

# SUPREME

*Testing Instruments*

"SUPREME BY COMPARISON"

TECHNICAL  
DATA

**SUPREME**  
**INCORPORATED**

GREENWOOD, MISSISSIPPI, U. S. A.

SUPREME MODEL 661

ELECTRICAL SPECIFICATIONS

Power Supply Requirements: (unless otherwise specified on plate attached to instrument)

Voltage.....110/125 volts A-C  
Frequency.....50/60 cycles  
Power Consumption.....25 watts maximum

MECHANICAL SPECIFICATIONS

Over-all Dimensions:

	Panel	Case
Height.....	9-1/4"	9-3/8 in.
Width.....	8-1/2"	8-5/8 in.
Depth.....		7-1/4 in.

Weight:

Net.....12-1/2 pounds  
Shipping.....15 pounds

STANDARD EQUIPMENT SUPPLIED WITH  
SUPREME MODEL 661 OSCILLATOR

QUANTITY INCLUDED	STOCK NUMBER	DESCRIPTION	PACKER'S CHECK
1	9635	Booklet, Operating Data	_____
1	6725	Card, Return Registration	_____
1	5668	Connector, Shielded Cable	_____

The foregoing list has been checked by the undersigned who is responsible for the completion of this package.

MODEL 661 Serial # \_\_\_\_\_  
MENTION ABOVE NUMBERS IN  
ALL CORRESPONDENCE.

(Signed) \_\_\_\_\_  
Shipping Department  
SUPREME INSTRUMENT CORPORATION  
GREENWOOD, MISSISSIPPI  
U.S.A.

#### IMPORTANT

SEE ENCLOSED COLORED PAGE FOR INFORMATION CONCERNING REGISTRATION, TRANSPORTATION DAMAGES, WARRANTY, REPLACEMENT PARTS, ETC.

The instructions listed on this colored sheet must be complied with before the warranty policy is applicable. The Model and Serial Numbers should be mentioned in all correspondence regarding this tester.

## SUPREME MODEL 664 SIGNAL GENERATOR

### GENERAL DESCRIPTION

The SUPREME Model 664 is a complete signal generator incorporating an audio frequency oscillator and radio frequency oscillator. This unit provides the service technician with two distinct types of signals, radio frequency and audio frequency, and thus makes it the ideal instrument for the testing and alignment of radio receivers, audio amplifiers and similar electronic equipment.

The radio frequency oscillator is the cathode feedback type using a single tube in an electron coupled circuit as an oscillator and buffer and a separate tube as modulator. The R.F. coils are so designed as to provide voltage of good waveform from 65 kilocycles to 20.5 megacycles in five bands on two scales. These coils use adjustable iron cores and air trimmer capacitors, which makes it possible to calibrate the oscillator extremely accurately. The output is equipped with a built-in isolating capacitor to prevent shorting out the AVC circuit of any receiver being aligned. It is also equipped with a completely shielded attenuator network for amplitude control continuously variable from minimum to maximum output.

The audio frequency oscillator is of the fixed frequency type designed to produce a voltage of good wave form at a frequency which has generally been accepted as standard for such equipment, namely 400 cycles. This section may be used to modulate the R.F. generator or the output may be used for testing audio amplifiers, inter-department communications system, etc. The output of this section is provided with a built-in isolating capacitor to prevent shorting out the plate or grid voltages in an audio amplifier. It is also equipped with a control for amplitude control continuously variable from minimum to maximum output.

#### POWER SUPPLY REQUIREMENTS

Unless otherwise specified, the instrument is designed to operate from 110 to 125 volts at 50/60 cycles. Power consumption is 25 watts maximum. The tubes used are 6X5GT rectifier, 76 audio frequency oscillator, and 6A8GT radio frequency oscillator.

This instrument is protected from damage in case of an overload by a fuse having a rating of one AMPERE. If your instrument fails to operate remove the fuse from its fuseholder and check it with an ohmmeter to see if it is burned out. If it is, replace it with a fuse of the same length having a rating of 1 AMPERE. If the second fuse burns out the instructions listed under SERVICE AND MAINTENANCE should be followed. The fuseholder in this instrument will be found mounted to the chassis close to the type 76 audio oscillator tube. It is necessary to remove the instrument from its metal carrying case to check the

fuse. CAUTION: THE 90-DAY WARRANTY ON THE INSTRUMENT IS VALID ONLY IF IT IS PROTECTED BY A FUSE HAVING THE SPECIFIED RATING. Do not substitute one of a higher rating.

## PANEL MARKINGS AND COMPONENTS

### DIAL:

Illuminated - Upper center of panel controlled by large knob directly below window for selection of radio frequencies between the band limits. Top scale (A-C-E) used in conjunction with 65-205, 650-2050, and 6.5-20.5 ranges. Lower scale (B-D) used in conjunction with 205-650 and 2050-6.5 ranges.

### ROTARY SWITCH:

Upper right hand corner labeled "RANGE". Five positions for selection of radio frequency band - 65KC-205KC, 205KC-650KC, 650KC-2050KC, 2050KC-6.5MC, 6.5MC-20.5MC, or A-B-C-D-E respectively.

### ROTARY SWITCH:

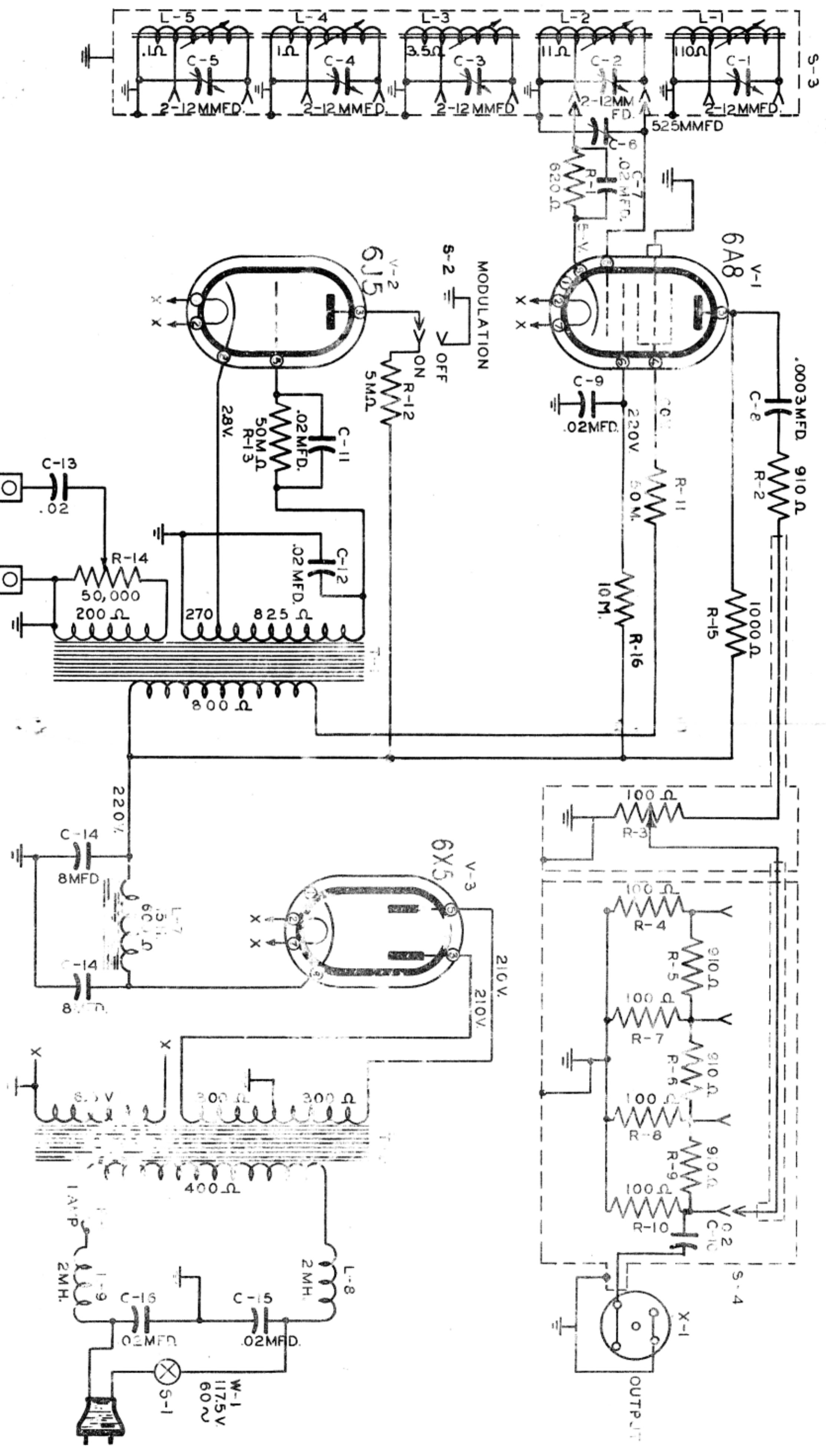
Upper left of panel labeled "MULTIPLIER". Four positions for controlling output of R.F. signal in decade multiples of 1, 10, 100, and 1000.

### ROTARY POTENTIOMETER:

Left center of panel labeled "ATTENUATOR". R.F. output control used in conjunction with "MULTIPLIER".

### ROTARY SWITCH:

Right center of panel labeled "POWER".



ALL VOLTAGES MEASURED WITH AN ELECTRONIC VOLTMETER.

SCHEMATIC WIRING DIAGRAM SUPREME MODEL 661 SIGNAL GENERATOR

A.C. power "OFF"-"ON" switch.

#### SLIDE SWITCH:

Lower right hand corner of panel labeled "MODULATION". For selecting type of signal. "ON" position signal is modulated with 400 cycle tone. "OFF" position is inaudible radio frequency or "C.W."

#### ROTARY POTENTIOMETER:

Lower center of panel labeled "AUDIO OUTPUT" For controlling the 400 cycle audio output voltage.

#### SOCKET:

Lower left hand corner of panel labeled "OUTPUT". Output connections for modulated or unmodulated R.F. signal.

#### PIN JACKS:

Lower center of panel labeled "GND" and "400 cycles - Ext. Mod." Output terminals for audio oscillator - Input terminals for external modulation.

#### MODEL NUMBERS:

"664" printed on lower center of panel below tuning knob. Use this number in all correspondence.

#### SERIAL NUMBER:

Stamped on panel directly below model number. Use this number in all correspondence.



## OPERATION

For those who are experienced in the use of the signal generators the following short procedure will familiarize the operator with the SUPREME Model 661. For further information, we refer you to "Receiver Alignment Procedures" one of a series of booklets written especially for the radio serviceman in a language he can understand. These booklets are available from the factory for fifty - cents (50¢) each.

1. Connect the power supply cable to convenient AC supply socket after you have made certain that it is the proper voltage and frequency. (See POWER SUPPLY REQUIREMENTS). Turn "POWER" switch "ON" and allow signal generator to reach proper operating temperature (5 to 15 minutes).
2. Set "RANGE" selector switch to the band which includes the desired frequency. Frequency coverage of each band is noted directly above and below each range letter. Turn dial knob to desired frequency on dial. Note this dial uses but two scales. The top scale reads from 65 to 205 and the bottom scale from 205 to 650. The top scale is used for bands "A" - "C" and "E". The bottom scale for bands "B" and "C". The following chart may be helpful.

FREQUENCY		USE	
<u>RANGE</u>	<u>COVERAGE</u>	<u>SCALE</u>	<u>READ</u>
A	65 - 205 kc.	Top	Direct
B	205 - 650 kc.	Bottom	Direct
C	650 - 2050 kc.	Top	Scale x 10
D	2.05 - 6.5 mc.	Bottom	Scale x 10
E	6.5 - 20.5 mc.	Top	Scale x 100

3. Slide "MODULATION -ON -OFF" switch to "ON" position. Connect shielded connector between "OUTPUT" jack on signal generator and proper place in receiver. NOTE: It is not necessary to use an isolating capacitor since one is built-in in the generator! Adjust "MULTIPLIER" and "ATTENUATOR" controls for desired output level and proceed with normal alignment adjustments.
  
4. RANGE "E" FOR HIGHER FREQUENCIES: Band "E" on the SUPREME Model 576 has a coverage from 6.5 mc to 20.5 mc. For higher frequencies it is only necessary to utilize harmonics of range "E". Thus, the second harmonic of 6.5 mc is 13.0 mc and the second harmonic of 20.5 is 41.0 mc. Therefore, any frequency may be obtained between 20.5 and 41.0 megacycles by setting the dial to one-half ( $1/2$ ) of the desired frequency. For frequencies of 41.0 mc to 61.5 mc., the third harmonic can be used. If a frequency of 45 mc is desired, by dividing by three, the result would be 15 and the dial should be so set at 15 mc.

The method of using harmonics for higher frequencies has been found to be much more satisfactory than the incorporation of fundamental ranges. Very high frequency oscillator circuits are liable to instability and, thus, are poor frequency standards unless fixed crystal control or elaborate design procedure is attempted. It must also be noted that although errors in kilocycles double on the second harmonic, triple on the third harmonic, etc., the per cent error remains the same. Thus, an error of 1 per

cent on a fundamental frequency will be 1 per cent on the second harmonic and 1 per cent on the third, etc. Therefore, this method, when used with care, is infinitely more accurate than fundamental oscillator circuits operating at extremely high frequencies.

5. **EXTERNAL AMPLITUDE MODULATION:** By placing the "MODULATION -ON -OFF" switch in the "OFF" position and introducing an external audio modulating signal across the "GND" and "400 cycle-EXT. MOD", the SUPREME Model 576 may be used for experimental purposes. The input circuit of this function allows amplitude modulation from 30 cycles up to 10,000 cycles. The input impedance of this circuit at 1000 cycles and with the rotary potentiometer set at maximum clockwise rotation is approximately 15,000 ohms.
6. **FIXED 400 CYCLES AUDIO FREQUENCY OUTPUT:** An audio voltage of fixed frequency and continuously variable voltage is available at the pin jacks marked "400 Cycle" and "GND". The maximum output voltage is about 20 volts when loaded with a 100,000 resistor. The minimum is 0 volts. A built-in isolating capacitor is provided which will prevent shorting out operating voltages when connection is made to various test points in an audio amplifier.
7. **ATTENUATOR CIRCUITS:** In the SUPREME Model 576 a ladder type attenuator gives approximately 100 ohms impedance at all attenuator and frequency settings. Attenuator controls are marked in reference points so that gain-per-stage measurements can be made.

## SERVICE AND MAINTENANCE

All functions and ranges of the SUPREME Model 661 were carefully tested and calibrated before shipment from the factory. Under normal operating conditions this instrument should give a long and trouble-free service. However, if for any reason this instrument should fail to operate properly, write the Service Engineer at the factory. Submit complete information regarding the difficulty and full instructions will be forwarded in detail. The model and serial numbers, position of controls, inoperative section, and any other information should be given in your first letter.

## REPLACEMENT PARTS

The parts used in the SUPREME Model 661 were carefully inspected for mechanical and electrical defects at the factory. Under normal conditions and average use the life of the tubes will be equal to those in radio receivers (approximately 1500 hours). Any special parts which are not available from regular dealer stocks may be ordered from your nearest SUPREME distributor by describing the item and giving the model and serial numbers of your unit.



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