

# **ACC100D (Digital Audio Inputs) Low Power FM Broadcaster**

**Sold Exclusively by Progressive Concepts. Circuit Design by Panaxis Productions**

The ACC100D is a quartz stabilized microprocessor and phase-locked-loop DIRECT FM modulated transmitter with digital audio inputs. This unit provides short range broadcasting to any FM receiver and/or portable FM radios. Typical applications include:

- (1) Advertising of homes for sale, or products for sale, to passing automobiles
- (2) Broadcast of church services and/or PA systems to the hearing impaired
- (3) Re-broadcast of TV sound to institutional inmates equipped with portable radios and earphones, then switching off speakers to reduce ambient noise levels – several TV's may be operated in an area without sound interference.

## ***Specifications:***

|                          |  |
|--------------------------|--|
| <b>Frequency</b>         | <b>87.9 MHz to 107.9 MHz in discreet 100KHz increments</b>         |
| <b>RF Output</b>         | <b>FCC Part 15 operation, 250 microvolts per meter at 3 meters</b> |
| <b>Harmonics</b>         | <b>-40 dB or better across band</b>                                |
| <b>Channels</b>          | <b>Selected by direct-reading rotary switches</b>                  |
| <b>Audio Response</b>    | <b>20Hz to 20KHz (mono)</b>  |
| <b>Audio Input</b>       | <b>Coaxial Digital RCA or Fiber Optic TOSLINK</b>                  |
| <b>Audio Level</b>       | <b>Line level, typical of TV, VCR, CD and PA system output</b>     |
| <b>Power Supply</b>      | <b>12 volts, 100 ma. DC wall adapter (supplied)</b>                |
| <b>Circuit Board</b>     | <b>2-sided epoxy glass, extremely rugged</b>                       |
| <b>Size &amp; Weight</b> | <b>1.5" x 4.1" x 5.5", 13 ounces</b>                               |
| <b>Antenna</b>           | <b>20-inch fixed-length wire</b>                                   |
| <b>Range</b>             | <b>50 to 300 feet dependent on sensitivity of the receiver</b>     |

**This device complies with CFR Title 47, Part 15 of the FCC Rules governing the use of low power radio frequency devices. It may be operated on the FM band without a license. Operating range may vary from 50 to several hundred feet depending on the sensitivity of the receiver. Operation must cease if this unit causes interference to licensed radio stations; however, it is not protected from receiving interference. Internal modification or change in the length of the fixed-wire antenna may void FCC certification.**

## ***Warranty & Repair***

This device is warranted for a period of two years from date of sale against defects in materials and workmanship. The user should not attempt repair or modification of this device. Contact customer support if you experience problems or need repairs.

***Progressive Concepts  
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***(630) 736-9822***

***(630) 736-0353 fax***

***Frequency Selection***

The operating frequency is selected by the rotation of three rotary switches accessible through the left side of the rectangular cutout on the rear panel of the enclosure. The circuit’s microprocessor accepts only frequencies between and including 87.9 MHz and 107.9 MHz. Any other setting is invalid and will default automatically to 88.1 MHz.

**Example of switch settings**

|                  | <b>S1<br/>(10’s)</b> | <b>S2<br/>(1’s)</b> | <b>S3<br/>(.1’s)</b> | <b>Resulting Frequency</b> |
|------------------|----------------------|---------------------|----------------------|----------------------------|
| <b>(Invalid)</b> | <b>7</b>             | <b>9</b>            | <b>6</b>             | <b>88.1 MHz (default)</b>  |
| <b>(Valid)</b>   | <b>8</b>             | <b>7</b>            | <b>9</b>             | <b>87.9 MHz</b>            |
| <b>(Valid)</b>   | <b>8</b>             | <b>8</b>            | <b>1</b>             | <b>88.1 MHz</b>            |
| <b>(Valid)</b>   | <b>9</b>             | <b>1</b>            | <b>5</b>             | <b>91.5 MHz</b>            |
| <b>(Valid)</b>   | <b>0</b>             | <b>7</b>            | <b>9</b>             | <b>107.9 MHz</b>           |
| <b>(Invalid)</b> | <b>0</b>             | <b>8</b>            | <b>0</b>             | <b>88.1 MHz (default)</b>  |

***Frequency of operation***

Select a channel which will not interfere with the reception of a commercial FM station and which will not interfere with your reception of the ACC100-D. These should be frequencies ending with .1, .3, .5, .7, or .9 Stagger individual frequencies when several ACC100’s are used in the same area, usually 3 to 5 channels apart will suffice such as 98.1, 98.9, 99.7, 100.5, etc.

***After the frequency has been set, disconnect the power supply for 5 seconds. The ACC100-D will return to the set frequency automatically whenever it is switched on and when power is restored after a power outage.***

***Digital Audio Connections***

For Coaxial Digital: Simply connect the ACC100-D to your audio source using the supplied RCA Digital Audio Cable. If your audio source has only a TOSLINK Optical output, you will need a TOSLINK Optical Cable. TOSLINK Cables are available from Progressive Concepts in 3’, 6’ and 12’ lengths (Part numbers TOS3, TOS6 and TOS12).

***Digital Audio Formats***

The model ACC100-D supports both PCM and S/PDIF Digital Audio Formats. Sampling rates of 32, 44.1, 48, and 96 KHz are also supported. Audio levels can still be adjusted using R36 on the main pc board found inside the unit. See page 4 for details.

***Stereo connections***

The ACC100-D is a monaural broadcaster. Both left and right channels of audio are internally combined into a single mono audio signal. If you require stereo audio then you may want to use the model ACC100-DS (Digital Stereo Model).

**WARNING:** You may ignore this warning if you use an audio source with an “RCA” output jack. These are typically used on consumer type audio equipment.

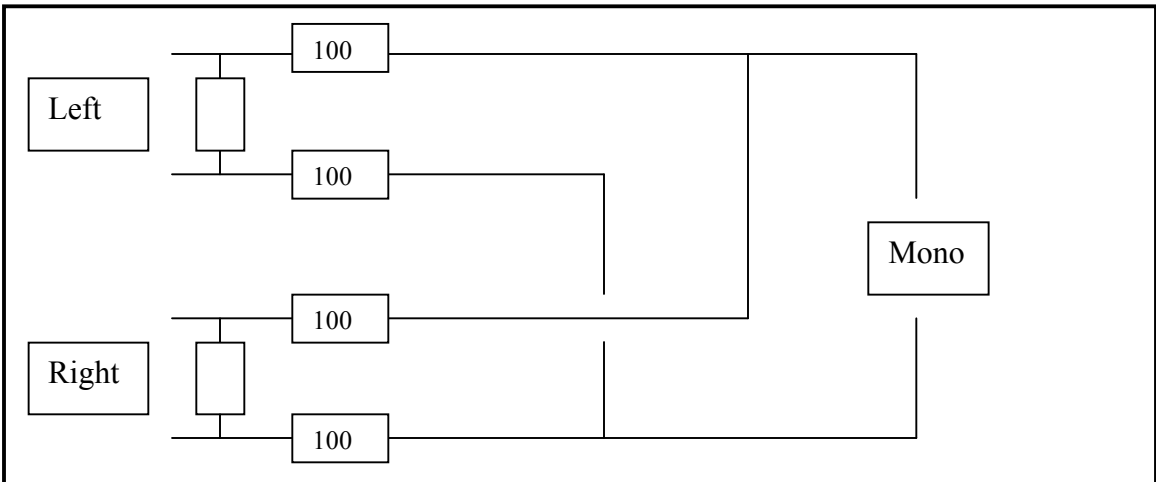
When attempting to derive audio from speaker output terminals, or from speaker wires, you must assure the source equipment is not electrically “hot”. Some equipment, especially radio and TV receivers, have internal switching power supplies, which may connect the equipment to one side of the AC power line. Touching the chassis, or any conducting device connected to the chassis, could result in a lethal electrical shock.

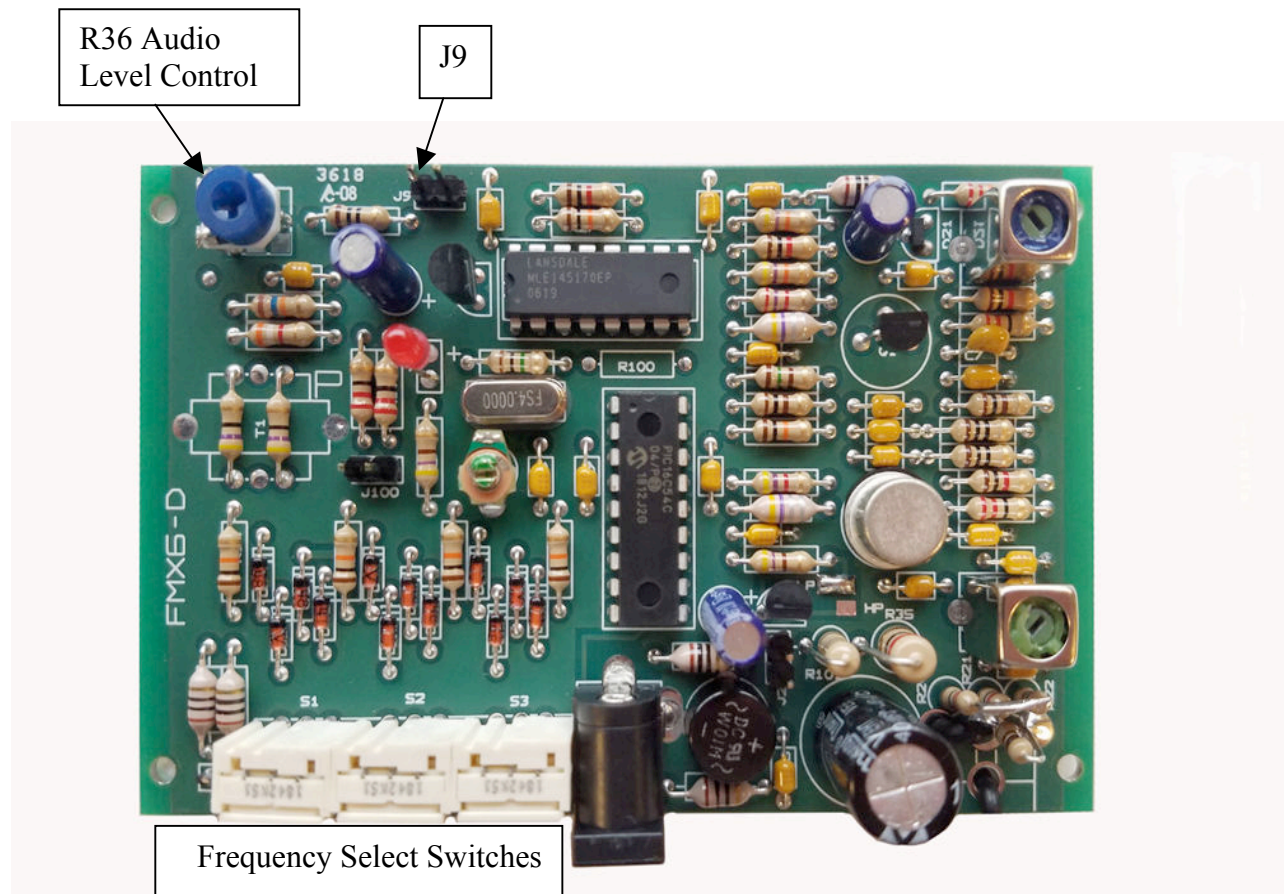
Therefore, if you intend to use speaker wires as your audio source, assure that neither speaker lead has an electrical potential in respect to “ground”. A simple AC and DC test with a multimeter connected between each speaker lead and a grounded object can determine if you have a safe connection.

Speaker leads, where one lead is common to “ground” or to the equipment chassis, and is not “hot” as described above, may be connected by way of an RCA plug and cable. You must assure the speaker ground connects to the cable shield (shell of RCA plug).

Speaker leads where both leads are “floating” and no common or chassis connection exists should use a “balanced” audio connection. A balanced audio isolation transformer is available separately for this purpose. To utilize this feature you must remove the RCA jack. Remove the 2 screws on the blank panel end of the ACC100. Slide the cover forward. Install the audio transformer. Cut the audio wires close to the RCA jack. Remove the jack and replace with a rubber grommet. Splice a pair of wires to the wires just removed from the jack. Pass your wire pair through the grommet. Slide back the cover and reinstall the blank panel. Now, neither audio lead connects to the chassis.

If required, the following circuit combines stereo channels to produce a balanced monaural output. Resistors are 100 -1000 Ohms each. If the sources are speaker leads, where the speaker is disconnected, you may want to terminate the leads with 5 watt resistors equal to the impedance of the removed speakers – typically 8 or 16 Ohms.





The ACC100D - Version 6 incorporates some changes for easier use. The original radio frequency circuitry and the associated parts placement remains exactly the same as in previous versions. There are no changes in the RF characteristics or modulator circuits.

A manual audio level control (R36) with a value of 1000 Ohms has been substituted for the original 1000 Ohm fixed resistance as the termination for the pre-emphasis network. This level control can be used to set your audio level to match any source audio from -20dB to +20dB.

The potentiometer may be replaced with a fixed resistor if desired; however a solder bridge is then required on pads located where the potentiometer would have been located. As before, if a multiplex signal is injected at J9 then one lead of R4 should be clipped to avoid degradation of the signal by the pre-emphasis network.

The audio transformer has been removed to increase audio quality. If you require an audio isolation transformer contact Progressive Concepts. The frequency selection switches have been moved closer to the edge of the circuit board to provide easier setting of the frequency.

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Thank you for your purchase and inquiry.

By FCC Rules the ACC100 is restricted in output power and range when used in the United States. FCC certification is void if the unit is modified in any way. Operation without certifications is not permitted in the United States, except by agencies of the US Government.

When operating the unit outside the United States, or if the unit will be operated by the Government of the United States, certain modifications may be made by the purchaser to increase range.

- (1) Remove the two screws on the blank panel end of the enclosure. Slide the cover back so the circuit board can be seen. Look at the point on the circuit board where the antenna wire is connected. There are three resistors standing on end in a row with a bridging wire across the top of them. There is also one resistor standing on end next to the three. That resistor has one bare wire lead exposed. Cut the lead and separate the two ends. Slide the cover closed and replace the panel and screws. This should give a range of 100 to 150 feet using a portable radio.
- (2) If greater range is required the circuit board must be removed from the case. Remove the control panel end of the enclosure. Tack solder a 10 to 100 Ohm resistor on the bottom of the circuit board so that it is connected to the two terminal pads of the 470 Ohm resistor which is located on the top of the board. This resistor is found next to a green choke with yellow, violet, silver, silver, stripes on it. The color code for the 470 Ohm resistor is yellow, violet, brown, (silver or gold). This should provide a range of 200 feet or more.
- (3) If greater range is still required then remove the solder bridge jumper located next to the 470 Ohm resistor marked "LP" (Low Power) and move it to the nearby position marked by a white line saying "HP" (High Power) jumper.
- (4) Any further modification requires the FMX schematic diagram for guidance.