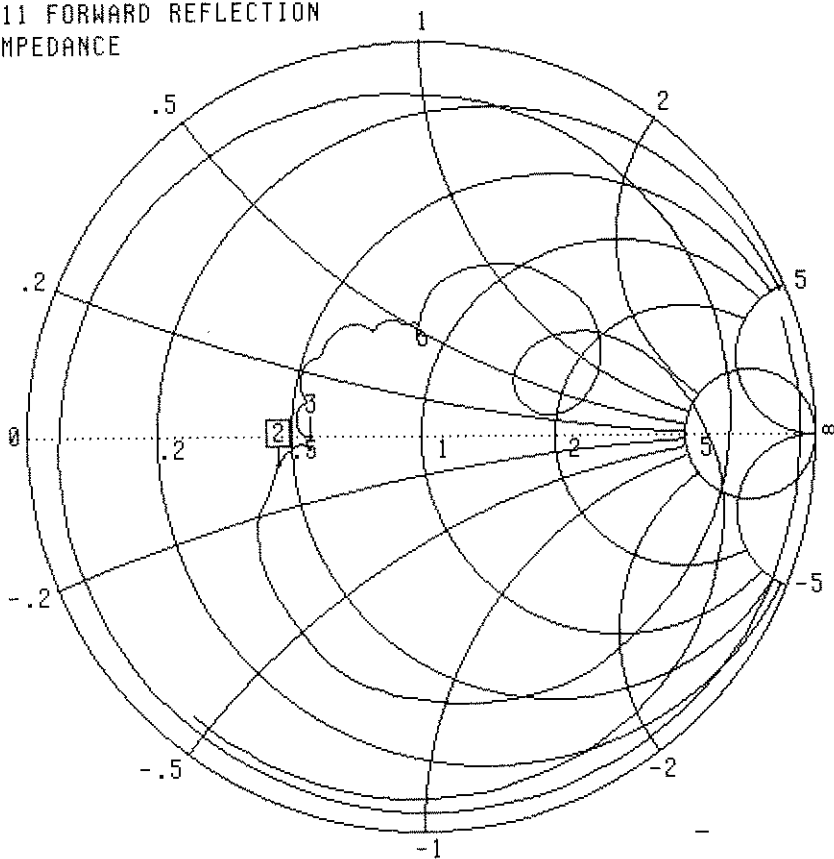
START: 1.001001051 GHz
STOP: 1.999201051 GHz
STEP: 0.003101939 GHz

GATE START: -
GATE STOP: -
GATE: -
WINDOW: -

ERROR CORR: REFL PORT1
AVERAGING: 1 PT
IF BNDWIDTH: 1 KHz

PARAMETER: -CH1-
NORMALIZATION: -S11-
REFERENCE PLANE: 0.0000 mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -

S11 FORWARD REFLECTION
IMPEDANCE



CH 1 - S11
REFERENCE PLANE
0.0000 mm

▶ MARKER 2
1.425701051 GHz
23.485 Ω
-4.131 $j\Omega$

MARKER TO MAX
MARKER TO MIN

3 1.475301051 GHz
28.489 Ω
-355.568 $j\Omega$

MARKER READOUT
FUNCTIONS

FIG. #3

Fig 3: Smith chart of S11 read from

37269B

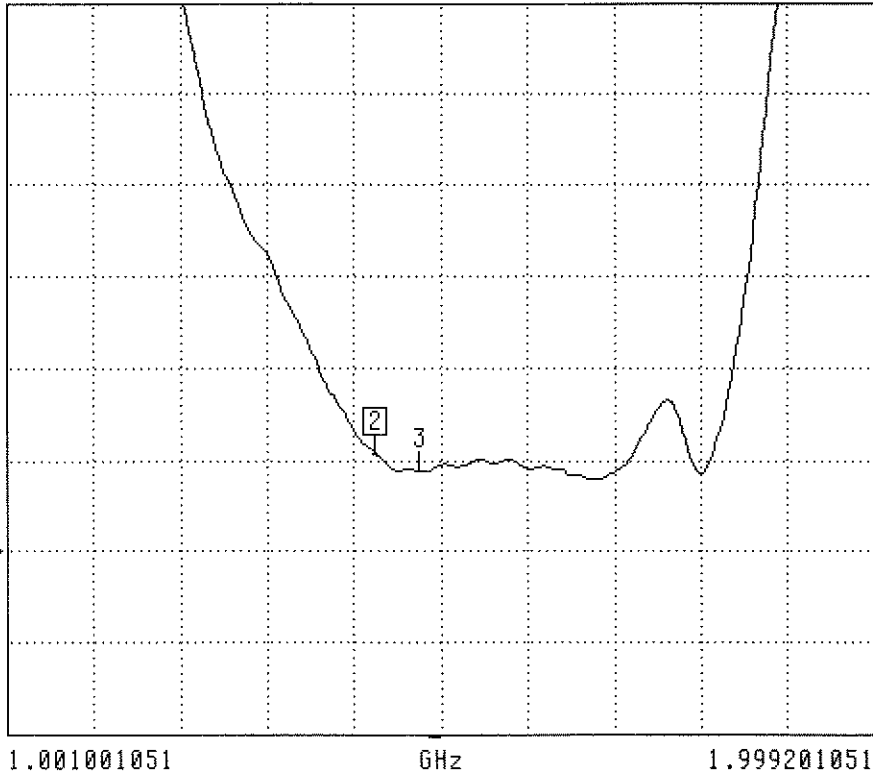
MODEL: DATE: 08/23/96 17:22 Page 1
DEVICE ID: OPERATOR:

START: 1.001001051 GHz GATE START: - ERROR CORR: REFL PORT1
STOP: 1.999201051 GHz GATE STOP: - AVERAGING: 1 PT
STEP: 0.003101939 GHz GATE: - IF BNDWDTH: 1 KHz
WINDOW: -

-----CH1-----
PARAMETER: -S11-
NORMALIZATION: OFF
REFERENCE PLANE: 0.0000 mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -

S11 FORWARD REFLECTION

SWR REF=0.000 pU 2.000 U/DIV



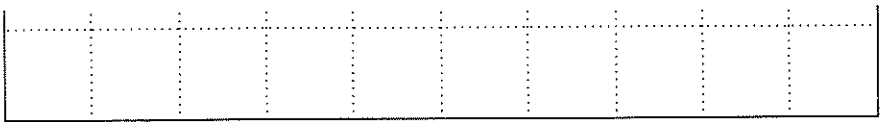
CH 1 - S11
REFERENCE PLANE
0.0000 mm
▶ MARKER 2
1.425701051 GHz
2.151 U

MARKER TO MAX
MARKER TO MIN
3 1.475301051 GHz
1.756 U

MARKER READOUT
FUNCTIONS

FIG. #4

Fig 4: VSWR at Feed Horn



TEST SIGNALS
 PRESS <ENTER>
 TO SELECT
 ON TURN ON/OFF ...

0.500000006 GHz 3.000000151

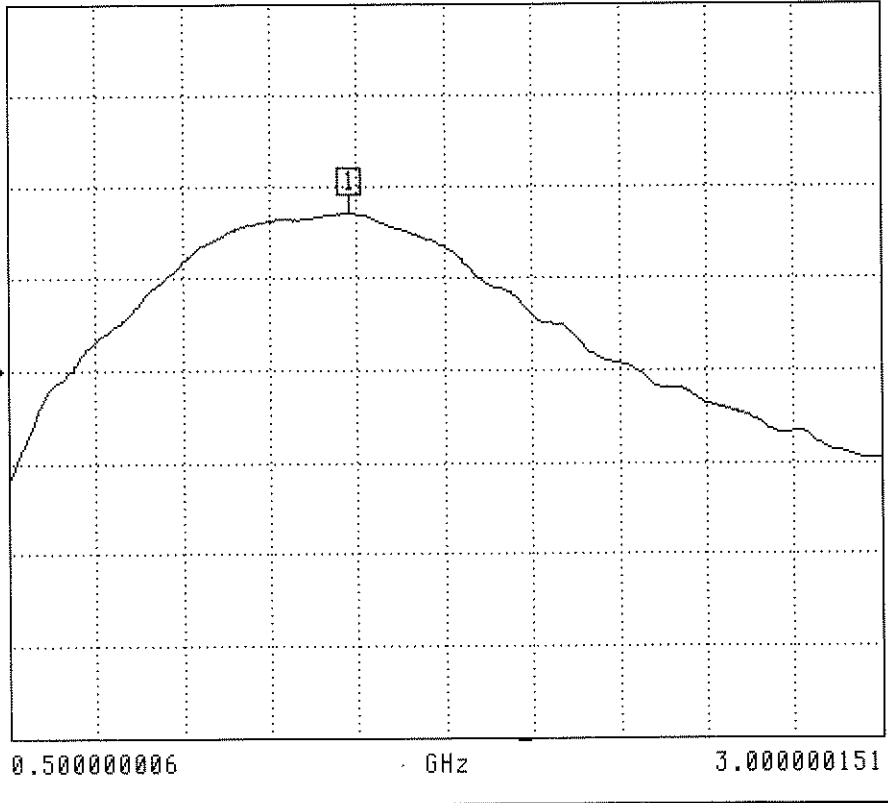
37269B
 MODEL: DATE: 07/16/96 14:39 Page 1
 DEVICE ID: OPERATOR:

START: 0.500000006 GHz GATE START: - ERROR CORR: NONE
 STOP: 3.000000151 GHz GATE STOP: - AVERAGING: 1 PT
 STEP: 0.006250001 GHz GATE: - IF BNDWDTH: 1 KHz
 WINDOW: -

PARAMETER: -CH3-
 NORMALIZATION: -S21-
 REFERENCE PLANE: 0.0000 mm
 SMOOTHING: 0.0 PERCENT
 DELAY APERTURE: -

S21 FORWARD TRANSMISSION

POWER OUT REF=0.000 dBm 10.000 dB/DIV



CH 3 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 1
 1.475000162 GHz
 17.029 dBm

MARKER TO MAX
 MARKER TO MIN

MARKER READOUT
 FUNCTIONS

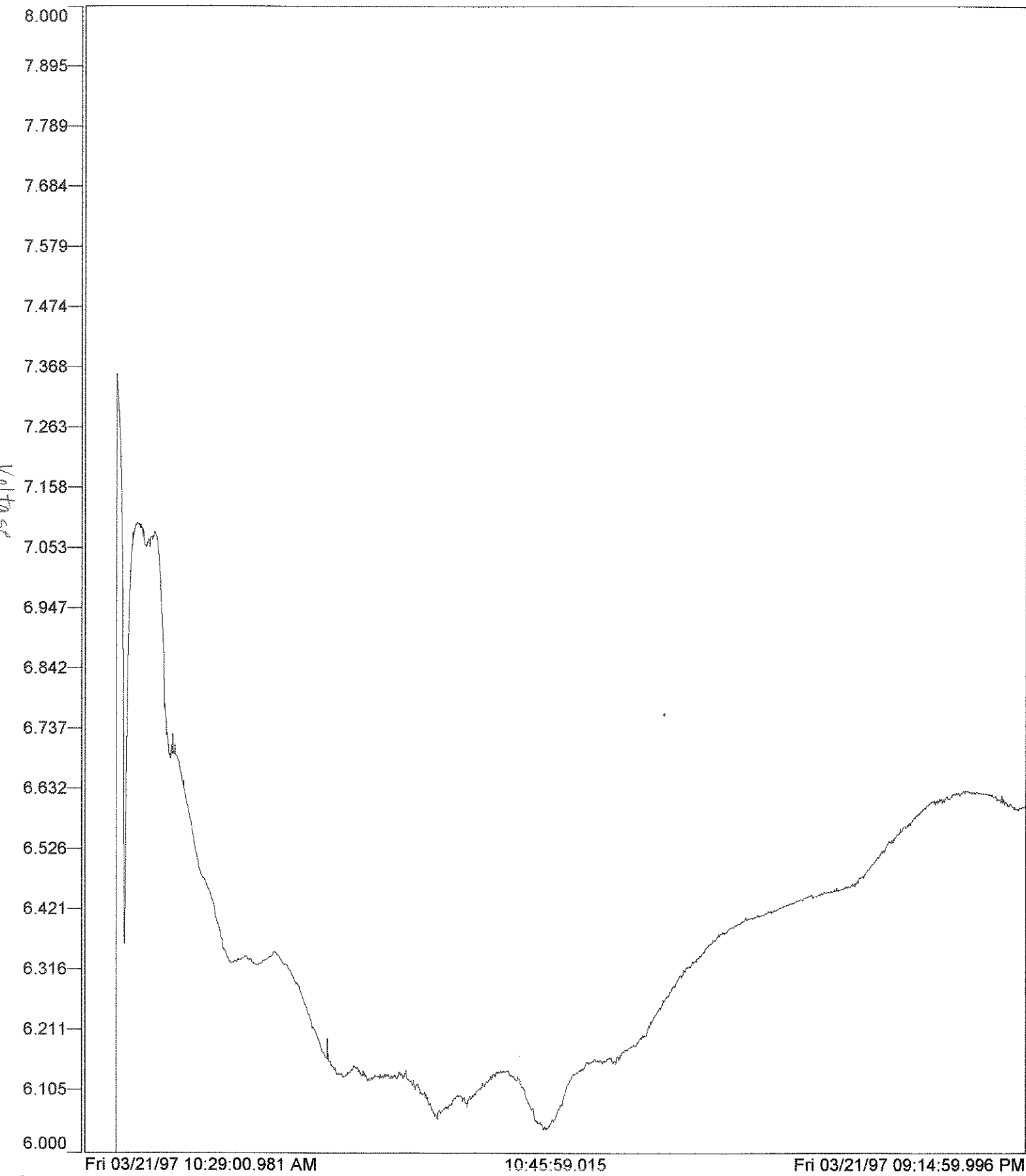
RATS pre-amp

FIG. #5

w/10 db pad on output

Fig 5: 1475 MHz LNA Gain vs. Frequency

Untitled



| Tag Name | Description | Scale Range | Sample Freq. | Eng. Units | Last Value |
|-----------------|-------------|-------------|--------------|------------|------------|
| X20 Curves:0101 | | 6.000/8.000 | 00:00:00.999 | VDC | 6.607 |

start

Time FIG. #6

stop

Fig 6: 1st scan with downconverter and smoothed front end

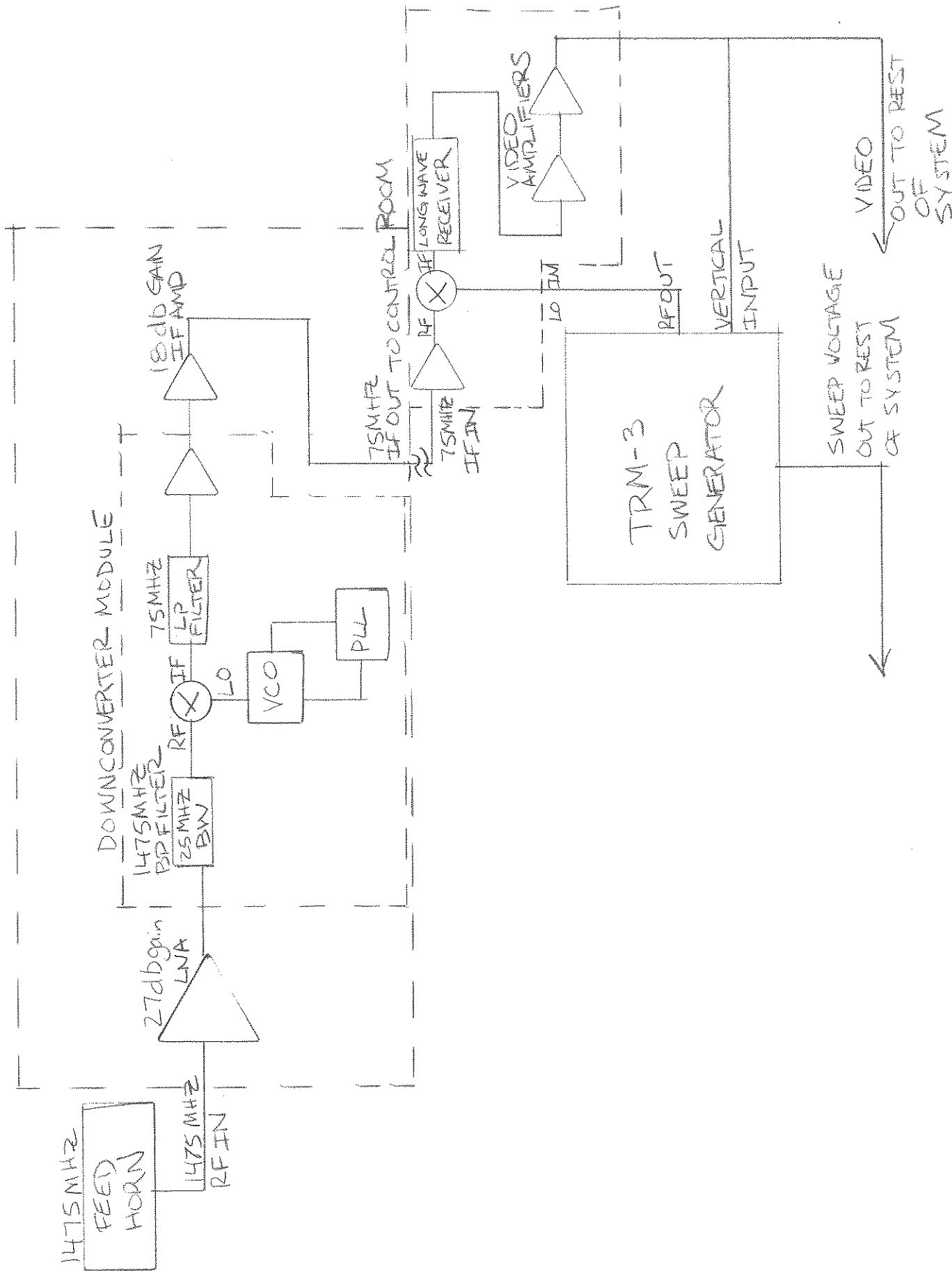


FIG. #7

FIG. 7: IFF CHASSIS 1ST DESIGN AND DOWNCONVERTER DIAGRAM

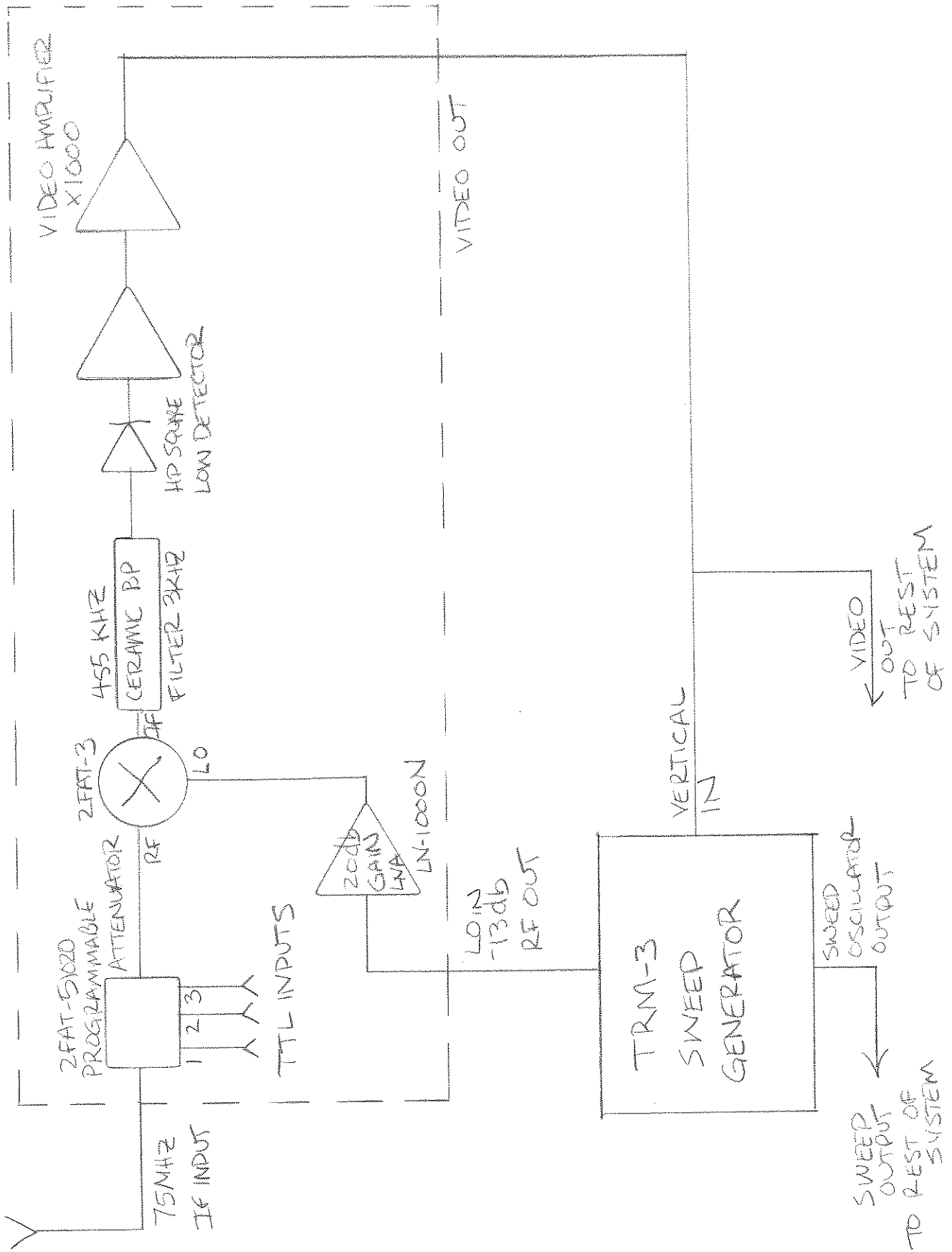


FIG. #8

FIG. 8: IF CHASSIS DESIGN WITH 455 KHZ CERAMIC FILTER AND SQUARE LAW DETECTOR

THE SYSTEM BLOCK DIAGRAM

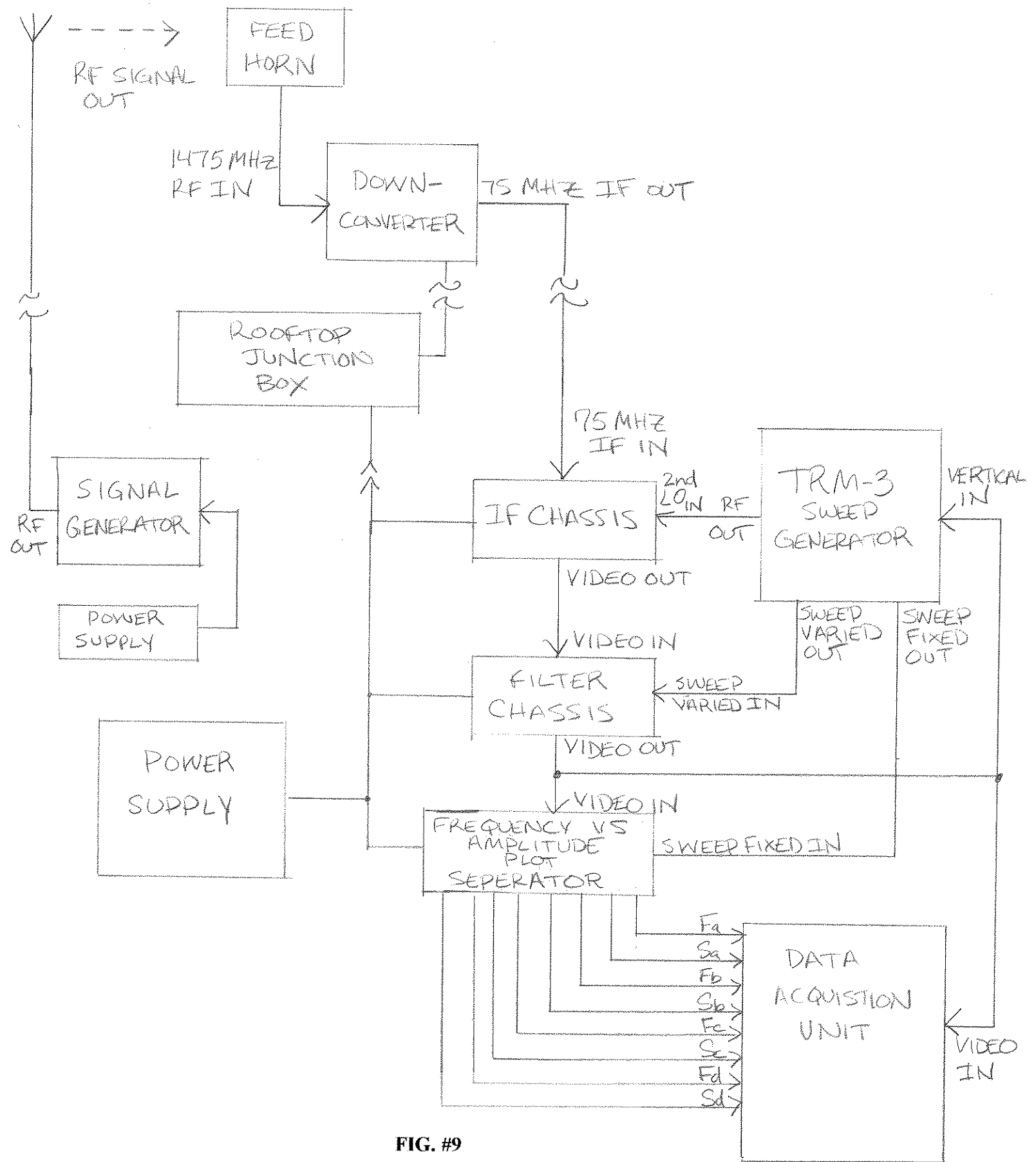


FIG. #9

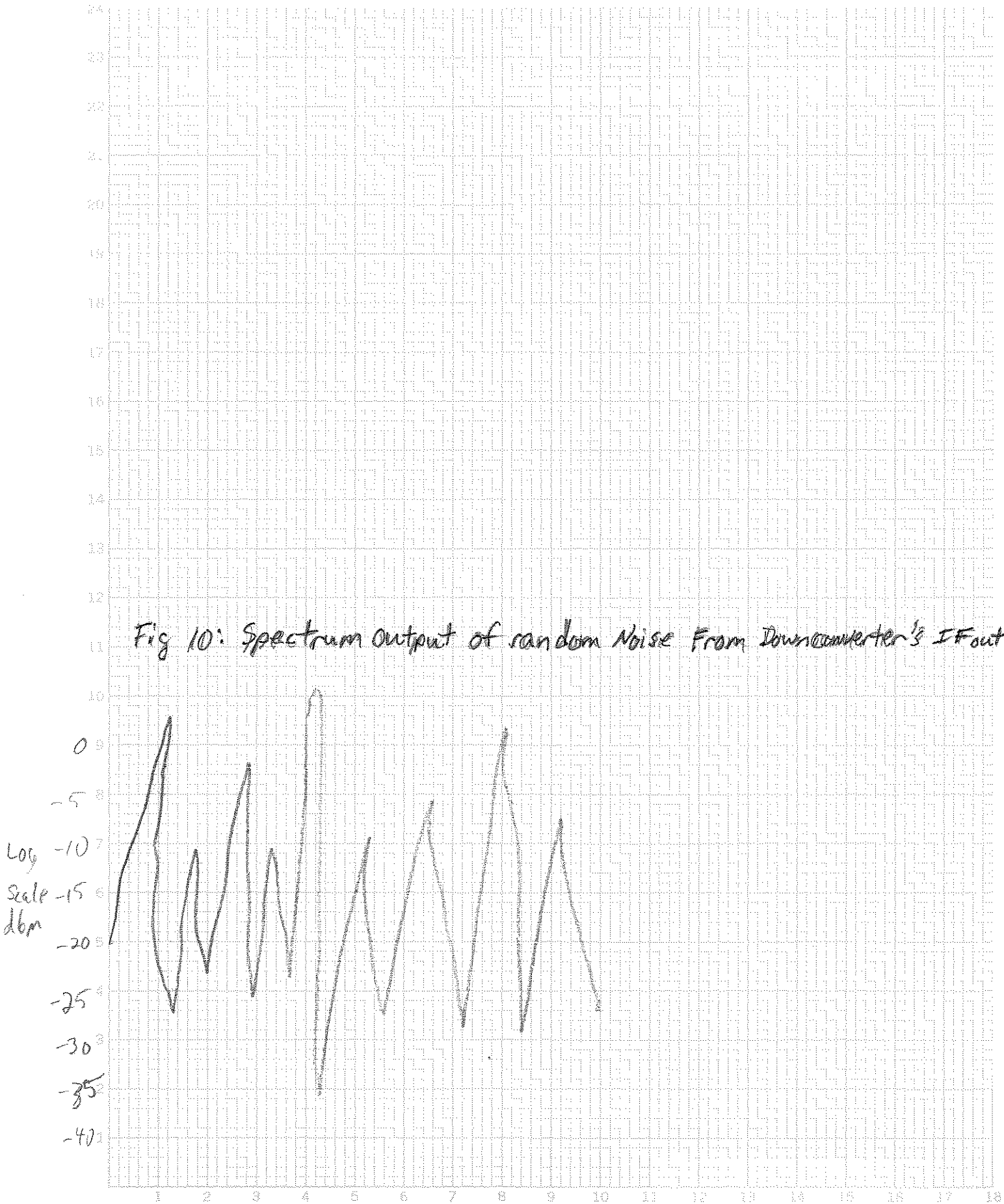


Fig 10: Spectrum output of random Noise From Downconverter's IFout

15 .4 .3 .2 11 -0+ 11 .2 .3 14 15

FIG. #10

5 Squares to the Contour Sweep width Factor center freq = 28MHz, Sweep width = 30kHz

DIGITAL STEP ATTENUATORS

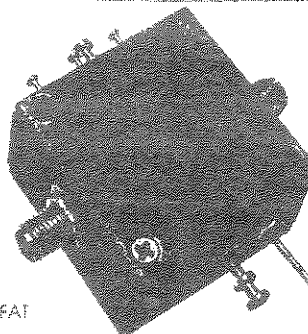
50Ω

Precision

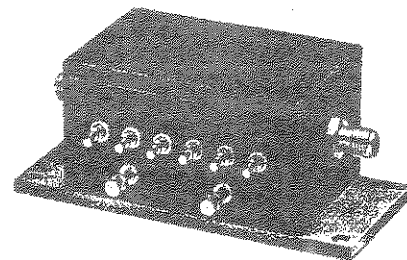
TTL CONTROL, PIN DIODE 10 MHz to 1 GHz



TOAT



ZFAT



ZSAT

| MODEL NO. | FREQ. MHz | | PRIMARY ATTENUATION STEPS (dB) | | | ATTENUATION (dB) | | VSWR | | | CAPD DATA | Case Style | Price | |
|------------|-----------|------|--------------------------------|--------|--------|------------------|------------|------|-----|-----|-----------|------------|-------|--------|
| | F | M | #1 | #2 | #3 | 10dB STATE | 20dB STATE | 10 | 15 | 20 | | | | |
| TOAT-R512 | 10 | 1000 | 0.5±0.18 | 1±0.25 | 2±0.25 | 3.5 | 4.0 | 1.6 | 1.4 | 1.5 | 5-6 | QQ96 | ca | 59.95 |
| TOAT-124 | 10 | 1000 | 1±0.25 | 2±0.25 | 4±0.3 | 7.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-7 | QQ96 | ca | 59.95 |
| TOAT-3610 | 10 | 1000 | 3±0.3 | 6±0.4 | 10±0.4 | 19.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-8 | QQ96 | ca | 59.95 |
| TOAT-4816 | 10 | 1000 | 4±0.4 | 8±0.4 | 16±0.5 | 28.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-9 | QQ96 | ca | 59.95 |
| TOAT-51020 | 10 | 1000 | 5±0.4 | 10±0.4 | 20±0.5 | 35.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-10 | QQ96 | ca | 59.95 |
| ZFAT-R512 | 10 | 1000 | 0.5±0.18 | 1±0.25 | 2±0.25 | 3.5 | 4.0 | 1.6 | 1.4 | 1.5 | 5-6 | SSS173 | - | 89.95 |
| ZFAT-124 | 10 | 1000 | 1±0.25 | 2±0.25 | 4±0.3 | 7.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-7 | SSS173 | - | 89.95 |
| ZFAT-3610 | 10 | 1000 | 3±0.3 | 6±0.4 | 10±0.4 | 19.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-8 | SSS173 | - | 89.95 |
| ZFAT-4816 | 10 | 1000 | 4±0.4 | 8±0.4 | 16±0.5 | 28.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-9 | SSS173 | - | 89.95 |
| ZFAT-51020 | 10 | 1000 | 5±0.4 | 10±0.4 | 20±0.5 | 35.0 | 4.0 | 1.6 | 1.4 | 1.5 | 5-10 | SSS173 | - | 89.95 |
| ZSAT-31R5 | 10 | 1000 | SIX CONTROL PORTS | | | 31.5 | 7.0 | 1.7 | 1.5 | 1.6 | - | AR214 | - | 119.00 |

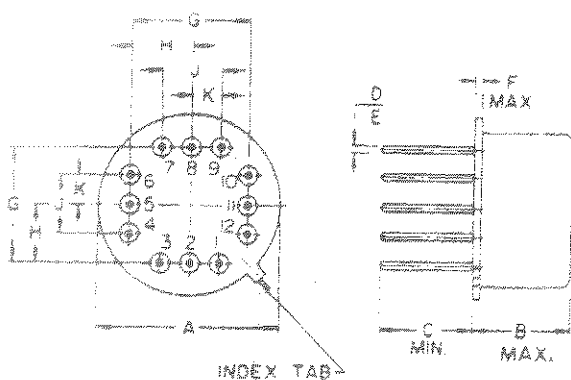
L = 10 to 100 MHz

M = 100 to 500 MHz

U = 500 to 1000 MHz



NOTE Pin numbers do not appear on unit for reference only



Additional Specifications

- DC Voltage +5V
- DC current 10mA max.
- Switching Time (50% TTL to within specified accuracy of the next-selected attenuation step, and to within 0.1 dB of steady-state Thru-Loss) 10 μs typ., 15μs max.
- TTL input High Threshold 2V min.
- TTL input Low Threshold 0.8V max.
- TTL Toggle Rate: 50 kHz typ.
- 1dB compression: 0 dBm (10-100MHz)
- +10dBm (100-1000MHz)
- For ZSAT-31R5:
- 1dB compression: +10 dBm (10-100 MHz)
- +15 dBm (100-1000 MHz)

Logic function:

TTL High activates associated in-line attenuation
TTL Low bypasses this attenuation

NSN GUIDE

| MCL NO. | NSN |
|------------|------------------|
| TOAT-124 | 5985-01-416-9021 |
| TOAT-51020 | 5985-01-416-9020 |

- General Quality Control Procedures, Environmental Specifications, Hi-Rel, MIL and TX description are given in section 0, see "Mini-Circuits Guarantees Quality" article.
- Connector types and case mounted options, case finishes are given in section 0, see "Case Style & Outline Drawings".
- Prices and Specifications subject to change without notice.
 - Absolute maximum power, voltage and current rating
 - Input power, 15 dBm
 - DC voltage, 5.5 Volts
 - TTL 5.5 Volts
 - Storage temperature -55°C to +125°C for TOAT models
- Step accuracy is specified for basic steps. For combination of steps accuracy is additive.
- Thru-loss is minimum insertion loss with all attenuation elements bypassed (All TTL controls state are Low)
- For optimum operation of TOAT models, ensure the device case is properly connected to the ground plane (4 PCB).

pin connections

see case style outline drawing

| PORT | cc |
|----------------|-------------------|
| RF IN | 4 |
| RF OUT | 11 |
| TTL CONTROL #1 | 2 |
| TTL CONTROL #2 | 3 |
| TTL CONTROL #3 | 7 |
| +5V DC | 12 |
| CASE GND | 5, 6, 7, 8, 9, 10 |

FIG. #11

37269B

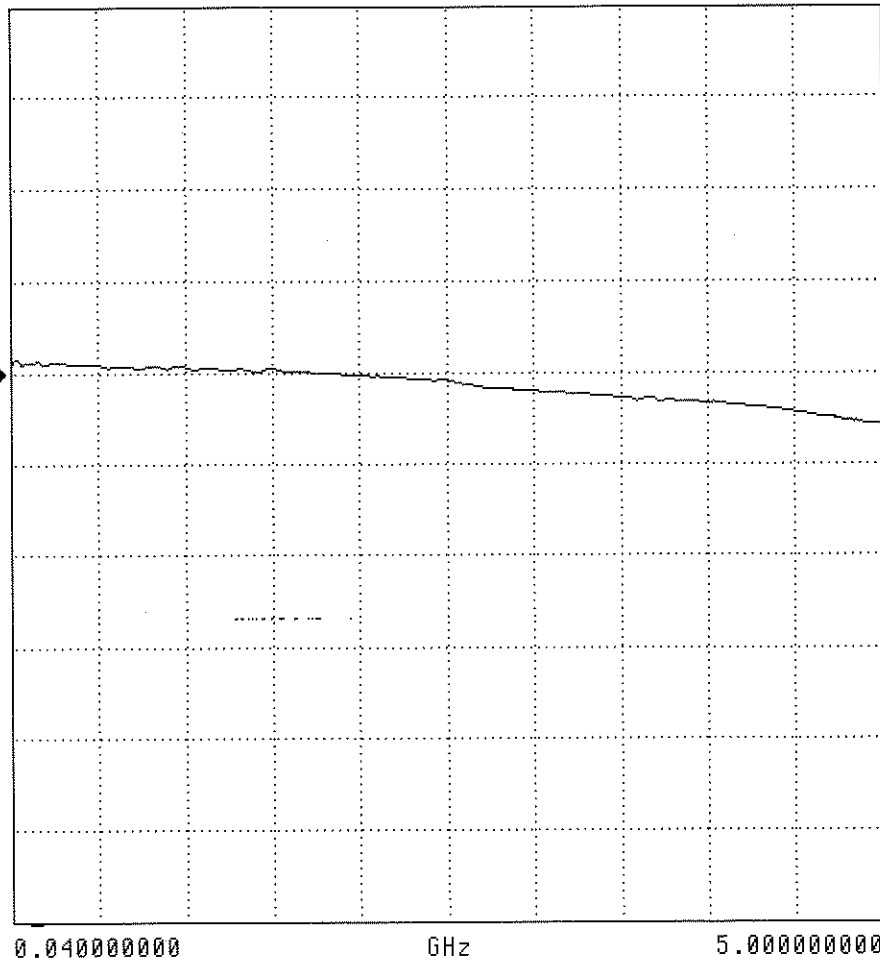
MODEL: DATE: 08/22/96 13:35 Page 1
 DEVICE ID: OPERATOR:

START: 0.040000000 GHz GATE START: - ERROR CORR: TRANS FWD
 STOP: 5.000000000 GHz GATE STOP: - AVERAGING: 1 PT
 STEP: 0.012400000 GHz GATE: - IF BNDWDTH: 1 KHz
 WINDOW: -

-----CH1-----
 PARAMETER: -S21-
 NORMALIZATION: OFF
 REFERENCE PLANE: 0.0000 mm
 SMOOTHING: 0.0 PERCENT
 DELAY APERTURE: -

S21 FORWARD TRANSMISSION

POWER OUT REF=-3.112 dBm 6.000 dB/DIV



- SELECT OUTPUT DEVICE
- PRINTER
- PLOTTER
- OUTPUT OPTIONS
- SETUP OUTPUT HEADERS
- DISK OPERATIONS
- ▶PRINT OPTIONS
- PLOT OPTIONS
- OPERATIONS
- ▶PRINT OPTIONS
- PLOT OPTIONS
- PRESS <ENTER> TO SELECT

TTL: 1 → +5 VDC
 0 → GND

Mini-Circuits
 15542
 ZFAT-51020

Step Attenuator
 1 → 5 db
 2 → 10 db
 3 → 20 db

1 2 }
 0 0 0

FIG. #12

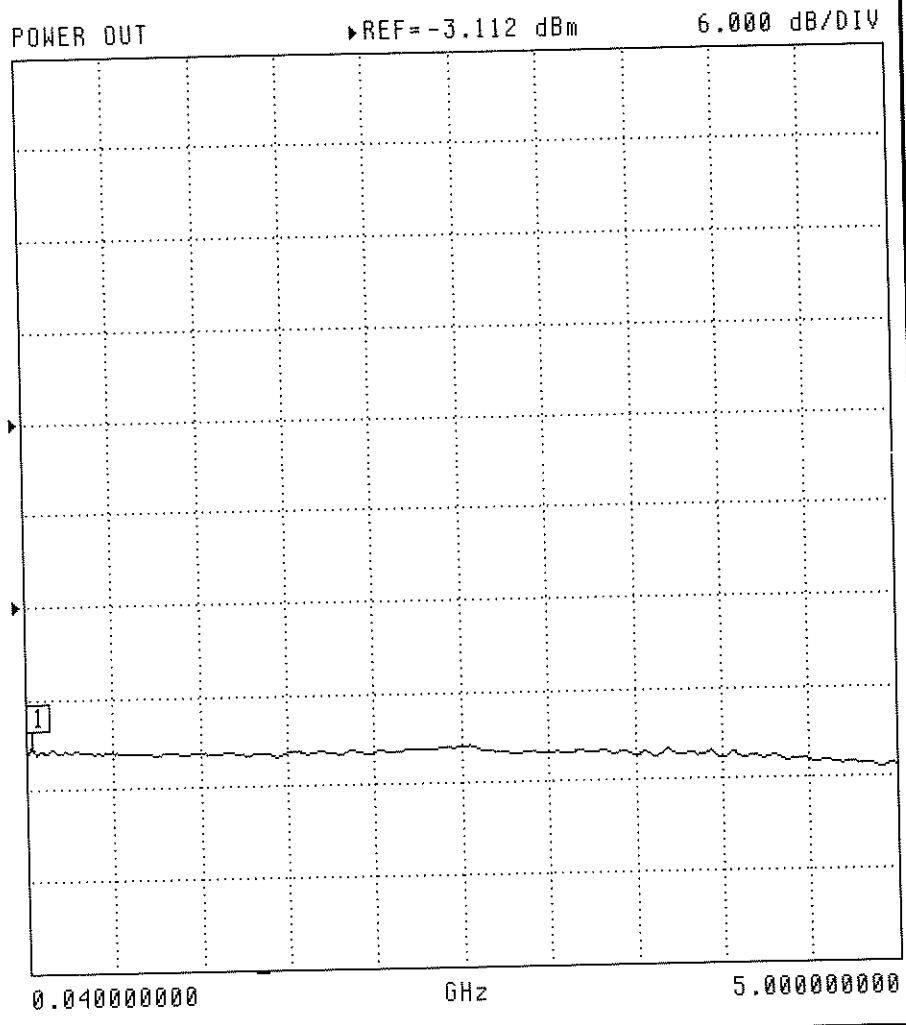
37269B

MODEL: DATE: 08/22/96 13:52 Page 1
 DEVICE ID: OPERATOR:

START: 0.040000000 GHz GATE START: - ERROR CORR: TRANS FWD
 STOP: 5.000000000 GHz GATE STOP: - AVERAGING: 1 PT
 STEP: 0.012400000 GHz GATE: - IF BNDWDTH: 1 KHz
 WINDOW: -

PARAMETER: CH1
 NORMALIZATION: -S21-
 REFERENCE PLANE: 0.0000 mm
 SMOOTHING: 0.0 PERCENT
 DELAY APERTURE: -

S21 FORWARD TRANSMISSION



CH 1 - S21
 REFERENCE PLANE
 0.0000 mm
 MARKER 1
 0.077200000 GHz
 -12.513 dBm

MARKER TO MAX
 MARKER TO MIN

MARKER READOUT
 FUNCTIONS

Mini-Circuits
 15542
 ZFAT-51020

Step Attenuator
 1 → 5db
 2 → 10db
 3 → 20db

TTL: 1 → +5vdc
 0 → GND
 1 2 3
 0 1 0

FIG. #14

Fig 14: Prog. Attn. ZFAT-51020 Freq. vs. Attenuation

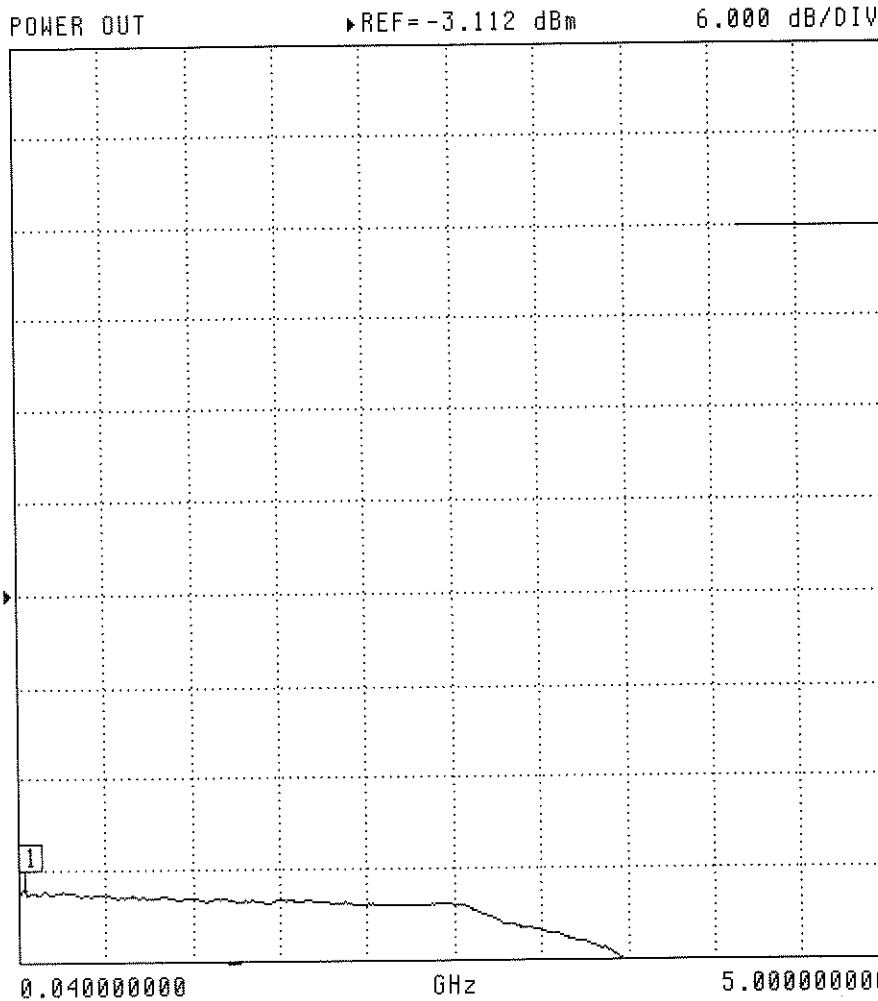
37269B

MODEL: DATE: 08/22/96 13:55 Page 1
 DEVICE ID: OPERATOR:

START: 0.040000000 GHz GATE START: - ERROR CORR: TRANS FWD
 STOP: 5.000000000 GHz GATE STOP: - AVERAGING: 1 PT
 STEP: 0.012400000 GHz GATE: - IF BNDWDTH: 1 KHz
 WINDOW: -

PARAMETER: -----CH1-----
 NORMALIZATION: -S21-
 REFERENCE PLANE: OFF
 SMOOTHING: 0.0000 mm
 DELAY APERTURE: 0.0 PERCENT

S21 FORWARD TRANSMISSION



CH 1 - S21
 REFERENCE PLANE
 0.0000 mm

MARKER 1
 0.077200000 GHz
 -22.369 dBm

MARKER TO MAX

MARKER 1
 0.077200000 GHz
 -22.369 dBm

MARKER TO MAX
 MARKER TO MIN

MARKER READOUT
 FUNCTIONS

Mini-Circuits
 1554L

FIG. #15

Step Attenuator

1 → 5db
 2 → 10db
 3 → 20db

TTL: 1 → +5vdc

0 → GND

1 2 3

0 0 1

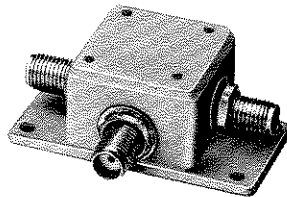
FAT: 51020

Mini-Circuits

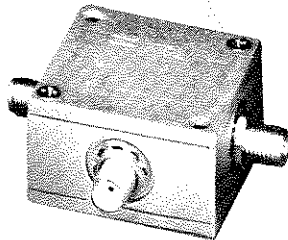
ULTRA-REL™ MIXERS

5-YR. GUARANTEE*

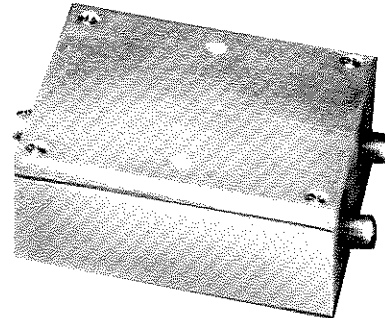
500 Hz to 4.3 GHz



ZEM



ZFM



ZAM

| MODEL NO. | FREQUENCY MHz | | CONVERSION LOSS dB | | | | LO-RF ISOLATION, dB | | | | | | LO-IF ISOLATION, dB | | | | | | CAPD DATA (see RF/IF Designer Handbook) Page | Case Style Note B | Z0-Connector | Price \$ Qty. (1-9) |
|------------|------------------------|---------|--------------------|----------|-------------|------|---------------------|------|------|------|------|------|---------------------|------|------|------|----|----|--|----------------------|--------------|------------------------|
| | LO/RF f_L - f_U | IF | Mid-Band | | Total Range | L | | M | | U | | L | | M | | U | | | | | | |
| | | | \bar{x} | σ | | Max. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | Typ. | Min. | | | | | | |
| △ ZEM-2B | 10-1000 | DC-1000 | 5.74 | .07 | 7.0 | 8.5 | 55 | 50 | 30 | 25 | 25 | 20 | 55 | 45 | 30 | 20 | 25 | 20 | 1-66 | V37 | ad | 59.95 |
| △ ZEM-4300 | 300-4300 | DC-1000 | 6.65 | .06 | — | 9.5 | 40 | 20 | — | — | 30 | 17 | 15 | 8 | — | — | 15 | 8 | 1-246 | V37 | af | 79.95 |
| ZFM-1W | 10-750 | DC-750 | 5.42 | .14 | 7.0 | 8.0 | 50 | 45 | 45 | 30 | 35 | 25 | 45 | 40 | 40 | 25 | 27 | 20 | 1-54 | K18 | ad | 51.95 |
| ZFM-2 | 1-1000 | DC-1000 | 5.72 | .06 | 7.5 | 8.5 | 50 | 45 | 40 | 25 | 30 | 25 | 45 | 40 | 35 | 25 | 25 | 20 | 1-66 | K18 | ad | 53.95 |
| ZFM-3 | 0.04-400 | DC-400 | 4.78 | .03 | 7.0 | 8.0 | 60 | 50 | 50 | 35 | 35 | 25 | 55 | 40 | 45 | 30 | 35 | 25 | 1-68 | K18 | ad | 61.95 |
| † ZFM-4 | 5-1250 | DC-1250 | 5.70 | .34 | 7.5 | 8.5 | 50 | 45 | 40 | 30 | 30 | 25 | 45 | 40 | 35 | 25 | 25 | 20 | 1-70 | K18 | ad | 61.95 |
| ZFM-5X | 1-1500 | 1-1000 | 5.9 | .10 | 7.0 | 9.0 | 60 | 40 | 40 | 20 | 28 | 17 | 60 | 45 | 45 | 25 | 38 | 20 | — | K18 | ad | 69.95 |
| ZFM-11 | 1-2000 | 5-600 | 7.03 | .17 | 8.5 | 9.0 | 50 | 45 | 35 | 25 | 25 | 20 | 45 | 40 | 27 | 20 | 25 | 20 | 1-72 | K18 | ad | 89.95 |
| ZFM-12 | 800-1250 | 50-90 | 5.67 | .12 | — | 7.5 | 35 | 25 | 35 | 25 | 35 | 25 | 30 | 20 | 30 | 20 | 30 | 20 | 1-74 | K18 | ad | 79.95 |
| △ ZFM-2000 | 100-2000 | DC-600 | 7.49 | .20 | 9.5 | 9.5 | — | — | 37 | 20 | — | — | — | — | 18 | 10 | — | — | 1-60 | K18 | ad | 71.95 |
| △ ZFM-4212 | 2000-4200 | DC-1300 | 5.44 | .088 | — | 8.5 | — | — | 25 | 17 | — | — | — | — | — | — | — | — | 1-84 | K18 | ad | 54.95 |
| △ ZAM-42 | 1500-4200 | DC-500 | 5.67 | .11 | — | 8.5 | 25 | 14 | 25 | 14 | 25 | 14 | 18 | 10 | 18 | 10 | 18 | 10 | 1-85 | F14 | af | 54.95 |

L = low range (f_L to $10f_L$)

M = mid range ($10f_L$ to $f_U/2$)
m = mid band ($2f_L$ to $f_U/2$)

U = upper range ($f_U/2$ to f_U)

NSN GUIDE

| MCL NO. | NSN |
|---------------|------------------|
| ZAD-1B(BNC) | 5985-00-280-7750 |
| ZAD-4B | 5895-01-127-0376 |
| ZAD-6B | 5895-01-344-7843 |
| ZEM-2 | 5895-01-235-7834 |
| ZFM-2 | 4935-01-230-3782 |
| ZFM-3 | 5895-01-257-9523 |
| ZFM-3 (SMA) | 5895-01-214-7362 |
| ZFM-3B | 5895-01-381-9289 |
| ZLW-1W | 5895-00-607-7010 |
| ZLW-2 | 6920-01-037-1974 |
| ZLW-2B | 5840-01-186-8398 |
| ZP-10514 | 6625-01-108-6156 |
| ZP-10514(BNC) | 5895-01-384-7453 |

coaxial connections

see case style outline drawings

| PORT | ad | ae | af | ag | hg |
|----------|----|----|----|----|----|
| LO | 1 | 1 | 2 | L | L |
| RF | 2 | 3 | 1 | R | X |
| IF | 3 | 2 | 3 | X | R |
| GND EXT. | — | — | — | — | — |
| CASE GND | — | — | — | — | — |
| NOT USED | — | — | — | — | — |

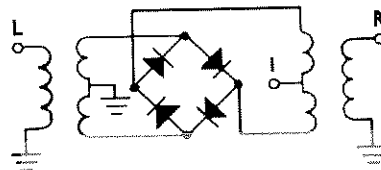


Fig 16: ZFM-2 Mixer Specs.

FIG. #16



In Stock...Immediate Delivery

For more information on standard models consult our applications dept.

37269B

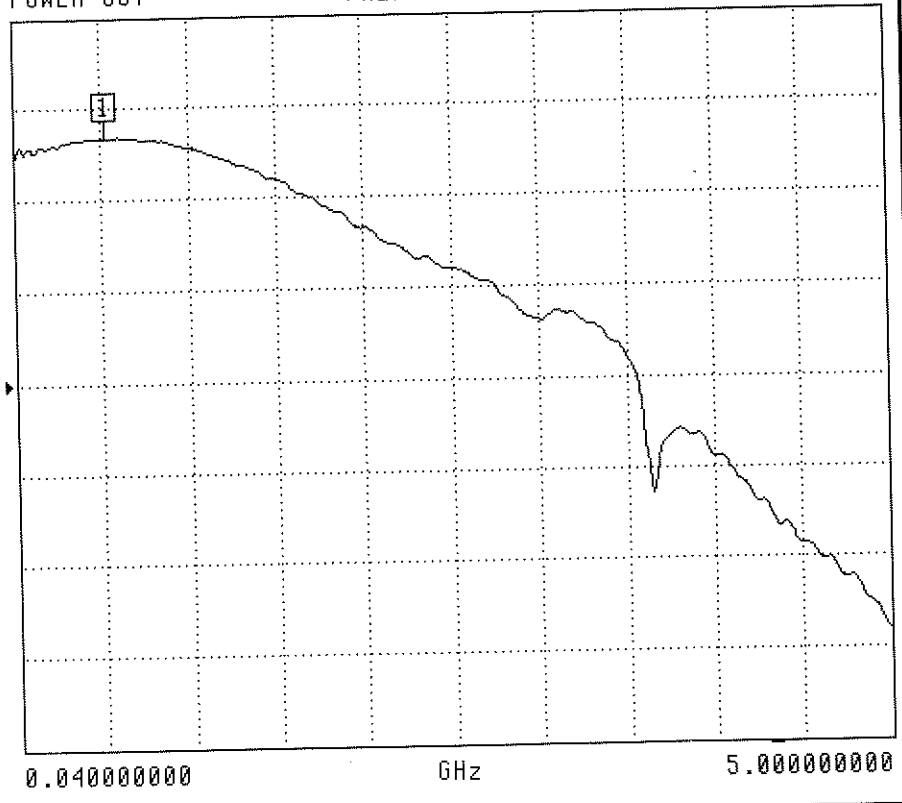
MODEL: DATE: 08/22/96 13:12 Page 1
DEVICE ID: OPERATOR:

START: 0.040000000 GHz GATE START: - ERROR CORR: TRANS FWD
STOP: 5.000000000 GHz GATE STOP: - AVERAGING: 1 PT
STEP: 0.012400000 GHz GATE: - IF BNDWDTH: 1 KHz
WINDOW: -

PARAMETER: -CH1-
NORMALIZATION: -S21-
REFERENCE PLANE: 0.0000 mm
SMOOTHING: 0.0 PERCENT
DELAY APERTURE: -

S21 FORWARD TRANSMISSION

POWER OUT REF=-3.112 dBm 6.000 dB/DIV



CH 1 - S21
REFERENCE PLANE
0.0000 mm
MARKER 1
0.568800000 GHz
12.973 dBm

MARKER TO MAX
MARKER TO MIN

MARKER READOUT
FUNCTIONS

Mini-Circuits
15542
ZFL-1000LN
9628

16 db LNA
w/10db pad

Fig 17: ZFL-1000LN Frequency vs. gain FIG. #17

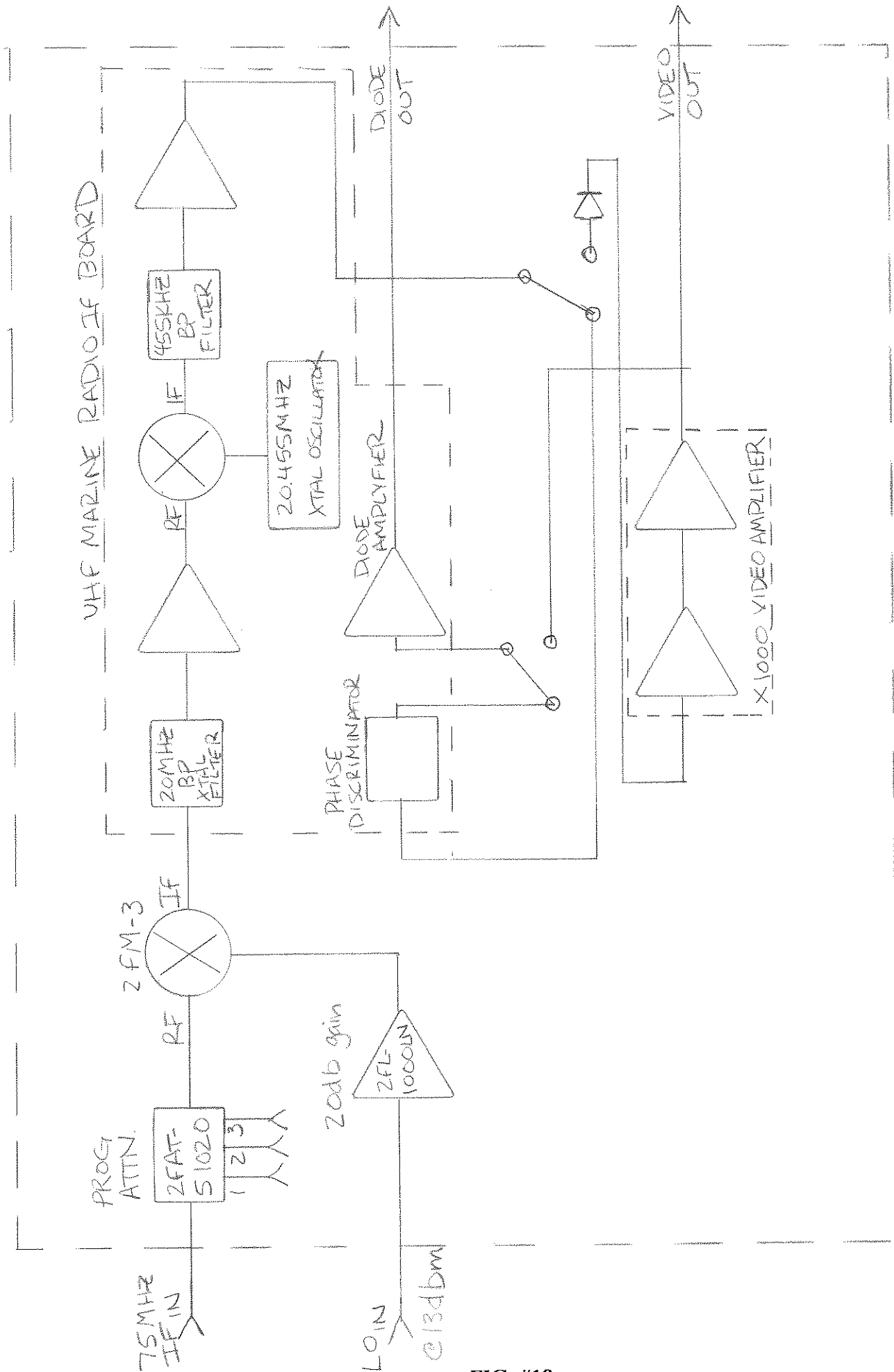
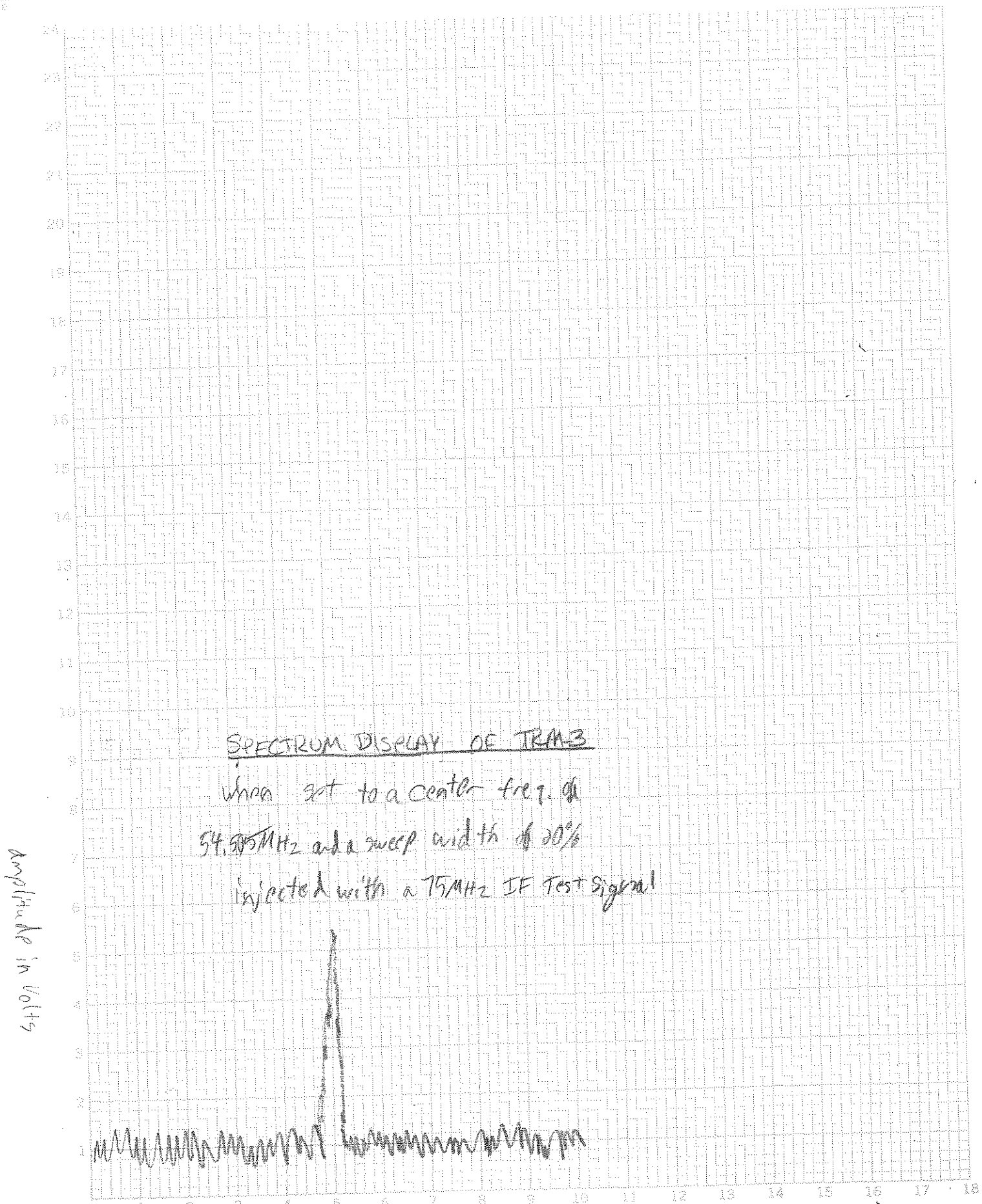


FIG. #18

FIG 18: WORKING IF CHASSIS BLOCK DIAGRAM WITH VHF MARINE RADIO IF BOARD



SPECTRUM DISPLAY OF TRM-3

When set to a center freq. of
54.505 MHz and a sweep width of 20%
injected with a 75 MHz IF Test Signal

Amplitude in Volts

49.055

54.505

FIG. #19

59.956

Frequency in MHz

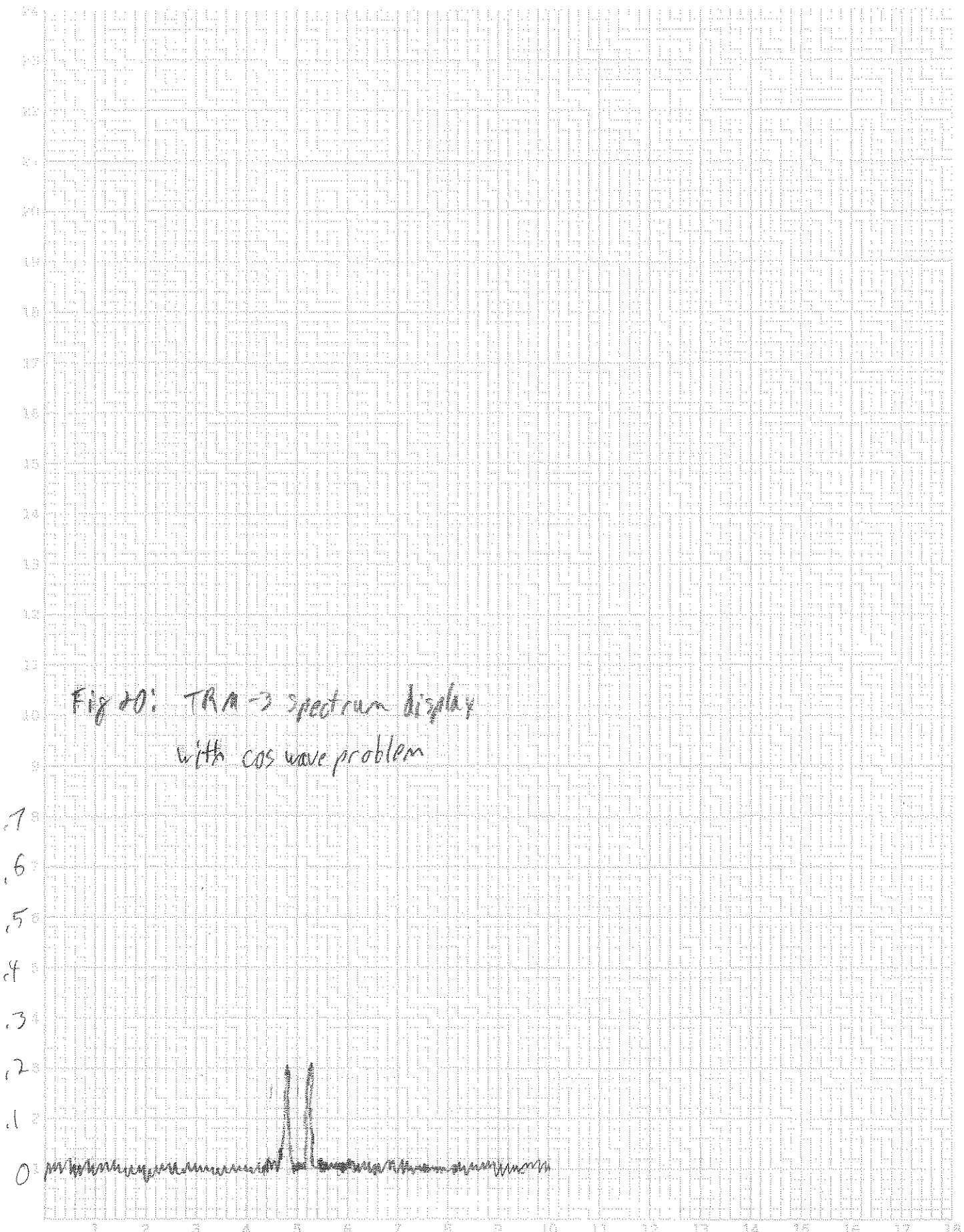


Fig #0: TRA -> spectrum display
with cos wave problem

Multiplied in Volts

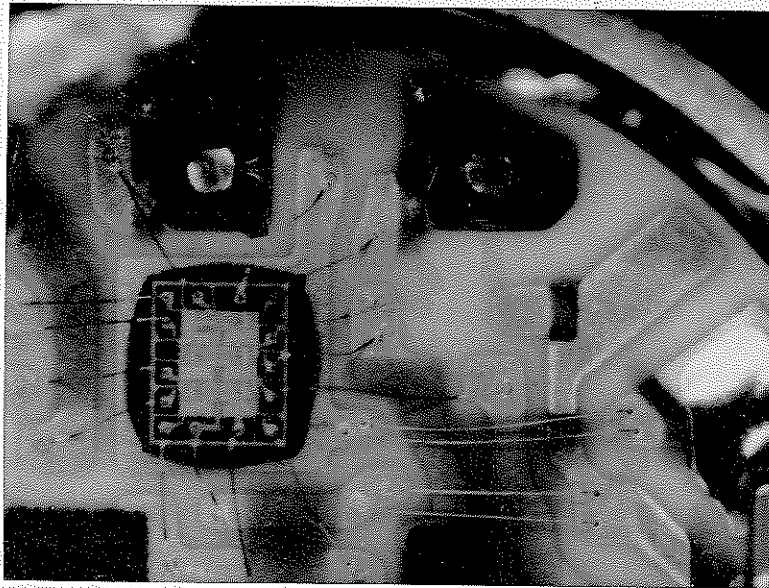
80

100
Frequency in MHz

FIG. #20

120

ZFAT-51020, RMA # 11544.



Yes
PIN
#12

FIG. #21

Fig 21: Photograph of bad. ZFAT-51020 Prog. Attn.

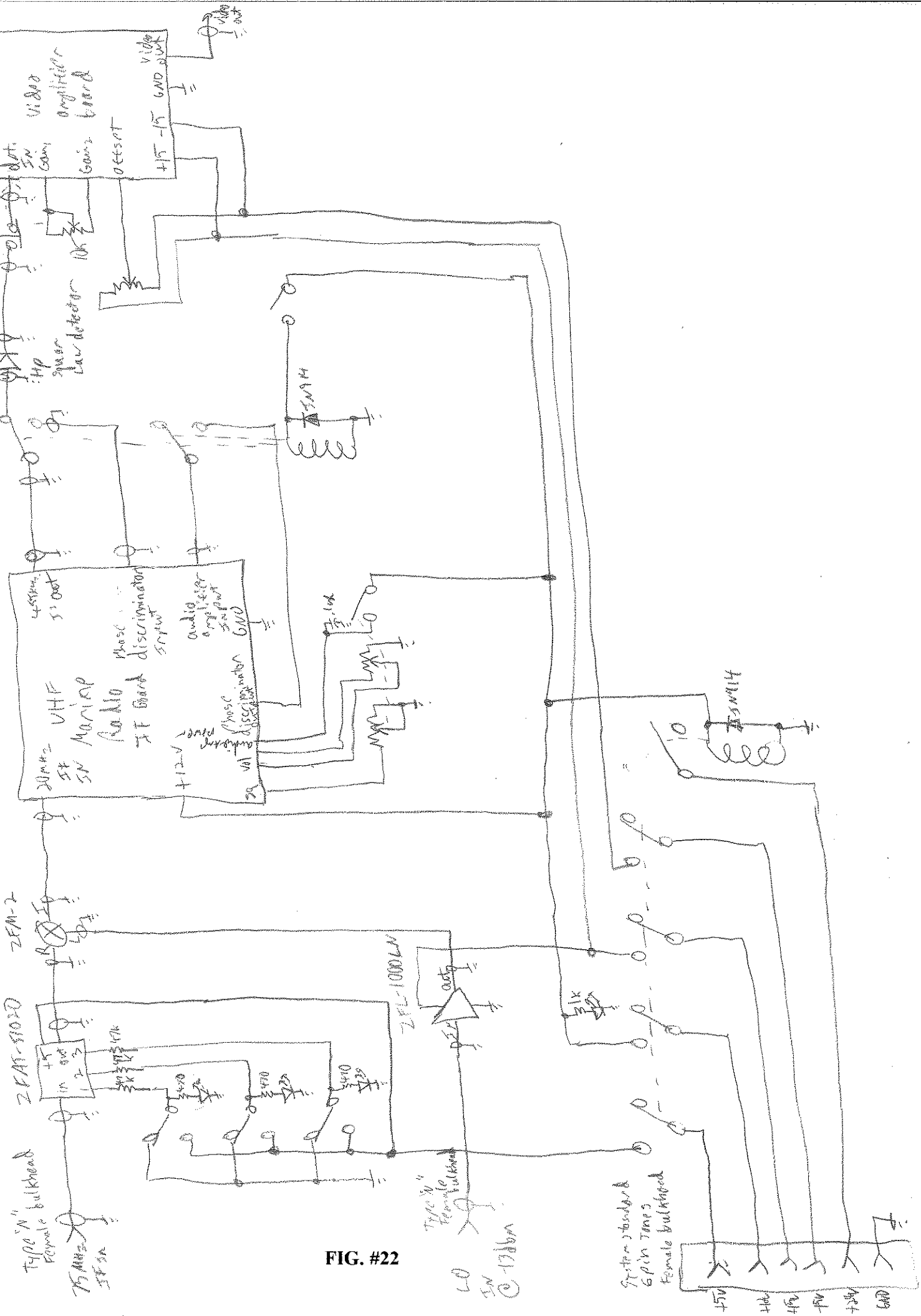


FIG. #22

Fig 22: Full schematic of IF chassis

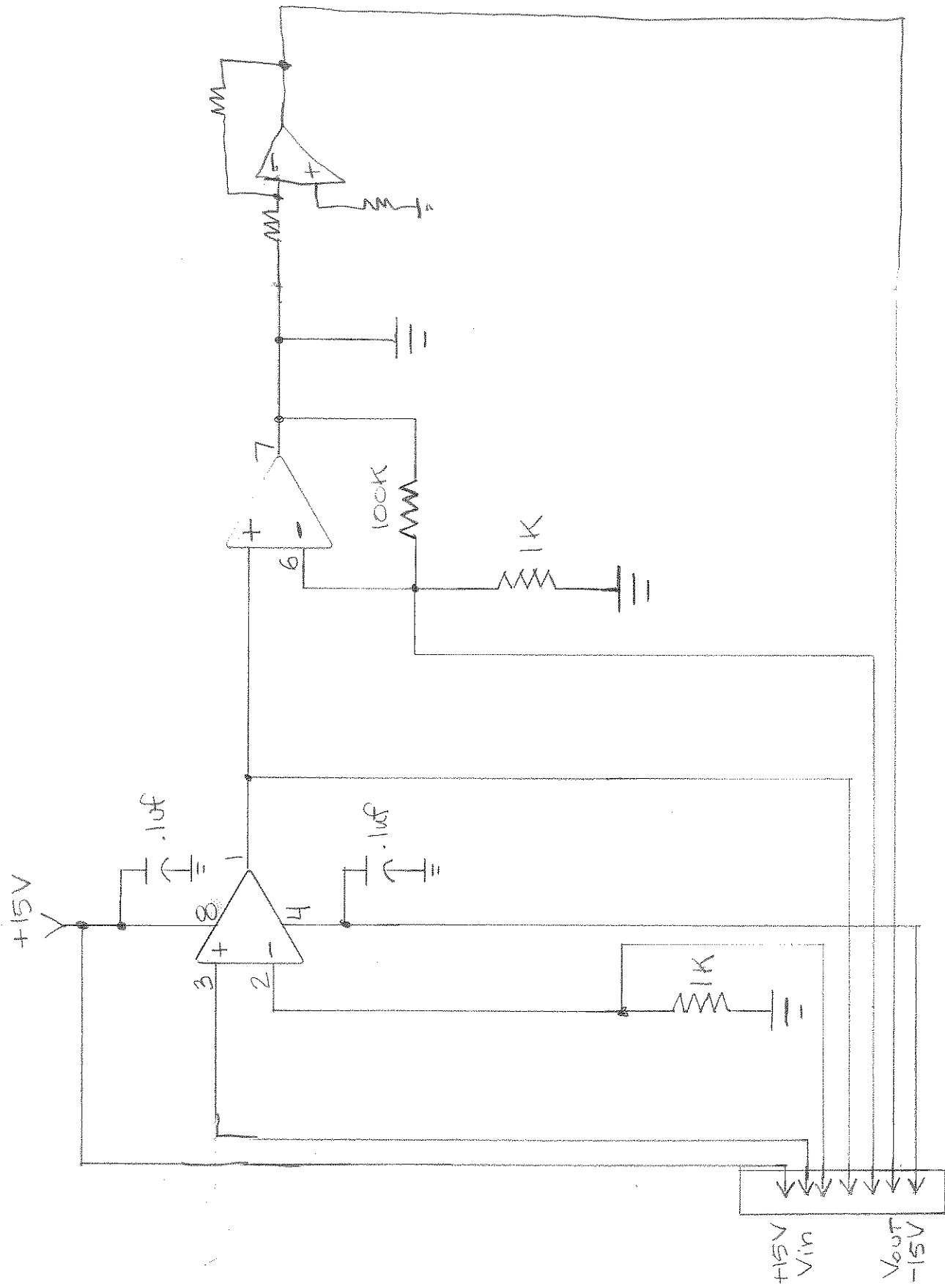


Fig 226: Schematic of Video Amplifier board

9-PIN
"D" TYPE
MALE
CONN.

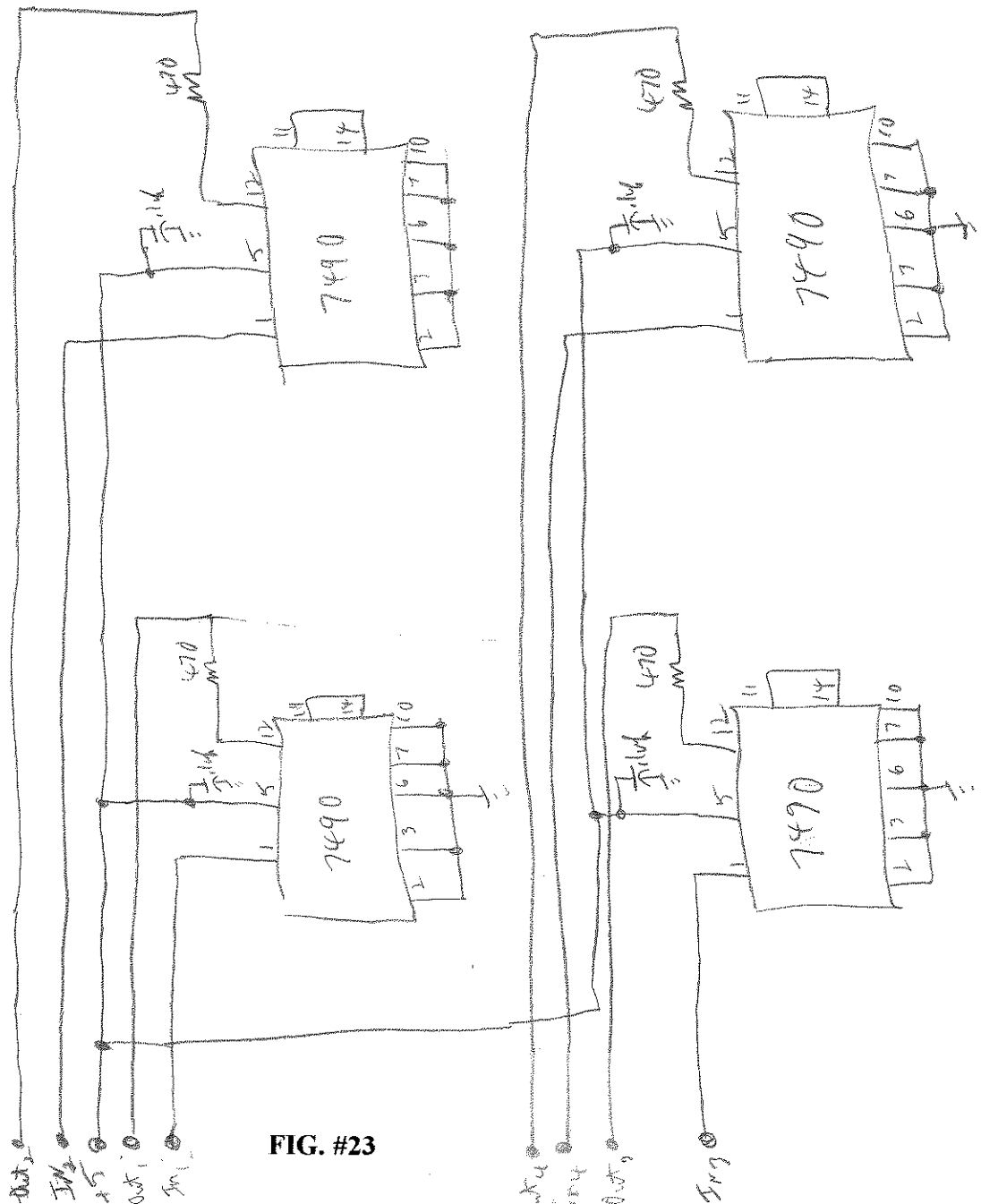
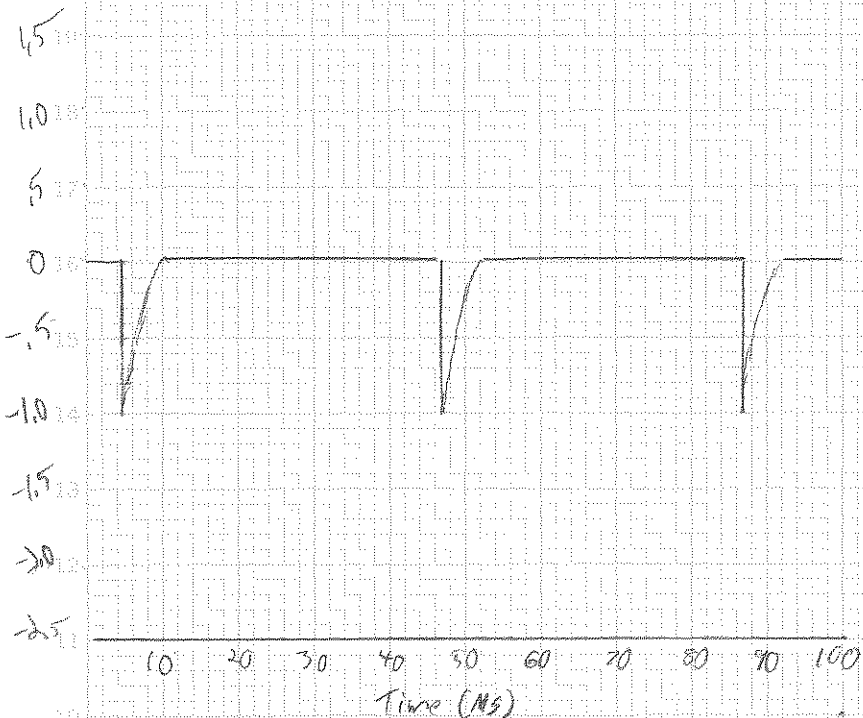


FIG. #23

Fig 23: Decade counter based schematic for both the filter chassis and bandpass separator

Fig 24: Sweep Voltage Vs. Strange wave form on comparator outputs

Signal from LM339 w/o +5 -15 supply voltage



Adjustable Sweep voltage

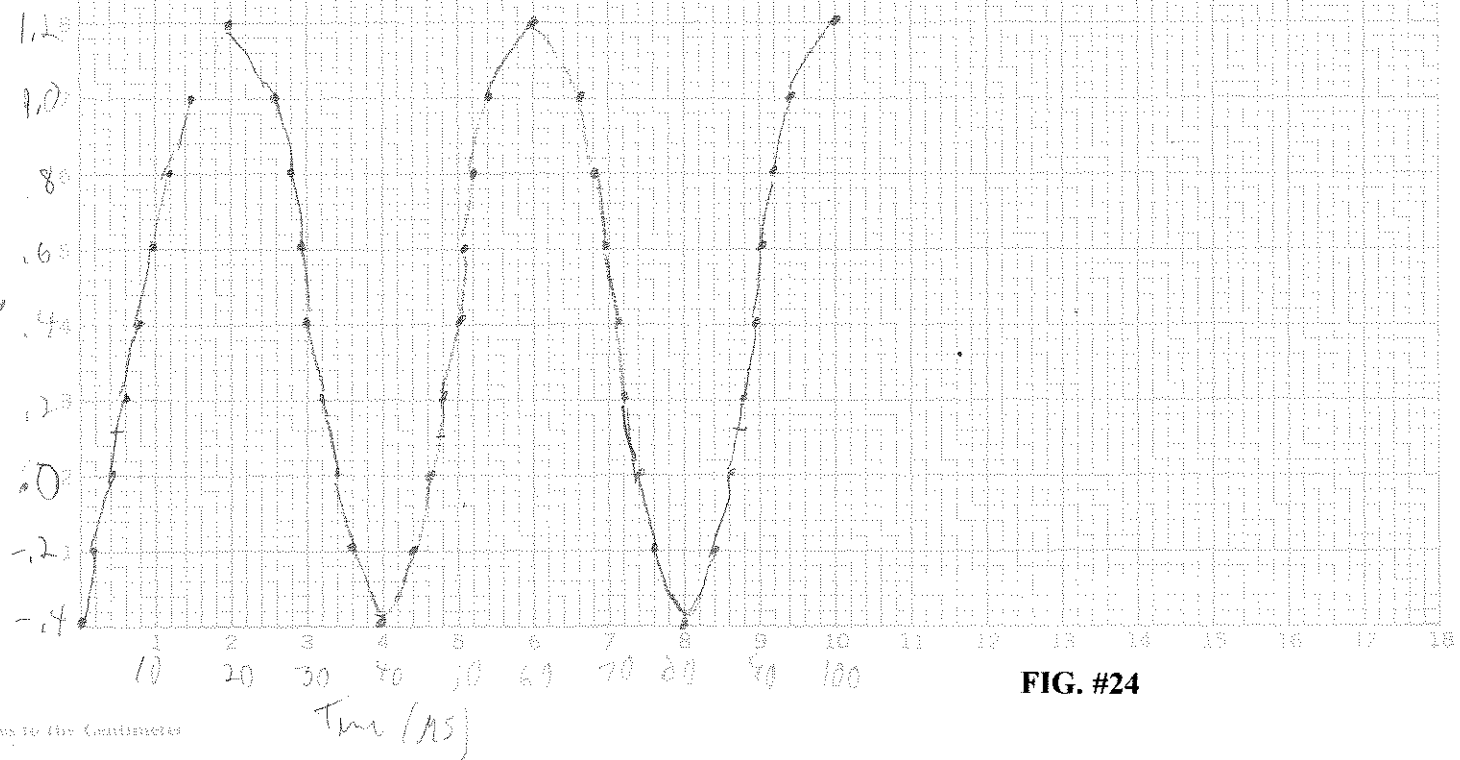


FIG. #24



Fig 25: Typical High/Low signal out of one window comparator vs sweep

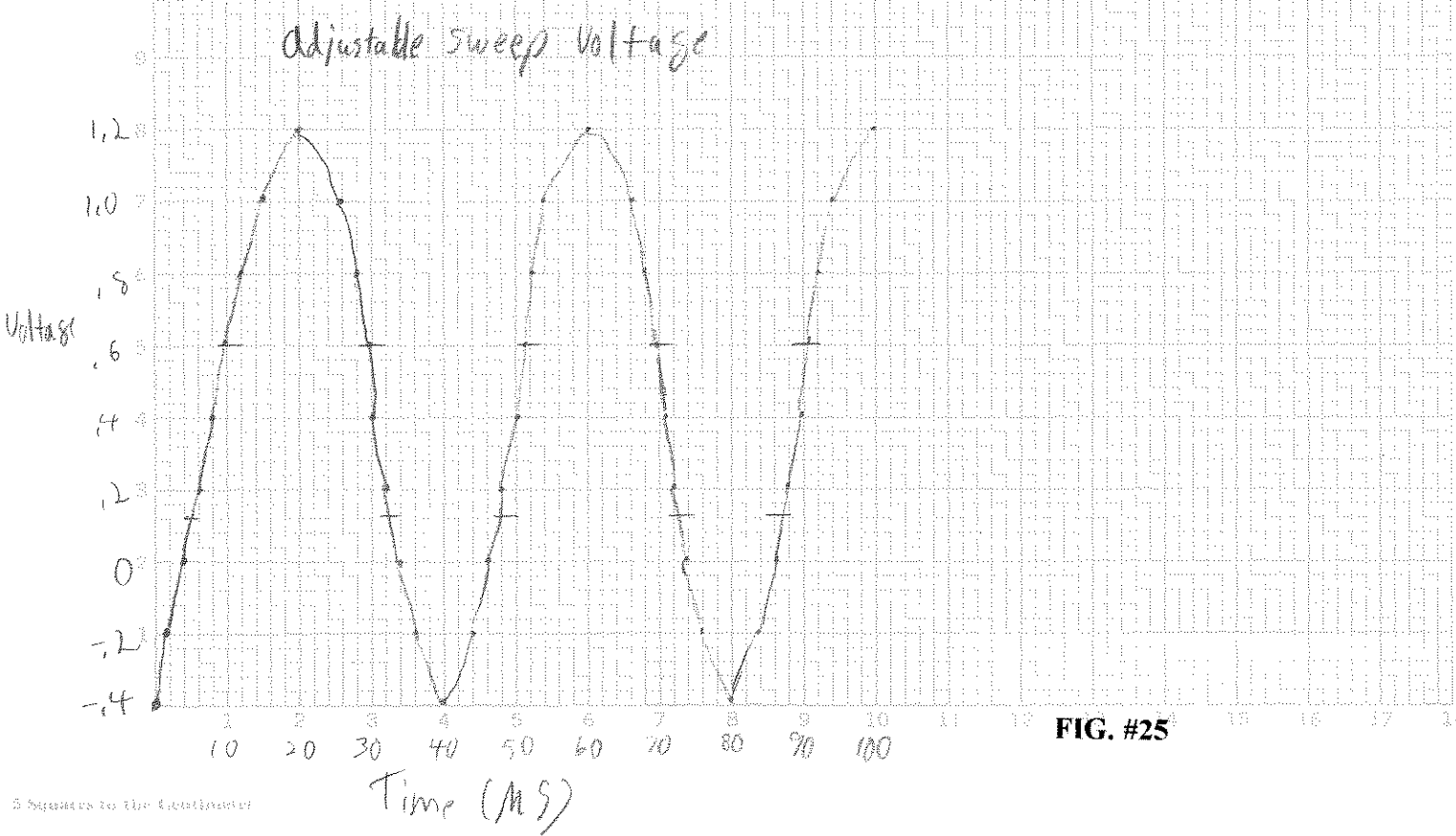
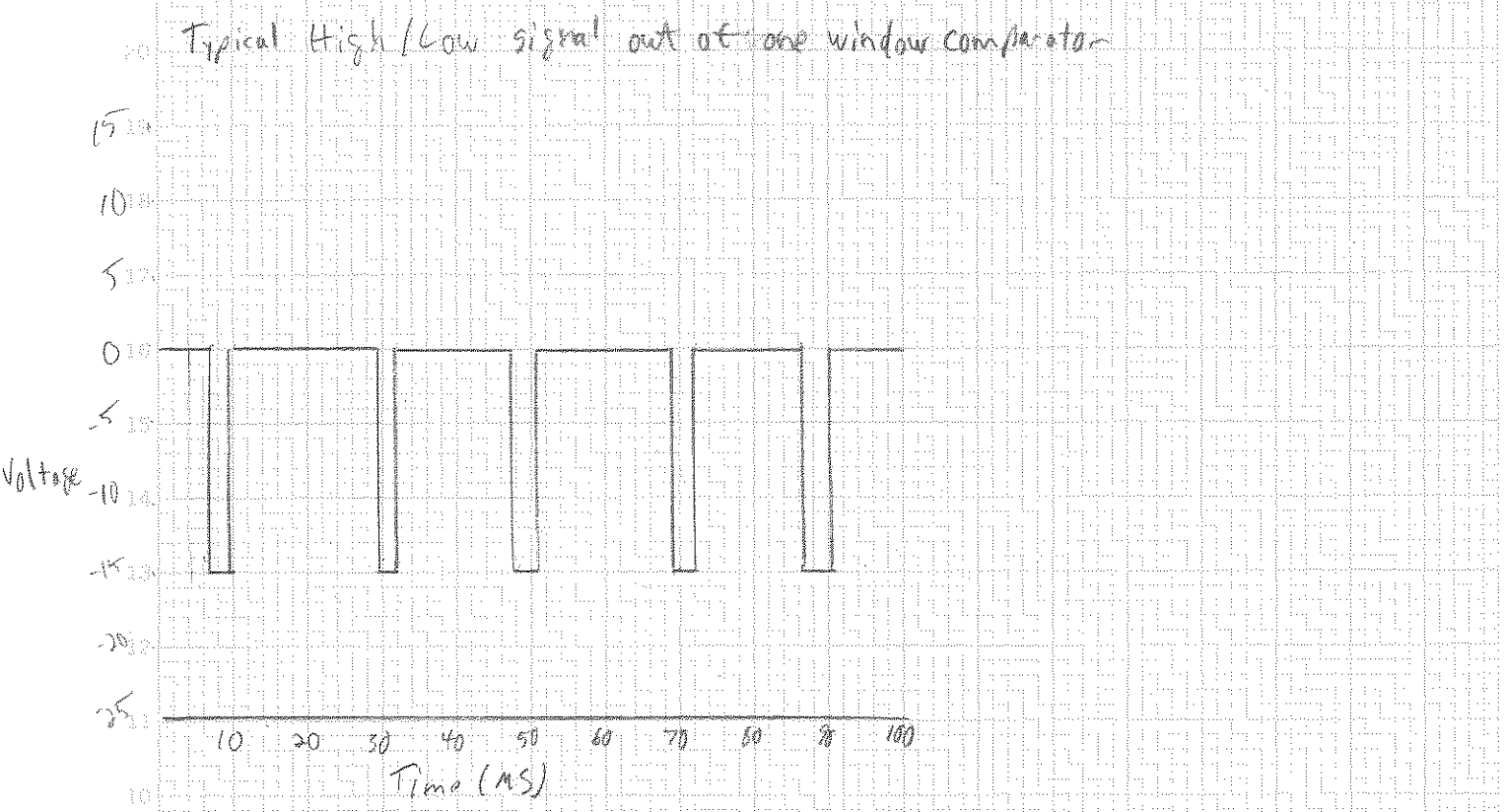
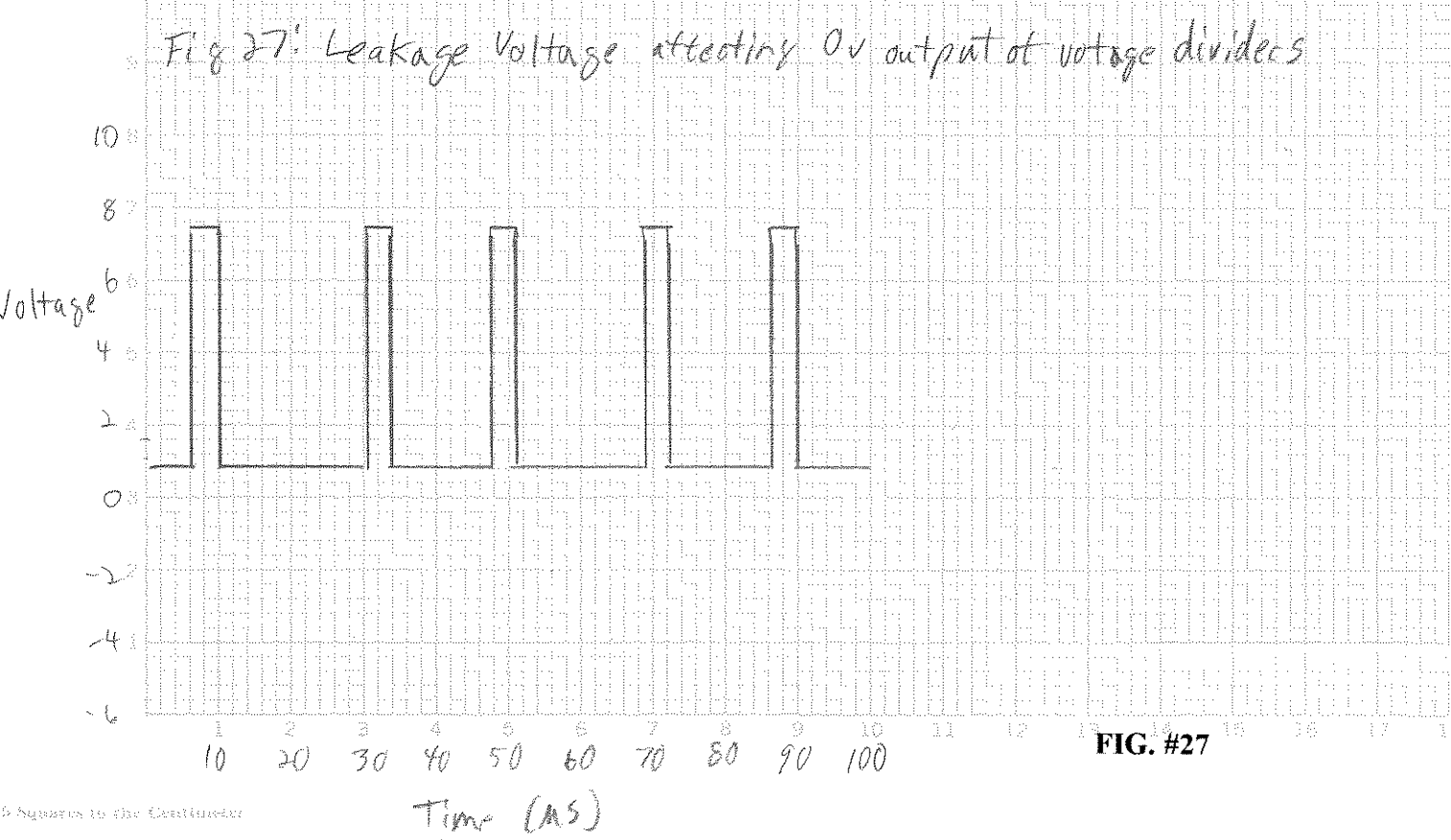
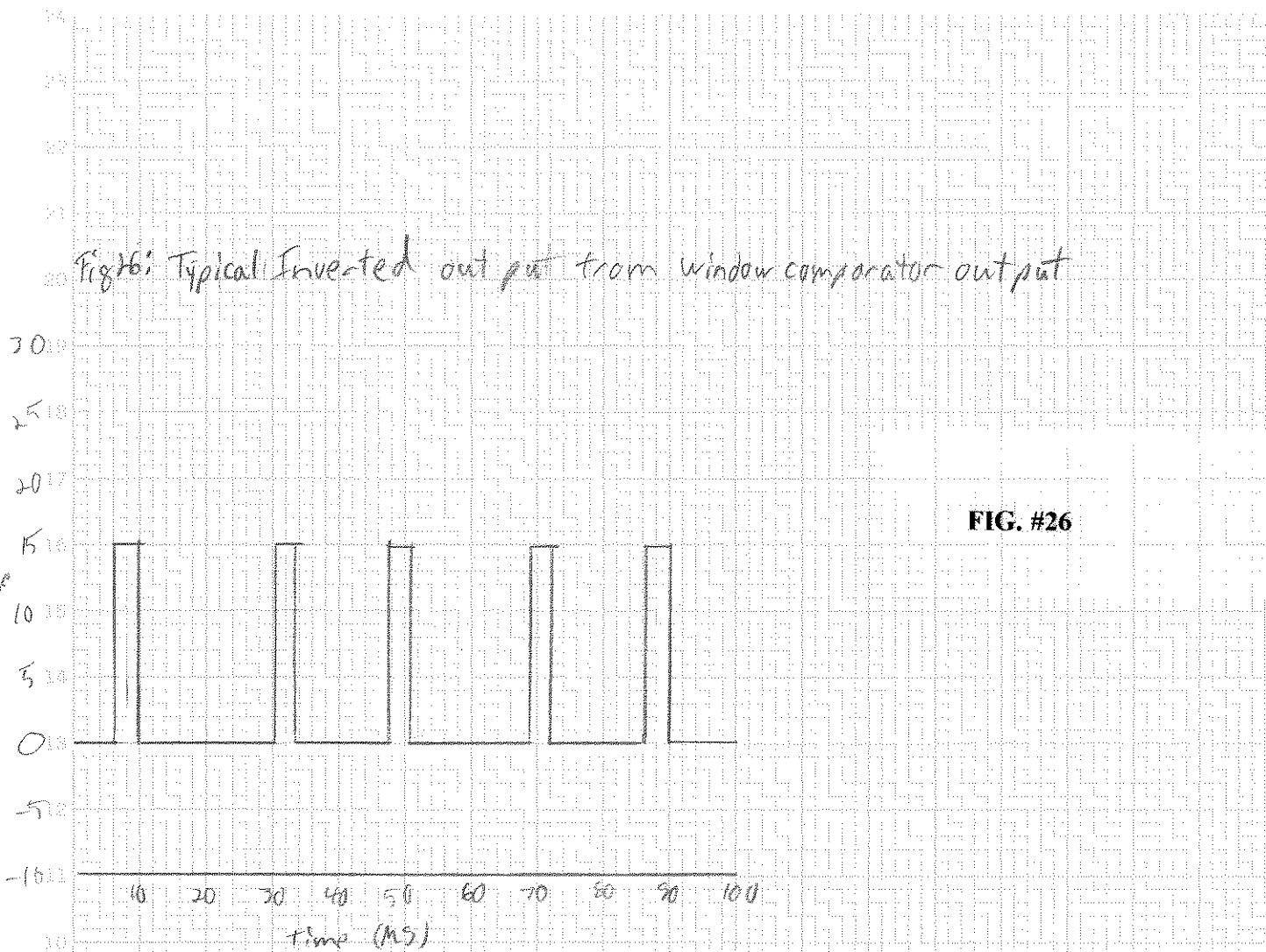


FIG. #25



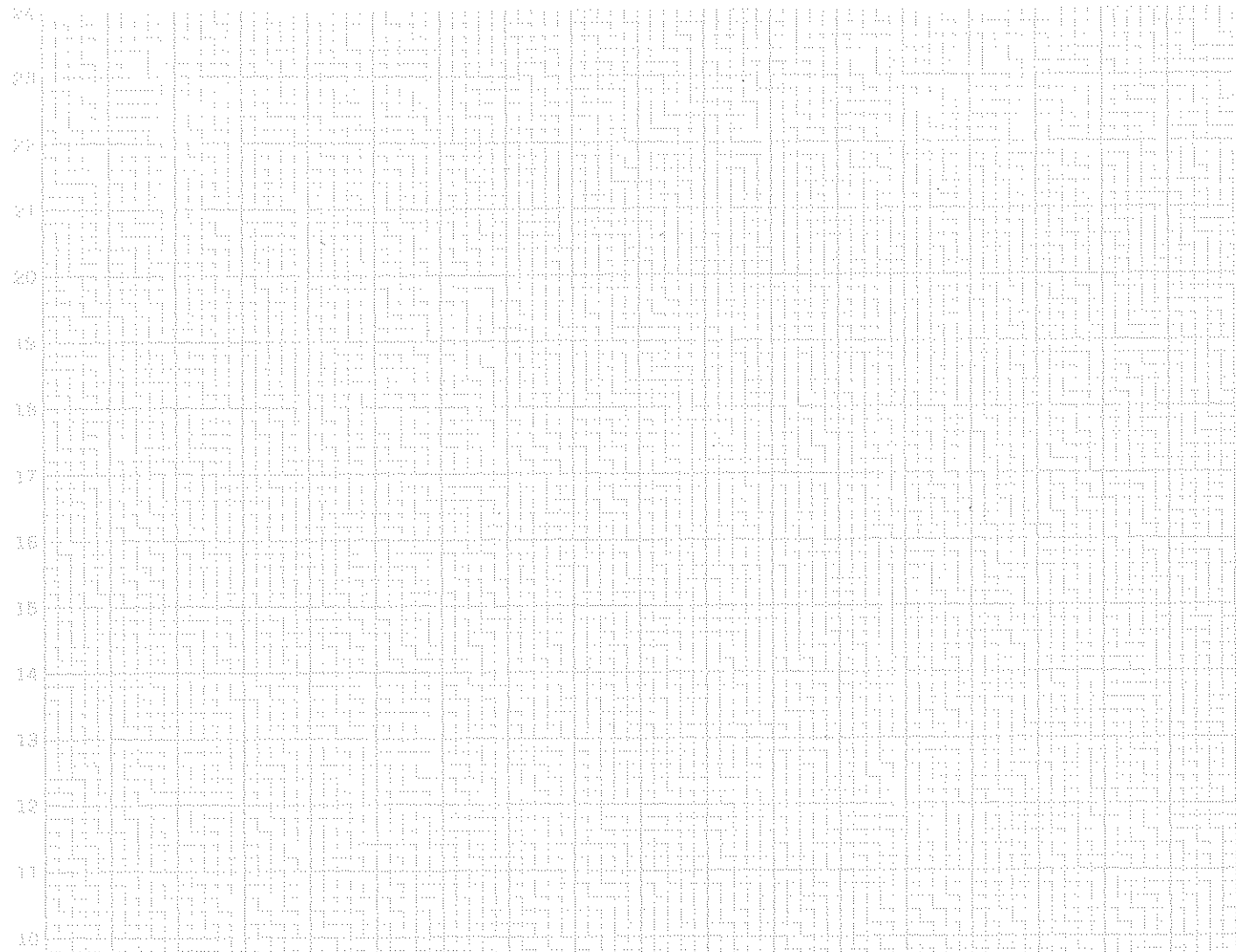


Fig 28: Corrected Voltage divider high Low output after modification

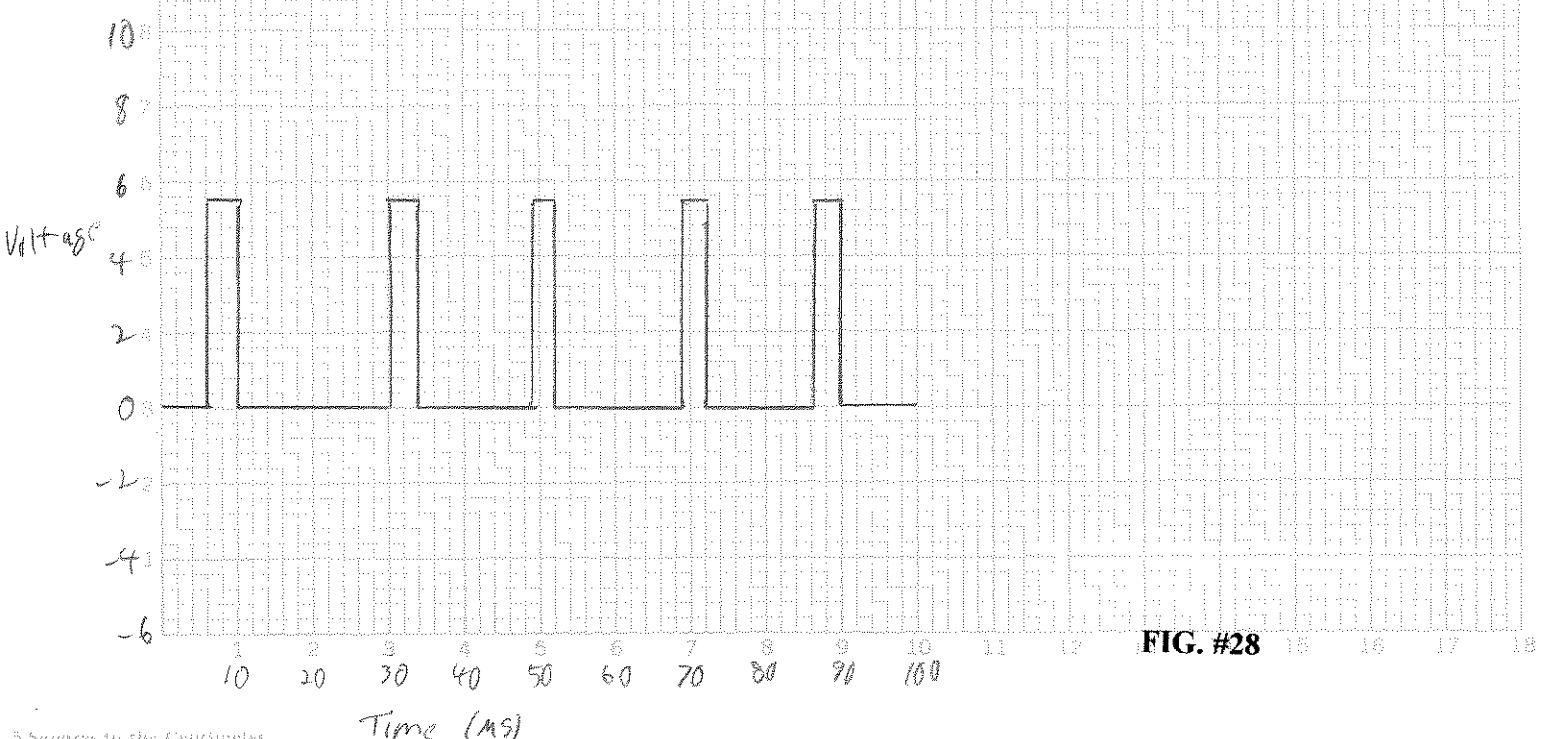
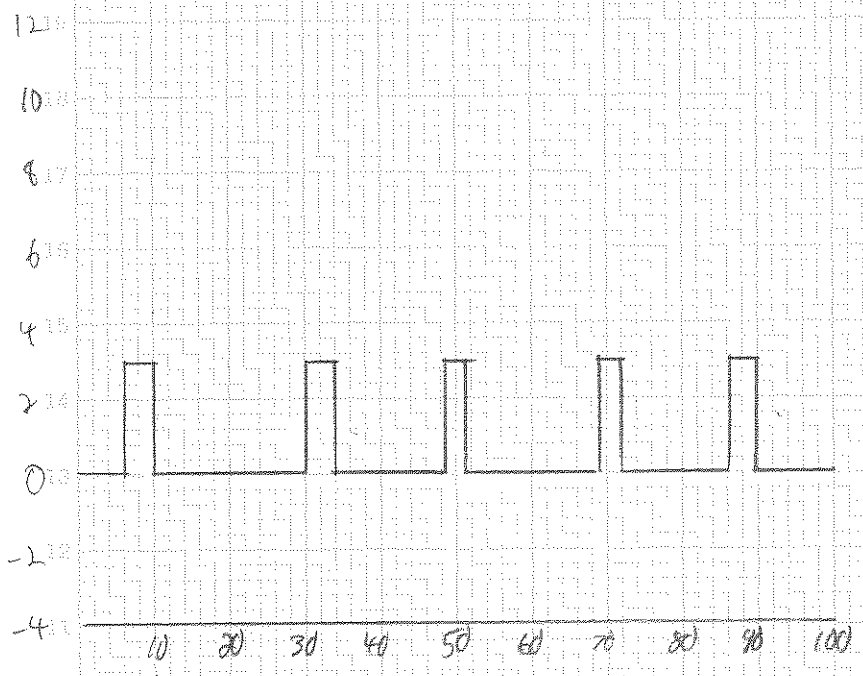


FIG. #28



Fig 29: Sweep vs output of Filter chassis w/5v dc test input

Output of Filter chassis w/5v dc test input



Adjustable sweep voltage

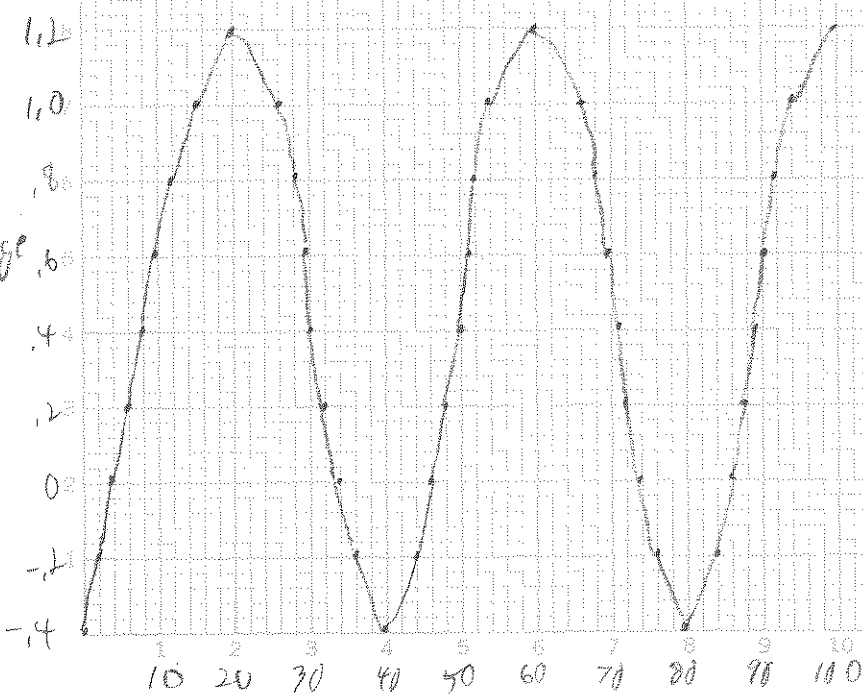


FIG. #29

THE FINAL SCHEMATIC OF THE FILTER CHASSIS

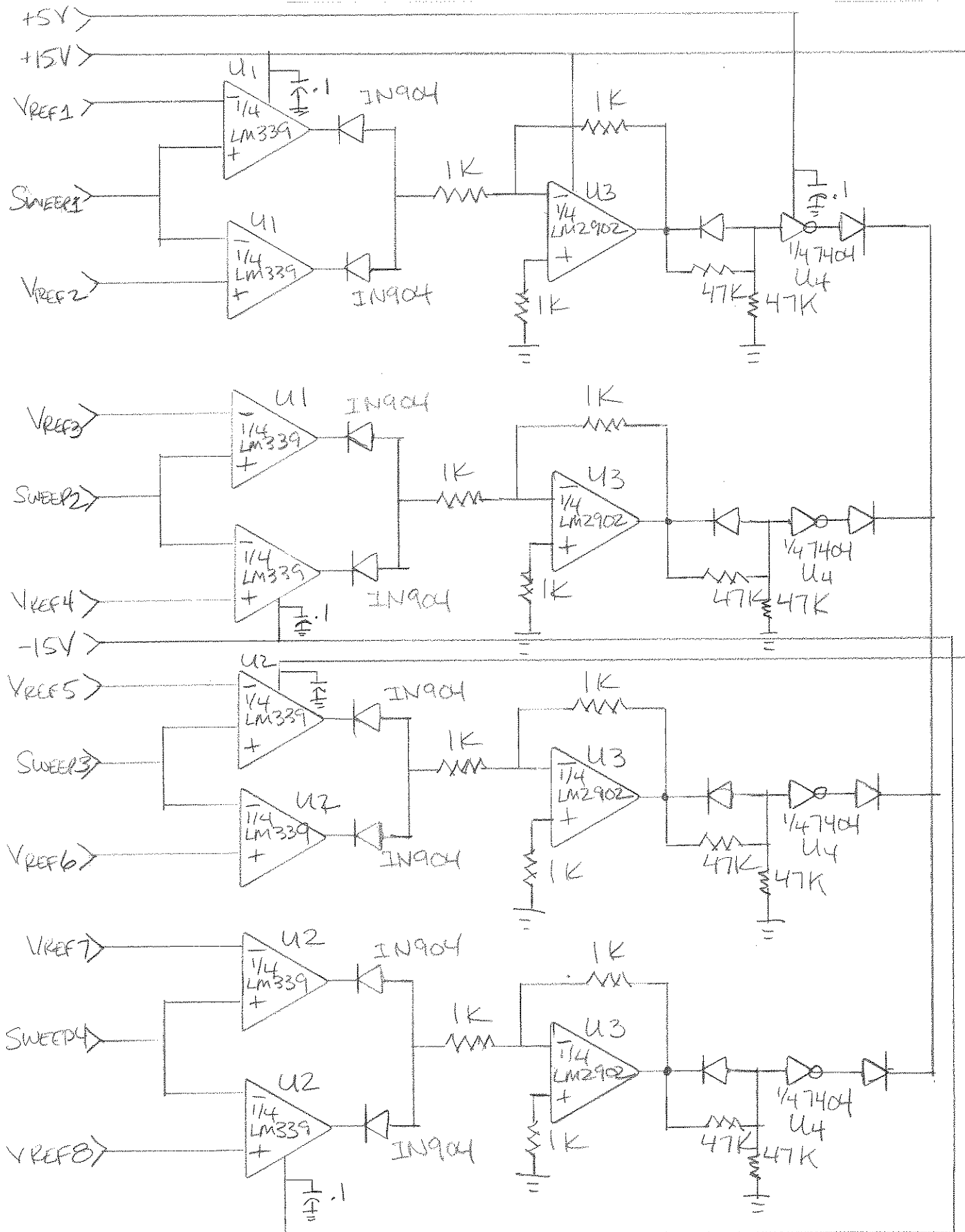


FIG. #30

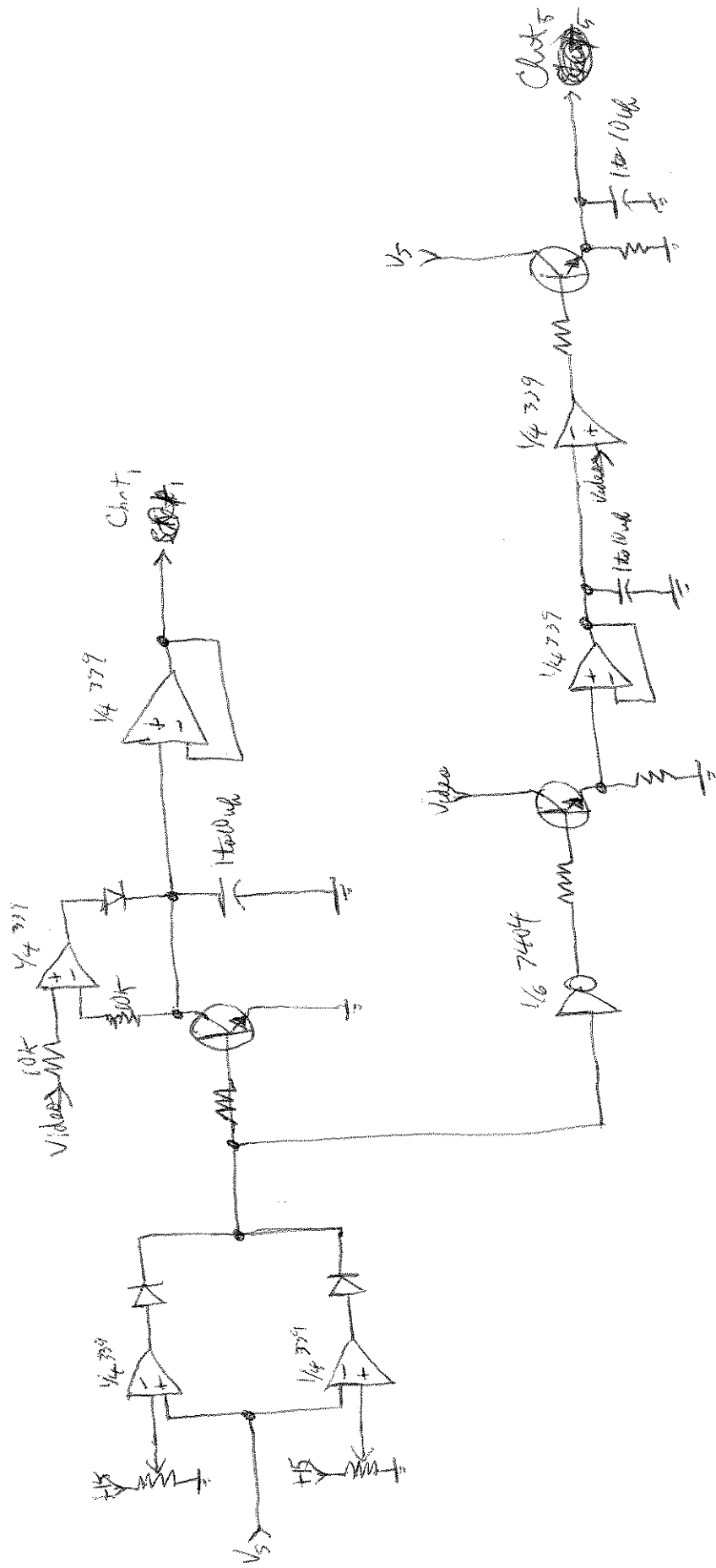


Fig 31: original simplified schematic of one Bandpass Separator Channel

FIG. #31

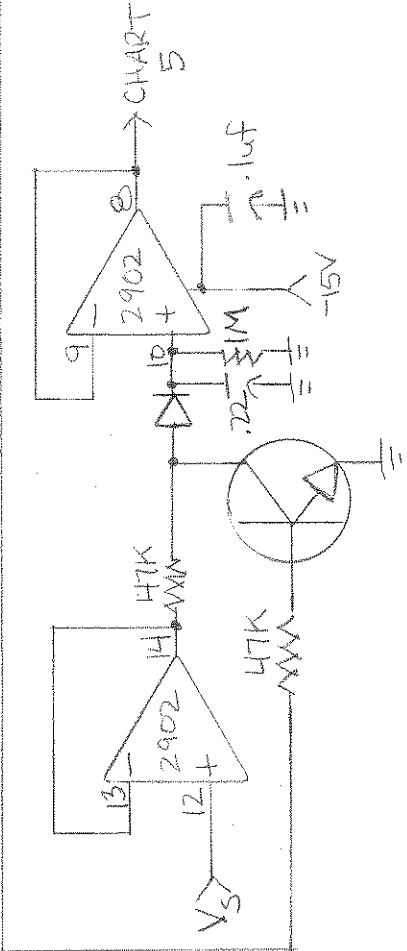
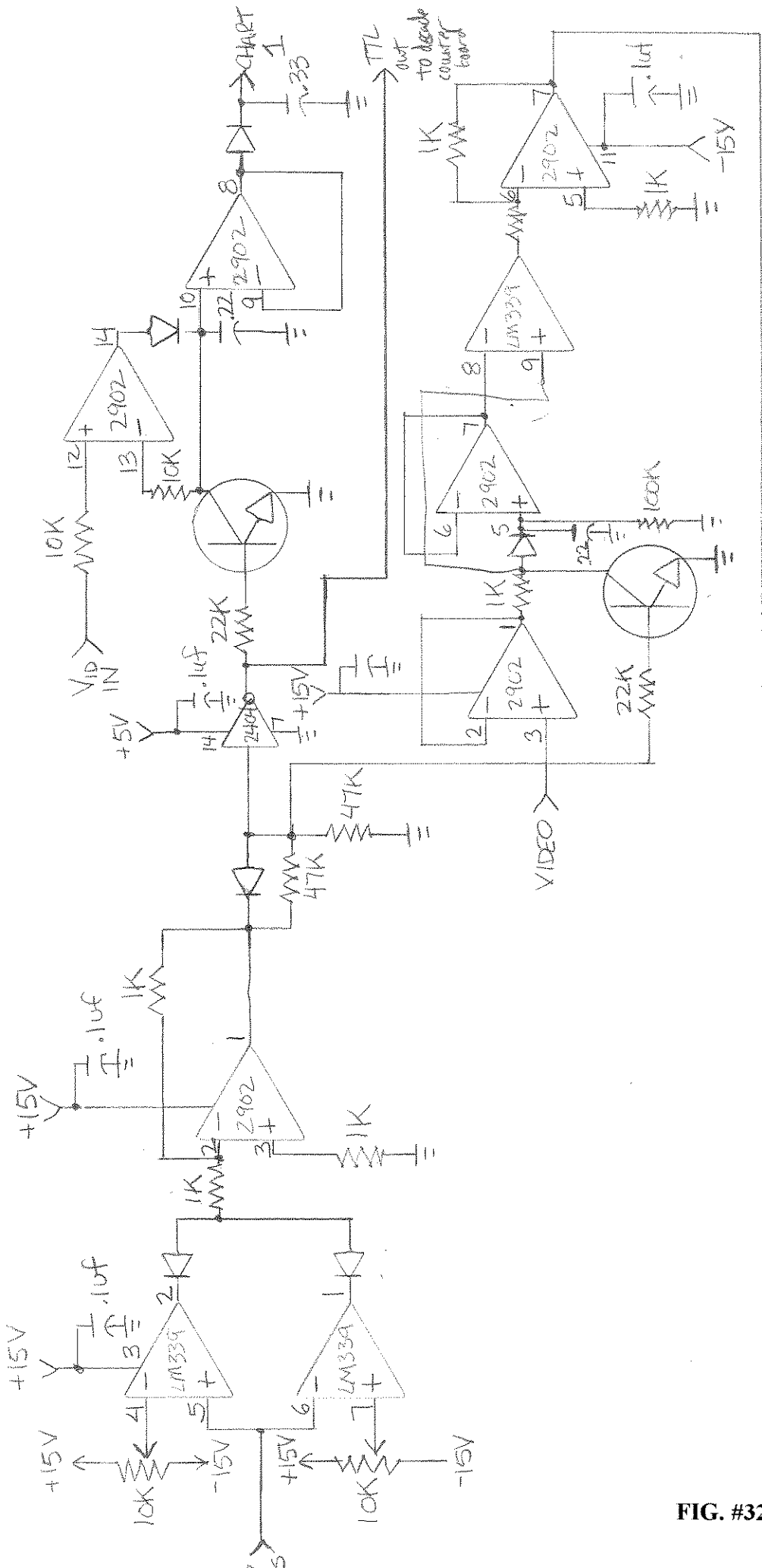


FIG. #32

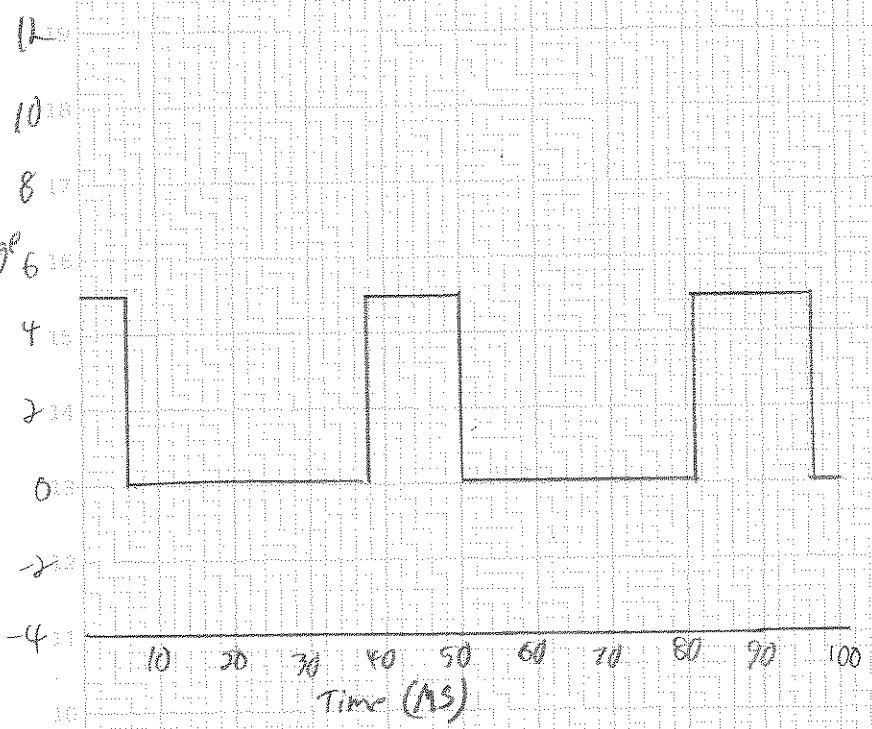
Fig 32: Final simplified schematic of an Frequency vs. Amplitude Plot separator channel



Fig 33:

Typical TTL output of one Hex inverter on one Bandpass Separator Channel
Vs. Fixed Sweep Voltage

Typical TTL output of one Hex inverter on one Bypass Separator Channel



Fixed Sweep Voltage amplified for Bandpass Separator

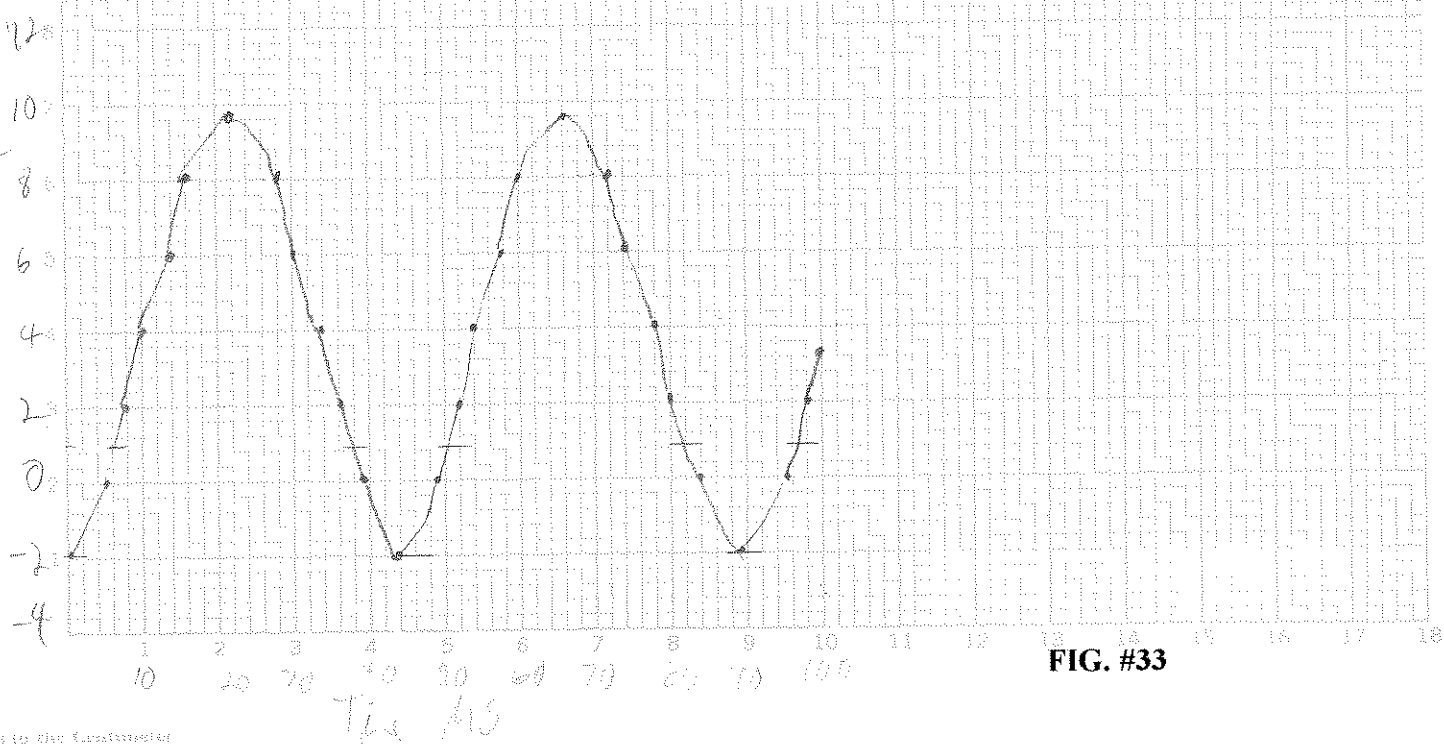
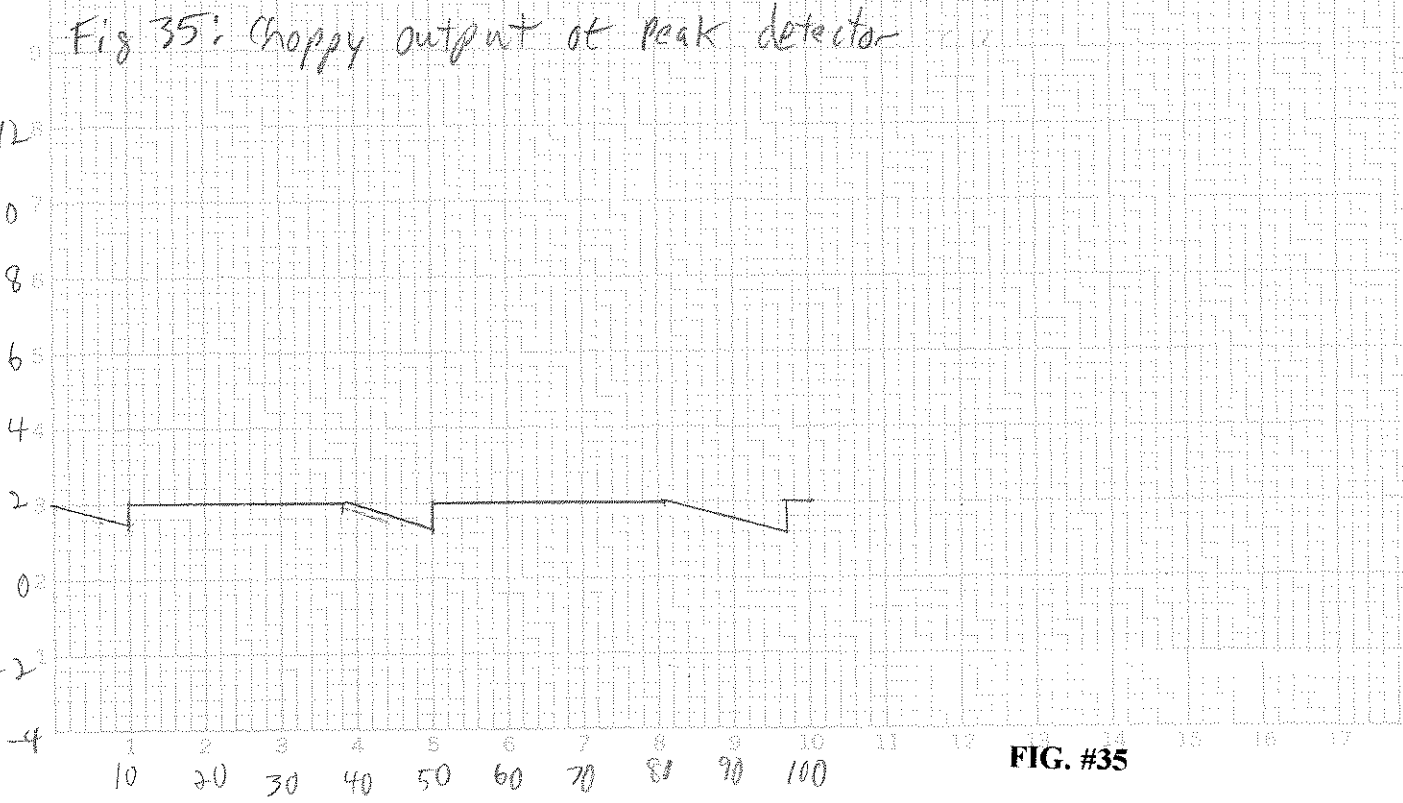
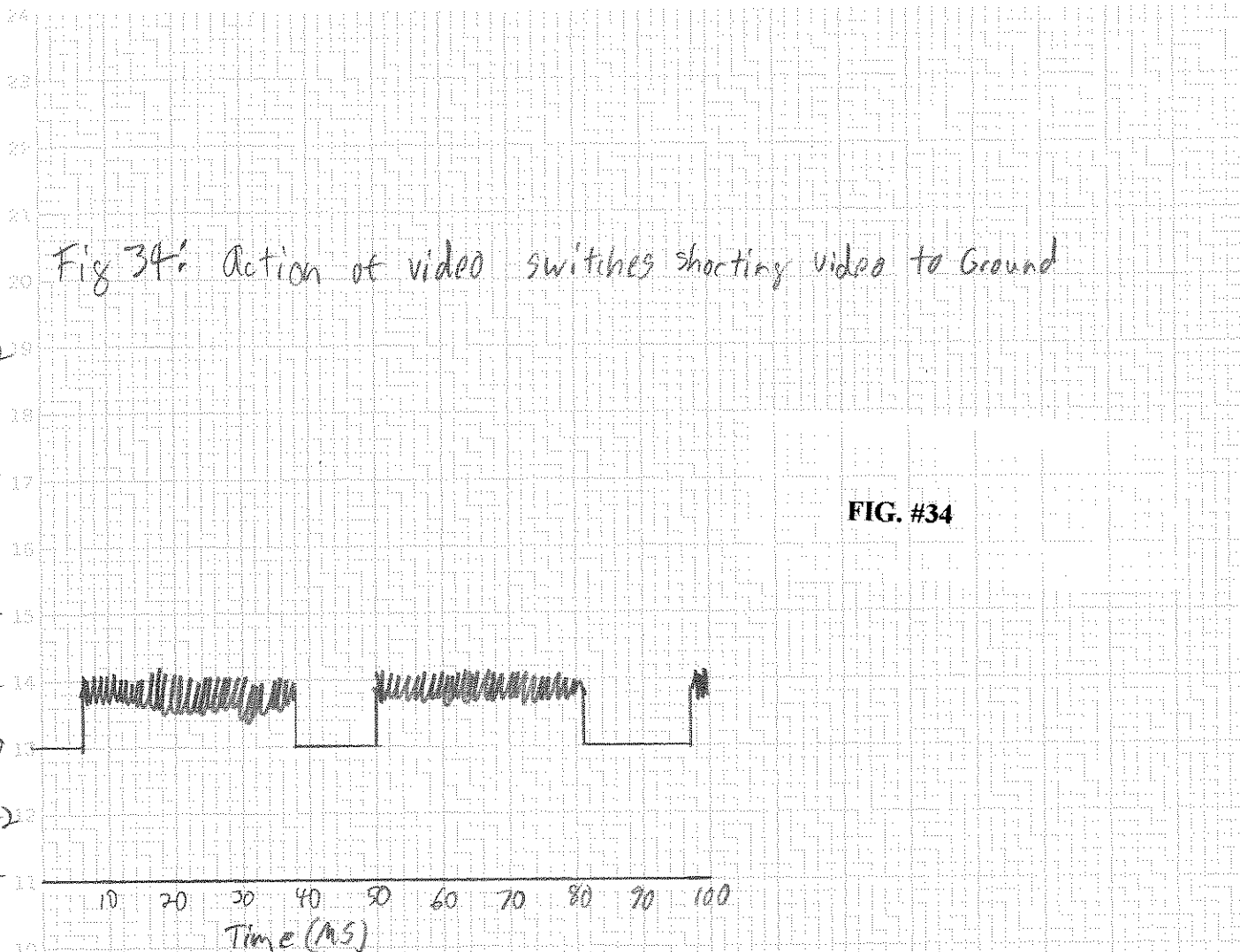


FIG. #33



POWER SUPPLY SCHEMATIC

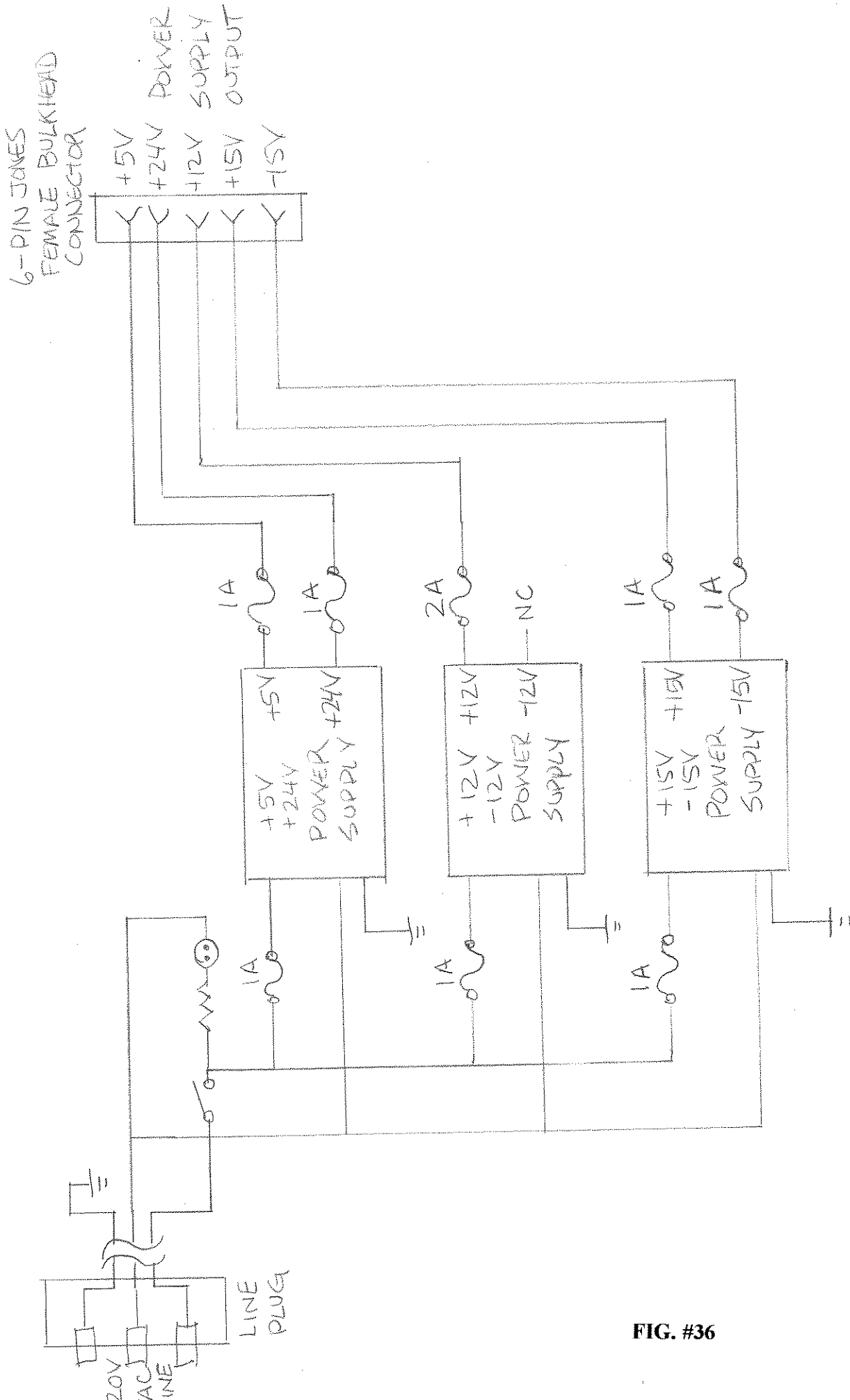


FIG. #36

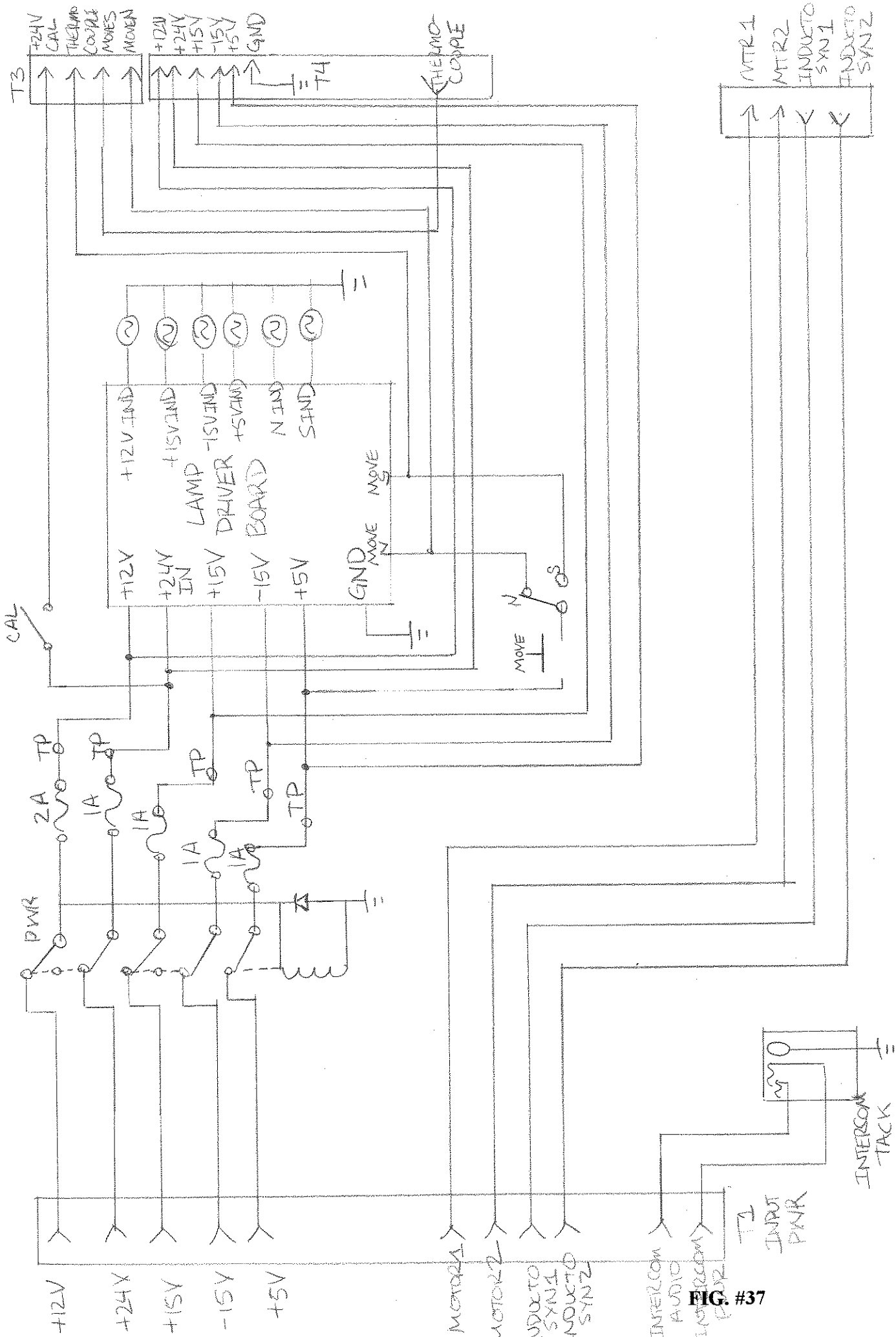


FIG. #37

ROOFTOP JUNCTION BOX SCHEMATIC
 (NOT INCLUDING SPARE CONNECTIONS)

FIG 39; 1st scan w/weak Bandpass Separation data

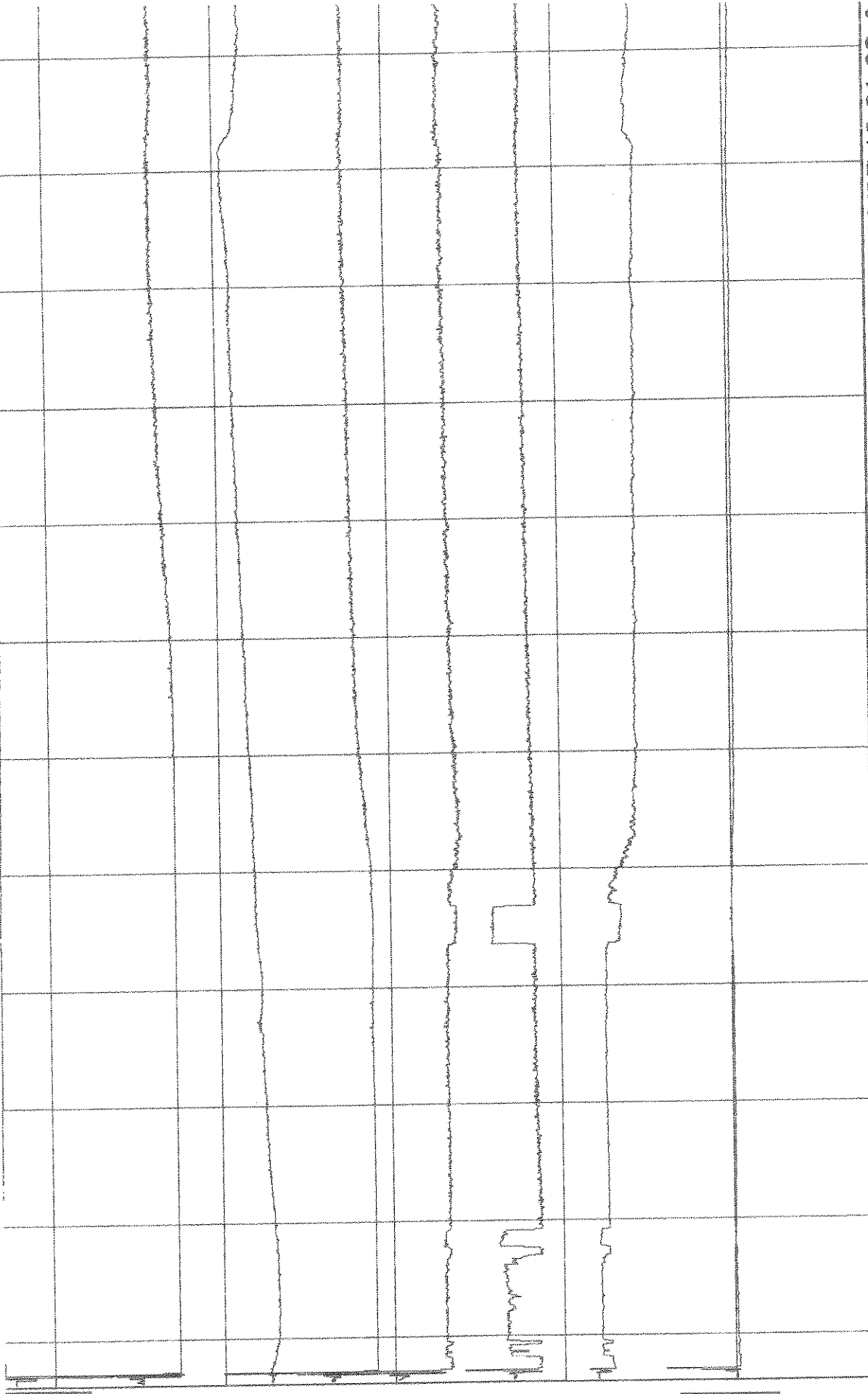
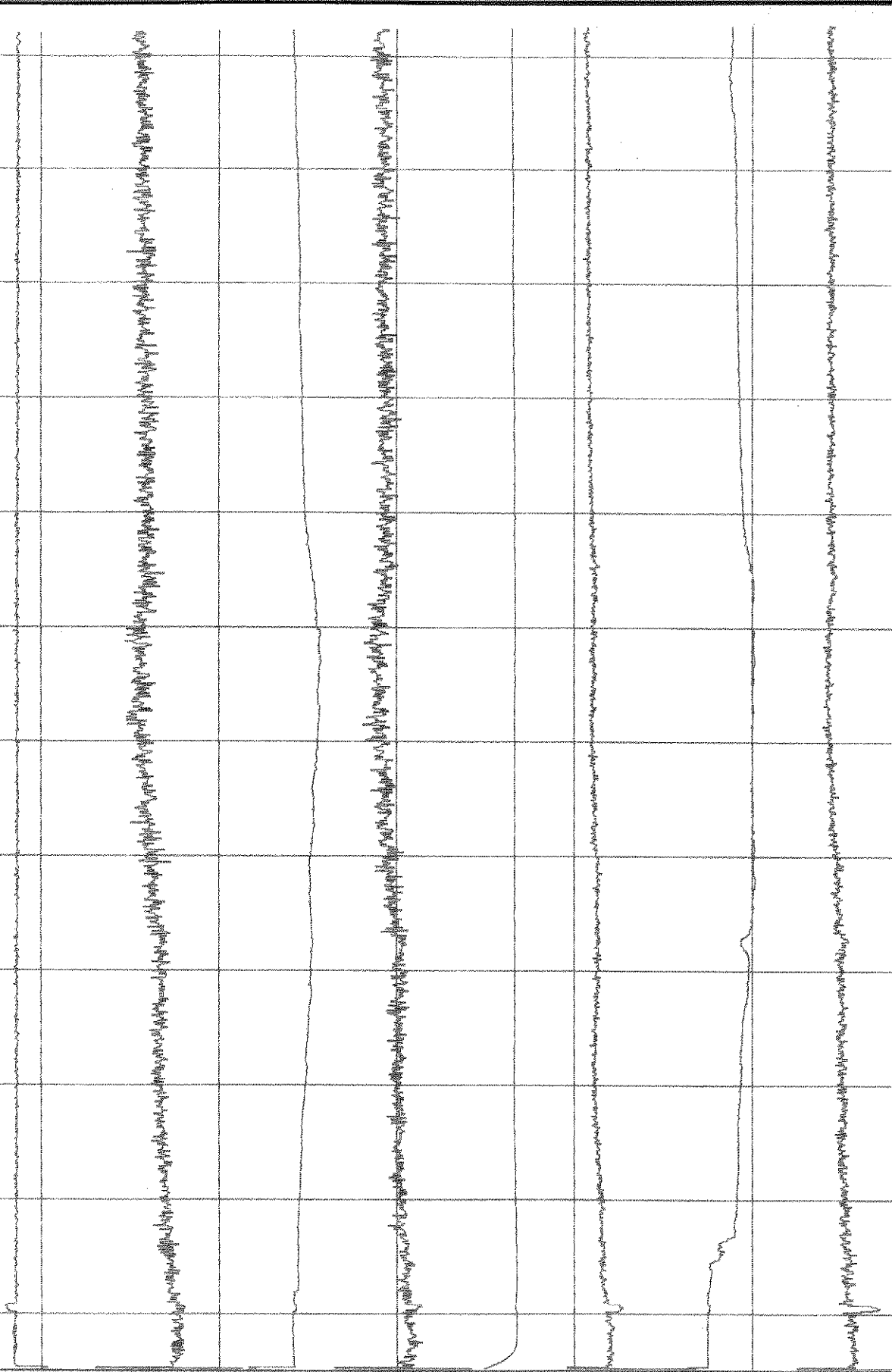


FIG. #39

| Tag Name | Description | Scale Range | Eng. Units | Last Value |
|-----------------|-------------|----------------|------------|------------|
| X20 Curves:0202 | | -0.2500/0.0000 | VDC | -0.0440 |
| X20 Curves:0203 | | 0.0000/0.5000 | VDC | 0.1481 |
| X20 Curves:0204 | | 0.0800/0.1000 | VDC | 0.0873 |
| X20 Curves:0205 | | 0.0000/0.5000 | VDC | 0.1718 |
| X20 Curves:0206 | | 0.0000/0.0200 | VDC | 0.0081 |
| X20 Curves:0207 | | 0.0000/0.5000 | VDC | 0.2506 |
| X20 Curves:0208 | | 0.0000/10.000 | VDC | 4.152 |
| X20 Curves:0209 | | 0.0000/0.5000 | VDC | 0.1955 |

Tue 04/08/97 05:22:21 PM 16:36:59 Wed 04/09/97 10:01:20 A



Wed 04/09/97 02:07:38 PM 17:47:59 Thu 04/10/97 07:55:37 A

| Tag Name | Description | Scale Range | Eng. Units | Last Valu |
|-----------------|-------------|-----------------|------------|-----------|
| X20 Curves:0202 | | -10.0000/0.0000 | VDC | -3.7832 |
| X20 Curves:0203 | | 9.50/10.50 | VDC | 9.97 |
| X20 Curves:0204 | | 5.000/10.000 | VDC | 6.329 |
| X20 Curves:0205 | | 9.50/10.50 | VDC | 10.00 |
| X20 Curves:0206 | | 0.000/20.000 | VDC | 6.955 |
| X20 Curves:0207 | | 9.50/10.50 | VDC | 10.23 |
| X20 Curves:0208 | | 0.000/10.000 | VDC | 4.952 |
| X20 Curves:0209 | | 9.50/10.50 | VDC | 10.02 |

Fig 40: 2nd scan with strong Bandpass Separator data

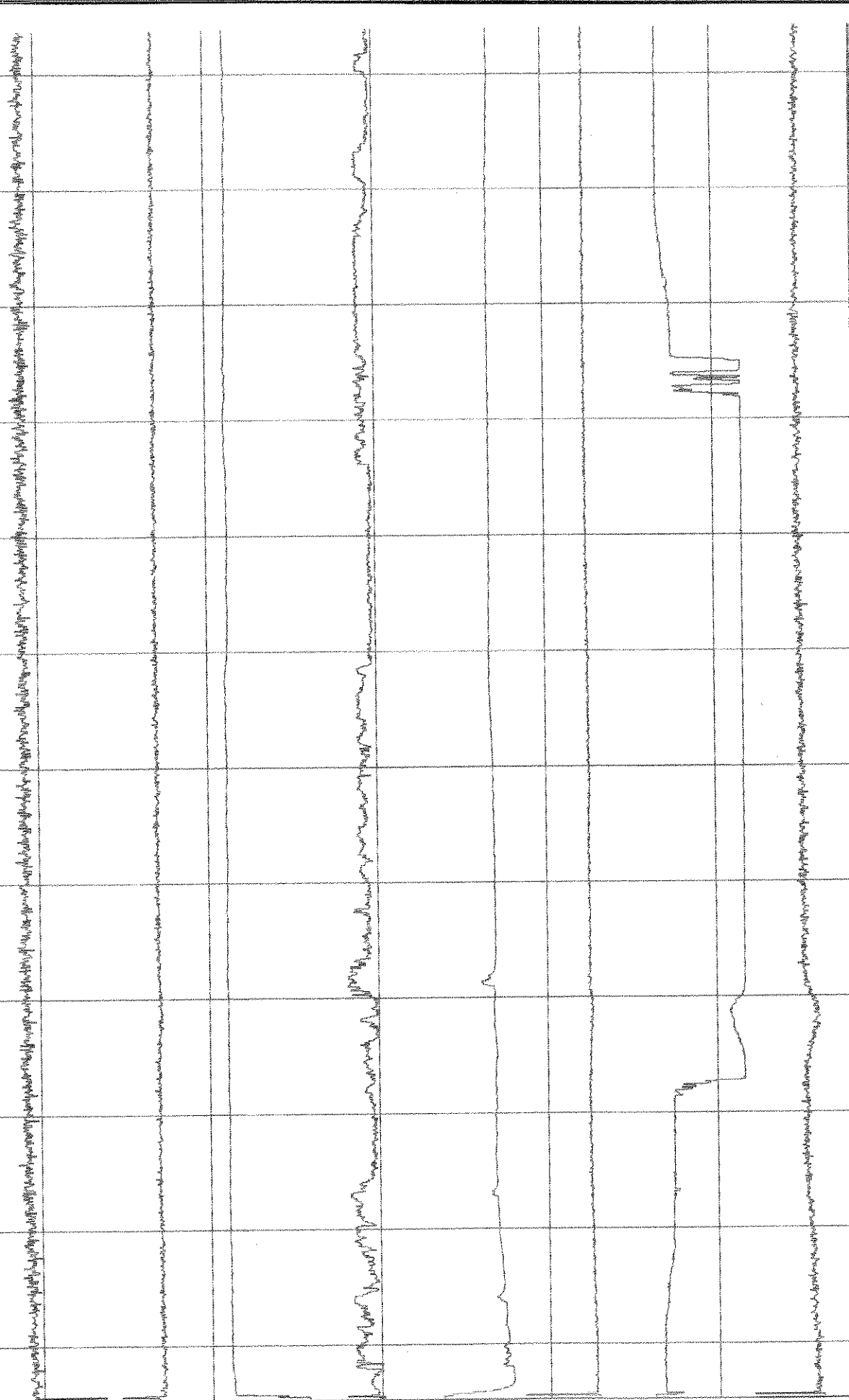
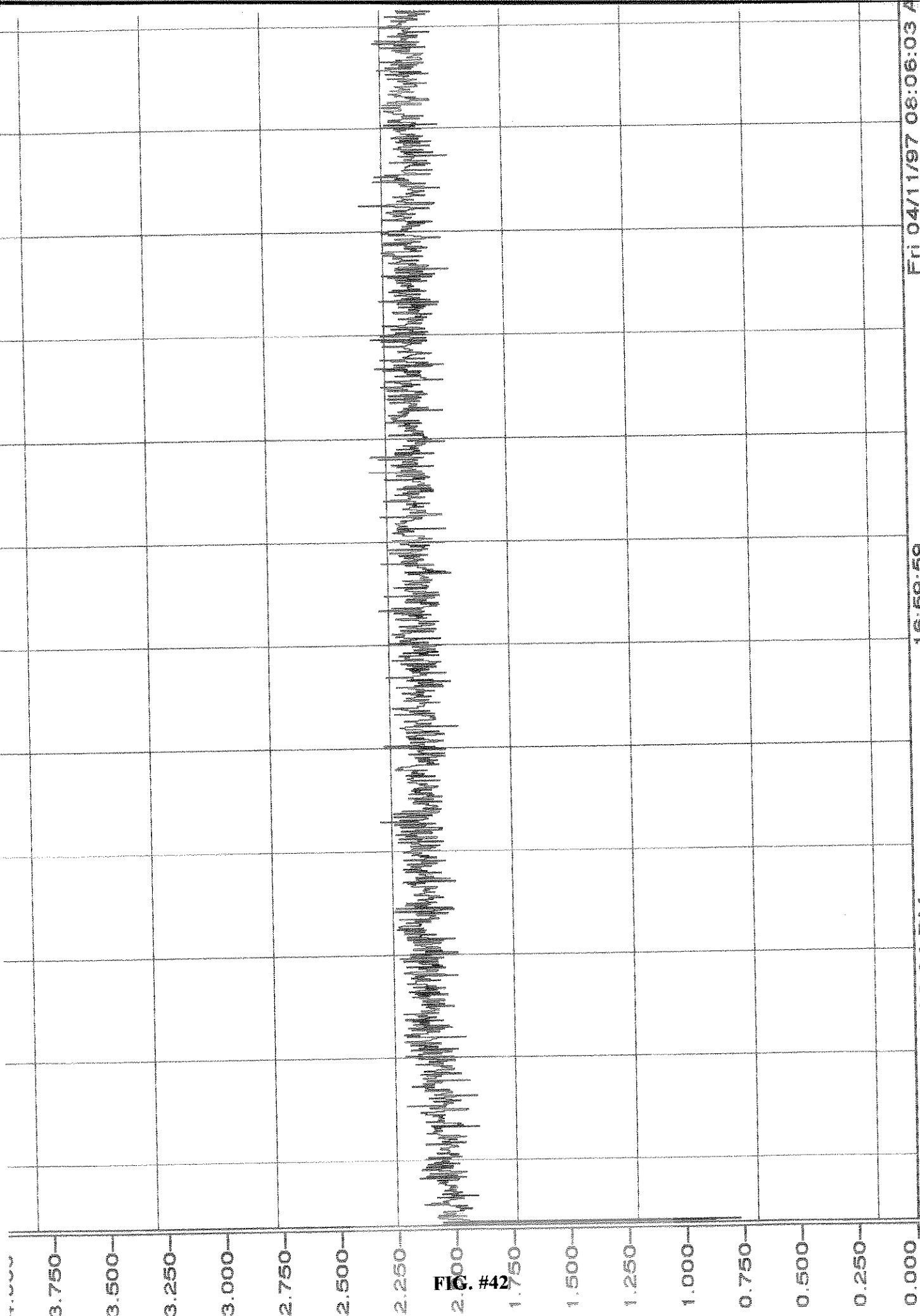


FIG. #41

| Tag Name | Description | Scale Range | Eng. Units | Last Valt |
|-----------------|-------------|--------------|------------|-----------|
| X20 Curves:0202 | | 1.000/3.000 | VDC | 2.373 |
| X20 Curves:0203 | | 4.000/8.000 | VDC | 5.510 |
| X20 Curves:0204 | | 0.000/10.000 | VDC | 7.139 |
| X20 Curves:0205 | | 4.000/8.000 | VDC | 5.557 |
| X20 Curves:0206 | | 5.000/10.000 | VDC | 6.551 |
| X20 Curves:0207 | | 5.000/7.000 | VDC | 5.849 |
| X20 Curves:0208 | | 0.000/10.000 | VDC | 7.615 |
| X20 Curves:0209 | | 5.000/7.000 | VDC | 5.982 |

Thu 04/10/97 03:06:04 PM 16:59:59 Fri 04/11/97 06:06:03 A

Fig 41: 3rd scan



Thu 04/10/97 03:06:04 PM
 Fri 04/11/97 08:06:03 AM
 16:59:59
 Scale Range 0.000/4.000
 Eng. Units VDC
 Last Val 2.373
 Tag Name
 X20 Curves:0202
 Description

Fig 42: Saturated video signal scan

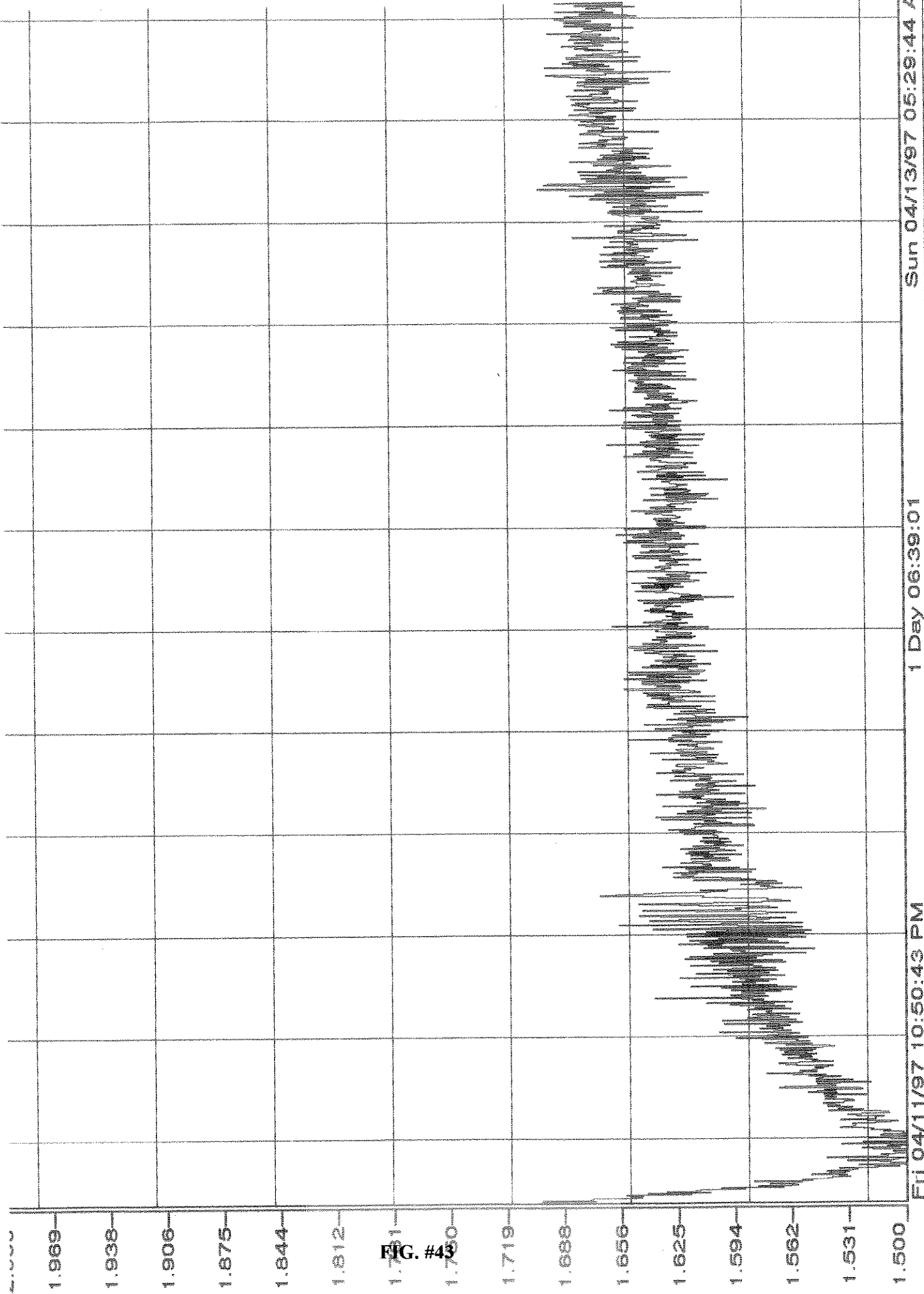


FIG. #43

Tag Name: Fri 04/11/97 10:50:43 PM
 Description: 1 Day 06:39:01
 Scale Range: Sun 04/13/97 05:29:44 A
 1.500/2.000
 Eng. Units: VDC
 Last Val: 1.709

Fig 43: Last scan with unsaturated video signal scan

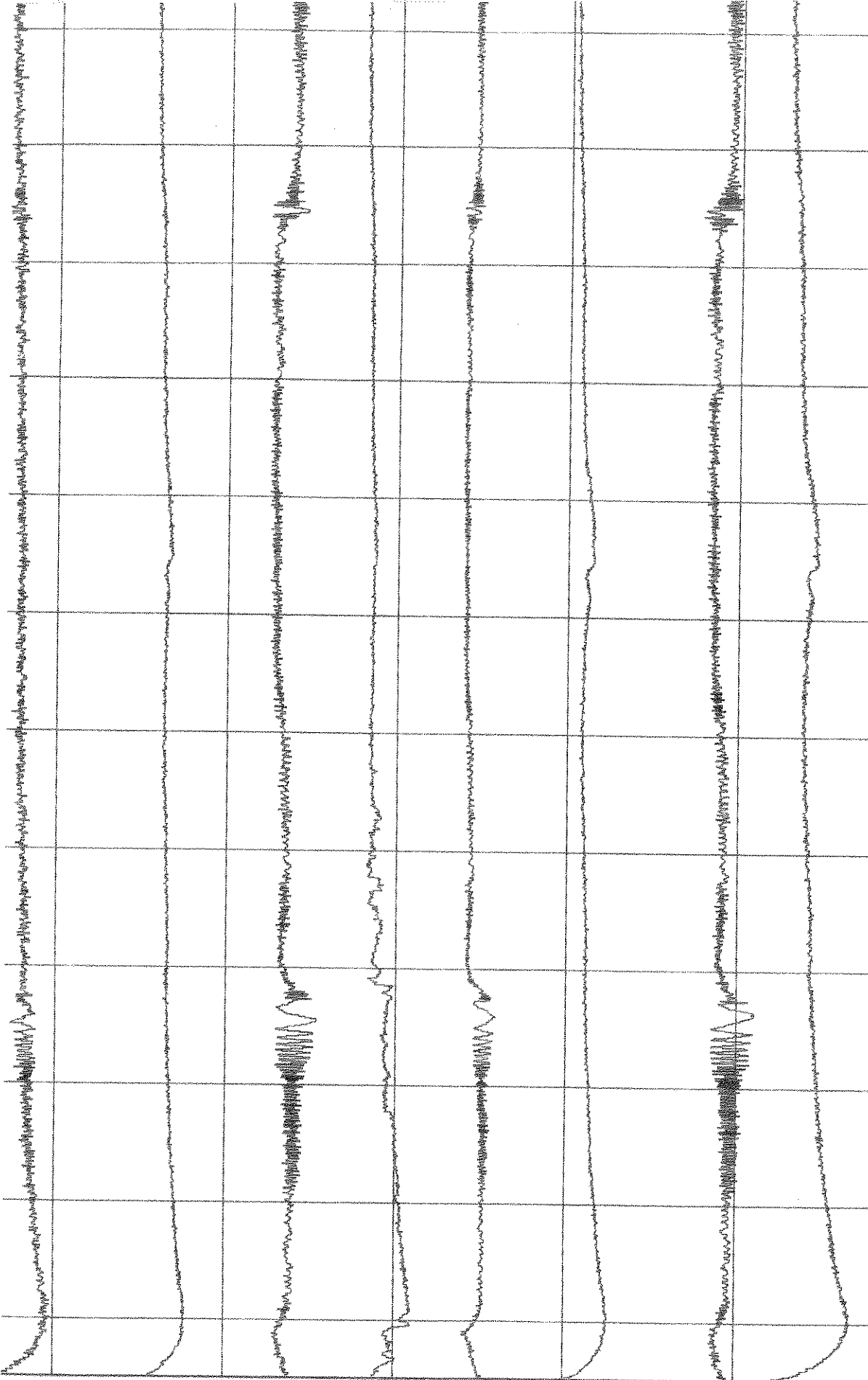


FIG. #44

Fri 04/11/97 10:50:43 PM 1 Days 06:39:01 Sun 04/13/97 05:29:44 A

| Tag Name | Description | Scale Range | Eng. Units | Last Val |
|-----------------|-------------|--------------|------------|----------|
| X20 Curves:0202 | | 1.250/1.750 | VDC | 1.709 |
| X20 Curves:0203 | | 3.500/4.500 | VDC | 4.084 |
| X20 Curves:0204 | | 6.000/10.000 | VDC | 8.183 |
| X20 Curves:0205 | | 3.500/4.500 | VDC | 4.155 |
| X20 Curves:0206 | | 6.000/10.000 | VDC | 8.294 |
| X20 Curves:0207 | | 3.500/4.500 | VDC | 4.268 |
| X20 Curves:0208 | | 6.000/10.000 | VDC | 8.853 |
| X20 Curves:0209 | | 3.500/4.000 | VDC | 3.960 |

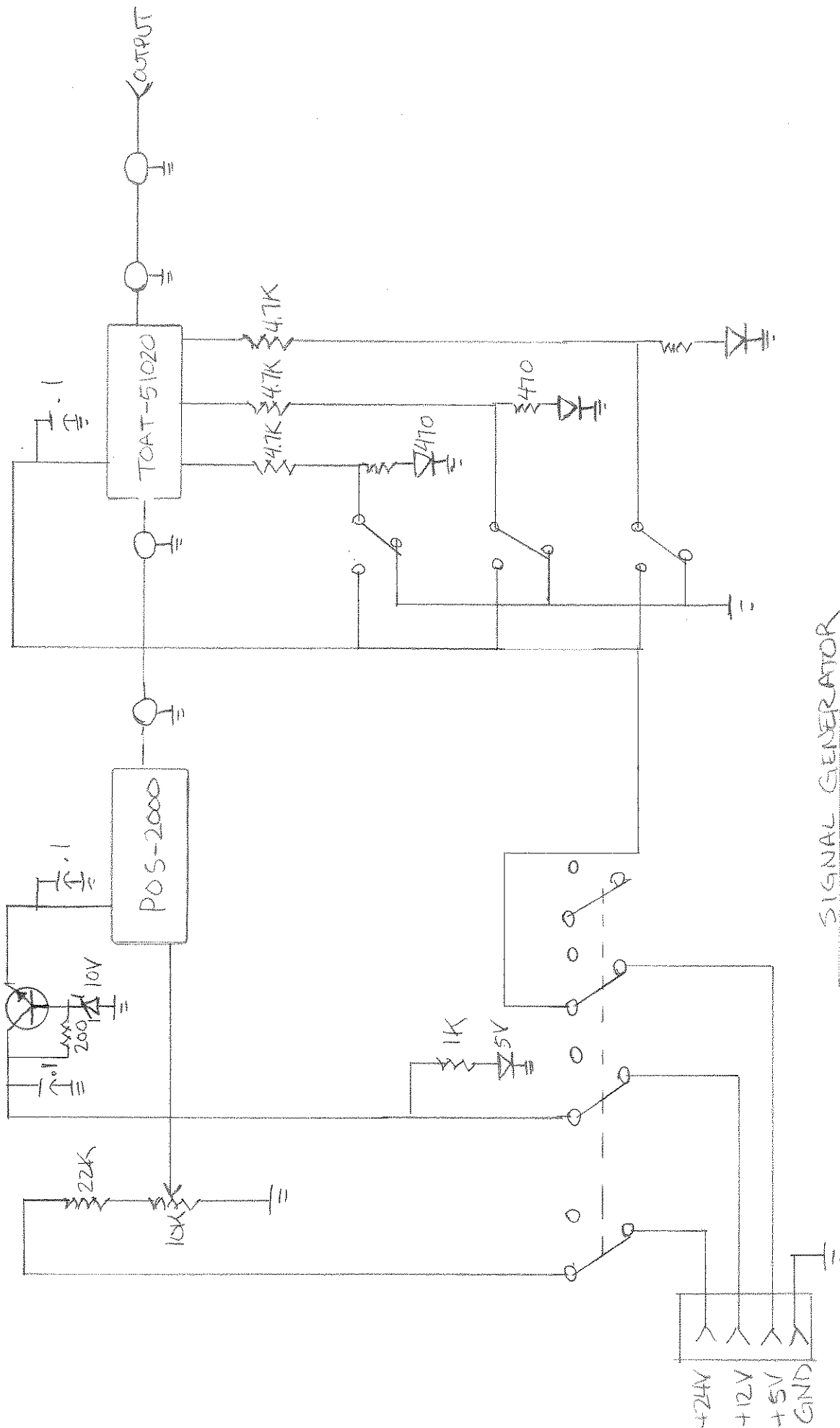
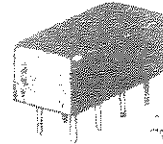


FIG. #45

VOLTAGE CONTROLLED OSCILLATORS

Plug-In

LINEAR TUNING 25 to 2000 MHz

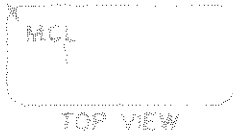


POS

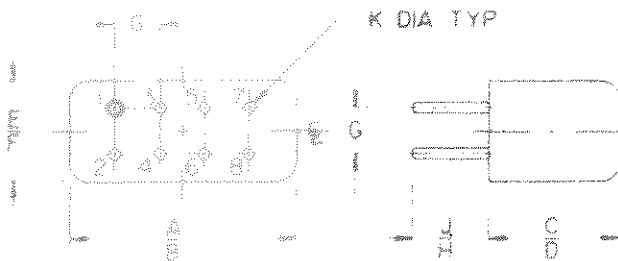
| MODEL NO. | FREQ. MHz Min. Max. | POWER OUTPUT dBm Typ. | PHASE NOISE, typ. dBc/Hz SSB @ offset frequencies: | | PULLING MHz pk-pk @ 12 dB Typ. | PUSHING MHz/V Typ. | TUNING SENSITIVITY MHz/V Typ. | HARMONICS dBc | | DC SUPPLY | | CAPD DATA Page | Case Style Note 5B | CONNECTION | Price \$ Qty (5-49) |
|--------------|------------------------|-----------------------------|--|---------|--|--------------------------|-------------------------------------|------------------|------|-----------|------|-------------------|-----------------------|------------|------------------------|
| | | | 10 kHz | 100 kHz | | | | Typ. | Max. | Typ. | Max. | | | | |
| POS-50 | 25 - 50 | +8.5 | -110 | -130 | 0.06 | 0.04 | 2.0 - 2.6 | -19 | -12 | 12 | 20 | 159 | A06 | hx | 11.95 |
| POS-75 | 37.5 - 75 | +8 | -110 | -130 | 0.15 | 0.11 | 3.1 - 3.8 | -27 | -20 | 12 | 20 | 159 | A06 | hx | 11.95 |
| POS-100 | 50 - 100 | +8.3 | -107 | -130 | 0.6 | 0.2 | 4.2 - 4.8 | -23 | -18 | 12 | 20 | 160 | A06 | hx | 11.95 |
| POS-150 | 75 - 150 | +9.5 | -103 | -127 | 0.8 | 0.3 | 5.8 - 6.7 | -23 | -17 | 12 | 20 | 161 | A06 | hx | 11.95 |
| POS-200 | 100 - 200 | +10 | -102 | -122 | 1.0 | 0.2 | 7.1 - 8.6 | -24 | -20 | 12 | 20 | 162 | A06 | hx | 11.95 |
| POS-300 | 150 - 250 | +10 | -100 | -120 | 1.8 | 0.3 | 9.5 - 13 | -30 | -20 | 12 | 20 | 163 | A06 | hx | 13.95 |
| POS-400 | 200 - 380 | +9.5 | -98 | -120 | 1.8 | 0.3 | 13.7 - 16.9 | -28 | -20 | 12 | 20 | 164 | A06 | hx | 13.95 |
| POS-535 | 300 - 525 | +8.8 | -93 | -116 | 2.0 | 0.4 | 10.5 - 24 | -26 | -20 | 12 | 20 | 165 | A06 | hx | 14.95 |
| POS-765 | 485 - 765 | +9.5 | -85 | -108 | 5.0 | 0.4 | 18 - 27 | -21 | -17 | 12 | 22 | 166 | A06 | hx | 16.95 |
| POS-1025 | 685 - 1025 | +9 | -84 | -104 | 5.0 | 0.6 | 21 - 36 | -23 | -18 | 12 | 22 | 167 | A06 | hx | 16.95 |
| NEW POS-1060 | 780-1060 | +12 | -90 | -112 | 50 | 3 | 18 - 32 | -11 | — | 8 | 30 | — | A06 | hx | 14.95 |
| NEW POS-1400 | 975-1400 | +13 | -95 | -115 | 36 | 1.5 | 21-43 | -11 | — | 8 | 30 | — | A06 | hx | 14.95 |
| NEW POS-2000 | 1370-2000 | +10 | -95 | -115 | 28 | 1.5 | 30-50 | -11 | — | 8 | 30 | — | A06 | hx | 14.95 |

A

LETTER M OVER PIN 2



1 MHz offsets



most models)
put, typically 2 dB
ind-down converters, CATV
frequency synthesizers, test
communications systems

NOTE Blue bead indicates pin 1.
Pin numbers do not appear on unit.
For reference only

- Tuning Voltage required to cover frequency range: 1 to 16V
 1a. Absolute Max. Supply Voltage (V_{cc}): +16V
 1b. Absolute Max. Tuning Voltage (V_{tune}): +18V, (+17V for POS-50)
 100 kHz typ.
- 3 dB modulation bandwidth: 1 MHz typ.
- Operating Temperature: -55°C to +85°C

options. HI-Rel, Mil, and TX description are given in General information (Section 0).
are given in section 0, see "Case Styles & Outline Drawings".

designers kits available

| KIT NO. | No. of Units in Kit | DESCRIPTION | PRICE \$ per kit |
|---------|---------------------|---|------------------|
| K-POS1 | 10 | 1 of each 50, 75, 100, 150, 200, 300 | 124.95 |
| K-POS2 | 7 | 1 of each 50, 100, 200, 400, 535, 765, 1025 | 79.95 |
| K-POS3 | 6 | 2 of each 1060, 1400, 2000 | 79.95 |

FIG. #46

pin connections

see case style outline drawings

| PORT | Pin |
|---------|-----------|
| RF OUT | 2 |
| V-CC | 1 |
| V-TUNE | 8 |
| GND EXT | 3,4,5,6,7 |

Scan11

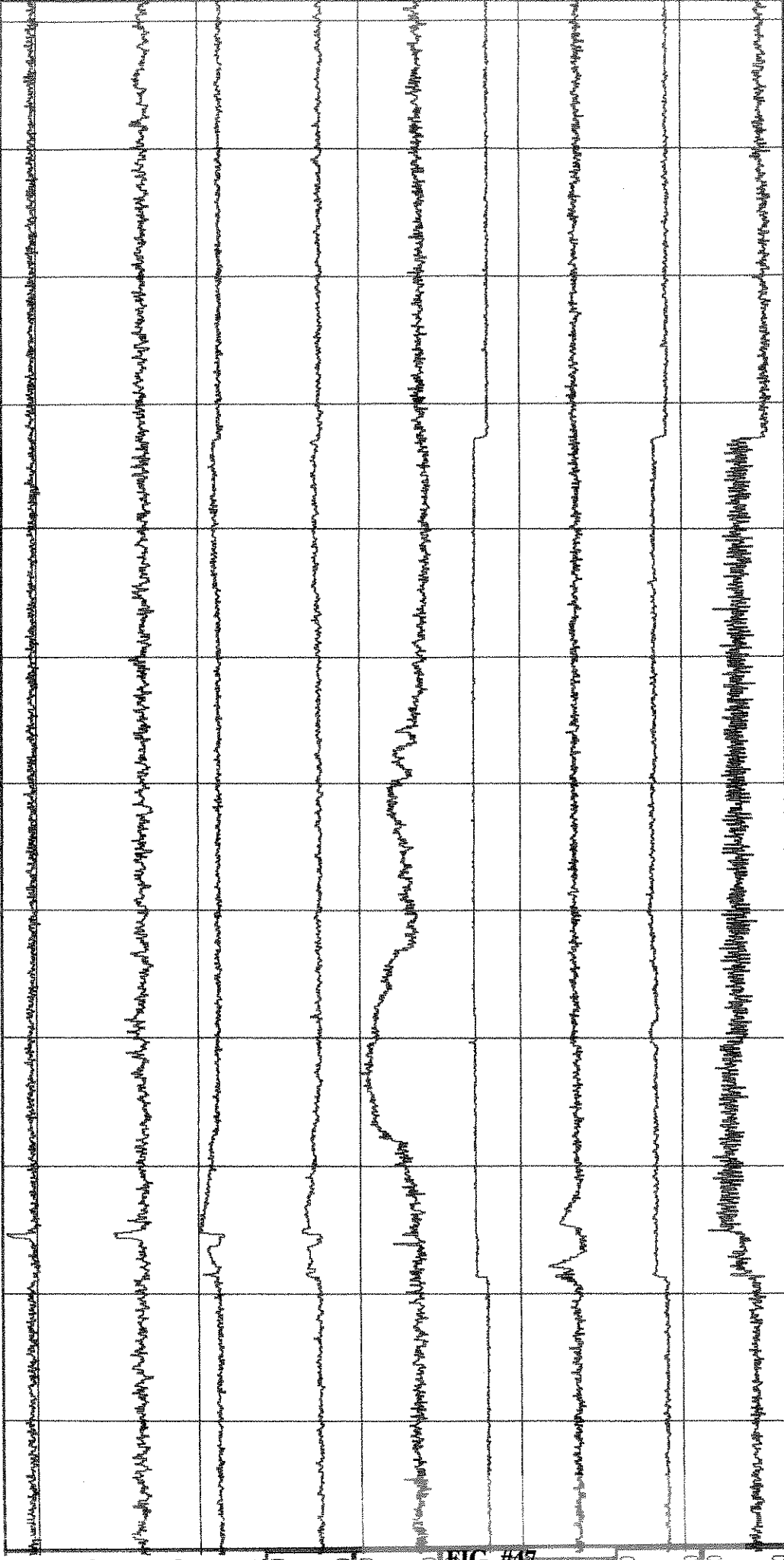


FIG. #47
 Fri 05/09/97 07:05:34.827 PM
 00:51:01.606
 Fri 05/09/97 07:56:36.434 PM

| Tag Name | Description | Scale Range | Eng. Units | Last Value |
|----------------|-------------|---------------|------------|------------|
| *20 Cires:0202 | | 4.000/8.000 | VDC | 6.083 |
| *20 Cires:0203 | | 2.000/6.000 | VDC | 3.731 |
| *20 Cires:0204 | | 2.000/6.000 | VDC | 4.236 |
| *20 Cires:0205 | | 0.000/10.000 | VDC | 3.694 |
| *20 Cires:0206 | | 0.07000/1.300 | VDC | 0.0822 |
| *20 Cires:0207 | | 0.000/10.000 | VDC | 4.074 |
| *20 Cires:0208 | | 1.000/3.000 | VDC | 1.631 |
| *20 Cires:0209 | | 0.000/10.000 | VDC | 3.540 |
| *20 Cires:0210 | | 0.5000/1.0000 | VDC | 0.5954 |