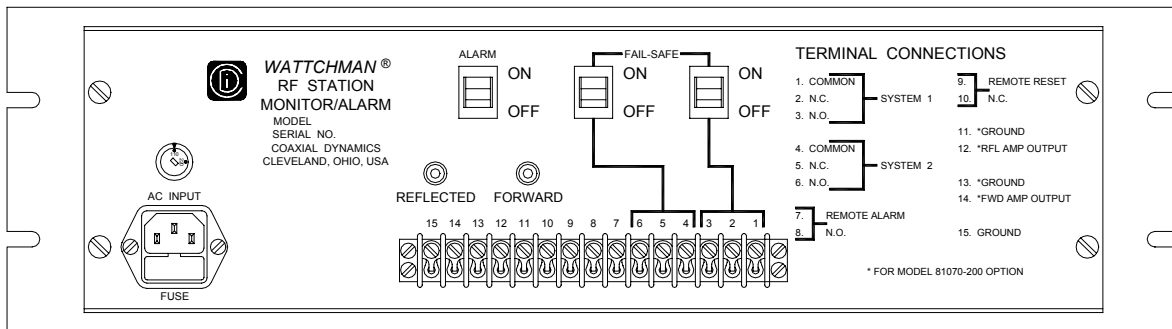
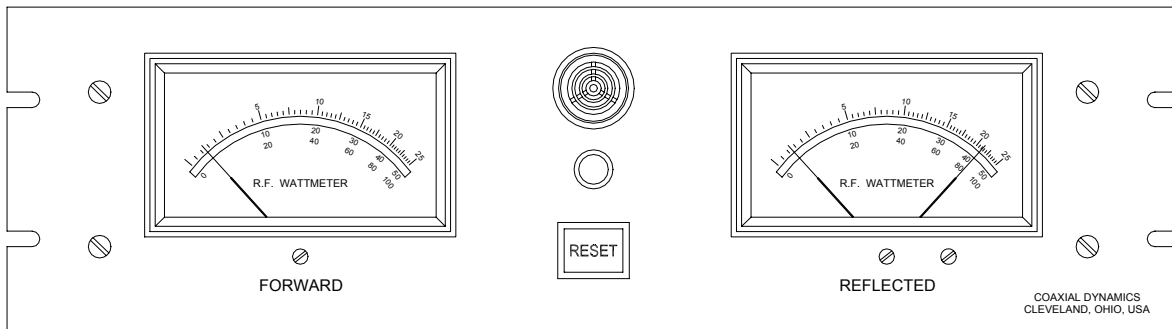


# Instruction Manual

## Model 81070 Wattchman Station Monitor / Alarm





## **SAFETY**

*Personnel operating high power or high voltage systems should use standard safety precautions at all times. Do not attempt to disconnect systems or replace parts while equipment is operating. Disconnect all supply power before servicing.*

## **WARNING**

*Remove power to this unit before removing top cover. The possibility of accidental shock is present.*

## MODEL 81070 SPECIFICATIONS

<b>Meter Specifications</b>		30 microamps $\pm 1\%$ full scale. 1400 Ohms resistance. 4-1/2" movement.
<b>Controls</b>	<i>Front Panel</i>	Push button reset. Trip set adjustment.
	<i>Rear Panel</i>	Audible alarm switch. Fail-safe mode switches. Voltage selector switch.
	<i>Connections</i>	Meter inputs. N.O./N.C. control connections. Remote alarm turn on - N.O. Remote reset connections. *Amplified D.C. outputs. AC power input. Fuse holder.
<b>Contact Ratings</b>		5 A at 120 VAC non-inductive.
<b>System Accuracy</b>		$\pm 5\%$ full scale when used with proper Coaxial Dynamics Line Sections and Detecting Elements.
<b>Power Requirements</b>		115 / 230 VAC, 50 / 60 Hz

\* FOR MODEL 81070-200 OPTION

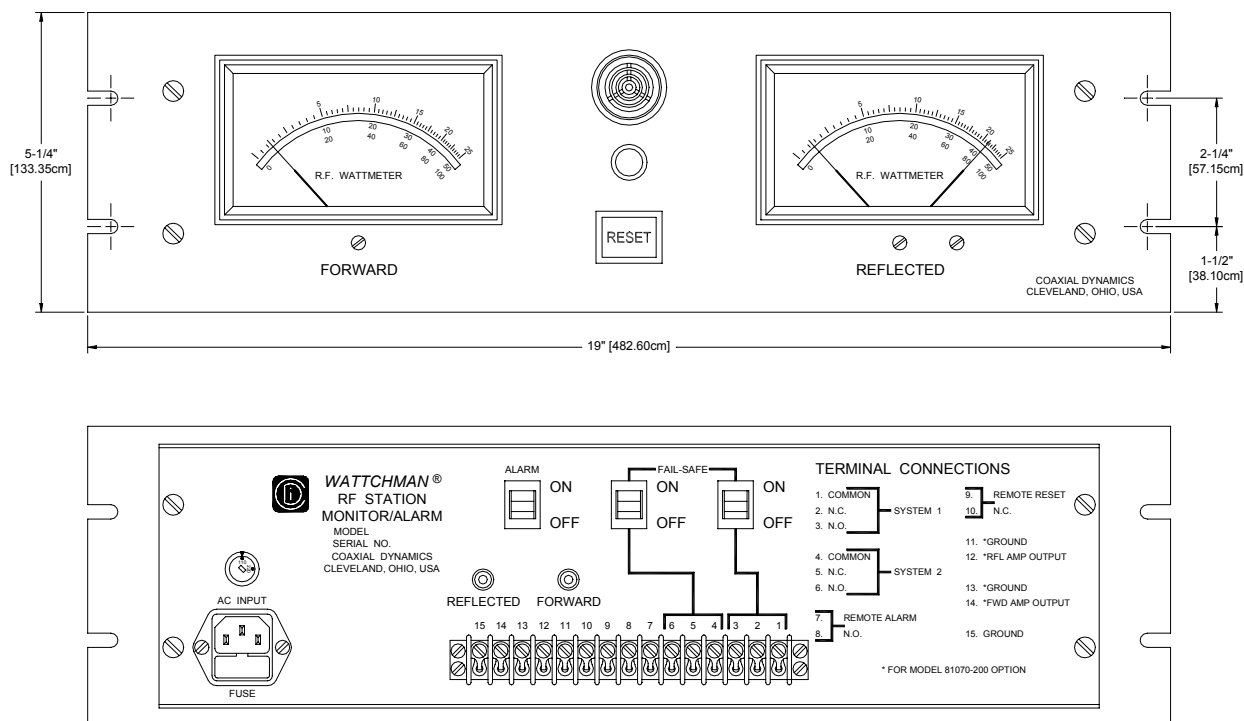
## INTRODUCTION

The Coaxial Dynamics Model 81070 Watchman is intended for use as a continuous performance monitor and protection device for use in RF transmission systems. It is designed to be used with 50-Ohm dual socket line sections. The operating frequency and power range is determined by the elements and line section used.

The forward meter on the Model 81070 will display forward power to the load while the system is in operation. The reflected meter will display power reflected from the load and will activate the shut down circuits if power reaches a preset level.

The Model 81070 with the Model 81070-200 Option installed also provides, on the rear panel, a 0 to 2.0 VDC output proportional to the RF power.

The Model 81070 is made with high quality components. Used and maintained properly, it will provide years of dependable service.



**Figure 1**

## SECTION 1 - INSTALLATION

### 1.1 Mounting

The Model 81070 is designed to be mounted in a standard 19" relay rack (*Refer to Figure 1 for dimensions*). Control and input wire lengths are not critical so the unit can be mounted in a convenient location offering easy accessibility and viewing.

When mounting, be sure to use proper grounding techniques. Interlock wiring should be shielded and the chassis ground connection on the Watchman should be attached to a good earth ground.

Place the unit in the rack and secure with (4) four screws located in the slots provided. The line section may be mounted in the transmission line or between the driver and final output transmitter. The latter provides protection in the event a malfunction in the input circuits of the final transmitter. The Model 81070 is designed to be used with all Coaxial Dynamics 50-ohm dual socket line sections. These line sections have dual sockets so that both forward and reflected elements may be placed in the system using only one line section.

Model 81070 comes supplied with two (2) 25' cables for connecting the line section to the unit. Cables up to 200' can be ordered from Coaxial Dynamics.

### 1.2 Connections

Connections to the Model 81070 barrier strip are printed on the back panel of the unit. They are:

Pin #1	System 1, Control Relay – common to 2 and 3
Pin #2	System 1, Control Relay – N.C.
Pin #3	System 1, Control Relay – N.O.
Pin #4	System 2, Control Relay – common to 5 and 6
Pin #5	System 2, Control Relay – N.C.
Pin #6	System 2, Control Relay – N.O.
Pin #7 & 8	Remote Alarm Relay – N.O.
Pin #9 & 10	Remote reset
Pin #11	*Ground
Pin #12	*0 to 2.0 VDC Reflected Output
Pin #13	*Ground
Pin #14	*0 to 2.0 VDC Forward Output
Pin #15	Ground

\* For Model 81070-200 Option

Input connectors are provided for connection to the Line Section. Make sure these connections are made to the proper line section socket (*Refer to Figure 1*).

### **1.3 Alarm**

Model 81070 is equipped with an audible alarm. When a fault is detected and the system is tripped, the alarm will sound. A switch is provided on the rear panel if an audible alarm is not desired

A set of relay contacts is also provided for operation of a remote alarm. These contacts are normally open and close during a fault condition. These contacts have a rating of 5 Amps at 115 VAC.

### **1.4 Remote Reset**

If a remote reset is desired, remove the jumper on pins 9 and 10 and connect a normally closed momentary switch to these terminals.

### **1.5 AC Power**

AC power is applied through the fused receptacle on the rear panel. The mating power cord is supplied. Power requirements are 115/230 VAC, 50/60 Hz.

### **1.6 Control Contacts**

Two sets of control contacts are provided. They are labeled System 1 (pins 1, 2 and 3) and System 2 (pins 4, 5 and 6). This allows protection for combined transmitter systems or shutdown of drive and final amplifier simultaneously. Fail-Safe or Non-Fail-Safe modes can be selected for each system and operate independently.

Connect the systems control line configuration as desired (i.e. N.O. or N.C.).

### **1.7 DC Output (For Model 81070-200 Option)**

Pins 11 through 14 provide an amplified DC output for both forward and reflected power respectively, proportional to R.F. power (*Refer to Figure 2*). The amplified outputs are calibrated at the factory so that at full scale meter indication, 2.0 VDC is available to drive remote monitoring equipment.

## SECTION 2 - OPERATION

### 2.1 Adjustments

The two panel meters should be checked for zero with no power applied. If the zero set needs adjustment, it can be reset with the screwdriver adjustment on the front of the meter.

The reflected trip point adjustment is made on the reflected meter. This relay meter will initiate an alarm and the shut down circuitry should power rise above the preset level. Simply use the screwdriver adjustment on the front of the reflected meter to set the moveable pointer to the desired limit.

### 2.2 Mode Selection

Model 81070 can be set to operate in one of two modes, Fail-Safe and Non-Fail-Safe. In the Fail-Safe mode, the unit will shut down the system in the event AC Power to the unit is lost. This prevents unprotected operation. In the Non-Fail-Safe mode, systems stay on in the event AC power is lost to the unit. The alarm and shut down systems will operate normally as long as there is AC power present.

### **!! WARNING !!**

*In the Non-Fail-Safe mode, there will be no protection if AC power is lost.*

### 2.3 Unit Operation

Make sure all connections, adjustments and mode selections are correct before operation of the unit. When power is present, the unit will operate as a power meter displaying both forward and reflected power. These measurements may be used to calculate VSWR quickly (Refer to Figure 3).

When the reflected power rises above the preset level, the Model 81070 will sound the alarm. The systems protected will be shutdown and the reset button will be illuminated red. To reset the unit, press the reset button until the illumination goes out. **Note: this resets only the Model 81070. The fault needs to be corrected before restarting the transmitter.**

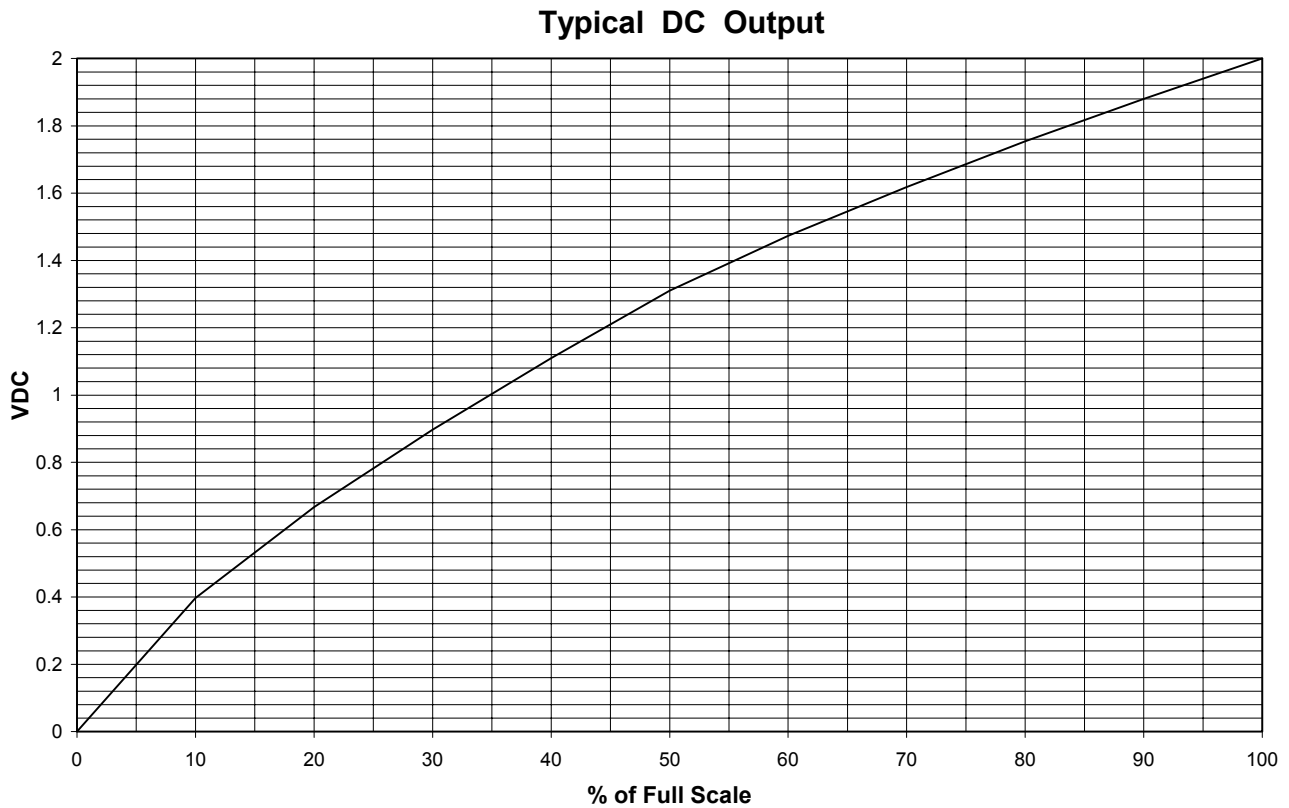
To prevent a false alarm after AC power failures, a two (2) second delay circuit has been incorporated in the trip lines.



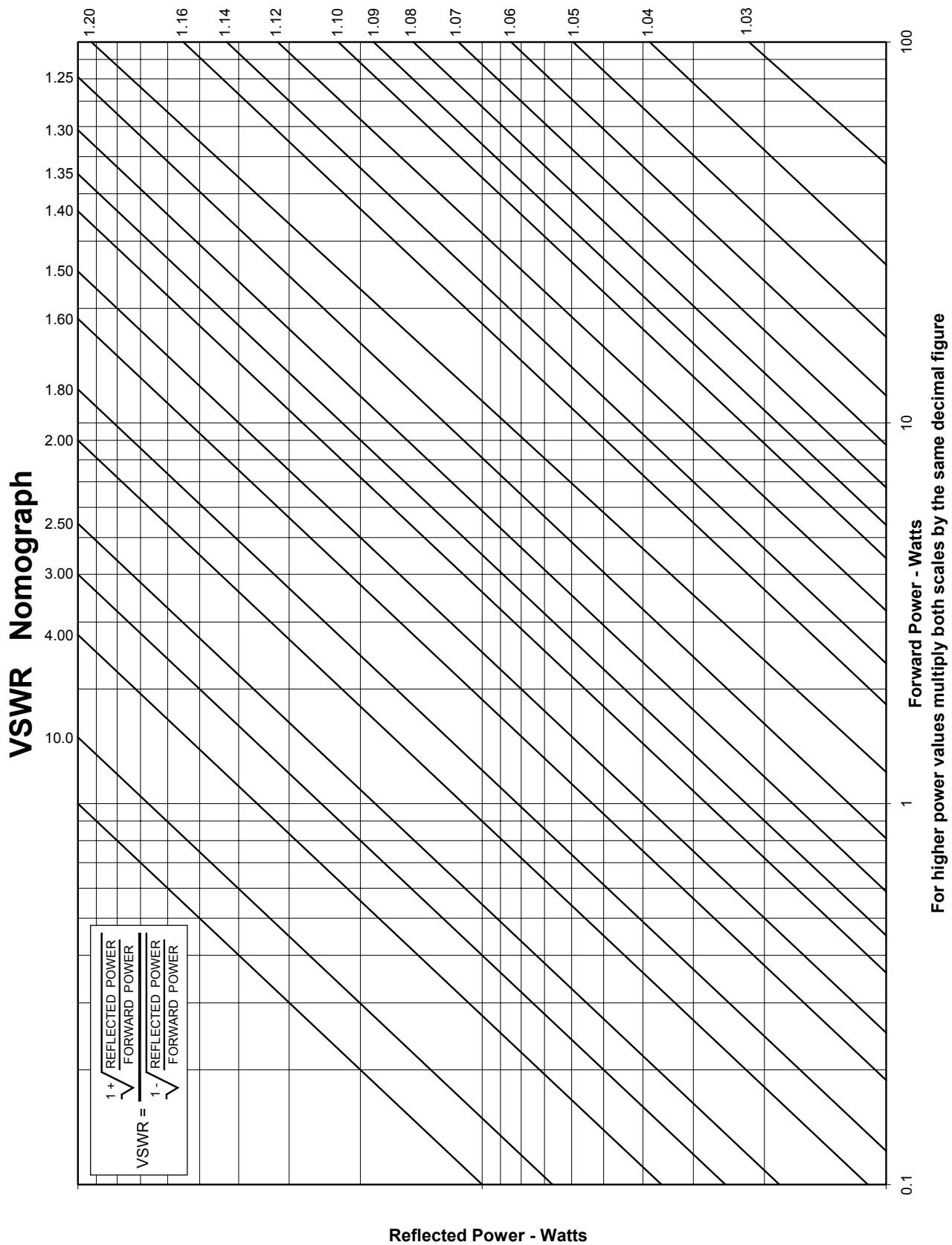
## 2.4 Load Adjustments

If adjustment at the load is required without interruption by the Model 81070, remove the jumper on the barrier strip terminals 9 and 10. If a remote reset is being employed, disconnect the switch until the adjustments are complete.

After completion of the adjustments, reconnect the jumper or switch for normal operation.

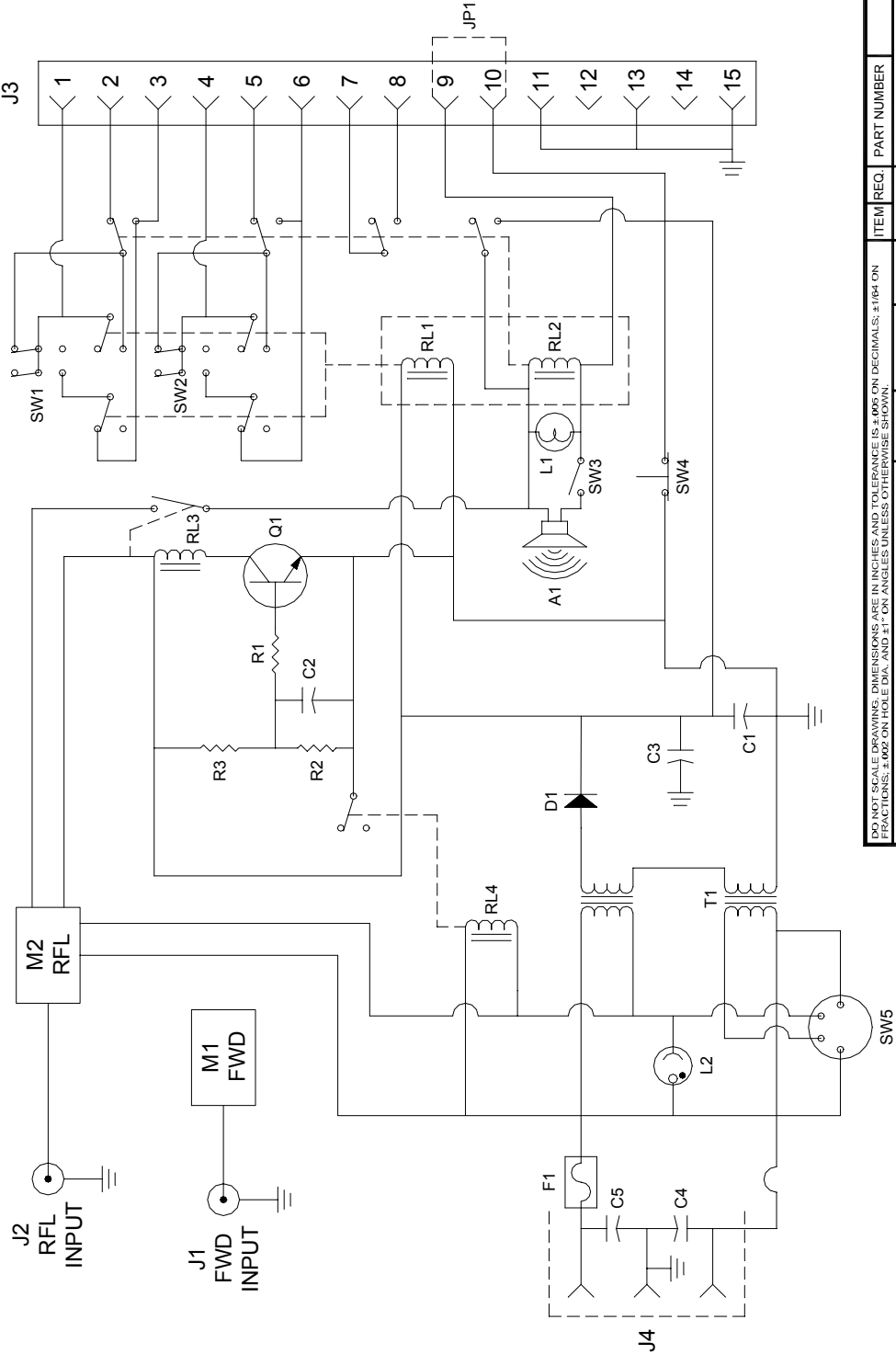


**Figure 2** (For Model 81070-200 Option)



**Figure 3**

REVISIONS



DWG. NO. 81070-099

DO NOT SCALE DRAWINGS. DIMENSIONS ARE IN INCHES AND TOLERANCE IS $\pm .005$ ON DECIMALS; $\pm 1/64$ ON FRACTIONS; $\pm .002$ ON HOLE DIA. AND $\pm .1^\circ$ ON ANGLES UNLESS OTHERWISE SHOWN.		ITEM REQ	DESCRIPTION	
DRAWN	CHECKED	APPROVED	COAXIAL DYNAMICS	
SCALE	MATERIAL		CLEVELAND, OHIO, USA	
10/11/99	SCHEMATIC, MODEL 81070		CODE IDENT #	DRAWING NUMBER
FINISH	USED ON		32186	81070-099
				SIZE
				B

## PARTS LIST FOR 81070

<u>Designation</u>	<u>Description</u>	<u>CDI P/N</u>
A1	Alarm	9946
C1	Capacitor, 1000uF, 35 VDC	9269
C2	Capacitor, 100uF, 16 VDC	9270
C3	Capacitor, 0.1uF, 50 VDC	9274-1
C4, C5	Capacitor, 0.01uF, 1000 VDC	9285
D1	Diode, Silicon	9419-1
F1	Fuse, .125 Amps, 250 VAC	9335
J1, J2	Connector, Miniature Audio	9087-2
J3	Barrier Strip	9572-2
J4	AC Power Receptacle	9129
JP1	Jumper	9573
L1	Lamp (part of SW4)	9904
L2	Lamp	9942
M1	Meter, Forward	9761-1
M2	Meter, Reflected	9765-1
Q1	Transistor, Silicon	9425-1
R1	Resistor, 10K Ohms, 1/4 W	9300-8
R2	Resistor, 18K Ohms, 1/4 W	9300-29
R3	Resistor, 100K Ohms, 1/4 W	9300-16
RL1, RL2	Relay, 4PDT	9731
RL3	Relay, SPST	9732
RL4	Relay, DPDT	9735
SW1, SW2, SW3	Switch, DPDT	9917
SW4	Switch, Momentary, DPST	9947
SW5	Switch, Voltage Selector	9855
T1	Transformer	9730-1

