

RADIO AND TELEVISION



# Service News

A PUBLICATION OF THE RCA ELECTRON TUBE DIVISION

DECEMBER

1961

Vol. 26, No. 4



Photo copyright: "©MCMLXI Walt Disney Productions."

What are you looking for, Professor? Could be this now-famous Walt Disney television star, Ludwig von Drake, is reaching for a pencil to remind you to make note to watch "Walt Disney's Wonderful World of Color" on Sunday evenings, December 17th and 24th. That's when this exciting full-hour NBC-TV show again sets the stage for presentation of an RCA commercial featuring Silverama® picture tubes (made with the finest parts and materials including a re-used envelope). Patterned for maximum promotional effect and customer interest, this dynamic commercial is part of a continuous RCA campaign which is pre-selling millions of consumers across the nation.

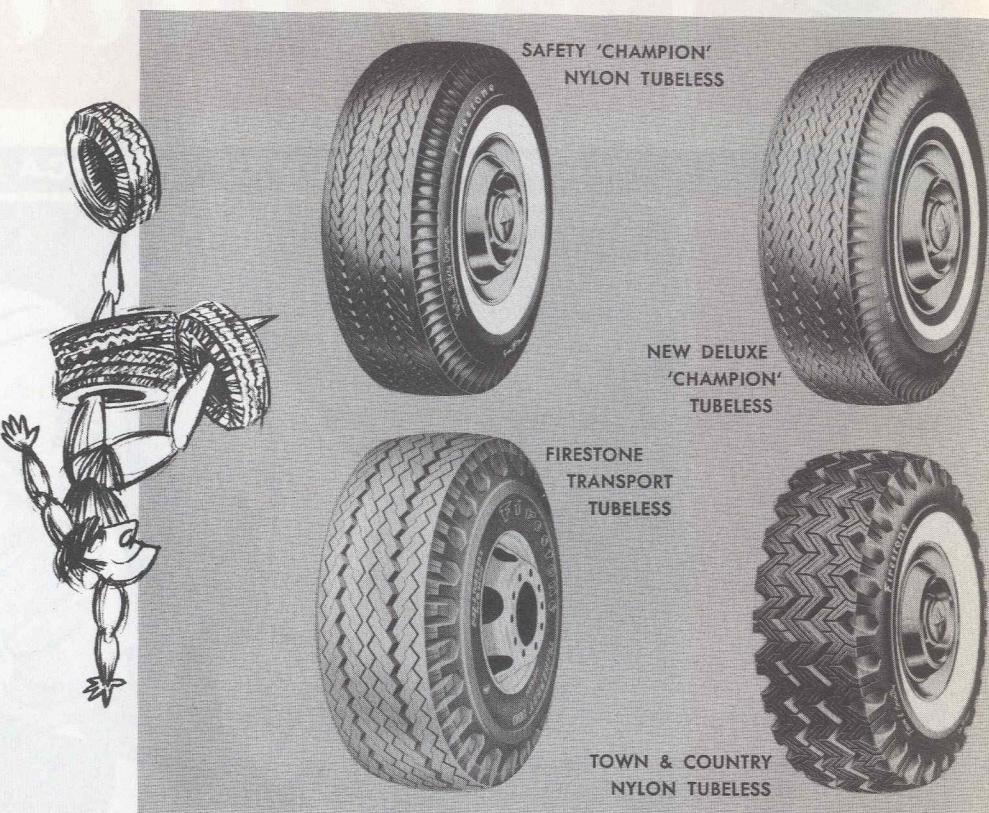
# RCA Launches Spectacular 'Tube

Santa Claus may have had nothing to do with it (or did he?)—but the glad tidings of this holiday season include the announcement of one of the most intriguing premium-certificate programs ever launched for the benefit of radio-TV service-dealers and technicians.

Stop in and ask your participating RCA distributor about the spectacular new RCA "Tube Roadshow" plan. With your purchases of RCA replacement tubes, you now can earn valuable certificates redeemable for an extensive variety of name-brand automotive and home supplies. These premiums are available direct from thousands of Firestone stores and Firestone franchised-dealer locations throughout the nation.

Your participating RCA distributor is prepared to immediately present you with "Roadshow" certificates when you purchase RCA entertainment receiving tubes or Silverama® black-and-white picture tubes (made with the finest parts and materials including a re-used envelope). However, if you wish to make the most of this current campaign, please bear in mind that your distributor will be handing out these special certificates for a limited time only. Hence, the more RCA tubes you buy, and the sooner you buy them, the wider your choice of RCA "Tube Roadshow" premiums.

Curious as to what specific products you can acquire in exchange for quantities of "Roadshow" certificates? At any convenient Firestone outlet (listed in the Yellow Pages of the telephone directory under the classification, "Tires," and the Firestone name), you



Service-dealers and technicians can redeem RCA "Tube Roadshow" certificates for a wide selection of Firestone premium items, including the popular-type tires shown above.

can choose premiums ranging from famous-quality tires, auto batteries, and auto accessories to numerous gift and toy items. Just imagine! Your "Roadshow" certificates—in the required numbers—can be traded for your selection from more than 70 different stock types of Firestone regular tires and snow tires, offered in popular sizes for trucks, conventional cars, compact and imported cars. You also can choose from such auto-accessory premiums as 6-volt and 12-volt batteries, spark plugs, car top carriers, safety belts, full contour auto mats, a car wash brush, and an emergency tire chain. Then again you may favor the toy and gift items featured in the campaign, including boys' and girls' bicycles, tricycles, wagons, scooters, fire trucks, and tractors, as well as golf

carts and croquet and badminton sets. To be even more specific:

#### Firestone Tires and Tubes

- The complete selection of Firestone tires and tubes meet varied user requirements. These many different code/stock numbers cover the Firestone New Deluxe "Champion" Tubeless Tires (Rayon) for conventional cars and compact and imported cars (the same Firestone tires that are installed on new cars by automobile manufacturers), as well as Firestone Passenger Car Snow Tires—Town & Country—Nylon Tubeless or Rayon Tubeless; Firestone Compact and Imported Passenger Car Snow Tires—Town & Country—Rayon Tubeless; Firestone Passenger Car Snow Tires—Town & Country—Rayon Tubed-Type; Fire-

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RCA RADIO & TELEVISION SERVICE NEWS is published in the interest of dealers and service technicians. It is written to assist them in providing better service, and to foster the growth of their business by supplying them with information on the latest troubleshooting and sales promotion techniques, sales and service aids, together with invaluable data on RCA tubes, transistors, batteries, sound tape, and test equipment.

RCA RADIO & TELEVISION SERVICE NEWS is a bi-monthly publication of the RCA Electron Tube Division, Harrison, New Jersey.

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Radio Corporation of America  
Harvey Slovik  
Editor

**Participating Distributors Offer  
Valuable Certificates Redeemable  
For Selection of Firestone Items**

# Roadshow' Premium Program

stone Passenger Car Tires—Safety Champion—Nylon Tubed-Type; Firestone Tubeless Truck Tires—Transport 100; Firestone Tubed-Type Truck Tires; and an assortment of Firestone Deluxe Champion and Transport Truck Tubes.

The number of RCA "Tube Roadshow" certificates you need per tire: from 21 to 97. A tire tube can be yours for from two to five certificates.

## Auto Batteries and Spark Plugs

- Your wide choice of auto batteries and spark plugs include the Firestone Extra-Life Series of 6-volt and 12-volt auto batteries; the Delco "DC-12" Series, Original-Equipment Line, auto batteries; AC Spark Plugs, and Autolite Spark Plugs.

The number of "Roadshow" certificates required for 6-volt and 12-volt automobile batteries range from 20 to 33. Only one certificate is needed to obtain a standard-type or resistor-type AC or Autolite spark plug.

## Auto Supplies

- The numerous auto supplies being offered are as follows:

- For only one certificate each, you can obtain a Firestone Windshield De-Icer (Aerosol can), a DuPont "Glow" Liquid Car Wash, an emergency tire chain, or a Sno-Chaser Brush.

The De-Icer (3-G-401) prevents formation of ice and melts ice already formed on windshields and car locks. It is harmless to paints, enamels, plastic, and rubber.

The highly-concentrated, self-drying, non-streaking Liquid Car Wash (3-G-382) is for use on all car finishes including acrylic lacquers and enamels. An effective cleaner for other

painted surfaces as well, it leaves a wax-like finish while removing dirt, oil stains, scum, and fresh tree sap.

The emergency tire chain (3-F-83 and 3-F-84) consists of a heavy rubberized, weather-proof strap, with a patented clamp-type buckle—easily operated, positive locking. It has brass-plated cross chains and zinc-plated side plates.

The Sno-Chaser Brush (3-E-233) is another handy winter item. It features a long 24-inch handle, an ice scraper, and a squeegee all in one.

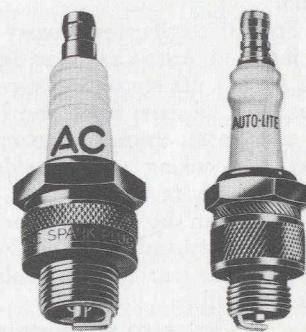
- For three certificates, there's the Full-Contour Rear Auto Rug (3-J-361). It provides full-width rear floor coverage. Smart styling matches the 3-J-363 front rug noted below. The rear auto rug is made of rubber and fits all cars. Be sure to specify color (red, blue, green, white, or black).

- For four certificates, you can select a Sno-Go Kit or a Dialamatic Car Wash Brush.

The Sno-Go Kit (3-E-286) is almost a necessity for winter driving. It consists of a short-handled snow shovel, a combination snow brush and ice scraper, and two deluxe flexible steel treads to place under tires for traction on slippery spots. The zinc-plated steel shovel is 9 by 11 inches and has a 24-inch wooden handle. The snow brush and plastic ice scraper are at opposite ends of the wooden handle.

The Dialamatic Car Wash Brush (3-G-309), a rotating brush of blended horse-hair bristles, is for car washing and various cleaning jobs around the home. It has a pistol-grip plastic handle with soap chamber, and a fingertip control dial for suds, clear rinse, and "off." Swivel action allows washing at any angle. Attachable to any garden

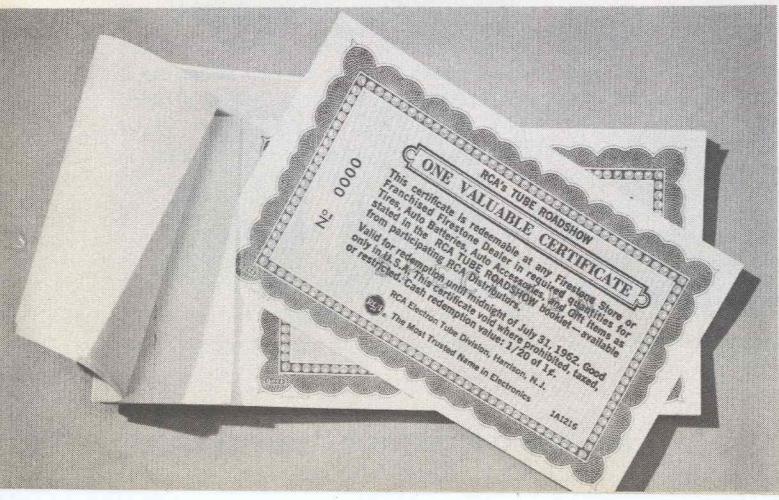
**Top to bottom:** Firestone 6-volt and 12-volt Extra-Life auto batteries; Delco "DC-12" 6-volt and 12-volt Original Equipment auto batteries; and AC and Autolite spark plugs.

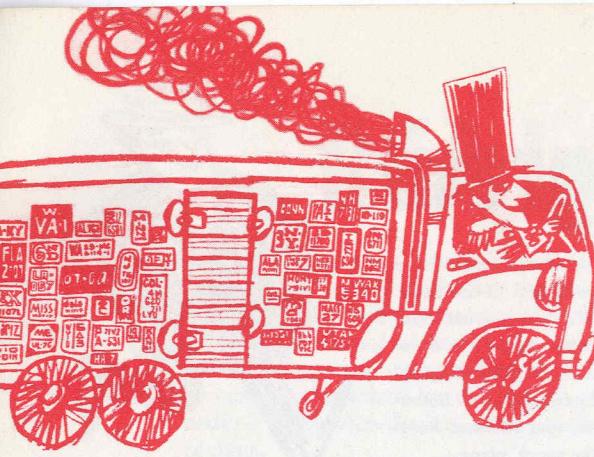


hose, this unit has a 3-foot aluminum handle with rubber grip.

- For five certificates, you can obtain the Full-Contour Front Auto Rug (3-J-363), which has a textured surface smartly styled in rubber with three attractive emblems. Fitting all automobiles except 1959-1960 General Motors cars, this one-piece mat gives door-to-door floor coverage and has a reinforced heel rest. Be sure to specify color (red, blue, white, green, or black).

(Continued on next page)





## Firestone Items Offered As 'Roadshow' Premiums

(Continued from preceding page)

(5) For six and seven certificates, respectively, there are Two-Tone Twin Mats—the 3-J-421 and 3-J-452. One of this pair of smart-looking front floor mats is for the driver's side, the other for the passenger's side. Easy to install or to remove for cleaning, these twin mats can be matched with the 3-J-422 or 3-J-377 rear floor mats. Be sure to specify color (red, blue, green, or black with white inlay or white with black inlay).

(6) For seven certificates, you can obtain the Two-Tone Door-to-Door Floor Mat (3-J-376). Color-keyed to match two-tone car interiors, this mat has a raised circular inlay and V-shaped ribbing design. It is offered in red, green, blue, or black with white inlay, and in white with black inlay—to match 3-J-377, 422. Be sure to specify color.

(7) For 10 certificates, there's the easily installed Auto-Crat Car Safety Belt (3-B-253). Its strong nylon-rayon fiber belt fits all cars, front and back seats, and most trucks. A chrome-finished, self-locking steel buckle is attached directly to webbing.

The belt can be adjusted or removed with one hand, since hardware attached to the car floor swivels in direction of pull.

Belt, buckle, and floor-mounting bracket meet legal requirements of all states. Be sure to specify color (gray, black, tan, dark blue, light blue, brown, red, green, or white).

(8) For 18 certificates, you can choose the Car Top Carrier (3-B-186), featuring rugged, embossed, pressed-steel construction. This unit has rolled corners with no sharp edges. Its platform is sturdy, spacious. Complete with heavy-duty, gray, non-staining cups, gutter straps, and safety hooks, this carrier fits most domestic and foreign cars. Length, 37 inches; width, 41 inches; height, 5½ inches.

(9) For 36 certificates, there's the Karpak Luggage Carrier (3-B-875). A heavy-duty zipper opens on one side for easy loading or unloading and can be locked with a padlock.

This unit holds four big two-suiter suitcases, two smaller bags, and plenty of odds and ends. A sturdy plated steel frame with four non-staining suction cups makes the Karpak easy to mount on car top. It's held firmly in place by four strong web straps and metal hooks that attach to the rain gutter. All metal parts are rust-proofed.

Folding flat when not in use, this Luggage Carrier is 36 inches long, 48 inches wide, and 14 inches high.

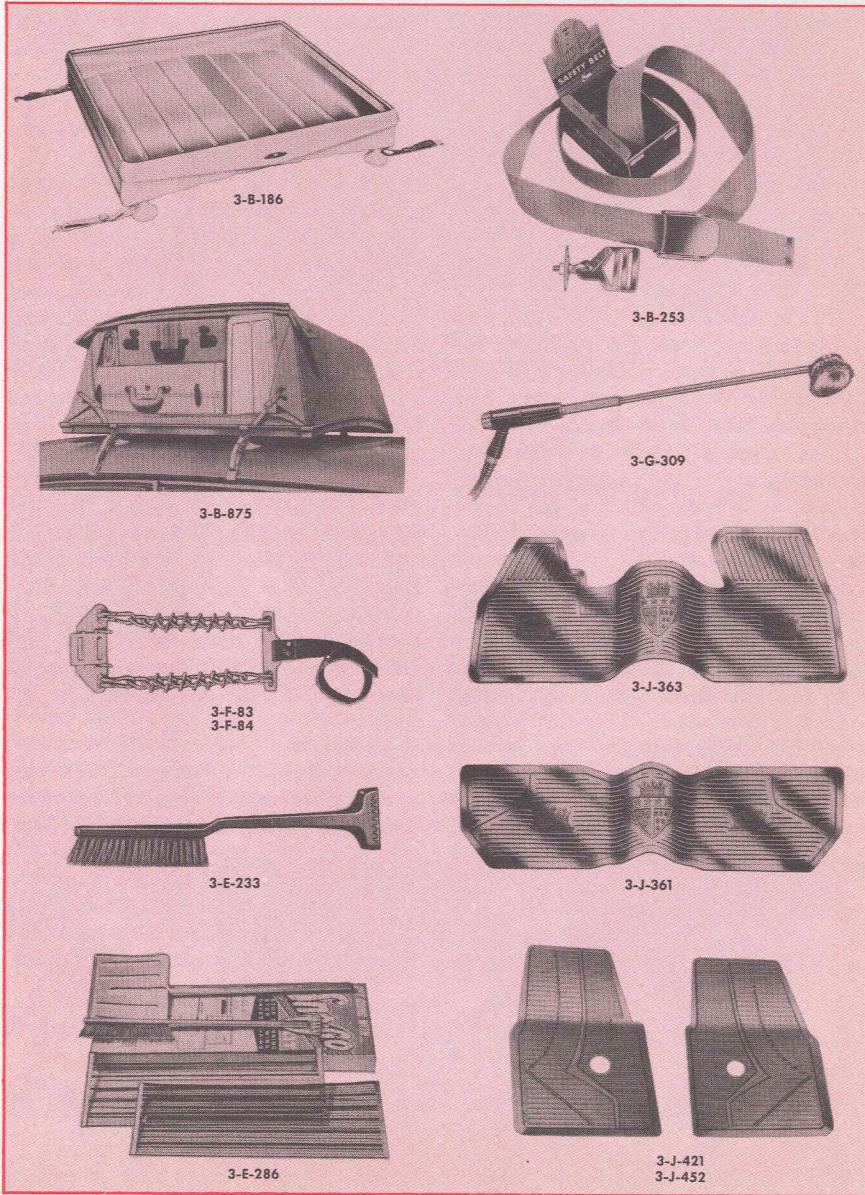
(10) For 19 certificates, you can obtain a Station Wagon Pad (3-L-108). This pad is not illustrated; nevertheless, if you're a station-wagon owner, here's a useful item worthy of your inspection at your nearest Firestone outlet.

## Wide Array of Toys

- Thinking of the youngsters? Consider this array of toys which you can obtain in exchange for "Roadshow" certificates:

(1) Wheel-King Ranch Wagon (9-C-241), for 24 certificates. It's extra-big and strong for heavy loads and rugged service. Body is constructed of select kiln-dried hardwood, reinforced with steel cleats. This wagon has big 10-inch steel double disc white wheels with Firestone semi-pneumatic tires, Ever-Wear bearings, and red permalock hub caps. Wood body is finished with clear, weather-resistant varnish; red and white enamel trim. Steel handle is black. Body length, 36 inches; width, 16 inches; height with panels, 9¾ inches.

(2) Ball-Bearing Cruiser Wagon (9-C-46), for six certificates. Here is an eye-catcher that has a brilliant flam-



boyant red finish with white side decorations and matching hub caps. Other features: speedy ball-bearings, smooth-rolling 1½-inch semi-pneumatic tires with straight rib tread design, and big 10-inch disc wheels. Body size is 34 by 15½ by 4¼ inches.

(3) Tot Wagon (9-C-191), for two certificates. All-steel and built low so tots shouldn't tumble, this 20-inch-long wagon has a red body, black handle and under carriage, white rubber-tired wheels with bright metal hub caps. It also has a tubular handle and safety-turned edges.

(4) Rex Wagon (9-C-217), for four certificates. It has a rugged 24-inch by 12-inch by 3½-inch steel body, 1-inch molded rubber tires, and a brilliant red finish.

(5) Radio Coaster Wagon (9-C-190), for eight certificates. Here is a sturdy all-metal wagon with 7x1.25 molded balloon rubber tires. It has smooth free-running "congo" lifetime bearings, double-disc wheels, and extra-sturdy construction in steering assembly and wheel suspension. The body is finished with a brilliant red baked enamel, with white wheels. Body size: 28 by 13 by 3¾ inches.

(6) Two-Wheel Rex Scooter (9-C-218), for three certificates. Husky and durably constructed, it has a one-piece heavy-gauge frame plus parking stand. This scooter is finished in a red baked enamel. Measurements: 33 inches long and 30 inches high, with 6-inch wheels.

(7) Scat Car (9-C-233), for 16 certificates. Safe, dependable, and fun to drive, this Scat Car looks like it is motor-driven. It is designed for children aged 3 to 7. Frame is ¾-inch lightweight steel tubing. The ball-bearing pedal drive is adjustable to five positions. Footrests on the frame permits coasting when desired. With a rear-wheel size of 9¾ by 1¼ inches and a front-wheel size of 7½ by 1¼ inches, it has semi-pneumatic tires. Finish is bright red baked enamel with black and white trim. Overall size is 39 inches long, 19 inches wide, 19 inches high.

(8) Two-Wheel Scooter (9-C-189), for six certificates. It has tubular steel curved handle with rubber grips, double-disc wheel with "congo" lifetime bearings, molded rubber balloon tires, parking stand and brake. This scooter has a red enamel finish with white trim. Size: 38 inches long, 34 inches high.

(9) Sky-Kar 880 (9-C-234), for 31 certificates. This sleek racer scoots along like a speed demon. Pedal-Matic chain drive permits backward and forward pedaling. Freewheeling per-



mits coasting. Sky-Kar has an all-steel body with one-inch tubular steel frame. Other features: a safe, easy-to-reach hand brake; airplane-type positive steering control; semi-pneumatic tires on 8-inch front and 10-inch rear wheels; and red baked enamel finish with white and black trim. Width is 21 inches; height, 20 inches, and length, 4 feet.

(10) Super Tot-Rod (9-C-242), for 22 certificates. It looks like a motor-driven racer. This all-steel chain-driven model has new advanced styling with extra-safety construction features. It is equipped with a bucket seat, rubber covered roll bar, double tubular drop wedge frame, and semi-pneumatic tires on 8-inch front and 10-inch rear wheels. Nylon bearing chain drive mechanism has drive ratio to give maximum pedaling ease. Attractive scarlet red with white trim, the Tot-Rod measures 41 inches long, 23 inches wide, and 22 inches high.

(11) Boy's or Girl's Firestone Speed Cruiser Bicycle (9-A-151 or 9-A-152, respectively), for 56 certificates. Here is a distinctive, middleweight bicycle with popular features, design, and color styling. Outstanding features include: cantilever-style, strong tubular steel lifetime-guaranteed frame on boy's model—regular on girl's model;

dependable Perry coaster brake; convenient kickstand for easy parking; saddles—red and white for boys, blue and white for girls; full sprocket-to-sprocket chain guard; Stimsonite rear safety reflector; sparkling chrome rims; double-braced front fender; luxurious flamboyant baked enamel finish. Boy's model is red with white and yellow trim, black pedals, and two-tone saddle. Girl's model is blue with white and red trim, black pedals, and two-tone saddle.

Also available: boy's 24-inch bicycle (9-A-153), for 54 certificates; girl's 24-inch bicycle (9-A-154), for 54 certificates; boy's 20-inch bicycle (9-A-155), for 52 certificates; and girl's 20-inch bicycle (9-A-156), for 52 certificates.

(12) Boy's or Girl's Imported 26-Inch Featherweight Bicycle (9-A-117 or 9-A-118, respectively), for 58 certificates. Here is a handsome, imported model with diamond style, sturdy lightweight frame. It is precision-built with latest features in design and construction. Amazingly effortless to ride. Popular Sturmey-Archer three-speed gear shift adjusts ride to fit road conditions smoothly, instantly. Front and rear Weinman caliper brake gives fast, easy stops. Boy's model is finished in

(Continued on next page)



## Firestone Items Offered As 'Roadshow' Premiums

(Continued from preceding page)

gleaming red enamel with white and gold trim. Girl's model is finished in blue with white and gold trim. Bicycle has white pedals and grips; two-tone mattress saddle; chrome fork crown; rubber-encased rear reflector; and 26 by 1½ whitewall tires with butyl tubes.

(13) Super Deluxe Fire Truck (9-C-247), for 29 certificates. With sleek modern automobile styling, this truck has a big fire-engine bell, flicker spotlight with a red warning lens, windshield, and two wooden ladders. Ball-bearing pedal drive is adjustable to five positions. Semi-pneumatic Firestone tires are on 8-inch wheels. Body and wheels are finished in scarlet red with white trim. Length, 45 inches; width, 17 inches.

(14) Ajax Tractor (9-C-250), for 22 certificates. Heavy steel tubular frame tractor-type body is finished in red baked enamel with white mechanical type decoration. Tractor features: simulated instrument panel; trailer hitch; fully-enclosed chain drive with ball-bearing construction and outside chain-adjuster; spring mounted adjustable saddle; and Firestone tractor-type tires on 7-inch front and 10-inch rear wheels. Length, 35½ inches; width, 20 inches; height, 24 inches.

A deluxe model of this tractor (9-C-178) can also be obtained. It's yours for 28 certificates.

(15) Super Velocipede with 10-inch front wheel (9-C-406), for 18 certificates. Advanced Aero-Jet styling with a durable two-coat red flamboyant finish is accented with white and gold trim. This tricycle has: heavy 1¼-inch steel tubing frame; heavy steel non-slip design step plate; ultra-modern over-fork design fender; two-piece bicycle-type pedals of red transparent plastic; and chrome handlebar with

red plastic grips, knuckle guards, and streamers. Adjustable saddle of white padded vinyl with red trim has coil springs. Heavy machine multi-spoke wheels; front wheel has full ball bearings. Firestone semi-pneumatic deluxe whitewall tires are also included.

The 9-C-407, the same Super Velocipede with a 12-inch front wheel, is offered for 21 certificates. Also available: the 9-C-408 Super Velocipede, with a 16-inch front wheel, for 23 certificates.

(16) 10-Inch Standard Velocipede (9-C-300), for 10 certificates. Here is a good tricycle that features an adjustable bucket-type saddle and bicycle-type handlebars. Sturdily-built with 1¼-inch heavy steel tubing frame, heavy 2-inch diameter head, steel step-plate and fork, block-type rubber pedals, full ball-bearing front wheel, and extruded rubber tires, this velocipede is handsomely finished in bright red and white baked enamel.

(17) 20-Inch Jet Hawk Bicycle (9-C-427), for 42 certificates. Snappily designed in beautiful flamboyant green finish with white trim, this bike is loaded with outstanding features such as new-style chromium-plated truss rods; white padded vinyl saddle with double coil springs; automotive-body-design luggage carrier; adjustable 6-inch training wheels; and chrome handlebars with colorful streamers and plastic grips. Full bicycle-type front and rear fenders have white stripe decoration. Other features: deluxe chain guard; removable tank for conversion to girl's model; tangent spoke wheels with 1.75 semi-pneumatic tires; and genuine Perry coaster brake.

(18) HO-Scale Model Motoring Highway Set (11-C-232), for 24 certificates. Two youngsters can test their racing skill on the big layout. Set includes 16 road sections, two-speed controls, two motor-powered racing cars, transformer and assorted trestle supports, posts, guard rails, and rail posts.

- Children aren't the only ones who can have fun with the gift items exchangeable for "Roadshow" certificates. Consider these premiums that can be yours:

(1) South Bend 6-Ball Croquet Set with 8-Inch Mallet Heads (10-C-82), for 15 certificates. Here is a deluxe set with modernistic, newly-designed, grooved 8-inch mallets made of selected Rock Maple. Mallets have 24-inch screw-in handles with heavy knurled triple grip to accommodate short, medium, or long grip by players. The handles are specially reinforced at the mallet head to provide additional strength for striking heavy wood balls. Grooved balls are full-size with two ½-inch color stripes. Exclusive tenite-coated automatic-setting arches provide an offset for easy placement with foot or mallet. All playing parts are double coated with gleaming weather-resistant finish. New modern tubular "Wheel 'N Play" rack with ball basket finished in blue and white enamel has rubber-tired steel disc wheels. Rules and suggested game book included.

(2) Spalding Four-Player Badminton Set (10-E-57), for six certificates. This set contains four Spalding "Champion" racquets, sturdily constructed with long-wearing nylon strings. It also includes regulation green net with white binding, two plastic shuttlecocks, rule book, and handy plastic carrying case with snap-fasten flap.

(3) Roll King #200 Golf Cart (10-H-141), for 20 certificates. Not only does this cart open and fold automatically by raising or lowering handle, but it rolls easily on big 10-inch sleeve bearing wheels with 10 x 1.50 air cushion tires. It comes with adjustable bag brackets.

• All this—and Christmas trees, too. That's right! Your "Roadshow" certificates are also redeemable for De-Lux "Evergreen" Aluminum Trees—made of super-hard, extra-bright aluminum, fully glued and taped to rod. Each branch is individually sleeve-packed. Trunks are foil-covered hardwood. The cadmium-plated steel tripod stands have plastic-tipped, non-skid legs.

Three sizes of trees are offered: a 4-foot tree (11-N-154), with 58 seventeen-inch branches; a 6-foot tree (11-N-156), with 94 twenty-four-inch branches; and a 7-foot tree (11-N-157), with 100 thirty-inch branches. They can be yours for eight, 15, and 20 certificates, respectively.

\* \* \*

What next? Hurry to your participating RCA distributor. He's waiting to make your Christmas season more delightful than ever.

# CHART No. 7

## V SYNC AT V OSCILLATOR

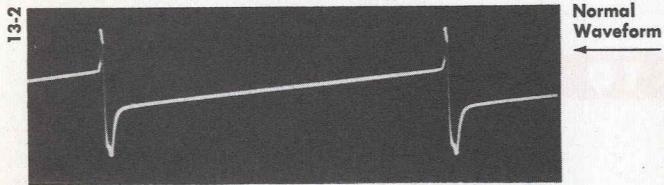
# TROUBLESHOOTING with an OSCILLOSCOPE

by John R. Meagher

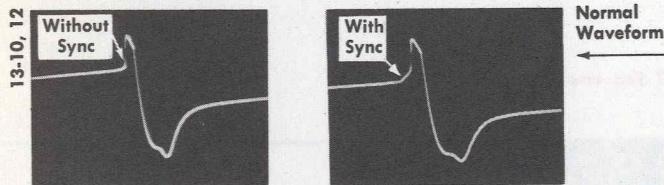
RCA Electron Tube Division, Harrison, N. J.

**Important:** Except as noted, all CRO photographs in this chart were taken at the grid of the vertical oscillator, using a sweep rate of 20 cycles, with "external" sync obtained from cathode of vertical output tube, and with the same vertical gain.

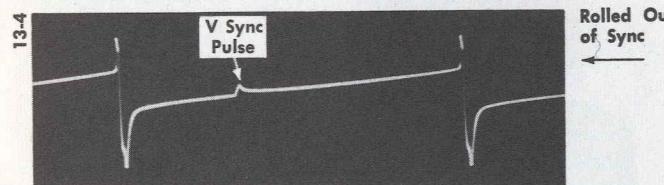
When using a CRO to localize vertical sync trouble, the first step is to check the waveform at the oscillator grid, noting especially the shape and relative amplitude of the integrated sync pulses. The sync pulses can be brought into view for inspection by adjusting the hold control to make the TV picture roll slowly downward out of sync. The sync pulses then move slowly from left to right in the CRO pattern as shown in 7C.



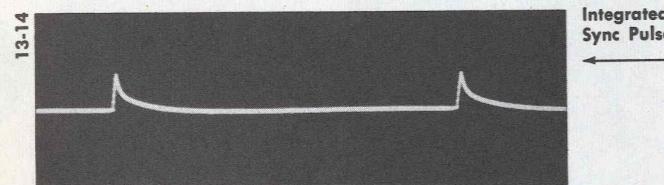
7A. Normal waveform at grid of vertical oscillator, with oscillator synced on a TV signal. The integrated vertical pulses are "hidden" in this pattern.



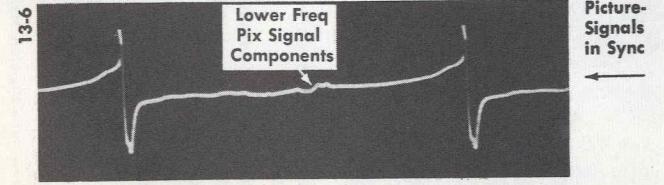
7B. Two expanded views of waveform at grid of vertical oscillator. At left, without a TV signal. At right, with oscillator synced on a TV signal. Arrows point to differences in these waveforms.



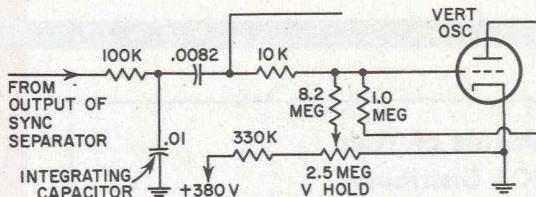
7C. The integrated vertical-sync pulses can be brought into view, as shown here, by turning the hold control to make the TV picture roll slowly downward out of vertical sync.



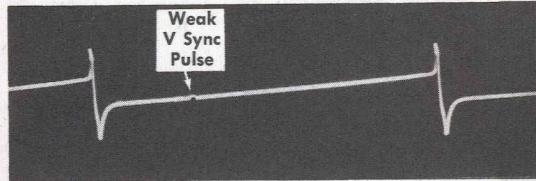
7D. The integrated vertical sync pulses can be seen alone, as shown here, by disabling the vertical oscillator tube (grid and plate pins cut off). For this photo, the CRO vertical gain was increased 3x, and internal sync was used.



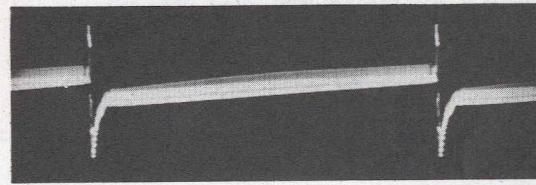
7E. The waveform at the grid of the vertical oscillator should be completely free from picture signals, noise, etc. If trouble, such as sync compression, allows picture signals to reach the grid, as shown here, the sync action is likely to be unstable.



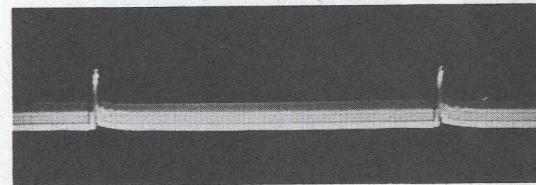
7F. Simplified input circuit of the vertical oscillator which was used in obtaining the CRO waveform photographs for this chart.



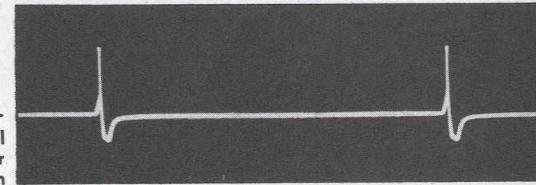
7G. Any appreciable reduction in sync amplitude, as shown here, can result in unstable sync action. The fault here was leakage (3000 ohms) across the integrating capacitor shown in 7F.



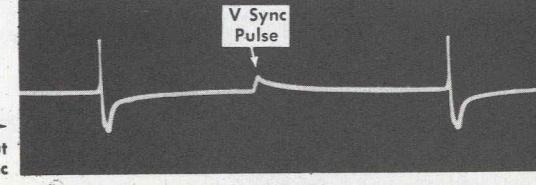
7H. If the integrating capacitor opens, 15-Kc pulses appear at the grid of oscillator, as shown here. For this photo, the CRO vertical gain was reduced 50% and internal sync was used.



7I. Similar to 7H, but with oscillator tube disabled (grid and plate pins cut off), in order to eliminate the oscillator-grid-voltage component. Internal sync was used for this photo.



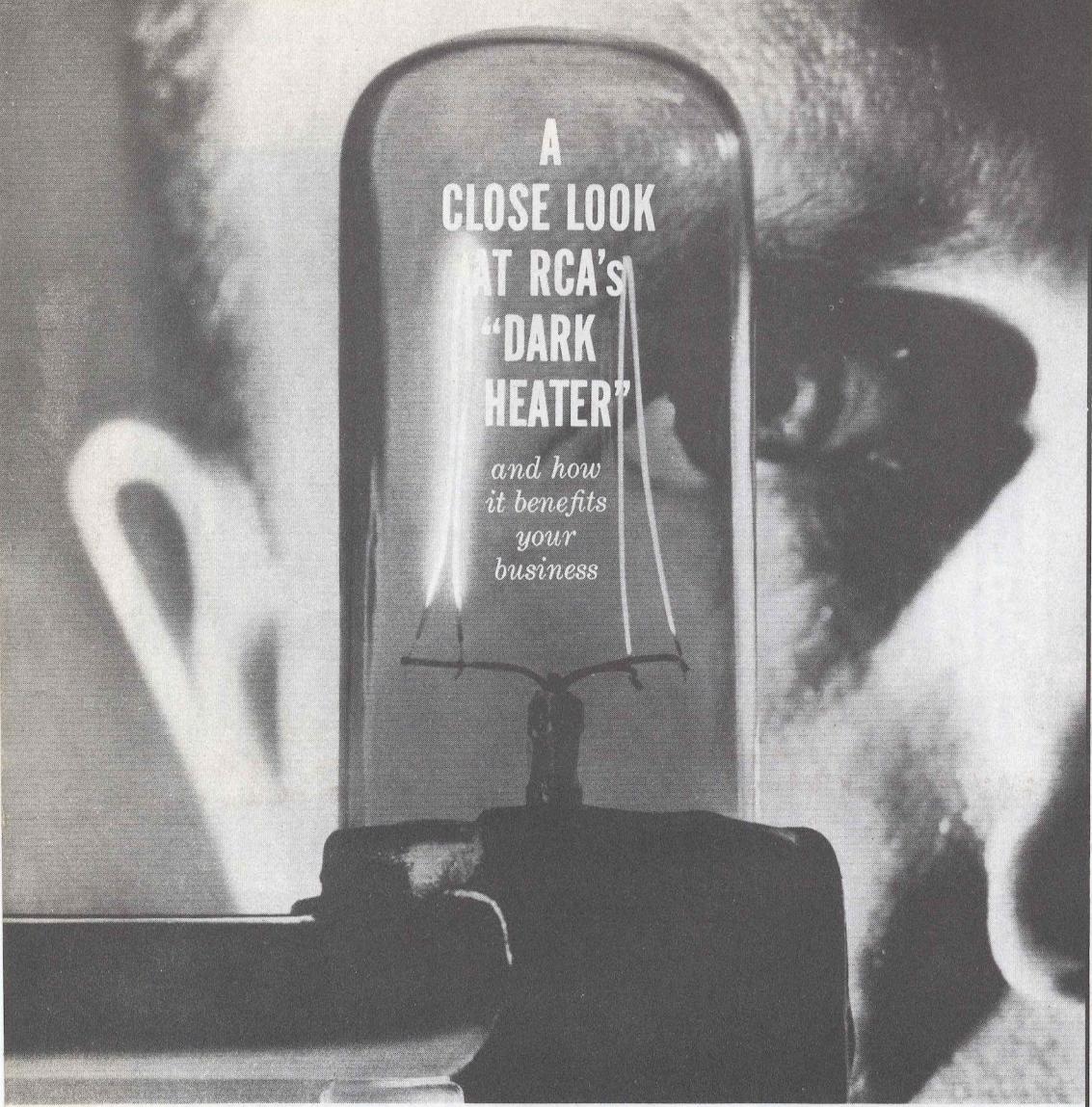
7J. Normal waveform of voltage across the integrating capacitor, with the vertical oscillator synced on a TV signal. See 7K.



7K. Normal voltage waveform across integrating capacitor, but with vertical hold control adjusted to make the TV picture roll slowly downward out of sync, thus bringing the integrated sync pulse into view in the CRO pattern.



The Most Trusted Name in Electronics  
RADIO CORPORATION OF AMERICA



You are looking at a dramatic example of RCA leadership in tube technology.

The wire at the right in the demonstration envelope is the new RCA "Dark Heater"—an exclusive RCA development. Operating at about 350°K below the temperature of a conventional heater (left), the remarkable "Dark Heater" reduces chance of heater failure, increases heater-current stability during the life of the tube, eliminates "spike" or pulse-leakage current, cuts AC heater-cathode leakage and hum, and provides greatly improved overall mechanical stability.

RCA Electron Tube Division, Harrison, N. J.

NET RESULT TO YOU: even greater assurance of customer satisfaction with your work—even greater freedom from callbacks, and in-warranty failures.

Now available in an increasing number of RCA receiving-type tubes, the RCA "Dark Heater" will be incorporated in those receiving-type tubes where potential benefits of increased life and reliability can be realized. This new RCA development is further assurance that you are working with the best and latest receiving tubes when you specify and install RCA.



The Most Trusted Name in Electronics

**RADIO CORPORATION OF AMERICA**  
**ELECTRON TUBE DIVISION**  
415 S. Fifth Street  
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