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HAND FREE UNIL-FOR MOTOROLA STARTAC CELLULAR PHONE
THEORY OF OPERATION

The Hand Free Unit (HFU) for Motorola StarTAC cellular phone is a simple to install, easy to use cellular phone accessory. This unit is designed for use inside a car for hand free talking. For safety reasons, it is advisable to stop the car at a safe location when using the HFU although it can also be used when the car is moving.

No installation is required when using this HFU. This HFU is operated under 12 VDC and can be powered by simply plugging the HFU into the cigarette lighter socket of a car. By doing so, not only the battery of the car will supply power to the HFU, it also supplies power to the cellular phone which save energy within the phone battery. In addition, if the battery level of the cellular phone is low, the RFU will also supply current to charge up the phone battery.

To operate the HFU, connect the HFU phone cord with the Motorola StarTAC cellular phone by plugging the connector into the slot of the phone. Insert the HFU into the cigarette lighter socket of a car. Turn on the engine of the car. If the engine of the car is not running, turn the ignition key to the position where there is power supplying to the car radio. Preset the car radio to one FM channel at 88.1 MHz. Turn on the radio and switch to this preset channel. The red color LED at the back of the HFU will light indicating the HFU is in operation.

When there is a call coming in, the ringer sound will be directed from the cellular phone to the HFU via the connector phone cord. This signal is being converted into FM radio signal and transmitted from the HFU to the antenna of the car and ultimately being broadcasted via loudspeakers installed inside the car. If the car radio is not tuned to the preset radio channel, the buzzer at the HFU will ring indicating there is a call coming in. In this case, the user has to press the preset button on the car radio to switch to the preset FM radio channel.

To receive the call, press the "SEND" button on the cellular phone. Incoming voice signal from the caller will be broadcasted inside the car as explained above. User's outgoing voice signal will be collected at the microphone attached to the phone cord, transmitted to the HFU, then transferred to the cellular phone and ultimately transmitted to the caller via phone carriers' cellular phone exchange systems. For detail explanation of the electronic circuit design of the HFU, please refer to attached electronic circuit diagram and detail block diagram.

The sound level of the incoming signal can be regulated to suit individual needs either by adjusting the volume level of the cellular phone or by adjusting the car radio volume switch. The outgoing voice signal is factory adjusted and hence, no adjustment is required.

The advantage of using this HFU are

Hand free talking during driving or operating a vehicle.

User friendly, no factory installation is needed.

Easy to use by simple press of buttons. No complicated programming is needed.

High fidelity sound quality broadcasted from the car radio.
Save phone battery energy resulting longer standby time and talking time.
Serve as a phone battery charger when battery level is low.
Reduce exposure to microwave energy because cellular phone is no longer placed
close to user.

