

# HF, VHF, UHF Technology

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**Abstract-** High frequency (HF),(3-30)MHz, and really high frequency(VHF),(30-300)MHz, radio are the backbones of communication systems from a few years. They're taking part in a significant role in country wide communication system. Sadly, there's no foolproof direct interface between these 2 radio frequencies. Plenty of analysis work had been done to make a cross patch between HF radio and VHF radio. But not enough success had been achieved. The explore for an entire answer for this cross patch circuit is still ongoing, the concept during this paper is to style a 2 method human action circuit to interface between these 2 frequency ranges can which can which is able to} not depend upon associate degree external signal rather will take the assistance of an internal signal to produce the interfacing

**Index Terms-** High frequency(HF), Very high frequency(VHF), Radio Signal Strength Indicator (RSSI), press-to-talk(PTT), signal to noise and distortion (SINAD), Dual tone multi frequency (DTMF).

## I. INTRODUCTION

### Radio HF/VHF/UHF

HF (High frequency) radio frequencies are between three and thirty megacycle. Additionally referred to as the dkm band or dkm wave because the wavelengths vary from one to 10 decameters (ten to 1 hundred meters). Frequencies straight off below HF are denoted Medium-frequency (MF), and therefore the next higher frequencies are referred to as terribly high frequency (VHF). Shortwave (2.310 - 25.820 MHz) overlaps and is slightly not up to HF.

VHF (Very high frequency) is that the oftenness vary from thirty megacycle to three hundred megacycle. Currently VHF is at the low-end of sensible frequency usage, new systems tending to use frequencies in radio frequency and EHF on top of the UHF vary. Common uses for VHF are FM broadcast, TV broadcast, land mobile stations (emergency, business, and military), long vary digital communication with radio modems, Amateur Radio,

marine communications, traffic management communications and air navigation systems (e.g. VOR, DME & ILS).

UHF (Ultra High Frequency) designates a variety of magnetism waves with frequencies between three hundred megacycle and three gigahertz (3,000 MHz), additionally referred to as the decimeter band or decimeter wave because the wavelengths vary from one one0} decimeters (10 cm to 1 meter). Radio waves with frequencies on top of the UHF band represent the radio frequency (super high frequency) and EHF (extremely high frequency) bands, all of that represent the microwave frequency vary.

## II.HF RADIO USE

The high band is extremely popular amateur radio operators, WHO will profit of direct, long-distance (often inter-continental) communications and also the "thrill factor" ensuing from creating contacts in variable conditions. International shortwave broadcasting utilizes this set of frequencies, yet as a apparently declining variety of "utility" users (marine, aviation, military, and diplomatic interests), who have, in recent years, been swayed over to less volatile suggests that of communication (for example, via satellites), however could maintain HF stations once switch-over for back-up functions. However, the event of Automatic Link institution technology supported MIL-STD-188-141A and MIL-STD-188-141B for machine-driven property and frequency choice, together with the high prices of satellite usage, have LED to a renaissance in HF usage among these communities. the event of upper speed modems like those orthodox to MIL-STD-188-110B that support knowledge rates up to 9600 bit/s has conjointly hyperbolic the usability of HF for knowledge communications. Different standards development like STANAG 5066 provides for error

free knowledge communications through the utilization of ARQ protocols.

### III.VHF RADIO USE

VHF propagation characteristics square measure ideal for short-distance terrestrial communication, with a variety usually somewhat farther than line-of-sight from the transmitter (see formula below). in contrast to high frequencies (HF), the part doesn't typically replicate VHF radio and therefore transmissions square measure restricted to the native space (and do not interfere with transmissions thousands of kilometers away). VHF is additionally less laid low with region noise and interference from electrical instrumentality than lower frequencies. while it's a lot of simply blocked by land options than HF and lower frequencies, it's less laid low with buildings and different less substantial objects than radio frequency frequencies.

### IV.UHF RADIO USE

UHF is that the most typically used frequency bands for transmission of TV signals. Fashionable mobile phones conjointly transmit and receive at intervals the radio frequency spectrum. Radio frequency is wide employed by public service agencies for two-way radio communication, typically victimization narrowband FM; however digital services square measure on the increase. Narrowband radio modems use radio frequency and VHF frequencies for long vary knowledge communications e.g. for management and management of power distribution networks and different SCADA and automation applications. There has historically been little or no radio broadcasting during this band till recently. the world Positioning System conjointly uses radio frequency.

### V.APPLICATION

The interfacing between HF and VHF radios will profit communication by nice suggests that. it might be conjointly useful to decrease the spectrum burden for VHF/UHF system as frequency spectrum is that the most expensive issue within the field of communication and it conjointly contains a limit. It will be accustomed connect foreign places

mistreatment HF-VHF interfacing as HF links will be used to connect places having massive separation and comparatively shut places will be connected mistreatment VHF link. It can even be used in case of Disaster Warning and Relief Content Distribution in Humanitarian Relief once the UHF/VHF networks square measure down.

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