PRICE 75 ¢ TS

RCA High-Sensitivity AC VTVM

Type WV-76A

- Specifications
- Operation
- Applications
- Maintenance

WV-76A

RADIO CORPORATION of AMERICA
ELECTRON TUBE DIVISION — HARRISON, N. J.
ELECTRONIC INSTRUMENTS — CAMDEN, N. J.

Safety Precautions

The metal case of this instrument is connected to the ground of the internal circuit. For proper operation, the ground terminal of the instrument should always be connected to the ground of the equipment under test. The WG-300B Direct/Low-Capacitance Probe and Cable has a shield throughout its entire length which is connected to the instrument ground and case. Always handle the WG-300B by the insulated probe housing. An important point to remember is that there is always danger inherent in working with electrical circuits which operate at hazardous voltages. Therefore, the operator should thoroughly familiarize himself with the circuit under test, bearing in mind that high voltages may appear at unexpected points in defective equipment. Additional precautions which the operator should observe are listed below.

1. It is good practice to remove power before connecting test leads to high-voltage points. If this is impractical, be *especially careful* to avoid accidental contact with equipment racks and other objects which can provide a ground. Working with one hand in your pocket and standing on a properly insulated floor lessens the danger of shock.

2. Filter capacitors may store a charge large enough to be hazardous. Therefore, discharge filter capacitors before attaching test leads.

3. Remember that leads with broken insulation provide the additional hazard of high voltages appearing at exposed points along the leads. Check test leads for frayed or broken insulation before working with them.

4. To lessen the danger of accidental shock, disconnect test leads immediately after test is completed.

5. Remember that the risk of severe shock is only one of the possible hazards. Even a minor shock can place the operator in hazard of more serious risk such as a bad fall or contact with a source of higher voltage.

6. The experienced operator continuously guards against injury and does not work on hazardous circuits unless another person is available to assist in case of accident.

ITEMS

Supplied with WV-76A

1 WG-300B Direct/Low-Capacitance Probe
1 "Slip-on" Alligator Clip
1 Clip Insulator
1 Instruction Booklet
1 RCA-6AN8
1 RCA-6BK7A

WV-76A IB (1) 7-62
Printed in U.S.A.

Description

The RCA WV-76A High-Sensitivity AC Vacuum-Tube Voltmeter is designed for laboratory and service use in measuring ac voltages from 0.01 volt to 100 volts, and for decibel measurements from −40 to +40 db. The instrument is also useful as a wide-range audio preamplifier, having approximately 38 db maximum gain. Frequency range on all measurement and amplifier functions is from 10 cps to 1.5 Mc with the WG-300B probe switched to the Direct position, and 10 cps to 500 Kc with the probe in the Low-Capacitance position.

Because of its high sensitivity, wide measurement range, and high-impedance input characteristics, the WV-76A is useful in high-fidelity, broadcast, design and development, production, and servicing applications. The instrument can be used for a variety of purposes, including amplifier frequency response tests, signal tracing, power-level measurements, gain measurements, amplifier-balancing applications, and general audio-voltage measurements.

Two different scales are provided for voltage measurements, and a separate scale is provided for decibel measurements. Measurements are made in nine overlapping ranges. Accuracy of the voltage and decibel measurements is ±5% of full-scale reading.

A coaxial-type shielded low-capacitance/direct probe, the RCA WG-300B, is supplied with the WV-76A. A sliding switch in the probe housing provides for switching from direct to low-capacitance input. In the Low-Capacitance position, the probe presents an overall input resistance of 10 megohms and an input capacitance of approximately 13 $\mu\mu$f to the test circuit. This feature permits measurements in circuits which are sensitive to loading.

When used as a preamplifier, the WV-76A has a maximum gain of 38 db on the 10-millivolt range. The WG-300B probe and cable is used for amplifier input. Output from the amplifier is taken from a separate terminal on the front panel.

The WV-76A operates from a power line source of from 105 to 125 volts at 50 to 400 cps. The instrument has a rugged blue-gray hammeroid case, and a stylish brushed aluminum panel with etched markings.

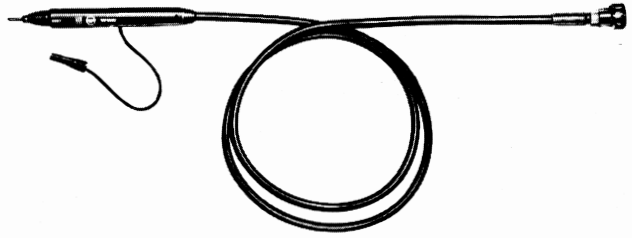


Figure 1. WG-300B Direct/Low-Capacitance Probe and Cable supplied with WV-76A.

Specifications

The calibration of the WV-76A is based on pure sine-wave input signal voltage. (Performance figures are based on a line voltage of 120 volts)

Electrical

Frequency Range
With WG-300B in "Direct" position ..... ±1 db 10 cps to 1.5 Mc
With WG-300B in "LOW-CAP" position ..... ±1 db 10 cps to 500 Kc

AC-Voltage Measurements (With WG-300B in "Direct" position):
Ranges ..... 0 to 0.01, 0.03, 0.1, 0.3, 1 volt; 0 to 3, 10, 30, 100 volts†
Accuracy ..... ±5% (full scale)

DB-Measurements* (With WG-300B in "Direct" position):
Ranges (nine) ..... —40, —30, —20, — 10, 0, +10, +20, +30, +40 db
Accuracy ..... ±5%

Input Characteristics:
At Input Connector ..... 1 meg shunted by 58 $\mu\mu$f
With WG-300B in "Direct" position ..... 1 meg shunted by 95 $\mu\mu$f
With WG-300B in "Low-Cap" position ..... 10 megs shunted by 13 $\mu\mu$f

Preamplifier:
Output Voltage ..... 0.8 output volt for 0.01 input volt
Output Impedance ..... less than 400 ohms
Gain ..... 38 db on 10-millivolt range

Power Supply:
Frequency ..... 50 to 400 cps
Voltage ..... 105-125 volts
Consumption ..... 35 watts

Tube Complement

1 RCA-6AN8 — 1 RCA-6BK7A

Mechanical

Width ..... 5⅜"
Height ..... 7⅜"
Depth ..... 4¾"
Weight (Net) ..... 5 lbs. (approx.)
Finish ..... blue-gray hammeroid case, satin-aluminum panel

† When the WG-300B is set to the "Low-Cap" position, up to 500 volts or +56 db may be measured.
* Zero db = 1 milliwatt into 600 ohms.

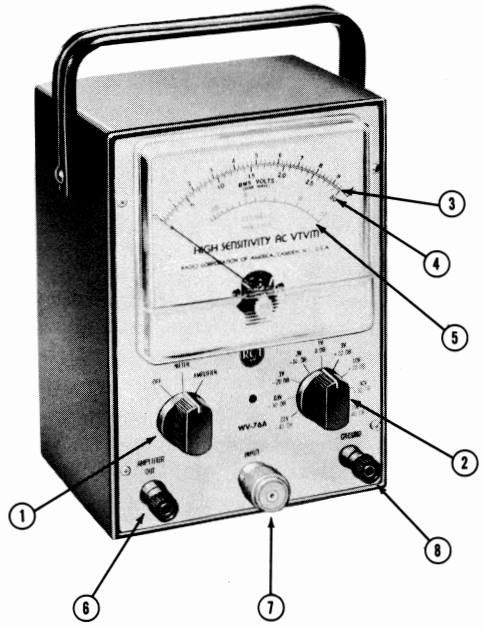


Figure 2. RCA WV-76A

Functions of Controls and Terminals

① FUNCTION SELECTOR SWITCH — Applies power to instrument when turned clockwise from the "OFF" position. When set to "METER" position, the instrument functions as an AC Voltmeter. When set to "AMPLIFIER" position the WR-76A can be used as an amplifier, as described under "Operation."

② RANGE SELECTOR SWITCH — Provides choice of nine ranges for voltage or decibel measurements.

③ ④ RMS VOLTS SCALES — All voltage measurements are read from these scales. Voltages measured on the 0 to 0.01, 0.1, 1, 10, and 100 volt ranges are read from the 0 to 1.0 scale. Voltages measured on the 0 to 0.03, 0.3, 3, and 30 volt ranges are read from the 0 to 3.0 scale.

⑤ DECIBEL SCALE — All decibel measurements are read from this scale. The meter readings are combined with the value indicated by the Range Switch.

⑥ AMPLIFIER OUT TERMINAL — The output signal is taken from this terminal and the "GROUND" terminal when the WV-76A is used as an amplifier.

⑦ INPUT CONNECTOR — Connection for WG-300B Probe. Input signals for voltage and decibel measurements and for amplifiers are fed through the probe.

⑧ GROUND TERMINAL — Connects internally to instrument chassis and case.

Operation

Connect the line cord to a power source which will furnish 105-125 volts at 50 to 400 cps. Connect the cable connector of the WG-300B Direct/Low Capacitance Probe to the INPUT connector of the WV-76A.

Turn the Function Switch to the "METER" position. Power is now applied to the WV-76A.

AC Voltage Measurements

1. Set the RANGE switch control to the position which includes the value of the voltage to be measured. When making voltage measurements, always use a range which gives a reading nearest the full-scale point on the meter.

2. Connect the ground lead of the WG-300B to a ground point near the voltage test point in the equipment under test. Set the slide switch in the WG-300B probe to the "DIRECT" position. Touch the probe tip to the voltage test point.

3. Read the voltage indication from the appropriate scale.

NOTE: The numbers on the Range Switch positions indicate the full-scale value in volts for their corresponding voltage scales. For example, if the Range Switch is set to the ".03V" position and the meter indicates "2.5" on the 0 to 3.0 scale, the measured voltage is 0.025 volt.

Measurements with Low-Capacitance Probe

When the sliding switch in the WG-300B is set to the "LO-CAP X10" position, the input resistance of the WV-76A is raised from 1 megohm to 10 megohms. When making low-capacitance measurements, therefore, multiply the voltage reading by 10 to obtain the true voltage value. Note: When the WG-300B is in the "LO-CAP X10" position, it is possible to measure voltages up to 500 volts. If voltages higher than 500 volts are measured, the probe may be damaged.

Decibel Measurement

1. With the Function Switch in the "METER" position, set the Range Switch to the range position that includes the AC voltage of the circuit to be measured.

2. Set the WG-300B probe switch to the "DIRECT" position, then connect the probe and ground lead to the circuit.

3. Read the decibel measurement directly from the decibel scale of the meter. Each division on the decibel scale equals 1 db. The scale is marked in DBM values for special applications (referenced to 0 DBM at 1 milliwatt across 600Ω at 1000 cps).

Although the actual numerical value of these DBM indications are of no significance when db measurements are made, the figures are helpful as a reference in determining the number of db units between two positions on the db scale.

Example: A frequency response check is being made on an amplifier as described on page 8. At the reference frequency, the output level of the amplifier causes the WV-76A meter to indicate "+1" on the db scale as shown in figure 3. The frequency of the input signal to the amplifier is then varied, resulting in a second reading of "−5" on the WV-76A. Since the meter pointer has deflected 6 db units in a negative direction (from +1 to −5), the power level variation would be expressed as −6 db.

If it becomes necessary to turn the range switch to another range while making db measurements, then the reading on each range must be algebraically added to the figure shown on the selected range switch position. This permits a db reading from one range switch position to another.

If in the above example the first reading of "+1" was taken with the range switch in the "10 DB" position, and for the second reading of "−5", it was necessary to switch to the "O DB" position, then the power level variation in db would be determined as follows:

First reading (+1)+(+10) = +11
Second reading (−5)+(0) = −5

From +11 to −5 indicates a −16 db power level variation.

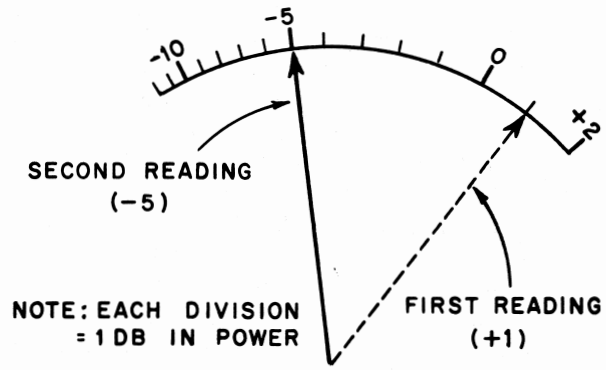


Figure 3.

Applications

Measuring Amplifier Frequency Response

Frequency response checks can be made with the WV-76A on amplifiers, preamplifiers, tone-control circuits, and other audio equipment. An audio-frequency generator, such as the RCA WA-44C, is also needed to supply the input signal.

Three response checks at different power levels are recommended to obtain an accurate picture of response. The amplifiers should be checked at a low audible level, a moderate listening level, and at the maximum rated power level.

Note: In all measurements read from the decibel scale, the figure shown on the selected Range Switch position must be added algebraically to the decibel scale indication.

1. Connect the equipment as shown in Figure 4. The WV-76A should be connected to the input of the amplifier each time the frequency of the input is changed. If necessary, adjust the output control of the audio generator to provide a constant input amplitude for all frequencies.

The resistive load connected across the amplifier output must be capable of dissipating the total power output of the amplifier. It is important that this resistor be of the non-inductive type so that its impedance will not vary with the frequency over the range being checked.

The oscilloscope shown in Figure 4 is not absolutely necessary for the frequency response check, however, it is helpful in that it may reveal distortion in the output waveform. The output should be a good sine-wave if the frequency response measurement is to be valid.

2. Set the Function Switch of the WV-76A to "METER", and the slide switch on the probe to "DIRECT". Set the Range Switch to a position which will include the expected value of the voltage to be measured.

3. Set the amplifier volume control to the position which provides the output level at which the test is to be made. If the amplifier has tone-controls, set them to the "flat" position so that they have a minimum effect on the frequency of the amplifier. For determining the effect of the tone-controls, refer to the following section entitled "Tone Controls".

4. Adjust the generator to the desired reference frequency. The usual reference frequency is 1000 cps.

5. Adjust the generator output control so that the WV-76A meter pointer indicates the desired reference level. Check the voltage at the input of the amplifier. It is important that the voltage of the input signal does not vary as the frequency is changed in the following steps. If it does, reset the output control of the generator so that the original input signal voltage is maintained.

6. Tune the audio generator to the lowest frequency to be measured. Record the db meter reading (number of db above or below the reference power level).

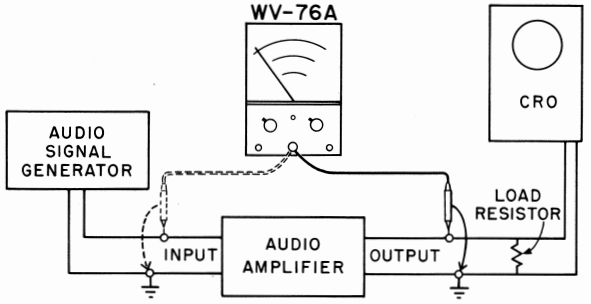


Figure 4. Test setup for frequency-response measurements.

7. Tune the generator up to the next frequency to be measured. Below 200 cps, take a reading every 10 or 20 cycles. The interval can be increased to 1000 cps when the readings begin to level off.

8. Repeat the steps 3 through 7 for each power output level at which the frequency response check is to be made.

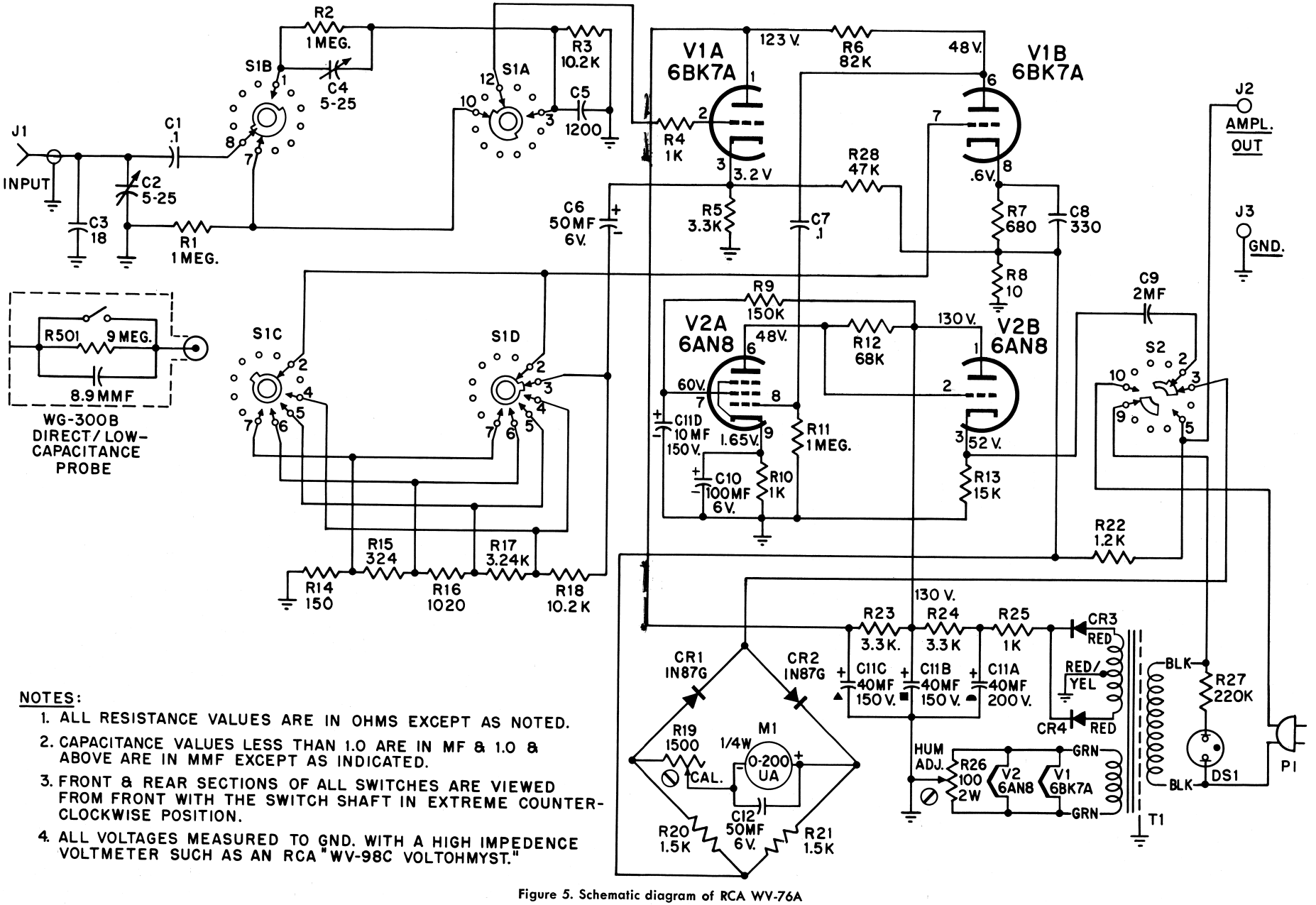
TONE CONTROLS – In amplifiers which contain tone-control circuits, separate tests are usually made with the tone-controls set for flat response, then with minimum bass, maximum bass, minimum treble, and maximum treble.

To plot the frequency response curve, it is necessary to determine the crossover frequency, or frequency at which both the bass and treble control have the least effect. Set the audio signal generator to a frequency in the treble range, 3000 cps is a possible starting point. Vary the bass control and notice the effect on the output voltage. Similarly, vary the treble control. If the treble control produces a large voltage change, lower the frequency of the audio generator. Alternately vary the bass and treble controls and adjust the frequency of the generator until a frequency is found at which both bass and treble controls have minimum effect on the output voltage. This frequency can be used as a reference frequency for plotting a curve of output level versus frequency. The effect of varying the bass control should be plotted from the lower limit of the amplifier up to the reference level, while the effect of varying the treble control should be plotted from the reference level frequency to the upper frequency limit of the amplifier.

Assume that 1000 cps has been found as the frequency at which the bass and treble control have the least effect on the output voltage. Set the bass control to minimum and take output voltage readings with the frequency varied from 30 to 1000 cycles. Set the bass control to maximum and repeat the output voltage readings as the frequency is varied.

The same process is followed in determining the effect of the treble control except that the output voltage reading need not be taken below 1000 cycles.

(Continued on page 13)



NOTES:

1. ALL RESISTANCE VALUES ARE IN OHMS EXCEPT AS NOTED.
2. CAPACITANCE VALUES LESS THAN 1.0 ARE IN MF & 1.0 & ABOVE ARE IN MMF EXCEPT AS INDICATED.
3. FRONT & REAR SECTIONS OF ALL SWITCHES ARE VIEWED FROM FRONT WITH THE SWITCH SHAFT IN EXTREME COUNTER-CLOCKWISE POSITION.
4. ALL VOLTAGES MEASURED TO GND. WITH A HIGH IMPEDENCE VOLTMETER SUCH AS AN RCA "WV-98C VOLTOHMYST."

Figure 5. Schematic diagram of RCA WV-76A

Replacement Parts List

Type WV-76A

When ordering replacement parts, include the stock number and description of the part, the instrument type, and the code number. Parts without stock numbers are standard catalog items. All parts should be ordered from your local RCA distributor.

Symbol No.	Description	Stock No.
	Capacitors	
C1, C7	Paper: 0.1 μf ±20%, 400 v	
C2, C4	Variable: 5-25 μμf, 500 v	204811
C3	Ceramic: 18 μμf ±5%, 500 v	39041
C5	Mica: 1200 μμf ±2%, 500 v	215765
C6, C12	Electrolytic: 50 μf, 6 v	78573
C8	Mica: 330 μμf ±5%, 500 v	79191
C9	Paper: 2 μf ±20%, 200 v	215766
C10	Electrolytic: 100 μf +250% —10%, 6 v	98781
C11A, B, C, D	Electrolytic: 40 μfd +200% —10%, 200 v; 40/40/10 μfd —10% +100%, 150 v	215768
CR1, CR2	Crystal Diode: 1N87G	76675A
CR3, CR4	Rectifier: selenium, 130 v. 50 ma	222649
DS1	Lamp, pilot: NE-2	48474
J1	Connector, microphone-type: male, single contact	96257
J2, J3	Post, binding: delf blue	212151
M1	Meter: 200-μamp	226139
	Resistors	
R1, R2	Carbon film: 1 meg ±1%, ½ w	208022
R3	Carbon film; 10,200 ohms ±1%, ½ w	215775
R4, R25	Composition: 1000 ohms ±10%, ½ w	502210
R5	Composition: 3300 ohms ±5%, ½ w	
R6	Composition: 82,000 ohms ±5%, ½ w	
R7	Composition: 680 ohms ±5%, ½ w	
R8	Carbon film: 10 ohms ±1%, ½ w	210763
R9	Composition: 150,000 ohms ±5%, ½ w	
R10	Composition: 1000 ohms ±5%, ½ w	
R11	Composition: 1 meg ±10%, ½ w	
R12	Composition: 68,000 ohms ±5%, ½ w	
R13	Composition: 15,000 ohms ±5%, ½ w	
R14	Carbon film: 150 ohms ±1%, ½ w	215771
R15	Carbon film: 324 ohms ±1%, ½ w	215772
R16	Carbon film: 1020 ohms ±1%, ½ w	215773
R17	Carbon film: 3240 ohms ±1%, ½ w	215774
R18	Carbon film: 10,200 ohms ±1%, ½ w	215775
R19	Variable: 1500 ohms ±20%, linear taper ¼ w	215769
R20, R21	Composition: 1500 ohms ±5%, ½ w	
R22	Composition: 1200 ohms ±5%, ½ w	
R23, R24	Composition: 3300 ohms ±5%, ½ w	
R26	Variable: 100 ohms ±10%, linear taper, 2 w	215770
R27	Composition: 200,000 ohms ±10%, ½ w	
R28	Composition: 47,000 ohms ±5%, ½ w	
	Miscellaneous	
S1	Switch, rotary: 2 sections, 9 positions, 4 circuits	215763
S2	Switch, rotary: 1 section, 3 positions, 2 circuits	215764
T1	Transformer, power	215762
	Clip, alligator	210088
	Insulator: black, for alligator clip	99539
	Handle, carrying	226241
	Knob, control: with pointer	59543
	Panel, front: aluminum	226140
	WG-300B Direct/Low-Capacitance Probe and Cable	
	Bushing, probe tip: for front-end housing	213257
	Clip: for ground lead	210207
	Clip, alligator: "slip-on" type	210088
	Connector: cable, internal, brass	213260
	Connector, female: microphone type, with set screw	203574
	Insulator: for alligator clip	99539
	Insulator: for ground clip	210209
	Ring, ground: for center section	213262
	Shell, probe: front section	212161
	Shell, probe: for center section, includes bushing and insulator and two shields	213256
	Shell, probe: rear section	213261
	Spring, coil: for front end	210197
	Spring, switch: includes insulation and insulator	213259
	Tip, probe: includes switch slide, 1-meg resistor, and capacitor	213258
	Washer: for probe tip.	213271

From these voltage readings four curves may be plotted. See Figure 6 for a typical tone-control response curve. These curves indicate the frequency response of the amplifier with minimum and maximum bass and treble. Intermediate positions of both controls are sometimes plotted to give an overall picture of the effect of varying these controls.

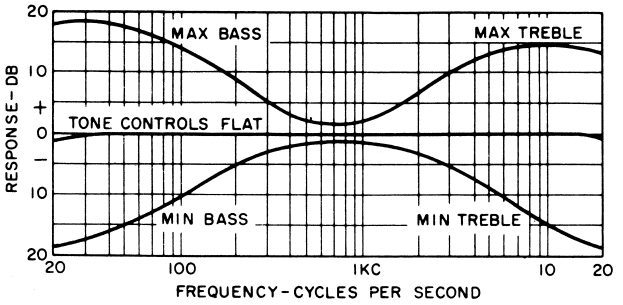


Figure 6. Typical tone control response curves

PREAMPLIFIERS – The frequency response curve of a preamplifier is plotted in the same manner as an amplifier with tone-controls, as described on page 9.

The equipment set-up is similar to that used for power amplifiers. Unless specified otherwise by the manufacturer, a load of .1 Megohm shunted by a 1000 μμf capacitor should be connected across the output terminals of the unit. The signal from the audio generator, usually about one volt, is applied through the "auxiliary" or "spare" input jack.

Gain Measurements

Voltage-gain measurements of amplifier stages can be made with the WV-76A simply by measuring the input and output voltages of the stage and dividing the input voltage into the output voltage. The quotient is the gain figure.

With a conventional amplifier arrangement such as that shown in Figure 7, the input voltage is measured from point "A" to ground. The gain of the tube is determined by measuring the voltage from point "B" to ground and dividing this reading by the input voltage. The entire stage gain must include whatever loss results in the coupling circuit. Consequently, the output voltage must be measured at the grid of the next stage, point "C".

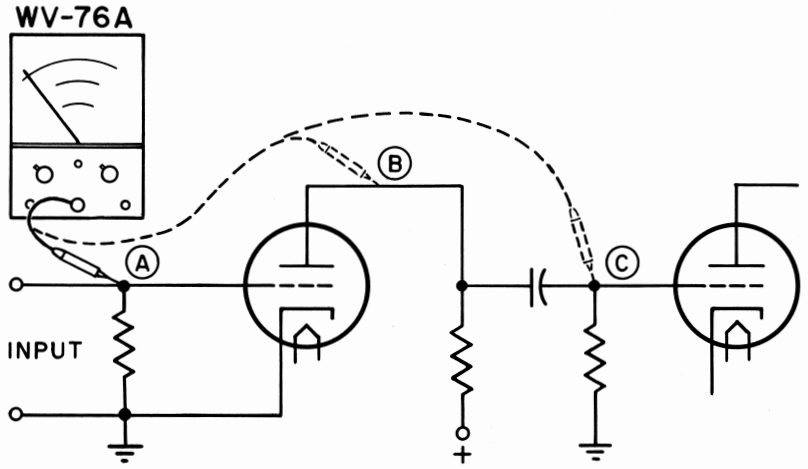


Figure 7. Test setup for voltage-gain measurements.

Checking for Hum

Common causes of hum in an amplifier include insufficient or faulty power-supply filtering, defective tubes and components, improper lead dress, and incorrect parts placement. The WV-76A can be used in hum trouble-shooting if a low ac-voltage range is used and the instrument is connected into an appropriate point in the circuit. In the circuit of Figure 8, for example, any residual hum in the amplifier will show up across the voice coil. The WG-300B probe can be connected to point "H" and the ground clip to "J". Various trouble-shooting remedies can be tried and their effects noted on the WV-76A. If the hum originates at a point ahead of the volume control, the voltage indicated on the WV-76A should vary as the volume control is rotated. In power amplifiers, set the volume control for maximum gain. It is not always possible to eliminate hum completely and the operator will have to set his own limits of acceptance.

AC-Balancing Adjustments

The dynamic balance of push-pull amplifier circuits can be checked by setting up the WV-76A for voltage measurements and checking the signal levels at various points throughout the amplifier. A typical amplifier circuit which uses a push-pull driver and push-pull output stage is shown in Figure 8. If the circuit is properly balanced, the signals as measured from point "C" and point "D" to ground should be equal. Similar balance checks can be made from points "A", "B", "E", and "F".

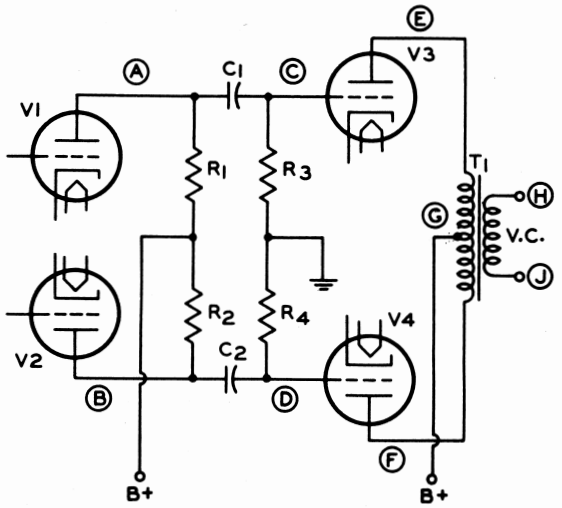


Figure 8. Test points in audio amplifier.

Power-Output Measurements

The output power of an amplifier can be determined easily if a resistive load is substituted for the speaker voice-coil or audio line. The output power is determined by squaring the rms value of the voltage measured by the WV-76A across the load resistance and dividing this squared value by the value of the load resistance. The chart in Figure 9 provides a convenient means of converting RMS volts directly to power (in watts) for the three popular resistive load values, 4, 8, and 16 ohms. Because the WV-76A indicates the rms value of pure sinewave voltages the WV-76A reading can be applied directly to the chart.

A signal from a sine-wave audio oscillator should be used as a source because the signal is continuous and has constant amplitude.

Use of the WV-76A as an Amplifier

When the Function Switch is set to "AMPLIFIER" and the Range Switch is set to the ".01V" position, the WV-76A can be used as an amplifier to provide approximately 38 db gain throughout the frequency range from 20 cps to 500 Kc. On the ".01" range, an input signal of 0.01 volt will produce an output signal of 0.8 volt, a voltage gain of 80. The ".01" range should be used when maximum amplification is desired, since the other range positions will attenuate the input signal. It is possible to increase the signal input slightly and achieve an output signal of 1 volt without distortion on the ".01" range.

(Continued on page 16)

The WG-300B probe is used to couple the signal into the WV-76A. The amplified signal is taken out at the "AMPLIFIER OUT" terminal. The meter is disconnected from the circuit when the WV-76A is used as an amplifier. The flat response and gain characteristics of the amplifier make it possible to use the WV-76A as a preamplifier in general audio work and oscilloscope measurements.

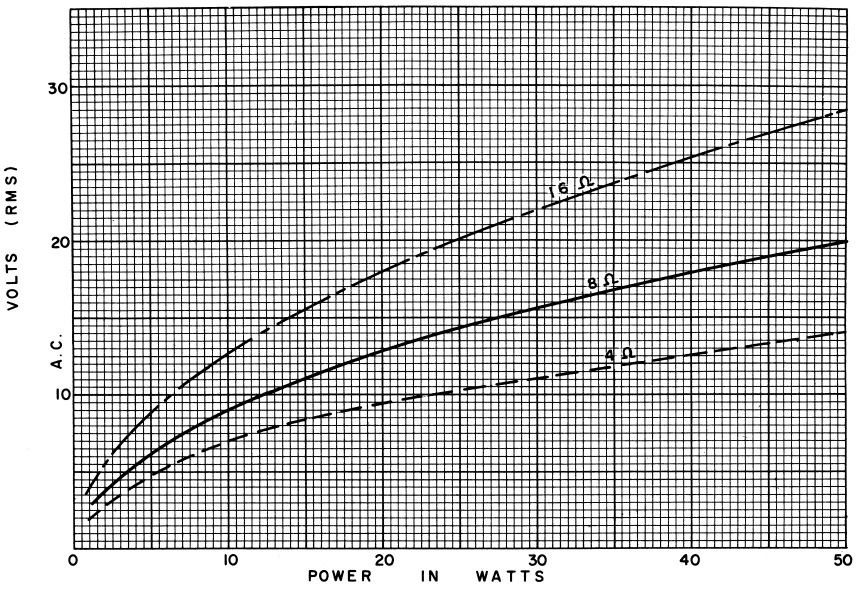


Figure 9. Graph for conversion of rms volts to power output in watts for amplifiers with output loads of 4, 8, or 16 ohms.

Maintenance

If it becomes necessary to replace any of the component parts, only RCA replacement parts or their exact equivalents should be used. Replacement parts should be ordered by their RCA stock numbers from a local RCA tube and parts distributor. Stock numbers and descriptions of all replacement parts for the WV-76A are given in the Replacement Parts List on page 12.

Theory of Operation

A complete schematic diagram of the WV-76A is included in the center of this booklet. A block diagram is shown in Figure 10.

The input signal for ac-voltage and decibel measurements and for the amplifier function of the WV-76A is fed into the INPUT connector, J1. On the 3- to 100-volt ranges, a 100-to-1 ratio precision attenuator reduces the signal before it is fed to the cathode follower stage, V1A. On the 10-millivolt to 1-volt ranges, the signal is attenuated between the cathode follower, V1A, and the first amplifier stage, V1B. Output from V1B is fed to the second amplifier stage, V2A and then into a cathode-follower output stage, V2B. When the Function Switch is set to "METER", the output from V2B is fed into the meter bridge circuit for measurement. In the "AMPLIFIER" position of the Function Switch, the metering circuit is disconnected and the output from V2B is available at the "AMPLIFIER OUT" terminal. A feedback loop from the metering circuit to the first amplifier stage provides additional stability and linearity.

Power supply hum is kept at an extremely low level by heavy filtering in the power-supply section, which utilizes two selenium rectifiers. A hum adjustment, R26, is connected across the heater winding of the transformer to provide for balancing out hum, which might otherwise affect the measurement.

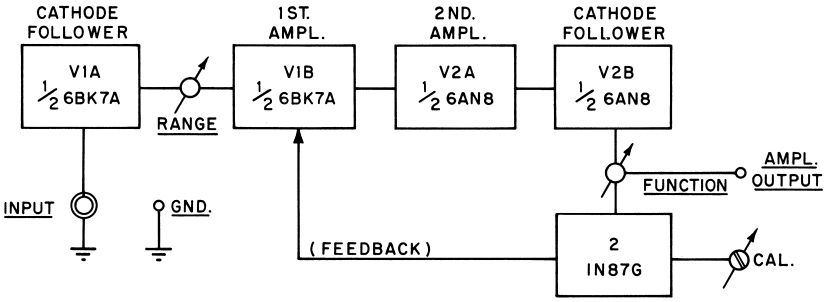


Figure 10. Block diagram of WV-76A.

Mechanical-Zero Adjustment

The meter pointer should rest at the left-hand zero mark when the Function Switch is turned to the "OFF" position. If the pointer should come to rest at a deflected position, adjust the plastic screw on the front of the meter case so that the pointer lines up with the left-hand "0" mark on the meter scale.

Tube Replacement

If it becomes necessary to replace either the 6AN8 or the 6BK7-A in in the WV-76A, install the new tube(s) and run the instrument for about six hours before calibrating.

Hum Adjustment

1. Connect the WV-76A to a 105-125-volt power source and allow 15 minutes warm-up time.

2. Turn the Function Switch to "METER" and the Range Switch to ".01V". With the WG-300B probe disconnected, apply a shield cover to the microphone-type INPUT connector.

3. With a screw driver, adjust the Hum Adjustment, R26, for minimum deflection of the meter pointer.

Voltage Calibration

It is recommended that the WV-76A be calibrated using a 1000 cps signal at 0.1 volt. A suggested test set-up is shown in Figure 11.

1. Connect the output from an audio generator such as the RCA WA-44C to a 10-to-1 voltage divider which has 10,000 ohms or less total resistance. Set the generator to provide 1V at 1,000 cps.

2. Set the WG-300B to "Direct". Set the Range Switch of the WV-76A to ".1V" and set the Function Switch to "METER".

3. With a screw driver, adjust the voltage-calibration adjustment, R19, for exactly full-scale reading.

Frequency-Compensation Adjustment

The recommended test set-up for frequency compensation is shown in Figure 12. A square-wave generator, such as the RCA WA-44C, and oscilloscope, such as the RCA WO-33A or WO-91A are required.

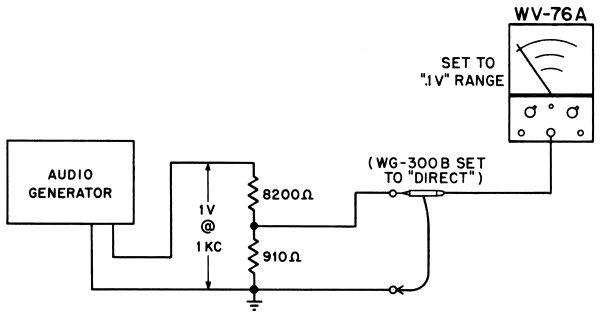


Figure 11. Test setup for voltage calibration of WV-76A.

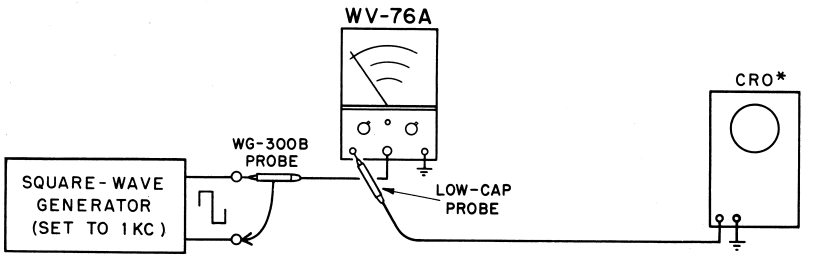


Figure 12. Test setup for frequency-compensation adjustments.

1. Remove the WV-76A from the case only far enough to allow adjustment of C-2 and C-4. Set the Range Switch of the WV-76A to the "3V" position, and set the Function Switch to "METER."

2. Adjust the square-wave generator to produce a 1 Kc output signal. Connect the probe of the WV-76A to the output of the generator. Set the probe switch to the "DIRECT" position. Adjust the output of the generator for full-scale deflection on the meter.

3. Connect the oscilloscope to the "AMPLIFIER OUT" terminal on the WV-76A, using a low-capacitance probe. Connect the ground lead of the oscilloscope to the "GROUND" terminal of the WV-76A.

4. Set the Function Switch to "AMPLIFIER." Adjust the oscilloscope so that a square-wave trace of suitable height is displayed. With an insulated screwdriver adjust C-4 for a square-wave trace with minimum tilt or overshoot.

5. Set the Function Switch to "METER." Set the probe switch to "LOW CAP" and the Range Switch to the .1V position. Readjust the output from the generator for full scale deflection of the WV-76A meter.

6. Set the Function Switch to "AMPLIFIER." Adjust C-2 for a square-wave trace with minimum tilt or overshoot.

RCA Repair Service

RCA maintains a complete repair service for the adjustment, calibration and maintenance of RCA test equipment. If it becomes necessary to service this equipment, fill out one of the Test Equipment Service order forms supplied with the instrument. It is important that:

1. Test equipment be packed carefully. The instrument should be double-packed. It is best to pack the unit in its original carton, or similar container, then "float" this carton in at least a 3-inch layer of shredded paper inside the outer carton.

2. A full description of the trouble be included in the report.

3. All probes, cables, and test leads used with the equipment be included in the shipment.

Attention to these details will help prevent damage in transit and delay in repairs.