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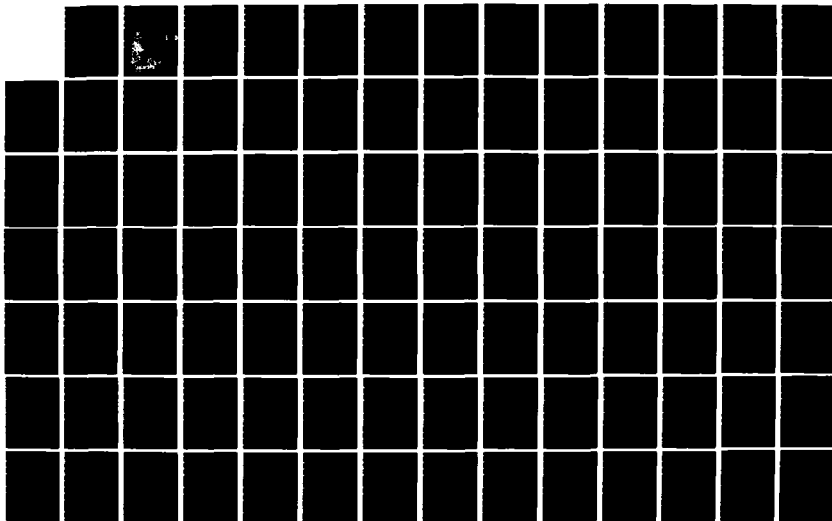
UE BENCH TEST PLANS AND REQUIREMENTS VOLUME 2
ROCKWELL-COLLINS UE SET(U) ESSCUBE ENGINEERING INC
MARLTON NJ SEP 84 CEA/GPS-85-156-00-030-VOL-2
N62269-82-D-0059

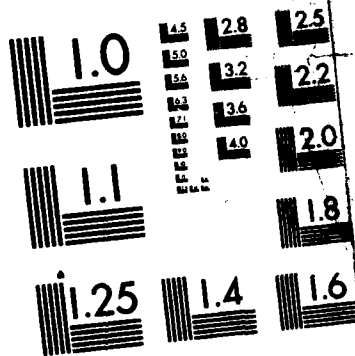
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RF LABORATORY UE BENCH TEST PLANS AND REQUIREMENTS

VOLUME 2. ROCKWELL-COLLINS UE SET

N62269-82-D-0059

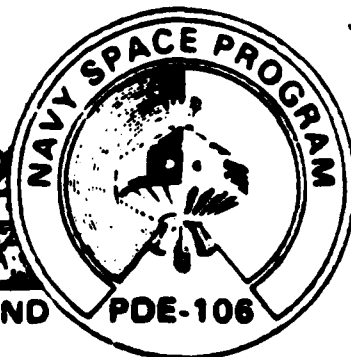
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UE BENCH TEST PLANS
AND REQUIREMENTS

VOLUME 2. ROCKWELL-COLLINS UE SET

SEPTEMBER 1984

CEA-RFL-84-005

Prepared for:
Naval Air Development Center
Warminster, PA 18974

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GPS UE BENCH TEST PLANS AND REQUIREMENTS

VOLUME 2

1.0 PURPOSE

The purpose of this report is to provide a basis for defining the hardware and software required to perform RF related bench tests of the Rockwell-Collins UE in the RF Laboratory of the GPS Central Engineering Activity at NAVAIRDEVCEEN. For additional background information, see Volume 1.

1.1 SCOPE

This report contains general test requirements for each test defining the:

- level of test (UE, board, component),
- test objective (parameter/function),
- test inputs ,
- tests outputs ,
- equipment required for each input/output ,
- initial test procedure ,
- data reduction requirements ,
- summary list of test equipment (standard/special),
- block diagram of test .

Since most of these tests will be computer controlled, special software will be required to control the conditions, parameters and data collection needs of the test.

A section on special software requirements is provided which defines the software needs of each test in terms of flowcharts.

2.0 LIST OF REFERENCE DOCUMENTS

The following documents were used as references for UE RF configuration and performance requirements:

1. ICD-GPS-204	GPS Instrumentation and Connector Stds.	5 June 1981
2. SS-US-200	System Segment Specification	4 Nov. 1982
3. Collins	Engineering Drawings	23 Feb. 1982
4. Collins	Design Review	15 March 1982
5. Harris	GPS AE-1 LRU Performance Test Procedures	26 March 1982

3.0 TEST REQUIREMENTS

The test requirements contained herein deal with the Rockwell-Collins UE set and are written at the board level. Specific values of parameters, ranges, tolerances and granularities are provided if known. As more detailed information on the sets become available, missing values will be provided and the test requirements will be refined and expanded down to the component level.

3.1 ROCKWELL-COLLINS UE TEST REQUIREMENTS

This section contains the test requirements, procedures and block diagrams for board level testing of the Rockwell-Collins UE set. Initial functional test procedures have been compiled for the following boards or units:

1. Power Supply
2. RF Synthesizer
3. Correlator
4. IF Processor
5. Reference Oscillator
6. Antenna Electronics

Although information is available for these boards, there is not enough to completely identify board input and output levels for stimulation and measurement purposes. For example, some of the boards require digital input signals as stimuli. There is not enough information available to determine the required input levels for these signals or the levels for output signals. These digital signals also present a problem in that special purpose hardware may be required to interface the test equipment to the board being tested. This problem will be discussed further in Volume 3, Section 5.0 (Special Purpose Hardware Requirements).

No information has been located concerning Rockwell-Collins Preamplifier Unit. Test requirements for this unit will be provided as information becomes available.

3.1.1 Rockwell-Collins Test Procedures

The following sheets contain the initial test requirements and procedures as listed in Section 1.1 for each of the boards identified in Section 3.1. These sheets will be refined and expanded as more information becomes available. Also as more detailed data on the boards becomes available sheets will be added for testing to the component level.

3.1.1.1 POWER SUPPLY MODULE

Contractor: Rockwell-Collins
Board Tested: Power Supply
Test Objective: Measure DC output voltages.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>AC or DC input</u>	<u>115V 400MHz(AC) or 160VDC</u>	<u>External Source</u>
2.	<u>(1/100) Fo</u>	<u>102,300Hz @ TBD</u>	<u>Function Generator (HP-8116A)</u>
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

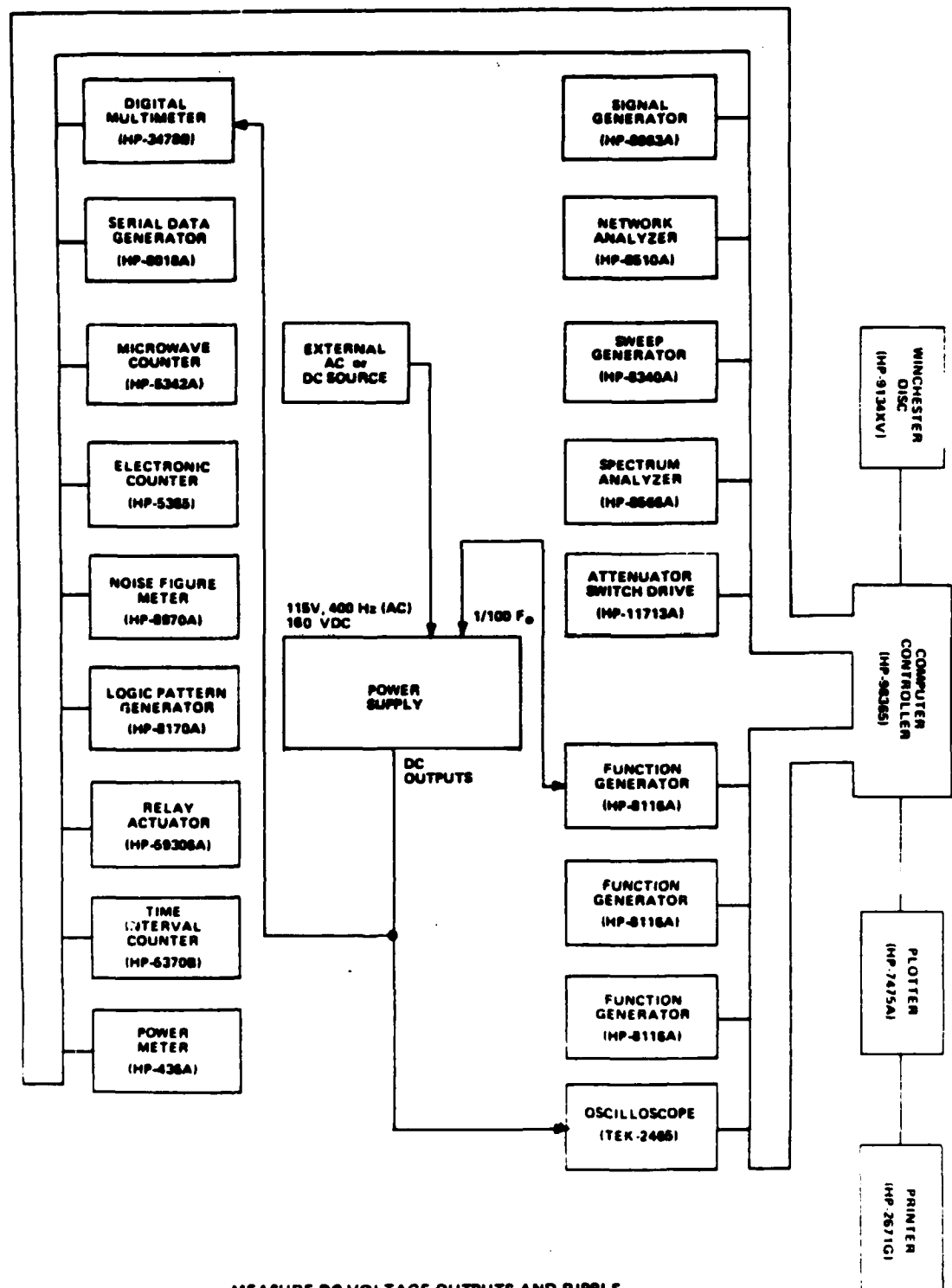
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>DC output</u>	<u>+ 5 volts</u>	<u>Digital Multi (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
proper ranges. Apply proper signal levels to all inputs. Measure DC
voltage with Digital Multimeter. An Oscilloscope will be used to check
for ripple. (This will be repeated for all DC outputs).

Data Reduction: Send input level and output of Digital Multimeter to
printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|------------------------------------|------------------------------------|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Oscilloscope (TEK-2465)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Digital Multi (HP-3478B)</u> | 5. <u>Function Gen. (HP-8116A)</u> | 8. <u></u> |
| 3. <u>Printer (HP-2671G)</u> | 6. <u>External Source</u> | 9. <u></u> |



Contractor: Rockwell-Collins
Board Tested: Power Supply
Test Objective: Verify Input Power Fault operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>AC or DC input</u>	<u>115V, 400Hz(AC) or 160VDC</u>	<u>External Source</u>
2.	<u>(1/100) F_o</u>	<u>102,300Hz @ TBD</u>	<u>Function Generator (HP-8116A)</u>
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

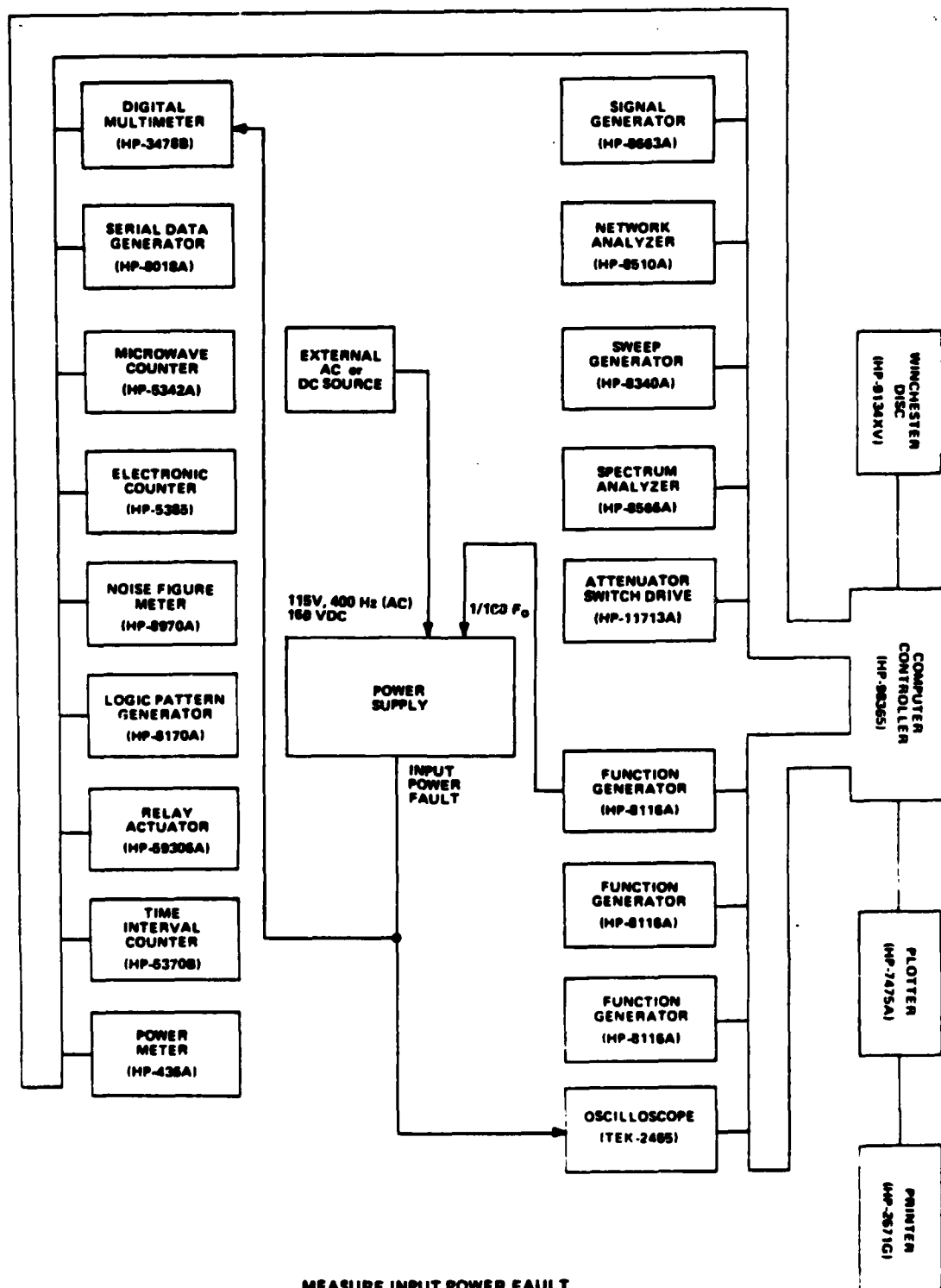
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Input Power Fault</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Input Power Fault with Digital Multimeter. Then disconnect input power
and measure Input Power Fault again with Digital Multimeter. An Oscillo-
scope will be used to display waveforms.

Data Reduction: Send input level and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|-------------------------------------|-----------------------------------|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Function Gen. (HP-8116A)</u> | 5. <u>Oscilloscope (TEK-2465)</u> | 8. <u></u> |
| 3. <u>Digital Multi. (HP-3478B)</u> | 6. <u>External Source</u> | 9. <u></u> |



Contractor: Rockwell-Collins
Board Tested: Power Supply
Test Objective: Verify Initiate Fault operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>AC or DC input</u>	<u>115V, 400Hz(AC) or 160VDC</u>	<u>External Source</u>
2.	<u>(1/100) Fo</u>	<u>102.300Hz @ TBD</u>	<u>Function Generator (HP-8116A)</u>
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

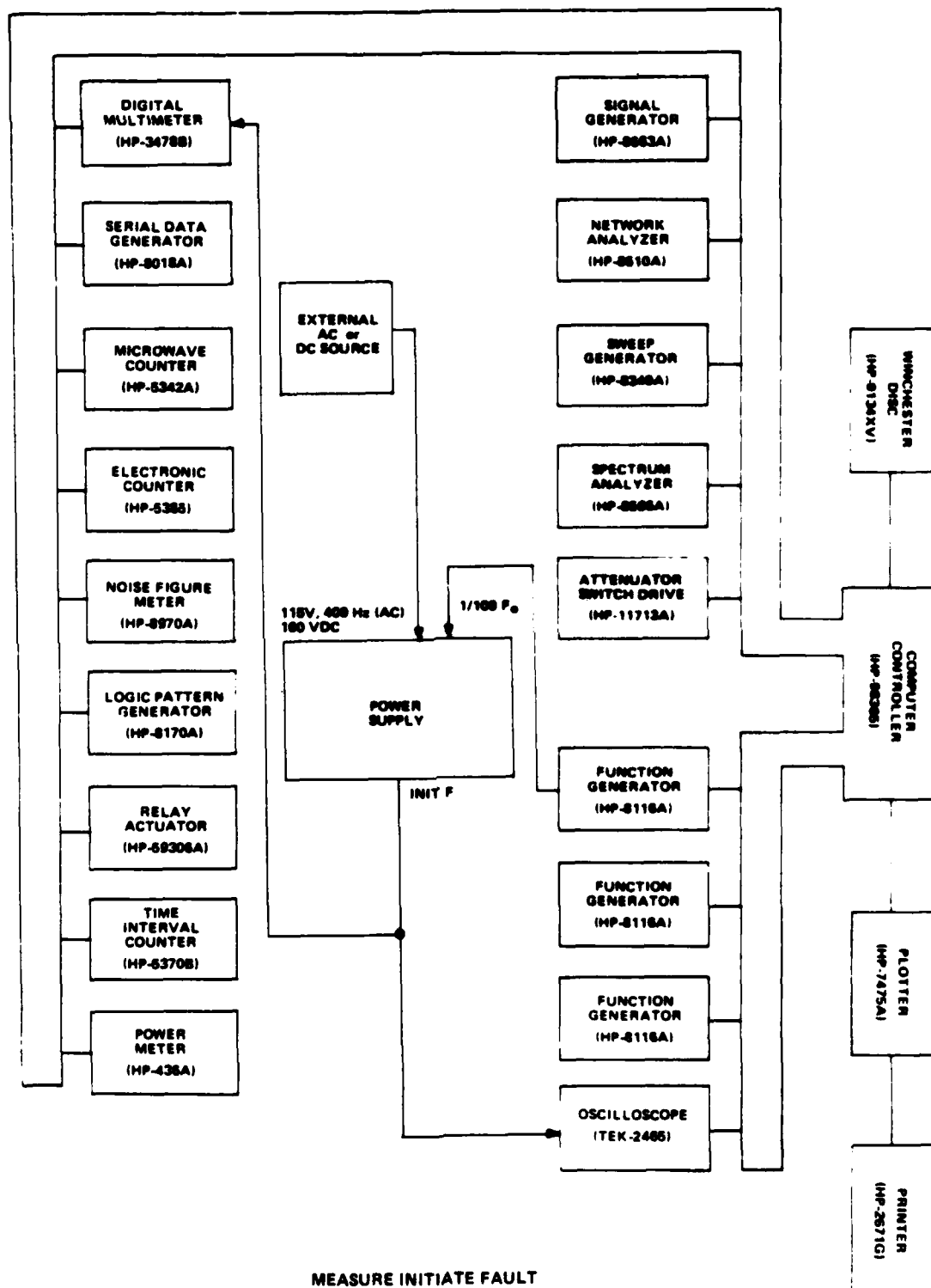
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Initiate Fault</u>	<u>TBD</u>	<u>Digital Multi (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Initiate Fault output with Digital Multimeter. An Oscilloscope will be
used to display waveform.

Data Reduction: Send input level and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|-------------------------------------|-----------------------------------|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Function Gen. (HP-8116A)</u> | 5. <u>Oscilloscope (TEK-2465)</u> | 8. <u></u> |
| 3. <u>Digital Multi. (HP-3478B)</u> | 6. <u>External Source</u> | 9. <u></u> |



Contractor: Rockwell-Collins

Board Tested: Power Supply

Test Objective: Verify receiver Power Supply Fault operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>AC or DC input</u>	<u>115V, 400Hz(AC) or 160VDC</u>	<u>External Source</u>
2.	<u>(1/100) Fo</u>	<u>102,300Hz @ TBD</u>	<u>Function Generator (HP-8116A)</u>
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

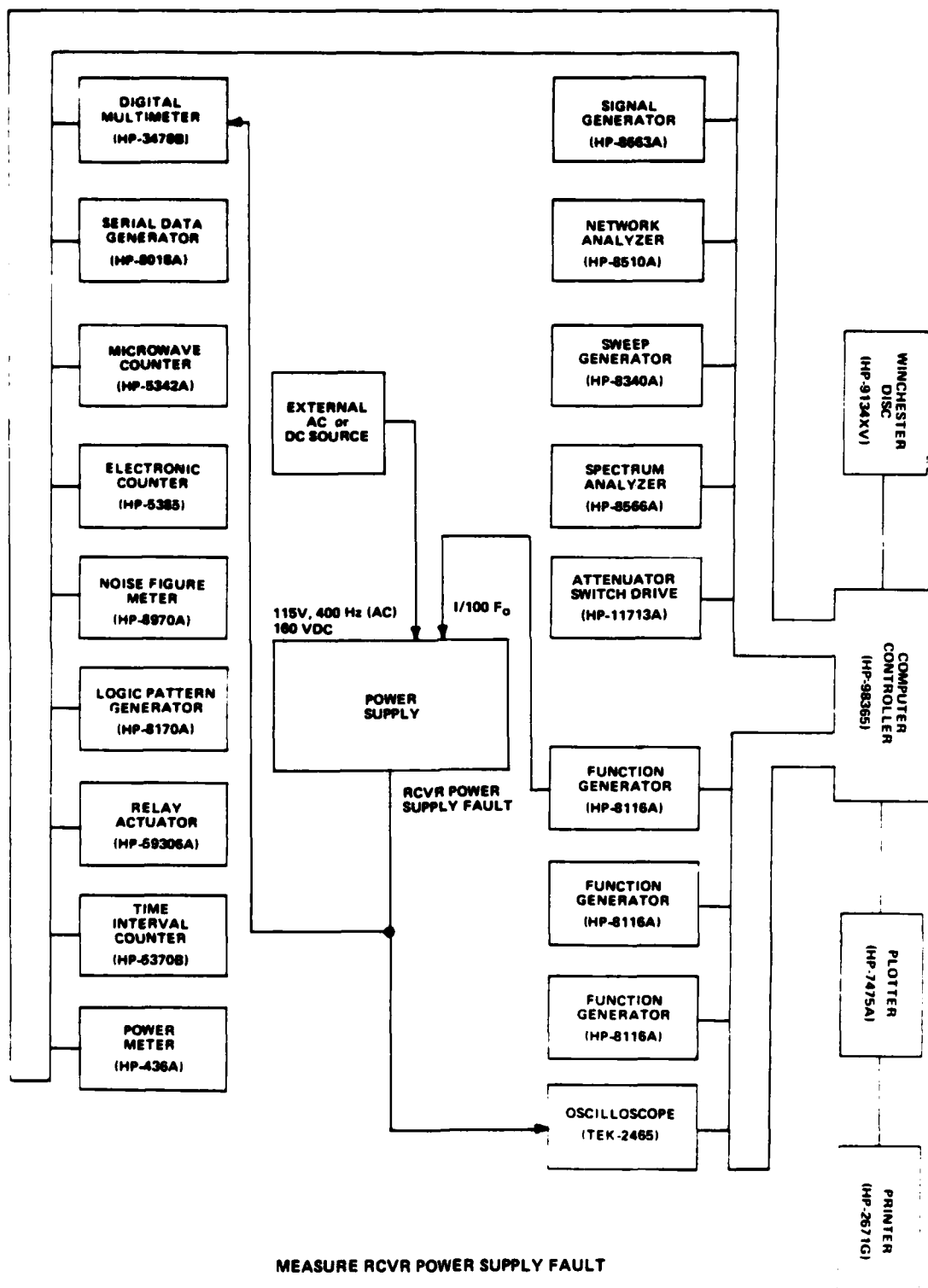
<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Rcvr. Power Supply Fault</u>	<u>TBD</u>	<u>Digital Multi (HP-3478B)</u>
2. <u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3. <u></u>	<u></u>	<u></u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Receiver Power Supply Fault with Digital Multimeter. An Oscilloscope
will be used to display waveform.

Data Reduction: Send input level and output of Digital Multimeter to
printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|-------------------------------------|-----------------------------------|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Function Gen. (HP-8116A)</u> | 5. <u>Oscilloscope (TEK-2465)</u> | 8. <u></u> |
| 3. <u>Digital Multi. (HP-3478B)</u> | 6. <u>External Source</u> | 9. <u></u> |



3.1.1.2 RF SYNTHESIZER MODULE

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper operation of Control Signals
output from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Generator (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

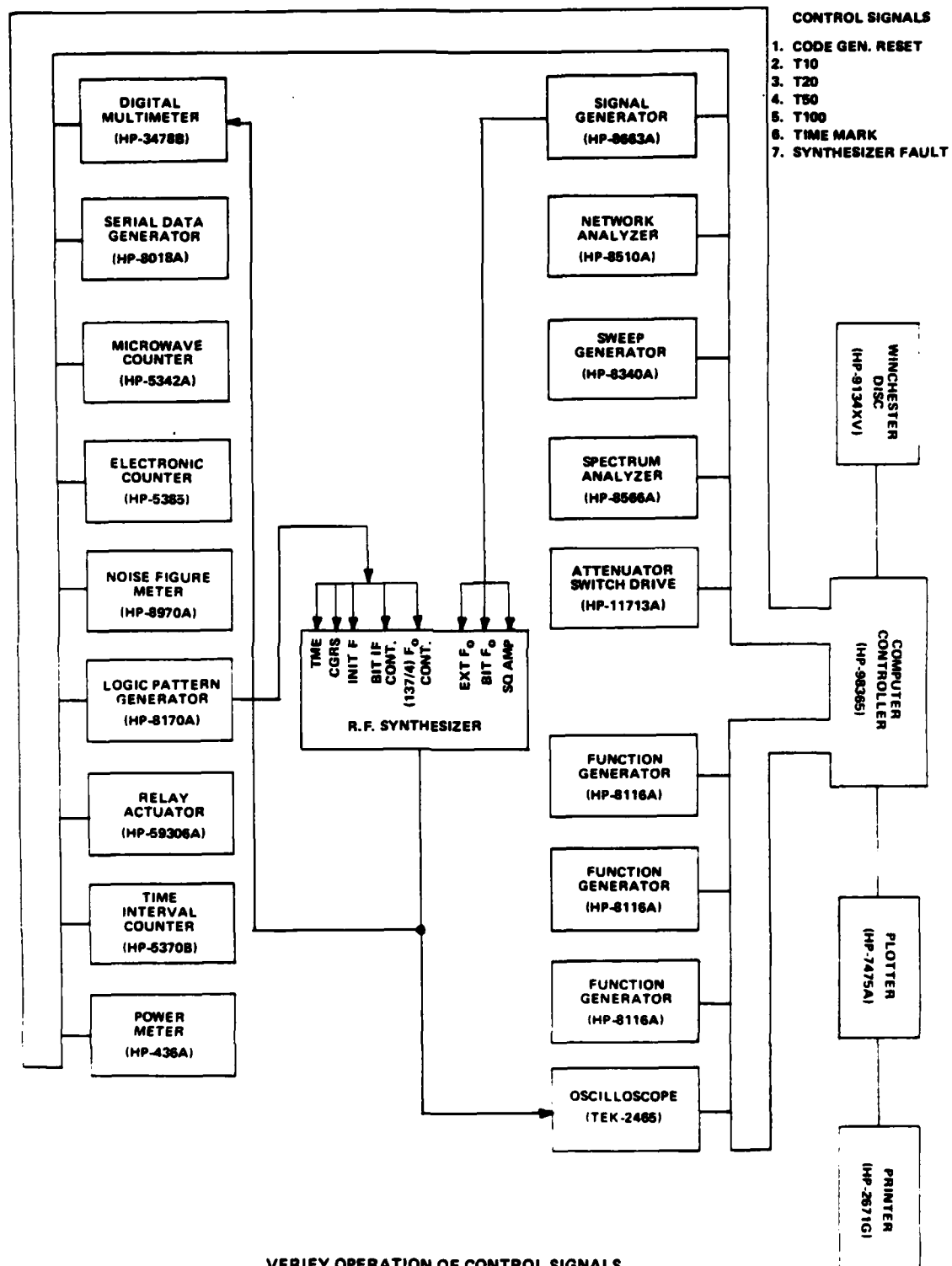
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Code Gen. Reset</u>	<u>TBD</u>	<u>DMM (HP-3478B)</u>
2.	<u>T10</u>	<u>TBD</u>	<u>Scope (TEK-2465)</u>
3.	<u>T20</u>	<u>TBD</u>	<u></u>
4.	<u>T50</u>	<u>TBD</u>	<u></u>
5.	<u>T100</u>	<u>TBD</u>	<u></u>
6.	<u>Time Mark</u>	<u>TBD</u>	<u></u>
7.	<u>Synthesizer Fault</u>	<u>TBD</u>	<u></u>

Test Procedure: Hook up unit test as shown in schematic. Turn on
test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure signal
level of Control Signals with DMM. Observe signal presence and level
with scope.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|-------------------------------------|------------------------------|------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Log Patt. Gen. (HP-8170A)</u> | 5. <u>DMM (HP-3478B)</u> | 8. <u></u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Scope (TEK-2465)</u> | 9. <u></u> |



Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper frequency output from BIT Fo
output of synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Generator (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ^{137/} ₄ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>BIT Fo</u>	<u>10.23MHz</u>	<u>Elec. Counter (HP-5385)</u>
2.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic.

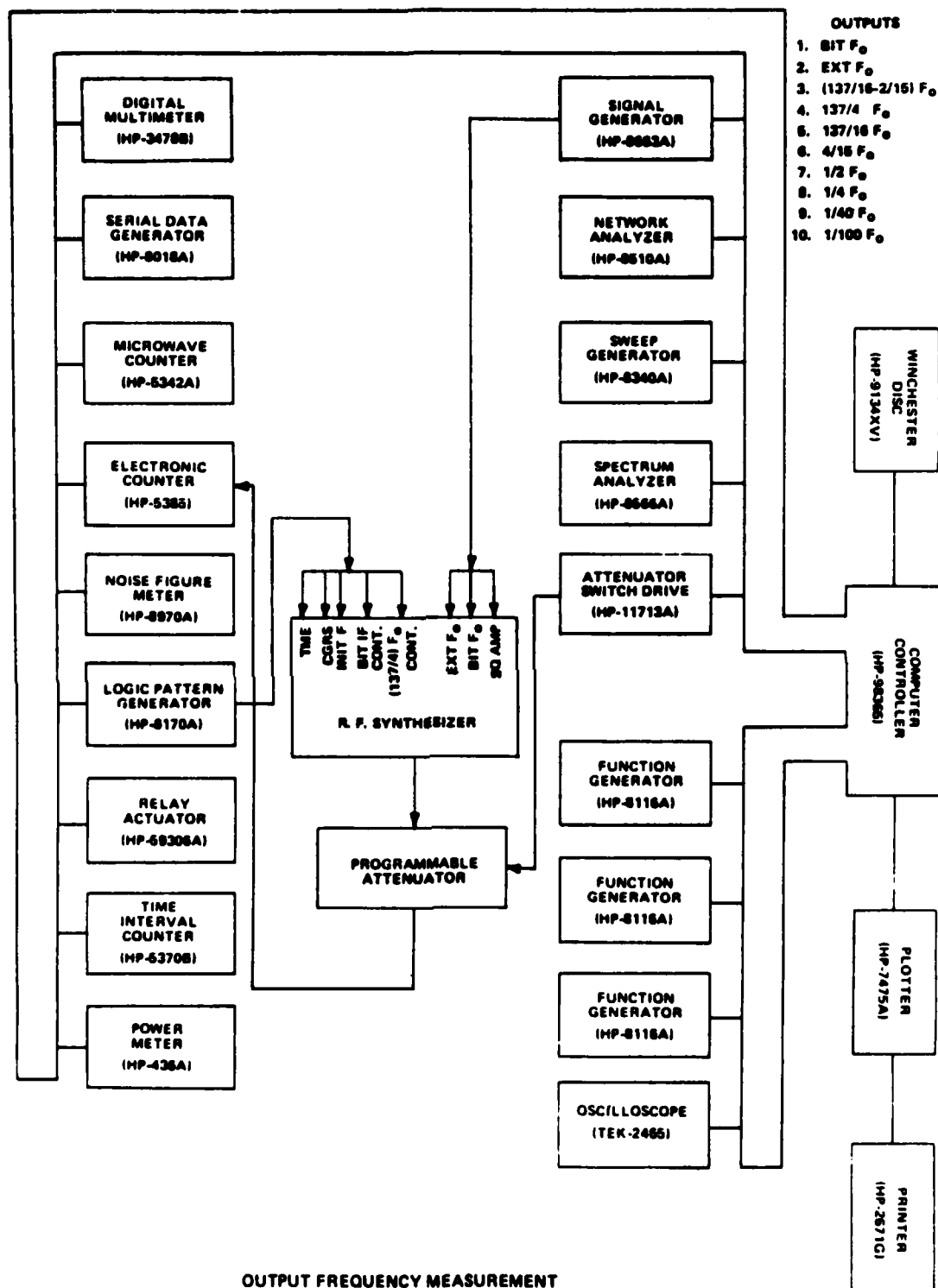
Turn on test equipment. Set measurement equipment to proper ranges.

Apply proper signal levels to inputs of synthesizer board. Measure
output frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter to
printer.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|-------------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Atten. Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Elec. Ctr. (HP-5385)</u> | 8. <u></u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u></u> |



Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper frequency output from Ext Fo output
of synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Ext Fo</u>	<u>10.23MHz</u>	<u>Elec Counter (HP-5385)</u>
2.	<u></u>	<u></u>	<u>Prog. Atten (HP-8494G)</u>
3.	<u></u>	<u></u>	<u>Att. Sw. Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure output
frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|-----------------------------------|----------------------------------|------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Elec Counter (HP-5385)</u> | 8. <u></u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog Atten. (HP-8494G)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper frequency from ($137/16 - 2/15$) Fo
output of synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>(¹³⁷/₁₆ - ²/₁₅) Fo</u>	<u>86.230375MHz</u>	<u>Elec Counter (HP-5385)</u>
2. _____	_____	<u>Prog. Atten (HP-8494G)</u>
3. _____	_____	<u>Att. Sw Drive (HP-11713A)</u>
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure (¹³⁷/₁₆ -
²/₁₅) Fo frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|-----------------------------------|----------------------------------|------------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Elec Counter (HP-5385)</u> | 8. _____ |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog Atten. (HP-8494G)</u> | 9. _____ |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper frequency output of ($^{137}/_4$) Fo
synthesizer output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $^{137}/_4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Output Name

Equipment Used

1.	$(^{137}/_4) F_0$	350.3775MHz	Elec Counter (HP-5385)
2.			Prog. Atten. (HP-8494G)
3.			Att Sw Drive (HP-11713A)
4.			
5.			

Test Procedure: Hook up unit under test as shown in schematic.

Turn on test equipment. Set measurement equipment to proper ranges.

Apply proper signal levels to inputs of synthesizer board. Measure
(¹³⁷/₄) Fo frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|-----------------------------------|----------------------------------|------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Elec Counter (HP-5385)</u> | 8. _____ |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog Atten. (HP-8494G)</u> | 9. _____ |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper output frequency from synthesizer
(¹³⁷/₁₆) Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ¹³⁷ / ₄ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for thes 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₁₆)Fo</u>	<u>87.594375MHz</u>	<u>Elec Counter (HP-5385)</u>
2.	<u> </u>	<u> </u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u> </u>	<u> </u>	<u>Att Sw Drive (HP-11713A)</u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure (¹³⁷/₁₆)Fo
frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|------------------------------------|-----------------------------------|--|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt Gen. (HP-8170A)</u> | 5. <u>Elec Counter (HP-5385)</u> | 8. <u> </u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u> </u> |

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper output frequency from synthesizer
(⁴/15)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ¹³⁷ /4 Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(⁴/15) Fo</u>	<u>2.728MHz</u>	<u>Elec Counter (HP-5385)</u>
2.	<u> </u>	<u> </u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u> </u>	<u> </u>	<u>Att. Sw Dr. (HP-11713A)</u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
frequency of the (⁴/15) Fo output signal with the Electronic Counter.
Repeat this measurement for the following outputs.

<u>1/2 Fo</u>	<u>1/40 Fo</u>
<u>1/4 Fo</u>	<u>1/100 Fo</u>

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|-------------------------------------|----------------------------------|-------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att. Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt. Gen. (HP-8170A)</u> | 5. <u>Elec Counter (HP-5385)</u> | 8. <u> </u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Attn (HP-8494G)</u> | 9. <u> </u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper power level for BIT Fo signal from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

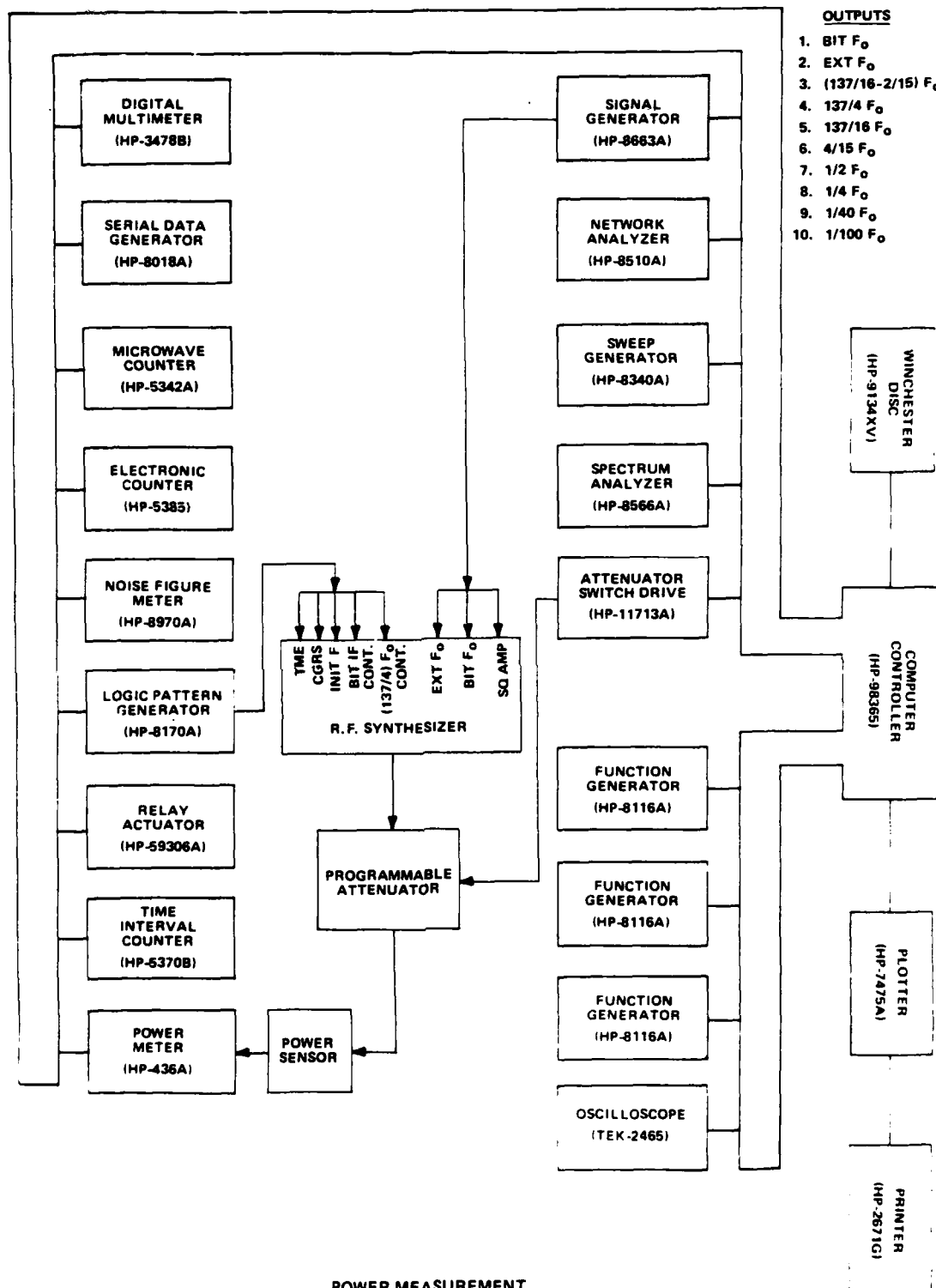
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>BIT Fo</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the power
level of the BIT Fo output signal with the Power Meter.

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|------------------------------------|-----------------------------------|------------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Prog. Atten. (HP-8494G)</u> |
| 2. <u>Log Patt Gen. (HP-8170A)</u> | 5. <u>Power Meter (HP-436A)</u> | 8. <u>Att Sw Drive (HP-11713A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Power Sensor (HP-8481A)</u> | 9. <u></u> |



OUTPUTS

1. BIT F_0
2. EXT F_0
3. $(137/16-2/15) F_0$
4. $137/4 F_0$
5. $137/16 F_0$
6. $4/15 F_0$
7. $1/2 F_0$
8. $1/4 F_0$
9. $1/40 F_0$
10. $1/100 F_0$

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper power level for Ext Fo signal
from Synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Ext Fo</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u>Att. Sw Dr. (HP-11713A)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the power
level of the output signal with the Power Meter.

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|-----------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Prog. Atten. (HP-8494G)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Power Meter (HP-436A)</u> | 8. <u>Att. Sw Dr. (HP-11713A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Power Sensor (HP-8481A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper power level for [$^{137/16} - ^{2/15}$] Fo
signal from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $^{137/4}$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

Output Name

Output Level

Equipment Used

1.	$(\frac{137}{16} - \frac{2}{15}) F_0$	TBD	Power Meter (HP-436A)
2.			Power Sensor (HP-8481A)
3.			Prog. Atten. (HP-8494G)
4.			Att. Sw Drive (HP-11713A)
5.			

Test Procedure: Hook up unit under test as shown in schematic.

Turn on test equipment. Set measurement equipment to proper ranges.

Apply proper signal levels to inputs of synthesizer board. Measure

the power level of the $(^{137}_{16} - ^2_{15})F_0$ output signal with the Power

Meter.

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

1. <u>Signal Gen. (HP-8663A)</u>	4. <u>Printer (HP-2671G)</u>	7. <u>Prog. Atten. (HP-8494G)</u>
2. <u>Log Patt Gen (HP-8170A)</u>	5. <u>Power Meter (HP-436A)</u>	8. <u>Att. Sw Drive (HP-11713A)</u>
3. <u>Computer (HP-9836S)</u>	6. <u>Power Sensor (HP-8481A)</u>	9. _____

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper power level for ($137/16$)Fo signal
from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>$^{137}_{16}\text{Fo}$</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2. <u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3. <u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
4. <u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
5. <u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic.

Turn on test equipment. Set measurement equipment to proper ranges.

Apply proper signal levels to inputs of synthesizer board. Measure
the power level of the ($^{137}_{16}\text{Fo}$) output signal with the Power Meter.

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Prog. Atten. (HP-8494G)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Power Meter (HP-436A)</u> | 8. <u>Att Sw Drive (HP-11713A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Power Sensor (HP-8481A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper power level for ($137/4$)Fo signal
from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for the 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₄)Fo</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
power level of the (¹³⁷/₄)Fo output signal with the Power Meter.

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|-------------------------------------|
| 1. <u>Sig. Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Prog. Atten. (HP-8494G)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Power Meter (HP-436A)</u> | 8. <u>Att. Sw Drive (HP-11713A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Power Sensor (HP-8481A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper power level (4/15)Fo output signal
from synthesizer.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(4/15) Fo</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the power
level of the (4/15)Fo output signal with the Power Meter. Repeat this
measurement for the following output:

<u>$\frac{1}{2}$Fo</u>	<u>$\frac{1}{40}$Fo</u>
<u>$\frac{1}{4}$Fo</u>	<u>$\frac{1}{100}$Fo</u>

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|-------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Prog. Atten. (HP-8494G)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Power Meter (HP-436A)</u> | 8. <u>Att. Sw Drive (HP-11713A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Power Sensor (HP-8481A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper spectral content of synthesizer
Ext Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ¹³⁷ / ₄ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Ext Fo</u>	<u>TBD</u>	<u>Spectrum Anal. (HP-8566A)</u>
2. _____	_____	<u>Prog. Atten. (HP-8494G)</u>
3. _____	_____	<u>Att Sw Drive (HP-11713A)</u>
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Hook up unit under test as shown in schematic.

Turn on test equipment. Set measurement equipment to proper ranges.

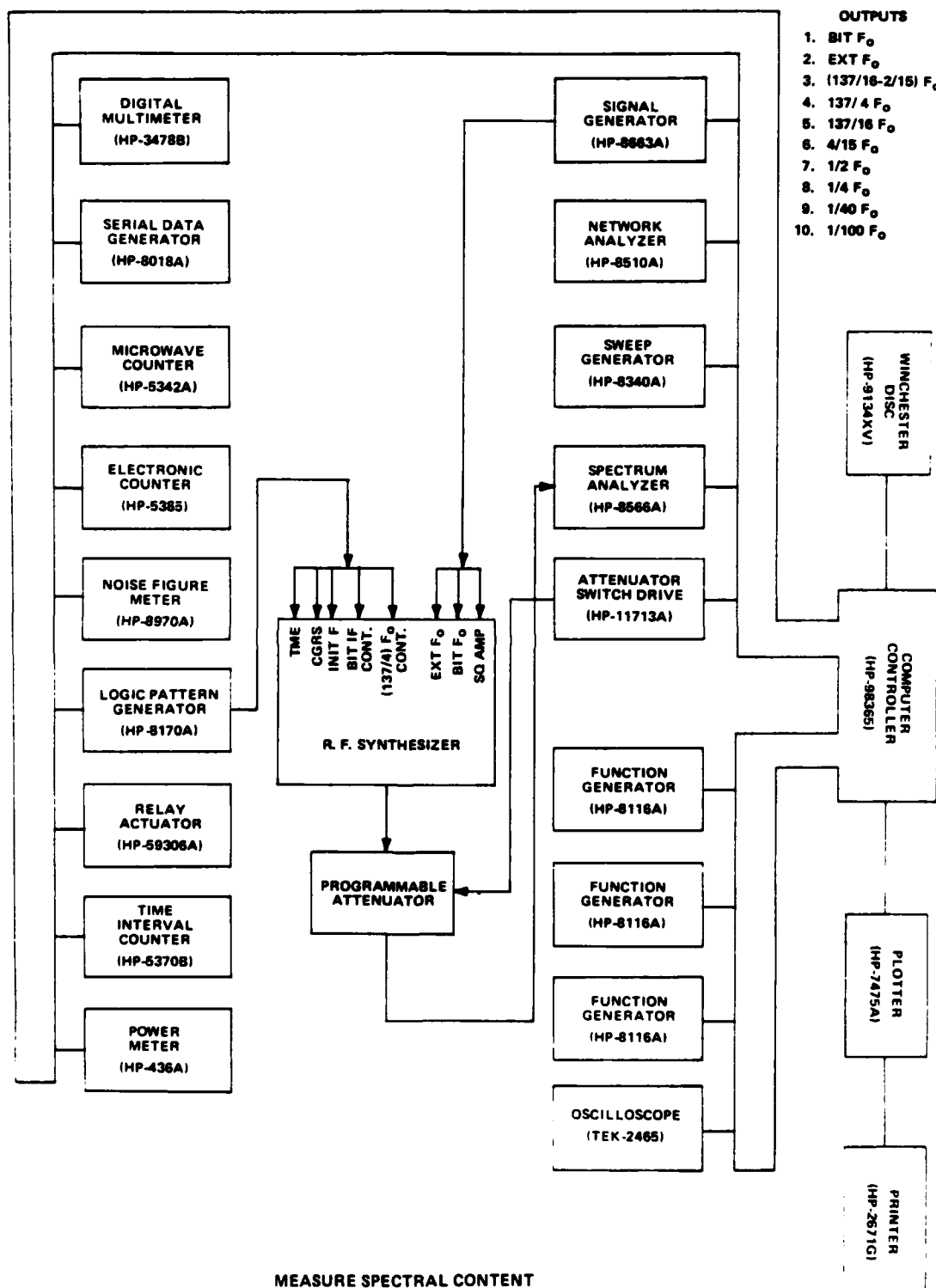
Apply proper signal levels to inputs of synthesizer board. Measure the spectral content of the Ext Fo output with the Spectrum Analyzer

checking for spurious outputs, harmonic levels, frequency stability etc.

Data Reduction: Send input levels to printer. Output of Spectrum Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|----------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper spectral content of synthesizer
BIT Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>BIT Fo</u>	<u>TBD</u>	<u>Spectrum Anal. (HP-8566A)</u>
2.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic.

Turn on test equipment. Set measurement equipment to proper ranges.

Apply proper signal levels to inputs of synthesizer board. Measure

the spectral content of the Bit Fo output with the Spectrum Analyzer

checking for spurious outputs, harmonic levels, frequency stability etc.

Data Reduction: Send input levels to printer. Output of Spectrum

Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|----------------------------------|------------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Drive (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten (HP-8494G)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper spectral content of synthesizer
($137/16 - 2/15$)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	$(^{137}/_{16} - 2/15)F_o$	TBD	Spec. Analyzer (HP-8566A)
2.			Prog. Atten. (HP-8494G)
3.			Att. Sw Drive (HP-11713A)
4.			
5.			

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
spectral content of the $(^{137}/_{16} - 2/15)F_o$ output with the Spectrum
Analyzer checking for spurious outputs, harmonic levels, frequency
stability etc.

Data Reduction: Send input levels to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|----------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper spectral content of synthesizer
(¹³⁷/₄)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ¹³⁷ / ₄ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₄)F₀</u>	<u>TBD</u>	<u>Spec. Anal. (HP-8566A)</u>
2.	<u> </u>	<u> </u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u> </u>	<u> </u>	<u>Att Sw Drive (HP-11713A)</u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
spectral content of the (¹³⁷/₄)F₀ output with the Spectrum Analyzer
checking for spurious outputs, harmonic levels, frequency stability etc.

Data Reduction: Send input levels to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|----------------------------------|
| 1. <u>Signal Gen. (HP-8170A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u> </u> |

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Verify proper spectral content of synthesizer
(¹³⁷/₁₆)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** ¹³⁷ / ₄ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₁₆)Fo</u>	<u>TBD</u>	<u>Spec. Anal. (HP-8566A)</u>
2.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
spectral content of the (¹³⁷/₁₆)Fo output with the Spectrum Analyzer
checking for spurious outputs, harmonic levels, frequency stability etc.

Data Reduction: Send input levels to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|----------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u></u> |

Contractor: Rockwell-Collins

Board Tested: RF Synthesizer

Test Objective: Verify proper spectral content of synthesizer
(4/15)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	* Fo (3 inputs)	10.23MHz @ TBD	Signal Gen. (HP-8663A)
2.	** Time Mark Enable	TBD	Log Patt. Gen. (HP-8170A)
3.	** Code Gen. Reset Strobe	TBD	Log Patt. Gen. (HP-8170A)
4.	** Init F	TBD	Log Patt. Gen. (HP-8170A)
5.	** BIT IF Control	TBD	Log Patt. Gen. (HP-8170A)
6.	** $137/4$ Fo Control	TBD	Log Patt. Gen. (HP-8170A)
7.			
8.			
9.			
10.			
11.			
12.			

* Power splitter needed to provide these 3 inputs.

** Breakout board needed to provide various levels for these 5 inputs.

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(4/15) F_o</u>	<u>TBD</u>	<u>Spec. Anal. (HP-8566A)</u>
2.	<u></u>	<u></u>	<u>Prog. Atten. (HP-8494G)</u>
3.	<u></u>	<u></u>	<u>Att Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Hook up unit under test as shown in schematic. Turn
on test equipment. Set measurement equipment to proper ranges. Apply
proper signal levels to inputs of synthesizer board. Measure the
spectral content of the (4/15)F_o output with the Spectrum Analyzer
checking for spurious outputs, harmonic levels, frequency stability etc.
Repeat for the following frequency outputs: $\frac{1}{2}F_o$ $\frac{1}{40}F_o$
 $\frac{1}{2}F_o$ $\frac{1}{100}F_o$

Data Reduction: Send input levels to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------------|-----------------------------------|----------------------------------|
| 1. <u>Signal Gen. (HP-8663A)</u> | 4. <u>Printer (HP-2671G)</u> | 7. <u>Att Sw Dr. (HP-11713A)</u> |
| 2. <u>Log Patt Gen (HP-8170A)</u> | 5. <u>Spec. Anal. (HP-8566A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Computer (HP-9836S)</u> | 6. <u>Prog. Atten. (HP-8494G)</u> | 9. <u></u> |

Outputs

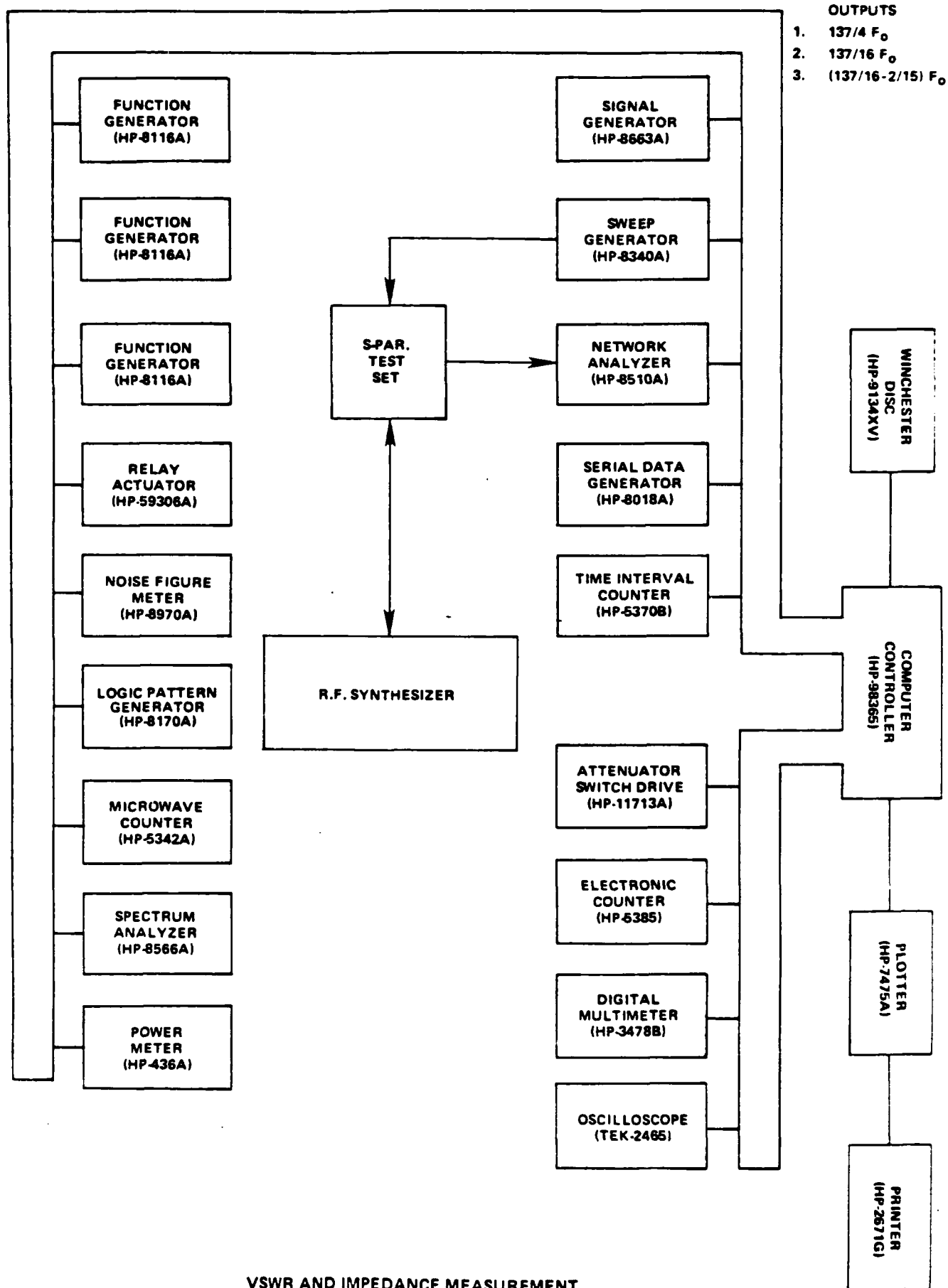
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₄)Fo</u>	<u>TBD</u>	<u>Network Analyzer (HP-8510A)</u>
2.	<u></u>	<u></u>	<u>S-Par. Test Set (HP-8515A)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply input signal to S-Parameter Test Set from
Sweep Generator. Measure VSWR and impedance with Network Analyzer.

Data Reduction: Send input level to printer. Output of Network
Analyzer to plotter.

Equipment List:

- | | | |
|-------------------------------|--------------------------------------|------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>S-Par. Test Set (HP-8515A)</u> | 7. <u></u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Network Anal. (HP-8510A)</u> | 8. <u></u> |
| 3. <u>Plotter (HP-7475A)</u> | 6. <u>Sweep Gen. (HP-8340A)</u> | 9. <u></u> |



VSWR AND IMPEDANCE MEASUREMENT

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Measure VSWR and impedance (¹³⁷/₁₆)Fo output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>S-Par. Test Set</u>	<u>TBD</u>	<u>Sweep Gen. (HP-8340A)</u>
2.	<u></u>	<u></u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>(¹³⁷/₁₆)F_o</u>	<u>TBD</u>	<u>Network Analyzer (HP-8510A)</u>
2.	<u> </u>	<u> </u>	<u>S-Par. Test Set (HP-8515A)</u>
3.	<u> </u>	<u> </u>	<u> </u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply input signal to S-Parameter Test Set from Sweep
Generator. Measure VSWR and impedance with Network Analyzer.

Data Reduction: Send input levels to printer. Output of Network
Analyzer to plotter.

Equipment List:

- | | | |
|-------------------------------|--------------------------------------|--|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>S-Par Test Set (HP-8515A)</u> | 7. <u> </u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Network Anal. (HP-8510A)</u> | 8. <u> </u> |
| 3. <u>Plotter (HP-7475A)</u> | 6. <u>Sweep Generator (HP-8340A)</u> | 9. <u> </u> |

Contractor: Rockwell-Collins
Board Tested: RF Synthesizer
Test Objective: Measure VSWR and impedance of (¹³⁷/16 - 2/15)Fo
output.

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>S-Par. Test Set</u>	<u>TBD</u>	<u>Sweep Generator (HP-8340A)</u>
2. <u></u>	<u></u>	<u></u>
3. <u></u>	<u></u>	<u></u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	$(^{137}_{16} - 2/15)F_0$	TBD	Network Anal. (HP-8510A)
2.			S-Par. Test Set (HP-8515A)
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Apply input signal to S-Parameter Test Set from Sweep Generator. Measure VSWR and impedance with Network Analyzer.

Data Reduction: Send input levels to printer. Output of Network Analyzer to plotter.

Equipment List:

- | | | |
|------------------------|------------------------------|----------|
| 1. Computer (HP-9836S) | 4. S-Par Test Set (HP-8515A) | 7. _____ |
| 2. Printer (HP-2671G) | 5. Network Anal. (HP-8510A) | 8. _____ |
| 3. Plotter (HP-7475A) | 6. Sweep Gen. (HP-8340A) | 9. _____ |

3.1.1.3 CORRELATOR MODULE

Contractor: Rockwell-Collins

Board Tested: Correlator

Test Objective: Measure Receiver Local Bus output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>17F(IF)</u>	<u>173.91MHz @ TBD</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>Code Gen. Reset</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>(¹³⁷/₁₆)Fo</u>	<u>87.594MHz @ TBD</u>	<u>Sweep Gen. (HP-8340A)</u>
4.	<u>(⁴/₅)Fo</u>	<u>2.728MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
5.	<u>** (¹/₄₀) Fo</u>	<u>255.750Hz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
6.	<u>(¹/₂)Fo</u>	<u>5.115MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
7.	<u>*(¹/₄)Fo</u>	<u>2.5575MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
8.	<u>T20</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>L1 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
10.	<u>*** L2 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
11.	<u>Analog Inputs</u>	<u>TBD</u>	<u>External Source</u>
12.	<u>_____</u>	<u>_____</u>	<u>_____</u>

* Need divide by 2

** Need multiply by 3, divide by 32

*** Need 2 way power divider

Outputs

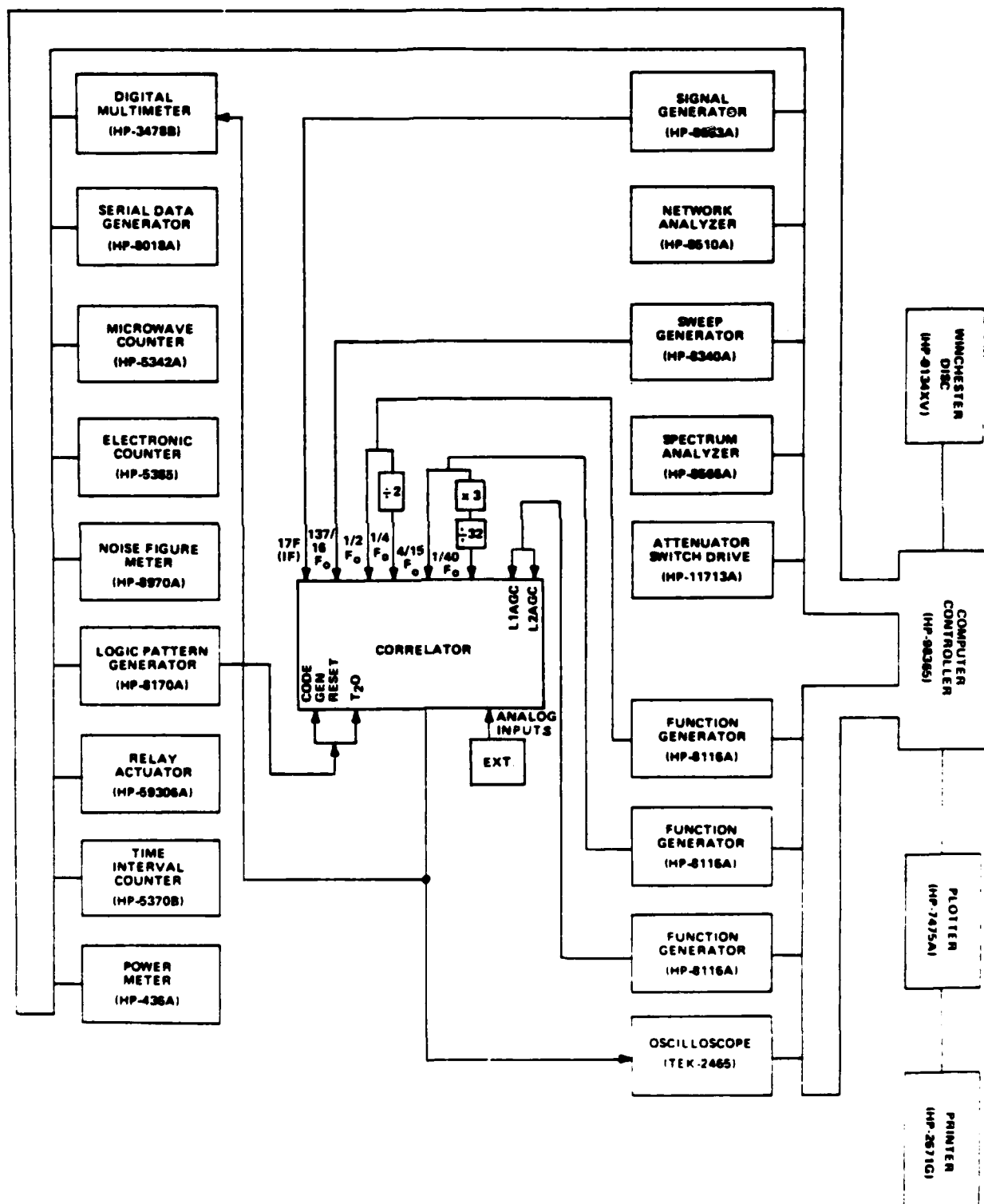
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Receiver Local Bus</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Receiver Local Bus output with Digital Multimeter. An Oscilloscope will
be used to display waveform.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|---|-------------------------------------|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. <u>Printer (HP-2671G)</u> |
| 2. <u>(3) Function Gens. (HP-8116A)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. <u>Oscilloscope (TEK-2465)</u> |
| 3. <u>Log. Patt. Gen. (HP-8170A)</u> | 6. <u>Digital Multi. (HP-3478B)</u> | 9. <u>External Source</u> |
| 10. <u>Plotter (HP-7475A)</u> | | |



Contractor: Rockwell-Collins

Board Tested: Correlator

Test Objective: Verify Code Generator Reset Strobe operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>17F(IF)</u>	<u>173.91MHz @ TBD</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>Code Gen. Reset</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>(¹³⁷/₁₆) Fo</u>	<u>87.594MHz @ TBD</u>	<u>Sweep Gen. (HP-8340A)</u>
4.	<u>(⁴/₁₅) Fo</u>	<u>2.728MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
5.	<u>** (¹/₄₀) Fo</u>	<u>255,750Hz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
6.	<u>(¹/₂) Fo</u>	<u>5.115MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
7.	<u>* (¹/₄) Fo</u>	<u>2.5575MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
8.	<u>T20</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>L1 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
10.	<u>*** L2 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
11.	<u>Analog Inputs</u>	<u>TBD</u>	<u>External Source</u>
12.	_____	_____	_____

- * Need divide by 2
- ** Need multiply be 3, divide by 32
- *** Need 2 way power divider

Outputs

<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Code Gen. Reset Strobe</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2. _____	_____	<u>Oscilloscope (TEK-2465)</u>
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Code Generator Reset Strobe output with Digital Multimeter. An Oscillo-
scope will be used to display waveform.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|---------------------------------------|-------------------------------------|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. <u>Printer (HP-2671G)</u> |
| 2. (3) <u>Func. Gens. (HP-8116A)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. <u>Oscilloscope (TEK-2465)</u> |
| 3. <u>Logic Patt. Gen. (HP-8170A)</u> | 6. <u>Digital Multi. (HP-3478B)</u> | 9. <u>External Source</u> |
| 10. <u>Plotter (HP-7475A)</u> | | |

Contractor: Rockwell-Collins

Board Tested: Correlator

Test Objective: Verify Switch Select operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>17F(IF)</u>	<u>173.91MHz @ TBD</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>Code Gen. Reset</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>(¹³⁷/16) Fo</u>	<u>87.594MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
4.	<u>(⁴/15) Fo</u>	<u>2.728MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
5.	<u>** (¹/40) Fo</u>	<u>255.750Hz @ TBD</u>	<u>Function Gen. (HP-8116a)</u>
6.	<u>(¹/₂) Fo</u>	<u>5.115MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
7.	<u>* (¹/₄) Fo</u>	<u>2.5575MHz @ TBD</u>	<u>Function Gen. (HP-8116A)</u>
8.	<u>T20</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>L1 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
10.	<u>*** L2 AGC</u>	<u>TBD</u>	<u>Function Gen. (HP-8116A)</u>
11.	<u>Analog Inputs</u>	<u>TBD</u>	<u>External Source</u>
12.	<u>_____</u>	<u>_____</u>	<u>_____</u>

- * Need divide by 2
- ** Need multiply by 3, divide by 32
- *** Need 2 way power divider

Outputs

<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Switch Select</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2. _____	_____	<u>Oscilloscope (TEK-2465)</u>
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
Switch Select output with Digital Multimeter. An Oscilloscope will be
used to display waveform.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|--------------------------------------|-------------------------------------|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Sig. Gen. (HP-8663A)</u> | 7. <u>Printer (HP-2671G)</u> |
| 2. (3) <u>Func. Gens. (HP-8116A)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. <u>Oscilloscope (TEK-2465)</u> |
| 3. <u>Logic Patt Gen (HP-8170A)</u> | 6. <u>Digital Multi. (HP-3478B)</u> | 9. <u>External Source</u> |
| 10. <u>Plotter (HP-7475A)</u> | | |

3.1.1.4 IF PROCESSOR MODULE

Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Verify L1 AGC operational.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Function Generator (HP-8116A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>*In-house Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Signal Gen. (HP-8663A)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Signal Gen. (HP-8663A)</u>
13.	<u>(¹³⁷/4) Fo</u>	<u>350.3775MHz @ TBD</u>	<u>Sweep Gen. (HP-8340A)</u>

* In-house designed P-Code Generator (may also need C/A Code Generator)

Outputs

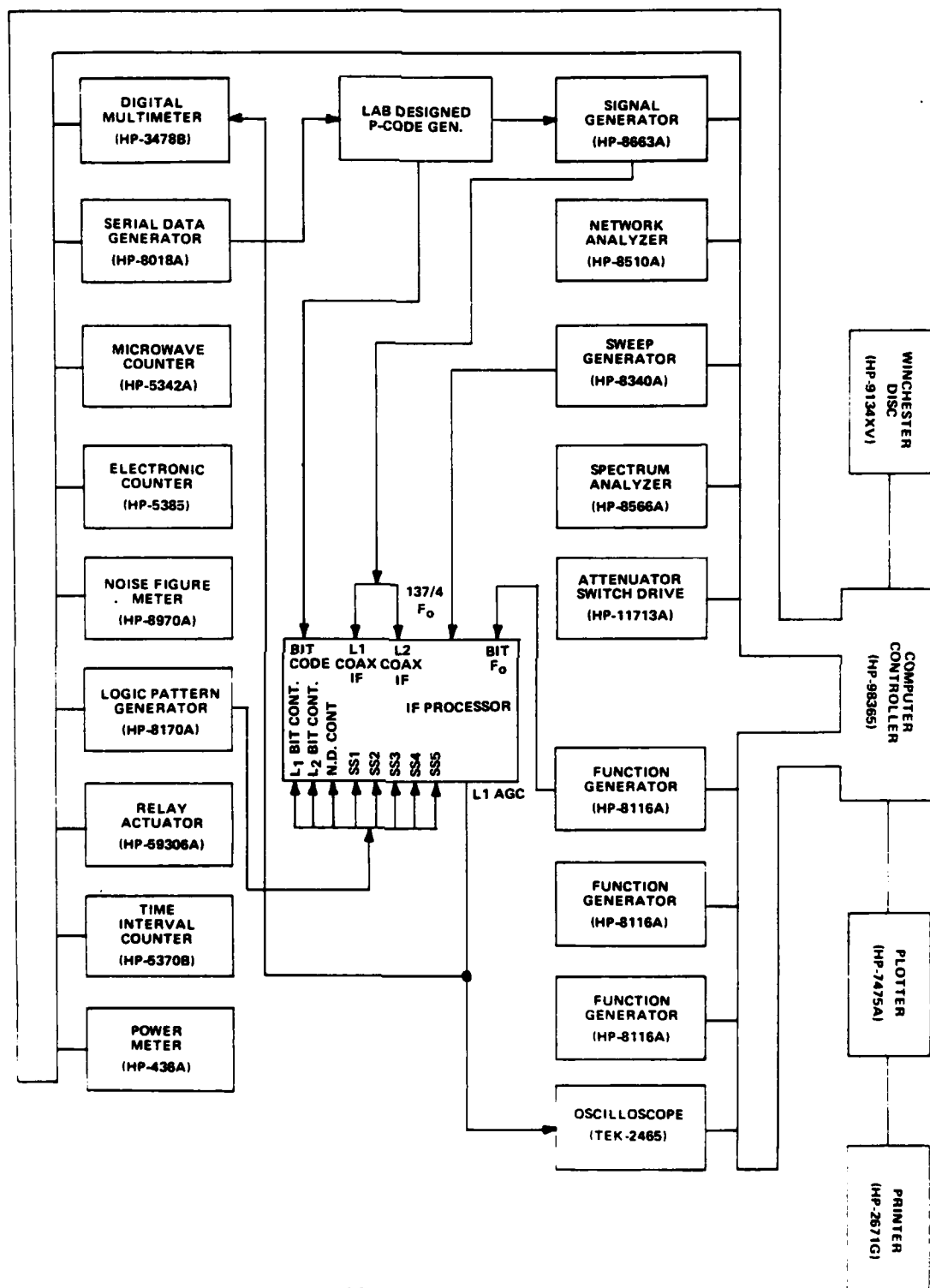
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 AGC</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
L1 AGC output with Digital Multimeter. An Oscilloscope will be used to
display waveform.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|--|----------------------------------|-------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. <u>Digital Multi. (HP-3478B)</u> |
| 2. <u>Log. Patt Gen (HP-8170A)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. <u>Oscilloscope (TEK-2465)</u> |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Printer (HP-2671G)</u> | 9. <u>In-house Design</u> |
| 10. <u>Serial Data Gen. (HP-8018A)</u> | 12. <u>Plotter (HP-7475A)</u> | |



L1 AGC MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Verify L2 AGC operational.

	<u>Inputs</u>		
	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Function Generator (HP-8116A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>*In-house Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Signal Gen. (HP-8663A)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Signal Gen. (HP-8663A)</u>
13.	<u>(¹³⁷/4) Fo</u>	<u>350.3775MHz @ TBD</u>	<u>Sweep Gen. (HP-8340A)</u>

* In-house designed P-Code Generator (may also need C/A Code Generator)

Outputs

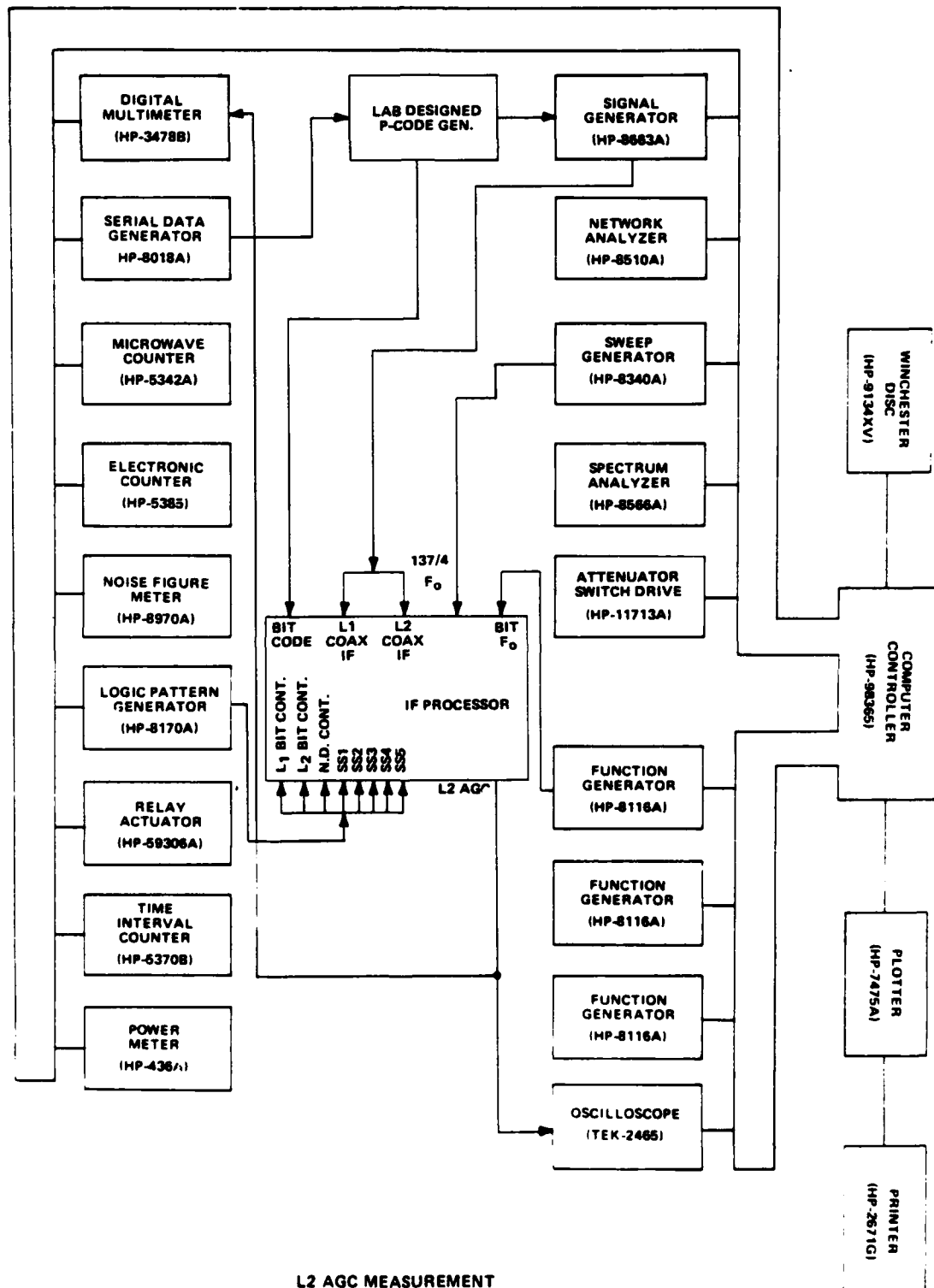
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L2 AGC</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2.	<u></u>	<u></u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
L2 AGC output with Digital Multimeter. An Oscilloscope will be used to
display waveform.

Data Reduction: Send input levels and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|--|----------------------------------|-------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. <u>Digital Multi. (HP-3478B)</u> |
| 2. <u>Log. Patt Gen (HP-8170A)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. <u>Oscilloscope (TEK-2465)</u> |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Printer (HP-2671G)</u> | 9. <u>In-house Design</u> |
| 10. <u>Serial Data Gen. (HP-8018A)</u> | 12. <u>Plotter (HP-7475A)</u> | |



L2 AGC MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Measure 17F(IF) output frequency.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>* In House Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
13.	<u>(137/4) Fo</u>	<u>350.3775MHz ± TBD</u>	<u>Sweep Generator (HP-8340A)</u>

* In-House designed P-Code Generator (may also need C/A Code Generator)

Outputs

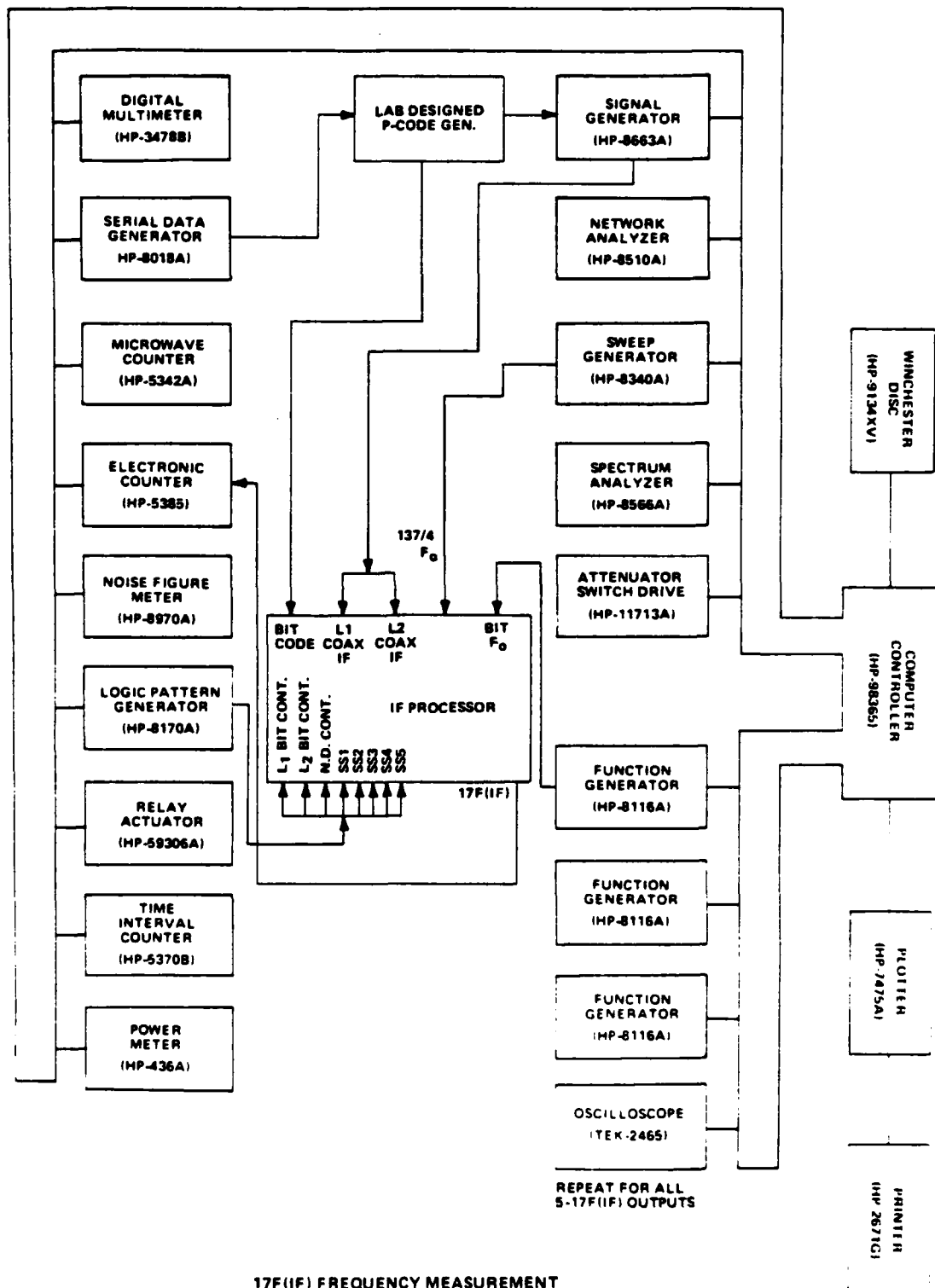
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	17F(IF)	173.91MHz	Electronic Ctr (HP-5385)
2.			
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Apply proper signal levels to all inputs. Measure 17F(IF) output frequency with Electronic Counter. (Repeat for all 5 17F(IF) outputs).

Data Reduction: Send input levels and output of Electronic Counter to printer.

Equipment List:

- | | | |
|--------------------------------|---------------------------|--------------------------------|
| 1. Computer (HP-9836S) | 4. Signal Gen. (HP-8663A) | 7. In-House Design |
| 2. Logic Patt. Gen. (HP-8170A) | 5. Printer (HP-2671G) | 8. Electronic Ctr (HP-5385) |
| 3. Function Gen. (HP-8116A) | 6. Sweep Gen. (HP-8340A) | 9. Serial Data Gen. (HP-8018A) |



17F(IF) FREQUENCY MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Measure output power of 17F(IF) output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Function Generator (HP-8116A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>* In House Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
13.	<u>(137/4) Fo</u>	<u>350.3775MHz @ TBD</u>	<u>Sweep Generator (HP-8340A)</u>

* In-House designed P-Code Generator (may also need C/A Code Generator)

Outputs

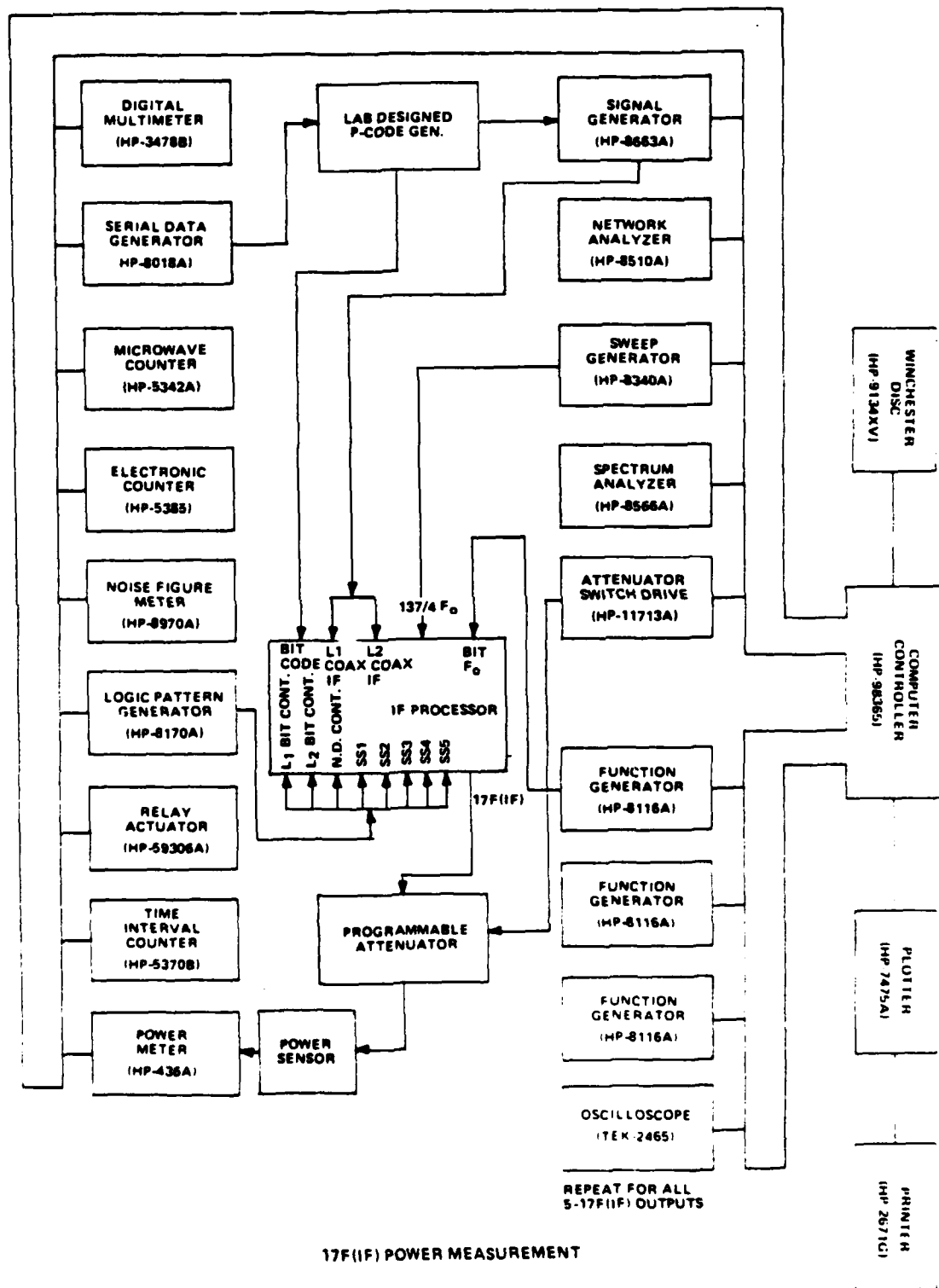
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>17F(IF)</u>	<u>TBD</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u>Prog. Att. (HP-8494G)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper signal levels to all inputs. Measure
output power of 17F(IF) output with Power Meter. (Repeat for all 5
17F(IF) outputs)

Data Reduction: Send input levels and output of Power Meter to
printer.

Equipment List:

- | | | |
|-------------------------------------|------------------------------------|---------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. <u>In-House Design</u> |
| 2. <u>Logic Patt Gen (HP-8170A)</u> | 5. <u>Printer (HP-2671G)</u> | 8. <u>Serial Data Gen. (HP-8018A)</u> |
| 3. <u>Func. Gen. (HP-8116A)</u> | 6. <u>Sweep Gen. (HP-8340A)</u> | 9. <u>Power Meter (HP-436A)</u> |
| 10. <u>Power Sensor (HP-8481A)</u> | 11. <u>Att. Sw Dr. (HP-11713A)</u> | 12. <u>Prog. Att. (HP-8494G)</u> |



Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Measure spectral content of 17F(IF) output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Function Generator (HP-8116A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>* In-House Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Signal Generator (HP-8663A)</u>
10.	<u>(137/4) Fo</u>	<u>350.3775MHz @ TBD</u>	<u>Sweep Generator (HP-8340A)</u>

* In-House designed P-Code Generator (may also need C/A Code Generator)

Outputs

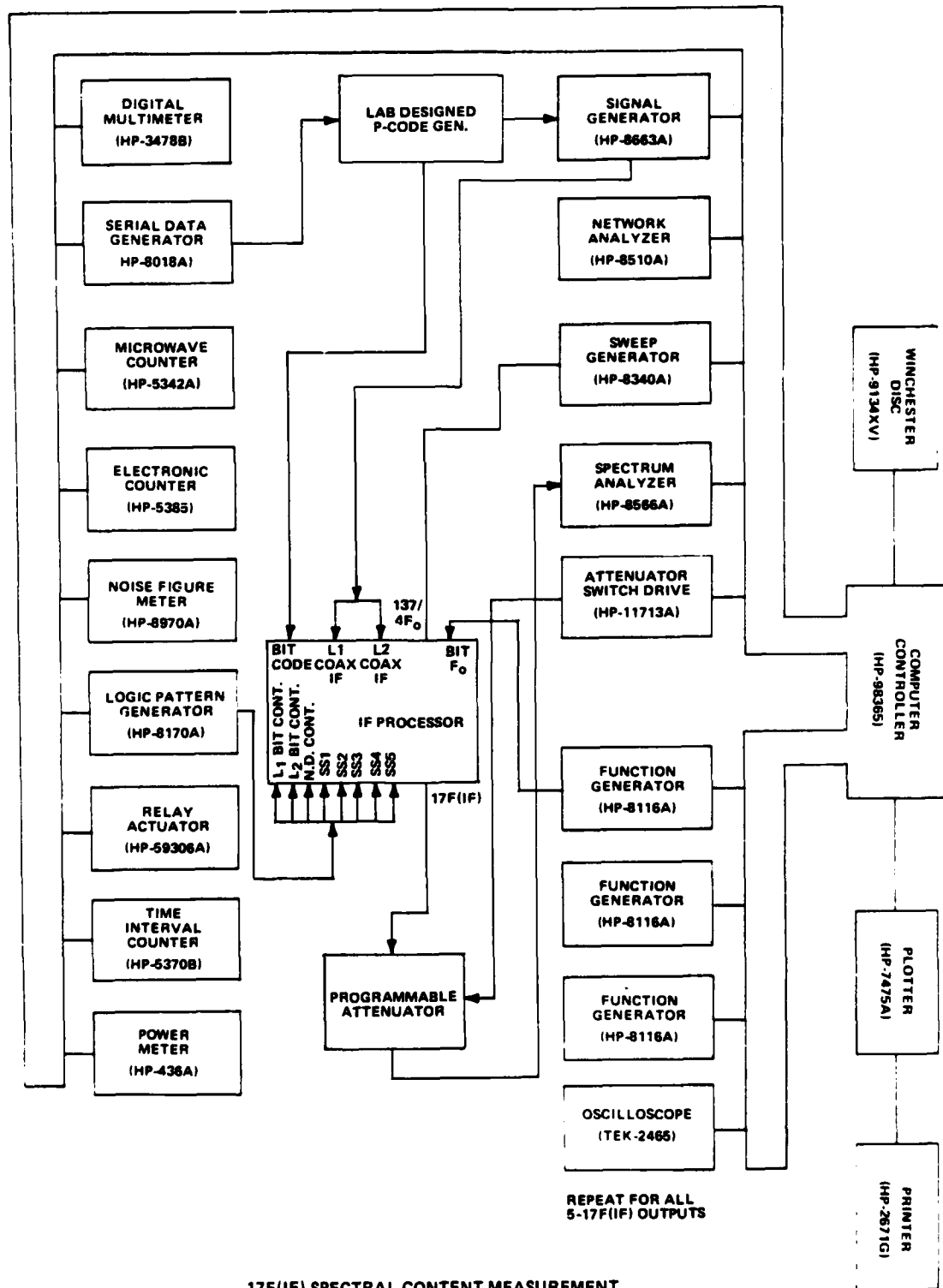
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	17F(IF)	173.91MHz @ TBD	Spectrum Analyzer (HP-8566A)
2.			Att. Sw Drive (HP-11713A)
3.			Prog. Att. (HP-8494G)
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Apply proper signal levels to all inputs. Measure spectral content of 17F(IF) output with Spectrum Analyzer. (Repeat for all 5 17F(IF) outputs)

Data Reduction: Send input levels to printer. Output of Spectrum Analyzer to plotter.

Equipment List:

- | | | |
|------------------------------|---------------------------|-------------------------------|
| 1. Computer (HP-9836S) | 4. Signal Gen. (HP-8663A) | 7. In-House Design |
| 2. Logic Patt Gen (HP-8170A) | 5. Printer (HP-2671G) | 8. Serial Data Gen (HP-8018A) |
| 3. Func. Gen. (HP-8116A) | 6. Sweep Gen. (HP-8340A) | 9. Spectrum Anal. (HP-8566A) |
| 10. Att. Sw Dr. (HP-11713A) | 11. Prog. Att. (HP-8494G) | 12. Plotter (HP-7475A) |



17F(IF) SPECTRAL CONTENT MEASUREMENT

Contractor: Rockwell-Collins
Board Tested: IF Processor
Test Objective: Measure output impedance and VSWR of 17F(IF)
output.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>S-Par Test Set</u>	<u>TBD</u>	<u>Sweep Gen. (HP-8340A)</u>
2.	<u></u>	<u></u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>17F(IF)</u>	<u>TBD</u>	<u>Network Analyzer (HP-8510A)</u>
2.	<u></u>	<u></u>	<u>S-Par. Test Set (HP-8515A)</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply input signal to S-Parameter Test Set from
Sweep Generator. Measure VSWR and impedance with Network Analyzer.
(Repeat for all 5 17F(IF) outputs)

Data Reduction: Send input levels to printer. Output of Network
Analyzer to plotter.

Equipment List:

- | | | |
|-------------------------------|-------------------------------------|------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>S-Par Test Set (HP-8515A)</u> | 7. <u></u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Network Anal. (HP-8510A)</u> | 8. <u></u> |
| 3. <u>Plotter (HP-7475A)</u> | 6. <u>Sweep Gen. (HP-8340A)</u> | 9. <u></u> |

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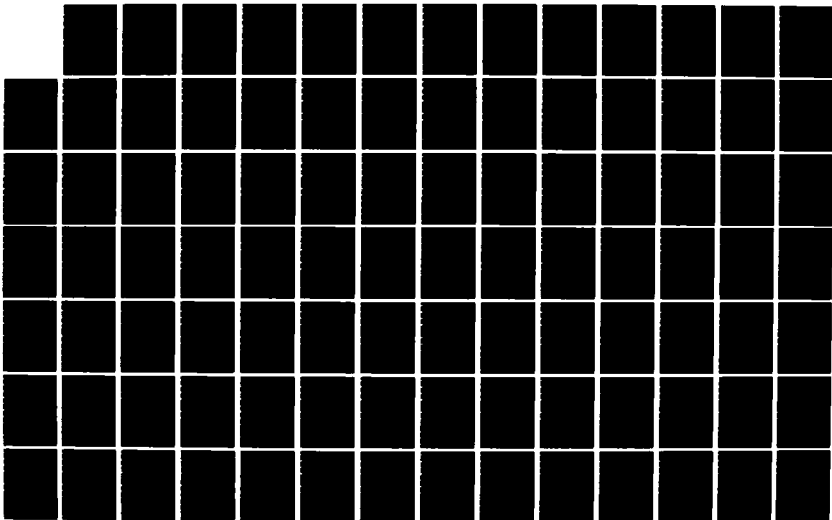
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N62269-82-D-0059

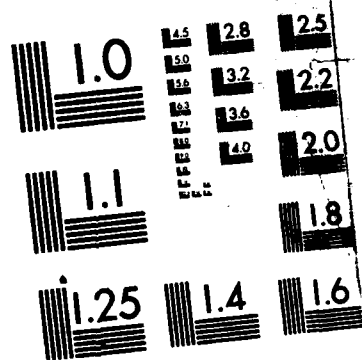
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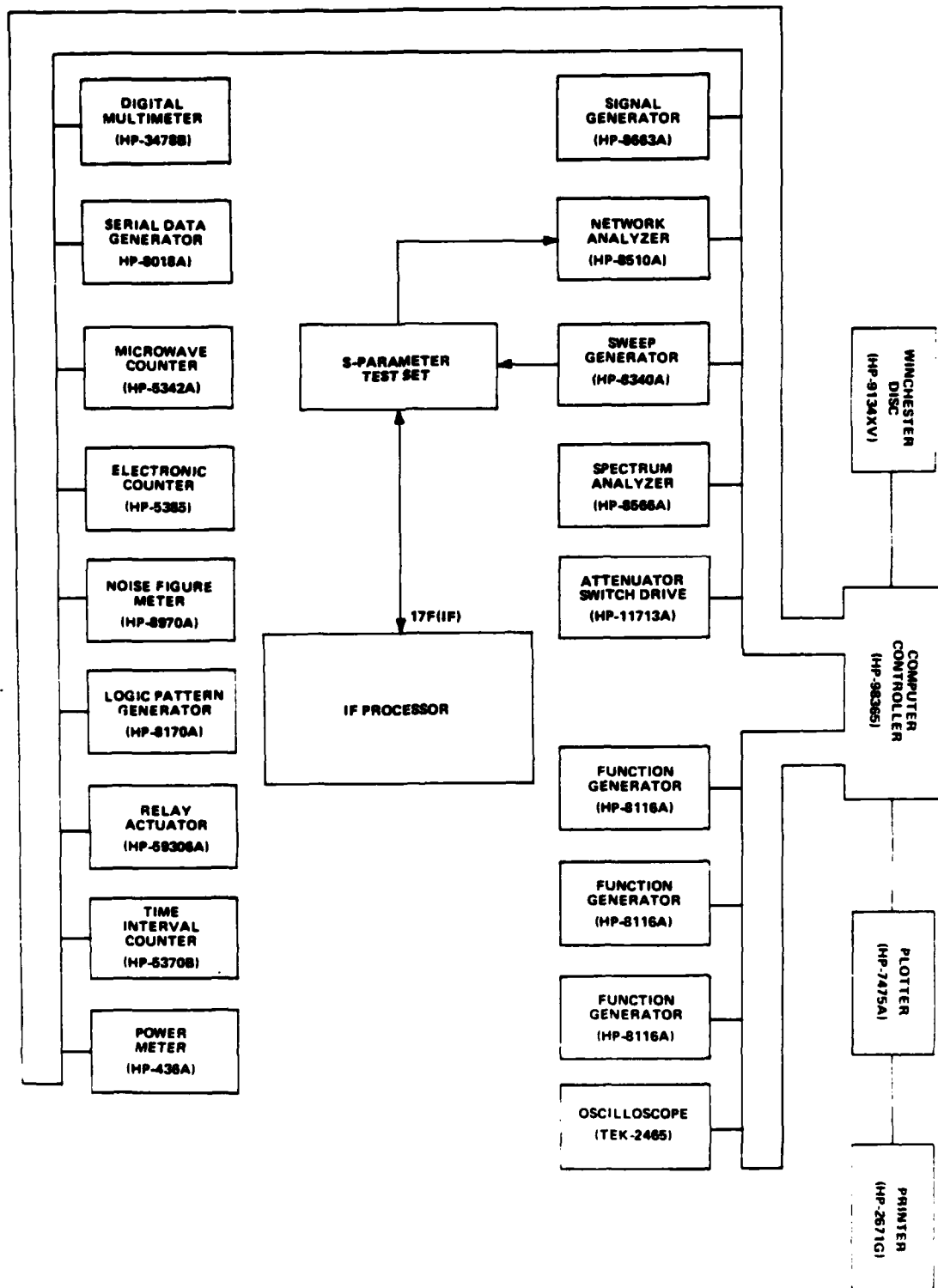
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



17F(IF) VSWR AND IMPEDANCE MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: IF Processor

Test Objective: Measure noise figure of 17F(IF) outputs.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Switch Select Input 1</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
2.	<u>Switch Select Input 2</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
3.	<u>Switch Select Input 3</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
4.	<u>Switch Select Input 4</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
5.	<u>Switch Select Input 5</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
6.	<u>L1 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
7.	<u>L2 BIT Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
8.	<u>Noise Diode Control</u>	<u>TBD</u>	<u>Logic Patt. Gen. (HP-8170A)</u>
9.	<u>BIT Fo</u>	<u>TBD</u>	<u>Function Generator (HP-8116A)</u>
10.	<u>BIT Code</u>	<u>TBD</u>	<u>* In-House Generator</u>
11.	<u>L1 Coax</u>	<u>TBD</u>	<u>Noise Source (HP-346B)</u>
12.	<u>L2 Coax</u>	<u>TBD</u>	<u>Noise Source (HP-346B)</u>
13.	<u>(137/4) Fo</u>	<u>350.3775MHz @ TBD</u>	<u>Sweep Generator (HP-8340A)</u>

* In-House designed P-Code Generator (may also need C/A Code Generator)

Outputs

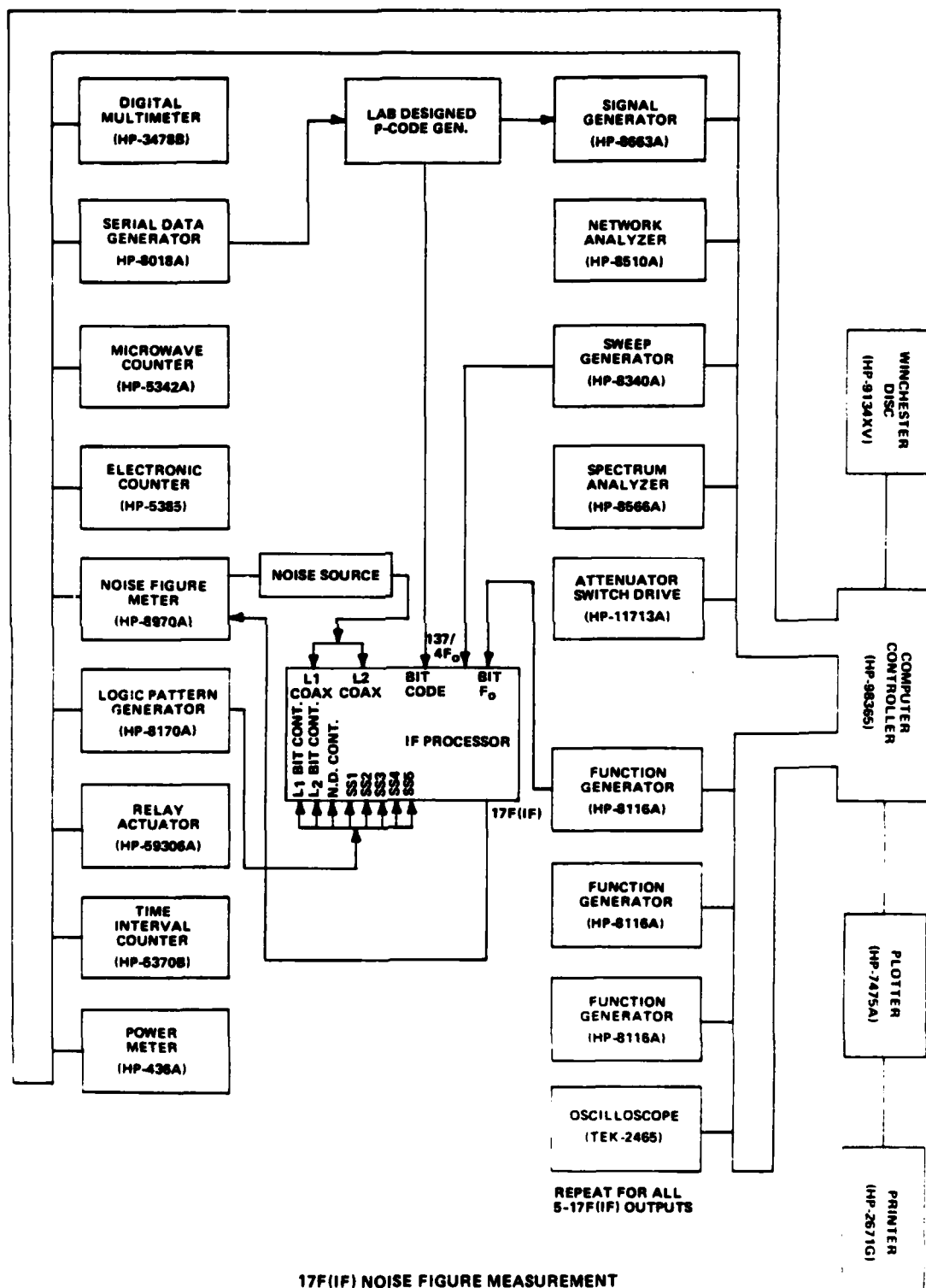
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	17F(IF)	TBD	Noise Figure Meter (HP-8970A)
2.			
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Apply proper signal levels to all inputs. Turn on noise source. Measure noise figure with Noise Figure Meter. (Repeat for all 5 17F(IF) outputs)

Data Reduction: Send input levels and output of Noise Figure Meter to printer.

Equipment List:

- | | | |
|---------------------------------|------------------------------|---------------------------|
| 1. Computer (HP-9836S) | 4. Ser. Data Gen. (HP-8018A) | 7. Signal Gen. (HP-8663A) |
| 2. Printer (HP-2671G) | 5. Sweep Gen. (HP-8340A) | 8. In House Design |
| 3. Logic Patt Gen (HP-8170A) | 6. Function Gen. (HP-8116A) | 9. Noise Source (HP-346B) |
| 10. Noise Fig. Meter (HP-8970A) | | |



3.1.1.5 REFERENCE OSCILLATOR MODULE

Contractor: Rockwell-Collins
Board Tested: Reference Oscillator
Test Objective: Measure output frequency

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>DC Input</u>	<u>8.25VDC</u>	<u>Function Gen. (HP-8116A)</u>
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

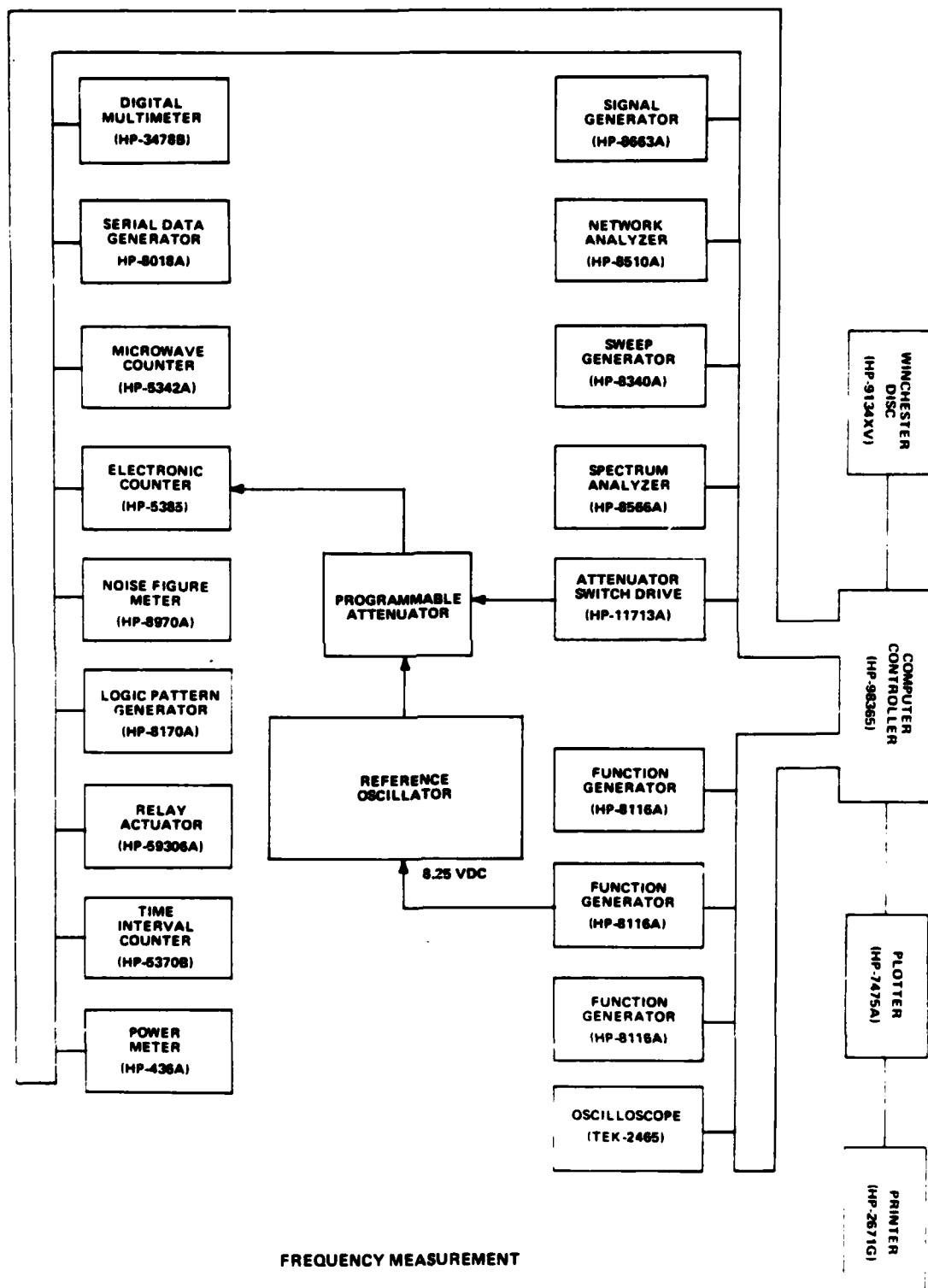
<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Fo</u>	<u>10.23MHz</u>	<u>Electronic Ctr. (HP-5385)</u>
2. <u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
3. <u></u>	<u></u>	<u>Prog. Att. (HP-8494G)</u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply a DC Voltage to input of Reference Oscillator.
Measure output frequency with Electronic Counter.

Data Reduction: Send input levels and output of Electronic Counter
to printer.

Equipment List:

- | | | |
|------------------------------------|-------------------------------------|------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Electronic Ctr. (HP-5385)</u> | 7. <u></u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Att Sw Dr. (HP-11713A)</u> | 8. <u></u> |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Prog. Att. (HP-8494G)</u> | 9. <u></u> |



Contractor: Rockwell-Collins

Board Tested: Reference Oscillator

Test Objective: Measure output power

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>DC Input</u>	<u>8.25VDC</u>	<u>Function Gen. (HP-8116A)</u>
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Fo</u>	<u>0dBm</u>	<u>Power Meter (HP-436A)</u>
2.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
3.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
4.	<u></u>	<u></u>	<u>Prog. Att. (HP-8494G)</u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply a DC voltage to input of Reference Oscillator.
Measure output power with Power Meter.

Data Reduction: Send input levels and output of Power Meter to printer.

Equipment List:

- | | | |
|---------------------------------|-----------------------------------|---------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Power Meter (HP-436A)</u> | 7. <u>Prog. Att. (HP-8494G)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481G)</u> | 8. <u></u> |
| 3. <u>Func. Gen. (HP-8116A)</u> | 6. <u>Att. Sw Dr. (HP-11713A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins
Board Tested: Reference Oscillator
Test Objective: Measure spectral content of output signal.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>DC Input</u>	<u>8.25VDC</u>	<u>Function Gen. (HP-8116A)</u>
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

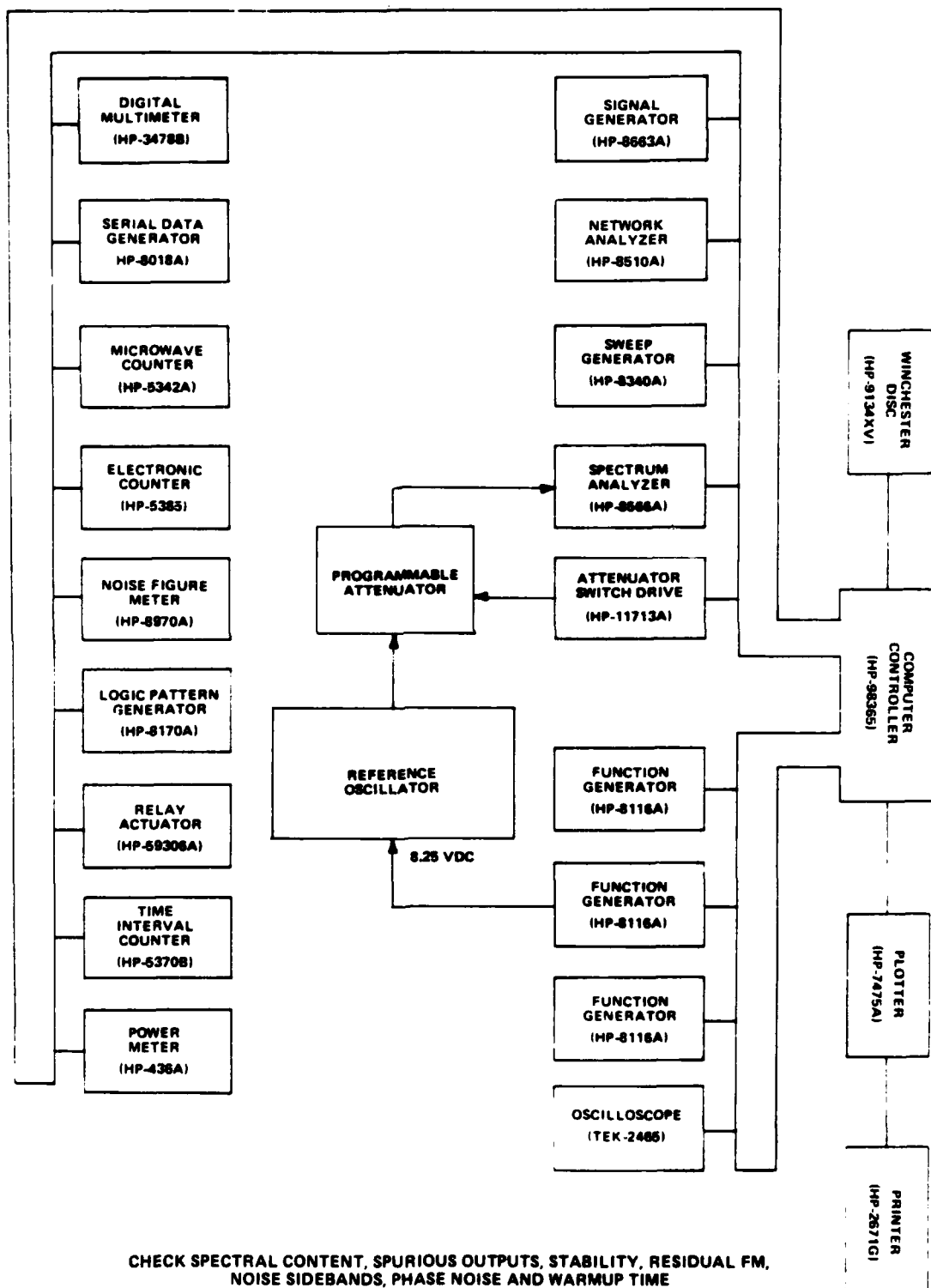
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Fo</u>	<u>10.23MHz @ 0dBm</u>	<u>Spectrum Anal. (HP-8566A)</u>
2.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
3.	<u></u>	<u></u>	<u>Prog. Att. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply a DC Voltage to input of Reference Oscillator.
Measure spectral content of output signal with Spectrum Analyzer.

Data Reduction: Send input level to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|------------------------------------|-------------------------------------|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Spectrum Anal. (HP-8566A)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Att. Sw Dr. (HP-11713A)</u> | 8. <u></u> |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Prog. Att. (HP-8494G)</u> | 9. <u></u> |



Contractor: Rockwell-Collins
Board Tested: Reference Oscillator
Test Objective: Check oscillator output for stability, residual
FM, noise sidebands and phase noise.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	DC Input	8.25VDC	Function Gen. (HP-8116A)
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Fo</u>	<u>TBD</u>	<u>Spectrum Anal. (HP-8566A)</u>
2.	<u></u>	<u></u>	<u>Att. Sw Drive (HP-11713A)</u>
3.	<u></u>	<u></u>	<u>Prog. Att. (HP-8494G)</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply a DC Voltage to input of Reference Oscillator.
Measure short and long term stability, phase noise, noise sidebands,
and residual FM at oscillator output.

Data Reduction: Send input levels to printer. Output of Spectrum
Analyzer to plotter.

Equipment List:

- | | | |
|------------------------------------|-------------------------------------|---------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u>Prog. Att. (HP-8494G)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Spectrum Anal. (HP-8566A)</u> | 8. <u></u> |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Att. Sw Dr. (HP-11713A)</u> | 9. <u></u> |

Contractor: Rockwell-Collins
Board Tested: Reference Oscillator
Test Objective: Verify within specification operation of oscillator
after 5 minute warm-up.

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>DC Input</u>	<u>8.25VDC</u>	<u>Function Gen. (HP-8116A)</u>
2.	<u></u>	<u></u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	Fo	-----	Spectrum Anal. (HP-8566A)
2.			Att. Sw Dr. (HP-11713A)
3.			Prog. Att. (HP-8494G)
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Apply a DC Voltage to input of Reference Oscillator. After 5 minute specification period, take stability reading with Spectrum Analyzer to verify proper operation after the warm up period.

Data Reduction: Send input level to printer. Output of Spectrum Analyzer to plotter.

Equipment List:

- | | | |
|-----------------------------|------------------------------|--------------------------|
| 1. Computer (HP-9836S) | 4. Plotter (HP-7475A) | 7. Prog. Att. (HP-8494G) |
| 2. Printer (HP-2671G) | 5. Spectrum Anal. (HP-8566A) | 8. |
| 3. Function Gen. (HP-8116A) | 6. Att. Sw Dr. (HP-11713A) | 9. |

Contractor: Rockwell-Collins
Board Tested: Reference Oscillator
Test Objective: Verify Standard Fault operation.

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>DC Input</u>	<u>8.25VDC</u>	<u>Function Gen. (HP-8116A)</u>
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____
6. _____	_____	_____
7. _____	_____	_____
8. _____	_____	_____
9. _____	_____	_____
10. _____	_____	_____
11. _____	_____	_____
12. _____	_____	_____

Outputs

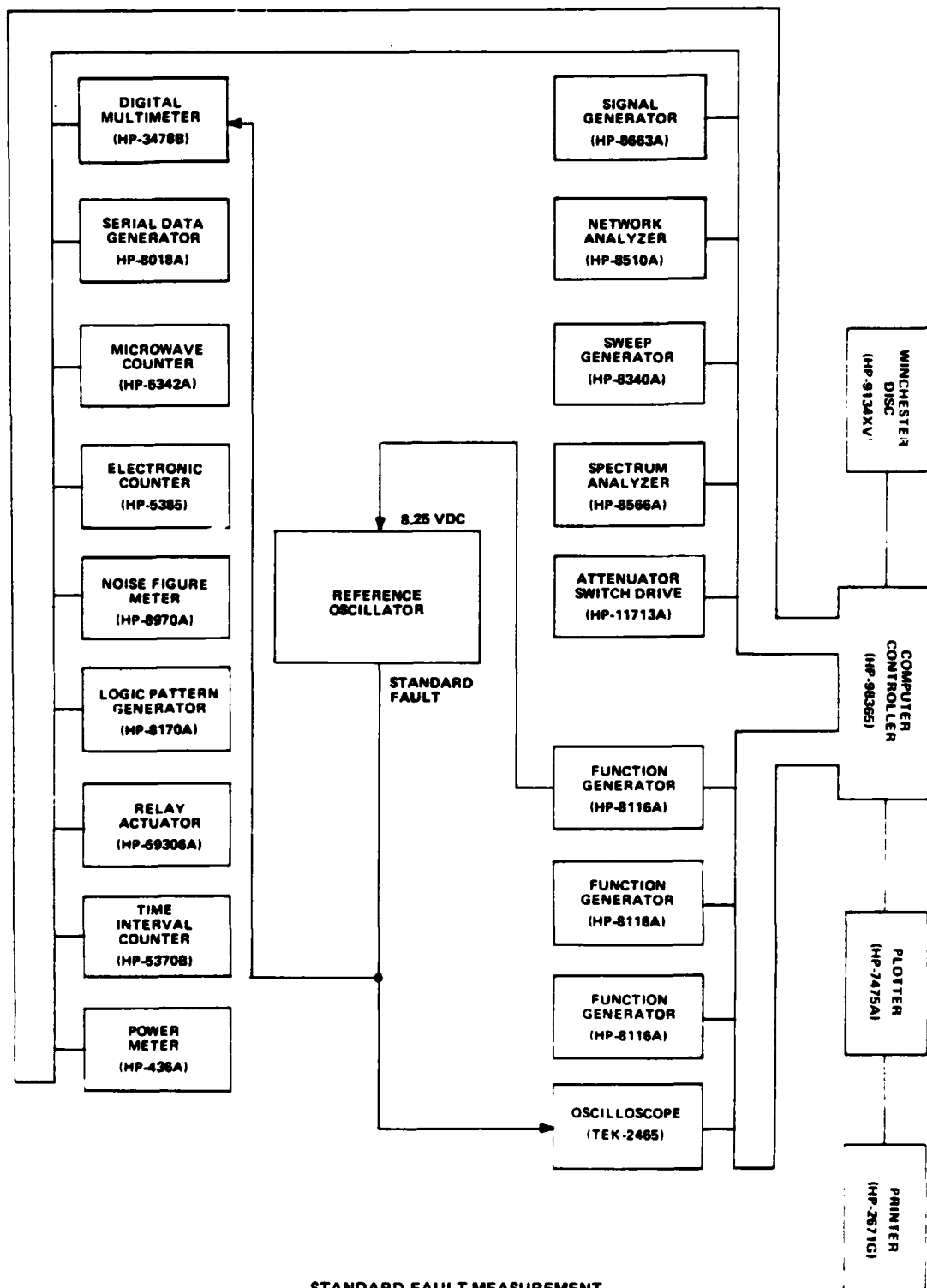
<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Standard Fault output</u>	<u>TBD</u>	<u>Digital Multi. (HP-3478B)</u>
2. _____	_____	<u>Oscilloscope (HP-2465)</u>
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply a DC Voltage to Reference Oscillator input.
Measure Standard Fault output with Digital Multimeter. An Oscilloscope
will be used to display waveform.

Data Reduction: Send input level and output of Digital Multimeter
to printer. Output of Oscilloscope to plotter.

Equipment List:

- | | | |
|------------------------------------|-------------------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Digital Multi. (HP-3487B)</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Oscilloscope (TEK-2465)</u> | 8. _____ |
| 3. <u>Function Gen. (HP-8116A)</u> | 6. <u>Plotter (HP-7475A)</u> | 9. _____ |



3.1.1.6 ANTENNA ELECTRONICS

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To ensure that the L1 and L2 IF interfaces of the
AE are AC coupled (DC Impedance)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
2.	<u>---</u>	<u>---</u>	<u>---</u>
3.	<u> </u>	<u> </u>	<u> </u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>
6.	<u> </u>	<u> </u>	<u> </u>
7.	<u> </u>	<u> </u>	<u> </u>
8.	<u> </u>	<u> </u>	<u> </u>
9.	<u> </u>	<u> </u>	<u> </u>
10.	<u> </u>	<u> </u>	<u> </u>
11.	<u> </u>	<u> </u>	<u> </u>
12.	<u> </u>	<u> </u>	<u> </u>

Outputs

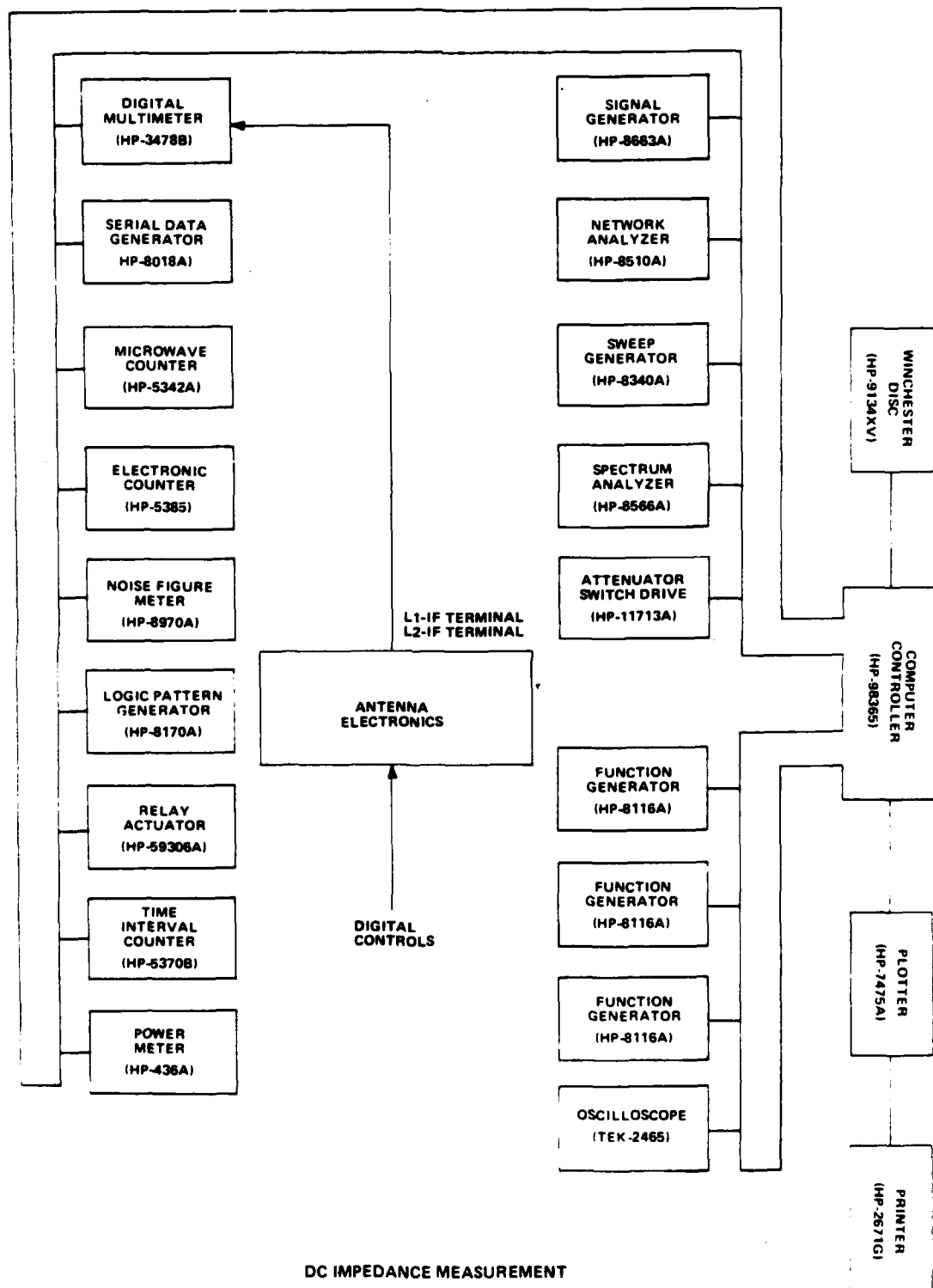
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	L2 IF	>100k Ω	Digital Multi (HP-3478B)
2.	L1 IF	>100k Ω	Digital Multi (HP-3478B)
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Connect the Digital Multimeter across the L2 IF terminal. A DC impedance greater than 100k Ω will indicate that the interface is AC coupled only. Repeat for L1.

Data Reduction: Send input levels and output of Digital Multimeter to printer.

Equipment List:

- | | | |
|--|-------------|-------------|
| 1. <u>Computer (HP-9836S)</u> | 4. _____ | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. _____ | 8. _____ |
| 3. <u>Digital Multimeter</u>
(HP-3478B) | 6. _____ | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: Verify that input impedance is not less than 2k ohms
resistive. (Blanking Pulse Input Impedance)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Blanking Pulse Input Z</u>	<u>2kΩ minimum</u>	<u>Digital Multi. (HP-3478B)</u>
2.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

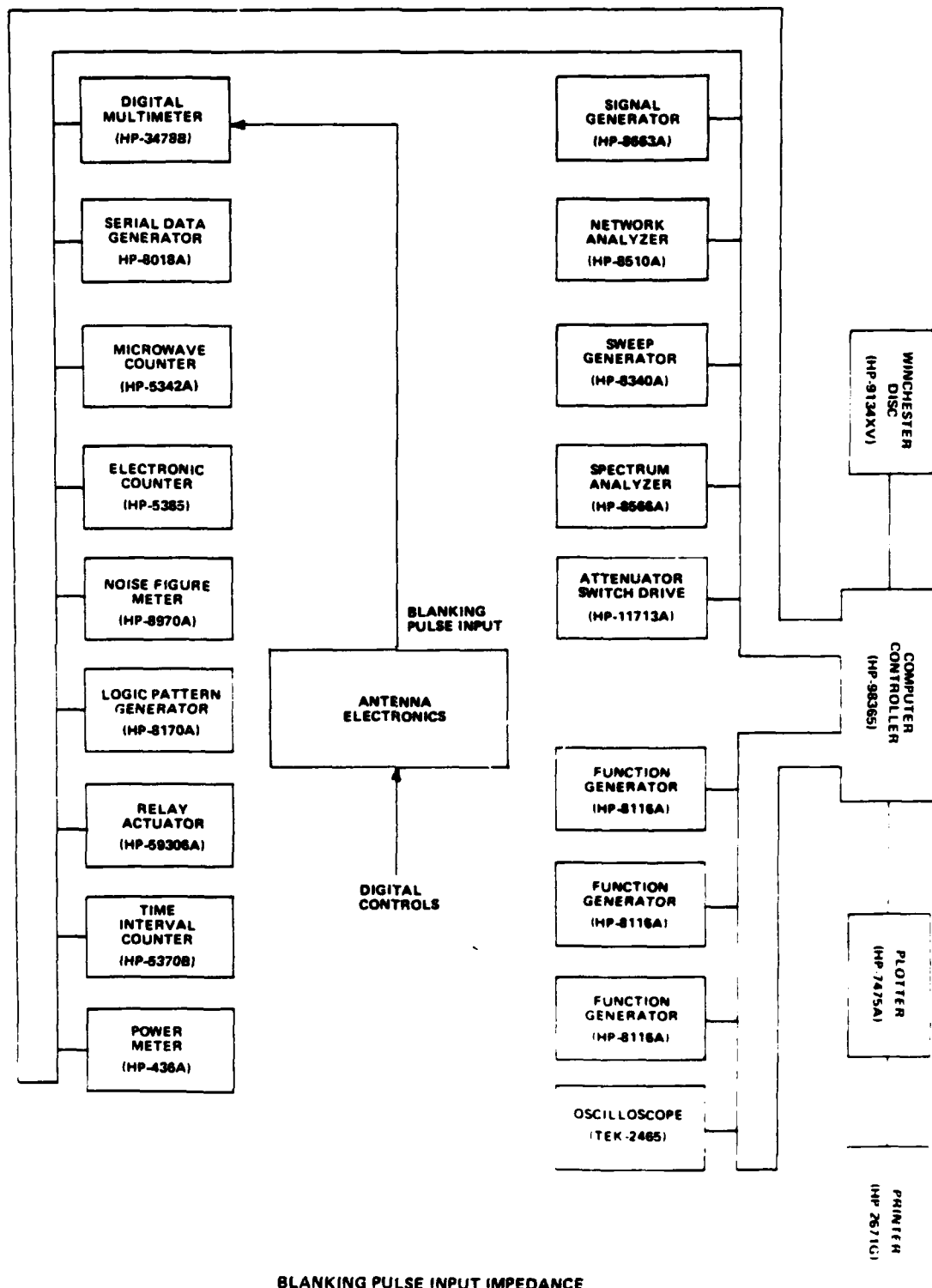
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	---	---	---
2.			
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Insert the Digital Multimeter across the Blanking Pulse
Input Terminal. Measure resistance.

Data Reduction: Send input levels and output of Digital Multimeter
to printer.

Equipment List:

- | | | |
|-------------------------------------|----------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. _____ | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. _____ | 8. _____ |
| 3. <u>Digital Multi. (HP-3478B)</u> | 6. _____ | 9. _____ |



BLANKING PULSE INPUT IMPEDANCE

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the AE does not exceed its specified
power consumption. (Power Consumption)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Main Power</u>	<u>115VAC/400Hz/1-Phase</u>	<u>External Source</u>
2.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

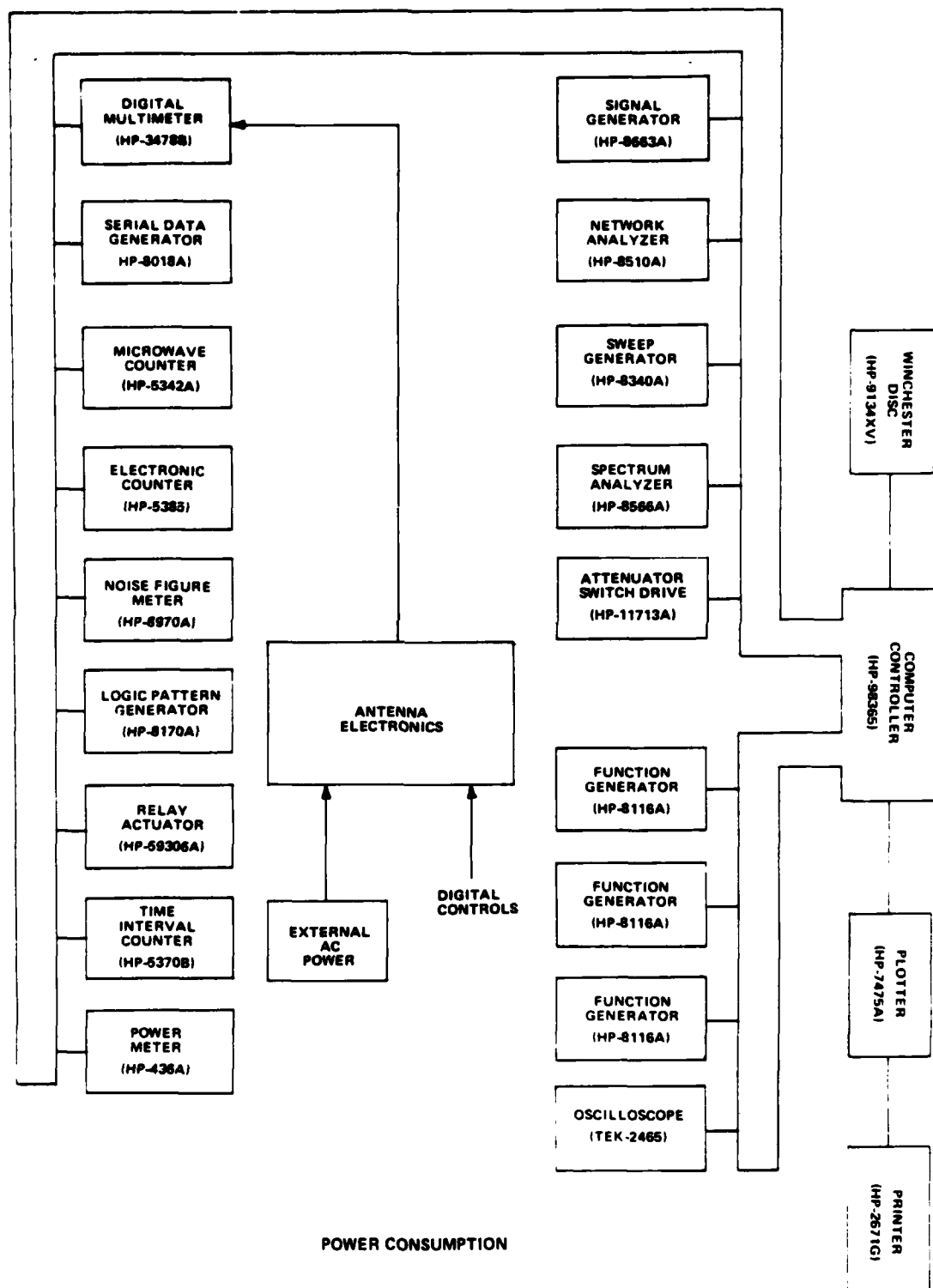
<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>Main power line current & line voltage</u>	<u>22 watts (max.)</u>	<u>Digital Multi. (HP-3478B)</u>
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. Measure current in main power line and line voltage with Digital Multimeter.

Data Reduction: Send output of Digital Multimeter to printer. Power calculation ($P=VI$).

Equipment List:

- | | | |
|-------------------------------------|--------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Ext. AC Source</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. _____ | 8. _____ |
| 3. <u>Digital Multi. (HP-3478B)</u> | _____ | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify that the VSWR at all of the AE inputs
is within specification. (Input VSWR)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>S-Par Test Set</u>	<u>L1 (1565.42 to 1585.42)MHz</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
2. <u>S-Par Test Set</u>	<u>L2 (1217.6 to 1237.6)MHz</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
3. <u>S-Par Test Set</u>	<u>fc = 350MHz @ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
4. <u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
5. <u> </u>	<u> </u>	<u> </u>
6. <u> </u>	<u> </u>	<u> </u>
7. <u> </u>	<u> </u>	<u> </u>
8. <u> </u>	<u> </u>	<u> </u>
9. <u> </u>	<u> </u>	<u> </u>
10. <u> </u>	<u> </u>	<u> </u>
11. <u> </u>	<u> </u>	<u> </u>
12. <u> </u>	<u> </u>	<u> </u>

Outputs

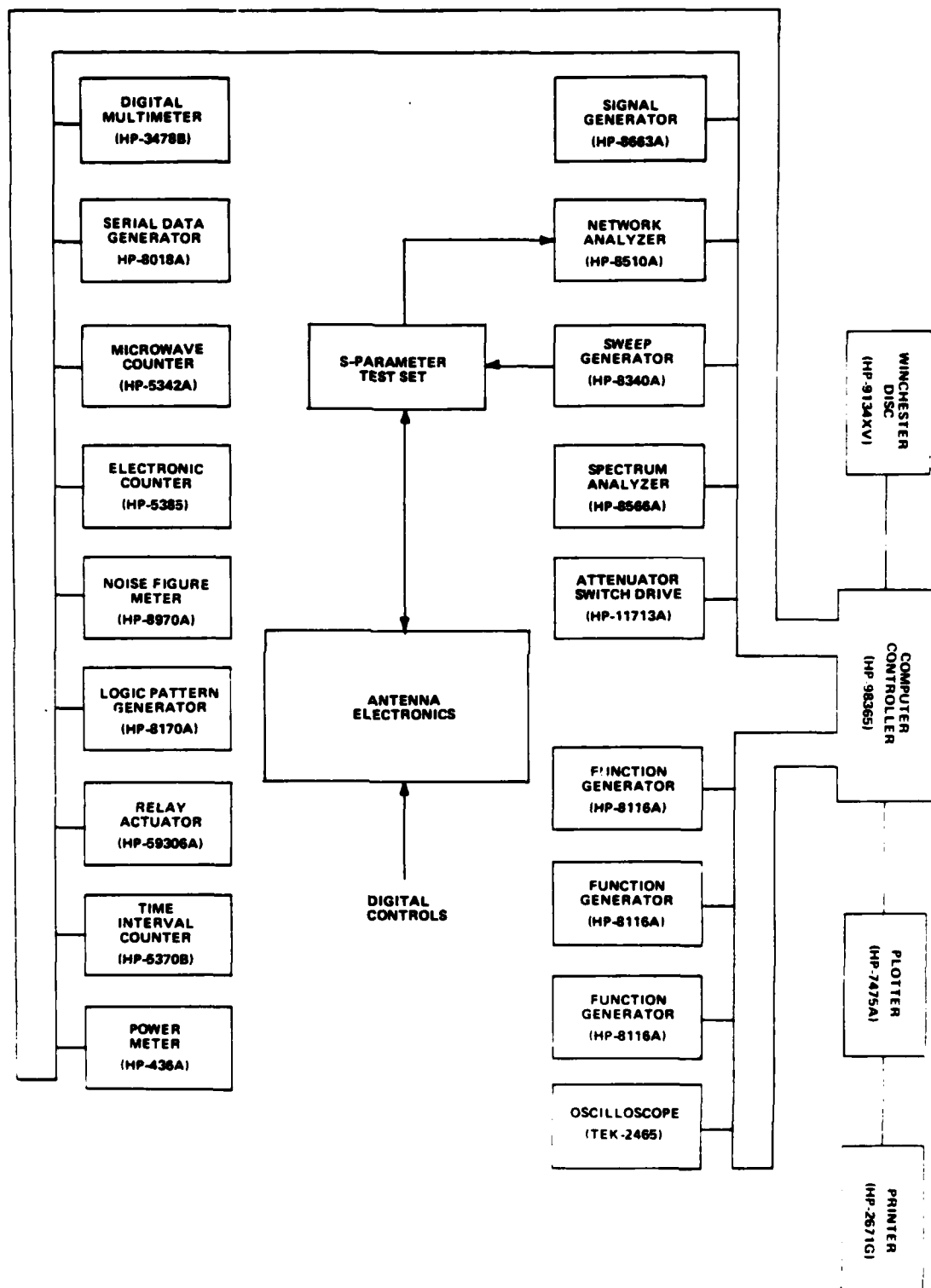
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>VSWR= 1.5:1 (max.) (I1,I2)</u>	<u>Network Anal. (HP-8510A)</u>
2.	<u>CRPA Aux. Inputs (6)</u>	<u>VSWR= 1.5:1 (max.) (I1,I2)</u>	<u>S-Par Test Set (HP-8515A)</u>
3.	<u>BMFRPA Input</u>	<u>VSWR= 1.5:1 (max.) (I1,I2)</u>	<u></u>
4.	<u>LO Input (L1 IF)</u>	<u>VSWR = 2.0:1 (max.)</u>	<u></u>
5.			

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. The reference channel input of the AE will be connected
to the test port of the S-Parameter Test Set. S11 (Input Reflection
Coefficient) will be measured. Repeat for all other inputs.

Data Reduction: Data will be plotted on a Smith chart using the
plotter. Inputs will be sent to printer.

Equipment List:

- | | | |
|------------------------------------|-------------------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>S-Par Test Set (HP-8515A)</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Sweep Gen. (HP-8340A)</u> | 8. _____ |
| 3. <u>Network Anal. (HP-8510A)</u> | 6. <u>Plotter (HP-7475A)</u> | 9. _____ |



VSWR MEASUREMENT

Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify that the VSWR at all of the AE outputs is
within specification. (Output VSWR)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>S-Par Test Set</u>	<u>L1IF(164MHz to 184MHz) @ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
2.	<u>S-Par Test Set</u>	<u>L2IF(164MHz to 184MHz) @ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
3.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF output</u>	<u>VSWR = 1.5:1 (max.)</u>	<u>Network Anal. (HP-8510A)</u>
2.	<u>L2 IF output</u>	<u>VSWR = 1.5:1 (max.)</u>	<u>S-Par Test Set (HP-8515A)</u>
3.	<u>MCR output</u>	<u>VSWR = 2.0:1 (max.)</u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. The L1 IF output will be connected to the test
port of the S-Parameter test set. S22 (Output Reflect Coefficient) will
be recorded. Repeat for all other outputs.

Data Reduction: Data will be plotted on a Smith Chart using the
plotter. Inputs will be recorded on printer.

Equipment List:

- | | | |
|---------------------------------|-------------------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>S-Par Test Set (HP-8515A)</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Network Anal. (HP-8510A)</u> | 8. _____ |
| 3. <u>Sweep Gen. (HP-8340A)</u> | 6. <u>Plotter (HP-7475A)</u> | 9. _____ |

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the gain of the AE from the CRPA
reference channel input to either IF output as well as the MCR output, and
the gain from the BMFRPA input to either IF output is as specified. (Gain)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>CRPA Ref. Channel Input</u>	<u>I1(1565.42 to 1585.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
2. <u>CRPA Ref. Input</u>	<u>I2(1217.6 to 1237.6MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
3. <u>BMFRPA Input</u>	<u>I1(1565.42 to 1585.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
4. <u>BMFRPA Input</u>	<u>I2(1217.6 to 1237.6MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
5. <u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
6. _____	_____	_____
7. _____	_____	_____
8. _____	_____	_____
9. _____	_____	_____
10. _____	_____	_____
11. _____	_____	_____
12. _____	_____	_____

* (May need LO Source (Signal Generator HP-8663A)) (350MHz)

Outputs

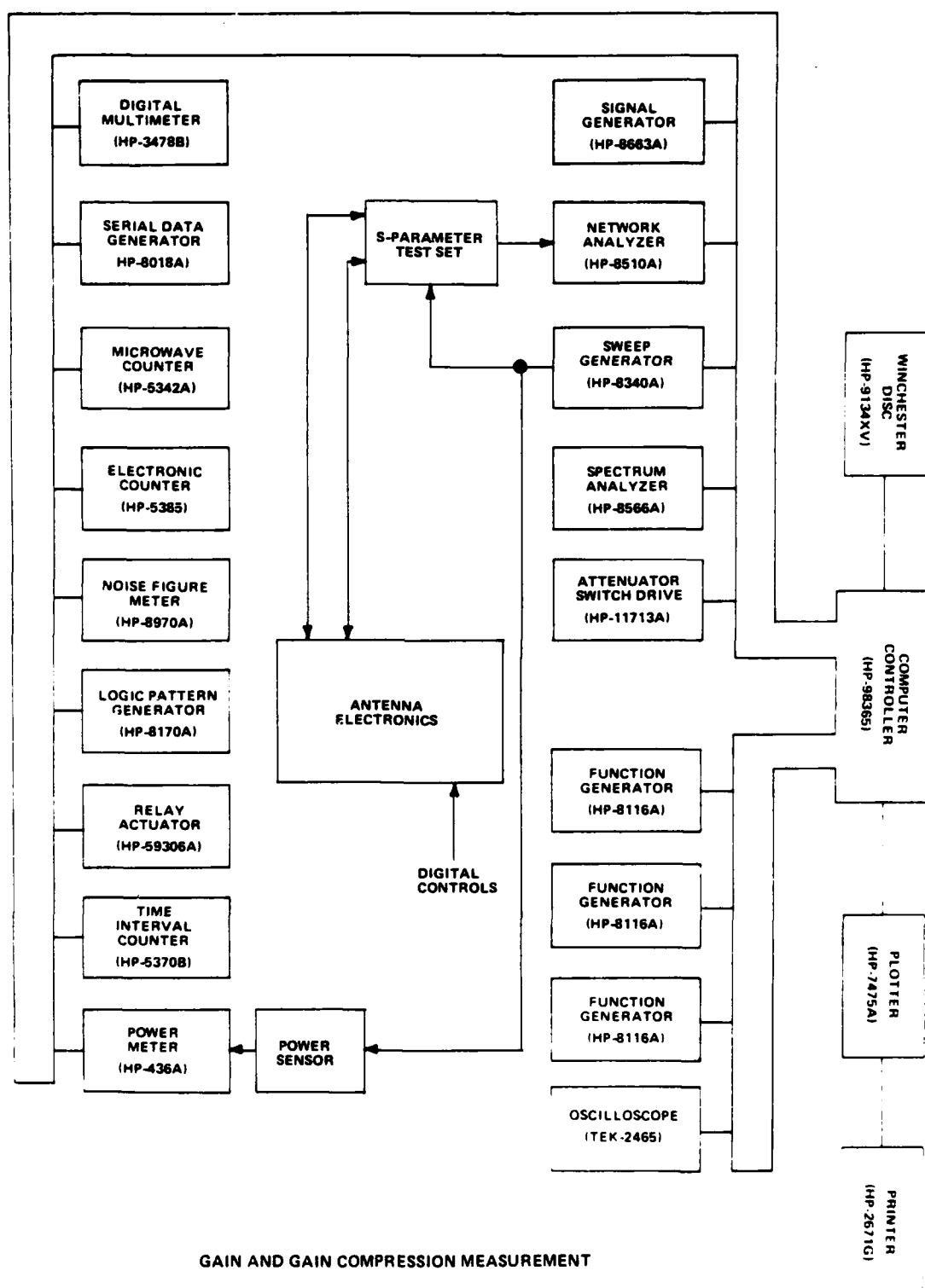
<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1. <u>CRPA Ref. to MCR Output</u> <u>for L1 & L2</u>	<u>17dB +5dB</u>	<u>Network Anal. (HP-8510A)</u>
2. <u>CRPA Ref. to L1 IF Output</u> <u>for L1 & L2</u>	<u>38 +5dB</u>	<u>S-Par Test Set (HP-8515A)</u>
3. <u>BMEFPA to L1-IF Output</u>	<u>38 +5dB</u>	
4. _____	_____	_____
5. _____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. The AE will be connected to the Network Analyzer. Input
power to the AE will be -40dBm +5dB. The passband response will be
measured at L1 between the CRPA reference channel input and the IF and
MCR outputs; and the bottom mounted FRPA input and IF outputs. Repeat
for L2, with proper digital control signals applied.

Data Reduction: Send output of Network Analyzer to plotter and
send inputs to printer. Read GAIN from passband response recorded on
plotter.

Equipment List:

- | | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u>S-Par Test Set (HP-8515A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481A)</u> | 8. <u>Network Anal. (HP-8510A)</u> |
| 3. <u>Sweep Gen. (HP-8340A)</u> | 6. <u>Power Meter (HP-436A)</u> | 9. _____ |



Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the AE exhibits less than specified amount of Gain Compression at the IF output with an input signal of -33dBm.
(Gain Compression)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>CRPA Ref, Channel Input</u>	<u>L1(1565.42 to 1585.42MHz)</u> <u>@ -33dBm +.1</u>	<u>Sweep Gen. (HP-8340A)</u>
2. <u>CRPA Ref. Input</u>	<u>L2(1217.6 to 1237.6MHz)</u> <u>@ -33dBm +.1</u>	<u>Sweep Gen. (HP-8340A)</u>
3. <u>BMFRPA Input</u>	<u>L1(1565.42 to 1585.42MHz)</u> <u>@ -33dBm +.1</u>	<u>Sweep Gen. (HP-8340A)</u>
4. <u>BMFRPA Input</u>	<u>L2(1217.6 to 1237.6MHz)</u> <u>@ -33dBm +.1</u>	<u>Sweep Gen. (HP-8340A)</u>
5. <u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

* (May need LO source (Signal Generator HP-8663A)) (350MHz)

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Output</u>	<u>+1dB</u>	<u>Network Anal. (HP-8510A)</u>
2.	<u>L2 IF Output</u>	<u>+1dB</u>	<u>S-Par Test Set (HP-8515A)</u>
3.	<u>MCR Output</u>	<u>+1dB</u>	<u>_____</u>
4.	<u>_____</u>	<u>_____</u>	<u>_____</u>
5.	<u>_____</u>	<u>_____</u>	<u>_____</u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. An input power level at the CRPA reference channel
input will be set at -33dBm. The AE will be connected to the Network
Analyzer. The passband response will be measured at L1 between the CRPA
reference channel input and the IF and MCR outputs; and the passband
response will be measured at L1 between the BMFRPA input and the IF
output. Repeat for L2.

Data Reduction: Send output of Network Analyzer to plotter and
send inputs to printer. Read GAIN from passband response recorded on
plotter. Compare results of this test with results of the GAIN test to
determine GAIN compression. (+1dB)

Equipment List:

- | | | |
|---------------------------------|-----------------------------------|-------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u>Network Anal. (HP-8510A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481A)</u> | 8. <u>S-Par Test Set (HP-8515A)</u> |
| 3. <u>Sweep Gen. (HP-8340A)</u> | 6. <u>Power Meter (HP-436A)</u> | 9. <u>_____</u> |

Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To demonstrate that L1 RF and L2 RF are down converted to the common IF and output to their respective ports. (RF Frequency Conversion)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Channel</u>	<u>1575.42 $\pm$10MHz</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>CRPA Ref. Channel</u>	<u>1227.6 $\pm$10MHz</u>	<u>Signal Gen. (HP-8663A)</u>
3.	<u>LO Signal (L1 IF Port)</u>	<u>350MHz</u>	<u>Sweep Gen. (HP-8340A)</u>
4.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

Output Name

Output Level

Equipment Used

1.	L1 IF Output	174MHz $\pm$.5MHz	Electronic Ctr (HP-5385)
2.	L2 IF Output	174MHz $\pm$.5MHz	
3.			
4.			
5.			

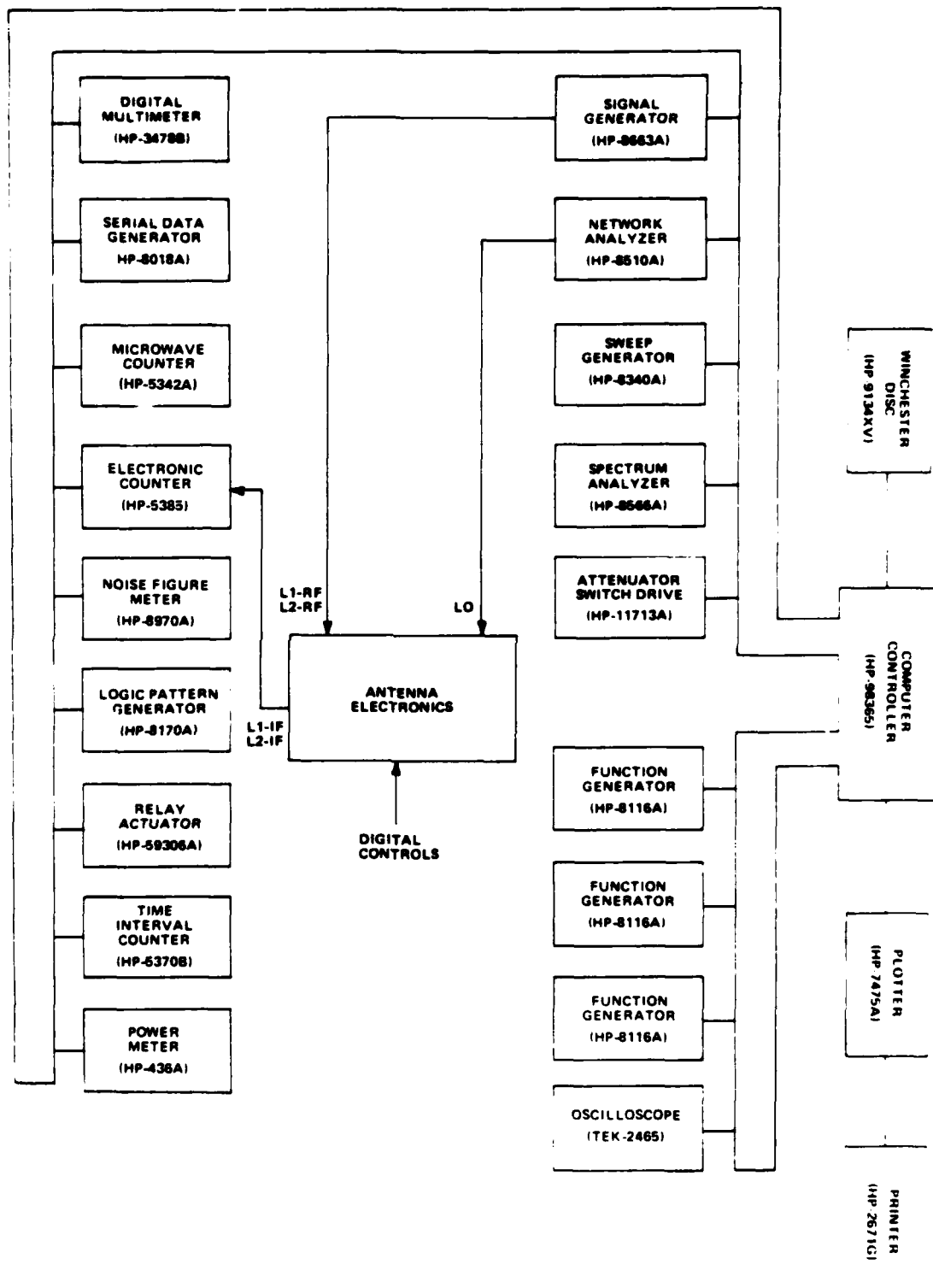
Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. A L1 RF CW signal will be injected into the AE and the L1 IF output will be determined. The test will be repeated for L2 RF.

Apply proper digital control signals.

Data Reduction: Send input levels and output of Electronic Counter to
printer.

Equipment List:

1. <u>Computer (HP-9836S)</u>	4. <u>Signal Gen. (HP-8663A)</u>	7. _____
2. <u>Printer (HP-2671G)</u>	5. <u>Sweep Gen. (HP-8340A)</u>	8. _____
3. <u>Electronic Str (HP-5385)</u>	6. _____	9. _____



R.F. FREQUENCY CONVERSION

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify the desired filter selectivity for the
L1 and L2 IF outputs (channel selectivity filtering)

<u>Inputs</u>			
	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref Input</u>	<u>L1(1450.42 to 1700.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
2.	<u>CRPA Ref Input</u>	<u>L2(1102.6 to 1352.6MHz)</u> <u>@ -45dBm</u>	<u>Microwave Ctr (HP-5342A)</u>
3.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
4.	<u></u>	<u></u>	<u>Power Meter (HP-436A)</u>
5.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

* (May need LO Source (Signal Generator HP-8663A)) (350MHz)

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Output</u>	<u>3dB(Bw) - 30 + 3MHz</u>	<u>Spectrum Anal. (HP-8566A)</u>
2.	<u>L1 IF Output</u>	<u>40dB(Bw) - 250MHz(max)</u>	<u>Spectrum Anal. (HP-8566A)</u>
3.	<u>L2 IF Output</u>	<u>3dB(Bw) - 30 + 3MHz</u>	
4.	<u>L2 IF Output</u>	<u>40dB(BW) - 250MHz(max)</u>	
5.			

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. The AE will be connected to the Spectrum Analyzer.

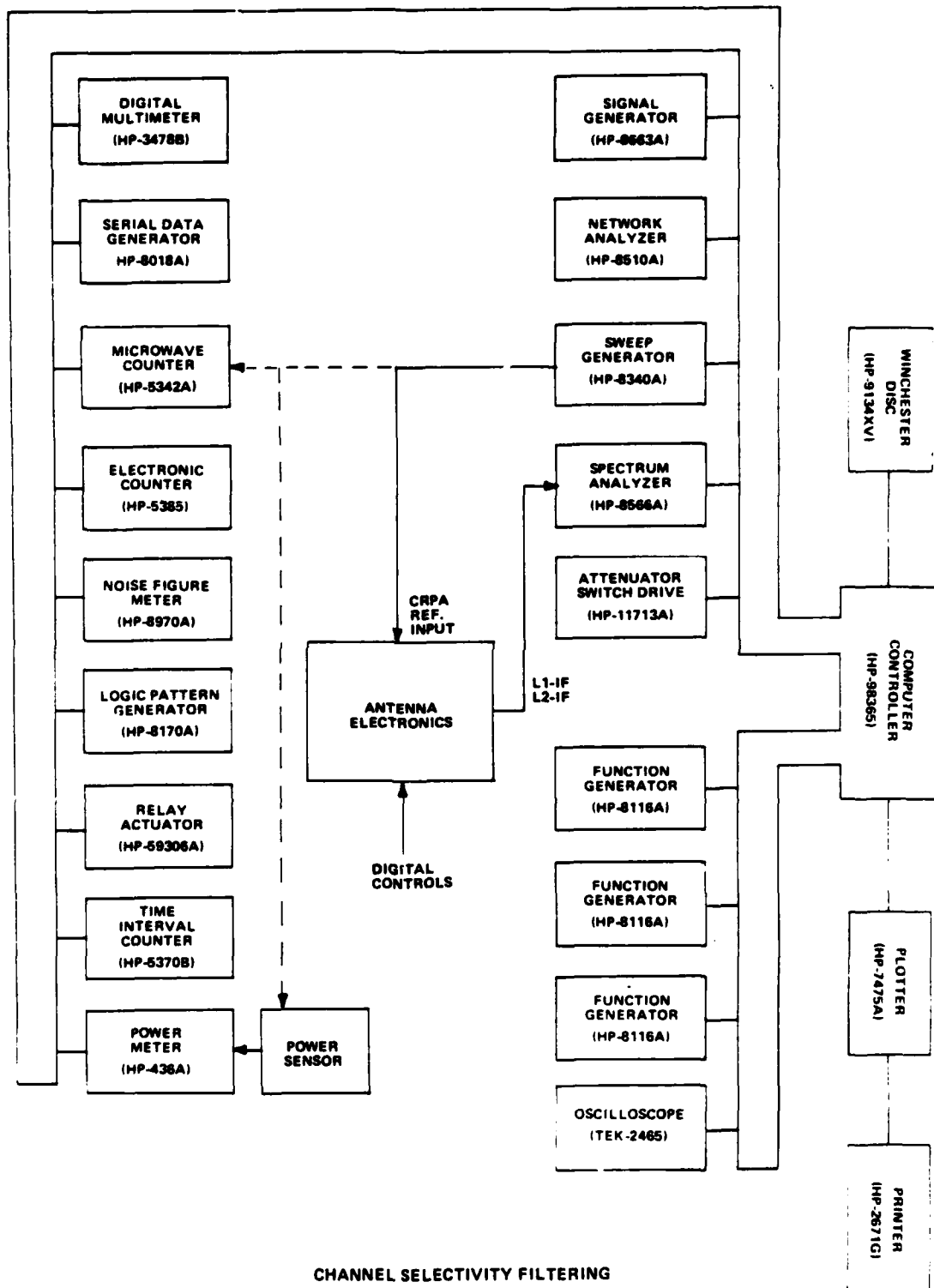
Input power to the AE will be $-40\text{dBm} + 5\text{dB}$. The passband response at L1
between the CRPA input and the IF output will be measured and recorded.

Repeat for L2. Apply proper digital control signals.

Data Reduction: Send output of Spectrum Analyzer to plotter and
send inputs to printer. Read 3 and 40dB bandwidths from the passband
response recorded on the plotter.

Equipment List:

- | | | |
|---------------------------------|------------------------------------|-------------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Microwave Ctr (HP-5342A)</u> | 7. <u>Spectrum Anal. (HP-8566A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481A)</u> | 8. <u>Plotter (HP-7475A)</u> |
| 3. <u>Sweep Gen. (HP-8340A)</u> | 6. <u>Power Meter (HP-436A)</u> | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify that the noise figures of the AE reference, auxiliary and BMFRPA signal paths are within specified values.
(Noise Figures)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>CRPA Ref Input</u>	<u>TBD</u>	<u>Noise Source (HP-346B)</u>
2. <u>CRPA Aux Inputs (6)</u>	<u>TBD</u>	<u>Noise Source (HP-346B)</u>
3. <u>BMFRPA Input</u>	<u>TBD</u>	<u>Noise Source (HP-346B)</u>
4. <u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
5. <u></u>	<u></u>	<u></u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

Outputs

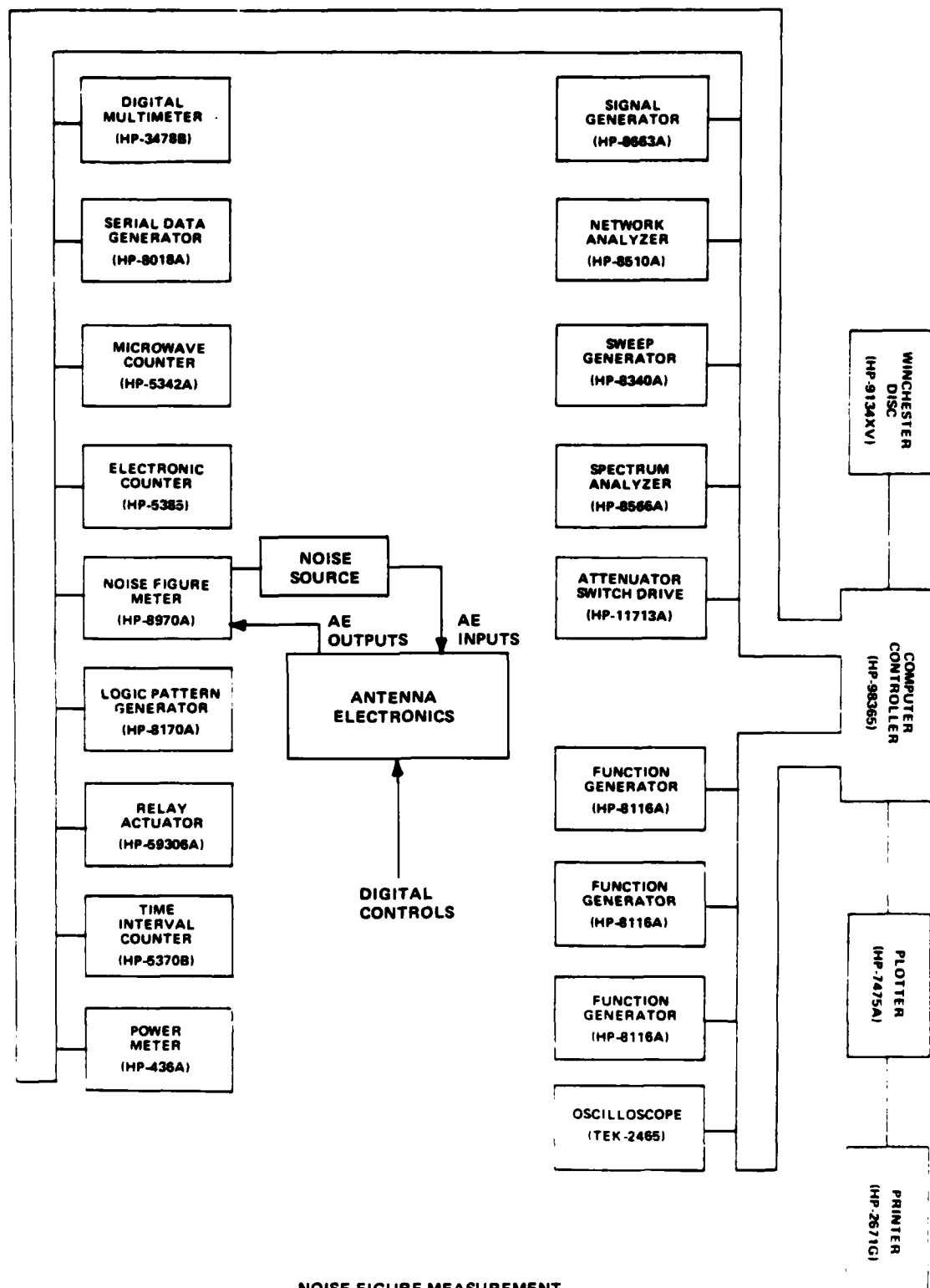
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Output</u>	<u>Ref. Input (3dB max.)</u>	<u>Noise Figure Meter (HP-8970A)</u>
2.	<u>L1 IF Output</u>	<u>Aux Inputs (7.5dB max.)</u>	<u>Noise Figure Meter (HP-8970A)</u>
3.	<u>L1 IF Output</u>	<u>BMFRPA Input (3.5dB max.)</u>	<u>Noise Figure Meter (HP-8970A)</u>
4.	<u>L2 IF Output</u>	<u>Ref. Input (3dB max.)</u>	<u>Noise Figure Meter (HP-8970A)</u>
5.	<u>L2 IF Output</u>	<u>Aux. Inputs (7.5dB max.)</u>	<u>Noise Figure Meter (HP-8970A)</u>
6.	<u>L2 IF Output</u>	<u>BMFRPA Input (3.5dB max)</u>	<u>Noise Figure Meter (HP-8970A)</u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Apply proper digital control signals. Apply noise
source to AE inputs. Measure noise figure in each signal path with noise
figure meter.

Data Reduction: Send input levels and output of Noise Figure Meter
to printer.

Equipment List:

- | | | |
|----------------------------------|---------------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>N.F. Meter (HP-8970A)</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. _____ | 8. _____ |
| 3. <u>Noise Source (HP-346B)</u> | 6. _____ | 9. _____ |



NOISE FIGURE MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the AE will not incur permanent
damage or performance degradation after being subjected to specified input
signal levels. (Non-damage input levels)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref Input</u>	<u>L1(1575.42MHz)@ 0dBm (CW)</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>CRPA Aux Inputs (6)</u>	<u>L1(1575.42MHz)@ 0dBm (CW)</u>	<u>Signal Gen. (HP-8663A)</u>
3.	<u>BMFRPA Input</u>	<u>L1(1575.42MHz)@ 0dBm (CW)</u>	<u>Signal Gen. (HP-8663A)</u>
4.	<u>CRPA Ref Input</u>	<u>+30dBm Pp pulse, 4uW, 0.1%DC</u>	<u>Function Gen. (HP-8116A)</u>
5.	<u>CRPA Aux Inputs (6)</u>	<u>+30dBm Pp pulse, 4uW, 0.1%DC</u>	<u>Function Gen. (HP-8116A)</u>
6.	<u>BMFRPA Input</u>	<u>+30dBm Pp pulse, 4uW, 0.1%DC</u>	<u>Function Gen. (HP-8116A)</u>
7.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
8.	<u></u>	<u></u>	<u>Power Sensor (HP-8481H)</u>
9.	<u></u>	<u></u>	<u>Power Meter (HP-436A)</u>
10.	<u></u>	<u></u>	<u>Pin Mod. (HP-8731A)</u>
11.	<u></u>	<u></u>	<u>30dB PAD</u>
12.	<u></u>	<u></u>	<u>TWT Amplifier</u>

Outputs

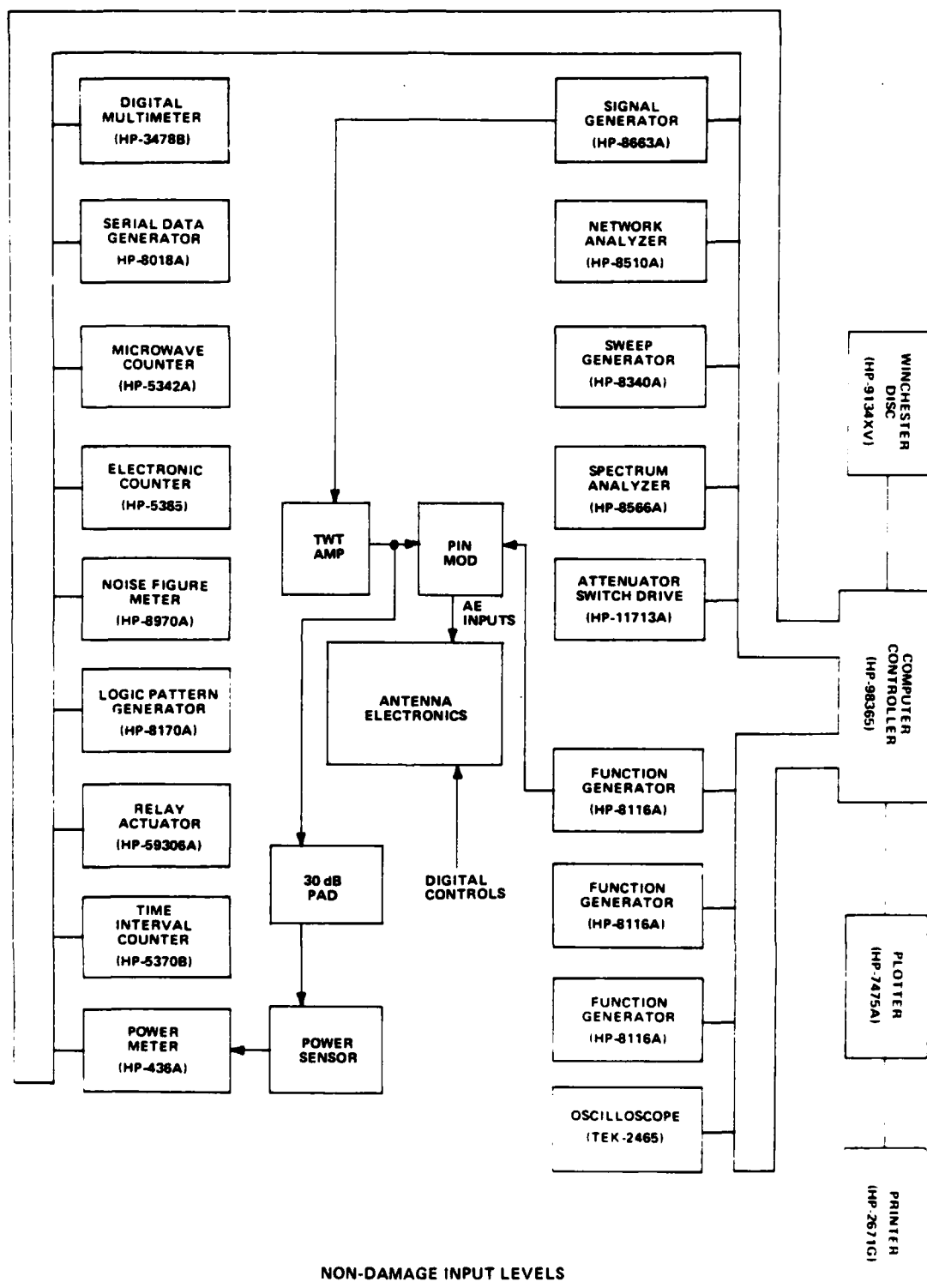
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	---	---	---
2.			
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. A 0dBm CW signal will be injected for five
minutes alternatively into each of the CRPA inputs as well as the BMFRPA
input. This will be repeated using a +30dBm peak power pulse signal with
4 μ s pulse width and 0.1% duty cycle for five minutes. The tests performed
for GAIN and Noise Figure will be repeated. Repeat procedure for L2
frequency.

Data Reduction: Send input levels and output of Power Meter to printer.
Compare results with data obtained in test performed for GAIN & NOISE
FIGURE to verify no damage to AE.

Equipment List:

- | | | |
|----------------------------------|---|-------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Function Gen. (HP-8116A)</u> | 7. <u>Amplifier</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481A)</u>
or H | 8. <u>PIN Mod. (HP-8731B)</u> |
| 3. <u>Signal Gen. (HP-8663A)</u> | 6. <u>Power Meter (HP-436A)</u> | 9. <u>30db Pad</u> |



NON-DAMAGE INPUT LEVELS

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify for a given frequency, the time delay from any CRPA auxiliary channel input to either the IF or MCR output does not vary more than a specified amount from the delay, from the reference channel input to the same output. (Time Delay) & (Time Delay Variations).

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref Input</u>	<u>L1(1565.42 to 1585.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
2.	<u>CRPA Ref Input</u>	<u>L2(1217.6 to 1237.6MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
3.	<u>CRPA Aux Inputs (6)</u>	<u>L1(1565.42 to 1585.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
4.	<u>CRPA Aux Inputs (6)</u>	<u>L2(1217.6 to 1237.6MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
5.	<u>BMFRPA Input</u>	<u>L1(1565.42 to 1585.42MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
6.	<u>BMFRPA Input</u>	<u>L2(1217.6 to 1237.6MHz)</u> <u>@ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
7.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

* May need LO signal

Outputs

	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>Aux 1-6 to IF out L1 or L2</u>	<u>$0.8 \pm 0.4\text{ns}$</u>	<u>Network Anal. (HP-8510A)</u>
2.	<u>Aux 1-6 to MCR out L1 or L2</u>	<u>$0.8 \pm 0.4\text{ns}$</u>	<u>S-Par Test Set (HP-8515A)</u>
3.	<u>L1-L2 variation</u>	<u></u>	<u></u>
4.	<u>MCR Output</u>	<u>2 ns max.</u>	<u></u>
5.	<u>IF output</u>	<u>2 ns max.</u>	<u></u>

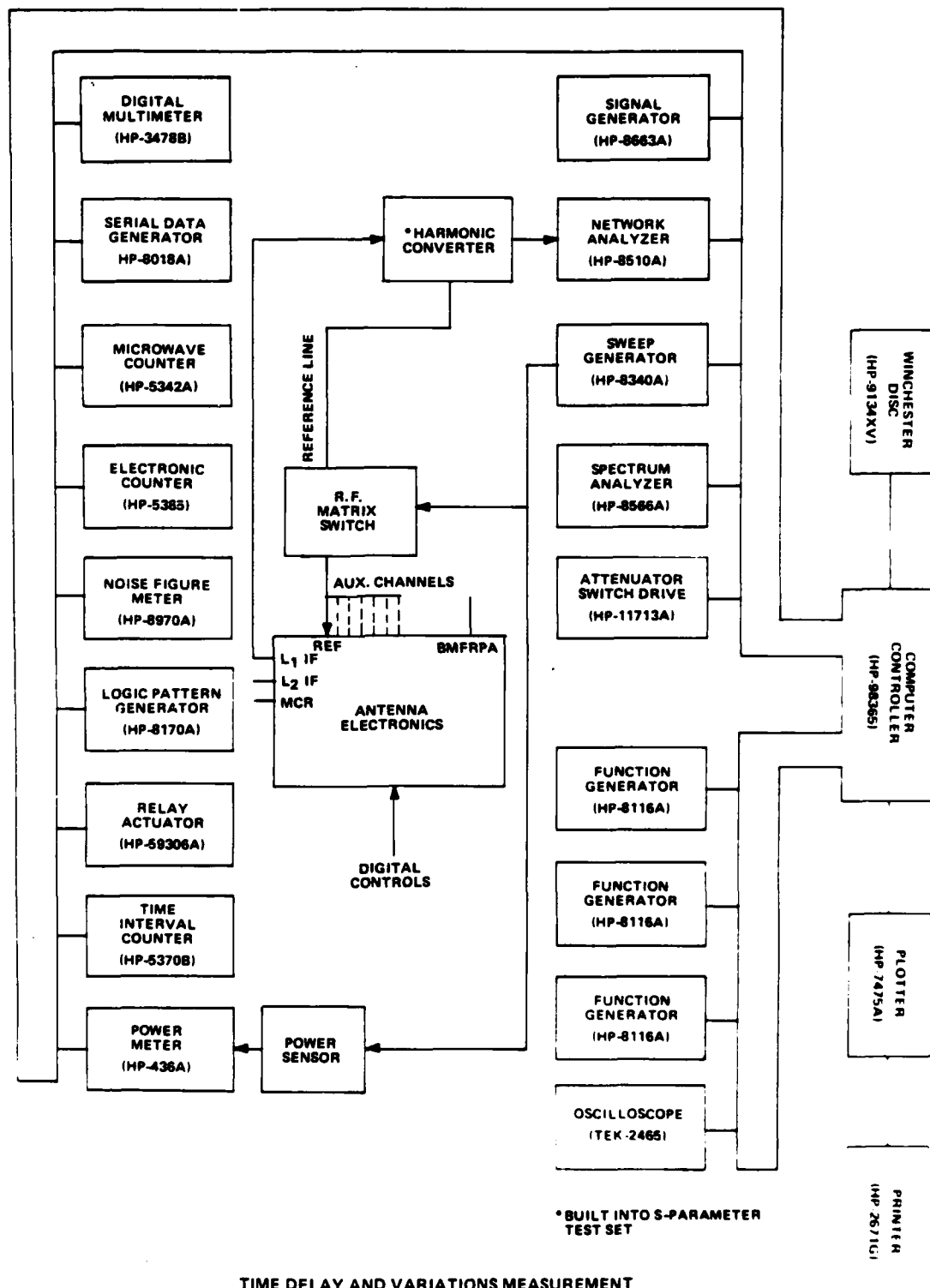
Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Connect the sweep generator to the reference channel
input of the AE and the L1 IF output to the test input of the harmonic
converter*. The reference input of the harmonic converter will be connected
to the sweep generator by a calibrated line length. The HP-8510 display
should show a flat phase slope. The sweep generator will be switched to
each of the auxiliary channels and the phase slope will be observed. This
will be repeated for L2 as well as for the MCR output. The Phase slope
will be measured with the sweep gen. connected to the BMFRPA at both L1 & L2.

Data Reduction: Send output of Network Analyzer to plotter and
send inputs to printer. Time delay will be calculated from phase slope
recording by the 8510 display.

Equipment List:

- | | | |
|---------------------------------|-------------------------------------|----------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u>RF Matrix Switch</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Network Anal. (HP-8510A)</u> | 8. <u></u> |
| 3. <u>Sweep Gen. (HP-8340A)</u> | 6. <u>S-Par Test Set (HP-8515A)</u> | 9. <u></u> |

*Harmonic Converter is built into S-Parameter Test Set.



TIME DELAY AND VARIATIONS MEASUREMENT

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify the ability of the AE to select a reduced performance monitor bandwidth within a specified time after being commanded to do so (Nulling bandwidth selection).

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>1580MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>CRPA Aux. Inputs (6)</u>	<u>1580MHz @ -45dBm</u>	<u>RF Matrix Switch</u>
3.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
4.	<u></u>	<u></u>	<u>Power Meter (HP-436B)</u>
5.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

* May need LO signal

Outputs

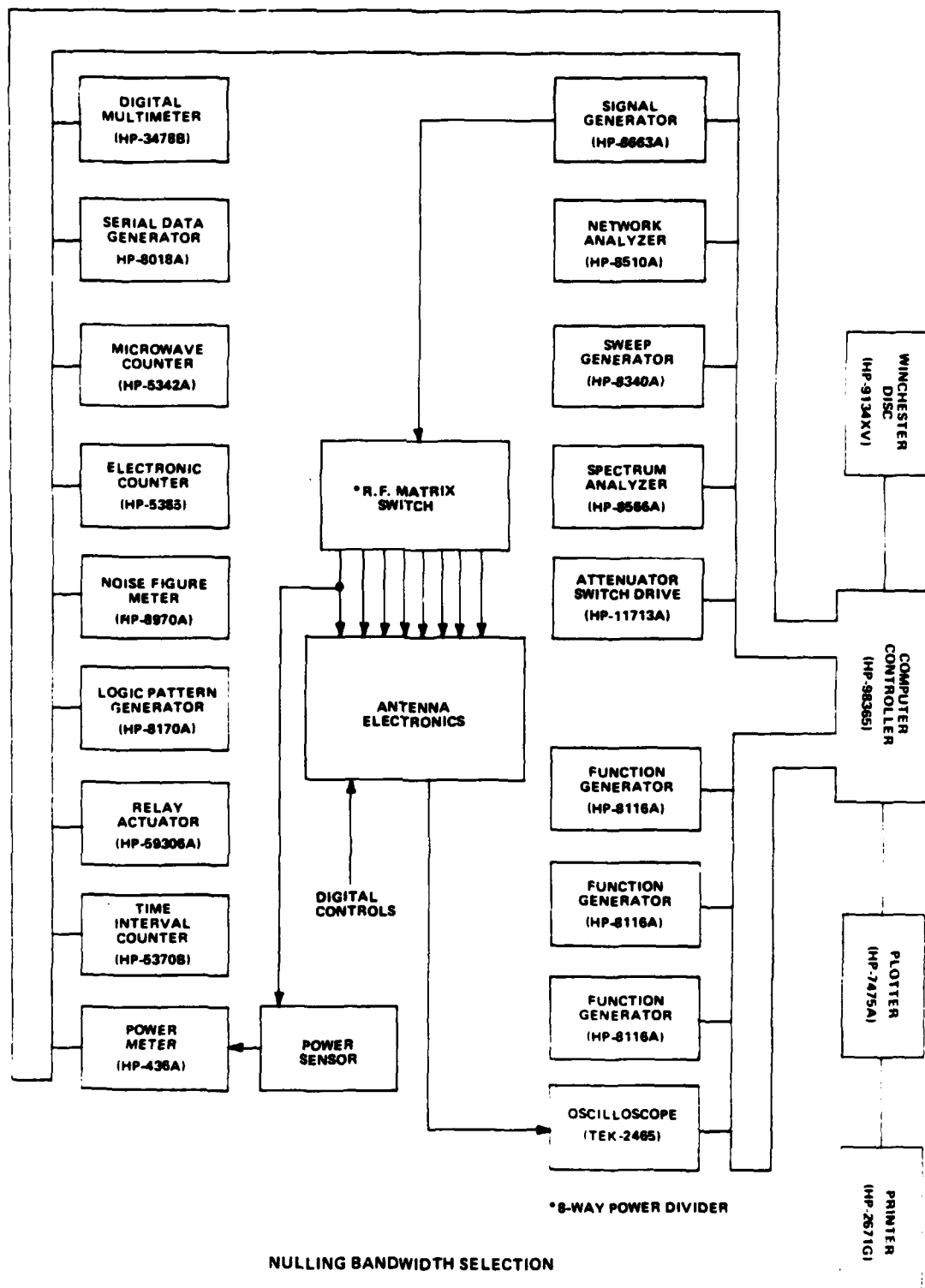
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>C/A to P</u>	<u>20 ms (max)</u>	<u>Oscilloscope (TEK-2465)</u>
2.	<u>P to C/A</u>	<u>20 ms (max)</u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. A -45dBm signal will be injected into the AE input. The
signal should be outside the C/A bandwidth but in the P-Bandwidth. Using
an oscilloscope to observe the output (triggered from the bandwidth select
line), the time required to change bandwidth will be recorded.

Data Reduction: Send output of Oscilloscope to plotter and send
inputs to printer.

Equipment List:

- | | | |
|----------------------------------|-----------------------------------|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u>Power Sensor (HP-8481A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>RF Switch Matrix</u> | 8. <u>Power Meter (HP-436A)</u> |
| 3. <u>Signal Gen. (HP-8665A)</u> | 6. <u>Oscilloscope (TEK-2465)</u> | 9. <u></u> |



Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the AE will switch nulling frequency
bands within a specified time upon command. (Nulling frequency selection)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>L1/L2 @ -45dBm</u>	<u>Signal Gen. (HP-8663)</u>
2.	<u>CRPA Aux. Inputs(s)</u>	<u>L1/L2 @ -45dBm</u>	<u>Sweep Gen. (HP-8340A)</u>
3.	<u></u>	<u></u>	<u>RF Matrix Switch</u>
4.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
5.	<u></u>	<u></u>	<u>Power Meter (HP-436B)</u>
6.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

*May need LO signal

Outputs

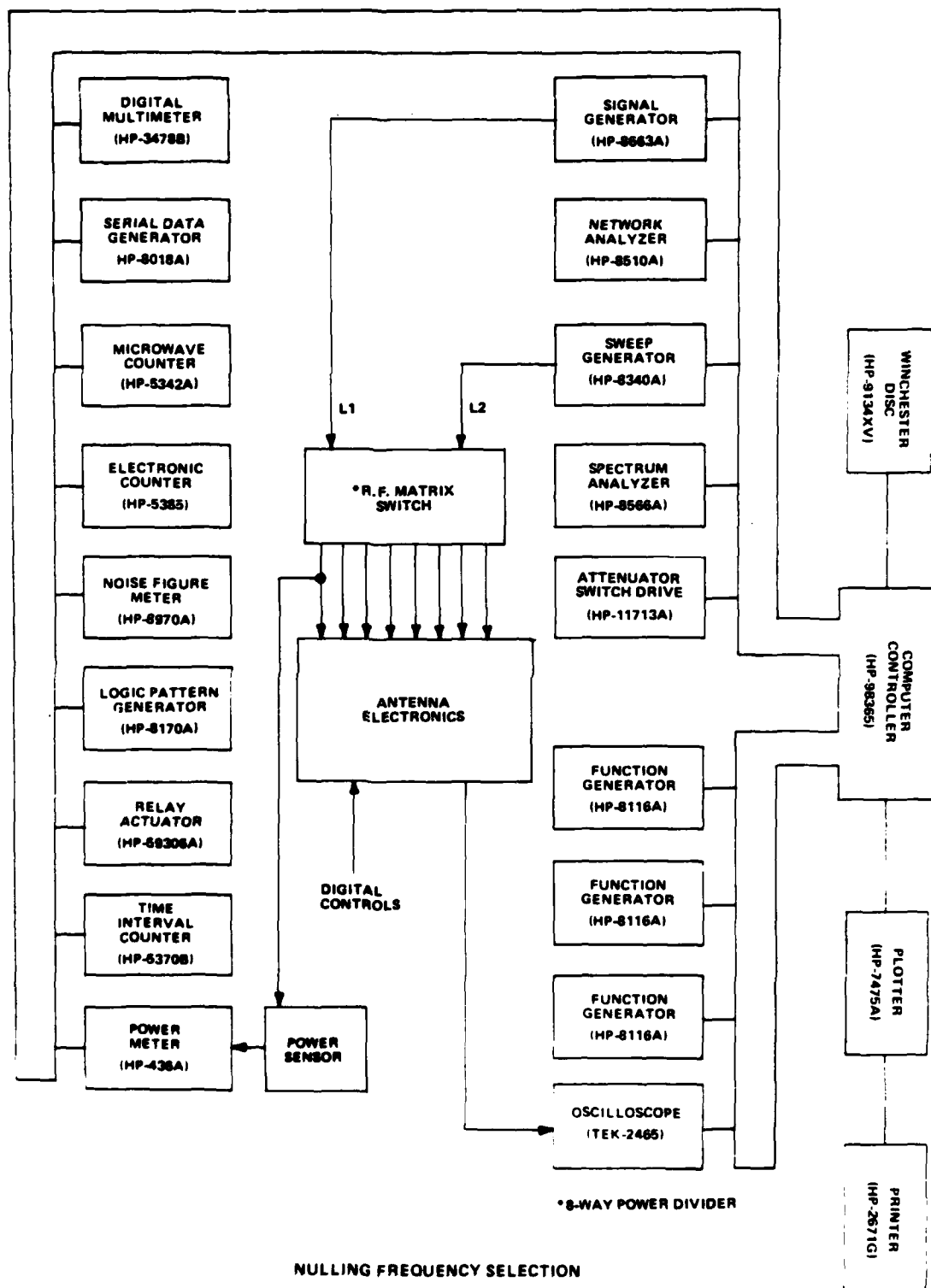
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 (1575MHz)</u>	<u>10ms (max.)</u>	<u>Oscilloscope (TEK-2465)</u>
2.	<u>L2 (1227MHz)</u>	<u>10ms (max.)</u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Two -45dBm CW jammers will be set up; one at L1 and one
at L2, and both of these be input to all 7 channels of the AE. The
Oscilloscope will be used to observe the output while being triggered from
the frequency select line of the AE. The frequency select will be com-
manded and the nulling time will be recorded.

Data Reduction: Send output of Oscilloscope to plotter and send
inputs to printer. Frequency switching times will be determined from
Oscilloscope.

Equipment List:

- | | | |
|----------------------------------|-----------------------------------|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Sweep Gen. (HP-8340A)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>RF Switch Matrix</u> | 8. <u>Power Sensor (HP-8481A)</u> |
| 3. <u>Signal Gen. (HP-8663A)</u> | 6. <u>Oscilloscope (TEK-2465)</u> | 9. <u>Power Meter (HP-36A)</u> |



Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To verify that the AE can select the BMFRPA in any
of its three modes within the specified time. (BMFRPA Selection)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>BMFRPA Input</u>	<u>1575MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
2. <u></u>	<u>1227MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
3. <u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

*May need LO signal

Outputs

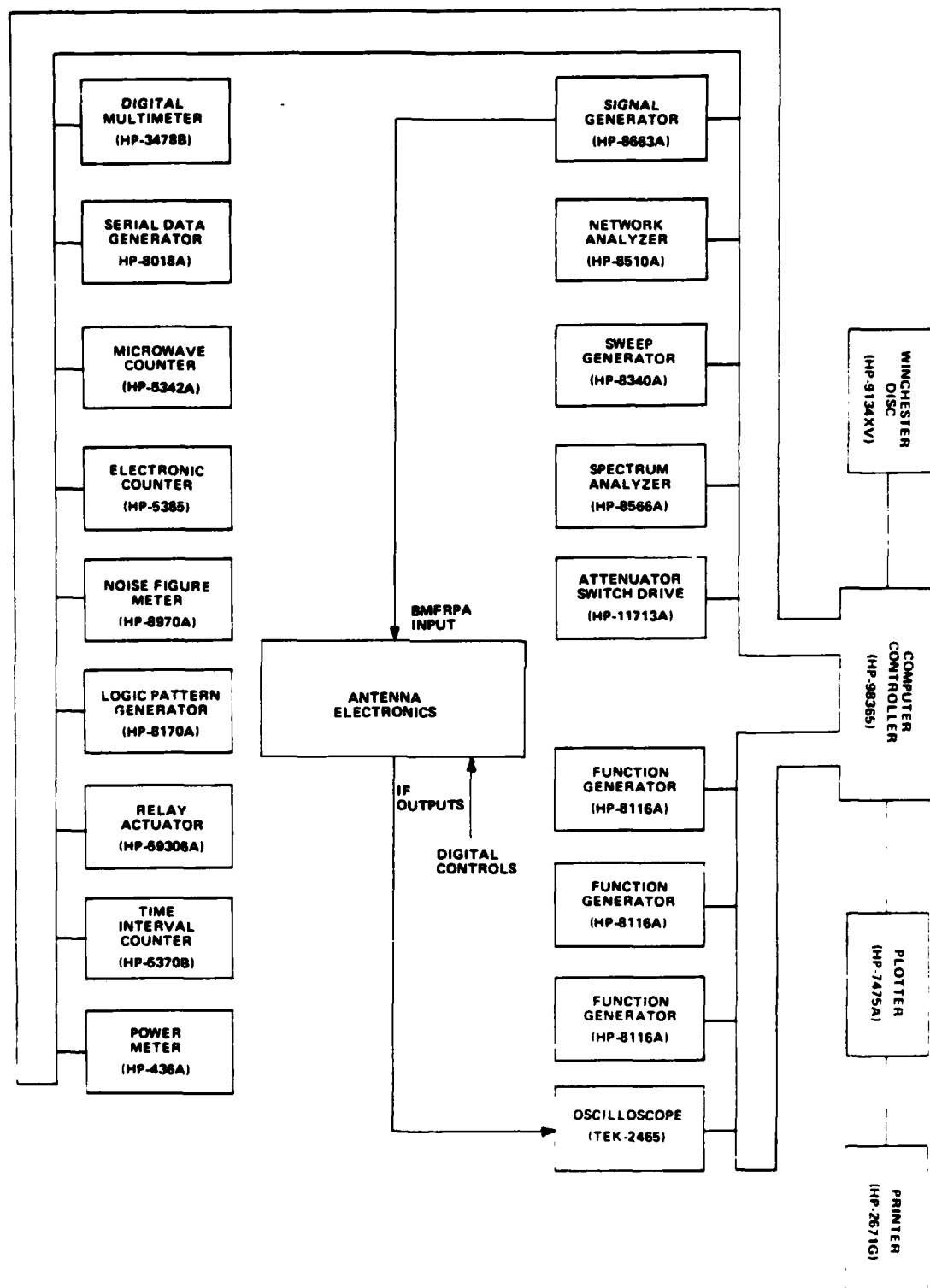
<u>Output Name</u>	<u>Output Level</u> (Cont'd)	<u>Equipment Used</u>
1. <u>IF Outputs</u>	<u>BMFRPA L2 to L1 10ms</u>	<u>Oscilloscope (TEK-2465)</u>
<u>OUTPUT LEVEL</u>	<u>max. (1227MHz)</u>	
<u>CA to P Code 20ms max.</u>	<u>BMFRPA L1 to L2 10ms</u>	
	<u>max. (1227MHz)</u>	
<u>P to CA Code 20ms max.</u>	<u>BMFRPA L1 Signal Select</u>	
	<u>10ms max.</u>	
<u>BMFRPA L2 to L1 10ms</u>	<u>BMFRPA L2 Signal Select</u>	
<u>max. (1575MHz)</u>	<u>10ms max.</u>	
<u>BMFRPA L1 to L2 10ms</u>		
<u>max. (1575MHz)</u>		

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. On L1, -45dBm signal will be injected into the BMFRPA
input. The output will be observed with an Oscilloscope and each of the
3 modes (L1, L2, L1/L2) of the BMFRPA will be selected while recording the
switching transients from the Oscilloscope.

Data Reduction: Send output of Oscilloscope to plotter and send
inputs to printer. Read switching time from Oscilloscope.

Equipment List:

- | | | |
|-----------------------------------|----------------------------------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Signal Gen. (HP-8663A)</u> | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Plotter (HP-7475A)</u> | 8. _____ |
| 3. <u>Oscilloscope (TEK-2465)</u> | 6. _____ | 9. _____ |



BOTTOM ANTENNA SELECTION

Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify the ability of the AE to null jammers in
the P-Code mode. (P-code wideband nulling)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>1575MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
2.	<u>CRPA Aux. Inputs(6)</u>	<u>1575MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
3.	<u>CRPA Ref. Input</u>	<u>1227MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
4.	<u>CRPA Aux. Inputs(6)</u>	<u>1227MHz @ -45dBm</u>	<u>Signal Gen. (HP-8663A)</u>
5.	<u></u>	<u></u>	<u>RF Switch Matrix</u>
6.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
7.	<u></u>	<u></u>	<u>Power Meter (HP-436A)</u>
8.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

*May need LO source

Outputs

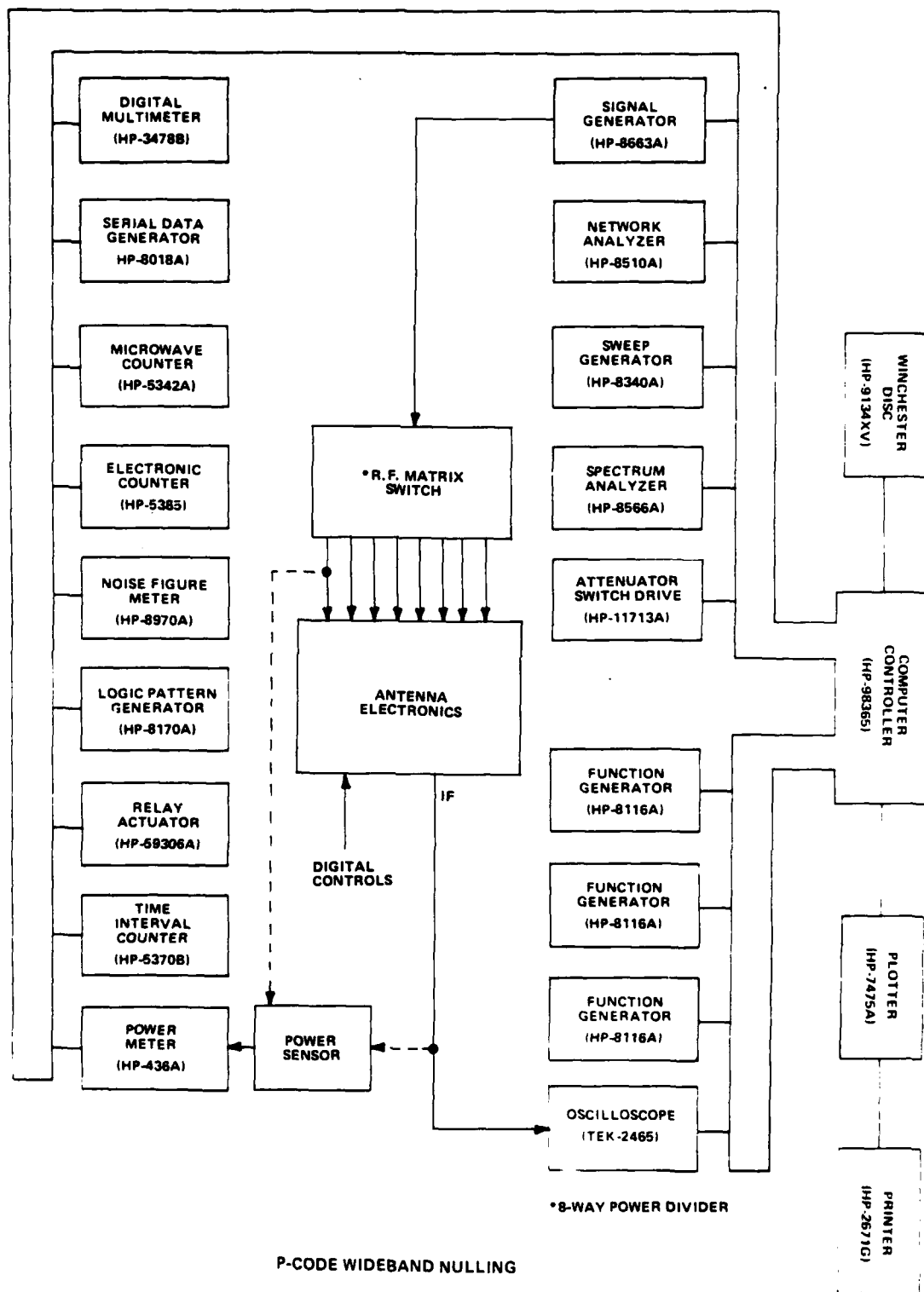
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Null Depth</u>	<u>35dB (min)</u>	<u>Power Meter (HP-436A)</u>
2.	<u>L1 IF Null Time</u>	<u>10ms (max)</u>	<u>Power Sensor (HP-8481A)</u>
3.	<u>L2 IF Null Depth</u>	<u>35dB (min)</u>	<u>Oscilloscope (TEK-2465)</u>
4.	<u>L2 IF Null Time</u>	<u>10ms (max)</u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. A -45dBm jammer input level will be set up and P-code
nulling will be selected. Using the Oscilloscope to observe the AE Test
Set performance monitor video output, the nulling time will be recorded. A
Power Meter will be used to measure the AE IF output power (null depth).
Repeat for L1 and L2.

Data Reduction: Send input levels and output of Power Meter to
printer. Output data from Oscilloscope to plotter.

Equipment List:

1.	<u>Computer (HP-9836S)</u>	4.	<u>(RF Matrix Switch)</u> <u>(8-way Power Divider)</u>	7.	<u>Oscilloscope (TEK-2465)</u>
2.	<u>Printer (HP-2671G)</u>	5.	<u>Power Sensor (HP-8481A)</u>	8.	<u></u>
3.	<u>Sig. Gen. (HP-8663A)</u>	6.	<u>Power Meter (HP-436A)</u>	9.	<u></u>



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify the ability of the AE to null wideband
noise jammers while in the P-code mode. (Wide Band Noise Nulling)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>1575MHz @ -45dBm</u>	<u>Noise Generator (20MHz BW)</u>
2.	<u>CRPA Aux. Inputs(6)</u>	<u>1575MHz @ -45dBm</u>	<u>Noise Generator (20MHz BW)</u>
3.	<u>CRPA Ref. Input</u>	<u>1227MHz @ -45dBm</u>	<u>Noise Generator (20MHz BW)</u>
4.	<u>CRPA Aux. Inputs(6)</u>	<u>1227MHz @ -45dBm</u>	<u>Noise Generator (20MHz BW)</u>
5.	<u></u>	<u></u>	<u>RF Switch Matrix</u>
6.	<u></u>	<u></u>	<u>Power Sensor (HP-8481A)</u>
7.	<u></u>	<u></u>	<u>Power Meter (HP-436A)</u>
8.	<u>*Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

*May need LO source

Outputs

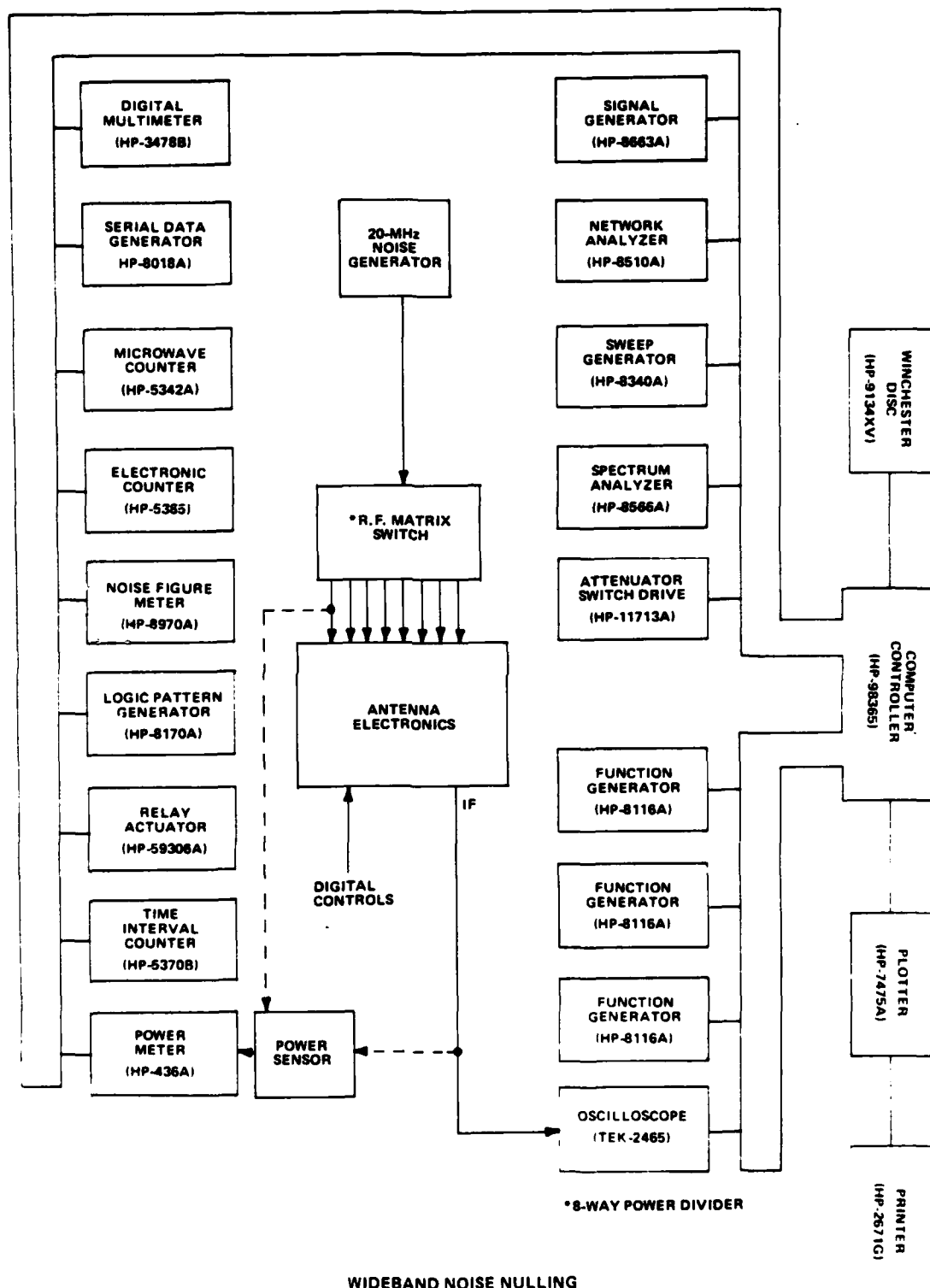
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Null Depth</u>	<u>30dB (min)</u>	<u>Power Sensor (HP-8481A)</u>
2.	<u>L1 IF Null Time</u>	<u>10ms (max)</u>	<u>Power Meter (HP-436A)</u>
3.	<u>L2 IF Null Depth</u>	<u>30dB (min)</u>	<u>Oscilloscope (TEK-2465)</u>
4.	<u>L2 IF Null Time</u>	<u>10ms (max)</u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. A -45dBm wideband jammer input level will be set up and
P-code nulling will be selected. Using the Oscilloscope to observe the
output, the Nulling Time will be recorded. A Power Meter will be used to
measure the AE output power (null depth). Repeat for L1 and L2.

Data Reduction: Send input levels and output of Power Meter to
printer. Output data from Oscilloscope to plotter.

Equipment List:

- | | | |
|---------------------------------|--|-----------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>(RF Matrix Switch)
8-way power divider</u> | 7. <u>Oscilloscope (TEK-2465)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Power Sensor (HP-8481A)</u> | 8. _____ |
| 3. <u>Noise Gen. (20MHz BW)</u> | 6. <u>Power Meter (HP-436A)</u> | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify the ability of the AE to null wideband
jammers a specified amount while in the C/A mode. (C/A Code Nulling)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>CRPA Ref. Input</u>	<u>1575MHz @ -78dBm</u>	<u>Sig. Gen. (HP-8663A)</u>
2.	<u>CRPA Aux. Inputs(6)</u>	<u>1575MHz @ -78dBm</u>	<u>Sig. Gen. (HP-8663A)</u>
3.	<u>CRPA Ref. Input</u>	<u>1227MHz @ -78dBm</u>	<u>Sig. Gen. (HP-8663A)</u>
4.	<u>CRPA Aux. Inputs(6)</u>	<u>1227MHz @ -78dBm</u>	<u>Sig. Gen. (HP-8663A)</u>
5.	<u></u>	<u></u>	<u>RF Matrix Switch</u>
6.	<u></u>	<u></u>	<u>Spectrum Anal. (HP-8566A)</u>
7.	<u>*Digital Control</u>	<u>TBD</u>	<u>TBD</u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

*May need LO source

Outputs

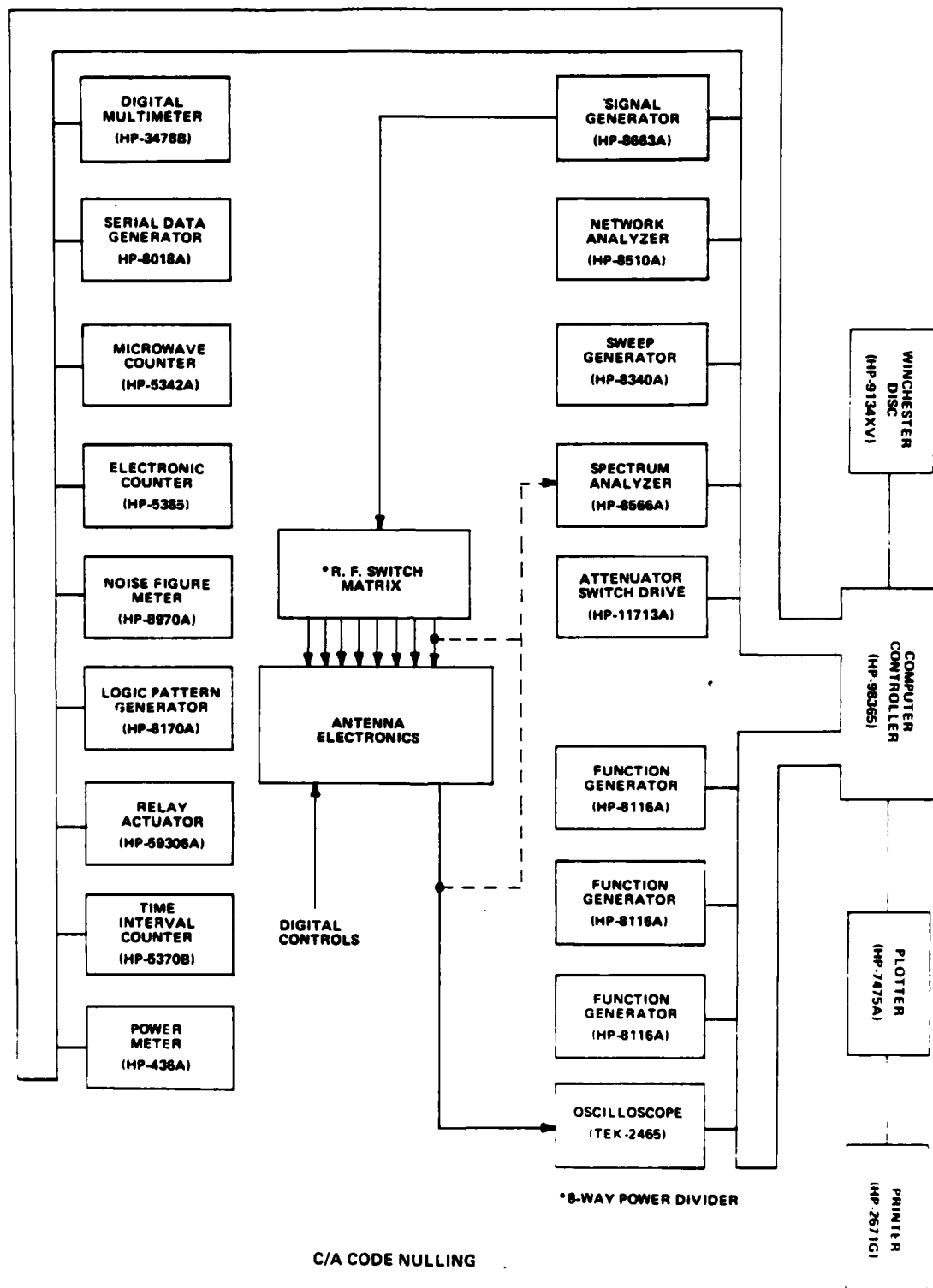
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>L1 IF Null Depth</u>	<u>25dB (min)</u>	<u>Spectrum Anal. (HP-8566A)</u>
2.	<u>L1 IF Null Time</u>	<u>100ms (max)</u>	<u>Oscilloscope (TEK-2465)</u>
3.	<u>L2 IF Null Depth</u>	<u>25dB (min)</u>	<u></u>
4.	<u>L2 IF Null Time</u>	<u>100ms (max)</u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment to proper ranges. A jammer input level of -78dBm will be set up and the C/A code nulling mode will be selected. The Oscilloscope will be used to observe the output, the nulling time will be recorded. A Spectrum Analyzer will be used to monitor the AE IF output power (null depth). Repeated for L1 and L2.

Data Reduction: Send output of Spectrum Analyzer and Oscilloscope to
plotter and send inputs to printer.

Equipment List:

- | | | |
|--------------------------------|--|------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>(RF Matrix Switch)</u>
<u>(8-way Power Divider)</u> | 7. <u>Plotter (HP-7475A)</u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u>Spec. Analyzer (HP-8481A)</u> | 8. _____ |
| 3. <u>Sig. Gen. (HP-8663A)</u> | 6. <u>Oscilloscope (TEK-2465)</u> | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To measure the AE BIT duration. The BIT duration
shall be 834 μ s $\pm$ 10 μ s (BIT Duration)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Z80</u>	<u>TBD</u>	<u>TEK emulator probe</u>
2.	<u>Digital Controls</u>	<u>TBD</u>	<u>(TEK 8561-40A)</u>
3.	<u></u>	<u></u>	<u>TBD</u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

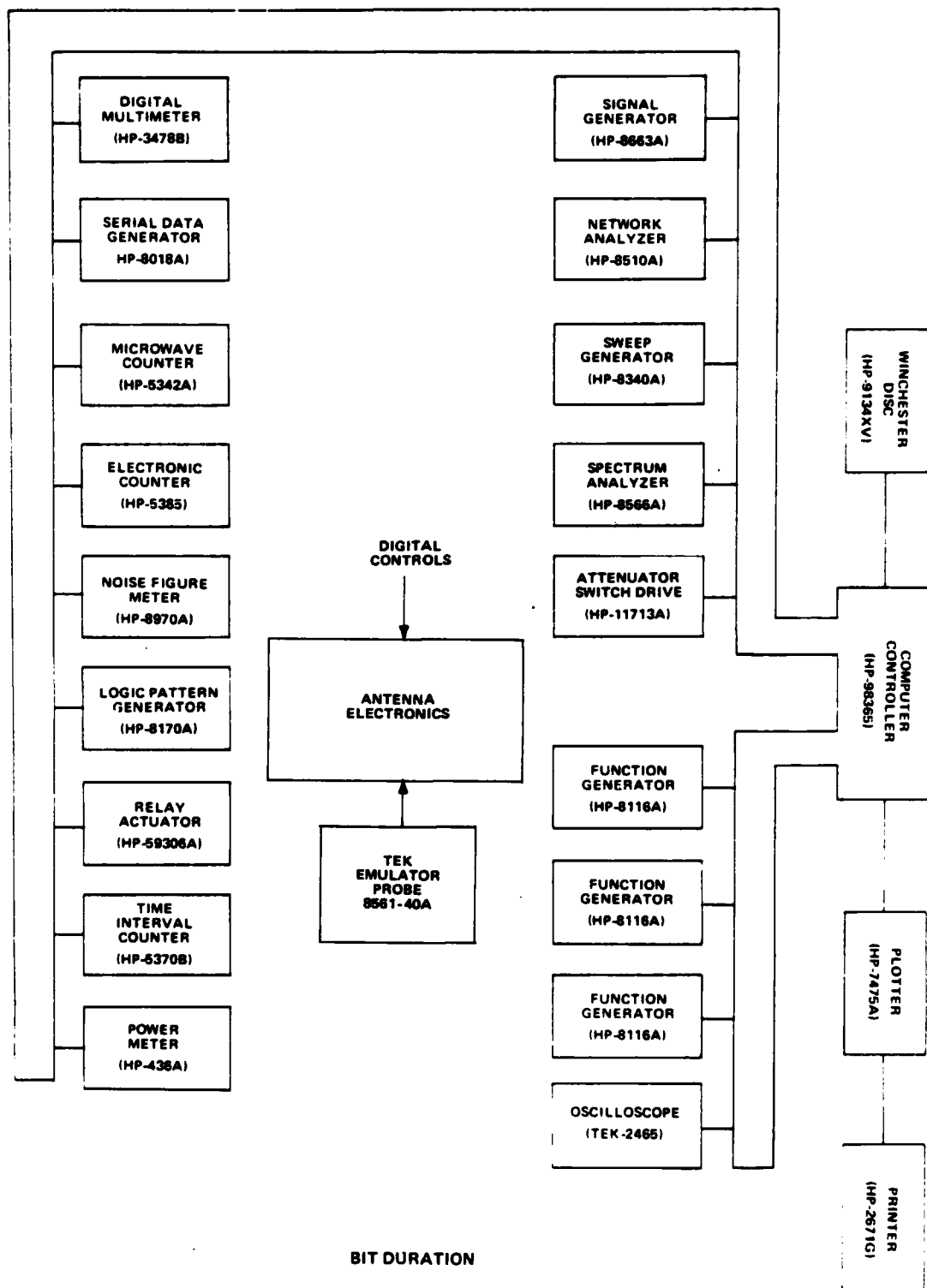
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Insert the emulator probe of the TEK(8561-40A) in
place of Z-80 in the AE. Set registers P, E and B so that only on BIT
equals one (1). Using the event time, measure duration of BIT. At the
present time, it is not recommended that this equipment be purchased
because of cost. Alterations are currently being studied.

Data Reduction: Send input and output levels to printer.

Equipment List:

- | | | |
|---|----------|----------|
| 1. <u>Computer (HP-9836S)</u> | 4. _____ | 7. _____ |
| 2. <u>Printer (HP-2671G)</u> | 5. _____ | 8. _____ |
| 3. <u>Tektronics Probe</u>
<u>(8561-40A)</u> | 6. _____ | 9. _____ |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify the quality of cable connections between
the functional blocks of the AE (LRU's). (Continuity Check)

<u>Inputs</u>			
	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
2.	<u>----</u>	<u>---</u>	<u>---</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

Output Name

Output Level

Equipment Used

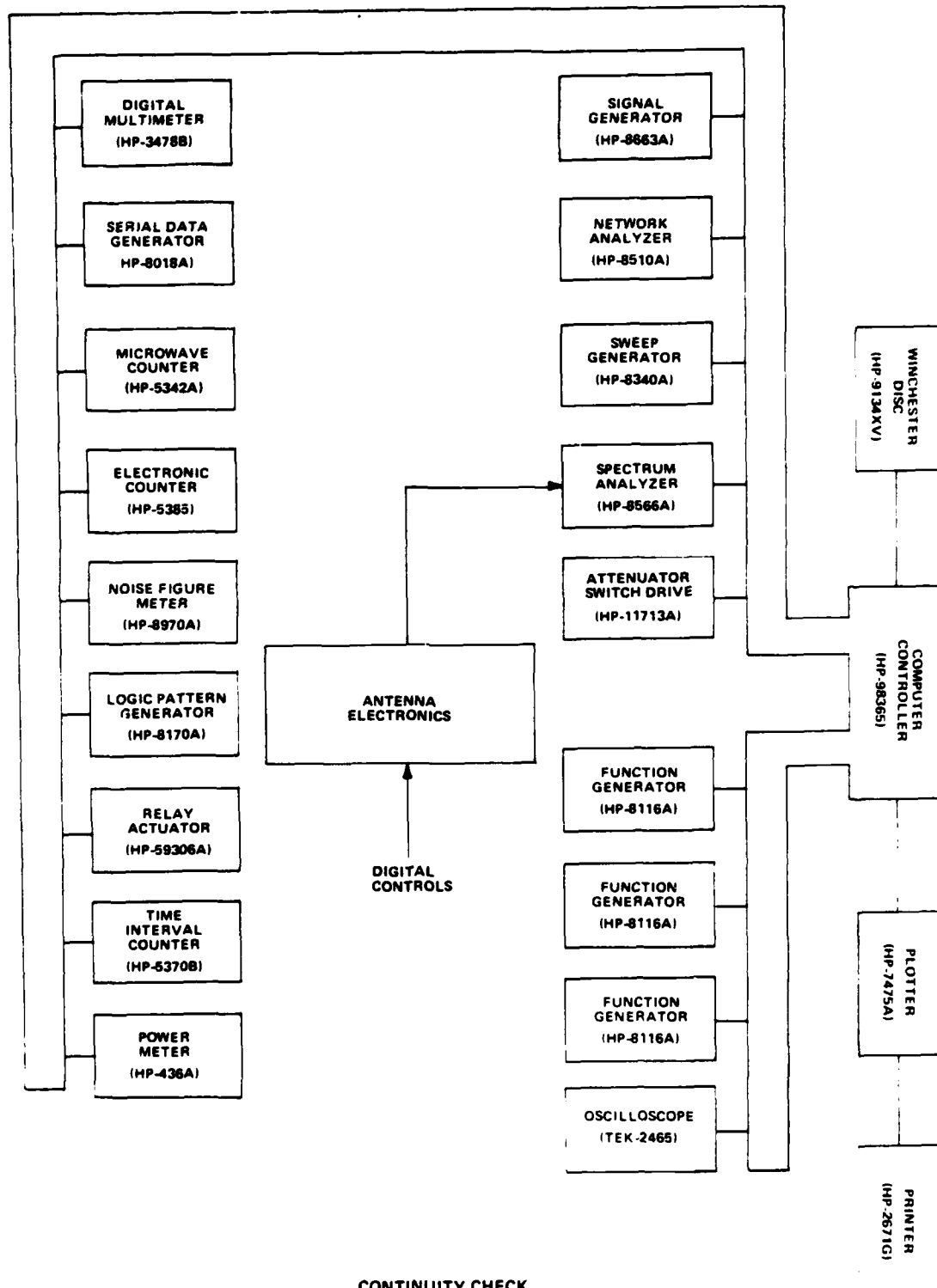
1.	AE Output	10 dB change	Spectrum Anal. (HP-8566A)
2.			
3.			
4.			
5.			

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Continuity will be checked by observing the change in
the level of the noise floor when the weights are switched from the minimum
noise condition to maximum noise condition. This will be shown by observing
the output. A 10dB change will verify the test.

Data Reduction: Send output of Spectrum Analyzer to plotter and
send inputs to printer.

Equipment List:

1. <u>Computer (HP-9836S)</u>	4. <u>Spectrum Anal. (HP-8566A)</u>	7. _____
2. <u>Printer (HP-2671G)</u>	5. _____	8. _____
3. <u>Plotter (HP-7475A)</u>	6. _____	9. _____



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To demonstrate that the LRU status is set to state
1 during normal operation in null steering mode. (LRU Status)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____

Outputs

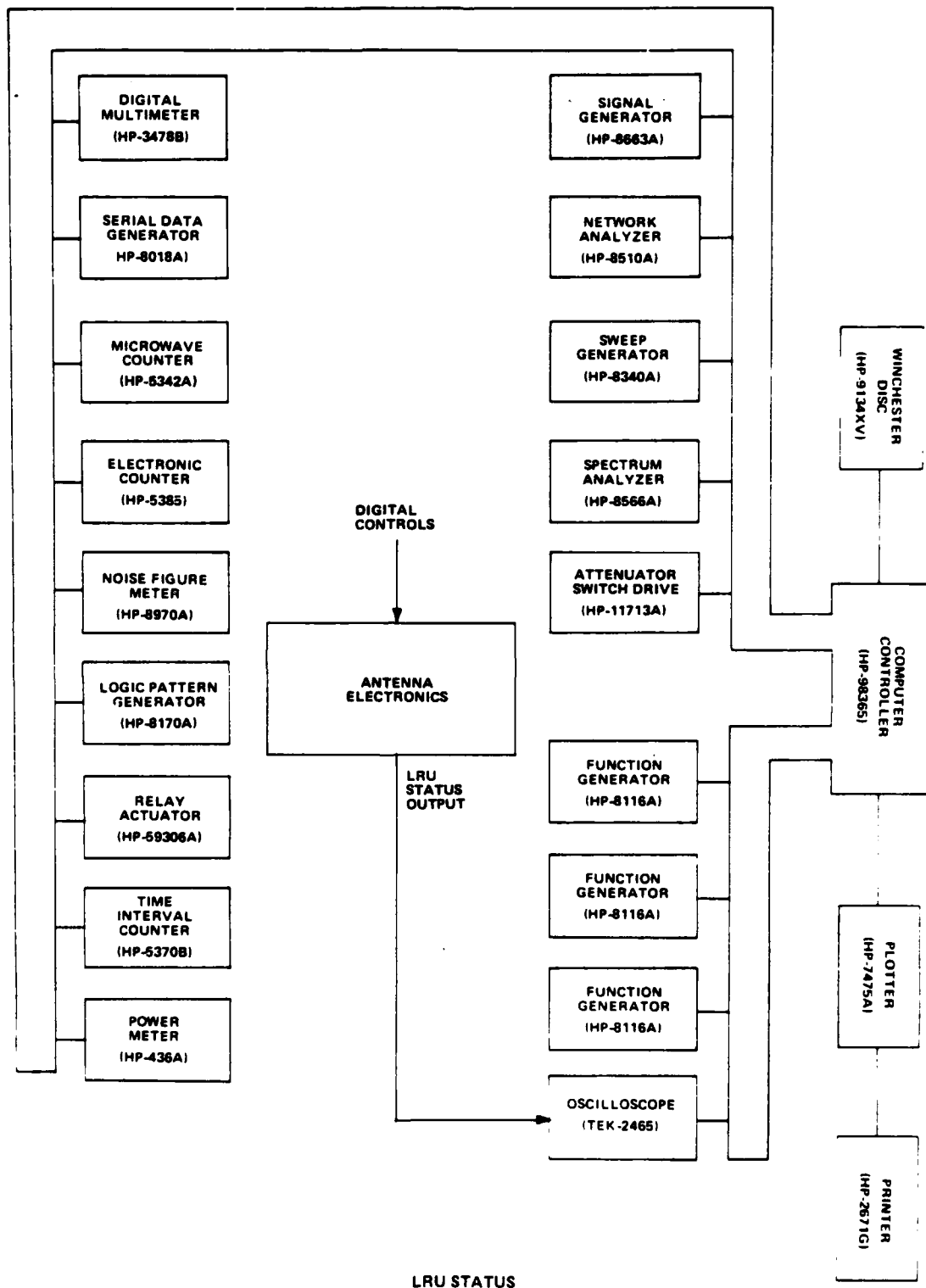
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>LRU Status</u>	<u>OK</u>	<u>Oscilloscope (TEK-2465)</u>
2.	<u> </u>	<u> </u>	<u> </u>
3.	<u> </u>	<u> </u>	<u> </u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Monitor LRU status during normal operation in null
steering mode.

Data Reduction: Send input levels to printer and output of Oscil-
loscope to plotter.

Equipment List:

- | | | |
|-----------------------------------|--------------------------------|--------------------------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Plotter (HP-7475A)</u> | 7. <u> </u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u> </u> | 8. <u> </u> |
| 3. <u>Oscilloscope (TEK-2465)</u> | 6. <u> </u> | 9. <u> </u> |



Contractor: Rockwell-Collins
Board Tested: Antenna Electronics
Test Objective: To verify that the timing of events is as specified
(Sequence Diagram BIT)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
2. <u></u>	<u></u>	<u></u>
3. <u></u>	<u></u>	<u></u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

Outputs

Output Name

Output Level

Equipment Used

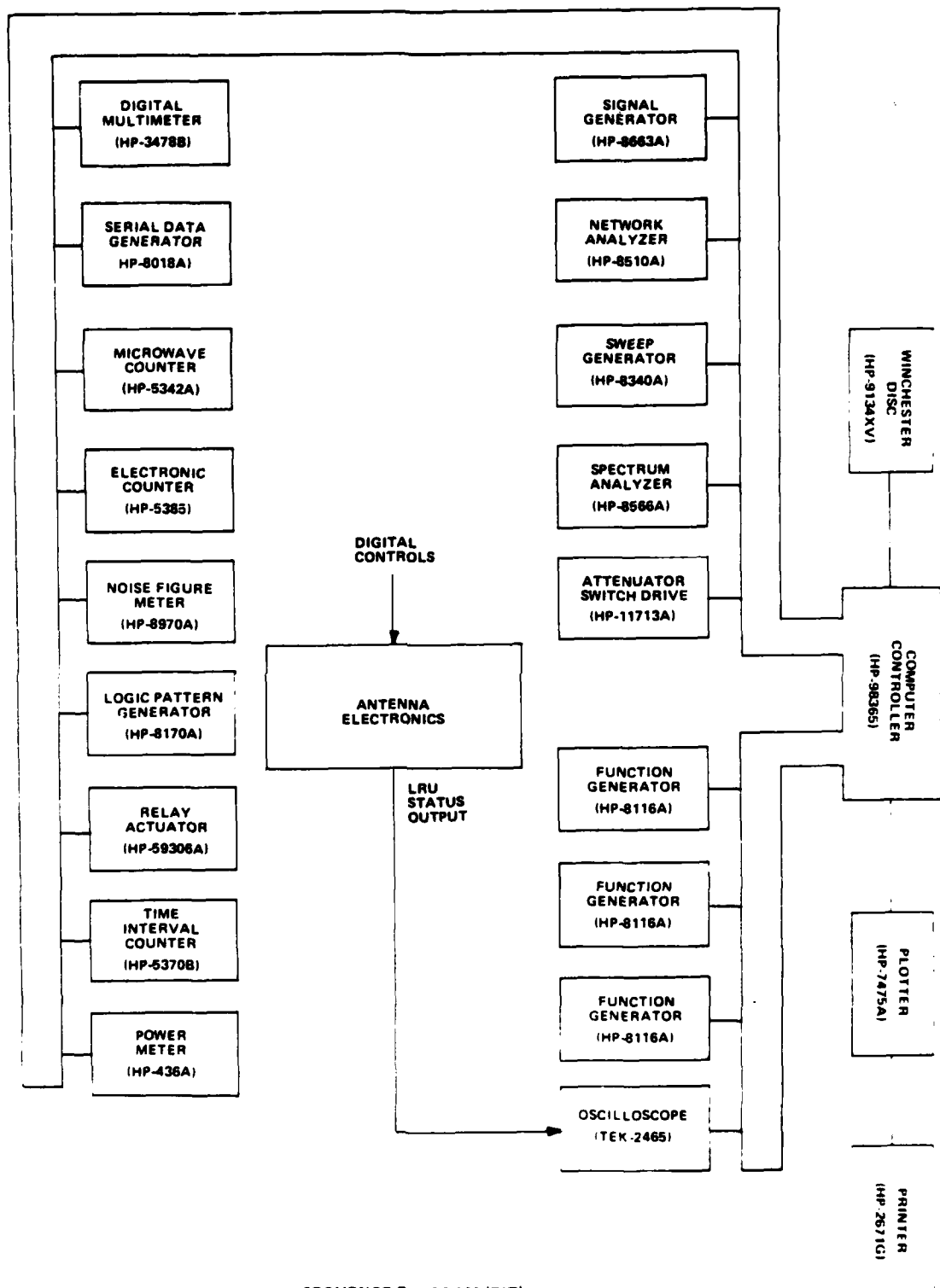
1.	<u>LRU Status Line</u>	<u>OK</u>	<u>Oscilloscope (TEK-2465)</u>
2.	<u> </u>	<u> </u>	<u> </u>
3.	<u> </u>	<u> </u>	<u> </u>
4.	<u> </u>	<u> </u>	<u> </u>
5.	<u> </u>	<u> </u>	<u> </u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. The sequence of events will be demonstrated using an
Oscilloscope connected to the LRU Status Line.

Data Reduction: Send input levels to printer and output of Oscilloscope to plotter.

Equipment List:

1. <u>Computer (HP-9836S)</u>	4. <u>Plotter (HP-7475A)</u>	7. _____
2. <u>Printer (HP-2671G)</u>	5. _____	8. _____
3. <u>Oscilloscope (TEK-2465)</u>	6. _____	9. _____



SEQUENCE DIAGRAM (BIT)

Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To demonstrate that the AE generates and transmits
the acknowledgement and the test result word. (Test result word acknowledge-
ment)

Inputs

	<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1.	<u>BITE (command BIT)</u>	<u>TBD</u>	<u>Logic Pattern Gen. (HP-8170A)</u>
2.	<u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>
6.	<u></u>	<u></u>	<u></u>
7.	<u></u>	<u></u>	<u></u>
8.	<u></u>	<u></u>	<u></u>
9.	<u></u>	<u></u>	<u></u>
10.	<u></u>	<u></u>	<u></u>
11.	<u></u>	<u></u>	<u></u>
12.	<u></u>	<u></u>	<u></u>

Outputs

Output Name

Output Level

Equipment Used

1. LRU Status Output

OK

Oscilloscope (TEK-2465)

2.

3.

4.

5.

Test Procedure: Turn on test equipment. Set measurement equipment

to proper ranges. Input BITE and record LRU Status output on Oscilloscope.

Data Reduction: Send input levels to printer and output of Oscillo-

scope to plotter. Verify that format and length of test result word is

as specified.

Equipment List:

1. Computer (HP-9836S)

4. Log. Patt. Gen. (HP-8170A)

7.

2. Printer (HP-2671G)

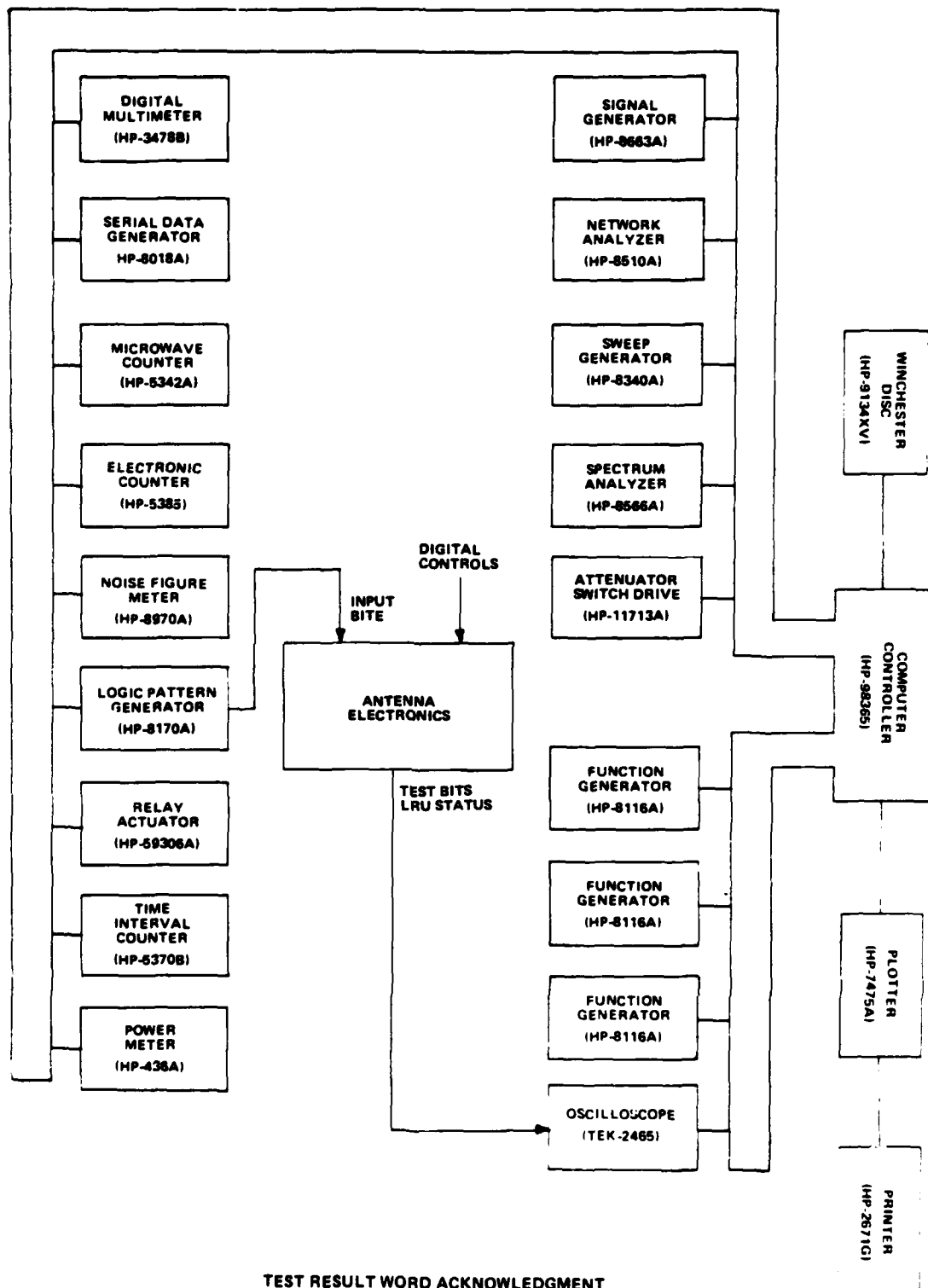
5. _____

8.

3. Oscilloscope (TEK-2465)

6. _____

9.



Contractor: Rockwell-Collins

Board Tested: Antenna Electronics

Test Objective: To demonstrate that the AE generates and transmits
the result word. (Word Format)

<u>Inputs</u>		
<u>Input Name</u>	<u>Input Level</u>	<u>Equipment Used</u>
1. <u>BITC</u>	<u>TBD</u>	<u>Logic Pattern Generator</u> <u>(HP-8170A)</u>
2. <u>Digital Controls</u>	<u>TBD</u>	<u>TBD</u>
3. <u></u>	<u></u>	<u></u>
4. <u></u>	<u></u>	<u></u>
5. <u></u>	<u></u>	<u></u>
6. <u></u>	<u></u>	<u></u>
7. <u></u>	<u></u>	<u></u>
8. <u></u>	<u></u>	<u></u>
9. <u></u>	<u></u>	<u></u>
10. <u></u>	<u></u>	<u></u>
11. <u></u>	<u></u>	<u></u>
12. <u></u>	<u></u>	<u></u>

Outputs

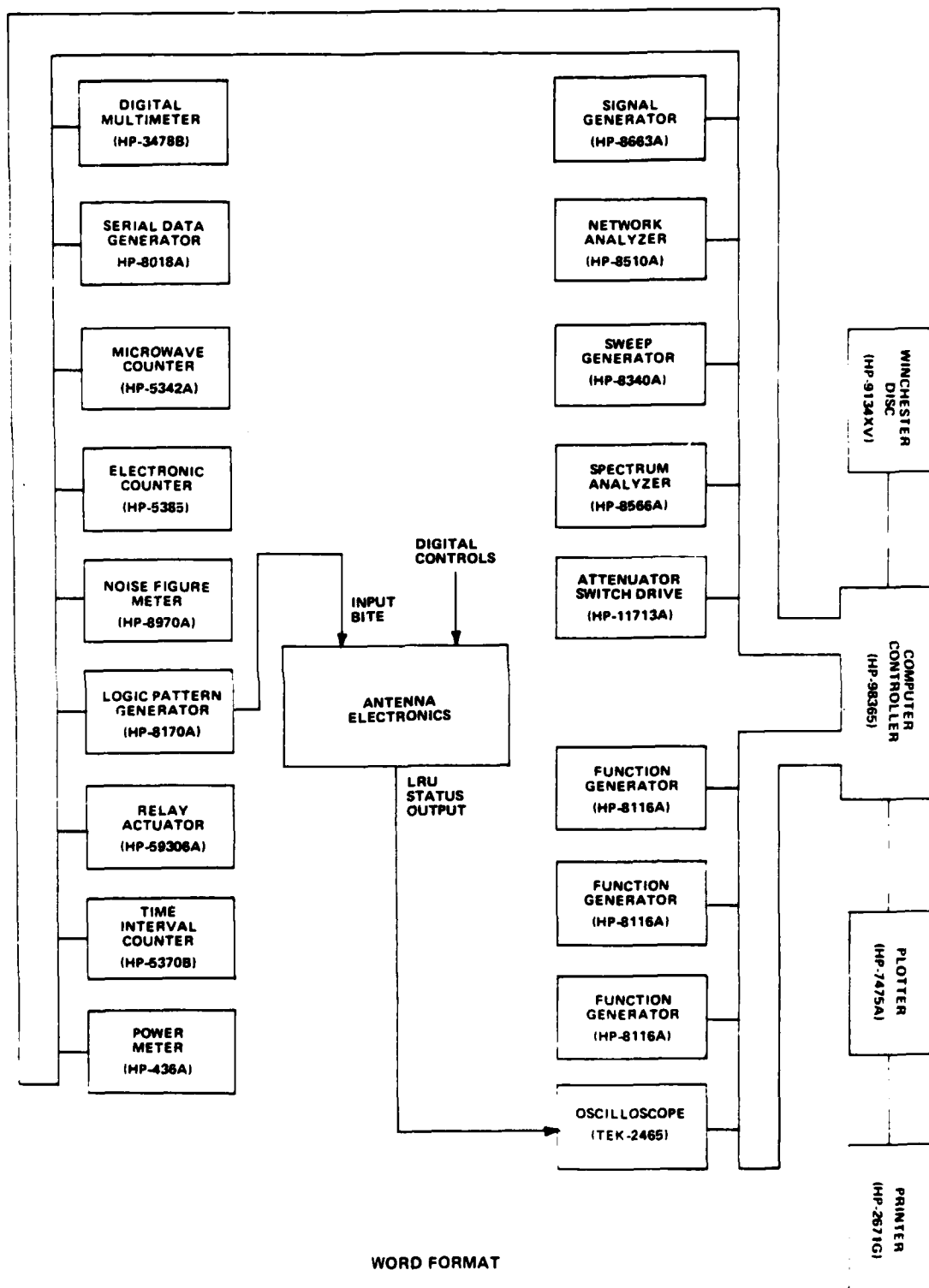
	<u>Output Name</u>	<u>Output Level</u>	<u>Equipment Used</u>
1.	<u>LRU Status Output</u>	<u>TBD</u>	<u>Oscilloscope (TEK-2465)</u>
2.	<u></u>	<u></u>	<u></u>
3.	<u></u>	<u></u>	<u></u>
4.	<u></u>	<u></u>	<u></u>
5.	<u></u>	<u></u>	<u></u>

Test Procedure: Turn on test equipment. Set measurement equipment
to proper ranges. Input BITC and record LRU status output on an Oscillo-
scope.

Data Reduction: Send input levels to printer and output of Oscillo-
scope to plotter.

Equipment List:

- | | | |
|---------------------------------------|-----------------------------------|------------|
| 1. <u>Computer (HP-9836S)</u> | 4. <u>Oscilloscope (TEK-2465)</u> | 7. <u></u> |
| 2. <u>Printer (HP-2671G)</u> | 5. <u></u> | 8. <u></u> |
| 3. <u>Logic Patt. Gen. (HP-8170B)</u> | 6. <u></u> | 9. <u></u> |



4.0 SOFTWARE REQUIREMENTS

This section contains the software requirements for the bench test procedures defined in Section 3. These software requirements are defined in terms of flowcharts.

The software requirements contained herein are written at the functional level. There is a flowchart for each test procedure that illustrates the sequence of events that will be required in order to perform these tests by computer. In addition to these requirements, all tests will include the following:

- o menu driven testing will prompt operator through:
 - 1. test set-ups
 - 2. testing
 - 3. data reduction/storage/hardcopy
- o Each test will have a program module number and will be contained in a testing menu. All tests with the same set-up can be grouped together to be run one after the other.
- o Each test will incorporate a full error-checking capability during operator inputs so that no manual error can be entered into the system.
- o Data reduction based on baseline data and/or range limits. The specified range values and/or tolerance will be stored and compared to the results obtained from the actual test. The values will be displayed and any differences can quickly be seen.
- o There will be real-time monitoring for any bus available information during testing.
- o There will be off-line storage or transfer of data for interfacing with the DPSSF/NSL system capabilities. This capability will be used for any information that is needed for the DPSSF, NSL or RFL.

- o All software will be stored including back-up disks and hardcopy listings, in a library which will contain as a minimum, the following information in its catalog:

1. program module name and number (disk #)
2. back-up copy # (disk #)
3. data written, by whom
4. date last revised, by whom

There are two floppy disk drives which have a memory of 170k each built into the computer. All information will be stored on either of these floppy disks. There is also a Winchester hard disk provided. This can be used as a temporary storage for data and information obtained while testing, if needed. For example, if a series of tests are being run and many data points are needed to be stored and all of the memory is being used in the computer, the information is stored temporarily on the Winchester disk until processing is complete and then archived onto the floppy disks.

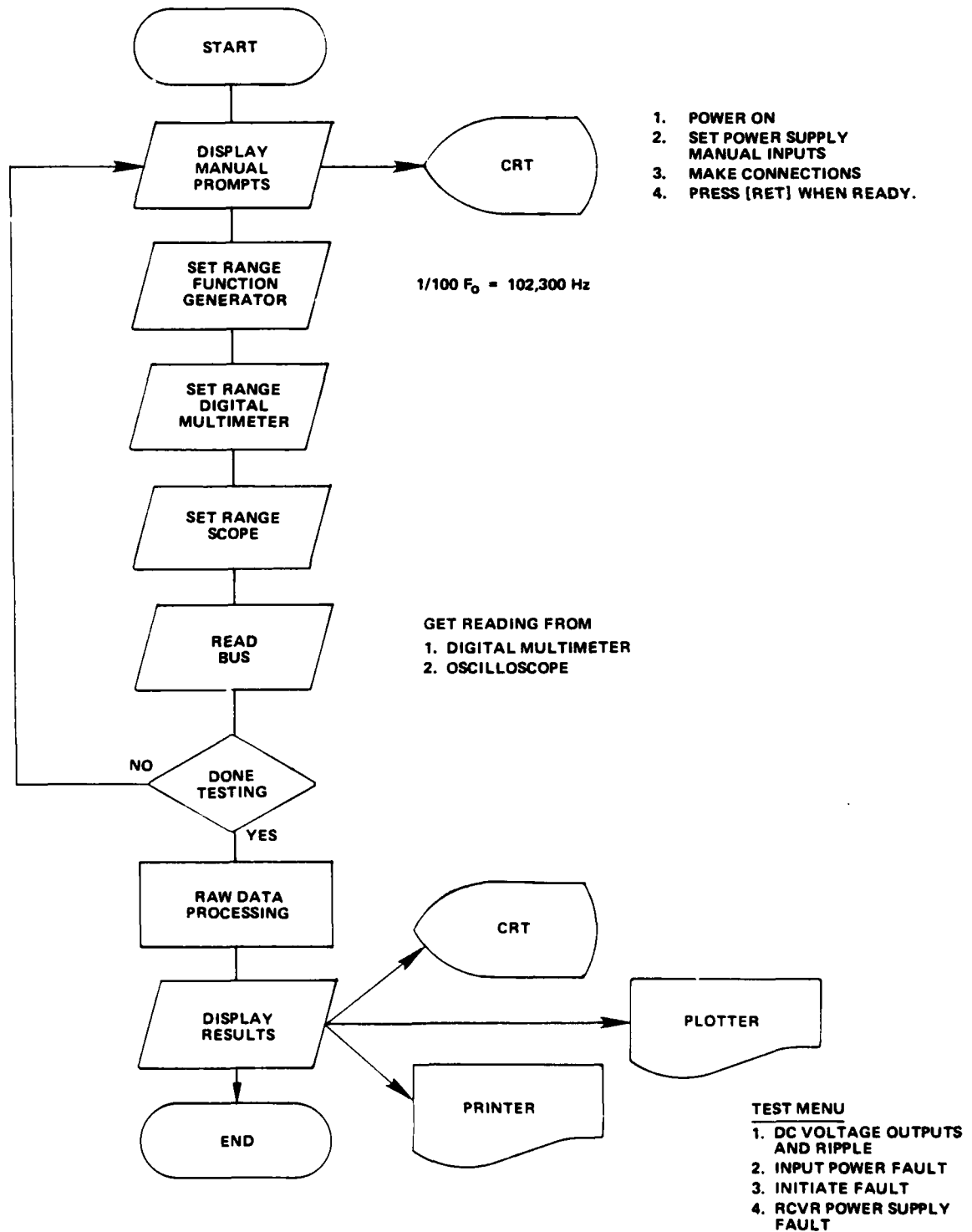
4.1 ROCKWELL-COLLINS SOFTWARE REQUIREMENTS

The following sheets contain the software requirements for the Bench Test Procedures for each of the boards identified in section 3.1. The software requirements will also be refined and expanded as more detailed information becomes available for the bench tests.

4.1.1 POWER SUPPLY MODULE

POWER SUPPLY MEASUREMENTS

PROGRAM MODULE NUMBER: _____



AD-A166 498

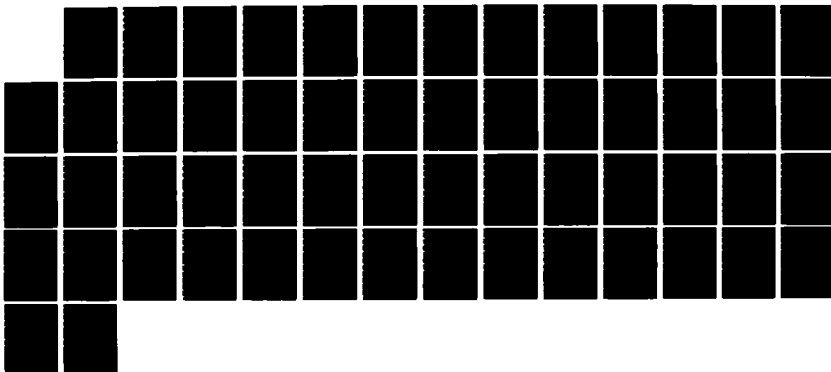
UE BENCH TEST PLANS AND REQUIREMENTS VOLUME 2
ROCKWELL-COLLINS UE SET(U) ESSCUBE ENGINEERING INC
MARLTON NJ SEP 84 CER/GPS-85-156-00-030-VOL-2
N62269-82-D-0059

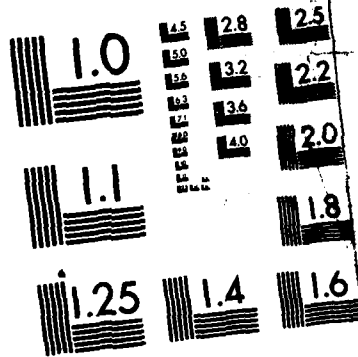
3/3

UNCLASSIFIED

F/G 14/2

NL



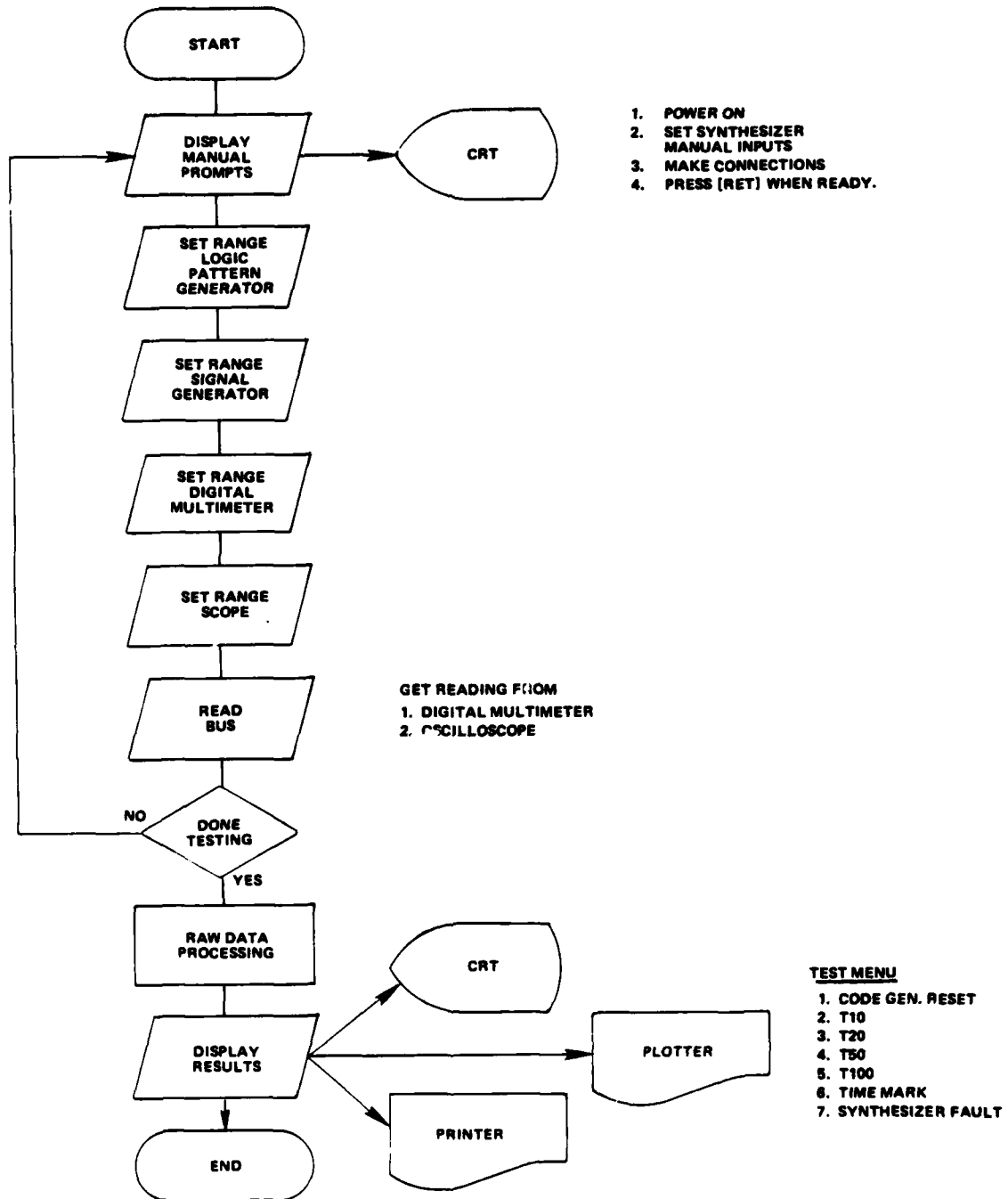


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

4.1.2 RF SYNTHESIZER MODULE

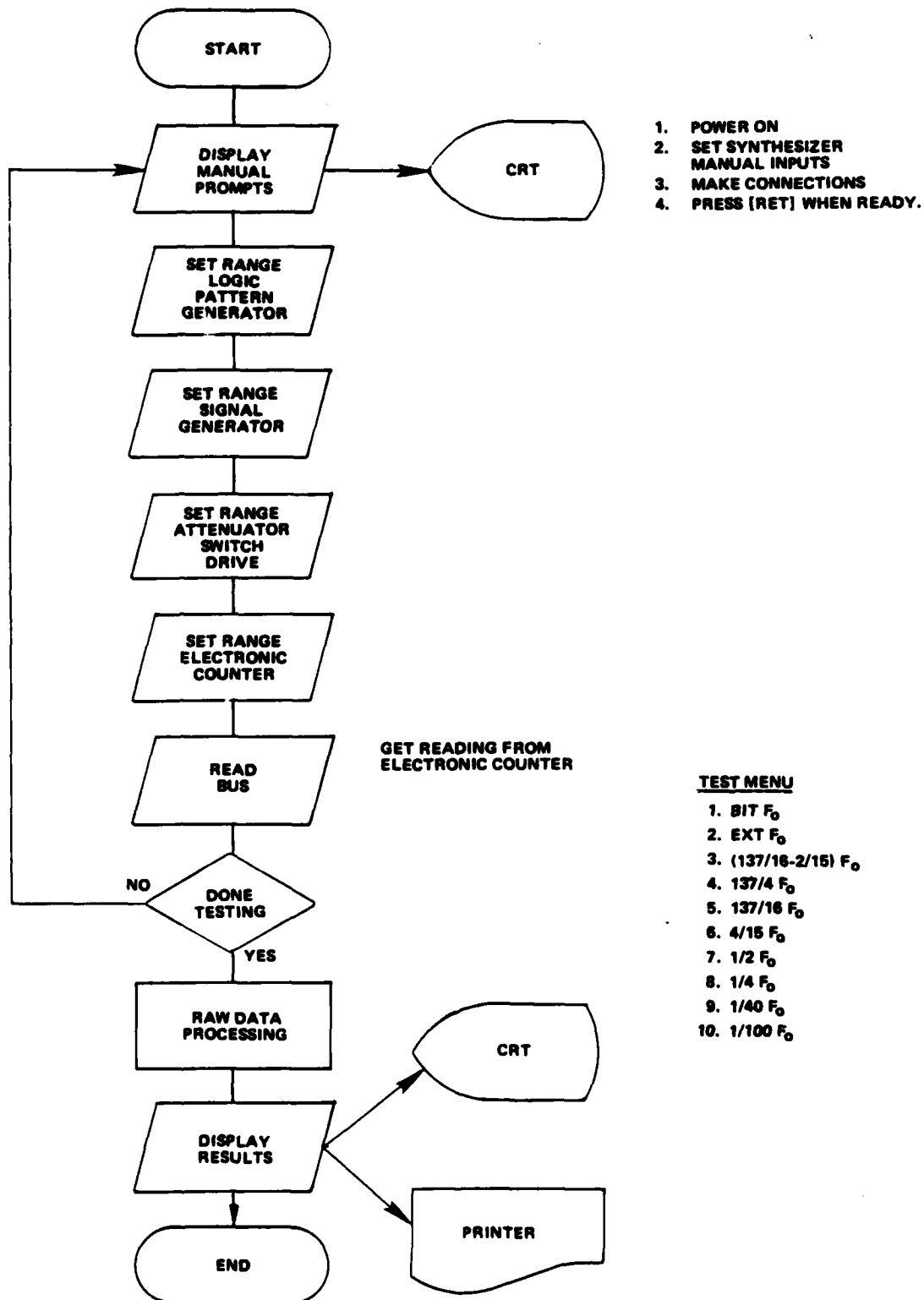
VERIFY OPERATION OF DIGITAL CONTROL SIGNALS

PROGRAM MODULE NAME: _____



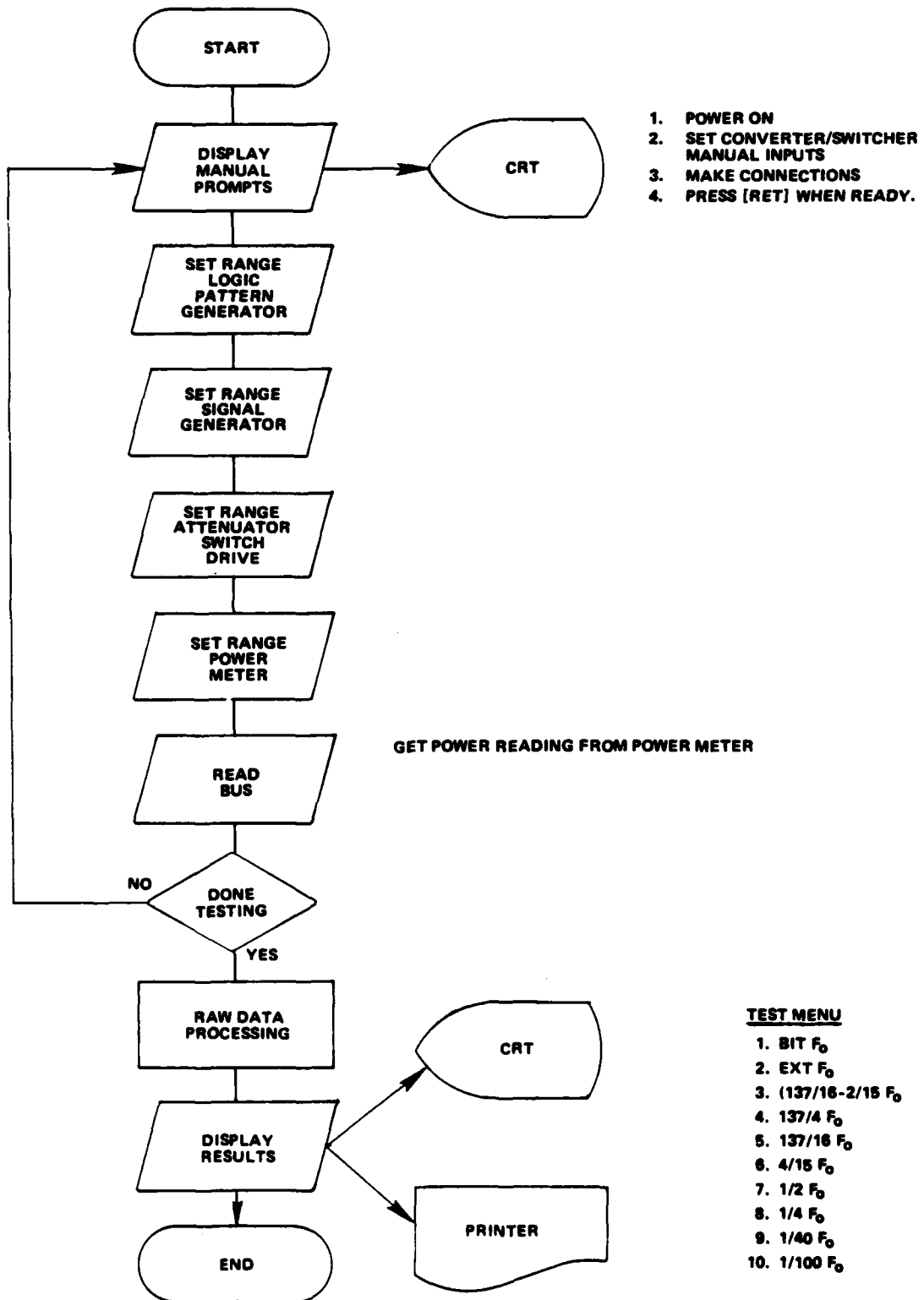
OUTPUT FREQUENCY MEASUREMENT

PROGRAM MODULE NAME: _____



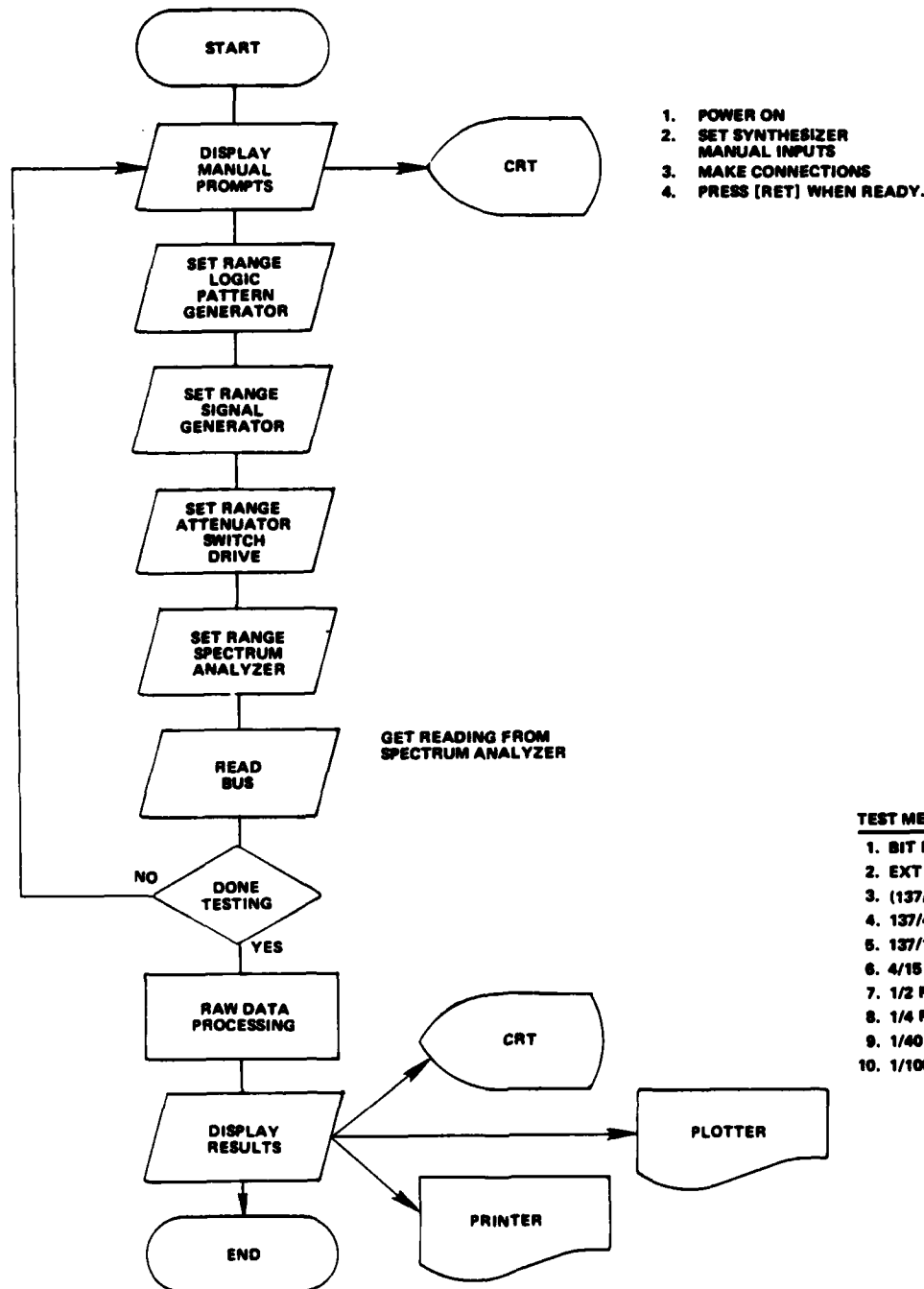
OUTPUT POWER MEASUREMENT

PROGRAM MODULE NAME:

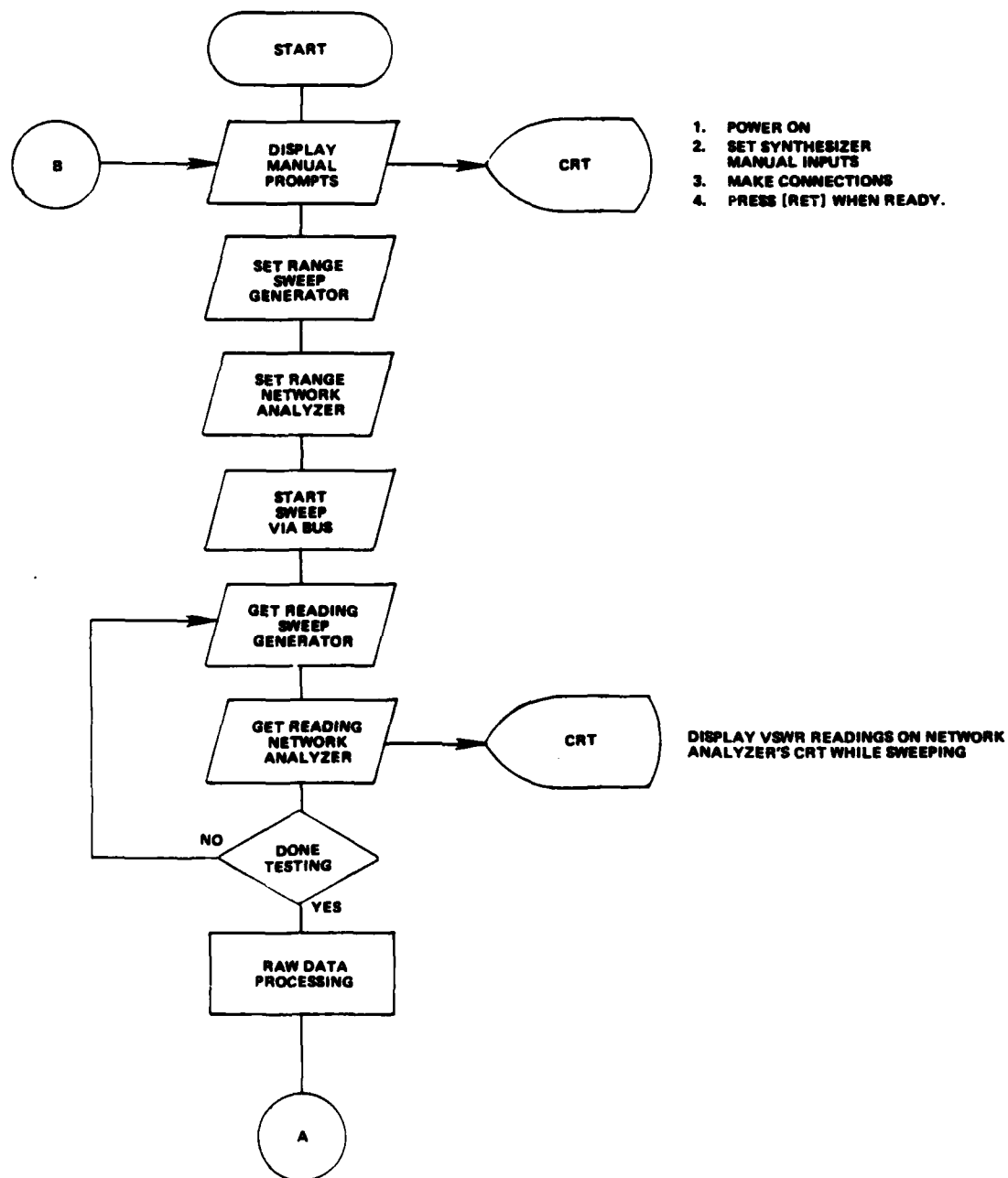


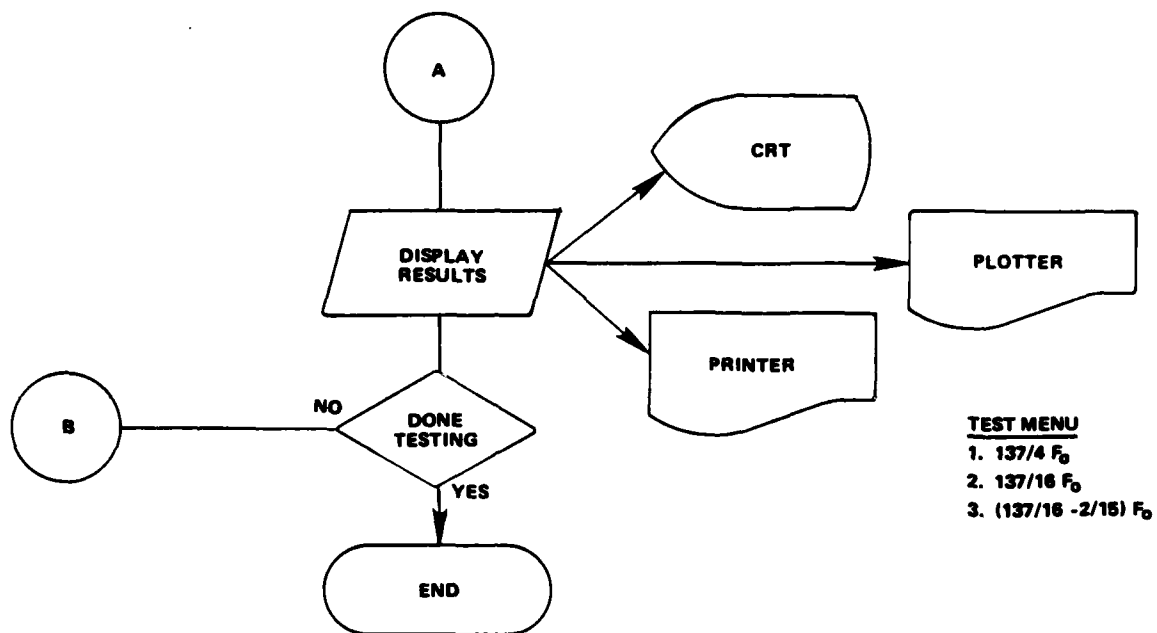
MEASURE SPECTRAL CONTENT

PROGRAM MODULE NAME: _____



VSWR AND IMPEDANCE MEASUREMENT
PROGRAM MODULE NAME: _____

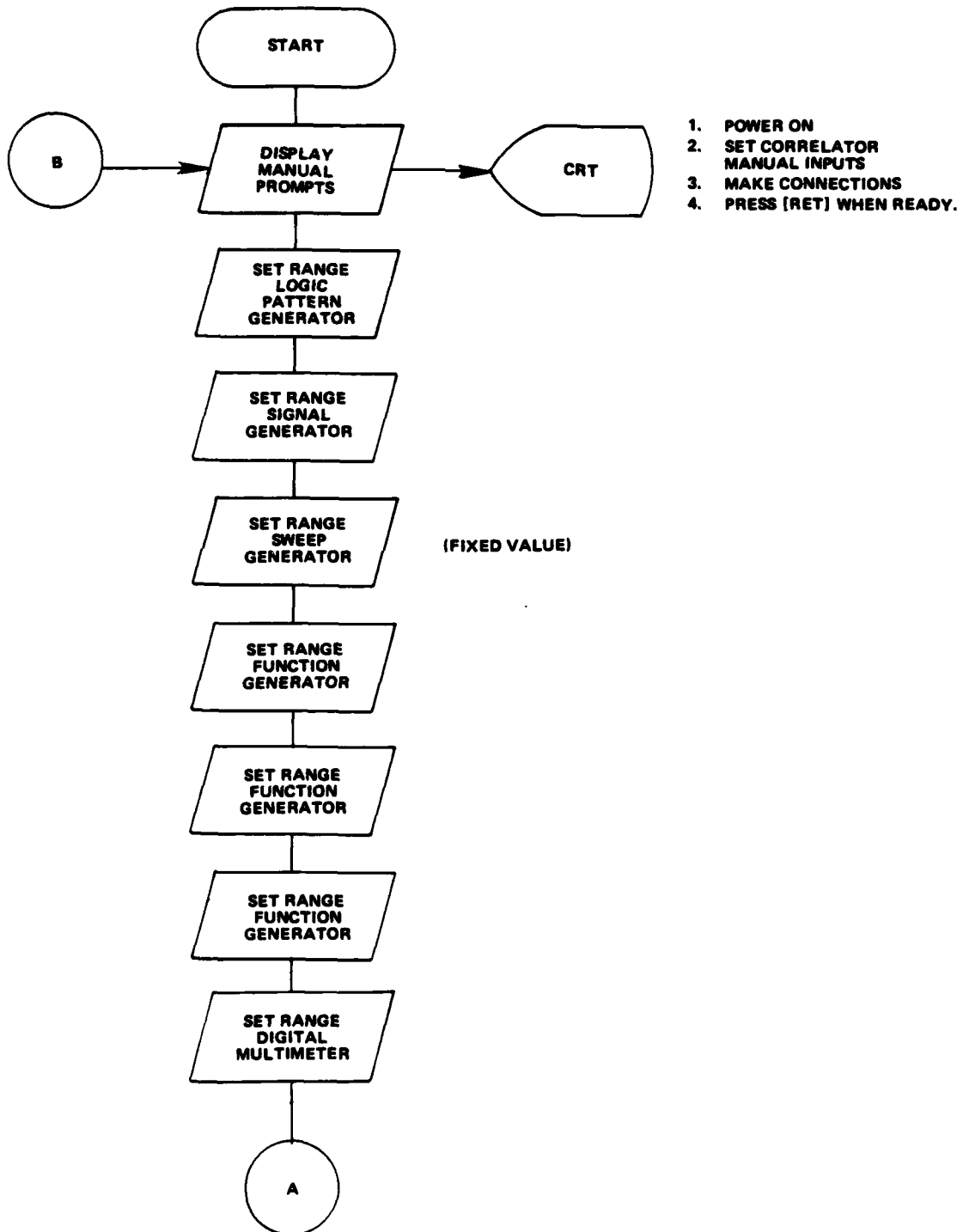


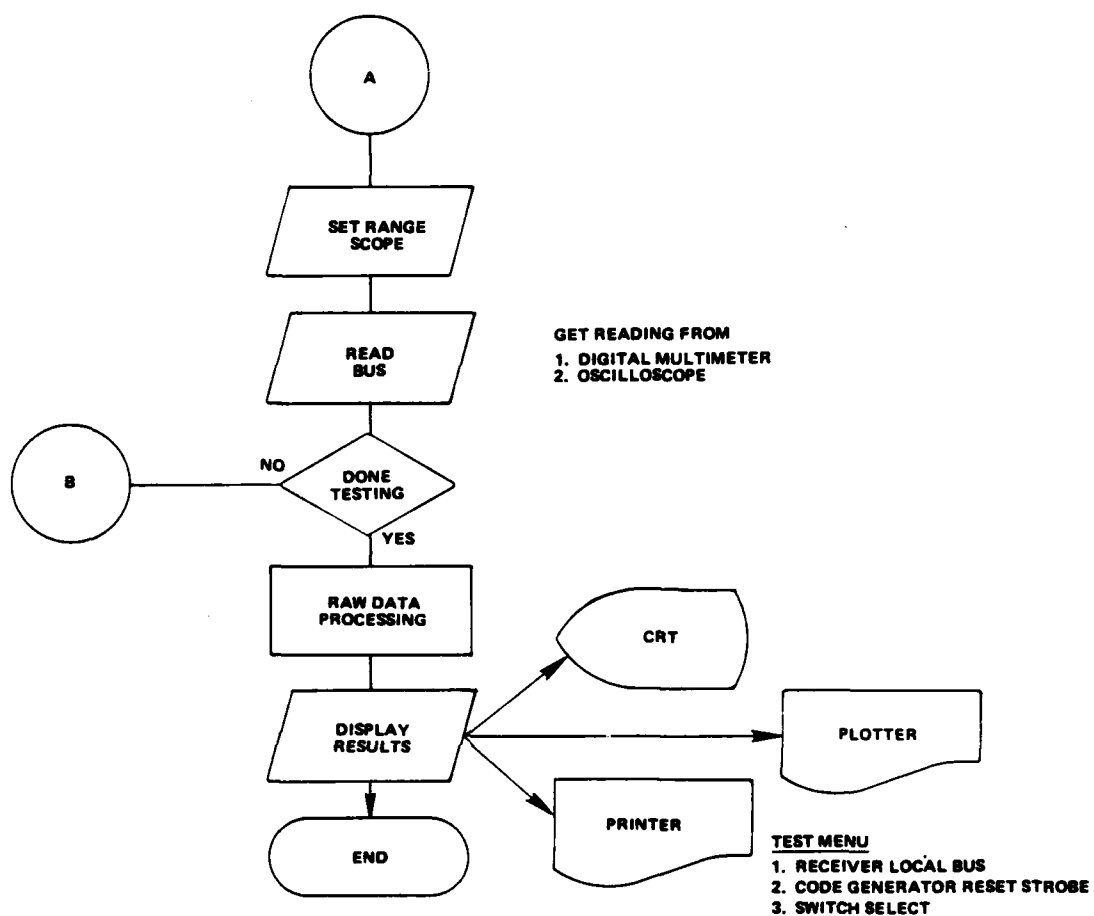


4.1.3 CORRELATOR MODULE

CORRELATOR DIGITAL SIGNALS

PROGRAM MODULE NAME: _____

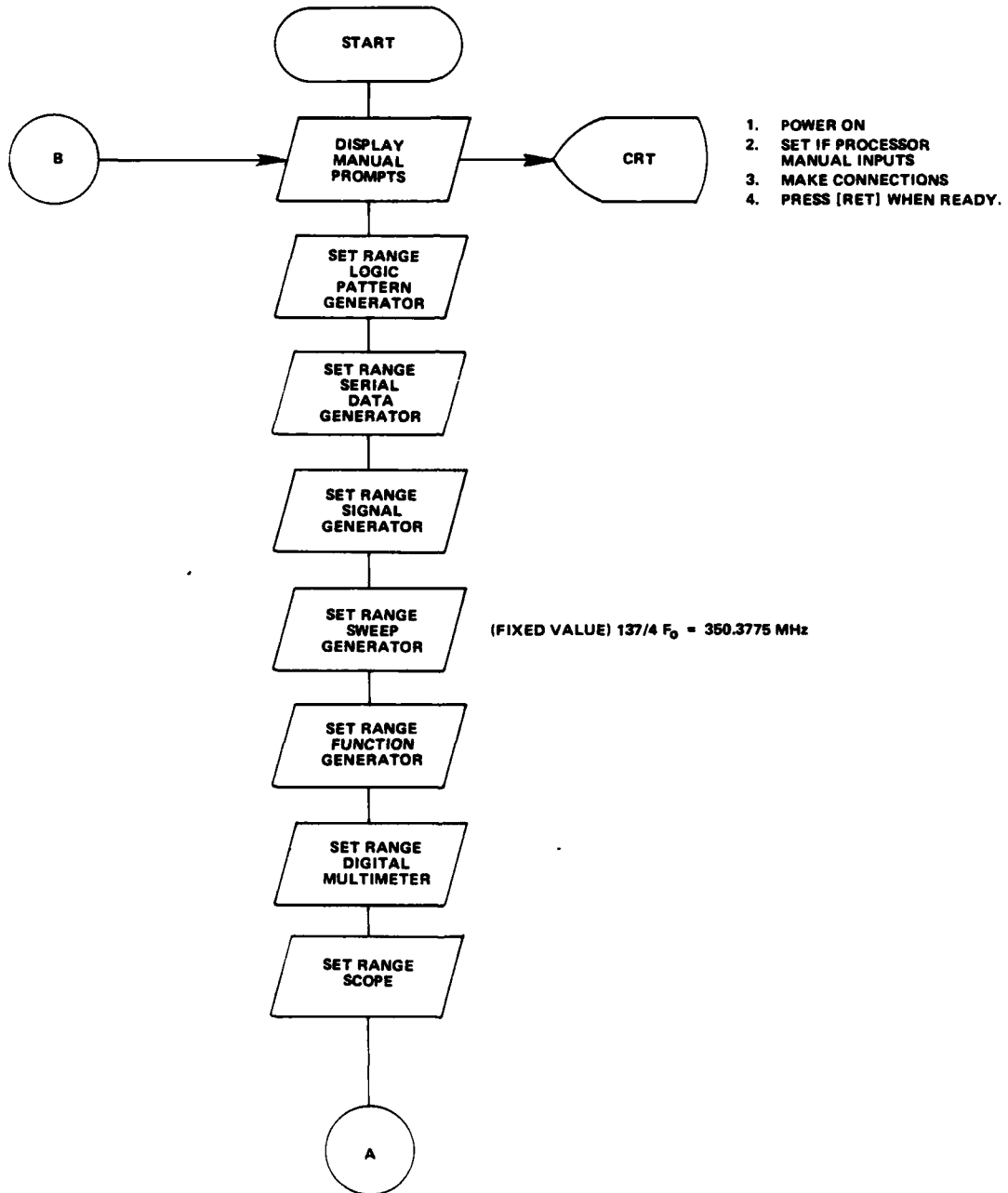


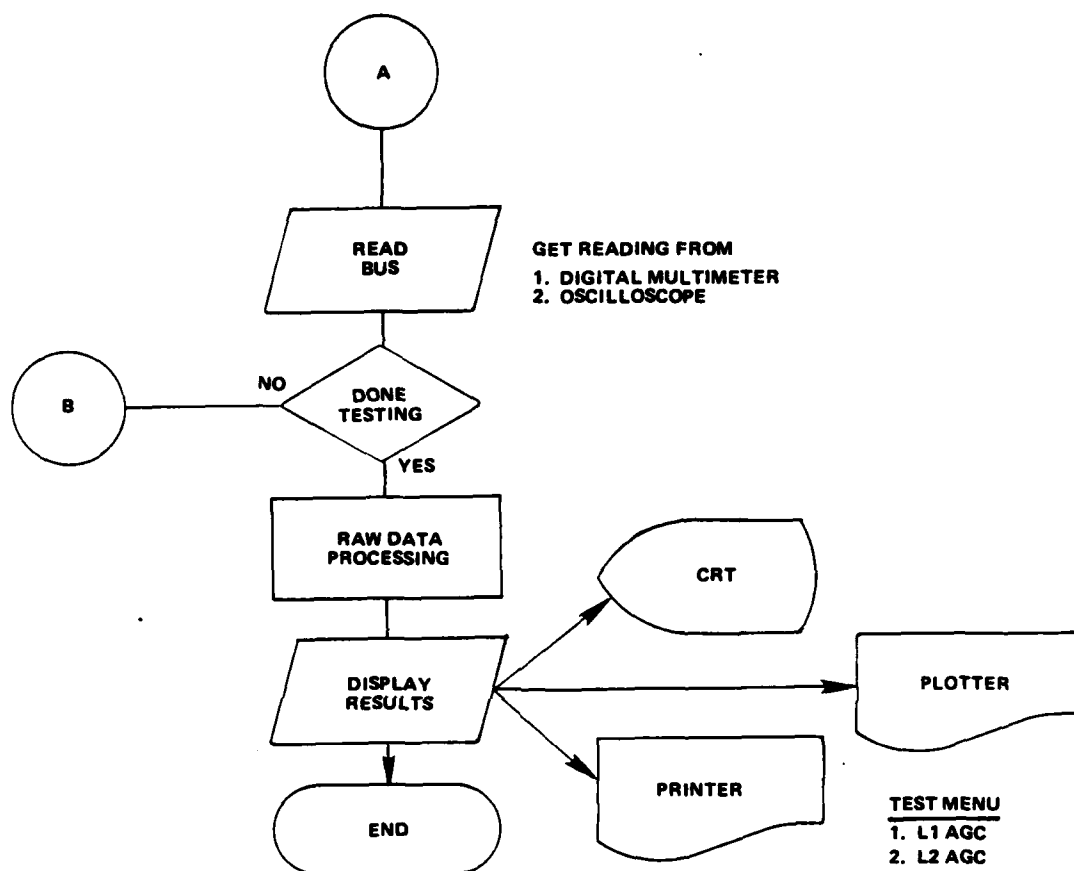


4.1.4 IF PROCESSOR MODULE

AGC MEASUREMENT

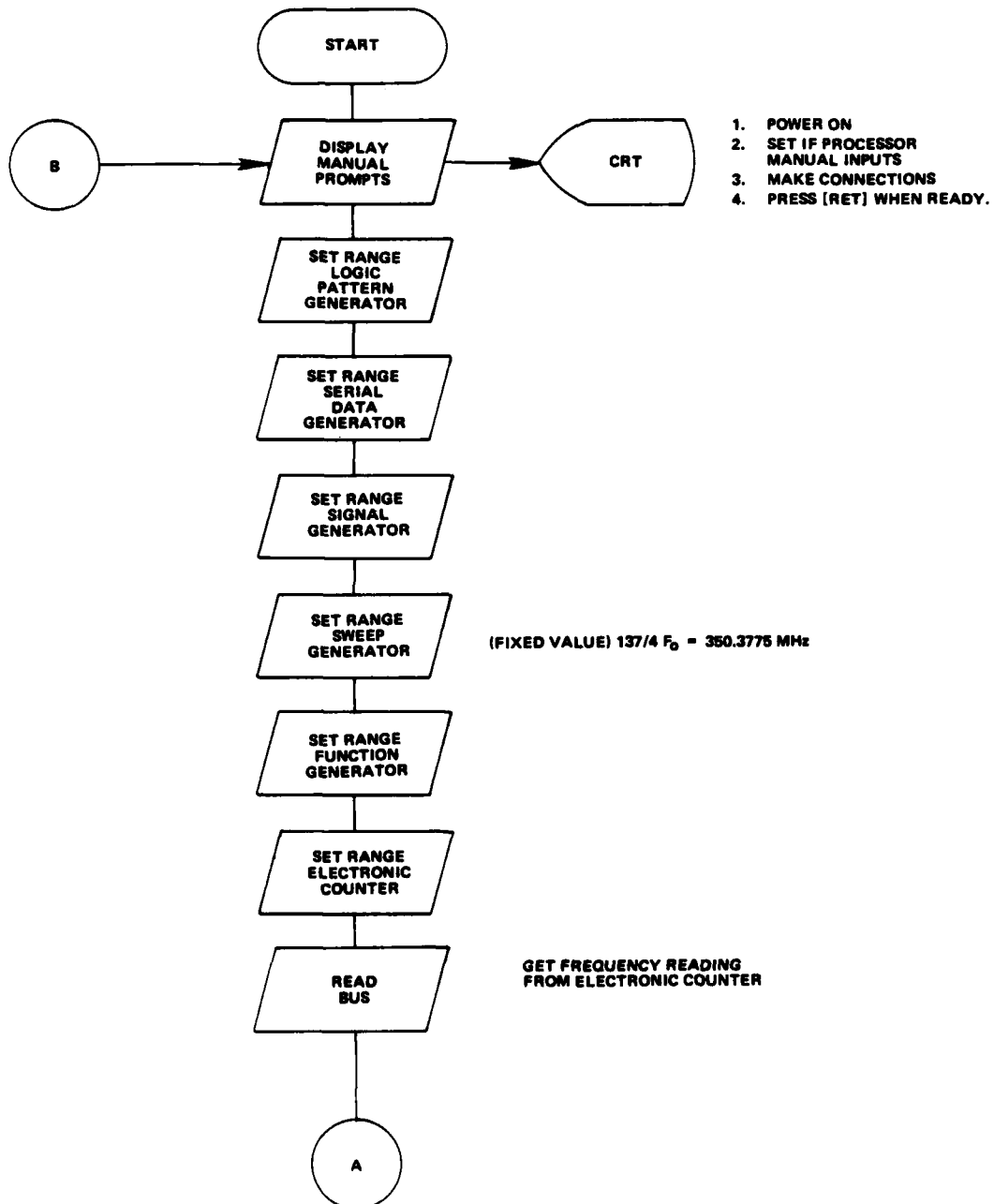
PROGRAM MODULE NAME: _____

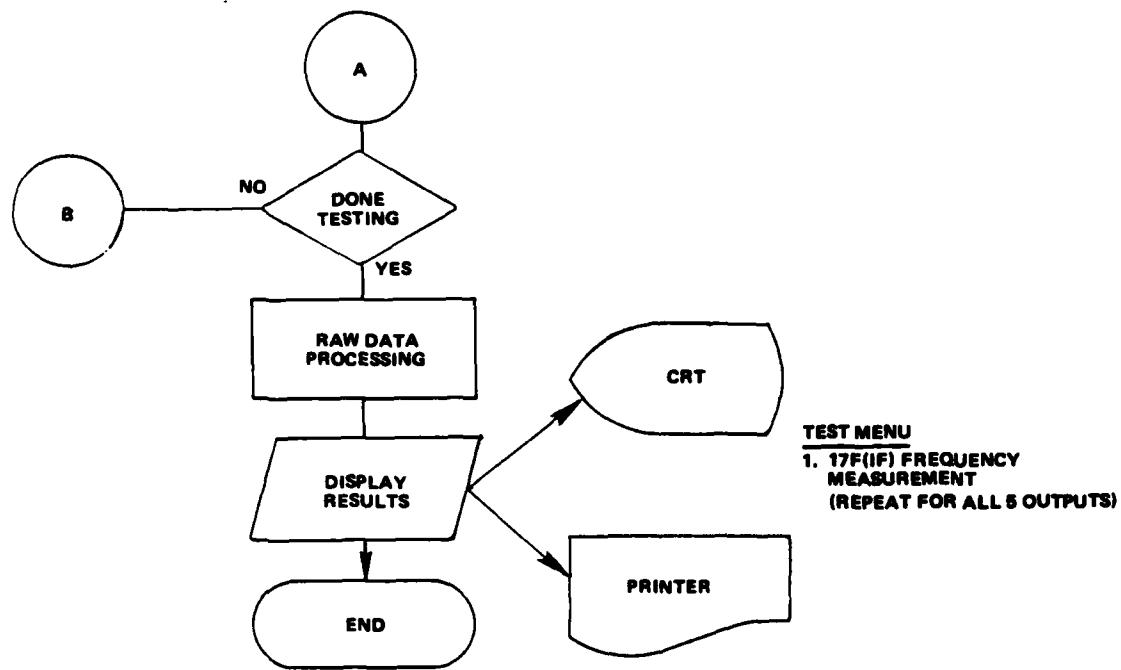




17F(1F) FREQUENCY MEASUREMENT

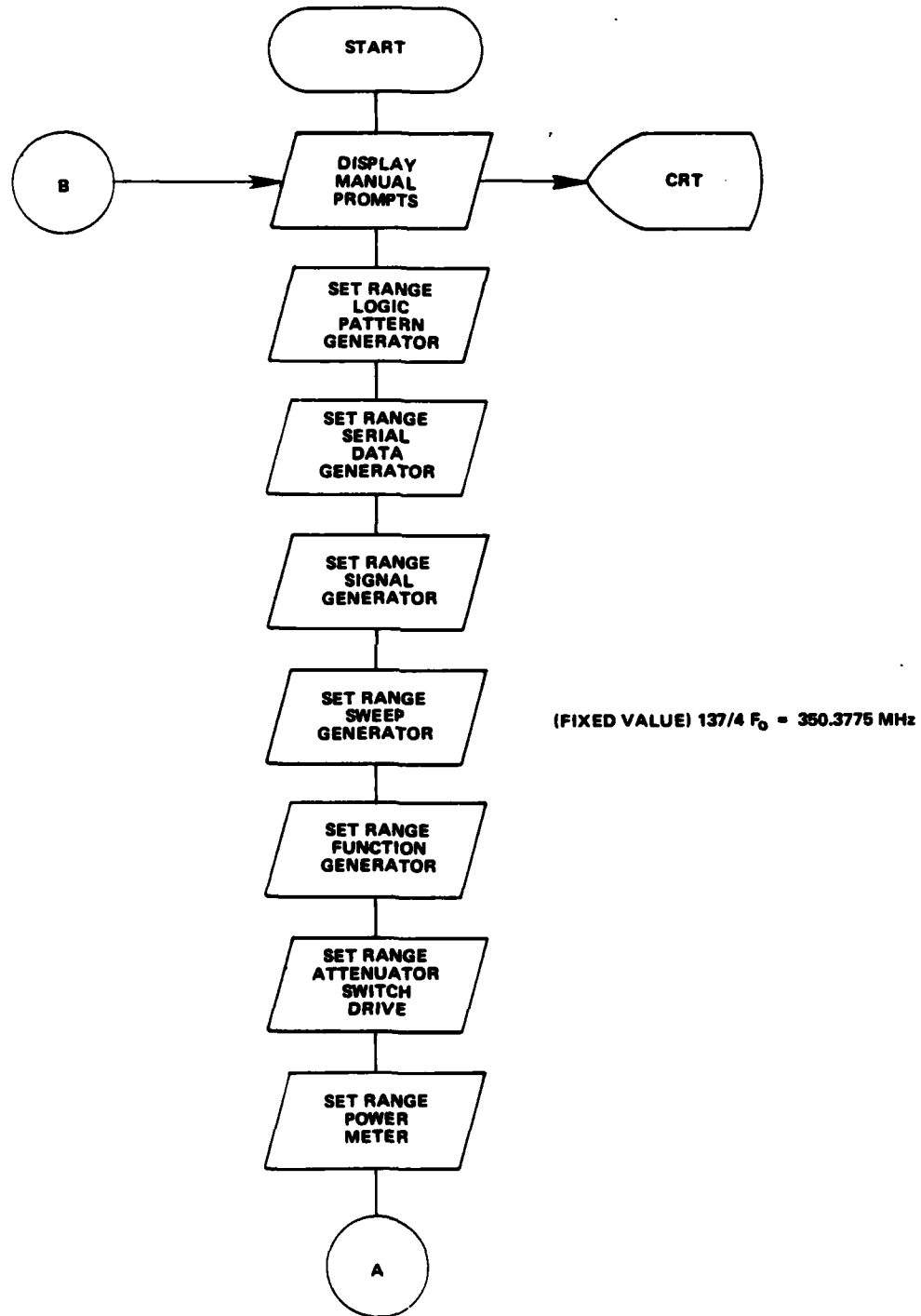
PROGRAM MODULE NAME: _____

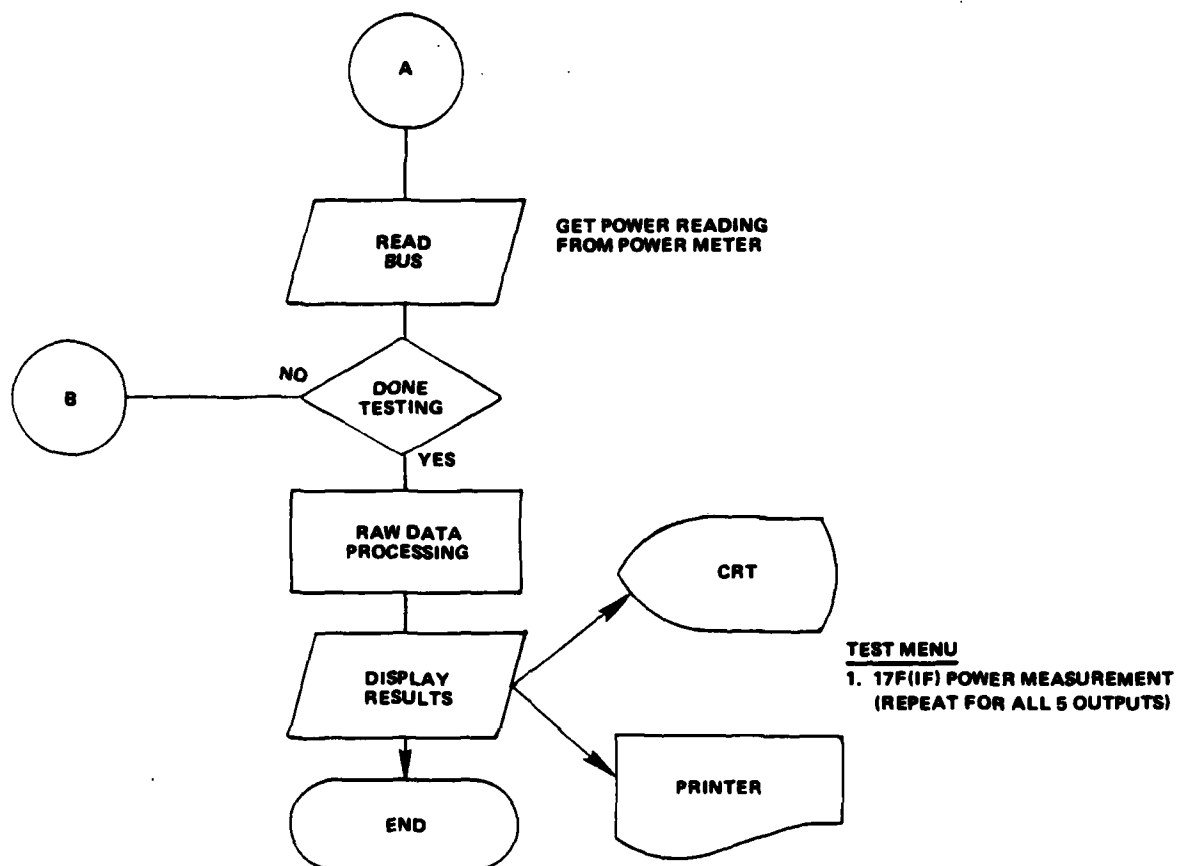




17F(IF) POWER MEASUREMENT

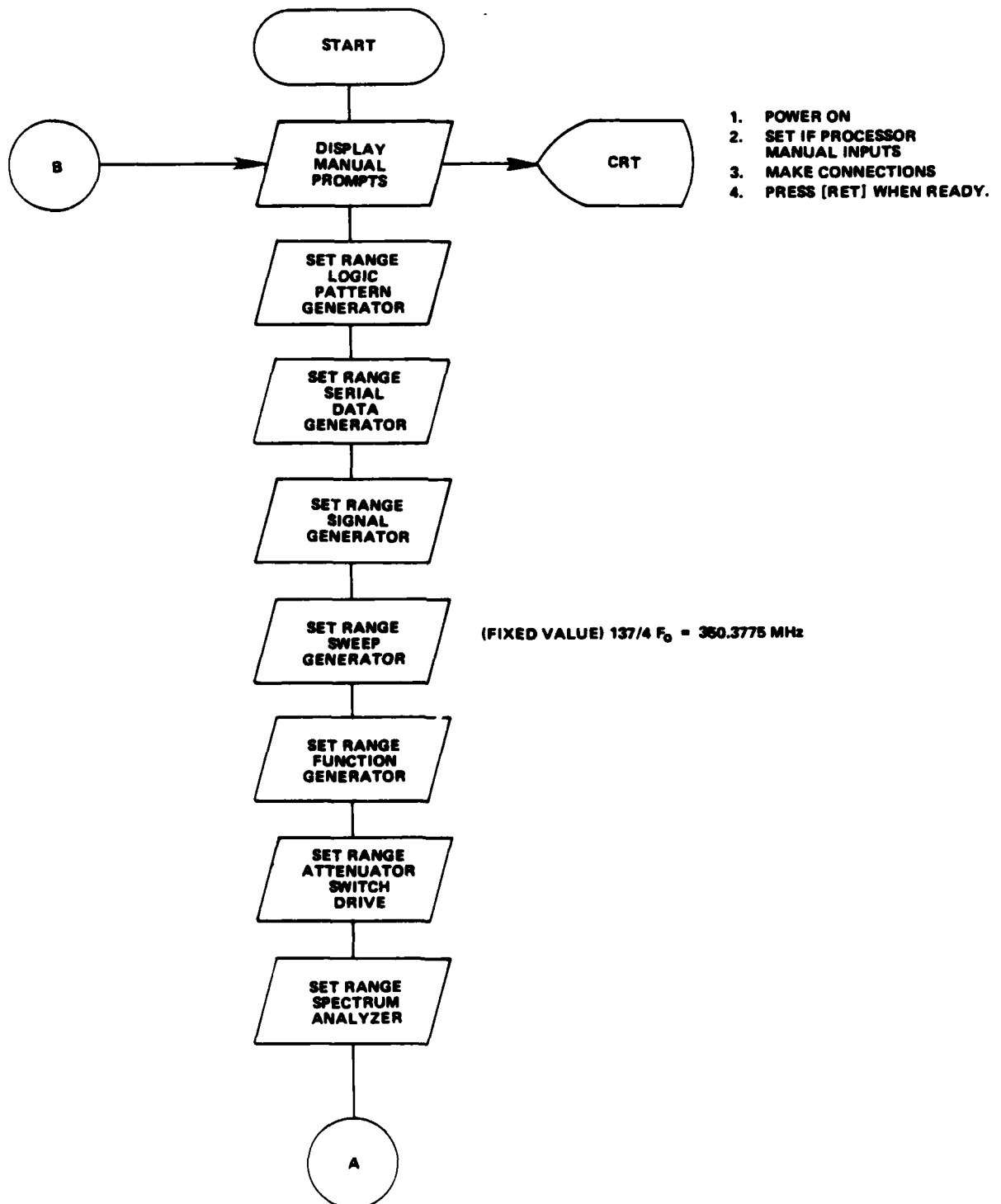
PROGRAM MODULE NAME: _____

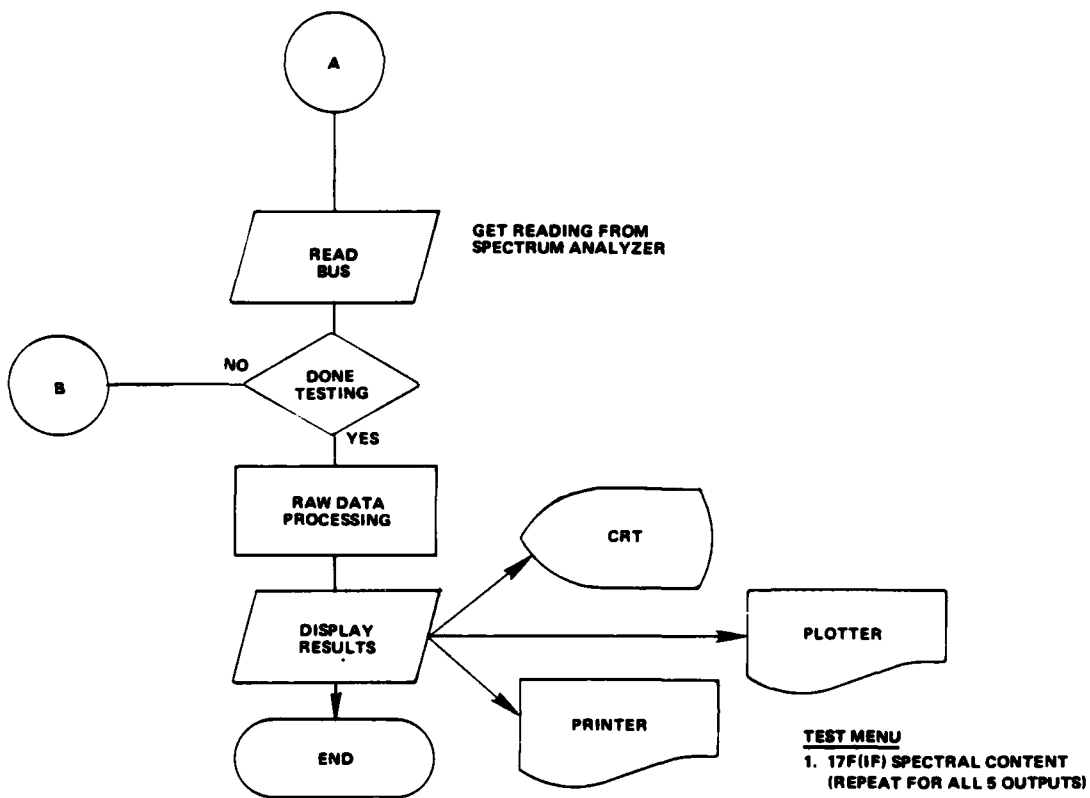




17F(IF) SPECTRAL CONTENT

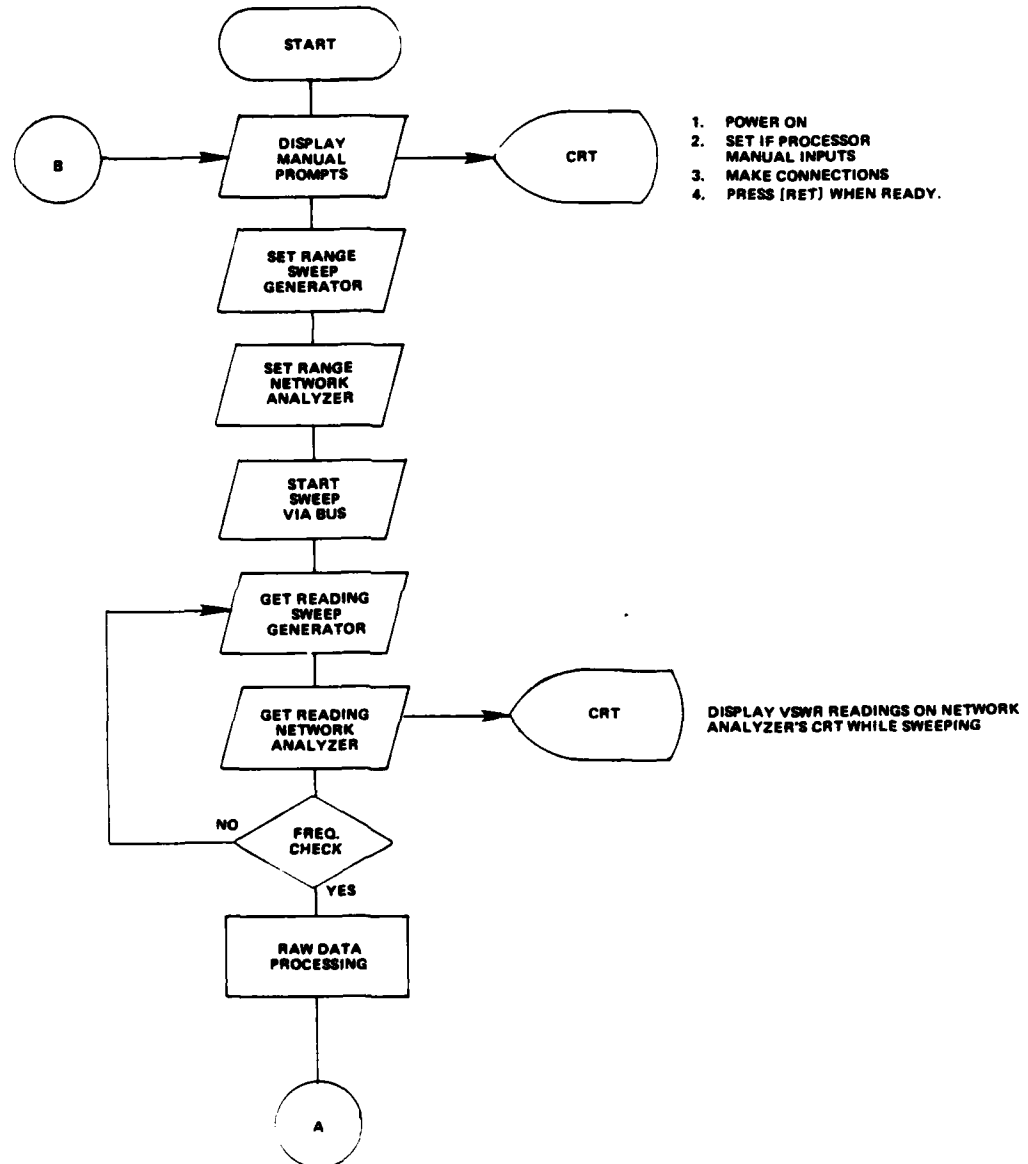
PROGRAM MODULE NAME: _____

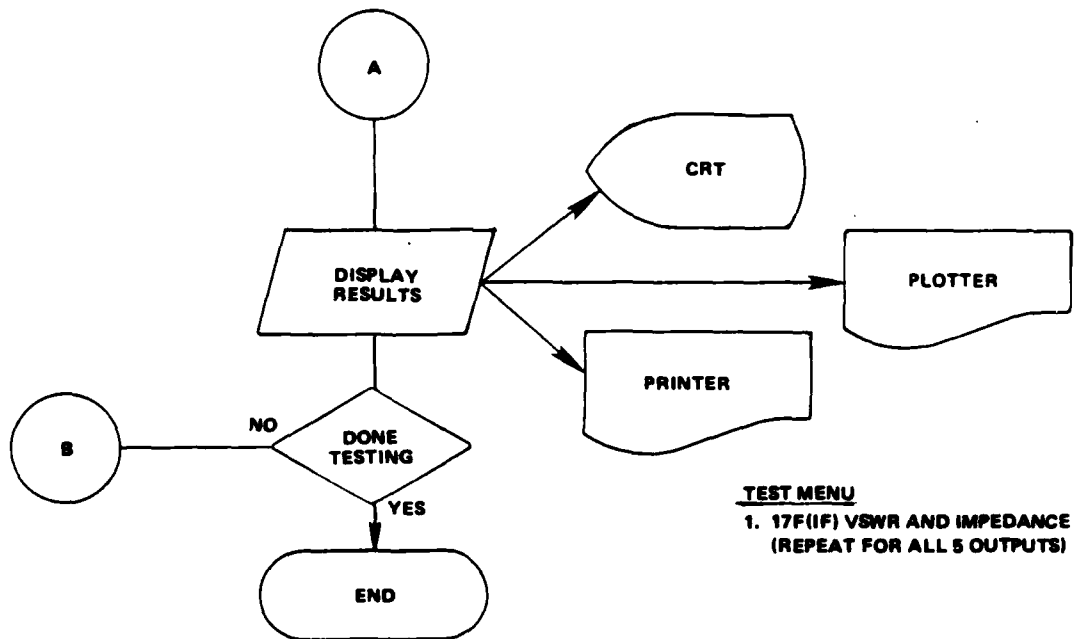




17F(1F) VSWR AND IMPEDANCE MEASUREMENT

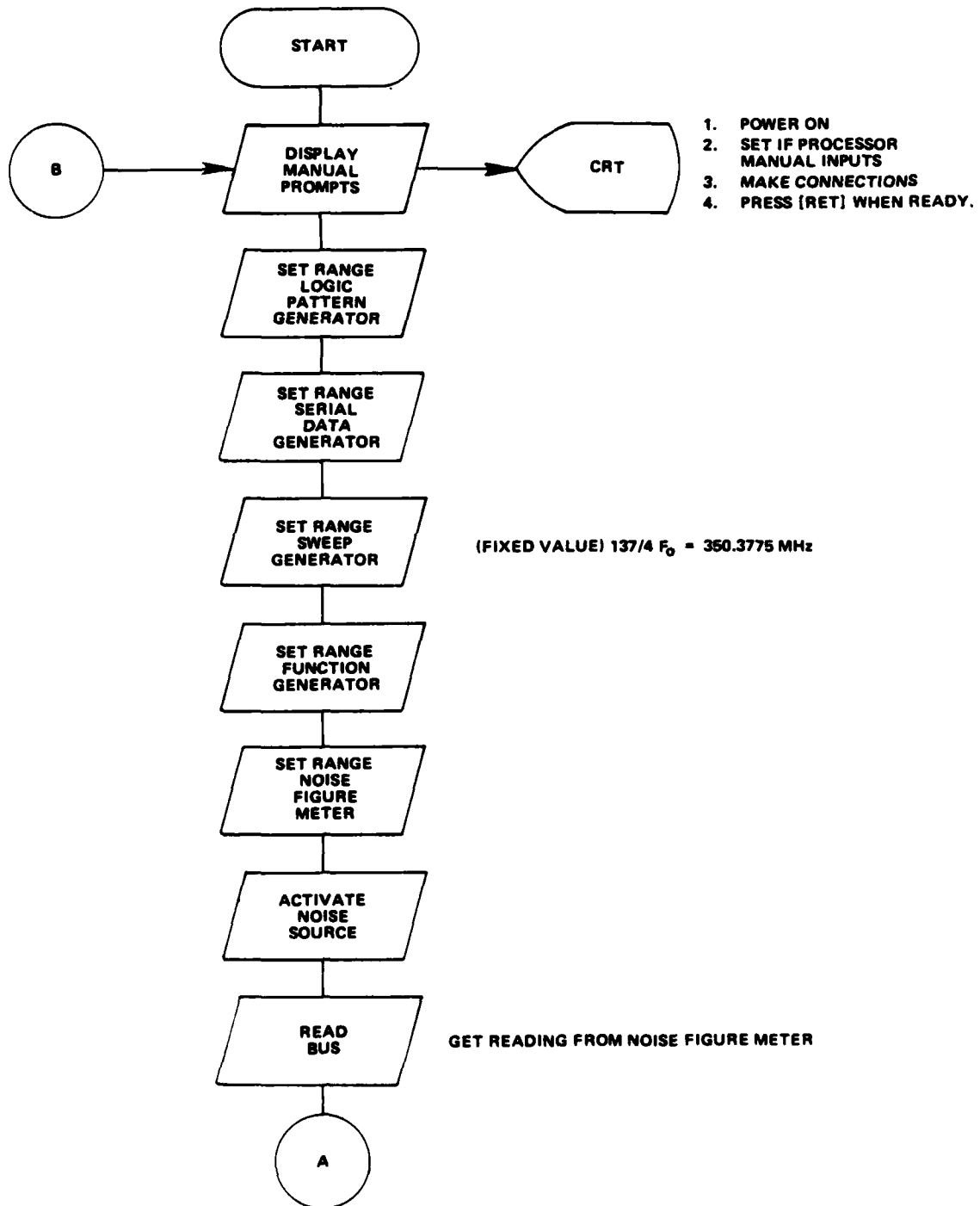
PROGRAM MODULE NAME: _____

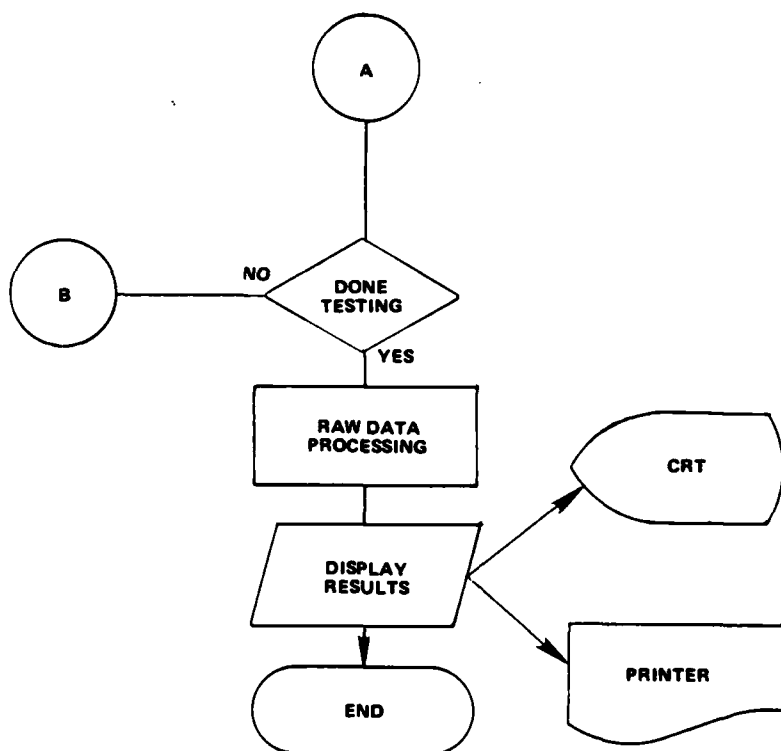




17F(IF) NOISE FIGURE MEASUREMENT

PROGRAM MODULE NAME: _____





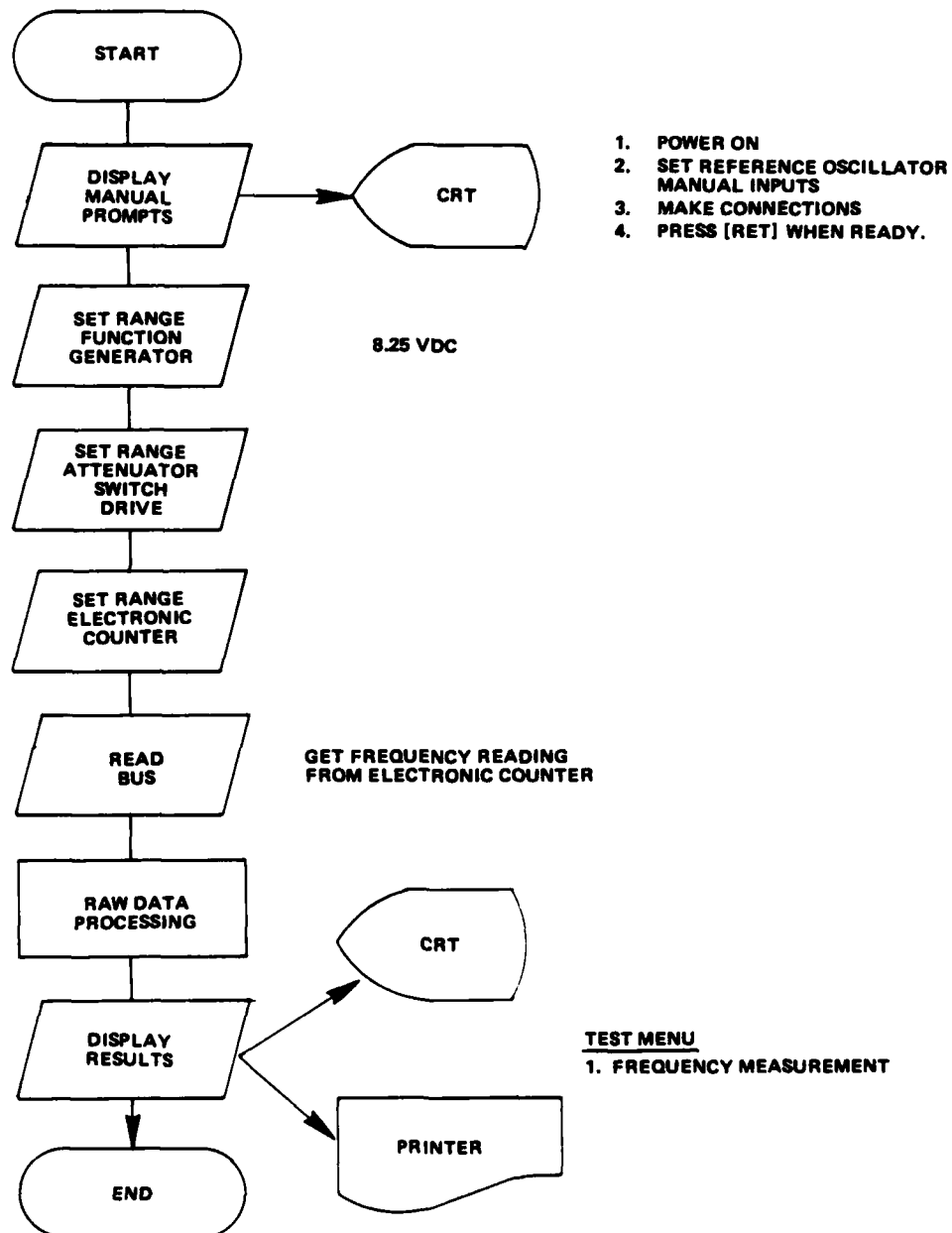
TEST MENU

1. 17F(1F) NOISE FIGURES
(REPEAT FOR ALL 5 OUTPUTS)

4.1.5 REFERENCE OSCILLATOR MODULE

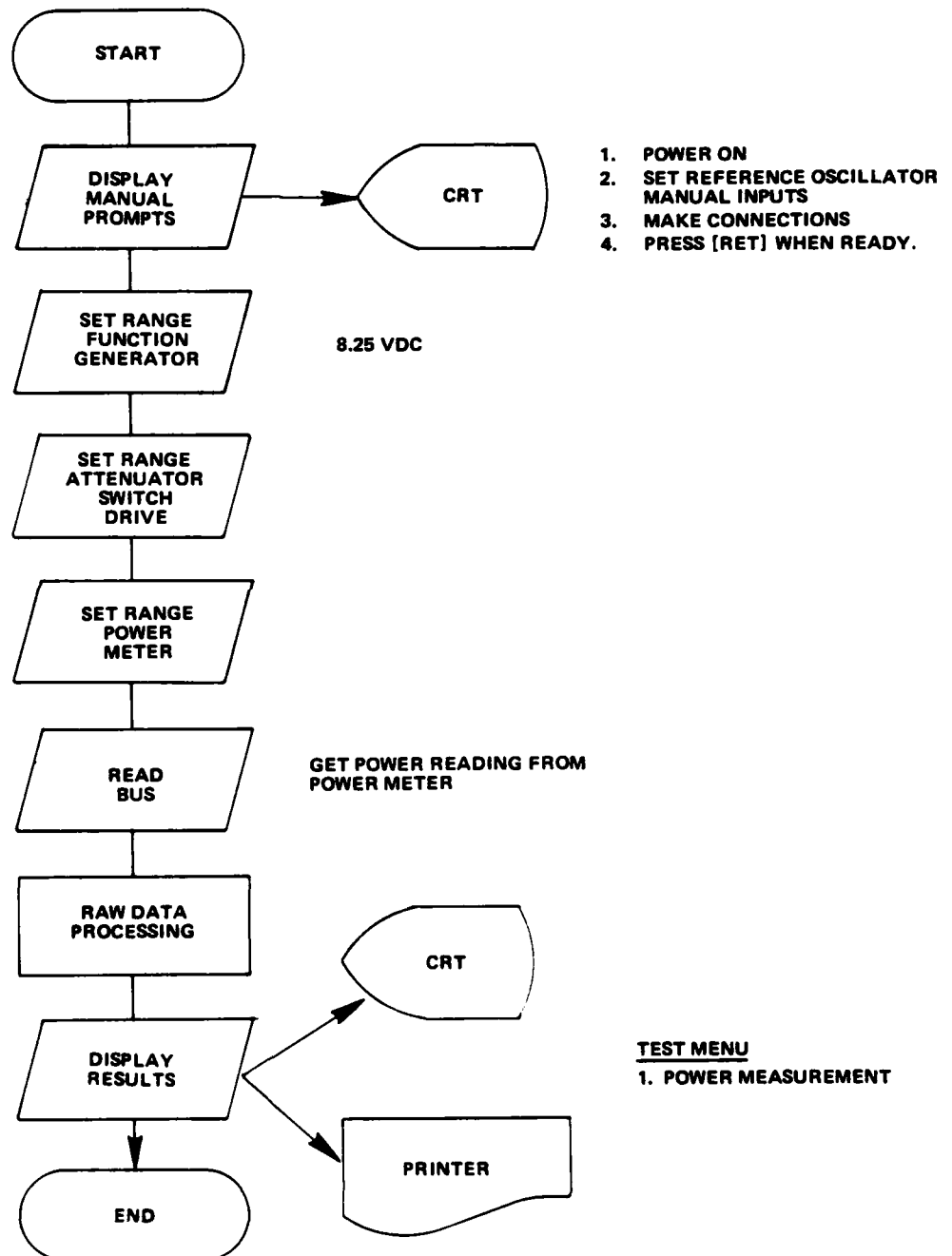
FREQUENCY MEASUREMENT

PROGRAM MODULE NAME: _____



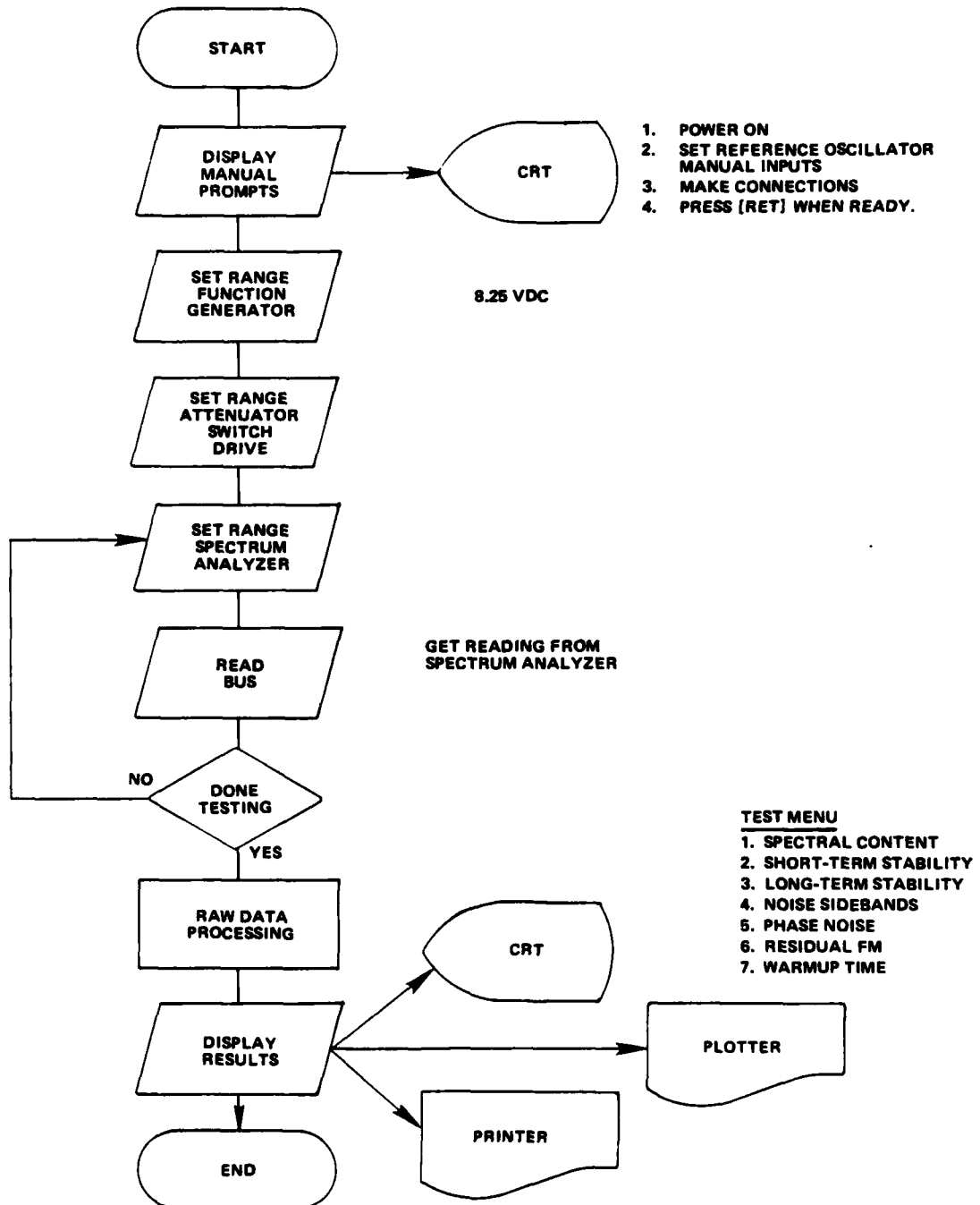
POWER MEASUREMENT

PROGRAM MODULE NAME: _____



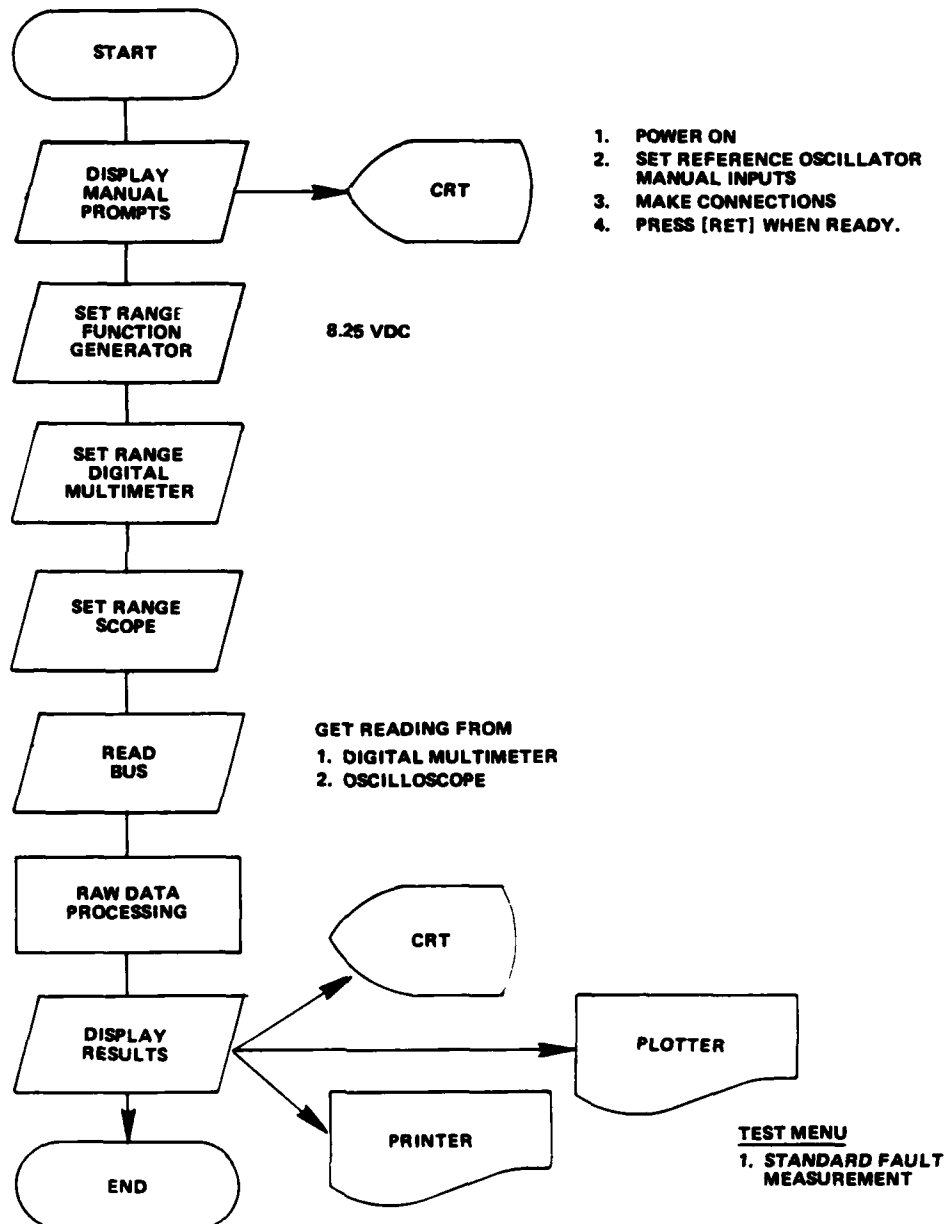
SPECTRAL CONTENT MEASUREMENTS

PROGRAM MODULE NAME: _____



VERIFY STANDARD FAULT

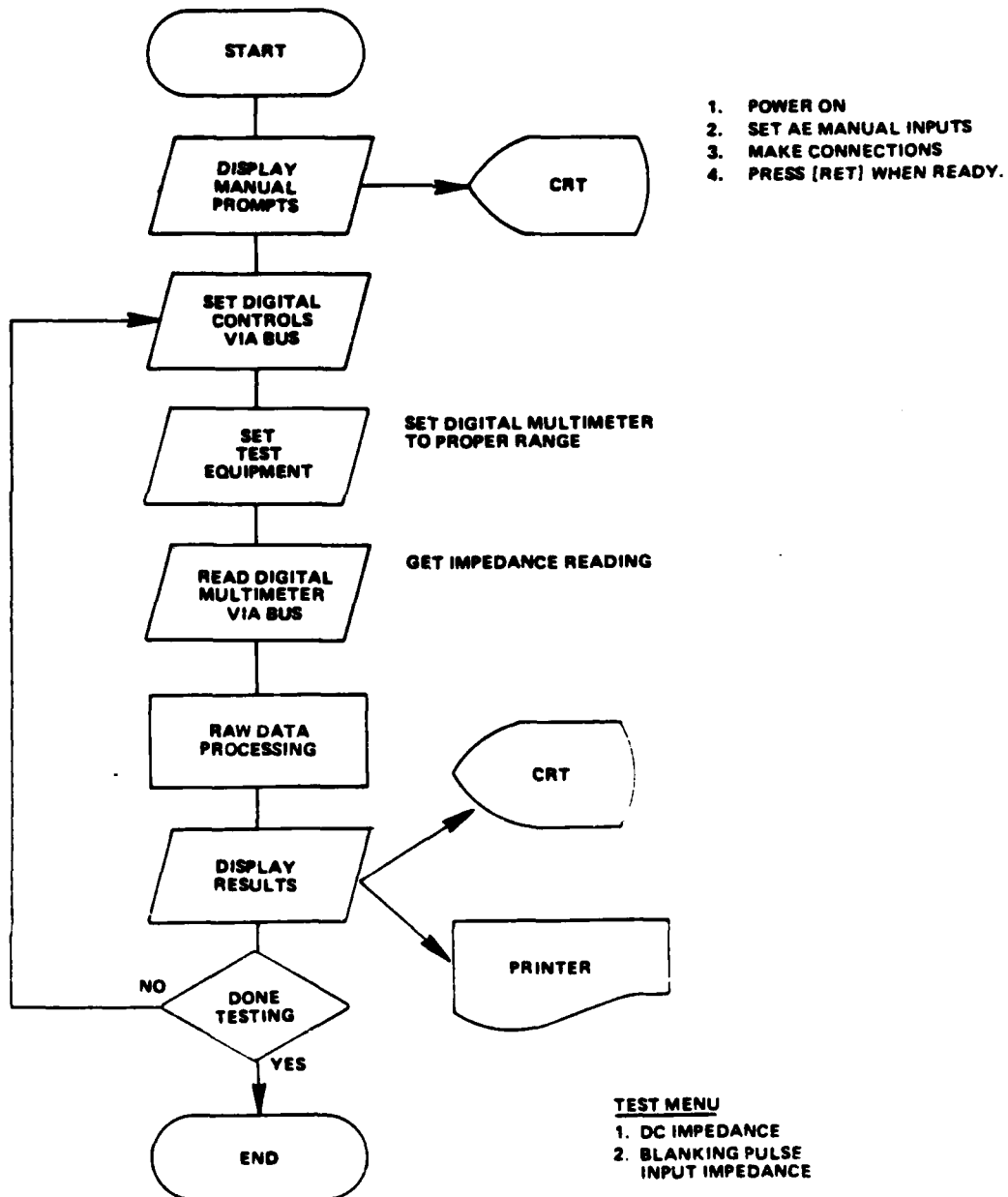
PROGRAM MODULE NAME: _____



4.1.6 ANTENNA ELECTRONICS

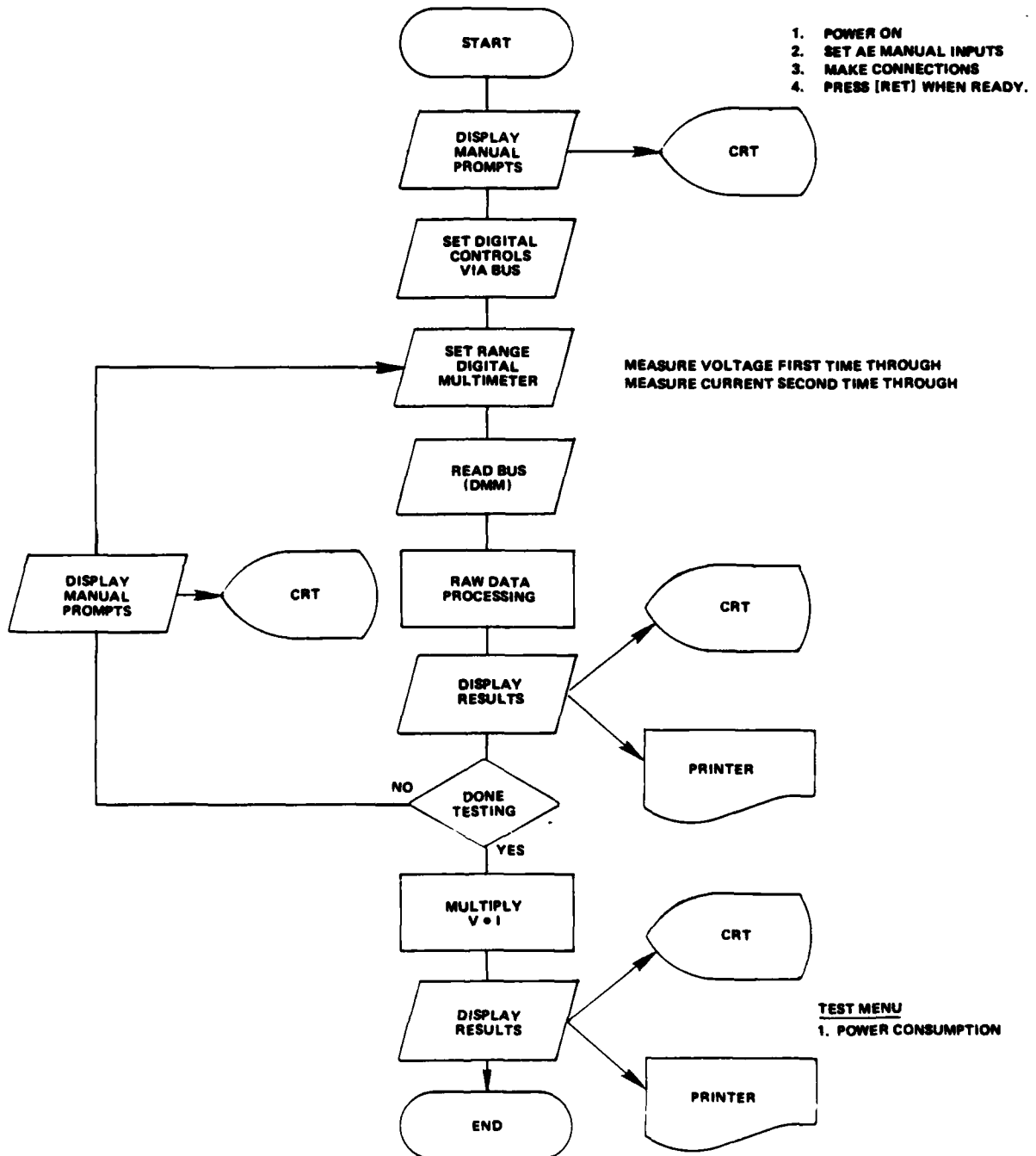
DC IMPEDANCE AND BLANKING PULSE INPUT IMPEDANCE

PROGRAM MODULE NAME: _____



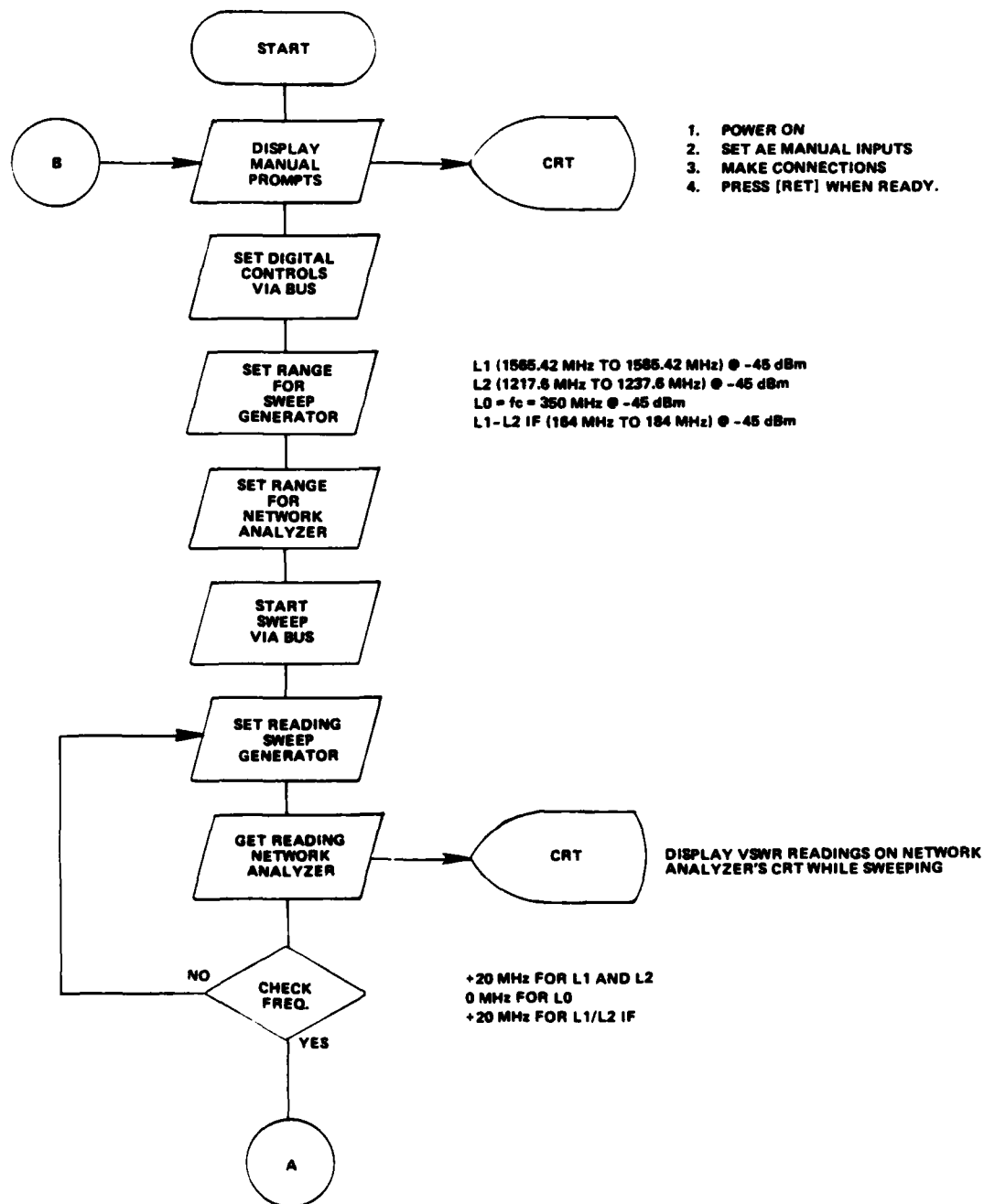
POWER CONSUMPTION

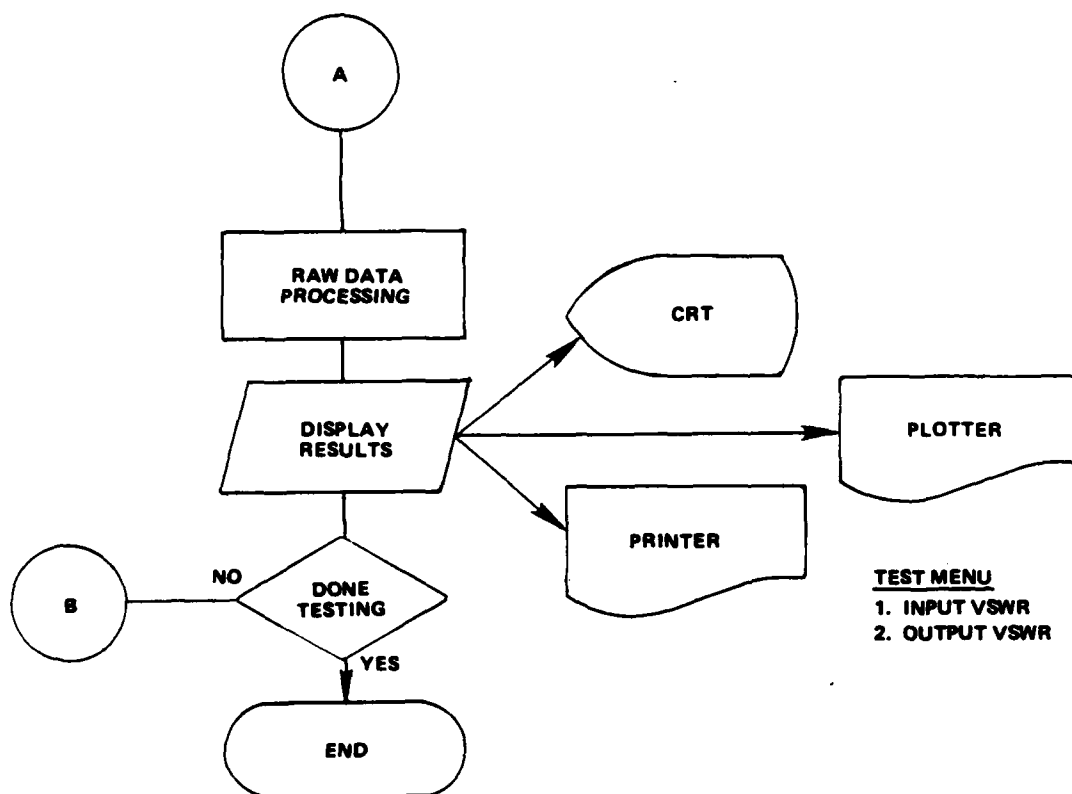
PROGRAM MODULE NAME: _____



INPUT/OUTPUT VSWR

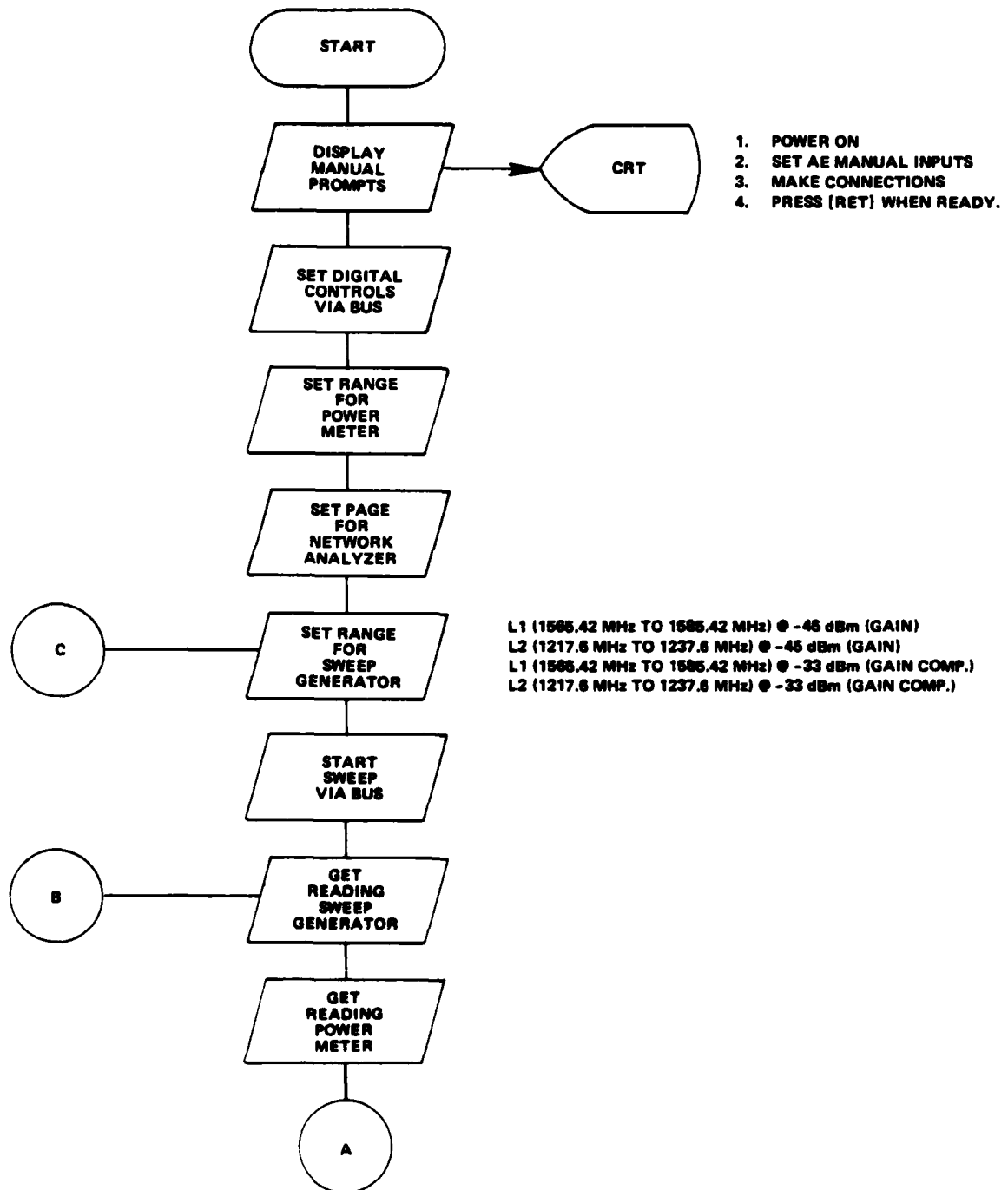
PROGRAM MODULE NAME: _____

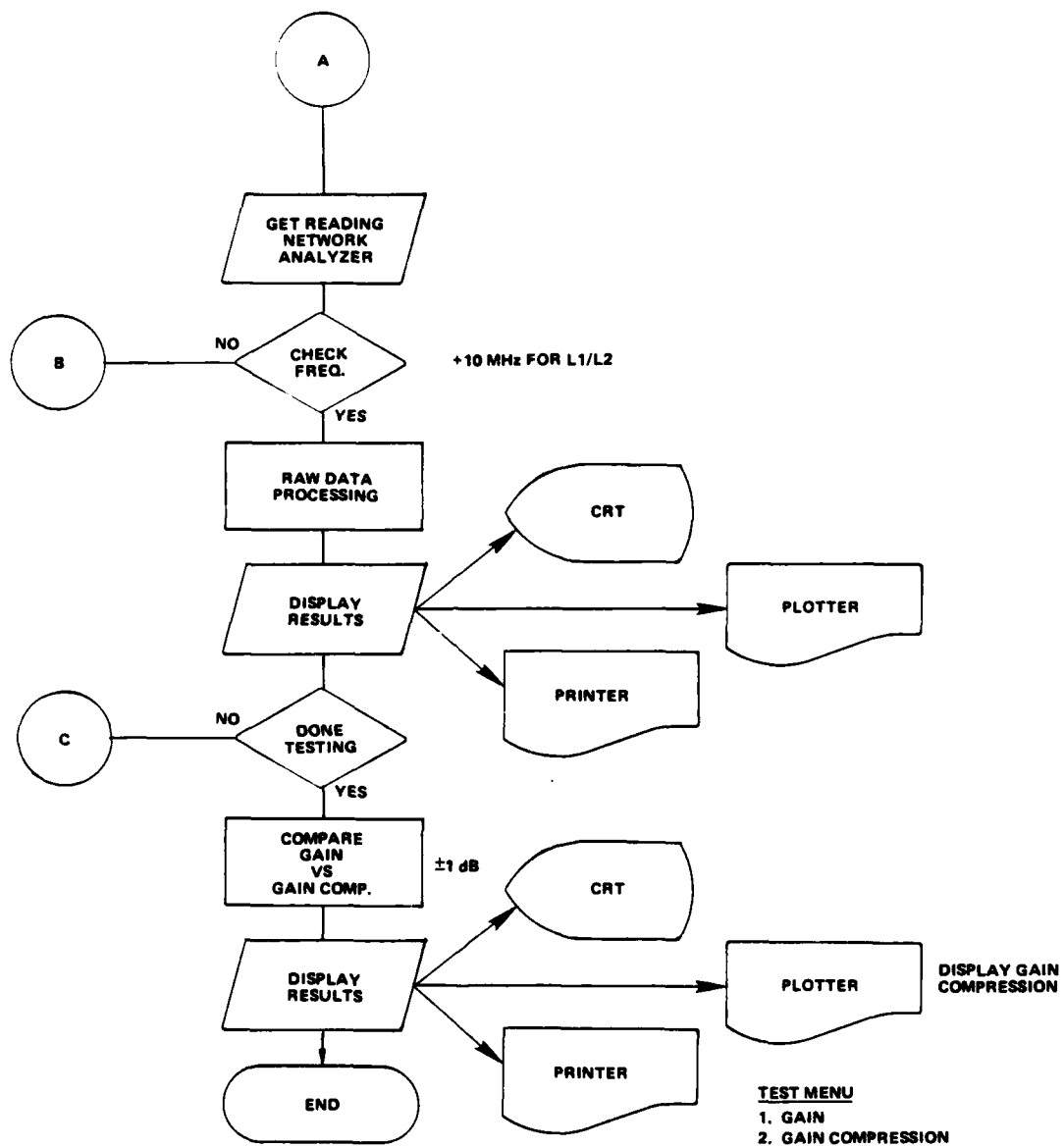




GAIN AND GAIN COMPRESSION

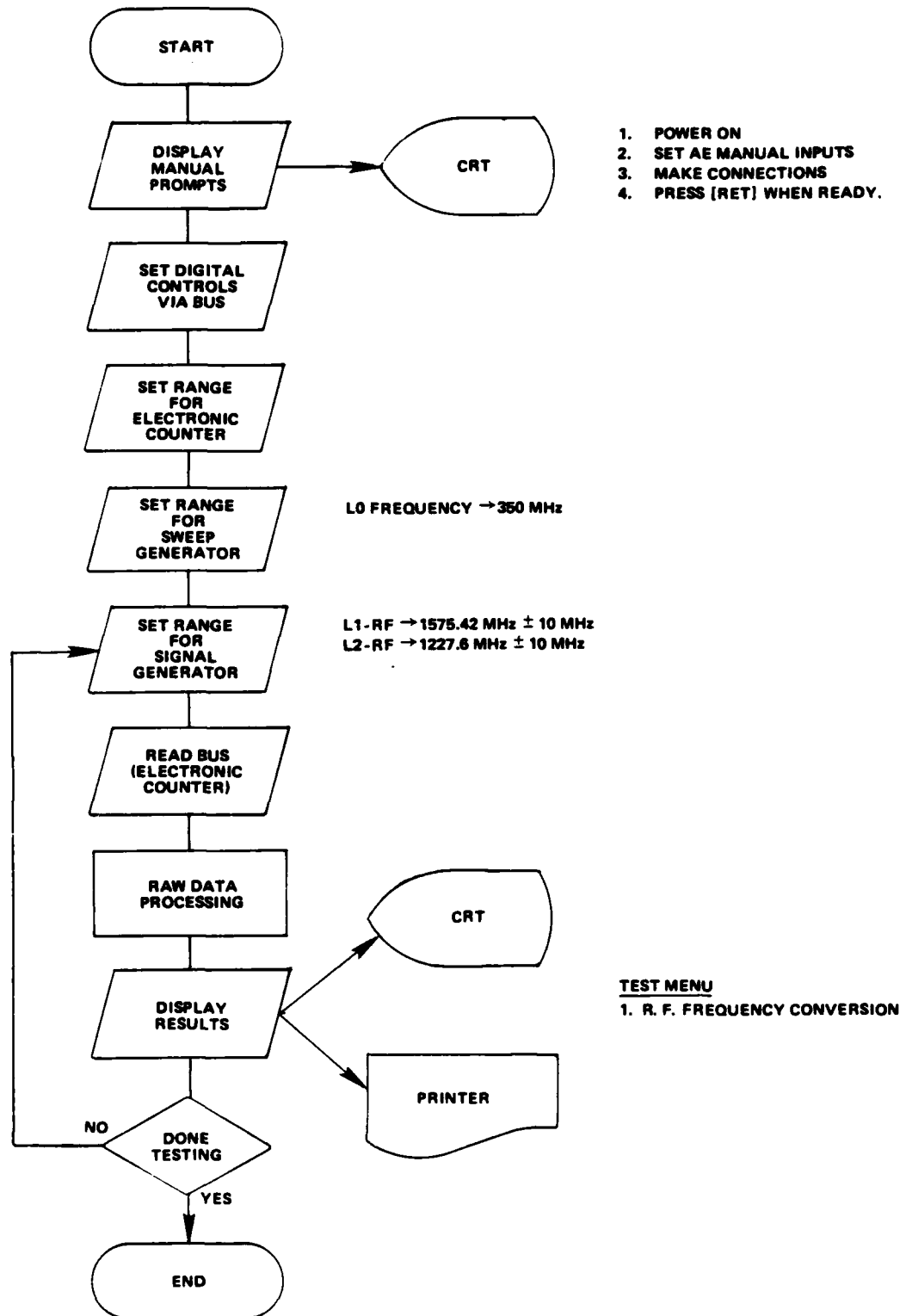
PROGRAM MODULE NAME: _____





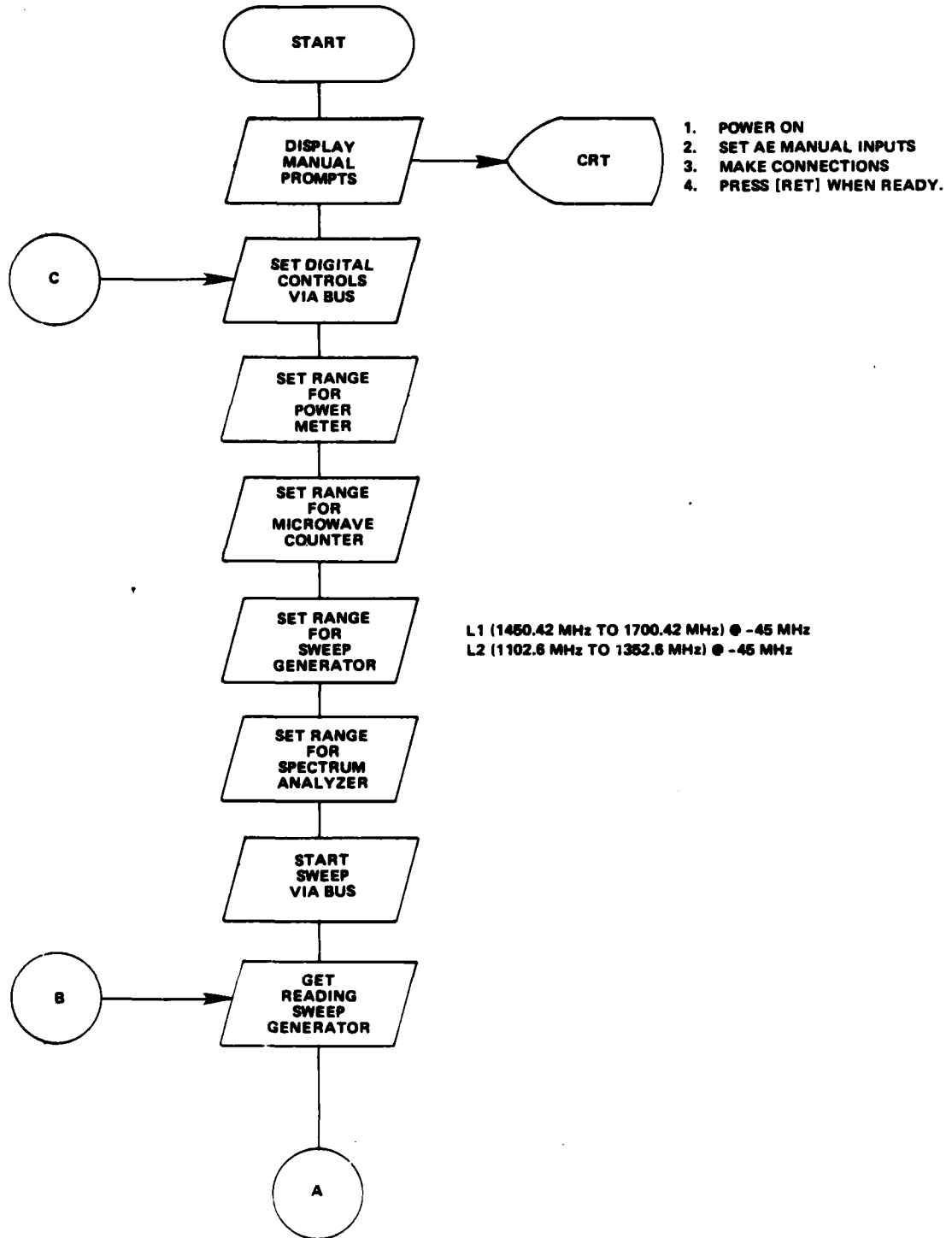
R. F. FREQUENCY CONVERSION

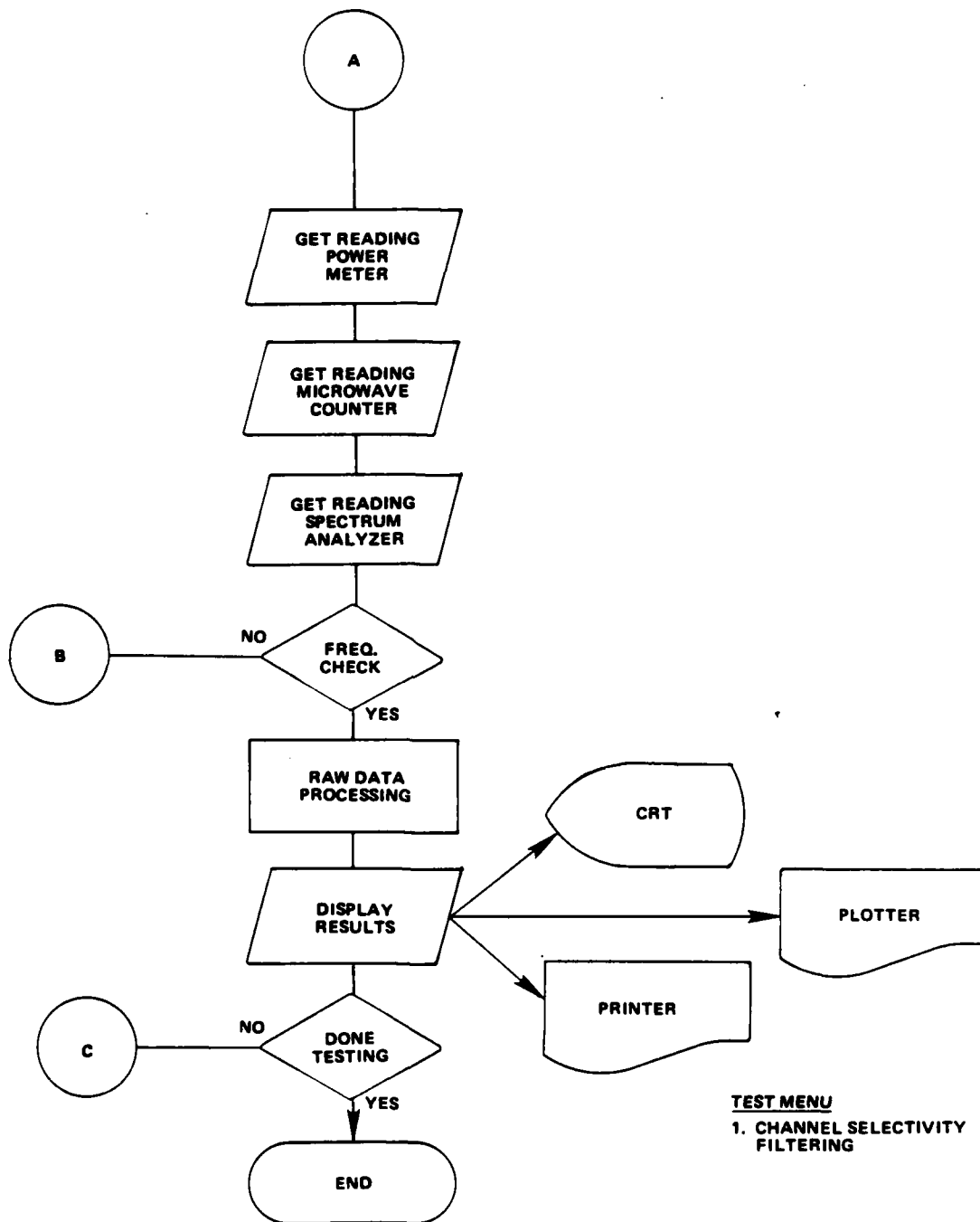
PROGRAM MODULE NAME: _____



CHANNEL SELECTIVITY FILTERING

PROGRAM MODULE NAME: _____

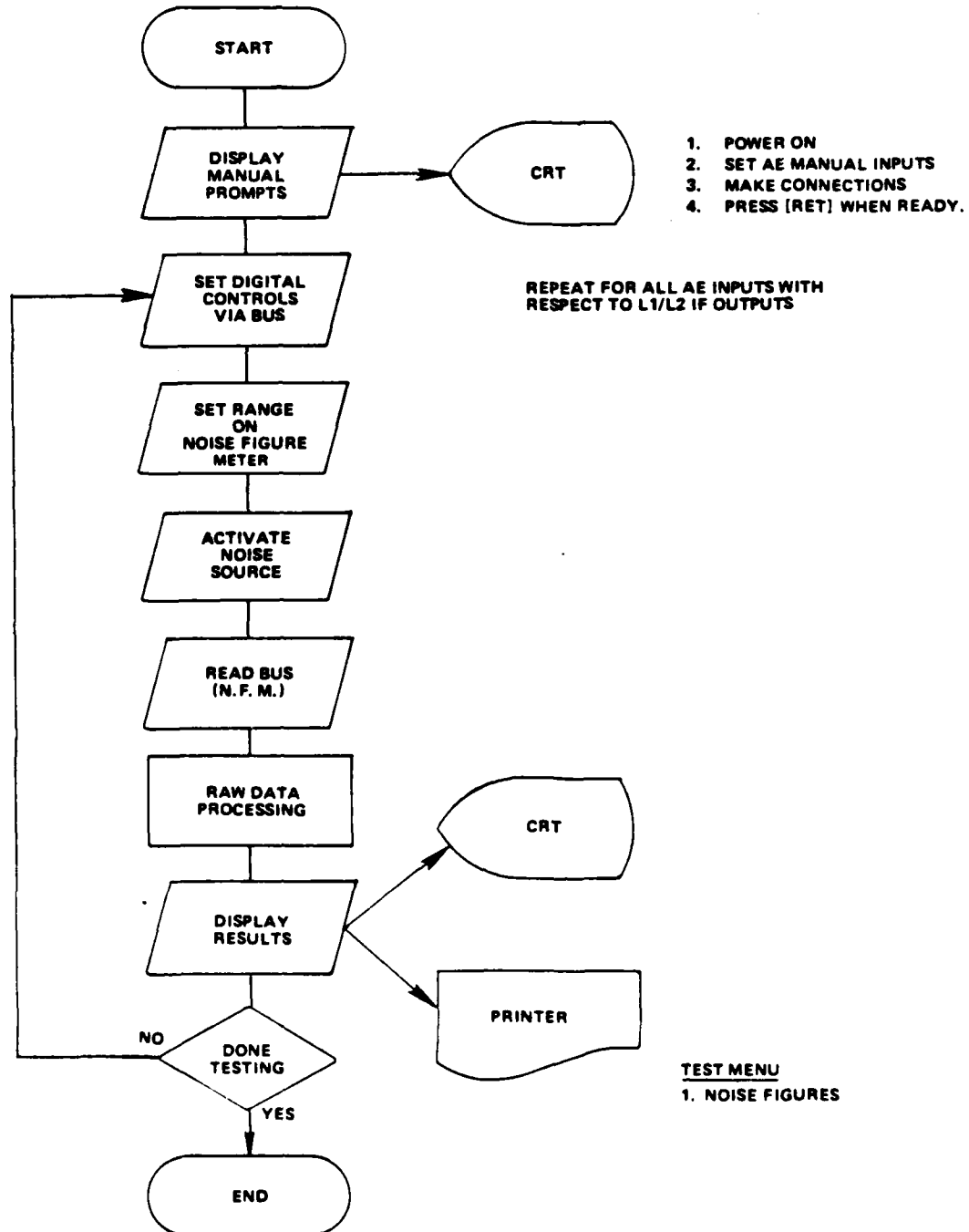




TEST MENU
1. CHANNEL SELECTIVITY
FILTERING

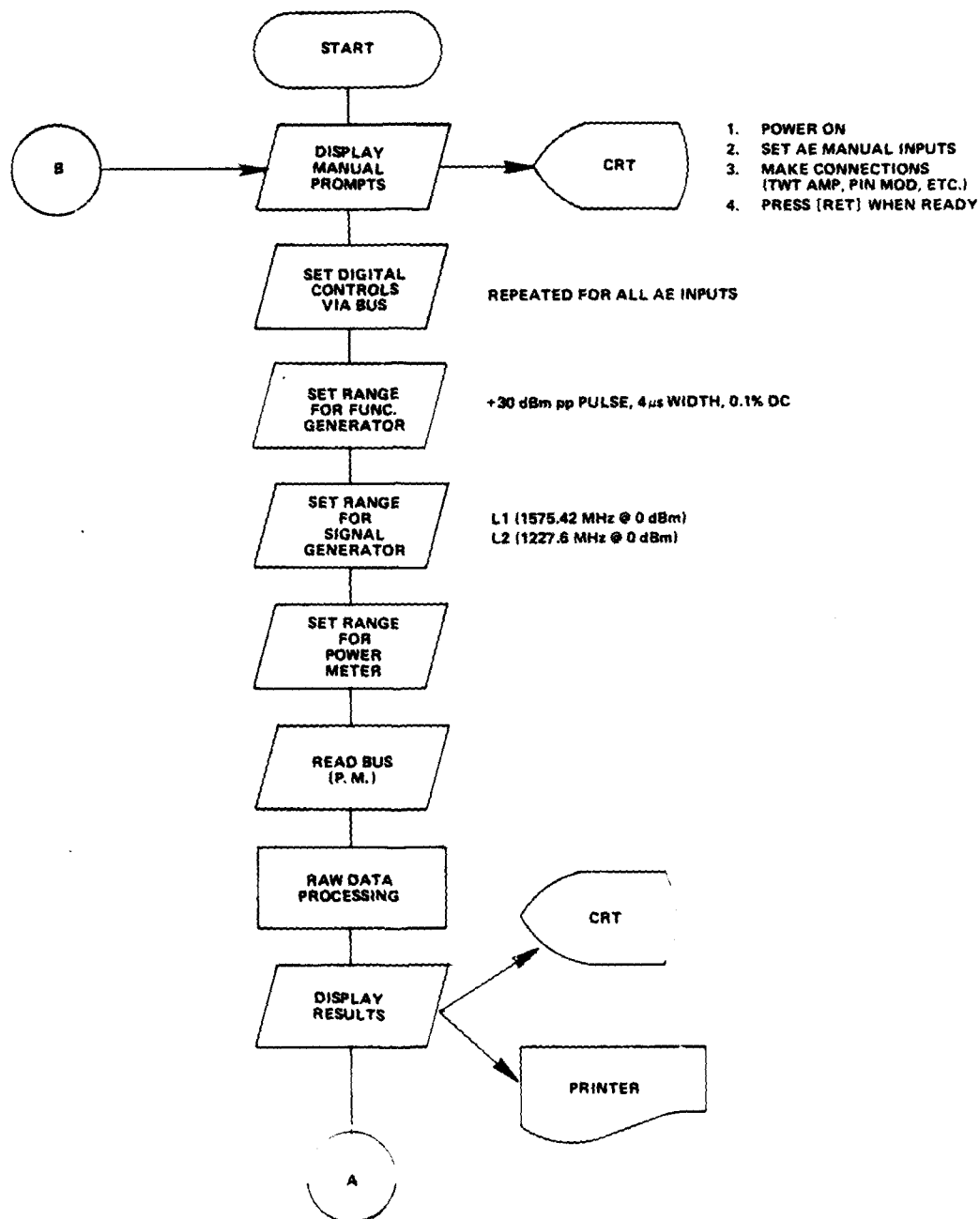
NOISE FIGURES

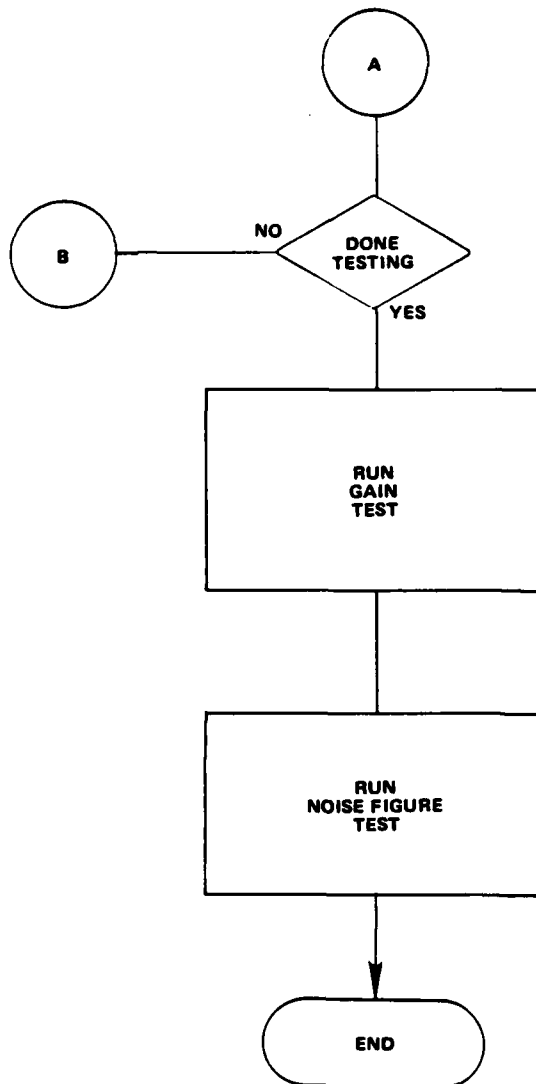
PROGRAM MODULE NAME: _____



NON-DAMAGE INPUT LEVELS

PROGRAM MODULE NAME: _____



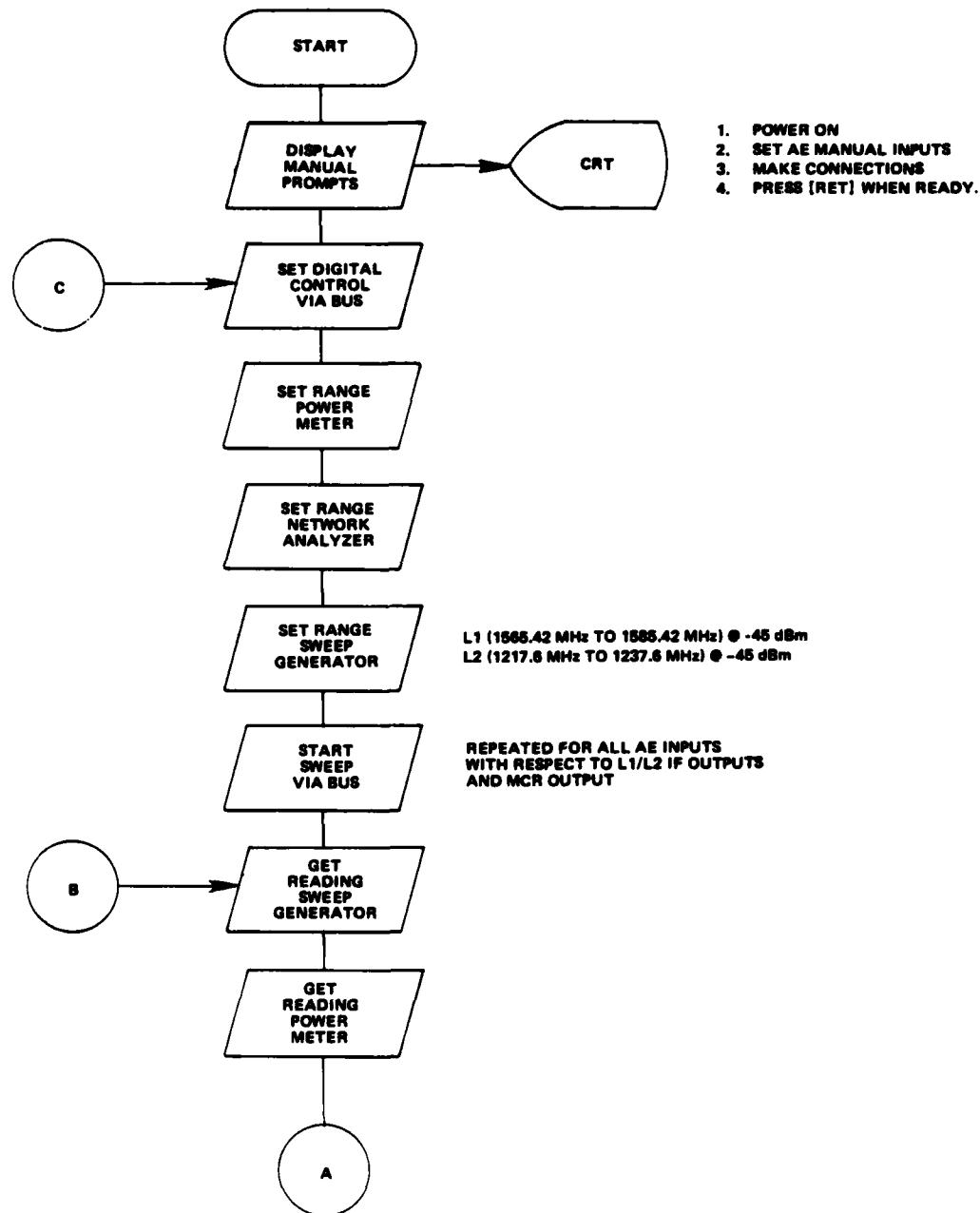


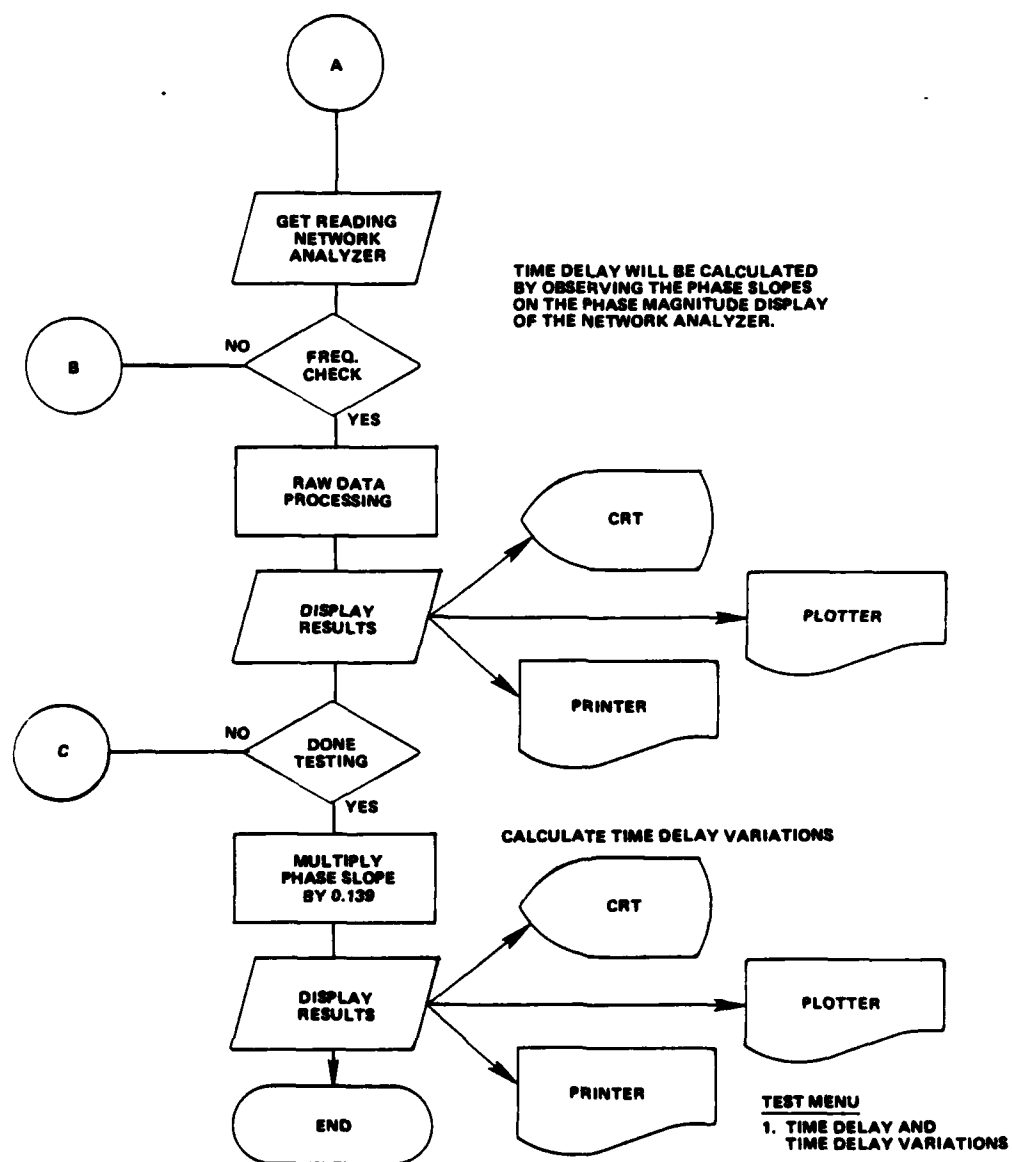
AFTER THE NON-DAMAGE INPUT LEVEL TEST IS COMPLETE THE GAIN TEST AND NOISE FIGURE TEST WILL BE RUN TO VERIFY THAT THE AE DID NOT INCUR PERMANENT DAMAGE.

TEST MENU

1. NON-DAMAGE INPUT LEVELS

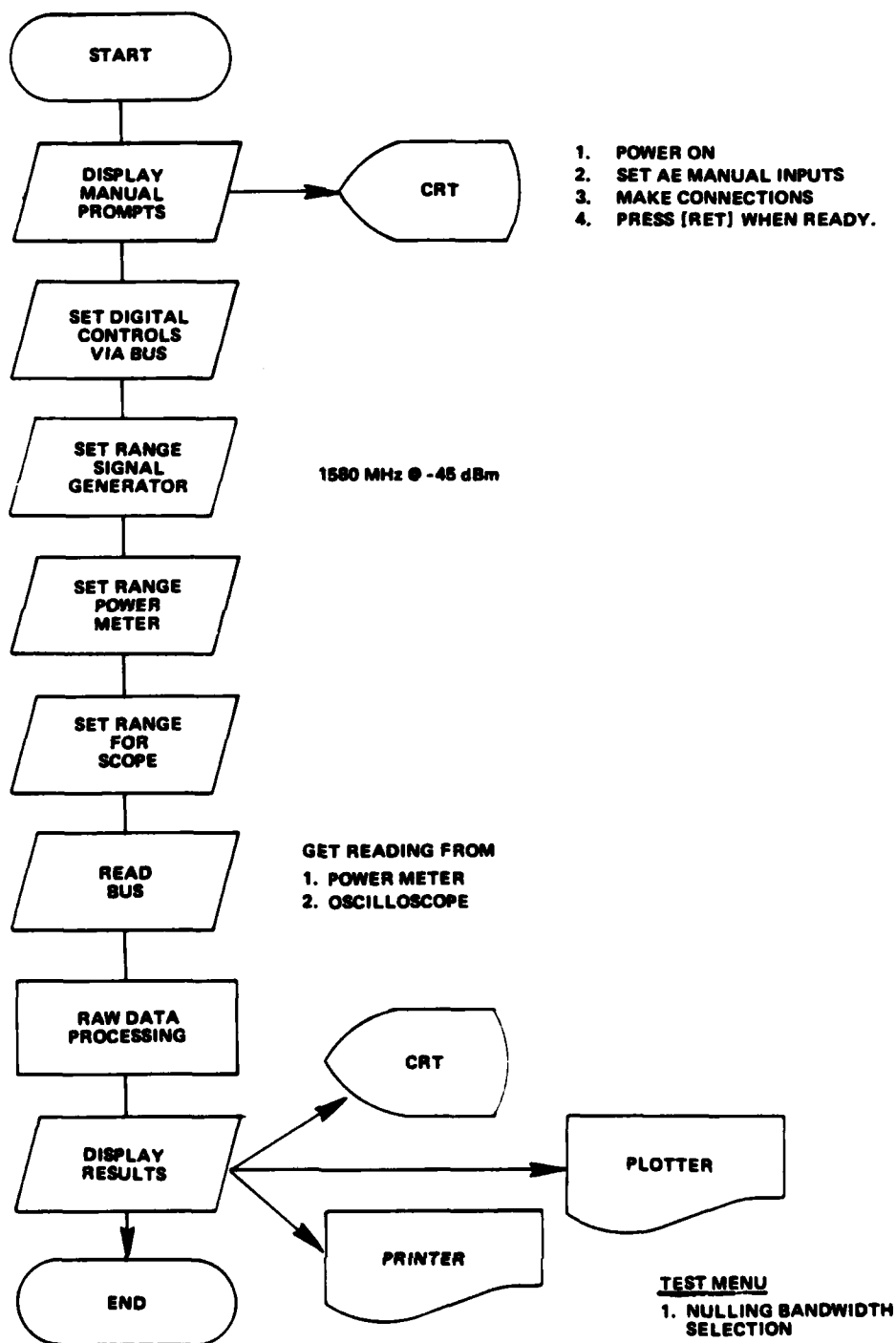
TIME DELAY AND TIME DELAY VARIATIONS
PROGRAM MODULE NAME: _____





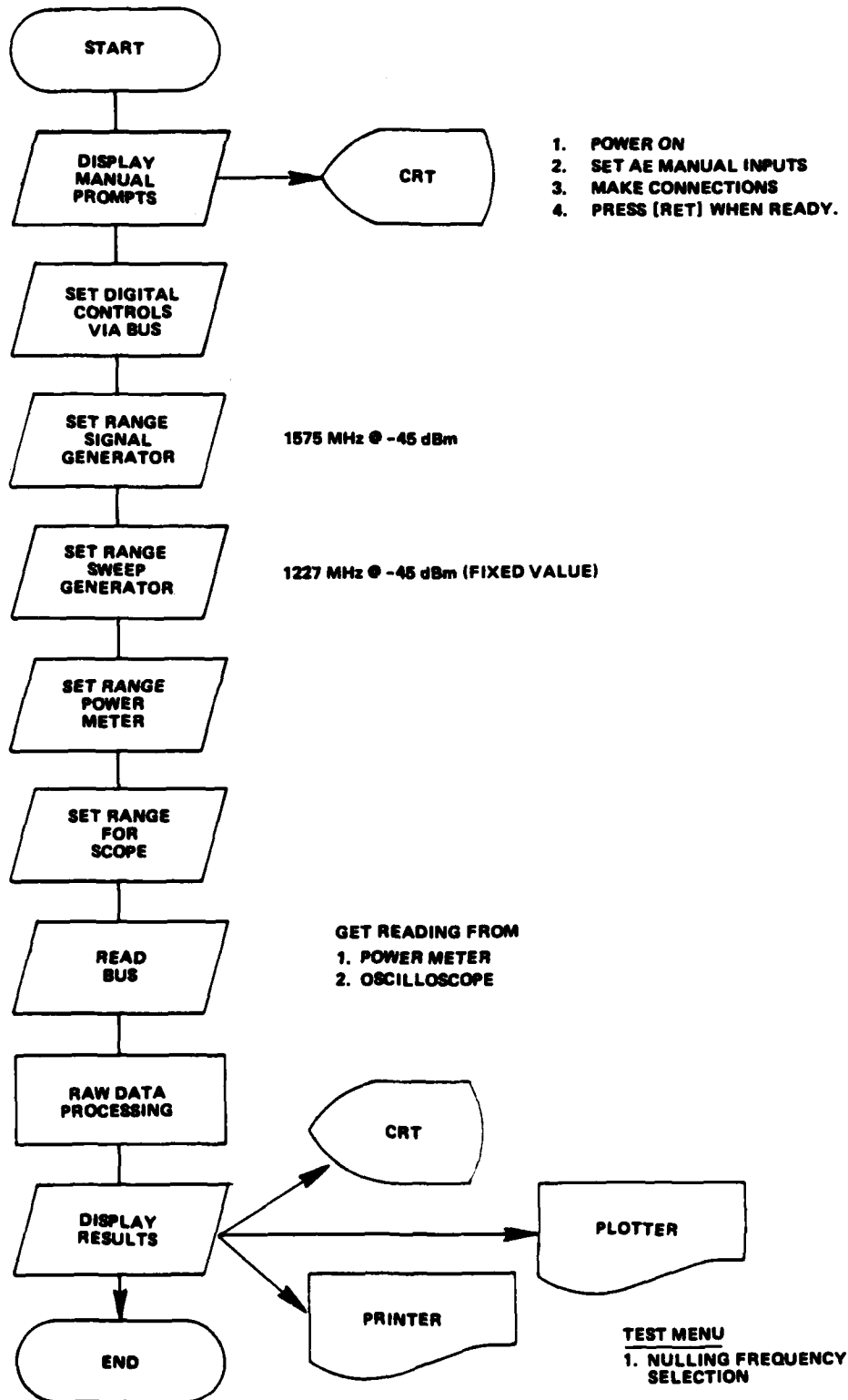
NULLING BANDWIDTH SELECTION

PROGRAM MODULE NAME: _____



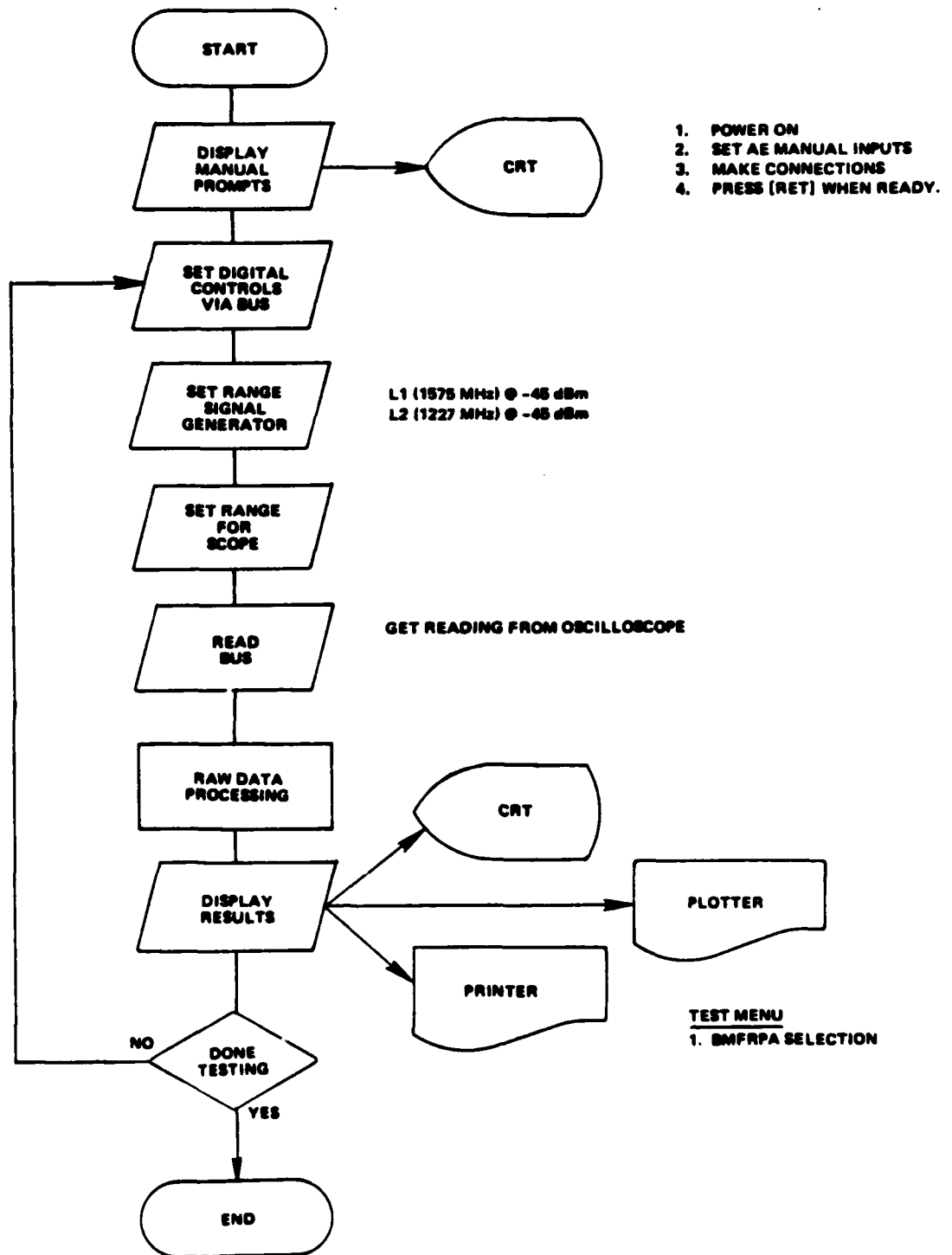
NULLING FREQUENCY SELECTION

PROGRAM MODULE NAME: _____



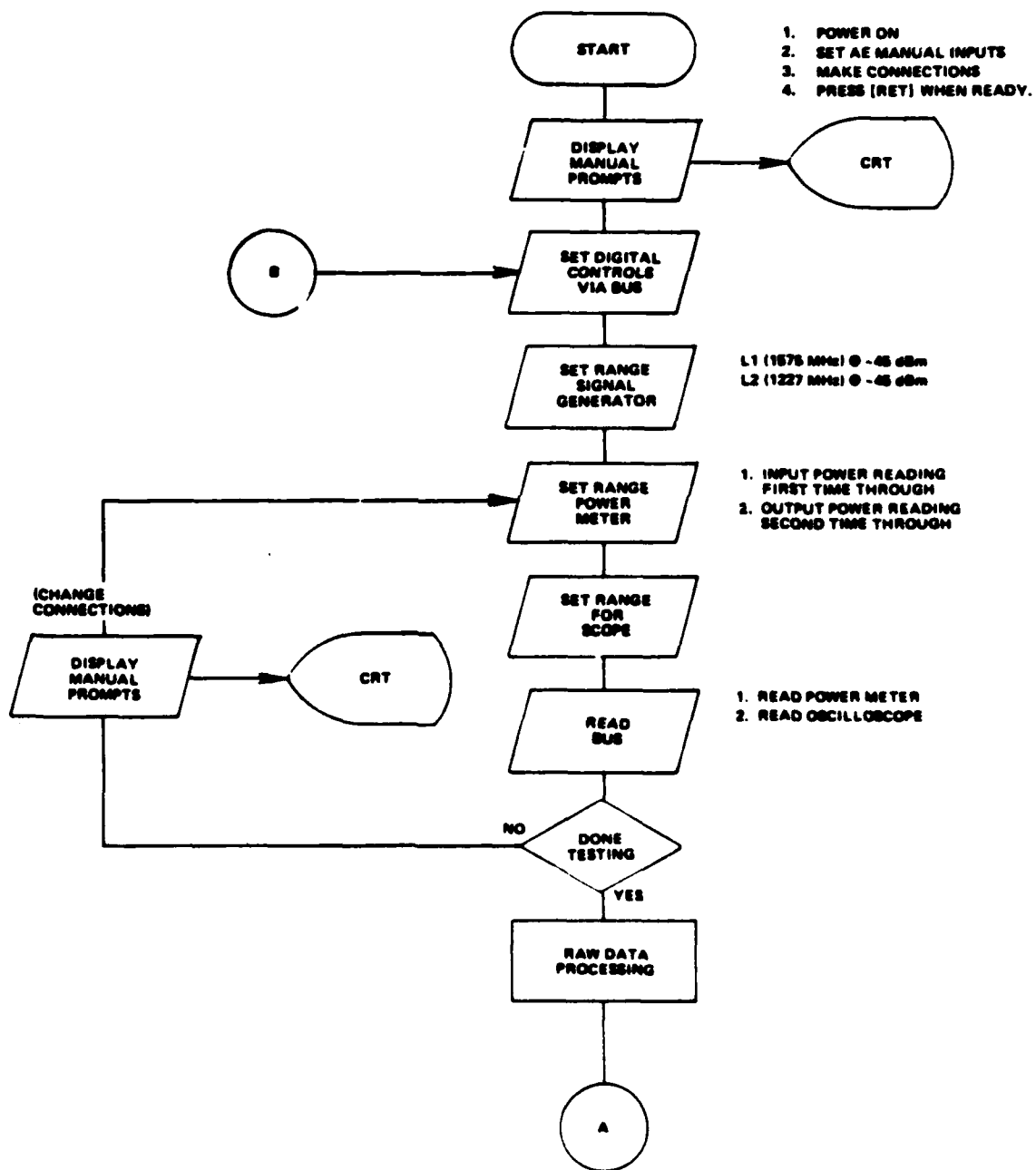
BMFRPA SELECTION

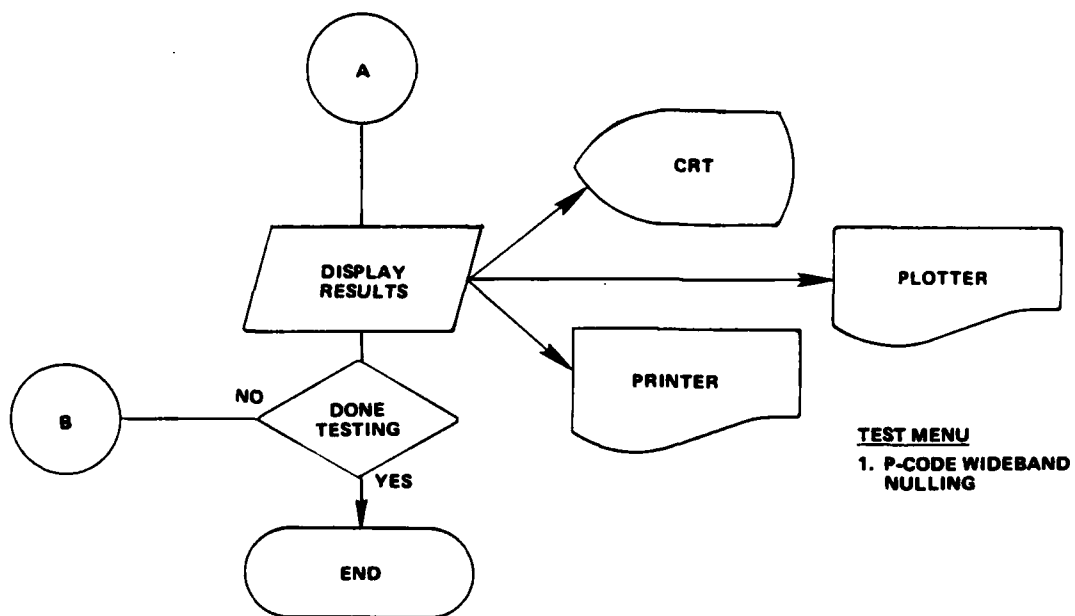
PROGRAM MODULE NAME: _____



P-CODE WIDEBAND NULLING

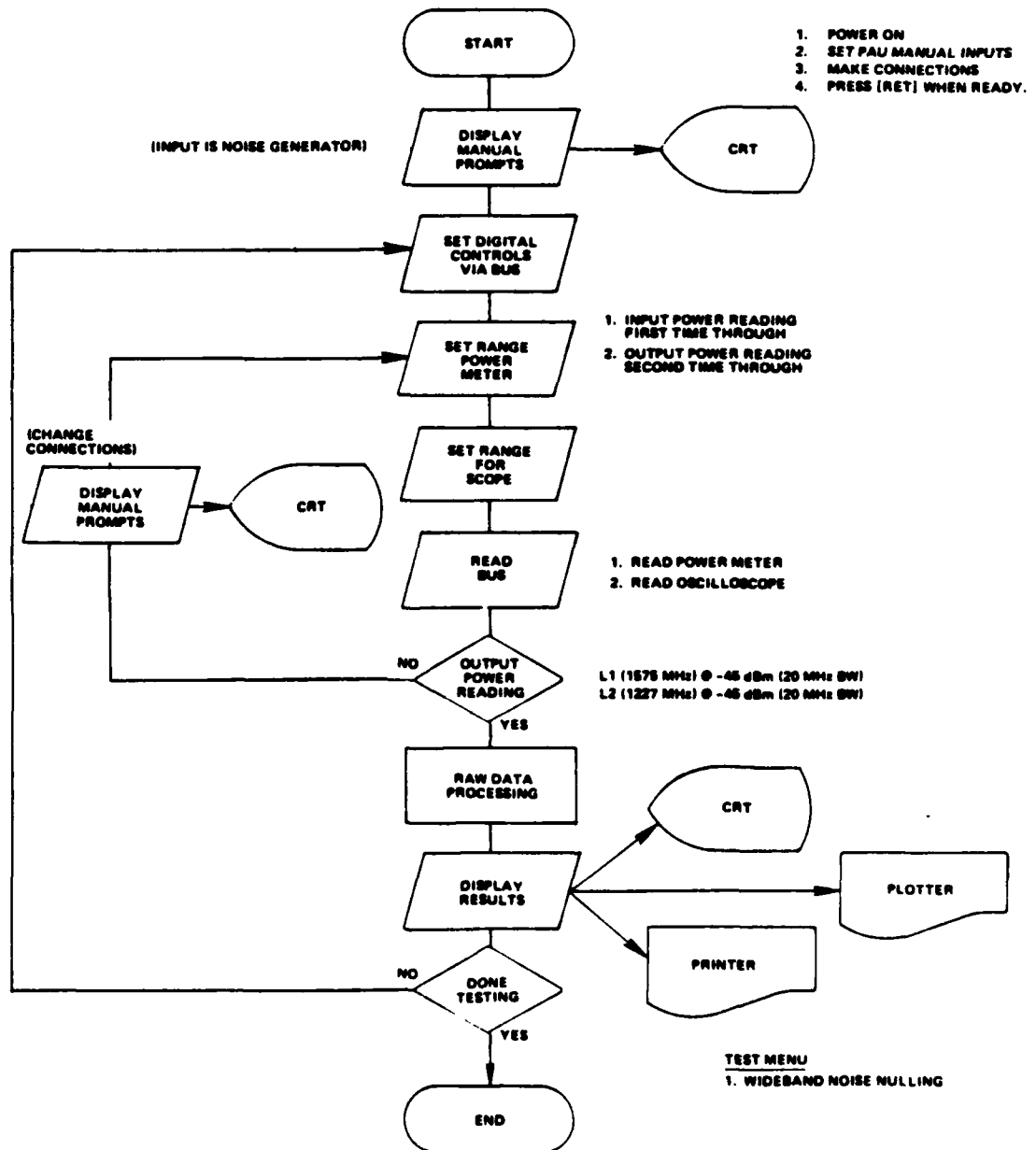
PROGRAM MODULE NAME: _____





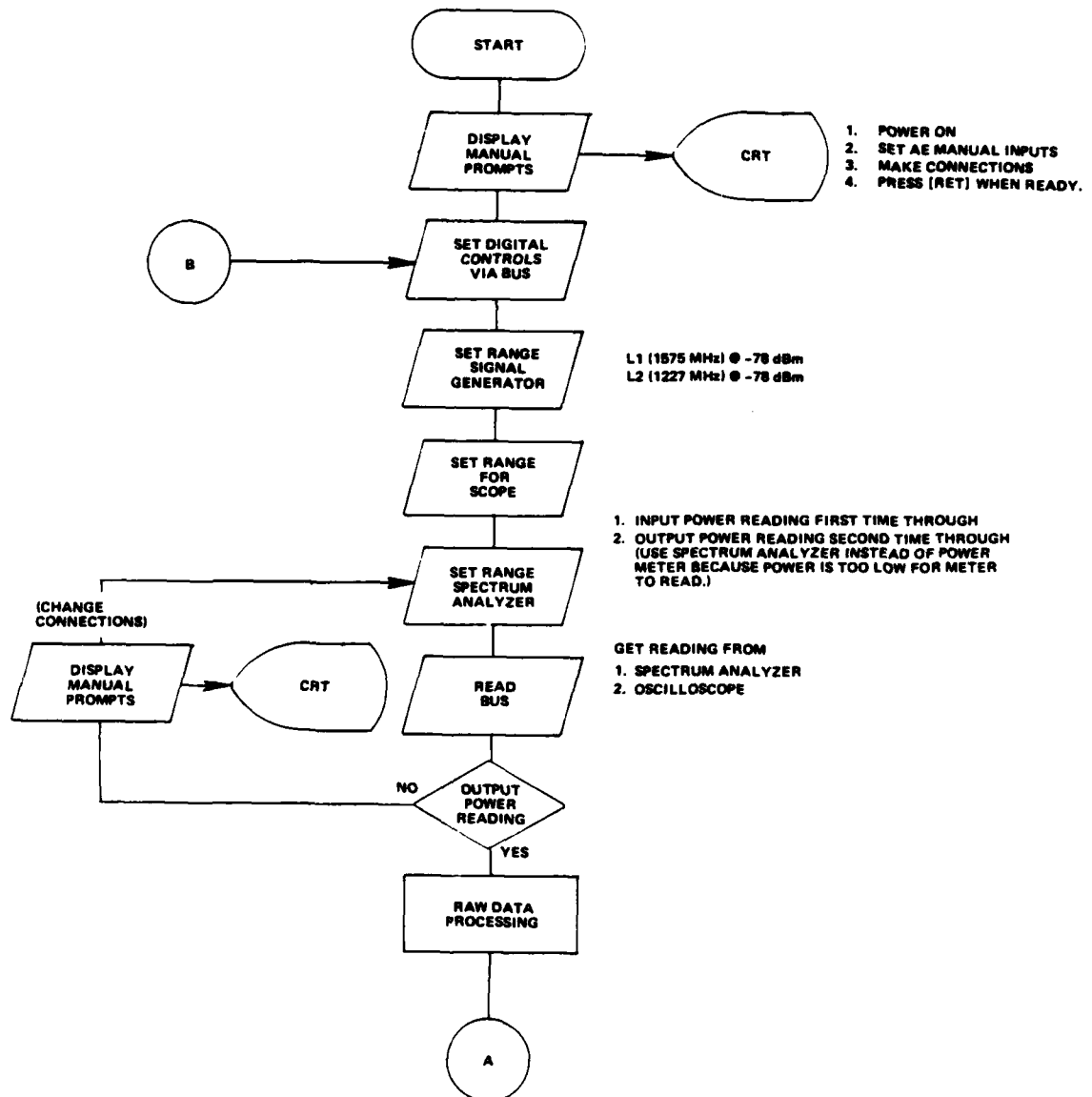
WIDEBAND NOISE NULLING

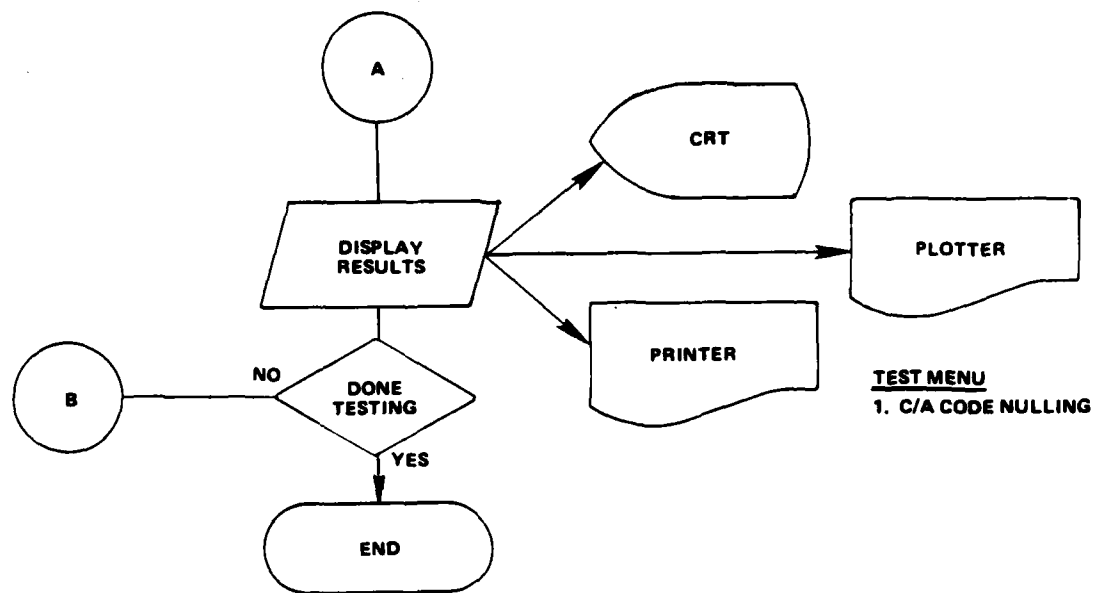
PROGRAM MODULE NAME: _____



C/A CODE NULLING

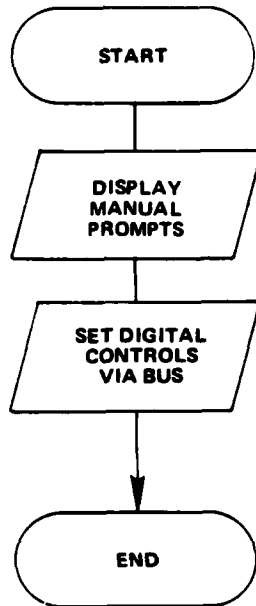
PROGRAM MODULE NAME: _____





BIT DURATION

PROGRAM MODULE NAME: _____



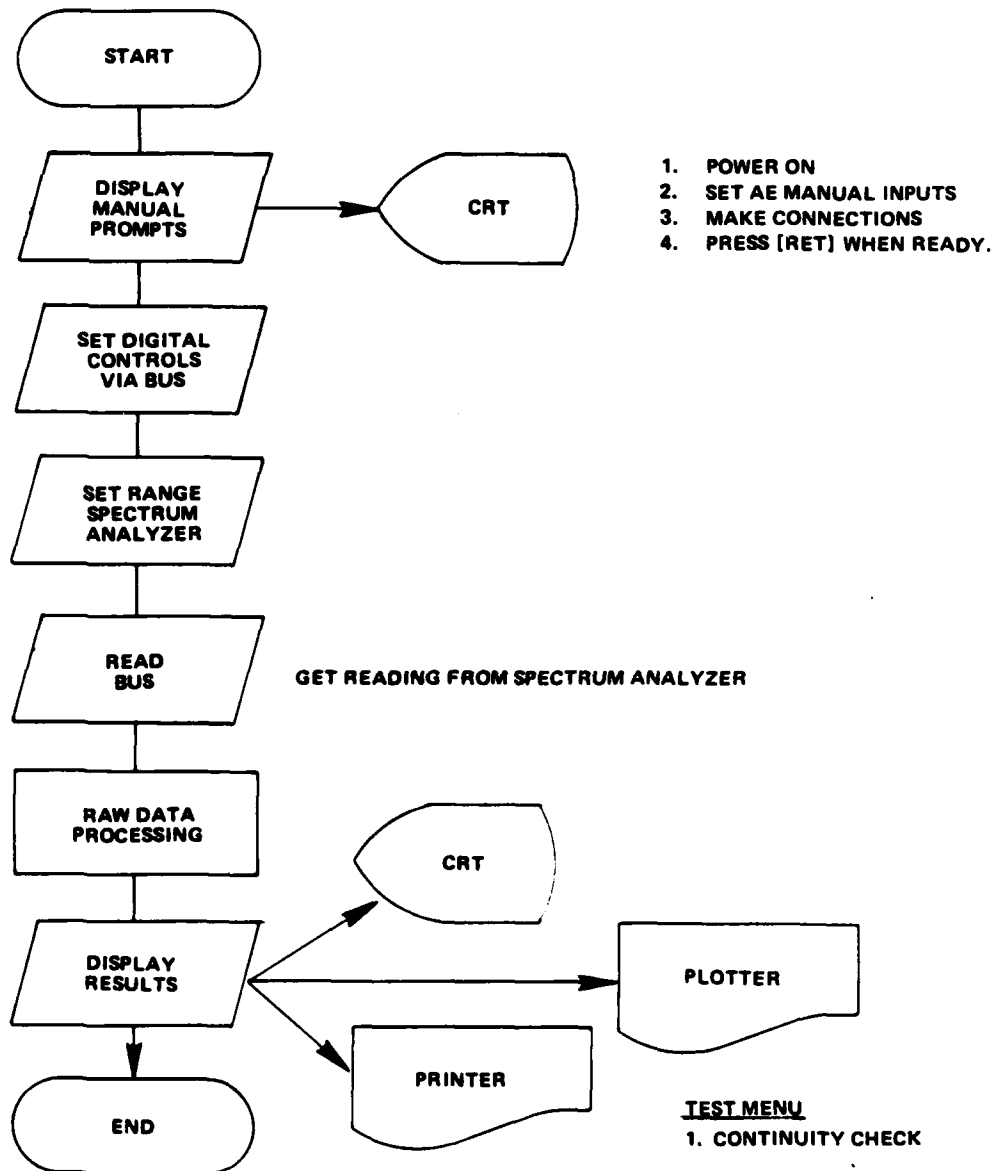
1. POWER ON
2. SET AE MANUAL INPUTS
3. MAKE CONNECTIONS
4. PRESS [RET] WHEN READY

TEST MENU

1. BIT DURATION

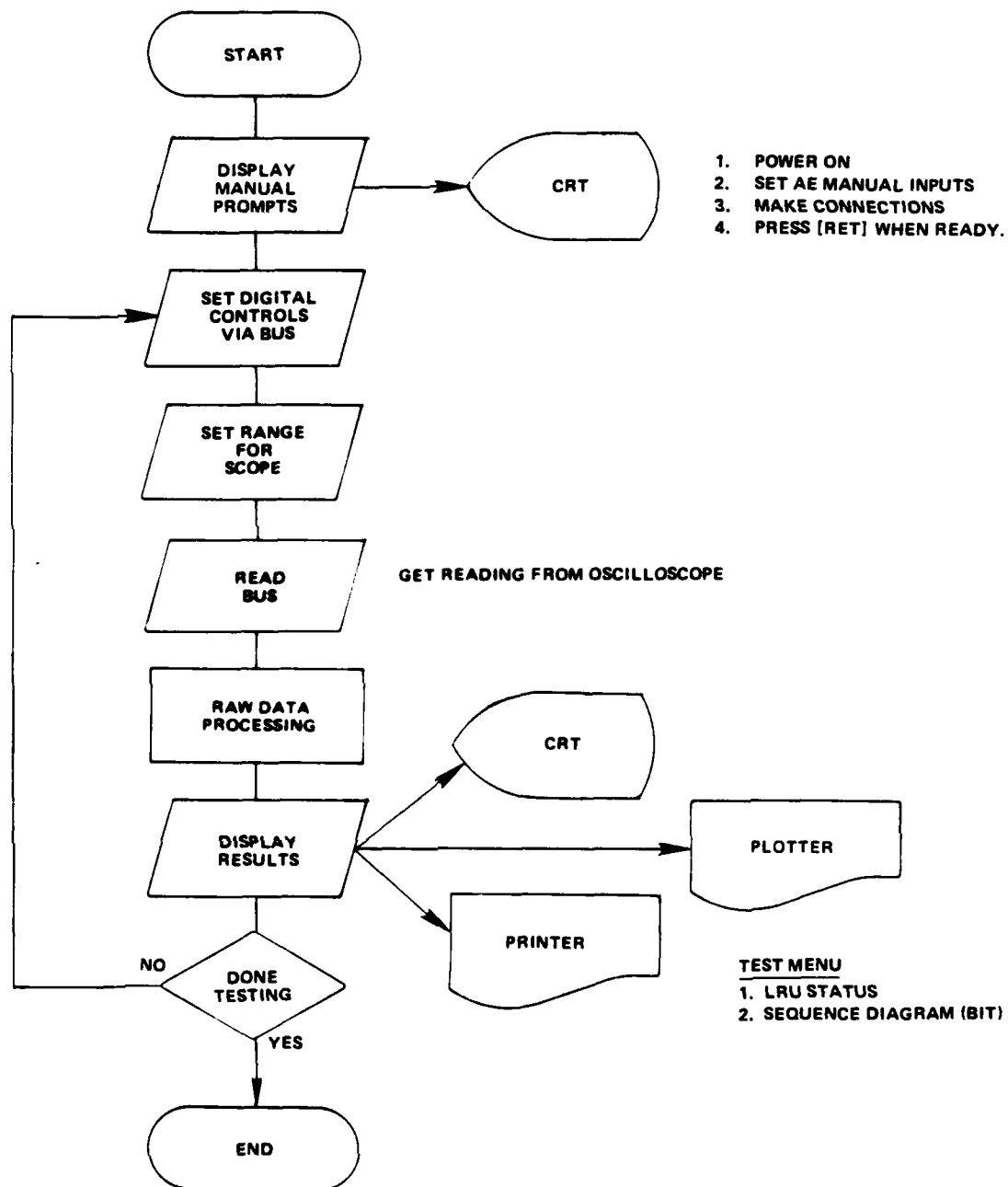
CONTINUITY CHECK

PROGRAM MODULE NAME: _____



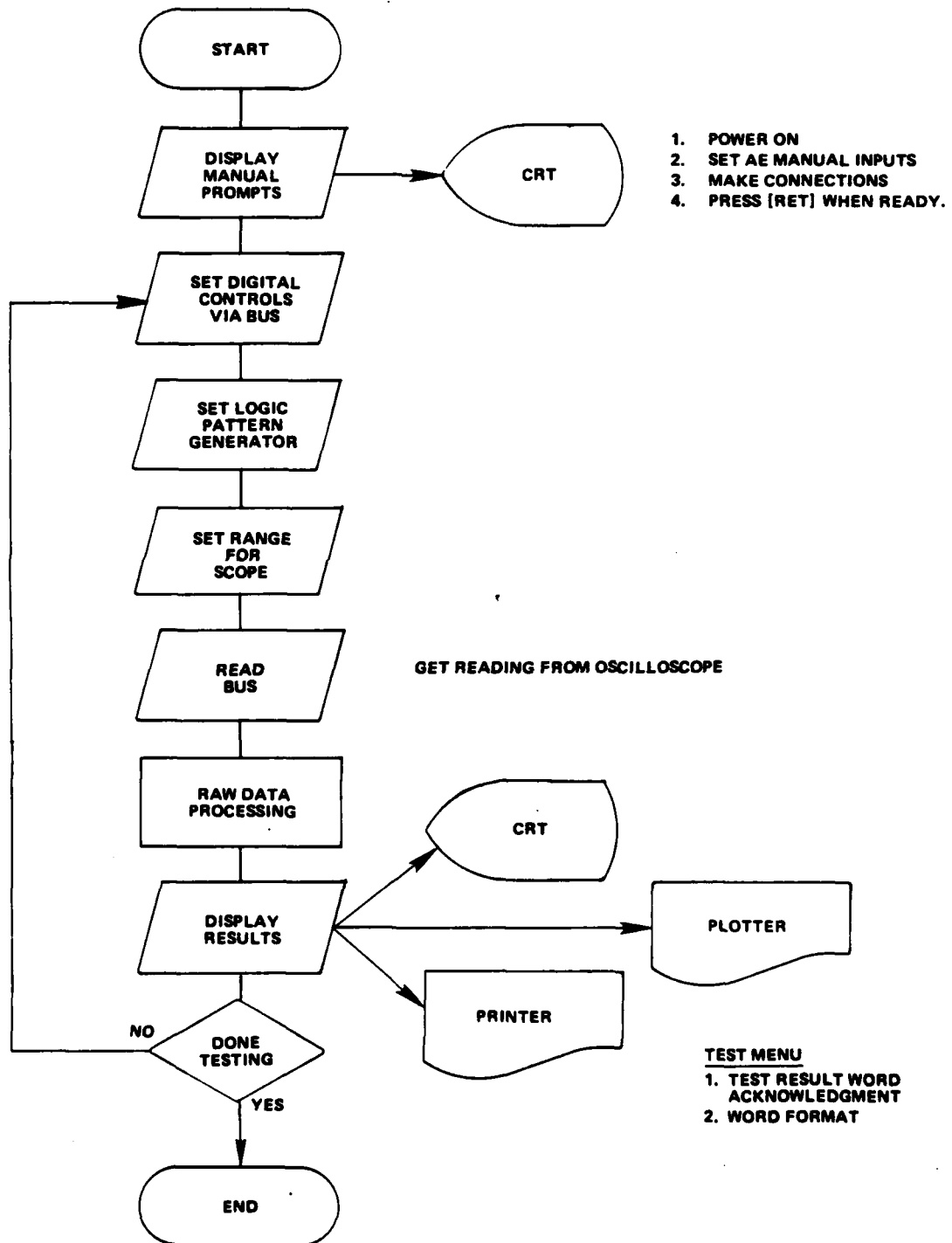
LRU STATUS AND SEQUENCE DIAGRAM (BIT)

PROGRAM MODULE NAME: _____



TEST RESULT WORD ACKNOWLEDGMENT AND WORD FORMAT

PROGRAM MODULE NAME: _____



END

Dtic

5-86