APOLLO G&N Specification
PS 2003027 Rev. C
Original Issue Date: 6-1-66
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Class A Release

PROCUREMENT SPECIFICATION

PRODUCT CONFIGURATION AND ACCEPTANCE TEST REQUIREMENTS

STRAND SELECT MODULE

DRAWING NUMBER 2003027

Record of Revisions

	Date	Revision Letter	TDRR No.	Pages Revised	Approvals MIT	Approvals NASA
(M)	9/1/66	A	30874	1, 7		
(M)	1/5/67	B	32547	1,2,12,13,&14		
(M)		C	33041	1, 6		

This specification consists of pages 1 to 14 inclusive.

APPROVALS	C. METZGER NASA/MSC	EC Hall 6/1/66	6-1-66 6/23/66	RAY

1. SCOPE

This specification establishes the detail requirements for complete identification and acceptance of the Strand Select Module, part number 2003027-021.

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein.

2.1 EFFECTIVE ISSUES. Unless otherwise specified herein, Military and Government Standards and specifications shall be the issue in effect on the date of request for proposal or invitation to bid.

SPECIFICATIONS

APOLLO G&N

ND 1002214	General Specification, for Preservation, Packaging, Packing and Container Marking of APOLLO Guidance and Navigation Major Assemblies, Assemblies, Subassemblies, Parts and Associated Ground Support Equipment.

DRAWINGS

APOLLO G&N

2003027	Strand Select Module Assembly

(Copies of specifications, standards, drawings, bulletins and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer).

2.2 CONFLICTING REQUIREMENTS. In the event of conflict between the requirements of the contract, this specification and the documents listed in this section, the following order of precedence shall apply and the contractor shall notify MIT APOLLO Management of the conflict as soon as it is determined.

a. The contract

b. This Specification

c. Documents listed in this section

3.1.7 (Cont'd)

Table 3-4 - Characteristics of Outputs 3 and 4

Characteristic	Output 3 Limits	Output 4 Limits
Amplitude (A_1) High	--------	0.1 volt below B+ max
Amplitude (A)	1.28 ± 0.06 volts	--------
Amplitude (A_2) Low	--------	1.00 ± 0.15 volts
Amplitude (A_3)	0.01 volts	--------
Turn ON (T on)	0.2 usec max	0.15 usec max
Turn OFF (T off)	1.5 usec max	0.3 usec max

3.1.8 Marginal Voltage and Temperature Extremes. The module shall perform as specified in paragraphs 3.1.5 through 3.1.6 when subjected to the combinations of extreme voltages and temperatures specified in (a) and (b) below:

(a) Low extreme: 12.2 ± 0.1 vdc and -10°C $^{+0°C}_{-2.8°C}$.

(b) High extreme: 16.5 ± 0.1 vdc and 70°C $^{+2.8°C}_{-0°C}$.

The requirements for amplitude A_1 high for outputs 1 and 3 under the marginal voltage and temperature extremes are as follows:

Output 1 tolerance (See Table 3-2) shall be increased by 0.05 volt.

Output 3 measurements shall be 1.28 $^{+0.13}_{-0.06}$ volts for the low extreme and shall be 1.28 $^{+0.06}_{-0.13}$ volts for the high extreme.

3.1.9 Vibration. The module shall perform as specified in 3.1.6 through 3.1.7 when installed in an operating computer which is being subjected to the vibration requirements specified in the applicable specifications for the computer subsystem. Acceptance criteria for the module shall be the compliance of the computer subsystem with its applicable specifications.

3.2 PRODUCT CONFIGURATION

3.2.1 DRAWINGS. The module shall comply with APOLLO G&N drawing 2003027 and all drawings and engineering data referenced thereon.

3.2.2 Weight. Maximum allowable weight of the module shall be 0.80 pounds.

4. QUALITY ASSURANCE PROVISIONS

4.1 GENERAL. The contractor responsible for the manufacture of the assembly shall be responsible for the accomplishment of each test required herein. The cross reference index (Table 4-1) shows the relationship between the performance requirements in section 3 and verification of those requirements in section 4.

TABLE 4-1

Requirement	Verification
3.1.2	4.2.2
3.1.3	4.2.3
3.1.4	4.2.4
3.1.5	4.2.5
3.1.6	4.2.6
3.1.7	4.3.1
3.1.8	4.3.2
3.2.1	4.2.1
3.2.2	4.2.7

4.1.1 Nonconforming Units. Failure of the unit to pass any examination or test of this specification shall automatically classify the unit as nonconforming. Each nonconforming unit corrected by the contractor shall be reinspected. Reinspection may be limited to the test or examination which defined the nonconformance, or, when directed by the cognizant inspector, a complete retest and re-examination may be required. Nonconforming units which have not been corrected will be considered for acceptance only upon formal application by the contractor to the cognizant NASA representative.

4.2.6.2 Outputs. The coincidence of inputs 1 and 2 at the proper terminals (See Table 4-2 and Figure 1) shall produce outputs in compliance with the requirements specified in paragraph 3.1.4. The output waveform shall comply with Figure 2 and shall be monitored at the pins specified in Table 4-2.

4.2.7 Module Select Current Driver.

4.2.7.1 Input. The inputs shall comply with the requirements specified in paragraph 3.1.6. Refer to Table 4-3 and Figure 3 for the sets of related input terminals.

4.2.7.2 Outputs. A coincidence of signals at the proper input terminals (See Table 4-3 and Figure 2) shall produce outputs (3 and 4) at the related output pins in compliance with paragraph 3.1.6. (See Figure 3 and Table 4-3 for input-output pin relationship). All A, L and V pins that are not being pulsed shall be terminated in accordance with paragraph 4.2.7.1.

TABLE 4-3

Circuit No.	Input 3 (L)	Output 3	Circuit No.	Input 4 (V)	Output 4 (W)
40631	245	131 (M)	40615	138	239
40632	242	134 (M)	40615	138	239
40631	245	123 (N)	40616	129	229
40632	242	125 (N)	40616	129	229
40631	245	115 (P)	40617	120	221
40632	242	117 (P)	40617	120	221

4.2.8 Weight. Weigh the module to the nearest .01 pound. Verify that the weight does not exceed the maximum allowable weight specified in paragraph 3.2.2.

4.3 WORKMANSHIP. The following tests shall be performed under the conditions specified as a verification of good workmanship.

4.3.1 Marginal Voltage and Temperature Extremes. The module shall be exposed to its ambient temperature for at least 30 minutes prior to starting electrical tests. The module shall be tested in accordance with paragraphs 4.2.6 and 4.2.7 in each of the extreme conditions specified in paragraph 3.1.7.

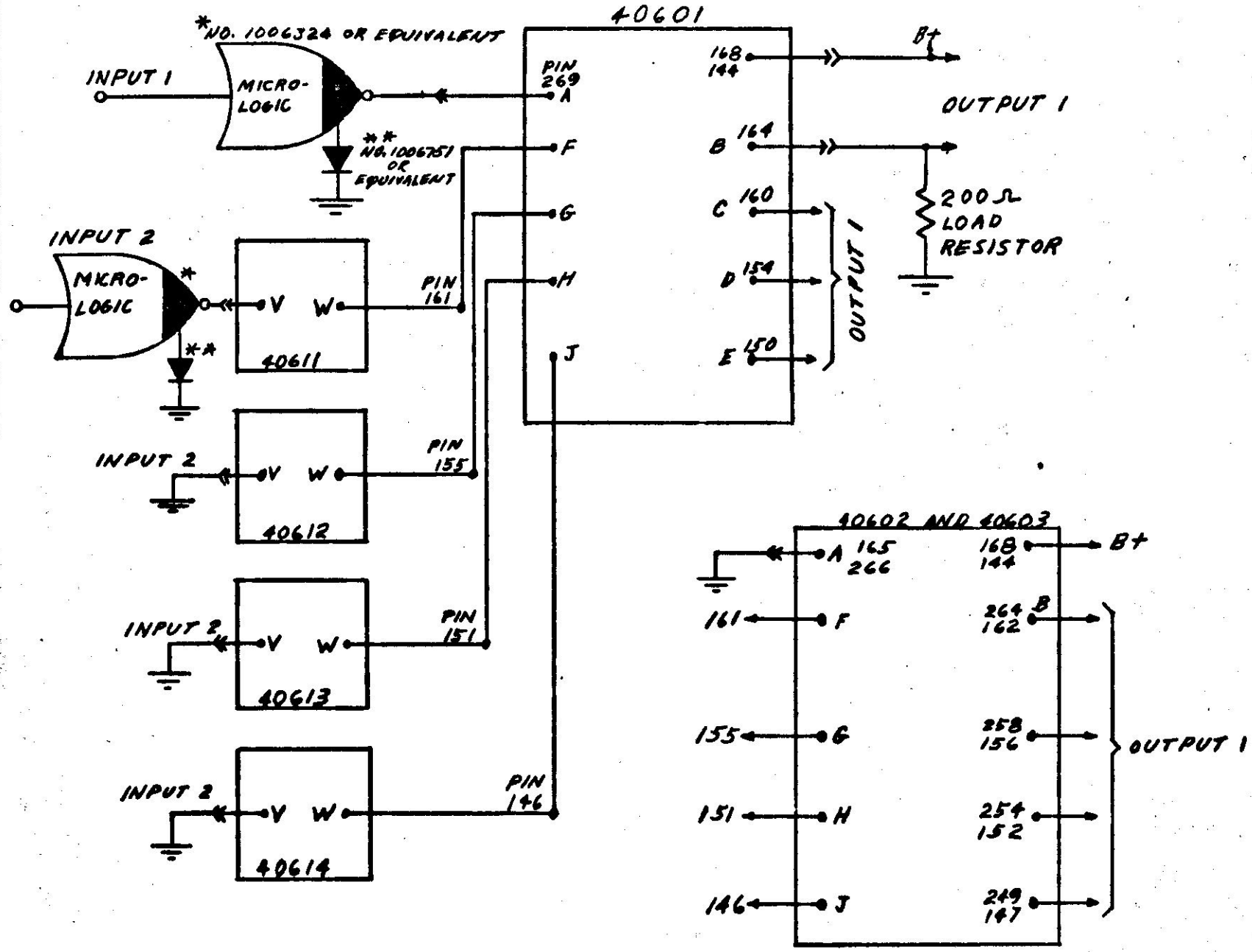

40601
*NO. 1006324 OR EQUIVALENT
INPUT 1
MICRO-LOGIC
PIN 269
A
**NO. 1006751 OR EQUIVALENT
F
G
H
J
168 144
B+
OUTPUT 1
B 164
C 160
D 154
E 150
OUTPUT 1
200Ω LOAD RESISTOR
INPUT 2
MICRO-LOGIC
*
**
V W
PIN 161
40611
INPUT 2
V W
PIN 155
40612
INPUT 2
V W
PIN 151
40613
INPUT 2
V W
PIN 146
40614
40602 AND 40603
A 165 266
161 F
155 G
151 H
146 J
168 144
B+
264 162 B
258 156
254 152
249 147
OUTPUT 1

FIGURE 1

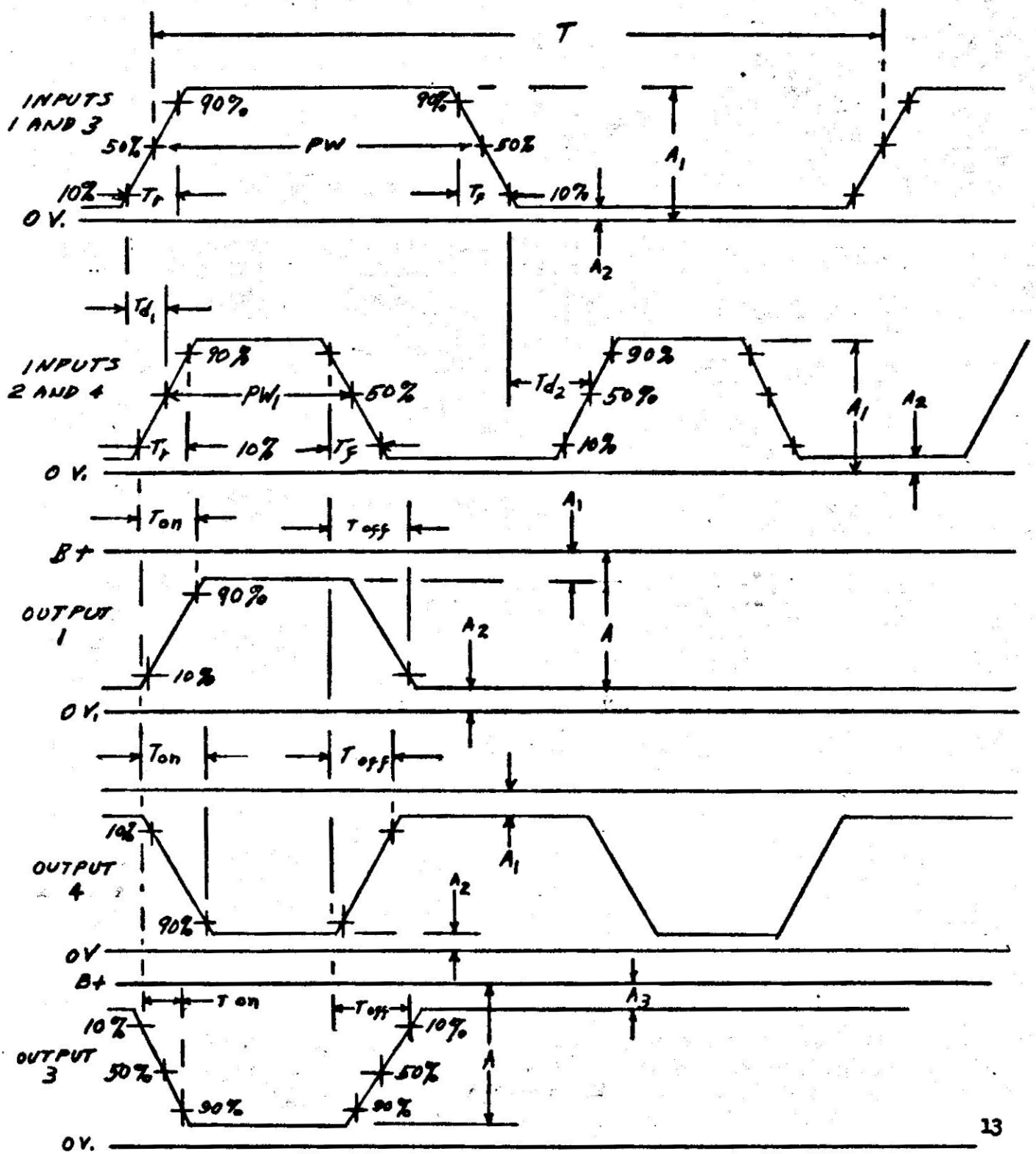
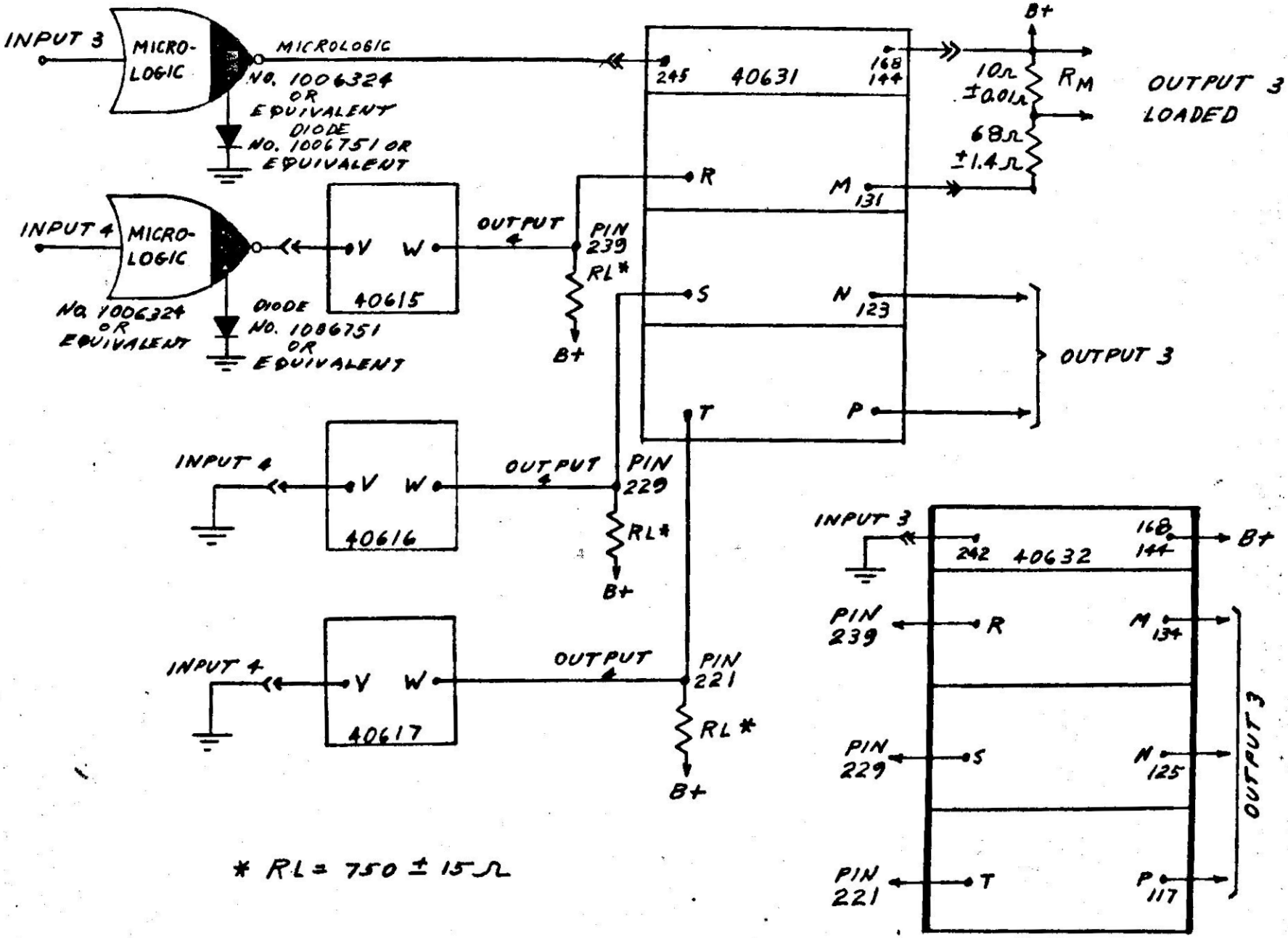

T
INPUTS 1 AND 3
90%
50%
PW
10%
T_r
T_f
0 V.
A_1
A_2
T_{d_1}
T_{d_2}
INPUTS 2 AND 4
PW_1
T_r
T_f
T_{on}
T_{off}
B+
OUTPUT 1
A
OV.
OUTPUT 4
OV
OUTPUT 3
A_3
13

FIGURE 2



* RL = 750 ± 15Ω

FIGURE 3