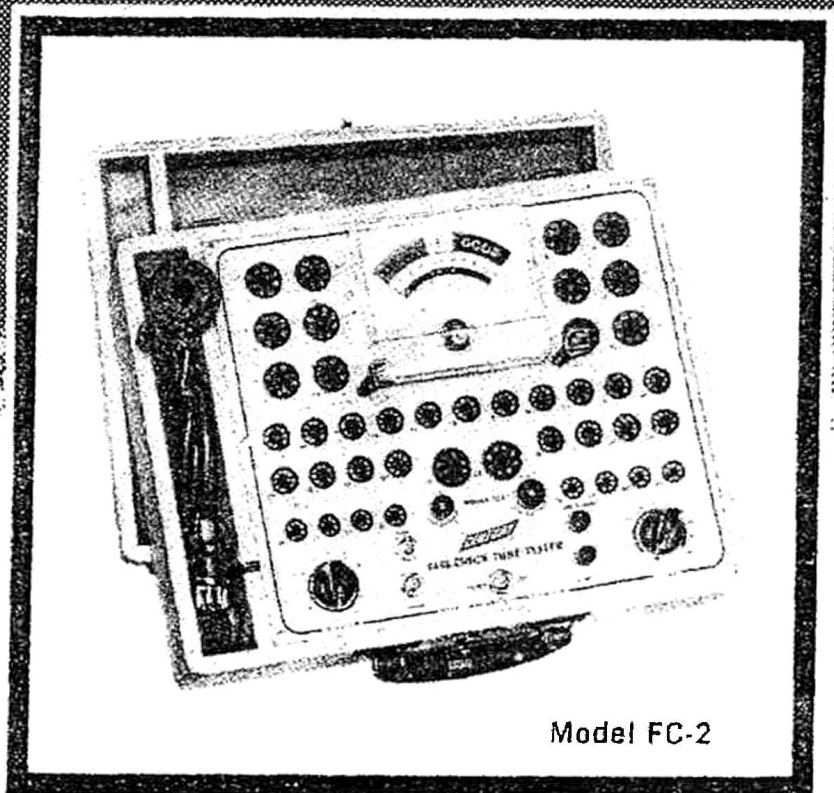


FAST-CHECK TUBE TESTER



Model FC-2

INSTRUCTION MANUAL

Century Electronics Co., Inc.

manufacturers of electronic equipment

MINEOLA, N. Y.

HOW IT WORKS

TUBE QUALITY

Tube quality is measured by the Dynamic Cathode Emission principle in which the rectified cathode current resulting from an A. C. input is measured. Tube quality may also be expressed by measurement of the Mutual Conductance, Plate Conductance or Amplification Factor.

Mutual Conductance (also known as trans-conductance or G-m) has limited usefulness in that it is valuable only for high gain amplifiers used in circuits where maximum gain is required. Thus, a measurement of Mutual Conductance has very little value for tubes used as sync. clippers, detectors, rectifiers, mixers, cathode followers, gas tubes, etc. The same is true for measurement of either Plate Conductance or Amplification Factor.

However, with the Dynamic Cathode Emission Principle employed in FAST-CHECK, *all* tubes can be checked regardless of tube type. In this way, we have been able to cover well over 700 type tubes on the Tube Chart with an accurate and complete check for the quality of every tube listed.

The FAST-CHECK is designed with special switching to handle the testing of multiple-section tubes. Each section is *tested separately* in tubes like 6SN7, 12AU7, etc. which contain two separate sections. Thus, if one section is "BAD" and the other section is "GOOD", the FC-2 will show such a tube to be "BAD".

Where two sections have a common emitter (such as in the 5U4) two tests are made. This is indicated on the tube chart in the following manner:

5U4)

5U4)

TUBE LEAKAGE AND GAS CONTENT

No tube test is complete without a check for inter-element leakage or gas content. The FAST-CHECK is extremely sensitive to leakage between Cathode-Heater (which is the most common type of inter-element leakage) . . . also Cathode-Grid leakage (which includes gas content). Thus, tubes which fail in service or perform in a sub-standard manner because of

leakage or shorts between elements or due to a gassy condition, will be found by the FAST-CHECK.

There are two indicators employed which allows for two sensitivities. In this way, leakage resistance all the way up to 5 megohms is picked up. One advantage of separating the indicators is to allow the experienced technician to judge whether the leakage is severe enough to warrant tube replacement.

TUBE LIFE EXPECTANCY

Tubes have a life expectancy which can be estimated by the rate of increasing emission from the Cathode, or by the ability of the Cathode to maintain a constant emission at normal level.

The first property is the familiar "warm-up" time. In general, if a tube takes an excessively long time to reach full output, its life expectancy is short.

The second property, which is always a sign of short life expectancy in a tube, is when the emission falls off after reaching normal output. This can be easily seen by holding down the "QUALITY" button. The meter needle should *not* "fade" back to a lower value after it reaches full output.

NEW TUBE TYPES

The tube types (well over 700) covered by the Tube Chart will be augmented periodically by new type listings which Century will issue at no cost to all FAST-CHECK owners. The circuitry of the FC-2 has been engineered to accommodate future tube types. As they are introduced, you will be informed of the proper settings to add to your Tube Chart.

PICTURE TUBES

The Picture Tube Adapter is designed for use with the FAST-CHECK only. With its use, you can check all picture tubes (including the new short-neck 110 degree types) for Cathode emission, shorts, gas and life expectancy. Weak picture tubes can also be rejuvenated and Cathode emission restored.

LINE VOLTAGE COMPENSATION

The FAST-CHECK incorporates compensation for line voltage variations from 100 Volts to 130 Volts.

SAFETY

The FAST-CHECK is entirely free of shock hazard because the panel is isolated from the line. In addition, possible damage to either tubes or meter due to error in test procedure has been eliminated by careful design of the unit.

TEST PROCEDURE

- 1) Plug in the line cord.
- 2) Turn the instrument on by rotating the "Load Control" clockwise.
- 3) Rotate the "Line Adjust" knob so that the meter reads "50" at the "Line Adjust" marker on the meter.

Important: Set the "Line Adjust" *before* inserting any tube in socket. Do not re-adjust after tube is in socket.

- 4) Find the tube listing on your Tube Chart.
- 5) Turn the "Selector Control" to the proper setting.
- 6) Rotate the "Load Control" to its proper setting.
- 7) Insert tube into proper socket. (If tube has top cap, use the clip with the red wire unless otherwise indicated.)
- 8) Observe the "Short" and "Gas" indicator jewels.
If either one glows, the tube has internal leakage or excessive gas content. A Cathode-Heater short will cause the bottom jewel to glow. Gas content will cause the upper jewel to glow. A grid short, or a combination of leakage paths, will cause both jewels to glow.

NOTE: If leakage glow is very faint, or flickers dimly, the leakage is not bad, and in some cases the tube can still be used. But if the tube is used in a critical circuit as an oscillator tube, AGC tube, I.F. Amplifier tube or sync. tube, it should be replaced.

- 9) If there is no short, press the "Quality" button and read tube quality on the meter.

LIFE EXPECTANCY TEST

Poor life expectancy of a receiving tube can be estimated in two ways.

1. *Fading* – If the needle reaches the “Good” area on the meter, but then “fades” back into the “Weak” or “Bad” area, life expectancy is poor.
2. *Sluggishness* – If needle climbs sluggishly or unevenly, and takes too long to reach the “Good” area, tube life expectancy is short. Once a tube has heated up the needle should climb into the “Good” area in about one second after you push the “Quality” button.

PICTURE TUBE TEST PROCEDURE

- 1) Insert Picture Tube Adapter into Fast-Check socket #2.
- 2) Note whether the picture tube has standard 6.3 volt rating or uses one of the newer ratings of 2.68 volts and 8.4 volts.
For standard 6.3 Volt tubes, set SELECTOR at D
For new 2.68 Volt tubes, set SELECTOR at B
For new 8.4 Volt tubes, set SELECTOR at E
- 3) Set "Load" control to "70".
- 4) Attach adapter cap to the picture tube under test. Use the special 110 degree adapter cap for the short-neck 110 degree tubes.
- 5) Allow 10 seconds for the picture tube to warm up.
- 6) If the tube has any shorted elements one or both of the "Short" or "Gas" indicators will light. A strong glow indicates the tube has a dead short. A faint glow indicates the tube is gassy or has a high resistance short.
- 7) If the indicators do not light, depress the "Quality" push-button and read the picture tube quality on the numerical scale of the meter as follows:
 - a. Readings over 20...emission is good.
 - b. Readings from 5 to 20...emission is low, but the tube may still show a good raster.
 - c. Readings below 5...emission is very poor. The tube should be rejuvenated according to the procedure outlined on page 12. Tubes which have a quality reading below 5 and do not respond to rejuvenation should be replaced.

LIFE EXPECTANCY TEST

If the picture tube has been already tested and found to have no shorts, allow at least 2 minutes for the filament to cool off. Then plug the picture tube into the Fast-Check adapter again and depress the "Quality" button, and note how long it takes the meter needle to climb to a reading of 20 or over on the numerical scale.

If the meter needle reaches 20 or higher after the "Quality" button has been depressed for:

10 to 15 seconds . . . life expectancy is HIGH

16 to 30 seconds . . . life expectancy is FAIR

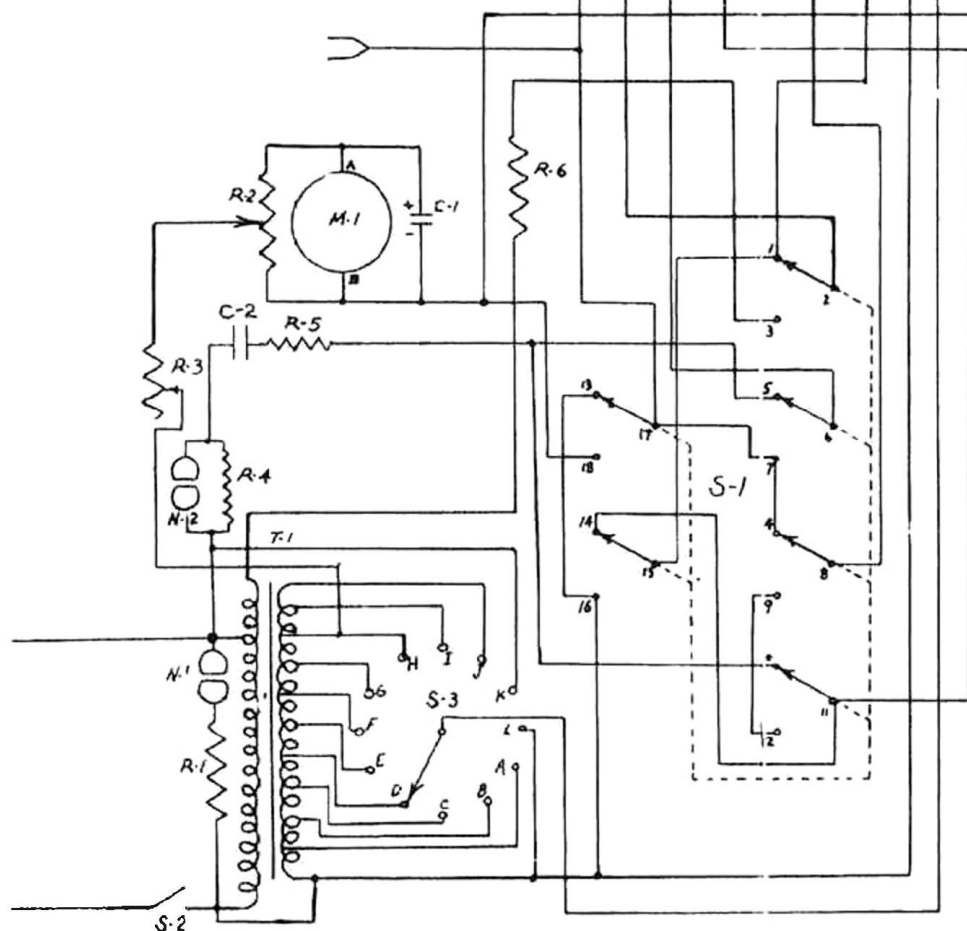
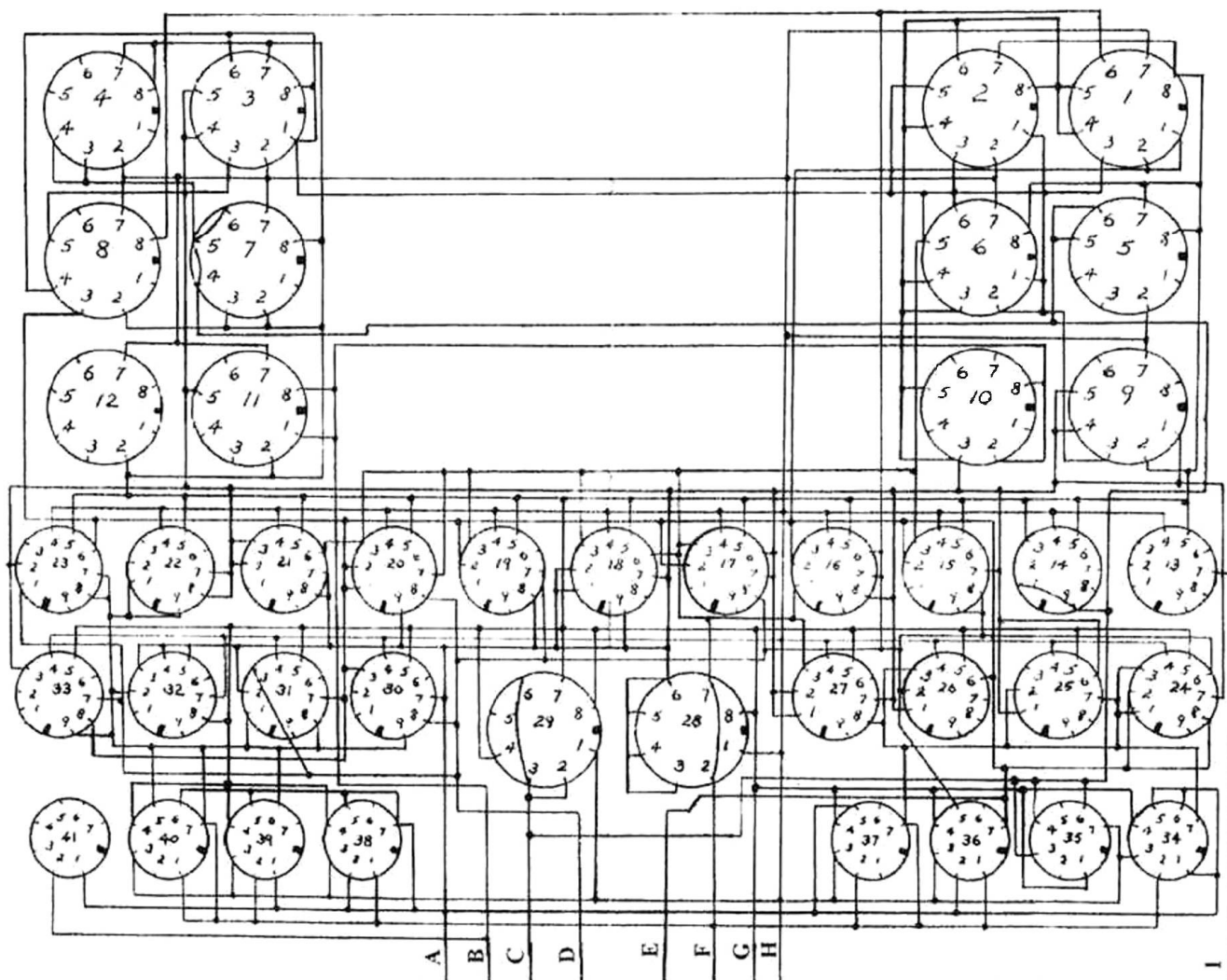
over 30 seconds . . . life expectancy is POOR

REJUVENATION

- 1) Advance SELECTOR clockwise to the next higher position and leave it there for one minute.

Note: A faint "Short" glow may appear when SELECTOR is advanced. The picture tube is not shorted provided the glow disappears when SELECTOR is returned to its original position.

- 2) At the end of one minute, return the SELECTOR to its original position.
- 3) Depress "Quality" button and note any improvement in Cathode emission.
- 4) This procedure may be repeated as long as further improvement is obtained each time.



CENTURY

FAST-CHECK TUBE TESTER

Model FC-1

Code 123

- R-1 33K Resistor
- R-2 200 W.W. Potentiometer
- R-3 1K Comp. Potentiometer
- R-4 2.2M Resistor
- R-5 6.8K Resistor
- R-6 3.9K Resistor
- C-1 200 Mfd. Condenser
- C-2 .01 Mfd. Condenser
- N-1 NE-2 Neon
- N-2 NE-2 Neon
- T-1 Power Transformer
- S-1 Short-Quality Switch
- S-2 On-Off Switch (part of R-2)
- S-3 Selector Switch
- M-1 0.5 ma. Meter

Note:

S-1 shown in normal (short) position

- PARTS LIST**
- R-1 33K Ohm Resistor
 R-2 200 Ohm W. W. Potentiometer
 R-3 1K Ohm W. W. Rheostat
 R-4 1.8M Ohm Resistor
 R-5 380K Ohm Resistor
 R-6 6.2K Ohm Resistor
 R-7 680K Ohm Resistor
 R-8 390K Ohm Resistor
 R-9 1K Ohm W. W. Rheostat
 R-10 470 Ohm Resistor
 C-1 200 mfd. Condenser
 C-2 .01 mfd. Condenser
 C-3 .002 mfd. Condenser
 C-4 .01 mfd. Condenser
 N-1 NE-51 Neon Lamp
 N-2 NE-2 Neon Lamp
 N-3 NE-2 Neon Lamp
 S-1 8-pole Push-Button Switch
 S-2 S. P. S. T. Switch (Part of R-2)
 S-3 12-Position Switch
 T-1 Power Transformer
 D-1 1N48 Rectifier
 M-1 0-5 ma. Meter
 NOTE:
 S-1 shown in normal (short) position

FAST-CHECK TUBE TESTER

MODEL FC-2
 (CODE 126)

