AM2020/AFP1010
Troubleshooting Guide
Installation Precautions - Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.

CAUTION - System Reacceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72-1993 Chapter 7 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring.

All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49°F C/32-120°F F and at a relative humidity of 85% RH (non-condensing) at 30°C/86°F F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 15-27°C C/60-80°F F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Fire Alarm System Limitations

While installing a fire alarm system may make lower insurance rates possible, it is not a substitute for fire insurance!

An automatic fire alarm system - typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control with remote notification capability can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

Any fire alarm system may fail for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in walls, or roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second floor detector, for example, may not sense a first floor or basement fire. Furthermore, all types of smoke detectors - both ionization and photoelectric types, have sensing limitations. No type of smoke detector can sense every kind of fire caused by carelessness and safety hazards like smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.

IMPORTANT - Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n’emet pas de bruits radioelecetrique depassant les limites applicables aux appareils numeriques de la classe A prescrire dans le Reglement sur le brouillage radioelecetrique edite par le ministere des Comunications du Canada.
Section One: Introduction

This troubleshooting guide addresses typical AM2020/AFP1010 hardware and software issues drawn from the Notifier Technical Services Department through customer input and experiences. This guide is not all encompassing; situations may occur that cannot be accurately accounted for when troubleshooting an AM2020/AFP1010 installation, and in that case, contact your Notifier Service Representative for assistance at 1-800-454-9779.

Removing and Reapplying Power to the AM2020/AFP1010.

When working on the AM2020/AFP1010, the typical power down sequence should consist of the following steps:

1) Remove any SIB field wiring.
2) Disconnect the battery connection from the main power supply, MPS-24A TB2 terminals 1(+) and 2(-).
3) Shut off all sources of AC power from the panel.
4) Allow the panel to discharge for approximately one minute before connecting or disconnecting any ribbon cables or harnesses or removing or adding any circuit boards.

When reapplying power, always reconnect AC power before reconnecting the batteries. Failure to follow this procedure may result in damage to the panel or loss of programming. The following steps must be completed to reapply power to the AM2020/AFP1010:

1) Connect all internal cables and components.
2) Apply AC power.
3) Connect batteries.
4) Reconnect any SIB field wiring.

Static Precautions When Working on the AM2020/ AFP1010.

When handling a printed circuit board or removing or installing EPROMs, proper static precautions must be observed. This includes wearing a grounding strap and clipping it to an appropriate ground point so that any potential in your body may be safely discharged to earth.
Ground Fault.
(Also referred to as Earth Fault)

A Ground Fault is an unintentional connection of one or more system conductors (wires, equipment electronics, etc.) to some object which is electrically tied to earth ground. This connection may be direct contact, capacitive coupling, inductive coupling, or any combination of these things.

**Note:** The sensitivity threshold of the ground fault detection circuit on the MPS-24A Power Supply is approximately 50,000 ohms. Any single or combined impedance to ground within the AM2020/AFP1010 system using this supply having less than 50,000 ohms will cause a ground fault.

The MPS-24A uses a 1/4 Hertz, 4.0 Vpp square wave on a 2.0 VDC bias relative to system common for ground fault detection. This square wave is present on the cabinet and is referenced to earth ground. A simplified schematic of this circuit is shown below. Point “a” on the schematic represents the electrical location of the cabinet which is at earth ground potential.

During a normal condition, the pulse detection circuitry detects the square wave at the proper peak-to-peak potential (4.0 Vpp) at Point “b” and no ground fault is indicated.

![Figure 2-1: Simplified schematic representation of the ground fault detection circuit on the MPS-24A](image)

When a conductor from the panel (either a system common conductor or a voltage carrying conductor) has some low impedance path to earth ground, the peak-to-peak amplitude of the square wave is reduced and a ground fault is detected. A schematic representation of what happens when a system common conductor is faulted to earth ground is shown below.

![Figure 2-2: Schematic representation of a negative ground fault](image)
In a similar manner, a ground fault will be detected when a voltage carrying conductor (such as: +5 or +24 VDC) is faulted to earth ground. A representation of a positive ground fault is shown below.

![Schematic representation of a positive ground fault](image)

**Figure 2-3:** Schematic representation of a positive ground fault

**The Affect of Multiple Impedances to Earth Ground**

It is important to realize that these paths to ground need not be dead shorts. In the very common case shown below, multiple seemingly-minor ground faults combine to exceed the ground fault threshold of the power supply.

The main power supply is shown with its reference to earth ground (Point "a").

The SLC loop is shown with multiple high impedance paths to ground (Z₁, Z₂, Z₃, Z₄, and Z₅) these may result from any number of problems, such as a nick in the insulation of an SLC loop wire, moisture or water in a backbox or conduit.

![Schematic representation of a typical ground fault condition caused by combined impedance](image)

**Figure 2-4:** Schematic representation of a typical ground fault condition caused by combined impedance
For the sake of this example, let's assume that each of these impedances to earth is approximately 200,000 ohms. Since all these impedances have found a path to earth ground at Points "b", "c", "d", "e", and "f" which are electrically effectively the same point as Point "a", all these impedances can be considered to be in parallel. Based on the simple calculations shown, we can see how the ground fault threshold is indeed exceeded.

\[
\frac{1}{Z_{\text{TOTAL}}} = \frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3} + \frac{1}{Z_4} + \frac{1}{Z_5}
\]

\[
\frac{1}{Z_{\text{TOTAL}}} = \frac{1}{200,000 \, \text{K}} + \frac{1}{200,000 \, \text{K}} + \frac{1}{200,000 \, \text{K}} + \frac{1}{200,000 \, \text{K}} + \frac{1}{200,000 \, \text{K}}
\]

\[
\frac{1}{Z_{\text{TOTAL}}} = 2.5 \times 10^5
\]

\[Z_{\text{TOTAL}} = 40,000 \, \text{ohms}
\]

Note: Since \(Z_{\text{TOTAL}}\) is less than 50,000 ohms, a ground fault will result.

Figure 2-5: Calculating the parallel impedances of multiple ground faults

The Affects of Capacitance on Ground Faults

Capacitance can also be a major cause of induced ground faults. For example, if the capacitance between the conductors of an SLC loop and earth ground exceed a certain value, the capacitive reactance (\(X_C\)) will fall below the ground fault circuit threshold and a ground fault indication will result. When using shielded cable for the SLC loop wiring, it is important to realize that since a conductor (the SLC loop wire) is running in close proximity to the shield for a long distance, it is basically acting as a large capacitor. If the capacitive value is known, the capacitive reactance can be calculated by using the following formula;

\[X_C = \frac{1}{2\pi fC}\]

Where "f" is the frequency (in Hertz) of the ground fault detection circuit, in this case one-quarter hertz (0.25 Hz) and "C" is the measured capacitance value (in Microfarads).

Example: If the measured capacitance value is 10 microfarads, the capacitive reactance will be approximately 63,660 ohms. Since this value does not drop below the threshold of 50,000 ohms, no ground fault will result.

Example: If the measured capacitance value is 15 microfarads, the capacitive reactance will be approximately 42,441 ohms. Since this value is below the threshold of 50,000 ohms, the result will be a ground fault indication.
The capacitive reactance formula can also be used to find the maximum allowable capacitance before an induced ground fault will result.

\[ X_C = \frac{1}{2\pi fC} \]

solving the formula for \( C \) (Capacitance) yields;

\[ C = \frac{1}{2\pi fX_C} \]

substituting the ground fault circuits frequency and threshold;

\[ C = \frac{1}{(2\pi)(.25)(50,000)} \]

\[ C = 12.73 \ \mu\text{fd} \]

**Figure 2-6: Calculating the maximum allowable capacitance before a ground fault will be induced**

The result is approximately 12.73 microfarads. The capacitive reactance \( (X_C) \) is inversely related to the capacitance value. So, as the capacitance goes up, the capacitive reactance goes down. If it goes below 50,000 ohms a ground fault will result. That means that 12.73 microfarads is the maximum allowable amount of capacitance collectively on all loops leaving the panel.

**Note:** A ground fault is not caused by the failure to connect earth ground to the system.

**Corrective Action:**

The most efficient way of troubleshooting a ground fault is to isolate the panel from the field wiring by removing circuits one at a time and leaving them off until the problem source has been identified.

1) Disconnect all SLC loops from the panel by removing the detachable terminal blocks from each LIB and wait for approximately one minute to see if the ground fault clears.
2) Disconnect the EIA-232 loop from the Serial Interface Board. Wait for one minute. If the ground fault clears, reconnect this loop to the SIB but disconnect the wiring from the external equipment (CRTs, printers, etc.) that are connected to this loop. If the ground fault clears, the problem lies with the external equipment. If the ground fault remains, the problem is with the actual field wiring.

3) Disconnect the EIA-485 loop from the Serial Interface Board. Wait for one minute. If the ground fault clears, reconnect this wiring to the SIB but disconnect the wiring at the external equipment (AMG, annunciators, etc.). If the ground fault clears, the problem is with the external equipment (an RPT-485W repeater module may be required to isolate the annunciator loop). If the ground fault is still present, the problem is in the field wiring.

4) Disconnect all field wiring from any AVPS-24s, AA-30s, AA-120s, AMGs, FFT-7s and any other equipment in the system which share a common reference with the same battery that the MPS-24A is connected to.

   a) If the system has multiple power supplies with ground fault circuitry, use isolation devices (i.e., RPT-485, ACT-1, etc.) to remove the electrical connection. When this is not possible, disable all but one ground fault detection circuit and connect the battery negative terminals of all power supplies. Isolation of supplies is preferable since multiple power supplies with a single detection circuit result in increased capacitance to earth and may give way to poor operation during an actual fault condition.

5) Disconnect all field wiring from terminal block TB3 on the MPS-24A.

6) Power down the panel. Disconnect the ribbon cable that connects the SIB plug P4 to the DIA plug P4. Disconnect the ribbon cable that runs between the CPU plug P3 to the DIA plug P3. Apply power to the panel. If the ground fault condition has cleared, the source of the ground fault is on the Display Interface Assembly (DIA) and it must be replaced. One simple check on the DIA is to make sure that a gasket is in place between the LCD display and the front of the metal assembly. If this gasket is missing, a temporary solution is to use electrical tape to isolate the display.

7) Disconnect the main power harnesses from the MPS-24A plugs P2 and P4.

8) Disconnect the 2-pin trouble cable from the CPU plug P2 (if connected).

9) Disconnect the battery connection at the batteries while leaving any common connection intact. If the ground fault still exists, replace the MPS-24A.

Low Chamber Value.

Low Chamber Value is an indication that the detection means of an addressable (Photoelectric, Ionization, and Thermal) detector may be failing. The trouble condition is produced when the signal from the detector falls below 20% of the alarm threshold.

Corrective Action:
1) Replace the addressable detector. To do this, remove the old detector. Wait approximately three minutes and replace with the new detector. Allow several minutes for the trouble to clear.

2) If the trouble persists, call Notifier Technical Support.

Maintenance Required/Pre-Alarm Alert.

Maintenance Required is an indication that the detection chamber of an addressable detector (Photoelectric and Ionization only) may be becoming increasingly dirty. The trouble condition is produced when the level in the chamber climbs
above 80% of the alarm threshold, and remains there for 26 consecutive hours (60 seconds for pre-alarm). If at anytime the level drops below 80%, the 26 hour (60 seconds for pre-alarm) timer is reset.

**Note:** Addressable thermal detectors cannot cause a "Maintenance Required" or "Pre-Alarm Alert" trouble.

**Corrective Action:**
1) Clean or replace the addressable detector. To do this, remove the old detector. Wait approximately three minutes and replace with the new detector. Allow several minutes for the trouble to clear.

2) If the trouble persists, call Notifier Technical Support.

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**Catastrophic LIB Communications Fault From a Consecutive Group of LIB's.**

If a group of consecutively placed Loop Interface Boards, such as (3,4,5 and 6) or (7,8,9 and 10) are all experiencing catastrophic communications faults, this could be a clue to the solution. Since the Loop Interface Boards all share a common Interconnect Chassis Assembly (ICA-4/ICA-4L), this may be the problem.

**Corrective Action:**
1) Using proper power removal procedure, move each of the LIBs that are experiencing the problem to a LIB position that is functioning properly and reapply power using proper power up procedure.

2) If each of the "problem" LIBs function in their new position, replace the faulty ICA-4/ICA-4L chassis and return the LIBs to their original positions.

For more information on LIB corrective action, refer to Section Five, Trouble Code T18.

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**Drift Compensation Error.**

AM2020/AFP1010 software is designed to automatically compensate for detector chamber sensitivity drift due to contamination in SDX-551/751 Photoelectric and CPX-551/751 Ionization detectors. If the detector sensitivity drifts to such an extreme that the panel cannot compensate for it, this error will be generated.

**Note:** FDX-551 Thermal detectors cannot cause a Drift Compensation Error.

This software-based compensation meets NFPA 72-1993, Chapter 6 "Inspection, Testing and Maintenance" periodic testing and maintenance requirements without removing and testing each detector in the system.

Alarm sensitivity in a detector's chamber tends to increase over time. This increase is caused by chamber contamination. In time, if the clean air level exceeds the alarm threshold, a false alarm occurs. Drift compensation eliminates this problem by increasing the alarm threshold as needed to maintain a constant sensitivity. When the detector is too dirty to be compensated, the Drift Compensation Error will occur.

Drift Compensation may be enabled or disabled in Full or Partial System Programming.
Drift Compensation is performed on every detector when the system is powered up and every 120 hours (based on at least four samples). In addition, a Drift Compensation is performed on a specific detector whenever a non-communications Invalid Reply clears.

**Corrective Action:**
If power has not been removed from the system recently and a Drift Compensation error is present, follow the procedure below:

1) Remove the detector in question.

2) Clean the detector by following the directions supplied with it.

3) Leave the detector out for at least three minutes before replacing it.

4) If the trouble does not clear within a few minutes, remove the detector.

5) Wait for approximately three minutes and replace the detector with a new one (of the same type) that has been set to the proper address.
   If power has been removed from the panel, some detectors may show drift.
Invalid Replies From All Devices on Every SLC loop.

If every device on every SLC loop is in a constant invalid reply condition, this may be a symptom of a bigger problem common to all the Loop Interface Boards. The 24 VDC bus originating from the main power supply may be loaded down to the point that it can no longer support proper operation.

Corrective Action:
1) On the MPS-24A Main Power Supply, with the main power harness or harnesses plugged in, measure with a voltmeter either Plug P2 or P4, pin 1 (-) to pin 7 (+).

![Original MPS-24A](image1)

![Revised MPS-24A](image2)

2) If this voltage reading is well below 24 VDC, power down the system and disconnect the harnesses from P2 and P4.

3) Wait five minutes. This will allow any PTCs (Positive Temperature Coefficient thermistors, a self-restoring circuit breaker device) on the main power supply to self-restore if they have been tripped.

4) Reapply power to the system and measure pin 1 (-) and pin 7 (+) of P2 or P4 again (with the harnesses disconnected). If 24 VDC is not present, the main power supply must be replaced. If 24 VDC is present, then something else in the system is loading down this 24 VDC bus. Refer to the current calculation tables in the AM2020/AFP1010 manual for further information.

Intermittent Invalid Reply.

Corrective Action:
1) An intermittent invalid reply may be caused by noise. If the SLC loop wiring is shielded, make sure the shields are terminated properly, refer to the AM2020/AFP1010 Manual for specific information.

2) Check the times that the invalid replies come in. Do they correspond to the startup of any electrical motors or other possible sources of noise?

3) If the device that is producing the invalid reply is a Control Module or XPR-8 point, then the source of the invalid reply may be the wiring attached to this device. Remove the field wiring and see if the invalid reply comes back.
If the symptoms at the left exist, it could be an indication of a power supply problem.

**Corrective Action:**
1) On the MPS-24A Main Power Supply, with the main power harness that connects the MPS-24A to the ICA-4L (part number 71030) plugged in, measure with a voltmeter either Plug P2 or P4, pin 1 (-) to pin 8 (+).

2) The voltage reading should be 5.0 VDC. If this voltage reading is below 4.7 or above 5.25 VDC, replace the MPS-24A.

3) Record the software EPROM numbers from the CPU, each LIB, SIB, and DIA and contact the Notifier Technical Service Representative for further instruction.

**Short Circuit From a Control Module or XPC Point.**

This is caused by a short circuit in the wiring of either a Control Module or an XPC point.

**Corrective Action:**
1) Check field wiring.

2) Check the style of the field wiring (Style Y or Z).

3) Remove field wiring and place ELR on screw terminals.

4) Check Type I.D.

5) Replace module or XPC card.

**Open Circuit From a Control Module or XPC Point.**

This is caused by an open circuit on the NAC of either a Control Module or an XPC point.

**Corrective Action:**
1) Check field wiring.

2) Check the style of the field wiring (Style D or B).

3) Remove field wiring and place ELR on screw terminals.

4) Replace module or XPC card.
Constant Invalid Reply.

The control panel is trying to poll a device (addressable detector, module, pull station) at a specific address and is either not receiving any response at all or it is not receiving a valid response. If two devices are set to the same address, an invalid reply may not occur immediately.

**Note:** Under Full System Programming, when a specific NFPA listing (72A, 72B, etc.) is selected, the AM2020/AFP1010 will automatically program in certain module addresses (L1M96, L1M97, L1M98, or L1M99). A control module must physically be connected to the SLC loop at this address, or an invalid reply will occur.

**Corrective Action:**
The first step in troubleshooting an invalid reply is make sure that the device is properly programmed into the control panel. Check the following programming issues:

1) Is the device programmed at the correct address? Check both SLC loop number and module/detector address.

2) Is the device correctly programmed as a detector or module? Addressable pull stations and XP Transponder points are considered to be modules.

3) Is the device programmed with the correct type I.D.? If a device is programmed with the wrong type I.D., it may take up to twenty minutes for the invalid reply to occur.

**Note:** If the device is an addressable pull station, it can have one of two type I.D.'s. The BGX-10L is an older pull station which is no longer available, it should be programmed as a "PULL". The BGX-101L, the most common pull station, must be programmed as an "MPUL".

4) Once the programming has been verified, check the hardware. Is the device physically connected to the correct SLC loop?

5) Are the rotary switches on the detector or module set correctly? Address "00" is not a valid address.

6) Are there two detectors or two modules set to the same address on the same SLC loop?

7) Does the device physically connected to the SLC loop actually correspond to what's programmed? Is it a Photoelectric or Ionization detector? Is it a control or monitor module?

**Note:** When a control module is programmed as a "CMXC" or an "FORC", the two tabs on the CMX must be broken.

8) It may be helpful to perform a Walk Test to identify if there is more than one device at the same address.

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Invalid Reply From an XP Transponder Point.

The control panel is trying to poll an XP Transponder point at a specific address and is either not receiving any response at all or it is not receiving a valid response. Depending on how they are configured, XP Transponders may take up to 27 addresses (up to 51 for Canadian Dual Stage).

**Corrective Action:**
The first step in solving an invalid reply problem from an XP Transponder is to calculate how many addresses the XP Transponder is consuming. Use the work sheet below to calculate the number of addresses:

If Power Supply Supervision is enabled (XPP switch 1=ON), it consumes one address (place one in the blank to the right). ___
If Relay Mapping is enabled (XPP switch 2=ON), it will consume two address (place a two in the blank).

Depending on how each card is configured, the expander cards of the Transponder (XPC, XPM, or XPR) can take up to 8 addresses. If the card is an XPC-8 that is using all eight circuits (Style Y) and is also configured for Canadian Dual Stage operation, it will consume sixteen addresses. Calculate the number of addresses that each card is consuming and enter the number on the corresponding line.

First expander card
Second expander card
Third expander card
Total number of addresses consumed

Take the total number of addresses consumed (above) and add it to the base address of the Transponder (set via the two rotary switches on the XPP-1) subtract one, and this will give you the last address that is being taken by the Transponder. Now that all the Transponder addresses are known, we may begin troubleshooting the invalid reply.

1) Check the position of switches 7 and 8 to make sure that the Transponder is not programmed for Local Mode operation (see chart below).

<table>
<thead>
<tr>
<th>Switch 7</th>
<th>Switch 8</th>
<th>Operating Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Communicates with the AM2020/AFP1010. However, the RESET, ACKNOWLEDGE, and ALL CALL commands are ignored. Automatically reverts to Local Mode if communications is lost.</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>No communication with the AM2020/AFP1010. Functions in Local Mode only.</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>Communicates with the AM2020/AFP1010. Will not function in Local Mode if communications is lost.</td>
</tr>
<tr>
<td>ON</td>
<td>ON</td>
<td>Communicates with the AM2020/AFP1010. The RESET, ACKNOWLEDGE, and ALL CALL commands are accepted. Automatically reverts to Local Mode if communications is lost.</td>
</tr>
</tbody>
</table>

2) If Power Supply Supervision is enabled, confirm that the base address of the Transponder is programmed with a "MTRB" type I.D.

3) If Relay Mapping is enabled, confirm that the next two addresses are programmed with an "FORC", "CMXC" or other similar type I.D.

4) Confirm that each address point on each of the expander cards is programmed appropriately. If performing Canadian Dual Stage with XPC cards, confirm that the first address of each circuit is programmed with a "CON" type I.D. and that each second point is programmed as a "FORC".

5) If the invalid reply persists call Notifier Technical Support.

What Does the Switch (SW1) on the CPU Board Do?

When activated, this switch performs a hardware reset of the microprocessor on the CPU. **Note: Never press this switch unless instructed to do so by a Notifier Technical Service Representative.** During troubleshooting procedures there are certain diagnostic reasons for pressing this switch. However, activating this switch at the improper time may result in loss of AM2020/AFP1010 fire protection. If this switch is activated without proper instruction, cycle power to the panel using the prescribed method.
The MPS-24A and MPS-24B Main Power Supplies are designed to withstand IEEE 587 Category A Long Branch Circuits transients. They have been tested to this standard by Underwriter's Laboratories as part of the UL 864 tests. The power supplies use Metal Oxide Varistors (MOV) to achieve this degree of protection.

The LIB-200 Loop Interface Board is designed to exceed FCC Part 68 Subpart D Telecommunication Line Transient standards. Underwriter's Laboratories has tested the LIB-200 to the UL 864 signal line transient level. The LIB-200/200A/400 uses gas discharge tubes and zener diodes for this protection.

The MPS-TR is designed to supervise any of the MPS series power supplies when they are remotely mounted.

Yes. Presently, there is only one way to reset the AM2020/AFP1010 from a keyswitch (either remotely or locally). Take a normally open keyswitch (that when rotated momentarily closes) and connect it to a control input point on an LDM-32 Lamp Driver Module. This annunciator point must be programmed with a "ARES" (Annunciator Reset) type ID. Whenever the keyswitch is activated, the Fire Alarm Control Panel will be reset.

Note: If this keyswitch is mounted remotely from the FACP, Underwriter's Laboratories requires that the status of all fire alarm zones be annunciated at this remote location.
### Section Three:
**AM2020/AFP1010 Software**

#### Possible Causes for Software Related Problems.

There are a number of possible causes for momentary software related problems. The majority of these problems will clear themselves when power is removed and then reapplied to the panel.

1. Electromagnetic interference.
2. Radio Frequency interference.
3. A nearby lightning strike or other electrical transient.

If at this point the problem does not clear, refer to the appropriate troubleshooting section. If the problem still cannot be resolved, contact Notifier Technical Support.

This situation may be related to a problem with the nonvolatile RAM memory chips that are located on the CPU, DIB, and SIB-NET. Older chips are prone to an undesired enabling of the write-protect feature when it is exposed to a small (0.2 V) negative voltage swing. This type of voltage swing may occur if any board is plugged in or removed with power applied to the system, or if a power harness is connected or disconnected with power applied.

All sources of power must be disconnected from the panel before plugging in or removing a board or power harness.

**Note:** Beware of hidden voltage sources! One such source could come from remotely powered annunciators. If an annunciator is powered from a remote source, this source of power may back-feed into the control panel through the EIA-485 connection on the Serial Interface Board. To eliminate this possibility disconnect the EIA-485 terminal block from the SIB.

**Corrective Action:**
1. Power down the panel and replace either the chips or the entire board.
2. Reprogram and retest the system installation.

#### The System Will Not Accept Any New Programming Information.

This situation may be related to a problem with the nonvolatile RAM memory chips that are located on the CPU, DIB, and SIB-NET. A damaging voltage surge may occur if any board is plugged in or removed with power applied to the system, or if a power harness is connected or disconnected with power applied.

All sources of power must be disconnected from the panel before plugging in or removing a board or power harness.

**Note:** Beware of hidden voltage sources! One such source could come from remotely powered annunciators. If an annunciator is powered from a remote source, this source of power may back-feed into the control panel through the EIA-485 connection on the Serial Interface Board. To eliminate this possibility disconnect the EIA-485 terminal block from the SIB.

#### The System Loses All Programmed Information.

This situation may be related to a problem with the nonvolatile RAM memory chips that are located on the CPU, DIB, and SIB-NET. A damaging voltage surge may occur if any board is plugged in or removed with power applied to the system, or if a power harness is connected or disconnected with power applied.

All sources of power must be disconnected from the panel before plugging in or removing a board or power harness.

**Note:** Beware of hidden voltage sources! One such source could come from remotely powered annunciators. If an annunciator is powered from a remote source, this source of power may back-feed into the control panel through the EIA-485 connection on the Serial Interface Board. To eliminate this possibility disconnect the EIA-485 terminal block from the SIB.
**Figure 3-3: Nonvolatile RAM Chips**

*Corrective Action:*
1) Follow proper precautions when applying or removing power from the Fire Alarm Control Panel. If proper procedures have been followed and loss of memory is still a problem, call Notifier Technical Services.

When new points are programmed into the system they will cause a trouble condition if the devices are not physically installed. When each trouble is received, the piezo sounder will sound and the user will get kicked out of programming. This situation can become quite annoying, but is easily resolved.

*Corrective Action:*
1) In Partial System Programming, select to silence the piezo sounder during programming.

2) Go to Full Point Programming, and program the first device to be added to the system.

3) Shortly after programming this device, a trouble condition (Invalid Reply) will be generated. This trouble condition will result in the user getting kicked out of Full Point Programming.

4) **Do not** acknowledge this trouble.

5) Instead, immediately reenter Full Point Programming and begin to program the next point. As soon as the user reenters Full Point Programming, the piezo sounder will silence and will not resound for subsequent trouble conditions while the user is in program mode.

6) Upon completion of all point programming, return to Partial System Programming and re-enable the piezo sounder during programming.

When the event reminder is enabled in Full or Partial System Programming, the piezo sounder will beep approximately every seven seconds as a reminder that acknowledged events remain in the system and have not been restored yet. If this condition is not desirable, it may be easily disabled.

*Corrective Action:*
1) Enter Full or Partial System Programming and disable the event reminder.

2) With the event reminder disabled, once the piezo sounder is silenced for an event condition, it will remain silenced until a new event occurs.
What is the Difference Between a Forward-Activated Zone and a Reverse-Activated Zone?

The main difference between a forward-activated zone and a reverse-activated zone is as follows:

A **forward-activated zone** has a Control-By-Event list of devices or higher numbered zones that it will activate when it (the zone) goes into alarm. It enters the alarm condition when an initiating device or lower numbered forward-activated zone (FZON) that is mapped to it goes into alarm.

A **reverse-activated zone** has a Control-By-Event equation that must be evaluated. If this equation becomes true the reverse-activated zone (RZON) will go into alarm. The equation consists of operands such as devices or zones and operators such as the OR, AND, NOT, XZONE, DEL, TIM and SDEL functions.

In Full System Programming a boundary must be set up between forward-activated zones and reverse-activated zones. Every zone above this boundary will be an RZON and every zone below this boundary will be an FZON. The AM2020/AFP1010 has 240 software zones. For typical installations Notifier recommends setting the boundary at Zone 200. Where Zone 200 would be the highest number forward-activated zone and Zone 201 would be the lowest number reverse-activated zone. Depending on your specific application this boundary may need to be moved higher or lower.

**Forward Activated Zones**

A forward activated zone (FZON) is a zone that may be activated by any initiating device (detector, monitor module, XPM point, or pull station) or by a lower number FZON. In addition, once activated an FZON will execute its Control-By-Event (CBE) list which can only consist of a number of things to activate.

**Example:** Let's assume that Zone 10 and Zone 11 are both forward activated zones. Zone 10 is activated by an addressable pull station on the first floor. Zone 10's CBE list could consist of the following:

(Z11 Z220 L1M80 L3M62 L10M33)

The above CBE is nothing more than a list of things to do. When Zone 10 goes into alarm it will activate: Zone 11 (a higher number FZON), Zone 220 (an RZON), and L1M80, L3M62, and L10M33 (these devices must be output type devices such as Control Modules, XPC, or XPR points). Remember, by definition a FZON's Control-By-Event list is only a list of things to do. It cannot contain any equations such as AND, OR, NOT, XZONE etc..

As in the example above, Zone 10 may be mapped to activate Zone 11. But, Zone 11 cannot be programmed to activate Zone 10. Since Zone 10 is of lower numerical value than Zone 11, Zone 11 cannot go back and activate it.

**Reverse Activated Zones**

A reverse activated zone (RZON) is a zone that may be activated by any initiating device, forward activated zone, and also by its own CBE equation (including lower number RZON). Unlike forward activated zones, RZONs have a Control-By-Event equation. The AM2020/AFP1010 continually processes each RZONs' programmed equation. If the equation becomes true, the RZON will activate. For examples of reverse-activated zone Control-By-Event equations, see specific functions such as the OR, AND, NOT, XZONE, DEL, TIM or SDEL functions.
The "OR" function operates identically to a logic OR statement. It may be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone.

**Equation Format:**

\[
\text{OR}(Z_a, Z_b)
\]

*These are the zones or devices to be "ORED" together.*

**Example 1:** Assume that Zone 208 is a reverse activated zone with the following Control-By-Event equation:

\[
\text{OR}(Z_{100}, Z_{201})
\]

This means that if either Zone 100 **OR** Zone 201 activate then Zone 208 will activate. The logic gate equivalent of this equation would look like Figure 3-4.

![Figure 3-4: Logic gate equivalent of a two input OR equation.](image1)

If it easier to visualize, this equation can also be represented in electrical terms as two normally open switches in parallel. So that if either one of the switches (Zone 100 or Zone 201) is activated, then the lamp (Zone 208) will turn on.

![Figure 3-5: Electrical equivalent of a two input OR equation.](image2)

**Note:** As shown in the above examples, a reverse activated zone (Zone 208) may reference another RZON (Zone 201) in it's equations provided that the zone that it is referencing is numerically lower.

The "OR" function may reference any number of inputs (provided that the 14 byte equation size limit is not exceeded). The "OR" function may also directly reference addressable detectors and modules as shown below.

**Example 2:** Assume that Zone 211 is a reverse activated zone with the following Control-By-Event equation:

\[
\text{OR}(L_{1M1}, L_{1D1}, Z_{12}, Z_{38})
\]

This means that if either L1M1 (a pull station, monitor module, or XPM point) **OR** L1D1 (an addressable detector) **OR** Zone 12, **OR** Zone 38 go into alarm then Zone 211 goes into alarm. The electrical equivalent of this equation would be four normally open switches in parallel.
The "AND" function operates identically to a logic AND statement. It may be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone.

**Equation Format:**

\[
\text{AND(Za Zb)}
\]

These are the zones or devices to be "ANDED" together. There must be at least two, but there may be more.

**Example 1:** Assume that Zone 201 is a reverse activated zone with the following Control-By-Event equation:

\[
\text{AND(Z10 Z11 Z12)}
\]

This means that Zone 10 **AND** Zone 11 **AND** Zone 12 must all be in alarm before Zone 201 will enter an alarm condition. The logic gate equivalent of this equation is shown below.

![Figure 3-6: Logic gate equivalent of a three input AND equation.](image)

The above equation can also be visualized in electrical terms as three normally open switches in series.

![Figure 3-7: Electrical equivalent of a three input AND equation.](image)

The "NOT" function operates identically to a logic NOT statement. It may be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone.

**Equation Format:**

\[
\text{NOT(Za)}
\]

This is the zone or device to be evaluated and the result "inverted".

**Example 1:** Assume that Zone 208 is a reverse activated zone with the following Control-By-Event equation:

\[
\text{NOT(Z100)}
\]
This means that if Zone 100 is active then Zone 208 is inactive. If Zone 100 is inactive then Zone 208 is active. The logic gate equivalent of this equation would look like Figure 3-8.

![Figure 3-8: Logic gate equivalent of a NOT equation.](image1)

The above equation can also be visualized in electrical terms as a normally closed switch.

![Figure 3-9: Electrical equivalent of a NOT equation.](image2)

### How Does the "XZONE" Function Work?

The "XZONE" function is an operator that may be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone. The "XZONE" function is not really a cross-zone, but more of a counting zone. When two or more initiating devices that are mapped to the operand zone activate, then the equation will prove true.

**Equation Format:** \[ XZONE(Zn) \]

\[ Zn \text{ is a FZON or an RZON that has at least two initiating devices mapped to it.} \]

**Example 1:** Assume that Zone 220 is a reverse activated zone with the following Control-By-Event equation:

\[ XZONE(Z48) \]

This means that when any two or more initiating devices (detectors, monitor modules, pull stations, and XPM points) that are mapped to Zone 48 go into alarm, then Zone 220 will activate.

The operand in an "XZONE" equation (Zone 48 in Example 1) can be either a forward or a reverse activated zone.

**Example 2:** Assume the following:

L1D1 is an addressable detector with the following CBE: (Z90)
L1D2 is an addressable detector with the following CBE: (Z90)
L1D99 is an addressable detector with the following CBE: (Z90)
L1M1 is an addressable pull station with the following CBE: (Z90)
Zone 220 is a reverse activated zone with the following CBE:

\[ XZONE(Z90) \]

This means that when any two or more of the initiating devices (L1D1, L1D2, L1D99, and L1M1) go into alarm, then Zone 220 will activate.
The "DEL" function can be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone to delay the activation of that output device or zone and as an option turn the output device or zone off after a specified time.

**Equation Format:**

```
DEL(dd.dd.dd tt.tt.tt (Zn))
```

- **dd.dd.dd** is the time delay in an hour.minutes.seconds format.
- **tt.tt.tt** is the time that the output device or zone will stay on after activation (this is optional, leaving it out will result in the output device or zone staying on until the operand restores or until the panel is reset).
- **Zn** is the input device or zone that acts as a trigger for the delay timer to start.

**Example 1:** Assume that Zone 205 is a reverse activated zone with the following Control-By-Event equation:

```
DEL(00.01.00 (Z12))
```

This means that after Zone 12 has been activated for one minute, Zone 205 will activate and stay active until either the panel is reset or Zone 12 returns to normal.

**Example 2:** Assume that Zone 206 is a reverse activated zone with the following Control-By-Event equation:

```
DEL(00.01.00 00.05.00 (Z12))
```

This equation means that after Zone 12 has been activated for one minute, Zone 206 will activate and stay active for five minutes unless the panel is reset or Zone 12 returns to normal.

The operand in a "DEL" equation (Zone 12 in both the above examples) may be either an input device, a forward activated zone or a reverse activated zone.

**Application Note:** The "DEL" equation may be used to delay the activation of the main sounders in a building to allow time for the source of the alarm to be investigated. **Note:** This application should only be used after obtaining written permission from the Local Authority Having Jurisdiction. Consider the following for a hypothetical building:

- All the smoke detectors in the building are mapped to Zone 1 (an FZON).
- All the pull stations in the building are mapped to Zone 200 (an RZON).
- The control modules that control the main sounders in the building are also mapped to Zone 200.

Zone 200 is given the following CBE:

```
DEL(00.01.00 (Z1))
```

**Note:** All the smoke detectors that are mapped to Zone 1 should be programmed as non-tracking to avoid resetting the one minute delay timer.

When a smoke detector goes into alarm it activates Zone 1. A counter is started that will delay the activation of Zone 200 for one minute, thus delaying the main sounders in the building and allowing the security guard time to investigate the source of the alarm.

A control module (mapped to Zone 1) may be configured to sound a local sounder at the security guard's location to alert the guard to the possible fire in the building. In addition, the panel's piezo sounder will automatically activate.

Once Zone 1 is activated, three possible scenarios may occur:

1) The guard goes to investigate the alarm and discovers that it was a false activation. In which case he can reset the panel before the building is needlessly evacuated.

2) The guard goes to investigate the alarm and realizes that it is indeed a fire. So he pulls the closest manual pull station which causes an immediate
activation of all the sounders and evacuates the building.

3) The guard goes to investigate the alarm and is unable to respond. In which case, after the one minute time out, the main sounders are activated and the building is safely evacuated.

How Does the "TIM" Function Work?

The "TIM" function can be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone to automatically turn on that zone or output device at a specific day and time. There are two types of "TIM" equations: the first may be used to turn on a zone or device on certain days of the week. The second may be used to turn on a zone or device on a specific date.

**Equation Type 1 Format:**

TIM(SU MO TU WE TR FR SA HH.MM HH.MM)

- These are the days of the week on which the zone or device will activate.
- This is the start time in an hours.minutes format (optional).
- This is the stop time in an hours.minutes format (optional).

**Equation Type 2 Format:**

TIM(MM-DD-YY HH.MM HH.MM)

- This is the specific date on which the zone or device will activate in a month/day/year format. The month, day, year specifier is optional. If one of these items is omitted then its entire range is used as the default (see examples below).
- This is the start time in an hours.minutes format (optional).
- This is the stop time in an hours.minutes format (optional).

**Note:** In the above equations the start and stop times are optional. If no times are specified the device/zone will activate for the entire day. If times are specified they must be in a 24-hour military format (00.01 to 24.00).

**Example of Equation Type 1:** Assume that Zone 236 is a reverse activated zone with the following Control-By-Event equation:

TIM(MO TU WE TR FR 08.00 17.00)

This means that Zone 236 will be activated everyday of the week (excluding Saturdays and Sundays) from 8:00 AM until 5:00 PM.

**Example of Equation Type 2:** Assume that Zone 225 is a reverse activated zone with the following Control-By-Event equation:

TIM(11-14-)

This means that Zone 225 will be activated on November 14th of every year for the entire day (from midnight of the previous day until midnight of the 14th).

How Does the "SDEL" Function Work?

The "SDEL" is a latching version of "DEL" which requires a system reset to restore once activated. The "SDEL" function can be used in the Control-By-Event equation of an output type device (CMX, XPC, or XPR modules) or of a reverse-activated zone to delay the activation of that output device or zone and as an option turn the output device or zone off after a specified time.
Equation Format: \( \text{SDEL}(\text{dd.dd.dd tt.tt.tt } \text{Zn}) \)

- \text{dd.dd.dd} is the time delay in an hour.minutes.seconds format.
- \text{Zn} is the input device or zone that acts as a trigger for the delay timer to start.
- \text{tt.tt.tt} is the time that the output device or zone will stay on after activation (this is optional, leaving it out will result in the output device or zone staying on until the panel is reset).

Example 1: Assume that Zone 205 is a reverse activated zone with the following Control-By-Event equation:

\( \text{SDEL}(00.01.00 \text{ (Z12)}) \)

This means that after Zone 12 has been activated for one minute, Zone 205 will activate and stay active until the panel is reset.

Example 2: Assume that Zone 206 is a reverse activated zone with the following Control-By-Event equation:

\( \text{SDEL}(00.01.00 00.05.00 \text{ (Z12)}) \)

This equation means that after Zone 12 has been activated for one minute, Zone 206 will activate and stay active for five minutes unless the panel is reset.

The operand in an “SDEL” equation (Zone 12 in both the above examples) may be either an input device, a forward activated zone or a reverse activated zone.

Application Note: The “SDEL” equation may be used to delay the activation of the main sounders in a building to allow time for the source of the alarm to be investigated. **Note:** This application should only be used after obtaining written permission from the Local Authority Having Jurisdiction. Consider the following for a hypothetical building:

All the smoke detectors in the building are mapped to Zone 1 (an FZON).
All the pull stations in the building are mapped to Zone 200 (an RZON).
The control modules that control the main sounders in the building are also mapped to Zone 200.

Zone 200 is given the following CBE:

\( \text{SDEL}(00.01.00 \text{ (Z1)}) \)

When a smoke detector goes into alarm it activates Zone 1. A counter is started that will delay the activation of Zone 200 for one minute, thus delaying the main sounders in the building and allowing the security guard time to investigate the source of the alarm. A control module (mapped to Zone 1) may be configured to sound a local sounder at the security guard’s location to alert the guard to the possible fire in the building. In addition, the panel’s piezo sounder will automatically activate.

Once Zone 1 is activated, three possible scenarios may occur:

1) The guard goes to investigate the alarm and discovers that it was a false activation. In which case he can reset the panel before the building is needlessly evacuated.

2) The guard goes to investigate the alarm and realizes that it is indeed a fire. So he pulls the closest manual pull station which cause an immediate activation of all the sounders and evacuates the building.

3) The guard goes to investigate the alarm and is unable to respond. In which case, after the one minute time out, the main sounders are activated and the building is safely evacuated.
**What is "Day/Night" Sensitivity?**

Day/Night Sensitivity allows the user to automatically force the sensitivity of selected addressable detectors to either a HIGH or LOW setting at a pre-programmed time of day.

**Note:** Day/Night Sensitivity must enabled (and the HIGH and LOW sensitivity zones must be assigned) in either Full or Partial System Programming.

**Example:** A good application of this would be in an office building where the employees are allowed to smoke and typically occupy the building from 8:00 AM to 5:00 PM. Since there is a higher ambient smoke level in the environment during business hours it may be wise to set the detectors for MEDIUM sensitivity to reduce the risk of false alarms during this part of the day.

The Day/Night Sensitivity feature may be used to automatically force the detectors to HIGH sensitivity after 5:00 PM. Since the building is unoccupied, and no one is smoking, there should be less chance of false alarms and the HIGH sensitivity setting may be used for the early detection of real alarms. In addition, since the building is unoccupied on weekends, the detectors may also be forced HIGH for all of Saturday and Sunday.

The following steps may be used to program the above application:

1) Enable High Day/Night Sensitivity in either Full or Partial System Programming.

2) Assign Zone 240 (reverse-activated) as the High Day/Night zone.

3) Set the sensitivity of all the addressable detectors to MEDIUM in Full or Partial Point Programming.

4) Assign all the addressable detectors to participate in Day/Night Sensitivity in Full or Partial Point Programming.

5) Program the following Control-By-Event equations:

   - Z240: OR(Z237 Z238 Z239)
   - Z239: TIM(MO TU WE TR FR 17.00 24.00)
   - Z238: TIM(MO TU WE TR FR 00.00 08.00)
   - Z237: TIM(SU SA)

**Note:** Two TIM equations (Z238 and Z239) must be used because the required zone activation extends from one day through midnight to another day.

Zone 239 will be activated from 5:00 PM through midnight. Zone 238 will be activated from midnight until 8:00 AM. Since Zone 240 is the "OR" of these two zones, Zone 240 will be activated from 5:00 PM until 8:00 AM the next morning.

Zone 237 will be activated all day Saturday and Sunday, which will in turn cause Zone 240 to be activated during those days (forcing the detectors to HIGH).

---

**What Does "Do You Want to Modify NFPA Listings" Mean?**

In order to meet UL 864, Underwriters Laboratories requires that the control panel query the user as to what NFPA listings are trying to be met with a specific installation. When the user selects a specific NFPA listing, the AM2020/AFP1010 automatically programs in certain control modules that are necessary to meet that listing.
Example: If the user selects NFPA 72B listing, the panel will automatically program in a control module at address L1M97 and assign it a type ID of "GAS" (general alarm - supervised). As per NFPA 72-1993 Auxiliary Fire Alarm Systems (formerly NFPA 72B), this control module must be used to trip a local energy type municipal box.

Note: A control module must physically be installed on the SLC loop and set to this address otherwise an "invalid reply" will occur.

Note: Selection of NFPA 72A listing automatically defaults all fire-alarm points to "latching" operation.
Section Four: Serial Communications

CRT Terminal Does Not Display Any Data.

The CRT terminal has a blank screen with a blinking cursor but does not display any information.

**Corrective Action:**
1) Verify that the CRT has 120 VAC connected and is turned on.

2) Verify that the SIB to DIB ribbon cable is installed.

3) Verify that the EIA-232 wiring from the Serial Interface Board is plugged in to the correct port on the CRT.

4) Check the EIA-232 connections from the Serial Interface Board to the CRT.

5) Check the setup programming of the CRT. If the programming is correct, try moving the CRT to the panel and connecting it to the SIB with a short length of cable. If it still does not function, replace the CRT.

![Figure 4-1: Connecting the EIA-232 to the CRT.](image)

The CRT Displays Information but Does Not Transmit Any Keyboard Input Back to the Panel.

The AM2020/AFP1010 is not receiving the proper "handshaking" signal from the CRT terminal.

**Corrective Action:**
1) Confirm that the CRT has power and has been turned on.

2) Verify that the EIA-232 connection is plugged into the correct port on the CRT.

3) Verify the EIA-232 wiring.

4) Check the setup programming on the CRT. Compare the programming to that shown in the AM2020 Manual.

5) Replace the CRT.
After Adding a SIB-2048, SIB-2048A or SIB-NET to the Panel, the EIA-232 Interface Works, but the EIA-485 Does Not.

When adding a SIB-2048, SIB-2048A or a SIB-NET to the panel, the Serial Interface Board must first be physically installed and then installed in software. If the board is plugged in but not enabled in software, the EIA-232 interface will work, but the EIA-485 will not.

**Corrective Action:**
1) Confirm that the SIB has been installed in the correct location.

2) Verify that the Intelligent Serial Interface Board (ISIB) has been installed in Full or Partial System Programming. After enabling the ISIB in programming, the panel must be powered down.

3) Compare the software EPROM number on the SIB to the rest of the software in the panel and verify that it forms a complete set.

4) If the EIA-485 interface still does not function, replace the SIB.

When the System Program Button is Pressed, the Password Cannot be Entered Properly Because the System Seems to be Entering Characters By Itself.

If the system seems to add characters without any buttons being pushed, check for the presence of an LCD-80 in terminal mode. If one or more exists, check the DIP switches of SW3. These switches must be thrown together; if one is on, then both need to be on and visa versa. Noise characters can be transmitted if these switches are not set correctly. If trouble persists after confirmation of the switches, disconnect the 485 connector from the DIA or CCM-1 while programming. Disconnecting the 485 connector allows programming, but does not correct noise problems. Further troubleshooting is recommended, check wiring, and/or call Notifier Technical Services for more information.

Can I Map a Detector or Module to More Than One Annunciator Point?

No. In Full or Partial Point Programming the control panel only gives the user the option of mapping the device to one annunciator point. A solution to the problem is to map the device to a zone, and then map the zone to an annunciator point.

**Example:** The user wishes to annunci ate a single addressable detector (L3D65) at two locations (Annunciator 01, Point 02 and Annunciator 09, Point 01).

This can be done by mapping the detector directly to one annunciator point and by indirectly mapping it to the other annunciator point through a software zone.

**Note:** A control module may be annunci cated in the same manner. However, mapping a device through a zone to a second annunciator only works for annunciation purposes. Only the annunciator point that is directly mapped may be used for control of that module. The second annunciator point is purely for annunciation. If control from both locations is required, Shadow Annunciators must be used.

![Figure 4-2: Annunciating a Single Device at Two Annunciators.](image-url)
How Far From the Panel Can the CRT or Printer be Located?

The UL Listed maximum distance is 50 feet. In non-listed applications, short haul modems can be used to extend this distance. (Refer to the Installation Manual.)

The DIA has an EIA-485 Port for Terminal LCD-80 Connections. Can the EIA-232 Terminal Connection Be Used on the SIB-NET/SIB-2048/SIB-2048A to Program the Panel?

Yes. These two connectors are parallel. We recommend that during programming, the LCD-80 should be disconnected to avoid unwanted interference from terminal supervision messages sent from the LCD-80 to the fire alarm control panel.
Section Five:
AM2020/AFP1010 Trouble Codes

T00 CPU Executive Routine Re-entered.
The microprocessor on the CPU has a number of tasks that it must continually accomplish. The executive routine keeps track of these tasks and sequentially sends them to the microprocessor. The "micro" is given a certain amount of time to accomplish each task. If it does not finish the current task in the allotted time, this trouble is generated.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC.
   Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

T01 CPU Receive Queue Overflow.
During normal operation, the CPU polls each board in the system (LIB, DIB, SIB) several times every second. When an inquiry is sent to a board, it sends a response back to the CPU. If, however, the CPU receives a response from a board without asking for it, this trouble will be generated.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC.
   Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

T02 CPU Data Message Received Error.
During the normal CPU polling/response cycle, which is explained above, this trouble will be generated if the response received by the CPU is invalid or corrupt. This was likely caused by a large electrical transient nearby.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC.
   Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

T04 CPU Level Queue Full.
This trouble will be generated if the task buffer of the executive routine overflows. Simply put, this means that there is a long list of tasks for the microprocessor to do. Eventually, as more and more tasks are added to this list, the buffer or queue overflows.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC.
   Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.
**T05 CPU External RAM Test Error.**

Each time the system is powered up or reset, the CPU performs a test of both the static RAM and nonvolatile RAM chips. This involves alternately writing zeros and ones to each memory location on these chips and reading the information back. If any of the chips fail the test this trouble will be generated.

_Corrective Action:_
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

**T06 CPU Code Memory Checksum Error.**

Each time the system is powered up or reset, the CPU performs a test of the operating system EPROM on the CPU board by looking at the checksum. This trouble is generated if the EPROM fails the checksum.

_Corrective Action:_
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Reapply power - AC first, then batteries.

2) Replace the EPROM on the CPU with one of the same software number or one of a compatible set.

3) If the trouble persists, call Notifier Technical Support.

**T07 CPU Message Transmitted Error.**

The CPU has sent a message to a LIB, SIB, or DIB but, because the checksum does not match, the message is considered invalid.

_Corrective Action:_
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

**T08 SCB Assembly Communications Verified Failed.**

SCB stands for Serial Communication Bus. The CPU is trying to send an inquiry to the DIB, SIB or to a specific LIB, but the response it is receiving is from a different board. This could indicate that there is a problem with the ICA-4L, Interconnect Chassis Assembly, since the ICA-4L handles the addressing of each board.

_Example:_ The CPU tries to send an inquiry to LIB #1. But, receives a response that it identifies is from LIB #5.

_Corrective Action:_
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power, AC first, then batteries.

2) If the problem does not clear, try replacing each ICA-4L one at a time.

3) If the problem still does not clear, call Notifier Technical Support.

**T09 8255 Port Chip Control Word Check Fail.**

The 8255 is an IC on the CPU board that is used for the input and output of data. This trouble will occur if the CPU and the 8255 are not communicating properly.

_Corrective Action:_
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.
T0A Installation Error or CPU/AVPS-24 Problem.

The AVPS-24 is an Audio Visual Power Supply that is designed to be mounted in the AM2020/AFP1010 cabinet. The AVPS-24 is supervised through the use of a two-wire trouble cable (part number 71033) which is supplied with each AVPS-24. This trouble cable must be connected from the AVPS-24 (Plug P1) to the CPU (Plug P5). When multiple AVPS-24s are used, the trouble cable should be daisy chained from one AVPS-24 (Plug P2) to the next AVPS-24 (Plug P1) and ultimately connect to the CPU (Plug P5).

In addition, the AVPS-24 must also be programmed into the system, in Full or Partial System Programming, so that the CPU will look for an input from this trouble cable. This specific trouble will be generated if the AVPS-24 is programmed into the system and the trouble cable is not connected to the CPU.

Corrective Action:
1) Make sure the trouble cable (part number 71033) is connected between the AVPS-24 (Plug P1) and the CPU (Plug P5).
2) Confirm that the polarity of this cable is correct. Check the continuity of this cable with a meter if necessary.
3) If the trouble does not clear, call Notifier Technical Support.

T0B Installation Error or CPU/AVPS-24 Problem.

For a description of this trouble refer to Trouble Code “TOA.” This specific trouble will be generated if the AVPS-24 is not programmed into the system and the trouble cable is connected to the CPU.

Corrective Action:
1) Program the AVPS-24 into the system using either Full or Partial System Programming.
2) If the trouble does not clear, call Notifier Technical Support.

T0C Installation Error or CPU/AVPS-24 Problem.

For a description of this trouble refer to Trouble Code “TOA.” This specific trouble will be generated if the AVPS-24 is programmed into the system and the trouble cable is connected to the CPU but something is wrong with the cable itself. The cable may be installed in the wrong polarity or it may be shorted.

Corrective Action:
1) Check the polarity of the trouble cable.
2) Make sure the cable is not shorted.
3) Replace the CPU.
4) If the trouble does not clear, call Notifier Technical Support.

T0D AVPS-24 Problem.

This trouble is generated when the AVPS-24 sends a trouble to the CPU through the two-wire trouble cable. The AVPS-24 does not supervise its power output or field wiring, therefore the only troubles generated on the AVPS-24 are either loss of AC power or battery power.

Corrective Action:
1) Is the trouble light illuminated on the AVPS-24? If no, then the problem may lie

2) If the trouble does not clear, call Notifier Technical Support.
with the trouble cable. If yes, see below.

2) Confirm that AC power is present at the AVPS-24 and the circuit breaker is not tripped.

3) Make sure that the AVPS-24 has battery power.

4) Replace the AVPS-24.

5) If the trouble does not clear, call Notifier Technical Support.

**T10 Ground (Earth) Fault Detected in Wiring or System.**
This specific Trouble Code is generated when an earth fault is detected on the system common. See *Ground Fault* in Section 2: AM2020/AFP1010 Hardware.

**T11 Ground (Earth) Fault Detected in Wiring or System.**
This specific Trouble Code is generated when an earth fault is detected on the power supply positive. See *Ground Fault* in Section 2: AM2020/AFP1010 Hardware.

**T12 Ground (Earth) Fault Detected in Wiring or System.**
This specific Trouble Code is generated when an earth fault is detected on the field wiring positive. See *Ground Fault* in Section 2: AM2020/AFP1010 Hardware.

**T13 Standby Battery(s) not Connected or Defective.**
This trouble will occur if the standby batteries have been disconnected. This trouble will also be generated if the batteries have become severely over or under charged. If this is the case, the likely causes are either defective batteries or a defective battery charger.

**T14 MPS-24 Monitor Cable Disconnected.**
There is a problem with the supervisory ribbon cable that runs between the CPU and the MPS Main Power Supply.

*Corrective Action:*
1) Check to make sure that the ten-conductor ribbon cable (part number 71031) is connected between the MPS-24A (Plug P3) and the CPU (Plug P2).

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Figure 5-1: Connecting the MPS-24 Monitor Cable
2) If cable appears to be connected properly, remove cable and check continuity with a voltmeter, replace cable if necessary.

**T15 A.C. Power (Main) Loss. Back up Activated.**

This trouble will occur when the Main Power Supply (MPS-24A) has either lost AC power or has detected a brown out condition. In either case, the power supply will automatically transfer to standby battery power. This trouble will occur if JP2 on the MPS-24A is intact and the 24V output at TB3 has failed. Cut JP2 on the MPS-24A and monitor the 24V output at TB3 using an end-of-line relay. This trouble will also occur when a device which has been improperly connected to the MPS-24A trouble input (P5) enters the trouble state. Make no connection to MPS-24A P5, use the CPU trouble input at P5.

**T16 Battery Charger Detached-Restore All Inputs to Normal.**

This trouble will be generated after the FACP has been in an active input condition for one hour. When an active input occurs on the panel, the battery charger is immediately shut off. However, this trouble will only be generated after the panel has been in a constant active input state for one hour to alert you that the batteries may be discharged.

**Corrective Action:**
1) Clear the active input condition and allow the batteries to recharge.

**T18 Catastrophic Loop Interface Board 1 Communications Fault.**

Trouble Codes T18 through T21 apply to Loop Interface Boards 1 through 10 respectively. This trouble means that the CPU is trying to communicate to a LIB board and is not getting any response from the LIB. This trouble may occur for a number of reasons. First, if the LIB board is physically installed in the ICA-4L chassis but has not been programmed in Full or Partial System Programming. Second, if the LIB has been programmed but has not been physically installed. This trouble will also occur if the LIB is not seated properly and not engaging all the pins of the ICA-4L.

**Corrective Action:**
1) Confirm that what is in Full System Programming actually matches what is installed in the panel (number and position of LIBs).

2) Verify that all the Loop Interface Boards are mated to the ICA-4Ls properly.

3) Check the software EPROM number on the LIB in question and verify that it is compatible with the other system boards.

4) Replace the EPROM.

5) Try a new LIB in the same position. If it still does not work. Try replacing the ICA-4L.

6) If the trouble is still present, replace the CPU.

7) If the trouble does not clear, call Notifier Technical Support.

**T22 Catastrophic ISIB Communications Fault.**

This trouble means that the CPU is trying to communicate with the Intelligent Serial Interface Board (ISIB) and is not getting any response. This trouble may occur for a number of reasons. First, if the ISIB is physically installed in the ICA-4L chassis but has not been programmed in Full or Partial System Programming. Second, if the ISIB has been programmed but has not actually been physically installed. This trouble will also occur if the ISIB is not seated properly and not engaging all the pins of the ICA-4L.
Corrective Action:
1) Confirm that what is in Full System Programming actually matches what is installed in the panel.

2) Verify that the ISIB is properly mated to the ICA-4L.

3) Check the software EPROM number on the ISIB and verify that it is compatible with the other system boards.

4) Replace the EPROM.

5) Try a new ISIB. If it still does not work, try replacing the ICA-4L.

6) If the trouble is still present, replace the CPU.

7) If the trouble does not clear, call Notifier Technical Support.

Each time the system is powered up, the CPU performs a test of the nonvolatile RAM chip. This test checks the write capability of the chip. If a problem is detected writing to the chip, this trouble will be generated.

Corrective Action:
1) Contact Notifier Technical Support for a replacement nonvolatile RAM chip.

T28 Style "6" Field Wiring Loop #1 or LIB #1 Abnormal.

T28 = LIB #1  T38 = LIB #2
T48 = LIB #3  T58 = LIB #4
T68 = LIB #5  T78 = LIB #6
T88 = LIB #7  T98 = LIB #8
TA8 = LIB #9  TB8 = LIB #10

Trouble Codes T28, T38, T48, etc. apply to Loop Interface Boards 1 through 10 respectively. This trouble means that either the style of wiring (Style 4 or 6) attached to the Loop Interface Board does not match what has been programmed or there is a short circuit in the field wiring. This trouble could also be an indication that one of the SLC loop drivers on the LIB board has failed.

Corrective Action:
1) Confirm that the loop wiring matches the LIB programming.

2) Remove the field wiring from the LIB (in case there is a short on the wiring).

3) If the trouble does not clear, replace the LIB board.

4) If the trouble persists, call Notifier Technical Support.

T29 Style "4" Field Wiring Loop #1 or LIB #1 Abnormal.

T29 = LIB #1  T39 = LIB #2
T49 = LIB #3  T59 = LIB #4
T69 = LIB #5  T79 = LIB #6
T89 = LIB #7  T99 = LIB #8
TA9 = LIB #9  TB9 = LIB #10

Trouble Codes T29, T39, T49, etc. apply to Loop Interface Boards 1 through 10 respectively. This trouble means that either the style of wiring (Style 4 or 6) attached to the Loop Interface Board does not match what has been programmed or there is a short circuit in the field wiring. This trouble could also be an indication that one of the SLC loop drivers on the LIB board has failed.

Corrective Action:
1) Confirm that the loop wiring matches the LIB programming.

2) Remove the field wiring from the LIB (in case there is a short on the wiring).

3) If the trouble does not clear, replace the LIB board.

4) If the trouble persists, call Notifier Technical Support.
Trouble Codes T2A, T3A, T4A,...etc. apply to Loop Interface Boards 1 through 10 respectively. SCB stands for Serial Communications Bus. The CPU uses the SCB to communicate with each Loop Interface Board. The CPU and LIBs constantly handshake with each other. When the CPU sends a message to the LIB, the LIB will send an acknowledgment back to the CPU if this message has been received and understood. This error will result when the LIB receives a message from the CPU that the LIB considers to be invalid because it does not match the checksum value.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power, AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

Trouble Codes T2B, T3B, T4B,...etc. apply to Loop Interface Boards 1 through 10 respectively. SCB stands for Serial Communications Bus. The CPU uses the SCB to communicate with each Loop Interface Board. The CPU and LIBs constantly handshake with each other. When the CPU sends a message to the LIB, the LIB will send an acknowledgment back to the CPU if this message has been received and understood. This error will result when the LIB receives a message from the CPU but does not send an acknowledgment back.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power, AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

Trouble Codes T2C, T3C, T4C,...etc. apply to Loop Interface Boards 1 through 10 respectively. This trouble will be generated when the programming in the master FACP (of a master/slave NIB-96 network) is incorrect. The master is either not addressing all the NIB-96 points or is addressing too many.

**Corrective Action:**
1) Correct the NIB-96 point programming in the master FACP.
2) If the trouble does not clear, call Notifier Technical Support.

Trouble Codes T2D, T3D, T4D,...etc. apply to Loop Interface Boards 1 through 10 respectively. This trouble will be generated if the master FACP receives an invalid response from one of the NIB-96 address points.

**Corrective Action:**
1) Make sure the NIB-96 is addressed properly.
2) Make sure the correct Type I. D.s are being used for the NIB-96 points.
3) Confirm that no discrete addressable devices (detectors, modules, or pull stations) are inside the range of the NIB-96.
**TC8 Catastrophic CPU Board Communications Fault.**

During normal operation, the CPU and DIB are continually sharing information. This trouble will be generated by the Display Interface Board if it does not receive any messages from the CPU for an entire minute.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power, AC first, then batteries.

2) If the trouble does not clear, check the software EPROM numbers of the chips on the CPU and DIB and confirm that they are a valid set.

3) If the trouble remains, call Notifier Technical Support

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**TC9 Terminal Supervisory Path is Interrupted.**

The AM2020/AFP1010 is not receiving the proper "handshaking" signal from the CRT terminal or LCD-80 in terminal mode. Every minute the AM2020/AFP1010 sends out an "05" character and expects to see a "~~" coming back. This method of terminal supervision is selected by enabling Terminal Supervision in either Partial or Full System Programming.

**Corrective Action:**
1) Confirm that the CRT and/or LCD-80 has power and has been turned on.

2) Verify that the EIA-232 connection is plugged into the correct port on the CRT.

3) Verify the EIA-232 wiring.

4) Check the CRT setup programming.

5) Replace the CRT.

**Corrective Action for LCD-80 in Terminal Mode:**
1) Check 485 wiring.

2) Check that SW3-1 and 2 are set properly for all LCD-80s that exist.

3) If you have both LCD-80 and CRT, is the CCM-1 used? If yes, check wiring. Remove the CCM-1 and try only the CRT connected at the SIB. Follow the CRT steps.

4) Next connect the CCM-1 and add the CRT. Then add the LCD-80.

5) Replace the LCD-80.

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**TCB DIB Executive Routine Re-entered.**

The microprocessor on the DIB has a number of tasks that it must continually accomplish. The executive routine keeps track of these tasks and sequentially sends them to the microprocessor. The "micro" is given a certain amount of time to accomplish each task. If the it does not finish the current task in the allotted time, this trouble is generated.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

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**TCC CPU Receive Que Overflow.**

During normal operation, the CPU polls the DIB several times every second. When an inquiry is sent to the DIB, it sends a response back to the CPU. If, however, the DIB receives an invalid response from the CPU, this trouble will be
TCD DIB Data Message Received Error.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If trouble does not clear, call Notifier Technical Support.

During the normal DIB polling/response cycle, which is explained above, this trouble will be generated if the response received by the DIB is invalid or corrupt.

TCE DIB External RAM Test Error.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

Each time the system is powered up or reset, the DIB performs a test of both the static RAM and nonvolatile RAM chips. This involves alternately writing zeros and ones to each memory location on these chips and reading the information back. If any of the chips fail the test, this trouble will be generated.

TCF DIB Code Memory Checksum Error.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) Replace the EPROM on the DIB with the one of the same software number or one of a compatible set.

3) If the trouble persists, call Notifier Technical Support.

Each time the system is powered up or reset, the DIB performs a test of the operating system EPROM on the DIB board by looking at the checksum. This trouble is generated if the EPROM fails the checksum.

TD0 Catastrophic LCD Failure on DIA.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

This message is generated if the Liquid Crystal Display on the Display Interface Assembly "hangs up" and refuses to process any information. This is generally caused by either a static discharge to the DIA or a failure on the DIA.

TD1 Catastrophic DUART Failure on DIA.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

TD1 is an acronym for Dual Universal Asynchronous Receiver/Transmitter. The DUART on the DIA is used to control the serial communications between the

DUART is an acronym for Dual Universal Asynchronous Receiver/Transmitter.
DIA and both the printer and CRT. A DUART failure can be caused by a static discharge that momentarily confuses and locks up the DUART.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) Check programming. Has the AUX printer been enabled? If yes, is the AUX printer connected properly? If no AUX printer exists, go into programming and disable it. Cycle power and trouble will clear.

3) If the trouble does not clear, call Notifier Technical Support.

**TD2 Catastrophic Failure. Incompatible Software or Invalid CBE.**

This error is caused replacing the software in the panel with an older revision that does not support some of the features programmed. **Example:** The panel is initially started up with revision 6.5 software and is programmed using some of the security features, such as: the SDEL Type I. D. (Security Delay). Then, for some reason the software is replaced with an older version, such as release 5.0 which did not support security. When the panel starts up, it will not recognize the SDEL Type I. D., so the TD2 Trouble Code will be generated.

**Corrective Action:**
1) Either reprogram the panel using valid Type I. D.s and Control By Event Equations or upgrade the operating software to a newer combination that supports these features.

**TD3 PRN Printer Off Line, Buffer Full or Out of Paper.**

The AM2020/AFP1010 has detected an error condition on the printer.

**Corrective Action:**
1) Verify that the printer is "on-line."

2) Verify that the printer has paper and it is not jammed.

3) Make sure the EIA-232 is plugged into the correct port on the printer.

4) Verify the wiring between the Serial Interface Board and the DB-25 connector.

**TD4 Aux Printer Disconnected, Buffer Full or Out of Paper.**

This Trouble Code applies to the AUX printer. The AUX printer is an 40-column strip printer that is designed to be mounted inside the FACP cabinet. This trouble condition will occur if the AUX printer is mistakenly programmed into the system when it is not actually present in the system. If an external serial printer (PRN) is being used in the system, do not enable the AUX printer in Full or Partial System Programming. See trouble code TD1, Catastrophic DUART.

**Corrective Action:**
1) Check the programming of the AUX printer in Full or Partial System Programming.

**TD5 Internal Print Buffer Full (Information may be lost).**

When there is a problem with one of the printers (PRN or AUX) such as the printer has been taken off-line or is out of paper, the AM2020/AFP1010 will try to maintain all the messages that are being sent to that printer (in the Internal Print Buffer) so they won’t be lost. However, the buffer can only hold fifty messages. If more than fifty messages are sent to the buffer it will overflow and the Trouble Code will be generated.
Corrective Action:
1) Check the status of the printer.

TD6 Fire Protection is Limited During Walk Test.
This trouble is produced when the panel is in Walk Test mode. It is a reminder that all of the LIB boards that are participating in Walk Test are incapable of generating an alarm. All other LIBs will still function.

Corrective Action:
1) Exit Walk Test to restore complete fire protection.

TD7 Remote Programming Mode Activated. Retest System.
This trouble is produced when the modem feature is enabled in either Full or Partial System Programming. It is intended to be a reminder that the entire system must be retested after the remote programming has been completed.

Corrective Action:
1) Complete remote programming.
2) Disable the modem feature in Full or Partial System Programming.
3) Retest the system.

TD8 Catastrophic DIA Nonvolatile RAM Failure. Each time the system is powered up, the DIA performs a test of the nonvolatile RAM chip. This test checks the write capability of the chip. If a problem is detected writing to the chip, this trouble will be generated.

Corrective Action:
1) Contact Notifier Technical Support for a replacement nonvolatile RAM chip.

TF0 ISIB SCB Receive Failure. This trouble message will be generated if the CPU has tried to send the same message to the ISIB several times and each time the message was received it was invalid.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

TF1 ISIB Data Message Received Error. During the normal ISIB polling/response cycle, this trouble will be generated if the response received by the ISIB is invalid or corrupt.

Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.
2) If the trouble does not clear, call Notifier Technical Support.

TF2 ISIB Executive Routine Re-entered. The microprocessor on the ISIB has a number of tasks that it must continually accomplish. The executive routine keeps track of these tasks and sequentially sends them to the microprocessor. The "micro" is given a certain amount of time to accomplish each task. If it does not finish the current task in the allotted time, this trouble is generated.
Corrective Action:
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

TF3 DIB to SIB Cable Bad or Missing.

This is an indication that the 20-conductor ribbon cable (part number 71046) that connects the DIB (Plug J4) to the SIB (Plug P4) is either missing or defective.

Corrective Action:
1) Verify that the cable is in place and is plugged in correctly.

2) Remove the cable and check the continuity with a voltmeter.

3) If the trouble does not clear, call Notifier Technical Support.

TF4 Communication Link Failure in Port A.

A NFN communications fault has been detected on the indicated port. This trouble may be due to disconnected or faulty media.

Corrective Action:
1) Verify wire/fiber is connected.

2) Use the MET-1 to evaluate the wire.

3) Verify NFN configuration (MIB thresholds, node address and port configuration).

4) Cycle power.

5) If the trouble does not clear, call Notifier Technical Support.

TF5 Communication Link Failure in Port B.

A NFN communications fault has been detected on the indicated port. This trouble may be due to disconnected or faulty media.

Corrective Action:
1) Verify wire/fiber is connected.

2) Use the MET-1 to evaluate the wire.

3) Verify NFN configuration (MIB thresholds, node address and port configuration).

4) Cycle power.

5) If the trouble does not clear, call Notifier Technical Support.

TF6 Upload/Download Communications Fault.

The Upload/Download must be enabled in Partial System Programming. A TF6 Trouble Code will be produced if the EIA-485 Interface is not communicating at all with the peripheral device.

Corrective Action:
1) Make sure that the Upload/Download has been enabled in programming.

2) Verify that the wiring between the 485 Interface and the computer is correct.
3) Make sure the UPDL program is running and is accessing proper COM port.

4) If the trouble does not clear, call Notifier Technical Support.

**TF7 Upload/Download Data Message Received Error.**

The Upload/Download must be enabled in Partial System Programming. A TF7 Trouble Code will be produced if the upload/download computer sends an invalid message to the 485 Interface.

**Corrective Action:**
1) Make sure that the Upload/Download has been enabled in programming.

2) Verify that the wiring between the 485 Interface and the computer is correct.

3) Make sure the UPDL program is running and is accessing proper COM port.

4) If the trouble does not clear, call Notifier Technical Support.

**TF8 LAN Communications Failure.**

NFN has stopped communicating with this node. This trouble may be due to disconnected or faulty media.

**Corrective Action:**
1) Verify wire/fiber is connected.

2) Use the MET-1 to evaluate the wire.

3) Verify NFN configuration (MIB thresholds, node address and port configuration).

4) Cycle power.

5) If the trouble does not clear, call Notifier Technical Support.

**TXX System Trouble Default Message.**

An undefined trouble has occurred in the system.

**Corrective Action:**
1) Remove power from the AM2020/AFP1010, batteries first and then AC. Wait one minute. Reapply power - AC first, then batteries.

2) If the trouble does not clear, call Notifier Technical Support.

**Nx0/8 Annunciator (01-32) Installation Error.**

Trouble Codes N00, N08, N10, N18, etc..., repeat for each annunciator address (01-32). A communications problem between the panel and the specific annunciator identified by the address.

**Corrective Action:**
1) Verify that the correct address annunciator has been installed in either Full or Partial System Programming.

2) Check the wiring of both the EIA-485 loop and the 24 VDC power.

3) Check the dip switch and address settings on the annunciator. Make sure the annunciator is not set in receive only mode.
4) Confirm that the 120 ohm anti-reflection resistor is in place at the end of the annunciator loop.

5) Make sure the proper gauge wire is being used and that the maximum wiring distances are not being exceeded for both the EIA-485 and 24 VDC power loops.

6) Try a new annunciator at the same location. If the new annunciator works, take the old annunciator and try it at a different address. If the old annunciator still does not work, it must be replaced.

**Nx1/9 Annunciator (01-32) Catastrophic Communications Fault.**

Trouble Codes N01, N09, N11, N19, etc..., repeat for each annunciator address (01-32). The Serial Interface Board is receiving a response from the specified annunciator, but it is not a valid response.

**Nx2/A External Equipment Annunciator (01-32) or Audio/Telephone.**

Trouble Codes N02, N0A, N12, N1A, etc..., repeat for each annunciator address (01-32). There is a problem with the external trouble contacts on the annunciator.

**Corrective Action:**
1) Check if the AMG is in ALLCALL mode. This trouble will happen if no one talks into the microphone on the AMG for 20 seconds.

2) Check if the AMG microphone is unplugged.

3) Check if the FFT-7 wiring is correct.

4) Check if the SCS has correct programming of its switch groups.

5) Check if the UDACT telephone line is disconnected.

**Nx3/B Annunciator (01-32) Expander Modules.**

Trouble Codes N03, N0B, N13, N1B, etc..., repeat for each annunciator address (01-32). There is a problem with one of the annunciator expanders at the specified annunciator address.

**Corrective Action:**
1) Check the dip switch and/or jumper settings to make sure that the annunciator is set for the proper number of expanders.

2) Confirm that the ribbon cables are plugged into the expanders properly.

**Nx5/D Annunciator (01-32) Manual Control.**

Trouble Codes N05, N0D, N15, N1D, etc..., repeat for each annunciator address (01-32). The specified annunciator has been placed in Manual Control. If Manual Control is not desired, check the position of DIP switch number one.

**NXX Annunciator Trouble Default Message.**

An undefined trouble has occurred with an annunciator.
NOTES
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