1. SCOPE. THIS DRAWING COVERS THE DETAILED REQUIREMENTS FOR CYLINDRICAL THIN FILM (CTF) INTENDED FOR USE IN A WORD ORGANIZED NON-DESTRUCTIVE READOUT (NDRO) MEMORY SYSTEM.

1.1 CLASSIFICATION: EQUIVALENT WIRE CAN BE PRODUCED BY USING EITHER OF THE FOLLOWING METHODS:

TYPE A CTF - THE TEST SEQUENCE INCLUDES AN ON-LINE TEST (TYPE A) AND OFF-LINE TESTS HEREIN DESCRIBED.
TYPE B CTF - THE TEST SEQUENCE INCLUDES AN ON-LINE TEST (TYPE B) AND OFF-LINE TESTS HEREIN DESCRIBED.

1.2 DEFINITIONS.

OUTPUT VOLTAGE (UV) - THE UNDISTURBED READ OUTPUT VOLTAGE OCCURRING FROM A SINGLE WRITE WITH LOW BIT CURRENT AND LOW WORD CURRENT.
WRITE THRESHOLD OUTPUT VOLTAGE (UV_0) - THE UNDISTURBED OUTPUT VOLTAGE OCCURRING FROM A SINGLE WRITE WITH LOW THRESHOLD BIT CURRENT AND LOW WORD CURRENT.
CRAWL DISTURB VOLTAGE (CRV) - THE READ OUTPUT VOLTAGE OCCURRING AFTER A SERIES OF CRAWL DISTURBS.
CREEP DISTURB VOLTAGE (CPV) - THE READ OUTPUT VOLTAGE OCCURRING AFTER A SERIES OF CREEP DISTURBS.
BIT DISTURB VOLTAGE (WV) - THE READ OUTPUT VOLTAGE OCCURRING AFTER A SERIES OF BIT DISTURBS.
READ OUTPUT VOLTAGE (DV_1) - THE READ OUTPUT VOLTAGE OCCURRING AFTER A SERIES OF ADJACENT BIT, BIT, AND WORD DISTURBS.
READ OUTPUT VOLTAGE (DV_2) - THE READ OUTPUT VOLTAGE OCCURRING AFTER A SERIES OF WORD DISTURBS.
CRAWL DISTURB - THE DISTURB CONDITION PRODUCED BY A FULL WORD CURRENT IN THE PRESENCE OF A "SNEAK" BIT CURRENT.
CREEP DISTURB - THE DISTURB CONDITION PRODUCED BY FULL BIT CURRENT IN THE PRESENCE OF A "FRINGE" OR DISTURB WORD FIELD.
BIT DISTURB - THE DISTURB CONDITION PRODUCED BY FULL BIT CURRENT.

2. APPLICABLE DOCUMENTS. THE FOLLOWING DOCUMENTS, OF THE ISSUE IN EFFECT ON THE DATE OF INVITATION FOR BIDS, FORM A PART OF THIS DRAWING TO THE EXTENT SPECIFIED HEREIN:

UNIVAC 7016743--- ON-LINE TEST FIXTURE
UNIVAC 7511807----ON-LINE TEST FIXTURE
UNIVAC 7511812----OFF-LINE TEST FIXTURE
QQ-S-571----------SOLDER; TIN ALLOY; LEAD-TIN ALLOY; AND LEAD ALLOY
MIL-F-14256-------FLUX, SOLDERING, LIQUID (ROSIN BASE)

3. REQUIREMENTS. ALL REQUIREMENTS APPLY TO THE FINISHED CTF UNLESS OTHERWISE STATED HEREIN.

3.1 MECHANICAL.

3.1.1 WORKMANSHIP. THERE SHALL BE NO BENDS, SCRATCHES, CHIPS, OR OTHER DEFECTS OR EVIDENCE OF POOR WORKMANSHIP THAT COULD ADVERSELY AFFECT THE SUITABILITY, USE, OR LIFE OF THE CTF. THE CTF SHALL BE FREE OF ALL DIRT AND FOREIGN MATERIAL.

3.1.2 MATERIAL. BERYLLIUM - COPPER WIRE, ELECTROPLATED WITH A IRON-NICKEL ALLOY.

3.1.3 DIMENSIONS. THE DIMENSIONS SHALL BE AS SHOWN IN FIGURE 1.

3.1.4 END CUT. THERE SHALL BE NO BURRS OR DEFORMATION EXTENDING BEYOND .0005 INCH FROM THE MAXIMUM WIRE DIAMETER SPECIFIED IN FIGURE 1.

3.1.5 STIFFNESS. ONE INCH MAXIMUM DEFLECTION ON A 5-INCH SPECIMEN WHEN TESTED PER SECTION 4.4.1.1.

3.1.6 STRAIGHTNESS. NO CTF SHALL HAVE A CURVATURE EXCEEDING 0.020 INCH PER RUNNING INCH WHEN TESTED PER SECTION 4.4.1.2.

3.1.7 COATING. THE WIRE SHALL BE COATED WITH BENZOTRIAZOLE.

3.1.8 SOLDERABILITY. THE WIRE SHALL MEET THE REQUIREMENTS OF THIS SECTION WHEN TESTED PER SECTION 4.4.1.3.

3.1.8.1 AT LEAST 90 PERCENT OF ALL WIRE SAMPLES TESTED SHALL EXHIBIT A PULL-OUT FORCE OF 0.5 POUND OR GREATER WHEN TESTED PER SECTION 4.4.1.3.

3.1.8.2 NO TESTED WIRE SAMPLE SHALL EXHIBIT A PULL-OUT FORCE OF LESS THAN 0.2 POUND.

3.2 ELECTRICAL.

3.2.1 DC RESISTANCE. THE DC RESISTANCE OF THE CTF SHALL BE 1.52 ± .10 OHMS PER FOOT.

3.2.2 MAGNETOSTRICTION. THE SKEW INDUCED BY A MINIMUM TWIST OF 5.5 DEGREES/INCH SHALL BE NO GREATER THAN 150 MILLIOERSTED (SEE SECTION 4.3.3.2).

3.2.3 AGING.

3.2.3.1 SHORT TERM. THE PEAK TO PEAK SKEW OF A CTF RESULTING FROM SHORT TERM AGING WHEN TESTED PER SECTION 4.4.2.4.1 SHALL NOT EXCEED 275 MILLIOERSTEDS. (SEE SECTION 4.3.3.1).

LTR	DESCRIPTION	CHK	DATE	APPROVED
L	REVISED 1.1, 4.2 AND 6.2. ADDED APPENDIX A. EIR BV01884		4-17-73	ST S.T.
M	REVISED 1.1, TABLE II, 4.3.7, 4.4.2.2.1.2, 4.4.2.2.1.4, 6.2, FIG. 8.9. DELETED APPENDIX A EIR BV101358-001		10-25-74	ST S.T.
N	REVISED 4.3.3, 4.3.3.2, 4.3.6, 4.4.2.4.3.2.1, 4.4.2.4.3.2.2, ADDED TABLE IIA, 4.3.6.1, 4.3.6.2. EIR BV106524-001		4-17-75	ST S.T.
P	REVISED REVISION HISTORY BLOCK, 4.4.2.2.1.4, 6.2 (ADDED FSC). EIR BV108160-001		10-28-75	ST S.T.
R	REVISED 4.3.6.2. EIR 155796-001		10-16-78	S.T. ST
T	REVISED 4.3.6.2. EIR 162316-001		11-10-78	S.T. ST

SHEET	1	2	3	4	5	6	7	8	9	10
REV.	T	T	T	T	T	T	T	T	T	T

(" " IN REVISION SPACE DENOTES ORIGINAL ISSUE)

THIS DOCUMENT CREATED FOR AND UNDER THE CONTROL OF MINUTEMAN

DWG. NO. 7903591

SOURCE CONTROL DRAWING
~~FOR MATL REQUIREMENTS SEE PL~~

PART NO. SEE 6.1

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES TOL ON
2 PLACE DECIMALS ± /
3 PLACE DECIMALS ± /
ANGLES ± /
HOLE DIA TOL
0 THRU .250 + .003 − .002
.251 THRU .500 + .005 − .003
.501 AND LARGER + .010 − .005
THREADS: EXT CL 2A, INT CL 2B

CONTRACT NO. F04701-69-C-0111

LAYOUT		
DRAWN	R.A.SANDERSON	4-10-73
CHECKED	G. W. H.	
ENGR	S. TAKO	
ENGR		
APPROVED		

UNIVAC DIVISION
UNIVAC PARK, P.O. BOX 3525, ST. PAUL, MINN. 55165

TITLE
MEMORY ELEMENT, CYLINDRICAL THIN FILM — —

SIZE	CODE IDENT	DWG NO.
C	90536	7903591

SCALE NONE | FORM 1 | REV T | SHEET 1 OF 10

3.2.3.2 LONG TERM. THE PEAK TO PEAK SKEW OF A CTF RESULTING FROM LONG TERM AGING WHEN TESTED IN ACCORDANCE WITH SECTION 4.4.2.4.2 SHALL NOT EXCEED 380 MILLIOERSTEDS OVER THE SKEW VALUE AT 5.4 HOURS.

3.2.4 SKEW. THE SKEW OF ANY CTF SHALL NOT EXCEED 20 MILLIOERSTEDS ABSOLUTE.

3.2.5 OUTPUT VOLTAGE (UV). THE OUTPUT VOLTAGE (UV) SHALL BE 6.0 MILLIVOLTS MINIMUM WHEN TESTED PER SECTION 4.4.2.2.2.1. (SEE FIGURE 4).

3.2.6 WRITE THRESHOLD OUTPUT VOLTAGE (UV_0). THE WRITE THRESHOLD OUTPUT VOLTAGE (UV_0) SHALL BE 7.5 MILLIVOLTS MINIMUM WHEN TESTED PER SECTION 4.4.2.3.2.1. (SEE FIGURE 4).

3.2.7 CRAWL DISTURB VOLTAGE (CRV). THE CRAWL DISTURB VOLTAGE (CRV) SHALL NOT BE LESS THAN 0.75 OF THE INITIAL UV WHEN TESTED PER SECTION 4.4.2.2.2.2 OR 4.4.2.3.2.2. (SEE FIGURE 4).

3.2.8 CREEP DISTURB VOLTAGE (CPV). THE CREEP DISTURB VOLTAGE (CPV) SHALL NOT BE LESS THAN 0.75 OF THE INITIAL UV WHEN TESTED PER 4.4.2.2.2.3. (SEE FIGURE 4).

3.2.9 BIT DISTURB VOLTAGE (WV). THE BIT DISTURB VOLTAGE (WV) SHALL NOT BE LESS THAN 0.75 OF THE INITIAL UV WHEN TESTED PER SECTION 4.4.2.2.2.4 OR 4.4.2.3.2.3. (SEE FIGURE 4).

3.2.10 READ OUTPUT VOLTAGE (DV_1 AND DV_2). THE READ OUTPUT VOLTAGE (DV_1 OR DV_2) SHALL NOT BE LESS THAN 6.4 MILLIVOLTS WHEN TESTED PER SECTION 4.4.2.4.3.2.1 AND 4.4.2.4.3.2.2. (SEE FIGURE 4).

3.3 ENVIRONMENTAL.

3.3.1 TEMPERATURE.

3.3.1.1 THE CTF SHALL OPERATE OVER A 50°F TO 85°F. TEMPERATURE RANGE.

3.3.1.2 THE CTF SHALL WITHSTAND A -40°F TO 150°F STORAGE TEMPERATURE RANGE.

4. QUALITY ASSURANCE PROVISIONS.

4.1 CLASSIFICATION OF INSPECTIONS. TESTING OF THE CTF SHALL CONSIST OF THE FOLLOWING INSPECTIONS:

(a) QUALIFICATION
(b) BATCH ACCEPTANCE

4.2 QUALIFICATION INSPECTION. THESE TESTS ARE INTENDED TO INSURE THE PERFORMANCE CAPABILITY OF THE PART UNDER ACTUAL USE CONDITIONS AND UNDER SIMULATED WORST-CASE CONDITIONS. THESE TESTS MAY INCLUDE, BUT ARE NOT LIMITED TO, LIFE, MOISTURE AND PLANE TESTS. PROOF OF COMPLIANCE SHALL CONSIST OF SATISFACTORY TEST RESULTS OR BY SHOWING SIMILARITY TO PREVIOUSLY-QUALIFIED DEVICES.

4.2.1 RESPONSIBILITY FOR QUALIFICATION. THE PROCURING ACTIVITY SHALL BE RESPONSIBLE FOR DETERMINATION OF THE QUALIFICATION STATUS AND SUBSEQUENT APPROVAL OF SOURCES. UNLESS OTHERWISE INDICATED ON THE PURCHASE ORDER, THE PROCURING ACTIVITY SHALL BE RESPONSIBLE FOR THE PERFORMANCE OF ALL QUALIFICATION TESTING.

4.3 BATCH ACCEPTANCE INSPECTION. THESE TESTS ARE INTENDED TO VERIFY THAT THE MANUFACTURING PROCESSES HAVE NOT DETERIORATED AND SHALL CONSIST OF GROUPS A, B AND C TESTING DEPENDING ON THE WIRE TYPE BEING SUPPLIED.

4.3.1 BATCH SIZE AND CONTROL.

4.3.1.1 BATCH SIZE. A BATCH SHALL CONSIST OF CTF ELEMENTS MADE IN ONE 24 HOUR PERIOD FROM A SINGLE BARREL OF A PLATER ON THE SAME LOT OF SUBSTRATE WIRE USING THE SAME PLATING SOLUTIONS, THE SAME PROCESSES, AND THE SAME FIXTURES. A LOT OF SUBSTRATE WIRE IS ALL 5 MIL WIRE PRODUCED FROM ONE SPOOL OF 20 MIL COPPER WIRE.

4.3.1.2 CONTROL. A BATCH SHALL HAVE AN IDENTIFYING CODE AS TO THE DATE PRODUCED AND THE PLATER AND BARREL USED. THE MANUFACTURER SHALL BE ABLE TO TRACE EACH BATCH BACK THROUGH HIS BASELINE PROCESS. THE SUPPLIER MUST MAINTAIN ALL TRACEABILITY AND TEST RECORDS FOR A PERIOD OF TWO YEARS.

4.3.2 GROUP A INSPECTION. THE TESTS SPECIFIED IN TABLE I SHALL BE PERFORMED ON EACH 0.040 INCH SECTION OF THE CTF IN THE ACTIVE REGION. THESE TESTS ARE NORMALLY PERFORMED ON A CONTINUOUS BASIS (ON-LINE). EACH SECTION OF THE CTF SHALL MEET THE LIMITS SPECIFIED. EACH TEST SHALL BE PERFORMED AT BOTH POSITIVE AND NEGITIVE POLARITY BIT CURRENTS.

TABLE I - GROUP A INSPECTION

TEST	TYPE A WIRE		TYPE B WIRE	
	PROCEDURE	REQT	PROCEDURE	REQT
UV	4.4.2.2.2.1	3.2.5	NONE	NONE
UV_0	NONE	NONE	4.4.2.3.2.1	3.2.6
CRV	4.4.2.2.2.2	3.2.7	4.4.2.3.2.2	3.2.7
CPV	4.4.2.2.2.3	3.2.8	NONE	NONE
WV	4.4.2.2.2.4	3.2.9	4.4.2.3.2.3	3.2.9

4.3.3 GROUP B INSPECTION. THE TESTS SPECIFIED IN TABLE II OR TABLE II-A SHALL BE PERFORMED ON A SAMPLE (OFF-LINE) OF THE CTF IN EACH BATCH OF TYPE A AND TYPE B WIRE.

TABLE II - GROUP B INSPECTION

TEST	PROCEDURE	SAMPLES	REQT
RESISTANCE		5 CTF OR 1% OF BATCH, WHICHEVER IS GREATER	3.2.1
MAGNETOSTRICTION		1 OF EVERY 20 CTF PER BATCH (SEE 4.3.3.2)	3.2.2
AGING (SHORT-TERM)	4.4.2.4.1	3 CTF PER BATCH	3.2.3.1
AGING (LONG-TERM)	4.4.2.4.2	1 CTF PER BATCH FROM SHORT-TERM AGING SAMPLE	3.2.3.2
SKEW		40 RANDOM CTF PER BATCH	3.2.4
DV_1	4.4.2.4.3.2.1	20 CTF PER BATCH -40 BITS PER CTF (EVEN-NUMBERED CTF FROM THE 40 SKEW SAMPLES)	
DV_2	4.4.2.4.3.2.2	SAME WIRES AS DV_1 TEST	3.2.10

REVISIONS				
LTR	DESCRIPTION	CHK	DATE	APPROVED

TABLE IIA - GROUP B INSPECTION

TEST	PROCEDURE	SAMPLES	REQT
RESISTANCE		5 CTF OR 1% OF BATCH WHICHEVER IS GREATER	3.2.1
MAGNETO-STRICTION		1 OF EVERY 20 CTF PER BATCH (SEE 4.3.3.2)	3.2.2
AGING (SHORT-TERM)	4.4.2.4.1	3 CTF PER BATCH	3.2.3.1
AGING (LONG TERM)	4.4.2.4.2	1 CTF PER BATCH FROM SHORT TERM AGING SAMPLE	3.2.3.2
SKEW		1 OF EVERY 20 CTF PER BATCH (SEE 4.3.3.2)	3.2.4
DV_1	4.4.2.4.3.2.1	1 OF EVERY 20 CTF PER BATCH - 40 BITS PER CTF	3.2.10
DV_2	4.4.2.4.3.2.2	1 OF EVERY 20 CTF PER BATCH - 40 BITS PER CTF	3.2.10

4.3.3.1 CONFIDENCE LEVEL. SAMPLES SHALL BE TESTED TO THE EXTENT NECESSARY TO ASSURE WITH AT LEAST 95% CONFIDENCE THAT NO MORE THAN 5% OF THE WIRES FROM ANY LOT WILL FAIL TO MEET THE REQUIREMENTS OF THIS SPECIFICATION FOR SHORT-TERM AGING.

4.3.3.2 TIGHTENED INSPECTION. IF A FAILURE IS DETECTED, ALL CTF INCLUSIVE OF A FAILED SAMPLE BETWEEN TWO ACCEPT WIRES SHALL BE REJECTED. TIGHTENED INSPECTION MAY BE USED TO LOCATE ACCEPTABLE CTF WITHIN THE PREVIOUS 20 CTF. NO WIRES SHALL BE ACCEPTED SUBSEQUENT TO FAILED CTF UNTIL AN ACCEPTABLE CTF IS PRODUCED AT WHICH TIME THE VENDOR MAY RETURN TO NORMAL INSPECTION. THE DETAILED PROCEDURE FOR THIS TIGHTENED INSPECTION SHALL BE SUBJECT TO APPROVAL IN THE VENDOR'S BASELINE.

4.3.4 GROUP C TESTING. THE TESTS SPECIFIED IN TABLE III SHALL BE PERFORMED ON FIFTY SAMPLES SELECTED RANDOMLY FROM A SINGLE BARREL OF A PLATER ON THE SAME LOT OF SUBSTRATE WIRE USING THE SAME PLATING SOLUTIONS AND PROCEDURES DURING A MAXIMUM PERIOD OF 168 HOURS. EACH OF THE SAMPLES SHALL BE AT LEAST ONE INCH LONG. THE NUMBER OF SAMPLES SELECTED FROM EACH BATCH SHALL BE PROPORTIONAL TO THE NUMBER OF CTF IN THE BATCH IN COMPARISON TO THE TOTAL NUMBER OF CTF MADE. THE SAMPLES MAY BE TAKEN FROM REJECT WIRES IF THE SAMPLES ARE IDENTIFIED AND TRACEABLE TO A SPECIFIC BATCH .

TABLE III - GROUP C TESTS

TEST	PROCEDURE	REQUIREMENT
SOLDERABILITY	PARA. 4.4.1.3	PARA. 3.1.8

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C	90536	7903591

SCALE NONE FORM 1 REV. T SHEET 2

4.3.5 RESPONSIBILITY FOR ACCEPTANCE TEST INSPECTION.

4.3.5.1 RESPONSIBILITY FOR INSPECTION. UNLESS OTHERWISE SPECIFIED IN THE CONTRACT OR PURCHASE ORDER, THE MANUFACTURER IS RESPONSIBLE FOR THE PERFORMANCE OF ALL INSPECTION AND TEST REQUIREMENTS AS SPECIFIED HEREIN. EXCEPT AS OTHERWISE SPECIFIED THE MANUFACTURER MAY UTILIZE HIS OWN FACILITIES OR A COMMERCIAL LABORATORY ACCEPTABLE TO UNIVAC DSD, ST. PAUL, MINNESOTA (REFERRED) TO AS UNIVAC). UNIVAC MAY PERFORM SURVEILLANCE ON ALL OF THE INSPECTIONS OR TESTS SET FORTH IN THIS SPECIFICATION. UNIVAC ALSO RESERVES THE RIGHT TO PERFORM ANY OF THE INSPECTIONS OR TESTS SET FORTH IN THIS SPECIFICATION WHERE SUCH INSPECTION OR TESTS ARE DEEMED NECESSARY TO ASSURE SUPPLIES AND SERVICES CONFORM TO PRESCRIBED REQUIREMENTS.

4.3.5.2 REJECTION. ANY BATCH OF WIRE NOT MEETING THE REQUIREMENTS SPECIFIED WILL BE REJECTED AND RETURNED TO THE VENDOR FOR REFUND OR CREDIT.

4.3.6 FAILURES.

4.3.6.1 FAILURES-TABLE II ONLY. NO FAILURES ARE ALLOWED IN ANY GROUP A OR GROUP B TEST EXCEPT FOR THE DV TESTS ON GROUP B. IN THE DV TESTS IN GROUP B, 30 BITS FOR DV_1 AND 10 BITS FOR DV_2 PER BATCH MAY HAVE OUTPUTS LESS THAN OR EQUAL TO THE LIMIT SPECIFIED IN SECTION 3.2.10 FOR EITHER OR BOTH POLARITY OUTPUTS. ANY BATCH HAVING A GREATER NUMBER OF FAILURES SHALL BE REJECTED. GROUP C FAILURES SHALL NOT EXCEED THE NUMBER ALLOWED IN SECTION 3.1.8. NO GROUP A FAILURES SHALL BE INCLUDED IN SHIPMENTS OF CTF TO THIS SPECIFICATION.

4.3.6.2 FAILURES-TABLE IIA ONLY. NO BIT FAILURES ARE ALLOWED IN ANY GROUP A OR GROUP B TESTS EXCEPT FOR THE DV TEST IN GROUP B. IN THE DV TESTS IN GROUP B, THE TOTAL NUMBER OF DV_1 BIT FAILURES (SEE SECTION 3.2.10) PER BATCH SHALL NOT EXCEED THE NUMBER OF SAMPLE WIRES TESTED FOR THAT BATCH. THE TOTAL NUMBER OF DV_2 BIT FAILURES (SEE SECTION 3.2.10) SHALL NOT EXCEED 25% OF THE NUMBER OF SAMPLE WIRES TESTED FOR THAT BATCH. IF THE NUMBER OF BIT FAILURES EXCEEDS THE ABOVE CRITERIA FOR EITHER DV_1 OR DV_2 THE BATCH SHALL BE REJECTED. GROUP C FAILURES SHALL NOT EXCEED THE NUMBER ALLOWED IN SECTION 3.1.8. NO GROUP A FAILURES SHALL BE INCLUDED IN THE SHIPMENTS OF CTF TO THIS SPECIFICATION.

4.3.7 DISPOSITION OF SAMPLES. NO CTF USED IN A SAMPLES TEST SHALL BE INCLUDED AS A PORTION OF AN ACCEPTED BATCH. A MINIMUM OF ONE THIRD THE SAMPLES USED IN ANY ELECTRICAL TEST DESCRIBED IN SECTION 4.3.3 SHALL BE SUPPLIED TO UNIVAC IN A SEPARATE CONTAINER WITH THE ACCEPTED BATCH.

4.3.8 REPORTING. RESULTS OF ALL GROUP B TESTS ON ANY GIVEN BATCH SHALL BE DOCUMENTED AND SUPPLIED TO UNIVAC WITH EACH SHIPMENT OF PARTS FROM THAT BATCH. INFORMATION CONTAINED ON THE DATA SHEET(S) SHALL INCLUDE, AS A MINIMUM, THE TEST PERFORMED, THE WIRE NUMBERS TESTED, THE PARAMETER MEASURED, UNITS OF MEASUREMENT, VARIABLES DATA FOR EACH WIRE, THE DATE FOR PERFORMING EACH TEST, THE BATCH NUMBER, BATCH SIZE, UNIVAC DSD SPECIFICATION NUMBER AND REVISION. EACH SHIPMENT SHALL ALSO CONTAIN A CERTIFICATE OF COMPLIANCE, SIGNED BY AN AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER, WHICH CONTAINS THE UNIVAC PART NUMBER, DRAWING REVISIONS, UNIVAC PURCHASE ORDER NUMBER, VENDOR NAME AND ADDRESS, VENDOR PART NUMBER, TOTAL NUMBER OF CTF IN THE SHIPMENT, THE BATCH NUMBERS IN THE SHIPMENT, THE QUANTITY OF CTF OF EACH BATCH IN THE SHIPMENT, AND THE APPLICABLE PROCESS BASELINE DATE AND/OR REVISION. AN ACCEPTABLE FORM FOR THIS INFORMATION IS AVAILABLE FROM THE PROCURING ACTIVITY.

4.4 TESTING PROCEDURES. THE FOLLOWING PROCEDURES SHALL BE USED FOR TESTS OR EXAMINATIONS OF CTF SUPPLIED TO THIS DRAWING.

4.4.1 MECHANICAL.

4.4.1.1 STIFFNESS. A FIVE-INCH PIECE OF CTF SHALL BE HORIZONTALLY CANTILEVERED AND SHALL BE ALLOWED TO CURVE UNDER ITS OWN WEIGHT. THE AMOUNT OF DEFLECTION OF THE TIP OF THE WIRE OPPOSITE THE SUPPORTED END SHALL BE MEASURED FROM THE TRUE HORIZONTAL. THE DEFLECTION SHALL NOT EXCEED THE AMOUNT SPECIFIED IN SECTION 3.1.5.

4.4.1.2 STRAIGHTNESS: SHALL NOT VARY FROM THE NORMAL MORE THAN 0.020 INCH PER RUNNING INCH WHEN MEASURED ON A 15 INCH PIECE SUSPENDED VERTICALLY.

4.4.1.3 SOLDERABILITY. EACH BATCH OF CTF'S SHALL MEET THE REQUIREMENTS OF THIS SECTION.

4.4.1.3.1 MATERIAL.

4.4.1.3.1.1 CIRCUIT BOARD. EPOXY GLASS PRINTED CIRCUIT BOARDS .060 INCH MINIMUM THICKNESS WITH 2 OUNCE COPPER CIRCUITRY ON ONE SIDE ONLY SHALL BE AS SPECIFIED IN FIGURE 11.

4.4.1.3.1.2 PLATING ON THE CIRCUITRY SHALL BE 60/40 TIN-LEAD, .0003 INCH MINIMUM THICKNESS.

4.4.1.3.1.3 SOLDERING FLUX. THE SOLDERING FLUX SHALL BE IN ACCORDANCE WITH MIL-F-14256 AND SHALL BE THINNED 1:1 WITH ISOPROPYL ALCOHOL.

4.4.1.3.1.4 SOLDER. THE SOLDER BATH SHALL CONSIST OF Sn 60 OR SN 63 SOLDER IN ACCORDANCE WITH QQ-S-571.

4.4.1.3.2 EQUIPMENT.

4.4.1.3.2.1 SOLDER BATH. A SOLDER POT WITH AT LEAST 5 POUNDS CAPACITY, CAPABLE OF MAINTAINING A TEMPERATURE OF 465 ± 5°F, SHALL BE USED.

4.4.1.3.2.2 TENSILE TESTER. A TENSILE TESTING MACHINE OR PULL-TESTER SHALL BE USED WHICH IS CAPABLE OF MEASURING WIRE PULL-OUT FORCES OF ±0.1 POUND IN THE RANGE OF 0 TO 2 POUNDS. THE TESTER MUST BE CAPABLE OF PULLING AT THE RATE OF 2.0 ± 0.1 INCHES PER MINUTE.

4.4.1.3.3 TEST PROCEDURE.

4.4.1.3.3.1 WIRE INSERTION. THE TEST WIRES ARE INSERTED INTO THE PRINTED CIRCUIT HOLES AS SHOWN IN FIGURE 12. THEY SHALL BE IN THE AS-RECEIVED CONDITION. THE SOLDER ON THE PRINTED CIRCUIT TEST BOARDS SHALL BE UNAGED AND CLEAN. THE TEST WIRES SHALL BE INSERTED INTO THE HOLES SO THAT THE ENDS EXTEND AT LEAST 1/16 INCH BEYOND THE CIRCUITRY (SEE FIGURE 12). THE INSERTED PORTION OF THE WIRES ARE HELD IN PLACE BY MEANS THAT WILL ALLOW GAS RELIEF ON THE UNSOLDERED SIDE OF THE BOARD AS SHOWN IN FIGURE 12.

4.4.1.3.3.2 SOLDERING. THE BOARDS, WITH WIRES IN PLACE, ARE FLUXED BY SPRAYING, PREHEATED TO PARTIALLY DRY THE FLUX, AND SOLDERED BY FLOATING THE BOARD ON THE SOLDER BATH FOR 5 ± 1 SECONDS AT 465 ± 5°F. SOLDERED BOARDS SHALL BE CLEANED IN A CHLORINATED SOLVENT TO REMOVE FLUX RESIDUES. THERE SHALL BE NO TOUCH-UP OF SOLDERED JOINTS.

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4.4.1.3.3.3 PULL-TESTING. EACH WIRE SHALL BE PULL-TESTED BY PULLING THE WIRE FROM THE HOLE AT AN ANGLE OF 90° TO THE PRINTED CIRCUIT BOARD AT A RATE OF 2.0 ± 0.1 INCHES PER MINUTE. MAXIMUM FORCES SHALL BE RECORDED AND USED TO DETERMINE COMPLIANCE WITH PARAGRAPH 3.1.8.

4.4.2 ELECTRICAL.

4.4.2.1 AMBIENT TEMPERATURE AND MAGNETIC FIELD REQUIREMENTS

4.4.2.1.1 TEMPERATURE. ELECTRICAL REQUIREMENTS ARE FOR 75 ± 5°F AT TEMPERATURES OTHER THAN THE STATED TEMPERATURE. I_W MAY BE COMPENSATED BY DECREASING I_W .55 mA PER DEGREE FAHRENHEIT INCREASE.

4.4.2.1.2 MAGNETIC FIELD. THE NET AXIAL MAGNETIC FIELD COMPONENT SHALL BE LESS THAN 0.05 OERSTEDS AND THE NET MAGNETIC FIELD IN ANY DIRECTION SHALL BE LESS THAN 1.0 OERSTED WHEN NO CURRENTS ARE DRIVEN.

4.4.2.2 ON-LINE TESTS (TYPE A WIRE).

4.4.2.2.1 TEST CONDITIONS.

4.4.2.2.1.1 FIXTURE. THE TEST FIXTURE SHALL BE PER UNIVAC 7511807.

4.4.2.2.1.2 WORD CURRENTS. (SEE FIGURE 2).

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_W	790 mA	150 ± 2 ns	40 ± 2 ns	40 ± 2 ns
ΔI_W	80 mA			
$I_{W1}=I_W-\Delta I_W$	710 mA	150 ± 2 ns	40 ± 2 ns	40 ± 2 ns
$I_{W2}=I_W+\Delta I_W$	870 mA	150 ± 2 ns	40 ± 2 ns	40 ± 2 ns

NOTE: DIMENSIONAL VARIATION FROM UNIT TO UNIT OF ON-LINE FIXTURES (UNIVAC 7511807) MAY NECESSITATE VARIATION OF THE AMPLITUDE OF I_W. IF ALTERNATE SETTINGS ARE USED, THE VENDOR SHALL INCLUDE THE CORRELATION PROCEDURE USED AS PART OF HIS PROCESS BASELINE. (SEE SECTION 4.5.2).

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4.4.2.2.1.3 BIT CURRENTS. (SEE FIGURE 2)

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_B	44 mA			
ΔI_B	5 mA			
$I_{B1}=I_B-\Delta I_B$	39 mA	110 ± 5 ns	40 ± 2 ns	40 ± 2 ns
$I_{B2}=I_B+\Delta I_B$	49 mA	110 ± 5 ns	40 ± 2 ns	40 ± 2 ns
I_{B3}	2 mA	110 ± 5 ns	40 ± 2 ns	40 ± 2 ns
I_{B4}	51 mA	110 ± 5 ns	40 ± 2 ns	40 ± 2 ns

4.4.2.2.1.4 TOLERANCES.

t_{ov} = 70 ns ± 7 ns
ALL CURRENT READING EXCEPT I_{B3}, ±3%; I_{B3}, +50%, -10%
ALL TIME READING ±3%

OVERSHOOT: ± 5% PULSE AMPLITUDE
DROOP: + 2% PULSE AMPLITUDE
BACKSWING: ± 5% PULSE AMPLITUDE

4.4.2.2.1.5 WRITE SEQUENCE PATTERN. MONOPOLAR WRITE SEQUENCE PER FIGURE 3, BOTH POLARITIES.

4.4.2.2.2 MEASUREMENTS.

4.4.2.2.2.1 UV_1. TEST CONDITIONS PER SECTION 4.4.2.2.1. TEST SEQUENCE PER FIGURE 6. READ UV_1 IN STEP 6 OF FIGURE 6.

4.4.2.2.2.2 CRV. TEST CONDITIONS PER SECTION 4.4.2.2.1. TEST SEQUENCE PER FIGURE 7. READ CRV IN STEP 7 OF FIGURE 7.

4.4.2.2.2.3 CPV. TEST CONDITIONS PER SECTION 4.4.2.2.1. TEST SEQUENCE PER FIGURE 6. READ CPV IN STEP 9 OF FIGURE 6.

4.4.2.2.2.4 WV. TEST CONDITIONS PER SECTION 4.4.2.2.1. TEST SEQUENCE PER FIGURE 5. READ WV IN STEP 5 OF FIGURE 5.

4.4.2.3 ON-LINE TESTS (TYPE B WIRE).

4.4.2.3.1 TEST CONDITIONS.

4.4.2.3.1.1 FIXTURE. THE TEST FIXTURE SHALL BE PER UNIVAC 7016743.

4.4.2.3.1.2 WORD CURRENTS. (SEE FIGURE 2)

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_W	700 mA			
ΔI_W	70 mA			
$I_{W1}=I_W-\Delta I_W$	630 mA	150 ± 3 ns	40 ± 2 ns	40 ± 2 ns
$I_{W2}=I_W+\Delta I_W$	770 mA	150 ± 3 ns	40 ± 2 ns	40 ± 2 ns

NOTE: DIMENSIONAL VARIATION FROM UNIT TO UNIT OF ON-LINE FIXTURES (UNIVAC 7016743) MAY NECESSITATE VARIATION OF THE AMPLITUDE OF I_W. IF ALTERNATE SETTINGS ARE USED, THE VENDOR SHALL INCLUDE THE CORRELATION PROCEDURE USED AS PART OF HIS PROCESS BASELINE. (SEE SECTION 4.5.2)

4.4.2.3.1.3 BIT CURRENTS. (REF. FIGURE 2)

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_B	40 mA			
ΔI_B	4 mA			
$I_{B1}=I_B-\Delta I_B$	36 mA	140 ± 3 ns	40 ± 2 ns	40 ± 2 ns
$I_{B2}=I_B+\Delta I_B$	44 mA	140 ± 3 ns	40 ± 2 ns	40 ± 2 ns
I_{B3}	3 mA	140 ± 3 ns	40 ± 2 ns	40 ± 2 ns
I_{B4}	54 mA	140 ± 3 ns	40 ± 2 ns	40 ± 2 ns
I_{B5}	29 mA	140 ± 3 ns	40 ± 2 ns	40 ± 2 ns

4.4.2.3.1.4 TOLERANCES.

t_{ov} = 85 ns ± 3 ns
ALL CURRENT READING EXCEPT I_{B3} ±3%; I_{B3} ±10%
ALL TIME READING ±3%

OVERSHOOT: ±5% PULSE AMPLITUDE
DROOP: +2% PULSE AMPLITUDE
BACKSWING: ±5% PULSE AMPLITUDE

4.4.2.3.1.5 WRITE SEQUENCE PATTERN. MONO-POLAR WRITE SEQUENCE PER FIGURE 3; BOTH POLARITIES.

4.4.2.3.1.6 TEST RATE. EFFECTIVE CLOCK RATE OF ON-LINE TEST SHALL BE SUCH THAT NO MORE THAN 5% OF A BIT PASSES THE TEST POINT DURING THE LONGEST SUBPROGRAM. IN ADDITION, EACH BIT SHALL RECEIVE AT LEAST THREE TWO-POLARITY TESTS.

4.4.2.3.2 MEASUREMENTS.

4.4.2.3.2.1 UV_0. TEST CONDITIONS PER SECTION 4.4.2.3.1. TEST SEQUENCE PER FIGURE 10. READ UV_0 IN STEP 5 OF FIGURE 10

4.4.2.3.2.2 CRV. TEST CONDITIONS PER SECTION 4.4.2.3.1. TEST SEQUENCE PER FIGURE 7. READ CRV IN STEP 7 OF FIGURE 7.

4.4.2.3.2.3 WV. TEST CONDITIONS PER SECTION 4.4.2.3.1. TEST SEQUENCE PER FIGURE 5. READ WV IN STEP 5 OF FIGURE 5.

4.4.2.4 OFF-LINE TESTS.

4.4.2.4.1 SHORT TERM AGING. SAMPLE WIRES SHALL BE STORED IN A 3.5 OERSTED DC HARD AXIS FIELD IN A 350°F AMBIENT FOR 5.4 ± 0.2 HOURS. PEAK-TO-PEAK SKEW SHALL BE MEASURED AFTER THE STORAGE. (SEE SECTION 3.2.3.1)

PEAK-TO-PEAK SKEW IS THE DIFFERENCE IN INDUCED SKEW BETWEEN REGIONS OF WIRE WHICH PRIOR TO AGING HAD BEEN SATURATED IN OPPOSITE DIRECTIONS USING A BIT CURRENT OF 160 mA.

4.4.2.4.2 LONG TERM AGING. THE TEST OF SECTION 4.4.2.4.1 SHALL BE RESUMED TO A TOTAL OF 160 ± 1 HOURS. PEAK-TO-PEAK SKEW SHALL BE MEASURED AFTER THE STORAGE. (SEE SECTION 3.2.3.2)

4.4.2.4.3 DV.

4.4.2.4.3.1 TEST CONDITIONS.

4.4.2.4.3.1.1 FIXTURE. THE TEST FIXTURE SHALL BE PER UNIVAC 7511812.

REVISIONS

LTR	DESCRIPTION	CHK	DATE	APPROVED

4.4.2.4.3.1.2 WORD CURRENTS. (SEE FIGURE 2)

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_W	760 mA			
ΔI_W	84 mA			
$I_{W1}=I_W-\Delta I_W$	676 mA	150 ± 2 ns	35 ± 2 ns	35 ± 2 ns
$I_{W2}=I_W+\Delta I_W$	844 mA	150 ± 2 ns	46 ± 2 ns	46 ± 2 ns

4.4.2.4.3.1.3 BIT CURRENTS. (SEE FIGURE 2)

	AMPLITUDE	t PULSE WIDTH	t_r RISETIME	t_f FALLTIME
I_{B_H}	44.6 mA			
I_{B_W}	35.4 mA			
ΔI_B	1 mA			
$I_{B_1}=I_{B_H}+\Delta I_B$	45.6 mA	140 ± 2 ns	40 ± 2 ns	40 ± 2 ns
$I_{B_2}=I_{B_H}-\Delta I_B$	43.6 mA	140 ± 2 ns	40 ± 2 ns	40 ± 2 ns
$I_{B_3}=I_{B_W}+\Delta I_B$	36.4 mA	140 ± 2 ns	40 ± 2 ns	40 ± 2 ns
$I_{B_4}=I_{B_W}-\Delta I_B$	34.4 mA	140 ± 2 ns	40 ± 2 ns	40 ± 2 ns

4.4.2.4.3.1.4 TOLERANCES.

t_{ov} = 85 ns ± 3 ns
ALL CURRENT READINGS: ±3%
ALL TIME READINGS: ±3%

OVERSHOOT: ±5% PULSE AMPLITUDE
DROOP: +2% PULSE AMPLITUDE
BACKSWING: ±5% PULSE AMPLITUDE

4.4.2.4.3.1.5 WRITE SEQUENCE PATTERN. BIPOLAR WRITE SEQUENCE PER FIGURE 3.

4.4.2.4.3.2 MEASUREMENTS.

4.4.2.4.3.2.1 DV_1. TEST CONDITIONS PER SECTION 4.4.2.4.3.1, TEST SEQUENCE PER FIGURE 8. READ DV_1 IN STEP 9 OF FIGURE 8.

4.4.2.4.3.2.2 DV_2. TEST CONDITIONS PER SECTION 4.4.2.4.3.1, TEST SEQUENCE PER FIGURE 9. READ DV_2 IN STEP 7 OF FIGURE 9.

DWG. NO. 7903591

SIZE	CODE IDENT	DWG NO.
C	90536	7903591

SCALE NONE | FORM 1 | REV. T | SHEET 4

4.5 VENDOR RELIABILITY PROGRAM. THE VENDOR SHALL PREPARE AND SUBMIT TO UNIVAC A RELIABILITY PROGRAM PLAN WHICH WILL DESCRIBE HOW THE VENDOR INTENDS TO ASSURE THAT PARTS SHIPPED WILL CONSISTENTLY MEET THE REQUIREMENTS OF THIS DRAWING. THE TOPICS DISCUSSED SHALL INCLUDE, AS A MINIMUM, THE ITEMS DESCRIBED IN THE FOLLOWING PARAGRAPHS. THE REPORT SHALL ALSO INCLUDE THE STANDARD OPERATING PRACTICES OF THE VENDOR. THE COMPLETED REPORT SHALL BE SUBMITTED TO UNIVAC FOR REVIEW AND/OR APPROVAL. UNIVAC SHALL REVIEW THE REPORT AND PROVIDE COMMENTS AND CORRECTIONS IF NECESSARY. A REVISED REPORT, IF REQUIRED, WILL THEN BE SUBMITTED FOR APPROVAL. UPON APPROVAL, THE PLAN BECOMES A CONTRACTUALLY BINDING DOCUMENT BETWEEN UNIVAC AND THE VENDOR. THE PLAN MUST BE APPROVED PRIOR TO SHIPMENT OF PRODUCTION PARTS TO THIS DRAWING. THE RELIABILITY PROGRAM PLAN SHALL BE A REVISION CONTROLLED DOCUMENT WITHIN THE VENDOR'S SYSTEM AND NO CHANGES TO THE PLAN SHALL BE MADE WITHOUT WRITTEN APPROVAL OF UNIVAC.

4.5.1 ORGANIZATION. THE VENDOR SHALL DESCRIBE HIS ORGANIZATIONAL STRUCTURE FOR THE DEPARTMENT INVOLVED USING AN ORGANIZATION CHART. THE NAME, JOB TITLE, AND RESPONSIBLITY OF KEY PERSONNEL WHO WILL BE WORKING ON THE PROGRAM SHALL BE INCLUDED IN THE CHART. FUNCTIONAL RELATIONSHIPS OF ADMINISTRATIVE AND MANAGEMENT PERSONNEL FOR THE DEPARTMENT INVOLVED SHALL BE INCLUDED. THE RELATIONSHIP OF RELIABILITY PERSONNEL TO MANAGEMENT, ENGINEERING, MANUFACTURING, INSPECTION, AND QUALITY SHALL BE INDICATED.

4.5.2 PROCESS IDENTIFICATION. THE VENDOR SHALL PROVIDE UNIVAC WITH A FLOW CHART AND LIST DEFINING ALL THE DESIGN, PROCESSING, INSPECTION, AND QUALITY CONTROL DOCUMENTATION IMPOSED IN THE MANUFACTURE OF MATERIAL TO THIS DRAWING. ALL PROCEDURES, PROCESS SPECIFICATIONS, MATERIAL SPECIFICATIONS, INSPECTION PROCEDURES, AND DESIGN DRAWINGS SHALL BE IDENTIFIED BY THE CONTROLLING DOCUMENT NUMBER, REVISION LETTER OR NUMBER, AND DATE OF REVISION. NO CHANGES TO THIS "BASELINE" SHALL BE MADE WITHOUT THE EXPRESS WRITTEN APPROVAL OF UNIVAC.

4.5.3 PROCESS AND DESIGN CONTROL SYSTEM. THE METHOD USED BY THE VENDOR TO CONTROL HIS PROCESS AND DESIGN DOCUMENTATION AND IMPLEMENTATION SHALL BE DESCRIBED. PROVISION SHALL BE MADE FOR UNIVAC TO REVIEW PROPOSED CHANGES TO THE BASELINED DOCUMENTS. NO CHANGES SHALL BE MADE TO ANY OF THE BASELINED DOCUMENTS WITHOUT THE WRITTEN APPROVAL OF UNIVAC.

4.5.4 MATERIAL CONTROL SYSTEM. MATERIAL CONTROL IS REQUIRED TO ENSURE THAT PART RELIABILITY IS NOT DEGRADED DURING STORAGE AND HANDLING. THE VENDOR SHALL DESCRIBE THE MATERIAL CONTROLS EMPLOYED IN HIS FACILITY. PROCEDURES FOLLOWED AND CONTROLLING DOCUMENTATION EMPLOYED SHALL BE INCLUDED.

4.5.5 RECEIVING INSPECTION. THE VENDOR SHALL DESCRIBE HIS RECEIVING INSPECTION PROCEDURES AND THE DOCUMENTATION USED FOR ACCEPTANCE OF RAW MATERIAL AND PIECE PARTS FOR USE IN THE DELIVERABLE PRODUCT.

4.5.6 WORKMANSHIP STANDARDS. THE VENDOR SHALL DESCRIBE THE WORKMANSHIP STANDARDS EMPLOYED IN HIS PLAN DURING THE MANUFACTURE AND ACCEPTANCE OF PARTS. THE DESCRIPTION SHALL INCLUDE PRESEAL INSPECTION CRITERIA AND WORKMANSHIP STANDARD DOCUMENTS.

4.5.7 OPERATOR TRAINING. THE TECHNIQUES EMPLOYED BY THE VENDOR IN SELECTING, TRAINING, AND QUALIFYING MANUFACTURING PERSONNEL SHALL BE DESCRIBED.

4.5.8 RELIABILITY INDOCTRINATION. THE VENDOR SHALL DESCRIBE HIS RELIABILITY INDOCTRINATION USED TO FAMILIARIZE MANUFACTURING PERSONNEL WITH THE IMPACT OF THEIR PERFORMANCE ON THE COUNTRY'S DEFENSE SYSTEM.

4.5.9 FAILURE ANALYSIS AND CORRECTIVE ACTIONS. THE VENDOR SHALL DESCRIBE HIS FAILURE ANALYSIS PROGRAM, THE METHOD OF FAILURE REPORTING, AND THE METHOD OF PROGRAM IMPLEMENTATION. DOCUMENTATION USED SHALL BE INCLUDED IN THE DESCRIPTION. THE FEEDBACK LOOP FOR INCORPORATING CORRECTIVE ACTIONS SHALL ALSO BE DESCRIBED. UNIVAC SHALL BE ADVISED OF PLANNED CORRECTIVE ACTIONS PRIOR TO THEIR IMPLEMENTATION.

4.5.10 RELIABILITY TESTING. THE TYPE OF RELIABILITY TESTING PERFORMED BY THE VENDOR TO ESTABLISH FAILURE RATES AND TO DETERMINE FAILURE MODES SHALL BE OUTLINED. A COPY OF THE VENDOR'S MOST RECENT REPORT OF FAILURE RATES AND SEARCH-FOR-FAILURE MODE TESTING SHALL BE INCLUDED. IN ADDITION, THE VENDOR'S PROPOSED PROGRAM FOR THE NEXT YEAR, IF DIFFERENT, SHALL BE DEFINED.

4.6 MONITORING AND REPORTING. UNIVAC WILL MONITOR THE VENDOR'S PROGRAM BY MONTHLY STATUS REPORTS WHICH WILL BE REQUIRED IN A FORMAT AGREED UPON BY UNIVAC AND THE VENDOR. A PHONE CALL WILL SUFFICE FOR A NORMAL REPORT UPDATE BUT WRITTEN REPORTS AND PERIODIC TECHNICAL INTERCHANGE MEETINGS (TI MEETINGS) MAY BE USED AS REQUIRED. SHOULD A STATUS REPORT REVEAL A PROBLEM REQUIRING FURTHER EFFORT, WRITTEN REPORTS AND FOLLOW UP ACTIONS MAY BE REQUESTED BY UNIVAC. IF REQUIRED, SURVEILLANCE BY UNIVAC QUALITY CONTROL WILL BE INITIATED. FREE ACCESS TO ALL PRODUCTION AREAS SHALL BE AFFORDED UNIVAC REPRESENTATIVES AND GOVERNMENT REPRESENTATIVES ASSIGNED TO MONITOR UNIVAC EQUIPMENT.

5. PACKAGING. THE WIRES SHALL BE PACKAGED TO PREVENT CONTACT WITH OTHER WIRES WITHOUT AT THE SAME TIME STRAINING THE WIRE OR SCRATCHING THE WIRE SURFACE IN ANY WAY. THE SHIPPING CONTAINER MUST BE APPROVED BY UNIVAC. THE PACKING SLIP WILL IDENTIFY THE CONTENTS OF EACH SHIPPING CONTAINER, NAMELY THE BATCH NUMBER AND THE NUMBER OF CTF'S WITHIN EACH BATCH.

6. NOTES.

6.1 IDENTIFICATION NUMBER: 7903591-00

REVISIONS				
LTR	DESCRIPTION	CHK	DATE	APPROVED

6.2 APPROVED SOURCE(S) OF SUPPLY.

ONLY THE ITEM(S) LISTED ON THIS DRAWING WHEN PROCURED FROM THE VENDOR(S) LISTED HEREON IS APPROVED BY UNIVAC DIVISION FOR USE IN UNIVAC DESIGNED EQUIPMENT. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY UNIVAC DIVISION OR BY THE COGNIZANT PROCURING ACTIVITY.

TYPE A WIRE

UNIVAC BRISTOL (98100),
DIVISION OF SPERRY RAND CORP.
FARRAGUT RD.
BRISTOL, TENNESSEE 37620
PART NUMBER: 2501227-02

UNIVAC (90536)
DIVISION OF SPERRY RAND CORP.
P.O. BOX 3525
UNIVAC PARK
ST. PAUL, MINNESOTA 55165
PART NUMBER: 7903591-00

TYPE B WIRE

UNIVAC BRISTOL (98100)
DIVISION OF SPERRY RAND CORP.
FARRAGUT RD.
BRISTOL, TENNESSEE 37620
PART NUMBER: 2790035-00

DWG. NO. 7903591

SIZE	CODE IDENT	DWG NO.
C	90536	7903591
SCALE NONE	FORM 1	REV. T SHEET 5

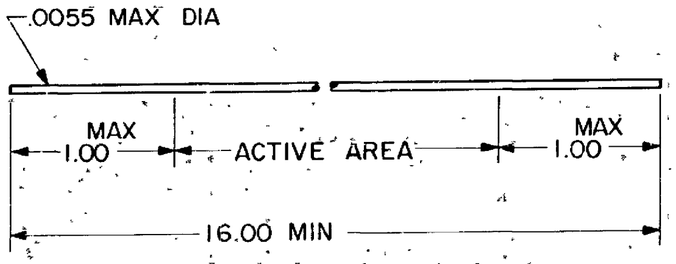
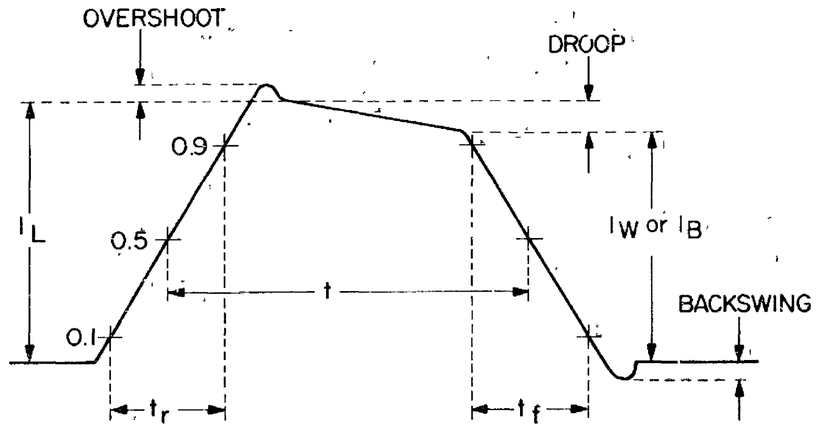


FIGURE 1

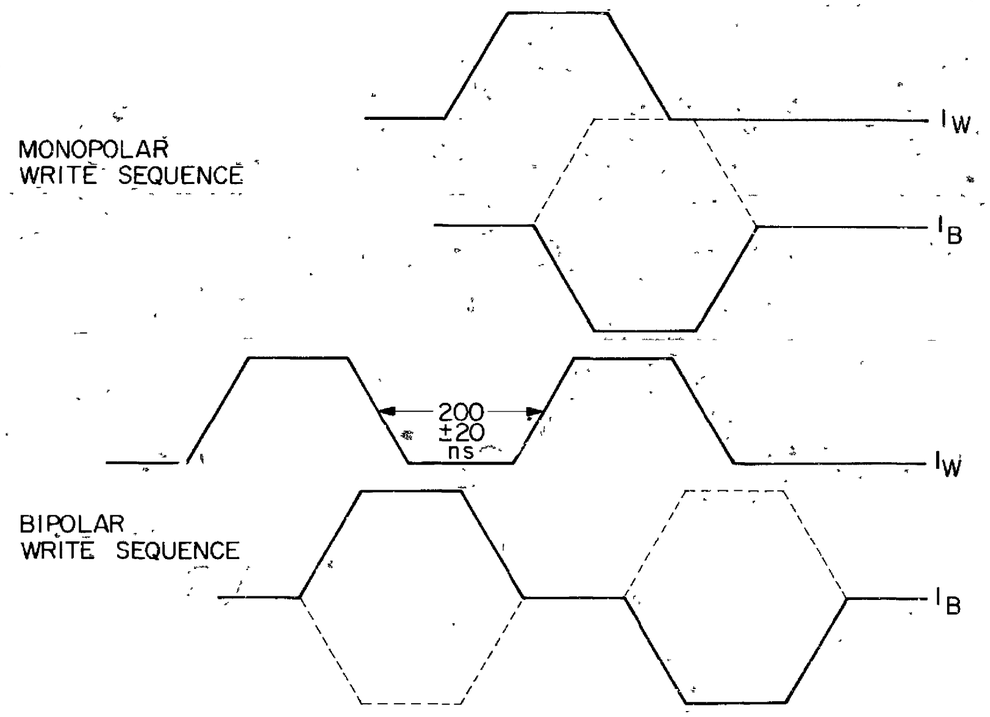


NOTES:

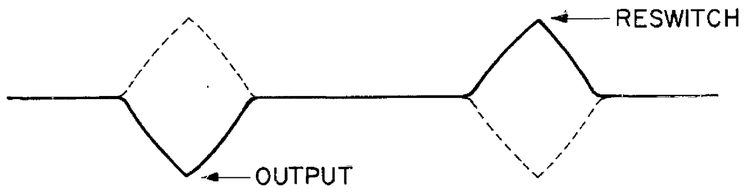
1. CURRENT PULSE DESIGNATIONS:
   - I_L - LEADING EDGE AMPLITUDE OBTAINED BY EXTENDING THE DROOP CHARACTERISTIC LINE, WITHOUT THE EFFECTS OF RESONANCE, UNTIL IT INTERSECTS THE LEADING EDGE, OR AN EXTENSION OF THE LEADING EDGE IF CURVATURE IS NOTICEABLE IN THIS REGION.
   - I_W - WORD CURRENT: AMPLITUDE OBTAINED BY EXTENDING THE DROOP CHARACTERISTIC LINE WITHOUT THE EFFECTS OF THE RESONANCE UNTIL IT INTERSECTS AN EXTENSION OF THE TRAILING EDGE.
   - I_B - BIT CURRENT AMPLITUDE OBTAINED BY EXTENDING THE DROOP CHARACTERISTIC LINE WITHOUT THE EFFECTS OF THE RESONANCE UNTIL IT INTERSECTS AN EXTENSION OF THE TRAILING EDGE.
   - I_{B_W} - NOMINAL BIT CURRENT AMPLITUDE DURING A WRITE SEQUENCE.
   - I_{B_H} - NOMINAL BIT CURRENT AMPLITUDE DURING A HISTORY OR A DISTURB SEQUENCE.
   - t_r - RISE TIME; THE TIME REQUIRED FOR THE CURRENT TO RISE FROM 10% TO 90% OF I_L.
   - t_f - FALL TIME; THE TIME REQUIRED FOR THE CURRENT TO FALL FROM 90% TO 10% OF I_W.
   - t - PULSE WIDTH; PULSE WIDTH MEASURED AT 50% I_W OR I_B.
   - t_{ov} - THE TIME INTERVAL DURING WHICH BOTH PULSES OVERLAP AND BOTH ARE ABOVE THE 50% LEVEL.
   - OVERSHOOT - THE AMPLITUDE BY WHICH THE FIRST CYCLE OF OSCILLATION AT THE TOP OF THE PULSE EXCEEDS I_L.
   - BACKSWING - THE AMPLITUDE OF THE FIRST CYCLE OF OSCILLATION AT THE END OF THE PULSE.
   - DROOP - THE LOSS IN AMPLITUDE OF THE PULSE BETWEEN THE LEADING EDGE AND THE TRAILING EDGE.

CURRENT PULSE SHAPES
FIGURE 2

LTR	DESCRIPTION	CHK	DATE	APPROVED



WRITE SEQUENCE PULSE PATTERNS
FIGURE 3



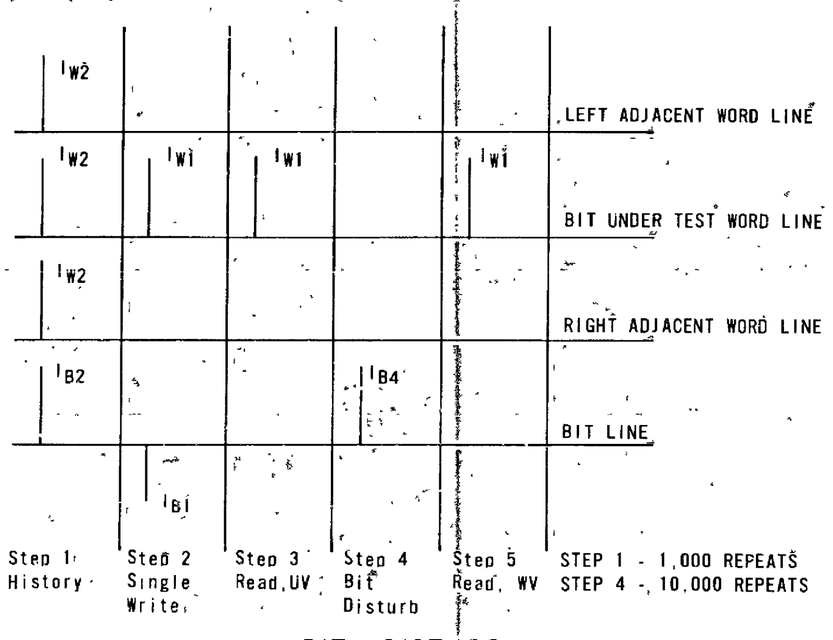
VOLTAGE OUTPUT SIGNAL SHAPE
FIGURE 4

DWG. NO. 7903591

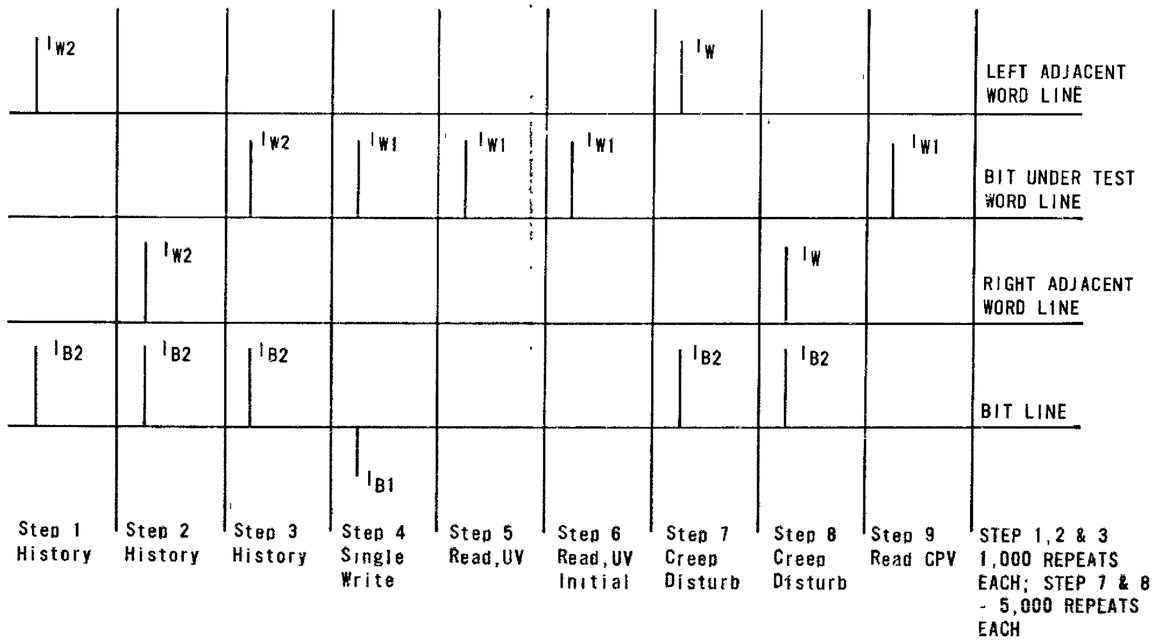
SIZE	CODE IDENT	DWG NO.
C	90536	7903591

SCALE NONE | FORM 1 | REV T | SHEET 8

REVISIONS				
LTR	DESCRIPTION	CHK	DATE	APPROVED



BIT DISTURB
FIGURE 5



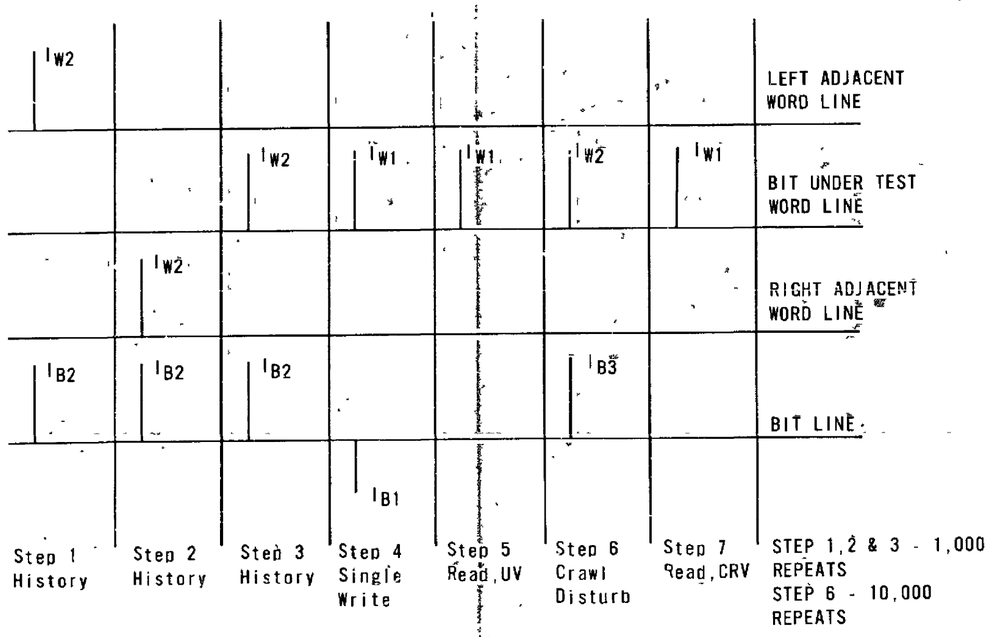
READ UV AND CREEP DISTURB
FIGURE 6

DWG. NO. 7903591

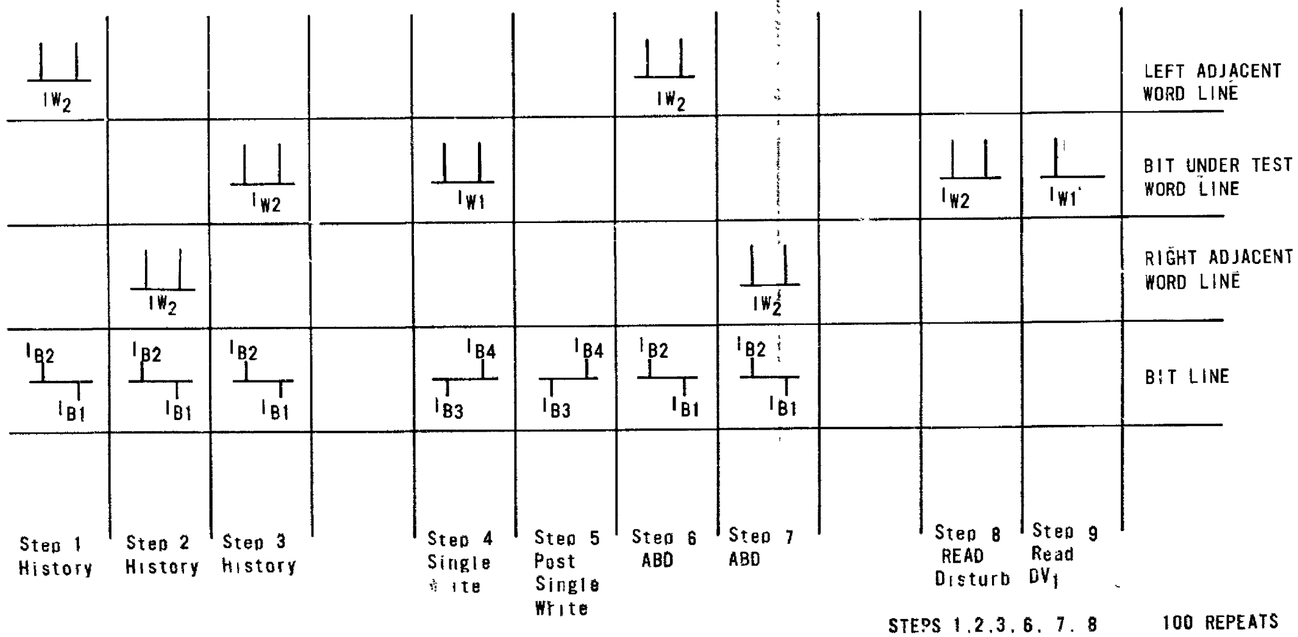
SIZE	CODE IDENT	DWG NO.
C	90536	7903591

SCALE NONE FORM 1 REV T SHEET 7

LTR	DESCRIPTION	CHK	DATE	APPROVED



CRAWL DISTURB
FIGURE 7



INTERLEAVED DISTURB TEST
FIGURE 8

STEPS 1,2,3,6, 7, 8 — 100 REPEATS
STEP 5 — 128 REPEATS
STEPS 6 THRU 8 — REPEATED 127 TIMES

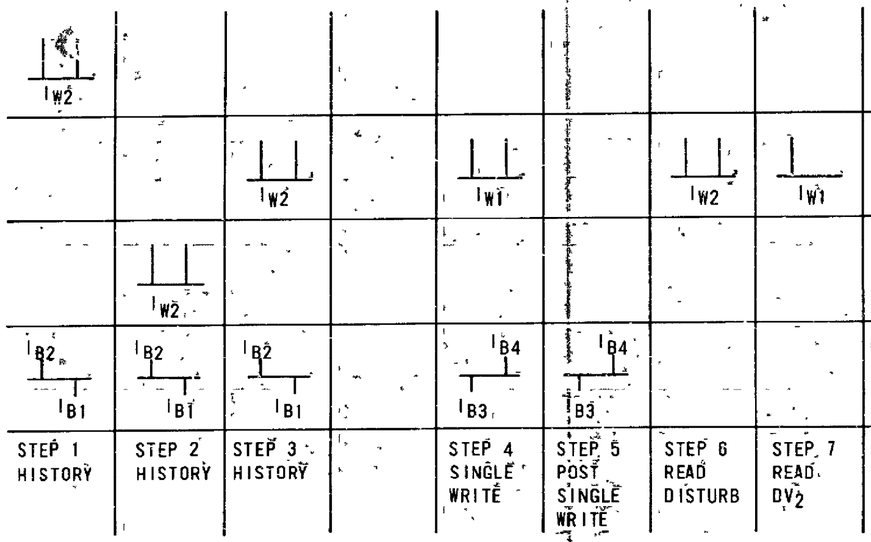
NOTE: TOLERANCE ON NUMBER OF REPEATS: ±5%.

DWG. NO. 7903591

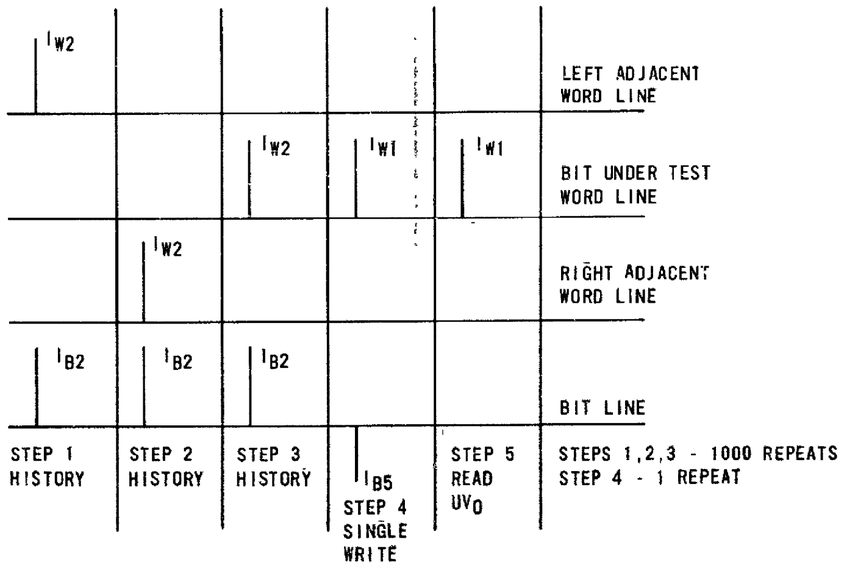
SIZE	CODE IDENT	DWG NO.
C	20536	7903591

SCALE NONE | FORM 1 | REV. T | SHEET 8

REVISIONS				
LTR	DESCRIPTION	CHK	DATE	APPROVED



WORD DISTURB TEST
FIGURE 9



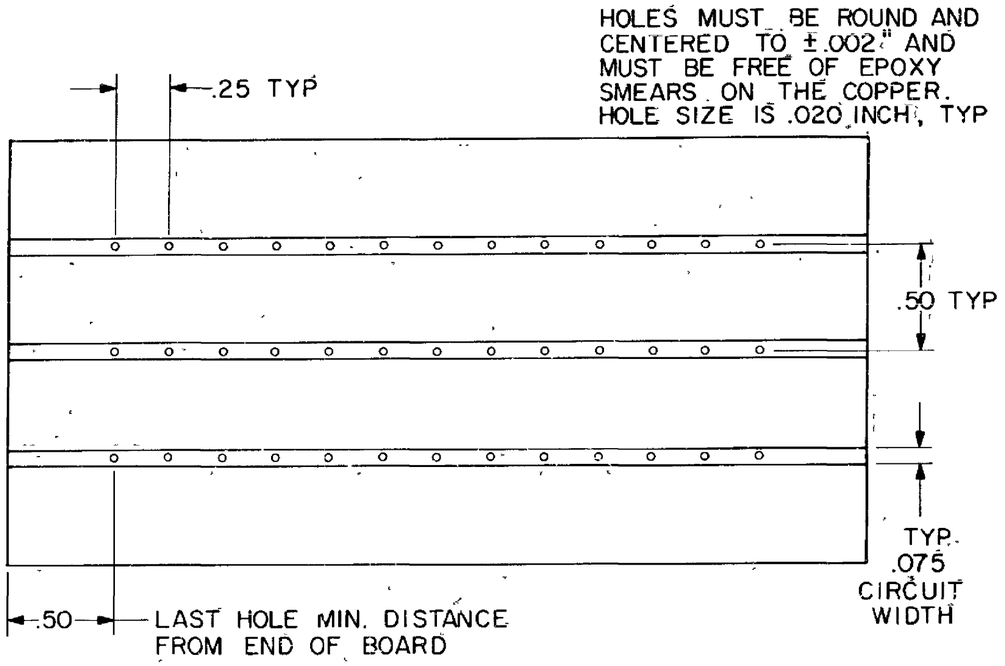
WRITE THRESHOLD TEST
FIGURE 10

DWG. NO. 7903591

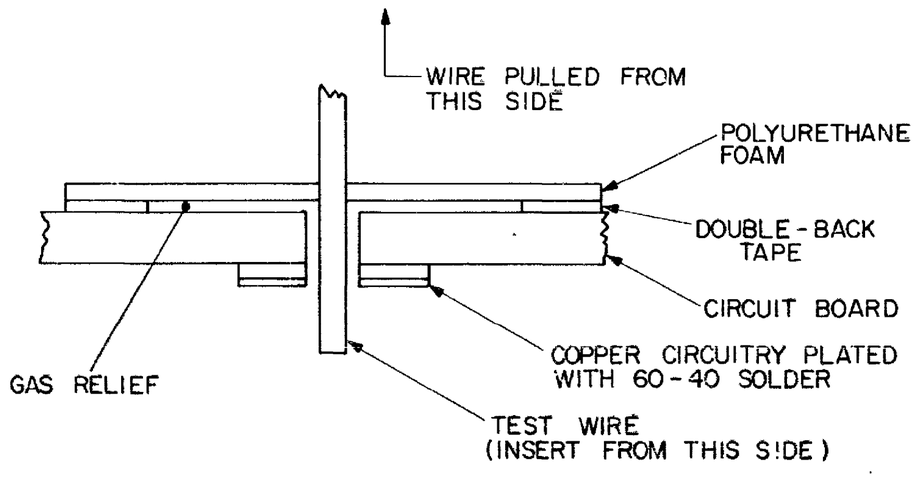
SIZE	CODE IDENT	DWG NO.
C	30536	7903591

SCALE NONE FORM 1 REV. T SHEET 9

LTR	DESCRIPTION	CHK	DATE	APPROVED



TEST BOARD PATTERN
FIGURE 11



ASSEMBLED TEST SPECIMEN
FIGURE 12

DWG. NO. 7903591

SIZE	CODE IDENT	DWG NO.
C	30536	7903591

SCALE NONE	FORM 1	REV T	SHEET 10