

MX Series

PC Command System

MXF-5500 Command & Control System Installation Guide

J9DA0302-001, Rev A
First edition
September 10, 2009



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INSTALLATION AND OPERATION INSTRUCTIONS

MXF-5500 Series



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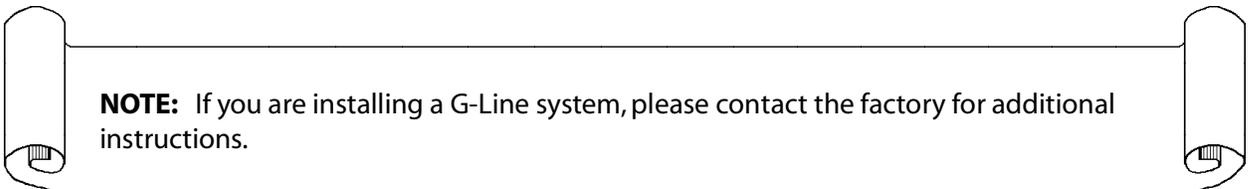
MXF-5500 SERIES

1 QUICK START FPS-5

Qualified technicians may follow these simplified procedures to install and test the typical MX-5000/ Fence Protection System, including installation of the MX-5000, FPS-5 fence protection, and MPS microwave system. Prerequisites for using the quick start procedures are:

- Attendance at one or more Magal-Senstar MX-5000 training class.
- Prior MX-5000 field installation experience.

Before proceeding, VERIFY that you have a complete site layout showing zone extents, processor locations, and conduit interconnections. If you are not familiar with any of the procedures described in this section, refer to the appropriate manual for more detailed information.



NOTE: If you are installing a G-Line system, please contact the factory for additional instructions.

IMPORTANT PROCEDURES

Throughout the installation it is very important that certain procedures are observed:

Install ground rods and proper grounding at the MX-5000, all FPS processor, and all microwave locations.

Terminate fiber as shown. Improper terminations will cause system noise and degrade performance.

Installation

Figure 1 shows the typical fiber optic interconnection of components.

- The interconnect wiring should be run in conduit, either underground or along the base of the fence.
- Optical fiber requirement: Multimode, 62.5 um/125um with not more than 3.5 dB loss/km at 850 nm wave length of light.

We recommend breakout style of cable with each fiber individually enclosed in aramid yarn and a 2 mm elastomer jacket.

A typical approved cable is Optical Cable Corp., (800) 622-7711 www.occfiber.com, part numbers: BX02-070D-WLS/900-OFNR for 2 fibers in cable, BX04-080D-WLS/900-OFNR* for 4 fibers in cable
*OFNR signifies indoor and outdoor riser. Use OFNP for indoor and outdoor plenum.

Use ST connectors with 2 mm strain reliefs.

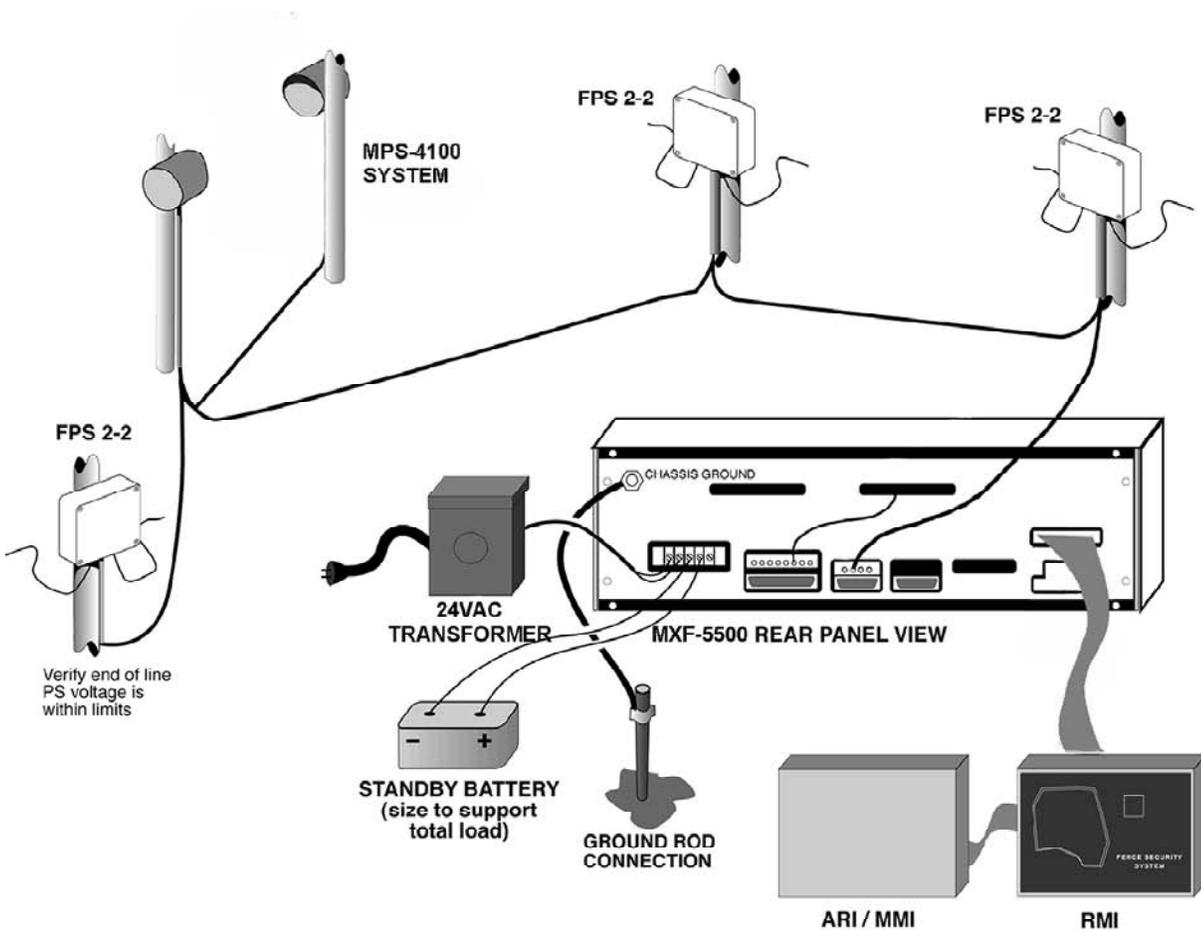


Figure 1. Typical MXF-5500 / FPS System Connections

Mount each FPS processor as shown in Figure 2.

- Use metal brackets or Unistrut-type mounting material to provide a solid backing. A fence post will provide a solid mounting.
- Arrange the conduit/control wiring entrance as shown.
- Install a copper-clad ground rod at each processor location, and connect a minimum 8-gauge ground wire to the processor bolt as shown. **IMPORTANT:** Connect the ground wire directly to the processor bolt as shown.

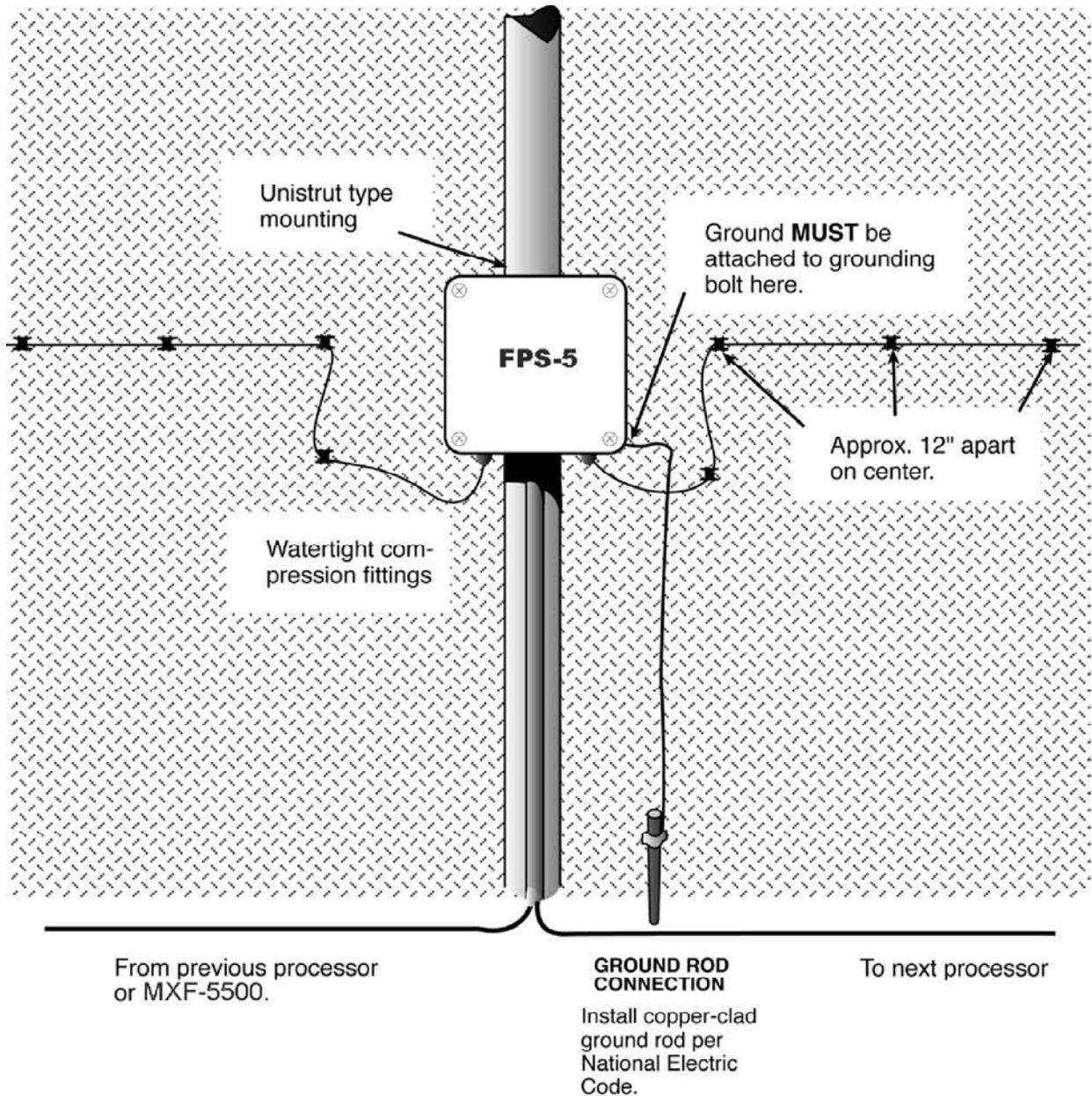


Figure 2. Fence Mounted FPS Processor

Run the sensor cable from each FPS processor as shown in Figures 2 and 3.

NOTE: Your installation may utilize either standard "black" sensor cable or Helisensor. Observe special requirements for each type sensor.

- Attach the sensor cable to the fence at approximate 12-inch intervals with black UV cable ties as shown in Figure 3. Use **ONLY** the approved black UV-protected cable ties.
- Provide loop at each fence post and increased sensitivity loops at each corner or end post. Provide cable overlap at adjacent zones. Install TSK termination boxes at each sensor end-of-line and splices if necessary.

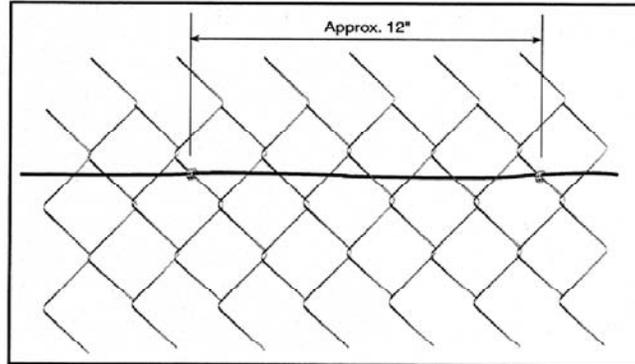


Figure 3. Cable Tie Installation

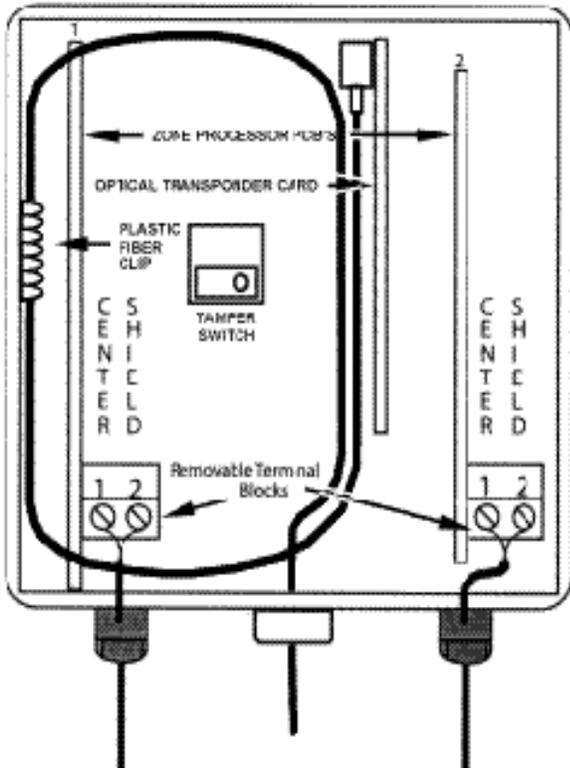


Figure 4. Transducer Cable Connections

- Connect each sensor cable to the processor as shown in Figure 4.

Make fiber and power connections to each processor as shown in Figure 5.

- Set the correct transmit and receive address for each processor. Refer to the FPS processor installation manual or the MXF-5500 manual, Table 5, for processor switch settings.

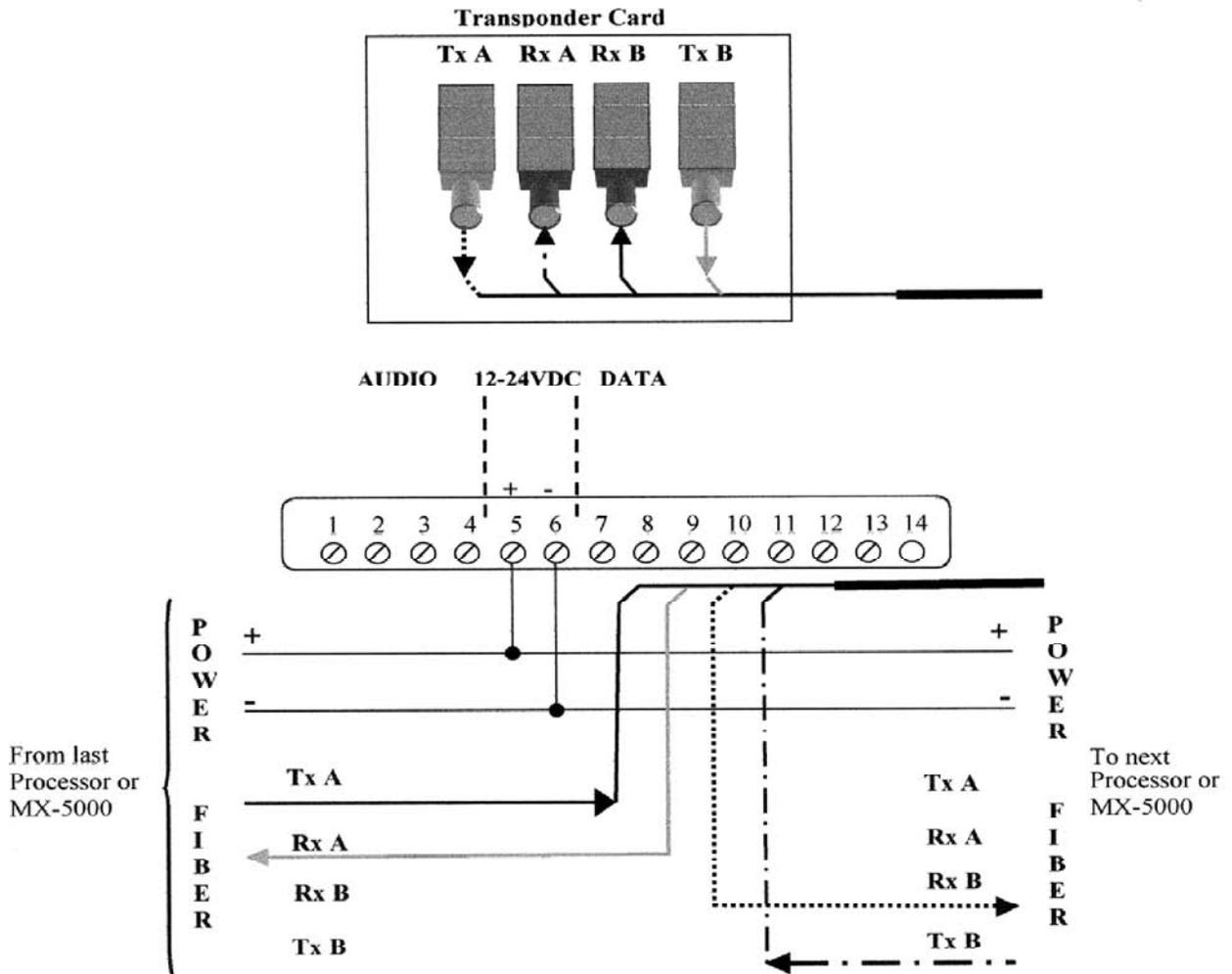


Figure 5. FPS Processor Wiring Connections

Mount each MPS microwave unit (pair) as shown in Figure 6. Note that the installation includes the microwave pair and the stand-alone transponder.

- Install each piece of equipment generally as shown.

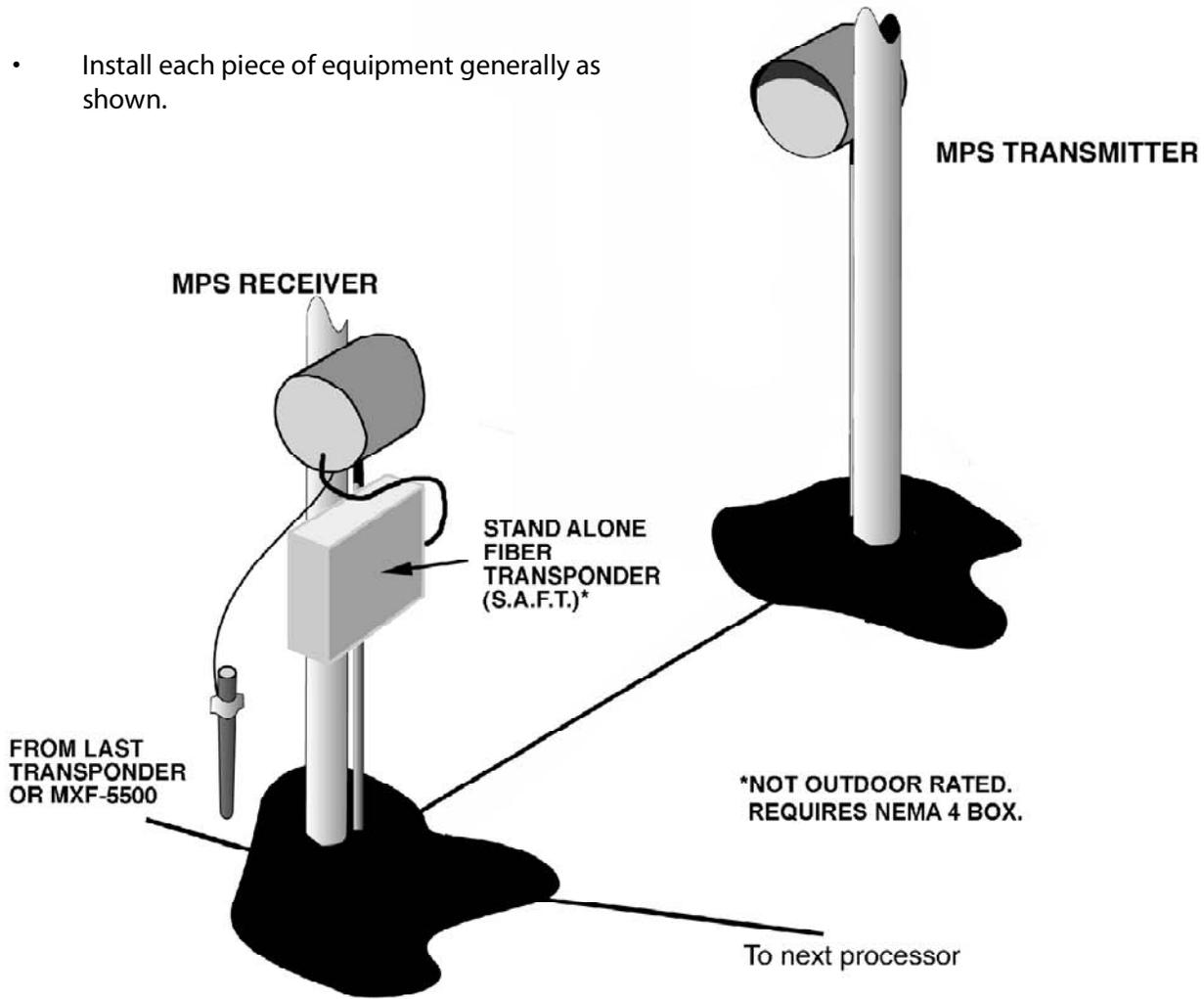


Figure 6. MPS Microwave Installation

- Run interconnecting cables and connect as shown in Figure 7.

Position the MXF-5500 Control Unit in the control room as appropriate for proper viewing and operation. Connections will be made to the MXF-5500 rear panel as shown in Figure 1.

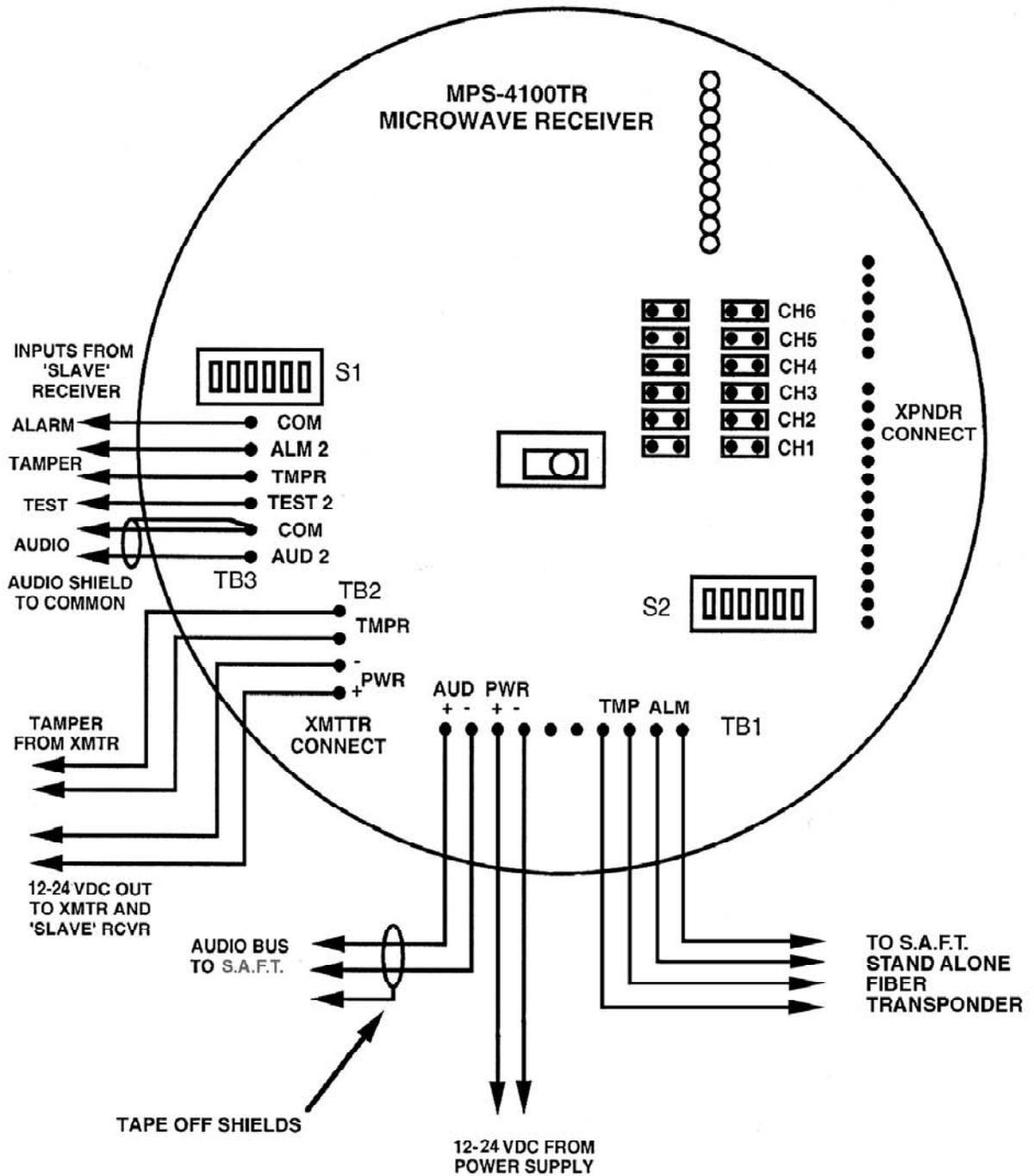


Figure 7. MPS Connections

Connect the power supply transformer and battery as shown in Figure 8.

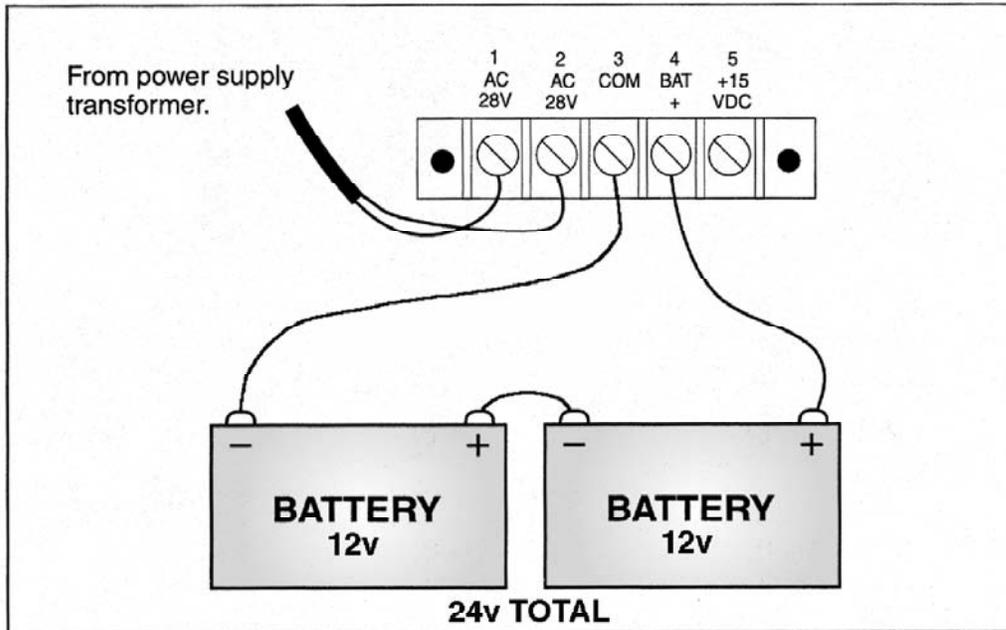


Figure 8. MXF-5500 Power Supply Connections

- Connect the transponder loop fibers as shown in Figure 9. Perform the connections for each transponder loop connected to your system.
- Connect the ribbon cable for the Map Interface and Relay/Mobile Map/RANS interface as shown.

Apply power to the MXF-5500 by connecting the AC power first, then the battery system. Perform initial programming to acknowledge initial alarms.

Complete MXF-5500 programming by performing the programming steps needed for your system. For programming reference, refer to Installation Manual, Table 4.

Perform initial testing of each zone, and perform fence quieting procedure if necessary. Adjust the sensitivity of each processor to provide required climb and cut detection.

Perform final testing, including climb test, in each zone as required by the system specifications.

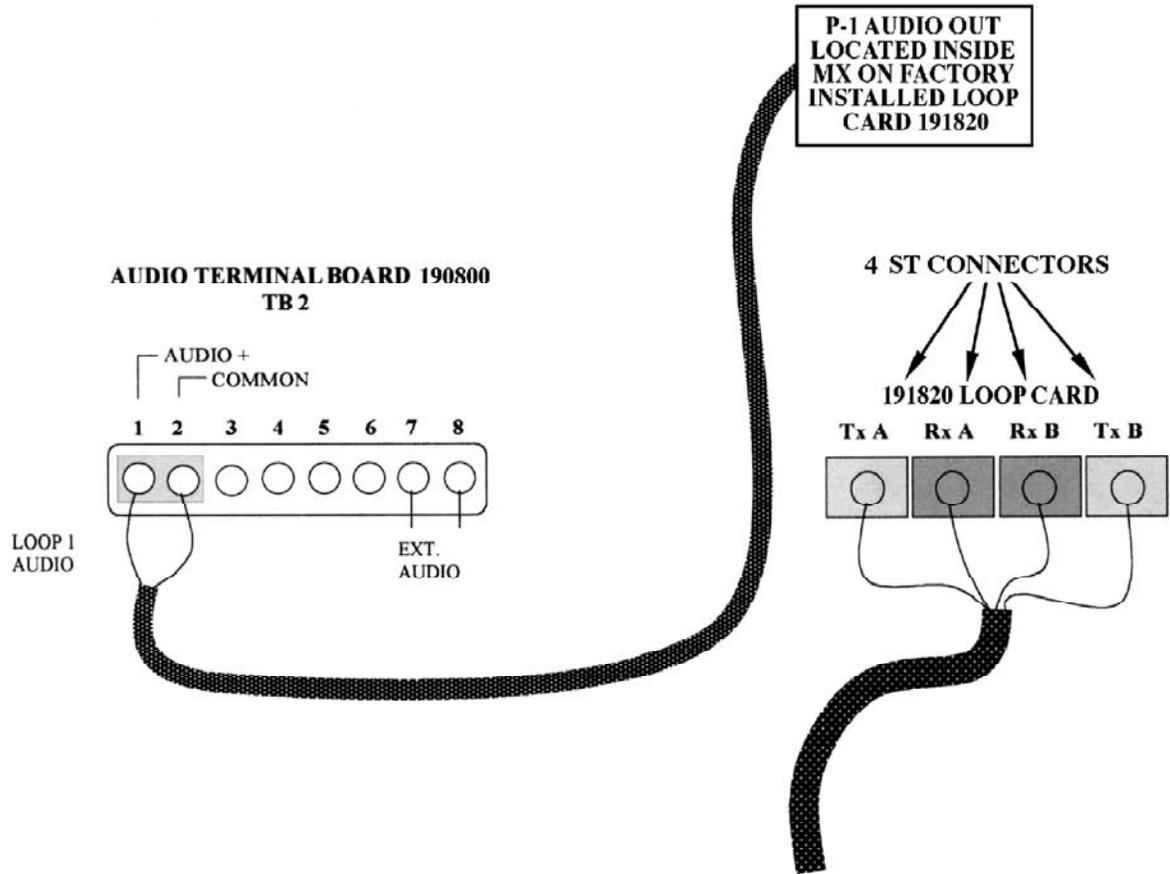


Figure 9. MXF-5500 Loop Connections

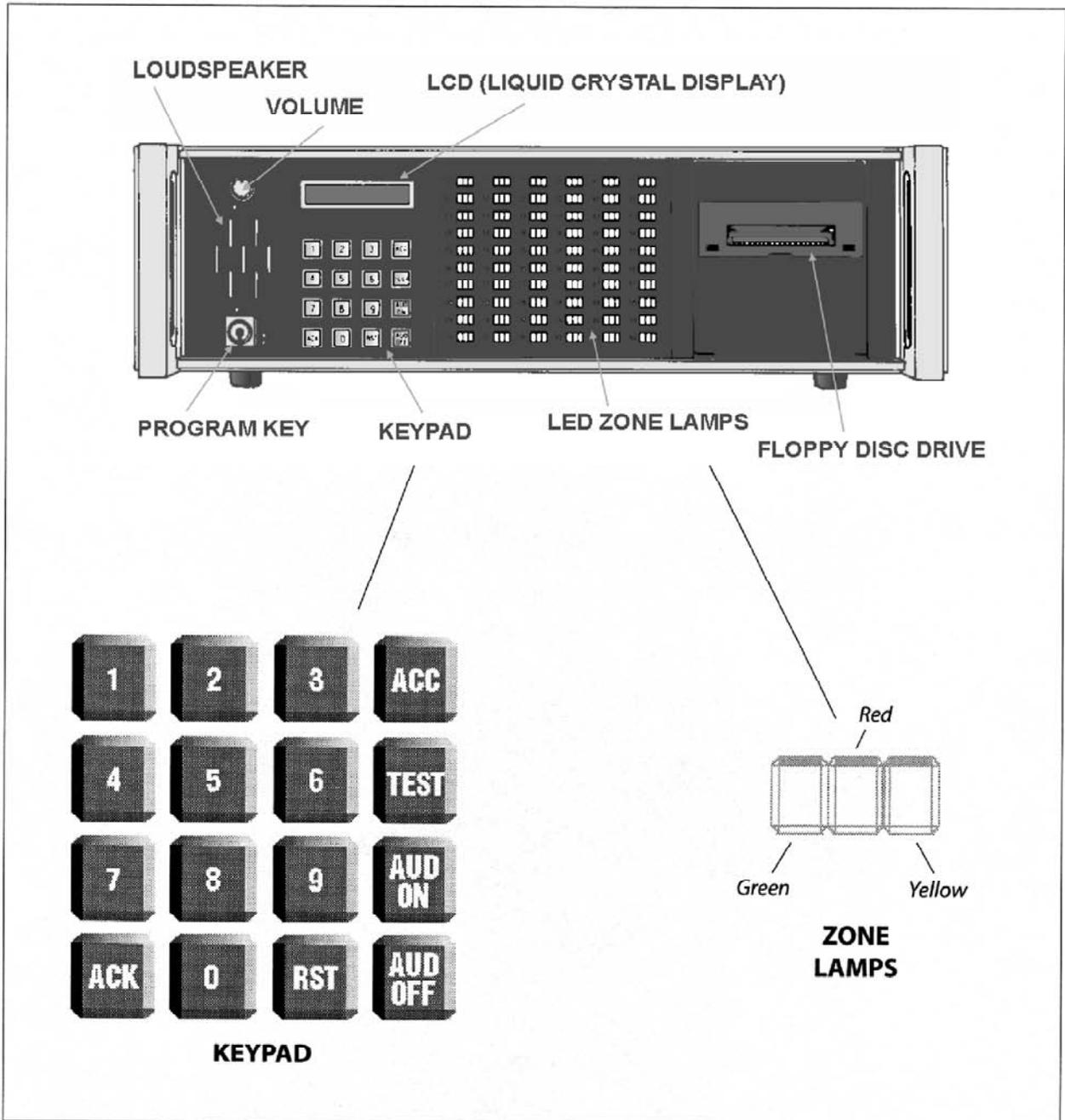
Reference Documents

The MXF-5500 is designed to operate with many other Magal-Senstar systems. If the system being installed utilizes other Magal-Senstar components, obtain additional documentation and manuals as follows:

System	Documentation
<input type="checkbox"/> FPS-5 Fence Protection Systems.....	Installation and Operation Manual
<input type="checkbox"/> GL-M 3 wire or Multi-wire G-Line Systems.....	Installation and Operation Manual
<input type="checkbox"/> MPS Microwave Systems.....	Installation and Operation Manual
<input type="checkbox"/> EDAPT System.....	Installation and Operation Manual
<input type="checkbox"/> Stand-alone Transponders.....	Technical Brochure
<input type="checkbox"/> Remote Display Unit.....	Installation and Operation Manual
<input type="checkbox"/> Super-Transponder.....	Installation and Operation Manual
<input type="checkbox"/> PC Command (PSYCON) System.....	Installation and Operation Manual
<input type="checkbox"/> Alarm Recordkeeping (ARKS) System.....	Installation and Operation Manual
<input type="checkbox"/> Weather Station.....	Operation Manual
<input type="checkbox"/> Remote Map Interface (RMI).....	Technical Note
<input type="checkbox"/> Relay Interface Unit (RMI).....	Technical Note
<input type="checkbox"/> Mobile Map Interface Unit (MMI).....	Technical Note
<input type="checkbox"/> Host Computer Connection.....	Technical Note
<input type="checkbox"/> Remote Printer Connection.....	Technical Note
<input type="checkbox"/> Mobile Map Plus System.....	Installation and Operation Manual
<input type="checkbox"/> RANS-Voice System.....	Installation and Operation Manual

2 OPERATOR INSTRUCTIONS

The MXF-5500 is your Perimeter Protection System Control Center. The MXF-5500 annunciates alarms audibly and visually, provides control of each zone, allows listening to each zone, and provides a permanent event record (if optional printer is installed).



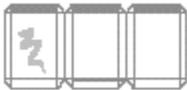
FRONT PANEL CONTROLS

For ...

- ▶ **Normal operation ... see page 30**
- ▶ **Special Display Indications & Operations ... see page 32**
- ▶ **Printer operations ... see page 34**

Normal operation

Secure



Solid GREEN indicates zone is operational and secure.

Alarm



Slowly flashing RED and slowly pulsating tone (Audible Alarm) indicates an alarm. The display window shows the zone # in alarm, and GREEN flashes to indicate that audio from that zone is on loudspeaker.

Display will read:



current zone in alarm

When more than one alarm is on the system, the display will flash between each alarm. PRESS zone # on keypad and **ACK** to silence audible alarm and change lamp from flashing to steady. Each zone must be handled individually.

Display will read



PRESS zone # and **RST** to reset alarm.

NOTE: When there is more than one alarm on the system, GREEN flashes on the last zone alarmed and the audio from that zone is on loudspeaker.

Tamper Alarm



Rapidly flashing RED and rapidly pulsating tone (Audible Alarm) indicate trouble on a zone. The display window shows the zone in trouble, and GREEN flashes to indicate that the audio from that zone is on loudspeaker.

Display will read



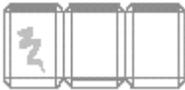
PRESS zone # and **ACK** to silence alarm, and report to maintenance.

Display will read



RED alarm lamp will continue to flash rapidly until the zone problem is repaired.

Audio Listening

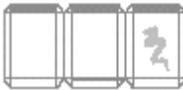


Flashing GREEN lamp indicates the audio signal from that zone is coming from loudspeaker.

PRESS **AUD OFF** to turn off audio and flashing lamp.

PRESS zone # and **AUD ON** to turn on audio from any zone.

Zone Access



Solid or slowly flashing YELLOW indicates a zone is in access or removed from alarm operation. Zones can only be placed in access at the console.

To access a zone, PRESS zone # and **ACC**. The YELLOW lamp will begin to flash slowly, accompanied by a slow beeping tone, indicating access is being requested.

Complete access by PRESSING zone # and **ACK**. The lamp will glow steady YELLOW, and the audible tone will be silenced.

To remove a zone from access at any time, PRESS zone # and **RST**. The YELLOW light will go out, and a steady GREEN will appear, indicating the access has been removed and the zone is secure.

NOTE: Zones may automatically return to the alarm monitoring state after a specified time period if programmed to do so. Refer to the programming manual for more information.

Communication Failure



Rapidly flashing YELLOW lamp and rapidly beeping tone indicate a communication failure to that zone.

Display will read

Comm Fail 1

PRESS the zone number and **ACK** to silence the audible alarm. The flashing YELLOW turns to solid RED and YELLOW. Refer the problem to maintenance.

Display will read

Comm Fail ACK 1

The RED and YELLOW lamps will not be extinguished until the problem is repaired.

Special Display Indications

05/01/05 11:01:30

date *time*

The display shows date and time when no other actions are present.

AC Power Loss

Indicates that AC power has been interrupted.

PRESS **ACK** to silence audible alarm, and report problem to maintenance.

Check Battery

Indicates that stand-by battery power has been lost or battery is low.

PRESS **ACK** to silence audible alarm, and report problem to maintenance.

Check Fiber

Indicates that at least one fiber link of the system has failed.

PRESS **ACK** to silence audible alarm, and report problem to maintenance.

Entering operator number

Supervisors should enter operator numbers when a shift begins.

To enter operator number ...

TURN program key to PROGRAM.

PRESS  so the display reads OPER NO. .

ENTER operator number and PRESS  .

RETURN program key to normal.

Self-test

A self-test can be performed on all sensors equipped with self-test capabilities.

To test all zones ...

PRESS **0**, then  . The display will show ACCESS .

PRESS **00** and  . The display will show TESTING __ .

The display will show TEST FAILED __ and the printer will print any zone(s) failing the self-test.

To test an individual zone ...

PRESS zone number and **TEST** on keypad.

Display will read TESTING.

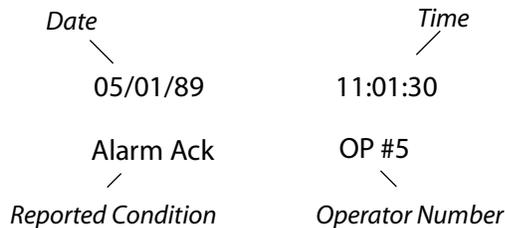
The printer (optional) will print Test Started. If the test passes, the display will show time and date, and the printer will print Test Completed.

If the test fails, the display will show TEST FAILED, and the printer will print the Test Failed message.

NOTE: Zones that fail self-test will display solid GREEN, RED and YELLOW lights and can only be reset by completing a successful self-test. Contact the maintenance department.

External Printer operation — optional

The printer responds to every action on the console.



```
05/01/89 — 11:01:30
Alarm Ack 1 OP# 5
05/01/89 — 11:02:30
Alarm RST 1 OP# 5
05/01/89 — 11:03:30
Access ACK 1 OP# 5
05/01/89 — 11:04:30
Access RST 1 OP# 5
05/01/89 — 11:05:30
Listen Reset 1 OP# 5
05/01/89 — 11:06:30
Tamper ACK 1 OP# 5
```

Printer Output

Printing system status

You may print a status of all MXF-5500 zones at any time. This feature may be useful at shift changes to inform the new operator of the system status. Enabling print status will immediately print out the current status of all zones, showing the individual secure, alarm, access, or tamper zone conditions.

To print the system status, PRESS "0" and **ACC**. The LCD screen will display PRINT STATUS ?.

PRESS **ACK**, and the printer will immediately print your system status report.

Optional features

Alarm Classification

This function is especially valuable if your system includes the Alarm Recordkeeping System (ARKS). When programmed to do so, your MXF-5500 will prompt you to classify alarms as belonging to one of six user defined categories.

To classify an alarm:

Proceed in the normal operating sequence when an alarm occurs: Press zone # on keypad and



to silence the alarm, then zone # and



to reset the alarm.

Display will read Alarm Type: ____

Enter the category number from 1 to 6 corresponding to the type of alarm as established for your facility. This information will be printed along with the alarm time and date, and also recorded by your ARKS for future review.

Priority alarm operation

This function is available if your system has been programmed to include joint domain operation. Joint domain operation provides priority alarms when associated zones are both alarmed.



Rapidly flashing RED and YELLOW lamps and a rapidly beeping tone indicate a priority alarm, meaning alarms have occurred in two associated zones. The flashing RED and YELLOW lamps appear in both alarmed zones.

Display will read



Zone #

PRESS the zone number and



to silence the audible alarm.

Display will read



Zone #

PRESS the zone number and



to reset alarm.

NOTE: The and procedures must be repeated for the companion priority alarm zone.

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3 GENERAL

The MX series is a modular, microprocessor-based communications and control center designed to monitor and control up to 60 zones of outdoor perimeter security sensors. The MX series includes models MX-5000, MXF-5500 and MX-6000. The MX-6000 is specially designed to operate with the PAS series personal alarm system and is discussed in a separate manual.

The MX series is designed to monitor and control the complete line of Magal-Senstar fence protection sensors as well as interface to alarm and control equipment by other manufacturers. All references to the MXF-5500 in this manual apply equally to all models unless specifically noted.

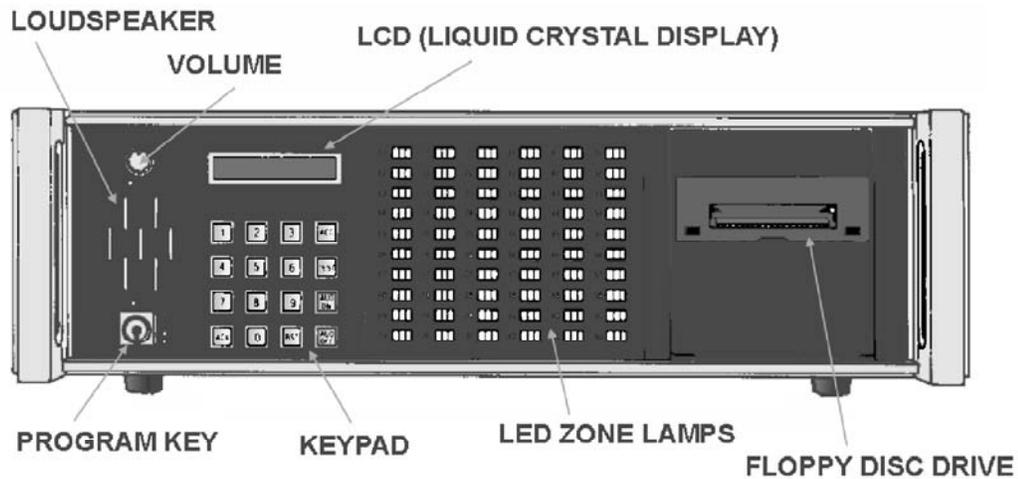


Figure 10. MXF-5500 Front Panel

4 THEORY OF OPERATION

The MXF-5500 operation is a state-of-the-art microprocessor-based control center. Alarms generated by field-mounted sensors are processed and displayed, while providing operator control of the security system. The MXF-5500 microcomputer system is "bus connected," meaning that the microprocessor communicates to all the other circuits inside the MXF-5500 using a common set of wires or a "bus." See the block diagram (Figure 20) for the MXF-5500 internal bus connections.

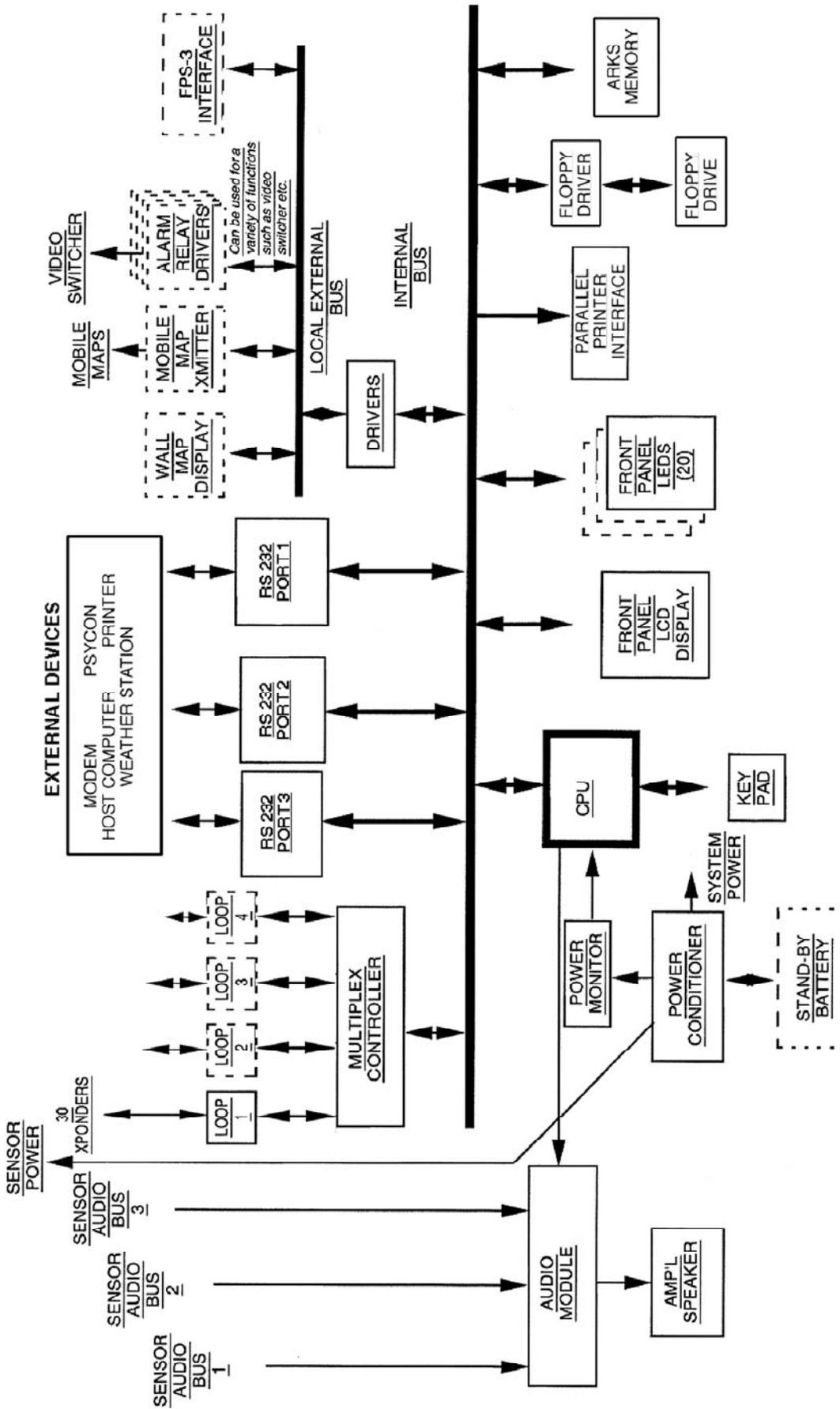


Figure 11. MXF-5500 Block Diagram

5 INSTALLATION

PLEASE NOTE: Before attempting field installation, the complete security system should be interconnected and tested in your shop. Because outdoor security systems are often installed over thousands of feet, troubleshooting in the field can be very time-consuming and expensive. Use the procedures shown in the Initial Setup and Adjustment section for testing and adjustment in your shop before beginning field installation and checkout.

The MXF-5500 is installed in conjunction with one or more of the following systems. Review the manuals of the systems included in your installation before proceeding.

- ▷ FPS-5 Fence Protection Systems
- ▷ GL-M 3 wire or multi-wire G-Line Systems
- ▷ MPS Microwave Protection Systems
- ▷ Stand-alone Transponders
- ▷ Remote Display Unit
- ▷ Super-Transponder
- ▷ Psycon Control Unit
- ▷ Alarm Recordkeeping (ARKS) System
- ▷ Weather Station
- ▷ Mobile Map Plus Systems
- ▷ Rans-Voice Systems

The initial installation planning should have been completed, which includes the general layout of the complete system, a determination of where each piece of equipment will be installed and where each alarm zone will be located. The location and length of each alarm zone should be determined in accordance with the manuals for the type of sensor/transponder used. The numbering of zones and the way they are connected to the external multiplex buses will affect the programming of the MXF-5500. Refer to Appendix B for initial planning information.

Mounting

Position the MXF-5500 control center in a location that:

- ▷ Provides operators with easy and comfortable access to the front panel controls.
- ▷ Allows the internal speaker to be clearly audible.
- ▷ Makes both the LED and LCD displays easily visible in the work area.
- ▷ Provides easy access for replacement of the printer paper.

AVOID installing the MXF-5500 in areas that:

- ▷ Are near heating systems or in direct sunlight. This ensures that the operating temperatures of the unit remain within specifications.
- ▷ Face direct sunlight that would make the displays difficult to see.
- ▷ Restrict the top case ventilation openings.

Fiber Cable

Use only the recommended fiber.

- The interconnect fiber should be run in conduit, either underground or along the base of the fence.
- Optical fiber requirement: Multimode, 62.5 um/125um with not more than 3.5 dB loss/km at 850 nm wave length of light.

We recommend breakout style of cable with each fiber individually enclosed in aramid yarn and a 2 mm elastomer jacket.

A typical approved cable is Optical Cable Corp., (800) 622-7711 www.occfiber.com, part numbers: BX02-070D-WLS/900-OFNR for 2 fibers in cable, BX04-080D-WLS/900-OFNR* for 4 fibers in cable *OFNR signifies indoor and outdoor riser. Use OFNP for indoor and outdoor plenum.

Use ST connectors with 2 mm strain reliefs.

Power Connections

The system must be supplied with transient and interference-free prime power. **Power conditioning transient suppressors suitable for computerized equipment must be employed between the MXF-5500 and the prime power line as required by good commercial practice to provide the highest level of protection from power spikes and surges.**

GENERAL: The MXF-5500 unit may be powered from either 120 volt 60Hz or 220 volt 50/60Hz power facilities.

OPERATION FROM 120-VOLT SERVICE. This unit is correctly wired at the factory for 120 volt operation. See figure 12.

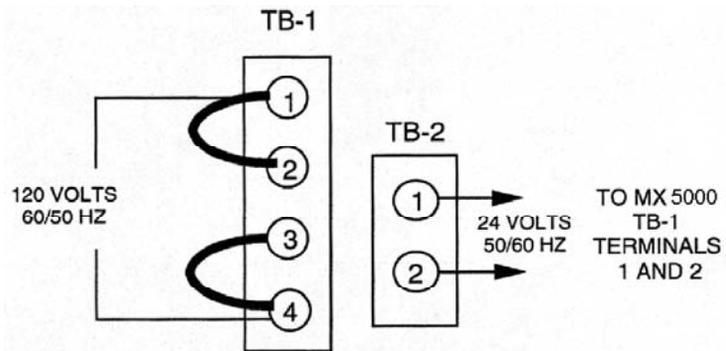
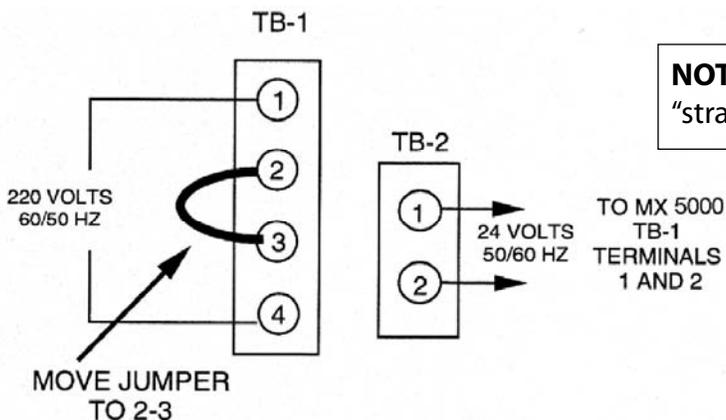


Figure 12. 120 Volt Connection for 24v Transformer



NOTE: Factory installed jumpers are "strap" type.

OPERATION FROM 220 VOLT SERVICE. To operate the system from 220 volt services, connect as in Figure 13.

Figure 13. 220 Volt Connection

OPERATION FROM 220-VOLT SERVICE.

To operate the system from 220-volt services, connect as in Figure 13. Move one factory installed jumper to 2-3. Discard the other.

Use good quality twisted pair cable, 18 AWG minimum from transformer output to MX.

BACKUP BATTERY CONNECTIONS. The optional 24VDC backup battery pack maintains MX operations if AC power is lost. Connect the battery as shown in Figure 8 on page 16. Use 18AWG minimum insulated wire.

Grounding

Make sure the chassis ground lug provided on the rear panel is returned to a true electrical ground in accordance with the National Electrical Code. **The MX requires a low impedance, low noise earth ground to ensure proper system operation and transient protection. This may be provided by a ground rod, cold water pipe, or an isolated “signal” ground circuit. Use insulated, 10AWG minimum wire for this ground connection.**

Connections to Field Equipment

All field connections to the MXF-5500 are made via the plug-in connections at the rear panel. See Figure 1 on page 10.

DATA/AUDIO CONNECTIONS. A typical installation requires a pair of multimode fibers looped through all FPS-5 and SAFT processors (up to 30 total) and returning to the MX. This provides redundant paths for data and audio information.

POWER CONNECTIONS. All field equipment is powered either locally or by way of a separate centralized power supply. The wiring distances required by outdoor perimeter protection systems often cause a substantial voltage drop between a central power supply and the processors. Each FPS-5 and SAFT processor requires approximately 130mA at 12-24VDC. The central power supply and connecting wire must be sized accordingly. See Appendix A.

Connecting and Testing the Processors

Connect the processor to the MXF-5500 as follows:

- ▷ Refer to Figure 9, MXF-5500 loop Connections.
- ▷ Using approved Fiber Optic cable, connect the fiber loop ST connectors to MXF-5500 Multiplex loop card. Typically Tx A and Rx A on the loop card connect to Rx B and Tx B respectively at the first processor on the loop. Then Tx B and Rx B on the loop card connect to Rx A and Tx A respectively at the last processor on the loop.
- ▷ Make sure the appropriate address is set on each FPS-5 and SAFT processor. Refer to Table 1 for switch setting illustrations.
- ▷ Apply power to field processors. (12-24 VDC)
- ▷ Check power connections to MX. Apply 24 VAC by plugging in MX transformer, then make 24 VDC battery connection at battery terminals.

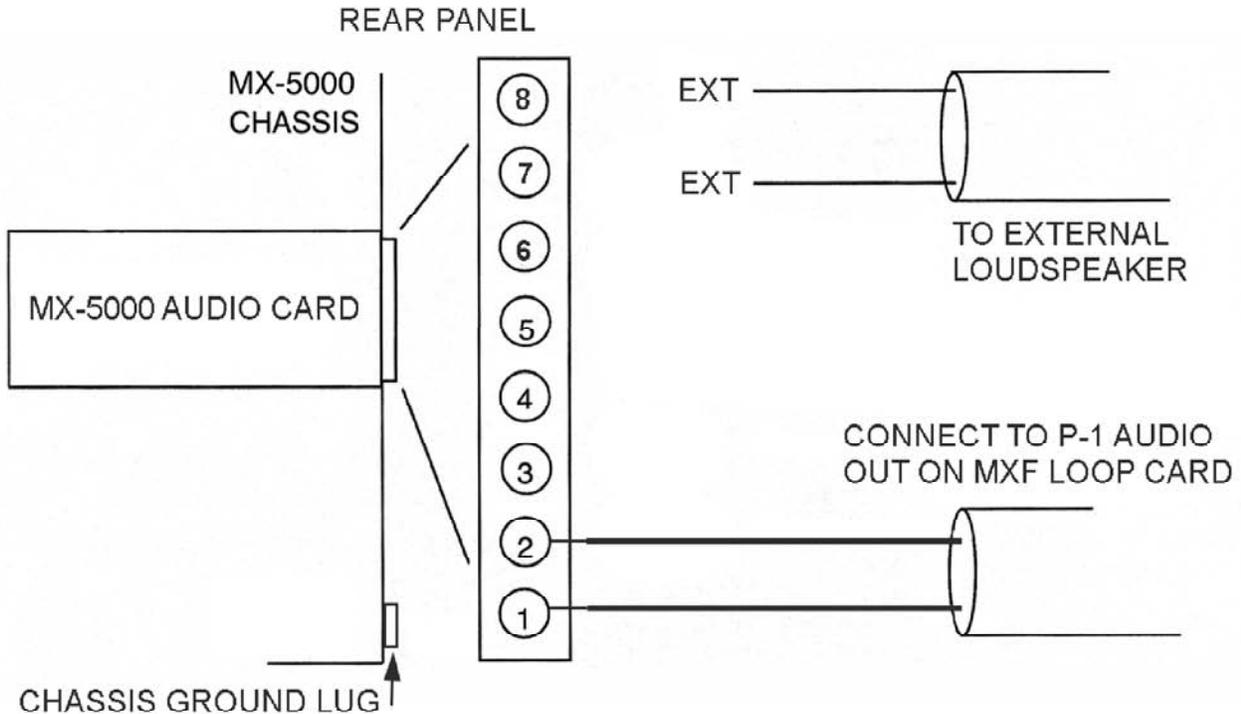


Figure 14. TB-2 Audio Input Connection

Connect audio jumper from Pins 1 & 2 of the Audio card TB2 to P-1 on the MXF Loop card. (This connection is typically already in place from the factory)

Lamp Test Connections

The MXF-5500 contains a feature for testing the front panel and externally mounted lamps utilizing a remotely mounted push button. To utilize the lamp test feature, the optional "general input" loop card must be installed in loop card #3 location. Connect an external 12 volt DC power supply and momentary switch as shown in Figure 26. When the lamp test switch is activated all lamps will light, the LCD screen will show "Lamp Test" and the printer will print lamp test with time, date and operator number. This feature must be enabled under Program Code 2. Please see system programming Table 2.

Setting the Correct Transponder Addresses

Each processor contains a transponder with a specific address that is related to the zones that the processor is reporting. The address switch settings for each transponder are provided in Table 1. Set the correct transponder address for each transponder card and reinstall each into one of the processors. The zone settings of the processor must match the initial site layout and the MXF-5500 modem and zone configuration settings detailed from Configuring Modems and Zones. At this time, each processor will have a specific mounting location on the perimeter and should be marked with that location.

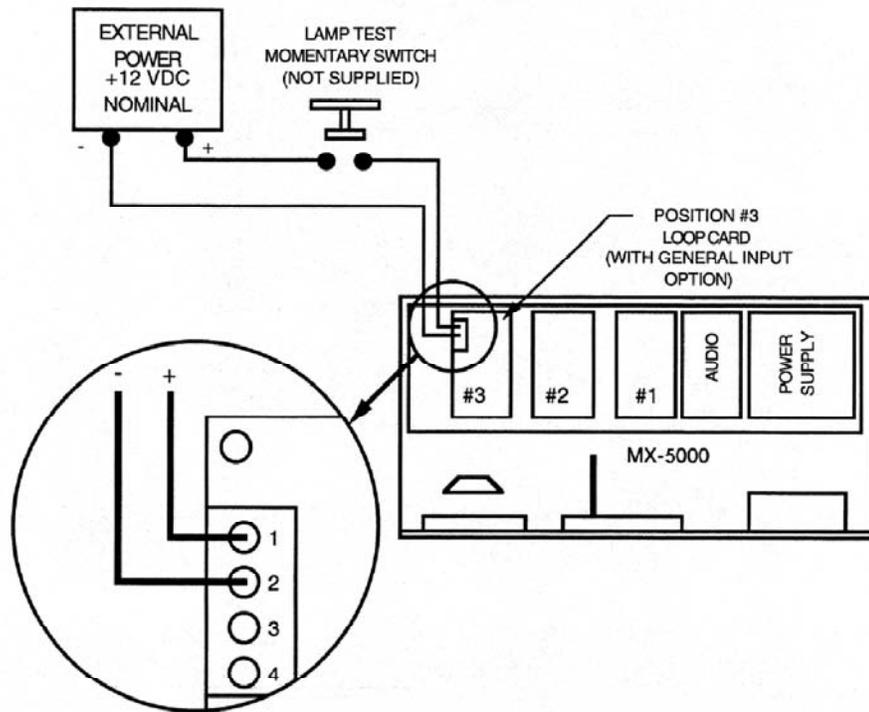


Figure 15. Lamp Test Connections

Testing Each Processor at its Zone Address

Test each processor on its external multiplex loop before equipment is taken to the field for installation.

To test each processor, proceed as follows:

- ▷ Though typically equipped with just one fiber loop card, the MXF-5500 can support up to three. If more than one is used, the field processors should be tested for operation on their respective loops.
- ▷ Identify all the processors that you have arranged to connect on loop 1. The order that they are tested does not matter but all loop 1 units must be tested on loop 1.
- ▷ If the processor and transponder card are operating properly, the green front-panel LEDs will light indicating the assigned zones of this processor, i.e., if this processor is programmed for zones 11 and 12, the green LEDs for zones 11 and 12 will be lit. All other zones will show a steady red and yellow LED indicating no communications (COMM FAILURE) with other processors, i.e., they are not installed.
- ▷ Simulate an alarm on one or both zones.
- ▷ If the operation is not as described, verify the transponder and address switch settings on the transponder card. Check the power supply voltage for the 12-24 VDC. If a problem still exists, swap the transponder card with another with the same switch settings. If the problem continues, replace the processor with another. If the problem still exists, contact the factory for assistance.
- ▷ Unplug the tested processor from the MXF-5500 and replace with one of the units remaining to be tested.
- ▷ Continue testing for each of the transponders that are to be connected to multiplex loop 1.
- ▷ Proceed to test the transponders to be connected to external multiplex loop 2.
- ▷ Proceed to test loop 3 processors in following the same procedures.

LEGEND  Signifies that switch is OFF

NOTE: Hold Transponder card as shown in Fig. 52 and set dip switches as shown

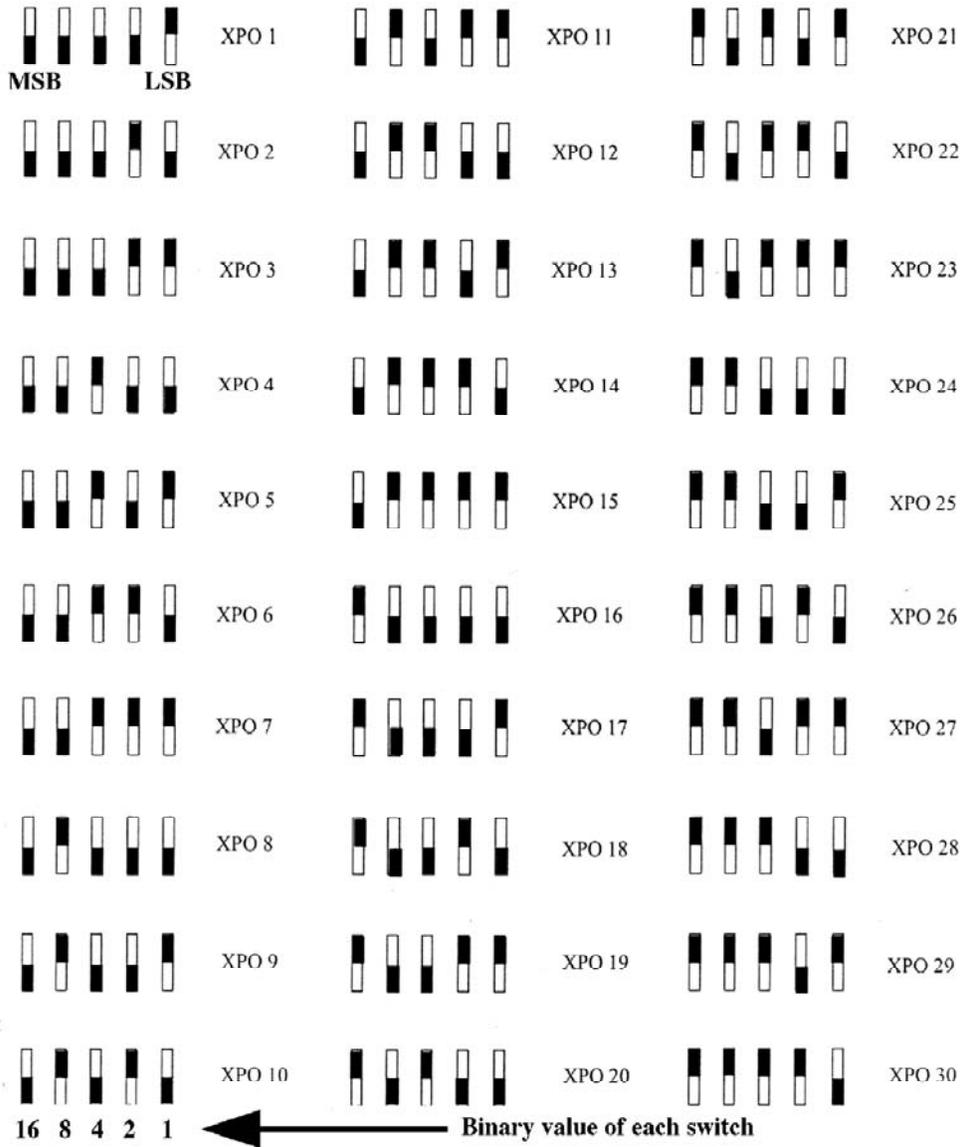


Table 1. Transponder Address Settings

6 INITIAL SETUP AND ADJUSTMENT

General

A complete security system requires that the MXF-5500 Multiplex Control Center be programmed to work with the configuration of transponders and sensors necessary for the total project. Since the requirements of each facility are different, each installation requires some amount of special programming.

It is strongly recommended that all initial programming, adjustments, and testing be accomplished in your shop. Outdoor security systems are normally installed over large areas with fences and locked gates making access for adjustment and troubleshooting difficult and time consuming. Initial testing in your shop facilitates easy programming and adjustment since all equipment can be located in very close proximity.

The following initial setup and adjustment procedure assumes that the work is being accomplished in your shop. If initial setup and adjustment in the field is required, the procedure should be changed to match the field conditions.

NOTE: During these procedures, the words “processor” and “transponder” are often used to describe the field units. The processor is generally the complete field-installed sensor system. The transponder is the circuit card inside each processor which controls all communications with the MXF-5500.

Beginning Procedures

- ▷ Check each unit for physical damage. Check for loose parts and connectors.
- ▷ Remove the top cover of the MXF-5500 by removing the two screws and sliding the cover toward the rear of the unit. Assure that all modules are securely in place and that all connectors and wiring are in place.
- ▷ Remove the front covers from all the sensors, FPS, G-Line, and stand-alone transponder as applicable to your installation. Choose one processor that will be your primary test unit. Refer to the manual of each processor for detailed instructions.
- ▷ Arrange enough workbench space for the MXF-5500 and several of the processors side by side.
- ▷ Approximately 10 feet of #18 gauge, twisted-pair wire will be used for power connections and 10 foot fiber optic patch cables for data and audio connections.

Power Connections

Verify that the MXF-5500 power connections are correctly wired for the proper voltage.

MXF-5500 System Programming

The MXF-5500 programming functions control system operation and display. The MXF-5500 contains a default program which can be used for most installations.

The programming matrix, Table 2, provides a simplified flow chart and description of the programming codes. This manual contains a paragraph describing the step-by-step use of each programming code.

As you proceed through the matrix, if you do not understand the operation of a programming code, refer to the paragraph where the programming step is explained in a step-by-step manner.

Initial Power Up

- ▷ Apply AC power to the MXF-5500.
- ▷ Connect the backup battery.

Entering Programming Mode

You must enter the initial program access code before programming the MXF-5500. This step is **required** before proceeding with any programming step.

To gain initial program access for ANY programming change proceed as follows:

- ▷ Turn key switch on front panel to PROG. The LCD screen will read OPERATOR.
- ▷ Press the *AUD/ON* key. The LCD screen will read Prgm Code__.
- ▷ Press 99 and press the *ACK* key on the keypad. The LCD screen will read ACCESS.
- ▷ Enter the system default password/access code 0000. If you have changed the program access code, enter it instead of 0000. The LCD display will read Prgm Code__.
- ▷ You may now enter your programming activity. Remember that this procedure is required before any programming activity.

Acknowledging All Alarms (Code 7)

Code 7 allows the operator to acknowledge all alarms at the same time.

- ▷ Enter programming mode.
- ▷ Press 7 and the *ACK* key. All alarms will acknowledge in sequence.
- ▷ Return key to normal.

NOTE: PROGRAM CODE 7 will not acknowledge that a battery failure has occurred if external batteries are not connected, you will be required to return the key to normal and press the *ACK* key to silence battery alarm tone.

Configuring Modems and Zones

The MXF-5500 must be configured to reflect the transponders and zones that will be installed in this facility.

This flowchart shows all the MXF-5500 software programming functions. The functions are divided into Initial Set-up and Troubleshooting categories. The Initial Set-up functions are performed with every MXF-5500 program setup. The Troubleshooting functions are typically used for maintenance operations. Some of the Initial Set-up functions may be required only if your system includes that special feature.

INITIAL SET-UP

- ▲ **Acknowledge all alarms (Code 7)**
During system startup, allows you to turn off all initial system alarms.
- ▲ **Configure Modems (Code 8)***
Allows you to set the number of zones connected to each data line.
- ▲ **Configure Zones (Code 0)**
Allows you to assign the zone numbers to each alarm zone in the system.
- ▲ **EDAPT Enable/Disable (Code 14)**
Allows you to turn on or turn off EDAPT or CONTACT operation for any FPS-5 transponder.
- ▲ **Count Lvl for EDAPT Zones (Code 12)**
Allows you to set count level for all zones operating under EDAPT supervision.
- ▲ **Set Date (Code 3)**
Allows you to set the correct date on the system clock.
- ▲ **Set Time (Code 4)**
Allows you to set the correct time on the system clock.
- ▲ **General Configuration (Code 2)**
Allows you to set several general operating parameters.
- ▲ **Weather Station (Code 13)**
Allows you to turn on or turn off weather station printout indications when your system is connected to the optional weather station.
- ▲ **Relay Interface (Code 9)**
Allows you to energize selected zone relays upon alarm or tamper.
- ▲ **Self Test Configuration (Code 10)**
Allows you to set the alarm zones that are to be tested under self test.
- ▲ **Audio Enable/Disable (Code 16)**
Allows you to turn on or turn off the audio listen-in feature on any system zone.
- ▲ **Configuration Printout (Code 1)**
Allows you to obtain a printout of all the software settings of your system program.
- ▲ **New Program Access Code (Code 99)**
Allows you to install a new access code in your system.
- ▲ **Zone Association (Code 17)**
Allows you to select primary zones and associated zones for high priority alarm indication.
- ▲ **Zone Classification (Code 23)**
Allows you to turn on or turn off the zone classification feature.

OTHER PROGRAMMING OPTIONS

- ▲ **Software Restart (Code 18)**
Enables a restart or reset of the system software.
- ▲ **Weather Station Printing (Code 88)**
Allows you to print the current weather status when your system includes the optional weather station.
- ▲ **Fiber Test (Code 25)**
Allows you to check that MX communicates to each transponder on both fibers.
- ▲ **Configuration Control (Code 24)**
Allows you to erase, load or copy MX configuration, and copy ARKS data.
- ▲ **Transponder Test (Code 11)**
Allows you to perform a test of an individual transponder connected to your system.

* Code 8 should be entered only once during initial programming. Subsequent entry will erase custom programming and reset the system to factory default values.

Table 2. MXF-5500 Programming Flow Chart

Configuring Modems (Code 8)

Program the number of zones connected to the MX.

- ▷ Enter programming mode.
- ▷ Press 8 and press the *ACK* key. The LCD screen will read Modem 1:20. If your system has 20 or less zones, enter that number and press the *ACK* key. If your system has 21 or more zones, just press the *ACK* key to accept 20 zones on modem 1, LCD screen will read Modem 2:20.
- ▷ If your system has 20 or less zones, enter 0 and press the *ACK* key. If your system has between 21 and 40 zones, subtract 20, and enter this result then press the *ACK* key. If your system has between 41 and 60 zones, just press the *ACK* key to accept 20 zones on Modem 2. LCD will read Modem 3:20.
- ▷ If your system has 40 or less zones, enter 0 and press the *ACK* key. If your system has between 41 and 60 zones, subtract 40, and enter this result then press the *ACK* key. The LCD will read Rly OFF.

If the MXF-5500 relay interface is used, proceed with the following steps. If not, press the *ACK* key on the keypad.

- ▷ To configure a relay output for alarm only on **ALL** zones:
 - Press the *AUD/ON* key once. The LCD screen will read Rly On Alarm.
 - Press the *ACK* key.
- ▷ If both alarm and tamper outputs are required:
 - Press the *AUD/ON* key twice. LCD will read Rly On Alm & Tam.
 - Press the *ACK* key.

The LCD screen will read XPO TYPE: STD.

This is the global option to select **ALL** zones for either Standard, Edapt, or Contact operation.

- ▷ To configure EDAPT for **ALL** zones:
 - Press the *AUD/ON* key once. The LCD will read XPO TYPE: EDAPT.
 - Press the *ACK* key to select.
- ▷ Contact operation is only applicable to FPS-3 systems.

As you completed configuring the modems, the MXF-5500 should have automatically initiated a software restart. The software restart is indicated by a blank LCD screen, and all front-panel lamps extinguished except for two. Following the automatic software restart, the MXF-5500 will show alarms since new conditions are present. Acknowledge these alarms by repeating the Acknowledge All Alarms procedure. The MXF-5500 will show solid red and yellow front-panel LEDs indicating Communications Failure in each zone since the processors are still not connected.

NOTE: Once MX programming is complete, do not re-select Program Code 8 to check your configuration or programming will revert to default condition. To check your zone programming, print the configuration using Program Code 1, or view zone programming with Program Code 0.

Setting Zone Configuration (Code 0)

The MXF-5500 contains a default program that sets all transponders and zones in sequential ascending order. Program Code 0 allows the system zone configuration to be tailored to accommodate site requirements. In this mode each zone can be identified with any transponder alarm output. The default configuration is as follows:

- Zones 1-20: Loop 1 addresses 001.1 to 010.2
- Zones 21-40: Loop 1 addresses 011.1 to 020.2
- Zones 41-60: Loop 1 addresses 021.1 to 030.2

For fiber operation the following loop addresses are used:

- Fiber Loop 1 Zones 1-60: addresses 401.1 to 430.2
- Fiber Loop 2 (if used) Zones 1-60: addresses 501.1 to 530.2
- Fiber Loop 3 (if used) Zones 1-60: addresses 601.1 to 630.2

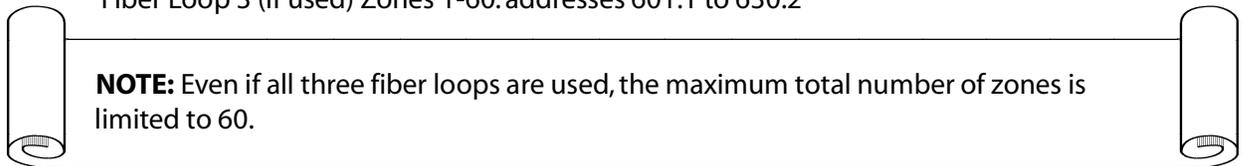


Table 3 is provided to record the zone configuration required for your system. Zones are not required to be in sequential order. If desired one or more zone numbers may be left blank to meet site requirements or to allow for future expansion.

To custom configure the system:

- ▷ Enter programming mode.
- ▷ Press 0 and press the *ACK* key. The LCD screen will read Zone 01 :001.1 This means zone 1 alarm information is being received from Transponder #1, sensor 1.
- ▷ Enter the MXF-5500 Program Code corresponding to detection zone No. 1 from Table 3 and press the *ACK* key.
- ▷ To skip a zone number, press the *Aud On* key until 'DISABLED' appears in the LCD screen and press the *ACK* key.

Repeat the procedure for each remaining zone in the system using the MXF-5500 program codes contained in Table 3. Following the last transponder zone assignment, the LCD will read Zone __ DISABLED. Press the 0 key or *Aud On* key until 'DONE EDITING' appears in the LCD screen. Press the *ACK* key and the software will restart itself with the new configuration.

Enabling EDAPT Operation (Code 14) to

This programming code selects EDAPT or STD (standard) operation for all compatible FPS-5 zones by their transponder (XPO) number. Choose STD operation only for all SAFT transponders. To enable EDAPT for each transponder proceed as follows:

- ▷ Enter programming mode, or if in programming mode:
- ▷ Press 14 and the *ACK* key. The LCD will display XPO (x):STD. (x) is the lowest number transponder configured in Program Code 0.
- ▷ Press the *AUD ON* key. LCD will read XPO (x):EDAPT.
- ▷ Press the *ACK* key. The LCD will advance to the next highest transponder number.
- ▷ Continue through all XPO numbers.

When finished setting the XPO types, the LCD screen will read: Combined Tamper. This is the factory setting for tamper output for EDAPT enabled transponders. If your FPS-5 processors are configured accordingly (see FPS-5 manual) the MX can be programmed for separate tampers so that a tamper is annunciated only in the zone that is actually in tamper. To select Separate Tampers, proceed as follows:

- ▷ The LCD will read: Combined Tamper.
- ▷ Press the AUD ON key. The LCD will read Separate Tamper.
- ▷ Press the ACK key. The LCD will read to PRGM CODE.

Table 3 Sample Zone Configuration

DETECTION ZONE	DEFAULT ZONE CONFIGURATION	CONNECTED TO TRANSPONDER #	TRANSPONDER SENSOR NO.	MXF-5500 PROGRAM CODE
1	001.1			
2	001.2			
3	002.1			
4	002.2			
5	003.1			
6	003.2			
7	004.1			
8	004.2			
9	005.1			
10	005.2			
11	006.1			
12	006.2			
13	007.1			
14	007.2			
15	008.1			
16	008.2			
17	009.1			
18	009.2			
19	010.1			
20	010.2			
21	011.1			
22	011.2			
23	012.1			
24	012.2			
25	013.1			
26	013.2			
27	014.1			
28	014.2			
29	015.1			
30	015.2			

Table 3 cont'd

DETECTION ZONE	DEFAULT ZONE CONFIGURATION	CONNECTED TO TRANSPONDER #	TRANSPONDER SENSOR NO.	MXF-5500 PROGRAM CODE
31	016.1			
32	016.2			
33	017.1			
34	017.2			
35	018.1			
36	018.2			
37	019.1			
38	019.2			
39	020.1			
40	020.2			
41	021.1			
42	021.2			
43	022.1			
44	022.2			
45	023.1			
46	023.2			
47	024.1			
48	024.2			
49	025.1			
50	025.2			
51	026.1			
52	026.2			
53	027.1			
54	027.2			
55	028.1			
56	028.2			
57	029.1			
58	029.2			
59	030.1			
60	030.2			

Setting EDAPT Counts (Code 12)

The MX contains the count circuit for all FPS processors set for EDAPT operation. The factory default setting is 4. The count may be changed by zone number as follows:

- ▷ Press 12 and the ACK key. The LCD will display Zone 1 Level 4.
- ▷ Enter the new count number. The display will show the new level.
- ▷ Press the ACK key. The LCD will advance to Zone 2.

Note: The LCD will display only those zones whose XPO type has been previously programmed for EDAPT operation. Program code 12 cannot be accessed if EDAPT has not been selected for any XPO.

General Configuration Programming (Code 2)

The general configuration programming mode contains several items associated with peripheral interface, communications port selections, operator number assignment, automatic alarm acknowledgment for servicing purposes, and time out of access conditions. The following programming selections are all contained under Code 2. Proceed through each step and select the required programming changes.

To enter the general configuration programming mode, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 2 and the ACK key. You are in the general programming mode. The LCD display will indicate COM 1: Printer.

If you don't wish to change any particular programming step, pressing the ACK key will move to the next programming step.

Configuring the Communication Ports (RS232 ports 1,2 & 3)

This port can be used to connect the MXF-5500 with an external printer, host computer, weather station, modem, video switch, remote display unit or the alarm recordkeeping (ARKS) system. If you are connecting one of these systems, refer to that system's manual before proceeding.

- ▷ Press the AUD/ON key to select; Disabled, Printer, Host I/F, Weather, RDU, Remote MX, modem, video switch, Ultimeter, or ARKS. When you have made your selection, press the ACK key.
- ▷ The LCD screen will show Baud: 2400. Press the AUD/ON key to select between 2400 and 9600. Press the ACK key to make the selection.
- ▷ The LCD screen will show Parity: None. Press the AUD/ON key to select between None, Odd or Even. Press the ACK key to make the selection.
- ▷ The LCD screen will show Data bits 8. Press the AUD/ON key to select between 8 and 7. Press the ACK key to make the selection.
- ▷ The LCD screen will show Stop bits 2. Press the AUD/ON key to select between 2 and 1. Press the ACK key to make the selection. Upon pressing the ACK key the LCD screen will read COM 2: Disabled. Com2 and Com3 are configured in the same manner as Com1.

When HOST I/F is selected, an additional option for sending status messages appears. This programs the MX to send a continuous supervisory data stream to the PSYCON. This option may be set to AUTO, ON or OFF. Systems with PSYCON NT should be set to AUTO. In this mode, the MX waits until prompted by PSYCON to start the data stream. For systems with Windows 3.1 PSYCON, set status to ON. When connecting the MX to other computer based controls such as a PLC, this data stream may not be desired and can be set to OFF.

To set status:

The LCD screen will read STATUS:(ON, AUTO, or OFF)
 Press AUD ON until the desired setting appears in the LCD display
 When you have made the selection, press the ACK key

NOTE: Only one port can be chosen for each function. For instance, COM2 and COM3 cannot both be ARKS ports.

Adding and Deleting Operator Identification Numbers.

To enter a new operator identification number, enter the number of the operator to be added and press the ACK key. Repeat this process for each new operator number and press the ACK key when all have been entered.

To remove an operator number that has already been entered into the system, press the ACK key until the display reads Remove Operator. Enter the number of the operator and press the ACK key. Repeat for each operator number to be removed and press the ACK key when done.

Setting the printer output to reverse print.

This command is used only when an external printer is used which must be fed the print information in reverse to the normal operation. This command is normally not used and the default is RVRs PRINT: OFF.

- ▷ Press the AUD/ON key to select either RVRs PRINT: ON or RVRs PRINT: OFF.
- ▷ When you have made the selection, press the ACK key.

Activate/Deactivate Automatic Acknowledge.

The MXF-5500 contains a convenient means of automatically acknowledging alarms as they occur. This feature is invaluable during start-up, maintenance, or during unattended operation. While in the Automatic Acknowledge mode, the MXF-5500 will acknowledge each alarm, reset and log all activity on the printer without operator intervention. Please note: This feature should NOT be used during normal system operation. Operator acknowledgement during normal system operation is required to assure all alarms are identified, and properly acted upon.

- ▷ To enable the Automatic Acknowledge mode, press the AUD/ON key until the LCD screen reads Auto ACK: On.
- ▷ To disable the Automatic Acknowledge mode, press the AUD/ON key until the LCD screen reads Auto ACK: Off.
- ▷ Press the ACK key.

Setting the MXF-5500 to the Host Mode.

The Host Mode is utilized whenever the MXF-5500 is being installed with another computer system that must control the MXF-5500 operations. The default condition is Host Mode: OFF.

- ▷ Press the *AUD/ON* key to select either HOST MODE: ON, OFF or BOTH.
- ▷ When you have made the selection press the *ACK* key.

NOTE: When Host Mode is enabled, all normal command functions are transferred to the host and the keypad is disabled unless the 'BOTH' option is selected. Connect host terminal or computer BEFORE you select HOST MODE: ON.

Selection of Access Timeout Period

The MXF-5500 contains a provision that does not allow zones to be placed permanently in the Access Mode. The Access Mode time period is selectable at the MXF-5500 from 1 hour to 99 hours. The default time period is 0 hours (no timeout period). To select a different Access Mode timeout period proceed as follows:

- ▷ The LCD display reads ACC TIMEOUT: 0. Enter the preferred timeout period (in hours) using the MXF-5500 keypad.
- ▷ When you have entered the selection, press the *ACK* key.

Lamp Test Function (See Lamp Test Connections for system requirements)

- ▷ The LCD screen reads LAMP TEST: Dis.
- ▷ Press the *AUD/ON* key. The LCD screen will read LAMP TEST: On. If you wish to disable the function, press the *AUD/ON* key so the LCD screen reads LAMP TEST: Dis.
- ▷ Press the *ACK* key.

Operator Control Language

The MX operator control language may be set for English or Spanish as follows:

- ▷ The LCD screen reads LANGUAGE: ENGLISH
- ▷ Press the *AUD ON* key. LCD will read LANGUAGE: SPANISH
- ▷ Press the *ACK* key.

Tamper Restoral: Auto or Manual

Tamper alarm restoral may be set to auto or manual reset as follows:

- ▷ The LCD reads Tamper RST: Auto
- ▷ Press the *AUD ON* key. The LCD will read Tamper RST: Man
- ▷ Press the *ACK* key. The LCD screen reads PRGM CODE_ indicating all Code 2 programming steps are complete.

Return key to Normal or continue with other programming options.

Setting the Correct Time and Date (Codes 4 and 3)

To set the time, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 4 and press the *ACK* key. The LCD screen will read HH:MM.
- ▷ Enter the time in hours and minutes. NOTE: This is a 24-hour clock.
- ▷ Press the *ACK* key. The LCD screen will read Prgm Code _ and the time is reset.
- ▷ Return key to normal.

To set the date, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 3 and press the *ACK* key. The LCD screen will read MM/DD/YY.
- ▷ Enter in two-digit sequence the month, day and year.
- ▷ Press the *ACK* key. The LCD screen will read Prgm Code _.
- ▷ Return key to normal.

Relay Interface Configuration (Code 9)

The MXF-5500 has an optional relay interface that provides a dry circuit signal relay capability for each zone monitored. Program Code 8 provides a global command to configure relays for **all** zones. To configure individual relay points:

- ▷ Enter programming mode.
- ▷ Press 9 and the *ACK* key. The LCD screen will read Rly 1 Off.
- ▷ Press the *AUD/ON* key. The LCD screen will read Rly1 Alrm Only.
- ▷ Press the *AUD/ON* key again. The LCD screen will read Rly 1 Alrm & Tam.
- ▷ Press the *AUD/ON* key until the desired operation appears on the LCD screen.
- ▷ Press the *ACK* key to move to the next zone.
- ▷ Repeat the above four steps for all zones.
- ▷ Return key to normal.

Establishing the Self-Test Configuration (Code 10)

The MXF-5500 provides a self-test feature that can electronically command a test of any one sensor or all sensors at the same time. If there are sensors in the system without self-test capability the configuration must be changed to exclude those sensors. To disable self-test for a specific zone:

- ▷ Enter programming mode.
- ▷ Press 10 and the *ACK* key. The LCD screen will read Zone 1 Test ENA.
- ▷ Press the *AUD/ON* key. The LCD screen will read Zone 1 Test DIS. Pressing the *AUD/ON* key again (toggle) will cause the LCD screen to read ZONE 1 Test ENA. Press the *AUD/ON* key until the desired operation appears on the LCD screen.

- ▷ Press the *ACK* key. The LCD screen will read Zone 2 Test ENA.
- ▷ Repeat the two steps for all zones.
- ▷ Return key to normal.

NOTE: Attempts to test zones which are not self-test capable will result in test failures which can only be cleared by restarting the system software (Code 18). Disable the self-test feature for all zones which are not self-test capable.

Enabling Weather Status Printing (Code 13)

This programming code is used only when the optional weather station is installed. The MXF-5500 program default is Weather Printing is OFF. To program weather status printing, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 13 and press the *ACK* key. The LCD display will read: WTR-OFF.
- ▷ Press the *AUD/ON* key. WTR-ALARM ONLY will appear on the display. Press the *ACK* key to select printing of weather status each time an alarm is printed.
- ▷ If not, press *AUD/ON* again. The LCD display will read WTHR ALARM AND HOURLY. Press the *ACK* key to select printing of weather status each time an alarm is printed AND printing of weather status every hour on the hour.
- ▷ Turn the key to normal.

Audio Signal Enable/Disable (Code 16)

This programming code allows you to select which alarm zones will have automatic listen-in capability. Alarm zones using a microwave unit or stand-alone transponder typically do not have audio capability, and the automatic listen-in capability should be disabled. The MXF-5500 default program has set all zones for automatic listen-in capability. To enable or disable individual alarm zones, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 16 and the *ACK* key. The LCD display will read: Zone 1 AUD: ON (indicating enabled)
- ▷ Press *AUD/ON* and the display will read OFF (disabled) Additional pressing will toggle between ON and OFF. Select the operation for this zone and press *ACK*. The LCD screen will read Zone 2 AUD: ON.
- ▷ Repeat for each zone in your system.
- ▷ When all zones are complete, return the key switch to normal.

Setting Zone Associations (Code 17)

This programming function is used when your system is being set up for joint domain operation. Joint domain operation means that alarm zones are associated with other alarm zones so that an alarm on any primary zone followed by another alarm on an associated zone within the specified time interval will cause a HIGH PRIORITY alarm.

During this programming step you will select primary zones and the other zones (associated zones) that will be associated with the primary zones.

To program the zone association of each alarm zone, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 17 and the *ACK* key. The LCD screen will read Assoc Time: 0.
- ▷ Enter the desired time interval for the association of the primary and associated zones from 1 to 99 minutes, then press the *ACK* key.
- ▷ The LCD screen will read Zone 1: PRIMARY. Press the *AUD/ON* key to toggle between Primary and Not Primary. Make your selection then press the *ACK* key. The LCD screen will read Zone 2: PRIMARY.
- ▷ Repeat for each zone in your system. When you have completed all zones in your system, press the *ACK* key one final time.
- ▷ The LCD screen will read ASSOCIATIONS: Press the *ACK* key. The LCD screen will show the first primary zone you selected followed by spaces for up to three associated zones (i.e., 00 00 00).
- ▷ Enter the first associated zone for the indicated primary zone and press the *ACK* key. The LCD screen cursor will move to the second associated zone location (i.e., 00 00 00).
- ▷ Enter the second associated zone and press the *ACK* key. If there is no other associated zones, just press the *ACK* key without entering a zone number.
- ▷ Likewise enter the third associated zone number, or just press the *ACK* key. An OK indication will appear on the LCD screen. Press the *ACK* key.
- ▷ The LCD screen will show the next primary zone with the same prompt as before. Continue by entering the associated zones as in the four previous steps.
- ▷ After the associated zones for the last primary zone have been selected, the LCD screen will show Pgrm Code __.
- ▷ Return key to normal.

Restarting or “Re-booting” the System Software (Code 18)

The MXF-5500 has a software restarting feature very similar to the rebooting feature of your personal computer. This feature is very useful during start-up and maintenance because a restart will clear all temporary memories that contain old alarm information and allow the system a fresh start.

To accomplish a software restart, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 18 and press the *ACK* key. The system will perform a self-restart, and the printer will print system startup.
- ▷ Return key to normal.

Getting a Configuration Printout (Code 1)

The MXF-5500 will provide a printout of the current system configuration, listing zone assignments, alarm relay programming, port configuration and option functions. Before executing this step, it may be beneficial to reboot the MX using Code 18. This clears the buffer of previously accumulated information.

To generate a configuration printout, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 1 and press the *ACK* key. Printer will print configuration.
- ▷ Return key to normal.

Obtaining a Weather Status Printout (Code 88)

This programming code is used only when the optional weather station is installed as part of your MXF-5500 system. If you wish to print the current weather status, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 88 and press the *ACK* key. The MXF-5500 printer will print the current weather status.
- ▷ Turn the key to normal.

Entering a New Program Access Code (Code 99)

The MXF-5500 protects all system programming with a four-digit password. This password is necessary to gain access to all system programming functions. Each MXF-5500 is shipped with a default password of 0000. The new access code must be a four-digit number.

To change the current access code to a new access code, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 99 and press the *ACK* key. The LCD screen will read Old Access.
- ▷ Enter the old code (e.g., 0000). The LCD screen will read new Access.
- ▷ Enter the new code.
- ▷ Press the *ACK* key.
- ▷ Return key to normal.

Configuration Control (Code 24)

Once the MXF-5500 is programmed, a back-up copy of the operating configuration can be made on a floppy disc. Should the programming in the MX be lost for any reason, this back-up diskette can be used to restore it. This program code also provides utilities to erase the existing MX program configuration reverting to the default settings, and to restore the MX configuration from a floppy disc. Finally, Code 24 allows ARKS (Alarm Record Keeping System) data downloads to floppies.

To enter the configuration control mode, proceed as follows:

Press 24 and the acknowledge key. You are in the configuration control mode and the LCD will indicate Exit. Press the ACK key to exit Code 24 and return to the Prgm Code prompt, otherwise press the AUD/ON key to select among the other choices of Save Config, Load Config, Erase Config or Make ARKS Disk.

Saving the Configuration Information

This process will make a copy of your current configuration to a floppy disc.

- ▷ Press the AUD/ON key until the LCD reads Save Config. Press the ACK key. The LCD will read SAVE Config?NO.
- ▷ Toggle to YES with AUD/ON key, and press ACK. The LCD will prompt you to insert an empty floppy disk, then press the ACK key. The LCD will read Format?NO.
- ▷ Toggle to YES with the AUD/ON key, press ACK and the LCD will read Save Complete when the copy process is done. Press ACK to return to the Prgm Code prompt.

Restoring the Configuration Information

This process transfers the configuration information from your back-up diskette to your MXF-5500.

- ▷ Press the AUD/ON key until the LCD reads Load Config. Press the ACK key. The LCD will read Load Config?NO.
- ▷ Toggle to YES with the AUD/ON key and press ACK. The LCD will prompt you to insert the diskette then press ACK.
- ▷ When the LCD reads Restore Complete, remove the diskette and press the ACK key. The MX will restart using the restored configuration.

Erasing the Configuration Information

This will delete the existing configuration information and the MX will revert to the default settings.

- ▷ Press the AUD/ON key until the LCD reads Erase Config. Press the ACK key. The LCD will read Erase Config?NO.
- ▷ Toggle to YES with the AUD/ON key and press ACK.
- ▷ When the LCD reads Erase Complete, press the ACK key. The MX will restart in default programming mode.

Downloading ARKS Data to a Diskette

If your MXF-5500 is equipped with the ARKS Data Recording option, this will allow you to copy data by way of the floppy drive for analysis.

- ▷ Press the AUD/ON key until the LCD reads Make ARKS Disk. Press the ACK key. The LCD will read From MM/YY.

- ▷ Enter the starting month and year of the time period for which you will download. Press ACK. Enter the ending month and year for the time period of interest. Press ACK again. The LCD will display the time interval you selected then the LCD will read Insert Disk.
- ▷ Insert an empty, formatted disk and press ACK. When complete, the LCD reads Archive Done and then returns to the Prgm Code prompt. Remove the floppy for analysis.

PLEASE NOTE: The MXF-5500 will **NOT** display the password at any time. Record the access code in a **secure** place. If the password is misplaced or forgotten, you cannot access the MXF-5500 program and should contact the factory immediately.

Set For Zone Classification (Code 23)

Enabling this feature allows operators to classify alarms as they are reset.

To activate this feature, proceed as follows:

- ▷ Enter programming mode.
- ▷ Press 23 and press the ACK key. The LCD screen will read Categories OFF.
- ▷ Press the AUD/ON key. The LCD will display Categories ON.
- ▷ Press the ACK key when the desired state is shown.
- ▷ Return key to normal.

Fiber Test Mode (Code 25)

This mode is used if testing/diagnostics only after an operator has received the Check Fiber indication.

Proceed as follows to run the test:

- ▷ Enter programming mode.
- ▷ Press 25 and press the ACK key. The LCD screen will display Testing... when the test is complete the LCD will display the test result for the lowest number transponder on the fiber loop i.e., *XPO1 all good*. Write down the result for further analysis.
- ▷ Press the ACK key to view the test result of the next highest number transponder on the fiber loop i.e., *XPO2 all good*. Record the result and continue this process until the results from all fiber transponders are recorded and the LCD returns to Prgm Code.
- ▷ Return key to normal.

Interpreting Test Results

When the test is run the MX communicates with each fiber transponder and expects to get a response on both channel A and channel B. A test result reading "XPO5 all good" means the response was received on both channels. A result reading "XPO8 A Failed" means the MX did not receive a response from channel A. Remember the test result is always from the point of view of the MX. Typically when a fiber link fails, all transponders on one side of the break will will read XPO(x) A Failed, and all transponders on the other side of the break will read XPO(x) B Failed. By comparing your list of test results with a map of the loop showing the transponder locations, the specific failed link can be identified.

Of course if no message is received on either channel A or channel B, the MX will already be indicating a COMM FAIL for the respective zones of this transponder. This may indicate a failed transponder or multiple fiber link failures.

This concludes the initial setup and adjustment of your MXF-5500 system. Shut down the system. Carefully disconnect your temporary wiring, remove external backup battery, and reinstall the MXF-5500 cover. Your system is now ready to be field installed.

7 SYSTEM START-UP AND TESTING

General

This section of the manual covers the start-up and testing of the field-installed system.

This section assumes that the MXF-5500 has been set-up and programmed in the shop in accordance with manual Section 7, the MXF-5500 has been installed in the field in accordance with manual Section 6, and the alarm processors and sensors including interconnecting cabling have been installed in accordance with the appropriate installation and operation manuals.

Applying Power

Verify power output from power supply for the field units is between 12 – 24 VDC.

Verify that all connections at the MXF-5500 rear panel are secure. Verify that all connections to external control room mounted equipment are secure.

Verify the connection of the ground terminal to a suitable electrical ground. This ground must be an independent ground rod or a water pipe in accordance with the National Electrical Code.

If using an external printer, switch it off.

Apply power to the MXF-5500 by plugging in the modular transformer. The transformer should be plugged into an approved plug strip containing suitable transient suppression. Connect the back up batteries. Make the final connection at the battery terminals to avoid potential damage to the MX.

Upon power-up, the MXF-5500 will attempt to initialize the modem and zone configuration that you previously programmed in Section 6. Undoubtedly there will be some alarm on the system and some clean-up programming may be necessary. Proceed by accessing the MXF-5500 program and acknowledging the alarms (see Section 6).

Alarms may occur while the system is being adjusted. These alarms can be acknowledged and reset using the zone number, ACK key, RST key, and the AUD/OFF key in accordance with Operator Instructions.

Before proceeding, take a look at the alarms appearing on the front-panel LEDs. The lamps will give you some idea of the parts of the system that need adjustment. However, do not attempt to resolve these items until you make sure each transponder is receiving 12-24 VDC.

Resolving Communications Problems

The MXF-5500 should be communicating with all processors at this time. There should be no yellow rapidly flashing LEDs with audible warning tone nor steady red and yellow (simultaneous) LEDs indicating Comm Failure.

If there are, this means that the zones showing Comm Failure are not communicating with the MXF-5500. Proceed through the steps below to determine what the problem may be.

- ▷ Perform a software restart.
- ▷ Inspect the fiber connections at the suspect processors for broken or loose connections.
- ▷ Inspect the transponder address settings at the suspect processors. If necessary, review the Configuring Modems and Zones procedure contained in Section 6.
- ▷ Review Initial System Planning. Verify that each zone has been properly designated and programmed into the MXF-5500.
- ▷ Conduct fiber test. (Program Code 25)

If, after performing the steps above, you continue to have a Comm Failure problem, contact the factory.

Initial Testing

At this point, all processors should be communicating with the MXF-5500, but there may be some alarms coming from the processors. These may be obvious (e.g., a tamper alarm because the processor faceplate is removed for testing, or an alarm defect that must be repaired).

Depending on the number of alarms on the system, you may wish to turn the printer on at this time. If so, perform a software restart (removes old alarm garbage) and activate the printer. If, for some reason, you have changed the MXF-5500 configuration, you may also wish to print a Configuration Report.

Place the MXF-5500 in the Automatic Acknowledge mode (Code 2). This will eliminate the requirement for an operator during initial testing.

Run a system self-test (see Operator Instructions). The printout of the self-test may be helpful in resolving field problems.

Refer to the processor manuals for processor testing criteria. Test each processor in accordance with the manual. Repeat the testing of each processor until you are assured that each is operating correctly. Your initial testing should include climb and simulated cut testing since these tests will be necessary during final testing.

Following the testing of each zone, proceed to test the other systems that are tied to the MXF-5500. Test the wall annunciator, the external relay outputs, the mobile map interface, and any other system that is connected.

You may wish to run a self-test again at the completion of the initial testing. Present the self-test printout to the owner's representative as an indication that the system is ready for final testing. Remember to deactivate the Automatic Acknowledge feature at the completion of initial testing.

Operator Training

Following final testing and acceptance, at least one operator training session should be conducted. As you are aware, many of the first service calls on any system are from operators who do not understand the system operation. An informed operator and maintenance technician are your best spokespersons. Provide reference copies of the MXF-5500 Operators Manual to each operator.

8 MAINTENANCE/TROUBLESHOOTING

General

The MXF-5500 is part of the total security system and should be tested as part of the complete system. Refer to the manuals for the processors and sensors to determine how testing should be conducted.

Periodic Tests

The MXF-5500 self-test of all zones should be conducted weekly, and at any other time when a system malfunction is suspected. Conduct the self-test before making any field tests of processors. The self-test will not only test the MXF-5500 operation but will give you a test of each field processor that contains self-test capabilities.

Systematic Testing

Problems sometimes occur due to equipment failures. However, in most cases, problems are caused by human- or installation-related items such as:

- Shipping damage
- Disturbed wiring or connections
- Incorrect connections
- Physical damage
- Defects in the fence mechanical installation.

Always look for the simplest problem first. For example, always check for power supply voltages before starting any further testing.

When approaching a system malfunction, look first for a related activity that could have caused the problem. This will help you go directly to the possible problem areas and/or obtain more accurate factory assistance. Examples are:

- Recent maintenance actions or installations of other equipment in the same area or equipment rooms.
- Water or lightning damage.

Factory customer assistance is available to help you find and correct system errors. It is important that you keep your as-built documentation and test records so the factory will have the data needed to help resolve your problem.

Problem Identification and Resolution

Table 4 is provided to help you find and resolve system defects. The MXF-5500 is the control center for the entire security system; therefore, defects reported on the MXF-5500 may result from problems in the other equipment. Be sure to refer to the technical data for the other equipment as well. Before

making more detailed tests, proceed as follows:

- ▷ Use the MXF-5500 self-test function first.
- ▷ Before proceeding further, check all power supply voltages, both at the MXF-5500 and at any questionable field-installed processors.

Repair

Perform system repairs using good commercial practice. It is recommended that repairs be performed by personnel who have received factory training in both the MXF-5500 **AND** the alarm processors used in the installation. Improper repairs or system damage caused by untrained personnel can affect the warranty.

Isolate defective components by swapping field connections with known good components or by using spare components reserved for maintenance actions. Repairs to equipment and circuits contained inside the MXF-5500 are not recommended in the field unless authorized by a factory technician. Consult the factory before attempting testing inside the MXF-5500 or removing MXF-5500 internal components. Perform testing and repair of field-installed components in accordance with the applicable manuals.

TABLE 4 TROUBLESHOOTING GUIDELINES		
SYMPTOM	POSSIBLE CAUSE	RECOMMENDED SOLUTION
Self test or COMM Failure in one zone	→ No power at processor →	Check processor power
	→ Defective sensor or processor →	Refer to manual for processor and sensor
	→ Defective MX-5000 programming →	Print configuration report and examine for defects
	→ Incorrect or broken fiber connections →	Check fiber connections
Self test or COMM failure on all zones on one loop card	→ Incorrect or loose fiber at rear of MX-5000 →	Check fiber connections
	→ Defective loop card →	Replace loop card
	→ Low voltage on loop power supply →	Check voltage of loop power supply
Irratic alarms or tamper alarms from one or more processors	→ Defective sensor, processor or fence →	See processor manual for troubleshooting procedure Disconnect and test for opens, shorts, and/or grounds
AC LOSS appears on LCD screen	→ AC main power lost →	Check circuit breakers and AC input wiring for correct voltage
	→ Power supply defective →	Check fuse located in MX-5000 transformer assembly. If fuse is blown check MX-5000 before installing new fuse

**TABLE 4
TROUBLESHOOTING GUIDELINES**

SYMPTOM	POSSIBLE CAUSE	RECOMMENDED SOLUTION
AC loss (con't)	Loose wiring	Check wiring at back of MX-5000
CHECK BATTERY appears on LCD screen	Battery defective or discharged	Disconnect and check battery voltage (load test is recommended)
	Fuse on Power Supply Card blown.	Replace fuse
	Battery connector loose or broken	Check wiring at rear of MX-5000
Hum in audio	Sensor cable shield shorted to fence	Check for short from sensor cable shield to fence
Audio level low	Audio level set low	Adjust gain controls on MX-5000 audio board. There are three controls; one for each loop.
No audio	Audio wiring broken or disconnected	Check connections from fiber loop card to audio card.
	Defective processor	Refer to processor manual and check processor
	Defective MX-5000 audio card	Swap audio cable from one loop to another and check to see whether MX-5000 or field is defective
Printer not functioning	Out of paper	Inspect and replace paper roll if necessary
	Ribbon cartridge defective	Inspect and replace printer ribbon if necessary
	Printer not selected properly in software	Refer to General Configuration Programming and check printer settings
	Printer defective	Perform self test on printer. If defective, return to factory for repair

APPENDIX A

Initial Installation Planning

The MXF-5500 security system is easiest to install, program, and service when the system design is simple and logical. The following general rules apply to installation planning:

- ▷ Alarm zones typically proceed in order, clockwise, or counterclockwise around the security perimeter, beginning at the main gate.
- ▷ The FPS-5 fence protection system contains two protection zones, which should be used in order (e.g., zones 1 and 2 or zones 11 and 12, etc.)
- ▷ The standard configuration MX-5500 contains one fiber loop card capable of connecting to 30 transponders or 60 alarm zones. Up to 3 fiber loop cards can be installed if separate fiber loops are required. The MFX-5520 is configured to display up to 20 zones, the MFX-5540 displays 40 zones; and the MFX-5560 displays 60 zones.

An example system layout with 12 fence protection zones and one microwave zone is shown in the figure on the following page. The accompanying table indicates which alarm zone is connected to which FPS processor. This information will be used directly to program the MXF-5500.

Brief description of figure and table:

This is a 13-zone system with one microwave and 12 FPS zones. The 12 FPS zones are connected to 6 FPS-5 processors (XPOs), and the microwave is connected to a stand-alone fiber transponder (SAFT). Zone 1 is the microwave zone. Since there is no other zone nearby, the other zone contained in the SAFT will not be used. Zones 2 and 3 are served by transponder (XPO) 2, zones 4 and 5 by transponder (XPO) 3, and so on to zones 12 and 13 by transponder (XPO) 7.

Conduit connects the transponders from the central control building to each transponder on the string. The minimum requirement is to run two multimode fibers around the perimeter starting at the MX; connecting through each processor; and returning to the MX. Fiber optic cables with more than two fibers can be used (see section 5). Additional fibers are spares.

If a centralized sensor power supply is used, the power bus can be run in the same conduit with the fiber. The wire size must be adequate to ensure the furthest transponder is supplied 12 VDC minimum (see wire selection table 2).

The table shows which zones are connected to which transponder. For example: zone 1 is connected to transponder (XPO) 1, sensor 1. Transponder 1, sensor 2 has no connection and is not used. Zone 2 is connected to transponder 2, sensor 1; zone 3 to transponder 2, sensor 2, and so on around the loop. The default configuration is shown to give you an idea of the amount of program changes that will be necessary.

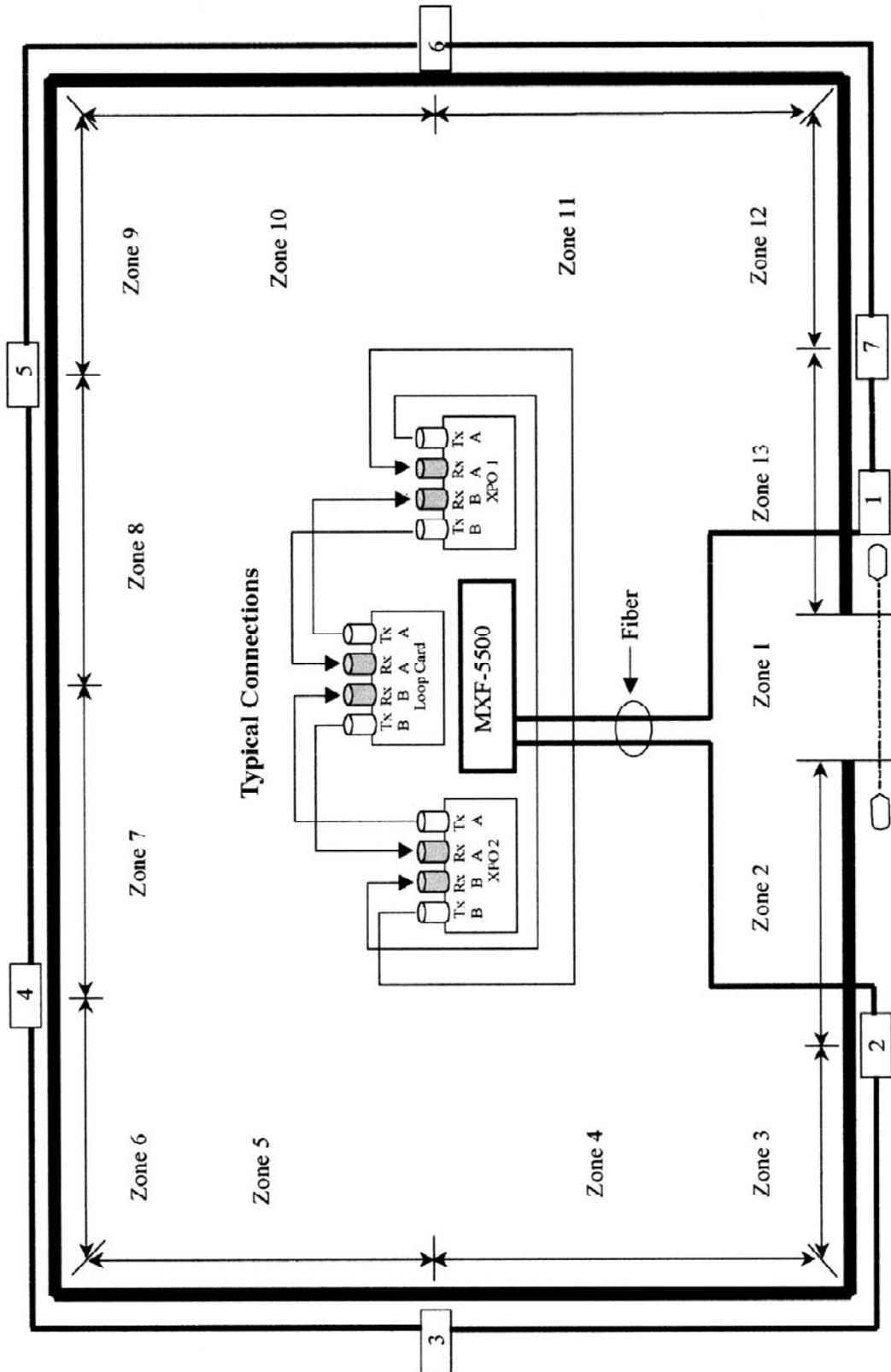


Figure 27. Example System Layout

Table 5
Sample System 1 Layout
Zone Configuration Programming

DETECTION ZONE	DEFAULT ZONE CONFIGURATION	CONNECTED TO TRANSPONDER #	TRANSPONDER SENSOR NO.	MXF-5500 PROGRAM CODE
1	1.1	1	1	401.1
2	1.2	2	1	402.1
3	2.1	2	2	402.2
4	2.2	3	1	403.1
5	3.1	3	2	403.2
6	3.2	4	1	404.1
7	4.1	4	2	404.2
8	4.2	5	1	405.1
9	5.1	5	2	405.2
10	5.2	6	1	406.1
11	6.1	6	2	406.2
12	6.2	7	1	407.1
13	7.1	7	2	407.2

MXF-5500 and zone configuration examples:

401.1 means transponder 1, sensor 1
 401.2 means transponder 1, sensor 2
 430.1 means transponder 30, sensor 1

When programming this system, configure modem 1 with 13 zones. Modems 2 and 3 will be set to DIS (disabled) or 0 zones. Set the zone configuration using the information in the table as shown above.

TABLE 6
Number of Processors on Single Leg of 24 VDC Power Bus

Typical Zone Length	Wire Size					
	18 AWG	16 AWG	14 AWG	12 AWG	10 AWG	8 AWG
50m	5	7	9	11	14	18
100m	3	4	6	7	10	13
150m	2	3	4	6	8	10
200m		2	4	5	6	9
250m			3	4	6	8
300m			3	4	5	7

APPENDIX B

Special MX Functions

Several special functions are available to the operator including zone status printout and restoring the MX configuration from a back-up diskette.

Printing System Status

You may print a status of all MXF-5500 zones at any time. This feature may be useful at shift change to inform a new operator of the system status. Enabling print status will immediately print out the current status of all the zones showing the individual secure, alarm, access, or tamper zone conditions.

To print system status, press "0" followed by the ACC key. When this is done the LCD will read Exit. Press ACK to return to normal operation, otherwise press the AUD/ON key to select among the other options. When the LCD reads Print Status, press ACK and the printer will immediately print the zone status report.

Restoring MX Configuration from a Back-up Disk

If for any reason your MX configuration is lost, it can be restored from a back-up disk which was copied earlier. To restore the MX zone configuration, press "0" followed by the ACC key. When this is done the LCD will read Exit. Press ACK to return to normal operation, otherwise press the AUD/ON key to select among the other options. When the LCD reads Restore Config, press ACK. The LCD will read Load Config?NO.

Press the AUD/ON key again so the LCD reads Load Config?YES. Press the ACK key and the LCD will prompt you to insert the back-up floppy disk. Insert the disk and press ACK again.

When the LCD reads Restore Complete, remove the diskette and press ACK. The MX will restart with the restored configuration.

Parallel Printer Connections

A parallel type printer can be connected to the "printer" port on the back of the MXF-5500. No special setup or configuration steps are involved, the port is automatically enabled. The printer output is compatible with all printers supporting Epson FX-100/FX-80 protocol.