

**Bingo and casino equipment technical
requirements**

July 2008

Contents

Introduction	4
PART I - Casino equipment technical requirements	
Game requirements	5
Speed of play	
Display of information on players' game devices	
Random number generation	6
Random number generation	
Mechanically based RNG games	
Scaling algorithms	
Electronic device and server based system requirements	6
General requirements	
Service interruption and resumption	
Previous game recall on electronic gaming devices	
System clocks	
Cashless play	
Printers	
Ticket validation	
Specific error conditions and alert requirements	8
Wireless network systems	8
Network coverage	
Network failure	
Communication requirements	
Power level display requirements	
Audit requirements	
PART II Bingo equipment technical requirements	
Game requirements	9
Definitions	
Main stage prize information board	
Display of information on players' game devices	
Random number generation	11
Random number generation	
Mechanically based RNG games	
Mechanical ball mixing method	
Scaling algorithms	

Electronic device and server based system requirements	12
General requirements	
Service interruption and resumption	
Determination of winners	
System clocks	
Cashless play	
Printers	
Ticket validation	
Specific error conditions and alert requirements	14
Wireless network systems	14
Network coverage	
Network failure	
Communication requirements	
Power level display requirements	
Audit requirements	
Bingo tickets	15
Bingo tickets	
Ticket limit on electronic bingo-card marking (EBM) devices	
Automatic game determinant marking	

1 Introduction

The Gambling Act 2005 (the Act) gives the Gambling Commission (the Commission), as part of its statutory role, the power to attach conditions to operating licences about equipment used in connection with gambling activities (section 85). In addition, the Commission has the power to set technical standards for remote gambling systems (including software) (section 89). Appropriate conditions have been attached to non-remote and ancillary remote bingo and casino operating licences.

These technical requirements will regulate bingo and casino equipment in two different situations: (a) equipment that is used on premises in Great Britain to provide casino games and bingo games to the public and (b) equipment used to provide such games in gambling premises by means of a remote communication system, where the provider is regulated by the Act. These Requirements cover a variety of equipment including a 'live' roulette wheel and bingo tickets. They do not cover gaming machines.

With the following exceptions, these technical requirements will come into force on 31 August 2008 and will replace the technical requirements published on 1 June 2007. The requirements of paragraphs 3.5d and 3.5e of the casino technical requirements and paragraphs 3.5d and 3.5e of the bingo technical requirements will come into force on a date or dates later than 31 August 2008, and the Commission will give at least three months notice of their implementation.

PART I: Casino technical requirements

Implementation

These requirements apply to gambling related equipment (excluding gaming machines) sited in licenced casinos after 31 August 2008.

1 Game requirements

Speed of play

- 1.1** An electronic terminal that gives a player the opportunity to bet on the outcome of a fully automated 'real' game must ensure that the game cannot be played at a speed significantly faster than the manually operated equivalent and that the player is given adequate time to place their initial and any subsequent bet(s) within the game.

For fully automated 'real' games played using electronic terminals the following game frequency must not be exceeded:

- a. games of roulette: 50 games per hour
- b. games played using dice: 50 games per hour
- c. games played using cards: 50 games per hour

Where electronic terminals provide a player with the opportunity to play multiple 'real' games on the same terminal, then the terminal must limit the play to a single game at a time. That is, the player must not be given the opportunity to stake on a second game until the first game is completed.

Display of information on players' game devices

- 1.2** Game devices must be capable of clearly displaying (either on screen or via labelling attached to the device), the following information:
- a. cost of bet(s) or stake(s) to play the game
 - b. prize amounts available within the game, or the information necessary to calculate the prize amounts, for example, the odds for each type of bet in a game of roulette
 - c. players' credit held on the system
 - d. information describing how the game is played on the device – this is optional if the method of playing the game on the device is identical to the method of playing the actual table game
 - e. information on how to gamble responsibly and help for problem gamblers; and alarm or fault information when needed

The game itself should be displayed in a recognisable form such that the player is able to follow the play and interact appropriately.

2 Random number generation

Random number generation

- 2.1** Random number generation (and game results) must be 'acceptably random'. Acceptably random here means that it is possible to demonstrate to a high degree of confidence that the output of the random number generators (RNG) is random, through, for example, statistical analysis using generally accepted tests and methods of analysis.

Random number generators should be capable of demonstrating the following qualities:

- a. the output from the RNG is uniformly distributed over the entire output range
- b. the output is unpredictable, ie it is computationally infeasible to predict what the next number will be, given complete knowledge of the algorithm or hardware generating the sequence, and all previously generated numbers
- c. random number generation does not reproduce the same output stream (cycle), and that two instances of a random number generator do not produce the same stream as each other (synchronise)
- d. any forms of seeding (the process of initialising the random number generation process) and re-seeding used do not introduce predictability
- e. any scaling applied to the random output complies with a) to d) above

Mechanically based RNG games

- 2.2** Mechanically based RNG games are games that use the laws of physics to generate the outcome of the game and must conform to the following rules:
- a. they must meet the requirements of Section 2.1
 - b. the mechanical pieces must be constructed of materials that prevent decomposition of any component over its lifetime (for example, a ball must not disintegrate)
 - c. the properties of physical items used to generate the random outcome must not be altered

Scaling algorithms

- 2.3** If a random number with a range shorter than that provided by the RNG is required for some purpose within the gaming device, the method of re-scaling, (ie converting the number to the lower range), must be designed in such a way that all numbers within the lower range are equally probable.

Randomisation with varying class size

- 2.4** Where a game is played using a finite set of randomised outcomes, eg a shuffled deck of cards, each outcome within the set must initially be equally probable as per Section 2.1 to 2.3 above. However, it is accepted that as the finite set reduces in number, the outcome may become more predictable as the game progresses.

3 Electronic device and server based system requirements

General requirements

- 3.1** The following must apply:
- a. any server used in the gaming process must be housed securely
 - b. an audit trail for all financial transactions, errors and significant events must be maintained either on the electronic device, on the server, or by some other secure means, such that it can be accessed for compliance audit purposes
 - c. data must be regularly backed-up and the back-up stored in a secure location

Errors and significant events and the methods of dealing with them are listed in section 4 below.

Service interruption and resumption

- 3.2** Operators must take all reasonable steps to ensure that their policies for dealing with service interruptions are fair and do not systematically disadvantage customers.

The system must not be adversely affected by the simultaneous or sequential activation of any inputs and outputs, such as 'play buttons', which might, whether intentionally or not, cause malfunctions or invalid results.

Where a peripheral device such as a note acceptor (accepting a note) or printer (printing a ticket/credit note) is in operation during a power failure it must, where practicable, on resumption of the power either complete or restart the task successfully or display an error message indicating that such a fault has occurred. The error message must remain until the fault has been resolved by either the automatic operation of the device or by the operator. In all circumstances the metering or audit controls must be able to identify any accounting anomalies for dispute resolution purposes.

Previous game recall on electronic gaming devices

- 3.3** Information about the current game and previous games played must always be available to view for dispute and/or complaint resolution purposes on the operation of a suitable external key-switch, or other secure method that is not available to the player. Last play information must provide all information required to fully reconstruct the game play. All values must be displayed, including the initial credits, credits bet, credits won, and credits paid. The information must include the final game outcome, including all player choices and game features.

Historic game data must be stored such that it can be called upon for evidential purposes in the event of a dispute and/or complaint. If the data is required to resolve a continuing dispute or complaint and the system is incapable of continuing to operate without overwriting or losing that historic data, then the pertinent data must be stored 'offline' until the dispute and/or complaint is satisfactorily resolved.

System clocks

- 3.4** The following must apply:
- a. gambling devices / systems used in a casino which incorporate an internal clock must use the time to provide an accurate time stamp of all financial transactions, errors and significant events
 - b. all clocks or clock systems related to gambling within a casino that can be adjusted shall be set to the correct time

Cashless play

- 3.5** Where a gaming device has the facility to accept a stake or participation fee from, and make payment of a prize to, the same medium of cashless payment, for example a smartcard ('the medium'), then the requirements of this section must be complied with. For the avoidance of doubt, neither ticket in and out (TITO) systems nor tokens are required to comply with this section. For the purposes of this section a 'token' is an object with a fixed monetary value (whether or not exchangeable for cash) that may be used for the purpose of paying a stake or participation fee or crediting a gaming device.

The following will also apply:

- a. a secure player account database must be held within the system
- b. the system must allow the player to retrieve their funds at any reasonable time when the venue is open
- c. a facility must be available on the premises which will show the player their current monetary balance held on the medium without the requirement to transfer funds or a game having to be played. Such a facility must not offer any inducements to the player to commit money for play or further play

- d. a gaming device must have the facility to enable it to be rendered incapable of accepting funds from the medium at any time when the account holder has entered a self-exclusion agreement in respect of the premises where the device is sited. Activation and de-activation of such facility must require action by the site operator
- e. the players must have the facility to track and/or limit the amount of money they are able to deposit into the medium over a given period of time. The limit that the individual chooses to impose may only be set or modified once in any 24 hour period

Printers

- 3.6** If a gaming device is equipped with a printer that is used to make payments, it must be located in a locked or otherwise secure area of the gaming device (for example, require opening of the main door to access).

The printed ticket/voucher/hand pay receipt ('the ticket') must display sufficient information to allow the following to be determined:

- a. details of where and when the ticket originated
- b. details of the transaction type (for example, cash out ticket, hand pay receipt)
- c. value of the ticket
- d. unique ticket identifier (for example barcode and validation number)

This data must be stored such that it is available for audit or dispute resolution purposes.

Ticket validation

- 3.7** Payment by ticket printer as a method of credit redemption is only permissible when there is an independent means to validate the printed ticket/voucher/hand pay receipt prior to any credit or other type of redemption. The validation system must be able to identify duplicate tickets to prevent fraud by reprinting and redeeming a ticket that was previously issued.

This data must be stored such that it is available for audit or dispute resolution purposes.

4 Specific error conditions and alert requirements

- 4.1** Devices must detect, display and alert the operator to the types of error conditions and significant events listed below. If the error or event affects the game-play in any way then the device should 'lock up' and allow no further game-play until the error or event is cleared either automatically or by operator intervention.
- a. events/errors related to payment to play, eg coins, notes
 - b. events/errors related to operation of the device, eg battery failure, programme error
 - c. events/errors related to security, eg door open
 - d. events/errors related to payouts, eg printer jam, hopper empty

5 Wireless network systems

Network coverage

- 5.1** If a gaming device is designed to allow players to participate using a wireless network the following must be complied with:
- a. unless denoted by clear signage, there must be no areas where players may participate in any gambling using such a device where the communication signal is:
 - i. not available
 - ii. of poor quality such that interruptions in play would be likely
 - b. there must be adequate wireless coverage so that the failure of a single transmitter does not significantly reduce the players' ability to participate in the game. This does not prohibit the use of a single transmitter

Network failure

5.2 Where a network failure occurs:

- a. all devices must alert the player of the failure as soon as it is possible to do so. It is permissible for a device to continue with any game if the network connection is restored provided that the player is not disadvantaged in any way
- b. a manual alternative method of play (for example, keying in game outcome or other element as opposed to an automatic download via wireless network) is permissible where there is no disadvantage to the player and where there is adequate time to do so. Catch up facilities (for example, button pressed to bring device up to current position within game) may be used where the game that was in play when the network failure occurred has not been completed

Communication requirements

5.3 All protocols must use communication techniques that have proper error detection and/or recovery mechanisms which are designed to prevent unauthorised access or tampering, employing Data Encryption Standards (DES) or equivalent encryption with secure seeds or algorithms.

Power level display requirements

5.4 Portable devices must give warnings when the battery life of the device reaches a low level.

Audit requirements

5.5 An audit log of sufficient time stamping of significant events must be maintained so as to be able to resolve any player disputes arising as a result of timing issues. It must be possible to display the audit log on the site operator's premises.

The Commission does not intend to set out exact requirements for time stamping of significant events as it is considered better that the manufacturer do so on the basis of the overall system design.

PART II: Bingo technical requirements

Implementation

These requirements apply to gambling related equipment (excluding gaming machines) sited in licenced bingo premises after 31 August 2008.

However, in the circumstances referred to below, equipment used for the playing of interval bingo games (as defined at 1.1) need not adhere to the following requirements:

- section 1.3
- section 3.1b
- section 3.2
- section 3.4a

The circumstances referred to above are where the player plays the interval bingo game using bingo tickets (or representations thereof) which are not presented to the player in an electronic (virtual) form. If such games are presented to the player partly using electronic (virtual) tickets and partly using non electronic forms of tickets then the portion of the game played using the electronic (virtual) tickets must comply with these technical requirements in full.

1 Game requirements

Definitions

1.1 Main Stage Bingo Game: This is the primary game (or games) played in any bingo session, involving physical (paper) and/or virtual (electronic) tickets which are typically purchased before the bingo session starts.

Interval Bingo Game: This is any game played outside of sessions of 'main stage bingo'. Entry into interval games is typically purchased prior to each game starting. An example of an interval game would be 'mechanised cash bingo'.

Prize information board

1.2 The prize information board together with any associated boards (if needed) must display the information listed below at all times during the game session (scrolling displays are permitted); and the vast majority of players must have a clear and unobstructed view of the board(s) during play, unless they can clearly view the same information, in real time, by other means.

Information to be displayed for main stage games:

- a. opening and closing numbers of tickets. Physical (paper) and virtual (electronic) tickets must be displayed separately. There must be provision to display both sets of numbers from any split series permutations
- b. total number of tickets in the game (whether tickets are paper, virtual or otherwise)
- c. total number of tickets not in the game, eg spoiled or unsold
- d. total prize fund (this may be subdivided into its constituent parts if required)
- e. details of allocation of prizes, eg one line, full house, value etc
- f. information to allow players to identify the ticket in play, eg book colour, page
- g. all previously called numbers within the game
- h. last number called

Additionally, during claim checking, a representation of the ticket being checked, including its relevant serial or permutation numbers must be shown, together with its status (valid, not valid, already checked).

If equipment manufactured before 31 August 2008 does not have the capability to display the information required at (f) above, the player must be provided with that information by some other means (eg orally).

Information to be displayed for interval bingo games:

- a. game number
- b. game type (eg prize, cash)
- c. cost per game (unless this is indicated orally to players)
- d. number of boards in play for linked games and number of boards or players in play for standards games
- e. prize (cash prizes only; non-cash prizes can be announced by other means)
- f. last number called

Additionally, during claim checking, a representation of the ticket being checked, including the card number, must be shown, together with its status (valid, not valid, already checked).

If equipment manufactured before 31 August 2008 does not have the capability to display the information required at (b) above, the player must be provided with that information by some other means (eg orally).

Display of information on players' game devices

- 1.3** Game devices must be capable of clearly displaying (either on screen or via labelling attached to the device), the following information:
- a. the information to be displayed for main stage games listed at 'a' to 'h', and information to be displayed for interval bingo games listed at 'a' to 'f', in Section 1.2, unless and to the extent the player can clearly see the prize information board(s) (or the same information in real time) during play
 - b. the operator's policy on the charging of participation fees and the proportion of stakes to be paid out by way of prizes. This is optional if the player can clearly see this information from their playing position, eg on the prize information board(s), or clearly at the point of ticket purchase
 - c. players' credit held on the system
 - d. price of play information
 - e. information describing how the game is played on the device – this is optional if the method of playing the game on the device is identical to the manual method of playing the game
 - f. information on how to gamble responsibly and help for problem gamblers
 - g. alarm or fault information when needed

The game itself should be displayed in a recognisable form such that the player is able to follow the play and interact appropriately.

2 Random number generation

Random number generation

- 2.1** Random number generation (and game results) must be 'acceptably random'.

'Acceptably random' means that it is possible to demonstrate to a high degree of confidence that the output of the random number generators (RNG) is random, through, for example, statistical analysis using generally accepted tests and methods of analysis.

Random number generators should be capable of demonstrating the following qualities:

- a. the output from the RNG is uniformly distributed over the entire output range
- b. the output is unpredictable, ie it is computationally infeasible to predict what the next number will be, given complete knowledge of the algorithm or hardware generating the sequence, and all previously generated numbers
- c. random number generation does not reproduce the same output stream (cycle), and that two instances of a random number generator do not produce the same stream as each other (synchronise)
- d. any forms of seeding (the process of initialising the random number generation process) and re-seeding used do not introduce predictability
- e. any scaling applied to the random output complies with a) to d) above

Mechanically based RNG games

- 2.2** Mechanically based RNG games of bingo are games that use the laws of physics to generate the outcome of the game and must conform to the following rules:
- a. they must meet the requirements of Section 2.1
 - b. the mechanical pieces must be constructed of materials that prevent decomposition of any component over its lifetime (for example, a ball must not disintegrate)
 - c. the properties of physical items used to generate the random outcome must not be altered

Mechanical ball mixing method

- 2.3** A mechanical device that uses air flow for mixing and randomly withdrawing balls to determine the letters, numbers or symbols to be used in a game of bingo must operate in the following manner:
- a. it must follow the rules for mechanically based RNG games
 - b. it must allow participants full view of the mixing action of the balls
 - c. it must not be possible to change the random placement of the balls at the exit receptacle of the device, except when the device is shut off

Scaling algorithms

- 2.4** If a random number with a range shorter than that provided by the RNG is required for some purpose within the gaming device, the method of re-scaling, (ie converting the number to the lower range), is to be designed in such a way that all numbers within the lower range are equally probable.

Randomisation with varying class size

- 2.5** Where a game is played using a finite set of randomised outcomes, eg a set of bingo balls; each outcome within the set must initially be equally probable as per Section 2.1 to 2.4 above. However, it is accepted that as the finite set reduces in number, the outcome may become more predictable as the game progresses.

3 Electronic device and server based system requirements

General requirements

- 3.1** The following must apply:
- a. any server used in the gaming process must be housed securely
 - b. an audit trail for all financial transactions, errors and significant events must be maintained either on the electronic device, on the server, or by some other secure means such that it can be accessed for compliance audit purposes
 - c. data must be regularly backed-up and the back-up stored in a secure location

Errors and significant events and the methods of dealing with them are listed in section 4 below.

Service interruption and resumption

- 3.2** Operators must take all reasonable steps to ensure that their policies for dealing with service interruptions are fair and do not systematically disadvantage customers.

The system must not be adversely affected by the simultaneous or sequential activation of any inputs and outputs, such as 'play buttons', which might, whether intentionally or not, cause malfunctions or invalid results.

Where a peripheral device such as a note acceptor (accepting a note) or printer (printing a ticket/credit note) is in operation during a power failure it must, where practicable, on resumption of the power either complete or restart the task successfully or display an error message indicating that such a fault has occurred. The error message must remain until the fault has been resolved by either the automatic operation of the device or by the operator. In all circumstances the metering or audit controls must be able to identify any accounting anomalies for dispute resolution purposes.

Determination of winners

- 3.3** Any determinant used in the game of bingo and distributed by any form of network must be transmitted simultaneously to all player devices designed to receive such information within that game. The receiving devices must be able to present the appropriate information such that no player is disadvantaged by the introduction of any delay.

This requirement does not apply to different venues involved in 'non simultaneous linked bingo games', providing that all players within a single venue receive their determinants simultaneously.

System clocks

- 3.4** The following must apply:
- a. gambling devices / systems used in a bingo club which incorporate an internal clock must use the time to provide an accurate time stamp of all financial transactions, errors and significant events
 - b. all clocks or clock systems related to gambling within a bingo club that can be adjusted shall be set to the correct time

Cashless play

- 3.5** Where a gaming device has the facility to accept a stake or participation fee from, and make payment of a prize to, the same medium of cashless payment, for example a smartcard ('the medium'), then the requirements of this section must be complied with. For the avoidance of doubt, neither ticket in and out (TITO) systems nor tokens are required to comply with this section. For the purposes of this section a 'token' is an object with a fixed monetary value (whether or not exchangeable for cash) that may be used for the purpose of paying a stake or participation fee or crediting a gaming device.

The following will also apply:

- a. a secure player account database must be held within the system
- b. the system must allow the player to retrieve their funds at any reasonable time when the venue is open
- c. a facility must be available on the premises which will show the player their current monetary balance held on the medium without the requirement to transfer funds or a game having to be played. Such a facility must not offer any inducements to the player to commit money for play or further play
- d. a gaming device must have the facility to enable it to be rendered incapable of accepting funds from the medium at any time when the account holder has entered a self-exclusion agreement in respect of the premises where the device is sited. Activation and de-activation of such facility must require action by the site operator
- e. the players must have the facility to track and/or limit the amount of money they are able to deposit onto the medium over a given period of time. The limit that the individual chooses to impose may only be set or modified once in any 24 hour period

Printers

- 3.6** If a gaming device is equipped with a printer that is used to make payments, it must be located in a locked or otherwise secure area of the gaming device (for example, require opening of the main door to access).

The printed ticket/voucher/hand pay receipt ('the ticket') must display sufficient information to allow the following to be determined:

- a. details of where and when the ticket originated
- b. details of the transaction type (for example, cash out ticket, hand pay receipt)
- c. value of the ticket
- d. unique ticket identifier (for example, barcode and validation number)

This data must be stored such that it is available for audit or dispute resolution purposes.

Ticket validation

- 3.7** Payment by ticket printer as a method of credit redemption is only permissible when there is an independent means to validate the printed ticket/voucher/hand pay receipt prior to any credit or other type of redemption. The validation system must be able to identify duplicate tickets to prevent fraud by reprinting and redeeming a ticket that was previously issued.

This data must be stored such that it is available for audit or dispute resolution purposes.

4 Specific error conditions and alert requirements

- 4.1** Devices must detect, display and alert the operator to the types of error conditions and significant events listed below. If the error or event affects the game-play in any way, then the device should 'lock up' and allow no further game-play until the error or event is cleared either automatically or by operator intervention:
- a. events/errors related to payment to play, eg coins, notes
 - b. events/errors related to operation of the device, eg battery failure, programme error
 - c. events/errors related to security, eg door open
 - d. events/errors related to payouts, eg printer jam, hopper empty

Equipment used for the playing of interval bingo games but which by reason of its design cannot meet the above requirement must indicate to the player whether they are entered into the game.

5 Wireless network systems

Network coverage

- 5.1** If a gaming device is designed to allow players to participate using a wireless network the following must be complied with:
- a. unless denoted by clear signage, there must be no areas where players may participate in any gambling using such a device where the communication signal is
 - i. not available
 - ii. of poor quality such that interruptions in play would be likely
 - b. there must be adequate wireless coverage so that the failure of a single transmitter does not significantly reduce the players' ability to participate in the game. This does not prohibit the use of a single transmitter

Network failure

- 5.2** Where a network failure occurs:
- a. all devices must alert the player of the failure as soon as it is possible to do so. It is permissible for the device to continue with any game if the network connection is restored provided that the player is not disadvantaged in any way
 - b. a manual alternative method of play (for example, keying in game outcome or other element as opposed to an automatic download via wireless network) is permissible where there is no disadvantage to the player and where there is adequate time to do so. Catch up facilities (for example, button pressed to bring device up to current position within game) may be used where the game that was in play when the network failure occurred has not been completed

Communication requirements

- 5.3** All protocols must use communication techniques that have proper error detection and/or recovery mechanisms which are designed to prevent unauthorized access or tampering, employing Data Encryption Standards (DES) or equivalent encryption with secure seeds or algorithms.

Power level display requirements

5.4 Portable devices must give warnings when the battery life of the device reaches a low level.

Audit requirements

5.5 An audit log of sufficient time stamping of significant events must be maintained so as to be able to resolve any player disputes arising as a result of timing issues. It must be possible to display the audit log on the site operator's premises.

The Commission does not intend to set out exact requirements for time stamping of significant events as it is considered better that the manufacturer do so on the basis of the overall system design.

6 Bingo tickets

Bingo tickets

6.1 The requirements for bingo tickets are as follows:

- a. every ticket used in a game of bingo must consist of a unique set of letters, numbers or symbols. This applies whether the tickets in play are physical (paper), virtual (electronic), a mix of the two, or any other representations of bingo tickets and applies whether the game takes place in one or at multiple venues
- b. each ticket in play (whether paper, electronic or other) must have a unique reference number or code associated with it, which can be used for ticket verification purposes

Automatic game determinant marking

6.2 In all circumstances, player participation is required to record the numbers or other game determinant called and to claim a win. The Commission does not intend to set rules as to what action the player must take in order to initiate the system to record the determinant(s) called, but this must involve a physical player interaction of some description.

This requirement does not prevent the use of catch up facilities within a game (for example, a button pressed to bring a device up to the current position within a game), providing the game is still in play.

Gambling Commission July 2008

www.gamblingcommission.gov.uk

T 0121 230 6666 E info@gamblingcommission.gov.uk