



Queensland Government
Treasury

Queensland Office of Gaming Regulation

EGM Communications Interface

and

LAN Requirements

Version 2.0

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Glossary

| | |
|------|---|
| BMS | Basic Monitoring Service |
| EGM | Electronic Gaming Machine |
| FO | Fibre Optic |
| HCS | Hard Clad Silica (fibre optic cable type) |
| IGT | International Gaming Technology™ |
| LAN | Local Area Network |
| LMO | Licensed Monitoring Operator |
| QOGR | Queensland Office of Gaming Regulation |
| SC | Site Controller |

Policy:

All EGMs in the state of Queensland must be connected to an Electronic Monitoring System and communicate using the same communications protocol, communications interface and LAN.

Purpose:

The purpose of this document is to publish the minimum technical requirements for the following items:-

- The EGM Communications Interface used for the Basic Monitoring Service.
- The EGM LAN used for the Basic Monitoring Service.

This document also provides general information regarding EGM LANs.

Scope:

This document is applicable to EGM manufacturers, Licensed Monitoring Operators, Licensed Repairers and any party wishing to interface to the EGM LAN.

This document refers to "loops". This refers to the EGM fibre optic LAN loops running the QOGR EGM Protocol "QCOM". There may be additional fibre optic networks in a venue running other services. These requirements do not apply to them.

Responsibilities:

The EGM manufacturer is to supply the EGM Communications Interface (including the FO Interface card). The Licensed Repairer is responsible for supplying and installing the LAN.

1 Overview.

There are two communication interfaces in an EGM which are specified by this document. They are cascaded together. Starting at the EGM's CPU, the first specified interface is a RS-232 interface (refer section 4 for details). The EGM RS-232 interface plugs into the second specified interface, which is the EGM's Network Interface Card (also known as the Fibre Optic (FO) Interface Card). This cards outbound interface is low-grade plastic optical fibre, not glass. Refer section 7 onward for specifications.

The fibre optic communications interface on the EGM's interface card is via the "Versatile Link"™ fibre optic connection system (or equivalent). This is a compatible interface as used currently throughout Queensland Clubs and Hotels in the EGM fibre optic communication system operating the old I.G.T. EGM communications protocol at 9600 baud and the new QOGR protocol "QCOM" operating at 19.2k

baud on the same interface and LAN. The two protocols can co-exist on the same LAN at different baud rates.

The EGM manufacturer supplies gaming machines with the RS-232 connector, a 240VAC connector and mounting studs for the addition of the fibre optic interface card also supplied by the EGM manufacturer.

The EGM LAN will be cabled according to QOGR requirements and specifications in this document to allow easy switching between licensed monitoring operators without having to re-cable the LAN. This means for the Basic Monitoring Service only the LMO's Site Controller equipment will have to be changed in order to switch operators. However, if the venue changing LMOs has any other value added services through their current LMO (eg. a player loyalty system) then they will probably have to be changed also in order to switch LMOs

2 Historical Information

Operators and third parties may require the following technical background concerning interfaces on older EGMs and EGM LANs prior the introduction of LMOs in Queensland.

2.1 The Old EGM Communications Interface

This old interface was specific to older EGMs which operated the I.G.T. Communications Protocol (note, currently the I.G.T. Protocol is being phased out of Queensland and replaced with QCOM Protocol EGMs). The interface was similar to the new interface in that there is an RS-232 cable connected to a fibre optic interface card. (Note, an EGM may have its software upgraded to QCOM with having to upgrade the interface, as the old hardware is forwardly compatible.)

The differences between the current and old RS-232 interface are as follows.

The physical RS-232 interface connector at the EGM was via a 5-circuit MOLEX Single Row Connector, Series 70066G. Pins are Box Female Crimp Terminal Series 70058G.

Pin 1 is Not Connected (NC),
Pin 2 is EGM Tx,
Pin 3 is NC,
Pin 4 is EGM Rx,
Pin 5 is Ground.

The interface is in accordance with RS-232 specifications.

The RS-232 interface is located near four mounting studs for the connection to an old IGT fibre optic interface card mounted on the studs, the studs are the same as for the current interface.

The old IGT FO Interface card differs from the new FO Interface Card in the following ways.

The 240V connector to the IGT FO interface card was via a 2 Way AMP MATE N LOK plug (AMP Part 1-480698-0) with male pins to suit. There was also a M4 x 10mm earth stud to earth the FO Interface card to its back plane.

The IGT FO interface was also a FO repeater as per the new FO Interface cards but used the older Versatile Link FO system which utilised:

1 x High Performance 1M baud Transmitter (HFBR-1522)
1 x High Performance 1M baud Receiver (HFBR-2522)

The IGT interface cards have been verified to operate at speeds up to 115.2K baud. However, there is no guarantee existing EGM FO LANs will operate at speeds any higher than 9600 baud without first testing at the higher speed and possibly making some adjustments to the existing cabling to ensure the FO cable has been laid within tolerances for a higher speed.

The old interface FO transmitter/receivers are forwardly compatible with the new FO transmitter/receivers. (ie. the old FO interface cards can talk fine to a new FO interface card and vice versa)

At this time there are still a significant number of EGMs with this old communications interface in the field.

2.2 The Old EGM LAN

The old EGM LAN's consisted of fibre optic loops with no more than 64 EGMs per loop. The loops terminated at various points throughout the venue inside an EGMs console (where the cash box is located), where the now obsolete IGT SC was located. This SC was called an LCOM, short for Location COMunicator. Each LCOM SC had a 240V mains power connection via an IEC connector and a standard phone line connection (dial-in only).

Occasionally a stand-alone IGT FO interface was used as a booster repeater for very long cable runs. (Note, the new FO interface card has a much greater range and a booster is rarely needed.)

Ownership of all the old IGT fibre optic interface cards and all the fibre optic cable was given to the venues by the QOGR.

2.3 Other Information

It should also be noted that a small number of the IGT Game King™ EGMs used a custom built-in FO interface card. This card differed from the standard IGT FO interface card in the following ways:-

- It used the Low Current/Extended Distance 40K baud FO Transmitter (HFBR-1533¹). However, IGT have advised QOGR (6th June 1997) that they are changing to the HFBR-1522 FO Transmitter on all new IGT Game King FO interface cards supplied and fitted in I.G.T. Game King EGMs.
- There is no easily accessible 240V power connector, RS232 connector or mounting studs. This makes it difficult to tap into the EGMs RS-232 signal because there is none readily available. Its possible to find a 0-5V EGM transmit serial signal in the ribbon cable going to the interface card (wires 6 & 10, one of which is earth and the other is EGM tx, order unknown)

It is estimated about 400 Game King EGMs went out into the field with this configuration. It is not known how many are left at this time.

3 The EGM Protocols

There are two EGM protocols currently in use in Queensland Clubs and Hotels. They are;

The IGT Communications Protocol (currently being phased out)
The QCOM EGM Communications Protocol.

The specifications to both protocols above are available for down-load from the QOGR web site in the publications section.

It is acceptable to mix old EGMs running the existing I.G.T. protocol (operating at 9600 baud) and new EGMs running the new QOGR protocol (operating at 19.2k baud) on the same fibre optic loop. This practise is currently a short term measure in QLD venues until all the old IGT Protocol EGMs are phased out of the field. When the old EGMs are being polled the new EGMs will see garbage (which they are programmed to ignore) and vice versa when the new EGMs are being polled.

In addition, an LMO may also run (with the written approval of the QOGR), their own protocols over the EGM LAN on the condition it is transparent to the QOGR EGM protocols and does not adversely affect

¹ Important Note! The HFBR-x5x3 series is not compatible with the new x5x8 series fibre optics, but it is compatible with the older x5x2 series. This means if the next EGM in the loop had a new FO interface card then it may have trouble relaying data from a HFBR-1533.

their operation².

4 The EGM RS-232 Interface

All EGMs are required to have an RS-232 Interface to the following specifications.

This interface normally connects directly to the EGM's FO Interface card.

4.1 Physical Interface

4.1.1 The physical interface at the EGM must be via a 6 circuit, RJ-12 Connector.

Pass

4.1.2 The EGM RS-232 connector and cable shall be in accordance with the following:

| <u>Pin</u> | <u>Wire</u> | <u>Signal</u> | <u>Description</u> |
|------------|-------------|---------------|---------------------|
| 1 | | NC | No connection |
| 2 | Black | GND | Ground |
| 3 | Red | Tx | EGM RS-232 transmit |
| 4 | Green | Rx | EGM RS-232 Receive |
| 5 | Yellow | GND | Ground |
| 6 | | NC | No connection |

Pass

4.1.3 The overall cable colour must be cream. Austel approved, 4 way flat modular cable is recommended.

Pass

4.1.4 The cable must be of sufficient length to easily reach the EGM Fibre optic Interface mounting regardless of the orientation of the interface card.

Pass

4.2 Electrical Interface

4.2.1 The EGM RS-232 interface must be in accordance with standard EIA specifications. Eg. voltage levels, rise/fall times etc.

Refer data-sheet of driver I.C. Pass

4.2.2 The EGM RS-232 interface must be rated to at least 19.2k baud as per the EGM protocol document.

Refer data-sheet of driver I.C. Pass

4.2.3 The EGM must not place an undue current drain on any device connected to this interface in either the power on or off condition.

With a break-out box on the RS232 signals, look for dimming of the LEDs of the interface card signals with the EGM powered on and off

Pass

4.2.4 The EGM RS-232 interface must have at least +/- 15kV ESD protection (Human Body Model).

Refer data-sheet of driver I.C. Pass

² . Available bandwidth will also be taken into account when accessing this.

5 EGM FO Interface Mounting

- 5.1.1 FO interface mounting studs (4 x M4 x 10mm) are to be installed inside the EGM with a spacing of 145mm x 72mm. (Note, this is the same dimensions as the old FO interface card mounting studs.)
Pass
- 5.1.2 The mounting studs must be positioned so that the FO interface card and associated cables will not interfere with removal and installation of modular components (eg. hopper).
Pass
- 5.1.3 To allow easy access to connect the required cables to/from the interface card, there must be no obstructions within 50mm of the fibre-optic interface unit(see section 7.2.1 for dimensions).
Pass
- 5.1.4 Provide drawings of the position and orientation of the interface unit as it is to be installed within the machine. Note that the interface must be internal to the EGM cabinet.
Pass
- 5.1.5 The mounting studs must be appropriately located, so that when an Interface Card is mounted, its indicator LEDs (which are visible from the top of the card) are visible from the exterior of the EGM with its main door open without having to first remove the card. It is acceptable to first have to remove a single component of the EGM first (eg. the hopper) so long as no tools are required to do this.

It is totally unacceptable to have to remove the FO interface card in order to be able to see its indicator LEDs.

Pass

6 The EGM 240VAC FO Interface Power Supply

The EGM will provide power to the FO interface card according to the following specifications.

- 6.1.1 The FO interface card will be supplied with a 240VAC power supply and earth from the EGM, sourced inside after the EGM line filter and before the main power supply.
Pass
- 6.1.2 The power supply will have its own switch independent of the EGM's power supply and EGM mains power switch so the interface card remains powered even when the EGM's mains power switch is off.
Pass
- 6.1.3 The FO interface power switch must be clearly labelled "INTERFACE", "ON" and "OFF" and located in an inconspicuous position within the EGM and as far removed from the main power switch as possible.
Pass
- 6.1.4 The EGM interface power connector will be via a standard Right Angle IEC free socket connector.
Pass
- 6.1.5 The power connector lead will have sufficient length to reach any side of the interface card when mounted in the EGM.
Pass

6.1.6 The IEC cable must be wired according to Australian Standards. Pass

7 EGM Fibre Optic Interface Card Specifications

1.17.1 General

7.1.1 A FO interface card meeting these requirements must be provided by the EGM manufacturer with each new EGM. Pass

7.1.2 EGMs must at all times contain a FO interface card meeting these requirements, regardless of whether it is actually used.

7.1.3 The FO interface card must be an interchangeable component between EGM manufacturers. No EGM must require a specific brand of interface card. Pass

7.1.4 The FO interface card submission must contain the following;

- A circuit diagram
- A component layout diagram
- A track layout diagram
- Copies of electrical approvals, c-tick etc.

Pass

7.1.5 The interface card will consist of the following ports and connectors:-

- A FO Transmitter
- A FO Receiver
- A RS-232 port
- A power input connector

Pass

7.1.6 The FO interface card is a repeater. It must echo all received FO data-in and RS-232 data-in (wired as logical OR), to the FO data out. Pass

7.1.7 There must be a jumper on the FO interface card which when removed, disables the FO data-in from being echoed to the FO data out. This must not affect data to/from the RS-232 interface or any other function of the card. The jumper must default to on when the card comes from production.

Pass

With the jumper on or off, all indicator-LEDs must still function as defined (see 7.1.9).

Pass

Note, this jumper will require the addition of a pull-up resistor to maintain the correct signal to the FO tx.

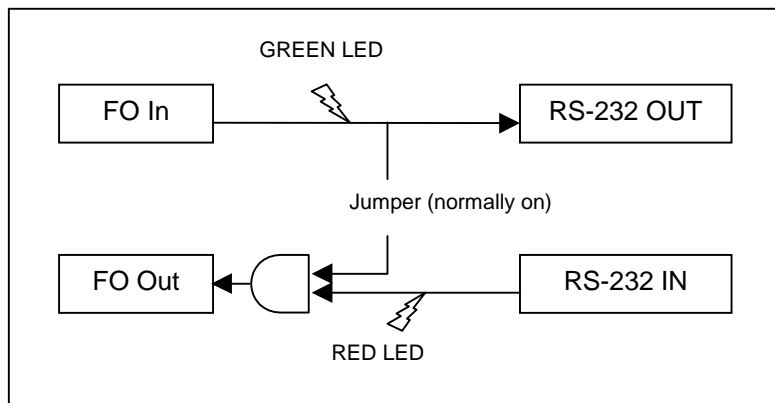
Pass

The jumper does not have to be accessible with the Interface card case on.

Pass

7.1.8 FO data-in must always be echoed to the RS-232 data-out (regardless of any jumper settings).

Pass



Interface Card Logic Diagram

- 7.1.9 The interface card must have the following indicator LEDs:
- A 240VAC power good LED (orange)
 - A FO Rx data LED (green), normally off
 - A RS-232 interface card Rx data LED (red), normally off
- Pass
- 7.1.10 The indicator LEDs must be clearly visible from the top of the interface card.
- Pass
- 7.1.11 With the interface card submission, please supply full circuit schematics, component cost and 'Mean Time Between Failure' (MTBF). Also state which component the MTBF applies to.
- Pass
- 7.1.12 The FO interface must have a cover with holes for indicator LEDs and connectors.
- Pass
- 7.1.13 The interface card must be electrically safe to operate while being held by hand and powered.
- Pass
- 7.1.14 If any part of the interface card casing is metal, then the case must be earthed.
- Pass
- 7.1.15 The case must be labelled with the following information:-
- Manufacturer name and model/part no.
 - All ports and connectors must be labelled according to their function
 - Fuse type and rating.
 - That the device is 240VAC
 - A laser warning, refer section 7.5.6
- Pass
- 7.1.16 The interface card must be designed with consideration to AS3260.
- Pass
- 7.1.17 All I.Cs on the interface card should have appropriate decoupling capacitors.
- Pass

7.1.18 The ICs on the interface card must operate from a regulated power supply. The IC voltages must be regulated with the voltage tolerances of its ICs for the specified operating range of the device (see 7.4.6).

Pass

7.2 Dimensions and Mounting

7.2.1 The EGM FO interface card must occupy a space with dimensions not exceeding:

Length: 155.0 mm

Width: 86.0 mm

Height: 60.0 mm* (* note the old IGT interface cards were only 42.0 mm)

Pass

7.2.2 The interface card must be mountable on four mounting studs as described previously. Note allow room to screw the nuts on.

Pass

7.2.3 Provision must be made for two fibre-optic cables and connectors to be passed through the base of the EGM (toward the back of the machine cabinet) and into the console (ie. where the cash-box is located), in such a manner such that the general public will not have access to the cable. The hole provided must have a diameter of not less than 20mm to enable the access of plastic fibre cable terminators. It is acceptable to have this hole shared with other cables.

Pass

7.2.4 The FO interface card must be an easily replaceable component.

Pass

7.2.5 The FO interface card must be located within the EGM so that all required cables may be easily attached once mounted.

Pass

7.3 The FO Interface Card RS-232 Port

This port normally connects the FO Interface Card to the EGM.

~~4.1.47.3.1~~ The FO Interface card must have at least one RS-232 port meeting the following specifications.

This port shall mate with the EGM RS-232 Interface as described previously with the following considerations:

7.3.2 The FO Interface Card RS-232 interface must be in accordance with standard EIA specifications. Eg. voltage levels, rise/fall times etc.

Refer data-sheet of driver I.C. Pass

7.3.3 The FO Interface Card RS-232 interface must not place an undue current drain on any device connected to this interface in either the power on or off condition.

With a break-out box on the RS232 signals, look for dimming of the LEDs of the interface card signals with the EGM powered on and off

Pass

7.3.4 The FO Interface Card RS-232 interface must have at least +/- 15kV ESD protection (Human Body Model).

Refer data-sheet of driver I.C. Pass

7.3.5 The FO RS-232 Interface must be rated to at least 115k baud.
Refer data-sheet of driver I.C. Pass

7.3.6 The physical interface must be via a 6 circuit, RJ-12 Connector. Pass

7.3.7 The FO RS-232 connector shall be in accordance with the following:

| <u>RJ-12 Pin</u> | <u>Signal</u> | <u>Description</u> |
|------------------|---------------|--------------------|
| 1 | NC | No connection |
| 2 | GND | Ground |
| 3 | Rx | RS-232 Receive |
| 4 | Tx | RS-232 Transmit |
| 5 | GND | Ground |
| 6 | NC | No connection |

Pass

7.4 FO Interface Power Connector and Fuses

7.4.1 The FO interface must connect to 240VAC power via a standard IEC Inlet connector and be earthed. Pass

7.4.2 The FO interface's internal fuse/s must be easily replaceable. Pass

7.4.3 The FO interface's internal fuse/s must be labelled with voltage and current rating. Pass

7.4.4 The FO interface card must be clearly labelled as a 240VAC device. Eg, "WARNING HIGH VOLTAGE INSIDE" Pass

7.4.5 Consideration must be given in the design of the FO interface power supply for power surges and sags.

7.4.6 The FO interface card must be capable of operating with the mains supply at 240VAC +10VAC -30VAC. Pass

7.4.7 EGMs must be electrically approved and tested for immunity to ESD and other power disturbances with the FO interface card installed and powered up. Provide evidence of all electrical testing and approvals with the interface card submission. Pass

7.4.8 The FO interface card transformer must comply with AS3108. Evidence of compliance must be provided with the FO interface submission. Pass

7.5 Fibre Optic Connectors

7.5.1 The FO interface card must use:

1 x High Performance 10M baud Transmitter HFBR-1528 (or equivalent)

1 x High Performance 10M baud Receiver HFBR-2528 (or equivalent)

Pass

These are low-grade fibre optics which use plastic optical fibre or HCS cable, not glass. It is a generation well below glass fibre, sitting in the 10Mbaud range, well suited for this application.

For more information on the Versatile Link system see:

www.semiconductor.agilent.com

7.5.2 The HBFR transmitters must be driven at the nominal current of $I_{Fdc} = 60\text{mA} @ 25\text{C}$

7.5.3 The interface card, FO transmitter and FO receiver circuits must be able to operate at speeds up to 10M baud over 50 metres of low loss plastic FO cable (@ 25 C) as per Versatile Link specifications.

7.5.4 Supply evidence of the required FO speed operation with the FO interface card submission to QOGR.

7.5.5 The HBFR-x528 data-sheet recommended transmitter and receiver driver circuits must be used. Also read the HBFR-x528 series application notes. This document contains important information regarding the circuit layout (eg. bypass capacitor near FO Rx, Rx ground plane, etc).

Pass

7.5.6 "When viewed under some conditions, the optical port may expose the eye beyond the maximum permissible exposure recommended in ANSI Z136.2, 1993. Under most viewing conditions there is no eye hazard". Refer data sheet.

While a warning label is not required for this class for FO by ANSI, it is required under these requirements that the FO interface card must have an appropriate warning label. eg. either use the above message or the equivalent, or the appropriate symbolic laser class symbol, or both.

Pass

8 The EGM Local Area Network

This section is applicable only to EGM fibre optic loops running the IGT and QCOM Protocols.



8.1 The FO LAN

- 8.1.1 The local area network to be provided as a part of the BMS will be multi-point half-duplex communication fibre optic loops.
- 8.1.2 All loops must return to a central point in the site to allow for both a centralised Site Controller or distributed Site Controller arrangements
- 8.1.3 LMOs must always provide this fibre optic network arrangement as a part of the mandatory minimum level of monitoring, whether or not their monitoring system actually uses it.

However, an LMO may offer at a negotiated price (eg. in order to provide bandwidth for their additional value-added services over the LAN), an upgrade of the LAN to full-duplex, point-to-point cabling or other network media. This is acceptable only on the condition that the mandatory EGM multi-point fibre optic loops are always present, intact and ready so the site can still easily change operators without re-cabling or replacing the LAN.
- 8.1.4 The site must own their EGM FO LAN. This is to ensure if the site decides to switch LMOs, that the FO cabling does not need to be removed..
- 8.1.5 EGM FO LANs must be cabled as half-duplex multi-point loops, with preferably no more than 32 EGMs per loop and absolutely no more than 64 EGMs per loop. New monitoring systems are required to handle a minimum of 32 EGMs per loop, check the venues LMO before adding more.

Where convenient, more loops of fewer EGMs are better than one large loop, for reasons of fault tolerancy. ie. with this type of LAN and protocol, if one FO interface fails, then all EGMs on the same loop will also disable.

-
- 8.1.6 Connectors on the fibre optic cabling must be colour coded. Either Blue or black to match the EGM FO receiver and light grey for EGM FO transmitter.
- 8.1.7 Each FO loop pair returning to the centralised point at the site must be individually labelled for identification.
- 8.1.8 Cable run lengths must be within the Guaranteed System Performance for the HBFR-0508 series (or equivalent) for the selected cable type.

Refer data-sheet, "Plastic Optical Fiber and HCS ® Fiber Cable and Connectors for Versatile Link", available from Versatile Link web page quoted previously.

8.2 Fibre Optic Cable types

- 8.2.1 There are 3 cabling options for optical fibre used by the interface card;

- Low Cost Standard (plastic)
- High Performance Extra Low Loss (plastic. Recommended)
- Hard Clad Silica (HCS) (good for very long runs)

For most cable runs, which are relatively short, eg. from EGM to EGM, the high performance plastic cable is recommended. For longer runs, HCS cable type may be considered rather than using stand-alone fibre optic repeater boxes.

Pre-terminated 3m lengths of HPELL cable can be purchased from some dealers.

8.3 Site Cabling Diagrams

- 8.3.1 The LMO must keep current, up to date site cabling diagrams of every site signed up with them. The site diagrams must be stored on-line at the LMO, in Portable Document Format (PDF), for down-loading to QOGR upon request.
- 8.3.2 An up to date, hard copy of a sites cabling diagram must be lodged with the site at all times.
- 8.3.3 Site diagrams must display at least the following information:
- Site and floor plan (location of walls, doors, toilets, bars, function rooms and other major items)
 - Site details; name, location, no. of EGMs etc.
 - Show all EGMs in their respective locations labelled with Manufacturer I.D. and Serial Number.
 - Location of Site Controller/s.
 - All LAN cabling.
 - Loop/cabling I.D. numbers.

8.4 Notes on Debugging Fibre Optic EGM Loops

This section is applicable only to EGM fibre optic loops running the IGT and QCOM Protocols.

One advantage of the type of fibre optic system used by the interface card specified in this document, is that it can be effectively debugged using the naked eye³ and without the use of any special tools. The health of a active signal at the end of a terminated cable can be gauged by the eye by comparison.

³ Refer section 7.5.6. Avoid looking directly down a FO transmitter port or active cable.

The quality of a terminated cable can also be found by inspecting the cable end using a good magnifying glass (don't do this when cable is active). This is rarely necessary when pre-made terminated cable lengths are used.

A common problem occurs when a cable is disconnected by pulling on the cable instead of the terminator, the fibre optic end recedes down inside the terminator so it is no longer flush with the very end of the terminated cable. This degrades a signal significantly. Disconnecting a fibre optic cable by pulling on the cable should be avoided.

8.4.1 Broken Loops.

Broken loops are easy to debug, it's an all or nothing situation and is simply a matter of finding where the signal stops.

8.4.2 Weak Loops.

These are harder to debug. It is possible to have a weak area in the middle of a loop, where EGMs on either side of the weak point are talking normally. This is because the FO receivers are actually an I.C that work to restore a dirty signal. Weak loops have trouble with sending long messages as opposed to shorter ones. Weak loops can also be temperature dependent, heat will make a problem worse.

One approach to repair a weak loop is to perform an inspection of the overall health of the signal at each receiver. When all receivers have been inspected, go back and start at the signal which looked the weakest (the dimmest) and improve its quality, then work backwards to the next dimmest until the problem is fixed. Another good indicator of where the problem lies is around the point where it is obvious EGMs are having trouble communicating via their on-screen messages. (Refer to the QCOM protocol for a description of Communications Disabling Conditions and codes.)

If this doesn't work then it may be an intermittent problem, see below.

8.4.3 Intermittent problems

Not necessarily a cabling problem but a faulty interface card, EGM RS-232 port or cable or EGM software. This is tricky to debug because the culprit may disrupt the communications of another EGM making it look like the problem. The technique of by-passing interface cards to isolate the problem works well. Selectively unplugging EGMs from the loop also works well.

One thing to check is to unplug the FO loop from the SC and confirm there is no data being received as should be the case. If there is any data then that will be the problem and should now be easy to find by working backwards.

9 Snooping the Loops

Suppliers of third party systems such as player loyalty systems, EGM performance/management systems and jackpot systems, often need to listen to information transmitted over the EGM loops running the QOGR EGM Communication Protocols in order to operate, usually in order to obtain EGM turnover. This section lists relevant requirements for this purpose.

Third party listening of EGM communications is acceptable only with the written approval of the QOGR and the verbal permission from each licensed gaming venue the third party wishes to install their system.

Third parties must make a written submission to the QOGR in order to obtain QOGR approval to tap into EGM communications. The submission must comprise of a covering letter of intent, a full functional description of the system, manuals, technical details and specifications of their LAN and tap-in methodology (most important).

9.1 General Requirements for Methods of Tapping EGM Communications

Only the LMO's monitoring system may transmit data onto an EGM loop unsolicited, or disrupt loop/EGM communications. As a failsafe, third party equipment must have no physical connection to be able to transmit data onto an EGM loop, or to an EGM, or to disrupt EGM/SC communications in any way. The only allowed exception to this rule, is when the third party's equipment communicates in cooperation with the existing SC and the third party has the LMO's and the QOGR's written consent to transmit.

Be advised that if any approved third party tap in is subsequently found by the QOGR to cause any problems or degradation of the existing EGM LAN in a venue, then it will be immediately removed/disabled without notice by the QOGR. Approval for the third party tap will be also suspended.

Note the QOGR reserves the right to change the communications protocols at any time. Notice of any pending changes will be posted on the QOGR web pages in the 'publications' section – technical.

All tap-ins must be neat and electrically sound. Note also the historical section in this document, which details differing hardware in the field will also have to be taken into account to cater for the different type of hardware which still exists in the field.

All Y-split cables used for tapping communications or power must be approved.

There are a number of methods possible to 'snoop' data from an EGM communications loop. Requirements for some of the main methods are listed as follows:-

1. Add a stand alone FO interface card at the end of a loop and tap into its RS-232 port.

This is the QOGR's preferred method for reasons of better electrical isolation. It also avoids having to handle differences with some of the older EGM RS-232 interfaces (refer section 2).

2. Tap-in at each EGM via the EGM's RS232 cable.

If a party desires to tap in at each EGM's RS232 port then it must comply with the following requirements:-

- The tap-in must draw as little current from the existing RS-232 signal as possible to avoid signal degradation.
 - An RS-232 signal may only be split once per EGM.
 - If the third part brings a wire out of the EGM, then the RS-232 tap-in must be via a high impedance optically isolated tap in. (A typical optically isolated tap-in uses a with a 10K input resistor coupled with a 1N914 diode with a 1N138 opto-coupler.)
 - A neat RS-232 Y-split cable must be used.
 - If power is required from within the EGM then a 240VAC IEC Y-split cable must be used.
3. Replace the FO Interface cards with a new card with extra ports.
 - This is quite acceptable so long the interface card is approved and meets the requirements in this document.
 - The owner of the EGM must always own the FO interface card placed in it.

Revision History

Version 2.0 Draft 8 August, 2001 R.Larkin

Converted to word.
General review.
Added check points.
Relaxed maximum EGMs per loop some (8.1.5).
Added an additional FO interface card mounting requirement (5.1.5)
Laser warning message now mandatory (7.5.6)
Increased space around FO interface card (5.1.3)
Venues must own their LAN (8.1.4)

Version 1.4 11 November, 1997 R.Larkin

Changed EGM electrical interface back to RS-232 for backward compatibility with existing EGMs
Other changes are minor, refer red-line and strike-out.

Version 1.1 20 June, 1997 R.Larkin Based on Version 1.0

Changes were extensive, they are summarised below:

Added Chapter on existing IGT interface and LANs.
Due to popular request, added requirements in order to make the new interface an interchangeable (between different EGM manufacturers) component.
Changed interface card FO transmitter from HFBR-1522 to 1528 to correctly allow the use of HCS FO cable. (The HFBR-0508 series is the same price as the HFBR-0502 series, however there appears to be a much greater lead time in ordering).
The FO interface card DC power input must now be rated 9-12VDC instead of 9V only.

Version 1.0 22 April, 1997 R.Larkin