



# INTRODUCTION [ManualsPlus.com](http://ManualsPlus.com)

The PR47 is designed to be used with any frequency counter with a range of 100 KHz-60 MHz (or more) to extend the counting range to 600 MHz by dividing the input frequency by ten. The PR47 operates from 9 Volts DC supplied from the front panel output jack on the Sencore FC45 230 MHz Frequency Counter, or from the optional Sencore PA202 AC Power Adapter when used with any other counter.

The input of the PR47 is terminated in 50 Ohms to prevent cable ringing due to impedance mismatch. The PR47 comes supplied with the PL207 RF Pick-Up Loop for inductive coupling of signals without the need for a direct connection which may load the circuits being tested and cause frequency errors.

## SPECIFICATIONS

**ACCURACY:** Does not change percent error of counter.

**INPUT IMPEDANCE:** 50 Ohms

**INPUT PROTECTION:** 1 MHz-400 MHz  
1 Watt (7 Volts RMS)  
400 MHz-500 MHz  
½ Watt (5 Volts RMS)  
500 MHz-600 MHz  
¼ Watt (3.5 Volts RMS)

INPUT SENSITIVITY: 1 MHz-450 MHz  
2 mW (325 mV) average  
450 MHz-600 MHz  
1 mW (225 mV) average

OUTPUT VOLTAGE: 1 Volt P-P

OUTPUT FREQUENCY: Input frequency divided  
by 10.

POWER REQUIREMENTS: 7-12 VDC @ 100-150  
mA supplied by 9V  
output of Sencore FC45  
or PA202

#### ACCESSORIES:

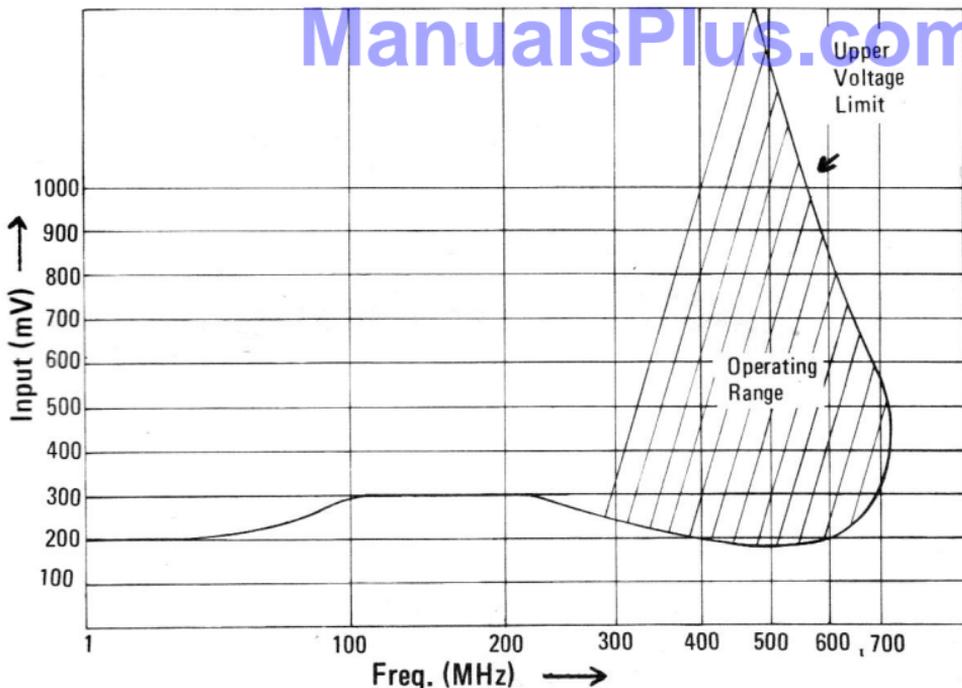
SUPPLIED: PL207 RF Pick-Up Loop  
39G116 DC Power Cord

OPTIONAL: PA202 AC Power Adapter (Not required  
when used with Sencore FC45.)

#### PR47 SENSITIVITY

The chart on the following page provides a typical sensitivity curve for the PR47. Notice that the input sensitivity of the PR47 typically is usable above 600 MHz, if the input limits shown on the graph are observed.

At the extreme upper frequency limits, the operating voltage range of the PR47 is between the limits specified in the shaded areas of the graph. If the input voltage is above the upper limit, the PR47 may fail to provide accurate prescaling due to input circuit saturation.



*Table I: Typical Counting Input Range*

## OPERATIONS

### FREQUENCY COUNTER CONNECTIONS

The PR47 is designed to operate from a source of 7 to 12 VDC. When operated with the Sencore FC45 230 MHz Frequency Counter, this voltage is supplied through the front-panel, 9-Volt output jack. This jack is controlled by the FC45 power switch and supplies the required operating voltage whether the FC45 is operating from the AC line or 12 VDC.

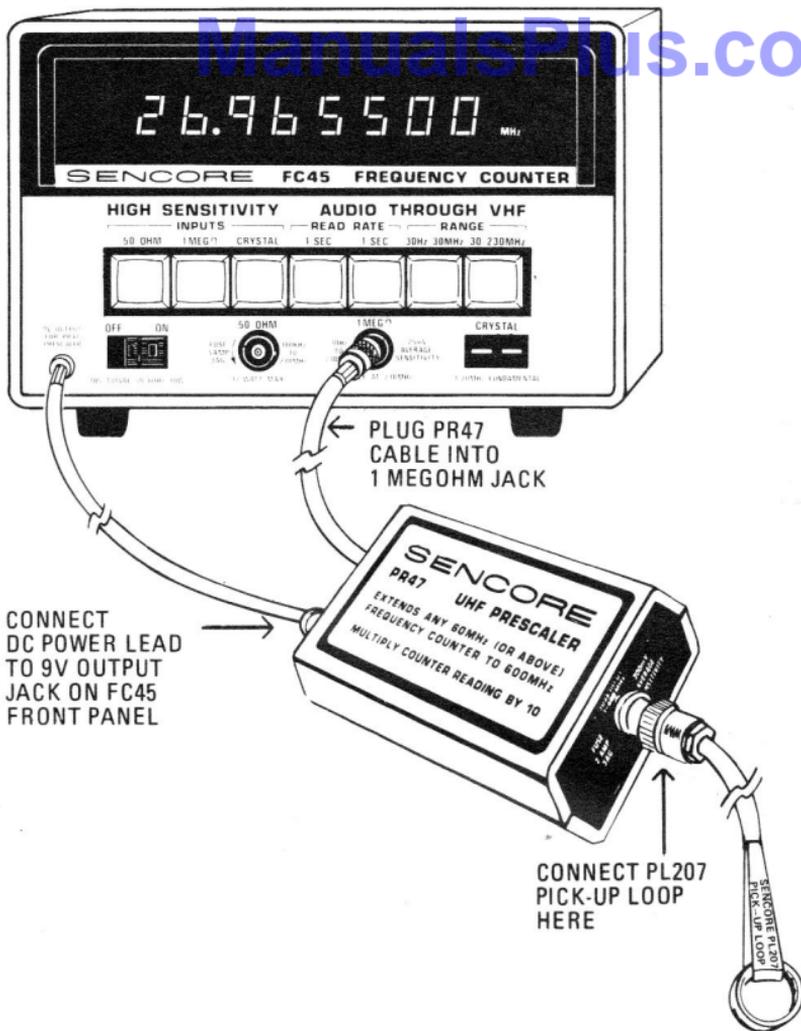
The PR47 may also be operated with the Sencore PA202 AC Power Adapter. This allows the PR47 to be used with other frequency counters such as the counter built into the Sencore CB42 CB Analyzer.

To connect the PR47 to the Sencore FC45 Frequency Counter:

1. Connect the power connector plug on the Power Supply Lead (supplied with the PR47) to the 9-Volt Input Jack on the PR47.
2. Connect the pin-plug on the opposite end of the Power Supply Lead to the 9-Volt Output Jack on the FC45 front panel.
3. Connect the Output Lead of the PR47 to the 1 Meg input jack of the FC45.

*NOTE: The common supply connection needed to operate the PR47 is provided by the shield of the signal lead connected to the 1 Meg Input Jack.*

4. Supply power to both the FC45 and PR47 by turning the FC45 power switch on.

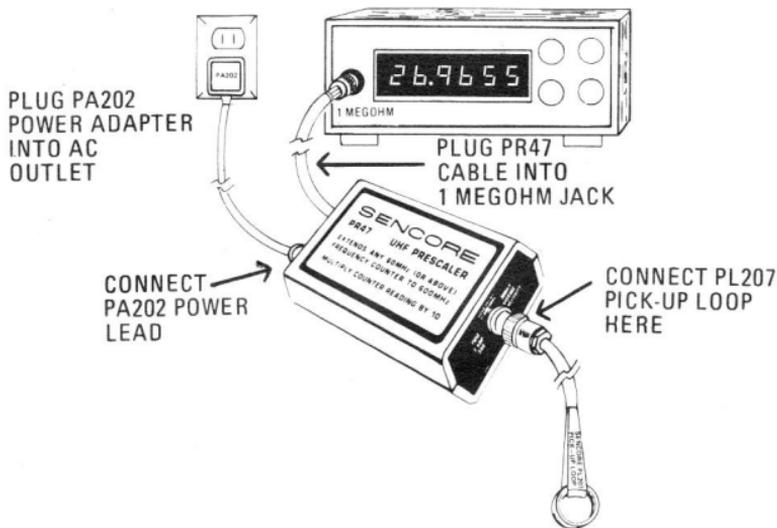


**Fig. 1: PR47 Connections to Sencore FC45 Frequency Counter.**

To connect the PR47 to any counter other than the Sencore FC45: **ManualsPlus.com**

1. Connect the adapter plug on the (optional) PA202 AC Power Adapter to the 9-Volt input jack of the PR47.
2. Connect the PA202 to a source of 110-120 VAC power.
3. Connect the signal output cable of the PR47 to the frequency counter input jack.

*NOTE: Use the 1 Meg input on frequency counters that have both a 1 Meg and 50 Ohm input. However, the PR47 will provide sufficient signals to drive the 50 Ohm input of most frequency counters that are not supplied with a 1 Meg input.*



**Fig. 2: PR47 Connections to Counter other than Sencore FC45.**

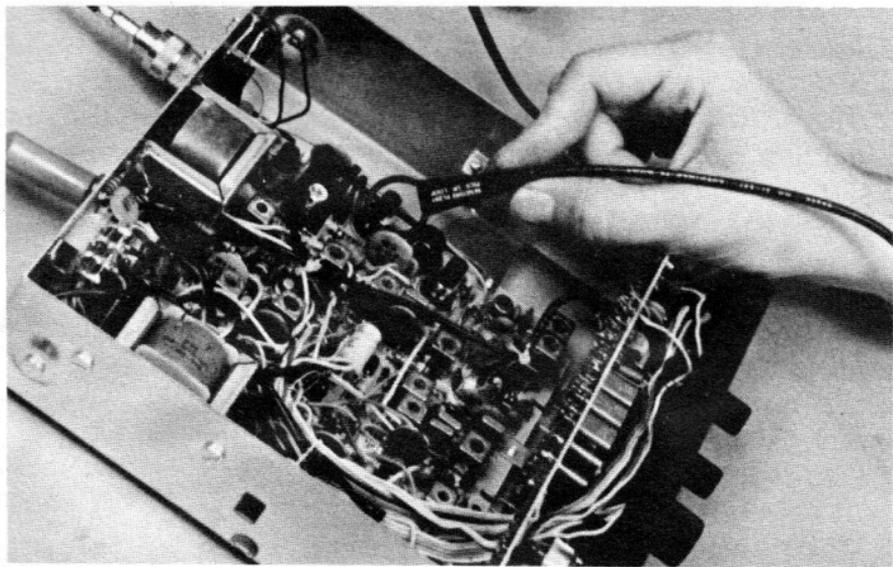
**WARNING:** The 50 Ohm input termination of the PR47 is rated at 1 Watt to 400 MHz, and derated to .25 Watts at 600 MHz (see specifications for details). To prevent possible damage to the PR47 input stage, always use the supplied PL207 Pick-Up Loop, rather than a direct connection when measuring high levels signal or transmitter output signals.

Direct connections may be made to the input of the PR47 if care is taken to prevent overload (see specifications). The capacitance of the test leads will often mistune the circuit under test and cause erroneous readings. The PL207 RF Pick-Up Loop (supplied with the PR47) will prevent this circuit loading, and also protect the PR47 input circuits from possible overload. To use the PL207 RF Pick-Up Loop:

1. Connect the PL207 to the input jack of the PR47.
2. Connect the PR47 to the frequency counter. (See "Frequency Counter Connections.")
3. Place the Pickup loop near a capacitor or coil in the circuit to be tested. If an unstable count is obtained, reposition the Pick-Up Loop or turn the loop over to reverse polarity of the pickup loop coil.

4. The pickup loop will function best when used near a coil; however, the sensitivity of the PR47 will allow signal pickup from a capacitor, transistor, tube, or crystal in many cases.

The pickup loop may be used to trace signals through a circuit by placing the coil near each stage. Generally, it is best to start with the signal source (oscillator) and work towards the output stages when signal tracing.



*Fig. 3: Using PL207 Pick-Up Loop to measure frequencies.*

## READING THE FREQUENCY COUNTER

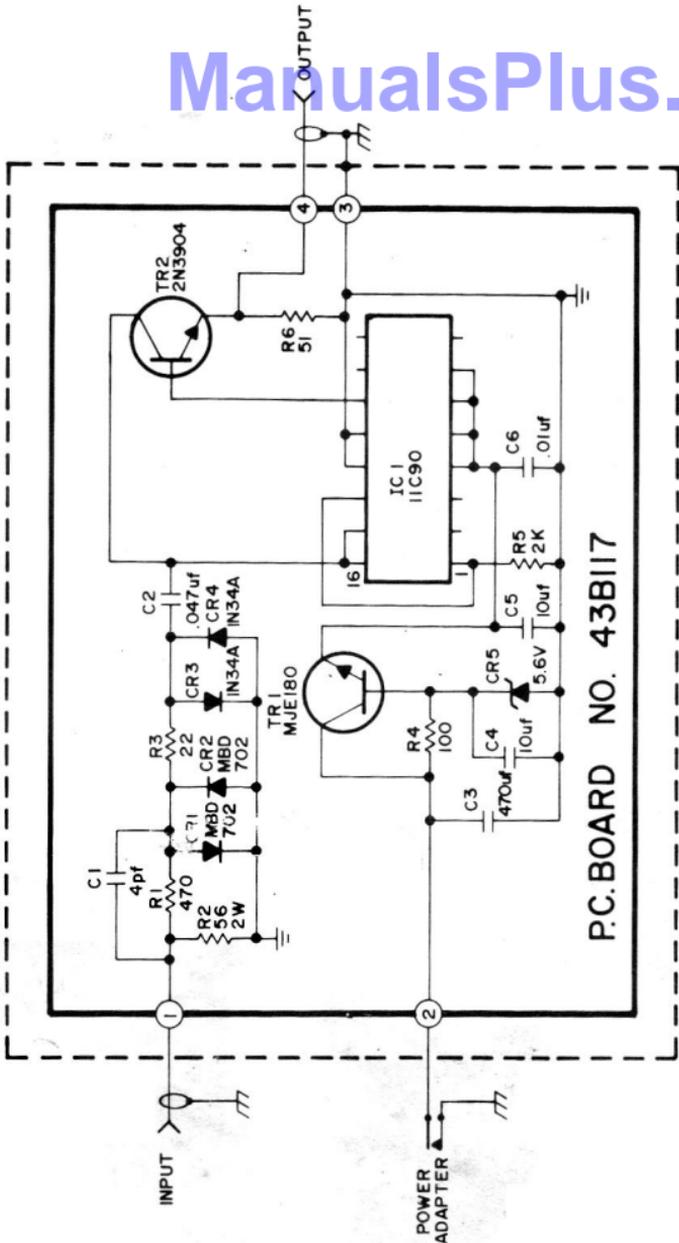
The PR47 divides the signal at its input jack by ten and feeds the resulting signal to the frequency counter. The input frequency range of the PR47 is 1 MHz-600 MHz, so the resulting output frequency is 100 KHz-60 MHz. If the frequency counter used with the PR47 does not have a full 60 MHz range, the PR47 will extend the range to ten times the upper frequency limit. **EXAMPLE.** A 30 MHz counter may be used to 300 MHz by using the PR47.

*NOTE: Since the PR47 simply divides the input by ten, the accuracy of the resulting count is strictly a factor of the frequency counter's accuracy. The PR47 will neither improve or degrade the accuracy of the counter's percentage (or ppm) error.*

To set the frequency counter for proper operation:

1. Connect the signal source to the PR47, and the PR47 output to the frequency counter input as described previously.
2. Set the counter as you normally would to read a frequency between 100 KHz and 60 MHz.
3. Multiply the resulting counter reading by ten (move the decimal point one position to the right) to determine the frequency present at the input of the PR47. **EXAMPLE:** A counter reading of 51.20 represents an input frequency of 512.0 MHz.





PR47 SCHEMATIC DIAGRAM

PR47 PARTS LIST

SCHEMATIC REFERENCE	PART NUMBER	DESCRIPTION	PRICE
IC1	69G43	IC, 11C90 600 MHz Decade Divide	20.00
TR1	19A29	Transistor, MJE180, NPN	1.75
TR2	19A33	Transistor, 2N3904, NPN	.50
CR1, 2	50A14	Diode, MBD702, High Frequency, Hot Carrier	2.25
CR3,4	50C3-1	Diode, 1N34A, Germanium	.50
CR5	50C4-14	Diode, 5.6 Volt Zener	.50

Components not listed are standard-replacement parts and may be purchased locally. When ordering parts, please specify instrument model number, schematic reference, part number, and description. Please include remittance (check or money order) with your order, otherwise invoice will be shipped C.O.D. Minimum billing is \$3.00. Prices and specifications in effect at date of printing and are subject to change without notice.