



*Excellence in Electronics*

**CK7575  
QK787**

**GENERAL DESCRIPTION**

The CK7575/QK787 is a dual-gun cathode-ray Recording Storage Tube capable of simultaneous writing and reading. This tube combines high output signal with high quality resolution. In addition, this tube features improved automatic priming speeds. Stored signals can be held for many hours, read several thousand times, or erased in a fraction of a second if desired. Both the writing and reading guns use magnetic deflection and can be operated with either electrostatic or magnetic focus or a combination form of focus. The guns are scanned independently, making it possible to use the tube for scan conversion. The properties of integration ability, dynamic range, storage duration and speed of operation in the various modes are approximately equivalent quantitatively with those found in the prototype tube, the CK6835/QK464A.

**GENERAL CHARACTERISTICS**

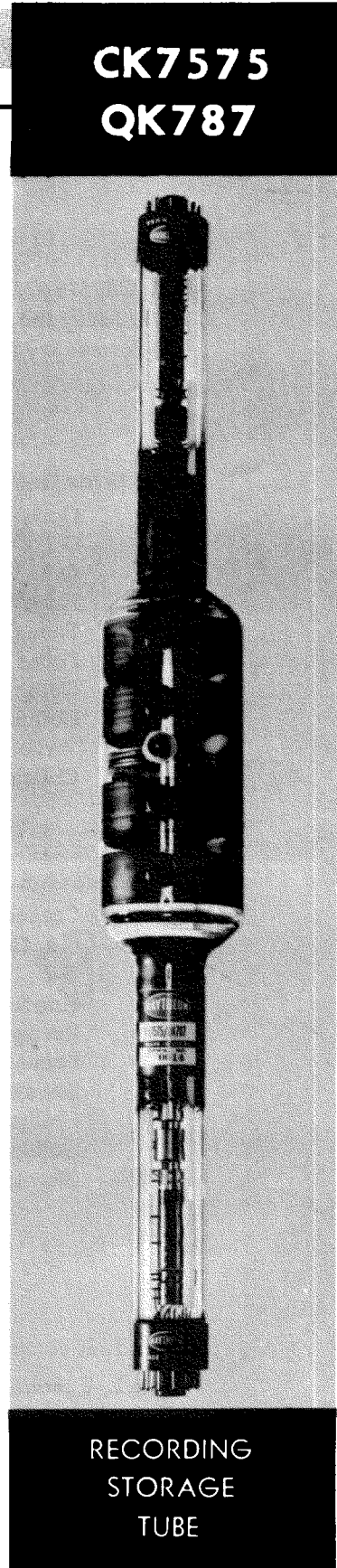
Gun Locations . . . . .	Co-axial
Gun Type (Both Guns) . . . . .	Tetrode, High Resolution
Deflection (Both Guns) . . . . .	Magnetic
Max. Defl. Angle (Both Guns) . . . . .	30°
Focusing . . . . .	Electrostatic or Magnetic
Mounting Position . . . . .	Any
Resolution (Magnetic Focus) . . . . .	900 Lines Nominal
Resolution (Electrostatic Focus) . . . . .	600 Lines Nominal
Output Capacitance (Col. plus Write Dec. to all elements) . . . . .	30 p.p.f
Erasing Technique . . . . .	By Switching or Automatic

**MECHANICAL CHARACTERISTICS**

Overall Length . . . . .	24" Nominal
Bulb Diameter . . . . .	3" Nominal
Neck Diameters . . . . .	1½" Maximum
Storage Screen Diameter . . . . .	2"
Bases (Both Ends) . . . . .	Small Shell Duodecal
Storage Assembly Buttons . . . . .	JETEC Type J1-22

**ELECTRICAL CHARACTERISTICS**

Heater		Maximum Ratings	
Heater Voltage	6.3±10%	Anode Voltage	4000 Vdc
Heater	0.6 A	Grid #1 Negative Bias	-125 Vdc
		Grid #2 Voltage	1000 Vdc
		Inter-Screen Voltage	600 Vdc
		(between any pair)	
		Focus Electrode Voltage	4000 Vdc



**RECORDING  
STORAGE  
TUBE**

**INDUSTRIAL TUBE DIVISION**

**RAYTHEON COMPANY**



## RECORDING STORAGE TUBE

## TYPICAL OPERATING CHARACTERISTICS

The CK7575/QK787 may be operated sequentially through erasing, priming, writing and reading, or by utilizing the automatic priming feature continuous writing and reading can be done simultaneously. The former we shall call Mode #1, the latter Mode #2.

Write Gun	Mode #1	Mode #2
Cathode . . . . .	0 Vdc	0 Vdc
G-1 Cut-off . . . . .	-30 Vdc	-30 Vdc
G-2 . . . . .	400 Vdc	400 Vdc
Anode . . . . .	3500 Vdc	3500 Vdc
Focus Electrode (note 1) . . . . .	400 Vdc	400 Vdc
Focus Electrode (note 2) . . . . .	3500 Vdc	3500 Vdc
Collimating Lens 1 . . . . .	500 Vdc	500 Vdc
Collimating Lens 2 . . . . .	300 Vdc	300 Vdc
Write Decelerator . . . . .	500 Vdc	500 Vdc
Collector . . . . .	500 Vdc	500 Vdc note 4

Read Gun	Mode #1	Mode #2
Cathode . . . . .	$E_{KR}$ note 3	200 Vdc
G-1 Cut-off . . . . .	$E_{KR}$ -100 Vdc	100 Vdc
G-2 . . . . .	$E_{KR}$ +400 Vdc	600 Vdc
Anode . . . . .	$E_{KR}$ +3500 Vdc	3700 Vdc
Focus Electrode (note 1) . . . . .	$E_{KR}$ +400 Vdc	600 Vdc
Focus Electrode (note 2) . . . . .	$E_{KR}$ +3500 Vdc	3700 Vdc
Decelerator . . . . .	$E_{KR}$ +500 Vdc	700 Vdc
Collimating Lens 1 . . . . .	$E_{KR}$ +500 Vdc	700 Vdc
Collimating Lens 2 . . . . .	$E_{KR}$ +300 Vdc	500 Vdc
Storage Screen . . . . .	$E_{KR}$ +20 Vdc	205 Vdc

Note 1. If electrostatic focus is used.

Note 2. If magnetic focus is used.

Note 3. In mode #1, the read gun potential will be switched during the various operations.

The values of  $E_{KR}$  are as follows:

Erase . . . . .	300 Vdc
Prime . . . . .	10 Vdc
Write . . . . .	300 Vdc

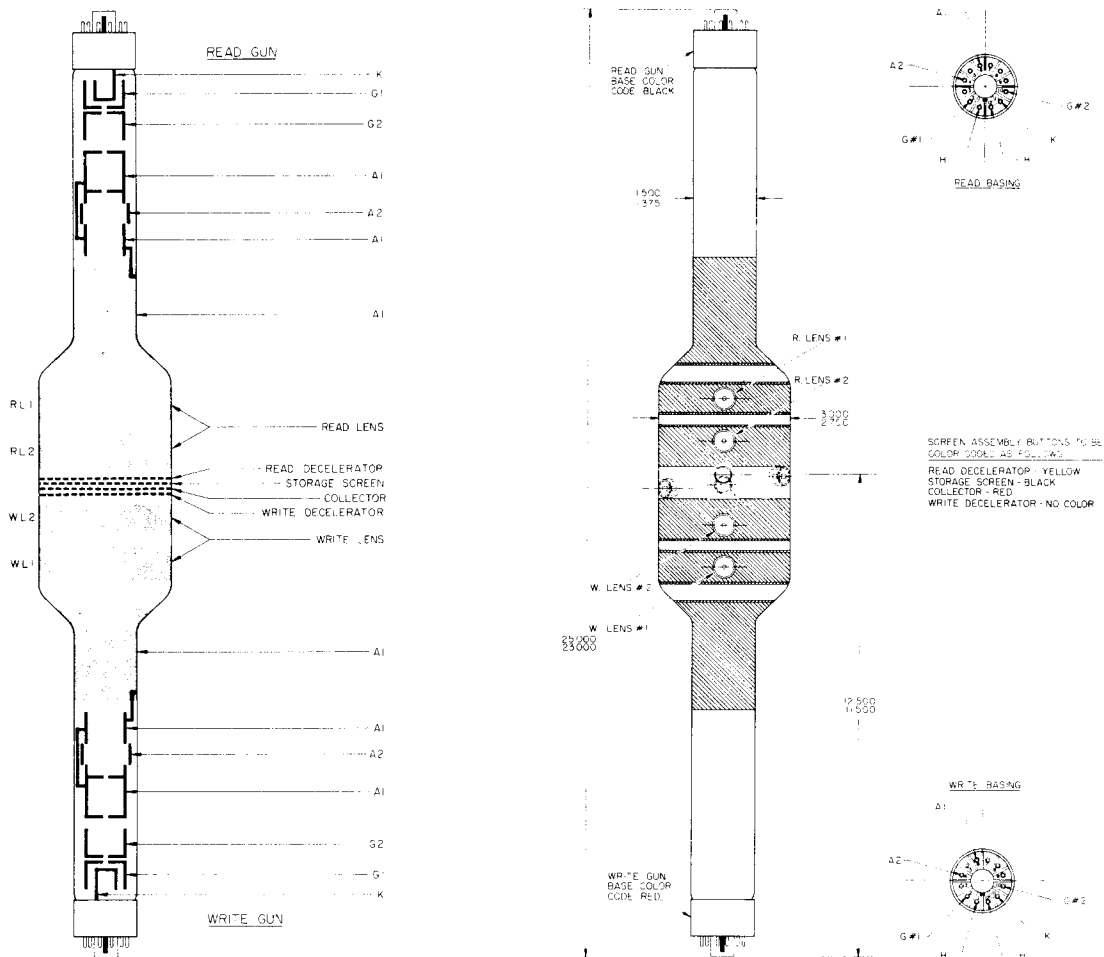
Note 4. Gradual automatic priming is controllable by varying the value of collector voltage from 500 Vdc (for slow erasing) down to 200 Vdc (for fast erasing). The same effect may also be achieved by varying the value of read cathode from 200 Vdc (for slow erasing) to 500 Vdc (for fast erasing) while keeping all read gun voltages the same with respect to read cathode.

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## RECORDING STORAGE TUBE



## DETAILED ELECTRICAL INFORMATION

In Mode #1 operation, in order to erase and write a picture on the storage screen, the storage screen must be about 300 Vdc positive with respect to the write gun cathode. For priming the storage screen must be about 30 Vdc positive to the write gun cathode. While all of these modes are in operation, the storage screen must remain

about 20 volts positive with respect to the read gun cathode.

In Mode #2 one technique for simultaneous writing and reading is RF modulation of the read beam. The output signal is obtained from the collector and write decelerator. Video cancellation techniques may also be practical.

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## RECORDING STORAGE TUBE

**RESOLVING POWER**

The resolution of the storage tube at the 50% modulation level is usually in excess of 900 lines across the diameter and is obtainable when the minimum current for writing a fully modulated signal is employed and the focus coil magnetic shell is designed to minimize astigmatism. Resolution is also dependent on the orientation of the focus coil with respect to the gun, and the sharpness of focus across the storage screen. Therefore, for applications requiring optimum resolution, dynamic focusing is often needed.

**STORAGE ABILITY**

The length of time a tube will retain the stored information is a function of the operating conditions and varies inversely as the reading current.

When reading with a low beam current of about 2  $\mu$ A at a television repetition rate and scan, several thousand consecutive readings can be made without any appreciable deterioration of the stored signal.

The tube is capable of storing information for

many hours without appreciable change or deterioration when not reading.

**FOCUSING TECHNIQUE**

This tube can be focused electrostatically, magnetically or using a combination of fixed focus by one technique and dynamic focus correction by the second. Magnetic dc focusing provides higher resolution than does electrostatic but frequently requires more power. When magnetic focusing is being used, the Focus Electrode is set at anode potential; when electrostatic focusing is being used, the Focus Electrode is typically set at 400Vdc when the anode is set at 3500 Vdc.

The recommended technique for dynamic focusing is to apply 1000 to 1500 Vdc to the focus electrode, then adjust the magnetic focus for optimum resolution near the center of the storage target, and finally apply the base-damped parabolic correction waveform to the focus electrode such that the edges of the target are brought into focus. Approximately 350 Vac peak to peak correction signal will provide correction across the diameter of the target at the above focus electrode voltage.

**LEADS**

- #1 — S1
- #2 — F1
- #3 — S2
- #4 — F2

**TICKLER COIL**

Resistance — 35 to 50  
ohms (at 20°C)

Max. current — 30 mA RMS

Voltage rating — 250 V

Inductance — 45 Millihenries  
Approx.

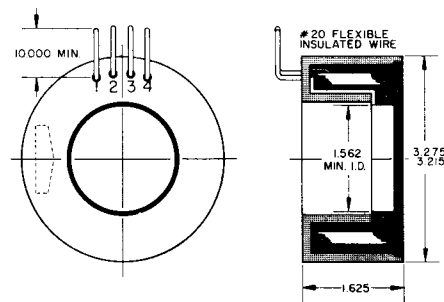
**FOCUS COIL**

Resistance — 6500 to 9000  
ohms (at 20°C)

Max. Current — 25 mADC

Voltage Rating — 250 V

BM-411 FOCUS COIL

**Notes:**

- 1) For use with recording storage tubes and simulators.
- 2) Tickler coil is provided to permit compensating for improper focus at the edges of a pattern caused by the variation in distance from the center of deflection to a) the center of a storage area of a storage tube, b) the periphery of the storage area.
- 3) When not required, the tickler coil may be left unconnected.
- 4) Shell material — annealed swedish iron or equivalent.

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