



Winning Solutions...Worldwide

SUPERCONTROLLERTM (CON2)

Models A, AF, I, and IF

Installation and User Manual

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MIKOHN CORPORATION OVERVIEW

There is a Mikohn product in every casino in the world. This simple statement is a testimony to the Mikohn influence as a key supplier to the international gaming industry. Within its four core divisions, Mikohn has a diversified portfolio that encompasses high-tech player tracking and management information systems, an advanced system for the automation of table games, turn-key design and manufacturing for high impact interior and exterior signage and lighting displays, and a wide and growing number of proprietary specialty games.

SYSTEMS

Heralded as the dominant leader in progressive jackpot systems, Mikohn continues to expand its offerings of sophisticated electronic systems to include the linking of multi-site casinos, advanced management information and player tracking innovations, related module enhancements, and bonusing technology.

TABLE GAMES

Mikohn continues to broaden its staple of proprietary table games, which include new branded specialty games. Designed to bring variety to the gaming floor and attract players, these games encourage greater play through their novel looks and concepts, progressive jackpot systems, and outstanding display features.

GAMING OPERATIONS

The Mikohn slot division continues to create unique and different products that will stand on their own merit. Mikohn will strive to introduce high margin products in games, predict and beat the changes in the industry, and drive that change while building a strong base of products that will gain market share, maintain a competitive edge, and focus on products with recurring revenue. Creating high demand and competitive slot products with a strong emphasis in differentiation added entertainment value and immediate brand recognition remains the focus of the Gaming Operations division.

EQUIPMENT SALES

As the pioneer and industry leader in the development of interior signage and displays in casinos, Mikohn is renowned for its unique, sensory-stimulating displays. This specialized form of artwork features multi-dimensional elements, thematic progressive displays, meters, robotics/animatronic technology, and computer-coordinated sound and light shows. Mikohn can also customize slot glass to a particular theme, color, and style, enhancing the overall effect of any game. The award-winning Mikohn exterior lighting and signage design team invents displays that not only illuminate buildings, but also magnify their presence and theme.

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## **1. Introduction**

This is a reprint of the SUPERCONTROLLER (CON2) Manual 990-010-00, originally released in November, 1993. Formatting and style has been updated to current MIKOHN standards. Some outdated material has been omitted, such as detailed discussions of using the Mitsuba Pocket PC. However, the information essentially has not changed from the original document.

### **1.1 Who Should Use This Manual**

This manual is for MIKOHN Technicians and customers who install, configure, and use CON2 controllers, which control progressive jackpot systems and associated displays.

#### **1.1.1 Terms and Conventions**

- **Caution** tells a reader to be careful with the components (such as hardware or software) he or she is using.
- **Casino** (see Site).
- **Machine** refers to a slot machine, also called an EGM (Electronic Gaming Machine) in some jurisdictions.
- **Interface Board** refers to the communications board installed in each machine; also called a SIB (Smart Interface Board).
- **Note** is for helpful and important information.
- **Operator** means the organization or persons running an establishment, such as a casino (also called site). Operator also refers to the person or group responsible for the procedures discussed in this document.
- **User** refers to the operator or any qualified member or affiliate of the operating establishment.
- **Site** refers to a casino, operation, or venue; and is used interchangeably with these terms.
- **Warning** tells a reader to be careful so as not to get hurt.
- **You** is the person reading this manual or performing some action relevant to the system.

## 1.2 Reference Documentation

Table 1.1 lists reference documentation for other products used with the CON2.

Table 1.1 Reference documentation

| Part Number     | Document Description                                  |
|-----------------|-------------------------------------------------------|
| 990-051-00      | PSP v2.0 software                                     |
| 990-241-38 RevA | CHAMII+ Display User Manual                           |
| 990-241-40      | SUPREME Display User Manual                           |
| 950-401-90      | PCID (Customized Machine IDs) v2.0 Technical Bulletin |
| 950-011-01      | CON2 Jackpot History Utility Technical Bulletin       |

## 1.3 CON2 Progressive System Overview

Progressive jackpots increment with each coin played on the participating machine or network of machines. A fixed percentage, the **progressive percentage**, of the players' wagers is contributed to the jackpot. To win, a player must wager the required amount and get a winning combination.

A SUPERCONTROLLER (CON2 here after) progressive jackpot system consist of one or more of each of the following: gaming machines, visual displays, and CON2s. An overhead visual display shows jackpot information, such as the current and winning amounts. The display is normally installed above the bank of machines linked to the progressive. Figure 1.1 shows an example of a CON2 progressive system.

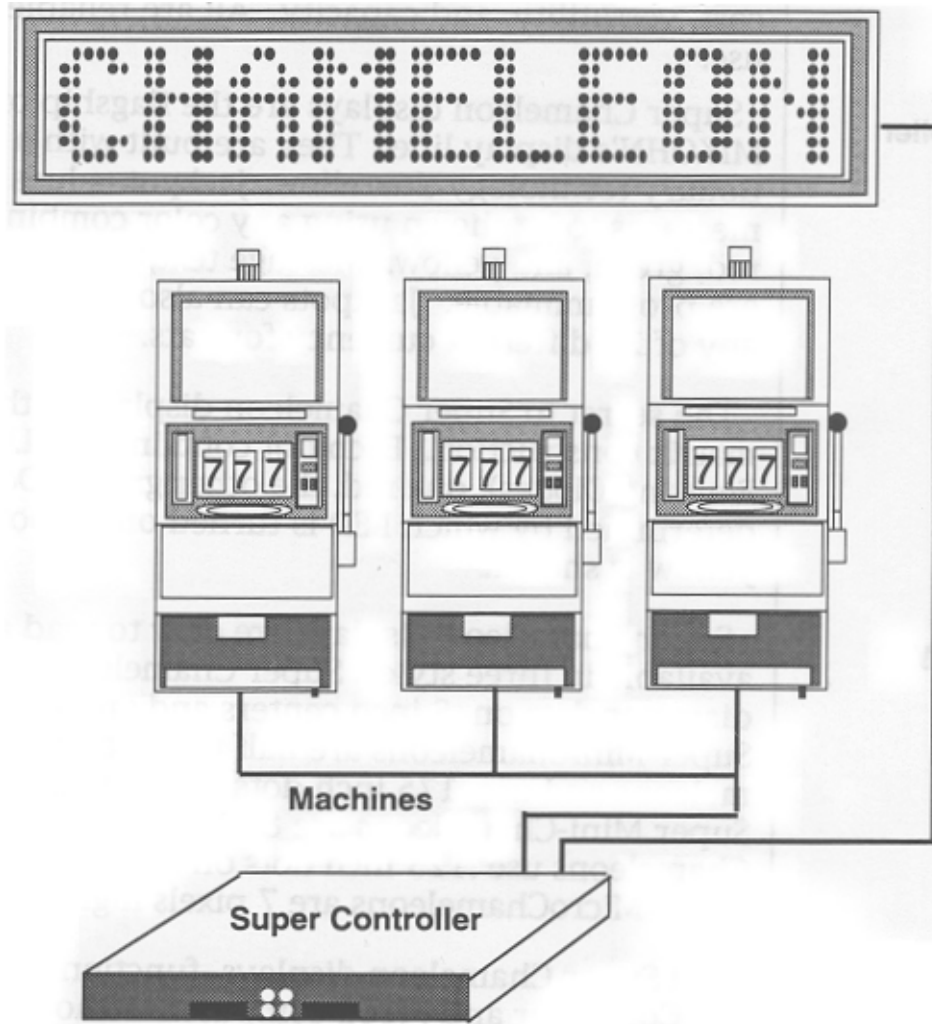


Figure 1.1 An example of a CON2 progressive system

## **1.4 Software Features and Functions**

The four CON2 models discussed in this manual support up to 32 machines. CON2 models A and AF have four coin/jackpot inputs, and a separate bi-directional serial port to be used for specific machine protocols. CON2 models I and IF have one coin/jackpot input. The modified CON2I and CON2IF controllers are not discussed in this manual. However, note that the CON2I **Modified** and the CON2IF **Modified** controllers support only 24 machines, with addresses 25 through 32 reserved for eight jackpot group reset key switches. In the modified controllers, this was done to support Mystery jackpots. The main features of the CON2 models A, AF, I, and IF are listed below:

- **Real Time Clock** supported: Real Time Clock standard is used for time/date stamping.
- **Communication:**

Capable of bi-directional communication with machines receiving serial information. Hopper pays can be shown as on-screen data.

Communication port available on the CON2 for gathering accumulated progressive jackpot group information.

Fiber optics: When converting fiber optic transmissions to wire signal transmissions, RS-422 protocol is used. Linked controllers – Using the fiber optic ports, up to 16 controllers can be linked. Full-duplex multidrop is supported with fiber optic communication.

Higher noise immunity: Display outputs have differential current loop, providing higher noise immunity, and full-duplex multi-drop.
- **Status Indicators:** Transmission, receiving, resetting, power, and watchdog functions are monitored and communicated via 16 LEDs (Light Emitting Diodes). See Section 1.5.4 for LED descriptions.
- **Jackpots**

Types supported: Single, three hidden types, double progressive with arrows, double progressive highest jackpot paid, and multiple jackpots.

History: The active jackpot area can maintain eight active jackpots along with a history of 100 past jackpots, including a time and date stamp.

Canceling: False jackpots can be cancelled, except those in HID modes.
- **Second Bet Machines:** The CON2 supports normal and second bet coins (see Section 1.5.3 for J1 wiring information). **Extra Coin:** The Extra Coin Increment Rate option must be set in PSP.
- **Security:** With PSP software, CON2 can allow unlimited, limited, and restricted access.
- **Checksum:** All serial communication supports some form of Checksum operation on the data.
- **Time/Date Changes:** Twenty one time/date stamps are maintained for changes using PSP.
- **Flexibility:** the CON2 is not limited to gaming applications and can be used for purposes such as a monitoring device or a counting accumulator. In addition, other devices can be connected to the CON2 for expanded functionality.

## **1.5 Hardware**

All CON2 models discussed in this manual support up to 32 machines and all jackpot types. All CON2 models have expandable memory, LED status indicators, and four fused power feeds.

This section contains the following:

- Drawings of CON2 models: Model A ([Figure 1.4](#)), Model AI ([Figure 1.5](#)), Model I ([Figure 1.6](#)), and Model IF ([Figure 1.7](#))
- Descriptions of the ports and connectors ([Section 1.5.2](#)), fuses ([Section 1.5.2](#)), and LED status indicators ([Section 1.5.4](#)).

### **1.5.1 Visual Displays Supported by the CON2**

The CON2 supports the following MIKOHN visual displays:

|         |       |         |
|---------|-------|---------|
| CHAMII  | MARK1 | SUPREME |
| CHAMII+ | MARK2 | AGL     |

### **1.5.2 Fuse Descriptions**

Always remove power prior to removing or replacing fuses.

- **F1** protects against machine serial current loop overload.
- **F2** protects against overload on display circuits and machine serial RS-422. Shorting of display circuits can blow F2 and disable display circuits.
- **F3** reflects I/O power overload on J1, J3, J5, or J6, or other I/O components.
- **F4** (labeled VCC power) protects the board components.

### 1.5.3 Ports and Connectors

In this section, CON2 models are specified where information applies only to certain models.

#### **J1: Machine Scan Port**

Function: In non-RBP mode, can detect up to four jackpot groups. J1 receives coin and jackpot information. Machine status is read every 16ms.

Maximums: Supports distances up to 2000 feet.

Technical information and pinouts: (Figure 2.1 shows an example harness hookup) Machine harness hard-wire connector: Multi-plexed, optically isolated inputs. J1 requires 20-24 gauge wire and is non-IDC.

Pin 1 – 4\* For models A and AF: Coin-in/jackpot signal (Data A – D)

Pin 9 – 40 Machine Select #1 – 32

\* Models I and IF use *only* Pin 1 (I/O GRND)

2<sup>nd</sup> Bet wiring information: CON2 supports normal and second bet coins. One coin signal is wired to input A (Pin 1) and the other is wired to input B (Pin 2). 2<sup>nd</sup> Bet jackpots are set to 2BET jackpot type and use jackpot groups JP0 (Pin 1) and JP1 (Pin 2). Pins 3 and 4 are non-multiplexed signals used for jackpot groups JP2 and JP3. You must also configure the Extra Coin Increment Rate in PSP for 2<sup>nd</sup> Bet machines.

#### **J2: Accounting Data System**

Function: Serial connection to a computer or laptop with PCID, JIS, or Totalizer software.

Maximums: Supports distances up to 50 feet at 9600 baud. Use RS-232 boosters for greater distances or additional devices.

Technical information and pinouts: Standard RS-232 input/output DB9 connector.

|       |      |       |     |
|-------|------|-------|-----|
| Pin 1 | CD   | Pin 6 | DSR |
| Pin 2 | TX   | Pin 7 | RTS |
| Pin 3 | RX   | Pin 8 | CTS |
| Pin 4 | DTR  | Pin 9 | RI  |
| Pin 5 | GRND |       |     |

### **J3: Machine Serial Communication Port**

Function: Serial control to various machine manufacturers. This port is most often used for output to machines. Determining whether to use this port or J1 is dependent on the machine software and whether bi-directional communication is required. The Bally Multi-Comm system uses this port.

Maximums: Supports distances up to 2000 feet at 9600 baud. Use RS-422 boosters for greater distances or additional devices.

Technical information and pinouts: Machine harness connector, bi-directional, RS-422 compatible. J3 requires 20-24 gauge wire and is non-IDC.

**Output** is RS-422 standard drive capable, disabled (high impedance mode) when not transmitting, and optically isolated prior to the RS-422 driver IC (75174). Two outputs provide twice the drive capability.

**Input** is RS-422 standard compatible and differential, but presents as a higher load than is standard. Use optical isolators for protection. One input is common to both outputs. Current uses: Bally MultiComm.

|           |          |             |        |
|-----------|----------|-------------|--------|
| Pin 1     | Serial + | Pin 10      | TX A-  |
| Pin 2 – 4 | I/O GRND | Pin 11      | TX A+  |
| Pin 5 – 6 | RX A-    | Pin 12      | TX A1+ |
| Pin 7 – 8 | RX A+    | Pin 13 – 14 | VI/O1F |
| Pin 9     | TX A-    |             |        |

### **J3: Machine Serial-Current Loop**

Function: Used for on-screen data and machine pays. This configuration is intended to provide serial progressive value and jackpot information back to slot machines, eliminating the need for the SINFO Gateway.

Maximums: Supports distances up to 1000 feet at 9600 baud with 32 machines. For greater distances, use converter boosters.

Technical information: Machine harness connector (output only).

### **J4: Programming Serial Port**

Function: Transmitting and receiving data between the controller and programming software.

Maximums: Supports distances up to 50 feet at 9600 baud. For greater distances, use standard RS-232 boosters.

Technical information and pinouts: Standard bi-directional RS-232 input and output proprietary to MIKOHN, DB9 connector

|       |      |       |     |
|-------|------|-------|-----|
| Pin 1 | GRND | Pin 6 | NC  |
| Pin 2 | TX   | Pin 7 | RTS |
| Pin 3 | RX   | Pin 8 | CTS |
| Pin 4 | NC   | Pin 9 | NC  |
| Pin 5 | GRND |       |     |

## **J5 and J6: Display Ports**

Function: Bi-directional communication between the controller and displays.

Maximums: Supports distances up to 2,000 feet at 9600 baud. For greater distances or connection to other devices, use standard RS-422 boosters.

Technical information and pinouts: Bi-directional RS-422 compatible.

**Output** is RS-422 compatible, disabled (high impedance mode) when not transmitting, and optically isolated prior to the RS-422 driver IC (75174). Two outputs provide twice the drive capability.

**Input** is RS-422 compatible, differential but represents itself as a higher load than the standard RS-422 input.

**Wiring:** Connectors have IDCs (Insulation Displacement Connectors) and do not require removal of insulation. The wire is pushed down into a V shaped metal contact that cuts into the insulation and makes a solid electrical connection. See Section 1.5.5 for information about IDC tools.

Pinouts for J5 and J6 are the same:

|       |          |       |        |
|-------|----------|-------|--------|
| Pin 1 | I/O GRND | Pin 4 | TX M1- |
| Pin 2 | RX M+    | Pin 5 | TX M1+ |
| Pin 3 | RX M1-   | Pin 6 | VI/OF  |

## **J7: Power**

12 Volt DC @ 1.5Amp input for the controller. The power pack is MIKOHN specified and the part number depends on the AC provided (115 – 220).

## **FOR1, FOR2, FOT1, FOT2: Fiber Optics**

Function: Controller fiber optic connections (bi-directional) used to create a linked progressive system with multiple controllers. Fiber optic connections are available only on CON2 models AF and IF.

Maximums: Supports distances up to 70 meters (229.5 feet).

Technical Information:

Data received from other controllers through **FOR1**, the primary fiber receiver port. Data received through FOR1 are amplified and transmitted through **FOT1**, the primary fiber transmitter port.

Data received from other controllers through **FOR2**, the secondary fiber receiver port, are amplified and transmitted through **FOT2**, the secondary fiber transmitter port.

See Figure 2.3 for an example of a CON2 fiber linked system.



### 1.5.4 LED Status Indicators

Figure 1.2 below shows the LED pattern on the controller panel where J1 and J3 are accessible. Figure 1.3 on the next page shows the LEDs on the opposite controller panel. In the LED descriptions below, the status indicated is Active.

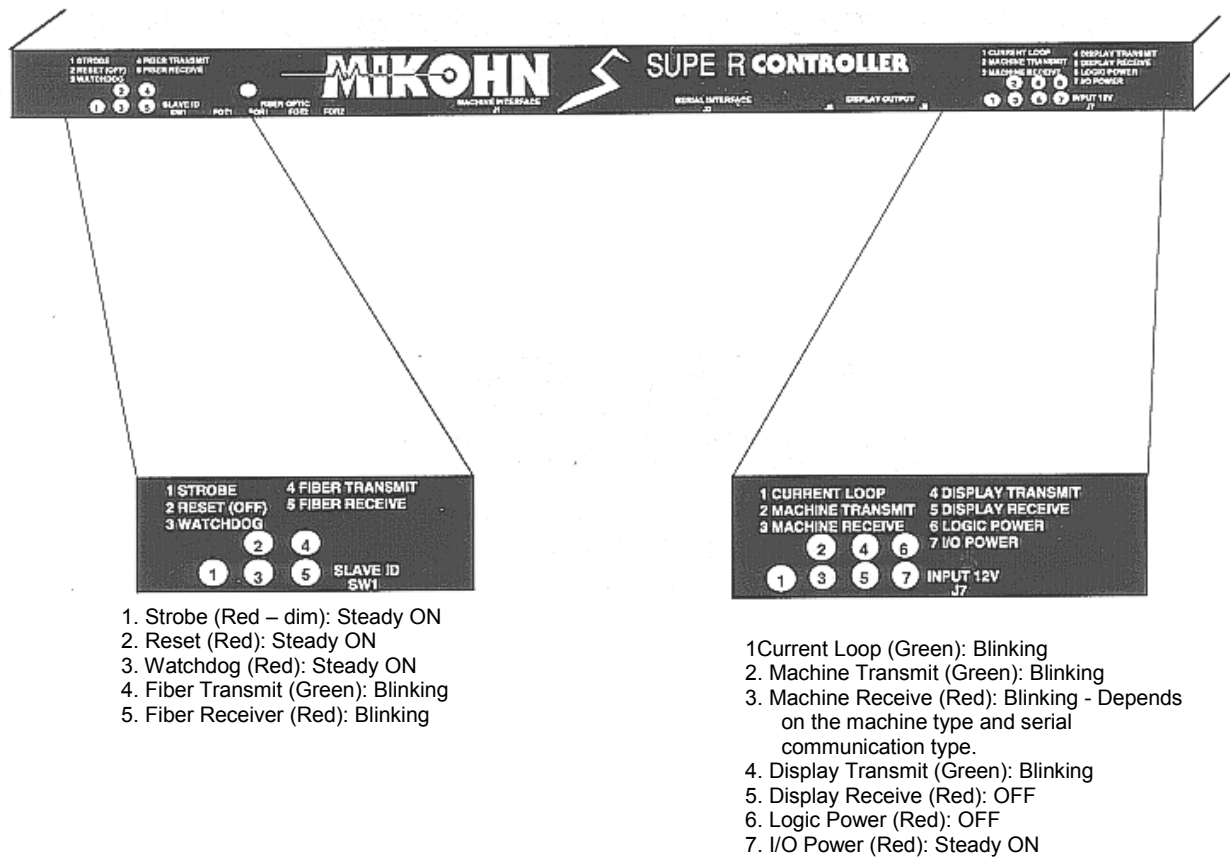
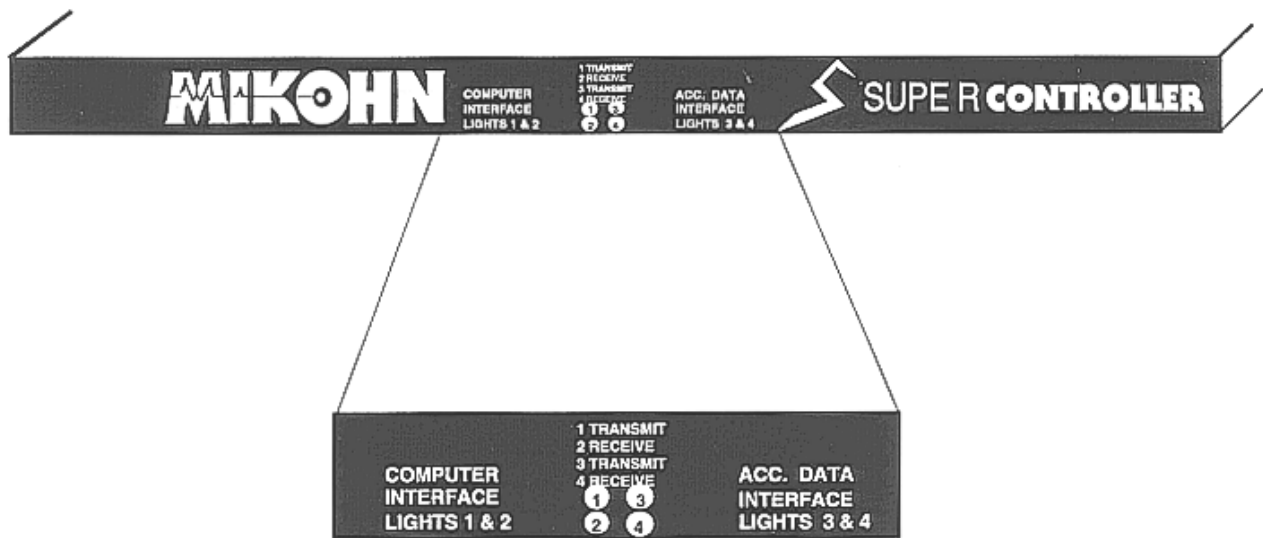


Figure 1.2 LEDs on controller panel where J1 and J3 are accessible

Figure 1.3 shows the LEDs and their functions on the controller panel where J2 and J4 are accessible.



1. Computer Interface (Green): ON when transmitting to programming device.
2. Computer Interface (Red): ON when receiving from programming device.
3. PCID/JIS computer interface (Green): ON when transmitting to computer.
4. PCID/JIS computer interface (Red): ON when receiving from computer.

Figure 1.3 LED status indicators on controller panel where J2 and J4 are accessible

### 1.5.5 IDC Connectors and Use of Tools

J5 and J6 on CON2 logic boards are IDC (Insulation Displacement Connectors) connectors. Wiring IDC connectors requires a special tool. There are two Panduit® models available (see [Table 1.2](#)). You can order the tools from MIKOHN or Panduit.

The hand tool can be used only with .156" connectors. Put the connector on a hard surface (do *not* use the logic board, as it can be damaged). With sufficient force, use the tool to push each wire into the V of its connector pin.

The IDC gun is easier to use and consists of a squeeze-gun and a nose section. Check that you are using the correct nose section for the connector size.

Table 1.2 IDC tools by Panduit

| Panduit Part Number | Description                                                                                            |
|---------------------|--------------------------------------------------------------------------------------------------------|
| MRT-156F            | Low cost hand tool for .156" connectors                                                                |
| MCT-GUN             | More expensive gun-type tool for .100" and .156" connectors.<br>Required "Nose" sections listed below. |
| CTD-100F            | Required with MCT-GUN. Used with .100" connectors.                                                     |
| CTD-156F            | Required with MCT-GUN. Used with .156" connectors.                                                     |

1.5.6 CON2 Model A Drawing

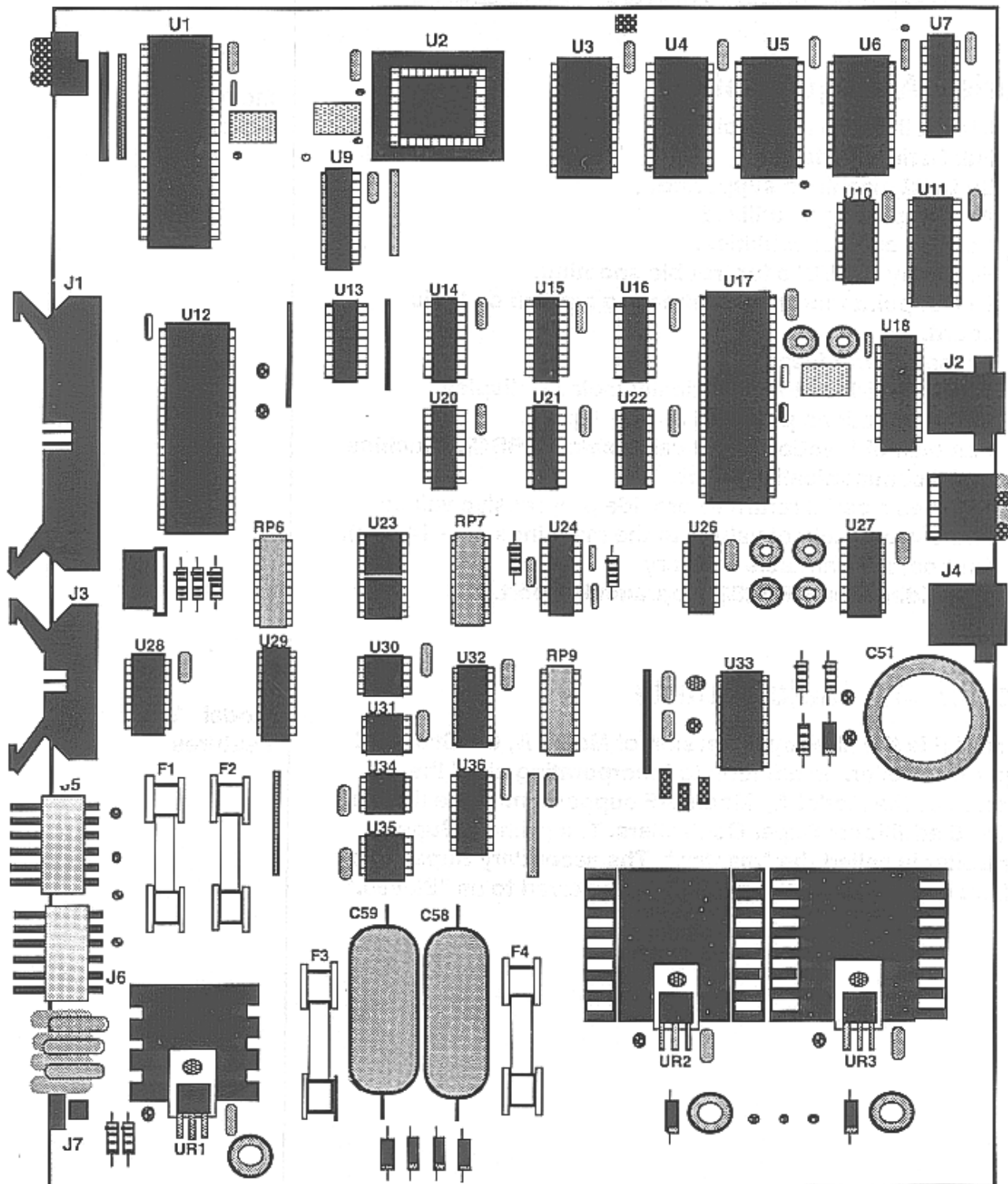


Figure 1.4 CON2 Model A

1.5.7 CON2 Model AF Drawing

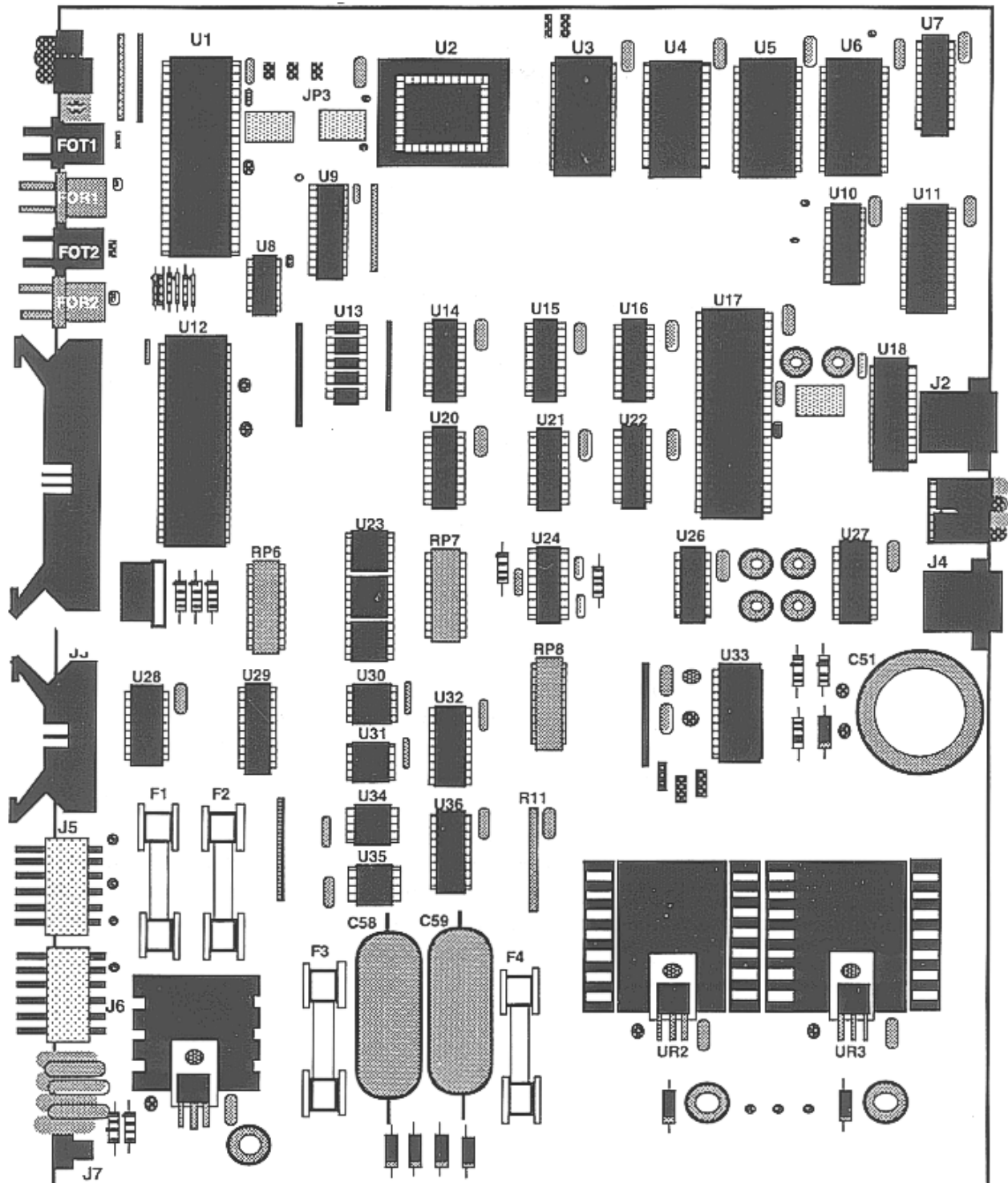


Figure 1.5 CON2 Model AF

1.5.8 CON2 Model I Drawing

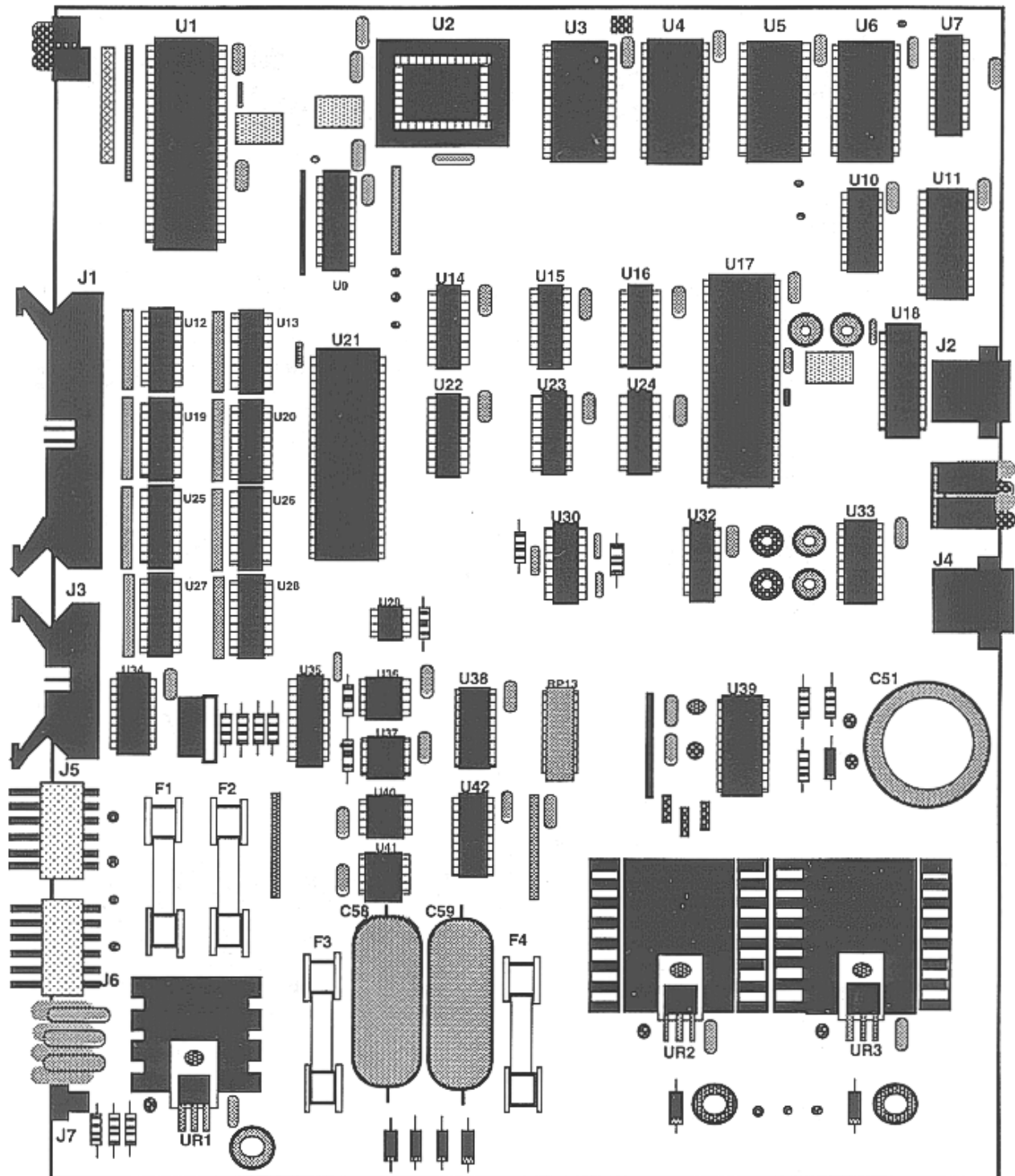


Figure 1.6 CON2 Model I

1.5.9 CON2 Model IF Drawing

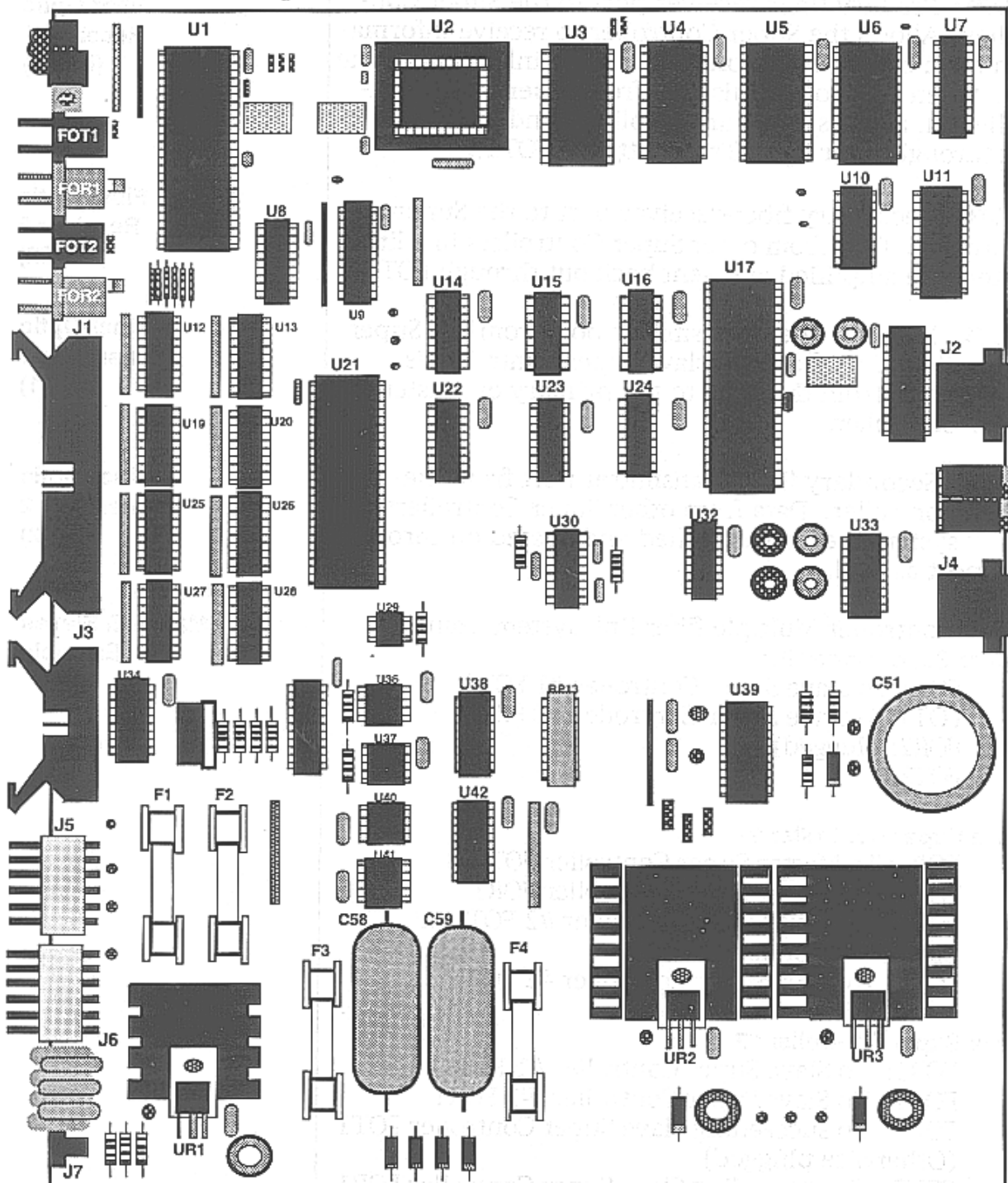


Figure 1.7 CON2 model IF

## **2. Installation**

This chapter contains the following:

- Overview of installation procedures. Specific installation procedures are not included, which are dependent on the equipment and requirements of the individual site.
- Display configuration procedures

### **2.1 Pre-install Requirements**

#### **2.1.1 Resources**

Before installation, make sure that you have the appropriate equipment, hardware, programming tools, and instructional material. Check that all appropriate manuals for the displays, machines, and controller programming software are available at the install location.

#### **2.1.2 Power Requirements**

MIKOHN equipment is available in both 110V and 220V configurations. Verify that all equipment is set for the proper voltage before applying power.

Verify that the AC power source can support the equipment load of the CON2s and displays.

#### **2.1.3 Ventilation**

Check that the displays have adequate ventilation to avoid overheating. The amount of heat generated inside the display must determine the size of the enclosure vents. In general, the CHAMIIs and MiniPhoton displays do not require as much ventilation as SUPREME displays.

The CON2 produces little heat and will operate correctly in almost any non-vented environment.

### **2.2 Installation Overview**

Installation is a six step process:

1. Install the visual displays and CON2 controller.
2. Configure the controller.
3. Connect the CON2 to the visual displays and slot machines.
4. Configure the visual displays.
5. Test the system operation.
6. Program the jackpot values.



## **2.3 Connections**

### **2.3.1 Visual Display Connections**

CON2 supports the following displays:

|         |       |         |
|---------|-------|---------|
| CHAMII  | MARK1 | SUPREME |
| CHAMII+ | MARK2 | AGL     |

The harness shown in Appendix A (on page 28) can be used to connect CON2s to all displays listed above, with the exception of the AGL. Visual displays are connected to the CON2 at J5 or J6. If you are using Mark 1 Animation Displays, read the Caution on the next page.

Visual displays and CON2s must be connected to a clean AC power source. Do not use power circuits that provide power to air conditioners or other electrically noisy devices. If noise interference cannot be avoided, install a good noise filter between the power source and the progressive equipment.

### **Mark1 and Mark2 Animation Display Logic Boards**

When connecting the CON2 to the Mark1 or Mark2 Animation Display logic boards, note the following:

The default channel on the Mark1 logic board is J5 (RS-232). If you use J4 (RS-422), there must be NO device (such as a plug, adaptor, or jack) installed on J5.

The default channel on the Mark2 is J6 (RS-232). If you use J4 (RS-422), there must be NO device (such as a plug, adaptor, or jack) installed on J6.

### **2.3.2 Programming Connections**

Use the appropriate harness below to connect the CON2 (at J4) to a programming device, such as a laptop or computer with PSP software installed.

Appendix G (on page 34): CHAMII to ADP-S, programming harness – The ADP-S board is a converter board for fiber optics/RS-422 conversion.

Appendix H (on page 35): CON2 (J5 or J6) to Gateway, programming harness. Use for CON2 to CHAMI communications with appropriate GW software (see MIKOHN Technician's Pocket Guide, P.N. 990-241-39 RevA).

### 2.3.3 Configure the CON2

This manual contains general instructions to configure the displays (see Section 2.4). You must also configure the CON2, prior to connecting the machines to the CON2. For controller configuration procedures, refer to the MIKOHN PSP v2.0 Technical Manual, P.N. 990-051-00.

### 2.3.4 Machine Connections

Connect machines to J1 (see page 6 for connector details) on the CON2. Each machine is assigned a separate ground strobe wire. Information returns on one or more data wires. Refer to the appropriate appendix, as indicated below, for machine harness connections to the CON2:

- CON2 models A and AF: harness connections with pinouts – Appendix B (on page 29)
- CON2 models I and IF: harness connections with pinouts – Appendix C (on page 30)
- CON2 to Bally, machine wiring diagram – Appendix D (on page 31)
- CON2 to IGT, machine wiring diagram – Appendix E (on page 32)
- CON2 to Universal, machine wiring diagram – Appendix F (on page 33)

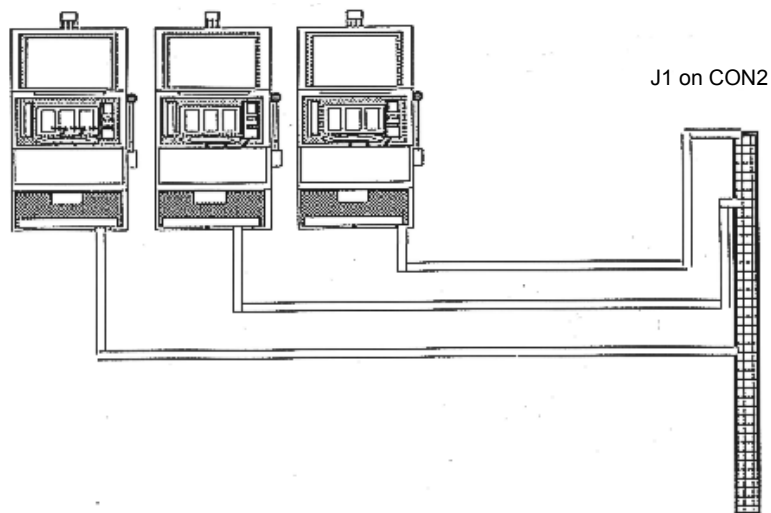


Figure 2.1 Machine connections to J1 connector on CON2

### 2.3.5 Controller Settings: Linked or Standalone

CON2 models AF or IF are required for a linked controller system and must be set as master or slave on JP3 and addressed using a rotary switch (see [Figure 2.2](#)).

Standalone controllers: Set the rotary switch to **0** and do NOT jumper the JP3 pins.

For a linked controller system, set the master and slaves as follows:

- Master: Set the rotary switch to **0** and jumper the JP3 pins.
- Slaves: Set the rotary switch on the slaves sequentially from 1 – F and do NOT jumper the JP3 pins.

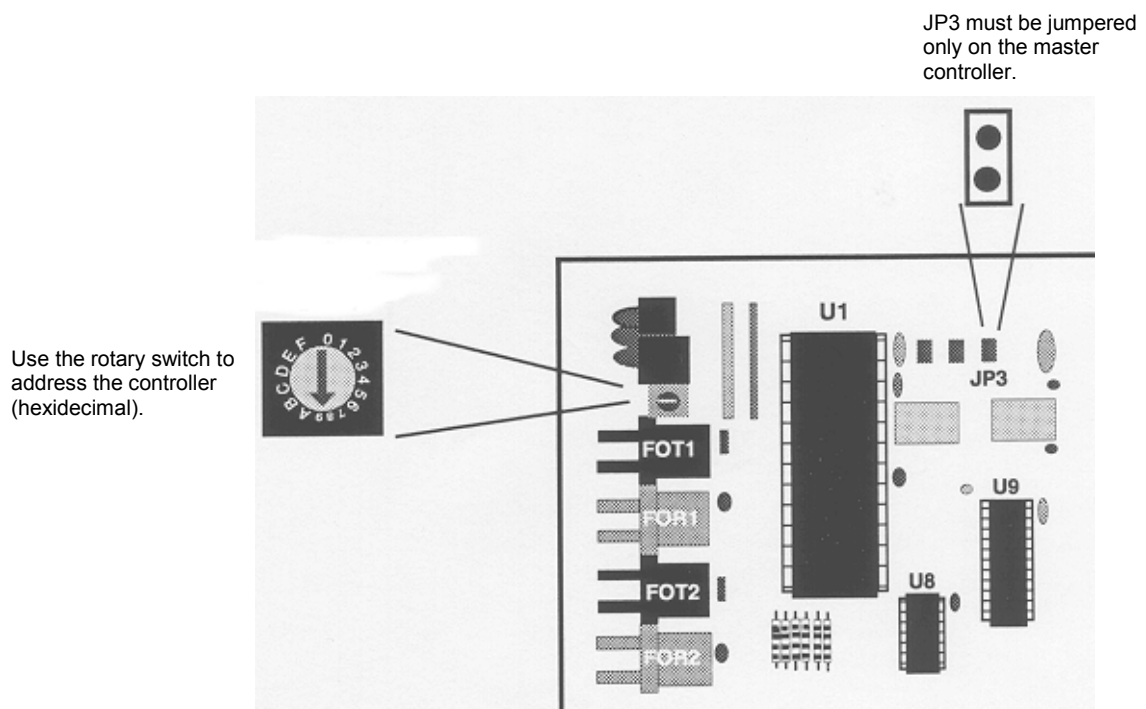


Figure 2.2 Rotary switch and JP3 on the CON2

### 2.3.6 Linked Controller System Connections

In a linked controller system, you must use CON2 models AF or IF, which have the fiber optic ports for communication between controllers. Check that the controllers are addressed correctly, as described in Section 2.3.5. Figure 2.3 below shows the connections in an example of a linked CON2 system.

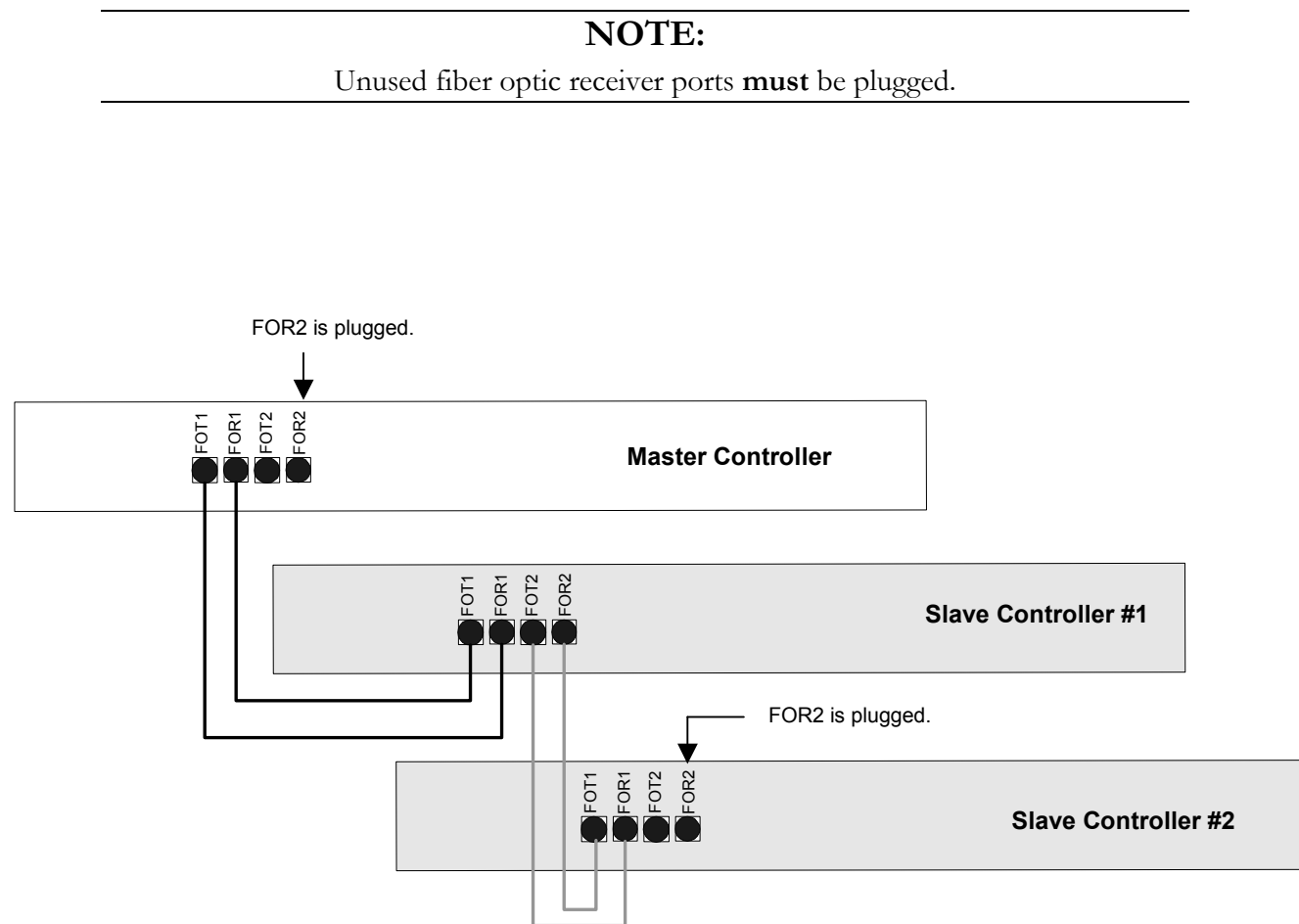


Figure 2.3 Example of a CON2 fiber linked system

## **2.4 Display Configuration**

### **2.4.1 Before Powering Up**

Before turning on displays, check the following:

- All hardware meets casino and regulatory requirements
- All connections to the CON2, machines, and displays are correctly installed and secure
- All cables are within defined distance limits
- Protocol configuration is correct

### **2.4.2 Display Logic Board Switches**

The configuration switches on most MIKOHN display logic boards are similar, regardless of logic board size or model. Although the switch labels may be different, there are always three configuration related buttons with the functions described below.

Configuration switch: Slide to change between normal operation and configuration mode.

Function switch: Push to scroll through configuration menu functions.

Value switch: Push to scroll to the appropriate value of a menu function.

### 2.4.3 Configure the Display

This section has basic configuration procedures for the display so that the CON2 system can function. Refer to the appropriate display manuals for more detailed information about configuration and function descriptions (refer to [Table 1.1](#)). To configure the display, perform the following steps:

1. Check that power is connected to the display.
2. Gain access to the logic board inside the display housing.
3. Slide the **Power** switch to ON and the Configuration switch to Configuration mode.
4. Press the **Function** button to select GRADR and the **Value** button to set the GRADR value.
5. Repeat step 5 above for the following functions:
  - IDADR
  - JPGRP: With multiple displays connected to one logic board, press the **Function** button to cycle through the JPGRPs associated with each display (such as JPGRP\_A and JPGRP\_B).
6. Press the **Function** button to enter the Color Test mode and the **Value** button to cycle through the color tests as follows: green, red, yellow, and off.
7. Press the **Function** button to select TIME and again to select the field (in the order Hours, Minutes, and Seconds). For each field press the **Value** button to select the field value.
8. Press the **Function** button to select DATE and again to select the field (in the order Year, Month, Date, and Day). For each field press the **Value** button to select the field value.
9. Press **Function** to select MFILE\_X and **Value** to set the value (See [Table 2.2](#) for MFILE definitions).

## Configure the Display (Continued)

10. Press **Function** to view the display software version number. [Table 2.1](#) shows the various formats.

Table 2.1 Software version formats for different logic boards

| MIKOHN Display Name | Software Version Format                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------|
| CHAMII              | CH2 x.xx                                                                                                       |
| CHAMII+             | CH2 STA x.xx                                                                                                   |
| Mark 1              | MARK-1 x.xx                                                                                                    |
| Mark 2              | Mark-2 x.xx (press S3 again to view APS = xxxx, which shows the applications port settings and configurations) |
| SUPREME             | CSM x.xx                                                                                                       |
| AGL                 | AGL x.xx (press S3 again to view APS = xxxx, which shows the applications port settings and configurations)    |

11. Configuration is complete. Slide **S2** to the Normal Operation mode. The display should enter the normal operation cycle. If not, recheck all wiring and configuration values.

---

### NOTE:

Contact MIKOHN service at 1-800-792-1942 if you are unable to resolve problems with the display.

---

Table 2.2 Token values for MFile Settings

| Value | Justify | Paint | Color  | Description                     |
|-------|---------|-------|--------|---------------------------------|
| 0     | NA      | NA    | NA     | User defined JPOT.JACK and MMSG |
| 1     | Center  | No    | Red    | Internal *                      |
| 2     | Center  | No    | Green  | Internal *                      |
| 3     | Center  | No    | Yellow | Internal *                      |
| 4     | Center  | No    | Dazzle | Internal *                      |
| 5     | Center  | Yes   | Red    | Internal *                      |
| 6     | Center  | Yes   | Green  | Internal *                      |
| 7     | Center  | Yes   | Yellow | Internal *                      |
| 8     | Center  | Yes   | Dazzle | Internal *                      |
| 9     | Right   | No    | Red    | Internal *                      |
| 10    | Right   | No    | Green  | Internal *                      |
| 11    | Right   | No    | Yellow | Internal *                      |
| 12    | Right   | No    | Dazzle | Internal *                      |
| 13    | Right   | Yes   | Red    | Internal *                      |
| 14    | Right   | Yes   | Green  | Internal *                      |
| 15    | Right   | Yes   | Yellow | Internal *                      |
| 16    | Right   | Yes   | Dazzle | Internal *                      |



### **3. Error Codes**

This chapter lists display and controller error codes.

#### **3.1 Display Error Codes**

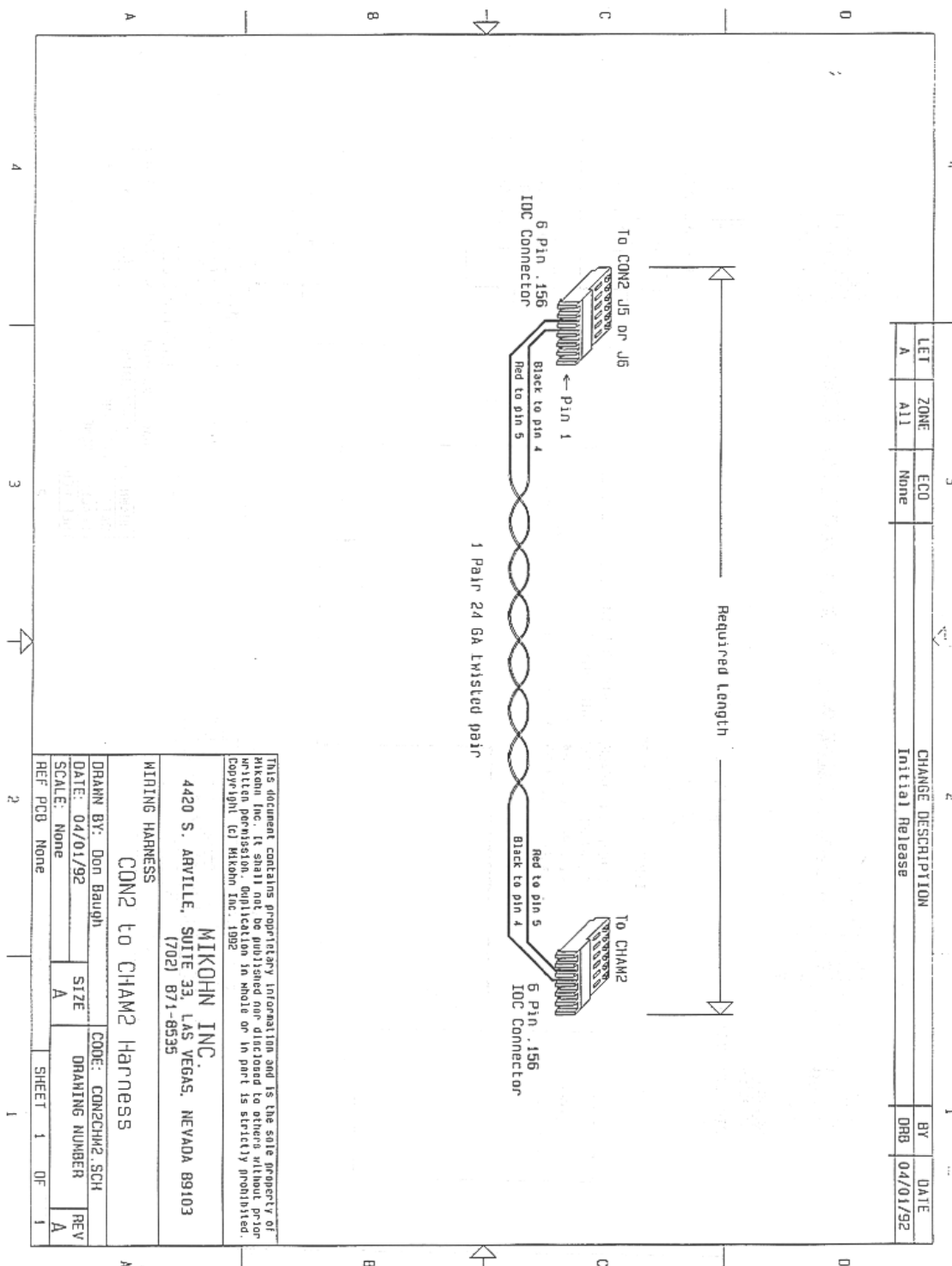
| <b>Code</b> | <b>Description</b>                                                                                                                                          |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C1</b>   | Communication loss between controller and display. This error may occur if wires become disconnected, controller power fails, or a fuse is blown.           |
| <b>C2</b>   | Meter value is too long (too many significant digits) for the display on the current programmed jackpot.                                                    |
| <b>C3</b>   | Test pattern written to RAM on logic, when read back, has been corrupted. This error may occur when the display receives a very long JACK. or JPOT.DO file. |
| <b>C4</b>   | PROM limit overflow. The current jackpot value exceeds the fixed limit value in the EPROM.                                                                  |
| <b>C5</b>   | <i>MultiLink mode</i> : Jackpot Token is not set to <b>8</b> in JPOT>DO file (PSP Message Programming).                                                     |
| <b>C8</b>   | Sentinel Timeout (CHAMII, v3.02 only).                                                                                                                      |
| <b>C9</b>   | Loss of configuration (CHAMII only). The display has lost its ID configuration. Reconfigure (switches S2 and S3).                                           |
| <b>C10</b>  | Checksum of a value in the controller has failed.                                                                                                           |
| <b>C12</b>  | Current jackpot amount is greater than the limit. Recheck the values in PSP Programming.                                                                    |
| <b>C14</b>  | Selected Machine Serial is not supported.                                                                                                                   |
| <b>C15</b>  | Progressive is not set up correctly (Base>Limit, Base>Current, or Hidden>Limit.                                                                             |
| <b>C52</b>  | MS10 Machine Serial setting: A serial machine has gone off line.                                                                                            |

### 3.2 Controller Error Codes

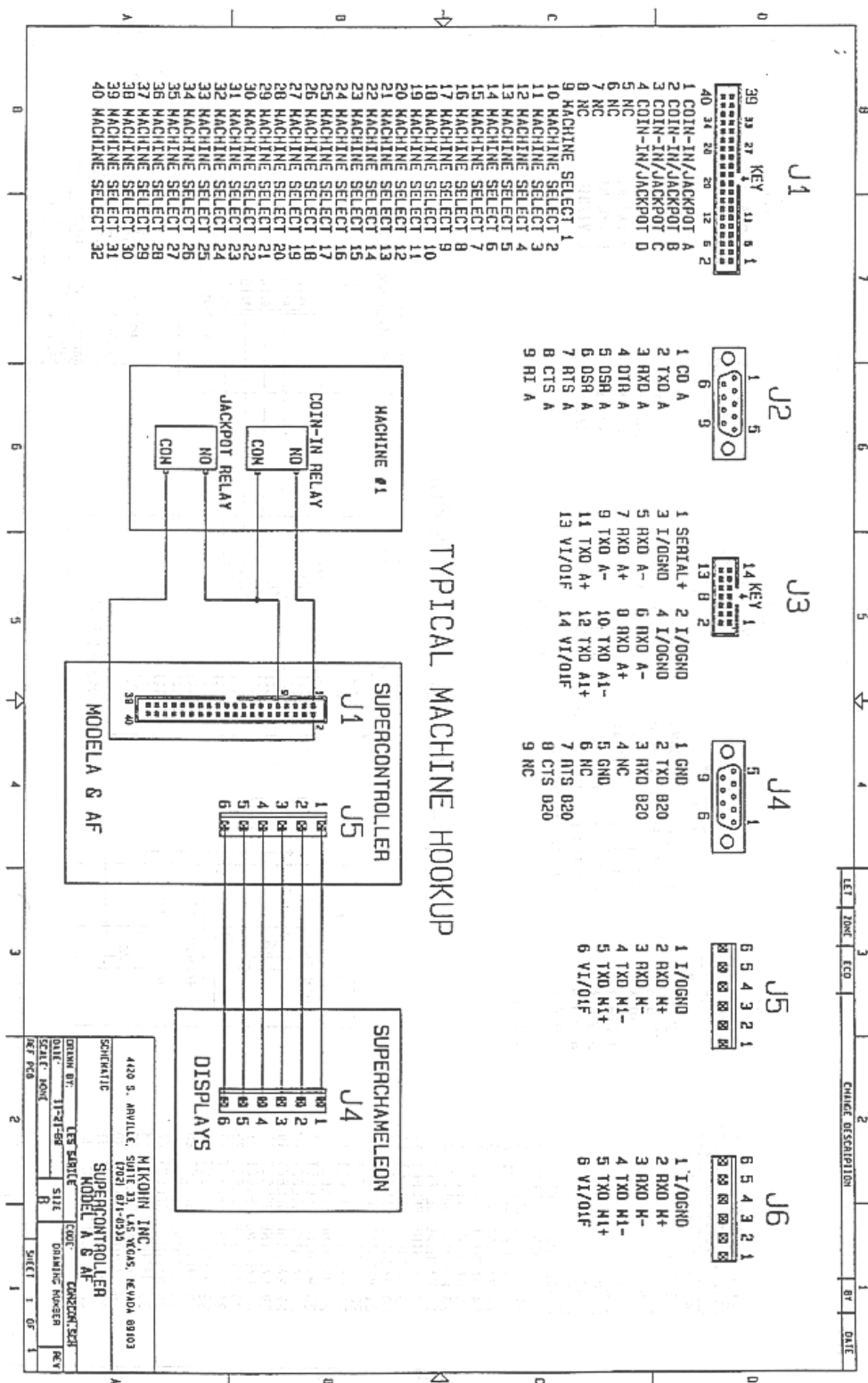
| Code       | Description                                                                                                                                                                                                                   |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C10</b> | Checksum of a value in the controller has failed. The value in question will be zeroed and a new checksum calculated. This can cause the controller to malfunction.                                                           |
| <b>C11</b> | Fiber bus communication error in the UART. Over 20 errors have been received from the fiber bus. The probable cause is a fault in the transmit or receive fibers or connectors.                                               |
| <b>C12</b> | Programmed jackpot limit is less than current jackpot. The probable cause is an error in programming in the Jackpot Values page in PSP (Page 1). Recheck all relevant PSP settings.                                           |
| <b>C13</b> | Over 20 errors have been received from the laptop. Probable cause is a fault in the transmit or receive wires.                                                                                                                |
| <b>C14</b> | Slot machine interface communication error in UART. Over 20 errors have been received from the slot machine interface. Probable cause is a fault in the transmit or receive wires.                                            |
| <b>C15</b> | Power up jackpot limit failure. The CURRENT JP value detected upon power up is above the JP LIMIT.                                                                                                                            |
| <b>C16</b> | Power brown out. There is insufficient power to one or more components. Check the AC line voltage range.                                                                                                                      |
| <b>C17</b> | RAM signature error.                                                                                                                                                                                                          |
| <b>C18</b> | Hidden jackpot (Minimum Value) is equal to or greater than the jackpot limit (Maximum Value). This error occurs in the Random Bonus Game. Correct the values on Page 1 in PSP Programming.                                    |
| <b>C19</b> | Current jackpot is greater than the jackpot limit (Maximum Value). This error occurs in the Random Bonus Game. Correct the values on Page 1 in PSP Programming.                                                               |
| <b>C20</b> | <i>Random Jackpot System only.</i> Coin-in Buffer.                                                                                                                                                                            |
| <b>C21</b> | Digit overflow.                                                                                                                                                                                                               |
| <b>C30</b> | Slave controller does not detect a master controller. The probable cause is incorrect switch settings in a slave controller or incorrect programming in the master controller. Also check the power to the master controller. |
| <b>C31</b> | Slave being polled but has not acknowledged after 20 retries. This error is related to the fiber system. Check all fiber cables and connectors.                                                                               |
| <b>C32</b> | Slave resend RAM failure.                                                                                                                                                                                                     |
| <b>C33</b> | Slave has acknowledged more coins than possible.                                                                                                                                                                              |
| <b>C34</b> | Master controller fiber pass through has failed after three attempts.                                                                                                                                                         |

| Code       | Description                                                                                                                                                                                                                                                                                                                                                                 |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C50</b> | MultiComm is not responding. Multi-Com has not responded after ten polls. Only a master or standalone controller displays this error. Check all connections and communication protocol. In PSP, Page 1, check for Machine Serial setting MS01. MS01 is for Bally® MultiComm only. If the controller is not connected to Bally MultiComm, change the Machine Serial setting. |
| <b>C51</b> | Transmission or reception failure. No serial machines are on line. This is a debug error for programmers.                                                                                                                                                                                                                                                                   |
| <b>C52</b> | Serial transmission or reception failure. A serial machine went off line.                                                                                                                                                                                                                                                                                                   |
| <b>C53</b> | Serial machine Mystery Pay is not available.                                                                                                                                                                                                                                                                                                                                |
| <b>C54</b> | <i>Bally MultiComm error:</i> Bad CRC.                                                                                                                                                                                                                                                                                                                                      |
| <b>C55</b> | <i>Bally MultiComm error:</i> Non-BCD value.                                                                                                                                                                                                                                                                                                                                |
| <b>C56</b> | <i>Bally MultiComm error:</i> Invalid group ID.                                                                                                                                                                                                                                                                                                                             |
| <b>C58</b> | <i>Bally MultiComm error:</i> Wrong sequence number.                                                                                                                                                                                                                                                                                                                        |
| <b>C59</b> | <i>Bally MultiComm error:</i> Invalid machine ID                                                                                                                                                                                                                                                                                                                            |
| <b>C60</b> | Event driven bonus not available.                                                                                                                                                                                                                                                                                                                                           |
| <b>C61</b> | Event driven bonus Threshold is 0.                                                                                                                                                                                                                                                                                                                                          |
| <b>C77</b> | Database error. The controller has encountered a problem with its copy of the database. The Machine ID program is off on this controller. The remaining controllers in the link may still be activated. Machine ID RAM failure has occurred.                                                                                                                                |
| <b>C80</b> | Slave controller does not detect a master present on a Random Bonus Game. The probable cause is incorrect switch setting on a slave controller or incorrect programming of the master controller. Also, check the power to the master controller.                                                                                                                           |
| <b>C81</b> | Slave coin buffer overflow. This is a debug error for programmers.                                                                                                                                                                                                                                                                                                          |
| <b>C82</b> | Random coin matrix buffer overflow. This is a debug error for programmers.                                                                                                                                                                                                                                                                                                  |
| <b>C83</b> | Random coin buffer overflow. This is a debug error for programmers.                                                                                                                                                                                                                                                                                                         |
| <b>C90</b> | <i>Error Code C11 replaces this error in CON2 v2.05 or greater.</i> Interference with fiber optic. Light is entering the transmission from an outside source. Unused fiber receivers should be plugged.                                                                                                                                                                     |
| <b>C91</b> | <i>Error Code C11 replaces this error in CON2 v2.05 or greater.</i> Controller conflict on fiber line. Probable cause is incorrect switch setting or that two or more masters are on the same line.                                                                                                                                                                         |
| <b>C92</b> | <i>Error Code C11 replaces this error in CON2 v2.05 or greater.</i> Transmission or reception failure on fiber line. Fiber optic cable is not communicating. Check for damaged cables or dirty connectors.                                                                                                                                                                  |
| <b>C93</b> | <i>Error Code C11 replaces this error in CON2 v2.05 or greater.</i> Controller conflict. (Same as C91)                                                                                                                                                                                                                                                                      |

## Appendix A: CHAMII to CON2 Harness Drawing

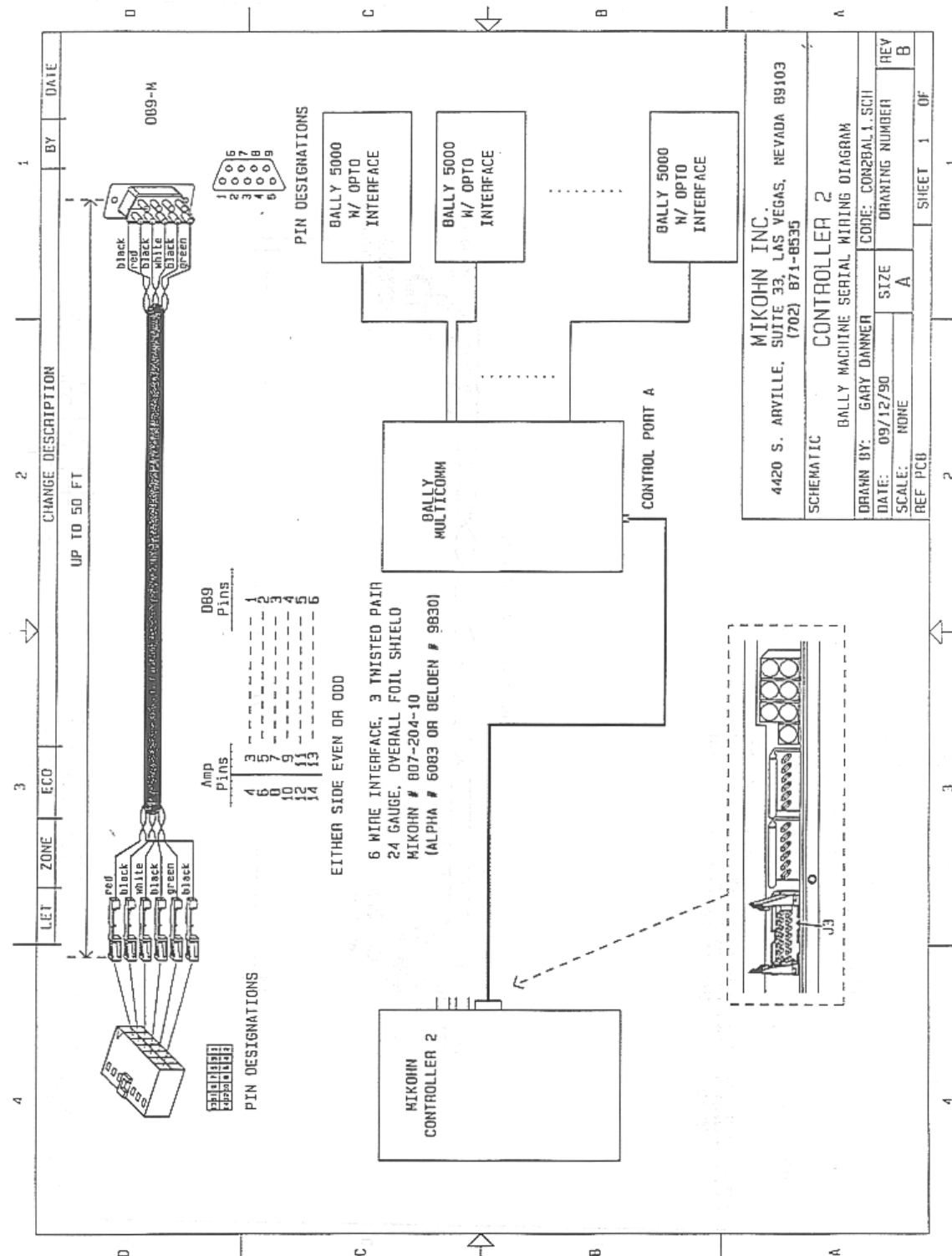


## Appendix B: CON2 A and AF Harness/Pinout Drawing

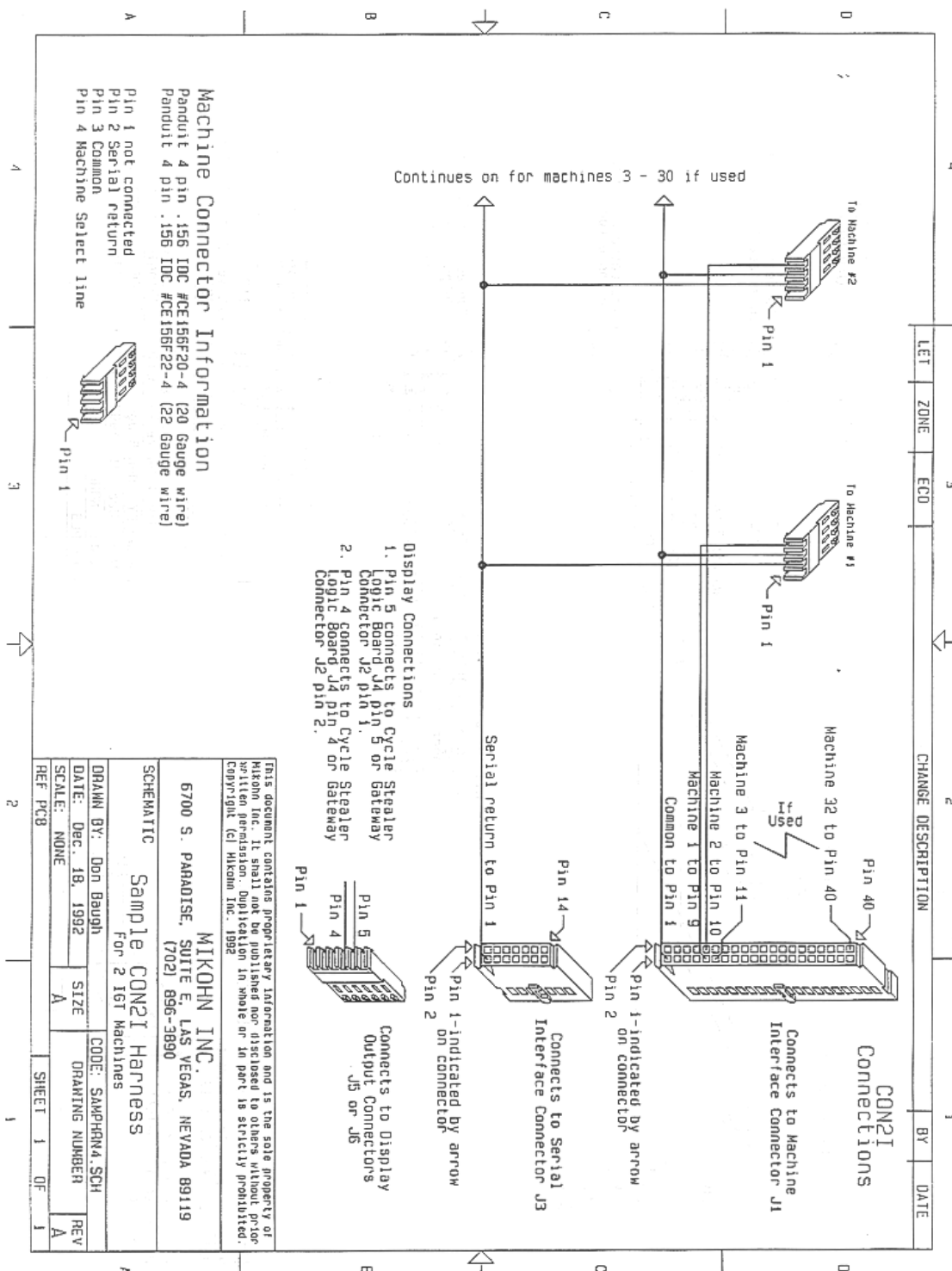




## Appendix D: CON2 to Bally Harness/Connection Drawing



## Appendix E: CON2 to IGT Harness Drawing





**Machine Connector Information**  
 Molex receptacle #03-09-1032  
 Molex pin #02-09-1119

**Machine Connections**

- Pin 1 Coin-in / JP#1
- Pin 2 Machine Select
- Pin 3 Coin-in / JP#2

**Display Connections**

- Pin 5 connects to Cycle Stealer Logic Board J4 pin 5 or Gateway Connector J2 pin 1.
- Pin 4 connects to Cycle Stealer Logic Board J4 pin 4 or Gateway Connector J2 pin 2.

**CON2A Connections**

- Machine 32 to Pin 40
- Machine 3 to Pin 11
- Machine 2 to Pin 10
- Machine 1 to Pin 9
- Coin-in / JP#1
- Common to Pin 1

**Connects to Display Output Connectors J5 or J6**

**Connects to Machine Interface Connector J1**

**Pin 1 - indicated by arrow on connector**

**Pin 2**

**Pin 1**

**Pin 40**

**Pin 11**

**Pin 10**

**Pin 9**

**Pin 5**

**Pin 4**

**Pin 1**

**Pin 2**

**Pin 1**

**Pin 2**

**Pin 3**

**Pin 4**

**Pin 5**

**Pin 6**

**Pin 7**

**Pin 8**

**Pin 9**

**Pin 10**

**Pin 11**

**Pin 12**

**Pin 13**

**Pin 14**

**Pin 15**

**Pin 16**

**Pin 17**

**Pin 18**

**Pin 19**

**Pin 20**

**Pin 21**

**Pin 22**

**Pin 23**

**Pin 24**

**Pin 25**

**Pin 26**

**Pin 27**

**Pin 28**

**Pin 29**

**Pin 30**

**Pin 31**

**Pin 32**

**Pin 33**

**Pin 34**

**Pin 35**

**Pin 36**

**Pin 37**

**Pin 38**

**Pin 39**

**Pin 40**

**Pin 1**

**Pin 2**

**Pin 3**

**Pin 4**

**Pin 5**

**Pin 6**

**Pin 7**

**Pin 8**

**Pin 9**

**Pin 10**

**Pin 11**

**Pin 12**

**Pin 13**

**Pin 14**

**Pin 15**

**Pin 16**

**Pin 17**

**Pin 18**

**Pin 19**

**Pin 20**

**Pin 21**

**Pin 22**

**Pin 23**

**Pin 24**

**Pin 25**

**Pin 26**

**Pin 27**

**Pin 28**

**Pin 29**

**Pin 30**

**Pin 31**

**Pin 32**

**Pin 33**

**Pin 34**

**Pin 35**

**Pin 36**

**Pin 37**

**Pin 38**

**Pin 39**

**Pin 40**

**Pin 1**

**Pin 2**

**Pin 3**

**Pin 4**

**Pin 5**

**Pin 6**

**Pin 7**

**Pin 8**

**Pin 9**

**Pin 10**

**Pin 11**

**Pin 12**

**Pin 13**

**Pin 14**

**Pin 15**

**Pin 16**

**Pin 17**

**Pin 18**

**Pin 19**

**Pin 20**

**Pin 21**

**Pin 22**

**Pin 23**

**Pin 24**

**Pin 25**

**Pin 26**

**Pin 27**

**Pin 28**

**Pin 29**

**Pin 30**

**Pin 31**

**Pin 32**

**Pin 33**

**Pin 34**

**Pin 35**

**Pin 36**

**Pin 37**

**Pin 38**

**Pin 39**

**Pin 40**

**Pin 1**

**Pin 2**

**Pin 3**

**Pin 4**

**Pin 5**

**Pin 6**

**Pin 7**

**Pin 8**

**Pin 9**

**Pin 10**

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**Pin 40**

**Pin 1**

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**Pin 3**

**Pin 4**

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**Pin 6**

**Pin 7**

**Pin 8**

**Pin 9**

**Pin 10**

**Pin 11**

**Pin 12**

**Pin 13**

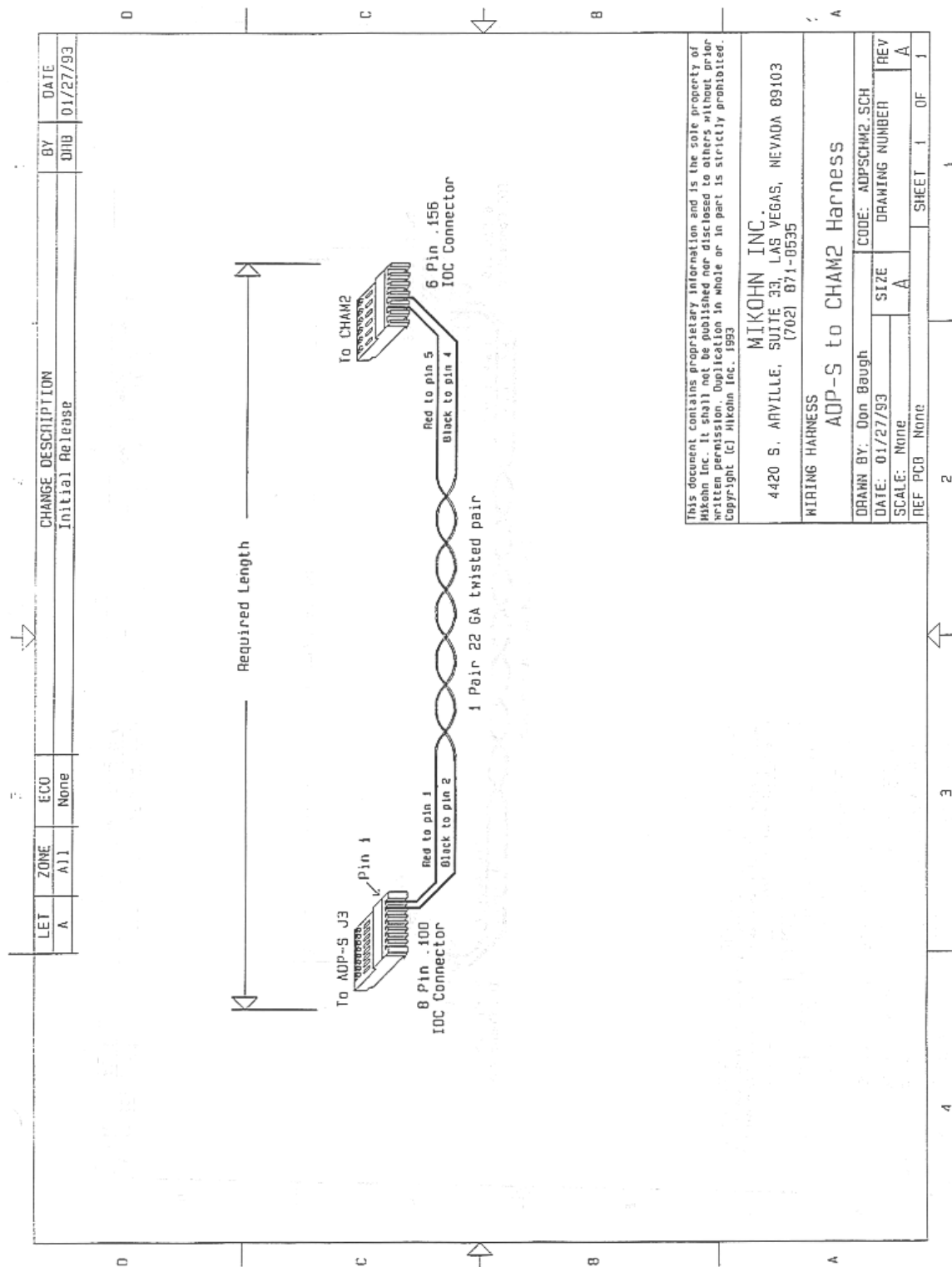
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**Pin 15**

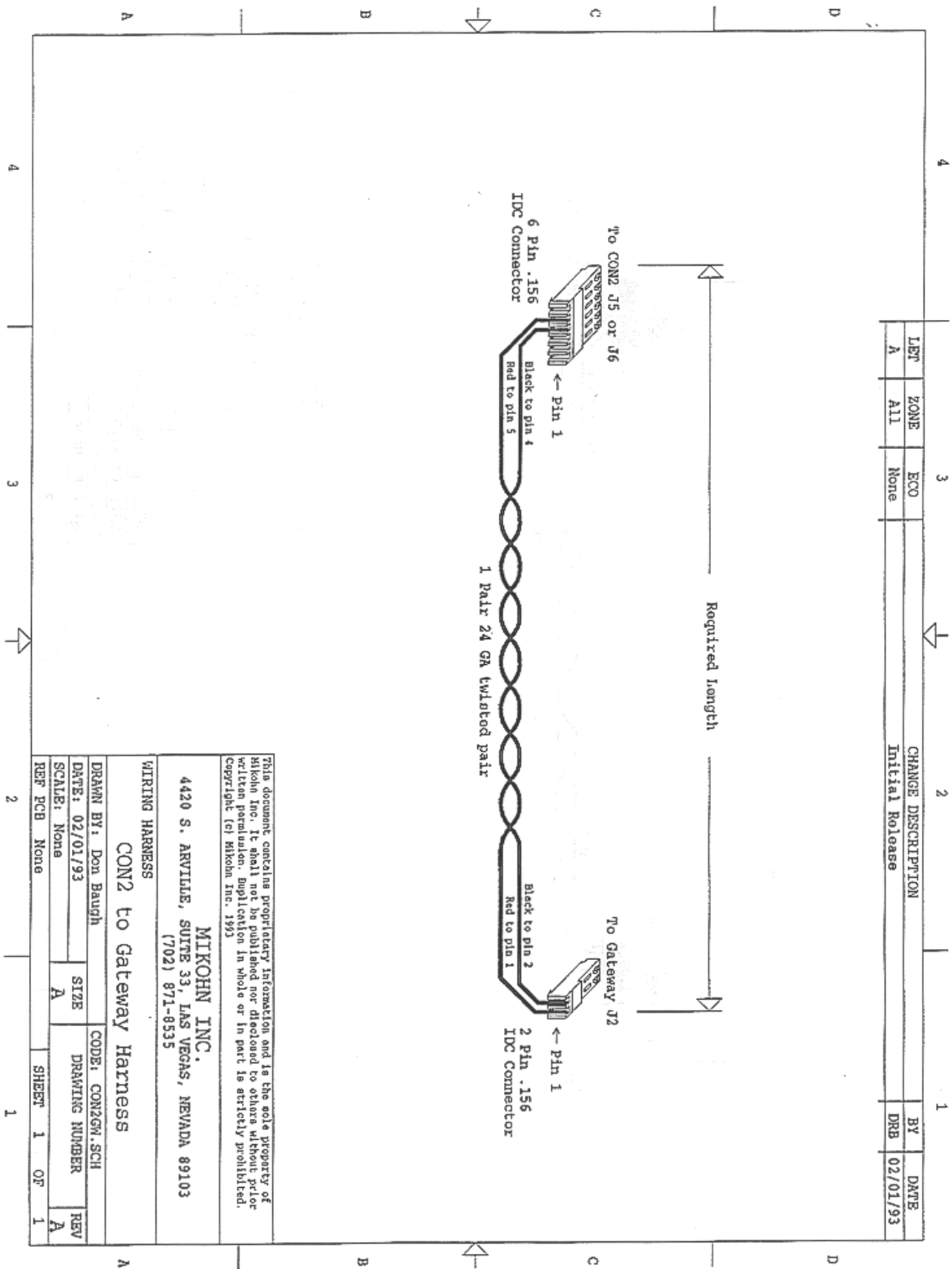
**Pin 16**

**Pin 17**

Appendix G: CHAMII to ADP-S Harness Drawing



Appendix H: CON2 to Gateway Harness Drawing



## Glossary

|                                              |                                                                                                                                                                                                                                                                                              |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Accounting Information</b>                | <ol style="list-style-type: none"> <li>1. Information a gaming location uses to reconcile accounts.</li> <li>2. The audit information on a gaming machine.</li> </ol>                                                                                                                        |
| <b>Bi-directional Communications CHAMII+</b> | <p>Communication paths that transmit and receive data.</p> <p>A visual display logic board that can be used as a standalone controller, as a linker board (display only), or as a combination (standalone controller and linker).</p>                                                        |
| <b>Coin In</b>                               | The value of coins wagered in a gaming machine. Also known as Turnover, (Coin) Credits Played, and (Coin) Credits Wagered.                                                                                                                                                                   |
| <b>CON2</b>                                  | A MIKOHN Controller. See <i>Controller</i> .                                                                                                                                                                                                                                                 |
| <b>Contribution Percentage</b>               | The percentage of each coin wagered in a gaming machine that is applied to a given <i>Progressive Jackpot</i> .                                                                                                                                                                              |
| <b>Controller</b>                            | A device that controls progressive game information such as jackpot amounts and contribution percentages.                                                                                                                                                                                    |
| <b>DB9 Display</b>                           | <p>9-pin RS-232 serial communications connector used for communication ports.</p> <p>Electronic sign using LED technology that receives progressive data from controllers.</p>                                                                                                               |
| <b>Full-duplex GRADR</b>                     | <p>Bi-directional and simultaneous data transmission over communication lines.</p> <p>Group Address. The address assigned to a group of items, such as jackpots, visual displays, jackpot trigger devices, or machines. There are up to 255 group addresses.</p>                             |
| <b>Half-duplex</b>                           | Non-simultaneous bi-directional data transmission over communication lines. See also <i>Full-duplex</i> .                                                                                                                                                                                    |
| <b>Harness</b>                               | The assembly of wiring that connects two or more components.                                                                                                                                                                                                                                 |
| <b>IDADR</b>                                 | ID Address. The address assigned to a group of items with a group (see <i>GRADR</i> ), such as jackpots, visual displays, jackpot trigger devices, or machines. There are up to 64 ID addresses. Addresses 1 – 32 are reserved for in-machine displays and 64 is used for overhead displays. |
| <b>I/O</b>                                   | Input/Output serial port.                                                                                                                                                                                                                                                                    |
| <b>Jackpot</b>                               | A prize awarded to a game player upon receiving a winning combination in a game.                                                                                                                                                                                                             |
| <b>JP GRP</b>                                | Jackpot Group. The CHAMII+ handles up to eight different progressive jackpot amounts, also called jackpot groups, for a single machine.                                                                                                                                                      |
| <b>LED</b>                                   | Light-Emitting Diode. The technology used in Visual Displays.                                                                                                                                                                                                                                |
| <b>Level</b>                                 | A classification of jackpot amounts. A machine can have up to eight jackpots. The top award is designated as Level 0, the next highest is Level 1, and so on.                                                                                                                                |
| <b>Link</b>                                  | A group of machines that jointly contribute to the same Progressive.                                                                                                                                                                                                                         |
| <b>Logic Board</b>                           | A circuit board that contains the power supply connection, the memory, chips for controlling the serial and parallel ports, and status LEDs.                                                                                                                                                 |
| <b>MFILE</b>                                 | Meter File. MFILE is a CHAMII+ display setting where the MFILE value corresponds to a pre-defined jackpot display format.                                                                                                                                                                    |
| <b>Pinout</b>                                | A functional description of each pin in a connection interface.                                                                                                                                                                                                                              |

|                         |                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PSP</b>              | Progressive System Programmer MIKOHN software that allows you to program the controller's settings and the progressive jackpot information.                                                                                                                                                                                                                                               |
| <b>RS-232</b>           | Recommended Standard 232. An interface that supports one transmitter and one receiver locally and is used to communicate serially.                                                                                                                                                                                                                                                        |
| <b>RS-422</b>           | Recommended Standard 422. A serial line standard that is used for communications between a circuit board and a receiver.                                                                                                                                                                                                                                                                  |
| <b>RS-485</b>           | Recommended Standard 485. A distribution board used to increase the number of devices connected to a CON2 display port. It supports 32 drivers and 32 receivers. Its serial communication protocol is used typically to connect a PC with other devices that share a common cable. The communication cable that meets the requirements for this interface is referred to as RS-485 cable. |
| <b>Serial</b>           | One by one; transmitting data one bit at a time.                                                                                                                                                                                                                                                                                                                                          |
| <b>Supreme</b>          | A visual display installed in the gaming machine that is one unit high and one unit wide. It is used to display text and graphics.                                                                                                                                                                                                                                                        |
| <b>In-Machine</b>       |                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Supreme Overhead</b> | A visual display installed above a bank of gaming machines that is used to display text and graphics                                                                                                                                                                                                                                                                                      |

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