

Major ASVAB R&D Efforts Milestones and Project Schedules

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Projects

- **ASVAB Development**
 - New CAT-ASVAB Item Pools*
 - Developing New CAT Item Pool for CEP
 - Automating Generation of AR and MK Items/GS Items
 - ASVAB Technical Bulletins
- **Career Exploration Program***
- **ASVAB and ETP Revision**
 - Evaluating New Cognitive Tests for ASVAB
 - Nonverbal Reasoning Tests*
 - Mental Counters
 - Cyber Test
 - Adding Non-cognitive Measures to Selection and/or Classification*
 - Expanding Test Availability: Web/Cloud Delivery of ASVAB and Special Tests
- **Defense Language Aptitude Battery**

*Will be presented/discussed at this meeting.

NOTE: Dates given in this document are subject to change depending on available resources, unexpected issues that arise, and other factors that may be beyond our control. Any changes will be communicated as soon as possible.

New CAT-ASVAB Item Pools

- **Objective**

- Develop CAT-ASVAB item pools (designated as Pools 11–15) from new items

- **Projected Completion**

- New item pool implementation: **Oct 2021**

- **Subtasks**

- Write items ✓
 - Pretest items (Summer 2018) ✓
 - Calibrate and scale items (Summer 2018) ✓
 - Conduct item screenings (May 2019) ✓
 - Identify item enemies (June 2019) ✓
 - Complete preliminary form assembly (July 2019) ✓
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New CAT-ASVAB Item Pools (continued)

- **Subtasks** (continued)
 - Complete final form assembly (Aug 2019–Nov 2019)✓
 - Prepare files for test delivery software (Dec 2019–Feb 2020)✓
 - Incorporate files into *i*CAT software, make programming changes, and conduct QA (Sep 2020–Nov 2020)[†]
 - Collect and analyze IOT&E data (Dec 2020–Jul 2021)
 - Obtain approvals and implement operationally in *i*CAT (Aug 2021–Oct 2021)
- **Predecessors**
 - ASVAB Item Development
- **Successors**
 - Operational administration of new CAT-ASVAB item pools
 - Final development of next set of item pools
 - Use of retired item pools in CEP, AFCT, *Pi*CAT, APT

[†]Implementation in *i*CAT delayed by a cloud-related software freeze.

Developing New CAT Item Pool for CEP

- **Objective**

- Build a CAT item pool from P&P Forms 20B, 21 A & B, and 22 A & B. The new CAT pool is for use in the implementation of CEP *i*CAT

- **Projected Completion**

- Jan 2020 ✓

- **Subtasks**

- CAT Pool
 - Compute preliminary score information functions for CAT pool (Aug 2010) ✓
 - Review content for obsolescence, accuracy, sensitivity (Aug–Oct 2010) ✓
 - Compute final score information functions and evaluate (Nov 2010) ✓
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Developing New CAT Item Pool for CEP (continued)

- **Subtasks** (continued)
 - CAT Pool
 - Reformat items for electronic delivery (Dec 2010–Oct 2011) ✓
 - Load items into database and review (May 2012–Oct 2013) ✓
 - Modify software to incorporate Pools 4 and 10 for equating (May 2017) ✓
 - Administer in MEPS to obtain final equating algorithms (Mar 2018) ✓
 - Conduct final equating analyses (Aug 2018) ✓
 - Implement in CEP *i*CAT (Jan 2020)[†] ✓
 - **Successors**
 - Implementation of new CAT pool for CEP *i*CAT
-

[†]Dates were dependent upon development/QA/deployment schedules for *i*CAT releases 16.0 and 16.1.

Automating Generation of AR and MK Items

- **Objective**

- Develop procedures for automating Arithmetic (AR) and Mathematics Knowledge (MK) item generation so that AR and MK item pools can be replaced on a frequent basis

- **Projected Completion**

- **May 2020**

- **Subtasks**

- Review literature relevant to mathematics (Jan 2018) ✓
- Model MK and AR items from existing items (May 2018) ✓
- Construct item generation software (Jul 2018) ✓
- Generate MK pilot items (Jun 2018) ✓
- Generate AR pilot items (Aug 2019) ✓
- Conduct MK data collection (Mar 2019–June 2019) ✓
- Conduct calibration and scaling (June 2019–Jul 2019) ✓
- Assess MK item quality and parameter accuracy (Jul 2019–Aug 2019) ✓
- Conduct AR data collection (Aug 2019–**Dec 2019**) ✓
- Conduct calibration and scaling (**Dec 2019–Jan 2020**) ✓
- Assess AR item quality and parameter accuracy (**Jan 2020–Feb 2020**) ✓
- Provide final generator, interface, and documentation (**May 2020**) ✓

Automating Generation of GS Items

- **Objective**

- Develop procedures for automating General Science (GS) item generation so that GS item pools can be replaced on a frequent basis

- **Projected Completion**

- Feb 2021

- **Subtasks**

- Review literature relevant to general science (Jan 2019)
- Model GS items from existing items (May 2019)
- Construct item generation software (Sep 2019)
- Generate GS pilot items (Apr 2020)
- Conduct GS data collection (Jul 2020–Aug 2020)[†]
- Conduct calibration and scaling (Sep 2020–Oct 2020)
- Assess GS item quality and parameter accuracy (Nov 2020–Dec 2020)
- Provide final generator, interface, and documentation (Feb 2021)

[†]Implementation in iCAT delayed by a cloud-related software freeze.

ASVAB Technical Bulletins

- **Objective**

- Develop a series of electronic ASVAB technical bulletins to meet APA standards

- **Projected Completion**

- Ongoing

- **Subtasks**

- CAT-ASVAB Pools 5–9 (Dec 2008)✓
- APT (May 2020)✓
- CAT-ASVAB Pool 10 for CEP iCAT (July 2020)✓
- CAT-ASVAB Pools 11–15 (Fall 2021)
- Other ASVAB Studies (as required)

- **Predecessors**

- New item pool development
 - New test development
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Career Exploration Program*

- **Objective**

- Revise/maintain all CEP materials (websites & print materials), conduct program evaluation studies, and conduct research studies, as needed

- **Projected Completion**

- Ongoing

- **Subtasks**

- Update and develop new military occupational profiles (May 2016) ✓
 - Revise printed materials for websites (Sep 2016) ✓
 - Implement revised CEP website (Sep 2016) ✓
 - Develop CEP program briefings and materials for external sources, as needed (ongoing)
 - Develop CEP Research and Evaluation Plans (in progress)
 - Develop plans for implementing CEP iCAT in schools and assessing impact of eliminating paper-and-pencil ASVAB (ongoing)
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Career Exploration Program*

(Continued)

- **Subtasks** (continued)

- Redesign Careers in the Military Website (FY 2017) ✓
- Enhance functionality of websites (ongoing)
- Automate score hosting on websites (Dec 2018) ✓
- Develop an application for the collection of Service occupational data (UNIFORM) (in progress)
- Cross-walk civilian and military occupations for inclusion in the OCCU-Find (in progress)
- Conduct needs analysis for computerized testing (Dec 2018) ✓
- Develop and conduct post-test interpretation training (Aug 2019) ✓
- Revise program materials as suggested by expert panel and evaluation efforts (ongoing)
- Monitor state usage of ASVAB and ASVAB CEP as related to legislative changes (ongoing)
- Conduct site visits to document and provide insight for business and process modernization of CEP systems (in progress)
- Refresh of FYI items (item writing, tryout, and calibration) (in progress)

Evaluating New Cognitive Tests: Mental Counters

- **Objective**

- Conduct a validity study that will evaluate the benefits of adding Mental Counters (MCt) to the ASVAB and will provide the data to establish operational composites that include MCt and operational cut scores for the new composites
- Navy is lead on this project

- **Projected Completion**

- TBD

- **Subtasks**

- Modify software (Apr–Oct 2011) ✓
 - MEPCOM QA & deployment (Oct 2012–May 2013) ✓
 - Conduct item analyses and possible revision of test (Sep–Dec 2013) ✓
 - Revise, if necessary, and conduct new item analyses (Apr–Jul 2015) ✓
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Evaluating New Cognitive Tests: Mental Counters (continued)

- **Subtasks** (continued)

- Conduct predictor and criterion data collection (Jun 2013–Nov 2015) ✓
- Investigate psychometric properties (in progress)
- Evaluate/refine instructions and practice items (in progress)
 - Update MCt software for evaluation (Summer 19) ✓
 - Data collection (Fall 19–Fall 20)
 - Final report (Spring/Summer 21)
- Conduct predictor and criterion data analyses (TBD)
- Examine projected impact of operational use of MCt scores for selected jobs (TBD)

- **Successors**

- Possible revisions to ASVAB content (TBD)
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Evaluating New Cognitive Tests: Cyber Test

- **Objectives**

- Develop and evaluate the Cyber Test (CT), formerly known as the Information Communication Technology Literacy (ICTL) test
- Air Force is lead on this project

- **Projected Completion**

- Ongoing

- **Successors**

- Possible revisions to ASVAB content (TBD)

- **Subtasks**

- Phase I: Initial Development/Pilot Test (Feb–Sep 2008) ✓
 - Phase II: Predictive Validation Study (USAF & Navy) (Jan–Sep 2009) ✓
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Evaluating New Cognitive Tests: Cyber Test (continued)

- **Subtasks** (continued)

- Phase III: MEPS Data Collection I—Norms, Construct Validity, Subgroup Differences, New Form Development (2010–2014) ✓
 - Use as special test; seed new items to develop follow-on forms (Aug 2013) ✓
 - Operational implementation: Air Force (May 2014), Army (June 2014), Navy (Oct 2016), USMC (Oct 2018) ✓
 - Phase IV: MEPS Data Collection II: Operational Support/Adv. Development
 - Integrate CT scores into classification process (Oct 2015) ✓
 - Develop scoring and reporting procedures/responsibilities (in progress)
 - Analyze existing items and develop new items (Nov 2018) ✓
 - Update operational forms to replace dated content (Oct 2020)
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Evaluating New Cognitive Tests: Cyber Test (continued)

- **Subtasks** (continued)

- Phase IV: MEPS Data Collection II—Operational Support/Adv. Development Continued
 - Develop CAT item pools (Dec 2018) ✓
 - Evaluate feasibility of CAT-Cyber Test (Feb 2019) ✓
 - Develop CAT-Cyber Test (TBD)
 - Conduct additional validation studies (TBD)
 - Program versions of the AF Electronic Data Processing Test and selected Cyber Aptitude and Talent Assessment (CATA) tests to evaluate psychometric properties and incremental validity (AF) (in progress)
 - Complete programming (Feb 2018) ✓
 - Conduct initial data collection using basic military trainees (Aug 2018) ✓
 - Develop web-based versions (Oct 2019) ✓
 - Evaluate psychometric properties ✓
 - Design predictive validation study to evaluate EDPT and CATA against training grades (in progress) ✓

Evaluating New Cognitive Tests: Cyber Test (continued)

- **Subtasks** (continued)

- Phase IV: MEPS Data Collection II—Operational Support/Adv. Development Continued
 - Administer CT for CTN training and collect data for analysis purposes (Navy) (ongoing)
 - Conduct predictor and criterion data analyses (Spring 2020) ✓
 - Examine project impact of operational use of CT scores for selected jobs (Summer 2020) ✓
 - Develop in-Service version of CT (Army project) (in progress)
 - Phase 1: Develop item pool ✓
 - Phase 2: Pilot test new items ✓
 - Phase 3: Analyze pilot items and develop two parallel forms ✓
 - Phase 4: Implement the new forms for in-service testing (TBD)
 - Phase 5: Develop new administration platform (TBD)
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Evaluating New Cognitive Tests: Cyber Test (continued)

- **Subtasks** (continued)
 - Explore utility of a serious gaming approach to assess cyber aptitude (AF) (in progress)
 - Phase I: Literature review ✓
 - Review archival materials regarding aptitudes & traits needed for success in cyber career fields (FY 19) ✓
 - Document critical aptitudes for cyber jobs (FY 19) ✓
 - Summarize literature & recommendations on how serious gaming could be used to enhance assessment of cyber aptitude (FY 19) ✓
 - Phase II: Cyber game development
 - Initial development (Feb 2019–May 2020) ✓
 - Validation (TBD)
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Evaluating New Cognitive Tests: Cyber Test (continued)

- **Subtasks** (continued)
 - Develop game-based assessment of Systems Thinking Ability (STA) (Army project) (in progress)
 - Phase 1: Develop component measures (2016) ✓
 - Phase 2: Incorporate measures into shell (2020)
 - Phase 3: Conduct validation of STA (2021)
 - Phase 4: Validate to cyber populations (2022)
 - Develop test of capabilities not covered by established measures that predicts success in cyber—the Common Cyber Capabilities (C³) Test (Army project) (in progress)
 - Phase 1: Literature review (2016) ✓
 - Phase 2: SME meetings to identify capabilities (2016–18) ✓
 - Phase 3: Develop measure of selected capabilities (2018) ✓
 - Phase 4: Conduct validation of items and scales (2019) ✓
 - Phase 5: Combine developed and validated measures into one cohesive computer-administered, self-scoring test (in progress)
 - Phase 6: Validate to cyber populations (Q2–Q4 FY21)
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Evaluating New Cognitive Tests: Nonverbal Reasoning Tests*

- **Objective**

- Address the ASVAB Expert Panel's recommendation to investigate including a test of fluid intelligence, such as a nonverbal reasoning test
- Plan and conduct construct validation studies

- **Projected Completion**

- TBD

- **Subtasks**

- Evaluate nonverbal reasoning tests
 - Design research (Mar–Sep 2008) ✓
 - Modify software (Sep–Nov 2011) ✓
 - Software quality assurance (Jan 2013–Jan 2015) ✓
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Evaluating New Cognitive Tests: Nonverbal Reasoning Tests (continued)*

- **Subtasks** (continued)

- Evaluate nonverbal reasoning tests (continued)
 - MEPCOM QA & deployment (Feb–Mar 2015) ✓
 - Collect data for DLAB bridge study (Sep 2015–Aug 2017) ✓
 - Analyze linking data & report results (Dec 2018) ✓
 - Evaluate Abstract Reasoning Test data ✓
 - **Develop a test of Complex Reasoning (in progress)**
 - Plan additional evaluations and validation studies (TBD)

- **Successors**

- Possible revisions to ASVAB content (TBD)
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Adding Non-cognitive Measures to Selection and/or Classification*

- **Objective**

- Address the ASVAB Expert Panel's recommendation to evaluate the use of non-cognitive measures in the military selection and classification process
- Army is lead on this project (excluding AF-WIN and JOIN efforts)

- **Projected Completion**

- Ongoing

- **Successors**

- Possible revisions to the ASVAB or addition of new special tests (TBD)

- **Subtasks**

- Empirically evaluate Army measures of work interests (Work Preferences Assessment, formerly PE-Fit) using Army applicants
 - Program WPA for ASVAB platform (Jan–Oct 2010) ✓
 - MEPCOM QA & deployment (Oct 2012–July 2013) ✓
 - Begin data collection (June 2017) ✓
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Adding Non-cognitive Measures to Selection and/or Classification (continued)*

- **Subtasks (continued)**
 - Evaluate NCAPS and SDI items/scales for possible use in TAPAS
 - Compile/review existing materials & psychometric data (Jan 2019) ✓
 - Administer TAPAS/NCAPS/SDI tests to Basic recruits to examine construct validity (in progress) (Oct 2018) ✓
 - Examine psychometric evidence (FY19) ✓
 - Conduct meta-analysis of TAPAS, NCAPS, and SDI validity studies ✓
 - Empirically evaluate the Tailored Adaptive Personality Assessment System (TAPAS)
 - Begin initial TAPAS testing on the ASVAB platform (May 2009) ✓
 - TAPAS use by Army for applicant screening (Jan 2010–ongoing)
 - TAPAS use by Air Force for classification and to evaluate for person-job matching (June 2014–ongoing)
 - Air Force analyses and presentation on score inflation, reliability, validity, and utility to date (June 2017) ✓
 - Air Force Testing Modernization effort:
 - Develop/Integrate new scales (e.g., Responsibility, Situational Awareness) into AF TAPAS (July 2018) ✓
 - Evaluate alternative item formats (e.g., unidimensional pairwise preference) (FY19) ✓
 - Develop Dark Tetrad facet items (FY19) ✓

Adding Non-cognitive Measures to Selection and/or Classification (continued)*

- **Subtasks (continued)**

- Empirically evaluate the Tailored Adaptive Personality Assessment System (TAPAS) (continued)
 - TAPAS testing of Navy applicants on ASVAB platform (Apr 2011–Mar 2013) ✓
 - Conduct analyses and evaluate impact for Navy applicants (Sep 2015–TBD)
 - USMC evaluation effort:
 - Begin initial research TAPAS testing on the ASVAB platform (Sept 2015) ✓
 - TAPAS use by USMC as an applicant requirement (Aug 2018–ongoing)
 - Develop proof of concept predictor for Recruit Training success based on TAPAS and other accession-related features (April 2019) ✓
 - Follow-on analysis for MOS Selection and First Term of Enlistment Success (TBD)
 - Efforts to resolve data system limitations and procedural challenges (real-time scoring, algorithm updates, MEPS visibility on scoring, etc.) (Ongoing)
- Develop and evaluate an Army Interest Inventory (AVID)
 - Identify basic interests ✓
 - Develop items, pretest items, and conduct preliminary analysis ✓
 - Develop computer adaptive software (Fall 2017) ✓
 - Conduct initial validation study (Summer 2018) ✓
 - Expand concurrent validation evidence (Fall 2020)

Adding Non-cognitive Measures to Selection and/or Classification (continued)*

- **Subtasks (continued)**
 - Develop, evaluate, and implement an Air Force Work Interest Inventory (AF-WIN)
 - Update job profile markers for 65 career fields (Aug 2017) ✓
 - Complete validation analyses (Sep 2017) ✓
 - Implement AF-WIN on AirForce.com (CY 2018) ✓
 - Update all job profile markers through 30 Apr 19 AFECD (Jul 2019) ✓
 - Gather ordinal SME marker data on all enlisted AFSCs (July 2019) ✓
 - Develop processes to streamline/automate AF-WIN processes (Oct 2019) ✓
 - Develop the Job Opportunities in the Navy (JOIN) personalized career interest assessment
 - Develop recruiting job/rating structure mode ✓
 - Develop for pre-Service use (2017 start; 2018 IOC)
 - Pilot version available for NRC use (Q3, 2017) ✓
 - Implement JOIN within recruiting process (08 Sep 2018) ✓
 - Develop new items and validate DNA (Q4, 2020)
 - Proof of Concept for gaming environment vice self-report format (Ongoing through Q3, 2020)
 - Develop a Marine Corps version of JOIN and RIDE (TBD)

Defense Language Aptitude Battery

- **Objective**

- Transition to all computer-based testing and improve the predictive validity of the Defense Language Aptitude Battery

- **Subtasks**

- Develop a computer-based DLAB that will run on the WinCAT platform in MEPS (Jan 2007–Jul 2008) ✓
- Develop a web-based DLAB (Jan 2008–Jan 2009) ✓
- Conduct an ASVAB/DLAB comparison (Sep 2009–Dec 2011) ✓
- Develop a new generation of the DLAB (DLAB2) (Dec 2018) ✓
 - Collect data for an equating study (Sep 2015–Dec 2017) ✓
 - Perform DLAB equating analysis (Jan 2018–Dec 2018) ✓
- Investigate the use of ASVAB versus DLAB for screening into DLIFLC (ongoing)
- Move DLAB2 from WinCAT to the iCAT platform (TBD)^{†*}

[†] Pending decision on the use of DLAB versus ASVAB as an entrance requirement for DLIFLC.

*Note that DLAB is already available on the DMDC web platform and that WinCAT must be decommissioned no later than Mar 2021.

Expanding Test Availability: Web/Cloud Delivery of ASVAB and Special Tests

- **Objective**

- Transition delivery of special tests from Windows-based platform to web-based and/or cloud platform

- **Projected Completion**

- May 2021

- **Predecessors**

- Cyber hardening and code modernization (ongoing)
- Develop cloud infrastructure (ongoing)

- **Subtasks**

- Identify requirements and design transition (Jan 2018–Sep 2018) ✓
 - Migrate Cyber Test to DMDC web-based platform (Oct 2018–Oct 2019) ✓
 - Modify *i*CAT software to accommodate special tests (Oct 2018–Oct 2019) ✓
 - Modify *i*CAT-A&R software to accommodate Cyber Test and Coding Speed (Oct 2019– Jul 2020) ✓
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Expanding Test Availability: Web/Cloud Delivery of ASVAB and Special Tests

- **Subtasks** (continued)

- SOFTWARE FREEZE (Apr 2020–Nov 2020)^{††}
 - Develop web service for transferring scores to MEPCOM (Apr 2019–May 2020)[‡] ✓
 - QA Cyber Test on DMDC web platform (Aug 2019–Oct 2019) ✓
 - Deploy Cyber Test to Production on DMDC web platform (Oct 2019–Oct 2019) ✓
 - Turn on Cyber Test for operational use (Oct 2020)^{†‡}
 - Migrate Coding Speed to DMDC web platform (Aug 2019–Feb 2020)^{††}
 - QA Coding Speed on DMDC web platform (Feb 2020–Jul 2020) ✓
 - Deploy Coding Speed to Production on DMDC web platform (Jul 2020–Jul 2020) ✓
 - Turn on Coding Speed for operational use (Oct 2020)[‡]
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[‡] Completion date is dependent upon MEPCOM's QA and deployment schedule for the web service.

[†] Cyber Test was deployed to production early, but cannot be turned on until the web service is in place **and software changes have been made to accommodate overseas testing.**

^{††} The transition-to-cloud software freeze and cloud milestones have been adjusted, as more time is needed to get an ATO in place.

Expanding Test Availability: Web/Cloud Delivery of ASVAB and Special Tests

- **Subtasks** (continued)
 - Migrate TAPAS to the cloud platform (May 2020–Nov 2020)[†]
 - Deploy TAPAS to Production in the cloud (Dec 2020–Dec 2020)[†]
 - Migrate iCAT and iCAT-A&R to the cloud (including Cyber Test, Coding Speed, and TAPAS) and QA (Apr 2020–Nov 2020)
 - Deploy iCAT & iCAT-A&R to Production in the cloud (Dec 2020–Dec 2020)
 - Decommission WinCAT (Dec 2020–Mar 2021)
 - Migrate Mental Counters to the cloud platform & conduct QA (Dec 2020–May 2021)^{††}
 - Complete deployment of Special Tests to Production in the cloud (May 2021–May 2021)

[†] TAPAS cannot be put on the DMDC web platform because it is programmed in an incompatible language. The transition start and end dates for TAPAS in the cloud are dependent upon the development of the cloud infrastructure and could shift.

^{††} The transition of Mental Counters to iCAT is being delayed until after DPAC moves to the cloud.

Appendix A

List of Acronyms

List of Acronyms

AF	Air Force
AFCT	Armed Forces Classification Test
AFQT	Air Force Qualification Test
AF-Win	Air Force Work Interest Navigator
APT	AFQT Predictor Test
ASVAB	Armed Services Vocational Aptitude Battery
ATO	Authority to Operate
AVID	Adaptive Vocational Interest Diagnostic
CAT-ASVAB	Computerized Adaptive Testing version of the ASVAB
C^3	Common Cyber Capabilities
CEP	Career Exploration Program
CS	Coding Speed
CT	Cyber Test
DLAB	Defense Language Aptitude Battery
DMDC	Defense Manpower Data Center
ETP	Enlistment Testing Program
iCAT	Internet-based CAT-ASVAB
iCAT-A&R	iCAT Authorization and Registration
ICTL	Information Communications Technology (CyberTest)

List of Acronyms (continued)

IOT&E	Initial Operational Test and Evaluation
JOIN	Job Opportunities in the Navy
MCt	Mental Counters
MEPCOM	Military Entrance Processing Command
MEPS	Military Entrance Processing Stations
NCAPS	Navy Computer Adaptive Personality Scales
NRC	Navy Recruiting Command
OCCU-Find	Occupational Finder
P&P	Paper and Pencil
PiCAT	Prescreen (CAT) ASVAB
QA	Quality Assurance
QC	Quality Control
R&D	Research and Development
STA	Systems Thinking Ability
TAPAS	Tailored Adaptive Personality Assessment System
TBD	To Be Determined
USMC	United States Marine Corps
WinCAT	Windows-based CAT-ASVAB
WPA	Work Preferences Assessment