SUBJECT: Diminishing Source of Supply: Only Source for Military Qualified Carbon Composition Resistors to Stop Production in 1996	**MANUFACTURER** Allen-Bradley Company	**PAGE NO.:** 1	**NO. OF PAGES:** Cover +3
	CAGE CODE: 01121	NASA **PARTS ADVISORY** OFFICIAL BUSINESS U.S. GOVERNMENT	
PART NO.: Various Carbon Composition Resistors Type RC & RCR	**FSC CODE:** 5905		
REFERENCE: MIL-R-39008, MIL-R-11 & associated slash sheets			

MESSAGE TO BE TRANSMITTED

PURPOSE:

The purpose of this NASA Parts Advisory is to notify the NASA EEE parts community of an impending manufacturing plant closure. This closure signals the disappearance of the only U.S. military qualified source for carbon composition resistors. Information is provided about final buy opportunities and the situation regarding part substitutions is discussed.

PROBLEM:

Rockwell Automation has announced that it will phase out its **Allen-Bradley** carbon composition resistor business due to a steady decline in worldwide demand. The Allen-Bradley manufacturing facility located in El Paso, TX will continue to **accept orders through August 15, 1996** Based on the projected volume of final buy orders, delivery of product is expected to continue into early 1997 at which time the facility will close permanently.

Allen-Bradley is the only U.S. military qualified source for this part type The Passive parts Supplier Assessment Program (PSAP) at Goddard Space Flight Center (GSFC) has contacted the Defense Electronics Supply Center (DESC) to inquire about potential new sources of supply. At this time, DESC has not been contacted by any other manufacturer expressing an interest in qualifying for this product. Therefore, after closure of the Allen-Bradley facility in 1997, users requiring this technology will have to rely on existing stock (in-house or at distributors).

The carbon composition resistor technology is over 30 years old and has found extensive use in NASA programs. However, other resistor technologies offering lower cost, smaller size and better performance (in most applications), have been replacing carbon composition parts. Allen-Bradley's loss of market share has made it unprofitable for them to continue in the business.

NAME AND TITLE OF ORIGINATOR (Type)	**ORIGINATOR'S TEL NO.**	**L. E. Check**	**DATE PREPARED**
Mike Sampson (GSFC Code 311)	(301) 286-8838		July 3, 1996
RELEASED BY (Signature of Authorizing Officer)	**ADVISORY COORDINATOR** Jack J. Shaw, 301-286-7123 Jack.J.Shaw.1@gsfc.nasa.gov	**A. C. Check**	NA-033

SUBJECT: Diminishing Source of Supply: Only Source for Military Qualified Carbon Composition Resistors to Stop Production in 1996	NA-033	**PAGE NO.:** 2	**NO. OF PAGES:** Cover + 3
PART NO.: Various Carbon Composition Resistors Type RC & RCR		**NASA PARTS ADVISORY** OFFICIAL BUSINESS U.S. GOVERNMENT	
REFERENCE: MIL-R-39008, MIL-R-11 & associated slash sheets			

MESSAGE TO BE TRANSMITTED

AFFECTED PART TYPES:

The part types which will soon become obsolete as a result of this facility closure are listed below. All of these parts are axial leaded devices.

Specification	Style	Power Rating	Resistance Range	Nominal Dimensions (L x D)
MIL-R-39008/4	RCR05	0.125 W	2.7 Ω to 22 MΩ	0.145″ x 0.062″
MIL-R-39008/1	RCR07	0.25 W	2.7 Ω to 22 MΩ	0.250″ x 0.090″
MIL-R-39008/2	RCR20	0.50 W	1.0 Ω to 22 MΩ	0.375″ x 0.138″
MIL-R-39008/3	RCR32	1.0 W	1.0 Ω to 22 MΩ	0.562″ x 0.225″
MIL-R-39008/5	RCR42	2.0 W	10.0 Ω to 22 MΩ	0.688″ x 0.318″
MIL-R-11/11	RC05	0.125 W	10.0 Ω to 22 MΩ	0.145″ x 0.062″
MIL-R-11/8	RC07	0.25 W	10.0 Ω to 22 MΩ	0.250″ x 0.090″
MIL-R-11/3	RC20	0.50 W	2.7 Ω to 22 MΩ	0.375″ x 0.138″
MIL-R-11/6	RC32	1.0 W	2.7 Ω to 22 MΩ	0.562″ x 0.225″
MIL-R-11/7	RC42	2.0 W	10.0 Ω to 22 MΩ	0.688″ x 0.318″

Note: The established reliability MIL-R-39008 parts are NASA standard parts per MIL-STD-975 and GSFC PPL-21.
The non-established reliability MIL-R-11 parts are not NASA standard.

SUGGESTIONS:

The RLR film style resistors from MIL-R-39017 have been used widely in applications where carbon composition resistors had previously been used. However, PSAP is unaware of a direct form, fit and functional replacement for the RC or RCR carbon composition resistor for all applications. PSAP has not performed an in depth parametric comparison among the various resistor technologies. Users should evaluate performance and parametric differences of alternate resistor technologies such as temperature stability, inductance, and surge capabilities prior to selection. Designers may consult with parts engineers to determine the suitability of alternate resistor technologies for their particular applications.

Although other resistor technologies provide generally better performance characteristics (particularly stability) than the carbon composition resistor, there are still some applications for which the carbon composition resistor is a preferred choice, especially:

- Pulse Load Handling Applications with High Inrush Current
- Circuits requiring High Resistance Values (Tens of Megohms)
- Use of the Resistor as a Fuse

PSAP does not currently have any suggestions for suitable alternatives for these applications.

SUBJECT: Diminishing Source of Supply:
Only Source for Military Qualified
Carbon Composition Resistors to Stop Production in 1996

NA-033

PAGE NO.: 3 | **NO. OF PAGES:** Cover + 3

NASA PARTS ADVISORY

OFFICIAL BUSINESS
U.S. GOVERNMENT

PART NO.: Various Carbon Composition Resistors
Type RC & RCR

REFERENCE: MIL-R-39008, MIL-R-11 & associated slash sheets

MESSAGE TO BE TRANSMITTED

SUGGESTIONS (Continued):

The list below identifies some potential alternate part types which may be considered for replacements for the carbon composition resistors. Each application must be evaluated to determine the suitability of the replacement part for the intended purpose. All parts listed below are axial leaded devices except where otherwise noted.

Specification	Style	Power Rating	Resistance Range	Nominal Dimensions (L x D)
Film (Insulated) Resistor				
MIL-R-39017/5	RLR05	0.125 W	4.7 Ω to 1.0 MΩ	0.150″ x 0.066″
MIL-R-39017/1	RLR07	0.25 W	10.0 Ω to 22.0 MΩ	0.250″ x 0.090″
MIL-R-39017/2	RLR20	0.5 W	4.3 Ω to 3.01 MΩ	0.375″ x 0.138″
MIL-R-39017/3	RLR32	1.0 W	10.0 Ω to 2.7 MΩ	0.562″ x 0.190″
Film/Foil Resistor				
MIL-R-55182/7	RNC50	0.05 W	10.0 Ω to 0.796 MΩ	0.180″ x 0.065″
MIL-R-55182/1	RNC55	0.10 W	10.0 Ω to 2.00 MΩ	0.250″ x 0.109″
MIL-R-55182/3	RNC60	0.125 W	10.0 Ω to 3.01 MΩ	0.375″ x 0.125″
MIL-R-55182/5	RNC65	0.25 W	10.0 Ω to 3.01 MΩ	0.625″ x 0.188″
MIL-R-55182/6	RNC70	0.50 W	10.0 Ω to 3.01 MΩ	0.750″ x 0.250″
MIL-R-55182/9	RNC90	0.30 W	4.99 Ω to 0.121 MΩ	radial leaded (H x W) 0.336″ x 0.310″
MIL-R-55182/1	RNR55	0.10 W	10.0 Ω to 1.21 MΩ	0.250″ x 0.109″
MIL-R-55182/3	RNR60	0.125 W	10.0 Ω to 2.49 MΩ	0.375″ x 0.125″
MIL-R-55182/5	RNR65	0.25 W	24.9 Ω to 4.99 MΩ	0.625″ x 0.188″
MIL-R-55182/6	RNR70	0.50 W	24.9 Ω to 7.50 MΩ	0.750″ x 0.250″
Wirewound (Accurate) Resistor				
MIL-R-39005/1	RBR52	0.5 W	0.1 Ω to 1.21 MΩ	1.000″ x 0.375″
MIL-R-39005/3	RBR54	0.25 W	0.1 Ω to 0.562 MΩ	0.750″ x 0.250″
MIL-R-39005/5	RBR56	0.125 W	0.1 Ω to 0.22 MΩ	0.344″ x 0.250″
MIL-R-39005/7	RBR57	0.75 W	0.1 Ω to 1.37 MΩ	1.000″ x 0.500″
MIL-R-39005/6	RBR71	0.125 W	0.1 Ω to 0.15 MΩ	radial leaded (H x D) 0.312″ x 0.250″
MIL-R-39005/8	RBR74	0.125 W	100.0 Ω to 6.52 kΩ	0.500″ x 0.193″
MIL-R-39005/9	RBR75	0.125 W	0.1 Ω to 0.150 MΩ	0.295″ x 0.250″
Wirewound (Power Type) Resistor				
MIL-R-39007/7	RWR78	10 W	0.1 Ω to 39.2 kΩ	1.780″ x 0.375″
MIL-R-39007/8	RWR80	2 W	0.1 Ω to 3.16 kΩ	0.406″ x 0.094″
MIL-R-39007/9	RWR81	1 W	0.1 Ω to 1.0 kΩ	0.250″ x 0.085″
MIL-R-39007/10	RWR84	7 W	0.1 Ω to 12.4 kΩ	0.875″ x 0.312″
MIL-R-39007/11	RWR89	3 W	0.1 Ω to 4.12 kΩ	0.560″ x 0.187″

Note: Not all of the resistance values specified above are considered NASA standard in accordance with MIL-STD-975 or GSFC PPL-21. In particular, wirewound resistors using a nominal wire diameter of less than 0.001″ are not recommended for space flight use. Consult the parts engineer for details.

SUBJECT: Diminishing Source of Supply: Only Source for Military Qualified Carbon Composition Resistors to Stop Production in 1996	NA-033	**PAGE NO.:** 4	**NO. OF PAGES:** Cover + 3
PART NO.: Various Carbon Composition Resistors Type RC & RCR		NASA **PARTS ADVISORY** OFFICIAL BUSINESS U.S. GOVERNMENT	
REFERENCE: MIL-R-39008, MIL-R-11 & associated slash sheets			

MESSAGE TO BE TRANSMITTED

SUGGESTIONS (Continued):

Commercial quality carbon composition resistors are available from International Resistive Corporation (IRC) of Boone, NC. These parts are manufactured in Japan by Kamaya in accordance with a Japanese commercial specification (JS series). The parts are sold as IRC's IBT series resistors and are advertised to meet the performance requirements of EIA RS-172. Currently, only the following styles are available:

Part Type	Power Rating	Resistance Range	Nominal Dimensions (L x D)
IBT 1/4	0.25 W	2.2 Ω to 5.6 MΩ	0.248″ x 0.094″
IBT 1/2	0.50 W	2.2 Ω to 20.0 MΩ	0.374″ x 0.142″

PSAP has no reliability information for the IBT resistor. PSAP cannot recommend the use of these resistors for space flight applications because we have no supporting experience or data at this time.

PSAP requests any information available on this topic such as additional sources for carbon composition resistors or experience with Kamaya or IBT resistors. If you need further clarification or if you have additional concerns, please do not hesitate to contact:

Michael J. Sampson
GSFC Code 311 Parts Branch
(301) 286-8838
(301) 286-1695 (Fax)
Michael.J.Sampson.1@gsfc.nasa.gov

or

Jay A. Brusse
Unisys Corporation
(301) 286-2019
(301) 286-1695 (Fax)
Jay.A.Brusse.1@gsfc.nasa.gov