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**scan
converter
signal
storage
tubes**



THE RAULAND CORPORATION

SCAN CONVERTER STORAGE TUBES

In the field of electronic signal processing there are many instances where it is necessary to convert an electronic signal from one time base to another. This can be accomplished by using a special purpose electron beam tube called a signal storage tube. The two basic types of signal storage tubes are the single gun and dual gun types. The Rauland Corporation is engaged in the design, development and manufacture of dual gun signal storage tubes.

The principal operational components of the dual gun tube design consist of a signal input "Writing" beam, a signal storage medium referred to as the target, and the "Reading" beam which is used to produce the signal output. In operation the signal-bearing writing beam scans the target surface, penetrating the aluminum backplate causing a charge distribution to form on the semiconductive storage medium. The read beam, scanning the semiconductive surface, generates secondary electrons which, when collected by the collector electrode, constitute the output signal. It should be noted that the write and read beam scan modes are independent; the read beam can dissect the stored image in any geometrical fashion without regard to the writing mode and at any frequency desired.

Some operational parameters worth consideration include:

Write Beam Anode voltage up to 10 kv; Both electrostatic and magnetic deflection designs are available

Storage Target Electron bombardment induced conductivity (EBIC) type

Reading Beam Anode voltage up to 2 kv, Both electrostatic and magnetic deflection designs are available

Resolution Depending on the tube type and actual application, resolutions of up to 1000 TV lines are attainable

Physical Both general and special purpose, ruggedized and miniaturized variations are available for ground-based equipment, aircraft, rocket-borne, and laboratory applications

Applications of dual gun scan converter signal storage tubes include:

PPI to TV Conversion of radar data to a TV readout format to allow the viewing of radar information without darkroom conditions—at the same time affording a signal "Memory" of moving objects because of the storage properties of the target

TV to TV Slow scan data transmission over narrow bandwidth communication channels; TV to TV scan conversion for otherwise incompatible scan formats

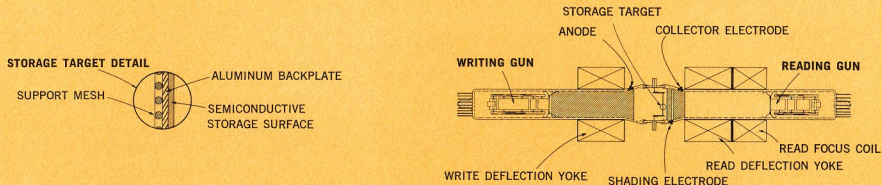
A-Scan to TV Fast transient waveform recording; pulse risetimes of less than 0.5 nanoseconds are recorded and stored with the R-6288 tube

TV to PPI The production of synthetic radar information for use in training simulators

Signal Integration The enhancement of signal-to-noise ratio—the detection of otherwise difficult to resolve information amidst random noise

Other application possibilities exist in analog to digital, digital to analog, random to TV, sonar to TV and computer data output to TV raster scan conversion. Quite obviously, the applications of the dual gun scan converter signal storage tube are limited only by the imagination of the system designer.

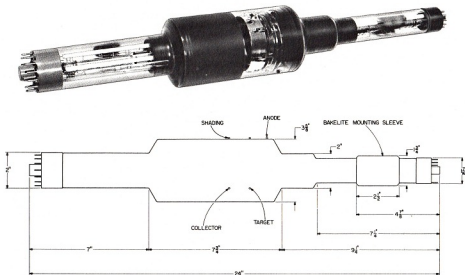
OPERATIONAL SCHEMATIC OF A DUAL GUN SCAN CONVERTER SIGNAL STORAGE TUBE



**GENERAL PURPOSE SCAN CONVERTER
TYPE R-6177-A**

Features include:

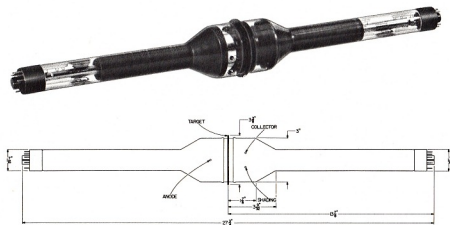
<i>Write Gun</i>	Magnetic deflection Electrostatic focus Anode voltage: 8 KV
<i>Read Gun</i>	Electrostatic deflection Electrostatic focus Anode voltage: 1.25 KV
<i>Resolution</i>	1000 TV lines
<i>Length</i>	24 inches maximum



**GENERAL PURPOSE SCAN CONVERTER
TYPE R-6280-A**

Features include:

<i>Write Gun</i>	Magnetic deflection Electrostatic focus Anode voltage: 10 KV
<i>Read Gun</i>	Magnetic deflection Magnetic focus Anode voltage: 1.25 KV
<i>Resolution</i>	1000 TV lines
<i>Length</i>	27 3/4 inches maximum



FOR DETAILED ELECTRICAL AND MECHANICAL DATA SEE INSIDE BACK COVER

SPECIAL PURPOSE SCAN CONVERTER TYPE R-6288

The R-6288 is an *ultrafast* scan converter storage tube capable of recording single transient pulses of nanosecond duration with rise times of less than 0.5 ns. The scan conversion of such pulses into a TV signal represents an enormous reduction in bandwidth.

Features include:

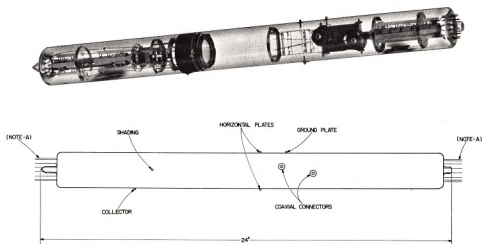
Write Gun Electrostatic vertical deflection
(TW meander element)
Electrostatic horizontal deflection
(conventional plates)
Electrostatic focus
Anode voltage: 10 KV

Read Gun Electrostatic deflection
Electrostatic focus
Anode voltage: 1 KV

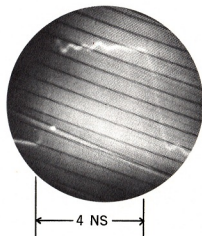
Frequency Limitation—Vertical write deflection
element—3,000 Mc

Vertical write deflection sensitivity—80 volts

The R-6288 is *ruggedized* for rocket-borne applications—axial forces up to 100 G's for a period of 15 seconds have been endured with no detectable impairment of tube performance. Radial and axial vibrations from 500 to 1500 cps with 30 G peak-to-peak amplitude were randomly varied throughout the frequency spectrum for 5 minutes with no deterioration of tube performance.



NOTE A: R-6288 NORMALLY SUPPLIED WITH FLYING LEADS OF .040 INCH DIAMETER; CONVENTIONALLY BASED VERSION AVAILABLE (ADD APPROXIMATELY 2 1/4 INCHES TO OVERALL LENGTH).



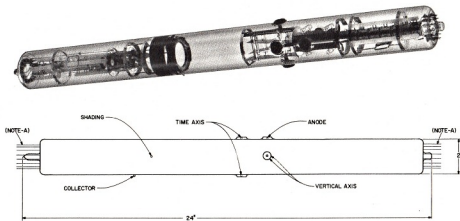
LABORATORY PHOTOGRAPH OF
4 NANOSECOND TRANSIENT PULSE
RECORDED WITH R-6288

SPECIAL PURPOSE SCAN CONVERTER TYPE R-6294-A

The R-6294-A is a *ruggedized* scan converter signal storage tube suitable for applications requiring input frequency response capabilities up to 200 Mc.

Features include:

<i>Write Gun</i>	Electrostatic deflection Electrostatic focus Anode voltage: 10 KV
<i>Read Gun</i>	Electrostatic deflection Electrostatic focus Anode voltage: 1 KV



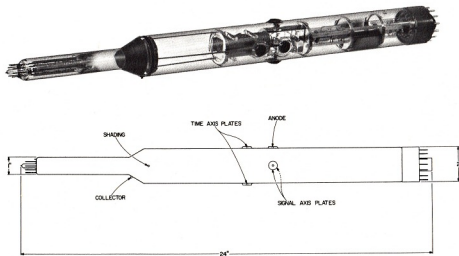
NOTE A: R-6294-A NORMALLY SUPPLIED WITH FLYING LEADS OF .040 INCH DIAMETER; CONVENTIONALLY BASED VERSION AVAILABLE (ADD APPROXIMATELY 2 3/4 INCHES TO OVERALL LENGTH).

SPECIAL PURPOSE SCAN CONVERTER TYPE R-6294-B

The R-6294-B is similar to the R-6294-A with the chief exception that the read gun utilizes magnetic deflection. The R-6294-B, also *ruggedized*, has input frequency response up to 200 Mc.

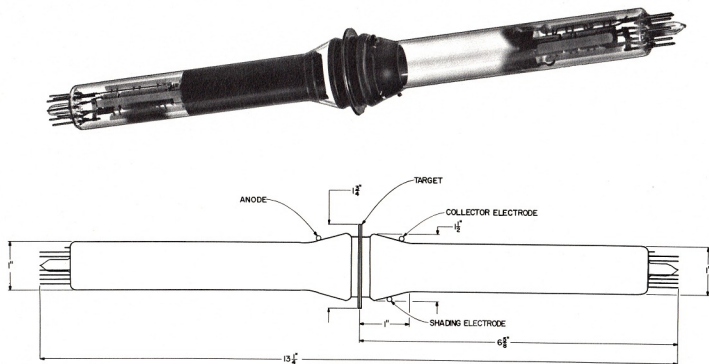
Features include:

<i>Write Gun</i>	Electrostatic deflection Electrostatic focus Anode voltage: 10 KV
<i>Read Gun</i>	Magnetic deflection Electrostatic focus Anode voltage: 1 KV



FOR DETAILED ELECTRICAL AND MECHANICAL DATA SEE INSIDE BACK COVER

TUBE SHOWN 1/2 ACTUAL SIZE



**MINIATURE GENERAL PURPOSE SCAN CONVERTER
TYPE R-6297**

Features include:

Write Gun

Magnetic deflection
Electrostatic focus
Anode voltage: 10 KV

Read Gun

Magnetic deflection
Magnetic focus
Anode voltage: 1 KV

Resolution

150 PPI range rings minimum

Length

13 1/4 inches maximum

FOR DETAILED ELECTRICAL AND MECHANICAL DATA SEE INSIDE BACK COVER