



SUBJECT YELLOW GOLD PLATING  
Process Specification

SUPERSEDED DATE

- 1. EQUIPMENT
  - a. Tank - Koroseal lined steel or Pyrex glass.
  - b. Heater - Stainless steel steam coil, hot plate, or steel immersion heater.
  - c. Temperature controls - Optional.
  - d. Agitator - Cathode and/or solution.
  - e. Filter - Gravity filter when necessary.
  - f. Exhaust - Exhaust required.
  - g. Power supply - D-C from rectifier or generator.
  - h. Contacts - Copper anode and cathode bars; case hardened steel anode hangers; barrel when required.
  - i. Electrical instruments - Ammeter, voltmeter, and rheostat.

2. MATERIALS

- G607 Gold Anodes, 24 Carat
- G601 Sodium Gold Cyanide, 46% Gold
- S114 Sodium Cyanide, Granular, 96%
- D600 Disodium Phosphate, U.S.P.
- W60 Deionized Water (or W7E Distilled Water)
- - Barium Hydroxide, Technical or Lime (Unslaked)
- - Sulfur
- - Nylon Anode Bags



CYANIDE SAFETY PRECAUTIONS: See 33-2-13A.

3. PREPARATION OF SOLUTION

- a. Composition:
  - Sodium gold cyanide - - - - - 1.4 av.oz./gal.
  - Sodium cyanide - - - - - 1.5 av.oz./gal.
  - Disodium phosphate - - - - - 1.0 av.oz./gal.
- b. Procedure:
  - (1) Fill the tank two-thirds full with deionized or distilled water.
  - (2) Dissolve the required amounts of sodium cyanide and disodium phosphate.
  - (3) Add slowly, and with constant stirring, the required amount of sodium gold cyanide.
  - (4) Add water to bring the solution up to the operating volume and heat to the specified temperature.
  - (5) Stir the solution and filter.
  - (6) Send a 100-200 cc. sample of solution to C & P Laboratory for analysis. See S.N. 34-36-1 for standard sampling procedure:
  - (7) Adjust solution to required limits.

4. SOLUTION OPERATION & CONTROL

a. Limits:

	Preferred	Limits
Gold as metal	0.63 av.oz./gal.	0.5-0.75 av.oz./gal.
Free sodium cyanide	1.75 av.oz./gal.	1.5-2.0 av.oz./gal.
Disodium phosphate	1.0 av.oz./gal.	0.8-1.2 av.oz./gal.

Temperature: 52°-66°C. (125°-150°F.)  
 Cathode current density: 2-5 amp./sq.ft.  
 D-C tank potential: 2-6 volts  
 Time: 45 min. to deposit 0.001" at 5 amp./sq.ft. (Cont. on pg. 2)

★ CHANGE These drawings and specifications are the property of Radio Corp. of America, RCA Victor Div. and shall not be re-  
 ★★ ADDITION produced or copied or used, in whole or in part, for the manufacture or sale of apparatus and/or devices without permission. 8-46  
 \*\*\* DELETION



LLL

STANDARDIZING  
NOTICE

34-36-68

SUBJECT YELLOW GOLD PLATING  
Process Specification

SUPERSEDED DATE

4. SOLUTION OPERATION & CONTROL (Cont.)

a. Limits: (Cont.)

(1) Sampling: Submit a 100-200 cc. sample of plating solution each week to C. & P. Laboratory, making sure that solution is well agitated and up to operating temperature before taking the sample. See S.N. 34-36-1 for standard sampling procedure.

b. Purification:

<u>Contaminant</u>	<u>Purification Method</u>
Insoluble matter	Filtration
Carbonates	Precipitation with barium hydroxide
Heavy metals	Dummy plating
Organic matter	Activated carbon

Refer to S.N. 34-36-1A for carbonate precipitation procedure.

c. Notes:

(1) The plating solution should be balanced as follows:

<u>Defect</u>	<u>Remedy</u>
Low gold	Add sodium gold cyanide
Low cyanide	Add sodium cyanide
Low phosphate	Add disodium phosphate
High cyanide	Add sodium gold cyanide
High cyanide & low gold	Add sodium gold cyanide
High gold	Replace some of the gold anodes with stainless steel anodes

The Hull Cell Test shall be made to determine carbonate content.

- (2) Mechanical stirring of bath is important when long-time plating is required.
- (3) Gold anodes shall not be left in bath when not in use.
- (4) Keep plating bath covered when not in use to prevent evaporation and contamination.
- (5) Metals such as chromium, aluminum, tin, iron, molybdenum and their alloys should be nickel plated prior to gold plating.
- (6) The solution should not be air agitated.
- (7) The anodes and cathodes (parts) must be completely immersed in the solution at all times.
- (8) After removing the parts from the plating solution they shall be thoroughly rinsed to remove all cyanide. (The details on types and number of rinses, and drying, are specified in the plating schedules either below or in S.N. 34-1-1P.)

(Cont. on page 3)



SUBJECT YELLOW GOLD PLATING  
Process Specification

SUPERSEDED DATE

4. SOLUTION OPERATION & CONTROL (Cont.)

c. Notes: (Cont.)

(9) Extreme care must be exercised to prevent introducing into the solution dirt or lint which may catch on the parts.

(10) The anodes should extend from one extremity of the jig or barrel to the other and should be as deep as the parts in the solution.

(11) All electrical contact areas should be kept clean.

(12) Barrel Plating: Excessive plating should not be allowed to build up on barrel contacts.

(13) Higher temperature makes color more yellowish.

5. DISPOSAL OF SOLUTION

a. Determine the amount of cyanide present.

b. Dilute with water.

c. For every pound of cyanide add 0.72 lb. of sulfur and 0.26 lb. of unslaked lime to the solution.

d. Heat to 90°C. for 2 hours stirring constantly during heating.

e. Allow to stand overnight.

f. Check for completion of reaction by inserting a bright copper wire. Destruction of cyanide is evidenced by wire turning dark.

g. Save the residue to salvage gold.

6. SAFETY PRECAUTIONS

This plating solution is a CYANIDE solution and should be handled with extreme care - see S.N. 33-2-13A.

Under no circumstances should acid be introduced into the solution - cyanides in contact with acids develop deadly hydrocyanic acid gas which is colorless and nearly odorless (burnt-almond smell can be detected by some persons).

SCHEDULES ON FOLLOWING PAGES →

SUBJECT YELLOW GOLD PLATING  
Process Specification

SUPERSEDED DATE 3/24/50

SCHEDULE NO. 1 (Initially for 3C33 plate)

A schedule will be specified here which will supersede  
34-36-8G, Sch. No. 1. \* (See Prod. Run PCL 12945)

SCHEDULE NO. 2 (Initially for RA3 apertures; supersedes S.N. 34-36-8C)a. Procedure:

1. Place 1000 parts in small Daniels plating barrel, Size 6H.
2. Add 25 cc. of small glass beads (3-5mm. dia.).
3. Nickel strike.  
10-12 min., 30-35 amps/1000 parts, room temperature.
4. Rinse 30 sec. in warm running water with agitation.
5. Transfer parts and beads to gold plating barrel (Daniels), Size 6H.
6. Gold plate.  
5-6 min., 5-6 amp/1000 parts, 52°-66°C. (125°-150°F.)
7. Rinse in warm water.
8. Transfer parts and beads to wire mesh basket.
9. Rinse 30 sec. in warm running water with agitation
10. Separate parts and beads with separating screen.
11. Rinse parts in deionized water.
12. Rinse in clean acetone.
13. Dry in oven.

b. Standards of Quality:

1. Gold plate shall adhere well, not peel or wipe off. Color to be yellow to orange.
2. There shall be no unplated areas within 1/8" of the central hole on either front or back of the part, and the sides of the hole itself must be plated.
3. Small unplated areas are not cause for rejections provided they do not fall within the area specified directly above.
4. Parts must be washed completely free of all plating salts and solutions, and the plating should not be discolored.
5. A nickel strike under the gold plate is acceptable, but a copper strike is not permissible.
6. The gold plated onto the plate should be pure gold, not alloyed with any other metal.



LLL

STANDARDIZING  
NOTICE

34-36-68

SUBJECT YELLOW GOLD PLATING  
Process Specification

SUPERSEDED DATE

SCHEDULE NO. 3 (Initially for MP6010 grid pantograph strip of 5831)

a. Material: Copper-Chromium Alloy, 1% Chromium.

b. Procedure:

1. Parts must be free of grease and excessive oxide.
2. Dip in 10-15% solution of sulfuric acid, room temperature, 5-10 seconds. Parts must be dipped individually.
3. Rinse in running water with agitation, 30 seconds.
4. Load parts into special jig which allows plating on 0.232" of each edge. Parts must be kept wet while loading.
5. Gold plate to thickness of 0.0002", agitate parts or solution, 0.13 amp./5" strip (5 amp./sq. ft.), 51-66°C. (125-150°F.), 15 minutes.
6. Rinse parts and jig in warm running water, 38-66°C. (100-150°F.), 30 seconds.
7. Remove parts from rack and place in wire basket.
8. Rinse in warm running water, 38-66°C. (100-150°F.), 30 seconds.
9. Dip in clean acetone (A55), 5 seconds.
10. Dry in oven.
11. Deliver to Inspection.

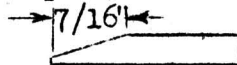
SCHEDULE NO. 4 (Initially for MP6009 grid pantograph diffusion plate of 5831)

a. Material: Copper.

b. Plating Surface: 0.06 sq. ft.

c. Procedure:

1. Degrease in hot Blacosolv.
2. Mask with Microstop lacquer(L631A) as indicated below:



3. Dry for 30 minutes.
4. Rack on 0.030" dia. copper or nickel wire, use 2 strands.
5. Electroclean, cathodic, 6 v., 93°C.(200°F.), 1 minute. See S. N. 34-34-74.
6. Rinse in running warm water with agitation, 38-66°C. (100-150°F.), 30 seconds.
7. Dip in hot 50% solution of hydrochloric acid, 51-66°C. (125-150°F), 5 seconds.
8. Rinse in running water with agitation, 30 seconds.
9. Dip in 5% solution of potassium cyanide (P60), room temperature, 30 seconds.
10. Rinse in running water with agitation, 30 seconds.
11. Gold plate to thickness of 0.0002", agitate parts or solution, 0.12 amp./part (2 amp./sq.ft.), 51-66°C. (125-150°F.), 30 minutes.
12. Rinse in running warm water with agitation, 38-66°C. (100-150°F.), 30 seconds.
13. Remove masking lacquer by soaking in acetone (A55).
14. Rinse in clean acetone to remove all traces of lacquer.
15. Dry in oven.
16. Deliver to Inspection



SUBJECT

YELLOW GOLD PLATING  
Process Specification

SCHEDULE NO. 5 (Initially for MP6005 cathode pantograph lamination of 5831)

a. Material: Copper-Chromium Alloy, 1% Chromium.

b. Procedure:

1. Parts must be free of grease and excessive oxide.
2. Dip in 10-15% solution of sulfuric acid, room temperature, 5-10 seconds. Parts must be dipped individually.
3. Rinse in running water with agitation, 30 seconds.
4. Load parts into special jig which allows plating on 5/16" of inner edge and 1/8" of outer. Parts must be kept wet while loading.
5. Fasten jig to motor which will make jig and parts oscillate in bath. Make anode and cathode contact to jig.
6. Gold plate to thickness of 0.0002", 0.18 amp./part (5 amp./sq. ft.), 51-66°C. (125-150°F.), 15 minutes, shake jig occasionally to remove air bubbles.
7. Detach jig from motor.
8. Rinse parts and jig in warm running water, 38-66°C. (100-150°F.), 30 seconds.
9. Remove parts from jig and place in wire basket.
10. Rinse in warm running water, 38-66°C. (100-150°F.), 30 seconds.
11. Dip in clean acetone (A55), 5 seconds.
12. Dry in oven.
13. Deliver to Inspection.