OPERATING INSTRUCTIONS
RF POWER SCANNER
MODEL PDC 700

1. GENERAL DESCRIPTION

RF POWER SCANNER Model PDC 700 is designed for the CB and two way communication operators to check out the performance, monitoring and in-line functions of their transceivers. The PDC 700 is a very sensitive instrument and will measure transmitter output, RF power, modulation percentage up to 100%, over-modulation to +3db and Standing Wave Ratio (SWR).

1. Up to 1000 watts Output RF Power Reading.
2. Frequency Range Capability to 220 Mhz.
3. Modulation to 100% and over-modulation to +3db
4. Standing Wave Ratio (SWR)
5. Factory Calibrated at twenty-seven (27) Mhz.
6. One large, easy-to-read, 4 x 6 meter for increased accuracy.

RF POWER SCANNER Model PDC 700 uses one large 4 x 6 sensitive meter to read RF power, modulation and SWR functions, respectively, during the transmit mode of in-line operations.

The PDC 700 is beautifully packaged to be used on desk tops and it can be placed on top of transceivers. Only two coax connections are required for the transmitter and antenna terminals.

The PDC 700 is a solid state device which minimizes the size, increases the reliability, improves the performance and is easy to service.

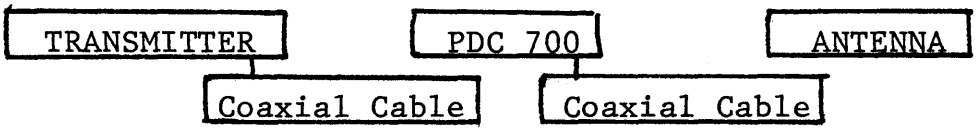
This unit features simplicity in design and operation. Quality, accuracy, reliability and freedom from any complicated connecting cables make the PDC 700 a must for two-way communication operators and CB'ers. Physical dimensions, 9-1/2" x 3" x 2-3/4"

2. SPECIFICATIONS

1. Impedance: Fifty (50) ohms.
2. Calibrated at factory for twenty-seven (27) Mhz.
3. Power: 0-10 watts, 0-100 watt, 0-1000 watts.
4. Modulation: to 100%, over-modulation to +3db.
5. SWR: 1:1 to 3:1.

3. CONNECTIONS

The following block diagram shows the transmitter and antenna connections to the PDC 700.



Use fifty (50) ohms coaxial cable RG8U with PL259 connectors for all connections.

Set the following controls on the PDC 700 instrument panel before the antenna and the transmitter connections are made.

1. Turn function switch fully counter clockwise to FWD SET position.
2. Rotate SWR control (bottom left) to fully counter clockwise position.
3. Rotate modulation control (bottom right) to fully counter clockwise position.
4. Set power range switch fully clockwise to 1000 position.

Now connect the transmitter to the terminal on the back panel marked TRANSMITTER and in similar manner, connect the antenna to the terminal marked ANTENNA. Turn the transmitter on and allow warm-up time.

4. SWR FUNCTION (Standing Wave Ratio)

The ratio of maximum to minimum current along a line is called a standing wave ratio. The same ratio holds for maximum voltage and minimum voltage.

The Standing Wave Ratio is a measure of mismatch between the load and transmission line and is equal to one when the line is perfectly matched. When the line is terminated in a purely resistive load, the Standing Wave Ratio is:

$$SWR = \frac{Zr}{Z0} = \frac{Zo}{Zr}$$

Where SWR = Standing Wave Ratio
Zr = Impedance of load (must be purely resistive).
Zo = Characteristic impedance line.

EXAMPLE: A line having a characteristic impedance of 52 ohms is terminated in a resistive load of 40 ohms. The SWR is:

$$SWR = \frac{Zo}{Zr} = \frac{52}{40} = 1.3 \text{ to } 1$$

The higher the SWR, the greater the mismatch between the line and the load (antenna). The power loss in the line increases with the SWR. It is also required that the output impedance of the power source must be equal to line impedance for maximum power transfer to the load (antenna). However, antenna mismatch may occur due to the weather conditions, poor contacts of the antenna connections, oxidation, cable leakage, etc. Standing Wave Ratio is read on the SWR scale. It allows the user to monitor forward and reflected power ratios.

5. PERFORM THE FOLLOWING STEPS TO READ SWR

1. Set the function switch to FWD SET position. Key your microphone (transmit mode) and rotate SWR control slowly clockwise until meter movement swings to SET position on SWR scale.
2. Release the microphone switch. Set the function to REF position. Key your microphone again and read the SWR value.

The perfect matching should read 1:1 ratio. A reading of 1.5 to 1 is to be considered satisfactory when taking into account the line losses and slight mismatching. Consult your electronics manual to apply various methods for proper matching techniques for various types of antenna applications.

6. MODULATION FUNCTION

Modulated signal contains the sum and the differences of two frequencies, namely radio and audio frequencies. In voice transmission, the amplitude of the modulation envelope (radio frequency) varies with the audio signal. These variations can be expressed in terms of percent of modulation. The ideal modulation level should read 100%. Higher than 100% modulation results in modulation distortion (voice distortion) and is defined as over-modulation. Lower than 100% modulation results in lower power and consequently lower audio transmissions. Desired percent of voice modulation level can be attained by adjusting the microphone position or employing the modulation boosters.

Modulation level is indicated directly on the modulation scale and allows full time monitoring of modulation during transmission.

7. PERFORM THE FOLLOWING OPERATIONS TO READ MODULATION

1. Set the function switch to MOD, SET position.
2. Key your transmitter (microphone switch) and rotate modulation control clockwise (located at lower right) to SET position on the modulation scale.
3. Rotate function switch to MOD position.
4. Key your transmitter and read the percent of modulation directly on the modulation scale while speaking into the microphone in a normal voice.

RF POWER FUNCTION

RF Output is read in watts and indicated on the meter by the three top scales. The power range switch is a three position rotary switch with positions 10, 100, and 1000 respectively.

8. PERFORM THE FOLLOWING OPERATIONS TO READ RF POWER

1. Rotate function switch to POWER position and rotate range switch to 1000 position.

2. Key the transmitter, if the power reading is less than 100 watts, set the power range switch to 100 watt position and read the RF power in watts on the second scale from the top.

3. If your power reading is less than 10 watts,rotate the range switch to 10 watts and read the RF power directly on the third scale from the top.

CAUTION: DO NOT AT ANY TIME SWITCH TO A LOWER SCALE SETTING THAN THE TRANSMITTER MAXIMUM OUTPUT RATING! SEVERE DAMAGE MAY OCCUR. ALWAYS USE THE MAXIMUM POWER SETTING SCALE OF THE POWER RANGE SWITCH FIRST TO DETERMINE THE CORRECT SETTING AND THEN SWITCH TO LOWER SCALES AS REQUIRED.

The PDC 700 is designed to maintain continuous life operation and it will provide you with the necessary performance information for your transmitting system. Whenever you change an integral part of your transmitting system, add or take off accessories or detect any abnormal readings, repeat the above operating procedures.

IMPORTANT-For Citizen Band Usage (27 MHz)

For maximum accuracy when using the power scanner in a line with a high SWR (>1.5), it is recommended that there be 3 or 9 feet of RG-58/u cable between the power scanner and the antenna. Other acceptable lengths may be calculated using the following formula:

$$L=3' + n(6'),\ n=2,3,4,...$$

L = Cable Length In Feet

GENERAL WARRANTY POLICY

We warrant each new product to be free from defects in material and workmanship under normal use and service for a period of ninety days after delivery to the ultimate user and will repair free of charge or replace at no charge, should it become defective and which our examination shall disclose to be defective under warranty.

This warranty shall not apply to any product which has been subject to misuse, neglect, accident, incorrect wiring not of our own installation, or to use in violation of instruction furnished by us, nor extended to units which have been repaired or altered outside of our factory. This warranty does not cover any accessories used in connection with the product.

SHIPPING INSTRUCTIONS

If the unit is to be returned for adjustment or service, attach a tag to the unit bearing your name and complete address, including zip code and a brief description of the difficulties encountered.

Wrap the unit in heavy paper before placing into the carton which should be large enough to permit the use of at least three inches of paper or excelsior between all sides of the unit and the carton. Mark "Fragile" on the outside of the carton and clearly address it as follows:

PARA DYNAMICS CORPORATION
14501 North 73rd Street
Scottsdale, Arizona 85260