CON2 MULTI-RANDOM

LINK SYSTEM

SETUP & INSTALLATION

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16 SEPTEMBER 1994

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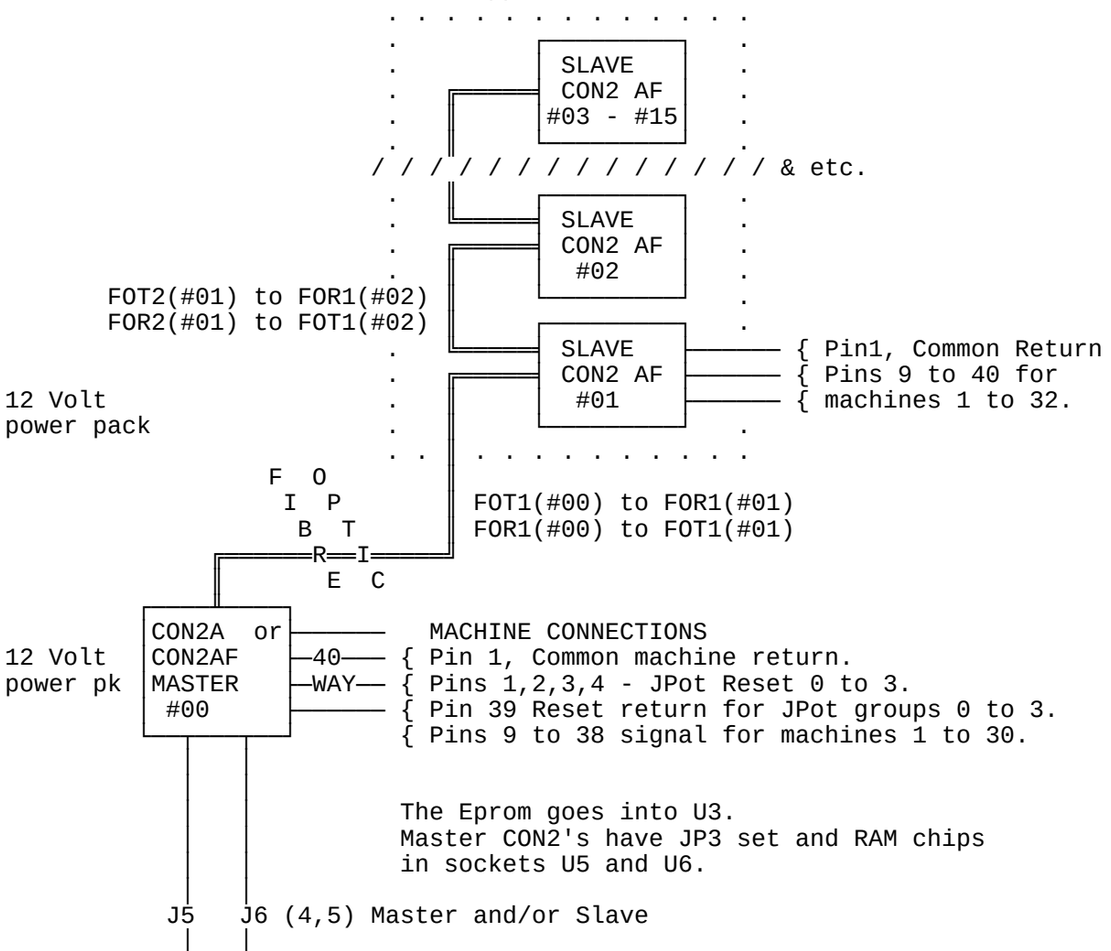
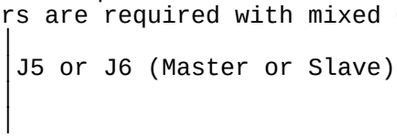
MIKOHN CONNECTION BLOCK DIAGRAM



NOTE: Connection to either MASTER or SLAVE ports J5 or J6 results in the same output except in the special case of the INSTALL. In INSTALL a Cham2 MUST be connected to EACH controller to confirm the PHYSICAL connection of its poker machines.

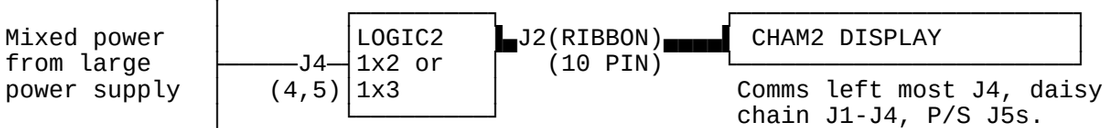
One wire pair is sufficient to connect all peripheral devices as used in most Clubs. Large and complex installations should be prepared on their own merits. Of course two pairs are required with mixed Cham2 and Cham1 installations.



(4,5)

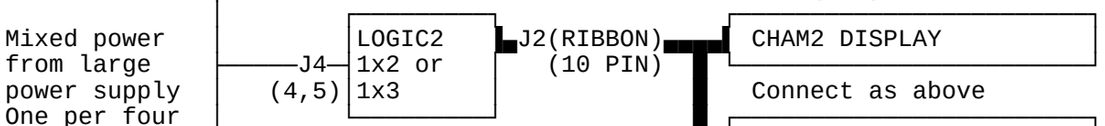
LARGE CHAMELEON 2 DISPLAYS

>>> SINGLE LARGE DISPLAY 1x2 / 1x3 (etc)



Switch S2, toggle S3 & S4
GRADR=255, IDADR=64, MFILE=0 or 4 & JPGRP=n

>>>> DOUBLE LARGE DISPLAY 1x2 / 1x3 (etc)



Switch S2, toggle S3 & S4
GRADR=255, IDADR=64,
MFILE=0 or 4 & JPGRP=n

NOTE

The selection of the MFILE is RECOMMENDED only.

MFILE=0 requires PSP2 to program how to display the available JPot and a MESSAGE can be displayed.

MFILE=4 is for display available JPot in DANCE format and NO message can be displayed.

MFILE other than 0 or 4 are all valid but works like 4 except may be all red, or green and etc.

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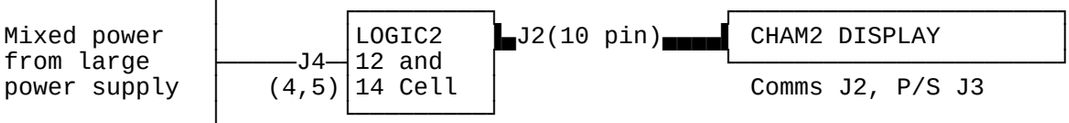
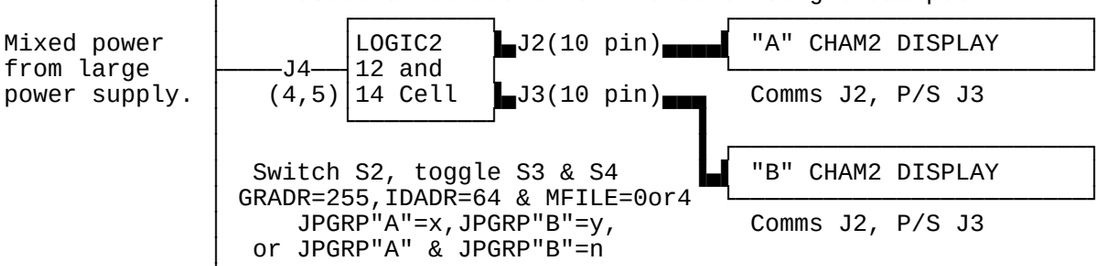
SMALL CHAMELEON 2 DISPLAYS
Being Micros, Minis and Midis

>>>> SINGLE SMALL DISPLAY



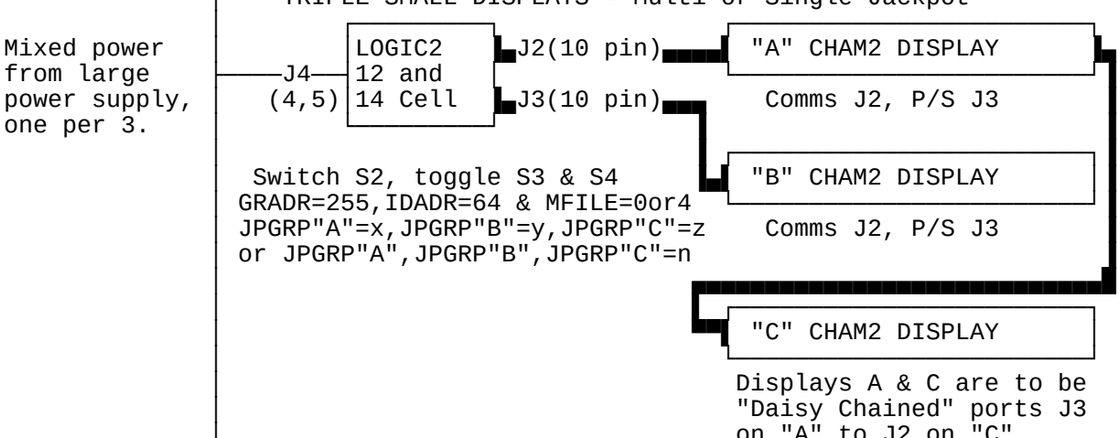
Switch S2, toggle S3 & S4
GRADR=255, IDADR=64,
MFILE=0 or 4 & JPGRP=n

>>>> DOUBLE SMALL DISPLAYS - Multi or Single Jackpot



Switch S2, toggle S3 & S4
GRADR=255,IDADR=64 & MFILE=0or4
JPGRP"A"=x,JPGRP"B"=y,
or JPGRP"A" & JPGRP"B"=n

>>>> TRIPLE SMALL DISPLAYS - Multi or Single Jackpot

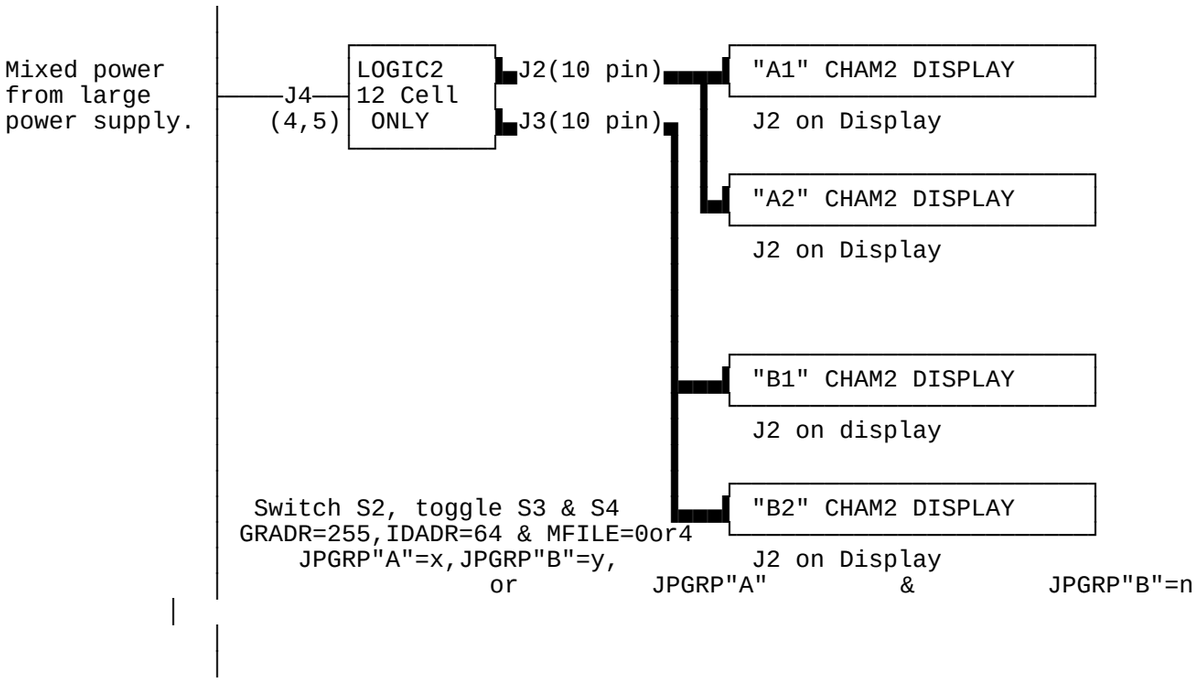


Switch S2, toggle S3 & S4
GRADR=255,IDADR=64 & MFILE=0or4
JPGRP"A"=x,JPGRP"B"=y,JPGRP"C"=z
or JPGRP"A",JPGRP"B",JPGRP"C"=n

Displays A & C are to be
"Daisy Chained" ports J3
on "A" to J2 on "C"

SMALL CHAMELEON 2 DISPLAYS
Being Micros, Minis and Midis
CONTINUED

DOUBLE / DOUBLE SMALL DISPLAYS - Multi or Single Jackpot
(Intended for two jackpots on a double sided sign)

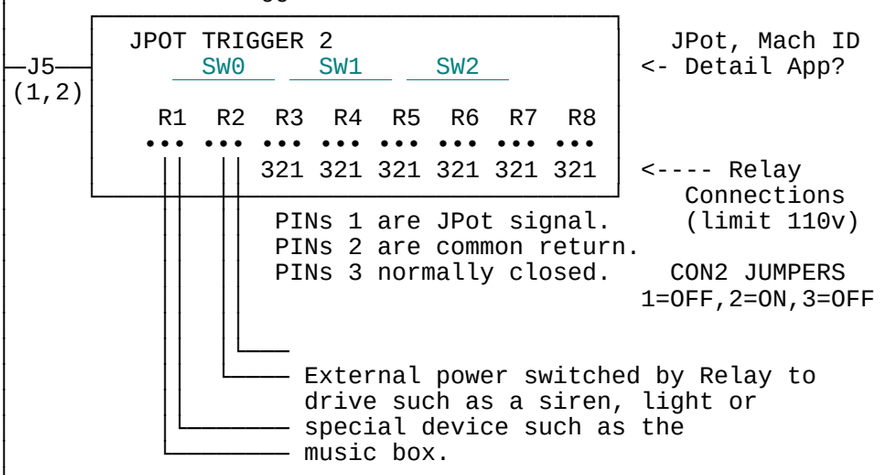

Mixed power
from large
power supply.
J4
(4,5)
LOGIC2
12 Cell
ONLY
J2(10 pin)
J3(10 pin)
"A1" CHAM2 DISPLAY
J2 on Display
"A2" CHAM2 DISPLAY
J2 on Display
"B1" CHAM2 DISPLAY
J2 on display
"B2" CHAM2 DISPLAY
J2 on Display
Switch S2, toggle S3 & S4
GRADR=255,IDADR=64 & MFILE=0or4
JPGRP"A"=x,JPGRP"B"=y,
or
JPGRP"A" & JPGRP"B"=n

>>>>

JACKPOT TRIGGER DEVICE V2.00 & V2.04 (JTD2)
(and mini Photon driver)
Appendix A

Trigger Function

12 volt power pack to J3



Ver 2.00 R1=JPGRP0; R2=JPGRP1; R3=JPGRP2; R4=JPGRP3
R5=JPGRP4; R6=JPGRP5; R7=JPGRP6; R8=JPGRP7

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STANDARD OVERHEAD SETTING

JACKPOT GROUPS 0 to 3

SW0	SW1	SW2
12345678	12345678	12345678
OOOOOOxx	OOOOOOOO	xxxxxxxx (O=on, x=off)

Ver 2.04 R1=JPGRP0; R2=JPGRP1; R3=JPGRP2; R4=JPGRP3
R5=JPGRP0; R6=JPGRP1; R7=JPGRP2; R8=JPGRP3

JACKPOT GROUPS 4 to 7

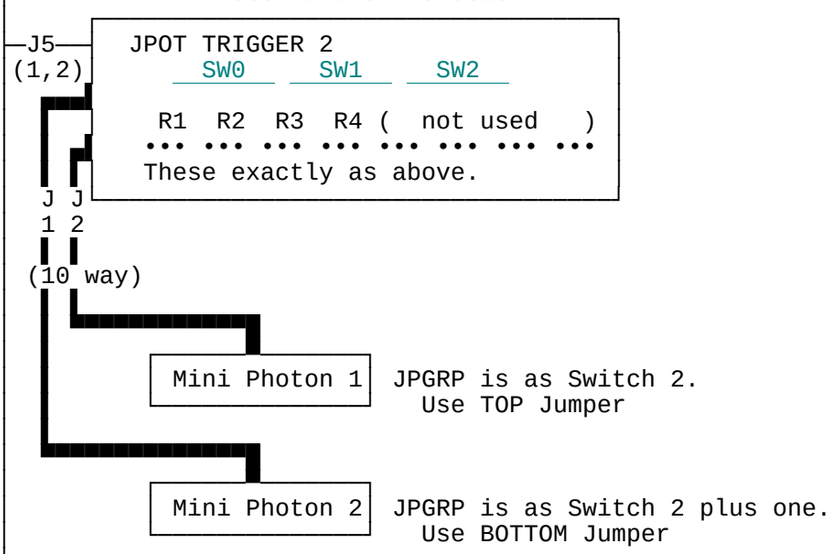
12345678	12345678	12345678
OOOOOOxx	OOOOOOOO	OOOxxxxx (O=on, x=off)

Ver 2.04 R1=JPGRP4; R2=JPGRP5; R3=JPGRP6; R4=JPGRP7
R5=JPGRP4; R6=JPGRP5; R7=JPGRP6; R8=JPGRP7

>>> JACKPOT TRIGGER DEVICE V2.00 & V2.04 (JTD2)
(siren and mini Photon driver)
CONTINUED

Photon Driver Function

9 volt power pack to J3



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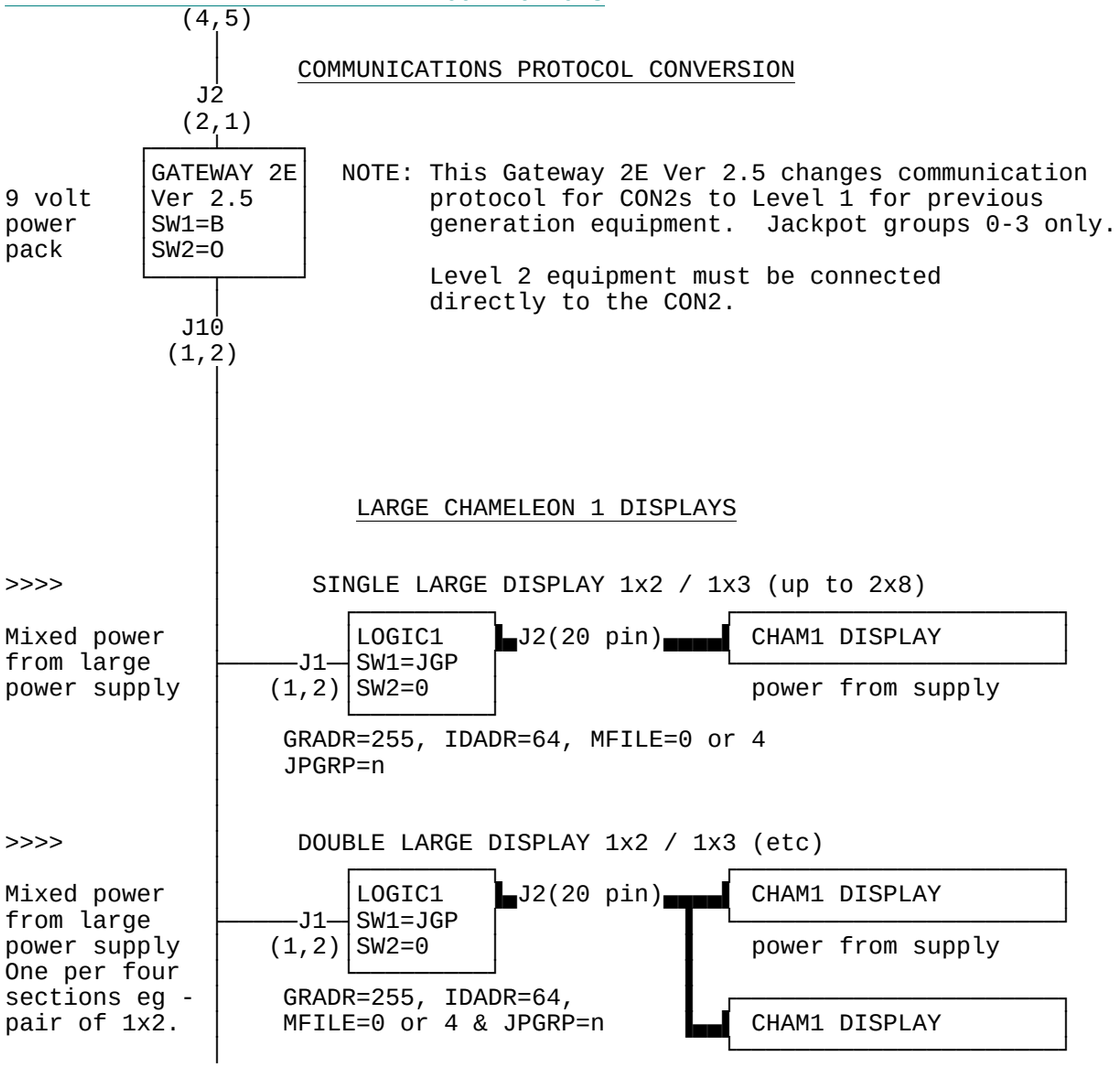
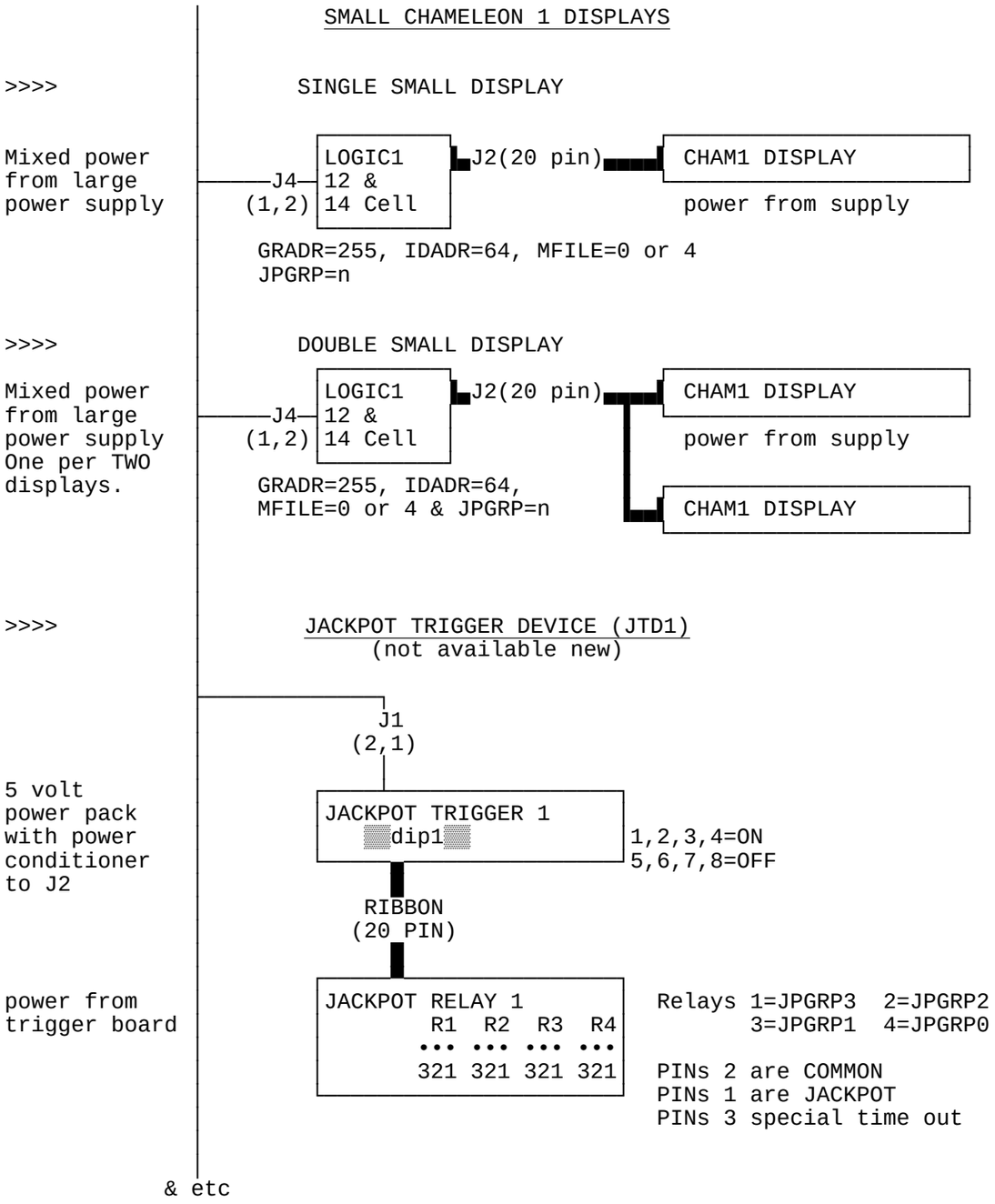
LEVEL 1 CONNECTIONS





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COMPATIBILITIES

Between the different levels of equipment some rules must be followed, some required by law, others from experience.

CHAM1 DISPLAYS

Any CON1 system can and only can use CHAM1 displays, Cham2 and Cham3 displays cannot be attached as they cannot operate on the early version of communications protocols. Naturally level 1 trigger devices are compatible but so to are level 2 (see below).

CHAM2 DISPLAYS

Any CON2 system *BY LAW* must have at least one CHAM2 display attached so that the advanced features of the CON2 can be accessed. These include the communications check in INSTALL and the Jackpot History file.

It is strongly recommendation that *ALL* jackpot levels should have its own CHAM2 display so that the PCID function is available, especially with larger links. Further, it is generally recommended that all displays in the gaming areas should be CHAM2 and that the use of CHAM1 be in remote signs such as (very effectively) in the foyer.

CHAM3 DISPLAYS

These work natively with CON2 but have the added capacity to support bit image graphics as message files. They are not compatible with for CON1

JACKPOT TRIGGER DEVICE, LEVEL 2 & 1

The JTD2 is designed to work natively with both CON1 and CON2, there is a simple jumper arrangement to select which alternative. The reason for this is that a key chip that used to be used for the level 1 trigger is no longer available.

The old Trigger Devices can be used with level 2, if the communications have been changed by a Gateway, it is recommended that the primary trigger in any new system should be the new JTD2.

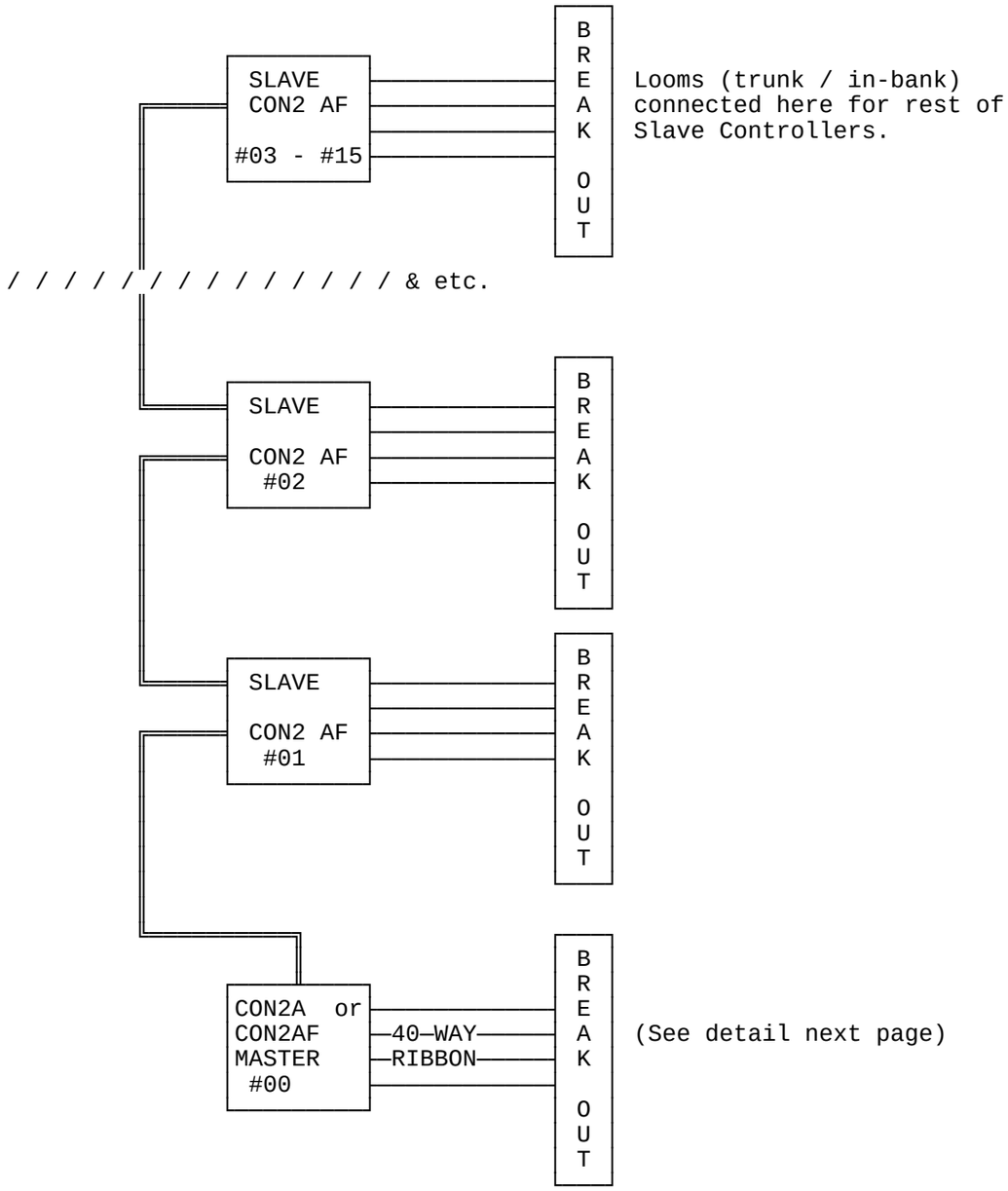
JACKPOT GROUPS

The recommended jackpot groups to be used are from 0 to 3 as these are common for both CON2 and CON1. Further only these groups can be converted by a Gateway to run a Cham1 or JTD1 from a CON2.

MIKOHN - MACHINE CONNECTION DIAGRAM

CON2 CONTROLLERS

(Appendix A)



BREAKOUT CONFIGURATION
PIN POSITION AND PURPOSE

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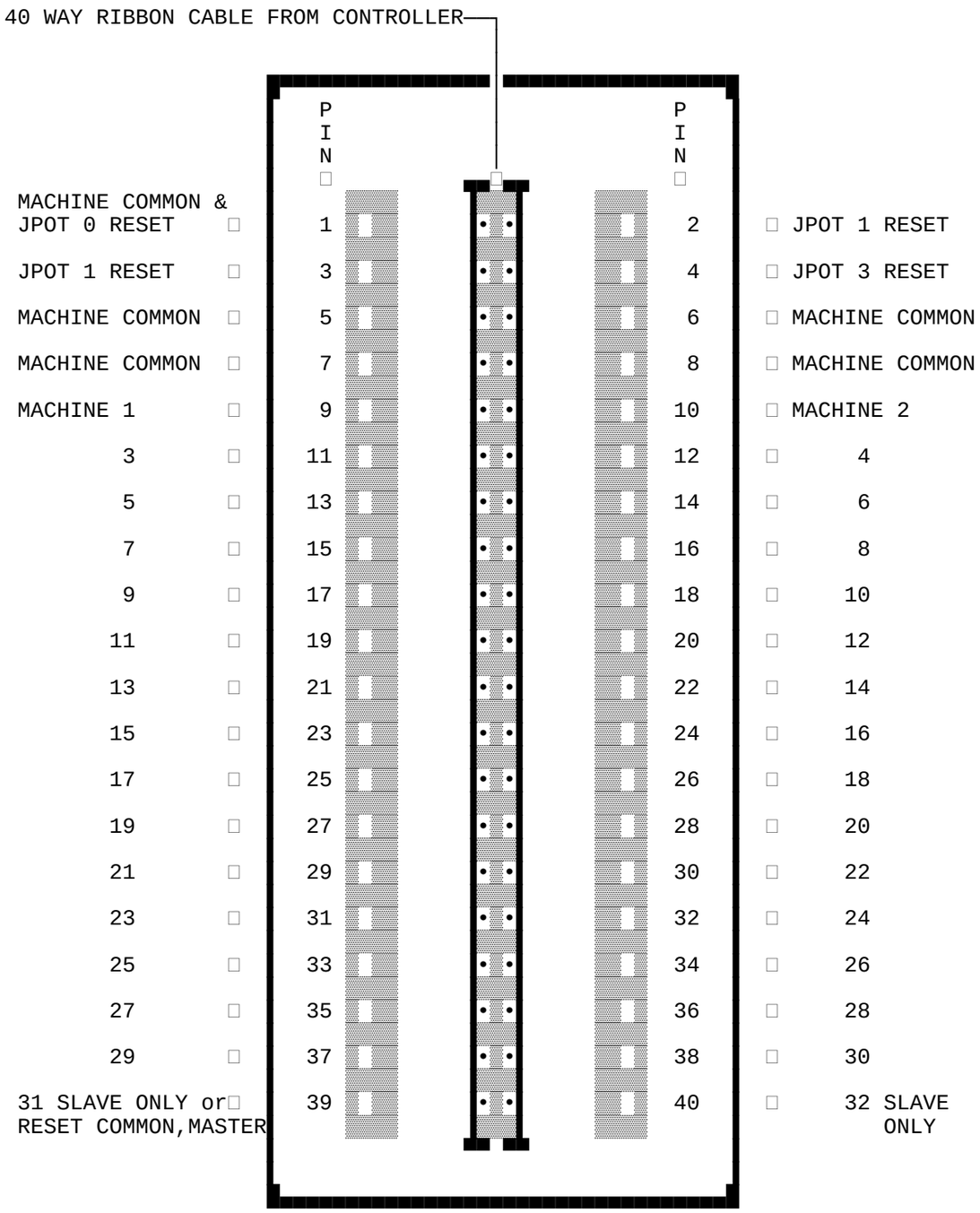


INSTALL CHECK LIST

GENERAL

There are two phases to the install being that of the sign proper and the gaming electronics.

Install of the sign proper tends to be the responsibility of the sign manufacturer who are mainly electricians. This frequently needs to be supervised by a gaming technician to ensure access for the power and communications lines.

The gaming electronics requires the presence of at least one experienced gaming technician, an efficient install is aided by two personnel for such as testing of communication lines. Experience from the typical 50 machine link is for a complete install is about one man week. If the job is very large additional personnel may be required.

PRE - INSTALL

This is a very important phase as links as such tend to be built into the fabric of a site and so the more work is carried out ahead of the approved turn on date, the less likely there is for major problems at the last moment.

By their very nature random links (as independent gaming devices) cannot affect the operation of the poker machines upon which they are dependant. Therefore pre-install can include the entire install, except for those items that interact with the patrons, being the LED displays and the jackpot sounding system. How far pre-install does occur will depend on the site itself including such factors as delivery of new poker machines and bases and delicencing of existing link systems.

CHECK LIST - SITE

1) Inspect bases for loom access.
2) Inspect paths of Trunk cables from controllers to banks, signs and reset/occurrence system.
3) Inspect position of reset/occurrence system/s.
4) Install interface cards.
5) Position rest of electronics in controller position.
6) Confirm trunk loom labelling correct as to banks & reset/occurrence system/s.
7) Confirm colours and continuity of looms from machines and reset/occurrence system/s back to controllers.
8) Prepare final floor plan including details of machine number, denomination, position in terms of banks and trunk/in-bank looms multi-strand colour.
9) Ensure denomination of the floor plan corresponds with the denomination table in the controller.
10) Connect bank loom to output on interface card.

INSTALL CHECK LIST
CONTINUED

11) Connect trunk looms to Breakout boards and plug into controllers.
12) Prepare PCID file from floor plan and load into controller.
13) Set controller to INSTALL test mode, ensure a display is connected to the controller under test (link signage or a potable display).
14) Confirm slot communications and PCID nicknames by Install Test.
15) Label machines with addresses on the Link.
16) Install reset/occurrence system/s and check continuity.
17) Install audible jackpot system, generally the amplifier with the controllers and speakers out in the pit.
18) Dummy run link to test whole system including controller settings (minimum, maximum increments and denomination tables) and correspondence of jackpot groups to reset/occurrence system, display panel and PCID nick-names. Ensure *ALL* jackpot groups are fired several times.
19) Prepare messages for displays and confirm management acceptance.
20) Confirm management acceptance of jackpot music content and speaker volume.
21 Carry out incrementation check on all level of jackpots with management member to confirm values with them in there own mind. If the incrementation is say 0.255%, play $3.92 ($1÷0.255) for 1¢ extra going from $3.90 to $3.95.

RELOAD ANY PCID INFORMATION, THIS TEST DESTROYS IT!

22) Dummy run link for final confirmation of functions and to train staff.
23) Confirm with management that their computer system has the correct settings. Many systems support only 2 decimals places for percentages and often three will be needed.

INSTALLATION - POSITION

Installation of a Multi Random link system can be a sizeable job, apart from the added complexities of multi-jackpots, it can involve MANY poker machines (up to 510). Fortunately, much of the work can (and should) be carried out in the month leading up to the L.A.B. approved powerup date for the link, particularly taking advantage of quiet times. In general it is suggested that the key electronic components be kept together including controllers, JTD2, music box, reset and occurrence systems.

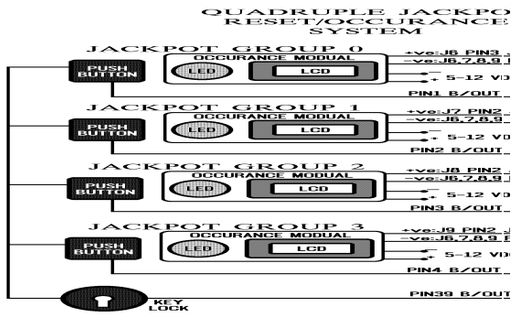
CONTROLLER POSITION

The controllers must be placed in a permanent secure position, this generally excludes poker machine top boxes (except for small links). Positions such as a cashiers booth or a counting room are recommended, they must be in a locked box and access controlled. A major advantage of the above positions are they have, by their nature, an extra layer of access control and may even be under observation.

The same rules that apply to poker machines also applies to link controllers. As a system, it is not to be active till the approval date except for testing purposes by the technician, at completion of a test it is to be deactivated (any active displays should display a message "THIS SI A TEST" frequently.

JACKPOT RESET (App C)

Not recommended on a poker machine as they change, the best positions are such as on a wall at on near such as the cashier. Regardless, it must always be in CLEAR VIEW of a sign showing the jackpot value. The cashier area is good as the floor staff usually have to pick up the books for payment.



It must be installed in a tamper resistant manner and it is recommended as a single unit combined with the occurrence meter (see security). Details are:

1) Key lock on the "COMMON" return".

2.1) Simple button reset for each jackpot level with (1) above.

2.2) Illumination of button at jackpot by such as a LED.

2.3) Associate appropriate occurrence meter next to illuminated button.

3) Loom with at least 5 core to provide for the legal maximum of 4 jackpots.

OCCURRENCE METER (App C)

It can be placed anywhere but preferably not associated with a poker machine as they are transitory and a large link may easily have 30 jackpots a day.

INSTALLATION - POSITION
CONTINUED

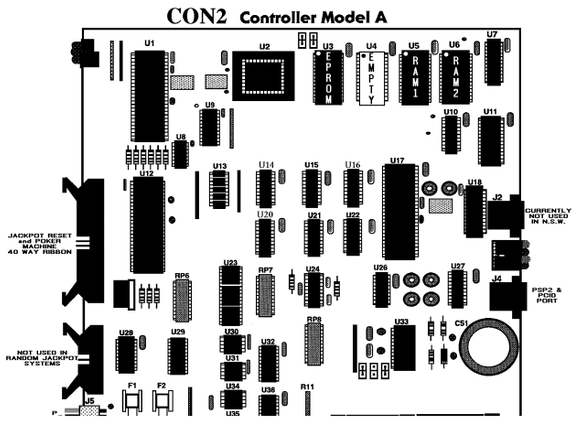
The following is suggested to select a position but it is common to combine it with the reset device:

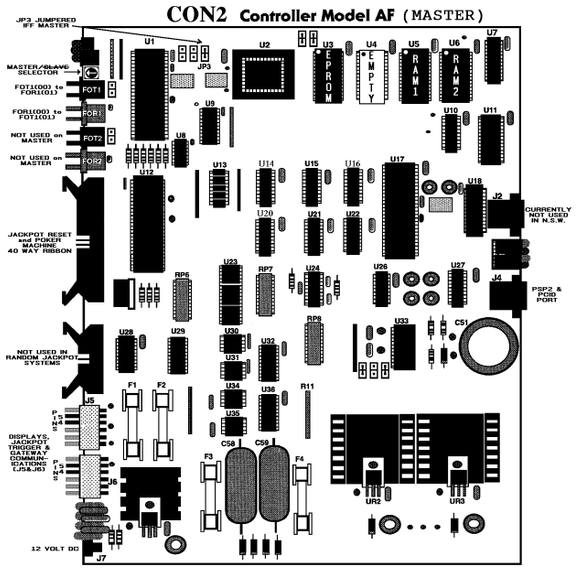
1) Near the Jackpot Reset.
2) Near or at the cashier or similar.
3) Within view of a sign.
4) Installed securely (see security).

SIGNS / DISPLAYS

In a position to provide good views for both players and staff. They can be installed at any time and connected to the looming for testing as long as they do not appear to be an active link before approval.

SETUP - CON2 TYPES A & AF





CON2 Type A (App A)

The easy way to confirm it is a Type A is that there is a cover plate over the fibre optic access. This type is hard wired as a "Master" and there is no need to confirm. Further details are described in the type "AF".

CON2 Type AF (App A)

Fibre CON2s are easily determined by confirming there are the ports for the fibre optic cable on the side of the controller case. Each cable consists of a joined pair of fibre cables, one for transmit, the other for receive.

A Master will have the GAME EPROM in position U3, with the externally accessible rotary switch set to 0, jumper JP3 set and will have two RAM chips in positions U5 and U6.

A Slave can have a vanilla EPROM in position U3, with the externally accessible hexadecimal rotary switch set to its position in the daisy chain, that is the first slave to 1 through to F for the fifteenth. Jumper J3 is NOT set and only one RAM chip in positions U5 is essential, though usually both U5 and U6 will have a chip.

CON2 EPROM INSTALL

After the EPROM is installed, using PSP "SEND" three factory resets and then a blank {Item 8 from main menu then toggle through "F3" to get "FAC" (3 times) then "---" (once)}.

DATE/TIME

Ensure that the date and time is programmed in using PSP (main menu 9) else the random link will CRASH. Apart from unpredictable failure, the main symptom is for the jackpots not to go off and to crash after running up to the jackpot maximum with a C10 error. As the system stores the details on the last 100 jackpots including date and time use the correct local standard time (ignore daylight saving).

WARNING :THIS IS A U.S. PRODUCT SO THAT DAY AND MONTH IS IN THE REVERSE U.S. MANNER (MM-DD-YY (MONTH-DAY-YEAR).

DENOMINATION

Check denomination multiplier table in the Master controller using PSP to confirm settings, item "E" from the main menu. The standard random link token value is 5c so that a 5 cent appears as "001", 10 cent "002", 20 cent "004", $1 "020" and $2 is "040".

PSP "INSTALL"

Controller test mode must be carried out at install, page 8 of PSP then scroll through the "F3" options till "INST" is shown and "SEND". The Chameleon 2 displays attached to the controller will show "3.10vr" being the software version number and an "r" for random.

As each machine is played the display will show its hardware number determined by which pin on the 40 way it is plugged into (pin number - 8) and the PCID name. Note them down, it is required by the L.A.B. that these details be attached to the poker machine.

To confirm the machines connected to slave controllers a display must be plugged into J5 or J6 on that slave controller.

LOOMING

Looming for a simple single controller array is similar as for existing small random jackpot systems. There are added complexities due to the capabilities.

Poker Machine

As a minimum for each bank one wire for each poker machine and controller plus whatever spares are prudent for possible future controllers and pokies on the bank.

Signs

Regardless of the number of jackpot displays only a pair of wires are essential, this assumes that all of the displays are the new Cham2.

If the site wants to load each display with different messages then a pair of wires per logic board allows direct access.

Where Cham1 displays are also included totally separate circuits need to be provided from the Gateway but subject to the same requirements as for Cham2.

BreakOut Boards

These can be positioned and connected to the looming. The breakouts must be housed securely, preferable with the controllers.

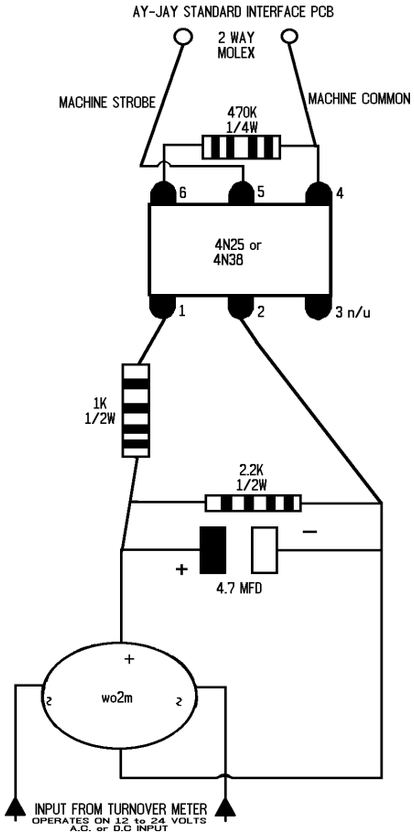
POKER MACHINE INTERFACE

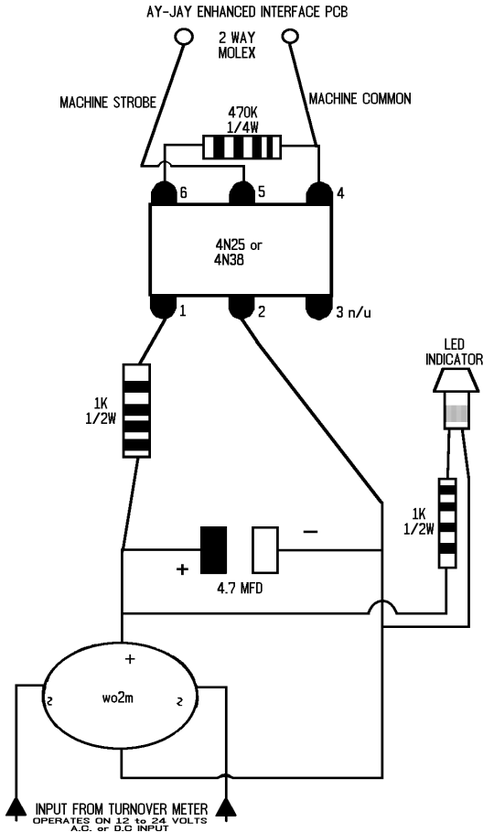
(App B)

There is a variation that includes an LED so that pulses can be viewed by the player and staff. It reinforces player attraction to the link in many coin play as well as trouble shoots for machines with meter runaway problems.

Connection to the major brands are detailed below and they entail at least 95% of the installed machines. In the case of orphans, where there may be non-Australian devices we prefer an IDC (Insulation Displacement Connectors) at the Turnover meter and an extended testing regime.

The recommended interface cards by Ay-Jay come in two configurations being the standard and the enhanced, the latter offers a door mounted LED so that players have feedback of their play. They are polarity insensitive due to a bridge and therefore there is no particular mention as to which of the pair of wire to where from the poker machine.





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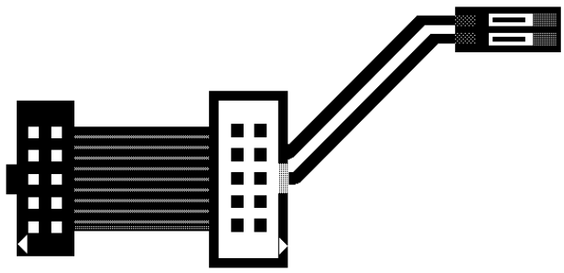
ARISTOCRAT - MK2, MK2.5 & 540

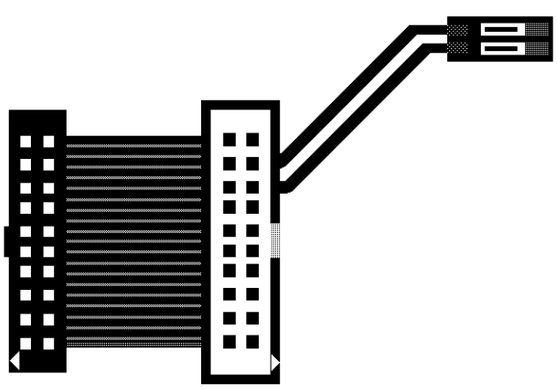


Pins 5 and 8 are to the turnover meter on the 10 way ribbon. Using a short extension rainbow ribbon, the required wires extend past the IDC plug and are pined to a standard panduit IDC.

VIDCO

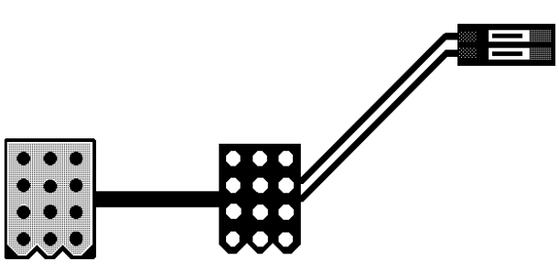
This manufacturer has been about for some period but has been represented in significant numbers since their introduction by their Tokenised machines. No break in is required as there is a purpose connection in the top box on the meter array with pins 8 and 9 being appropriate.

OLYMPIC



Pins 4 and 1 or 2 on the 20 way ribbon. Using a short extension rainbow ribbon, the required wires extend past the IDC plug and are pined to a standard panduit IDC.

I.G.T.



Pins 3 (com) and 10 (T/O) are to the turnover meter on the 12 way molex. Using a short male/female extension, the required wires extend past the molex plug and are pined to a standard panduit IDC.

PACIFIC

Error! Bookmark not defined.

The major problem is the volatility, small volume and overseas sourcing of components. The most stable factor is that the mauve wire is the common and the turnover is yellow from plug “CN19".

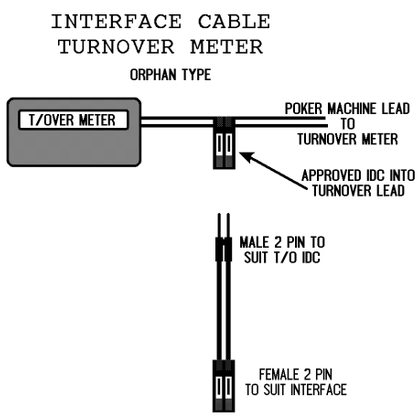
Interface cards must be connected to the Hard Turnover meters, there are some machines that have not been fitted with such during the middle 1980's with the major class being early Aristocrat video poker machines. If there are no hard meters they must be installed. Full details can be obtained from Alan Frith.

ORPHANS

As indicated there are orphans such as due to inconsistent production such as for Pacific(Universal) or small volume such as Jades. From experience these machines represent only 5% of the total and justifiably fall under a miscellaneous heading.

Reliability

Inherent with dealing with such few machines the technician will not be in position to confirm experience with orphans, therefore it is likely to be superior outcomes if the they confirm the correct looms by connecting at the turnover meter by use of an approved IDC (preferable) or second by soldering to the terminals both being followed by an extended testing regime.



It is to note that the preferred interface cards are polarity and AC/DC insensitive with respect to this connection so any wire of the loom may be connected to either pole of the meter. Generally an IDC can be reliably hooked into the loom at the turnover meter with minimal effort.

Extended Communication Testing -

Incrementation

Regardless, testing should go beyond the simple "INSTALL" check for majority machines and include an increment test. This involves calculating how much credit must be played on the machine to produce an increase in the value (usually) the smallest jackpot.

It is common for a jackpot to have a 0.5% contribution, playing $2 through should produce an increase of the display of 1¢ if communications are good. Similarly if the increment is 0.167% tha calculation is $1÷0.167% = $5-98", that is going from $5.95 to $6.00.

To ensure that there are no residual pulses in the controller from previous tests, carry out a factory reset (FAC) using PSP2.

SITE RESPONSIBILITIES

The site is GENERALLY responsible to assist with:

Mains Power

The supply is to be a clean 240 volts, that for the signage and displays can be piggy backed from the slot machines as the draw is not heavy.

For the other gaming electronics and in particular the controllers the power is to be continuous clean mains. Their draw is minimal but *any* electronics runs better when left on continuously.

Controller Housing

It is recommended that all the links are to be together in an agreed secure position with easy, comfortable access, lighting, at least two shelves better three, power, and a secure key lock on the door to the same type as used for the machines. Suitable secure positions include such as cash handling areas, supervisors offices and data retrieval offices.

Trunk Looming

This is defined as the multi-core cable that connects the wiring from the looms in the banks back to where the controllers are housed. Local knowledge is essential as the best route has to be determined including going through obstacles such as drilling through concrete floors and walls.

Reset/Occurrence Preparation

Apart from the laying of cable (Trunk), a suitable position for the jackpot reset has to be agreed on. Generally the best position for a link will not be at a bank, possibly being at the cashier. Once a configuration is agreed on then it is housed to suit.

CONTROLLER & LOGIC BOARD PROGRAMMING
PSP & PCID

.

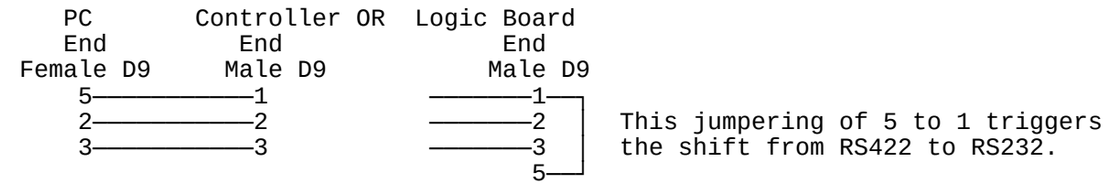
These programs are designed to be used on a PC (microcomputer) using the native DOS operating system. A minimum of a laptop or portable computer with 80286 processor, 640k of memory, hard disk and a serial communications port is required.

Connections

Connection is via a serial communications port, the computer shorthand being the "COM" port, usually there being COM1 and COM2 on a typical machine. They are normally a male plug on the back of the PC and are usually what is called a D9, that is a "D" shaped shroud with nine pins. On older machines it may be a D25, that is with 25 pins but a "D" shape.

PC to Controller or Cham2 Logic Board Communications Cable

A three core cable is needed with the appropriate plugs at each end, the standard being a male D9 at the controller end and a female D9 at the PC end.
Suitable for CON2 using PSP, PCID and C2A.



PSP, CONTROLLER CONFIGURATION & MESSAGE SOFTWARE

This is really an improved version of the old "TANDY" device with a full screen and a "F9" Help function that is actually helpful. Anyone who has used a Tandy will need minimal training to use this software.

The default password is "135642" and is entered by the F10 function key.

JACKPOT MESSAGE - PCID MACHINE NUMBERING

Machine numbering of multi controller arrangements are a combination of the standard machine number and the controller number. The controller number for the master and the slaves is included as part of the programming setup of the CON2. Machine number is determined by the position on the 40 pin connector starting from pin 9 for machine 1 to pin 40 for machine 32 (Master 38 for machine 30). The machine number is the pin number minus eight (8) and visa versa the pin number is the machine number plus eight (8).

An additional naming system using the PC program "PCID" should be used with which it is possible to start at one (1) and go to the total of machines connected. The naming depends on the site, but are generally either a sequential numbering and the site machine number. Which is used depends on which system is best for staff and players.

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FINAL CHECK

Once the key equipment is installed, the controller is to be set to "DUMMY RUN" to confirm *ALL* features of the system. Staff and management understanding is an often under rated feature of any system and therefore all available should be gathered to watch the play. This training has proven to be very effective.

The controller will emulate being played from a full complement of machines at maximum rate.

As jackpots occur confirm the following, ensure all levels go off:

1) The jackpot settings of the displays.
2) Confirm reset button to jackpot level.
3) Confirm occurrence meter to jackpot level.
4) Inspect the hardware and PCID jackpot messages to ensure they correspond.

SECURITY

General

Essential in what has become a large distributed system, but a few simple rules below if applied, will ensure that the system can operate securely. Any system installed outside these rules voids all warrantees, the installer is absolutely liable.

Position

See install check list.

SEALS, CON2 controller

Case must be sealed by two L.A.B. approved seals in a manner so that the EPROM cannot be tampered with.

SEALS, Con1 Controller

CON1 controllers can have their settings altered by use of Tandy or PSP2 and therefore will be provided with an outer steel box with provision for seals.

JACKPOT RESET

It must be in a tamper resistant housing with fixings either enclosed so that access is from such as a locked container, access controlled room or is closed with a SEAL.

A key lock is required to be able to operate the reset. Security is achieved if the lock is placed on the common return wire, if interrupted no reset will work.

POKER MACHINES

It is mandatory that the hardware number and (if used) PCID name be attached to the poker machine in a sturdy manner so that players can see them.

AT JACKPOT THE ATTENDANT MUST CONFIRM THAT THE HARDWARE NUMBER ON THE DISPLAY CORRESPONDS TO THE HARDWARE NUMBER ON THE POKER MACHINE, BY L.A.B. REQUIREMENT ONLY ON SUCH CONFIRMATION MAY A JACKPOT BE PAID.

OCCURRENCE METER

Best is in association with the reset. If used it can be placed anywhere subject to:

1) Near or at the cashier or similar aids observation.
2) It must be installed in such a manner that it cannot be opened. A box must be either be secured by SEAL or access via the opening of an access controlled container (e.g. top box) or glued.

AUDIT

There reliability of the Mikohn controller has been proven over a decade of use with the software operating without intervention by technical staff. But, being the centre of what is often the largest jackpot generating device in a site, there are often operational, jurisdictional and accounting reasons to extract and confirm data from the controller.

There is a range of methods available with the most detailed being on-line data retrieval systems such as Mikohn's "JIS" and Aristocrat "DACOM", through to the more general batch approaches which is the purpose of this discussion.

With version 3.xx CON2 software, the major enhancement is the controller has the option of protecting key settings, that is they are protected or fixed in the EPROM. Anything communicated with respect to these settings is ignored, this can be confirmed by SENDing a new value (PSP2) and then LOADing back, the value will not have changed. Also values can be protected, that is they vary with operation but cannot be manually altered, the most important being the current jackpot level.

- Values that may be FIXED are indicated by **BOLD**ing of the letters.
- Values that may be PROTECTED are indicated by SHADOWing of the letters.

Other values are largely cosmetic options and are not discused such as should a "$" or a "¥" be displayed.

FIXED VALUES CAN ONLY BE CHANGED BY CHANGING THE EPROM. PROTECTED VALUES CAN ONLY BE CHANGED BY THE EXTREME EXPEDIENT OF EITHER A FACTORY RESET OR EARTHING OF THE RAM CHIPS, BOTH OF WHICH WIPE ALL DATA OUT OF THE CONTROLLER.

There are three pieces of software and one technique available to audit various data in the controller being:

- PSP2 This software allows verification / setting (non-fixed) of the jackpot settings including minimum, maximum, incrementation rates, communications, jackpot history (slowly) and denomination settings. Also if values are altered by PSP these are logged with a date/time stamp by the controller (this log is itself protected).

- C2ACCT This software allows verification of communications while the system is live. Specifically the investigation of and preventative checks for intermittent communication errors by counting of turnover pulses.

- C2HIST This software allows the verification of the jackpot history of the controller in live systems in a rapid efficient manner by such as management.

- INCREMENT The increment test only requires an understanding of how links opperate to confirm that it is increasing at the correct rate. Though slow, it is powerful and should be carried out on a few random machines at install.

AUDIT-SETTINGS

Continued

MENU 1 :JACKPOT SETTINGS

This is the province of the "PSP2", the general purpose set-up software. The settings of the controller can be set (open EPROM) and confirmed by use of this software. the main menu item "1. Jackpot Programming" can sequentially load the values of the possible 8 jackpot groups.

Extract :Menu 1

```
                J A C K P O T  P R O G R A M M I N G

                  BASE VALUE     : 00,000,000.00
                  CURRENT JP     : 00,000,000.00
                  HIDDEN  JP     : 00,000,000.00
                  JP LIMIT       : 00,000,000.00
                  INCREMENT1     : 00.000 000 00
                  INCREMENT2     : 00.000 000 00

 SEND  LOAD  MANY  M-00  7SEC  JP0  $$$$  MS00  HELP  EXIT
  F1    F2    F3    F4    F5    F6   F7    F8    F9    F10  Page 1
```

When the key F2 is pressed, the controller is requested to supply the data for the jackpot group indicated by F6, in this case for jackpot group 0 (JP0).

BASE VALUE This is the value that corresponds to the minimum value for the link, often referred to as the "START UP" and is expressed in dollars, for the example it would display

BASE VALUE : 00,000,050.00

CURRENT VALUE This is the value that has been incremented by play on the gaming machines and is available *NOW* to be won. If the link is allowed to be quiet so that any attached displays have had time to complete their ODOMETERing, both the signs and CURRENT will be the same.

HIDDEN JP This is not an active value insomuch as it should *AT ALL TIMES* be the same as the BASE VALUE, it is used as a reference by the controller that it is a valid random link.

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JP LIMIT This is the value by which this link jackpot *MUST* occur by, it is often referred to as the "MAXIMUM" and is expressed in dollars. The example value would appear as:

JP LIMIT : 00,000,150.00

Standard practice for reasons of efficiency, the recommended value actually loaded would be:

JP LIMIT : 00,000,149.99

INCREMENT1 This is the rate at which each pulse increments the CURRENT JACKPOT with every coin or credit accepted as played from an attached gaming machine. This rate is based on a fraction of a dollar and the actual value is affected by the system denomination (token) value selected. If the increment value is (quite common) half a cent per dollar, this means that each play of a dollar increments the link by 1/2 a cent. With multi denomination links typical values for the system denomination is 5¢ or 1¢ (if 2¢ machines are connected.

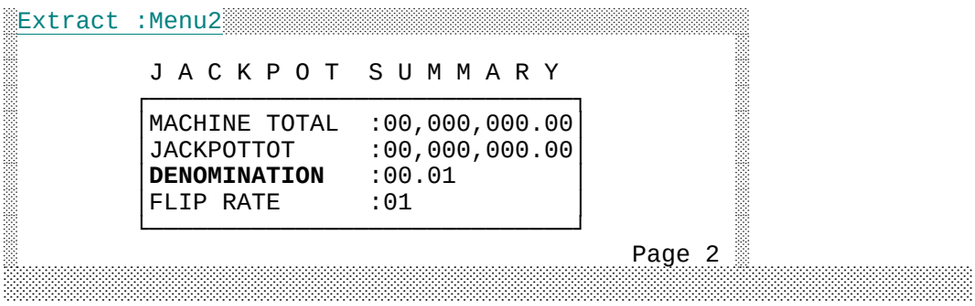
A 1/2 cent or 0.5% increment link, is as a fraction 0.005, with a one cent denomination which is 1/100 of a dollar the value is 0.00005. This would be displayed as:
INCREMENT1 :000 050 00

At sites where there are only 5¢, 10¢, 20¢, $1 or $2 machines, the system denomination used is 5¢. Therefore a 1/2 cent per dollar increment would convert to again a fraction of 0.005, but with a 5¢ token, which is 1/20 of a dollar, the value is divided by 20 to give 0.00025.

INCREMENT2 This is relevant only for progressive links and has no meaning with random/mystery links.

MENU 2 : DENOMINATION (SYSTEM TOKEN)

For AUDIT purposes, the only relevant value in this menu is that for DENOMINATION, which is expressed in dollars and cents. In the above discussion about "INCREMENT1", the typical values of 1¢ and 5¢ would appear respectively as 00.01 and 00.05.



AUDIT-SETTINGS

Continued

SYSTEM DENOMINATION

The CON2 version 3.10 major enhancement was the addition of recognition of denomination, that if there is both 5¢ and a $2 machines connected there is a table to contain multipliers so that the link correctly values each signal from the machines. For instance if the 5¢ has a multiplier of 1 then the $2 will have one of 40. These setting can be either Fixed in the EPROM or RAM resident.

Menu "E" from the main menu

```
Extract :Menu 14

                    S E T  D E N O M I N A T I O N S



              REQUIRES SUPERCONTROLLER VERSION 3.1 & ABOVE


 SEND  LOAD  LOADF SAVEF MASTR EDIT PATH        HELP  EXIT
  F1    F2    F3    F4    F5    F6   F7    F8    F9    F10  Page 14
```

Select the controller whose settings are of interest by cycling through F5 then load the data using F2.

Inspect the settings by hitting the key F6 and they appear as:

```
┌──────────────Press F10 to exit (Master)──────────────────────┐
│      MACHINE # 1   001   MACHINE # 17   000                  │
│      MACHINE # 2   002   MACHINE # 18   000                  │
│      MACHINE # 3   020   MACHINE # 19   000                  │
│      MACHINE # 4   040   MACHINE # 20   000                  │
│      MACHINE # 5   000   MACHINE # 21   000                  │
│      MACHINE # 6   000   MACHINE # 22   000                  │
│      MACHINE # 7   000   MACHINE # 23   000                  │
│      MACHINE # 8   000   MACHINE # 24   000                  │
│      MACHINE # 9   000   MACHINE # 25   000                  │
│     MACHINE # 10   000   MACHINE # 26   000                  │
│     MACHINE # 11   000   MACHINE # 27   000                  │
│     MACHINE # 12   000   MACHINE # 28   000                  │
│     MACHINE # 13   000   MACHINE # 29   000                  │
│     MACHINE # 14   000   MACHINE # 30   000                  │
│     MACHINE # 15   000   MACHINE # 31   000                  │
```

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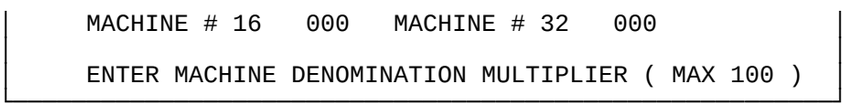


If the system token is 5¢ then Machine # 1=5¢, #2=10¢, #3=$1 and #4=$2.

AUDIT-SETTINGS

Continued

INCREMENTATION TEST

The final audit test requires no special software and is extremely accurate as the system is being tested in its operational state but it requires that no others are playing, it is very slow, sometimes may require a lot of play and has a small but increased chance of triggering a jackpot. In general only a few machines need to be reviewed and rather than testing communication it is a powerful test of the increment rates.

What is required is the incrementation for the jackpot levels of the link. The overhead signs increment one cent at a time, with a half cent incrmentation rate the meter will roll over 1¢ for every $2 of play. To calculate for each 1¢ increase divide 1¢ by the increment fraction (eg 1¢÷0.005=200¢). A common increment rate is 0.167% which requires $5.99 of play (1¢÷0.00167=598.8¢).

In practical terms the jackpot level needs to be played a credit at a time till it rolls over the display, then commence play and confirm that the display rolls over with the correct level of play subject to the resolution of the system token. With a link having 5¢ and $2 machines connected each play of a 5¢ is at most only 4¢ over rather than a possible $1.99 with a $2 machine.

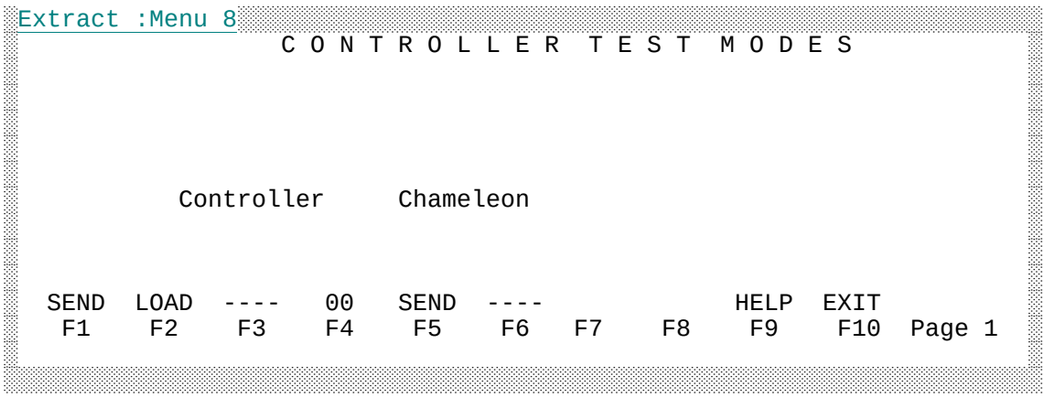
AUDIT-COMMUNICATIONS

Continued

There are three tests available to confirm the system and in particular communications between the controller and the gaming machines and key controller settings. The primary test is INSTall requiring PSP2 and mainly used at that time, another is to inspect the soft turnover registers in the controller using C2ACCT and the last requires no software but needs knowledge of the increment rates (by site record or use PSP2) and plenty of time.

PSP2

When first entered, the menu 8 appears as:



When F3 is pressed the display changes from "----" to "INST" (for install), then press the F1 to send it to the Master controller. The link is suspended and the overhead signs then display the version number of the controller, which for random/mystery links is currently "v3.10r". When a coin is played in an attached machine the position it is connected to on the controller is displayed. NOTE: If PCID has been loaded, in addition to the position, the message for that machine is also displayed.

The display of this information is limited only to those machines and displayed on those signs connected to the controller being tested. If a Master controller is to be tested, then only machines and signs connected to it are relevant, if then SLAVES are to be tested then sign must be connected to them in turns.

To clear the "INSTall" mode press F3 till "----" returns and then using F1 send it to the Master controller, the link is no longer suspended.

AUDIT-COMMUNICATIONS

Continued

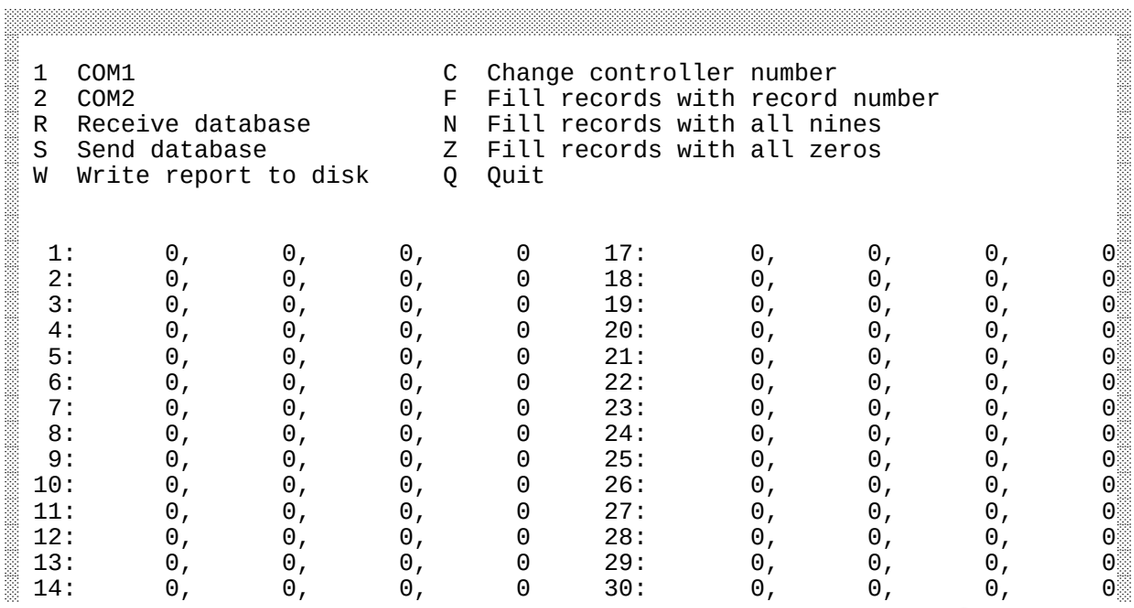
C2A

The strength of this software is it does not interrupt play as only the machines being confirmed needing to be put out of play and crucially, there are no effects on the jackpot cycle or any other function.

This software accesses the soft registers in the controller, and as accounting information has a low processing priority, allow some seconds when the system is busy for the file to be updated. Further, if the controller is not ready to respond, it will ignore the request responding with all zero values.

This software is particularly useful where communications are under review such as when a new machine is connected or when machines are suspected to have dropped off the link or where intermittent errors are suspected.

To confirm a slots communications, take a reading and then play and confirm that the correct increase in turnover has occurred. Note this file records pulses received by the controller with out any adjustment for the denomination of the machine. If the machine is played 5 times whether a $2 or a 5¢ the increase is "5". The column of the turnover pulses is the first one to the left of the port numbers.



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```
15:      0,      0,      0,      0     31:      0,      0,      0,      0
16:      0,      0,      0,      0     32:      0,      0,      0,      0


COM1:  Controller 0
```

Error! Bookmark not defined.

AUDIT-JACKPOTS

Continued

C2HIST

This software allows the easy interroation of the jackpot history stack which records full details of the jackpots in order with date/time controller/port address, which group and how much. It does not affect the play od the controller, similarly to its sister software, C2ACCT.

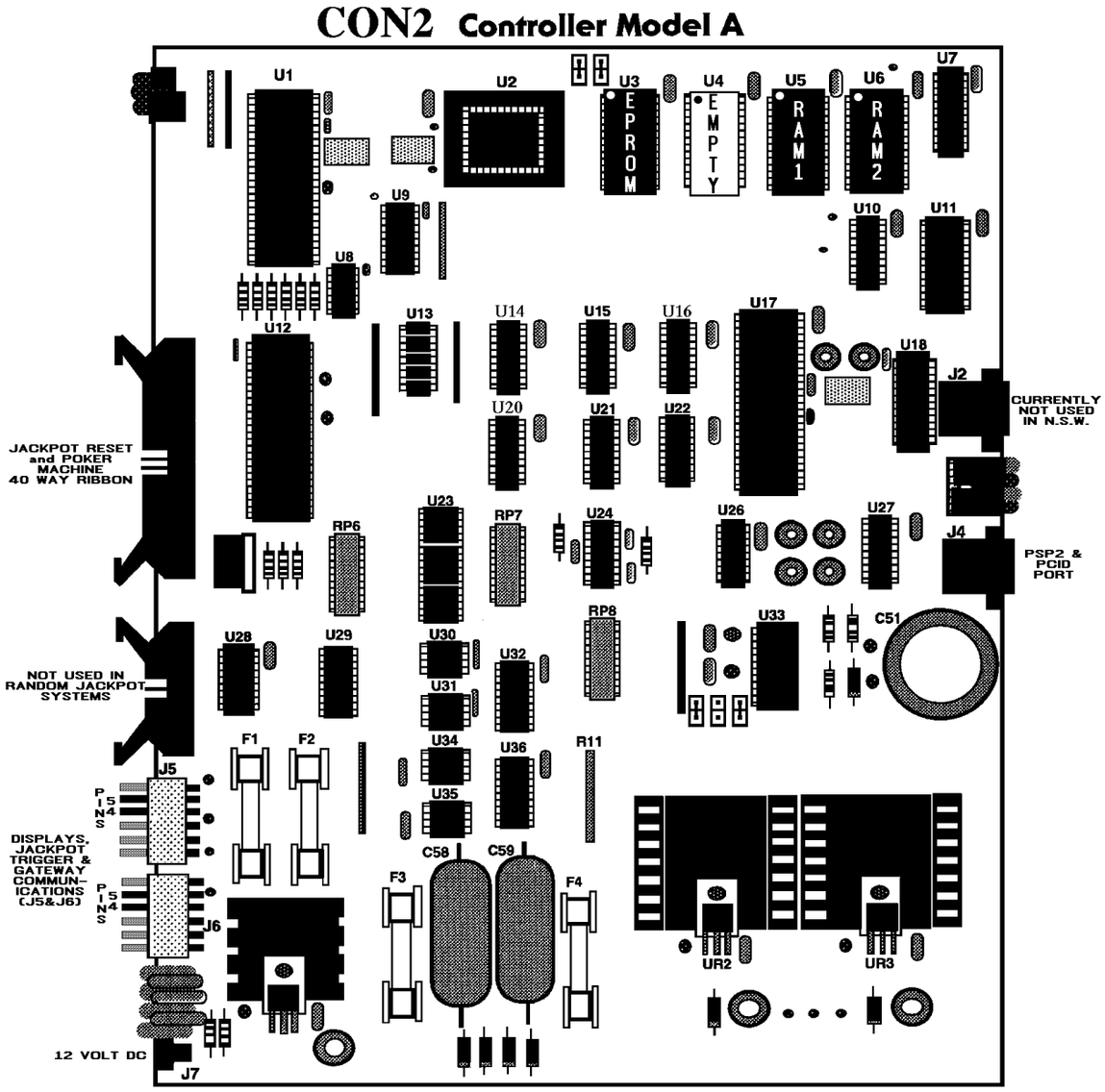
APPENDIX A

KEY MIKOHN COMPONENTS

DETAIL DRAWINGS

CON2 Type A

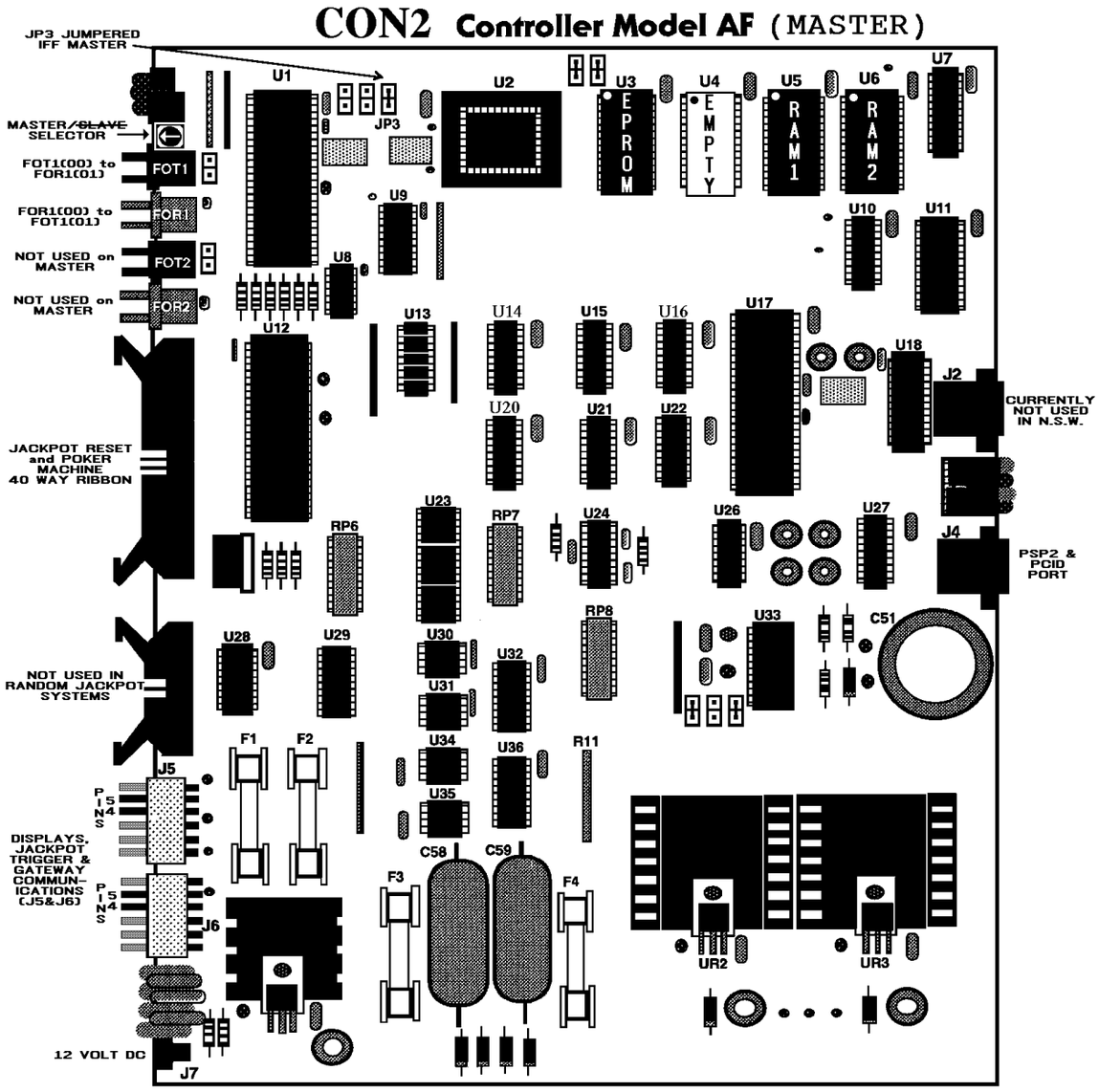
At maximum, this controller is capable of supporting up to 30 poker machines, and in N.S.W. is permitted to run up to 4 jackpot levels. Apart from the limitation of not having fibre optic ports it is identical to the more common Type AF in software and install.



CON2 Type AF - MASTER

This controller type is capable of supporting 30 poker machines on the Master and 32 per Slave controller, up to 15 Slaves, for a grand total of 510 machines (connected via the fibre optic ports). The Master supports fewer machines as it requires two port positions to manage the jackpot reset functions. It is permitted in N.S.W. to run up to 4 jackpot levels.

The master as described below, is identified by the selector being at "0" and "JP3" (jumper 3) being ON.

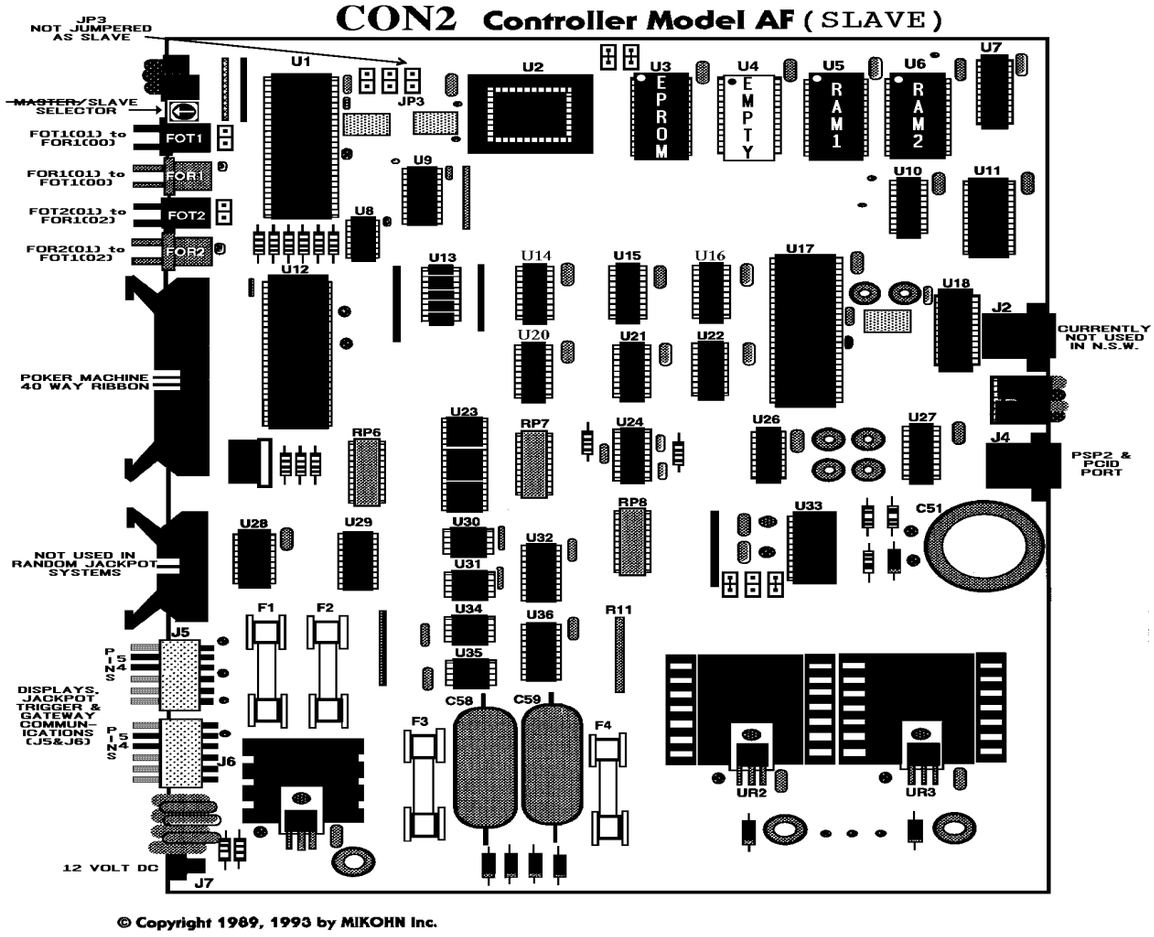


CON2 Type AF - SLAVE

This is physically the same as the Master above except the selector is set to *OTHER THAN "0"*, from 1 to F, and that jumper "JP3" if OFF.

MIKOHN

CON2 Controller Model AF (SLAVE)



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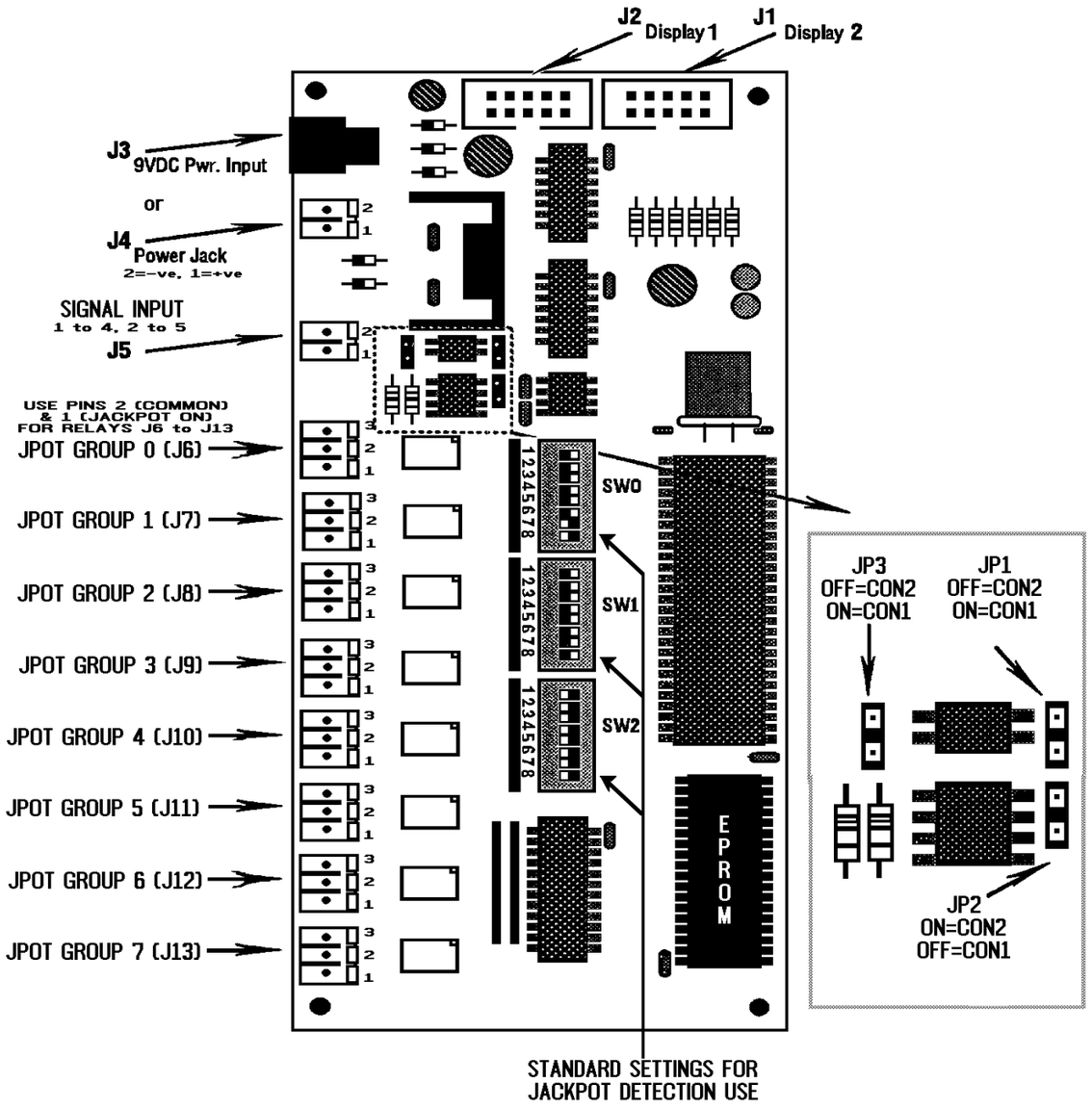
JACKPOT TRIGGER DEVICE

This device has been designed to support both level 1 and 2 (CON1 & CON2) controllers, set by the jumpers and dips below. There are two versions being V2.00 (original) and Ver 2.04 (released late in 1994), V2.00 fires one relay for each jackpot level and V2.04 fires a pair of relays per jackpot.

Operating with the standard Reset/Occurrence device the centre pole of the relay is to have +ve voltage with pins 1 going to the JP1 to JP4 and JP COM to the -ve voltage.

JACKPOT TRIGGER DEVICE (JTD2)

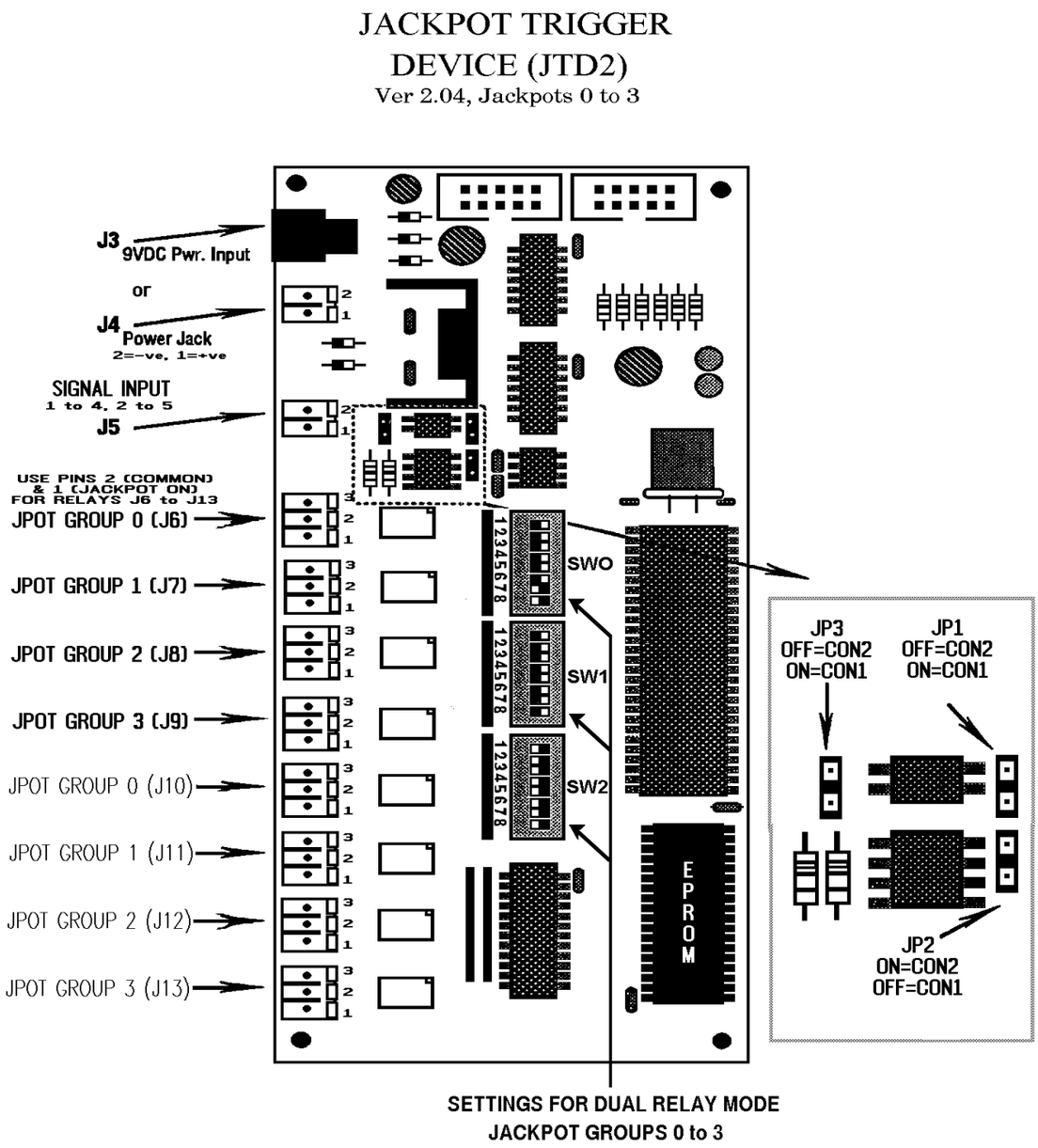
Ver 2.00, Jackpots 0 to 8



JACKPOT TRIGGER DEVICE

Continued

With V2.04 Jackpots on groups 0 to 3 set SW2 switches 0-3 to ON, for Jackpots 4-7 set



them to OFF.

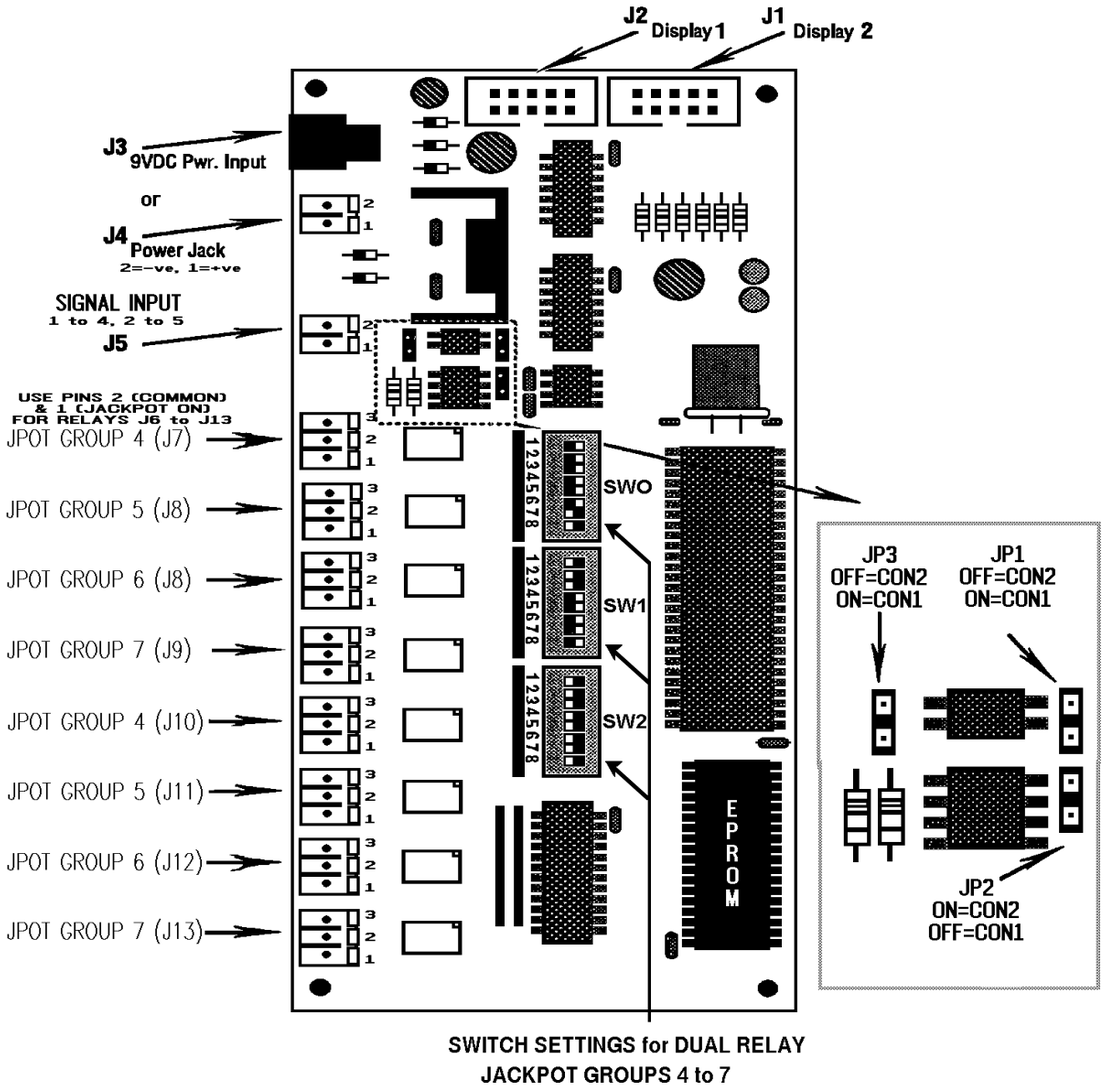
JACKPOT TRIGGER DEVICE

Continued

With V2.04 Jackpots on groups 0 to 3 set SW2 switches 0-3 to ON, for Jackpots 4-7 set them to OFF.

JACKPOT TRIGGER DEVICE (JTD2)

Ver 2.04, Jackpots 4 to 7

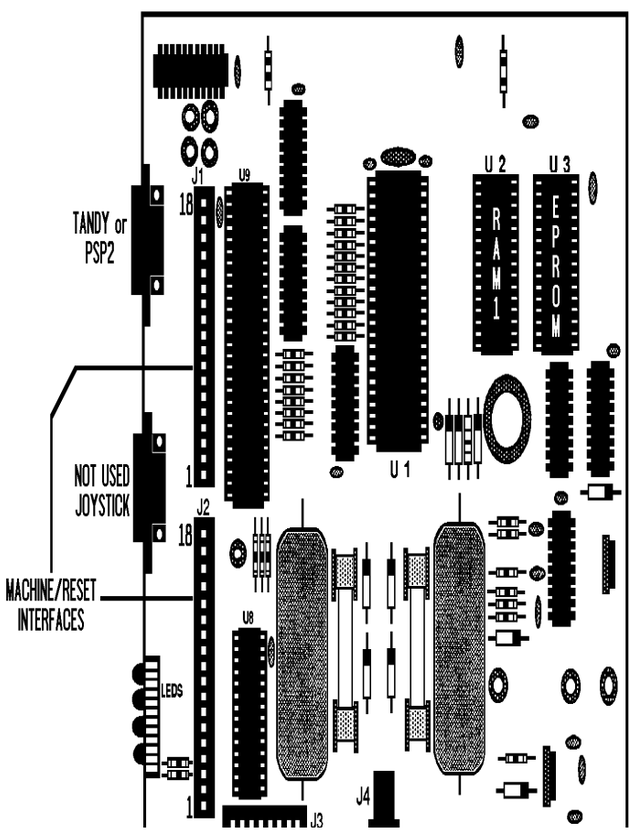


SWITCH SETTINGS for DUAL RELAY JACKPOT GROUPS 4 to 7

CON1

CON1 controller is that which has successfully available from the middle 80's in N.S.W.. It is capable of supporting only one random jackpot from groups zero to 3. It is only capable of driving level one displays (Cham1), and does not support the advanced functions such as PCID, essential for larger links.

CON1 CONTROLLER

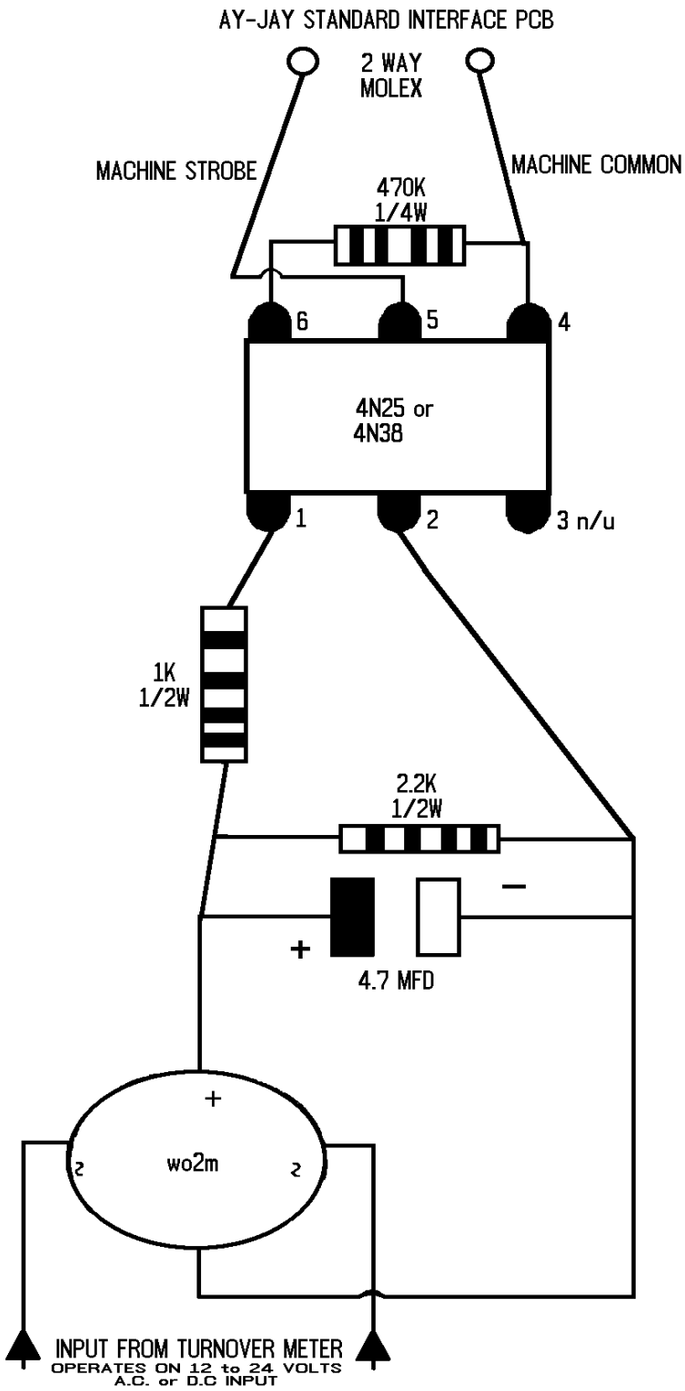


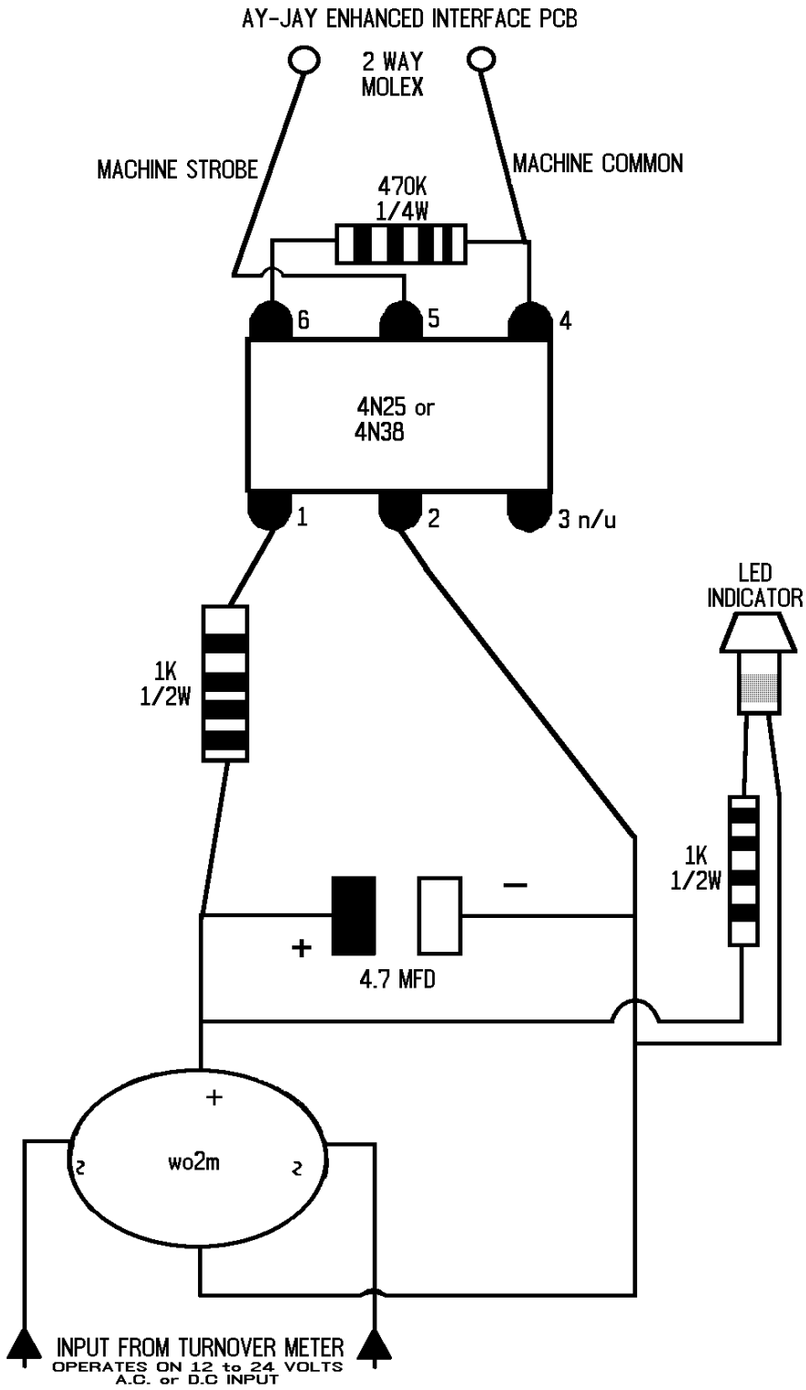
APPENDIX B

INTERFACE

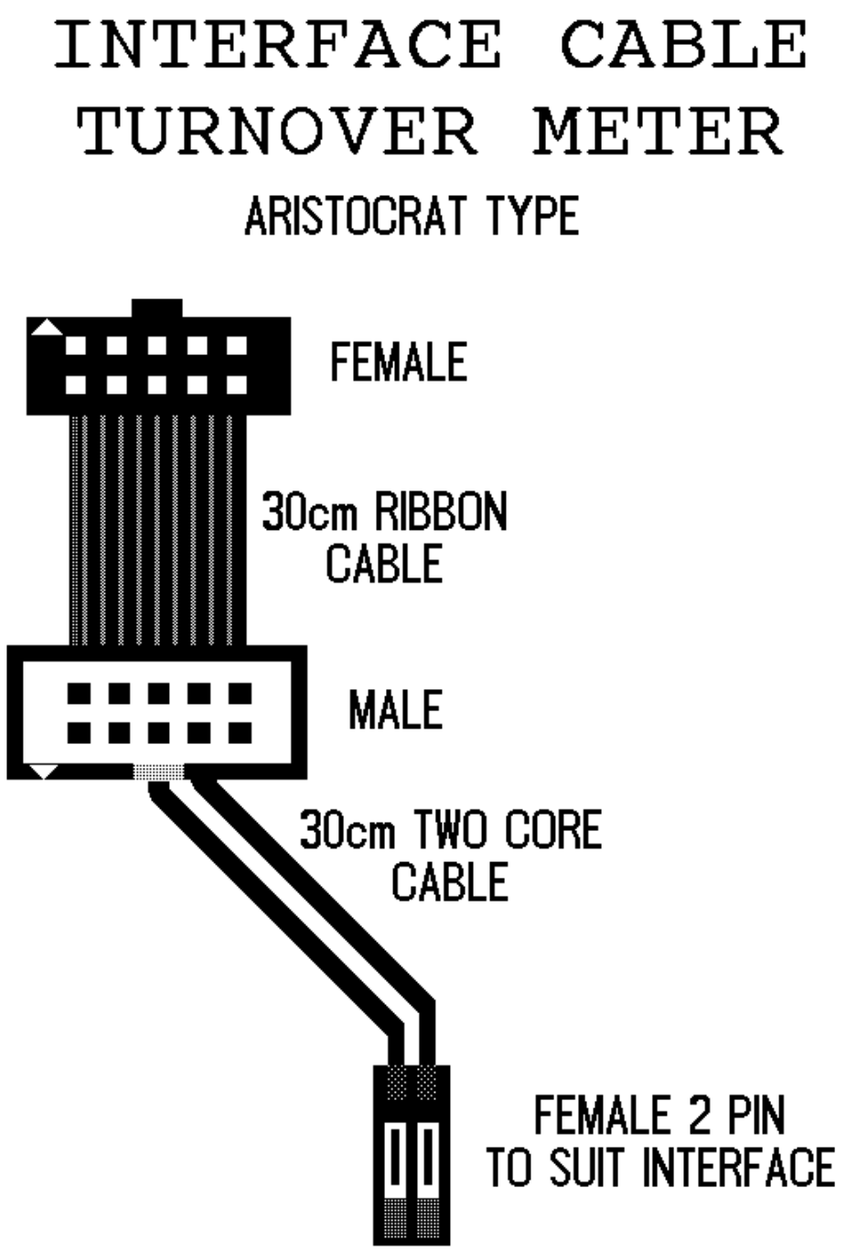
DETAIL DRAWINGS

AY-JAY INTERFACES




AY-JAY ENHANCED INTERFACE PCB
2 WAY
MOLEX
MACHINE STROBE
MACHINE COMMON
470K
1/4W
6
5
4
4N25 or
4N38
1
2
3 n/u
LED
INDICATOR
1K
1/2W
1K
1/2W
+
4.7 MFD
−
+
wo2m
INPUT FROM TURNOVER METER
OPERATES ON 12 to 24 VOLTS
A.C. or D.C INPUT

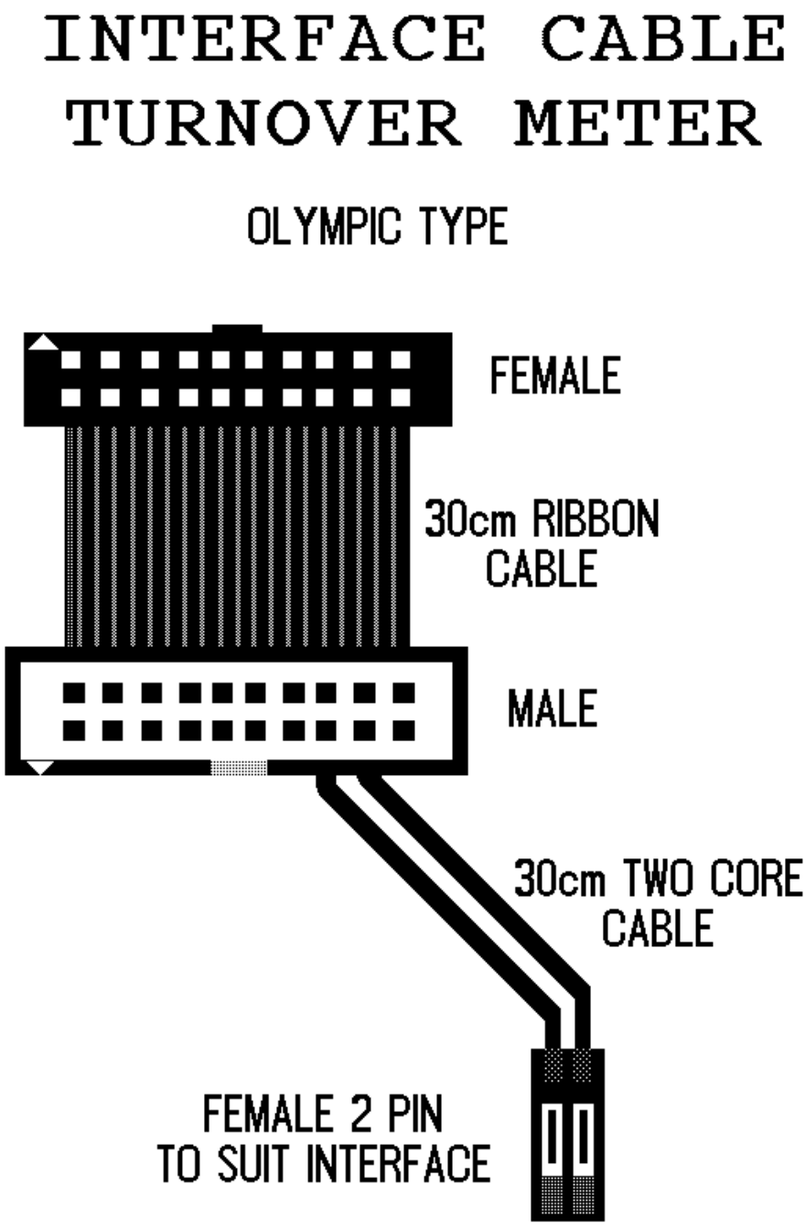
ARISTOCRAT INTERFACE LOOM



This mini-loom is to be plugged in series with the meters loom.

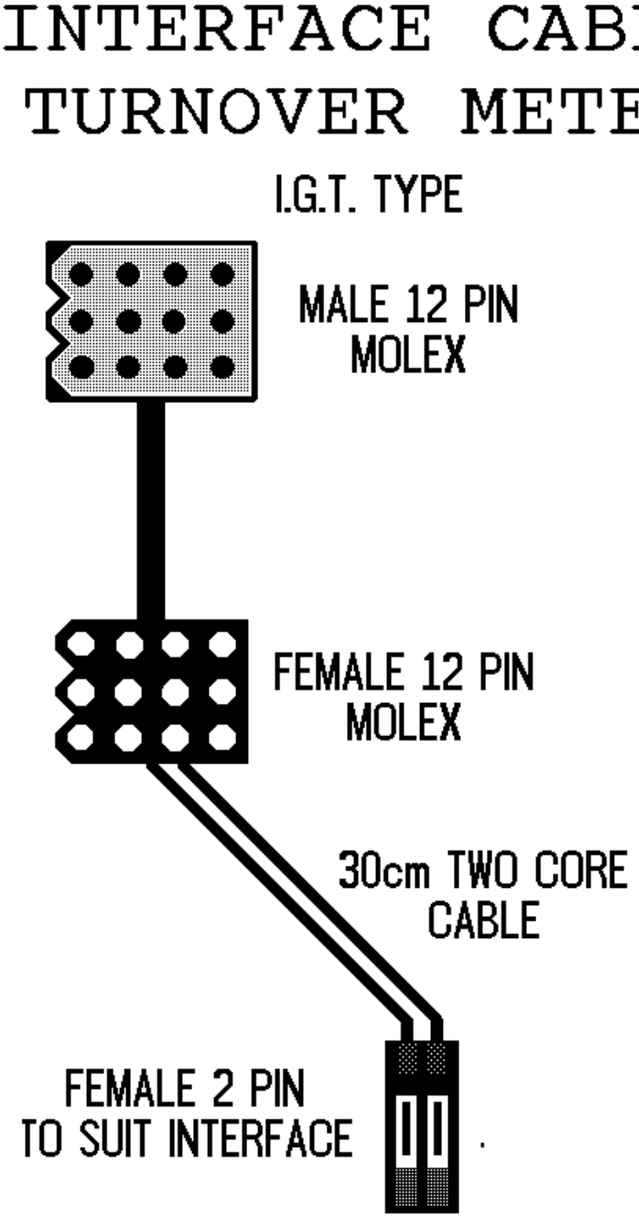
OLYMPIC INTERFACE LOOM

This mini-loom is to be plugged in series with the meters loom.

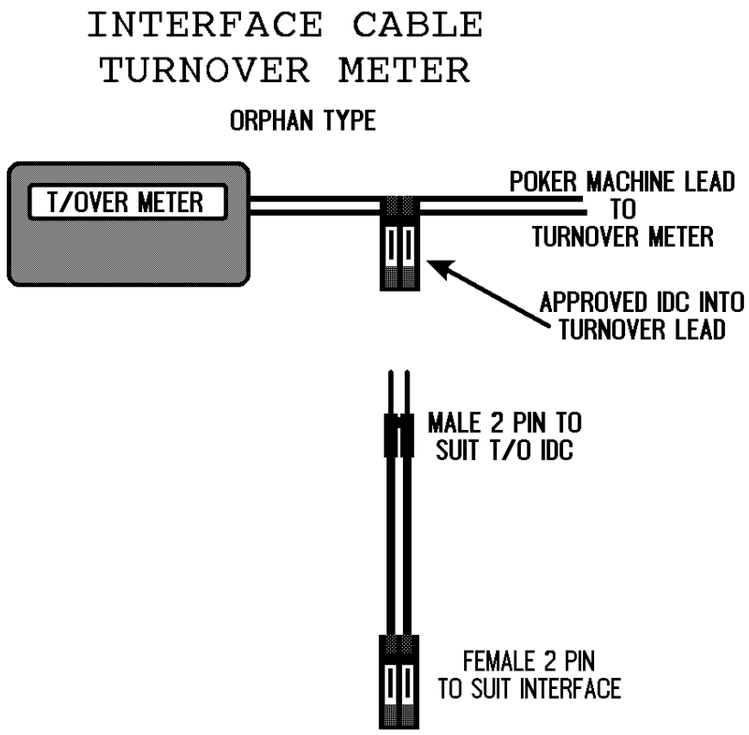


I.G.T. INTERFACE LOOM

This mini-loom is to be plugged in series with the meters loom.



ORPHAN INTERFACE LOOM

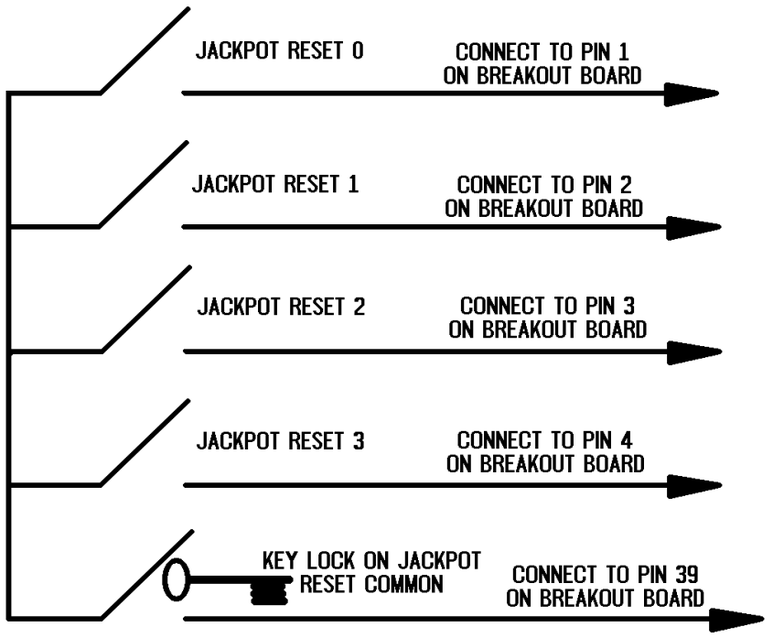


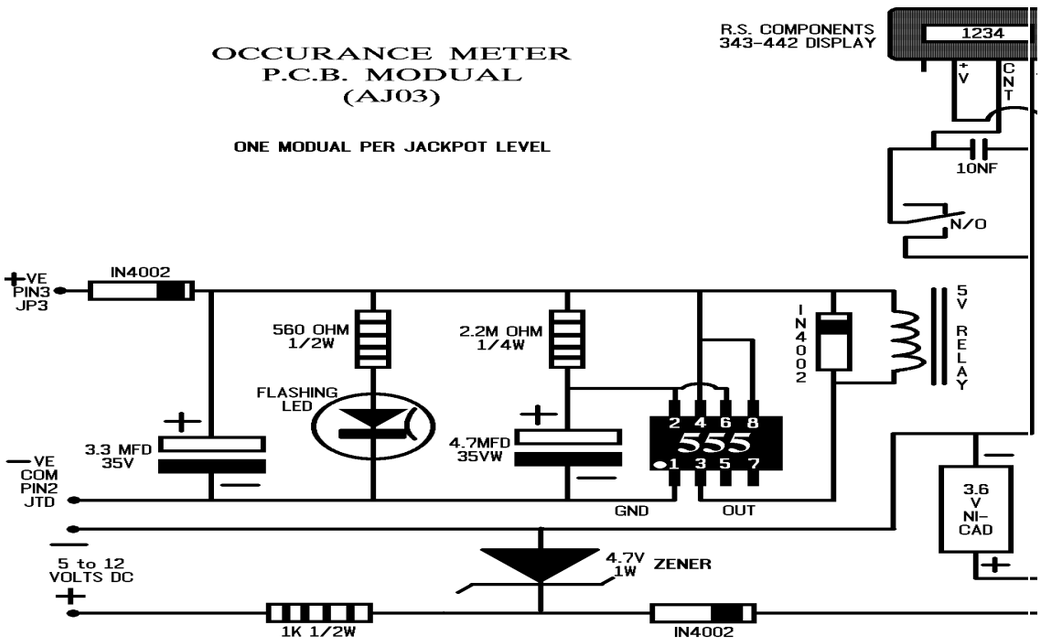
APPENDIX C

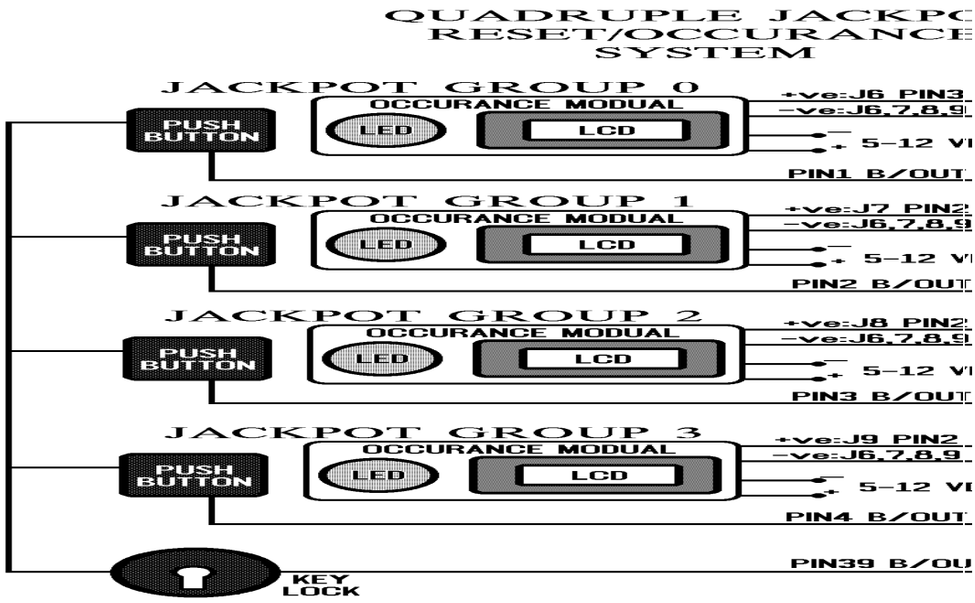
RESET / OCCURRENCE SYSTEM

DETAIL DRAWINGS

JACKPOT RESET
SYSTEM




OCCURANCE METER
P.C.B. MODUAL
(AJ03)
ONE MODUAL PER JACKPOT LEVEL
R.S. COMPONENTS
343-442 DISPLAY
1234
+V
CNT
10NF
N/O
+VE
PIN3
JP3
IN4002
560 OHM
1/2W
2.2M OHM
1/4W
IN4002
5V
RELAY
FLASHING
LED
2 4 6 8
555
1 3 5 7
3.3 MFD
35V
4.7MFD
35VW
-VE
COM
PIN2
JTD
GND
OUT
3.6
V
NI-
CAD
5 to 12
VOLTS DC
4.7V
1W
ZENER
1K 1/2W
IN4002


QUADRUPLE JACKPO
RESET/OCCURANCE
SYSTEM
JACKPOT GROUP 0
OCCURANCE MODUAL
LED
LCD
PUSH BUTTON
+ve:J6 PIN3
−ve:J6,7,8,9
5−12 V
PIN1 B/OUT
JACKPOT GROUP 1
OCCURANCE MODUAL
LED
LCD
PUSH BUTTON
+ve:J7 PIN2
−ve:J6,7,8,9
5−12 V
PIN2 B/OUT
JACKPOT GROUP 2
OCCURANCE MODUAL
LED
LCD
PUSH BUTTON
+ve:J8 PIN2
−ve:J6,7,8,9
5−12 V
PIN3 B/OUT
JACKPOT GROUP 3
OCCURANCE MODUAL
LED
LCD
PUSH BUTTON
+ve:J9 PIN2
−ve:J6,7,8,9
5−12 V
PIN4 B/OUT
PIN39 B/OU
KEY LOCK

APPENDIX D

APPROVED

RANDOM JACKPOT SETTINGS

APPROVED RANDOM JACKPOT SETTINGS

Line	Lower ...$ Limit...	Upper $ JPot	Average %	TOTAL %	Start Up %	Contrib	Grp

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16 SEPTEMBER 1994

APPENDIX E

ERROR MESSAGES & STATES

CONTROLLER AND DISPLAYS

ERROR MESSAGES & STATES

1) If the system appears confused or corrupted such as during installation or lightning, it may require more than a factory reset by PSP. With a controller check that the date {see date} has been set, if this does not work then earth then reseat the EPROM and RAM chips.

   Warning, clearing the RAM chips remove ALL data.

   Symptoms are most likely to be it wont work, but in theory can be anything strange, as a general rule if you cant find anything else clear the chips.

   For CON2 the EPROM is U3 and the RAMs are U5/U6 and for LOGIC2 board EPROMs are U6/U7 and RAMs U4/U5. Be very careful of static, earth yourself by grasping an earthed item such as the metal in a poker machine first.

   MOUNT CHIPS CORRECTLY OR THEY WILL BE DESTROYED.

2) "C16" indicates a "brown out", a state of the mains power being seriously below the 240 volts, it clears itself.

   Occurs at powerup.

3) Jackpot Trigger Device Level 1 may play up on a CON2. The 5 volt power pack for the level 1 Trigger Board may need to be connected to an approved power conditioner when so used.

4) Jackpots only at maximum value then "C10". If the date and time are not set in the CON2 at install, or is lost, then it will react very strangely with the system running up to maximum jackpot as the only consistent symptom.

5) "C9", the setup of Logic Board is incomplete or lost, common at install, acute power outage (eg lightning) and if the RAM power backup fails. If is due to Ram backup failure, it is obvious when turned on in the morning (super capacitor "C1" has shit itself).

   Ensure the displays are set up according to the block diagram for "Multi Small Displays" above and the EPROM is on the logic board. {see JPGRP"A"=x}

6) Message is not correctly positioned on a chameleon. Confirm that the logic board has the correct EPROM. A 1x2 may have a 1x3 or a 12cell has a 14cell EPROM (or visa versa).

7) Chameleon does not react to controller.

   1) Turn on, Cham2 logic boards, early version have an ON/OFF switch "S1".

   2) Incompatible logic board and EPROM version or speed setting. {see 2.02}

   3) Confused RAM, remove and earth chips {see confused}.

   4) Check fuse on logic board, 1 amp.

   5) Ensure that the ribbon cable has been correctly made, it is easy to reverse the connector if making own (red always to one).

   6) Ensure the ribbon is in the correct plug on the display, there are two, J3 does not work for the large displays.

8) EPROM version number 2.02 assumes an 8MHz mini cham logic board and version 2.05 assumes the faster 10MHz logic board (see incompatible), this can be varied.{see 07F82H}

9) Sub jackpot groups not offered with multi smell displays at setup means the wrong logic board EPROM variant has been installed. {see 07F7AH}

10) "EMPTY" displayed on chameleons. The logic board has been set with the MFILE=0 (user programmable) but it has not been programmed how to display. Are the wires connected?

   1) Program in page 4 "JPOT.DO" message with PSP, if not possible alter the MFILE from 0 to any other. A common JACKPOT.DO message is " ├▪α5≈_♠8". {see S2}

   2) The logic board wont talk to its EPROM, if "LOADING" does not show at a PSP send, change EPROM or board. {see 2.02}

   3) Confused RAM, symptoms can be anything. {see confused}

   4) Occurs in morning, then the backup (super) capacitor may be failing. {see capacitor}

   5) If no message wanted, alter MFILE to another number, 4 recommended as the best visually.

11) No increment on a few machine/s when played is usually due to the common and the strobe being the wrong way about, this causes NO damage.

1) Ensure that the common wire is on the correct pole of the interface card. Frithy uses "PINK" as the common for his looms and the common pin is indicated by a pink mark (the corner pin of the interface card).

2) Interface may have failed, swap in spare.

3) Denomination multiplier may be "000", check using PSP item "E" from the main menu.

12) The Controller number is **not** shown on CHAM1 displays at jackpot. This is an inconsistency, not an error, with old displays (Chameleon 1). A machine on the master controller will not display a zero "0" before the machine number, slave controller numbers are shown. {see PCID}

13) The pokies software name from PCID are not shown.

    1) Not available on Chameleon 1 displays. {see glitch}

    2) Glitch such as lightning , reload the software names using PCID.

    3) Testing, such as the "Incrementation" test will destroy this record in the CON2, reload.

    4) Changing of the EPROM or reseating the RAMS will destroy it, reload.

14) Logic Board, Jackpot Reset and etc EPROM does not fit. This can occur due to the change in the processor used as the long time used "Hitachi" chip is no longer available. The last version for the old chip 1x2/1x3 logic board is Version 7.15, after that a pair of chips are used, similarly the "E" version of the Gateways use a pair of chips and the same has occurred for Jackpot Trigger Devices with only the new version available.

15) C31. At least one of the slave controllers has dropped off the system due to loss of power or the fibre optic link has been broken. This will only occur after the master has initially detected the existence of the Slave, if it has never been connected then it will not ask for it.

This loss of communications can also occur where the fibre buss is towards the limits of its length, nominally 70 metres. In such a case enabling the jumpers (JP??) behind the transmit fibre ports FOT1 and FOT2 boosts the signal, this is not to be done unless the problem is due to attenuation. {see C30}

16) C30. The slave controller has lost communications with its master, it displays only on a sign that is directly connected to it that slave controller (local, the same as for an INSTALL check). {see C31 : see INSTALL}

17) Values lost from controller. If it happens twice without GOOD explanation the controller is to be replaced immediately (excluding obvious external factors such as lightning strike).

Immediate action in the case of multi controller systems is to swap the Master with a Slave with the most different serial number and reconfigure while awaiting replacement of the slave(ex-Master). {see setup}

1) If occurs after being turned off (eg overnight) then the memory backup capacitors may have failed, till fixed leave mains on ALL the time. {see capacitors} Note that it is recommended that the controller and in fact any electronics should remain on *ALL* the time.

18) Actual incrementation percentage (%) too high or low in a stable and proportionate manner. This is mainly due to connecting a machine to the wrong position on the breakout. Use PSP menu item "E" to confirm denomination settings and then check off each poker machines denomination. Reposition as needed at breakout.

19) Large Cham2 displays such as 1x2 or 1x2 do not work. This may be due to incompatible mixing of the release of Driver board with a Logic board. Prior to December 1993 the Drivers part # 341-006-60 or# 341-008-70C used a 68 pin XYLINX chip in U2 and a

Cycle stealer "OVDR V1.0" or "OVLG V1.1" in U1 these can only be used with the logic board running a cycle stealer chip in U9 or U10 version 1.1 or 1.0 part # 341-009-11 or 341-016-10. The newer driver board has a part #321-010-40B and without a cycle stealer chip and requires a logic board that uses a cycle stealer chip in U10 of OVLG V1.2 or V1.3 or higher.

The new driver board can be easily distinguished by having no large square XILINX chip and only a red power LED compared to a large square XILINX chip two LEDs, a red power and a green communication.

20) False Jackpots. If in doubt don't pay, use your 24 hours and get a tech with HIST2 or PSP to check the history file of the last 100 jackpots in the controller. There are a multiplicity of causes of this apparent state;

1) Early model tokenised machines. If the software has been updated to tokenised , the hardware turnover meter can be so slow that it is easy for this meter to be incrementing minutes after the player has departed. A disappearing problem, get later version software/hardware.

2) Late model Aristocrat (Jan 94) 540 and converted Mark 2.5 (540 type) have a nasty tendency to run away, so do some of the later model IGT. The only cure is the pokie maker which has been occurring.

3) Some Poker machines are showing generalised malfunction of the Turnover system so that they generate pulses that do not increment the hard meter but does tick over the controller. The preferred CON2 settings suppress this. (These pulses have voltage but no amperage.) Current generation Interfaces are buffered against this.

4) Misunderstanding of what the staff is paying out on, this is a confusion that occurs with new staff and newly installed systems. They may mix up the link number with the house number, the hardware number with the nickname and the options go on. Training is the only answer.

21) No MESSAGE displayed on display. The MFILE parameter for the display has not been set to 0 (set to MFILE=0). Note that to display messages, information on how to display the current jackpot must also be loaded to the logic board, a common JPOT.DO message is ├▪α5≈_♠8. If a message is not to be displayed the recommended MFILE setting is "4", this is the jackpot centre aligned and in DANCE colour (adjusted on the logic board by switches S2, S3 and S4.).

22) Loss of controller values and PCID names. If this happens during a power down, such as overnight it is usually a failure of the RAM power backup system a super capacitor "C51". Immediate action is to ensure the power remains on all the time and replace the capacitor. Reload data and PCID.

APPENDIX F

POWER SUPPLIES

SUNDRY DATA

POWER SUPPLIES

CHAMELEON POWER SUPPLIES

The white wire on the 240 volt lead into the chameleon power supplies is the active, black is neutral and green is earth.

All power outputs have been 10.5 volts totally independent of what has been displayed on the power supplies themselves. Only 10.5 volts. Early ones had 12 volts marked on them but had been adjusted internally to 10.5 volts.

MINI CHAMELEONS 2 - 12 & 14 Cell

Uses a 12 pin AMP plug.

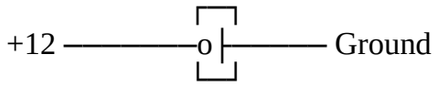
Output Voltage	Wire Colour		Pin	
+12	purple	‖o o o‖	3	Purple Logic board power
+ 5	yellow	‖o o o‖	6	Red LED power
Gnd	black	‖o o o‖	9	Black Ground
-12	red	‖o o o‖	12	-

MINI CHAM1

+ 5 Yel	Yel	Note :This is the end near the Triacs on the Logic PCB.
-12 Red	Red	
+12	Org	Pur
Gnd	Blk	Blu

CON2 - Type A, AF, I and IF

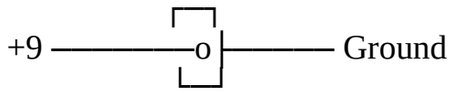
This normally driven by a regulated 12 volt 1.2 to 1.5 amp power pack terminating by a standard low voltage plug with the centre being +12v and the outer being the ground.



The small power packs are not to be used as they rate at 18 volts unloaded and variable amounts loaded plus provide little protection from surges. The correct ones to use are larger and are properly regulated to 12 volts, loaded or not plus providing far more protected power.

JACKPOT TRIGGER DEVICE & GATEWAYS (IGT and Standard)

The maximum voltage to be switched by the relays is 110 volts, 240 volts is NOT to be attached. It uses a 9 volt power pack as standard which is able to support 1 JTD2 and 2 mini-photon cells. Unloaded the power pack rates at about 13 volts.



JTD2 power panduit "J4", the 1 is the +ve pin and 2 is the -ve.

To draw off low current of clean 5 volts the outputs for the mini-photons can be utilised. Pin 2 is +5 and 10 is Ground.

CON2 EPROM type 27C512-150

GATEWAY EPROM type M27C256B

1x2 / 1x3 CHAMELEON 2 - Logic Board EPROM
The "LOADING" message can be disabled.

1) Cham1 version 7.20 up by editing address "7EB2H" from default "1" to "0".
2) Cham2 version 1.06 up by editing address "07FD8H" to "1" at bit 1.

MINI CHAMELEON 2 - Logic Board EPROM 27C256

Display Number
Each possible combination of attached displays requires that the address on the "U7" EPROM chip "07F7AH" must be correctly set.

12 Cell	Single 0002, Double 0004, Triple * 0007	
14 Cell	Single 0003, Double 0006	
12 Cell / 14 Cell	One Each 0005	

Note: With Triple the heavier 780-026-50 50 watt power supply is required for the double combinations the standard unit being able to drive to 26 cells is sufficient.

Logic Board Speed
There is a range of speeds for the logic boards (see 8MHZ & 10MHZ). Modify address "07F82H", the speed of the board is half of the crystal.

Value	Speed	Crystal
0000H	8 MHZ	16 MHZ
0001H	10 MHZ	20 MHZ
0002H	12 MHZ	24 MHZ
0003H	16 MHZ	32 MHZ

CHAM2 1x2/3 DRIVER BOARD

This is available in two versions which are NOT mutually compatible with respect to the LOGIC board

JACKPOT TRIGGER DEVICE 2 (JTD2) - M27C256B
The version 2.00 (**2.04**) software has the following options:

Value	Effect
7FDCH	Select which relay to respond to ALL jackpots
00H	One to one for JP6=JPot0 to JP13=JPot7
01H	First relay
08H	Eighth relay

For Version 2.04 ONLY

10H	**Dual Mode, fire in pair either to first or last 4 jackpot groups subject to SW2 dips 1-3.(xxx = JPGRPs 0-3, OOO = JPGRPs 4-7)**

7FDDH	Relay operation Mode
00H	Normal.
01H	Flash (Pulse time by two then on/off at 50% duty cycle).
02H	Wink (relay fires once then stays off).

	Flash Details
7FDEH	Enable.
00H	No flash, always ON.
01H	Flash available.

7FDAH	Pulse Duration
to 7FDBH	(relay ON duration, 0001H per 10 milli seconds)
0033H	0.5 seconds ON.
0064H	1.0 seconds ON (eg 0064Hex = 100 decimal).
00C8H	2.0 seconds ON.

7FE0H	Display Configuration
00H	Single display panel.
01H	Double display panels.

7FDFH	Panel size, Maximum digits displayed.
06H	Six digit panel used.
to	
09H	Nine digit panel used.

COMMUNICATIONS

CHAM2 LOGIC TO DRIVER BOARD

The 10 way ribbon used in level 2 communications such as between the logic and driver and driver to driver utilises only 5 lines per sa. The ribbon is wired to:

PINS	USE
1,3,5,7 & 9	Logic Ground
2	Sync Signal
4	Strobe
6	Not Used
8	Data
10	Clock

Suggested wiring for such as replacing the ribbon with standard shielded 6 multi-core is:

PINS	USE
1	Logic Ground
2	Sync Signal
4	Strobe
8	Data
10	Clock

(Note that one wire is not used)

JACKPOT TRIGGER DEVICE 2 (JTD2)

STANDARD OVERHEAD SETTINGS

		12345678	12345678	12345678	
JPGRPs 0-3	Relay	OOOOOOxx	OOOOOOOO	**xxx**xxxxx	(Ver 2.04)
JPGRPs 0-7					(Ver 2.00)
JPGRPs 4-7	Relay	OOOOOOxx	OOOOOOOO	**000**xxxxx	(Ver 2.04)

CON2 TYPE CONTROLLER SELECTION

JUMPER	CON2 SET
1	OFF
2	ON
3	OFF

Bank #	Switch 8
SW2	x
SW1	O

(O=ON, x=OFF)

MACHINE ID (Number) SETTINGS
SW0 (first bank)

Mach ID	Switch 123456	Mach ID	Switch 123456	Mach ID	Switch 123456	Mach ID	Switch 123456
1	xxxxxx	11	xOxOxx	21	xxOxOx	31	xOOOOx
2	Oxxxxx	12	OOxOxx	22	OxOxOx	32	OOOOOx
3	xOxxxx	13	xxOOxx	23	xOOxOx	Over Head	OOOOOO
4	OOxxxx	14	OxOOxx	24	OOOxOx		
5	xxOxxx	15	xOOOxx	25	xxxOOx		
6	OxOxxx	16	OOOOxx	26	OxxOOx		
7	xOOxxx	17	xxxxOx	27	xOxOOx		
8	OOOxxx	18	OxxxOx	28	OOxOOx		
9	xxxOxx	19	xOxxOx	29	xxOOOx		
10	OxxOxx	20	OOxxOx	30	OxOOOx		

(O=ON, x=OFF)

TEST AND OPERATE MODE
SW0 (first bank)

FUNCTION	Switch 78
NORMAL	xx
Normal, Internal flash	xO
Software Version, Mach ID, Jackpot GRP	Ox
Photon Test Mode (digits segments)	OO

JACKPOT LIMIT - PHOTON
SW1 (second bank)

Photon Size	Maximum Value	Switch 1234567
6	9,999.99	Oxxxxx0
7	99,999.99	Oxxx0x0
9	999,999.99	Oxxx000

JACKPOT GROUP SETTINGS - PHOTON
SW2 (third bank)

JPOT GRP	Switch 123
0	xxx
1	Oxx
2	xOx
3	OOx
4	xxO
5	OxO
6	xOO
7	OOO

(O=ON, x=OFF)

CON2 CONTROLLER - IN MACHINE
SW2 (third bank)

GRP #	Switch 4567	GRP #	Switch 4567	GRP #	Switch 4567	GRP #	Switch 4567
0	xxxx	4	xxOx	8	xxxO	12	xxOO
1	Oxxx	5	OxOx	9	OxxO	13	OxOO
2	xOxx	6	xOOx	10	xOxO	14	xOOO
3	OOxx	7	OOOx	11	OOxO	15	OOOO

CHAMELEON 1 SETTINGS

IGT
GATEWAY GWE V2.5
LOGIC BOARD SETTINGS
1) SW1=4
2) SW2=0

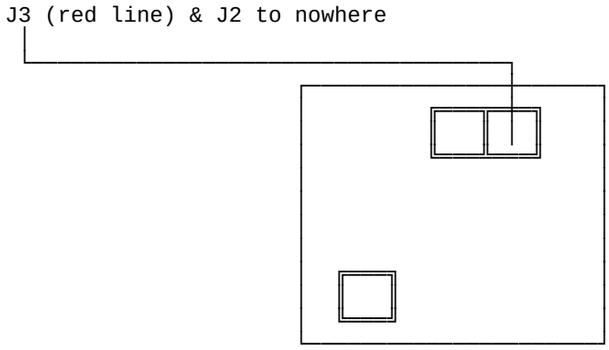
CASINO ROYALE
LOGIC BOARD SETTINGS
1) LOADING SUPPRESSED EPROM
2) SW1=8
3) SW2=0
1

AGL

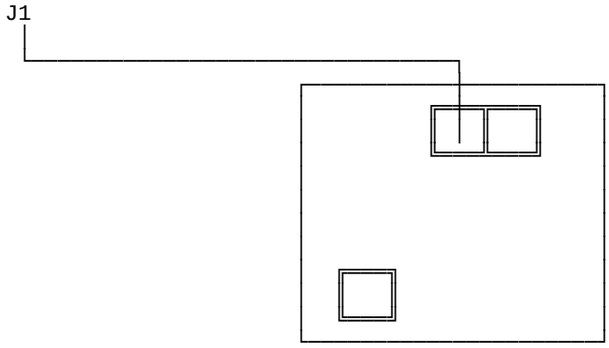
LOGIC
J7 (red line) & J6 to driver.

Red to the top board and the other to 5 panels down.

J3 (red line) & J2 to nowhere



J1



J11 to 40 way