



IBG LLC

SYSTEMS AND ORGANIZATION CONTROLS (SOC) 3 REPORT

**REPORT ON THE BROKERAGE SYSTEM RELEVANT TO SECURITY, AVAILABILITY,
PROCESSING INTEGRITY, AND CONFIDENTIALITY**

FOR THE PERIOD JANUARY 1, 2018 TO DECEMBER 31, 2018

**Prepared Pursuant to Statements on Standards for Attestation Engagements
No. 18**

Section I – Assertion of IBG LLC’s Management

ASSERTION OF IBG LLC MANAGEMENT

We are responsible for designing, implementing, operating, and maintaining effective controls within IBG LLC's (IBG or the Company) brokerage system (system) throughout the period January 1, 2018 to December 31, 2018 to provide reasonable assurance that IBG's service commitments and system requirements relevant to security, availability, processing integrity, and confidentiality were achieved. Our description of the boundaries of the system is presented in Section III and identifies the aspects of the system covered by our assertion.

We have performed an evaluation of the effectiveness of the controls within the system throughout the period January 1, 2018 to December 31, 2018 to provide reasonable assurance that IBG's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality (applicable trust services criteria) set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy* (AICPA, *Trust Services Criteria*) and with International Standard On Assurance Engagements 3000. IBG's objectives for the system in applying the applicable trust services criteria are embodied in its service commitments and system requirements relevant to the applicable trust services criteria.

There are inherent limitations in any system of internal control, including the possibility of human error and the circumvention of controls. Because of these inherent limitations, a service organization may achieve reasonable, but not absolute, assurance that its service commitments and system requirements are achieved.

We assert that the controls within the system were effective throughout the period January 1, 2018 to December 31, 2018 to provide reasonable assurance that IBG's service commitments and system requirements were achieved based on the applicable trust services criteria.

IBG LLC Management

May 20, 2019

Section II – Independent Service Auditors’ Report



Independent Service Auditors' Report

To: IBG LLC

Scope

We have examined IBG LLC's (IBG or the Company) accompanying assertion titled, "Assertion of IBG LLC Management," (assertion) that the controls within IBG's brokerage system (system) were effective throughout the period January 1, 2018 to December 31, 2018 to provide reasonable assurance that IBG's service commitments and system requirements were achieved based on the trust services criteria relevant to security, availability, processing integrity, and confidentiality (applicable trust services criteria) set forth in TSP section 100, *2017 Trust Services Criteria for Security, Availability, Processing Integrity, Confidentiality, and Privacy (AICPA, Trust Services Criteria)* and with International Standard On Assurance Engagements 3000.

Service Organization's Responsibilities

IBG is responsible for its service commitments and system requirements and for designing, implementing, and operating effective controls within the system to provide reasonable assurance that IBG's service commitments and system requirements were achieved. IBG has also provided the accompanying assertion about the effectiveness of controls within the system. When preparing its assertion, IBG is responsible for selecting and identifying in its assertion, the applicable trust service criteria and for having a reasonable basis for its assertion by performing an assessment of the effectiveness of the controls within the system.

Service Auditors' Responsibilities

Our responsibility is to express an opinion, based on our examination, on whether management's assertion that controls within the system were effective throughout the period to provide reasonable assurance that the service organization's service commitments and system requirements were achieved based on the applicable trust services criteria. Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants and the International Auditing and Assurance Standards Board. Those standards require that we plan and perform our examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.



Our examination included:

- Obtaining an understanding of the system and the service organization's service commitments and system requirements;
- Assessing the risks that controls were not effective to achieve IBG's service commitments and system requirements based on the applicable trust services criteria;
- Performing procedures to obtain evidence about whether controls within the system were effective to achieve IBG's service commitments and system requirements based on the applicable trust services criteria.

Our examination also included performing such other procedures as we considered necessary in the circumstances.

Inherent Limitations

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls.

Because of their nature, controls may not always operate effectively to provide reasonable assurance that the service commitments and system requirements were achieved based on the applicable trust services criteria. Also, the projection to the future of any conclusions about the effectiveness of controls is subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Opinion

In our opinion, management's assertion that the controls within IBG's brokerage system were effective throughout the period January 1, 2018 to December 31, 2018, to provide reasonable assurance that IBG's service commitments and system requirements were achieved based on the applicable trust services criteria is fairly stated, in all material respects.

Marcum LLP

Boston, Massachusetts
May 20, 2019

Section III – IBG LLC’s Description of the Boundaries of its Brokerage System

IBG LLC’s Description of the Boundaries of Its Brokerage System

Overview of IBG LLC

IBG LLC (IBG or the Company) is an automated global electronic broker and market maker. The Company services custody and service accounts for hedge and mutual funds, registered investment advisors, proprietary trading groups, introducing brokers and individual investors. In addition, IBG specializes in routing orders while striving to achieve best executions and processing trades in securities, futures, foreign exchange instruments, bonds and mutual funds on more than 120 electronic exchanges and market centers around the world.

For the purpose of this report, IBG refers to the following entities: Timber Hill LLC, Interactive Brokers LLC, IBKR Financial Services AG, Interactive Brokers Hong Kong Limited, Timber Hill Canada Company, Interactive Brokers Canada, Interactive Brokers (UK) Limited, Interactive Brokers Corp., Interactive Brokers (India) Private Limited, Interactive Brokers Securities Japan Inc., and Interactive Brokers Australia Pty Limited.

Services Provided

The Company’s activities are divided into two principal business segments: (1) electronic brokerage operations and (2) market making:

A. Electronic Brokerage Operations

As a direct market access broker, the Company serves the customers of both traditional brokers and prime brokers. The Company provides customers with an advanced order management, trade execution and portfolio management platform at a very low cost. Customers can simultaneously access many financial markets worldwide and trade across multiple asset classes (stocks, options, futures, foreign exchange (forex), bonds, and mutual funds) denominated in 23 different currencies, on one screen, from a single account based in any major currency. Large financial advisor and broker-dealer customers may “white label” the trading interface (i.e., make the trading interface available to their customers without referencing the Company’s name), or can select from among modular functionalities, such as order routing, trade reporting or clearing on specific products or exchanges where they may not have up-to-date technology, to offer their customers a comprehensive, global range of services and products.

The Company performs the following services for its customers:

- Order Execution
- Trade Clearing and Settlement;
- Reconciliation and Control (custody and safekeeping of securities);
- Pricing and Valuation of Customer Positions;
- Corporate Actions –Dividends and Reorganization Processing and Reconciliation;
- Wire Transfer, Check Processing and ACH;
- Customer Reporting.

Customers initiate transactions electronically through a variety of processes. Transactions are processed directly into a specific order entry system either electronically through direct customer input, or to a much lesser extent by fully registered branch office personnel if necessary.

Security transactions referenced above are processed directly into the Company's trade processing, clearing and settlement systems. The Company's Corporate Actions department process dividends and reorganizations (i.e. tender offers, stock splits).

The Company's Clearing and Control department also confirms that positions with custodians and internal ledgers are reconciled. Customer reporting, including electronic confirmation and statement reporting services are also provided. Securities pricing is facilitated by the Technical Clearing Operations Group which confirms pricing data obtained from independent pricing vendors which are updated across the Company's internal firm and external customer reporting systems.

B. Market Making

As a market maker, the Company provides continuous bid and offer quotations on securities and futures products listed on electronic exchanges around the world. Quotes are driven by proprietary mathematical models that assimilate market data and reevaluate outstanding quotes each second.

Components of the Brokerage System

The following section describes the systems included in the IBWeb application, which forms the basis for IBG's brokerage system. The Company receives customer order requests from various sources and applications, trade confirmation information from various clearing corporations and depositories, and reference information relating to corporate announcements and pricing from external vendors. There are numerous systems involved in the processing of brokerage related transactions.

The significant computerized systems supporting the Company's daily activities includes, but is not limited to:

System Name	Description
Credit Manager	Automatically confirms that customers have sufficient credit for transactions before orders are executed.
Trade Store	Utilized by Operations personnel as a repository of all trades.
Price Store	Utilized by Technical Clearing Operations personnel to store prices for securities.
ClearWeb	Utilized by Clearing Operations personnel as a repository of reports.
Real Time Trade Match (RTTM)	Utilized by Clearing Operations personnel to match all trades. All matched trades are transferred to the Company's books and records.
Centralized Position Reconciliation (CPR)	Utilized by Clearing Operations personnel to reconcile positions between the Company's books and records versus depository locations.
Dividend Reconciliation System	Utilized by Corporate Actions personnel to inquire, update, and review the status of dividends.
Corporate Actions System	Utilized by Corporate Actions personnel to maintain reorganization information.
Liquidation Monitor	Monitors that each customer account is properly funded and liquidates positions to maintain margin requirements.
Cashiering System	Utilized by Cashiering Personnel to enter and disburse checks, wires and ACH transactions.
CAST	Utilized by Customer Service and Compliance personnel as a repository for customer account information including customer agreements.
SWIFT	Utilized by Treasury personnel to process wire instructions and track payments.
IB Release	Program change management system used by the Information Technology group to track and approve program changes.
IB Inventory Management System	Utilized by Clearing Operations personnel to track and report on Broker to Broker trading activity.
IB Reference Database	Trading products are set up in IB Reference Database
CardServ	Utilized for the processing of Debit Card transactions
Retail Equity Clearing	Among other functions, calculates customer interest margin and commission rates based on underlying market interest rates and agreed upon commission rates respectively.
Client Trading Platforms (TWS/ WebTrader/ Mobile / Client Portal	Trading platform utilized by the user entities.

Infrastructure

Strong authentication and access controls are implemented to restrict administrative access to the IBWeb application. Employees access the IBWeb application through their desktop on company-supplied computers either through the local area network or by VPN using two-factor authentication if accessing remotely. IBG follows a formal process to grant or revoke employee access to IBG systems and the IBWeb application.

User access is restricted through the use of unique user IDs and strong passwords. Periodic reviews of access lists are implemented to help ensure access is appropriate and authorized. Access to production machines and network devices is managed via an access group management system and membership in these groups must be formally approved prior to the granting of access.

The Company has processes in place to identify and remediate vulnerabilities. Both internal and external reviews are performed on a routine basis. Action plans to address identified findings are compiled and remediated by members of the IT group.

The Company's database servers are housed and maintained locally on Company premises. Physical and environmental protections have been set up and monitored by IBG personnel. The monitoring of system performance and processing capacity is also conducted by IBG personnel.

Change management policies are in place and procedures for tracking, testing, approving, and validating changes are formally documented. IBG requires all changes to be reviewed and approved by a separate technical resource, other than the developer, to evaluate the quality and accuracy of changes. All changes are also tested prior to their migration to the production environment.

People

IBG's organizational structure provides a framework for planning, executing, and controlling business operations. Executive and senior leadership play important roles in establishing the Company's tone and core values. The organizational structure assigns roles and responsibilities to provide for adequate staffing, security, and segregation of duties. Management has also established authority and appropriate lines of reporting for key personnel.

The Company follows a structured on-boarding process to familiarize new employees with the Company's tools, processes, systems, security practices, policies and procedures. Employees are provided with the Company's Employee Policies Manual, which details the Code of Conduct and Ethics and additionally are required to complete annual security & awareness training to educate them as to their responsibilities concerning information security. IBG management actively monitors employee compliance with required training requirements.

Data

IBG provides controls at each level of data storage, access and transfer. IBG has established training programs for information security to support data confidentiality. All employees are required to complete these training programs annually. IBG has established incidence monitoring and response policies and processes to report and handle incident events related to confidentiality. IBG establishes agreements, including non-disclosure agreements, for preserving confidentiality of information and exchanges with external parties.

Principal Service Commitments and System Requirements

IBG designs its processes and procedures related to the brokerage system to meet its objectives for services rendered. Those objectives are based on the service commitments that IBG makes to user entities, the laws and regulations that govern the provision of its technology services, and the financial, operational and compliance requirements that IBG has established for the services.

Security, availability, processing integrity, and confidentiality commitments to user entities are documented and communicated in service level agreements and/or other customer agreements. Security, availability, processing integrity, and confidentiality commitments are standardized and include, but are not limited to, the following:

- Security, availability, processing integrity, and confidentiality principles within the fundamental designs of the brokerage system that are designed to permit system users to access the information they need based on their role in the system while restricting them from accessing information not needed for their role;
- Use of encryption technologies to protect customer data;
- Restricting access to the system through the use of strong passwords and unique user IDs;
- Continuous monitoring of system performance and processing capacity;
- Secure and timely backup and retention of customer data;
- The complete, accurate, and timely processing of customer initiated transactions within the system.

IBG establishes operational requirements that support the achievement of security, availability, processing integrity, and confidentiality commitments, relevant laws and regulations, and other system requirements. Such requirements are communicated in IBG's system policies and procedures, system design documentation, and contracts with customers. Information security policies and procedures define an organization-wide approach to how systems and data are protected. These include policies around how the service is designed and developed, how the system is operated, how the internal business systems and networks are managed and how employees are hired and trained.