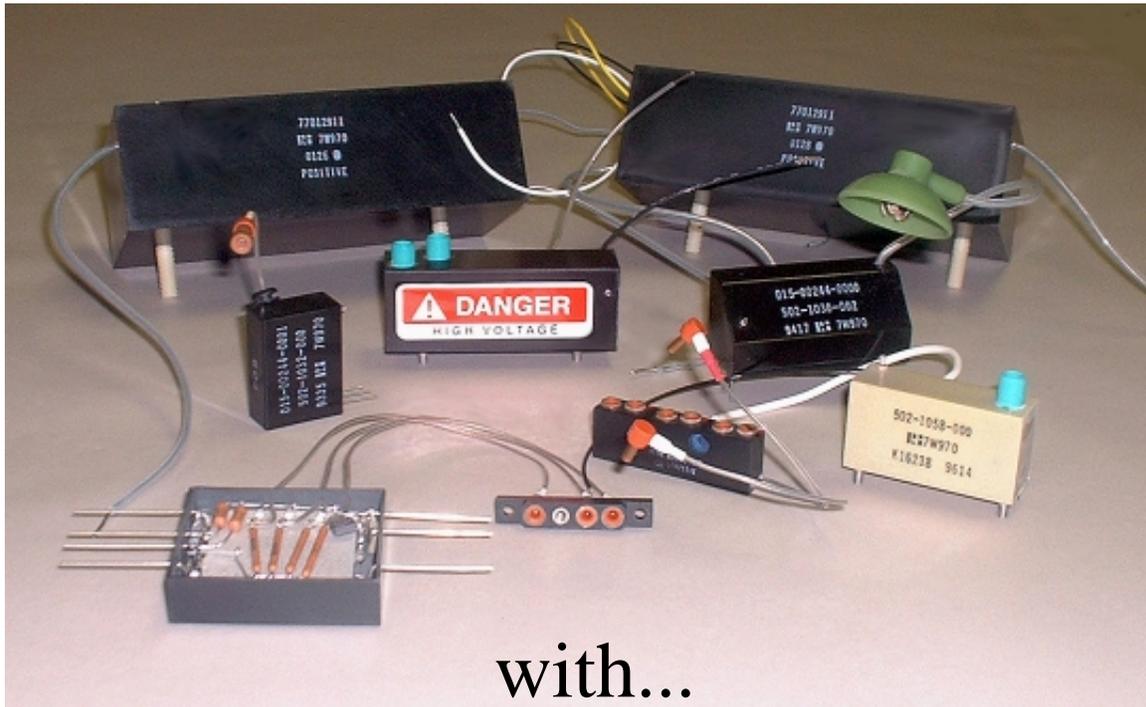




**REYNOLDS**  
INDUSTRIES INCORPORATED  
Electronic Products Division  
Santa Maria, California

## MicaPliers

### HIGH VOLTAGE MULTIPLIERS

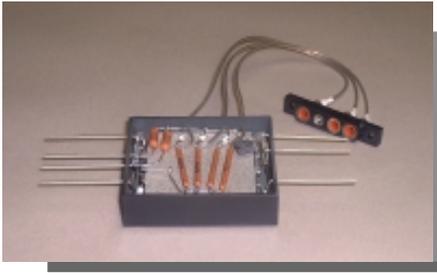


with...  
**monobloc** construction

#### FEATURING:

- **monobloc** reconstituted mica capacitor sections
- high speed diodes with optional selection and screening
- high output voltages ranging from 3 KVDC to 80 KVDC
- rated for stable, continuous operation from  $-55^{\circ}$  to  $+125^{\circ}$  C
- wide selection of optional termination methods
- corona-free operation
- optional burn-in and environmental stress screening

# About MicaPliers



## Introduction

In many situations, the use of voltage multipliers becomes the only realistic way to produce high voltages. A low current transformer, for example, producing 25 KV directly, has to be physically large to satisfactorily handle the voltage stresses, especially when required to operate at altitude. Using a **Micaplier** voltage multiplier, the transformer needs only to produce voltages up to 3 KV peak to produce the same results. This by itself makes it possible to reduce both the size and weight dramatically. Further, the high speed diodes used in the micaplier permit a much higher operating frequency to be used than is possible in a direct transformer design, leading to even more space and weight reduction.

## Mica vs Ceramic

The chart below rates mica and ceramic as material candidates for voltage multipliers designed for use in military/aerospace applications. Reynolds **Micaplier** voltage multipliers have been in production for more than 15 years and much of the production has been for applications subject to hostile environments typical of those shown in the material rating chart.



PARAMETER	RATING	
	MICA	CERAMIC
Temperature coefficient to capacitance	<b>Good</b>	<b>Poor</b>
Voltage coefficient to capacitance	<b>Good</b>	<b>Poor</b>
Thermal shock	<b>Good</b>	<b>Poor</b>
Mechanical shock	<b>Good</b>	<b>Poor</b>
Vibration	<b>Good</b>	<b>Poor</b>
High current discharge cycle capability	<b>Good</b>	<b>Poor</b>

## Diodes and Testing

**Micapliers** are manufactured using the highest quality, high speed diodes available. Diode selection and screening can be in accordance with Reynolds internal standards or to customers specifications as an option. Other options are burn-in and most electrical and environmental testing required by the customer.

## Applications

**Micapliers** are used in airborne display systems as CRT anode and focus supplies. Other applications are X-Ray equipment and low power (mini) TWT's and plasma etching machines. **Micapliers** should be considered for any application where a high voltage, low current supply is required and where environmental conditions or size and weight are design concerns.

## Potting and Optional Terminations

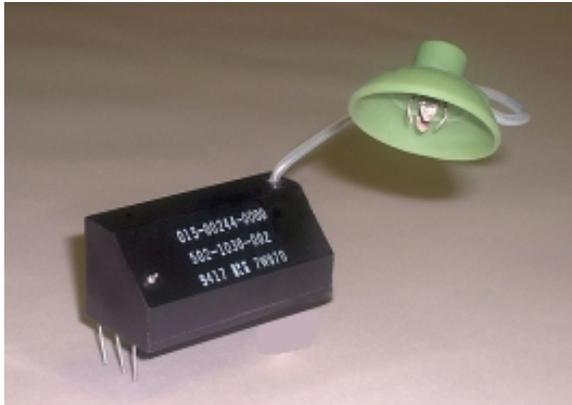
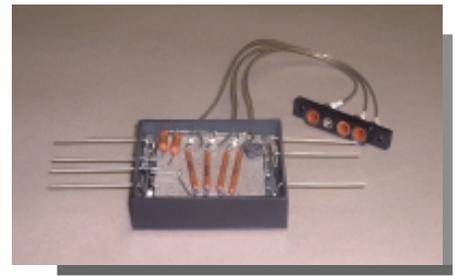
We are experts at potting /encapsulating high voltage components and assemblies. **Micapliers** are a fully potted, stand alone high voltage package that have been voltage stress tested and are ready to solder or connect into a circuit in the same manner as any other component.

A wide selection of termination hardware is available to fit almost any application. This includes solderable pins, Reynolds Advanced series Pee-Wee and JR connectors and CRT anode caps J1-21 or J-22 manufactured by Reynolds Connector Products Division.

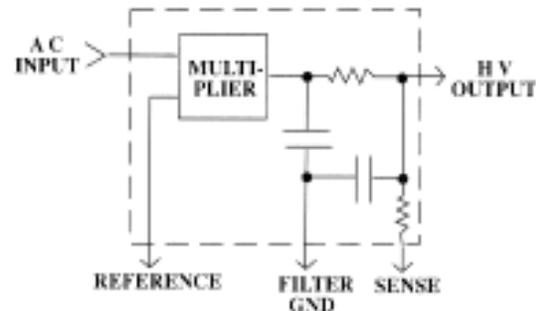
# VOLTAGE MULTIPLIERS

## CRT Anode supply P/N 502-1030-002

A Micaplier designed specifically for CRT Final Anode applications requiring 12-16 KVDC at up to 1 mA with less than 5 volts ripple. Using the **monobloc** reconstituted mica capacitor sections, the assembly comprises a complete eight stage multiplier with an output surge limiter, feedback divider and a mica Pi filter for ripple reduction. Rated for continuous operation at 85°C, the device can be used at altitudes up to 55,000 feet without additional overpotting. For a more detailed product drawing, please request drawing 502-1030-002.

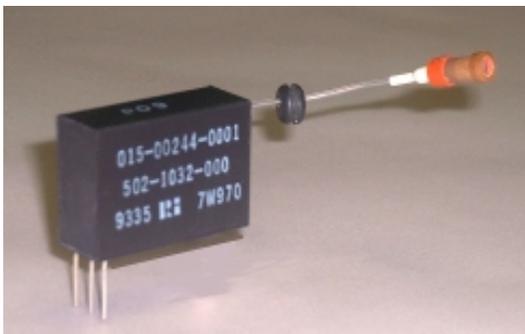


Part No.	<b>502-1030-002</b>
Description	8 stage (4xpp) Voltage Multiplier
Voltage In	4 KVpp
Voltage Out	15KVDC
Current Out	1mA
Frequency	50-100 KHZ
Ripple	< 5 Vpp
Dimensions	2.36" W x 1.06" H x 1.06" D
Weight	75gm
Output connector	Reynolds J1-21 or J1-22

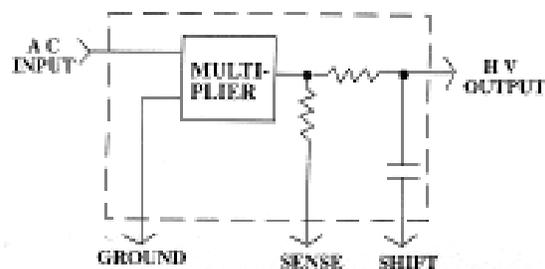


## CRT Anode supply P/N 502-1030-000

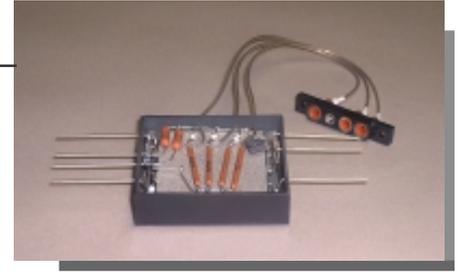
A Micaplier designed specifically for CRT Modulated Focus applications requiring 4-6 KVDC at up to 100  $\mu$ A current. Using the **monobloc** reconstituted mica capacitor sections, the assembly comprises a complete four stage (2xpp) multiplier with feedback divider and a capacitor coupled level shifter at the output providing Focus/De-focus shift operation for Write/Scan function. Rated for continuous operation at 85°C, the device can be used at altitudes up to 55,000 feet without additional overpotting. For a more detailed product drawing, please request drawing 502-1030-000.



Part No.	<b>502-1030-000</b>
Description	4 stage (2xpp) Voltage Multiplier
Voltage In	2.6 KVpp
Voltage Out	5K VDC
Current Out	100 $\mu$ A
Frequency	50-100 KHZ
Dimensions	1.44" W x 1.06" H x 0.56" D
Weight	25 gm
Output connector	Reynolds Advanced series Pee-Wee Rectp

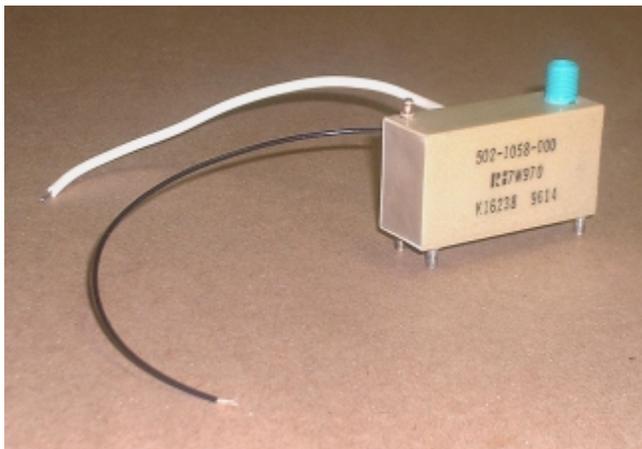


# VOLTAGE MULTIPLIERS

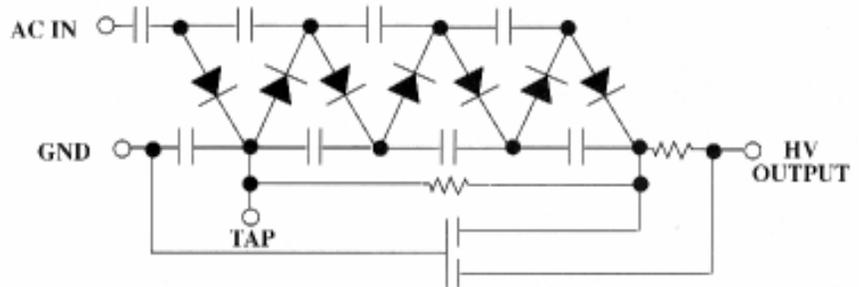


## Anode Supply with a Focus Tap **P/N 502-1050-000**

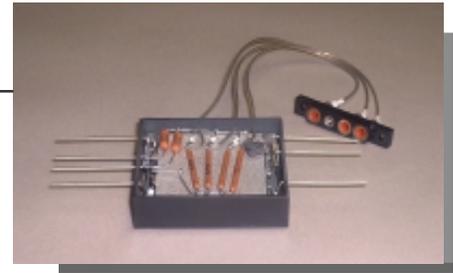
Designed specifically for CRT applications requiring 7 KVDC at up to 10  $\mu$ A current and a 1600 VDC focus tap at 200  $\mu$ A. Using the **monobloc** reconstituted mica capacitor sections, the assembly comprises a complete seven stage (3.5xpp) half wave multiplier with a focus tap at the first stage and a Pi filter and internal bleeder resistor. Rated for continuous operation at 85°C, the device can be used at altitudes up to 55,000 feet without additional overpotting. For a more detailed product drawing, please request drawing 502-1050-000.



Part No.	<b>502-1050-000</b>
Description	7 stage (3.5xpp) Voltage Multiplier
Voltage In	1.7 KVpp pulse
Voltage Out	(1) 7.2 KVDC (2) 1.62 KVDC
Current Out	(1) 10 $\mu$ A (2) 200 $\mu$ A
Frequency	50-100 KHZ
Dimensions	1.25" W x 2.00" H x 0.75" D
Weight	50 gm
Output connector	Reynolds 730 series receptacle

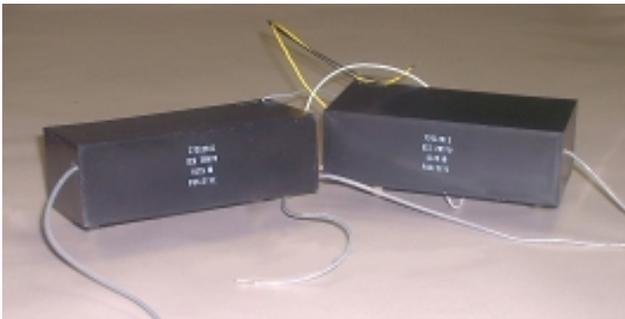


# VOLTAGE MULTIPLIERS

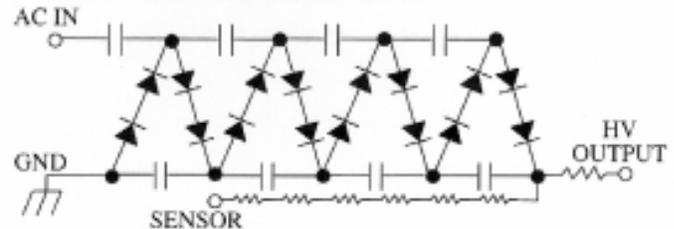


## X-Ray Tube Supply P/N 502-1040-000 & 502-1041-000

An 8 stage (4xpp) multiplier designed for X-Ray applications requiring up to 80 KVDC at 1 mA. Using reconstituted mica capacitor technology and internal feedback resistors for voltage sense, this unit provides reliable continuous operation at 85°C. When interconnected with P/N 502-1041-000, the two units are capable of 160 KVDC output at 1 mA.

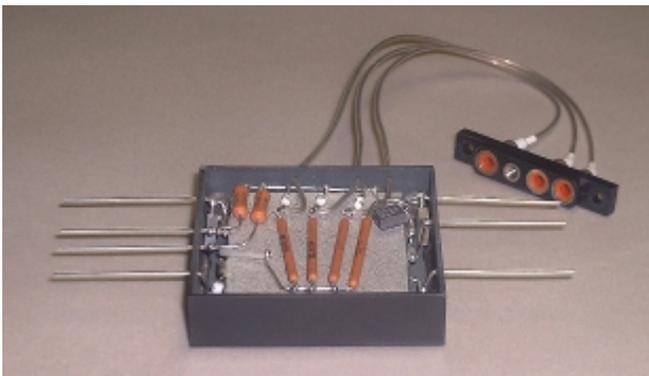


Part No.	<b>502-1040-000 &amp; 502-1041-000</b>
Description	8 stage (4xpp) half wave series
Voltage In	20.9 KVpp
Voltage Out	80 KVDC pos. and 80 KVDC neg.
Current Out	1.0 mA
Frequency	20 KHZ
Dimensions	5.62" W x 2.12" H x 1.75" D
Weight	600 gms
Output connector	Wire leads. Other methods available

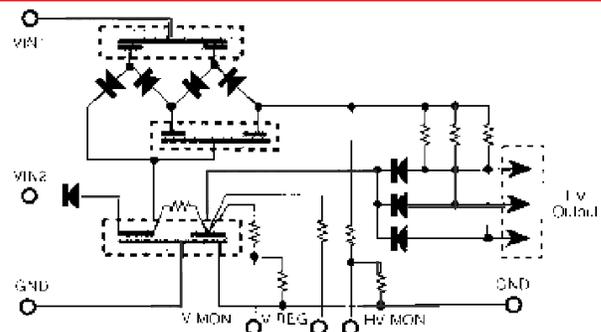


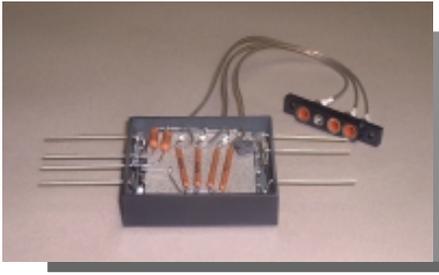
## Ring Laser Gyro Supply P/N 502-1047-000

A Micaplier designed specifically for Ring Laser Gyroscope Navigation Systems. Using [monobloc](#) reconstituted mica capacitor sections, the assembly provides both "START" and "RUN" voltages for laser energization. This unit is rated for continuous operation from -55°C to 125°C and altitudes up to 70,000 feet.



Part No.	<b>502-1047-000</b>
Description	7 stage (3.5xpp) Voltage Multiplier
Voltage In	1.7 KVpp pulse
Voltage Out	(1) 7.2 KVDC (2) 1.62 KVDC
Current Out	(1) 10 $\mu$ A (2) 200 $\mu$ A
Frequency	50-100 KHZ
Dimensions	1.25" W x 2.00" H x 0.75" D
Weight	50 gm
Output connector	Reynolds Advanced Series Pee-Wee Recp





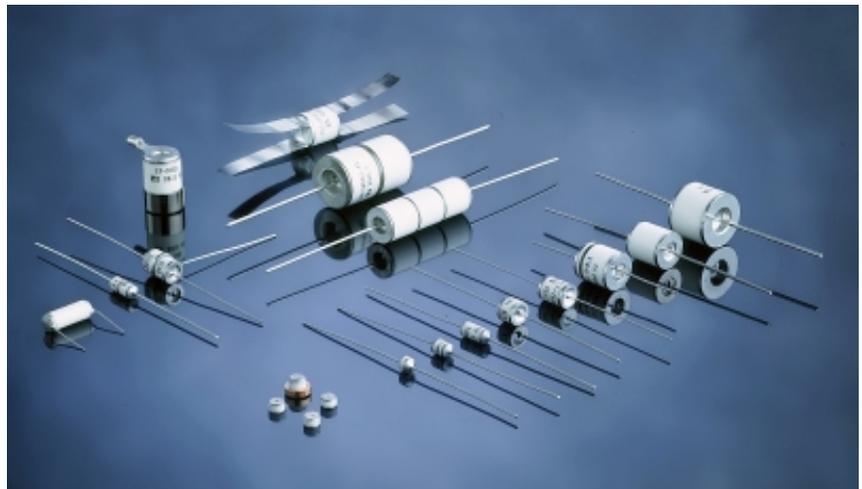
In addition to Voltage Multipliers , we also design and manufacture the following products at the Electronic Products Division in Santa Maria, California.

- Electronic Safe and Arm low inductance capacitors
- Reconstituted Mica high voltage capacitors for applications up to 120 KVDC
- Transient protection and sub assemblies.
- Packaging and encapsulation of capacitors and associated electronic and mechanical components for use at sea level to 70,000 feet



A selection of Mica High Voltage Capacitors including individual components, multi-section parts, filter networks and molded assemblies.

Reynolds Gas Discharge Tubes are ruggedly constructed with high temperature brazed ceramic to metal seals for long term (more than 15 years) hermeticity.



**REYNOLDS**  
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