

RT-202 & RT-300

AUTOMATIC RADIO DIRECTION FINDERS FOR SAR, MOB AND COMMUNICATIONS



RT-300



RT-202

- Extended range, high sensitivity
- High bearing accuracy better than $\pm 5^\circ$
- Relative bearing; magnetic or true north (RT-300)
- VHF: 121.500 MHz; 118.000 to 124.00 (RT-300)
- Marine: 156.000 to 162.025 MHz (RT-300-VS)
- UHF: 241.000 to 245.000 (RT-300-VU)
- Monitoring of 121.500 MHz; and CH16 (RT-300)
- RS-232, RS-485, NMEA (RT-300), Alarm relay (RT-300)
- Self-contained Antenna-Receiver unit
- Easy installation, no RF cables into display unit



**AFFORDABLE
ALL-PURPOSE
RDFs**



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Circuits and components

When we look at a board filled with resistors, capacitors, transistors, chips etc., we often don't look very close at what is going on or how all this stuff is wired together. It just looks very impressive and neat, but there is far more to it than that. Every component on that board is there for a reason, and we are going to discuss this in the next few issues.

In DC circuits, there are series and parallel circuits. We talked about this earlier using Ohm's Law. Resistors (passive component) can be used to make voltage and current dividers by using more than one in a series arrangement. By doing this you can control the voltage drop for a known value and drop the voltage at a given point in the circuit. In other words, if you have a 10Vdc supply and put two 5Ω resistors in series across the supply, you will read 5Vdc at the mid-point on the negative terminal on the supply. This is a voltage divider. You might also want to run LED lights from this same 10 volt supply but the LEDs run at 2 volts. We calculate the value of the voltage drop needed from the known current that the LED will

draw and insert it in series with the LED. This circuit is a current divider circuit and regulates the current the LED can draw. You can install a potentiometer (variable resistor) in the circuit and dim the LED by turning the knob on the potentiometer and increasing the resistance, which will increase the voltage drop. Potentiometers are used a lot in radio audio circuits to control the volume, squelch, etc.

There are many components used today to control voltage and current and most require passive devices in the circuit. Zener diodes are one device used to control voltage, and resistors are almost always used in these circuits throughout the radio.

The other devices that we do not give much thought to are switches. Switches are used today in almost all electronic equipment. Most of us do not think of processor chips as switches but that is just what they are. Processors make decisions by opening (logic 0 state) or closing (logic 1 state) and sometimes no state. We think of switches as something that you toggle on and off with your finger or hand. These devices are used to stop current flow (open state or logic 0) or start current flow (closed state or logic 1). Switches come in many different types and are rated by the current they can handle and the voltage rating of the insulated material they are made from. Some of these switches are set in oil-filled tanks for high voltage and high-current operations. Other forms of switches are relays, which are normally controlled from a voltage source for remote operation.

So far I have talked about mechanical devices, and these devices can have more than one contact, some have multiple contacts (2, 4, 6, 8, 12, etc.). They also can be more than just open and closed. They can be double pole double through. In other words there is an A and B contact with the center (C for common) being the feed point.

These switches have no true off position—A is closed and B is open or A is open and B is closed. A switch with only one contact and either open or closed is known as a SPST (single pole single through) switch (on-off). A switch with A and B contacts is known as SPDT (single pole double through) switch (on-on). Some of these switches have a center off position (on-off-on). If there is more than one pole, they are labeled by the number of poles, SPDT, OR DPDT (double pole (2) double through [A-B]), or DPST (double pole single through).

There are rotary switches with many positions and gangs (used a lot in radio) and many other forms of mechanical and remote relay systems. Today, a lot of these functions are being done by switch transistors and integrated chip technology. In many of our new radio and electronic devices, these decisions are being made by a key stroke on a keyboard or a face panel on the equipment. These devices come in many names, such as shift registers, flip flops, ring counters, processors, etc. All of these devices are switching data in and out. They all function on a logic 1 or 0 count, pass current or not.

Another type of device that is a switch but not thought of one very much is a fuse or circuit breaker. These devices operate on power consumption (heat). As the element heats up it will open the circuit at some point according to its rating and current will no longer flow. The same is true for a circuit breaker. These devices work on the same principle and will trip open and current will no longer flow. You have to reset the circuit breaker and turn it back on. These devices also act as a SPST OR DPST OR 3PST SWITCH in the electrical panels. The next time you look at a board, take a closer look—you may be surprised at what you find.

Next: We will discuss AC Theory and Reactance, a word that most do not understand. When this section is done you will understand reactance and be able to calculate it.

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