

NOTICE - WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY ASSUMES NO RESPONSIBILITY FOR ANY OBLIGATION WHATSOEVER, AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONFERRING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THEREBY.

REQUIREMENTS:

1. GENERAL:

- A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
- B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
- C. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 1.
 - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION:

A. MECHANICAL PROPERTIES:

- (1) SURFACE QUALITY: CORE INSIDE DIAMETER SHALL HAVE A SURFACE ROUGHNESS AS DELINEATED AND THE PART SHALL HAVE NO SHARP EDGES OR BURRS. MAX. DIA. OVER ISOLATED SURFACE IMPERFECTIONS ON-.001 CORE .252
- (2) SEALING COAT: A SUITABLE UNIFORM, HOMOGENOUS, CONTAMINANT-FREE COATING SHALL BE APPLIED TO EFFECT A SEAL CAPABLE OF WITHSTANDING THE FOLLOWING TEST (-001 ONLY SHALL BE SEALED AND TESTED)
 - (a) SUBMERGE THE CORES TO A DEPTH OF TWO INCHES MAXIMUM IN A HALF AND HALF GLYCERIN-ETHYLENE GLYCOL MIXTURE.
 - (b) APPLY A VACUUM, SUCH THAT A MERCURY COLUMN AT SEA LEVEL WILL DROP 25 INCHES, FOR 2 MINUTES MINIMUM.
 - (c) REJECT ANY UNIT THAT EXHIBITS BUBBLES.
 - (d) PERFORM A COMPLETE ELECTRICAL TEST ON UNITS AFTER THOROUGHLY WASHING IN RUNNING WATER AND ALLOWING TO DRY.

(3) ANY LOT WITH GREATER THAN FIVE (5) PERCENT REJECTION BECAUSE OF THIS TEST SHALL BE RETURNED TO THE VENDOR AND SHALL NOT BE RESUBMITTED

B. ELECTRICAL CHARACTERISTICS (MEASURED AT ROOM TEMPERATURE PER TEST METHOD BELOW, VALUES OF TABLE I OR II, AND AS DEFINED IN FIGURES 3 & 4): SET PULSE SHOULD BE 0.9±0.1 AMPERE IN AMPLITUDE AND 4±0.1 MICROSECONDS IN DURATION UNLESS OTHERWISE SPECIFIED BELOW, 100% INSPECTION IS REQUIRED UNLESS OTHERWISE SPECIFIED.

- (1) TIME TO PEAK (T_p) - MEASURED FROM START OF THE RAMP TO PEAK OF THE OUTPUT VOLTAGE. START OF THE RAMP CAN BE FOUND BY EXTENDING RAMP BACK TO CROSSING OF THE "ZERO CURRENT" AXIS.
- (2) SWITCHING TIME (T_s) - MEASURED AT 10% OF NOMINAL V₁ OUTPUT.
- (3) PEAK "ONE" OUTPUT (V₁) - MEASURED FROM ZERO TO THE PEAK OF THE OUTPUT WAVEFORM.
- (4) PEAK "ZERO" OUTPUT (V₀-V_{JIG}) - MEASURED INSTANTANEOUSLY BETWEEN INDUCED JIG VOLTAGE (V_{JIG}) AND PEAK "ZERO" VOLTAGE.
- (5) DELTA V₁ (ΔV₁): CHANGE IN PEAK "ONE" OUTPUT WHEN SET PULSE AMPLITUDE IS CHANGED FROM 0.9 AMPERE TO 4.0 AMPERE.
- (6) DELTA T_p (ΔT_p): CHANGE IN TIME TO PEAK WHEN SET PULSE AMPLITUDE IS CHANGED FROM 0.9 AMPERE TO 4.0 AMPERE.
- (7) A TEN (10) PERCENT SAMPLE OF THE LOT SHOULD BE INSPECTED TO THE REQUIREMENTS OF PARAGRAPH 2.B.5 AND 2.B.6 IN THE EVENT ANY FAILURE IS DETECTED THE ENTIRE LOT SHOULD BE INSPECTED.

C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING:

- (1) CERTIFICATE OF COMPLIANCE WITH MATERIAL AND CONSTRUCTION REQUIREMENTS.
- (2) CERTIFICATE OF COMPLIANCE WITH ND 1015404, CLASS 2.
- (3) CERTIFICATE OF COMPLIANCE WITH SEAL TEST.
- (4) EACH SHIPMENT OF CORES SHALL CONTAIN TEN (10) CORES WHICH HAVE BEEN TAGGED WITH THE NUMERICAL ELECTRICAL VALUES. THESE SAME CORES SHALL THEN BE TESTED BY THE PROCURING ACTIVITY NOTING THEIR NUMERICAL RESULTS. THE TAGS SHOULD THEN BE RETURNED TO THE VENDOR WITHIN TEN (10) DAYS FROM RECEIPT OF SHIPMENT.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

3. DESIGN:

A. OPERATING TEMPERATURE RANGE: -95°C TO +85°C.

B. CONSTRUCTION AND MATERIAL: PARTS SHALL BE A PERMALLOY TYPE RIBBON MATERIAL WOUND ON A BOBBIN, SLEEVED WITH AN INSULATING MATERIAL AND COATED EXTERNALLY WITH AN INSULATING COMPOUND TO EFFECT A HERMETIC SEAL.

- (1) BOBBIN: NON-MAGNETIC ANNEALED CORROSION-RESISTING STEEL.
- (2) CORE: 1/8 MIL NOMINAL THICKNESS NO-PERM RIBBON (OR EQUIVALENT).
- (3) SLEEVE (JACKET): .011 THICK PHENOLIC SLEEVE (OR EQUIVALENT).
- (4) CORE-.001 ONLY SHALL HAVE AN AIR SPACE OF 0.008 MINIMUM FROM THE TOP LAYER OF TAPE TO THE BOBBIN EDGE. COMPLIANCE SHALL BE CERTIFIED.

C. TEST METHOD:

(1) EQUIPMENT:

TEKTRONIX 530-340 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

A TEST UNIT CAPABLE OF SUPPLYING A "SET CURRENT" PULSE SUFFICIENT IN AMPLITUDE & DURATION TO PERFORM ALL TESTS CALLED OUT ABOVE THIS PULSE TO BE FOLLOWED BY AN ESSENTIALLY LINEAR CURRENT RAMP WHOSE SLOPE MAY BE MEASURED.

AT LEAST 5 STANDARD CORES TOGETHER WITH CALIBRATION DATA FOR EACH, SUPPLIED BY THE PROCURING AGENCY, TO BE USED FOR INSTRUMENT CALIBRATION

(2) CALIBRATION AND MEASUREMENT PROCEDURE:

EQUIPMENT SHALL BE CONNECTED TO A WELL REGULATED SUPPLY LINE AND ALLOWED TO STABILIZE FOR ONE HOUR PRIOR TO MEASUREMENT.

CALIBRATE SCOPE SWEEP WITH TIME-MARK GENERATOR.

USING THE CORE ANALYZER PLUG-IN, CALIBRATE THE VERTICAL SCOPE AMPLIFIER WITH A KNOWN VOLTAGE ± 1%. THE INTERNAL SCOPE CALIBRATOR MAY BE USED IF ITS ACCURACY HAS BEEN VERIFIED.

ADJUST THE "SET" PULSE SO THAT AMPLITUDE AND DURATION ARE 0.9±0.1 AMPERE AND 4±0.2 MICROSECONDS RESPECTIVELY.

ADJUST RAMP TO APPROXIMATELY 200, 400, OR 1000 MILLIAMPERES/MICROSECOND.

USING ONE OF THE STANDARD CORES, ADJUST THE RAMP SLOPE FOR EITHER 200, 400, OR 1000 MA/USEC AS APPROPRIATE TO YIELD THE T_p, T_s, AND V₁ VALUES SUPPLIED WITH THE STANDARD.

NOTE: WHEN CALIBRATING OR MEASURING FOR 1000 MA/USEC RAMP, DISCONNECT "SET" PULSE AND USE THE INTEGRATING CIRCUIT OF FIGURE 2.

MEASURE ELECTRICAL PARAMETERS FOR CORES UNDER TEST, IN ACCORDANCE WITH TABLES I AND II, FOR EITHER 200, 400, OR 1000 MA/USEC.

REPEAT THE CALIBRATION PROCEDURE AT LEAST EVERY HALF HOUR WHILE TESTING.

E 1006320

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	2/17/65	WR
B	REVISED PER TDRR 19194	6/24/65	WR
C	REVISED PER TDRR 21869	6/25/65	WR
D	REVISED PER TDRR 23639	11/9/65	WR
E	REVISED PER TDRR 26549	2/1/66	WR

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>T. J. ...</i> CHECKED <i>R. F. ...</i>		CORE, MAGNETIC	
DO NOT SCALE THIS DRAWING MATERIAL SEE NOTES		SPECIFICATION CONTROL DRAWING	
HEAT TREATMENT NONE		CODE IDENT NO. 80230	NASA DRAWING NO. 1006320
FINAL FINISH SEE NOTES		SIZE C	SHEET 1 OF 2
NEXT ASSY	USED ON	SCALE NONE	WT
APPLICATION			

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1006320 E

REVISIONS 15327			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16365	3/17/65	WHL
B	REVISED PER TDRR 19194	6/24/66	WHL
C	REVISED PER TDRR 21869	9/28/66	WHL
D	REVISED PER TDRR 23639	11/9/67	WHL
E	REVISED PER TDRR 26549	3/1/68	WHL

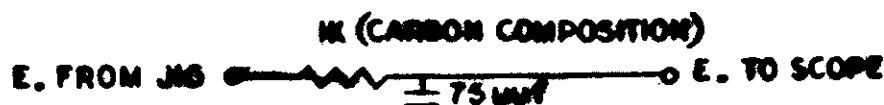


FIG 2. INTEGRATING CIRCUIT

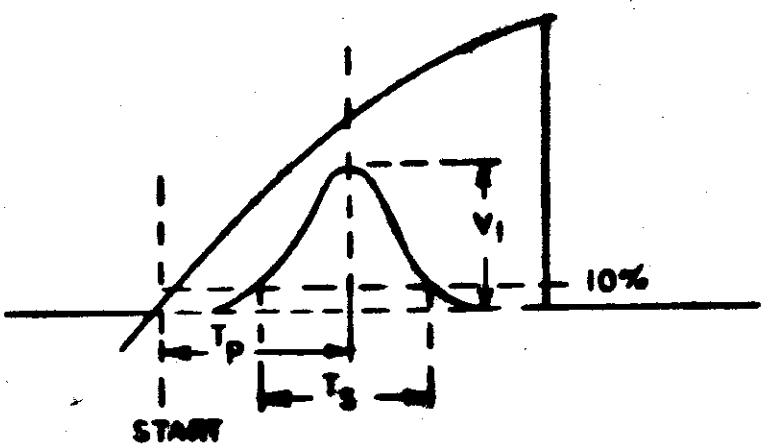


FIGURE 4

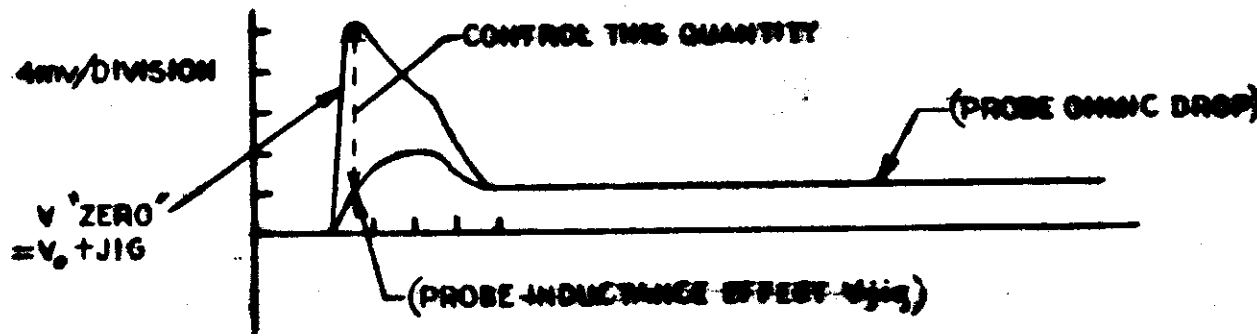


FIG 3 TYPICAL OUTPUT VOLTAGES AFTER INTEGRATION

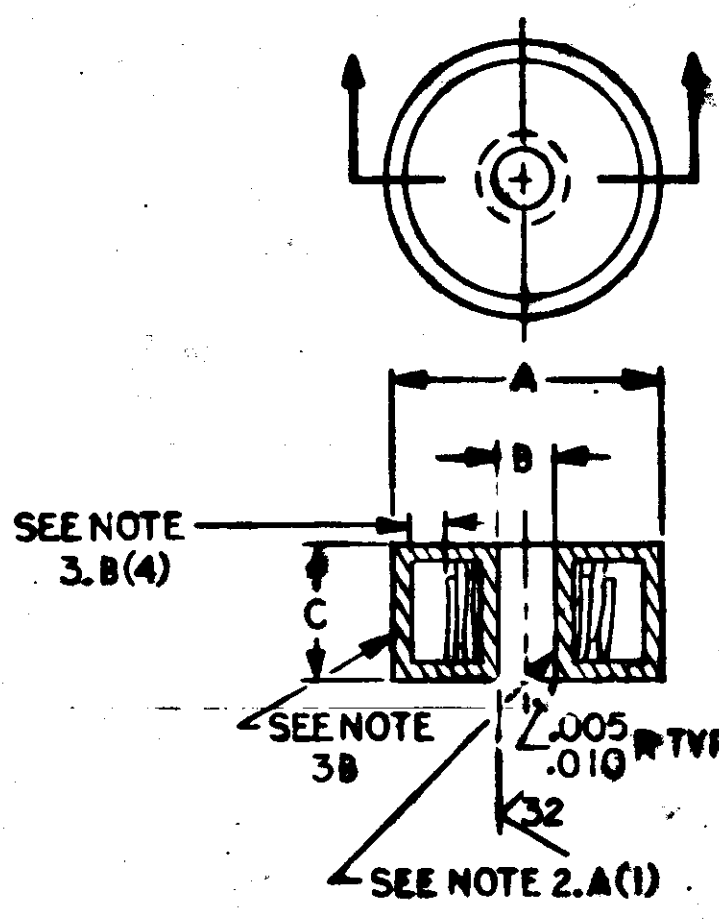


FIGURE 1

TABLE I
26 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	Tp USEC	Ts USEC	V1 MV	V1 NOM	V0 MV	Δ V1 MV	Δ Tp
200 MA USEC	2.375 MIN 2.625 MAX	1.5 MIN 2.3 MAX	215 MIN 290 MAX	240 MV	-	10 MV MAX	.10 USEC
400 MA USEC	1.4 MIN 1.6 MAX	1.3 MIN 1.6 MAX	325 MIN 430 MAX	360 MV	-	-	-
1000 MA USEC	-	-	-	-	15 MAX	-	-

TABLE II
11 MAXWELL CORE
FUNCTIONAL CHARACTERISTICS

RAMP	Tp USEC	Ts USEC	V1 MV	V1 NOM	V0 MV
200 MA USEC	2.09 MIN 2.31 MAX	1.5 MIN 2.1 MAX	100 MIN 130 MAX	110 MV	-
400 MA USEC	1.24 MIN 1.37 MAX	1.0 MIN 1.4 MAX	145 MIN 190 MAX	150 MV	-
1000 MA USEC	-	-	-	-	9 MAX

TABLE III					
DASH NUMBER	DIM A MAX	DIM B	DIM C MAX	CHARACTERISTICS	REMARKS
-001	.249 NC	.140 MIN	.105	TABLE I	SEE NOTE 2A(1)
-002	.187	.100 MIN	.075 MAX	TABLE II	

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>[Signature]</i>		CORE, MAGNETIC	
CHECKED <i>[Signature]</i>		SPECIFICATION CONTROL DRAWING	
APPROVAL <i>[Signature]</i>		NASA APPROVAL <i>[Signature]</i>	
APPROVAL <i>[Signature]</i>		MIT APPROVAL <i>[Signature]</i>	
APPROVAL <i>[Signature]</i>		MIT APPROVAL <i>[Signature]</i>	
HEAT TREATMENT NONE		CODE IDENT NO. 80230	
FINAL FINISH SEE NOTES		SIZE C	
NEXT ASSY		NASA DRAWING NO. 1006320	
USED ON		SCALE NONE	
APPLICATION		SHEET 2 OF 2	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTES
HEAT TREATMENT
NONE
FINAL FINISH
SEE NOTES

NOTED