Media Control Systems
CFD-3001A
Operation Guide

Spyglass TV Channel Failure Detector

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1.0 Product Overview

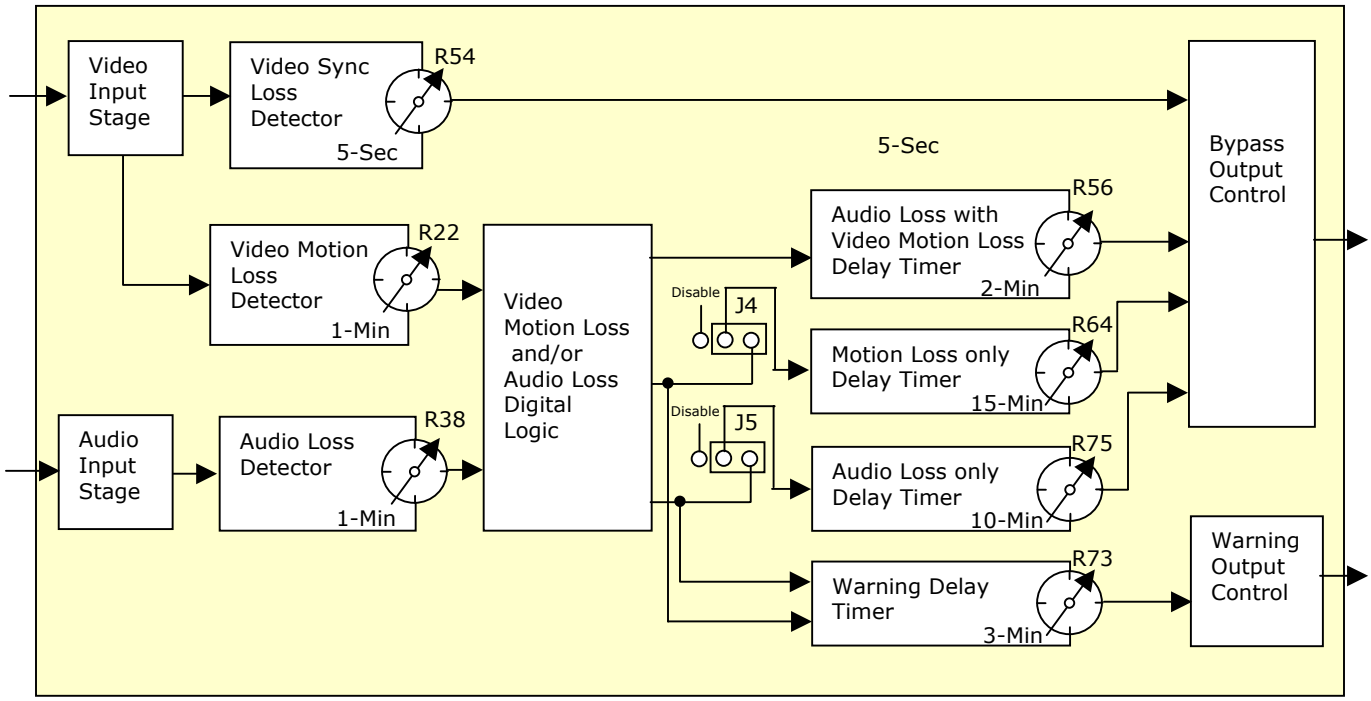
The Spyglass TV Channel Failure Detector was developed to prevent unattended TV Channels from being off air due to equipment or media failure. When a failure is detected the Spyglass system switches your normal channel feed to an alternate source. This source can be your character generator or alternate programming. An automatic telephone dialer can be added to the system to notify the operator of the failure.

The Spyglass Detector Module (CFD-3001A) looks at three signal parameters, valid video signal presence, video motion, and audio signal presence. Each of these signal parameters is evaluated in different ways to determine the type of failure and what the response time should be before action is taken. Delay timers are employed to prevent false triggering on valid programming material.

A video input signal is considered valid if vertical sync pulses are detected. If the input signal is just noise or if the input video is very low or not present at all, a failure is detected after an evaluation time of 5-seconds.

A valid program may have a period of time when no audio or no video motion is intended. Thus delay timers are used to determine how long a period is allowable for no audio and/or no motion. The default time is set for 10-minutes for no audio only, and 15-minutes of no motion only. The operator can adjust the timers if longer or shorter delay times are desired. If there is no audio and at the same time there is no motion, the default time before action is taken is 2-minutes. No motion only detection or no audio only detection can be disabled and these parameters will be ignored. (See figure 1.1)

Spyglass Functional Block Diagram Figure 1.1

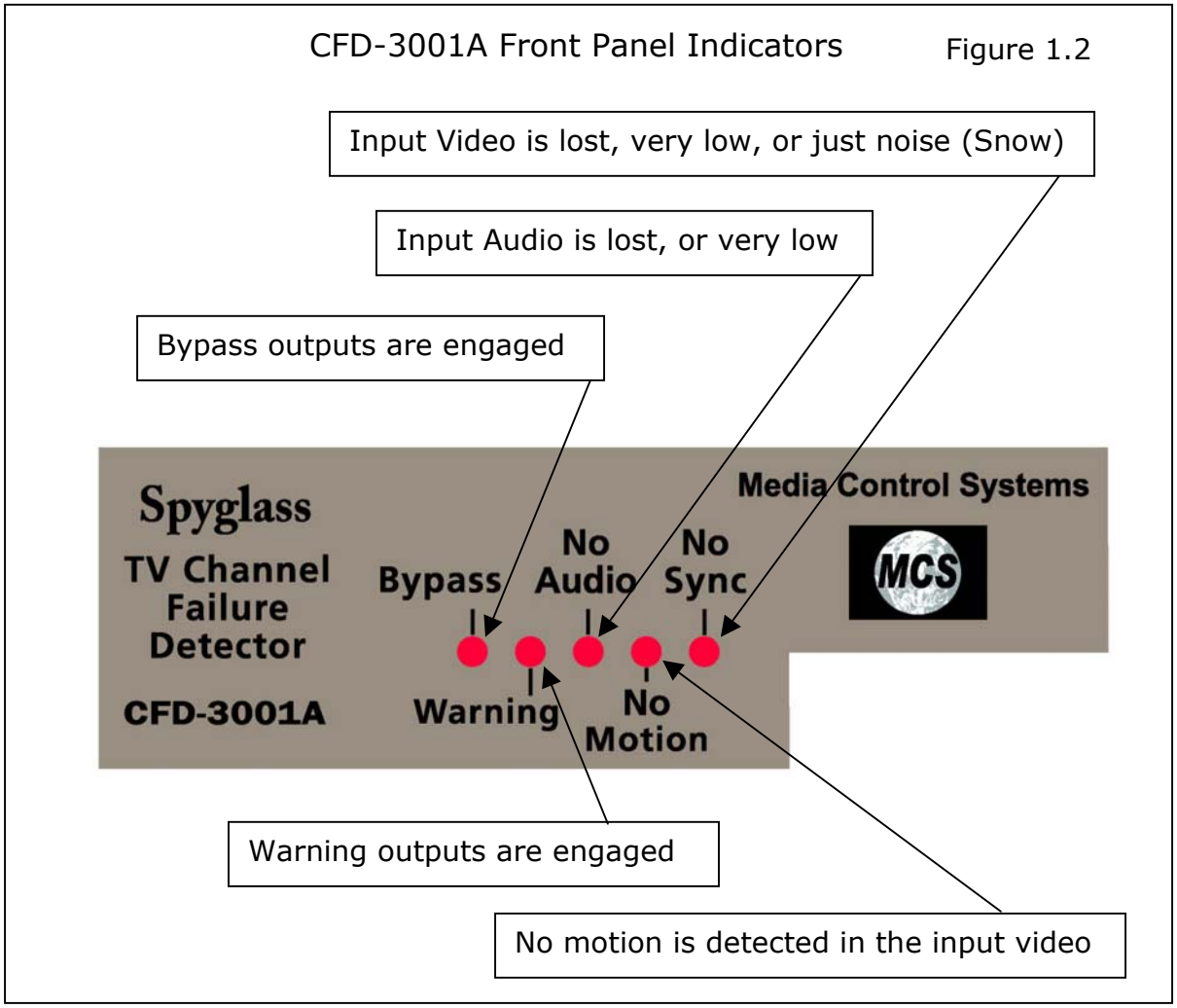


The CFD-3001A detector module has multiple outputs for status and control. Front panel LED indicators show the status of the detectors and output stages; video signal loss, motion loss, audio loss, warning output and bypass output. (See Figure 1.2) Open collector and digital outputs are available for video signal loss, motion loss, audio loss, warning timer output and bypass output control. (See Figure 1.3)

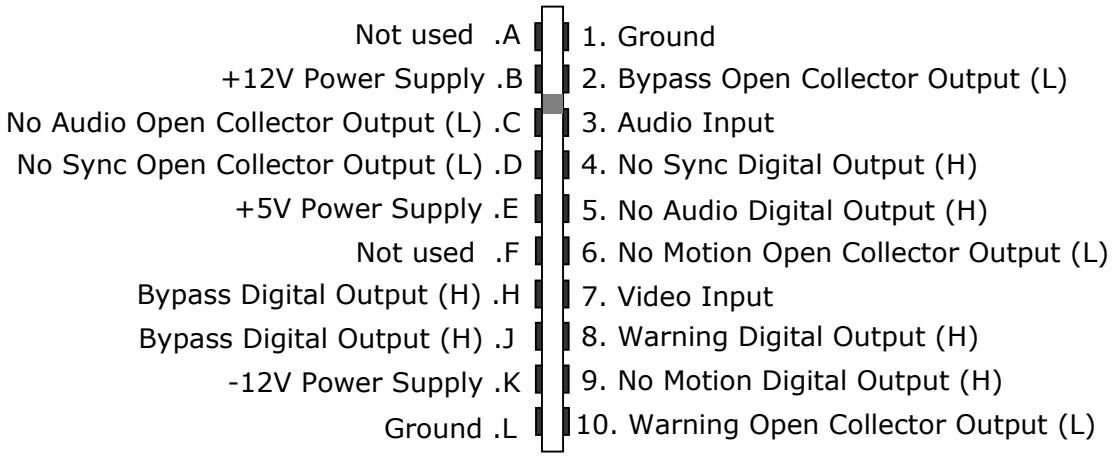
The audio and video inputs to the CFD-3001A are high impedance so channel output signals can be bridged and looped.

The CFD-3001A Channel Failure Detector module is to be used in conjunction with an Audio/Video bypass switch module or monitored by automation software. An automation system could monitor the CFD module and switch the main system A/V router or play alternate programming in case of a failure. A bulletin board system, satellite feed, or a backup redundant playback system can be used as an alternate source.

CFD-3001A Front Panel Indicators Figure 1.2



CFD-3001A Input and Output Connections Figure 1.3



2.0 Failure Detection and Time Delay Parameters

2.1 Video Input Sync Detection

The CFD-3001A expects a 1V P-P Composite Video Input terminated at 75 ohms. Typically the video would be looped through the CFD's host frame and terminated at its final connection. If not a terminating resistor is required at the input connector of the frame.

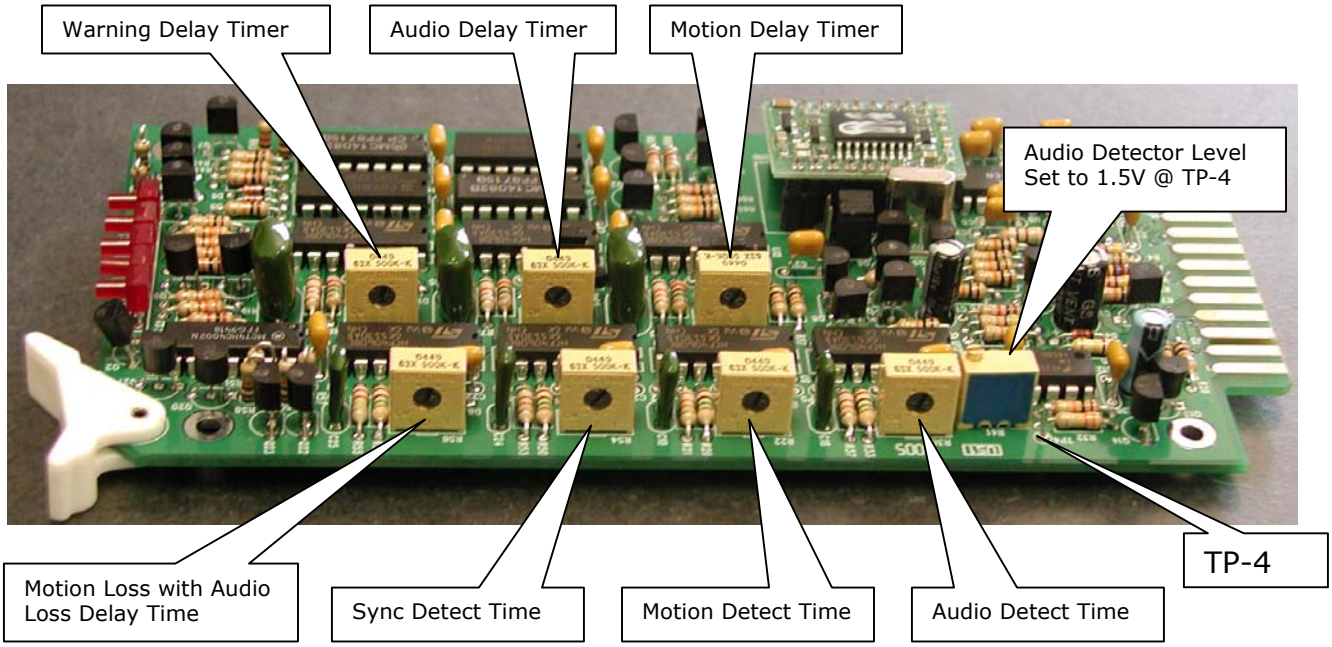
The CFD checks the input signal for vertical sync pulses. If sync pulses are present and are above 200-millivolts in amplitude the detector is satisfied. Should the input drop below 200-millivolts or lower, the 5-second sync detector timer is started. After a 5-second time-out the bypass output is activated. Should the signal return before the 5-second time-out the timer is stopped and not output is activated.

If the input signal is noise (snow) from a tuner or satellite receiver, no vertical sync pulses will be detected and the sync detect timer will be engaged.

The CFD is very tolerant of poor video quality, if any vertical sync pulses are present, even though intermittent, the detector will remain satisfied and will not bypass the channel.

The Sync timer can be adjusted from 2-seconds to 10-seconds. (See Figures 2.1, 2.2, 2.3, 2.4)

Timer Adjustment Locations Figure 2.1



2.2 Video Motion Detection

Incorporated in the CFD is a very sophisticated video motion detector processor. The processor analyzes each frame of video and compares it to other frames in its buffer. If it detects that content in the frames has changed from frame to frame it provides a motion detection output. Movements of small objects may not be detectable so time is required to search for movement in video.

The default detect time is set at 1-minute. It is common for normal video programming to have very little motion for more than a minute. As a result the CFD incorporates two additional video delay timer functions after the detector timer has expired.

The first second-stage timer function looks at both audio presence and video motion together. If no audio is detected after 1-minute and no motion is detected after 1-minute a secondary timer is started and runs for an additional 2-minutes. If audio or motion hasn't returned after this combined 3-minutes the bypass output is activated.

Another second-stage timer is activated if no motion is detected after 1-minute and the audio is ok. This timer is set for 15-minutes. This time is adjustable from approximately 3-minutes to 18-minutes. This timer stage can be disabled with a jumper if you do not want this secondary timer to be engaged.

The purpose of using motion detection is to detect a frozen frame from an MPEG-2 Decoder, frame synchronizer, and blue or black outputs from a failed or stopped media device. (See Figures 2.1, 2.2, 2.3, 2.4)

2.3 Audio Presence Detection

The CFD expects to receive an audio input of typical audio levels, .5V to 4V P-P. If the audio levels drop below 200-millivolts, a 1-minute detection timer is started. If the audio stays at a very low level for over 1-minute, secondary delay timers are started. The audio sensitivity level can be adjusted. The default level is set high enough to stay out of the noise floor but low enough to pickup very quite audio scenes.

Similar to the motion detection feature, the audio detector engages two secondary timers upon its expiration. One is the audio loss with motion loss timer and the other is an audio only loss timer. The audio only loss delay timer is set for 10-minutes. If audio doesn't return after the 1-minute detect time plus the 10-minute delay time the bypass output is engaged. The audio loss only delay timer is adjustable from approximately 3-minutes to 18-minutes. (See Figures 2.1, 2.2, 2.3, 2.4)
The audio only delay timer can be disabled with a jumper if this feature is not wanted.

2.4 Audio Loss with Video Motion Loss

The CFD has the capability of detecting in addition to blue or black screens, frozen picture outputs of digital MPEG decoders or frame synchronizers. Typically when these conditions occur there is no audio and a frozen picture. After the 1-minute detect time for the audio and motion detectors the secondary combined 2-minute A/V timer is started. When the 2-minute delay timer expires the bypass output is engaged. Both audio and video motion must return before the bypass output is disengaged. This prevents a premature return should a temporary glitch of video or audio noise glitch should occur under these bypass conditions.

2.5 Warning Delay Timer

The CFD has a warning timer that engages when the audio loss only or video motion loss only conditions occur. When the timer expires warning output circuits are engaged that can be used to alert an operator of a potential problem. The warning delay timer is set for 3-minutes and is adjustable. (See Figures 2.1, 2.2, 2.3, 2.4)

Default Detection and Delay Time Settings — Figure 2.2

Detection Time	Delay Before Alarm Output
Sync Loss Detection Time: 5-Seconds	Delay Time: 0-Seconds
Audio Loss with Motion Loss: 1-Minute	Delay Time: 2-Minutes
Motion Loss Only: 1-Minute	Delay Time: 15-Minutes (disable option)
Audio Loss Only: 1-Minute	Delay Time: 10-Minutes (disable option)
Warning Output (Audio or Motion Loss only)	Delay Time: 3-Minutes

All timers are adjustable but any changes should be made with the assistance of MCS factory personnel.

Approximate Timer Adjustment Settings

Figure 2.3

Sync Detector
R54

5-Sec = .6ms

2sec	4sec	5sec	6sec	7sec	9sec	10sec
.2ms	.4ms	.6ms	.8ms	.9ms	1.1ms	1.3ms

Motion Detector,
Audio Detector
R-22, R-38

1-Min = 7.5ms

0.16	0:32	0:53	1:06	1:24	1:38	1:53	Min:Sec
2ms	4ms	6.5ms	8ms	10ms	12ms	14ms	

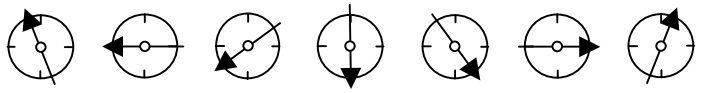
Audio / Motion
Loss Timer
R-56

2-Min = 15ms

0:40	0:57	1:14	1:29	1:42	1:57	2:13	Min:Sec
5ms	7ms	9ms	11ms	13ms	15ms	17ms	

Audio Timer,
Motion Timer,
Warning Timer
R64, R75, R73

10-Min = 75ms
15-Min = 110ms
3-Min = 23ms



2:40	5:28	8:16	10:44	13:33	16:09	18:48	Min:Sec
20ms	40ms	60ms	80ms	100ms	120ms	140ms	

2.6 Motion Sensitivity Level Jumpers (*Factory Assistance Recommended*)

The sensitivity of the motion detector processor can be changed for special applications. **It is not recommended to change the setting under normal conditions.** The motion detectors ability to detect video motion has four sensitivity levels. The levels can be changed using Jumpers JMP1, JMP2 and JMP3. (See figure 2.4 for the location of the jumpers)

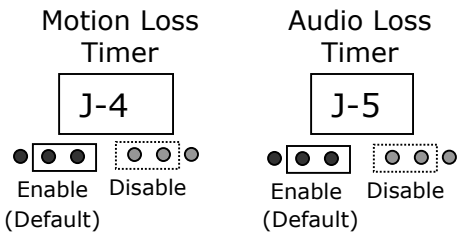
Level 1	Level 2	Level 3	Level 4
Most Sensitive	**(Default)**		Least Sensitive

Second Level Motion Sensitivity Jumper

Fast Detection Response (Default)	Slow Detection Response (Not Recommended)

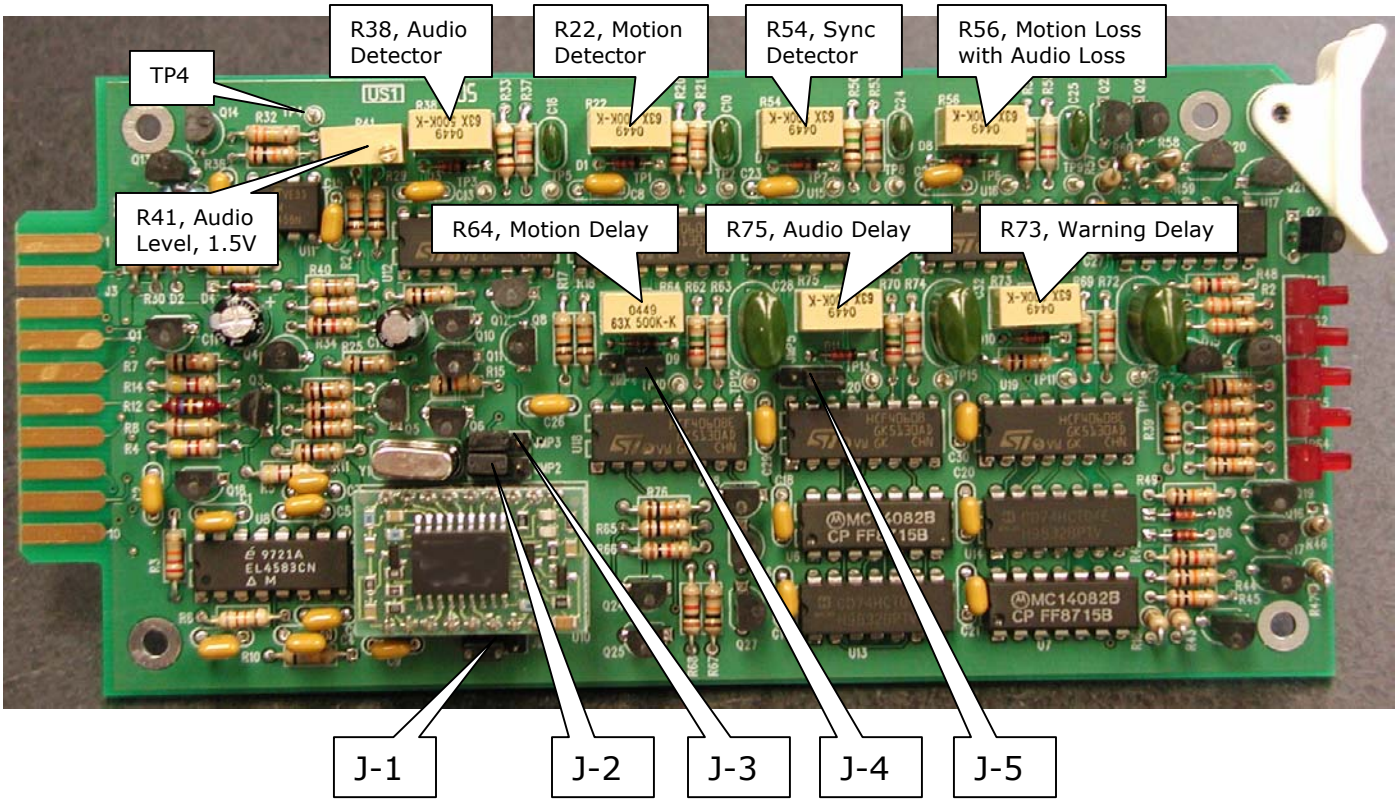
2.7 Motion Loss Only and Audio Loss Only Timer Disable Jumpers

If there is a concern that the CFD will false trigger on valid programming, these jumpers allow an operator to disable the audio loss only and video loss only delay timers.
(See Figure 3 for the location of jumpers)



Jumper and Timer Locations

Figure 2.4



3.0 Installation

This section outlines procedures that will help you get the equipment unpacked, installed and operation as quickly as possible. Before installing the equipment, please read and study this section thoroughly. If you received your CFD-3001A module as part of a 3000 series custom system, please refer to the documentation provided with the custom system for specific instructions on connecting audio/video and/or control to the module.

Carefully inspect the unit and all accessories for damage. If damage to the equipment or a shortage in the shipment is noted, notify the carrier promptly. Make the proper claim with the carrier and contact Media Control Systems at (619) 599-1050 immediately.

The CFD-3001A module is designed for installation in a 1000 or 3000 series rack mount frame. Each frame is custom designed and wired to meet a specific application. If your existing frame is not wired for a CFD-3001A module, pre-wire kits containing the required card edge connector and rear panel are available from the Media Control Systems factory.

To install the CFD-3001A, simply plug the module into the frame position wired for the module. Refer to the custom system documentation if there are any doubts about its location in the frame.

Any component level repairs to the module during the first year must be performed only by Media Control Systems to keep the warranty in effect. After one year, service should be performed only by Media Control Systems or by a qualified electronic repair technician.

Like any other piece of complex equipment, the CFD-3001A Channel Failure Detector will perform as designed only if it is installed, used, and serviced in accordance with the manufacturer's instructions.

All individuals who have, or will have the responsibility for installing, using, and servicing the product must carefully read this manual.

The warranties made by Media Control Systems, with respect to this product are void if the equipment is not installed, operated, and maintained in accordance with the instructions in this manual. Please protect you and your employees by following these instructions.

At Media Control Systems, we are continually striving to provide our customers with equipment that performs maximally and is commensurate with the latest techniques in circuit design. Consequently, changes made in our equipment from time to time reflect this desire for customer satisfaction.

Limited Warranty

MEDIA CONTROL SYSTEMS, LLC, Warrants each new product manufactured by it to be free of defective materials and workmanship, and agrees to remedy any such defect by repair or replacement at no extra charge for a period of one (1) year from the original date of purchase.

This warranty does not extend to any MCS product subject to misuse, neglect, accident, improper wiring or installation, or used in violation of MCS instructions. Nor does it extend to equipment that has been altered outside MCS's factory without prior written approval, nor to equipment that has had the serial number removed, nor to accessories used herewith, which were not manufactured by MCS. Fuses and batteries are specifically excluded from this Warranty. Equipment sold by but not manufactured by MCS is warranted by the original equipment manufacturer.

The owner must deliver equipment covered by this warranty with all transportation charges prepaid, to the MCS factory for examination. If examination discloses, by MCS's judgment, that this is thus defective, the equipment will be repaired or replaced at no charge. Equipment returned prepaid under warranty and repaired in MCS's factory will be returned with all transportation charges, surface freight only, paid by MCS. Units that fail under conditions cited above, as being outside of the warranty extension will be repaired on a time-and-material basis after notification to and approval by owner. All freight incurred in repairing equipment not under warranty will be the responsibility of the owner.

In respect to any and all equipment furnished by MCS, this warranty is in lieu of any other warranty, obligation, or liability expressed or implied including warranty of merchantability or fitness for a particular purpose. No person, including a company representative, is authorized to assume for MCS any other liability in connection with the sale of its products.

Under no circumstances shall MCS be liable in contracts or in tort for any economic loss, including any loss of profits, or for any special or consequential damage.

All inquires relating to either product operation or warranty service should be directed to:

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