PART I

M-STRUCTURE
Part II: Generalizations of the Banach-Stone theorem

Consider the following problem:

**Problem 1:** Let $X$ be a Banach space and $M$ and $N$ locally compact Hausdorff spaces such that $C^0(M,X)$ and $C^0(N,X)$ are isometrically isomorphic. Does it follow that $M$ and $N$ are homeomorphic?

If this is always true we will say that $X$ has the Banach-Stone property (note that the classical Banach-Stone theorem asserts that $K$ has the Banach-Stone property).

In the next chapters we will apply $M$-structure methods to investigate problem 1. The main results are proved in chapter II. For example, it will be shown that

- if $X$ is $M$-finite, then $X$ has the Banach-Stone property iff the minimum of the $M$-exponents is one
- if a maximal function module representation of $X$ is known (and this representation is not too pathological) then there is a family of subsets of $K_X$ such that $C^0(M,X) \cong C^0(N,X)$ implies that $\Delta \times M \cong \Delta \times N$ for every $\Delta$ in this family. Thus $X$ has the Banach-Stone property if it can be shown that there is a $\Delta$ which contains exactly one element.

We will proceed as follows:

Suppose that $X$ is a Banach space for which a maximal function module representation is known and suppose that this is sufficient to determine maximal function module representations of $C^0(M,X)$ and $C^0(N,X)$. If this is the case then corollary 4.17 provides us with the explicit form of every isometric isomorphism $I$ from $C^0(M,X)$ onto $C^0(N,X)$.

Accordingly we will have to discuss the following problems in order to treat problem 1:

**Problem 2:** For what Banach spaces $X$ is it possible to determine a