IMAGE ORTHICON
For simultaneous color pickup

MAGNETIC FOCUS

DATA

GENERAL:
Heater, for Unipotential Cathode:
Voltage
Current
Direct Interelectrode Capacitance:
Anode to all other electrodes
Photocathode, Semit transparent:
Response

See accompanying Spectral-Sensitivity Characteristics curve

Rectangular image (4 x 3 aspect ratio):
Useful size of

Note: The size of the optical image focused on the photocathode should be adjusted so that its maximum diagonal does not exceed the specified value. The corresponding electron image on the target should have a size such that the corners of the rectangle just touch the target ring.

Orientation of

Proper orientation is obtained when the vertical scan is essentially parallel to the plane passing through center of faceplate and pin 7 of the shoulder base.

Focusing Method
Deflection Method
Overall Length
Greatest Diameter of Bulb
Minimum Deflecting-Coil Inside Diameter
Deflecting-Coil Length
Focusing-Coil Length
Alignment-Coil Length
Photocathode Distance Inside End of Focusing Coil
Operating Position

See Operating Considerations

Weight (Approx.)
End Base

Small-Shelf Diheptal 14-Pin (JETEC No. B14-45)

BOTTOM VIEW

Pin 1 - Heater
Pin 2 - Grid No. 4
Pin 3 - Grid No. 3
Pin 4 - Internal Connection—Do Not Use
Pin 5 - Dynode No. 2
Pin 6 - Dynode No. 4
Pin 7 - Anode
Pin 8 - Dynode No. 5
Pin 9 - Dynode No. 3
Pin 10 - Dynode No. 1, Grid No. 2
Pin 11 - Internal Connection—Do Not Use
Pin 12 - Grid No. 1
Pin 13 - Cathode
Pin 14 - Heater

See basing diagram on next page.
Shoulder Base .................. Keyed Jumbo Annular 7-Pin
BOTTOM VIEW

Pin 1 - Grid No.6
Pin 2 - Photocathode
Pin 3 - Internal Connection - Do Not Use
Pin 4 - Internal Connection - Do Not Use
Pin 5 - Grid No.5
Pin 6 - Target
Pin 7 - Internal Connection - Do Not Use

Maximum and Minimum Ratings, Absolute Values:

PHOTOCATHODE:
Voltage ........................................ -550 max. volts
Illumination ................................... 50 max. ft-c

OPERATING TEMPERATURE:
Of any part of bulb .......................... 50 max. °C
Of bulb at large end of tube
(Target section) .............................. 40 min. °C

TEMPERATURE DIFFERENCE:
Between target section and any part
of bulb hotter than target section ....... 5 max. °C

GRID - No. 6 VOLTAGE ...................... -550 max. volts

TARGET VOLTAGE:
Positive value ................................ 10 max. volts
Negative value .............................. 10 max. volts
GRID - No. 5 VOLTAGE .................. 150 max. volts
GRID - No. 4 VOLTAGE .................. 300 max. volts
GRID - No. 3 VOLTAGE .................. 400 max. volts
GRID - No. 2 & DYNOE - No. 1 VOLTAGE ... 350 max. volts
GRID - No. 1 VOLTAGE:
Negative bias value ..................... 125 max. volts
Positive bias value ..................... 0 max. volts

PEAK HEATER - CATHODE VOLTAGE:
Heater negative with respect to cathode .......... 125 max. volts
Heater positive with respect to cathode .......... 10 max. volts

ANODE - SUPPLY VOLTAGE* .............. 1350 max. volts
VOLTAGE PER MULTIPLIER STAGE .......... 350 max. volts

*: See next page.
Typical Operation and Characteristics Range Values:

Photocathode Voltage (Image Focus) ... -400 to -540 volts
Grid-No.6 Voltage (Accelerator) —
   Approx. 75% of photocathode voltage ... -300 to -405 volts
Target-Cutoff Voltage \( O \) ... -3 to +1 volts
Grid-No.5 Voltage (Decelerator) ... 0 to 125 volts
Grid-No.4 Voltage (Beam Focus) ... 140 to 180 volts
Grid-No.3 Voltage \( # \) ... 225 to 330 volts
Grid-No.2 & Dynode-No.1 Voltage ... 300 volts
Grid-No.1 Voltage for picture cutoff ... -45 to -115 volts
Dynode-No.2 Voltage ... 600 volts
Dynode-No.3 Voltage ... 800 volts
Dynode-No.4 Voltage ... 1000 volts
Dynode-No.5 Voltage ... 1200 volts
Anode Voltage ... 1250 volts
Anode Current (DC) ... 30 \( \mu A \)
Signal-Output Current (Peak to peak) ... 3 to 24 \( \mu A \)
Target-Temperature Range ... 40 to 45 \( ^\circ C \)

Ratio of Peak-to-Peak Highlight
Video-Signal Current to RMS Noise Current (Approx.) ... 60
Minimum Peak-to-Peak Blanking Voltage ... 5 volts
Field Strength at Center of Focusing Coil \( \Delta \) ... 75 gaussess
Field Strength of Alignment Coil (Approx.) ... 0 to 3 gaussess

• Ratio of dynode voltages is shown under Typical Operation.
• Normal setting of target voltage is +2 volts from target cutoff. The target-supply voltage should be adjustable from -3 to +5 volts.
• Adjust to give the most uniformly shaded picture near maximum signal.
\( \Delta \) Direction of current should be such that a north-seeking pole is attracted to the image end of the focusing coil, with the indicator located outside of and at the image end of the focusing coil.

OPERATING CONSIDERATIONS

The operating position of the 7037 should preferably be such that any loose particles in the neck of the tube will not fall down and strike or become lodged on the target. Therefore, it is recommended that the tube never be operated in a vertical position with the Diheptal-base end up nor in any other position where the axis of the tube with base up makes an angle of less than 20\( ^\circ \) with the vertical.

When the equipment design or operating conditions are such that the maximum temperature rating or maximum temperature difference as given under Maximum Ratings will be exceeded, provision should be made to direct a blast of cooling air
from the Diheptal-base end of the tube along the entire length of the bulb surface, i.e., through the space between the bulb surface and the surrounding deflecting-coil assembly and its extension. Any attempt to effect cooling of the tube by circulating even a large amount of air around the focusing coil will do little good, but a small amount of air directly in contact with the bulb surface will effectively drop the bulb temperature. For this purpose, a small blower is satisfactory, but it should be run at low speed to prevent vibration of the 7037 and the associated amplifier equipment. Unless vibration is prevented, distortion of the picture may occur.

Ordinarily, the temperature in a camera equipped with a blower will not exceed 45°C, except in very hot weather or unless the target heater is left on accidentally for a long period.

To keep the operating temperature of the large end of the tube from falling below 45°C, some form of controlled heating should be employed. Ordinarily, adequate heat will be supplied by the focusing coil, deflecting coils, and associated amplifier tubes so that the temperature can be controlled by the amount of cooling air directed along the bulb surface. If, in special cases, a target heater is required, it should fit between the focusing coil and the bulb near the shoulder of the tube, and be non-inductively wound.

Resolution in excess of 500 lines at the center of the picture can be produced by the 7037 when operated for color reproduction.

To utilize the resolution capability of the 7037 in the horizontal direction with the standard scanning rate of 525 lines, it is necessary to use a video amplifier having a bandwidth of at least 6 megacycles.
IMAGE ORTHICON

DETAILED VIEW OF JUMBO ANNULAR BASE

CROSS-HATCHED AREA IS FLAT

1.315" R.MIN.
1.185" R.MAX.

NOTE 1: DOTTED AREA IS FLAT OR EXTENDS TOWARD DIHEPTAL-BASE END OF TUBE BY 0.060" MAX.

ANNULAR-BASE GAUGE

ANGULAR VARIATIONS BETWEEN PINS AS WELL AS ECCENTRICITY OF NECK CYLINDER WITH RESPECT TO PHOTOCATHODE CYLINDER ARE HELD TO TOLERANCES SUCH THAT PINS AND NECK CYLINDER WILL FIT FLAT-PLATE GAUGE WITH:

a. SIX HOLES HAVING DIAMETER OF 0.065" ± 0.001" AND ONE HOLE HAVING DIAMETER OF 0.150" ± 0.001" ALL HOLES HAVE DEPTH OF 0.265" ± 0.001". THE SIX 0.065" HOLES ARE ENLARGED BY 45° TAPER TO DEPTH OF 0.047" ALL HOLES ARE SPACED AT ANGLES OF 51°26' ± 5' ON CIRCLE DIAMETER OF 2.500" ± 0.001".

b. SEVEN STOP HAVING HEIGHT OF 0.187" ± 0.001" CENTERED BETWEEN PIN HOLES, TO BEAR AGAINST FLAT AREAS OF BASE.

c. RIM EXTENDING OUT A MINIMUM OF 0.125" FROM 2.812" DIAMETER AND HAVING HEIGHT OF 0.126" ± 0.001".

d. NECK-CYLINDER CLEARANCE HOLE HAVING DIAMETER OF 2.200" ± 0.001".

92CM-8293R3

ENLARGED BOTTOM VIEW

3.00" ± 0.06" 1.35" ± 0.015" ± 0.025"

2.56" ± 0.12"

0.425" ± 0.025"

0.040" ± 0.002" DIA.

6 PINS

JUMBO ANNULAR
7-PIN BASE

15.20" ± 0.25"

2.00" ± 0.06"

SMALL-SHELL
DIHEPTAL
14-PIN BASE

JETEC No.
B14-45

2.500"

38.5° ± 10°

-0.093" ± 0.003" DIA.
SPECTRAL-SENSITIVITY CHARACTERISTICS

FOR INCIDENT RADIANT ENERGY WITHIN NORMAL OPERATING RANGE OF TUBE.
DASHED CURVE SHOWS SPECTRAL CHARACTERISTIC OF AVERAGE HUMAN EYE.

MICROAMPERES FROM PHOTOCATHODE (MICROWATTS)
OF RADIANT ENERGY INCIDENT ON PHOTOCATHODE

0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000

0 100 80 60 40 20 0

ULTRA VIOLET BLUE GREEN YELLOW RED INFRA RED

WAVELENGTH — ANGSTROMS

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY
BASIC LIGHT-TRANSFER CHARACTERISTIC

ILLUMINATION: WHITE LIGHT, FOR SMALL-AREA HIGHLIGHTS.

TYPICAL SIGNAL OUTPUT—MICROAMPERES

0.1  2  4  6  8  10
0.001 2.001 0.01 0.1

HIGHLIGHT ILLUMINATION ON PHOTOCATHODE—FOOT—CANDLES

LIGHT-TRANSFER CHARACTERISTICS

MAXIMUM DESIRED HIGHLIGHT SIGNAL—PER CENT

TARGET VOLTS: 4

HIGHLIGHT ILLUMINATION ON PHOTOCATHODE—PER CENT

ELECTRON TUBE DIVISION
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY