

APR 1964

Techni-Guide

SPARTON PORTABLE TV

1903-K Glengarry 19

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In these days of hard-sell advertising, of good-in-looks-only TV sets, and continual downgrading due to incessant price-warfare, it's good to come across the occasional piece of design aimed at producing a television set from the viewpoint of service and dependability not of looks and a big, big LOW PRICE.

Sparton's Canadian designed and built 1903-K, (and presumably their 1901 and 1902 since they all have basically the same chassis) is just such a design. It's a solid set with passable looks that is evidently designed for continual, day-in, day-out use. The chassis and picture tube, integrally mounted on heavy L-brackets and heavily braced, neatly slide into an all-metal, reinforced cabinet. The rear cover, too, is made of perforated sheet metal. And the plastic front panel is one piece, and fully 7/16" thick. The safety glass is plexiglass — not plastic — and virtually scratchproof. A child-proof set, if ever there was one. No "revolutionary advances", no frills — just a straightforward, business-like approach to proper design and construction of a television set.

This set is unique in that there is nothing unique about it — it uses standard tubes, has standard 1/4" shafts on all controls (unlike those sets which have almost irreplaceable and very fragile controls with 1/8" plastic shafts, or non-standard slotted shafts), is put together with one standard screw type (Robertson), uses all standard components that can be easily purchased at just about any parts supply house, and uses standard, easy to understand circuitry.

Maybe I'm old-fashioned. I remember several years back, when almost all parallel (transformer) TV sets used the same types of tubes, and almost all series sets used the same types of tubes. I remember the sudden outcropping of new tube-types (basically the same type of tubes with different base configurations) — at one time it seemed that every new set on the market had a couple of new-type tubes. The 1903-K, using standard tubes and a fantastically straightforward circuit, produces a clear, steady, and wholly satisfactory picture.

THE CIRCUIT

The RF signal is amplified at its incoming frequency in the 2GK5 RF amplifier, and mixed in the pentode section of the 5CG8 tube. The triode section of the same tube acts as local oscillator. The 41 mc. IF output frequency goes through three stages of staggered IF amplification in V105 and 106, both 3BZ6's, and in the pentode section of the 5AM8. The diode

section of the same tube acts as video detector. The 6AU8 acts as video amplifier and, incidentally, sound IF amplifier and sync amplifier. The amplified video signal, together with brightness control, are applied to the cathode of the 19XP4 picture tube. Blanking pulses are applied to its control grid. Three different focus voltages are supplied, but they are not too easily available, being located under the chassis through soldered connections. A 3AU6 is used in a keyed AGC circuit that controls only the RF amplifier. One diode section of the 5T8 tube serves as AGC clamp preventing positive voltages from appearing on the AGC line. V110, erroneously labelled in the circuit diagram as a sync separator, is really a sync amplifier and pulse shaper. Separation of the vertical and horizontal sync pulses is really done in the triode section of the 6AU8 — erroneously described as a sync splitter. The horizontal circuit consists of a straightforward multivibrator with phase detector control, standard 'DQ6 horizontal output, and standard 'AX4 damper circuit. A 1B3GT rectifies the HV needed at the picture tube's 2nd anode. The vertical circuit consists of a 10DE7, one half used in a standard, simple blocking oscillator circuit, the other as vertical output. Again, no design "tricks". The power supply is a simple voltage doubler type using silicon diodes. A filter choke, together with heavy capacitive filtering, provides good regulation. Sound IF signal is taken off the plate circuit of the 6AU8 video amplifier, amplified in a 3AU6, and converted to audio in a straightforward ratio detector circuit. Output is fed to a 12CU5 audio output tube which feeds 3 watts into the 4" speaker. Regulated 125 volts is taken off the 12CU5's cathode, and supplies the sound IF section, AGC section, and sync section.

The chassis of this set is hand-wired but the layout is so neat, and so care-

fully thought out, that there are almost no long interconnecting wires. Terminal strips are extensively used, so that all parts are solidly mounted (in my opinion, much preferable to the current trend to printed circuits).

Because of the all-in-one chassis, parts are easy to reach; circuits are easy to trace. Every serviceman who has had to do portable TV servicing to any great extent, will thank Sparton for their chassis-mounted picture tube.

The tuner in this set is fairly good. The basic circuit — frame grid RF and triode-pentode mixer — gives adequate sensitivity and sharpness. Channel switching follows turret design: individual channel strips are used. The unique pre-set fine tuning system actually uses the tuning cores in the strips for fine tuning. This is performed through a gear system. Plastic gears — so don't oil them.

The test set supplied me worked well in all respects but two: it was impossible to produce good vertical linearity at any position of the vertical size and linearity controls; and, too, horizontal linearity was poor. Troubles such as these can be caused by many things — parts out of tolerance, mismatch between transformers and yoke, too much or too little drive. These faults may be peculiar only to my test set, but if not — vertical linearity can be altered by changing the values of C156 or C157. As for horizontal linearity, a trimmer with a capacity range of 10-200 uuf could be installed between the junction of R194-C188 and ground. Adjust this for proper width and linearity.

A couple of last thoughts — you won't be able to get the set out of the cabinet unless you remove the carrying handle; and, after reassembly, make sure that the metallic parts of the cabinet show more than 200K ohms resistance to either side of the power cord.



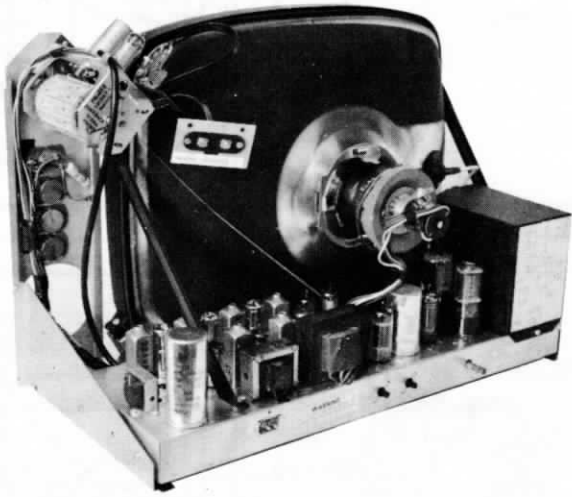


Fig. 1 A solidly built set — note the braces and angle bracket supports. CRT is rigidly mounted, so the set can be placed in any position.

Fig. 2 Under the chassis — a neat, orderly layout. Easier by far to service and trouble shoot than any printed circuit.

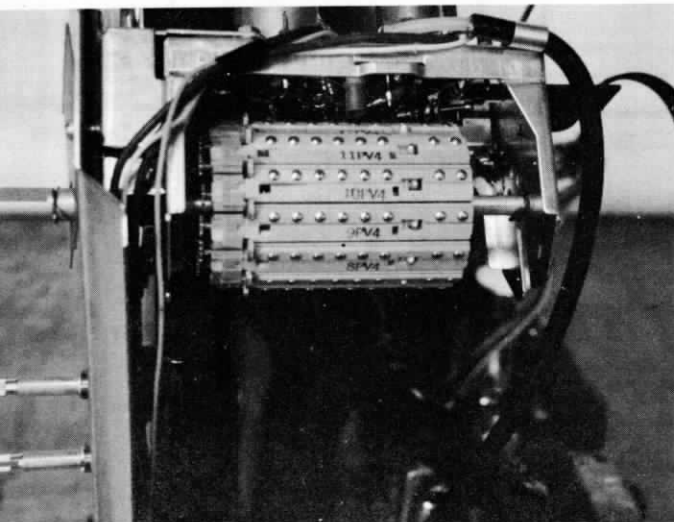
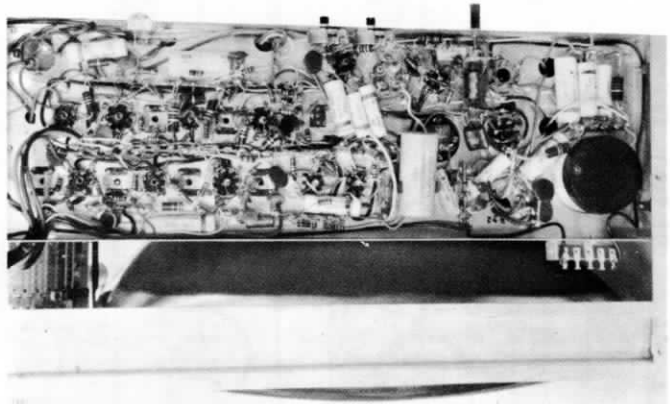
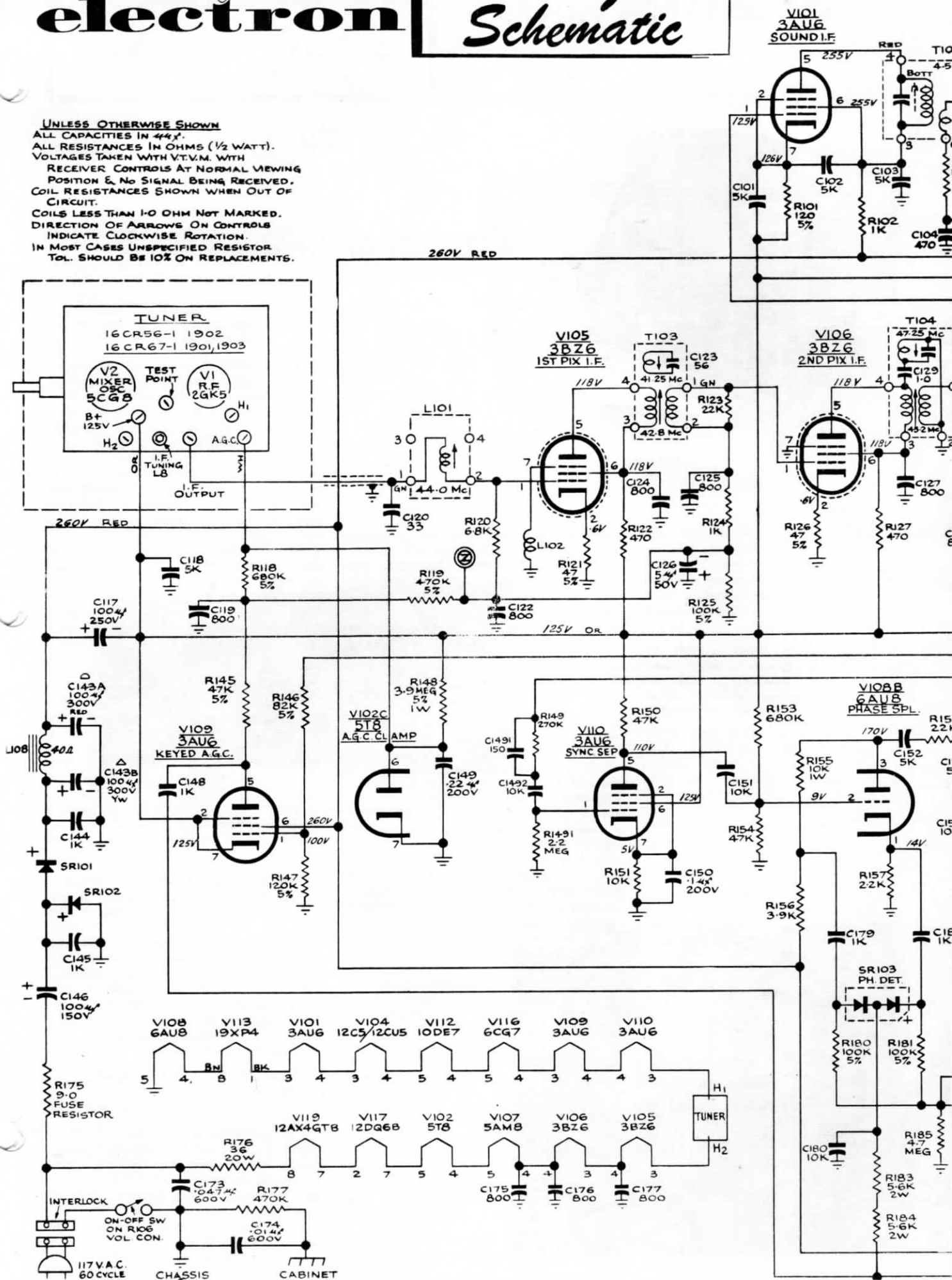


Fig. 3 The turret tuner — note that fine tuning is pre-set and accomplished by adjusting the strips' tuning cores.

UNLESS OTHERWISE SHOWN
 ALL CAPACITIES IN μF .
 ALL RESISTANCES IN OHMS ($\frac{1}{2}$ WATT).
 VOLTAGES TAKEN WITH V.T.V.M. WITH
 RECEIVER CONTROLS AT NORMAL VIEWING
 POSITION & NO SIGNAL BEING RECEIVED.
 COIL RESISTANCES SHOWN WHEN OUT OF
 CIRCUIT.
 COILS LESS THAN 10 OHM NOT MARKED.
 DIRECTION OF ARROWS ON CONTROLS
 INDICATE CLOCKWISE ROTATION.
 IN MOST CASES UNSPECIFIED RESISTOR
 TOL. SHOULD BE 10% ON REPLACEMENTS.



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