



EMPACT SERIES
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ANNUNCIATION & DISPLAY DESIGN GUIDE

MOBILE MAP PLUS (MMP)

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Introduction

This design guide will provide you information for developing the design and installation of *Mobile Map Plus (MMP)* radio-graphic display systems. It is recommended you review this entire manual before designing a Mobile Map system. Table 1 provides an easy form for developing a list of materials as you proceed through this manual. Prepare pricing by obtaining equipment prices from the most current **CDT's EMPACT series** price list. If you need assistance, please contact the factory.

A set of sample specifications are provided in this manual. These specifications are also available on diskette in IBM-compatible or Macintosh format. Please contact the factory.

Overview

The *MMP* is a radio-graphic display system designed to provide graphic indication of an alarm condition to roving personnel located in a vehicle or remote location. The *MMP* receives alarm information and transmits the alarm type and location to roving personnel. The wireless alarm connection allows the vehicle to rove the facility and receive an alarm regardless of location. Remote locations, such as towers, can also use *MMP* without the need for wiring installation.

The *MMP* faceplate contains a graphic representation of the monitored area with alarm and status lamps showing the presence of alarm conditions. The *MMP* audible alarms can be connected to the vehicle horn alerting personnel when they are outside the vehicle.

Examples of Use

Correctional Facility with Perimeter Fence Protection Alarm System

A correctional facility with a fence protection system needs to respond to alarms rapidly and with a minimum number of personnel. Correctional facilities are finding that staffing towers to provide perimeter security is becoming cost-prohibitive. A successful and much less expensive alternative is a quality perimeter security system with *MMP* communications to armed personnel located in roving vehicles.

Several facility vehicles are outfitted with *MMP* Mobile Display Units. The *MMP* system is connected to the fence protection system so that all fence alarms are automatically sent to the *MMP* Mobile Display units. One or two of the *MMP*-equipped vehicles patrol the perimeter assess road at all times. Any fence protection alarms are automatically sent to the *MMP*-equipped vehicles. Response to perimeter alarms is very rapid.

Military Facility Needing a Portable Security System for a Short Period of Time

A military facility requires a security system that can be set up in a short time and then disassembled and reused at a new site.

A portable security system is connected to the *MMP* system. The vehicles provide the response to any security alarms.

Industrial Facility Requires a Perimeter Security System

An industrial facility requires a fence protection system around one of their remote installations. The security patrol that will respond is roving a larger area in a vehicle.

The fence protection system is connected to an *MMP* system. Alarms from the fence protection system are transmitted to the *MMP* mobile display mounted in the patrol vehicle. The patrol vehicle knows immediately the type and location of alarm.

Another *MMP* graphic display can be mounted in a remote stationary control room. This *MMP* will also receive the fence protection alarm signals.

Detailed Design

Discussion

The *MMP* system is normally installed to connect roving vehicles or remote stationary control points with the central control equipment. The *MMP* is a supervised communication system with a graphic display panel. See Figure 1.

The *MMP* system connects to alarm equipment by other manufacturers. The *MMP* sends the alarm information generated by the other manufacturers alarm equipment. Therefore, the number of alarms to be transmitted by the *MMP* system will be dependent on the design of the facility and the requirements of the other alarm equipment.

The design of the *MMP* system is not complicated, there are only four items to be selected and placed. These are: (1) the Mobile Display Unit and antenna; (2) the alarm encoder; (3) the radio transmitter; and (4) the transmit antenna.

Because the *MMP* system uses a radio transmission system, each system must be assigned an operating frequency. This is not difficult, and factory assistance is available. Frequency recommendations and a form for requesting assistance are contained in this manual.

The design information contained in this section should be sufficient to acquaint you with the system and plan a system design. Additional installation and wiring technical information is contained in the *Mobile Map Plus* Installation and Operations Manual.

Frequency Selection

Each *Mobile Map Plus* system must have a licensed radio frequency. This frequency is normally in the UHF range although frequencies in other ranges are available with factory assistance.

Figure 2 contains recommended frequencies for typical *MMP* systems. The offset channels are recommended and are used by most installations.

Factory assistance is available for selecting and licensing an operating frequency. Figure 3 is a two-page (front/back) form which can be copied and completed to request frequency selection and licensing assistance. Contact your representative or the factory if you have any questions.

Equipment Placement

MOBILE DISPLAY UNIT

- Place a Mobile Display Unit and antenna in each roving vehicle that will be on duty on any of the work shifts. A spare unit for when a vehicle is out of service is also recommended. The quantity of zones monitored by the *MMP* Mobile Display Unit will be calculated under equipment list.
- If there are several vehicles which may be used for patrol from time to time, there is an installation kit that can be used in those vehicles. The installation kit consists of the mobile display mounting bracket and the power harness. The installation kit and a mobile antenna kit will provide the installation requirements.

REMOTE STATIONARY DISPLAY

- Place a Remote Stationary Display in locations where the alarms are necessary. These displays can be mounted using the supplied mounting bracket.
- The mobile unit antenna or a fixed station antenna can be specified depending on the distance from the central control point.
- This installation will require a low voltage power supply and probably a emergency power backup battery. Contact the factory, if you have questions.

MMP ALARM ENCODER UNIT

- The *MMP* encoder unit is designed to be mounted adjacent to the alarm equipment that will produce the alarm information that will be transmitted to the remote displays.
- The encoder location will require a 120VAC power connection, connections to the alarm equipment by other manufacturers, and a connection to the radio transmitter. Battery backup may also be necessary.

***MMP* TRANSMITTER UNIT**

- The transmitter unit is located adjacent to the transmitter antenna to be sure maximum transmitter power is delivered to the antenna. A transmitter to antenna distance of not more than 25 feet is recommended.
- You may wish to locate the transmitter after locating the transmitter antenna. The transmitter location will require 120 VAC power and the cable from the encoder location.

***MMP* TRANSMITTER ANTENNA**

- The location of the transmitter antenna is critical to the proper operation of the system. Locate the transmitter antenna on the highest structure whenever possible. The best reception will be achieved at the mobile displays when the transmitter is in a “line-of-sight.”
- The antenna should be mounted on a minimum 20-foot mast located on either a flat or slightly pitched roof. The antenna mast will usually require guy wires. There should be sufficient roof space for installing the guy wires.
- Additional antenna mounting information is contained in the *MMP* Installation and Operations Manual.

Interconnections

The *MMP* system interconnections are not complicated. Connections are required as follows:

- The alarm equipment by other manufacturers must be connected to the *MMP* alarm encoder. The distance should not exceed 15 feet.
- The encoder will be connected to one outlet of 120VAC power. A two-conductor cable will run from the encoder to the *MMP* transmitter. The distance between the encoder and transmitter can be up to 3000 feet.
- The transmitter location will require one outlet of 120 VAC power. The two-conductor wire from the encoder will terminate in the transmitter.
- A special radio frequency transmission cable will run from the transmitter to the antenna. The recommended distance for this cable is 25 feet or less.
- Running the transmission cable to the antenna usually involves penetrating the roof. Additionally, the transmission cable is delivered from the factory assembled and tested. If conduit and a “roof jack” are used, a sufficient size should be specified to accommodate the cable and connectors (i.e., 1-inch conduit)

Equipment List

Proceed through following steps to make an equipment list for this system. Figure 1 is a sample equipment form for your use. Copy this form and use it for your design. Current pricing is available on the **CDT's** *EMPACT series* price list.

Begin by determining the quantity of alarm zones required for your system.

- Typically there is one alarm zone for each distinct alarm. For example, a perimeter alarm system with 22 zones will require a 22-zone *MMP* system.
- The most common alarm zones utilize one red/green alarm lamp for each alarm zone. The alarm lamp is red during alarm and green when the zone is secure. If the customer desires different lamp orientation, the *MMP* is programmable at the display. Contact the factory for additional information.

Determine the quantity of Mobile Displays required.

Determine the quantity of Remote Stationary Displays required.

Determine the number of additional decoder zone cards required.

- Each basic Mobile or Remote Stationary Display contains 8 zones. Additional zones must be added to EACH display; with each additional decoder zone card adding 8 zones.
- For example, each 22-zone display in our example requires two additional decoder zone cards for a total of 24 zones in each display; 22 zones will be used.

Determine whether your system should use the security code option. The security code assures that the mobile display will only receive correct alarm transmissions from the system encoder.

- One security code option is required for each mobile or remote stationary display in your system.

There is a one-time charge for developing the *MMP* graphic display artwork. If all displays contain the same artwork, one charge covers all displays. Each new graphic display artwork will require a one-time set up charge.

The system will normally require only one *MMP* encoder. Specify the encoder as follows:

- Determine the number of encoder alarm zones required.
- The encoder will require additional 8-zone encoder cards for each 8 zones beyond the 8 zones provided with the basic encoder unit. For the 22-zone example unit, two additional 8-zone encoder cards will be required.

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- Determine whether the security code option is required. One security code option is required for the encoder.
 - Determine whether the encoder unit will require a backup battery. A backup battery is recommended unless the system power will be furnished by an on-line uninterruptible power source.

Determine the radio transmitter as follows:

- There is only one transmitter usually used with the *MMP* system. If your system has different requirements, please contact the factory.
- Determine whether the transmitter unit will require a backup battery. A backup battery is recommended unless the system power will be furnished by an on-line uninterruptible power source.

Determine which transmitter antenna assembly should be used.

- There are three different antenna assemblies listed. The use of a particular antenna will be determined by the installation.
- The recommended antenna is the highest gain stick antenna. This antenna will assure you that the maximum possible signal is reaching the mobile displays.
- The ground plane antenna should only be used if the antenna is mounted on the highest building and the mobile displays will operate in an area which is truly line-of-site at distances not more than 1/2 mile.
- The higher gain stick antenna can be utilized if the antenna is mounted on a tall building and the operating distance for the mobile units is not more than 1-1/2 miles.

One transmitter antenna cable assembly is required to connect the transmitter unit to the antenna.

- The maximum recommended distance is 25 feet. If the required distance is longer than 25 feet, consult the factory for additional cable recommendations.
- Select the antenna cable assembly and the length of the antenna cable required. If the exact cable length is not known, use the 25-foot length. The factory will make the cable to the requested installation length.

Select the antenna assemblies for the mobile displays and the remote stationary displays.

- One *Mobile Map Plus* antenna assembly is required for each vehicle mounted mobile display. The mobile antenna is suitable for mounting on most vehicles. The antenna assembly is provided with the cable and mating connector.

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- Each remote stationary display unit will require an antenna. The most suitable antenna for this application is the ground plane antenna as described above. If distances are greater than shown a higher gain stationary antenna should be used. Each antenna will require an antenna cable assembly.

Determine if the vehicles will require a horn relay assembly. A horn relay assembly will be required if the mobile display is to be connected to the vehicle horn and the vehicle does not have an electronic horn.

Budgetary Pricing

The system can be priced by applying the pricing from the current **CDT's EMPACT series** price list to the list of materials you have developed on Table 1. If you are not sure you have current pricing schedules, please contact the factory.

A complete budgetary should include the installation pricing also. Labor and overhead costs are regional in nature and should be obtained from your local area. Please remember to include taxes, insurance, and any bond or other special fees.

Always allow sufficient installation hours to include complete system testing, documentation, and training of the facility staff.

Ordering

Prepare your *Mobile Map Plus* order using Table 1. If you wish, you may copy Table 1 and attach it to your purchase order.

If you have any difficulty planning your installation or have special circumstances, please do not hesitate to contact our engineering staff.

Specifications

CDT maintains a complete set of specifications for the *Mobile Map Plus* system. These specifications are suitably written for inclusion in larger project specifications.

CDT's EMPACT series specifications are available on diskette in either IBM compatible (Word Perfect 6) or Macintosh (Microsoft Word 6).

The **CDT** sales engineering staff is also available for technical assistance. If you wish we can provide plans' preparation and specification preparation assistance. Please contact us if you have any questions.

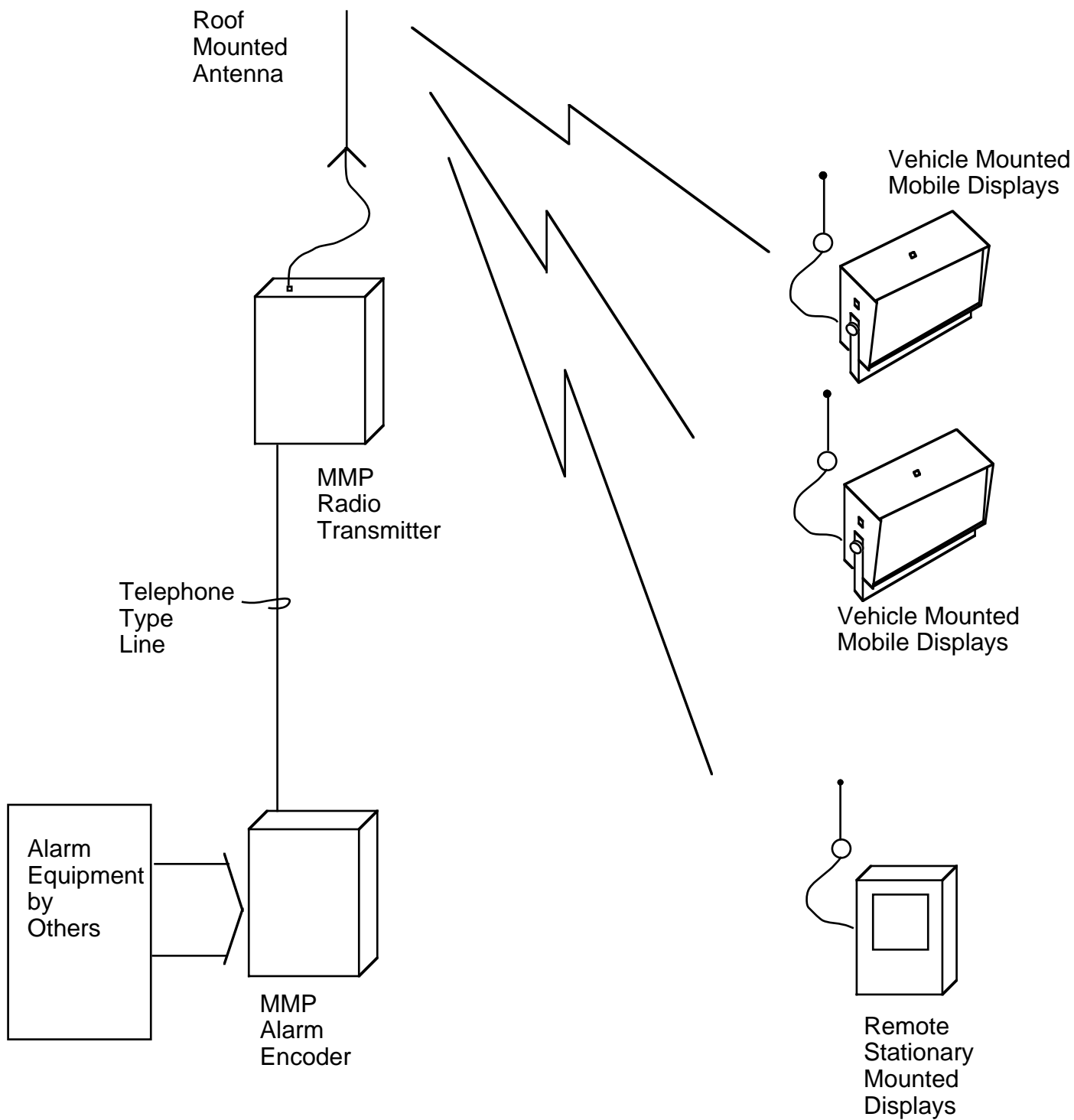


FIGURE 1

TYPICAL MOBILE MAP PLUS (MMP) INSTALLATION

Table 1. Equipment List

Part No.	Description	Qty.	Price Each	Total
2500 MP	<i>Mobile Map Plus Radio Graphic Display</i> w/bracket; includes receiver and decoder, basic 8 zone; specify frequency; see Note 2			
2510 MP	Additional MMP 8-zone decoder module; add one 8-zone module for each additional 8 zones up to a maximum of 64 zones.			
1000 MP	<i>Mobile Graphic Display Artwork</i> ; one-time charge for the development of CAD artwork for map display.			
1500 MP	<i>Mobile Map Plus Encoder/Alarm Interface</i> ; Basic 8 zone; includes enclosure and plug-in power supply.			
1510 MP	Additional MMP 8-zone encoder module; add one 8-zone module for each additional 8 zones up to a maximum of 64 zones.			
3500 MP	<i>Transmitter Assembly, UHF</i> ; includes 2-watt UHF transmitter, enclosure, and power supply; specify frequency; see Note 2. <i>Transmitter Antenna Assemblies</i> (one required); antenna masts not included; specify frequency.			
659 MP	<i>Basic Ground Plane Antenna</i> ; approximately 2 dB gain; 38-inch height.			
2015 MP	<i>Higher Gain Stick Antenna</i> ; approximately 6 dB gain; 6-1/2-foot length.			
2025 MP	<i>Highest Gain Stick Antenna</i> ; approximately 7 dB gain; 12.9-foot length.			
150 MP	<i>Transmitter Antenna Cable Assemblies</i> ; maximum distance transmitter/antenna - 25 ft.; completely assembled; includes connectors, assembly, and testing; add cable length below.			
152 MP	<i>Transmitter Antenna Cable Length</i> ; add for each foot of antenna cable up to 25 feet maximum; consult factory if longer lengths are required by your installation.			

Part No.	Description	Qty.	Price Each	Total
1610 MP	<i>Mobile Map Plus Unit Antenna Assembly; 1/4 wave root top or trunk mount; includes 14 feet cable and mating connector.</i>			
100 MP	<i>Horn Relay Assembly; required by newer vehicles which do not have horn relays; consult vehicle manufacturer.</i>			
120 MP	<i>Optional Encoder Battery Backup; installs in encoder enclosure.</i>			
130 MP	<i>Optional Transmitter Battery Backup; installs in transmitter enclosure.</i>			
100 TE	<i>Optional Accessory Mobile Unit Mounting Bracket and Wiring Harness Assembly Mounting components for a second vehicle.</i>			
150 MP	<i>Installation and Test Kit; contains power meter, scanner, and connectors for testing and adjusting installation. Kit returned to factory in good condition will receive full credit.</i>			

NOTES:

1. The Mobile Map Plus System is capable of providing up to 64 different alarm indications. These 64 channels can be programmed to produce a variety of outputs to the custom graphic display panel. Refer to the Mobile Map Plus Design Guide and consult factory for assistance.
2. Refer to the Mobile Map Plus Design Guide for frequency selection recommendations and licensing assistance.
3. Prices and features subject to change without notice.
4. Consult factory for VHF frequency option.