Reel Module

Machine Overview

During this module you will learn:

- What the reel assembly is
- What the reel assembly does
- How reel strips and PAR sheets are related

Floor Operations

During this module you will learn:

- The components of the reel assembly
- How the reel assembly works
- How to clear a reel tilt
- About physical reel stops

Service and Troubleshooting

During this module you will learn:

- Detailed components of the reel assembly
- How the reel assembly works
- Physical and virtual reel stops
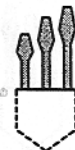
GENERAL COMPONENT DEFINITIONS

Reel Strips: Silk-screened plastic strips.
Reel Basket: The mechanism spun by the motor.
Reel Chassis: The framework containing the stepper motor and optic sensors.
Optic Sensor: A network composed of an LED and a light sensitive transistor. As the encoder flags break the constant light beam a signal is sent to the processor.
Stepper Motor: A motor incremented by a given number originating from the processor. Turns the reel assembly.
Encoder Flags: A series of plastic tags sequenced to allow the optic sensor to count turns of the reel and detect the virtual stop produced by the random number generator on the processor.

DETAILED COMPONENT DEFINITION

Reel Chassis

The plastic frame supporting the reel basket, optic sensor, stepper motor, and electrical connections for the optic sensor and stepper motor. There are three to five reel chassis, numbered with respect to their position in the machine. Other than the numbering, all reel assemblies within a machine are identical. Slant-top and upright machine reels are not interchangeable.

Stepper Motor

A 12v 3a motor used for precision motion control. Stepper motors rotate by applying a pulsating voltage to their windings. Each pulse causes the stepper motor shaft to rotate only a few degrees, or individual steps, in a full (360 degree) circle.

Reel Basket

Plastic frame to which the reel strip is mounted. There is a specific position for the mounted reel strip, indicated by index notches in both reel basket and reel strip.

There are 11 sets of encoder flags built into the reel basket: one set of index flags and 10 sets of standard encoder flags. There's a specific positional relationship between the index flags and the index notches.
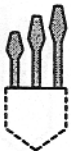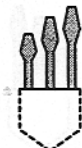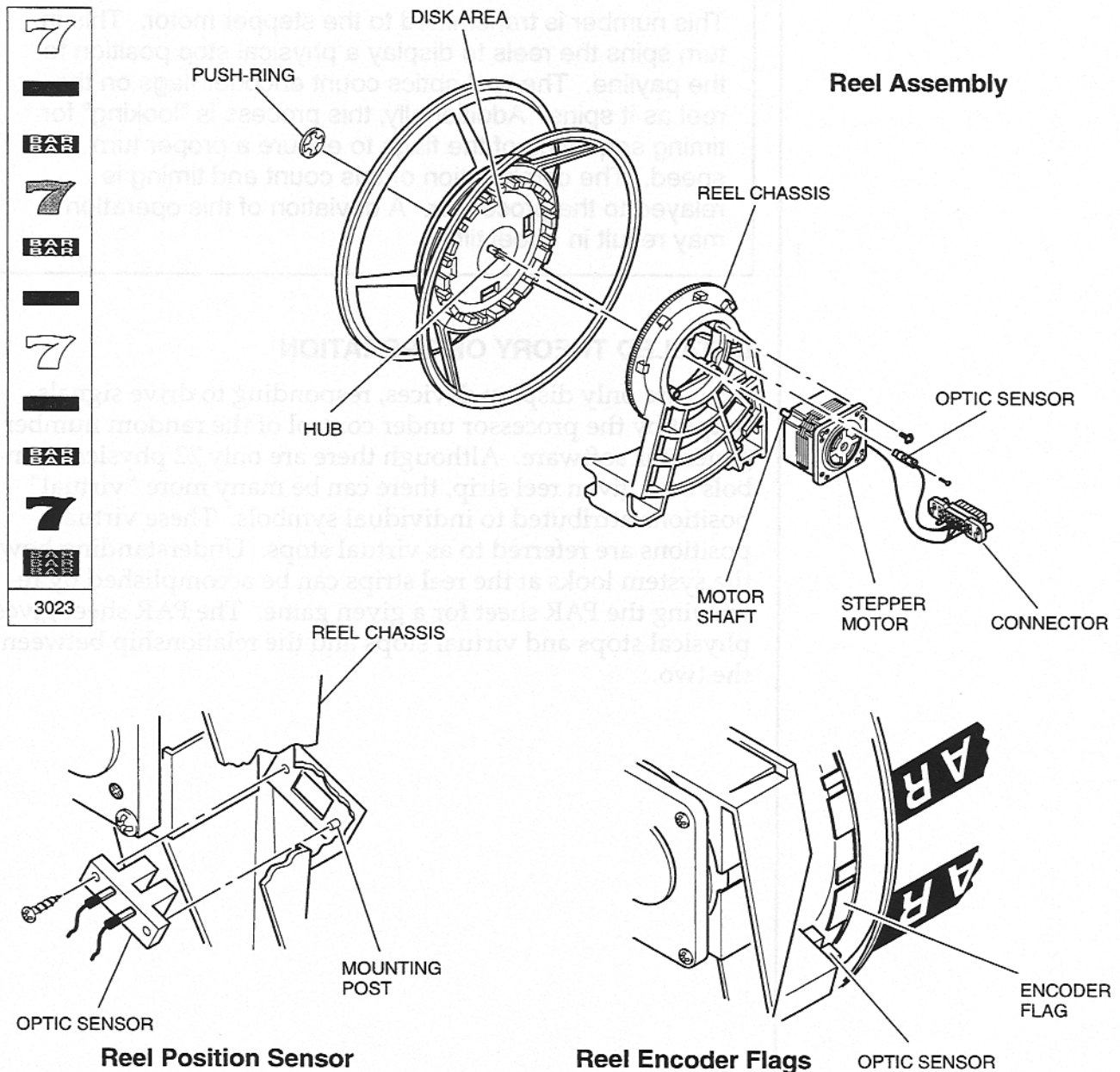
Optic Sensor

LED/light-sensitive transistor pair that detects the presence or absence of an encoder flag on the reel basket.

Reel Strip

Silkscreened plastic strips with the symbols for a given game in a specific pattern.

There will be three to five reel strips for a given game. The strips for a game *may not be identical* and *must* be mounted to the appropriate reel. The only way that correct installation of reel strips for a given game can be absolutely verified is via a complete paytable test. A paytable test is conducted in the Game Test menu of the game software, and verified against the PAR sheet and the glass.

3023

Reel Assembly

DISK AREA
PUSH-RING
REEL CHASSIS
HUB
OPTIC SENSOR
MOTOR SHAFT
STEPPER MOTOR
CONNECTOR

REEL CHASSIS
OPTIC SENSOR
MOUNTING POST

Reel Position Sensor

ENCODER FLAG
OPTIC SENSOR

Reel Encoder Flags
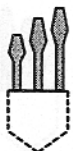
GENERAL THEORY OF OPERATION

The primary function of stepper reels is to display a winning or losing indication to the player.
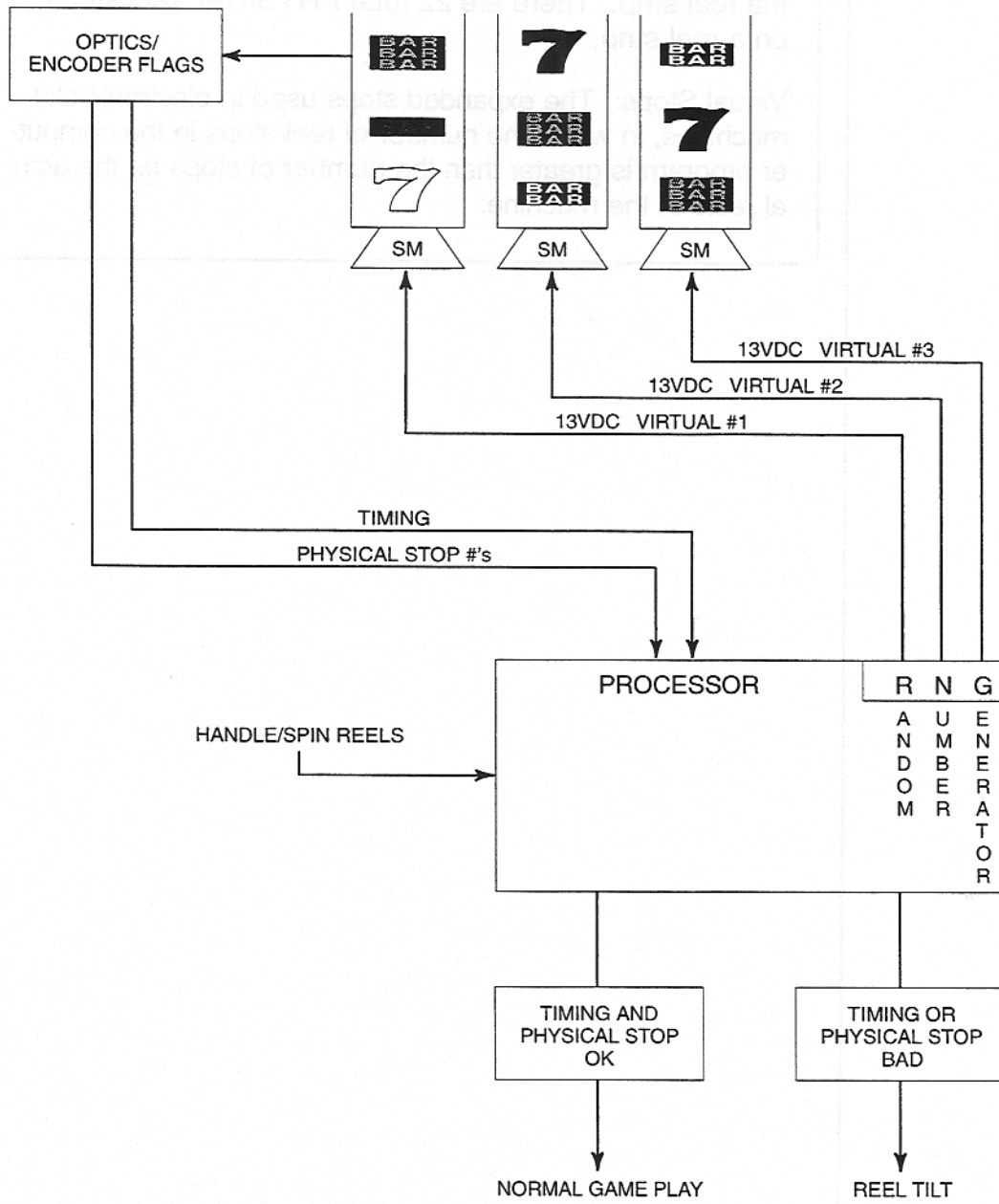
Signals from the handle or Spin Reels switch activates the random number generator programmed into the game firmware. This random number is selected from the preprogrammed virtual stop positions. The number also corresponds to the 22 physical stop positions on the reel strips.

This number is transmitted to the stepper motor. This in turn spins the reels to display a physical stop position to the payline. The reel optics count encoder flags on the reel as it spins. Additionally, this process is "looking" for timing sequence of the flags to ensure a proper turn speed. The combination of this count and timing is relayed to the processor. A deviation of this operation may result in a reel tilt.
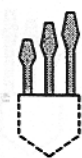
DETAILED THEORY OF OPERATION

Reels are only display devices, responding to drive signals output by the processor under control of the random number generator software. Although there are only 22 physical symbols on a given reel strip, there can be many more "virtual" positions attributed to individual symbols. These virtual positions are referred to as virtual stops. Understanding how the system looks at the reel strips can be accomplished by reviewing the PAR sheet for a given game. The PAR sheet gives physical stops and virtual stops and the relationship between the two.

OPTICS/
ENCODER FLAGS

BAR BAR | 7 | BAR BAR
— | BAR BAR |
7 | BAR BAR | BAR BAR BAR

SM   SM   SM

13VDC   VIRTUAL #3
13VDC   VIRTUAL #2
13VDC   VIRTUAL #1

TIMING
PHYSICAL STOP #'s

PROCESSOR   R N G
RANDOM NUMBER GENERATOR

HANDLE/SPIN REELS

TIMING AND
PHYSICAL STOP
OK

TIMING OR
PHYSICAL STOP
BAD

NORMAL GAME PLAY   REEL TILT

G0599-1T

Reel Module

> **REEL STRIP INFORMATION**
>
> Physical Stops: The actual places where the spinning reel can stop. There is a stop for each symbol shown on the reel strip. There are 22 total PHYSICAL reel stops on a reel strip.
>
> Virtual Stops: The expanded stops used in electronic slot machines, in which the number of reel stops in the computer program is greater than the number of stops on the actual reels of the machine.
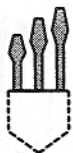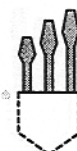
REEL STRIPS

PHYSICAL REEL STRIP LISTINGS

LINE # 1	--	--	--
LINE # 2	B7	B7	H7
LINE # 3	--	--	--
LINE # 4	HB	RB	RB
LINE # 5	--	--	--
LINE # 6	BB	BB	HB
LINE # 7	--	--	--
LINE # 8	R7	H7	B7
LINE # 9	--	--	--
LINE # 10	BB	BB	HB
LINE # 11	--	--	--
LINE # 12	HB	RB	RB
LINE # 13	--	--	--
LINE # 14	B7	B7	H7
LINE # 15	--	--	--
LINE # 16	HB	RB	RB
LINE # 17	--	--	--
LINE # 18	BB	BB	HB
LINE # 19	--	--	--
LINE # 20	H7	R7	R7
LINE # 21	--	--	--
LINE # 22	RB	HB	BB

REFERENCE NUMBER ———————➤   3021   3022   3023

YOU CAN SEE THAT EACH OF THE REEL STRIPS IS DIFFERENT
BECAUSE THE SYMBOLS ARE NOT THE SAME. THIS IS ALSO
INDICATED BY THE REFERENCE NUMBER AT THE BOTTOM.

PAR SHEETS

It is important to understand the relationship between a PAR sheet and a machine.

The PAR sheet in conjunction with the reel strip and paytable tests in the machine software menus are the only way to verify that a machine is paying out correctly.

A PAR sheet is a legally binding document describing the expected range of payouts and percentages for a specific program.

<u>Reel Strip Test</u> – will verify the correct reel strips are actually in the right position on the machine.
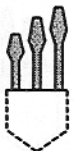
<u>Paytable Test</u> – will verify that the machine reels, software, and glass are all saying the same thing.

The only way to be 100% sure your machine is set up correctly is to do a full reel strip and paytable test. It is possible to convert a machine using a conversion kit that has a wrong reel strip, wrong software or wrong glass. Conducting these tests, as IGT recommends, can catch such hard-to-spot inconsistencies before a machine is put into play.

Exercise

There are 12 areas of a par sheet numbered on the following pages. Identify what each area is and/or what it represents.

1.   7.

2.   8.

3.   9.

4.   10.

5.   11.

6.   12.

3 Reel's coin coin multiplier
Hit Frequency
% pay est.
on %
Based on 10 million Handle pulls.

SS:8152 3R3CM MU PRC:80.366 HTFQ:11.763 P:H 15:17:47 2-SEP-97 Page: 1

[1] **[2]** **[3]**

International Game Technology
9295 Prototype Drive
Reno, Nevada 89511

TYPE 5

Reel Strip Number 8152 HOLD % 19.634 Denomination:

MODEL # : XX33X PAYTABLE 245B105
90% Confidence value, 10,000,000 pulls- LOW %: 79.84   HIGH %: 80.89

COIN #	PERCENT PAY BACK	HIT FREQ	TOTAL HITS	TOTAL PAYS
1	80.009%	11.763%	43904.	298632.
2	80.009%	11.763%	43904.	597264.
3	80.366%	11.763%	43904.	899896.

| SYM	NUMBER/REEL		
	R1	R2	R3
--	37	41	45
O1	9	0	7
U1	8	1	0
1B	8	3	10
O2	0	10	0
U2	0	0	2
2B	3	9	2
O3	1	0	0
U3	0	1	0
3B	2	2	2
R7	2	3	3
TD	2	2	1

[4] *Distinct symbol's chart.*

"NUDGE UP" SYMBOLS:01,02,03.
"NUDGE DOWN" SYMBOLS:U1,U2,U3.

This is a 3 reel , 3 Coin 72 stop machine.   373248. **[5]** *- machine cycle*

[6] PAY COMBO	# PER REEL			HITS	PULLS/HIT	PAYS	TOTAL PAY
TD XX XX	2	70	71	8726.	43.	2.	17452.
XX TD XX	70	2	71	8502.	44.	2.	17004.
XX XX TD	70	70	1	4088.	91.	2.	8176.
AB AB AB	31	26	23	16592.	22.	5.	82960.
TD TD --	2	2	72	180.	2074.	10.	1800.
TD TD	72	2	1	74.	5044.	10.	740.
TD -- TD	2	72	1	82.	4552.	10.	820.
1N 1N 1N	25	4	17	1700.	220.	10.	17000.
AB AB TD	31	26	1	640.	583.	15.	9600.
TD AB AB	2	26	23	896.	417.	15.	13440.
AB TD AB	31	2	23	540.	691.	15.	8100.
2N 2N 2N	3	19	4	228.	1637.	20.	4560.
1N 1N TD	25	4	1	100.	3732.	30.	3000.
TD 1N 1N	2	4	17	136.	2744.	30.	4080.
1N TD 1N	25	2	17	850.	439.	30.	25500.
3N 3N 3N	3	3	2	18.	20736.	40.	720.
2N 2N TD	3	19	1	57.	6548.	60.	3420.

Different stops
PAY-Table every possible pay combo
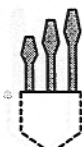
Reel Module

PAY COMBO	# PER REEL			HITS	PULLS/HIT	PAYS	TOTAL PAY
2N TD 2N	3	2	4	24.	15552.	60.	1440.
TD 2N 2N	2	19	4	152.	2456.	60.	9120.
TD TD 1N	2	2	17	68.	5489.	90.	6120.
TD 1N TD	2	4	1	8.	46656.	90.	720.
1N TD TD	25	2	1	50.	7465.	90.	4500.
R7 R7 R7	2	3	3	18.	20736.	100.	1800.
3N 3N TD	3	3	1	9.	41472.	120.	1080.
TD 3N 3N	2	3	2	12.	31104.	120.	1440.
3N TD 3N	3	2	2	12.	31104.	120.	1440.
2N TD TD	3	2	1	6.	62208.	180.	1080.
TD TD 2N	2	2	4	16.	23328.	180.	2880.
TD 2N TD	2	19	1	38.	9822.	180.	6840.
R7 R7 TD	2	3	1	6.	62208.	300.	1800.
TD R7 R7	2	3	3	18.	20736.	300.	5400.
R7 TD R7	2	2	3	12.	31104.	300.	3600.
TD TD 3N	2	2	2	8.	46656.	360.	2880.
TD 3N TD	2	3	1	6.	62208.	360.	2160.
3N TD TD	3	2	1	6.	62208.	360.	2160.
R7 TD TD	2	2	1	4.	93312.	900.	3600.
					Coin # 2	1800.	
					Coin # 3	2700P	
TD TD R7	2	2	3	12.	31104.	900.	10800.
					Coin # 2	1800.	
					Coin # 3	2700P	
TD R7 TD	2	3	1	6.	62208.	900.	5400.
					Coin # 2	1800.	
					Coin # 3	2700P	
TD TD TD	2	2	1	4.	93312.	1000.	4000.
					Coin # 2	2000.	
					Coin # 3	4000P	

Total hits   43904. Total Coins Paid   298632.

SS:8152   3R3CM   MU   PRC:80.366   HTFQ:11.763   P:H   15:17:47   2-SEP-97   Page: 3
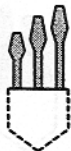
| Physical Strip. | | REEL STRIP # :8152 |

_R1 R2 R3._

```
Line #     1  O1  U3  ~~
Line #     2  1B  1B  3B
Line #     3  ~~  ~~  ~~          7
Line #     4  R7  R7  R7
Line #     5  ~~  ~~  ~~
Line #     6  1B  1B  2B
Line #     7  U1  U1  U2
Line #     8  2B  2B  1B
Line #     9  ~~  ~~  ~~
Line #    10  TD  TD  TD
Line #    11  ~~  ~~  ~~
Line #    12  1B  1B  3B
Line #    13  O3  O2  O1
Line #    14  3B  2B  1B
Line #    15  ~~  ~~  ~~
Line #    16  2B  3B  2B
Line #    17  ~~  ~~  ~~
Line #    18  TD  TD  1B
Line #    19  ~~  ~~  ~~
Line #    20  1B  2B  R7
Line #    21  ~~  ~~  ~~
Line #    22  3B  3B  1B
```
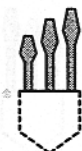
```
3  3  3
9  9  9        8    ← Never pay
3  3  3              Attention to this
2  3  4                  again.
```

Reel Module

Virtual Stops

REEL STRIP # :8152

9

Line #	1 O1 U3 ~~	Line #	40 TD O2 O1
Line #	2 O1 1B ~~	Line #	41 ~~ O2 O1
Line #	3 O1 ~~ ~~	Line #	42 ~~ O2 O1
Line #	4 O1 ~~ 3B	Line #	43 ~~ O2 1B
Line #	5 O1 ~~ ~~	Line #	44 ~~ O2 1B
Line #	6 O1 ~~ ~~	Line #	45 1B 2B ~~
Line #	7 O1 ~~ ~~	Line #	46 1B ~~ ~~
Line #	8 O1 R7 ~~	Line #	47 O3 ~~ 2B
Line #	9 O1 R7 ~~	Line #	48 3B ~~ ~~
Line #	10 1B R7 ~~	Line #	49 ~~ ~~ ~~
Line #	11 1B ~~ R7	Line #	50 ~~ 3B 1B
Line #	12 ~~ ~~ ~~	Line #	51 ~~ ~~ ~~
Line #	13 ~~ ~~ ~~	Line #	52 ~~ ~~ ~~
Line #	14 ~~ ~~ ~~	Line #	53 ~~ ~~ ~~
Line #	15 ~~ ~~ ~~	Line #	54 2B ~~ ~~
Line #	16 ~~ ~~ ~~	Line #	55 2B ~~ ~~
Line #	17 R7 1B ~~	Line #	56 ~~ TD ~~
Line #	18 R7 U1 2B	Line #	57 ~~ ~~ ~~
Line #	19 ~~ 2B U2	Line #	58 ~~ ~~ ~~
Line #	20 ~~ 2B U2	Line #	59 ~~ ~~ R7
Line #	21 ~~ 2B 1B	Line #	60 ~~ ~~ R7
Line #	22 ~~ 2B 1B	Line #	61 ~~ ~~ ~~
Line #	23 1B ~~ 1B	Line #	62 TD 2B ~~
Line #	24 1B ~~ ~~	Line #	63 ~~ 2B ~~
Line #	25 U1 ~~ ~~	Line #	64 ~~ 2B ~~
Line #	26 U1 ~~ ~~	Line #	65 ~~ 2B ~~
Line #	27 U1 ~~ ~~	Line #	66 ~~ ~~ ~~
Line #	28 U1 TD ~~	Line #	67 1B ~~ ~~
Line #	29 U1 ~~ TD	Line #	68 1B ~~ ~~
Line #	30 U1 ~~ ~~	Line #	69 ~~ ~~ 1B
Line #	31 U1 ~~ ~~	Line #	70 ~~ ~~ 1B
Line #	32 U1 ~~ ~~	Line #	71 ~~ ~~ 1B
Line #	33 2B ~~ ~~	Line #	72 3B 3B 1B
Line #	34 ~~ 1B ~~		
Line #	35 ~~ O2 3B		3 3 3
Line #	36 ~~ O2 O1		9 9 9
Line #	37 ~~ O2 O1		3 3 3
Line #	38 ~~ O2 O1		2 3 4
Line #	39 ~~ O2 O1		
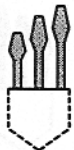
PAR Sheets

[10]

HANDLE PULLS	LOWER PERCENTAGE	UPPER PERCENTAGE
1000.	28.24	132.49
10000.	63.88	96.85
100000.	75.15	85.58
1000000.	78.72	82.01
10000000.	79.84	80.89

90% Confidence chart.

PAY TABLE FILE NAME : PTDAT:SS8152.PAY
REEL STRIP FILE NAME : RSDAT:SS8152.LAY
OPERATOR'S INITIALS: DL

[11]

VOLATILITY INDEX = 16.483

This # = The Risk To The casino.

COMMENTS

PAY TYPE........: Pays Only Highest Winner Per Lit Line
            :_____
FROM SS #.......:
            :_____
TO SS #.........:
            :_____

AB : O1,U1,1B,O2,U2,2B,O3,U3,3B
1N : O1,U1,1B
2N : O2,U2,2B
3N : O3,U3,3B

[12] *Special symbols chart.*

—
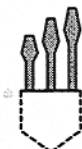
Monitor Module

Machine Overview

In this module you will learn:

- The components of monitor and touchscreen assemblies
- Component function
- General operational theory

Floor Operations

In this module you will learn:

- The components of monitor and touchscreen assemblies
- Component function
- Operational theory of monitor and touchscreen assemblies
- How to resolve monitor problems

Service and Troubleshooting

In this module you will learn:

- Detailed component function
- Detailed operational theory of monitor and touchscreen assemblies
- Voltages related to the monitor and touchscreen

Monitor Module

Notes

MONITOR MEASUREMENTS

19"

17"

13"
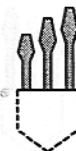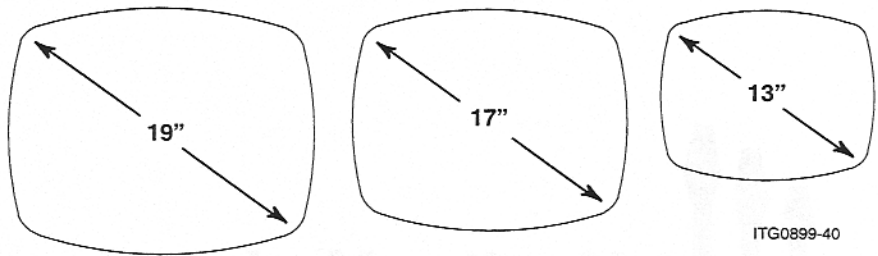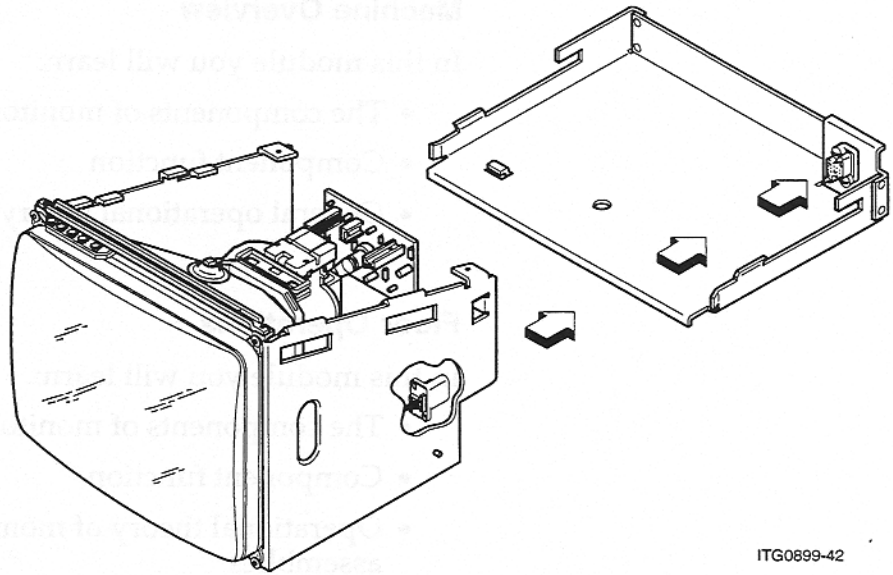
ITG0899-40

MONITOR QUICK CONNECTION

ITG0899-42

GENERAL COMPONENT DEFINITION

Monitor: Primary display device for Game King machines.

DETAILED COMPONENT DEFINITIONS

Monitor

Monitors for Game King machines have cathode ray tubes (CRTs) in three sizes: 13", 17", and 19". The measurement is taken diagonally across the face of the screen. Not all of the CRT display area is visible to the customer.

Monitors are mounted on a sheet metal shelf.

Monitor power and input signals are connected to the monitor via a single quick-release connector that makes connection when the monitor is slid into place in the machine.

The monitor only receives data from the processor – it doesn't *generate* data. If the monitor is displaying, it is working. If what is being displayed is unreadable, the fault is in the data generator.

Resolution

- 13" = 680 x 80
- 17" = 640 x 480
- 19" = 550 x 680

NOTE
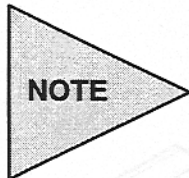
The touchscreen assembly is separate and distinct from the monitor assembly. They are not directly related electronically. The *apparent* relationship exists only in software. Directly associated with the Game King monitor is a touchscreen and its associated NETPLEX-level circuitry. The touchscreen is mounted directly to the face of the monitor. The associated circuitry exists on a single circuit board mounted on the monitor chassis. The power and signal connections for the touchscreen circuitry are connected through the same quick-release connector as the monitor itself.
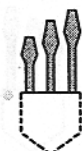
Monitor Module

Notes
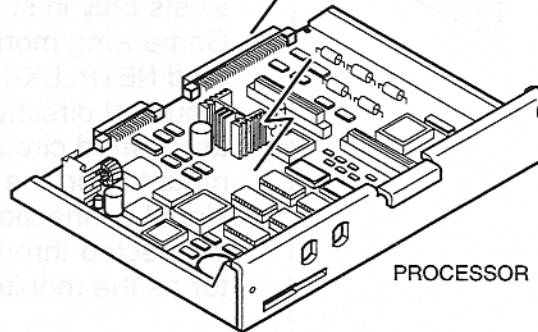
PROCESSOR

ITG0899-44
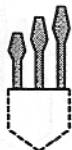
GENERAL THEORY OF OPERATION

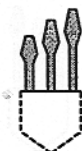The monitor displays data that is communicated to it from the machine's processor.

DETAILED THEORY OF OPERATION

The monitor runs on 230VAC through a step-up transformer. Depending upon the configuration or model of machine, the transformer may be located either in the AC power distribution box or on the monitor frame.

Data is communicated from the processor board to the monitor. The monitor displays only what it is told by the processor. On power-up, the monitor should display within a few seconds. (A little experience watching different monitors come up will tell you what the typical amount of time is for your site.)

Monitor Module

SEE DETAIL

TOUCHSCREEN
CONTROLLER
BOARD

DETAIL
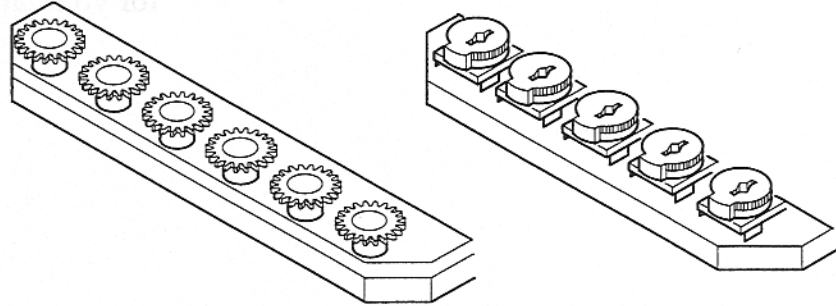
ITG0899-41

TYPICAL ADJUSTMENT CONTROLS
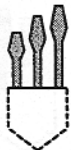
SAFETY FIRST!
The monitor is heavy. It is awkward to handle because most of the weight is in the front. Be careful when removing and replacing the monitor.

STOP

ADJUSTMENTS

The monitor has five-to-seven technician-accessible adjustments.

The adjustment controls on IGT Game King monitors are grouped with a controller board on the outer edge of the CRT. Exact location varies with the configuration of the machine as well as the specifications of the original equipment manufacturer. The controls are visible only when the machine door is open.

The knobs or thumbwheels also vary in design, but all function in the same way. The controls are labeled, and perform the following functions:

- **Horizontal Size** – widens and narrows the video picture.

- **Horizontal Position** – moves the entire video picture left or right.

- **Vertical Size** – enlarges and reduces the video picture.

- **Vertical Position** – moves the entire video picture up and down.

- **Pincushion** – corrects concave or convex distortion on the outside edges of the video picture.

- **Contrast** – changes the degree of difference between the darkest and lightest parts of the video picture.

- **Brightness** – brightens and darkens the entire video picture.

Other than making those adjustments, maintenance of the monitor is limited to:

- Cleaning
- Degaussing
- Replacement

The monitor for Game King machines should be treated as a field replaceable unit (FRU). If reasonable adjustments do not resolve monitor performance problems, the entire component should be sent to IGT (especially while components are under warranty to IGT) or a bench technician.

IGT bench-level technicians should handle all in-depth alignment and setup.

Be sure to obtain service manuals from the original equipment manufacturer for in-depth or post-warranty repairs.
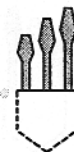
GENERAL COMPONENT DEFINITION

The touchscreen receives input when the surface is touched, and conveys information to the processor.

DETAILED COMPONENT DEFINITION

Touchscreen

The touchscreen is an analog sensor made up of a conducting film of Indium Tint Oxide (ITO) applied to a glass substrate – approximately 1/8" thick – that is curved to fit the front of the monitor CRT.

The sensor has four separate L-shaped electrodes attached at the four corners. These four electrodes are connected to the touchscreen circuit board via a shielded cable. The shield is connected to earth ground.

ITO Film

The ITO film is covered by a thin film of Silicon Dioxide (basically just glass), which acts as a protective and insulating shield for the ITO film. People touching the touchscreen do not come into contact with the conductive ITO film.

There is a second ITO layer applied to the back of the glass substrate, which has a single electrode connected to the perimeter of the ITO layer. This electrode is also connected to the touchscreen circuit board via the shielded cable. This ITO layer is used to apply compensating signals to the touch-screen to account for changes to the touchscreen environment created by the CRT.
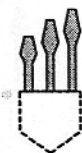
Touchscreen Circuit Board

The touchscreen circuit board is physically mounted to monitor chassis. It is a microcontroller-level board that evaluates signals to/from the touchscreen sensor and communicates touch location data to the processor board via the NETPLEX. The touchscreen circuit board is very ESD sensitive, and can be damaged easily if mishandled. The touchscreen circuit board is considered to be a FRU. There are socketed PROMs on the board.
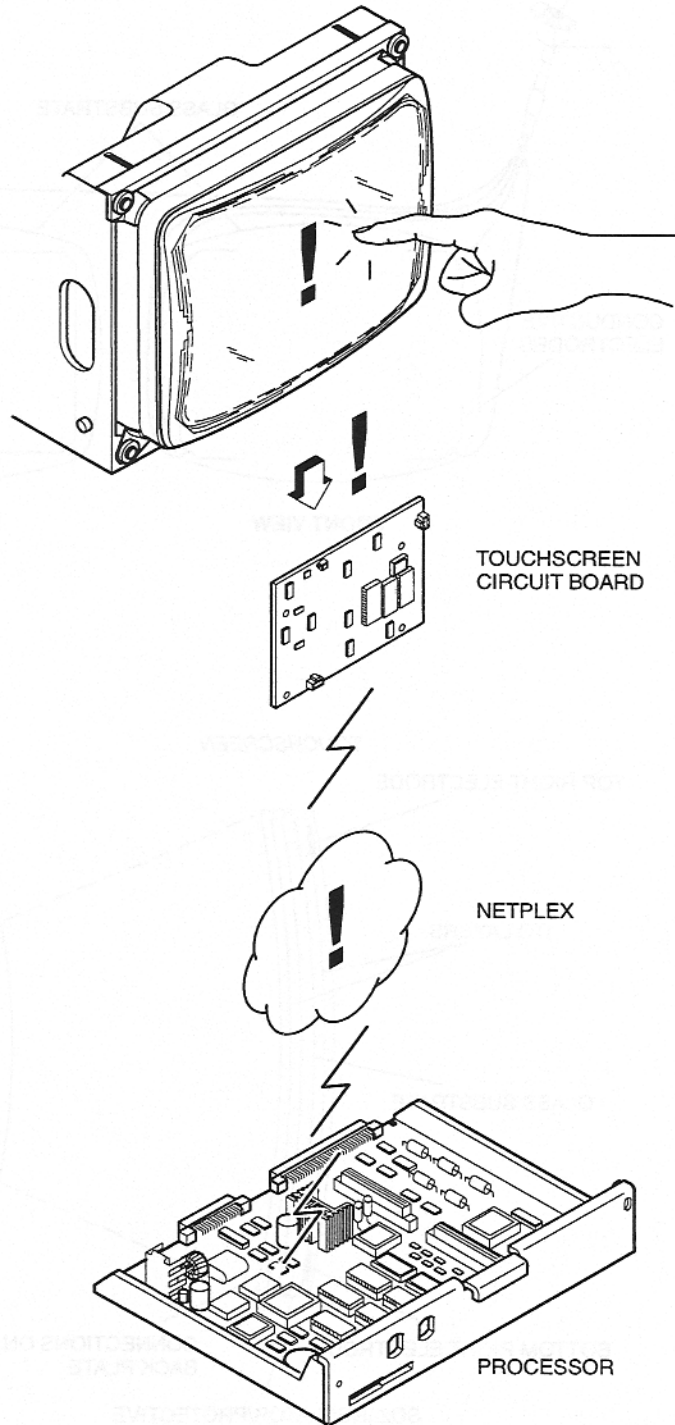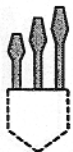
DB9 CONNECTOR

GLASS SUBSTRATE

CONDUCTIVE
ELECTRODES

BACK PLATE
CONNECTION

FRONT VIEW

BACK VIEW

TOUCHSCREEN

TOP RIGHT ELECTRODE

CATHODE RAY TUBE

ITO LAYERS

GLASS SUBSTRATE

BOTTOM RIGHT ELECTRODE

CONNECTIONS ON
BACK PLATE

SO2 INSULATOR/PROTECTIVE
COATING

SIDE VIEW
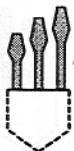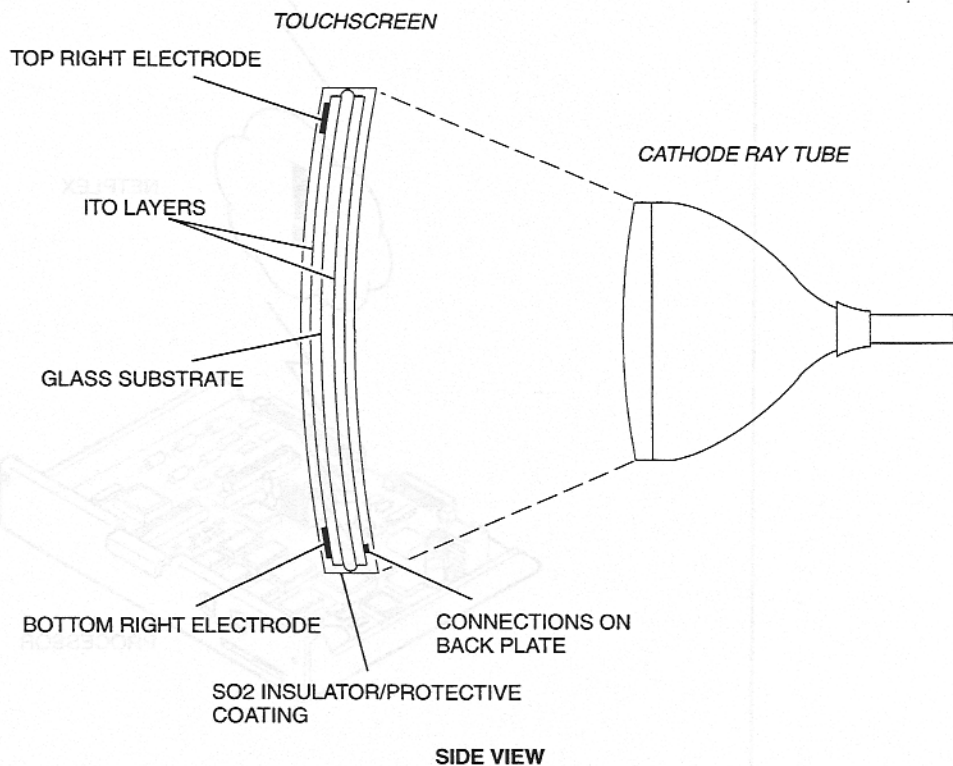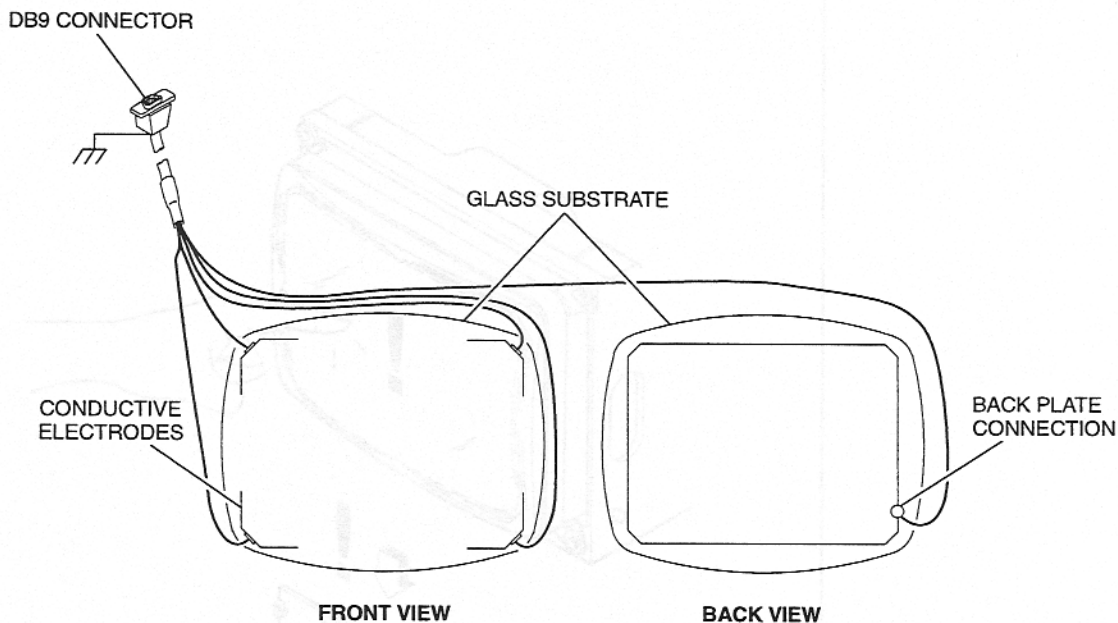
G0599-10T

Monitor Module

TOUCHSCREEN
CIRCUIT BOARD

NETPLEX

PROCESSOR

ITG0899-43

142

GENERAL THEORY OF OPERATION

The touchscreen receives input when the surface is touched. The coordinates of the touched spot are communicated to the processor, and the appropriate action is taken by the software.

DETAILED THEORY OF OPERATION

The ITO film has a known resistance per square centimeter. An 11KHz signal is applied to and evaluated at the four corner electrodes. A person touching the touchscreen draws current from the point of contact and impacts the 11KHz signal applied to the four corner electrodes in a manner that can be translated to a physical position on the touchscreen sensor by the touchscreen circuit board.

The touchscreen circuit board communicates the physical touch location (x, y coordinates) to the machine's processor board via the NETPLEX circuit. Since the touchscreen sensor does not have a direct signal link to the CRT, the CRT image and touchscreen touch position must be aligned together.

### Touchscreen Removal & Replacement

There are two types of touchscreens used on IGT monitors:

- A bonded touchscreen is actually bonded to the face of the monitor, and cannot be removed or replaced.

- A non-bonded touchscreen is taped to the front of the monitor, and can be replaced, although this is generally not recommended by IGT.

Replacement of taped-on touchscreens should be attempted only by qualified bench technicians using proper equipment.

Touchscreen Alignment

1. Access the monitor graph alignment test under Diagnostics/Video Test in either Attendant or Operator menu.

2. Mark the bezel position, with the door closed, on the CRT using tape or some other removable marker.

3. Open the door and center the display within the marks using the size/position adjustments located above the CRT.

4. Perform a touchscreen calibration using the Diagnostics option of either Attendant or Operator Menu.

⚠ CAUTION
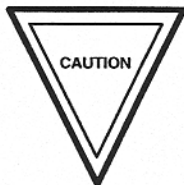
HIGH VOLTAGE!
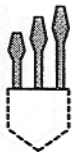The CRT uses very high voltages, which can be retained even *AFTER* power has been turned off, and the monitor is removed from the machine. *NEVER* touch the back of the monitor – it can result in shock.
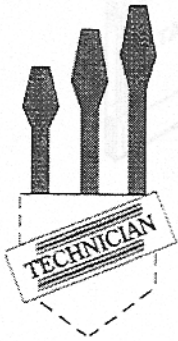
Monitor Module

WORK EXERCISE

Turn to exercises 8 and 9 in the Workbook section of this training guide.

Liquid Crystal Display (LCD) Module

Machine Overview

During this module you will learn:

- What the liquid crystal display is and how it works

Floor Operations

During this module you will learn:

- What the liquid crystal display is and how it works

Service and Troubleshooting

During this module you will learn:

- What the liquid crystal display is and how it works
- How to remove and replace

Liquid Crystal Display (LCD) Module

Notes

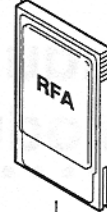*(handwritten notes in margin:)*
DeDused (CRTS)
INSTRUCTION SET
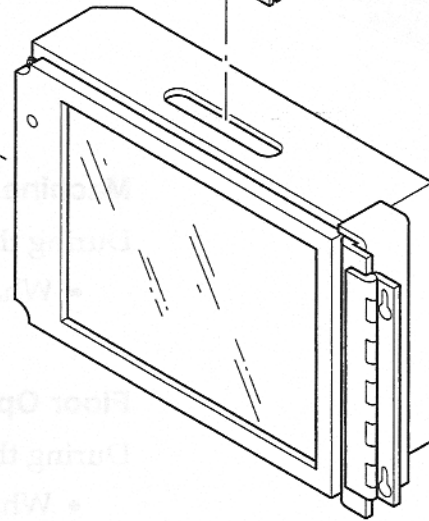COMPUTER

(TFT)
Thin Filled
Transistor

456 pc.
WINDOWS
95

CUSTOMIZED
ATTRACTS

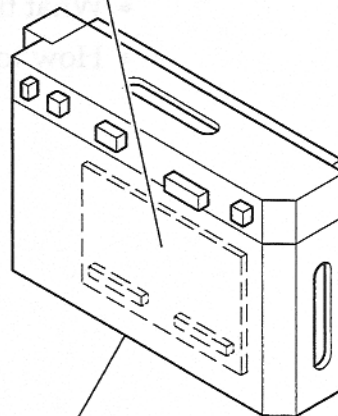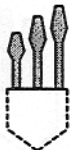LATEST WINDOWS
VERSION

BONUS GAME
MODULES

ATA

RFA

CUSTOMER
CARD
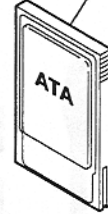
ITG0399-29

MULTIMEDIA
BOARD

LCD (REAR VIEW)

ITG0399-30

GENERAL COMPONENT DEFINITION

Liquid Crystal Display (LCD): A color, active-matrix display similar to a laptop computer. This display is located in the top box of Vision machines and is used to display bonus games, attract messages and a variety of diagnostic and set-up menus.

Resident Flash Array (RFA): A flash array that holds the operating system.

Advanced Technology Attachment (ATA): This PCMCIA flash card stores information that can be downloaded to the LCD by plugging it into PCMCIA drive on the unit.

Customer Card: A flash card that holds customized attracts designed by the customer.

GENERAL THEORY OF OPERATION

The "LCD" unit is a custom 486 laptop computer with an attached LCD display. IGT considers the LCD to be a field replaceable unit (FRU). There are a limited number of things that a technician can do to/with the LCD.

The LCD has 2 PCMCIA slots: one on the top and one on the side. The top slot holds the ATA card, a flash card that holds the bonus game(s) for the machine. This slot also accepts the RFA card when updating the Microsoft Windows 95 Operating System for the LCD, which is stored in FLASH memory on the main processor board for the LCD.

The side slot will accept a card containing customer-generated custom attracts. Those attracts can be generated by the customer using the customer's image and sound files and a program supplied by IGT called Vision Builder.

There are four to five connections between the Vision machine and the LCD.

At the LCD end, the connections are not labeled, but they are distinct from each other. They are:

- 2-pin M (P/J3) = Audio In
- 4-pin M (P9/J2) = Audio Out
- 4-pin F (J4) = Not Used
- 6-pin M (P/J 89A) = Connects to J5 of the communications board housed inside the AC power distribution module and is for RS-232 serial communications.
- 10-pin M (P/J3A) = NETPLEX

Liquid Crystal Display (LCD) Module

The +13 VDC and +25 VDC that originate in the power supply provide power to the LCD unit. The voltages are routed to the motherboard via J/P13, then out of the motherboard through J/P6, then on to J/P233 at the cabinet/topbox pass-through point, and ultimately connect to the 10pin M (P/J3A) NETPLEX connector of the LCD.

The LCD may or may not have a multimedia board attached to it. When present, the multimedia board adds three additional connectors to the LCD:

- J1 = 3.5MM Stereo Jack
- J2 = RCA Jack
- U17 = Connector on TV Tuner Module