STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Preparation of Conductive Coating (Inside Paint)

EQUIPMENT:

1. Graduated cylinders, 100 mls capacity
2. Wide mouth bottle and cap, one quart capacity
3. Rollers 10 - 20 rpm
4. Eyedropper

MATERIALS:

1. De-ionized water
2. Acheson Dag #191, Acheson Colloids, Port Huron, Michigan
3. Sodium Silicate N Solution, Philadelphia Quartz Co., Philadelphia, Pa.
4. Aerosol OT Wetting Agent 75% Aq., American Cyanamide Co.
5. Flint pebbles, 12

PREPARATION:

1. Put 45 mls de-ionized water into a clean quart jar.
2. Add 60 mls of sodium silicate N solution to (1) above and swirl gently to make solution homogenous.
3. Add one drop of aerosol wetting agent to above. Swirl solution gently to insure homogeneity.
4. Add 95 mls of Acheson Dag #191 to above.
5. Place twelve flint pebbles in jar and secure cap to same.
6. Vigorously shake jar for thirty seconds.
7. Place jar on rollers for four (4) hours before use.

/fmd

SK-CD2

PRINTS TO

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SECTION

SI K-69982 44A10
SECTION

PREPARATION: (Cont'd)

8. Designate this paint as M-1 dag.

Note: Sodium silicate N solution "sets" quickly, therefore always keep the cap on the paint jar closed at all times except when in use. Before replacing the cap on the paint jar wipe the mouth of the bottle with a slightly moistened clean rag to prevent the sodium silicate from setting up and cementing the cap to the jar permanently. Follow this same procedure with the stock bottle of sodium silicate when measuring out quantities to prepare this paint.

Always clean the equipment IMMEDIATELY after formulating new batches of paint. If this is not done the silicate solution will "harden" and in the case of the graduated cylinders reduce their internal diameter. With time, proper quantities of silicate solution cannot be measured accurately from the scaled markings and the paint will not be formulated according to the above specifications.

Shelf life of stock sodium silicate N solution, as specified by the vendor, is six (6) months.

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Preparation of Frit

EQUIPMENT:

1. 50 mls capacity graduated cylinder
2. 250 mls capacity graduated cylinder
3. Weighing scale
4. Two liter capacity beaker

MATERIALS:

1. Deionized water
2. Butyl carbitol
3. Solder glass #8363

PREPARATION:

1. Add 20 mls of deionized water to the 2 liter capacity beaker.
2. Add 200 mls of butyl carbitol to the water and mix well.
3. With constant gentle stirring, slowly add 1,550 grams of solder glass #8363 to the water and butyl carbitol solution.

When step (3) has been completed the frit solution should have the consistency of whipped cream. When a glob of this paste is purposely dropped on a flat surface it should remain intact and not flow.

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Wash Funnel

EQUIPMENT:

1. Wash tank
2. Drying rack
3. Stopper

MATERIALS:

1. Oakite solution (2 lb. oakite #30/120 liters H_2O)
2. Deionized water
3. Tap water

PROCEDURE:

1. Place funnel in wash tank, flange down.
2. Insert stopper into neck flare.
3. Wash with hot oakite solution (approximately 135° - 145°F) for 2 minutes.
4. Place funnel with stopper upon funnel support in rinse tank.
5. Rinse inside and outside with hot tap water for 2 minutes.
6. Rinse inside and outside with deionized water for 1 minute.
7. Place funnel on drying rack for 15 minutes.

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A13

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Application of Conductive Coating (Inside Paint)

EQUIPMENT:

1. Stand to hold panel or funnel
2. Hard bristle brush

MATERIALS:

1. M-1 Dag (Conductive Coating) S.I. K-69982 44A10

PROCEDURE:

1. Swirl bottle gently to make solution homogenous.
2. Paint according to sketch drawing.
3. Air dry for 30 minutes.

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SECTION

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Application of Frit to Flange

EQUIPMENT:

1. Binks model 31V flow gun with accessories
2. Turntable

MATERIALS:

1. Frit paste (solder glass)
2. Trichorethylene
3. Alcohol, Solox U.S.I.

PROCEDURE:

1. Clean flange of facepanel and funnel with trichorethylene to remove gun residue from masking tape.
2. Remove fingerprints and/or grease from the flange of the facepanel and funnel with alcohol.
3. Pour frit paste into jar of flow gun.
4. Pressurize flow gun tank to 28 psi.
5. Operate gun to apply a 3/8" wide and 0.010" to 0.022" thick ribbon of solder glass to flange. Leave at least 1/16" spaces free of solder glass on inside edge of flat part of flange and on the outside bevelled edge of flange, both for the facepanel and funnel.
6. Let solder glass (frit) air dry at room temperature for 1/2 hour.
7. Cure for 15 minutes at 400°C with a 4°C/min temperature rise and a 3°C/min cooling rate. This schedule applies to both the face panel and funnel.

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SECTION

PROCEDURE (Cont'd)

8. IMPORTANT - Clean solder glass gun with water immediately after use. Do not allow solder glass paste (frit paste) to remain in gun, hose or nozzle.

/fmd

SUBJECT: Frit Inspection

EQUIPMENT:

None

MATERIALS:

1. Facepanel or funnel with frit applied.

PROCEDURE:

Listed below are the terms identifying defects in the applied frit, their causes and means to correct the same.

1. Tearing and Crawling

The frit (solder glass) cracks during drying, forming small mounds leaving adjacent areas of bare metal exposed.

Cause: a. Too large a ratio of the large size particle to the fine size particles in the supplied frit mixture.

b. Too thick an application of frit and a too rapid drying time.

Remedy: a. Discard this batch of frit. Mill the supplied frit mixture for one hour to break down the large particles before preparing a new batch.

b. Decrease thickness of frit applied to the flange.

2. Chipping

The frit chips or flakes off usually during or after the cooling cycle.

Cause: a. Dirty surface on metal flange.

b. Mechanical abuse.

c. Too thick an application of frit.

Remedy: a. Be certain that metal flanges are cleaned well.

b. Handle panels carefully during processing.

c. Reduce thickness of applied frit.

3. Specking

An occurance of dark spots in the frit.

Cause: a. Dirt on the metal flange.

Remedy: a. Be certain that metal flanges are cleaned well.

4. Dark-colored Frit after Firing

The glass frit, after firing, should have a brownish color.

Cause: a. Exposure of the powdered frit mixture to the atmosphere.

Remedy: a. Do not allow the powdered frit mixture to become exposed to the atmosphere for any length of time. Store in air tight containers.

5. Etching

The frit looks etched.

Cause: a. Acids were not washed away during the panel washing process.

Remedy: a. Be certain that the de-ionized water covers the frit during the rinse process.

SUBJECT: Set Up of Evaporator Heater Assembly for Funnel

EQUIPMENT:

1. P-5 High Vacuum Evaporation Unit - Optical Film Engineering Corp., Philadelphia, Penna., or any other similar unit.

MATERIAL:

1. POFP funnel to be aluminized
2. Tungsten filament - K-69982-46A115 - One (1) required
3. Aluminum slug - 99.6% min. .125" dia.; 230-260 mg. pellets. One (1) required.

PROCEDURE:

1. Support funnel horizontally in aluminizing unit, flange forward.
2. Shield as required by coated funnel assembly drawing.
3. Center tungsten filament holder in funnel, 5 inches back of flange.
4. Place aluminum slug in filament.
5. Aluminize per S.I. K-69982-44A17.

Note: Tungsten filaments and aluminum slugs must be kept clean at all times and not placed in any container other than those in which they were received from the vendor.

Tungsten filaments and aluminum slugs must be cleaned before use. Only clean enough for immediate use. See appropriate drawing for cleaning schedule.

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SUBJECT: Aluminize

EQUIPMENT:

1. P-5 High Vacuum Evaporation Unit - Optical Film Engineering Corp., Philadelphia, Penna., orany similar unit. (Schedule A)
2. Aluminizing Buggie including Welch Pump, Diffusion Pump, with tank and cover adapted on rubber gasket. (Schedule B)

MATERIALS:

1. POFP facepanel to be aluminized (or funnel).
2. Equipment set up for aluminizing

PROCEDURE: (Schedule A)

A. Starting Up

1. Turn main power switch on.
2. Open main water valve one full turn.
3. Open operating water valve one-half turn.
4. Turn on the following switches:
   a. Roughing pump
   b. Holding pump
   c. Diffusion pump heater (set variac at 11.0 amps)
   d. Popette valve (including air supply)
   e. Control panel power
5. Set meter selector to TC-2.
6. Close popette valve.
7. Close chamber door
8. Close valve from roughing pump to bottom of diffusion pump.

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PROCEDURE (Cont'd)

9. Open valve from holding pump to bottom of diffusion pump.
10. Open valve from roughing pump to chamber.
11. When TC-2 reads less than 200 microns close valve from roughing pump to chamber.
12. Open valve from roughing pump to diffusion pump.
13. Close valve from holding pump to diffusion pump.
14. Open popette valve and continue to: -

B. Flashing

15. Pump down to below one micron (15 minutes, if diffusion pump was pre-heated).
16. Warm tungsten filament by setting rheostat to #7 setting for thirty seconds.
17. Adjust rheostat setting to #8 for thirty seconds to melt the aluminum slug.
18. Adjust rheostat from setting from #8 to #18 slowly (fifteen seconds) and hold at #18 setting for two minutes to vaporize the aluminum.
19. Adjust rheostat setting to zero, turn off filament switch and continue to: -

C. Shuting Down

20. Turn off control panel switch.
21. Turn off roughing pump, leaving holding pump on until unit cools.
22. Open main water valve to maximum.

/fmd

PROCEDURES (Cont'd)

23. Open operating water valve to maximum.

24. Open cooling water valve to maximum.

25. Turn off diffusion pump heater switch.

26. When unit is sufficiently cooled (approximately one hour) turn off all water and vacuum valves.

27. Turn off holding pump switch and main switch.

PROCEDURE: (Schedule B)

1. Open valve for cooling water on diffusion pump.
2. Turn power switches marked 440 volts and 220 volts on.
3. Activate pushbutton switch next to timer.
4. Cycle must be interrupted and system permitted to continue with heat on diffusion pump until such time (45 minutes) as pressure reaches 2-3 microns. This is accomplished by toggle switch on side of timer.
5. Turn switch to position marked run and set Variac #1 to 10. (Without interruption this variac is activated in 15 minutes).
6. When this is activated (observe meter for reading in amps), increase to 25.
7. When timer changes (2 minutes) set Variac #2 at 30 and slowly increase to 60.
8. Filament remains activated 2 minutes and then #2 Variac is shut off automatically.
9. Oil in diffusion pump is then cooked for 3 minutes.
10. Pump is shut off and system is bled.
11. Panel (or funnel) is then ready for application of chromic oxide.

Note:

This system is semi-automatic and therefore all times are set on multiple timer.

/fmd

SUBJECT: Aging

EQUIPMENT:

1. Suitable equipment for aging color tube as per following schedule

MATERIAL:

1. Final assembly

PROCEDURE:

1. Plug tube into socket.
2. Preheat at 6.3 vac. for not less than 3 min.
3. Age all guns simultaneously per:

Time	E_f	E_{g1}
3 min.	9.5 vac.	+ 1 VDC
30 min.	9.0 vac.	+ 1.5 VDC
10 min.	9.0 vac.	+ 1.0 VDC

? How

4. If necessary to reage, select gun and reage as per following schedule.

Time	E_f	E_{g1}
2 min.	9.5 vac.	+ 3 VDC
25 min.	9.0 vac.	+ 2 VDC

/fmd

SUBJECT: TEST SPECIFICATIONS

GENERAL:

The purpose of test specifications is to provide standards against which our product can be compared to insure that it conforms with JETEC registration and is competitive with that of the rest of the industry. To be acceptable, a tube must meet all of the specifications within the specified limits.

EQUIPMENT:

1. Suitable test set for performing the prescribed electrical tests.
2. Other equipment as specified in the test notes.

NOTES: (1) Socket connections for Telefunken guns per M69982-46A126.

(2) Unless otherwise specified, the base pin connections for all tubes are as follows:

Pin No.	Standard P. A.	Telefunken Triode	Telefunken Tetrode
1	G_1 - Green	H - Common	H - Common
2	H - Blue	G_1 - Blue	G_1 - Blue
3	K - Blue	K - Blue	K - Blue
4	G_1 - Blue	No Connection	G_2 - Blue
5	H - Common	Astigmatism Control	Focus
6	G_1 - Blue	Fixed Focus Volt. #4	Focus
7	No Connection	Fixed Focus Volt. #2	Focus
8	Focus	Blue Gun Defl. Plate	Deflection Plate-Blue
9	No Connection	Red Gun Defl. Plate	Deflection Plate-Red
10	Deflection Plate-Blue	Fixed Focus Volt. #1	Focus

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SKCP-2 8-16-56 JB

Pin No.	Standard P. A.	Telefunken Triode	Telefunken Tetrode
11	Deflection Plate-Red	Fixed Focus Volt. #3	Focus
12	No Connection	Fixed Focus Volt. #5	Focus
13	No Connection	Adjustable Focus Volt.	Focus
14	G_1 - Red	No Connection	G_2 - Red
15	H - Common	K - Red	K - Red
16	G_1 - Red	G_1 - Red	G_1 - Red
17	K - Red	No Connection	G_2 - Green
18	H - Red	K - Green	K - Green
19	H - Green	G_1 - Green	G_1 - Green
20	K - Green	H - Common	H - Common

Recessed small - cavity cap on minor axis of funnel - Anode

Metal Flange - Grille

Recessed small - cavity on panel - 2-1/4" off minor axis - Screen

SPECIAL SYMBOLS:

E_f - Heater Voltage

E_{c_1} - Grid #1 Voltage

E_{c_2} - Grid #2 Voltage

E_A - Anode Voltage

[1] E_{FGE} - Focus Voltage of G.E. Gun

E_g - Grille Voltage

E_s - Screen Voltage

I_s - Screen Current

F_r = 15750 x 60 cps.

[1] E_{FT} = Focus Voltage of Telefunken Gun

/fmd

SKCF-2 8-16-56 J.B. N Little 1

NOTES TO 22" COLOR TUBE TEST SPECIFICATIONS

1. Disconnect all pins except heater and cathode when performing H-K leakage test.
2. Tie cathodes together when performing H-K leakage test.
3. Reject for continuous arcing. Acceptable if tube does not arc within 5 seconds of applying operating voltage. If tube arcs within first 5 seconds, observe for 5 seconds following arc. Tube acceptable if no arcs in second 5 seconds.
4. For recorded readings and life test, use R_{g1} = 10 M. Subtract test set leakage from measured leakage value.
5. Undeflected, unconverged spots are under-converged with the blue spot falling within 1/4" diameter circle whose center is .427 horizontally to the right of the green spot center. The center of the red spot falling within a 1/4" diameter circle whose center is .427" horizontally to the left of the green spot center.

REMARK: When performing this test, remove yoke and the convergence correction assembly from the tube neck and connect the deflection plate leads to the anode voltage.

6. Undeflected, unconverged green spot must fall within a 1-1/4" circle whose center is the geometric center of the screen. See Remark of No. 5.
7. If the "corrected" TVRD yoke is used, converge statically as follows:
   a. With the sweep off - converge the three spots by adjusting the

/fmd

DC magnets in the static convergence correction assembly on the tube neck and the deflection plate voltage.

b. Turn on the sweep and the crosshatch pattern. Readjust the above DC magnets and the deflection voltage if needed to obtain the optimum crosshatch pattern convergence throughout the picture area.

8. The picture area is found in "A" and "B".

Zone A - Include the area within a line one inch in from the decorative mask.

There shall not be noticeable color impurities or screen defects when viewed at a distance of 5 feet.

Zone B - Include the remainder area. (For POFP tube can not be determined how much impurities or fringes permissable.)

9. a. Reduce the screen voltage by approximately 2KV.

b. Center the green field by adjusting the Helmholtz cool current so that the blue and red bars are symmetrical. If the color bars are not vertical, adjust the "Z" cool current.

c. Increase the screen voltage until the other two colors disappear from the green field.

d. Check the three color convergence using the crosshatch pattern per No. 7.

e. Repeat "a" and "b". The three color fields shall be pure simultaneously.

10. The difference in the focus voltage between the individual guns in the same tube should not exceed ± 100V.

11. Adjust E_{c1} to just cut off the spot. Note presence of grid emission. If present, turn on scanning and reject if grid emission is visible on a full scan horizontal and 7" vertical pattern. If stray emission is noted during factory testing, the breakdown tests shall be made. The difference in the cut-off voltage between the individual guns in the same tube should not be greater than 15V DC.

12. GENERAL:

Turn E_{c1} to zero bias slowly. The zero bias conditions should not be maintained for more than 5 seconds at a time.

At the electrode voltages specified, the cathode current shall be greater than the zero bias current for tubes having the corresponding grid #1 cut-off voltage as listed in the following table.

THEORY:

Production experience has shown that if the grid #1 cut-off bias of a cathode ray tube is (-50) volts, then an average zero-bias emission current of 1050 microamperes will be obtained. (With good cathode coating materials and base materials, this figure will average 1250 microamperes.)

Use is made of the 3/2 power law of emission to obtain the following chart:

$$I_{limit} = I_{au} \left(\frac{E_{g1}(c.o)}{E_{g1}(-50)} \right)^{3/2} \times 70\%$$

I_{au} = 1050 microamperes

E_{g1} = G#1 Cut-Off Voltage

E_{g1} (-50) = -50 Volts Reference Point

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SK-CD2

MINIMUM ZERO-BIAS

CURRENT IN MICROAMPERES

Grid #1 Cut-Off Voltage	I_k Min.	Life Test End Point Limit	Grid #1 Cut-Off Voltage	I_k Min.	Life Test End Point Limit
65	1090	763	98	2010	1410
66	1120	783	99	2045	1430
67	1140	798	100	2075	1455
68	1165	817	101	2110	1478
69	1185	830	102	2140	1500
70	1215	851	103	2175	1522
71	1240	868	104	2205	1543
72	1270	890	105	2225	1558
73	1300	910	106	2260	1583
74	1325	928	107	2300	1610
75	1350	946	108	2330	1630
76	1375	963	109	2365	1655
77	1400	980	110	2395	1678
78	1430	1000	111	2430	1703
79	1460	1020	112	2460	1722
80	1485	1040	113	2500	1751
81	1515	1060	114	2535	1773
82	1545	1080	115	2570	1800
83	1570	1100	116	2600	1820
84	1600	1120	117	2630	1842
85	1625	1137	118	2670	1868
86	1655	1159	119	2705	1895
87	1685	1180	120	2735	1915
88	1715	1200	121	2770	1940
89	1745	1220	122	2810	1968
90	1770	1240	123	2840	1990
91	1800	1260	124	2880	2012
92	1835	1283	125	2910	2035
93	1865	1305	126	2950	2065
94	1895	1325	127	2980	2085
95	1920	1345	128	3015	2110
96	1955	1370	129	3050	2135
97	1985	1390	130	3090	2165

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13. If the anode current I_a exceeds the maximum test limit, inspect the cathode image and re-age if underaging noticeable.

If the cathode image is normal and zero bias emission in the test limits, reject the tube.

14. No grille wire vibration should be visible at normal operating conditions. (I_g total = 400 ua)

15. Damping threads should not be visible to a trained observer 5 feet from the face of the tube with any field at any value of brightness up to 20 feet initially or after 1000 hours of life.

16. The differences in G_1 voltage for obtaining I_g = 200 ua should not be greater than 20V DC for the same tube.

17. a. LIFE TEST CONDITIONS:

Life Test shall consist of operating the tri-color tube samples at the condition specified below.

E_f = 6.3V AC

E_{anode} = 6.8KV DC

E_{grille} = 6.4KV DC

// E_{FGE} = 3.0KV DC

E_{screen} = 25.0KV DC

Adjust E_{c1} on each gun to give:

rI_k = 150 ua

gI_k = 150 ua

bI_k = 150 ua

// E_{FT} = 6.8KV DC for Telefunken Gun supplied to Voltage Divider per M69982-46A126

JB. SKCO-2 2-16-56 W Keller

b. INTERVAL TESTS:

Tests should be made on samples every 50, 150, 300, 500, 750, 1000, 1500 and 2000 hours.

c. TEST CONDITIONS:

All Life Test samples shall be tested per M-69982-4A85, 1 through 12, 20 through 47.

d. END OF LIFE:

1. Emission decreased below the limits (see No. 16).

2. Other tests are exceeding specified limits.

18. CATHODE IMAGE

PURPOSE

The purpose of this test is to determine what percentage of the usable cathode area is active.

GENERAL

The trajectories of the electrons in a cathode-ray tube are such that they form an enlarged image of the cathode appropriately called the cathode images within the tube some distance beyond the crossover. Under certain operating conditions an image of the cathode image can be focused on the screen where it provides a means of examining the condition of the emitting surface. Areas whose emission is good appear bright while spots with poor emission are dark. An estimate of the percentage of dead area in the cathode can be made from the drawings on page 10.

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A19

SECTION

CONT ON SHEET 10

REVISIONS

PROCEDURE

1. Operate the tube under the conditions specified on M-69982-44A85 for this test with E_{c1} adjusted to give the clearest image of the cathode on the screen.

2. Examine the image to see if it contains any dark spots indicative of low emission areas in the cathode.

3. Reject the tube if the total percentage of dark areas due to dead spots in the cathode emitting surface, plus any dark areas due to beam obstruction (burrs, lint, etc.) exceeds 20%. (See page 10). [1]

4. Reject the tube if there is any bright area (due to burnt aperture) visible outside the circular area of the cathode image.

LIMITATIONS:

1. The phosphor screen can be damaged if the emission current is too high or if the spot is left on too long.

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PRINTS TO

1 SKCR-2 8-16-56 H. Bath [illegible]

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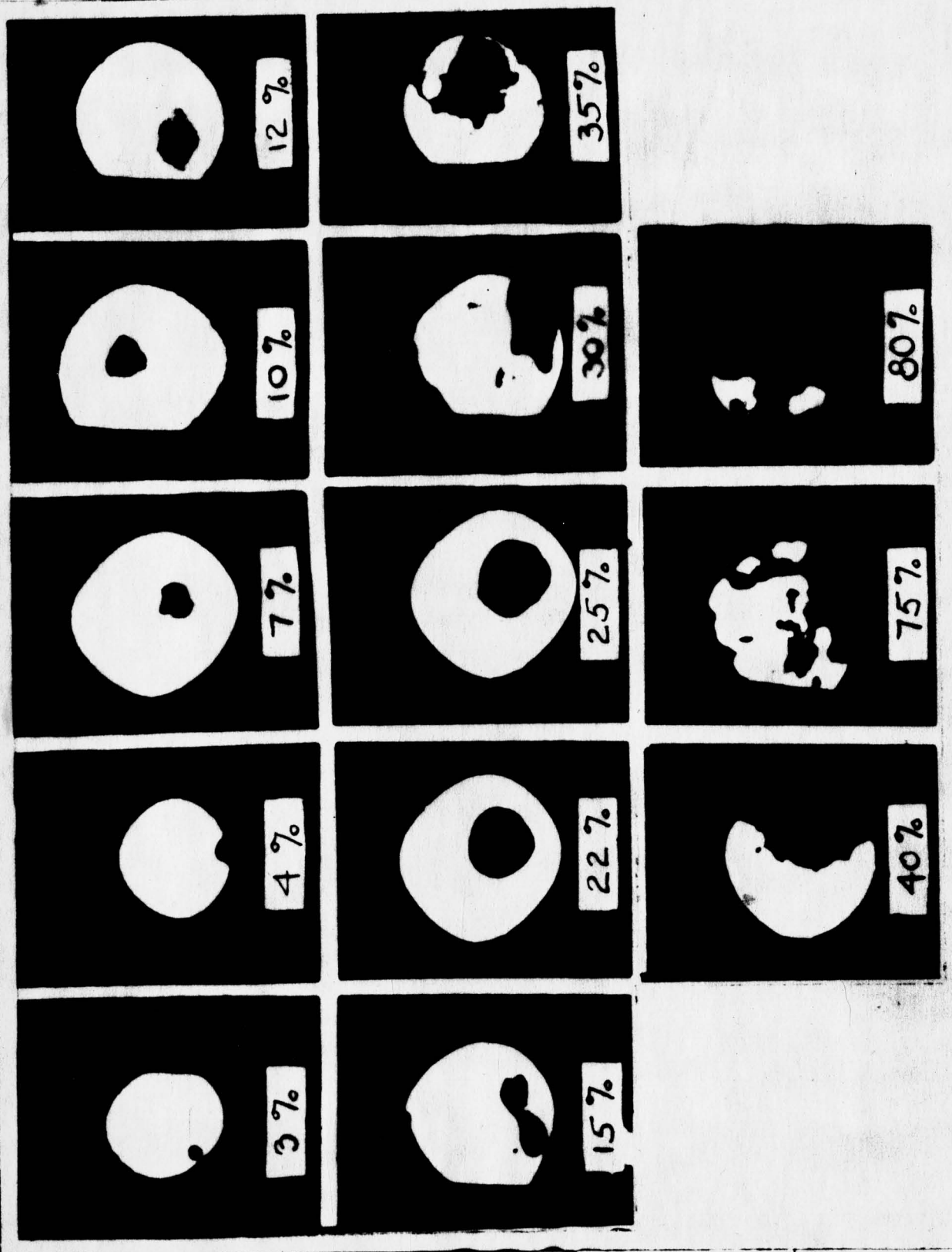
STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY



REVISIONS

N19:

For the Telefunken Gun, focus voltage is applied to a voltage divider network per M-69982-46A126. There are three (3) controls provided: - coarse and fine focus adjustments and astigmatism adjustment. In order to obtain the optimum focus quality for a given beam current, do the following:

1. Adjust the coarse and fine focus controls so that the first focus is obtained approximately in the middle of the fine adjustment range. After this range has been obtained for a given gun, use only the fine control for final adjustments.
2. Adjust the astigmatism control for minimum astigmatism by observing unconverged spots in the middle of the screen.

N20:

To defocus a Telefunken gun in order to obtain a cathode image, do the following:

1. Turn the coarse focus voltage control to the clockwise position.
2. Adjust E_{c1} voltage until cathode image is visible.
3. Adjust the fine focus voltage and astigmatism control until a well defined cathode image is obtained.

SUBJECT: Preparation of Cement

SCHEDULE A:

CEMENT FORMULA #21 MATERIALS:

1. Silver powder, F.W. 107,880, Fisher Scientific Co., or equivalent
2. 600 B Crystolon, Norton Abrasives, or equivalent
3. 400 B Crystolon, Norton Abrasives, or equivalent
4. Sodium silicate solution, Will Corporation, or equivalent
5. Sauerisen thinning liquid #14, Sauerisen Cements Co., or equivalent
6. Aerosol OT Wetting Agent, Grade 100%, American Cynamid Co., or equivalent

FORMULA:

Silver Powder	160 grams
600 B Crystolon	112 grams
400 B Crystolon	48 grams
Sodium silicate solution	96 cc.
Sauerisen thinning liquid	96 cc.
Aerosol solution (0.5%)	5 cc.

PROCEDURE:

1. Mix sodium silicate and aerosol solutions thoroughly and add silver powder. Then add crystolon solids followed by Sauerisen thinner and mix thoroughly.
2. Store in properly labeled air-tight container.
3. Use Sauerisen #14 thinner when necessary.

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SCHEDULE B:

IRON CEMENT

MATERIALS:

1. Iron powder, reagent #1-2226, Baker Chemical Co.
2. Iron powder, electrolytic pure #1-60, Fisher Scientific Co.
3. Kasil PS-5
4. Surfynol 82, Air Reduction Chemical Co., New York, N.Y.

FORMULA:

Iron powder, reagent	40 gm.
Iron powder, electrolytic pure	40 gm.
Kasil	68 ml.
Surfynol, 10% aqueous soln.	1 ml.

PROCEDURE:

1. Mix iron powders together thoroughly.
2. Take 68 ml. of kasil ann boil down slowly to 62 ml. stirring continuously.
3. Take 38 ± 2 ml. of boiled down kasil and add 1 ml. of 10% surfynol.
4. Blend with iron powders, pour into 2 oz. jar and place on rolling mill for 15 min. before using.
5. Cement should be rolled continuously except when using.

Note: The surfynol content may be varied within the above stated limits to change the cement constituency.

This cement will withstand degreasing after pre-cure.

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Syracuse LOCATION
SECTION

SI K-69982 44A20
SECTION

REVISIONS

SUBJECT: Frame Prestress

EQUIPMENT:

1. Prestress jig (W-69982-46A65).
2. Two sets of weights totaling 23-1/2 lbs. each.
3. Prestress clamp (P-69982-46A69).

MATERIALS:

1. Frame

PROCEDURE:

1. Attach a 23-1/2 pound load to each of the two cables in the prestress jig.
2. Place frame in prestress jig and apply pre-stress.
3. Place pre-stress clamp across minor axis of frame and lock to hold this position.
4. Release pre-stressing from the jig and remove frame.

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Welding Mounts to Frame

EQUIPMENT:

1. Welding jig (T-69982-46A11)
2. Resistance welder - National Electric Welding Machine Co., Type 75 ser. A.O.P.T. proj 12 or equivalent

MATERIAL:

1. Frame (pre-stressed)
2. Mounts

PROCEDURE:

1. Place pre-stressed frame in welding jig.
2. Place stud holes in mounts over pins. Mount positions are given by drawing M-69982-45A37.
3. Weld mounts to frame. Inside of mounts should be flush with inside of frame.

/fmd

SK-CD2

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A23

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Prestress Transfer

EQUIPMENT:

1. Prestress jig (W-69982-46A65)
2. Two sets of weights totaling 23-1/2 lbs. each
3. Second prestress clamp

MATERIALS:

1. Frame with mounts welded in place

PROCEDURE:

1. Attach a 23-1/2 lb. load to each of the two cables in the prestress jig.
2. Place frame in prestress jig and apply prestress.
3. Remove prestress clamp and attach second clamp to holes in sides of center mounts.
4. Adjust clamp to remove all slack but do not tighten and over stress frame.
5. Release prestressing from the jig and remove frame.

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SI K-69982 44A23

SECTION

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STANDING INSTRUCTIONS

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REVISIONS

SUBJECT: Brazing Studs to Mounts

EQUIPMENT:

1. Brazing jig (T-69982-46A6)
2. Hydrogen-Oxygen torch

MATERIALS:

1. Frame with mounts welded in place.
2. V-ball studs
3. Handy Flux - Handy and Harman, New York, N.Y.
4. Brazing wire, RTSN - Handy and Harman, New York, N.Y.

PROCEDURE:

1. Inspect cones of brazing jig and wipe clean if necessary.
2. Place frame with mounts on brazing jig.
3. Drop V-ball studs, ball end down, thru mount stud holes and seat in cones.
4. Make closed loops from brazing wire which just slip over studs and place one over each V-ball stud.
5. Brush flux around area to be brazed.
6. Adjust torch for an excess of hydrogen over oxygen. Slowly bring stud and mount up to temperature until brazing material flows freely around stud. Do not over heat mounts.

CAUTION:

Do not let flame strike brazing jig at any time.

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SI K-69982 WA25
SECTION
CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Frame Sandblast

EQUIPMENT:

1. Sandblaster - Type EN2 - Pangborn Corp., Hagerstown, Md.
2. Grit #30

MATERIALS:

1. Frame

PROCEDURE:

1. Rest frame on support in sandblaster.
2. Direct sanblast nozzle at areas to be sandblasted.
3. Continue sandblast until surface appears clean and dull.

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STANDING INSTRUCTIONS

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SI K-69982 44A26

SECTION

CONT ON SHEET F SH NO 1

REVISIONS

SUBJECT: Grille Winding

EQUIPMENT:

1. Suitable lathe with automatic wire feed adjusted for 3 oz. tension.
2. Lathe platens (T-69982 53A440) with combs (T-69982 46A46).

MATERIALS:

1. Frame with V-ball studs
2. Wire

PROCEDURE:

1. Place frame on platen and push V-ball studs into cones with holding screws.
2. Take end of wire from wire feed and attach to side of lathe mandrel.
3. Start lathe and see that wire enters first tooth of combs properly.
4. When wire has wound across the entire frame, allow a few extra turns, stop lathe and attach wire to the other side of lathe mandrel.
5. Examine wire plane for double wires.

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GENERAL ELECTRIC

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SECTION
CONT ON SHEET F SH NO 1

REVISIONS

SUBJECT: Cementing

EQUIPMENT:

1. Infra-red lamps in movable fixtures.
2. Small brushes
3. Shears
4. Baking oven

MATERIALS:

1. Frame with wires positioned under tension.
2. Cement

PROCEDURE:

1. Move the platen into a horizontal position.
2. Brush cement over wires being careful that it does not run inside frame. A technique of brushing must be developed where in the cement is puddled and brushed out not touching wires with the brush.
3. If more than one frame is being cemented, move next platen into a horizontal position apply cement, etc.
4. Place 4 infra-red lamps about 18" from each frame and let cement dry.
   a. Dry iron cement for 45 min.
   b. Dry formula 21 cement for 1-1/2 hrs.
5. Remove lamps, release holding screws and cut grille free using shears.
6. Bake at 350°F for 1/2 hour.

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SUBJECT: Grille Inspection

EQUIPMENT:

1. Grille inspection fixture
2. Electrical contact circuit including battery and milliammeter

MATERIALS:

1. Grille

PROCEDURE:

1. Wipe clean the ends of the micrometer anvils.
2. Place grille onto V-grooves of fixture base.
3. Place micrometer assembly fixture onto its V-grooves on fixture base.
4. Record, in turn, each micrometer reading. A reading is taken as inital contact between the micrometer anvil and grille wire is indicated by movement of the milliammeter needle.
5. Remove micrometer fixture and lightly oil the ends of the micrometer anvils.

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/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Preparation of Stock P.V.A. Solution

EQUIPMENT:

1. Waring Blender, Model CB2
2. Large narrow mouth jug, 20 liters capacity
3. Stainless steel mesh, #150
4. Balance
5. Graduate cylinders, 1000 mls. capacity

MATERIALS:

1. Polyvinyl alcohol (PVA) DuPont Elvanol Grade 52-22
2. Deionized water
3. Anhydrous Solox U.S.I.

PREPARATION:

1. Put 1800 mls. of deionized water into Waring Blender
2. Set on speed #1, 8000 RPM
3. While mixing at speed #1, 8,000 rpm, add 900 ml. solox
4. Next add 97.5 gms. P.V.A., set on speed #3 and mix for 10 minutes
5. Shut blender off and let cool for 30 minutes. A water bath can be used for cooling.
6. Upon cooling, filter through a stainless steel mesh #150 into a 20 liter bottle.
7. Repeat until bottle is full.

PRECAUTIONS:

1. Bottle should be kept air tight when not in use to prevent loss of Solox through evaporation.
2. Should be stored at 72° ± 5°.

If solution is stored at above temperature, it is stable and the preparation of large quantities reduces variations in small separate batches.

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1 Hilda Little Oct 24 1957

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GENERAL

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A30

SECTION

CONT. ON SHEET FINAL SH NO. 1

REVISIONS

SUBJECT: Preparation of Photo-Sensitive Filming Solution

EQUIPMENT:

1. Brown bottle, narrow mouthed, 3,000 mls capacity
2. Balance
3. Graduated cylinders, 1,000 mls capacity
4. Fritted glass filter
5. Vacuum pump, hose, vacuum flask 3,000 mls capacity

MATERIALS:

1. Stock P.V.A. solution K-69982-44A29
2. Solox, U.S.I. anhydrous
3. Ammonium dichromate, reagent grade, Eimer and Amend (or any good reagent grade).
4. Deionized water

PREPARATION:

1. To 760 ml. stock, add 250 ml. of deionized water.
2. While stirring add 1,250 ml. of solox
3. Add 8.8 grams of Ammonium dichromate and put on rollers to roll for approximately 1/2 hour before using. (Best results are obtained if the solution is permitted to roll for 3-4 hours before use).
4. Vacuum filter through a fritted glass filter and store in a narrow mouthed brown bottle.

Note: Solution may be prepared in Waring Blender, Model CB2, at speed #1 (8,000 rpm) or in Waring Blender, Model #702 at low speed to eliminate stirring by hand.

PRECAUTIONS:

1. Store in brown bottle and in red light at 72°F ± 5°.
2. Any remnant of this solution should be discarded 5 days after preparation.

SK-CP-22 Hilda Little Oct 24 1956

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GENERAL

PRINTS TO

PREPARED BY P. Marapodi 4-9-56

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SECTION

FF-660-C (10-55) PRINTED IN U.S.A.

SUBJECT: Preparation of Blue Phosphor Slurry

EQUIPMENT:

1. Waring Blender Model 702 or Model CB2
2. Balance
3. 2,000 mls capacity brown bottle, wide mouth
4. 600 mls capacity beaker
5. 1,000 mls capacity graduated cylinders
6. Stainless steel mesh, #150
7. Rollers

MATERIALS:

1. G. E. Phosphor #113-3-203P (blue)
2. Stock P.V.A. solution K-69982 44A29
3. Solox (U.S.I.), anhydrous

PREPARATION:

1. If using Waring Blender (Model 702), add 280 mls of anhydrous solox and set at slow speed. If using large Waring Blender (Model CB2) add any multiple of 280 mls and set at speed #1 (8,000 rpm).
2. Slowly add 250 gms of phosphor.
3. Mix for one minute at high speed in the small blender and at speed #2 (10,000 rpm) in large blender.
4. With blender speed at initial setting, slowly add 160 mls of stock P.V.A. solution.

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PREPARATIONS (Cont'd)

5. Mix for 3 minutes at high speed for small blender and speed #2 for large blender.
6. Filter through #150 mesh, stainless steel, into brown bottle.
7. Keep solution rolling continuously while not in use.

* When using large blender, use same multiple of (2) and (4) as was used for (1) but do not exceed capacity of large blender (4 liters).

PRECAUTIONS:

1. If phosphor comes out of solution, put contents of bottle back into blender and mix for 3 minutes. Filter and continue rolling.
2. Slurry should be filtered through stainless steel mesh #150 just before use.
3. Any remnant of this slurry should be discarded 5 days after preparation.

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Preparation of Green Phosphor Slurry

EQUIPMENT:

1. Waring Blender Model 702 or Model CB2
2. Balance
3. 2,000 mls capacity brown bottle, wide mouth
4. 600 mls capacity beaker
5. 1,000 mls capacity graduated cylinders
6. Stainless steel mesh, #150
7. Rollers

MATERIALS:

1. G. E. Phosphor #113-3-253P (green)
2. Stock P.V.A. solution K-69982 44A29
3. Solox (U.S.I.), anhydrous

PREPARATION:

1. If using Waring Blender (Model 702), add 280 mls of anhydrous solox and set at slow speed. If using large Waring Blender (Model CB2) add any multiple of 280 mls and set speed at #1 (8,000 rpm).
2. Slowly add 250 gms of phosphor.
3. Mix for one minute at high speed in the small blender and at speed #2 (10,000 rpm) in large blender.
4. With blender speed at initial setting, slowly add 160 mls of stock P.V.A. solution.

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PRINTS TO CD2

FF-660-C (7-54) PRINTED IN U.S.A.

PREPARATIONS (Cont'd)

5. Mix for 3 minutes at high speed for small blender and speed #2 for large blender.
6. Filter through #150 mesh, stainless steel, into brown bottle.
7. Keep solution rolling continuously while not in use.

* When using large blender, use same multiple of (2) and (4) as was used for (1) but do not exceed capacity of large blender (4 liters).

PRECAUTIONS:

1. If phosphor comes out of solution, put contents of bottle back into blender and mix for 3 minutes. Filter and continue rolling.
2. Slurry should be filtered through stainless steel mesh #150 just before use.
3. Any remnant of this slurry should be discarded 5 days after preparation.

/fmd

SK-CD2

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Preparation of Red Phosphor Slurry

EQUIPMENT:

1. Waring Blender Model 702 or Model CB2
2. Balance
3. 2,000 mls capacity brown bottle, wide mouth
4. 600 mls capacity beaker
5. 1,000 mls capacity graduated cylinders
6. Stainless steel mesh, #150
7. Rollers

MATERIALS:

1. G. E. Phosphor #1092-1 (red).
2. Stock P.V.A. solution K-69982 44A29
3. Solox (U.S.I.), anhydrous

PREPARATION:

1. If using Waring Blender (Model 702), add 280 mls of anhydrous solox and set at slow speed. If using large Waring Blender (Model CB2) add any multiple of 280 mls and set at speed #1 (8,000 rpm).
2. Slowly add 260 gms of phosphor.
3. Mix for one minute at high speed in the small blender and at speed #2 (10,000 rpm) in large blender.
4. With blender speed at initial setting, slowly add 160 mls of stock P.V.A. solution.

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SK-CD2

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FF-660-C (7-54) PRINTED IN U.S.A.

PREPARATIONS (Cont'd)

5. Mix for 3 minutes at high speed for small blender and speed #2 for large blender.
6. Filter through #150 mesh, stainless steel, into brown bottle.
7. Keep solution rolling continuously while not in use.

* When using large blender, use same multiple of (2) and (4) as was used for (1) but do not exceed capacity of large blender (4 liters).

PRECAUTIONS:

1. If phosphor comes out of solution, put contents of bottle back into blender and mix for 3 minutes. Filter and continue rolling.
2. Slurry should be filtered through stainless steel mesh #150 just before use.
3. Any remnant of this slurry should be discarded 5 days after preparation.

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SK-CD2

SUBJECT: Preparation of P.V.A. Methacrylate Filming Solution

EQUIPMENT:

1. Brown bottle, 2000 mls capacity, wide mouth
2. Balance
3. 600 mls capacity beaker
4. Rollers
5. Graduate cylinders, 1000 mls. capacity
6. Stainless steel mesh, #150
7. Waring Blender #CB-2 or #702
8. Fritted glass filter

MATERIALS:

1. Toluene
2. Acetone
3. Acryloid B-72 Rohm and Haas
4. Methacrylate (Hypalon P-5 DuPont)
5. Stock P.V.A. K-69982 44A29
6. Solox, anhydrous - U.S.I.
7. Oil red dye E.G.N. National Aniline and Dye Corp.

PREPARATION OF P.V.A.:

1. While mixing at low speed for the small Waring Blender #702 or at speed #1, 8,000 rpm, for the large blended #CB-2, add enough stock PVA to make 50% by volume of total solution desired, and 50% by volume of anhydrous solox.

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2. Mix for 3 minutes
3. Filter through fritted glass folter (under vacuum.
4. Store in brown bottle at 72°C ± 5°

PREPARATION OF METHACRYLATE (Lucite 45):

1. While gently stirring 1,440 mls of Toluene in a 2,000 mls brown bottle slowly add 90 gms of methacrylate.
2. Continue stirring and add 0.75 gms of Acryloid B-72.
3. When methacrylate and acryloid are dissolved slowly add 360 mls of acetone and mix.
4. Add 1.8 grams of oil red dye to above, cap bottle and shake vigorously.
5. Put on roller and roll for three hours.

PRECAUTIONS:

1. If stock PVA and Solox are mixed too fast, the solution will gel. If the gel does not go back into solution upon continued mixing, discard and start over.
2. Keep methacrylate solution in an air-tight bottle to prevent evaporation of Toluene and acetone.
3. Do not use wax covered insert in lid of storage bottle for methacrylate.
4. Let PVA filming solution set for 30 minutes before use.
5. The oil red dye is used to facilitate inspection of the dried applied film. It will thermally decompose at bake-out temperature (400°C for 1 hr. without leaving a residue or stain. Use 0.1 gram of dye for

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H. Kessler 8-16-56
SKCP-2 1

PRECAUTIONS (Cont'd)

each 100 mls of filming solution made. Of course, the methacrylate solution can be made without this dye if it is preferred.

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SUBJECT: Preparation of Chromic Oxide Paint

EQUIPMENT:

1. 100 mls capacity graduated cylinder
2. Glass stirring rod
3. Pint Size Ball Mill & Flint Pebbles.
4. Wide Mouth bottle and cap.

MATERIALS:

1. De-ionized water
2. Green chromic oxide powder Fischer Scientific (sesqui) Cr_2O_3
3. Sylvania PS-5 silicate solution
4. Surfynol 82 solution - Air Reduction Chemical Co., 60 E. 42nd St., New York 17, New York
5. Flint pebbles, twenty-five.

PREPARATION:

1. Pour 100 mls de-ionized water into Ball Mill.
2. Add 40 mls PS-5 silicate solution to Ball Mill.
3. Add 2 mls of a 10% solution of surfynol 82.
4. Add 150 grams of chromic oxide powder ($Cr_2 O_3$).
5. Put 25 flint pebbles into Mill.
6. Place Mill on roller (10 - 20 rpm) for 12-16 hours.
7. Add 100 mls de-ionized water and pour entire contents (except Flint pebbles) into wide mouth bottle and cap.
8. Material should be left on roller until ready for use.

[1] GENERAL

1 3KCP#1 Hilde Little Oct. 2, 1957

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A37

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Preparation of Gelatin Solution

EQUIPMENT:

1. Beaker, 1,000 ml.
2. Therometer 0 - 110°C
3. Hot plate
4. Bottle, wide mouthed
5. 150 mesh stainless steel strainer and funnel

MATERIALS:

1. Deionized water
2. Gelatin, U.S.P. Baker Chemical
3. Ammonium Dichromate, Analytical Grade

PREPARATION:

1. Place 980 ml. deionized water in beaker.
2. Warm to 30 - 35°C.
3. Add 20 gms. of gelatin while stirring to prevent lumping.
4. Allow temperature of water and gelatin to reach 40 - 43°C.
5. Allow gelatin to dissolve with ocassional stirring.
6. Dissolve 2 grams of ammonium dichromate in geletin solution with occasional stirring.
7. Filter solution through 150 mesh strainer before using.

NOTE: Do not use when solution is gelled or cloudy. Shelf life 7 days.

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PREPARED BY P. Marapodi 4-9-56

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CONT ON SHEET F SH NO. 1

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Wash Face Panel

EQUIPMENT:

1. Wash Tanks
2. Drying racks

MATERIALS:

1. Oakite solution (2 lb. oakite #30/120 liters H_2O).
2. Deionized water
3. Tap water
4. Ammonium Biflouride solution, 5% by volume with water.

PROCEDURE: Schedule A "New Ware"

1. Place panel in open tank, face down, upon panel supports.
2. Start rinsing panel with tap water at room temperature and gradually over a five (5) minute period, bring the temperature of the water up to approximately 130°F.
3. Close lid and wash with hot oakite solution (approximately 135° to 145°F) for two minutes.
4. Rinse with hot tap water for 2 minutes.
5. Pour approximately 150 ml of 2½% Ammonium Biflouride into the panel and flow over the face for 30 seconds. Place panel in rinse tank, face down, upon panel supports.
6. Rinse with tap water for 2 minutes.
7. Rinse with deionized water for 2 minutes.
8. Place panel on drying rack for 15 minutes.

PROCEDURE: Schedule "B" - Rework

1. Place panel in open tank, face down, upon panel supports.
2. Start rinsing panel with tap water at room temperature and gradually over a five (5) minute period, bring the temperature of the water up to approximately 130°F.
3. Close lid and wash with hot oakite solution (approximately 135° to 145°F) for 2 minutes.

1 SK-CDHQ H.LITTLE 8-30-56 LEN

PROCEDURE: Schedule "B" - Rework (cont'd.)

4. Allow panel to cool for 2 minutes.

5. Add warm water and "Alconax" to the face panel and scrub for approximately one (1) minute to help remove paint and loosen materials.

6. Rinse with hot tap water for 2 minutes.

7. Place panel in acid wash tank and wash for 2 minutes with 10% Ammonium Biflouride.

8. Pour approximately 150 ml of 2½% Ammonium Biflouride into the panel and flow over the face for 30 seconds. Place panel in rinse tank, face down, upon panel supports.

9. Rinse with tap water for 2 minutes.

10. Rinse with deionized water for 2 minutes.

11. Place panel on drying rack for 15 minutes.

SUBJECT: Application of Photo-Sensitive Film and Dry

EQUIPMENT:

1. Cellulose sponges
2. Graduate cylinders, 100 mls capacity
3. Suitable drying rack

MATERIALS:

1. Photo-sensitive filming solution K-69982 44A30
2. Filtered humidity and temperature controlled air. Room temperature is 72°F ± 2°F and drying air relative humidity is 6% or below. Room relative humidity is 23% or below.

PROCEDURE: (to be performed in reduced red light)

1. Dispense 60 mls of filming solution into one end of panel.
2. Distribute solution over the entire face of panel, flowing evenly from one end to the other. Flow coat over entire face four times before draining.
3. Drain with face panel in vertical position.
4. Sponge excess solution from panel.
5. Drain in the vertical position perpendicular to lines for approximately 45 seconds to 1 minute.
6. Blow dry air across face of panel, making use of proper drying box, and making certain that the flow of air is gentle enough to prevent disturbing the film. (4.5 psi on our single unit, pressure must be evaluated for a multi-position unit).

SK-CD2
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PROCEDURE (Cont'd)

7. Dry for 10 minutes.

PRECAUTIONS:

1. Be sure nothing comes in contact with the film while draining or drying.
2. Take care in pouring film into panel so as to prevent air bubbles from forming in film.
3. While flow-coating film over face of panel, keep film off sides so as to eliminate possibility of draining patterns leading from glass posts.

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A40
SECTION
CONT ON SHEET 2 SH NO. 1

REVISIONS

SUBJECT: Expose Photo-Sensitive Film

EQUIPMENT:

1. Exposure unit
2. Master and mask

PROCEDURE: (to be performed in reduced red light)

1. Set lens f stop to f-16.
2. Place panel into exposure unit and position against stops provided.
3. Properly place master with respect to positioning gages and index position.
4. Turn on lamp and allow to warm up for a couple minutes.
* 5. Open shutter for appropriate time. Approximately 3 minutes for blue, 5 minutes for green, and 7 minutes for red.
6. After shutter closes remove panel from exposure machine.

* Exposure times will come down as the present master making technique is developed and proper line widths are obtained.

PRECAUTIONS:

1. Caution must be taken to make sure master and panel are positioned correctly. All master positioning gages must be set and kept at their proper settings.

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PRINTS TO SK-CD2

PREPARED BY / ISSUED BY: P. Marapodi 4-11-56

APPROVALS: EFS

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FF-660-C (10-55) PRINTED IN U.S.A.

PRECAUTIONS (Cont'd)

Note: Since the techniques employed in making a master to index, or a set of three masters indexed with respect to each other are relatively new, the specific instructions pertaining to location and indexing of masters will be published later under this Standing Instruction, revised.

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Application of Blue Phosphor Slurry

NOTE: This procedure is also used for the green and red phosphor slurry.

EQUIPMENT:

1. Cellulose sponges
2. Graduate cylinders, 100 mls capacity
3. Suitable drying racks

MATERIALS:

1. Proper phosphor slurry. Blue is applied first, green next, and red last. K-69982 44A31 (blue); K-69982 44A32 (green); K-69982 44A33 (red)
2. Filtered humidity and temperature controlled air. Room temperature 72°F ± 2°F and drying air relative humidity 6% or below. Room relative humidity is 23% or below.

PROCEDURE: (to be performed in red reduced light)

1. Dispense 60 ml. of slurry onto one end of panel.
2. Distribute solution over the entire face of panel, flowing evenly from one end to the other. Flow coat over entire face three times before draining. 11
3. Drain with face panel in vertical position.
4. Sponge excess solution from panel.
5. Drain in the vertical position perpendicular to lines for approximately 45 seconds to 1 minute.

/fmd

CD2

1 SKCP-2 8-16-56 /EHG

PROCEDURE (Cont'd)

6. Blow dry air across face of panel, making use of proper drying box, and making certain that the flow of air is gentle enough to prevent disturbing the film. (4.5 psi on our single unit, pressure must be evaluated for a multi-position unit).
7. Dry until "wet" pattern leaves screen.

PRECAUTIONS:

1. Be sure nothing comes in contact with the film while draining or drying.
2. Take care in pouring film into panel so as to prevent air bubbles from forming in film.
3. While flow-coating film over face of panel, keep film off sides so as to eliminate possibility of draining patterns leading from glass posts.
4. If panel is put into the drying rack with insufficient draining, mottling will occur.
5. Do not dry after the "wet" pattern has disappeared. The drier the phosphor becomes, the harder it is to wash off and can present a contamination problem if it becomes too dry.

/fmi

SUBJECT: Develop

EQUIPMENT:

1. Water supply, deionized
2. Cellulose sponges
3. Suitable drying rack

PROCEDURE I

1. Carefully pour 2 liters of water, approximately 35°C, into one end of the panel, keeping leading edge of water pool intact.
2. Wet complete screen by moving water back and forth across face of panel. Continue for 1 minute and pour off.
3. Set panel so the long axis is in a horizontal position, thus the phosphor lines are in the vertical position.
4. Carefully and with smooth motion allow smooth flow of water to pass over face of panel by moving hose back and forth across the top of the screen. Continue water flow, parallel to lines, until areas between lines are clean.
5. Dry the screen for 10 minutes on dryer unit - air pressure is 4.5 psi.

PRECAUTIONS:

* 1. When wetting screen do not splash water onto the face of panel. Isolated water spots on the screen will leave wash or drain marks causing contamination.

* 2. Do not use too great a water pressure during developing or the

SK-CD2
/fmd

PRECAUTIONS (Cont'd)

lines will wash off.

3. Excessive washing will cause lines to come off.

4. It is best to develop by flowing water over the screen from first one side of the panel and then turning it over and continuing until clean. This cuts down the possibility of wash off.

* A light spray or mist from a fogging nozzle can be used instead of the method described in steps 1 and 2 under Procedure I. The entire phosphor screen must be wetted uniformly and instantaneously. Then follow with a relatively heavier, but still soft spray to complete the developing process.

PROCEDURE II

1. Place panel on its long edge and allow a gentle flow of deionized water (41°C) to cover the entire phosphor surface. The phosphor striped being developed are in the vertical position and the direction of the water cascading down the inner panel surface is parallel to these lines. Continue water flow until lines of phosphor appear, (one minute).

3. Place panel on drier unit and dry for 10 minutes, air pressure at 4.5 psi.

Note #1 - If the gelatin method is used, Procedure I is used only for developing the first set of color stripes. Then use Procedure II to develop the second and third sets of color stripes.

SK-CD2

/fmd

If the gelatin method is not used, use Procedure I to develop all three sets of color stripes.

Note #2 - Room temperature is 72°F ± 2°F, room relative humidity is 23% or below, relative humidity of air coming from dryer unit is 3 - 4%.

/fmd

SUBJECT: Screen Inspection

EQUIPMENT:

1. Line measuring machine
2. Vacuum screen check oscillator unit
3. 40X microscope or suitable eyepiece

PROCEDURE:

1. Set panel, open side down, onto line measuring machine.
2. Turn light on in line measuring machine.
3. Looking through eyepiece of the compound microscope, line width measurements, pitch, and line quality can be obtained and evaluated.
4. Place panel on vacuum screen check oscillator unit.
5. Turn vacuum screen check oscillator unit on and when a low enough vacuum is obtained (20 micron) excite phosphor screen.
6. Evaluate screen for phosphor cross-contamination with a microscope.

Note: When sufficient quality control has been established, final inspection can be done on a spot-check basis.

/fmd

Operation of Vacuum Screen Check Oscillator Machine

1. Turn on main power switch to screen check oscillator.
2. Make sure the hose clamp is engaged and then turn on vacuum pump. (Make sure bleed switch is off).
3. Let the pump warm up approximately 10 minutes.
4. Remove spark filament cap.
5. Place panel over the filament on the machine with edges of panel seated on the rubber gasket.
6. Check the panel which is resting upon the rubber gasket to see that it is free to be drawn to an air tight seal.
7. Disengage vacuum hose clamp.
8. Allow to pump down for 5 minutes.
9. Turn on the vacuum gage and take reading.
10. When a vacuum of 20 microns has been obtained, turn on "Heater and Plate" switches.
11. Engage spark filament switch, with foot, and adjust the "gain and tuning" dials until maximum brightness is obtained.
12. Screen and line quality can be checked at this point.
13. Shut off "Heater and Plate" switches.
14. Shut off vacuum gage switch.
15. Turn on vacuum "bleed" switch.
16. When the system has been bled, remove panel and place cap over filament.
17. Turn off main power switch and open hose clamp.

/fmd

SUBJECT: Application of Gelatin Solution

EQUIPMENT:

1. Suitable drying racks
2. Graduated cylinder, 200 mls. capacity
3. Cellulose sponges

MATERIALS:

1. 2% gelatin solution K-69982 44A37
2. Deionized water

PROCEDURE:

1. Dispense 125 mls of 2% gelatin solution into one end of the panel and cover panel thoroughly with the solution (one minute).
2. Drain excess gelatin solution from panel, drain pattern perpendicular to the phosphor stripes and remove excess gelatin solution with sponge. Be careful only to remove solution accumulating on the panel skirt wall and do not sponge the panel face at all.
3. Place on the dryer unit and dry for 10 minutes at 4.5 psi air pressure.

Note#1 - If the gelatin method is used, apply the gelatin solution BEFORE the photosensitive filming solution (S.I. K-69982-44A39) for the second AND third color stripes are applied, prior to exposing said photosensitive filming solution for screening. If the gelatin method is not used, follow the normal procedure of "Application Photosensitive film, drying and exposing".

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 4A4A4

SECTION

CONT ON SHEET F SH NO 2

REVISIONS

Note #2 - Room temperature is 72°F ± 2°F, room relative humidity is 23% or below, relative humidity of air coming from the dryer is 3 - 4 %.

/fmd

SK-CD2

PRINTS TO

PREPARED BY P. Marapodi 4-11-56

ISSUED BY

APPROVALS EFS

Cathode Ray Tube Sub DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982 4A4A4

SECTION

FF-660-C (10-55) PRINTED IN U.S.A.

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A46
SECTION
CONT ON SHEET 2 SH NO. 1

REVISIONS

SUBJECT: Flow-Coat P.V.A. Film

EQUIPMENT:

1. Cellulose sponges
2. Graduate cylinders, 100 mls. capacity
3. Suitable drying rack

MATERIALS:

1. P.V.A. filming solution K-69982-44A35

PROCEDURE: (to be performed in reduced red light)

1. Dispense 60 mls of filming solution onto one end of panel.
2. Distribute solution over the entire face of panel, flowing evenly from one end to the other. Flow coat over entire face four times before draining.
3. Drain with face panel in vertical position.
4. Sponge excess solution from panel.
5. Drain in the vertical position perpendicular to lines for approximately 45 seconds to 1 minute.
6. Blow dry air across face of panel, making use of proper drying box, and making certain that the flow of air is gentle enough to prevent disturbing the film. (4.5 psi on our single unit, pressure must be evaluated for a multi-position unit).
7. Dry for 10 minutes.

/fmd

SKCP-2 8-16-56 LE

1

PRINTS TO	PREPARED BY / ISSUED BY	APPROVALS	DIV OR DEPT	SI K-69982 44A46
	P. Marapodi 4-16-56	EFS	Cathode Ray Tube Sub	
			Syracuse LOCATION	SECTION
			SECTION	

FF-660-C (10-55) PRINTED IN U.S.A.

PRECAUTIONS:

1. Be sure nothing comes in contact with the film while draining or drying.
2. Take care in pouring film into panel so as to prevent air bubbles from forming in film.
3. While slow-coating film over face of panel, keep film off sides so as to eliminate possibility of draining patterns leading from glass posts.

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A47

SECTION

CONT ON SHEET 2 SH NO. 1

REVISIONS

SUBJECT: Flow-Coat Methacrylate Film

EQUIPMENT:

1. Cellulose sponges
2. Graduate cylinders, 100 mls capacity
3. Suitable drying rack and hood

MATERIALS:

1. Methacrylate filming solution (dyed red) K-69982 44A35

PROCEDURE:

1. Dispense 60 mls of filming solution into one end of the panel.
2. Distribute solution over the entire face of the panel, flow coating evenly from one end to the other. Flow coat entire face only once.
3. Drain with face of panel in vertical position, perpendicular to lines.
4. Remove excess solution with a suction device or if unavailable a disposable absorbent tissue (e.g. "Kimwipes").
5. Drain and air dry in vertical position, perpendicular to lines. Do not force dry.
6. Let dry for 10 minutes.
7. Inspect film for holes, tears, uneven distribution and areas of the phosphor screen not covered by the film.

PRECAUTIONS:

1. Be sure nothing comes in contact with the film while draining or drying.

/fmd

SKCD-2 8-16-56 LE

PRINTS TO C82

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SECTION

SI K-69982 44A47

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FF-660-C (10-55) PRINTED IN U.S.A.

PRECAUTIONS (Cont'd)

2. Take care in pouring into panel so as to prevent air bubbles from forming in film.

3. While flow-coating film over face of panel, keep film off sides so as to eliminate possibility of draining patterns leading from glass posts.

4. Do not "back track" while flow coating film. Coat screen only once, starting at one end of panel and flow coating to the other end, perpendicular to lines. "Back tracking" will cause film layers to form, causing blistering of aluminum upon bakeout.

5. The oil red dye in the film facilitates visual inspection. The dye will thermally decompose at bake out temperature (400°C for one hour) without leaving a residue or stain.

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-4A48

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Set Up of Evaporator Heater Assembly for Facepanel

EQUIPMENT:

1. P-5 High Vacuum Evaporation Unit - Optical Film Engineering Corp., Philadelphia, Penna., or any similar unit.

MATERIALS:

1. POFP facepanel to be aluminized
2. Tungsten filament, K-69982-46A115. Two (2) required.
3. Aluminum slug, 99.6% min. 0.125" dia. 230-260 mg pellets. Two (2) required.

PROCEDURE:

1. POFP facepanel is placed in the bottom of the aluminizing unit open end up.
2. Tungsten filament holders are centered over the panel, 4.5 inches apart, with the axes of the filaments parallel with the minor axis of the panel.
3. Filaments are ten inches away from the panel surface.
4. Place an aluminum slug in each of the filaments.
5. Evaporator heater assembly is ready to operate. See S.I. K-69982-4A17, Aluminize.

Note: Tungsten filaments and aluminum slugs must be kept clean at all times and not placed in any container other than those in which they were received from the vendor.

Tungsten filaments and aluminum slugs must be cleaned before use. Only clean enough for immediate use. See appropriate drawing for cleaning schedule.

/fmd

SK-CD2

PRINTS TO

PREPARED BY P. Marapodi

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A49

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Application of Chromic Oxide Paint

EQUIPMENT:

1. Stand to hold facepanel
2. Natural bristle brush

MATERIALS:

1. Green chromic oxide paint K-69982 44A36

PROCEDURE:

1. Apply chromic oxide paint to inner facepanel skirt wall according to dimensions in drawing number
2. Air dry for at least 30 minutes.

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PREPARED BY P. Marapodi 4-11-56

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SI K-69982 44A49

SECTION

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Screen Assembly Inspection

EQUIPMENT:

1. Aluminum thickness gage.

PROCEDURE:

1. Check screen for non-uniformity in filming and aluminizing. Dark areas indicate aluminum penetration through film and aluminum build-up.

2. Turn panel over so the open side is up.

3. Check screen for aluminum sputtering during vaporizing.

4. Check for flow of marks of film, causing non-uniform brightness of aluminizing film.

5. Check aluminum thickness using gage.

Note #1 - When sufficient quality control has been established, final inspection can be done on a spot check basis.

SKCA-2 8-16-56 LETTER RE-TYPED

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A51
SECTION
CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Bake Screen Assembly

EQUIPMENT:

1. Proper baking facilities

MATERIALS:

1. Facepanels completely screened, silicized, filmed, aluminized, painted.

PROCEDURE:

1. Place facepanel face up (open end down) on abestos-covered stand in oven.
2. Turn on flushing air.
3. Heating rate is 2°C/min. to 400°C, soak for one hour at this temperature and cooling rate is 2°C/min.

/fmd

PREPARED BY	APPROVALS		
I. Leising 4-11-56	EFS	Cathode Ray Tube Sub (DIV OR DEPT)	SI K-69982 44A51
		Syracuse (LOCATION)	SECTION
		SECTION	

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Final Inspection

PROCEDURE:

1. Check screen for aluminum blistering.
2. Check screen for paint flaking.
3. Check frit.

Note: When sufficient quality control has been established, final inspection can be done on a spot check basis.

/hl

SKCD-2 8-16-56 LENS N Ferrell (RE-TYPED)

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A53
SECTION
CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Firing Lava Parts

EQUIPMENT:

1. Suitable air oven capable of operating at 2500°F.
2. Refractory trays.

MATERIAL:

1. Lava parts to be fired.

PROCEDURE:

1. Lay parts on trays and insert in cold oven.
2. Raise temperature to 600°F and fire 1 hour.
3. Raise temperature to 1000°F and fire 1 hour.
4. Raise temperature to 1400°F and fire 1 hour.
5. Raise temperature to 1800°F and fire 1 hour.
6. Raise temperature to 2200°F and fire 1 hour.
7. Turn off furnace and open door slightly.
8. When temperature is below 300°F, trays may be removed and let cool to room temperature.
9. Inspect fired parts and reject any with cracks or chips.

/fmd

SK-CD2

PRINTS TO

PREPARED BY K. Miller 5-11-56

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FF-660-C (10-55) PRINTED IN U.S.A.

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A54

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Alignment of Panel and Funnel

EQUIPMENT:

1. Alignment pins K-69982-46A119

MATERIAL:

1. Funnel - beam shield assembly
2. Grille - screen assembly
3. Lintless paper
4. Alcohol

PROCEDURE: - Schedule "A" - For 8363 Frit.

1. Wipe frit surfaces with alcohol using lintless paper.
2. Place fritted flanges together such that screen lead and anode button are on same side.
3. Insert alignment pins into tab aligning holes.

PROCEDURE:- Schedule "B" - For 186 PK Frit.

1. Just prior to panel funnel assembly, wipe flange with alcohol using lintless paper.
2. Brush panel face with clean static brush.
3. Place flanges together such that screen lead and anode button are on same side.
4. Insert alignment pins into tab aligning holes.

/fmd

SK-CD2

PRINTS TO

PREPARED BY I. Leising 4-23-56

ISSUED BY

APPROVALS EFB

Cathode Ray Tube Sub DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982 44A54

SECTION

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FF-660-C (7-54) PRINTED IN U.S.A.

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A55

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Sealing Panel to Funnel

EQUIPMENT:

1. Suitable oven with temperature control.

MATERIAL:

1. Aligned panel and funnel

PROCEDURE: - Schedule "A" - For 8363 Frit. [1]

1. Place aligned panel and funnel on bulb support in oven.
2. With control thermocouple on flange, raise temperature at 4°C/min to 437 ± 5°C.
3. Hold at 437°C for 20 minutes.
4. Lower to 100°C at 3°C/min.
5. Remove from oven when it has cooled sufficiently to handle.
6. Remove alignment pins.

PROCEDURE:- Schedule "B" - For 186 PK Frit. [1]

1. Place aligned panel and funnel on bulb support in oven.
2. With control thermocouple on flange, raise termperature at 4°C/min. to 440° ±5°C.
3. Hold at 440°C. for one (1) hour.
4. Lower to 100°C. at 3°C/min.
5. Remove from oven when it has cooled sufficiently to handle.
6. Remove alignment pins.

/fmd

5K-CD2

1 5KCP#15 [illegible] Sept 28 [illegible]

PRINTS TO

PREPARED BY E. L. Leising 4-23-56

ISSUED BY

APPROVALS EFS

Cathode Ray Tube Sub DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982 44A55

SECTION

CONT ON SHEET F SH NO. 1

SUBJECT: Helium Leak Check

EQUIPMENT:

1. Suitable rough pump capable of exhausting color bulbs to the 10-20 Micron range in a reasonable length of time.
2. C.E.C. Helium leak detector or equivalent.
3. Suitable vacuum gauge.
4. Suitable receptacle and "O" ring to hold stem and cork (rubber) for sealing open end of stem.

MATERIALS:

1. Bulb assembly (less mount) or stems (for gun mounts).
2. Tank of Helium.

PROCEDURE:

1. Connect the bulb assembly or stem (less mount) to the exhaust system and exhaust to 10 - 20 micron by means of the rough pump. Use Apiezon grease for "O" ring seal when testing stems.
2. Valve off the rough pump.
3. Open the throttle valve of the detector to allow the detector's hot diffusion pump to exhaust the bulb or stem to the detector's operating range (under normal conditions it will take less than one minute for the pump to exhaust the system so that the vacuum gage on the detector reads less than one micron.
4. Turn on the diatron filmanet and select a high sensitivity range.

/fmd

PROCEDURE (Cont'd)

5. Release helium in the immediate flange area of bulb or fillet of stem either by probing or by enveloping the area. (The latter method will be found more advantageous from the production standpoint as it will eliminate probing on all tubes except leakers.
6. After a thorough check, close the throttle valve, turn off the diatron filament and let the bulb or stem down to air slowly.

NOTE:

1. Failure of the leak check pump system to evacuate the bulb or stem quickly is normally an indication of a large leak.
2. The diatron filmanet should be degassed before use. This can be checked by turning the helium air switch to air and reading the leak rate meter. A reading of less than 1/3 full scale is satisfactory.

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Short Check

EQUIPMENT:

1. Triplett, model 630 or equivalent.

MATERIAL:

1. Bulb mount assembly

PROCEDURE:

1. Set meter switch on highest ohm range except when measuring heater continuity for which lowest ohm range is used.
2. Short check as follows, placing negative probe on stem leads under column marked "Neg."

Telefunken Triode

Neg.	Pos.	Reading
1	20	$<$5 ohms (use lowest ohmic range)
1	3, 15, 18	NC
2	3	NC
16	15	NC
19	18	NC
5	6 thru 13	NC
6	7 thru 13	NC
7	8 thru 13	NC
8	9 thru 13	NC
9	10 thru 13	NC

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SK-CD2

PROCEDURE (Cont'd)

Telefunken Triode

Neg.	Pos.	Reading
11	12, 13	NC
12	13	NC

P.A. Gun

Neg.	Pos.	Reading
5	18, 19, 2	< 5 ohms (use lowest ohm range)
5	15	0
4	6	0
14	16	0
5	17, 20, 3	NC
1	20	NC
4	3	NC
16	17	NC
8	10, 11	NC
10	11	NC

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3K-CD2

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A58

SECTION

CONT ON SHEET 2 SH NO. 1

REVISIONS

SUBJECT: Exhaust and Activation

EQUIPMENT:

1. Suitable exhaust pumps with cold trap.
2. Exhaust oven with temperature control.
3. R. F. equipment.
4. Activation buggie.
5. Tipping equipment.

MATERIAL:

1. Bulb - Mount assembly

PROCEDURE:

1. Place bulb - mount assembly in oven and connect to exhaust pumps.
2. Turn on rough pumps.
3. [1] When pressure drops to 50. microns, turn on diffusion pump.
4. [1] Raise oven temperature at 4°C/min. to 400°C. Control T.C. is on flange.
5. [1] Add liquid nitrogen to cold trap when oven temperature reaches 125°C. on flange.
6. Hold temperature at 400°C for 20 minutes.
7. Lower temperature at 3°C/min. to 100°C.
8. When pressure reaches .5 microns (during cooling cycle), R.F. G_1s at dull red heat for 15 minutes. [2]

/fmd

2 SK-CP #22 Hilda Leitch Oct 24 '58

1 SK-CP #20 Hilda Leitch Oct 9 1956

SK-CP2

PRINTS TO

PREPARED BY I. Leising 7-23-56

ISSUED BY

APPROVALS EFS

Cathode Ray Tube Sub. DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982-44A58

SECTION

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PROCEDURE (Cont'd)

9. When pressure reaches .05 micron, activate per following schedule. Ground all G and K leads.

Ef *	G1 (VDC)	Time (min)
4.0	0	5
5.5	0	10
6.0	0	5
6.5	0	5
7.0	0	5
8.0	0	10
6.5	0	to tipoff

* Reduce Ef if necessary to prevent pressure from exceeding .05 micron.

10. Tipoff when pressure stabilizes below .005 micron (at approximately 210°C.

/fmd

SUBJECT: Getter Flash

EQUIPMENT:

1. Suitable RF oscillator and induction heating coils.
2. Source of 8 volts AC. (optional)

MATERIALS:

1. Bulb mount assembly.

PROCEDURE: Pellet Type Getter

1. (Optional) A few seconds prior to flashing, apply 8 volts AC to the heaters. Continue to apply heater voltage for the duration of the flashing operation.
2. Flash all getters (preferably sequentially) as follows:
   a. Place the RF heating coils close to the tube neck in the vicinity of the getter so that the plane of the coils is parallel to the plane of the getter assembly.
   b. Apply RF to the coil. Adjust the RF power so that the active portion of the getter reaches a temperature of 900°C to 1100°C in 7 or 8 seconds; maintain this temperature for 10 - 20 seconds, during which time an opaque deposit of getter material should condense on the inside of the tube neck.

LIMITATIONS:

1. Do not apply any voltage other than to the heater.

/fmd

LIMITATIONS (Cont'd)

2. Do not underflash the getter. An underflashed getter is indicated by a thin getter deposit through which the getter or gun structure may be seen. Underflashing may be caused by:
   a. Coil not close enough to the tube neck.
   b. Insufficient RF power.
   c. Insufficient flash time.
   d. R.F. coil not properly lined up with getter assembly.
   e. Air tube.
3. Do not overflash the getter. An overflashed getter is indicated by a sudden, short-lived brightness during the flashing operation as the getter support itself burns through. This vaporizes metal which deposit on top of the getter and reduce its effectiveness. It may also result in loose getter or getter support particles inside the tube which can cause shorts or scratched screens. overflashing may be caused by:
   a. Coil too close to tube neck.
   b. Excessive RF power.
   c. Excessive flash time.
4. Avoid heating other mount parts, especially the contact clips, through improper positioning of the RF coils.

/fmd

SK-CDR

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Sparking

EQUIPMENT:

1. Hand Sparker
2. Shorting Wire - (such as solder)

MATERIALS:

1. Final Assembly

PROCEDURE:

1. Connect flange to ground.
2. Short all pins together.
3. Spark outside of neck - from base to top of gun for 60 seconds. Spark completely around neck.
4. Spark pins (connected together) for 60 seconds.

/fmd

SK-CD2

PRINTS TO

PREPARED BY / ISSUED BY: J. Leising 7-23-56

APPROVALS: ETS

Cathode Ray Tube Sub (DIV OR DEPT)
Syracuse (LOCATION)
(SECTION)

FF-660-C (7-54) PRINTED IN U.S.A.

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Wire Inspection

EQUIPMENT:

1. Scott tester
2. Micrometer
3. 40X microscope

MATERIAL:

1. Spool of wire as received from vendor.

PROCEDURE:

1. Unwind several yards of wire from spool and discard.
2. Take a 15" sample, being careful not to kink when handling and examine under 40X microscope for die marks and pits. There should be none.
3. Place sample in Scott tester and observe its tensile strenght. Tensile strength should be 300 000 psi minimum.
4. Cut off a length of wire and lay out on a surface to check for curl. Wire should lay out straight.
5. Measure diameter with micrometer. This should be .002".

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982 44A62

SECTION

CONT ON SHEET 2 SH NO. 1

REVISIONS

SUBJECT: Damper Insertion

EQUIPMENT:

1. Special comb to elevate every other wire by more than 1/8"
2. 1/16" dia. curved rod pointed at one end
3. 1/8" dia. curved rod pointed at one end
4. Felt covered board
5. Infra-red lamp

MATERIAL:

1. Grille
2. Damper
3. Cement

PROCEDURE:

1. Place grille on special comb
2. Slide 1/16" rod thru seperated wires
3. Remove from comb
4. Slide 1/8" rod next to 1/16" rod
5. Attach damper to pointed end of 1/16" rod with cement
6. Harden cement under infra-red lamp
7. Pull damper thru grille from felt covered board being careful that the damper is not stripped off from hitting against wires.
8. Attach damper to each end of the frame with cement and harden under infra-red lamp.

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SK-CD2

PRINTS TO

PREPARED BY K. Miller 5-11-56

ISSUED BY

APPROVALS EB

Cathode Ray Tube Sub DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982 44A62

SECTION

FF-660-C (10-55) PRINTED IN U.S.A.

PROCEDURE (Cont'd)

9. Re-insert 1/16" rod at side of 1/8" rod opposite to damper.

10. Remove 1/8" rod then remove 1/16" rod gently so as not to break damper.

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K69982-44A63
SECTION
CONT ON SHEET F SH NO. 1

REVISIONS

CLEANING WITH DEIONIZED WATER

EQUIPMENT

Beaker, Lintless Paper, Infra-Red Lamp Headed Cabinet and Plastic Dust-Free Containers.

MATERIALS

Deoinized Water

PROCEDURE

1. Boil parts in deionized water using beaker for 5 minutes.
2. Repeat (1) using a fresh solution of deionized water.
3. Drain out solution and spread parts out on lintless paper.
4. Dry under an infra-red lamp.
5. Store parts in a heated cabinet in a plastic dust-free container until ready for use.

/fmd

SK-CD2

PRINTS TO

PREPARED BY F. Doggett 8/23/56
ISSUED BY ASSIGNED H. Little 8-23-56

APPROVALS EFS

CATHODE RAY TUBE DIV OR DEPT
Syracuse LOCATION
SECTION

SI K69982-44A63
SECTION
CONT ON SHEET F SH NO. 1

FF-660-C (7-54) PRINTED IN U.S.A.

SIMILAR TO K-69982-42A81

FIRING - DRY HYDROGEN WITH SPECIAL COOLING SCHEDULE

a) Use Hayes "Super Dry" furnace and fire at 1100°C for 15 minutes. (same as K-69982-44A74 up to this point.)

b) Cool parts in furnace using a dry hydrogen atmosphere at a rate of 50°C per hour.

c) When parts cool to 500°C remove from furnace and cool to room temperature (cooling rate is unimportant) in an inert atmosphere (argon or equivalent).

d) Remove parts and store in heated cabinet in a plastic dust-free container until ready for use.

/fmd

CLEANING WITH ALCOHOL

EQUIPMENT:

1. Beaker
2. Lintless Paper
3. Infra-Red Lamp
4. Heated Cabinet
5. Plastic Dust-Free Container

MATERIALS:

1. Clean CP Methyl or CP Isopropyl Alcohol

PROCEDURE:

1. Rinse parts in a solution of clean alcohol.
2. Drain out solution and spread parts out on lintless paper.
3. Dry under an infra-red lamp.
4. Store parts in a heated cabinet in a dust-free plastic container until ready for use.

CLEANING - STEMS

EQUIPMENT:

1. Suitable containers

MATERIALS:

1. Trichlorethylene Solution
2. Solution of tap water and "Cutscum" or equivalent detergent.
3. CP Methyl or CP Isopropyl Alcohol
4. Deionized water

PROCEDURE:

1. Degrease in trichlorethylene solution (same as ∅ 44A72).
2. Wash stems in water (same as ∅ 44A73).
3. Wash stems in a solution of tap water and cutscum.
4. Rinse in hot tap water.
5. Rinse in alcohol and dry in air.

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

CLEANING BEADING GLASS

EQUIPMENT

Beaker, Lintless Paper, Infra-Red Lamp Headed Cabinet and Plastic Dust-Free Containers.

MATERIALS

Deionized Water
Mixture of water and Cutscum (or similar detergent)

PROCEDURE

1. Wash in Cutscum and water.
2. Rinse in tap water.
3. Boil parts in deionized water using beaker for 5 minutes.
4. Repeat (3) using a fresh solution of deionized water.
5. Drain out solution and spread parts out on lintless paper.
6. Dry under an infra-red lamp.
7. Store parts in a heated cabinet in a plastic dust-free container until ready for use.

SK-CD2

PRINTS TO

PREPARED BY F. F. Doggett 5-23-56

ISSUED BY ASSIGNED H LITTLE 5-23-56

APPROVALS EPS

CATHODE RAY TUBE DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982-WA67

SECTION

SIMILAR TO K-69982-42A89

CATHODE PROCESSING (LESS COATING)

MATERIALS

1. Aloxite Cloth - 240 mesh
2. Cyclodiene - purchasable from Colonial Alloy Co., Colonial Phil. Bldg., Phila., Pa.
3. Synasol (D5B55)
4. Deionized water

EQUIPMENT

1. Sizing dies for flattening cathode caps.
2. Fixture for holding caps during abraiding process.
3. Hot plate.
4. Six 500 c.c. stainless steel beakers and fitted baskets.
5. Pyrex containers with suitable lids.

PROCEDURE

1. Size caps in sizing dies to give a uniform degree of flatness to cathode caps.

* 2. Abraid caps (passes made in one direction only) with Aloxite cloth to remove smooth cold-worked areas and increase coating adherence.

3. Wash cathodes in fresh solution of Cyclodiene and agitate for three minutes.
   Limitation: Use Cyclodiene for two batches of parts only. Drain parts thoroughly between washes (one batch = 1,000 cathodes).

4. Boil the cathodes in three successive beakers of deionized water for three minutes each.
   Limitation: Rotate the beakers of deionized water, so that the final rinse is always in fresh deionized water, and discard the first rinse water.

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PROCEDURES (Cont'd)

5. Rinse the cathodes in fresh Synosol for two minutes with agitation. Limitation: Use one batch of Synosol for three batches of parts and then discard.

6. Drain parts and put in drying oven (80°C temperature). Leave parts in oven until thoroughly dry.

* 7. Air fire cathodes at 700°C for twenty minutes.

8. Hydrogen fire cathodes in suitable furnace (hydrogen dewpoint is -70°C) at 900°C for ten minutes.

9. Store cathodes in pyrex containers in drying type of oven at a temperature of 150°F.

Note: Shake all baskets rigorously before immersing parts in next container to limit contamination of solutions.

* Either steps #1 and #2 or Step #7, but not both may be eliminated if good results are obtained in tube processing and life tests.

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SK-C02

TELEFUNKEN GUN ASSEMBLY

GENERAL DESCRIPTION

The mount produces three electrostatically focused parallel beams which lie in a common plane perpendicular to the grille wires of the color tube. The focus assembly consists of a number of triple-aperture plates common to all three guns. These plates are connected in such a way that the voltage gradient gradually decreases as the electrons (in the beam) progress up the gun until the middle of the focus assembly is reached and the focus voltage becomes a minimum. From this point until the beam leaves the mount, the focus voltage increases in value (the maximum value is equal to the anode voltage). The above voltage gradient is set up by properly interconnecting the aperture plates and bringing seven high voltage leads out to the mount stem. These stem leads are in turn connected to a resistance-divider network to supply the needed voltages. (For additional information refer to M-69982-46A126).

The immersion lens of each gun is a separately beaded structure consisting of an anode and a grid #1 in the case of the triode mount with a #2 grid added in the tetrode mounts. Each of these beaded structures is referenced and welded to a common plate (tri-gun plate) which in turn is referenced and welded to the focus structure. The cathode in each gun is indirectly heated and all three heaters are connected in parallel to two common heater leads.

The limiting apertures are combined in a three aperture plate which forms the base for mounting the static beam deflecting structure. Static horizontal convergence is accomplished by magnetic pole pieces operating on the two outside beams. Static vertical convergence is brought about by electrostatic deflection plates also centered on the outside beams. Magnetic shielding is used on the center gun to equalize raster sizes. A completed sub-assembly is made of the limiting aperture plate, the beam deflecting structure, the mount springs and the getters. This sub-assembly is accurately referenced and welded to the focus assembly to complete the mount.

The focus assembly which is the basis of reference for the entire mount (the tri-gun and beam deflection structure are referenced to it) has a provision in the form of alignment holes to reference the mount to the front end of the tube.

EQUIPMENT:

1. Suitable welders, electrodes and controls.
2. Clean rayon gloves or finger cots.
3. Suitable mount fixtures.
4. Tweezers, pliers, shears and other needed hand tools.
5. Storage trays for parts and sub-assemblies.
6. Heated cabinets (approximately 130°).
7. Suitable beading fires and fixtures.
8. Necessary cleaning equipment for gun parts.

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F.D.G. 8-16-56 SKCP-2 1

MATERIALS:

1. Telefunken tetrode mount K-69982-45A76
2. Telefunken triode mount K-69982-45A77

PROCEDURES:

Process all parts and assemblies as indicated on the appropriate drawings. Use the procedures listed below to supplement the drawing instructions.

1. WELDED SUB-ASSEMBLIES

(a) Weld connecting leads to lugs on focus aperture plates with the leads on the bottom side of the lugs (see focus assembly drawing). Arrange the leads such that the nearest points of contact with adjacent apertures (other than those welded to the lead in question) are at least 1/16" from the leads. In order to prevent the leads from touching the glass neck, the assembly must conform to the specification given on note 3 of the focus assembly drawing.

(b) Spot weld the beading straps to the #1 grids and anodes as indicated on the appropriate drawings. Grid and anode cups should fit tightly on strapping mandrels to prevent the formation of excessively large weld burrs inside the cups.

(c) The cathode retainer should be welded in place with no less than six equally spaced welds - use enough pressure so that cathode can not be turned when tab is rocked gently with the forefinger.

(d) The heater extensions should be welded to the heater bars with suitable jigs to insure that the final result conforms to the drawings.

(e) To assemble the deflection plate sub-assemblies, set up a suitable jig with the plates arranged and spaced as indicated on the proper drawing. Spot weld the two plates together at their points of contact making sure that the stainless steel plate is not buckled as a result of the assembly operation.

For those assemblies requiring brackets weld the brackets to the magnetic plate before attaching the electrostatic deflection plate. Add stainless steel ribbon leads to those deflection plate sub-assemblies having brackets - attach as shown on the appropriate drawing.

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2. GLASSED SUB-ASSEMBLIES

(a) Assemble the focus assembly aperture plates on a proper beading mandrel using spacers and arranging the plates as indicated on the focus assembly drawing (rounded lugs all on same side of assembly). Bead with four multiform glass beads; beads must be white hot with no grey shadows showing at the instant the fires cut off.

(b) Assemble the grid #1, grid #2 (tetrode only) and the appropriate anode on a suitable beading mandrel and bead with two multiform glass beads. Beads must be white hot with no grey shadows showing at the instant fires cut off.

(c) Beading of the glass insulators used on the mount should be regulated to insure a good glass-to-metal seal as good mechanical strength is needed to support the heater bars and deflection plates.

3. WELDED ASSEMBLIES

(a) Assemble the tri-gun assembly in the following manner. Place the aperture plate over the mandrels of a suitable jig and slide the three gun and cathode sub-assemblies onto the mandrels. Align the guns, as shown on the assembly drawing. Spot weld the anode flanges on each of the guns to the aperture plate. Insert the heaters and weld the heater bar sub-assemblies in place; use a jig for this purpose. Finally weld the heater leads to the heater extensions.

(b) Assemble the limiting aperture and deflection plate assembly as described below. Attach the deflection plates and deflection plate sub-assemblies using a suitable jig and mounting, the sub-assemblies with brackets attached by means of glass insulators (see assembly drawing). Add springs and getter sub-assemblies, paying close attention to the orientation of each as indicated on the assembly drawing.

4. MECHANICAL ASSEMBLIES

(a) Crimp eyelets to stem; the stem should not be restrained in any way during the crimping operation. Select the two stem fillets with the longest wetted nickel area for attaching the heater bars and trim and form stem accordingly.

5. COMBINING MAJOR ASSEMBLIES

(a) Assemble the focus and tri-gun assemblies by welding the two units together with at least ten equally spaced spot welds. Use two mandrels of the proper diameter, threaded through the focus assembly and through the anode apertures of the two outside guns to hold the two assemblies in alignment during the welding operation.

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(b) Assemble the combined focus and tri-gun assembly to the stem using a suitable stemming fixture. Rotate the stem until lead #9 is approximately aligned with the two holes in the wings on opposite ends of the focus assembly. Then rotate stem slightly so that heater bars may be welded to the stem leads without bending the heater bars. The bottom of the #1 grids should be spaced properly from the stem dish (see mount assembly drawing). Weld the heater bars and four insulated supports in place. Attach all grid #1 cathode and high voltage leads (grid #2 leads on tetrode only). When stemming is complete mark dish on center line of holes in focus assembly wings (high voltage side of gun).

(c) Assemble the limiting aperture plate assembly to the mount using the holes in the wings on the limiting aperture plate and the focus assembly to give proper alignment before welding. Attach deflection plates to stem.

(d) Place completed mount in a section of color tube neck glass and examine centering due to springs. Adjust until mount is centered and all springs are bearing firmly on glass neck.

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TELEFUNKEN GUN INSPECTION

Every completed mount assembly must be checked prior to leaving the mount room.

EQUIPMENT:

1. Toolmaker's microscope with fixture to check immersion lens alignment.
2. Clean rayon gloves or finger cots.
3. Tweezers
4. Spacer gages 0.020", 0.039, 0.059, 0.079" (triode only).
5. Magnifier
6. Short testing device
7. Suitable mandrels to check focus assembly - trigun assembly alignment.

MATERIALS:

1. Gun sub-assemblies
2. Mount assembly

PROCEDURE:

A. Inspect parts at Incoming Inspection as described on sheet #2 of the parts drawings.

B. Perform any inspections called for on the sub-assembly and assembly drawings.

C. Supplement the inspcetion procedure with the information contained in the paragraphs listed below:

1. Welded Sub-Assemblies

a. General instructions for welding inspection include testing the welds for tightness with tweezers, inspecting for the presence of excessive weld burrs primarily inside grid cylinders or cups and copper deposits from electrodes. Reject sub-assemblies for any of the above defects and also for badly burned welds if there is any evidence that sub-assemblies have loose welds after hydrogen firing.

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b. Inspect coated cathode assemblies and reject any that have weld splash or loose ceramics. Examine coating under microscope and reject for thin spots, chips or obvious contamination.

c. Inspect heater bar sub-assemblies for proper arrangement of heater extensions and shape of heater bars. (see drawing)

d. Inspect welds and alignment at junctions of stainless steel and magnetic material on deflection plate sub-assemblies.

2. Glassed Sub-Assemblies

a. General instructions for beaded sub-assemblies. Inspect visually for broken beads, bead cracks between adjacent glass-to-metal seals and circumferential bead cracks. Inspect for loose beads as evidenced by detachable movement of the bead on the strap (or lead in the case of insulators). This movement can be easily detected, as a clicking sound will be heard if the bead being tested is loose.

b. Inspect the glassed focus sub-assembly for correct alignment (visual) and spacing of the paertures (use plug gage). Variations in aperture spacing will result if beading spacers are not properly extracted. The beads should also be free of embedded carbon particles such as that which might be picked up from a dirty beading block..

c. Inspect the electrode spacing on the lower gun structures with plug gages. CAUTION: Do not allow plug gages to shift electrode spacings on tetrode lower gun sub-assemblies. Reject any sub-assemblies which exceed the tolerances allowed on the drawing for placement of the beads. Reject for any distorted #1 grid apertures.

d. Inspect gun and cathode sub-assembly for loose cathodes and proper welding of retainers (see gun assembly instructions). Inspect for proper location of cathode tab and grid #1 lead. (see sub-assembly drawing).

3. Welded Assemblies

a. All leads on the focus assembly should be at leadt 1/16" from any surface where contact would produce an undesired electrical short. Inspect to see that none of the aperture plates are damaged and that all leads are properly connected.

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b. Inspect trigun assemblies for quality and number of gun to aperture plate welds (minimum of ten on outside guns - eight on center guns). Check gun alignment of assemblies on a sampling basis (after trigun assembly is complete). Inspect arrangement of heater leads and welds. Reject any assemblies with cracked insulators.

c. Inspect the limiting aperture plate assembly for tightness of welds, proper location of springs and getters and alignment of insulated deflection plates.

4. Mechanical Assemblies

a. Inspect formed stems for chipped fillets. Reject any stem which has a fillet height which is less than 5/64" above the lead weld knot. Eyelets must not be loose and should be at least 1/32" above fillets (see drawing).

5. Combining Major Assemblies

a. Check the alignment of the focus to trigun assembly with one of the two mandrels used during assembly at the following two stages of processing:

1. After welding focus assembly to trigun assembly.

2. After stemming.

Reject assembly if mandrel cannot penetrate thru focus assembly and anode aperture easily or with very little force. Mandrel must penetrate all three guns.

b. Inspect mount after stemming for proper arrangement of heater and cathode leads (see mount assembly drawing) and stem fillet cracks. Cathode leads must be straight for approximately 1/4" from cathode sleeve welds followed by a 90° bend and another 1/4" straight section before attaching to stem lead. This arrangement will prevent crystallization of the nickel cathode lead at a point where continued flexing occurs during the life of the color tube. Inspect the stemmed mount visually for proper location of stem leads especially the high voltage leads (see mount assembly drawing).

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c. After the limiting aperture plate assembly has been attached to the mount it is ready for the final inspection.

1. Visually examine all welds and leads and test leads for mechanical strength with tweezers (except ribbon welds to deflection plates).

2. Check spring and getter welds for mechanical strength.

3. Inspect stem for fillet cracks and chips in flare.

4. Use short testing device and check leads for shorts or open connections.

5. Check mount visually in glass tubing for proper spring and getter adjustment and alignment of deflection plates.

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SK-C02

SUBJECT: Stem Inspection

A. Cracks - reject stem showing any visible cracks.

1. Fillets - any chips or cracks in this area shall be scrapped.
2. Tubulations showing severe chipping shall be scrapped or glazed over when in lower portion of tubing.
3. Flare chipping shall be cause for rejection when the chip exceeds one third the thickness of the flare. Where the chip is less than one third the flare thickness, the stem may be passed, providing no "live crack" origins are visible.
4. "Live cracks" and "fire checks" that are not glazed over will be cause for rejection.

B. Flare Area

1. Reject if the press is not filled out.
2. Reject if flare flatness varies from the normal plane by more than one third of the flare thickness.

C. Lead Wires

1. Reject where wires are broken or missing.
2. Reject where wires are bent in fillets or off center in fillets, such that there is not a minimum of one millimeter of glass coverage at the weld knot.
3. Reject where positioning of weld knot is not as specified.

Note: A common rule of thumb check for proper position is: When the nickel wire is bent and broken at the weld knot, the lead should show a minimum of 1 mm of lead length where the glass has

/fmd

wet the nickel. The maximum wetting of the nickel should not exceed two and a half millimeters or extend into flare, whichever is greater. This wetted area is defined as that portion of the nickel where there is no evidence of oxidation of the nickel. The measurement will be made from the weld knot.

D. Dumet Color

Breakdown of dumet is to be a light honey color on the inside surface of the lead wires. This breakdown should measure at least 1 mm in length from the weld knot.

A dark red color indicates insufficient sealing of dumet, stem production should be stopped when this condition exists. Machine attendant should make proper fire adjustments and then proceed with production when condition is corrected.

Dark or silvery streaks along the length of the dumet wire are cause for rejection. This is evidence of a drawn impurity of crack in copper clad and will definitely cause stem leaks. Notify factory engineering immediately whenever this condition is observed.

E. Stem Throat Area

1. Inside - This portion of the stem should be free from wrinkles in the glass. Severe scalloping is cause for rejection. Maximum scalloping will be determined by drawing a .020 wire over the glass surface; if the wire catches, the stem shall be rejected.

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2. Outside - there shall be no re-entrant angles or severe over molding within this area. Criteria for rejection will be the same as for scallops.

F. Stones, etc.

All stems having opaque stones or metal spew in the flare or extending into the tubulation for the distance of one half inch, shall be rejected.

G. Strain

Strain limits will be designated by samples procured from acceptable stem production. These samples will be designated as strain limits and the limit samples will be held by incoming inspection with duplicates held by the responsible process engineer. Stem lots considered to be outside of accepted strain limits will be held in lot segregation for disposition by the engineer most concerned.

H. Bubbles

1. Bubbles along lead wire are cause for rejection when they are connecting and do not permit a minimum of 1 mm of unobstructed dumet seal along length of wire.
2. Continuous bubbles in the inside throat area are objectionable. Open bubbles in this area should be given the acceptance standards applicable to re-entrant angles and scallops.

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SUBJECT: Vapor Degreasing in a Chlorinated-Hydrocarbon Solvent Vapor

Vapor degreasing is used to remove non-water soluble contaminants from the surface of work. The hot vapor condenses on the relatively cold part, dissolves the contaminants and washes it off the part. The cleaning action ceases when the bath and work surface have the same temperature.

EQUIPMENT:

1. Two-dip solvent degreaser
2. Stainless steel mesh baskets

MATERIALS:

1. Chlorinated hydrocarbon solvent - D5B56A (Permachlor or equivalent)

PROCEDURE: (Heavily contaminated parts)

1. Parts are loaded and placed into the vapor zone until vapor ceases to condense on them.
2. Parts are transferred into the rinse chamber and immersed until the parts reach the temperature of the rinse (approx. 30 sec.)
3. Parts are transferred back into the vapor zone until vapor ceases to condense on the work surfaces.
4. Tilt, slowly agitate or rotate basket to remove trapped solvent and remove from the machine.

PROCEDURE: (Lightly contaminated parts)

1. Parts are loaded and placed into vapor zone until vapor covers them (aaprox. 1 minute).
2. After vapors cease to condense on work, basket is gently shaken to assure dryness and removed from machine.

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SK-CD2

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

CAUTION:

1. Hands will be burned if placed into the vapor zone.
2. Adequate ventilation must be provided for maintenance of low trichlorethylene concentration in the working area.
3. Avoid breathing vapor and avoid physical contact with solvent as much as possible.
4. Equipment should not be located in the vicinity of open flames, high temperature surfaces (500°F), welding operations, etc., nor in drafts whose air currents may carry vapors to a location endangering other workmen.

LIMITATIONS:

1. Solvent must condense over the work's entire surface.
2. Water in the solvent results in high solvent loss and inefficient cleanising of the work. Water may appear as "ghost" vapors or actual water on the solvent surface. Remove with chamois or 150 mesh screen wetted first in solvent.
3. Condenser outlet temperature should be comfortable to the hand (100° - 120°F).
4. Parts are never water-rinsed first.
5. HCL may result from particles dropping into solvent and breaking down. Measures should be taken to prevent this.

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SK-CO2

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Parts Washing and Dehydrating

EQUIPMENT:

1. Two stainless steel cascade tanks of three sections each, with heat and drains.
2. Stainless steel tank with cover.

MATERIALS:

1. Deionized water
2. Denatured alcohol - D5B55.

PROCEDURE: Tap Water Wash

1. Flow of water in first cascade tank is adjusted to approx. 5 gal. per hour at a temperature of approx. 75 - 85°C.
2. Parts are loaded into steel mesh baskets, immersed into section at overflow end of tank and agitated for approx. one minute.
3. Basket is raised out of water, tilted and drained.
4. Parts are immersed into next higher section and agitated for approx. one minute.
5. Procedure 3 is repeated.
6. Parts are immersed into the third section (cleanest) and agitated for approx. one minute.
7. Procedure 3 is repeated. - Deionized Water Wash.
8. Flow of deionized water in second cascade tank is adjusted to approx. 5 gal. per hour at a temperature of approx. 75 - 85°C.
9. Repeat procedures 2 - 7 inclusive for deionized water cascade.
10. While still wet, parts are lowered into the denatured alcohol bath and agitated for approximately 30 seconds.

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PROCEDURE (Cont'd):

11. Parts are raised from bath, tilted and drained.
12. Parts are air dried.
13. Parts are stored so as to maintain cleanliness and freedom from moisture.

CAUTION:

1. Denatured alcohol is inflammable and toxic. Keep open flames away from working area, and from clothes and gloves which may be wetted by solvent.

LIMITATION:

1. Denatured alcohol should be chnaged when its specific gravity is greater than 0.85 (or sooner if unduly contaminated by physical impurities).

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HYDROGEN FIRING (GENERAL)

EQUIPMENT:

1. Suitable hydrogen furnace
2. Thermocouple and meter
3. Optical pyrometer or equivalent
4. Suitable firing boats
5. Rod to push boats through furnace and hooked rod to remove boats from cooler.
6. Clean white gloves to wear when handling fired parts.
7. Asbestos gloves
* 8. Source of hydrogen

Types of Hydrogen:

a)	Line Hydrogen	Dew point +30 to + 50°F (depending on ambient outdoor temp.)
b)	Dry Hydrogen	Dew point -60 to -90°F
c)	Super-Dry Hydrogen	Dew point Better then -100°F
d)	Wet Hydrogen	Dew point +60 to +95°F

*For best results in firing most metals, purified, dry Hydrogen is recommended. Line Hydrogen may be purified and dried by running it through a copper chip furnace (maintained at 650°C) and an alumina dryer (maintained at 35°F) or Catalytic Oxidizer, "Deoxo" purchasable from Baker Chemical Co., Philipsburg, New Jersey, or equivalent.

Stainless steels are best fired in hydrogen dried by "Deoxo" type of catalytic oxidizer.

Fernico parts that are to be sealed to glass are fired in line (wet) hydrogen, and cooled in dry hydrogen. The presence of oxygen causes the carbon in the Fernico to combine at a faster rate.

If line Hydrogen is used it is recommended for economic and safety reasons that one furnace be reserved for this use only.

HYDROGEN FLOW:

The hydrogen flow through the furnace should be of a volume such that the flame meniscus touches the bottom of the tube at a point where it is not visibly hot.

The hydrogen flow through the coolers should be so adjusted that escaping hydrogen can barely be felt on a moistened finger held 1/2 inch from the jet. The hydrogen flow should not be measured while hot work is in the cooler, due to the expansion of gas. Less gas exhausts from the cooler when the cooler is cold or empty.

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FURNACE TEMPERATURE CONTROL:

The furnace temperature should be checked by means of appropriate temperature measuring instruments as often as consistent with type of work in progress and the number of jobs per day. A safe rule is to measure furnace temperature hourly. When checking furnaces where the unit is visible the heat should be off, or temperature spotted on a hot spot of the brickwork near the center of the furnace; perhaps the radiation head tube.

After furnace temperature appears to be stabilized the parts are not yet actually at temperature. Heat is still flowing in the parts and normal heat losses occur in the furnace. The contactor should be closely observed to accurately determine the time the parts reach temperature.

LOADING:

General: No ceramic insulators should be fired in Molybdenum boats, Steel (only below 1000°C), or quartz boats are recommended.

Parts should be loaded into boats in a manner to avoid distortion by weight or pressure. Grids or similarly shaped parts may be racked on a rod; other parts may be stacked or scattered over the bottom of the boat, depending on the shape and size of the parts. Coated parts should be handled carefully with clean instruments to prevent removal of coating and contamination from the hands.

FIRING PROCEDURE:

Depending upon requirements, parts may be fired with or without preheating or in manner approximating a continuous schedule. Loaded boats should be pushed directly into the center of the heating tube and sufficient time allowed between insertion of successive boats to avoid reducing furnace temperature.

* While boat is being removed from the cooling tube, air is likely to enter the furnace and oxidize the parts being fired. This oxide is removed in a short time if the parts are in the heat zone but not so readily from parts in the cooling chamber. To prevent this oxidation there should always be an interval between unloading and pushing boats out of the hot zone; also when a boat is pushed into the cooling chamber it should be given time to cool before the furnace is opened for unloading.

* CAUTION: When the cooling chamber is opened the entering air forms an explosive mixture of hydrogen and oxygen.

Should covered boats be used to fire parts there should be top and bottom ventilation to permit hydrogen and water vapors to escape.

/fmd

Covered boats should be removed from the cooling chamber with care as a combustible mixture of hydrogen and oxygen may form inside.

Air may enter the furnace by admission through a leak or by presence in boats being inserted as well as through the cooling chamber. It is advisable to flush boats with hydrogen, especially covered boats, just before insertion in furnace.

This air may result in contamination of parts as follows:

1) by uniting with Hydrogen, steam may form on the parts leaving a peculiar black oxide;
2) free oxygen will cause scale on the parts;
3) air from a leak or admittance through cooling chamber will cause a spectrum color on fired parts.

It is a conservative rule to fire only one type of material in the furnace at a time. Some combinations of materials can be fired successfully but should be attempted only on a basis of experience and metallurgical knowledge.

Lead, tin, mercury zinc, and cadmium (low melting metals) should not be admitted in a regular production hydrogen furnace as they vaporize and will contaminate parts subsequently fired. For example, lead vapor in a furnace will render copper brazing impossible since lead will not unite with copper.

Any ceramic or lava parts or metal parts where the cross section varies considerably should be brought up to temperature slowly and cooled slowly to avoid cracking.

TIME AND TEMPERATURE:

The firing time and temperature depends upon many factors: Mass, material, character of operation, method of loading, material and size of boats, use of material, etc. The specified **times and *temperature appear on the appropriate Standardizing Notice and in all cases indicate the period of time for which the parts are to be held in the heat zone after the furnace has recovered the heat loss when the load is admitted. When temperature only is specified parts are to be brought up to that temperature then pushed into the cooling section.

The time necessary to bring parts to temperature must be determined by the operator's judgement, observations, and experience.

* A tolerance of + 25C is allowed on all specified temperatures.
** All stated times are in minutes unless otherwise specified.

/fmd

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CDZ

Fired parts should in general remain in the cooling chamber until they cool to approx. 80C.

HANDLING FIRED PARTS:

Fired parts should be handled with clean instruments or clean white gloves only, be kept in clean covered containers, and stored in a clean, dry place until used. Exposure to air will allow contamination and reabsorbtion of gases. Cleaned parts should never be stored in or allowed to remain near, a chemical room or other source of acid fumes as these fumes readily attack clean parts.

/fmd

SPRAY COATING OF CATHODES

EQUIPMENT:

1. Devilbiss Spray Gun, type CV-31643, or equivalent.
2. Jig for holding cathodes.
3. Ventilated spray booth, semi-automatic.
4. Rolling mill
5. 0.-C10" Federal Dial Gage or equivalent.
6. Devilbiss Air Transformer, type HCL-501-3, or equivalent.

MATERIAL:

1. Coating -- see cathode sub-assembly drawing.
2. C. P. Acetone.

PROCEDURE:

1. The coating mixture is rolled for at least one hour before use.
2. The cathodes are placed in a suitable jig with only the top surface of the cathode cap exposed to the spray.
3. The jig with the cathodes is placed in a ventilated spray booth, and as many passes with the spray gun are made as are necessary to yield the thickness specified on the cathode assembly drawing. Between successive passes and after the last pass, the jig of cathodes passes through a clean atmosphere at approximately 200°C for approximately 15 sec. The spray gun is operated with compressed filtered air. The line of spray is held perpendicular to the cathodes, and the distance of the gun from the cathodes depends upon the desired quality and thickness of the coating. The farther the gun from the cathodes, the lower the coating density.
4. The cathodes are stored in a clean, moisture-free atmosphere at 60°C-70°C until used. Cathodes should be assembled within 24 hours.
5. The jig is cleaned periodically with high pressure filtered air, and a soft brush. The spray gun is cleaned by spraying C.P. acetone through it.

LIMITATIONS:

Care is taken to avoid deposit of any coating material on any part of the cathode other than the designated area.

/fmd

SK-C-23

GRID-CATHODE SPACING

EQUIPMENT:

1. Cathode height gauge with suitable adapter.
2. Hand press
3. Assorted spacer stops (.1050" to .1150")
4. Cathode spacer height gauge with suitable adapter
5. Grid-cathode spacing gauge
6. Clean rayon gloves or finger cots
7. Tweezers

MATERIALS:

1. Cathode spacers
2. Cleaned and sprayed cathodes

PROCEDURES:

The grid-cathode spacing and the component parts needed to make up an assembly can be determined from the gun and cathode sub-assembly drawing. The grid-cathode spacing dimensions shown as A in Figure 1, is controlled by measuring the cathode height C and matching it with a cathode spacer whose height B is such as to give the required A dimension. The cathode spacer is not purchased to tolerance adequate for use in this method of matching and, consequently, it is necessary to size all of the parts before use to insure that the top and bottom surfaces are parallel. This sizing operation is performed by squeezing spacer B (Figure 2) between two flat parallel surfaces, A and C, using an exterior stop D to control the distance between the surfaces. The operation is performed with a small hand press.

The height of the coated cathode surface above the ceramic should be measured on the cathode height gauge. This distance plus the desired grid-cathode spacing gives the desired spacer height. An exterior stop D is chosen of the right height and a spacer sized to this height by means of the stop and the hand press. The cathode spacer combination is checked on the grid-cathode spacing gauge and, if the spacing is within the tolerance indicated on the gun and cathode sub-assembly drawing, the assembly is placed in the grid #1 cup, the retainer inserted and the unit welded in place (see K-69982-44A69 for retainer welding procedure). If the spacing is not within tolerance as indicated on the grid-cathode spacing gauge, another stop D is chosen to produce a spacer height which will satisfy the drawing tolerances.

/fmd

SK-CD2

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-LLA76

SECTION

CONT ON SHEET F SH NO. 2

REVISIONS

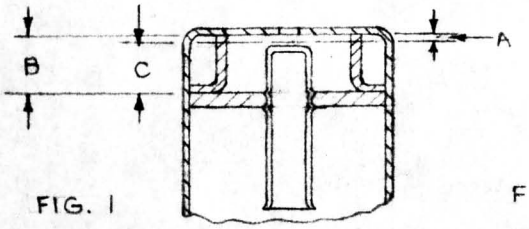


FIG. 1

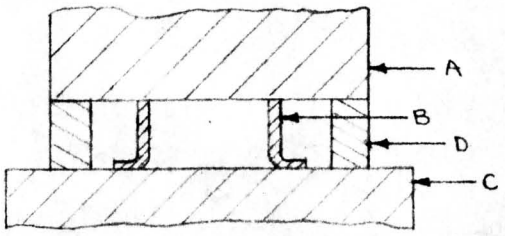


FIG. 2

/fmd

PRINTS TO SC-cD2

PREPARED BY F. Doggett 7-24-56

ISSUED BY ASSIGNED EGY 6-21-56

APPROVALS

Cathode-Ray Tube Sub- DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982-LLA76

SECTION

MECHANICAL INSPECTION

PURPOSE:

The purpose of this test is to insure that the tube will be acceptable to the customer from a mechanical point of view.

GENERAL:

There are several criteria which a tube must meet before it can be considered acceptable mechanically. Its physical dimensions must conform with JETEC registration data to insure that the tube is interchangeable with others of the same type. It must be of sufficient structural strength that it will not constitute an implosion hazard under normal handling. It should contain no visible defects which might impair its operation or whose appearance might be objectionable to the customer. In addition, it should be packed in an attractive carton which will protect the tube against a moderate amount of rough handling during shipment.

PROCEDURE:

1. Physical dimensions - Measure the critical dimensions of the tube as tabulated in Figure 1 and Figure 2. Reject the tube if any of it dimensions fall outside the indicated tolerances.

2. Resistance of outside coating - If applicable, measure the resistance of the external conductive coating using a conventional 3-volt type ohmmeter equipped with ball contacts of 3/16" radius, spaced 1" apart. Each contact should be at least $\frac{1}{2}$" from the edge of the coating. Make three measurements approximately 120° apart around the tube. Reject the tube if the highest of the three readings exceed 1300 ohms.

3. Pressure test - Place the tube in a pressure tank and seal the tank hermetically. Increase the pressure in the tank at a rate between 2 and 4 psi (pounds per square inch) per minute until a gauge reading of 30 psi is reached. If the tube withstands this pressure for 1 minute without implosion, it is acceptable from a standpoint of structural strength.

4.a. Base Torque Test (Dry) - Gradually apply a 40" pound torque between the base and the tube neck. Reject the tube if the cemented joint loosens, or if the base breaks.

b. Base Torque Test (Wet) - Immerse the based neck for 18 hours in water which is maintained at approximately 50°C. Remove from the water and cool for 1 hour at room temperature. Gradually apply a 20" pound torque between the base and tube neck. Reject the tube if the cemented joint loosens, or if the base breaks.

5. Tube defects - Examine the tube for any visible defect which might make it inoperable, reduce its life, or present an objectionable appearance.

/fmd

15K-CO2

5. Tube defects - Cont'd.

a. Bump Checks (Applicable to glass tubes only) - Reject the tube for any of the following conditions:

1. Any unhealed bump check within the quality area of faceplate.
2. Two or more bump checks of any size any place on the tube.
3. An unhealed bump check greater than 1/16" diameter in the corner region of a rectangular tube, i.e., the four corners extending between the quality area, the faceplate seal line, and the points where the corner radius changes to the greater side radius.
4. An unhealed bump check of any size in the edge region of a rectangular tube, i.e., the four edges not covered in (3) extending from the quality area to the mold match.
5. An unhealed bump check greater than 1/16" diameter in the side region of a rectangular tube, i.e., the four sides not covered in (3) extending from the mold match to the faceplate seal line.

b. Face Defects - Reject the tube for any of the following conditions:

1. Any etch on the face of the tube, such as an acid or silicate etch, that is visible from a distance of more than two feet when viewed along the path of reflected light whose incident angle is greater than 45°, provided that such etch, if considered as an opaque spot, would be rejectable according to the specifications of K-69982-45A7.
2. Any paint on the face of the tube which, if considered as an opaque spot, would be rejectable according to the specifications of K-69982-45A7.
3. Scratches on the face of the tube whose total length exceed the following limits:

Width of Scratch	Glass Tubes	Metal Tubes
Under .002"	Unlimited	Unlimited
.002" - .004"	1"	2"
.004" - .006"	½"	½"
Over .006"	None	None

c. Glass-to-metal seals (Applicable to metal tubes only) - Reject the tube for any visible crack or fracture in the neck or faceplate seal.

d. Inside paint - Reject the tube for any of the following conditions:

1. The paint has blistered or pulled loose from the wall of the tube, without cracking, over an area whose equivalent diameter (average of length and width) exceeds 3/16".

/fmd

d. Inside paint - Cont'd

2. The paint has cracked and has peeled away from the glass on one or both sides of the crack for a total distance of more than 1/8" perpendicular to the crack.

3. A flake of paint greater than 3/32" in diameter has cracked loose for more than 2/3 of its circumference.

e. Aluminum (Applicable to aluminized tubes only) - Reject the tube for any of the following conditions:

1. The aluminum has blistered or pulled loose from the wall of the tube, without tearing, over an area whose equivalent diameter (average of length and width) exceeds 3/4".

2. The aluminum has torn and has peeled away from the glass on one or both sides of the tear for a total distance of more than ½" perpendicular to the tear.

3. A flake of aluminum greater than ¼" in diameter has torn loose for more than 2/3 of its circumference.

f. Outside conductive paint (Applicable to glass tubes only) - Reject the tube for any of the following conditions:

1. Any portion of the top or bottom edge of the paint deviates by more than ¼" from its intended position.

2. The paint is missing or damaged over an area of more than 1 square inch to the extent that the resistance of the paint in the affected area exceeds 1300 ohms (See Procedure - Step 2).

3. The radius of the clear glass area around the anode button, except for anti-corona coating, is less than the value indicated in the following table. This area must be clear of all silicate, oil, and other contaminates which attract moisture or conducting particles with the following exceptions:

1. Spots adjacent to the metal portion of the button and touching the button are permissible if not over 1/8" in greatest dimension.

2. Isolated spots up to 3 in number and not over 1/8" in greatest dimension are permissible anywhere in the radius if separated at least 1" from one another (see K-69982-45A7).

/fmd

5. Tube defects - Cont'd

g. Outside insulating paint - (Applicable to metal tubes only) - Reject the tube is paint is missing from an area of more than ¼ square inch.

h. "Caution" Label - Reject the tube is the label is missing, illegible, or peeled away from the tube for more than 10 percent of its area.

i. Neck Splices - Reject the tube if it has more than 2 splices.

j. Neck and Base Alignment - Reject the tube if a cylinder of 2.260" $^{+.003"}_{-.000"}$ inside diameter and 5" long (K-69982-46A116) will not pass freely over the base and up to the bulb body.

k. Getter Flash - Reject the tube if the deposit of getter material on the inside of the neck is missing or obviously deteriorated.

l. Inside neck checks - Reject the tube if there are any glass checks inside the neck such as those caused by hot getters, focus leads, etc., in contact with the glass.

m. Type etch - Reject the tube if the type etch is illegible, incorrect, or missing.

n. Base and pins - Reject the tube for any of the following conditions:

1. The base cement protrudes more than 1/16" above the base shell.
2. The angle between the axis of the base and that of the neck exceeds 3°. (Use base tilt gage K-69982-46A116)
3. The base is loose, cracked, or blistered.
4. A serviceable section of the dowel extends less than 1/32" above the place of the ends of the soldered base pins.
5. There is contaminations, such as flux, grease, lime, sputtered solder, etc., between the pins, between the pins and the dowel, or on the dowel.
6. One or more pins are loose so that its free end can move more than 0.008" from its intended position.
7. Bent pins or excess solder which causes pin diameter to exceed .096".
8. The pins are unsoldered or have holes in the solder.
9. The lead wire projects more than 1/32" through the solder or beyond the end of the pin (whichever is farther from the base). Such a projection must not be bent so as to increase the effective O.D. of the pin.

o. Particles inside tube - Reject the tube for any of the following conditions:

SK-CD2

/fmd

o. Particles in tube - Cont'd

1. There is a loose particle within the tube which is obviously capable of scratching the screen.
2. There is more than one loose particle within the neck of the tube, or which can be readily shaken down into the neck of the bulb body, whose size is greater than .015" in any dimension.
3. There is a metallic particle, such as an aluminum drop, greater than .015" in any dimension, adhering to the inside of neck wall below painted area.

6. Carton defects - Examine the carton for any visible defect which will weaken it, lessen the protection it provides for the tube, or cause it to present an objectionable appearance.

a. Kimpack - Replace the Kimpack if it contains a tear more than 2" in length.
b. Inserts - Reject the inserts or tube supports if they are damaged or incorrectly assembled.
c. Seams - Reject the carton if the seams and openings are improperly sealed. Each widthwise seam or opening should be covered with tape up to within 1" of its entire length. Each lengthwise seam or opening should be covered for its entire length with tape that overlaps at least 2" onto the end panels.
d. Broken edges - Broken edges are acceptable unless the surface is torn or opened in which case the carton should be rejected.
e. Broken corners - Reject the carton if any corner is broken to a distance of more than 1½" from the intersection of the three edges, or if more than two corners are broken to any degree.
f. Stripped sides - Reject the carton if its outer layer is stripped away baring the corregations over a distance of more than 3" in any direction or over a total area of more than 6 square inches. Reject the carton if stripping has occurred in more than one area regardless of degree.
g. Holes - Reject the carton if it has been pierced forming a hole whose maximum dimension exceeds ½", or if there are more than two holes of any size. Any hole not rejectable should be covered with tape.
h. Marking - Reject the carton if it displays any superfluous information or extra or erroneous labels unless covered by tape. Allow a maximum of three such repairs per carton.

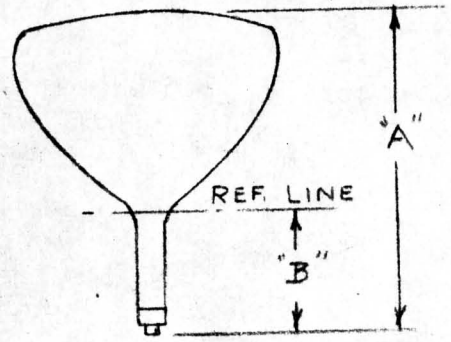
SK-C02

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS



Reference: M-69982-46A5

Tube Type (Glass)
See DL K-69982-45A38

A	B
25.250 ± .375"	9.125 ± .125"

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A78

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Frit Bake - Funnel
Schedule A

EQUIPMENT:

1. Suitable in-line oven or lehr (the latter is perferred). Supports must be of point-suspension type made of asbestos-base material such as Transite, Marinite, or equivalent.

PROCEDURE:

1. Place the funnel, neck down, in an in-line oven or on its side, neck trailing, in a lehr.
2. Heat the funnel gradually to 450°C.
3. Maintain the funnel at 445°C - 450°C for at least 10 minutes.
4. Cool the funnel gradually until it is below 200°C.
5. Remove the funnel from the oven and store it capped to keep out dirt prior to panel-funnel seal.

LIMITATIONS:

1. The temperature is to be measured at the "X" band flange with a contact thermocouple supported by ceramic tubing.
2. The heating and cooling rates are limited by glass breakage only. Heating at 5°C per minute and cooling at 3°C per minute have been found satisfactory.
3. The peak temperature must not exceed 454°C or the glass will be excessively strained.
4. To minimize breakage, the bulb must not be permitted to contact any other bulb or any part of the oven structure.

/fmd

PRINTS TO	PREPARED BY / ISSUED BY	APPROVALS		
	I. Leising 7-30-56	CFS	Cathode Ray Tube Dept. DIV OR DEPT Syracuse LOCATION SECTION	SI K-69982-44A78 SECTION

FF-660-C (10-55) PRINTED IN U.S.A.

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A79

SECTION

CONT ON SHEET F SH NO 1

REVISIONS

SUBJECT: Damping Wire Preparation

EQUIPMENT:

1. Hydrogen and Oxygen torch

MATERIALS:

1. 1/8" Corning Glass #1990

PROCEDURE:

1. Heat an area 1/8" in length to white heat with a small pointed flame.
2. Draw out to 1/32" diameter then when the glass is at proper consistency pull rod apart forming a fiber less the .001" in diameter.

/fmd

PRINTS TO 3K-KD2

PREPARED BY K. Miller 7-26-56

~~issued by~~ ASSIGNED Egy 6-22-56

APPROVALS EFS

Cathode Ray Tube Sub DIV OR DEPT

Syracuse LOCATION

SECTION

SI K-69982-44A79

SECTION

PF-660-C (10-55) PRINTED IN U.S.A.

SUBJECT: Base Filling and Storage

EQUIPMENT:

1. Suitable equipment for applying cement to bases.
2. Refrigerator or storage cabinets.

MATERIALS:

1. Base assembly K-69982-45A112
2. Basing cement K-69982-44A84
3. Denatured alcohol D5E1 or Solvent D5B55

PROCEDURE:

1. By means of the base-filling equipment, apply the basing cement to the base assembly as indicated in K-69982-45A111. Use alcohol as a lubricating agent in the filling process and also as a cleaning agent for the machinery.

2. Load the filled bases in an inverted position on trays and store in a refrigerator or storage cabinet. If a cabinet is used, cover the bases with another tray to retard alcohol evaporation.

LIMITATIONS:

1. The cement must be well mixed, of the proper consistency, and must contain no lumps or foreign matter that may plug the machinery. A deficiency of alcohol causes the cement to harden which results in (a) improper fitting of the base, and (b) a slower curing rate which can indirectly cause blistered bases. On the other hand, an excess of alcohol speeds up the curing rate and results in puffy cement with reduced adhesion.

2. Allow at least 5 hours to elapse between the mixing and the use of the base cement.

3. Cement which has stood more than 8 hours must be remixed before use.

4. Filled bases must be used within 24 hours if stored in a cabinet, or within 48 hours if stored in a refrigerator.

5. When a filled base is cemented to a tube neck as per K-69982-44A86, it must be capable of successfully passing the Base Torque Tests described in K-69982-44A77, procedure steps 4a and 4b.

CAUTION:

1. Evaporation of alcohol from the bases produces an explosion hazard against which suitable precautions must be taken.

/fmd

ALCOHOL AND/OR ACETONE RINSE

EQUIPMENT

1. Clean cloths
2. Suitable containers for solvents
3. Suitable basket for parts to be rinsed

MATERIALS

1. Denatured alcohol, D5 B1.
2. Methanol, D5B51A
3. Acetone, D5B24

PROCEDURE

1. Rub the parts with a clean cloth soaked in alcohol, methanol, or acetone unless the shape and/or size of the parts makes this method impractical, in which case proceed to step 2.
2. Load the basket with the parts to be rinsed. Lower the basket into a tank containing solvent and agitate for approximately 30 seconds.
3. Remove basket from solvent. Tilt as necessary to drain entrapped solvent.
4. Repeat steps 2 and 3 using clean solvent.
5. Dry the parts in a ventilated oven.

LIMITATIONS

1. When parts are to be stored, the container and/or lining must be clean.

CAUTION

1. Alcohol, methanol, and acetone are flammable and must be kept away from open fire. This applies to clothes and gloves wet with the solvent. Foremen must inform operators of the hazards involved. Acetone is particularly dangerous because of its low flash point.

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Distilled or Deionized Water Rinse

EQUIPMENT:

1. Stainless steel cascade tanks equipped with covers, drains, and heat sources.

2. Stainless or cadium-plated steel baskets.

MATERIAL:

1. Distilled or deionized water

PROCEDURE:

1. Adjust the water flow to approximately 5 gallons per hour and adjust the heat so that bubbles rise from the bottom of the tank without violent boiling.

2. Load the basket with the parts to be rinsed. Lower the basket into the tank farthest from the water inlet. Agitate for approximately 1 minute.

3. Remove basket from water. Tilt as necessary to drain entrapped water.

4. Repeat steps 2 and 3 in the remaining tanks, proceeding successively toward the clean water inlet.

LIMITATIONS:

1. Keep tanks covered when not in use.

2. If distilled or deionized water rinse follows or precedes another type of wash, do not allow parts to dry between operations.

/fmd

SK-CD2

PRINTS TO

PREPARED BY E. Krackhardt 7-26-56
ISSUED BY

APPROVALS
EFS

Cathode Ray Tube Sub DIV OR DEPT
Syracuse LOCATION
SECTION

SI K-69982-44A82
SECTION

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Solvent Cleaning with Water, Acetone and/or Alcohol (Tap Water Cascade)

Schedule V

EQUIPMENT:

1. Stainless steel cascade tanks with counter-balanced covers, gas heated and equipped with drains.

2. Stainless or cadmium plated steel baskets.

MATERIAL:

Tap Water - In cascade tanks the water is fed to one tank and flows over a wier or wiers through one or more tanks to the drain. It is customary to wash parts first in the lowest tank proceeding successively to the next higher tank always ending with a wash in the top tank which is fed directly with clean water. The only adjustments are the water temperature and rate of supply. During operation, water supply is usually maintained at 5 gal/hr (flow meters are recommended) and the heat adjusted so bubbles are rising from the bottom of the tanks but violent boiling is not desirable. When the tanks are not in operation the lid should be kept closed to prevent dirt from collecting in the water.

LIMITATION:

If parts are to be rewashed, e.g., from tap water to distilled water to alcohol, do not allow them to dry between operations but proceed immediately to the next operation.

PROCEDURE:

1. Parts are loaded in a basket, lowered into the water in the lowest tank and left for approximately 1 minute.

2. The basket of parts is then raised out of the water, tilted and drained.

3. It is then placed in the next higher tank and agitated in the water for approximately 2 minutes.

4. Step 2 is repeated.

/fmd

SK-CD2

PRINTS TO

PREPARED BY E. Krackhardt 7-26-56
ISSUED BY

APPROVALS EFS

Cathode Ray Tube Sub DIV OR DEPT
Syracuse LOCATION
SECTION

SI K-69982-44A83
SECTION

SUBJECT: Basing Cement Preparation

EQUIPMENT:

1. Dry blender - #8-A Paul O. Abbe' Mixing Mill, or equivalent.
2. Mixer - Pony-mixer (2 blades) No._____ J.N. Day Co., or equivalent.
3. Rolling mill.
4. Scale (110 lb. capacity).
5. Beam balance (5 kilogram capacity).
6. Hand grinding mill.
7. 1 gallon spouted can.
8. 1 ml. graduate.
9. 2 gallon mixing bottle or equivalent.
10. Straining funnel (30 mesh).
11. Scoops.
12. Pans.
13. Long blade putty knife.

MATERIALS:

1. Durite D50A1 - 4 lb.
2. Rosin - D5D19A - 793 grams.
3. Shellac (dry orange) - D5D26A - 1019 gms.
4. Denatured alcohol - D5H1, Solvent D5B55 or equivalent 2200 cc.
5. Marble flour - D50A3 - 40 lb.
6. Malachite or Calcozine Green - 6 gms.
7. Silicone Resin G. E. SR-98 - 1 lb.

SK-502/fmd

PROCEDURE:

1. Put marble flour and Durite in the dry blender and mix for 1/2 hour. Discharge through 30 mesh screen.
2. Grind the rosin in the hand grinding mill.
3. Put rosin, shellac and 2000 cc of alcohol in a mixing bottle and roll on the rolling mill until all material is in solution - minimum time four (4) hours. Strain into the mixing can of the mixer.
4. Add malachite amd mix until it is completely dissolved.
5. Add the blended and screened marble flour, Durite and Silicone resin and mix approximately thirty (30) minutes. All or part of the remaining 200cc of alcohol may be added, if necessary, to give the proper consistency. Consistency is determined by the workability of the cement in base filling. Stop mixing occasionally and scrape down the blades and sides of the can.
6. Store the cement in the covered mixing can.
7. Identify each batch of material prepared by a batch number and notify the Plant Chemist when a new batch is prepared.
8. Tube a 4 oz. sample of the material prepared, label it with the batch number and give it to the Plant Chemist for chemical analysis.

LIMITATIONS:

1. Cement which has stood eight (8) hours or more must be remixed before using.

/fmd

LIMITATIONS (Cont'd):

2. Cement which has been made up seven (7) days must be discarded. If quality is questionable, test a sample of filled bases by running through basing reel and observing appearance of cement. Good cement puffs and swells up when heated, whereas it will swell very little if it is too old.

3. The cement should be mixed 10 to 15 minutes each morning before distribution for use. If too thick, alcohol may be added.

/fmd

REVISIONS

1	SKCP-2 8-16-56 W. LITTLE
2	

TEST SPECIFICATIONS M-69982-44A85
FIRST MADE FOR DL K69982-45A38
CATHODE RAY TUBE DEPT.
Page 1 cont'd. on 2
EFS J.B.

SK-CD2

	DESCRIPTION OF TEST	REFER. K-69982-44A19	TEST CONDITIONS E_f V	E_{c_1} V	E_{TT} KV	E_A KV	E_{FGE} KV	E_g KV	E_s KV	I_s uA	Brightness Ft.L.	Scan Freq.	Raster Size	Symbol	Units	LIMITS CUST. Min.	CUST. Max.	MEDIAN	FACT. Min.	FACT. Max.
1.	H-K Leakage	N1, N2	6.3	EH-K = +180V										+ I_{HK}	ua		25			20
2.	H-K Leakage	N1, N2	6.3	EH-K = -180V										- I_{HK}	ua		45			40
3.	H-K Breakdown	N2	6.3	EH-K = -450V for 15 sec.											No Breakdown					
4.	Heater Current	-	6.3	-	-	-	-	-	-	-	-	-	-	I_f	Amps	1.62	1.98	1.8	1.68	1.92
5.																				
6.																				
7.	Anode Breakdown	N3		ADJ	9.0	9.0	3.0	8.6	25.0	50	-	Fr.	15"x10"					Note		
8.	Focus Breakdown	N3		ADJ	6.8	6.8	4.0	6.4	25.0	50	-		15"x10"					Note		
9.	Screen Breakdown	N3		-200	6.8	6.8	3.0	6.4	29.0	-	-		-			-		Note		
10.																				
11.																				
12.	Anode Leakage	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LA}	ua	-	-	-	-	5
13.	Focus Leakage	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LF}	ua	-	-	-	-	3
14.	Screen Leakage	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LS}	ua	-	-	-	-	10
15.	Grid #1 Leakage - R	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LG1}	ua	-	-	-		3
16.	Grid #1 Leakage -G	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LG1}	ua	-	-	-		3
17.	Grid #1 Leakage -B	N4		-200	6.8	6.8	3.0	6.4	25.0	-	-		-	I_{LG1}	ua	-	-	-		3
18.																				
19.																				
20.	Uncorrected Conv. (1)	N5, N6, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	-	-	Off	-	St.Conv.	-	-	-	Note	-	-
21.	Corrected Conv.	N7, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	-	-	Off	-	1st.Conv	-	-	-	Note	-	-
22.																				
23.																				
24.	R- Color Field Cond.	N8, N9, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	-	-	Fr.	Full	r- CFC	-	-	-	Note	-	-
25.	G- Color Field Cond.	N8, N9, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	-	-	Fr.	Full	g- CFC	-	-	-	Note		
26.	B- Color Field Cond.	N8, N9, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	-	-	Fr.	Full	b- CFC	-	-	-	Note	-	-
27.																				
28.																				
29.	White Anode Current	N9, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	r-250 g-100 b- 50	-	Fr.	Full	Ia - W	ua	-	-	Note	-	100
30.																				
31.																				
32.	White Focus Voltage	N10, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	50	-	Fr.	Full	Ef - W	KV	-	-	3.05	2.85	3.15
33.	White Resolution	N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ		10	Fr.	Full	-	-	-	-	-	-	-
34.	R- Focus Voltage	N10, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	50	-	Fr.	Full	Ef - R	KV	-	-	3.05	2.85	3.15
35.	R- Resolution	N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ		10	Fr.	Full	-	-	-	-			
36.																				
37.																				
38.	G-Focus Voltage	N10, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	50	-	Fr.	Full	Ef - G	KV	-	-	3.05	2.85	3.15
39.	G-Resolution	N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ		10	Fr.	Full	-	-	-	-			
40.																				
41.																				
42.	B-Focus Voltage	N10, N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	50	-	Fr.	Full	Ef - B	KV	-	-	3.05	2.85	3.15
43.	B-Resolution	N19		ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ		10	Fr.	Full	-	-	-	-			
44.																				
45.																				
46.	R- Cathode Condition	N18, N20		ADJ	6.8& Defoc	6.8	1.2	6.4	12.0	-	-	Off	-	-	-	-	-	Note		
47.	R- Cut-off Volts (1)	N11, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	-		Off	-	R- COE_{cl}	Volts	-	-	105	75	125

REVISIONS

1	SKCP-2 8-16-56 HLynne
	JB

TEST SPECIFICATIONS M-69982-44A85

FIRST MADE FOR DL K69982-45A38
CATHODE RAY TUBE DEPT.

JB
EFS

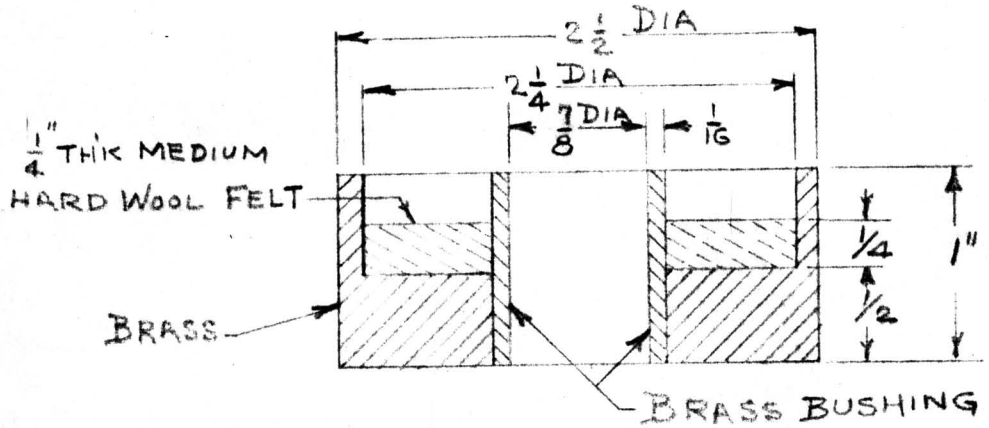
SK-CD2

	DESCRIPTION OF TEST	TEST CONDITIONS: REFER. K-69982-44A19	E_f V	E_{c_1} V	E_{FF} KV	E_A KV	E_{FOE} KV	E_g KV	E_s KV	I_s uA	Brightness Ft.L.	Scan Freq.	Raster Size	Symbol	Units	LIMITS CUST. Min.	CUST. Max.	MEDIAN	FACT. Min.	FACT. Max.
48.	R- Maximum $C_a$thode Current	[11] N12, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	-	-	Fr.	Full	R-Ik	ua	-	-	Note	-	-
49.	R- Anode Current	N13, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	200	-		Full	R-Ia	ua	-	-		-	75
50.	R-G1 Volts	N16, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	200	-	Fr.	Full	R-Ecl	Volts	-	-	60	40	80
51.	R-Light Output	N8, N9, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	100	-	Fr.	12"x9"		Ft.L.					
52.																				
53.																				
54.	G-Cathode Condition	N18, N20	6.3	ADJ	6.8&Defoc	6.8	1.2	6.4	12.0			Off	-	-	-	-	-	Note	-	-
55.	G-Cutoff Volts	N11, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0			Off	-	G-COEcl	Volts			105	75	125
56.	G-Maximum $C_a$thode Current	N12, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0			Fr.	Full	G-Ik	ua	-	-	Note	-	-
57.	G-Anode Current	N13, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	200		Fr.	Full	G-Ia	ua					75
58.	G-G1 Volts	N16, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	25.0	200		Fr.	Full	G-Ecl	Volts	-	-	60	40	80
59.	G-Light Output	N8, N9, N19	6.3	ADJ	6.8& Foc	6.8	Foc.	6.4	ADJ	100		Fr.	12"x9"		Ft.L.					
60.																				
61.																				
62.	B-Cathode Cond.	N18, N20	6.3	ADJ	6.8&Defoc	6.8	1.2	6.4	12.0	-	-	Off	-	-	-	-	-	Note	-	-
63.	B-Cutoff	N11, N19	6.3	ADJ	6.8 Foc	6.8	Foc.	6.4	25.0	-	-	Off	-	B-COEcl	Volts	-	-	105	75	125
64.	B-Maximum Cathode Current	N12, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	-	-	Fr.	Full	B-Ik	ua	-	-	Note	-	-
65.	B-Anode Current	N13, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	200	-	Fr.	Full	B-Ia	ua					75
66.	B-G1 Volts	N16, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	200	-	Fr.	Full	B-Ecl	Volts	-	-	60	40	80
67.	B-Light Output	N8, N9, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	ADJ	100	-	Fr.	12"x9"							
68.																				
69.																				
70.	Grille Current	N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	200	-	Fr.	Full	I Grille	ua	-	-	9.0	-	12.0
71.																				
72.	Grille Wire Vibration	N14, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	200	-	Fr.	Full			-	-	Note	-	-
73.																				
74.	Damper Visibility	N15, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	100	-	Fr.	Full			-	-	Note	-	-
75.																				
76.	Cold and Field Emission	[17] N16, N19	6.3	ADJ	6.8&Foc	6.8	Foc.	6.4	25.0	50	-	Fr.	Full			-	-	Note	-	-
77.																				
78.	Brightness																			
79.																				
80.																				
81.	Interel. Capac.																			
82.	G#1 to all other electrodes														uuf	-	-	-	-	7.5
83.	except 2 other																			
84.																				
85.	Cathode to all other electrodes														uuf	-	-	-	-	5.5
86.																				
87.	G1 to Cathode (all other ground)														uuf	-	-	-	-	2.7
88.																				
89.	External Cond.																			
90.	Coating to:																			
91.	Anode -																			
92.	Grille -																			
93.	Screen -																			
94.																				
95.																				
96.	Life Test	N17	6.3	ADJ	-	6.8	2.8	6.4	25.0		-	Fr.	Full			-	-	Note	-	-
97.	Mechanical Inspection	K-69982-44A77																		

BASING

EQUIPMENT

1. Suitable base alignment and heating fixture
2. Wire cutter and tweezers
3. Flux pad and holder (per sketch)
4. Suitable soldering pot with temperature control
5. Shallow stainless steel pans (2)
6. Sponge
7. Excess solder gage, K-69982-46A118



MATERIALS

1. Red Glyptal, G.E. #1201, or equivalent
2. Soldering flux, A10B14
3. Solder, B20C13D
4. Ammonium Hydroxide Solution, 3%
5. Phenolphthalein Solution, 0.5%

PROCEDURE

1. With the tube face down on a smooth clean surface, separate and straighten out the lead wires. Avoid any sidewise pull, which might chip the glass. Insulate H.V. leads with silicone sleeving and silicone putty.
2. Thread the leads about $\frac{1}{2}$" through the corresponding pins of a filled base assembly.
3. Apply a thin coating of Glyptal around each of the lead wire seals. The Glyptal must not extend more than $\frac{1}{4}$" along the lead wires.

/fmd

SK-CD2

4. Keeping the lead wires taut, slip the base down until it is in firm contact with the tube neck and in correct rotational alignment with respect to the anode button.

5. Trim off any base cement that protrudes more than 1/32" from the base.

6. Again keeping the lead wires taut, clip off each wire about .010" from the end of the pin.

7. Place the heating fixture on the base. Make sure that the base does not rotate with respect to the tube.

8. By means of the heating fixture, apply heat to the base so that its temperature reaches 100°C after approximately 5 minutes of baking, and 160°C after approximately 11 minutes.

9. Discontinue the application of heat. Allow the base to cool with the fixture still in place until its temperature is below 90°C.

10. Remove the fixture.

11. Press the ends of the base pins evenly against the flux pad which has been saturated with soldering flux with the excess drained off.

12. Immediately dip the ends of the pins into the soldering pot which contains molten solder at 270° ± 10°C. Hold the pins in the solder about 3 seconds.

13. Allow the pins to cool for a few seconds, then dip the pins for 1 or 2 seconds in 3% ammonium hydroxide solution to which a few drops of phenolphthalein solution has been added.

14. Rinse the pins in tap water.

15. Remove excess water by pressing pins lightly into a sponge.

16. Check the diameter of the soldered pins with the excess solder gage. Repeat the soldering operation if gage will not fit readily over pins.

LIMITATIONS

1. Excessive flux may cause a chemical reaction of sufficient violence to prevent the flow of solder into the pin orifice. It may also spatter on the leads, causing corrosion, or on the Bakelite, causing electrical leakage. A water wash is recommended as a remedy for excessive flux.

2. Oxides, dirt, and other dross should be skimmed from the top of the molten solder to present a clean metallic surface to the base pins.

/fmd

SK-C21

3. The pins should be dipped in the solder no further than necessary to obtain good soldering.

4. The amount of solder adhering to the outside of any pin must not increase the pin diameter by more than .008".

5. Refrain from inverting the tube to examine the pins immediately after soldering. If not set up, the solder may run into the base and constitute a short-circuiting hazard.

6. The depth of solder penetration may be checked by clipping off the pin 5/32" from the end and examining it to see that it is filled with solder. This is a destructive test which should be performed only as often as necessary to check on the operation.

7. In case of unsatisfactory results, the entire soldering operation may be repeated.

8. To avoid spattering, pins must be allowed to cool sufficiently before dipping them in flux, ammounium hydroxide, or water.

9. Replace the 3% ammonium hydroxide with fresh solution when its color fades.

PRECAUTIONS

1. Flux is corrosive. If any gets on the skin, wash it off immediately with water.

SK-C01

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A87
SECTION
CONT ON SHEET 2 SH NO 1

REVISIONS

SUBJECT: Electro-Polishing

EQUIPMENT:

1. One gallon crock
2. Negative electrode (connect to negative (-) terminals.
3. D-C power supply, requirements 20 - 30 amps. at twenty volts.
4. Holder for anode, stainless steel clip assembly (connect to (+) positive terminals.

MATERIAL:

Polishing solution - Two liters of a mixture of 65% conc. phosphoric acid ($H_3 PO_4$) and 35% conc. sulfuric acid ($H_2 SO_4$) (by volume). Mix acid very slowly, stirring frequently and cooling the bottle under running tap water.

Rinsing Bath - Solution of 50%, by volume, of conc. nitric acid (HNO_3) in water.

PROCEDURE:

1. Negative electrode is placed in tank and polishing solution is poured in, the quantity sufficient to cover parts in holders.
2. Parts are placed in holder and immersed in the bath.
3. Power is turned on and current is adjusted to 20 amps.
4. Parts are polished for 4 minutes or as required.
5. Power is turned off, holder removed and parts dropped into a beaker of clean hot tap water.
6. When approximately 25 parts are accumulated, rinsing is continued for about 3 minutes. Parts are drained and then immersed in the nitric acid solution for 2 minutes.
7. Parts are removed and rinsed in a beaker of clean hot running water for 5 minutes.
8. Parts are boiled in deionized water for 5 minutes.
9. Repeat 8.
10. Parts are then drained and placed under infra-red lamps or in a suitable oven and thoroughly dried.

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PRINTS TO	PREPARED BY / ISSUED BY	APPROVALS	DIV OR DEPT / LOCATION / SECTION	SI K-69982-44A87 SECTION
	E. Krackhardt 7-26-56	EFS	Cathode Ray Tube Sub / Syracuse	

FF-660-C (10-55) PRINTED IN U.S.A.

MAINTENANCE:

1. The polishing solution should be removed when a sludge has formed on the bottom of the container.

2. After the container has been thoroughly cleaned, it should be filled to the proper depth with a new polishing solution.

3. The solution of nitric acid should be changed when needed, usually this may be determined by checking the parts after rinsing or by observing the discoloration of, or foreign matter in, the solution.

CAUTION:

Bodily contact with electro-polish solution is to be avoided to prevent severe burns.

/fmd

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Funnel Bake
Schedule A

EQUIPMENT:

1. Suitable in-line oven or lehr (the latter is perferred). Supports must be of point-suspension type made of asbestos-base material such as Transite, Marinite, or equivalent.

PROCEDURE:

1. Place the funnel, neck down, in an in-line over or in its side, neck trailing, in a lehr.
2. Heat the funnel gradually to 400°C.
3. Maintain the funnel at 400 - 410°C for 15 - 20 minutes.
4. Cool the funnel gradually until it is below 200°C.
5. Remove the funnel from the oven and store it capped to keep out dirt prior to panel-funnel seal.

LIMITATIONS:

1. The temperature is to be measured at the "X" band flange with a contact thermocouple supported by ceramic tubing.
2. The heating and cooling rates are limited by glass breakage only. Heating at 5°C per minute and cooling at 3°C per minute have been found satisfactory.
3. The peak temperature must not exceed 454°C or the glass will be excessively strained.
4. To minimize breakage, the bulb must not be permitted to contact any other bulb or any part of the oven structure.

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A89
SECTION
CONT ON SHEET F SH NO 1

REVISIONS

SUBJECT: Frit Bake - Panel
Schedule A

EQUIPMENT:

1. Suitable in-line oven or lehr (the latter is preferred). Supports must be of point-suspension type made of asbestos-base material such as Transite, Marinite, or equivalent.

PROCEDURE:

1. Place the panel face down, in an in-line over or lehr on point suspension supports.
2. Heat the panel gradually to 450°C.
3. Maintain the panel at 445°C - 450°C for at least 10 minutes.
4. Cool the panel gradually until it is below 140°C.
5. Remove the panel from the oven and store it capped to keep out dirt prior to screening.

LIMITATIONS:

1. The temperature is to be measured at the "X" band flange with a contact thermocouple supported by ceramic tubing.
2. The heating and cooling rates are limited by glass breakage only. Heating at 5°C per minute and cooling at 3°C per minute have been found satisfactory.
3. The peak temperature must not exceed 454°C or the glass will be excessively strained.
4. To minimize breakage, the panel must not be permitted to contact any other panel or any part of the oven structure.

/fmd

PRINTS TO

PREPARED BY I. Leising 7-30-56
ISSUED BY

APPROVALS
EFS

Cathode Ray Tube Dept. DIV OR DEPT
Syracuse LOCATION
SECTION

SI K-69982-44A89
SECTION

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GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A90

SECTION

CONT ON SHEET F SH NO 1

REVISIONS

SUBJECT: Removal of Frit from Flanges

EQUIPMENT:

1. Stainless steel sink with nitric acid resistant drain under hood.

MATERIALS:

1. Stock of 1.5 normal nitric acid solution. (Warm water, 140°F)
2. Rubber gloves.

PROCEDURE:

1. Place funnel or panel flanges down into stopped sink.
2. Add 1.5 normal nitric acid solution at 140°F slowly until level is sufficient to just cover ground flat on flanges.
3. Allow reaction to continue for 20 - 30 minutes until all frit is removed.
4. Rinse thoroughly with tap water.

SK-CPA 8-16-56 (ISSUE) LEM

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PRINTS TO	PREPARED BY / ISSUED BY	APPROVALS	DIV OR DEPT / LOCATION / SECTION	SI / SECTION
	I. Leising 8-15-56	EIS	Cathode Ray Tube Sub / Syracuse	K-69982-44A90

FF-660-C (10-55) PRINTED IN U.S.A.

SUBJECT: Phosphor Line Inspection
(For the blue and green stripe)

MATERIAL:

1. Flourscent light (white)
2. Short wavelength ultra-violet source* (Mineralite 2537 A.U.) or equivalent.
3. Long wavelength ultra-violet source* (Mineralite 3660A.U.) or equivalent.
4. Line width measuring mechanism with a 20X - 40X microscope with a scale graduated in 1 or 2 mils.

* Black Light Eastern Corp., 33-00 Northern Blvd., Long Island City 1, N.Y.

PROCEDURE - Blue

1. Place panel face down over flourescent light with anode button in upper left corner.
2. Measure line width in mils in the following places (see note #4)
   a. In the four corners of the panel approximately 1" in from both sides
   b. Three measurements along the major axis, one of which is in the center and the other two are 1/4 the length of the major axis on both sides of center.
   c. Two measurements along the minor axes 1/4 the length of the minor axes on both sides of center.
3. Number the positions from left to right along the panel 1 - 9. (numbers 1, 2, 8, 9, are located at 2a above; 4, 5, 6 at 2b; and 3,7 at 2c).

/fmd

SK CD# 8-16-56 (ISSUE) LEMg

4. While measuring line widths also observe the phosphor lines in the field of view of the microscope for holes or areas of poor phosphor build. (see note #1)

5. With the unaided eye note the overall phosphor build over the face of the panel. Note areas of light and heavy phosphor build and voids or breaks in the line. (see note #1)

6. Shine the long wavelength ultra-violet light on the phosphor side of the face panel. Check line condition as per procedure #5. Also check the panel through the microscope for fogging (blue phosphor on bare glass) in 10 random positions. (see note #1)

PROCEDURE - Green

1. For green an additional factor of contamination (green in the blue stripe) will be noted in 10 random positions. (see note #1) For green use the short wavelength ultra-violet light.

PROCEDURE - Red

1. Evaluate the red line (except for fogging) according to S.I. K-69982-44A43.

NOTE:

1. Indicate screen conditions in four categories:

   a. Eveness of phosphor build

   b. Voids, breaks, etc.

   c. Fogging (except for red)

   d. Contamination (except for blue)

   This is done by designating the four factors individually as poor, fair, good or excellent.

/fmd

SE-CP4 8-16-56 LEMC (ISSUE)

2. For measuring line widths of the green stripe a u.v. light may be used instead of white fluorescent so as to distinguish between it and the blue stripe.

3. CAUTION: - do not look directly into the ultra-violet lamps with the naked eye.

4. Since the phosphor line does not appear to have a perfectly straight edge under the microscope, line widths and pitches must be measured along the edge of the line at an average position taking into account projections and bays in the phosphor line edge.

/fmd

SR-CRA 8-16-56 LEM

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STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Sealing Mount in Funnel (Gun Seal)

EQUIPMENT:

1. Eight position sealing machine
2. Stem preheater. A rectangular transite oven is used with calrod heaters, variac controlled, in the bottom. Holes in the oven top for supporting the flare with the exhaust tube section extending down into the oven.
3. Polariscope - Polarizing Instrument Company.

MATERIALS:

1. Coated funnel assembly
2. Mount assembly

PROCEDURE:

1. General: Sealing length is determined by positioning the topmost aperture plate (K-69982-45A82) Top for Telefunken type guns at the paint line of the funnel neck.
2. a. Turn on gas and light all fires. Next, turn on air and last oxygen. When shutting down machine reverse this procedure.
   b. Check pressures: gas - 1½ lbs. per sq. in.; air - 11½ lbs. per sq. inch; oxygen - 9 lbs. per sq. inch.
   c. After machine is fully lighted adjust flames as necessary.
   d. Turn on motors for funnel rotation and seal head indexing
   e. Run machine for 10 minutes prior to loading mounts into stem pre-heater.

/fmd

SK-CPL 8-20-56 Issue

CD2

PRINTS TO

PREPARED BY I. Leising
ISSUED BY

APPROVALS EFS

Cathode Ray Tube Sub DIV OR DEPT
Syracuse LOCATION
SECTION

SI K-69982-44A92
SECTION

3. Preheating mount stems:

   a. Mounts must be handled with clean, lint free gloves by the stem flange or tubulation only.

   b. Turn on stem preheater and load mounts. Preheater temperature should be adjusted between 110° and 150°C.

4. Loading machine and sealing:

   a. Insert pre-heated mount in funnel neck per instructions "General" under Procedure 1 above.

   b. Load bulb into sealing head and secure it in position with clamping device.

   c. Carefully center the stem flange in the tube neck. Raise sealing pin to position of 1/64" clearance from stem flange.

   d. Seal per following preheat, seal, annealing schedule:

Position	Function	Time	Pin Temp.	Neck Temp.
1	Preheat	60 sec.	250 - 300°C	200°C
2	Preheat	60 sec.	300 - 400°C	350°C
3	Preheat	30 sec.	450 - 600°C	700°C
4	Drop cullett	drop & wet	450 - 600°C	750 - 850°C
5	Cut cullett	cutoff (60 sec)	450 - 600°C	1000°C
6	Anneal	60 sec.	300 - 375°C	500 - 600°C

   e. Remove bulb from machine.

5. Inspection: a. Check gun insertion and rotational alignment in tube neck.

   b. Check gun seal condition and shape.

   c. View seal in polariscope, should be free from excessive stress.

SK-CPL 8-20-56 (ISSUE)

/fmd

GENERAL ELECTRIC

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

SI K-69982-44A93

SECTION

CONT ON SHEET F SH NO. 1

REVISIONS

SUBJECT: Gun Seal Length Check

EQUIPMENT:

1. Reference line gage with scale. Gage Dwg. M-69982-46A5.

MATERIALS:

1. Funnel - mount assembly unbased.

PROCEDURE:

1. Apply gage (Dwg. #M-69982-46A5) to tube at reference line with scale adjusted to read directly along neck.
2. Read seal length to reference line.
3. Pass 7.250 ± .040" per dwg. K-69982-45A30. ? will be corrected by D.L. RTM 8/24
4. Reject, too long or too short, as otherwise measured.

/fmd

CD2

SK-CP-6 8-20-56 H Leising (ISSUE) 1 L

PRINTS TO	PREPARED BY	APPROVALS			
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			SECTION		

FF-660-C (10-55) PRINTED IN U.S.A.

STANDING INSTRUCTIONS

FOR USE OF G-E EMPLOYEES ONLY

REVISIONS

SUBJECT: Application of External Insulating Coatings

EQUIPMENT:

1. Sponge coater pad, large (dwg. K-69982-46A129)
2. Sponge coater pad, small (dwg. K-69982-46A130)
3. Sponge coater pad, flange area (dwg. K-69982-46A131)
4. Shallow "pie" pan dish for coating liquid
5. Suitable means for ventilation of application area
6. Clean cloth

MATERIALS:

1. G.E. Dri-film S.C. 87 (keep stoppered when not in use)
2. Final tube assembly per dwg. K-69982-45A33

PROCEDURE:

1. General: clean sponge pads are moistened with G.E. Dri-film S.C. 87 and the surface of clear glass of the tube is rubbed in an area of a circle: of 2" radius from the lip of the anode button, a circle of 1" radius from the lip of the screen lead button, and a band of 1" width on both sides of the metal X-band flanges. Dri-film must not be permitted to run into button contact cavities.
2. When the dri-film has an oily appearance, the excess is wiped off with a clean dry cloth to give a bright finish.
3. Allow air dry (of 6-7 min) before handling.

LIMITATIONS:

1. Wear gloves; do not allow skin or eye contact.
2. Material has a flash point of 100°F, therefore electrically discharge tube contacts to ground before pplication.

SK-CRT 8-20-56 W/Ltr (ISSUE) 1 L

CD2

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PRINTS TO

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