



RangeStud Professional Grade FM Transmitter

ADJUSTABLE
RANGE
STUD



Package Contents:

- 1-20W RangeStud FM Transmitter
- 1-12V 4 A Power Adapter
- 1-Power Cord
- 1-Amateur Grade Tunable ¼ Wave FM Antenna +
30' Amateur Grade BNC Male x BNC Male Cable

Instructions:

1. Connect properly tuned antenna cable (see Antenna Tuning Instructions) to antenna port (B). (DO NOT operate transmitter without properly tuned antenna connected, damage may occur to the unit such as overheating)
2. Connect power to the Power Jack (A).
3. Connect audio source using 3.5mm male audio cable. Connect one end to Audio Input Jack (C) on the transmitter. Connect the other end of the cable to audio output jack /headphone jack of the source device (ie: MP3 player, iPod, PC, MAC, PDA, DVD player, etc.)
4. Optional – transmitting from a microphone: You may transmit audio from a microphone by connecting a stereo plug-type microphone to the microphone input jack

(DO NOT USE A MONO PLUG-TYPE MICROPHONE, DOING SO MAY CAUSE PERMANENT DAMAGE)

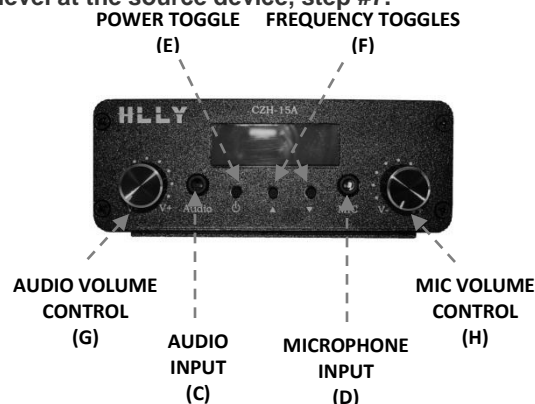
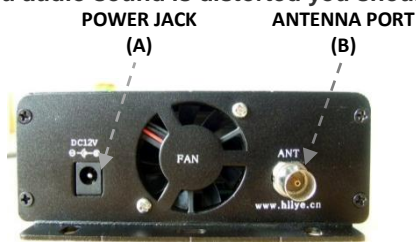
5. Power unit ON using by pressing down Power Toggle (D). LCD will come on.
6. Set transmitting frequency using the Frequency Toggle Buttons (E). (Helpful hint: You should pre-scan your local FM frequencies using an FM radio or www.radio-locator.com to find an unused frequency and set the transmitter to this frequency).
7. Refer to Antenna Tuning Section
8. Set volume level on the audio source device (ie: MP3 player, iPod, PC, MAC, PDA, DVD player, etc.) Optimal audio level varies for each type of device and recorded audio volume. Generally you should set audio level at about 50-60% and slowly increase to optimum level

(IF AUDIO IS SET TOO HIGH IT WILL CAUSE DISTORTION IN THE RECEIVING RADIO)

Helpful Hint: Setting volume level (PC/Mac). When using the 20 Watt RangeStud FM Transmitter with a PC or MAC computer the volume level will need to be optimized at all three different sources: (1) computer sound card, (2) Media player software and (3) FM receiver radio. Set audio level at about 50% and slowly increase to optimum level. Audio should also be increased at the FM radio receiver to optimum level.

9. Set volume level on FM transmitter using Audio and Microphone Volume Controls (G & H) and then on radio receiver: When the source audio level is optimized you should be able to have full audio level range with the FM receiver radio without any distortion and crystal clear audio.

If you audio sound is distorted you should lower the volume level at the source device, step #7.



Six Common Rules for All Users:

1. The AC adapter supplied is designed for dry indoor use only. DO NOT use the AC adapter outdoors or in wet conditions.
2. Make sure the supplied antenna is connected at all times when transmitter unit is powered ON. This will prevent damage to your unit.
3. For best results, try to find an open (unused) frequency to transmit on (<http://www.radio-locator.com>). Do not transmit on occupied commercial radio station frequency; for legal and ethical reasons.
4. Always follow your local regulations regarding the proper use of an FM transmitter.
5. Only use power adapters supplied with your unit. Using other types of power adapters may produce background noise with your transmitted audio and/or could damage your unit.
6. When transmitting from a microphone; only use a stereo plug microphone, using any other type of microphone such as a mono plug microphone will permanently damage your unit, see "Operating Instructions - step #4"
7. Always ensure that proper antenna tuning methods were used. Be resourceful, this Instruction Manual is only a guide...
FM Radio Transmission is a very tedious task and many variables factor into how clear your signal gets. DAGCO Electronics has done the best they can to make this unit as "Plug and Play" ready as possible!

Troubleshooting:

1. **Transmitting volume is too low:** Make sure to increase volume level of audio source device to at least 50% level. When using transmitter with PC or Mac computer the volume will need to be set at three different levels, see step #7 in operating instructions section.
2. **Transmit range is too low:** The transmit range will vary as per your environment, antenna type, power supply, and/or frequency setting. Placing the transmitter (or antenna) on the highest altitude inside or outside of a building with the least amount of obstacles will give you the optimum range. In addition, optimizing the antenna tuning with the help of a SWR Meter would be recommended!
3. When using transmitter with satellite receiver, TV or DVD player audio the sound is distorted: These types of audio/video devices generally do not have volume control capabilities. Therefore, simply adjust (G) Audio Volume Control.
4. **There is a constant hum on my radio:** Proper grounding techniques and tuning of the antenna are very important steps (See the Antenna Tuning Section). Also, make sure any input wire coming into the transmitter has an RF Noise Filter (Ferrite). *Remember: Every frequency has a unique antenna setting!*

New Adjustable Output Level Feature:

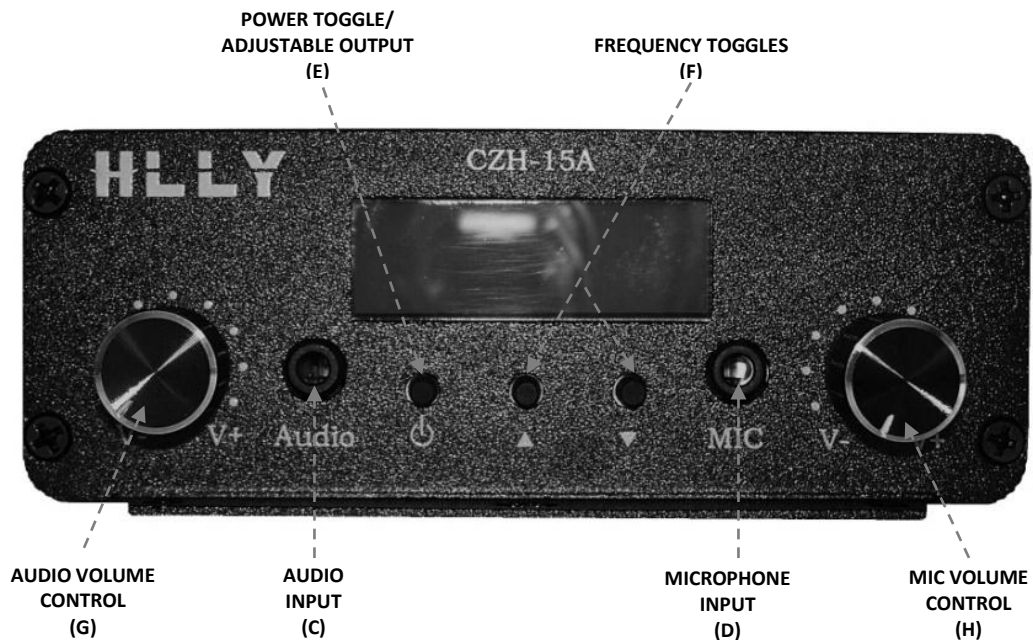
To adjust from High to Low Output Mode

1. From 'OFF' press and hold the Power Toggle / Adjustable Output (E)
2. 'H' or 'L' will appear on the screen
3. Press the Frequency Toggles (F) to toggle between H-High 20 Watt and L- Low 1 Watt Mode
4. Press Power Toggle / Adjustable Output to Exit
5. Press Power Toggle / Adjustable Output (E) to Power Unit On



To view Internal Temperature

1. From 'OFF' Press Power Toggle / Adjustable Output (E) to Power Unit On
2. Press and hold the Power Toggle / Adjustable Output (E)
3. Temperature in Celsius appears on the screen
4. Press Power Toggle / Adjustable Output to Exit

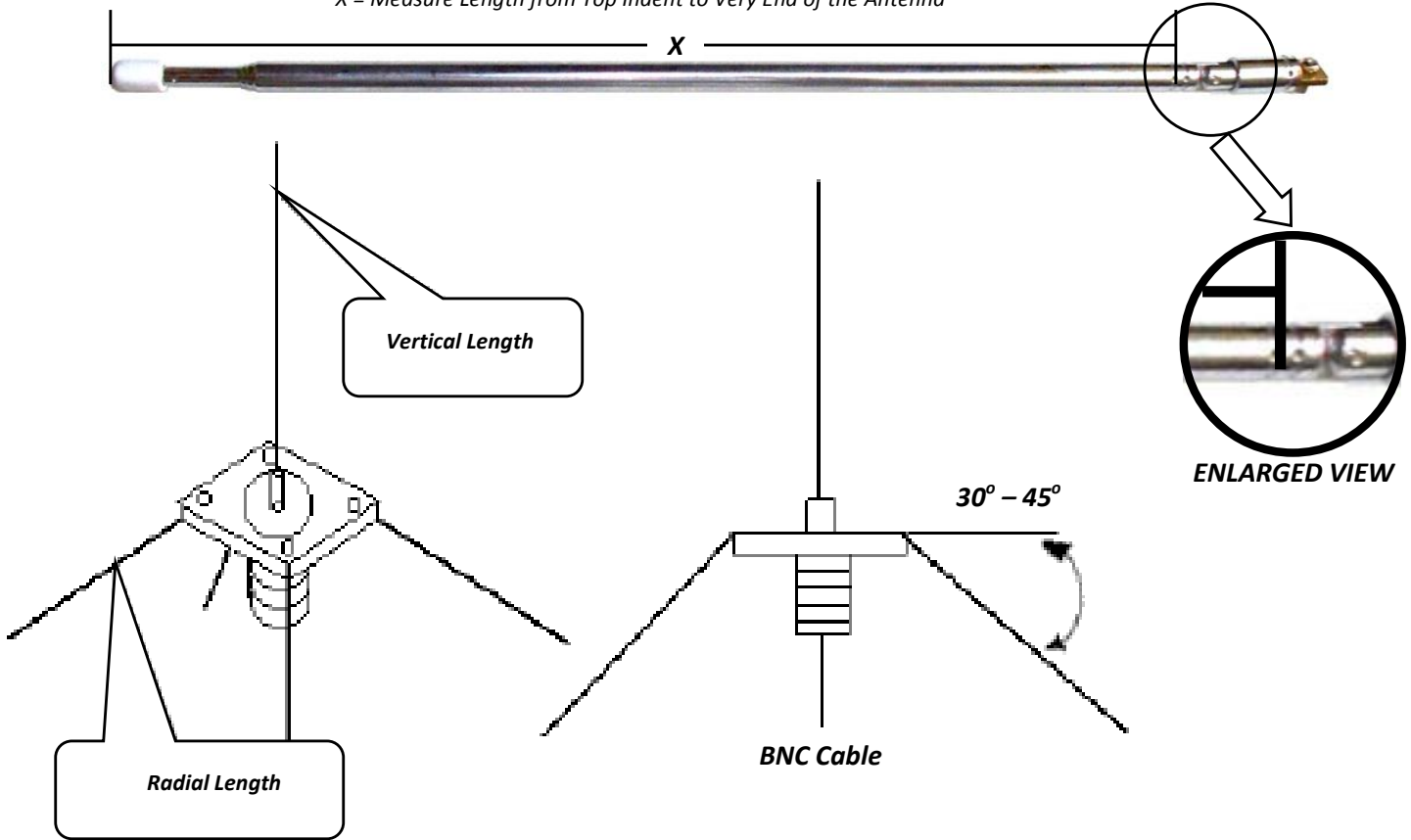


Tuning your FM Antenna

DAGCO Electronics has done its best to simplify this unit to be tuned as easy as possible. Improper tuning MAY DAMAGE your transmitter and will void warranty. FM radio transmission is a very tedious task! Please note that RF Engineers have designed and have been contacted to clarify this issue as best as possible! See diagrams below and simply adjust the radials to the desired frequency lengths: Please note that all measurements are from the base of the antenna (see below pictures), not from the connector (to verify you are measuring correctly, the length of a fully extended antenna is 33 inches).

1/4 WAVE FM ANTENNA + COAX CABLE

X = Measure Length from Top Indent to Very End of the Antenna



Tuning Your FM Antenna (continued)

Frequency (MHz)	Vertical Length (Inches)	Radial Length (Inches)	Frequency (MHz)	Vertical Length (Inches)	Radial Length (Inches)	Frequency (MHz)	Vertical Length (Inches)	Radial Length (Inches)	Frequency (MHz)	Vertical Length (Inches)	Radial Length (Inches)
87.0	32.28	32.28	92.3	30.42	30.42	97.6	28.77	28.77	102.9	27.29	27.29
87.1	32.24	32.24	92.4	30.39	30.39	97.7	28.74	28.74	103.0	27.26	27.26
87.2	32.20	32.20	92.5	30.36	30.36	97.8	28.71	28.71	103.1	27.24	27.24
87.3	32.16	32.16	92.6	30.32	30.32	97.9	28.68	28.68	103.2	27.21	27.21
87.4	32.13	32.13	92.7	30.29	30.29	98.0	28.65	28.65	103.3	27.18	27.18
87.5	32.09	32.09	92.8	30.26	30.26	98.1	28.62	28.62	103.4	27.16	27.16
87.6	32.05	32.05	92.9	30.23	30.23	98.2	28.59	28.59	103.5	27.13	27.13
87.7	32.02	32.02	93.0	30.19	30.19	98.3	28.57	28.57	103.6	27.10	27.10
87.8	31.98	31.98	93.1	30.16	30.16	98.4	28.54	28.54	103.7	27.08	27.08
87.9	31.95	31.95	93.2	30.13	30.13	98.5	28.51	28.51	103.8	27.05	27.05
88.0	31.91	31.91	93.3	30.10	30.10	98.6	28.48	28.48	103.9	27.03	27.03
88.1	31.87	31.87	93.4	30.06	30.06	98.7	28.45	28.45	104.0	27.00	27.00
88.2	31.84	31.84	93.5	30.03	30.03	98.8	28.42	28.42	104.1	26.97	26.97
88.3	31.80	31.80	93.6	30.00	30.00	98.9	28.39	28.39	104.2	26.95	26.95
88.4	31.76	31.76	93.7	29.97	29.97	99.0	28.36	28.36	104.3	26.92	26.92
88.5	31.73	31.73	93.8	29.94	29.94	99.1	28.33	28.33	104.4	26.90	26.90
88.6	31.69	31.69	93.9	29.90	29.90	99.2	28.31	28.31	104.5	26.87	26.87
88.7	31.66	31.66	94.0	29.87	29.87	99.3	28.28	28.28	104.6	26.85	26.85
88.8	31.62	31.62	94.1	29.84	29.84	99.4	28.25	28.25	104.7	26.82	26.82
88.9	31.59	31.59	94.2	29.81	29.81	99.5	28.22	28.22	104.8	26.79	26.79
89.0	31.55	31.55	94.3	29.78	29.78	99.6	28.19	28.19	104.9	26.77	26.77
89.1	31.52	31.52	94.4	29.75	29.75	99.7	28.16	28.16	105.0	26.74	26.74
89.2	31.48	31.48	94.5	29.71	29.71	99.8	28.14	28.14	105.1	26.72	26.72
89.3	31.44	31.44	94.6	29.68	29.68	99.9	28.11	28.11	105.2	26.69	26.69
89.4	31.41	31.41	94.7	29.65	29.65	100.0	28.08	28.08	105.3	26.67	26.67
89.5	31.37	31.37	94.8	29.62	29.62	100.1	28.05	28.05	105.4	26.64	26.64
89.6	31.34	31.34	94.9	29.59	29.59	100.2	28.02	28.02	105.5	26.62	26.62
89.7	31.30	31.30	95.0	29.56	29.56	100.3	28.00	28.00	105.6	26.59	26.59
89.8	31.27	31.27	95.1	29.53	29.53	100.4	27.97	27.97	105.7	26.57	26.57
89.9	31.23	31.23	95.2	29.50	29.50	100.5	27.94	27.94	105.8	26.54	26.54
90.0	31.20	31.20	95.3	29.46	29.46	100.6	27.91	27.91	105.9	26.52	26.52
90.1	31.17	31.17	95.4	29.43	29.43	100.7	27.88	27.88	106.0	26.49	26.49
90.2	31.13	31.13	95.5	29.40	29.40	100.8	27.86	27.86	106.1	26.47	26.47
90.3	31.10	31.10	95.6	29.37	29.37	100.9	27.83	27.83	106.2	26.44	26.44
90.4	31.06	31.06	95.7	29.34	29.34	101.0	27.80	27.80	106.3	26.42	26.42
90.5	31.03	31.03	95.8	29.31	29.31	101.1	27.77	27.77	106.4	26.39	26.39
90.6	30.99	30.99	95.9	29.28	29.28	101.2	27.75	27.75	106.5	26.37	26.37
90.7	30.96	30.96	96.0	29.25	29.25	101.3	27.72	27.72	106.6	26.34	26.34
90.8	30.93	30.93	96.1	29.22	29.22	101.4	27.69	27.69	106.7	26.32	26.32
90.9	30.89	30.89	96.2	29.19	29.19	101.5	27.66	27.66	106.8	26.29	26.29
91.0	30.86	30.86	96.3	29.16	29.16	101.6	27.64	27.64	106.9	26.27	26.27
91.1	30.82	30.82	96.4	29.13	29.13	101.7	27.61	27.61	107.0	26.24	26.24
91.2	30.79	30.79	96.5	29.10	29.10	101.8	27.58	27.58	107.1	26.22	26.22
91.3	30.76	30.76	96.6	29.07	29.07	101.9	27.56	27.56	107.2	26.19	26.19
91.4	30.72	30.72	96.7	29.04	29.04	102.0	27.53	27.53	107.3	26.17	26.17
91.5	30.69	30.69	96.8	29.01	29.01	102.1	27.50	27.50	107.4	26.15	26.15
91.6	30.65	30.65	96.9	28.98	28.98	102.2	27.48	27.48	107.5	26.12	26.12
91.7	30.62	30.62	97.0	28.95	28.95	102.3	26.32	26.32	107.6	26.10	26.10
91.8	30.59	30.59	97.1	28.92	28.92	102.4	26.29	26.29	107.7	26.07	26.07
91.9	30.55	30.55	97.2	28.89	28.89	102.5	26.27	26.27	107.8	26.05	26.05
92.0	30.52	30.52	97.3	28.86	28.86	102.6	26.24	26.24	107.9	26.02	26.02
92.1	30.49	30.49	97.4	28.83	28.83	102.7	26.22	26.22	108.0	26.00	26.00
92.2	30.46	30.46	97.5	28.80	28.80	102.8	26.19	26.19			

A brief introduction to the rules of the FCC and your FM Transmitter

It is the policy of DAGCO Electronics, that knowing and observing the lawful use of all transmitters is a first responsibility of our end users. We do not endorse any unlawful use of any of our transmitters, and we try to give you as much common sense help about normal and lawful use as we can. Further, it is the policy of DAGCO Electronics to cooperate with all applicable federal regulations in the design and marketing of our electronic devices. Finally, we urge all of our overseas customers to observe the regulations of their own national telecommunications authorities. In all instances, compliance with FCC rules in the operation of what the FCC terms an "intentional radiator" is always the responsibility of the user of such an "intentional radiator".

DAGCO Electronics only offers this information to make the user aware of the full impact a transmitter can have. In no way should this brief discussion be construed as a definition of the FCC rules, it is the users obligation to obtain a copy of the rules and operate legally according to them. ***DAGCO Electronics makes no representation as to the following discussion being legally correct - it is simply offered as an introduction to the responsibilities that a user must realize.*** To order your copy of the FCC rules part 15, call the US Government, Superintendent of Documents, at 202-512-1800, or fax at 202-512-2250. To order the correct document, ask for "CFR Title 17: Parts 1 to 199." The cost is \$24.00. Master Card and Visa are accepted.

The present edition of Part 15 of the FCC rules provides detailed guidance on ALL aspects of using a low-power transmitter. The main points to consider are; to remain within the field strength limitations, that you may not cause any interference whatsoever to licensed broadcast services, and that you must be willing to put up with any interference that you may experience. Remember, the FCC doesn't need to be bothered by policing a privilege given to unlicensed operators. If the rules are flagrantly violated, they might just revoke the privilege altogether!

If you become further fascinated with the service rendered by low-power broadcasting, other FCC regulations explain how to apply for a license or other authorization which may permit you to upgrade your equipment to accomplish any objective which the FCC sees to be in the public interest and not interfering with other authorized uses of the radio spectrum.

Lawful use suggestions:

- Follow instructions.
- Use the stock antenna supplied within the case.
- Do not modify your transmitter in any way.
- Check your intended operating frequency very carefully, to ensure you will not cause interference to reception of licensed broadcasting. (<http://www.radio-locator.com>)
- If you receive ANY complaint about your transmissions interfering with broadcast reception, stop or change your operation IMMEDIATELY.
- If you are contacted by the FCC regarding use of this device, cooperate fully and promptly.
- Do your own homework and research to understand and comply with present and future FCC rulings concerning devices of this kind. Do not rely only upon this short discussion.
- Do not use made-up "station call signs" to identify your transmissions. Only the FCC has the authority to issue such call signs. Use some other way to identify your transmitting activity, such as "This is Stereo 90.5, Seabreeze School Student Music Radio," and so forth.
- Identify the location and purpose of your transmissions from time to time. This is common courtesy toward other persons who may hear your signal. The FCC is toughest about clandestine transmission which cost time and money to track down.
- Do not assume that the mere fact that you purchased this transmitter gives you any specific right to use it for any purpose beyond generating a low-level RF signal which is barely detectable beyond the perimeter of your personal dwelling space.

Finally, the FCC Rules call for the posting of printed notices on devices intended for non-licensed operation under Part 15 Rules. You will find such notices written up for the front or back of the instruction manual for nearly any computer or video accessory that you have seen in recent months. Consult the Part 15 Rules for the exact wording of such notices. Following is a text for such a notice which responds to FCC rule making intentions:

NOTICE:

The individual users of this device assume responsibility for lawful uses conforming to FCC Part 15 Rules. Operation is subject to the following two conditions:

- 1. This device may not cause harmful interference, and**
- 2. This device must accept any interference received, including interference that may cause undesired operation.**

Final comment:

A well-informed person will see today's FCC Rules to be evolving and progressively less restrictive. Even though today's technology is far more complex than what was possible at the time of the Communications Act of 1934, the FCC rules are becoming more relaxed, giving radio experimenters more and more opportunities to explore many frequency bands, using many communications modes, with no need for a formal license of any kind. A thorough study of Part 15 of the FCC Rules, which is completely beyond the purpose of this brief discussion, will show you many legal uses of radio transmitting devices which do not require licensing, either amateur or commercial. To provide more personal and club radio learning opportunities, and to cut down on administrative costs, today's FCC permits far more non-licensed activity than at any time in previous history. On the other hand, today's FCC enforcement actions get bigger fines and real prison terms for scofflaws! From CB radio to easy entry-level Amateur Radio with long-term licensing, to numerous unlicensed Part 15 operations, the FCC is beginning to look out for the interest and good plans and intentions of private citizens and school-community groups as never before in radio communications history.