

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 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 THERETO.

W 9929001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
H	REPLACES REV G WITH CHANGES PER TDRR 0316F	9/1/63	WJK
J	REVISED PER TDRR 03705	8/28/63	WJK
K	REVISED PER TDRR 06011	2/4/64	WJK
L	REVISED PER TDRR 13664	4/1/64	WJK
M	REVISED PER TDRR 16050	4/9/65	WJK

REQUIREMENTS:

1. GENERAL:

- A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
- B. THESE CAPACITORS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-26655 /2B FOR STYLE CS-13, WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED IN THIS DRAWING.
- C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS IN ND 1015404, CLASS 2. PERIODIC INSPECTIONS MAY BE SATISFIED BY THE SUBMISSION AND ACCEPTANCE OF CERTIFIED TEST DATA FOR PURCHASED PRODUCTION LOTS.
- D. CAPACITORS SHALL BE PACKAGED IN ACCORDANCE WITH SUPPLIERS NORMAL COMMERCIAL PRACTICE PER LEVEL C AS DEFINED IN MIL-C-26655.

2. INSPECTION AND ACCEPTANCE:

- A. MECHANICAL DIMENSIONS AND TOLERANCES PER DRAWING.
- B. LEAD MATERIAL SHALL BE NICKEL IN ACCORDANCE WITH ND PS 1015400.
- C. EACH CAPACITOR SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURERS NAME AND/OR SYMBOL, TYPE NUMBER, CAPACITANCE VALUE AND TOLERANCE, VOLTAGE RATING AND POLARITY. EACH UNIT PACKAGE AND SHIPPING CONTAINER SHALL ALSO INCLUDE THE NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER PER MIL-STD-129.
- D. ALL PARTS SHALL BE SERIALIZED. PARTS WHICH HAVE FAILED NEED NOT BE FORWARDED.

E. ELECTRICAL REQUIREMENTS: @ 25°C

- (1) CAPACITANCE VALUE PER TABLE
- (2) DISSIPATION FACTOR 6% MAXIMUM FOR VOLTAGE OF 15 VDC OR LESS. 4% MAX. FOR ALL OTHER VOLTAGE RATINGS.
- (3) LEAKAGE CURRENT: PER TABLE I

F. UNITS SHALL BE SUPPLIED FROM A PRODUCT LINE WHICH IS CONTINUOUSLY MONITORED FOR AND EXHIBITS A FAILURE RATE OF LESS THAN 0.15% PER THOUSAND HOURS AT A 60% CONFIDENCE LEVEL WHEN PLACED ON LIFE TEST UNDER THE FOLLOWING CONDITIONS:

- (1) TEMPERATURE: 85°C
- (2) VOLTAGE: FULL RATED VOLTAGE
- (3) SERIES RESISTANCE (EXTERNAL): 10 OHMS, 1/10 WATT, FUSIBLE
- (4) POWER SUPPLY: 25 AMPERES FOR 1 MINUTE CAPABILITY.

FAILURE RATE DATA FROM A PRODUCT LINE WHOSE ONLY DIFFERENCES ARE:

- (a) THE TYPE OF INSULATION SLEEVING OR (b) LEAD MATERIAL WILL BE ACCEPTABLE FOR THIS REQUIREMENT.

3. DESIGN REQUIREMENTS:

- A. UNITS SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-C-26655. FOR CONSTRUCTION AND ENVIRONMENT.
- B. OPERATING TEMPERATURE RANGE: -55°C TO +85°C AT FULL RATED VOLTAGE; DERATED TO 2/3 RATED VOLTAGE AT +125°C.
- C. SURGE VOLTAGE: 130% OF RATED VOLTAGE.
- D. STABILITY AT HIGH AND LOW TEMPERATURE: CAPACITANCE SHALL CHANGE FROM 25°C VALUE BY NO MORE THAN -15% AT -55°C AND BY NO MORE THAN +15% AT +85°C.
- E. LEAD BEND AND PULL TEST (DESTRUCTIVE):
 - (1) LEADS SHALL WITHSTAND A 4 POUND AXIAL PULL MINIMUM WITHOUT IMPAIRMENT OF PERFORMANCE.
 - (2) LEADS SHALL WITHSTAND THE BEND TEST AS SPECIFIED IN MIL-C-26655 EXCEPT THE WEIGHT SHALL BE 2 POUNDS.

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

NOTE:

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON
		FRACTIONS DECIMALS ANGLES
		± ± ±
		DO NOT SCALE THIS DRAWING
		MATERIAL
		SEE NOTES
		HEAT TREATMENT
		FINAL FINISH
NEXT ASSY	USED ON	
APPLICATION		

4. SPECIAL CONDITIONING BY SUPPLIER: (100%)

- A. ALL UNITS SHALL BE X-RAYED PER MIL-STD-202, METHOD 209, PERPENDICULAR TO THE MAJOR AXIS OF THE CAPACITOR. ALL X-RAYS SHALL BE INSPECTED FOR LOOSE SOLDER PARTICLES, INADEQUATE ANODE ANCHORAGE, OR POOR ALIGNMENT.
- B. BURN-IN: EACH UNIT SHALL BE CONNECTED IN SERIES WITH A 3 OHM RESISTOR AND A ONE AMP FUSE. UNITS SHALL BE TESTED AT RATED VOLTAGE AT +125°C FOR A MINIMUM OF 250 HOURS. ALL UNITS WHICH HAVE A BLOWN FUSE OR WHICH ARE OUTSIDE OF ALLOWABLE TOLERANCE FOR CAPACITANCE, DISSIPATION FACTOR, OR LEAKAGE CURRENT WHEN TESTED AT 25°C ON COMPLETION OF BURN-IN SHALL BE DISCARDED.
- C. EQUIVALENT SERIES RESISTANCE AT 25°C: UNITS SPECIFIED IN TABLE III SHALL BE SCREENED FOR MAXIMUM ESR BY PLACING UNITS IN TEST CIRCUIT AND CALCULATING ESR BY THE FORMULA:

$$ESR = \frac{E_{C1} R_1}{E_{R1}} \left[\frac{E_{R1}^2 + E_{C1}^2 - E_A^2}{2 E_{R1} E_{C1}} \right]$$

WHERE

- E_{C1} = AC COMPONENT ACROSS C_1 (RMS)
- E_{R1} = AC COMPONENT ACROSS R_1 (RMS)
- E_A = AC VOLTAGE APPLIED (RMS)
- R_1 = VALUE FROM TABLE I

5. VENDOR SUPPLIED DOCUMENTATION:

- A. CERTIFICATE OF COMPLIANCE WITH PS1015400.
- B. BEFORE-AND-AFTER BURN-IN READINGS FOR
 - (1) CAPACITANCE
 - (2) DISSIPATION FACTOR
 - (3) LEAKAGE CURRENT
- C. X-RAY NEGATIVES OF SHIPPED PARTS.
- D. TEST DATA TO SUBSTANTIATE REQUIRED FAILURE RATE.
- E. CERTIFICATE OF COMPLIANCE SHOULD CONTAIN THE FOLLOWING INFORMATION
 - (1) PURCHASE ORDER NUMBER
 - (2) NASA PART NUMBER
 - (3) QUANTITY AND DATE OF SHIPMENT
 - (4) ANY REFERENCED SPECIFICATION REQUIRED TO BE CERTIFIED BY THIS DRAWING OR PURCHASE ORDER

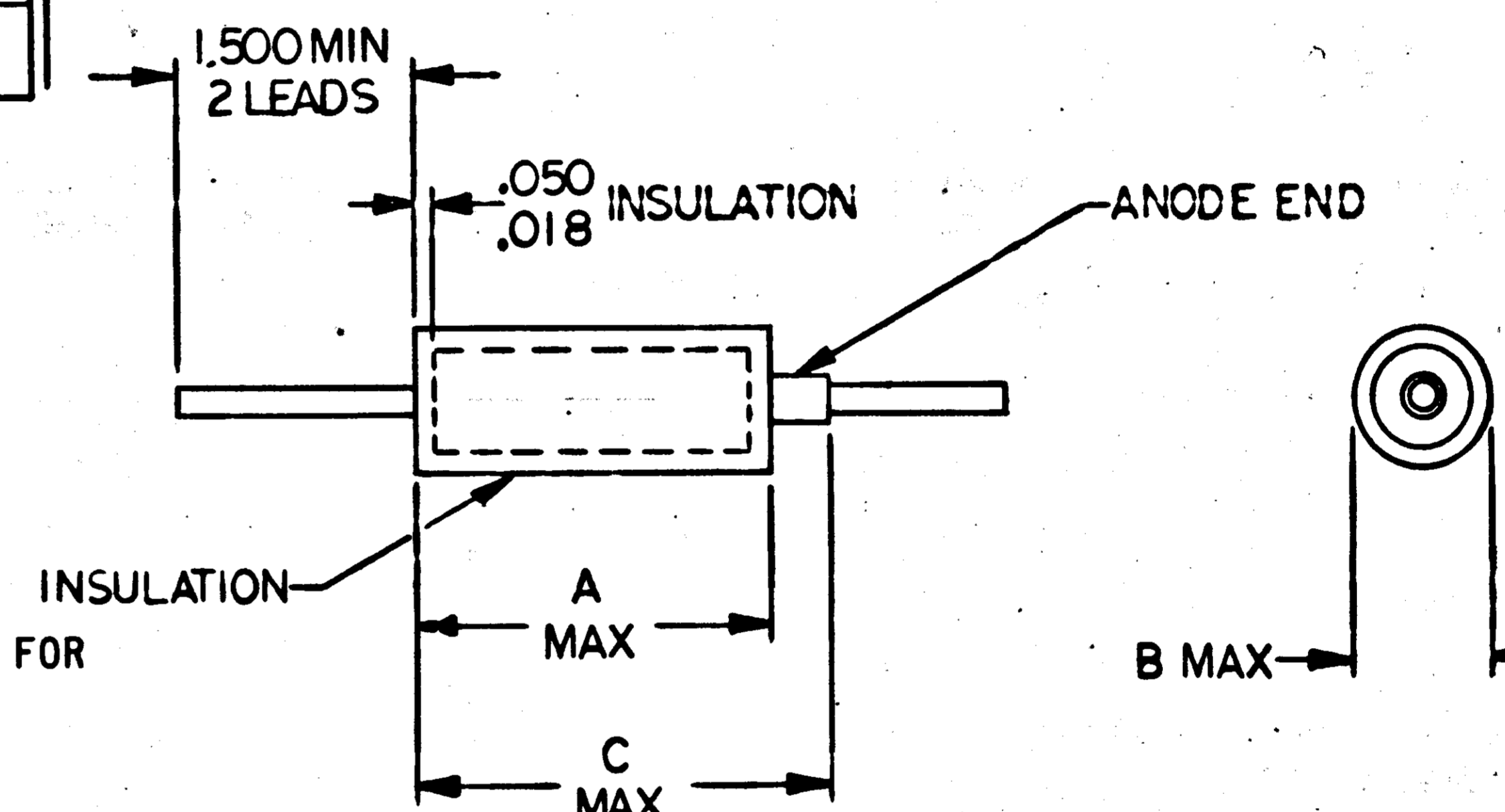


TABLE I

CASE SIZE	NOMINAL LEAD SIZE	DIMENSIONS		
		A	B	C
A	NO. 24 AWG.	.784	.151	.422
B	(.020 DIA)	.572	.201	.610
C	NO. 22 AWG	.784	.305	.822
D	(.025 DIA)	.884	.367	.982

Ⓜ REPLACES REV G WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIN NO
LIST OF MATERIALS			
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DRAWN <i>R. Kagan</i> DATE <i>6 Sept 63</i>		CAPACITOR FIXED, ELECTROLYTIC SOLID TANTALUM SPECIFICATION CONTROL DRAWING	
CHECKED <i>W. J. Hall</i> DATE <i>16 Sept 63</i>			
APPROVAL <i>Edwin C. Hall</i> DATE <i>17 Sept 63</i>		CODE IDENT NO.	NASA DRAWING NO.
NASA APPROVAL <i>John D. ...</i>		SIZE C	1006755
MIT APPROVAL <i>L. N. ...</i> DATE <i>9/17/63</i>		SCALE NONE	WT
			SHEET 1 OF 2

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1006755

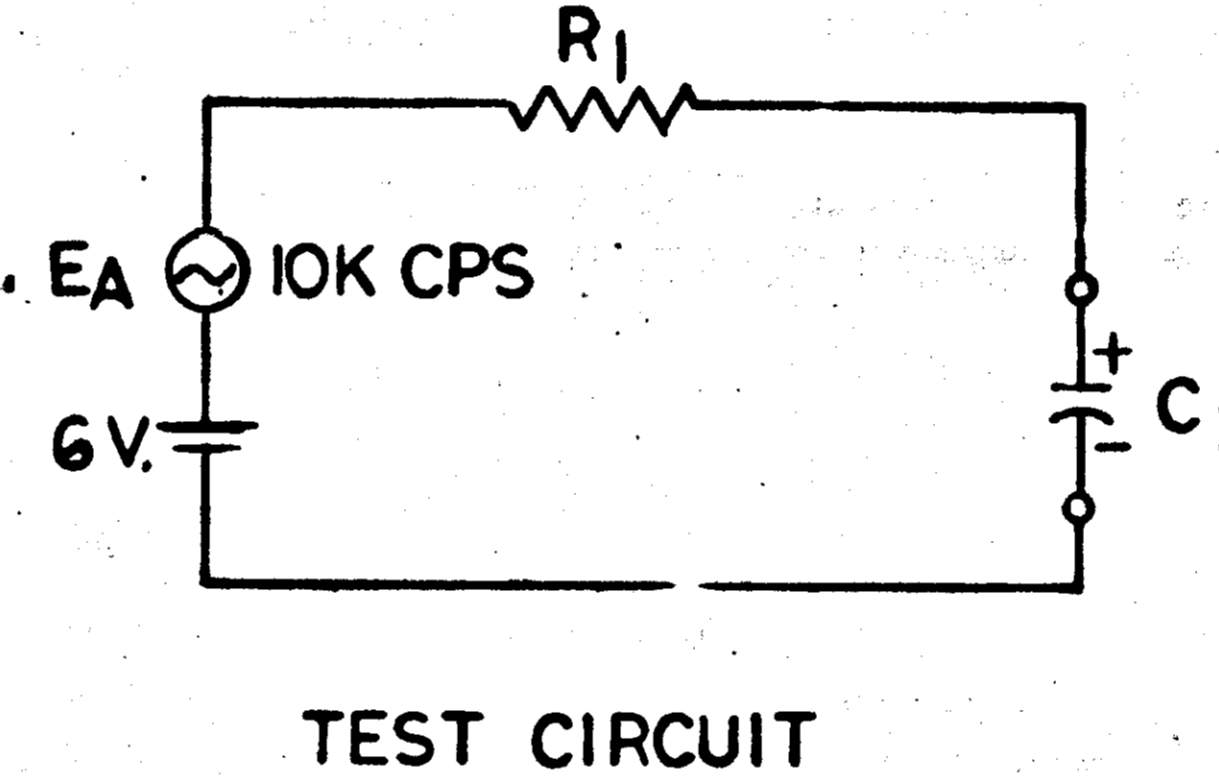
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
E	REPLACES REV D WITH CHANGES PER TDRR 01161	8/19/63	WKC
F	REVISED PER TDRR 01560	12 Jan 63	P.C.B.
H	REVISED PER TDRR 03168	9/17/63	SWR
J	REVISED PER TDRR 03705	8/28/63	WKC
K	REVISED PER TDRR 06011	2/4/64	RPE WKC
L	REVISED PER TDRR 13664	4/20/64	WKC
M	REVISED PER TDRR 16050	2/16/64	WKC

TABLE II
RATED CONTINUOUS DC VOLTAGE AT 25°C

CAP VALUE UF ±10%	RATED CONTINUOUS DC VOLTAGE AT 25°C																	
	6 VDC			10 VDC			15 VDC			20 VDC			35 VDC			50 VDC		
	DASH NO.	I _L	S _C	DASH NO.	I _L	S _C	DASH NO.	I _L	S _C	DASH NO.	I _L	S _C	DASH NO.	I _L	S _C	DASH NO.	I _L	S _C
.0047													- 41	.6	A	- 90	0.1	A
.0056													- 42	.6	A	- 91	0.1	A
.0068													- 43	.6	A	- 92	0.1	A
.0082													- 44	.6	A	- 93	0.1	A
.010													- 45	.6	A	- 94	0.1	A
.012													- 46	.6	A	- 95	0.1	A
.015													- 47	.6	A	- 96	0.1	A
.018													- 48	.6	A	- 97	0.1	A
.022													- 49	.6	A	- 98	0.1	A
.027													- 50	.6	A	- 99	0.1	A
.033													- 51	.6	A	- 100	0.1	A
.039													- 52	.6	A	- 101	0.1	A
.047													- 53	.6	A	- 102	0.1	A
.056													- 54	.6	A	- 103	0.1	A
.068													- 55	.6	A	- 104	0.1	A
.082													- 56	.6	A	- 105	0.1	A
.10													- 57	.6	A	- 106	1.0	A
.12													- 58	.6	A	- 107	1.0	A
.15													- 59	.6	A	- 108	1.0	A
.18													- 60	.6	A	- 109	1.0	A
.22													- 61	.6	A	- 110	1.0	A
.27													- 62	.6	A	- 111	1.0	A
.33													- 63	.6	A	- 112	1.0	A
.39													- 64	.6	A	- 113	1.0	A
.47													- 65	.6	A	- 114	1.0	A
.56													- 66	.6	A	- 115	1.0	A
.68													- 67	.6	A	- 116	2	A
.82													- 68	.6	A	- 117	2	A
1.0													- 69	.6	A	- 118	2	A
1.2									- 26	.6	A		- 70	.6	B	- 119	2	B
1.5									- 27	.6	A		- 71	.8	B	- 120	2	B
1.8									- 28	.6	A		- 72	1	B	- 121	2	B
2.2									- 29	.7	A		- 73	1.2	B	- 122	2	B
2.7													- 74	1.4	B	- 123	2	B
3.3													- 75	1.7	B	- 124	2	B
3.9													- 76	2	B	- 125	2	B
4.7													- 77	2.5	B	- 126	3	B
5.6	- 1	.6	A										- 78	3	B	- 127	3	C
6.8	- 2	.6	A										- 79	3.5	B	- 128	3	C
8.2													- 80	3.5	C	- 129	3	C
10													- 81	4	C	- 130	3	C
12													- 82	4	C	- 131	3	C
15													- 83	4	B	- 132	6	C
18													- 84	4	B	- 133	6	C
22													- 85	5	B	- 134	6	D
27													- 86	5	C			D
33													- 87	5	C			D
39													- 88	6	C			D
47	- 3	4	B										- 89	7	C			D
56	- 4	5	B										- 36	7	C			D
68													- 37	8.5	D			D
82													- 38	10	D			D
100													- 39	12	D			D
120													- 40	15	D			D
150	- 5	9	C															
180	- 6	11	C															
220																		
270	- 7	16	D															
330	- 8	20	D															

* I_L = MAX LEAKAGE CURRENT AT 25°C IN MICROAMPERES
**S_C = CASE LEAKAGE - SEE TABLE I

TABLE III			
C1	R1	ER1	ESR, MAX
1006755-134	1Ω ± 1%	1.0 VRMS	0.5Ω
1006755-128	5Ω ± 1%	0.5 VRMS	1.0Ω
1006755-118	15Ω ± 1%	1.5 VRMS	5.0Ω



ⓔ REPLACES REV D WITH CHANGES

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 C. de C. H. P. DATE 2 MAR 63		CAPACITOR, FIXED, ELECTROLYTIC, SOLID TANTALUM	
CHECKED D. M. S. DATE 5 MAR 63			
APPROVAL		SPECIFICATION CONTROL DRAWING	
MATERIAL SEE NOTES		CODE IDENT NO. SIZE	
HEAT TREATMENT		NASA APPROVAL Jack B. ...	
FINAL FINISH		NASA DRAWING NO. 1006755	
NEXT ASSY	USED ON	SCALE NONE	WT
APPLICATION		SHEET 2 OF 2	