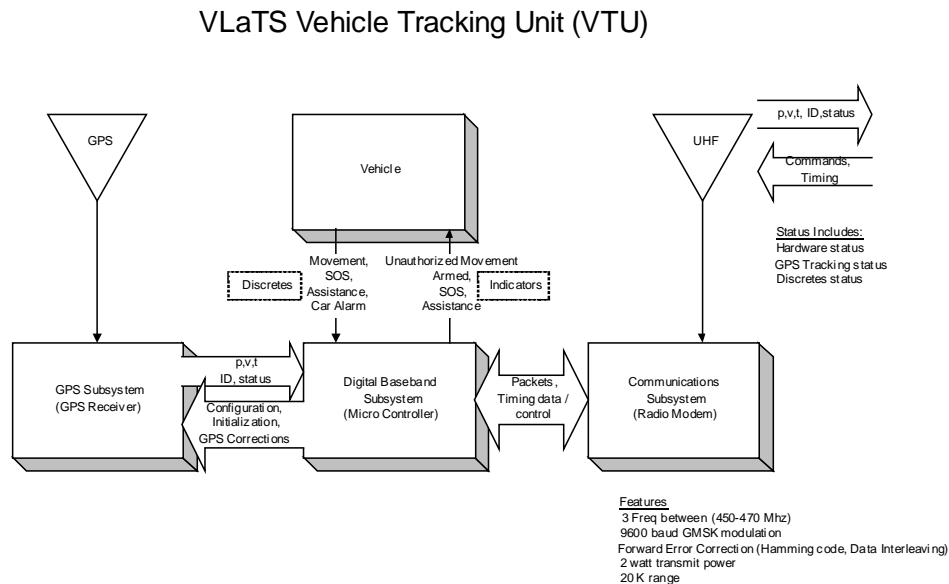


## 2.0 VTU Block Diagrams

### 2.1 VTU Components



**Figure 1 - Vehicle Transceiver Unit (VTU)**

## 2.2 VTU System Enclosure

### 2.2.1 GPS Receiver

Every VTU contains a GPS Receiver and is equipped with a GPS antenna and an antenna cable. The receiver is differentially aided through the RF link to provide vehicle position accuracy to within a few meters and synchronized system time accurate to within .5 ms. The position information is transmitted to the command center at a precise predetermined moment based on system time.

The GPS receiver will report a position at 0 degrees latitude and 0 degrees longitude unless it can find and track GPS satellites. This takes less than a minute under normal circumstances, but can take up to a half an hour the first time the VTU is turned on. It is recommended that the VTU equipped vehicle be allowed to remain stationary for 15 minutes, with a clear view of the sky, the first time it is powered up.

### 2.2.2 Data Transceiver

The VTU Data Transceiver is capable of operation on 16 distinct frequencies over the frequency range of 450 to 470 MHz at 2 watts operating within 25kHz channels. VTU

radio can be configured at the factory to operate at other frequencies and channel widths. Frequencies are preset at the factory and selected for operation from the command center via the RF link.

### **2.2.3 Digital Baseband Board**

The Digital Baseband Board is the system controller and the heart of the VTU. It integrates the Data Transceiver and GPS Receiver, contains the system logic the overall operation of the VTU. It is comprised of a single board embedded controller equipped with a Motorola 68HC11 microcontroller, 32 Kilobytes of flash ROM, 32 Kilobytes of SRAM and various support components to enable the circuitry to perform the desired tasks. In addition, the Digital Baseband Board is equipped with a MX-COM 909A single chip GMSK data pump modem for the purpose of providing the communications subsystem with modulation and Forward Error Correction (FEC) for data transmission and reception.

### **2.2.4 Antennas and Cables**

A GPS Antenna, a UHF antenna, associated cables and power cabling are included with each VTU. GPS antennas are available as permanently mounted units, temporary magnetic mount units or as covert units. Similar options are available for UHF antennas. Refer to the VTU Installation Guide details.

## **2.3 Optional Components**

### **2.3.1 Switch Box (Alarms and Indicators)**

As an option, a small switch box can be acquired for installation in VTU equipped vehicles. The box houses the three momentary contact switches for issuing alarms and arming the unauthorized movement sensor and four LED indicators. Three of the indicators display alarm status, the fourth monitors VTU power and transmit activity.

The switch box is small enough that it can be mounted unobtrusively in the passenger compartment in such a way that the operator can monitor status, but it will go unnoticed by other occupants (or a thief).

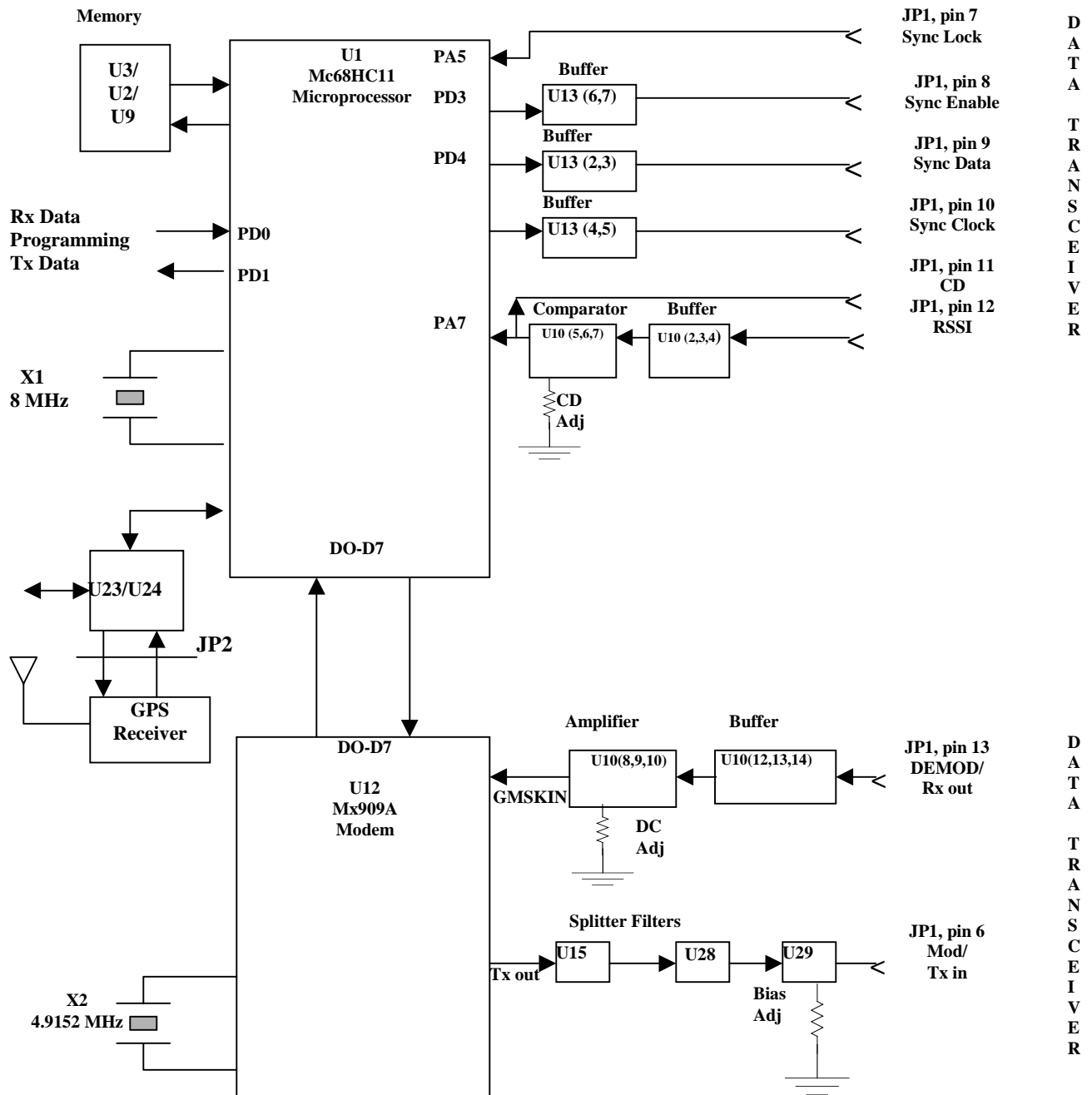
### **2.3.2 Relay Box (Vehicle Controls)**

The VTU provide four outputs suitable for controlling relays. With the relays installed in various automotive systems, lights, horn, ignition, etc. the VTU can be controlled or disabled by suitably equipped chase vehicles. Refer to the Mobile Tracking Unit (MTU) User's Guide.

This type of installation is very model or even vehicle specific and is ordinarily left to qualified mechanics or motor pool personnel.

## 2.4 VTU Digital Baseband Subsystem Block Diagram

**VTU Digital Board RF Block Diagram**



## 2.5 Communications Subsystem/Data Transceiver Block Diagram

### CIRCUIT DESCRIPTION

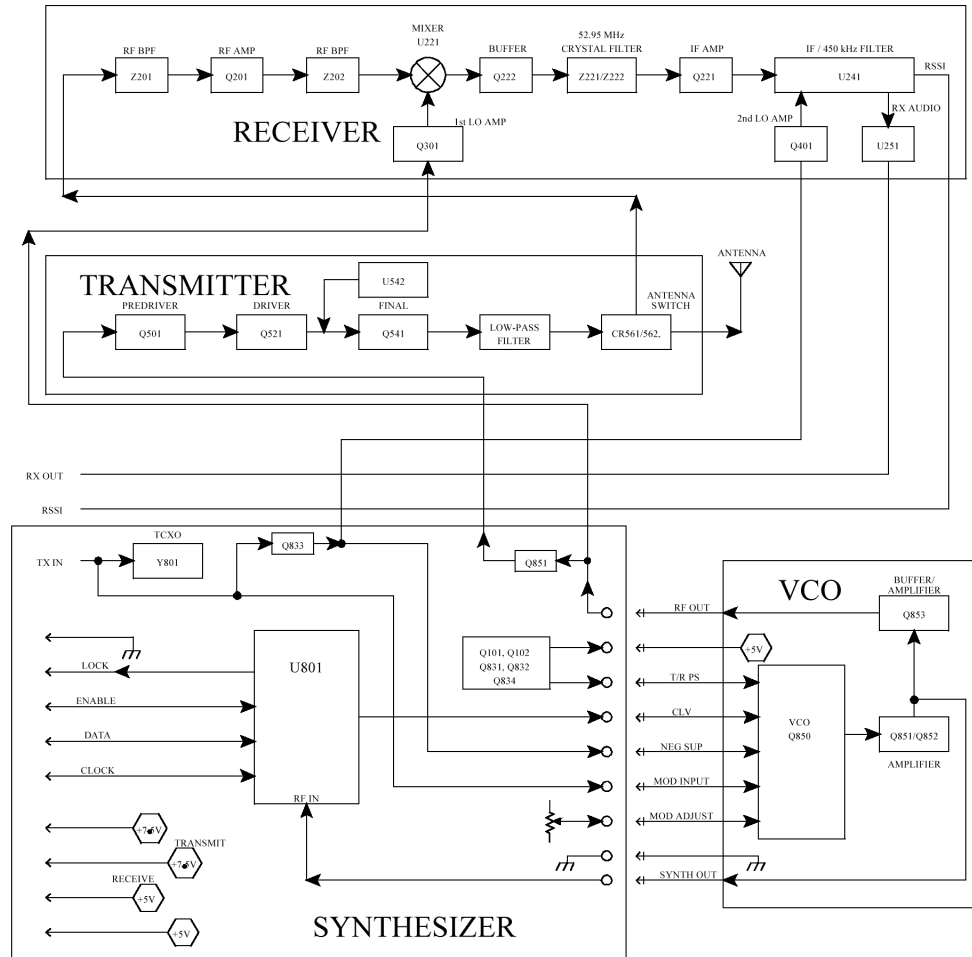


Figure 4-1 DATA TRANSCEIVER BLOCK DIAGRAM

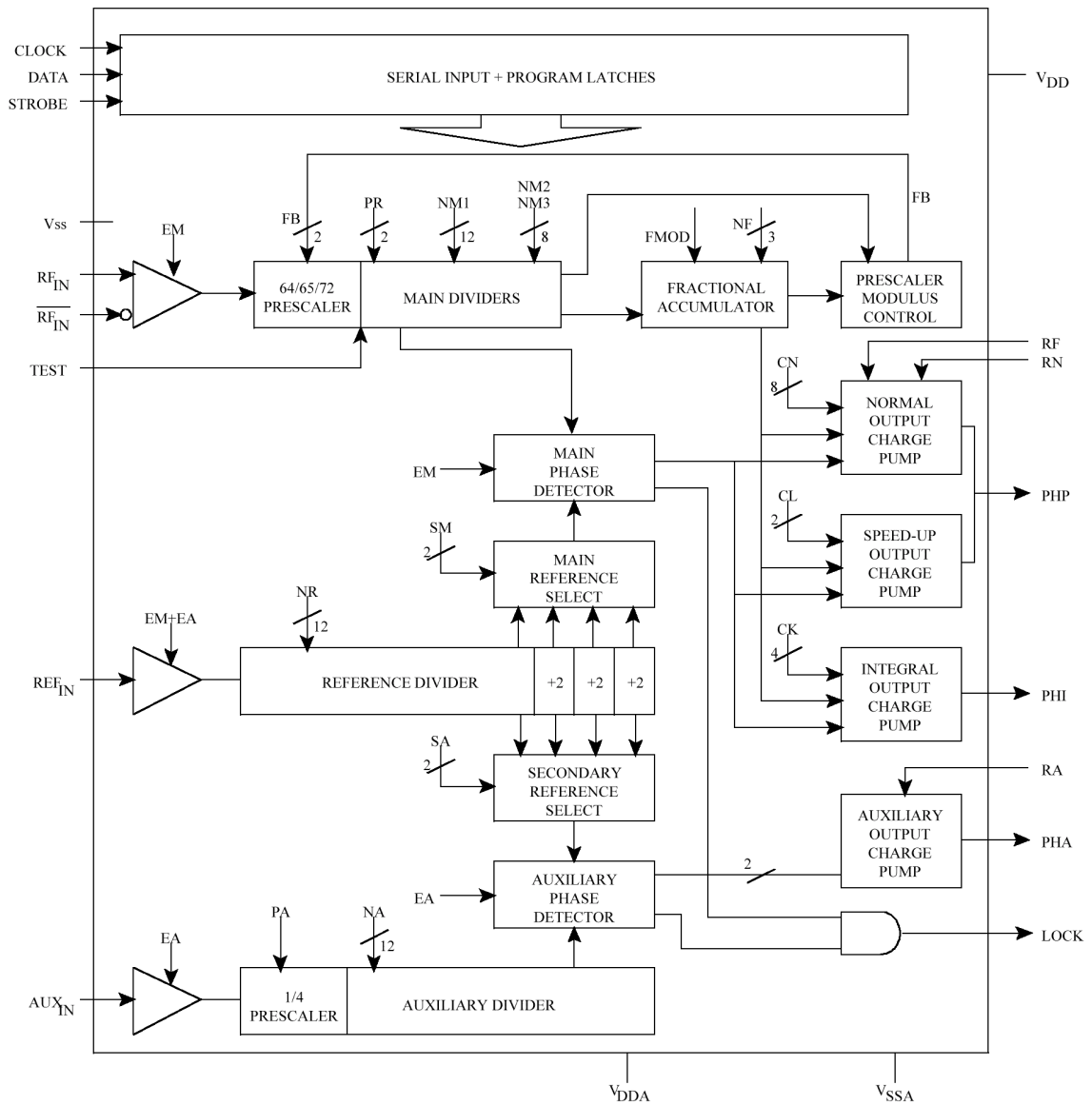


Figure 4-2 U801 SYNTHESIZER BLOCK DIAGRAM

## 2.6 GPS Subsystem/GPS Receiver Block Diagram

