# THY MEDICAL REQUIREMENTS OF THE CIVIL AERONAUTICS ADMINISTRATION AND THE RECOMMENDED MEDICAL REQUIREMENTS OF THE PERSONNEL LICENSING DIVISION OF THE PROVISIONAL INTERNATIONAL CIVIL AVIATION ORGANIZATION 

Prepared
by

National Research Council Committee on Selection and Training of Aireraft Pilots


June 1947




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June 2947

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| :--- | :--- | :--- | :--- |
|  | $\ddots$ | $\ddots$ | $\ddots$ |

CIVIL AERONAUTICS ADMINISTRATION
Division of Research
Weshington, D. C.

## National Research Council

Committee on Selection and. Training of Aireraft Pilota
Lxecutive Subcomittee
M. S. Viteles, Chaimuan
, II. L. Barr
A. I. Ballowell
C. W. Bray
E. L. Kelly
D. R. Brimhell .
D. B. Iindsley
J. G. Darley
P. J. Rulon
P. M. FItics
A. C. Tuclier
J. C. Flanagan

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## NATIONAL RESEARCH COUNCIL

2101 Constitution Avenue, Washington, D. C. Division of Anthropology and Psychology

Committee on Selection and Training of Aircraft Pilots
June 16, 1947
Dr. Dean R. Brimhell
Assistant to the Administrator
for Research
Civil Aeronautics Administration
Room 5217, Commerce Building
Washington 25, D. C.
Dear Dr. Brimhal.1:
In accordance with your request the medical requirements of the Civil Aeronautics Adininistration (as of January, 1947) and those proposed. by the Provisional International Civil Aviation Organization (PICAO) have been reviewed by the Committee on Selection and Training of Aircraft Plots. In the attached report these requirementer have been restated in "layman's language" and the two sets of requirements presented in parallel. form so as 'to facilitate their comparison.

- This report mas prepared largely through the cooperation of Dr. Frank N. Low, Assistant Professor of Anatomy, Johns Hopkins Medical School, Baltimore, Maryland. In addition, it has boon reviewed by the medical liaison of the Committee on Selection and Training of Aircraft Pilots and by a representative of the Division of Medical Sciences, National Research Council. It has been difficult at points to overcome the diversity of the materials in the two sets of regulations but, nevertheless, there is reason to believe that the medical requiremontes are now listed. in as convenient a form as possible for direct comparison.

MSV:xma
Cordially yours,


Morris S. Vitelee, Chairman Comanittee on Selection and Training of Aircraft Pilots rational Research Council

## CORTMMPS

Page
SUMMARY ..... V11
Immantorion ..... 1
PART A - PICAO MEDICAL REQULREMREMS ..... 5
PTCAO TMTVPRATTONAT RECOMMBNDED PRACTTCRS
Licensing of Operating, Mechanicel and Controller Personnel CEAPTER XIV - MEDICAL RERUIREMIMISS ..... 7
SECTION I, General ..... 7
SECTIO II, PHYSTCAL RURULRBMEMPS FOR IICKMSES ..... 9
Physical Standard Jio. 1 ..... 9
Physical Standard No. 2 ..... 15
Physical Standard No. 3 ..... 27
SSCCITOR III, VISUAL REQUIRTMEMAS FOR LICENSES ..... 19
Visual Standard Fo. 1 ..... 19
Visual Standard Jio, 2 ..... 21
Visual Standard Io. 3 ..... 21
SIBCTION IV, COLOUR PERCIEPTION REQUIREWEHES FOR LTCEKSES ..... 22
Colour Ferception Standard No. 1 ..... 22
Colour Perception Standard. No. 2 ..... 22
SECTION $V$, HEARING FERUTREMIANT FOR LICENSES ..... २2
Hearing Standard. No. 1 ..... 22
Hearing Standard. Mo. 2 ..... 23
Hearing Standard No, 3 ..... 23
Hearing Standard No. 4 ..... 23
PART B - CAA MEDICAI REOUIRBMEMSS ..... 25
PART III - PEYSICAL REQUIRTMEITSS, SECOID की THIRD CLASSES ..... 28
(A) KMT ..... 28
(B) EAR, NOSE, TERROAI, AKD BRUILIBRIUM ..... 34
(C) GENERAL PHYBICAL COKDITION ..... 40
(D) NIRRVOUS SYSTRM ..... 50
SUPPLRMRTLARY REPORTS ..... 56
PFYSICAL RERUTREMENIS, FIRST CLASS PILOIS ..... 58
(A) BYE ..... 58
(B) PAR, HOAE, THROAT, AND TOEUILTBRITM ..... 62
(C) GENIKRAL PEYSTCAL COKDIIIOH ..... 64
(D) KERTVOUS SYSmas ..... 70

## SUMMARY

In this report are presented the medical requirements of the CIVIL ARIKONAUSICS ADMINISIRATION, DEPARTMEMNI OF COMMERCE, U. $S_{.} A_{0}$, in comparison with thoee reocwmended in the FITMT REFORI, PMRSOITEL LTCMTSITG DIVISIOIT, PROVISIONAL INPERNATIONAL CIVIL AVIAIION ORGANIZATION, Montreal, Canada, February 24, 1946. Both the CAA requirements and the PICAO recomendations have been stated in their original forms, with explanations of technical medical terms inserted. The PICAO materials are presented in full in Part A. The CAA materials are presented in full in Part B, this presentation being on the left hand pege throughout. On the right hand page, i.e., on the page opposite the CAA requirements, the sections from the PICAO reguirements (wich were presented. in original context in Part A) are presented opposite the general section of the CAA requirements in texms of which they may be classified.

Inaewuch as the organization of the CAA materials differs from that of the PICAO materials, and since further differences exist in terms of classification of pilots, and inclusiveness of the detailed requirements presented, a direct comparison of the two materiale is impossible in many cases. Father, the PICAO materlals have boen organized as far as poselble as they pertain to (2) Vision, (2) ear, nose, throst, and equilibrium; (3) general physical condition, end (4) nexvous syatem, the categories in terms of which the CAA materials are organized. Furthermore, the PICAO Standarts 70.1 have been prosented in connection with the CAA requirements for traneport pilots. Again, however, it should be observed that it is not implied that these references to pllot types in terms of physical standards, are necessarily diroctly comparable. However, both the PICAO Standarde $\mathbb{N O} .2$, and the CAA. Ftret Cless requirements represent the most strict specifications in the PICAO and CAA materials, reapectively.

## 1/24/47

THE MEDICAI REQUIRRMENIS OF THE CIVIL AESRONAUITCS ADMLNISTRATION AND THE RECO AMENDED MEDICAL REQUIREMENTS OF THE PERSONISK LICENSING DIVISION OF THE PROVISIONAL IWEERNATIOKAL

CIVIL AYIATION ORGANIZATION

## INIRODUCTION

The medical requirements of the Civil Aeronsutics Administration (CAA) of the Department of Comerce, U.S.A。, epecified for various pilot types are expressed in technical medical teminology. The same circumstance prevails in the Medical Requirements recommended by the Personnel Licensing Diviaion (PEL) of the Provisional International Civil Aviation Organization (PICAO).

This report presents a clarification of the technical medical terminology found in the CAA regulations and in the PICAO recommendations.

The CAA requirements have been printed in RRD With insertions wich represent clarifications of the technical terms printed in PURPLE. The PICAO recamendations have been prepared. in the same manner.

The PICAO recomendatione are set up as follows: Pllots are classio fied according to the type of elying done, by descriptive titles. Certain medical requirements are specified for each pilot type. These medical requirements are divided into four standards: Physical Standaxd, Viaual Standard, Color Perception Standard, and Hearing Standard. Bach of these four standards is further aubdivided into two, three, or four groups, according to the strictneas of the specifled requirements. Physical Standard No. I is the strictest physical standard and. Physical Standard. Flo. 3 the least strict. The aubdivisions of the remaining three standents are aimilarly related. The PICAO reccmondations with technical medical terminology translated are found in Part A, which includes a atatement of the source material used in its preparation.

The CAA requirements are set up as Pollows: Pllots are classified according to the type of flying done. There are three classes of pliots: First Class Pilots are alrline transport pilots. Second Class Pllots are comercial pilots. Third Class Pilots are student pilots, private pilots, and free balloon pilots. The CAA requirements with technical modical terminology translated are found in Part B, which includes a statement of the source material used in its preparation.

The materials in this report are presented as follows: In Part A are presented the PICAO recamendations with the technicel modical terminology translated as indicated above. In Part $B$ are presented the CAA materials, this presentation being on the left hand page. On the right hand pege, 1.e., on the pege opposite the CAA requirements, the sections from the PICAO requiremente (which were presented in thoir original context in Part A) are given.

The PICAO matemials have been organized as far es possible e.s they pertain to (1) vision, (2) ear, nose, throet, and equilibrium; (3) general physicel condition, end (4) nervous syatem. These are the categories in terms of which the CAA materials are organized. It should be emphasized. again that the direct comparebility of relerence between CAA and PICAO materials within these general categories is far from perfect because of the diversity of the two sets of mater18.s.

For ease of reference, opposite the CAA requirements for transport pllots, have been presented the PICAO P1rst class physicel standerds. Again, however, although the PICAO first clase physicsl requirements apply chiefly to transpoxt pilots, it should be recognized that this is not exclusively so and that certain of the first class phyaicel standards apply also to other classifications of pilots as presented in the PICAO materials.

A comparibon of CAA and PICAO materials is presented in the teble on pege 3. By reference to the page numbers given in this table, the apeciifications applying to a.11 pilot types can be loceted. in both parts of the report. Again, it should be noted thet it has been dipficult to collate the CAA and PICAO meterials with exactitude beceuse of differing methode of classification. This applio particularly to the four atandarde used by the PICAO, no comparable subdiviaion being used by the CAA. However, the page location of the CAA atipulations which most noarly correapond, in the medical sense, to the PICAO standards has been indicated in this table.

The following points should also be noted:

1. In the PICAO recommendetions Iteme $13.05,23.06,13.07$, and 23.21 pertain to flying personnel not pilots and heve been omitted.
2. In the PICAO recomendations Itens 13.09 (3rd Clase and 2nd. Clase Airship P1lot) and 13.10 (lat Cless Airship P1lot) pertain to pilots of ligtiter-than-air aircraft. The licensing of lighter-than-air aircraft poxsonnel. was recommended for further study (PICAO - Doc. 1390 , PRI/75, paragraph 5.06, pp. 4-5). For clarification the reader is referred to Doc. 1385 , PEL/ $/ 70$, Standards suggested by the Uaited Statos for P110ts of IIghter-than-A1s Atroxeft.
3. Certain of the supporting documents included in the Chairman's Report (PICAO) are related to medical standards for alrmen. Doc. 1156 , PEL/35, Coments by the United States concerning Fhysical Standende for Atwon, represente the outlook of the U.S.A. Doc. 1282, PRL/57, Noto by the Thited Kingiom Medical Adviser on the Proposed Modical Stondends, ropresents the outlook of the Thited Kingdom.

CAA - PART B
pp. pp.

## PICAO - PARI A

| $\begin{gathered} \text { lst Class } \\ \text { Pilot } \end{gathered}$ | $58-74$ | Alrilne Transport Pilot |  | pp。 |
| :---: | :---: | :---: | :---: | :---: |
|  | 62-74 | Physical Standard | 1 | 9-15 |
|  | 58-62 | Visuel Standard | 1 | 19-21 |
|  |  | Color Perception Standard |  | 22 |
|  |  | Hearing Standard | (3) 1 | 22 |
| and Class Pllot | 28-58 | $\begin{aligned} & \text { Commercial (or Aerial Work) } \\ & \text { Pslot } \end{aligned}$ |  |  |
|  |  |  |  |  |
|  |  | Physical Standard | 2 | 15-17 |
|  |  | Visuel Standard. | 1 | 19-21 |
|  |  | Solor Perception Standard |  | 22 |
|  |  | Hearing Standard | (3) 1 | 22 |
| 3nd Class Pllot | 28-58 | Student Pilot |  |  |
|  |  | Physical Standerd. | 3 | 17-18 |
|  |  | Tieval Standard. | 2 | 21 |
|  |  | Color Perception Standard. | 2 | 22 |
|  |  | Hearing Standard |  | 23 (22) |
| 3rd Class P1lot | 28-58 | Private Pilot |  |  |
|  |  | Physical Standard | 3 | 17-18 |
|  |  | Yisual Standard | 2 | 21 |
|  |  | Color Perception Steindand. | 2 | 22 |
|  |  | Hearing Standard | 4 | 23 |
| 3rd Class Plot | $\begin{array}{cr}28-58 & \\ & 34-58 \\ & 28-34\end{array}$ | Pilot of Free Balloon |  |  |
|  |  | Physical Standard. | 2 | 15-17 |
|  |  | Tisuel Standard. | 2 | 21 |
|  |  | Color Perception Standard. | 2 | 22 |
|  |  | Hearing Standard. | 4 | 23 |

4. The above PICAO materiale are to be found in the FINAL REPORT of PRFSONEEL LTCENSIWG DIVISION, FIRST SESSION of the PROVISIONAL INIERNATIONAI CIVIL AVIATION ORGANIZATION, Montreal, Canada, Febxuary 24, 1946.

## 1. PART A

## PICAO Medical Requiremonts

Part A contains CHAPISR XIV - MEDICAT REQUIR WMEMPS, occunyIng paces 29-43 of the FTNAL REPORI of PERSONGEL LICENSIMG DIVISION of the PROVISIOMAL IWIERNATIOMAL CIVII AVTATION ORGAMTZATICH, Nontreal. Canada, February 24, 1946.

Tho original material of CHAPPER XIV above has been rondered in RED and explanatory insertions have been printed in PURPLS.

## PICAO IMTERITATIONAT ROCOMMENDED PRACTICES

## Lhogning of Opomatinge. Iteohanical and Controller Perponn3)

## CHAPTER XIV - YEDTCAL REOUXREMENSS

## SECTION I - Ganaral

9. Ivery candidate who presente himesls to undergo the madical examination required for the fasue or remawal of one of the licenses must furnish to the medicel examiner a doclaration aignod by him, Stating whother ho hee previously undergone such a nodicel emanination, and with what results. A falss declaration may ontail the withdrawal of the license 1ssued and the facts will bo brought to the knowledge of the Authorities of the Contracting state whose nationality the person concornod posaesses.
1.0. The mediosl examinations must bs paesed, with the exception of the examination referrad to in para, of Annex Doc. $1025 \mathrm{PEL} / 2$, before rredical.
 suing the liconss. Nodioal exomizens responatble for applying the oritical standards for weubers of the operating crew must bo amare of the practical conditions in wilich the personnel will have to fulefll their functions. Each Contracting State shall cesf.gnate for the purpose of the medient emmimatione, modienl exminers from arong modicol preotitionars licensed in the practice of medicino by that State.
10. Each Contracting State shall provisiozalky fix its own mothods of oxamination, until the detsils and the winimal condioions of the teate shell have bean settled by a dectsion of the Internetionsl Civil Aviation Organiantion.
11. The medioal re-exeminstions to ensure the maintenance of effioioncy of the holder of a lioense shall be the same as for the original accoptance.
12. The medical standarde for the verious types of licenses are divided intos

Phyaioal Standerdis No3, 1, 2, and 3;
Vieual Standards Nos. $1_{0} 2$, and $3 ;$.
Colour Perception Standards Nos, 1 and 25 and
Hearing Stendarde Nos. 1, 2, 3, and 43
and full dotails are set out below in Seotions II, IIIs IV, and V of this Chapter. ${ }^{1}$
${ }^{1}$ In these standards; the lower the number, the atrioter the requiremonte.

The wadical requiromentis for thu various typas of 1 icenses shall bes
13.01 Student T1106

Physical Standard 18o. 3
Visuel Standerd \$o. 2
Colour Perception Standexd No. 2
Hearing Standard No. 4
13.02 Privete p12ot

Plysical Standard
No. 3
Visual Standard No. 2
Colour: Percoption Standard Ho. 2
liearing Standard No. 4
13.03 Conmercion (or Aoriv2 Work) P110t

Physicel Standard
No, 2
Vísual Standard
Colou' Perception Stenderd.
No. 1
Hearing Standard
NO .2
No. 3 (1)
13.04 Alrilne Sranaport P11ot

Physical Stendard
No, 1
Visual Stauderd
No. 1
Colour Percoption Standard Mo. I
Hearing Stendard
No. 2 (2)
$13.05^{2}$ Flight Englneer and Gadet Engineor
Phyaical Standard
No. 2
Visual Standerd
Colour Perception Standard
No. 3
Hearing Standard
$13.06^{2}$ Havigator and Osdet Navigator
Physical Standard
No. 2
Trestrm stunderd No. 3
Colour Peroeption Standard No. 2
Hearing Standard No. 3
$13.07^{2}$ Plight Radio Operator
Physical Standard
No. 2
Visuel Standard
No. 3
Colour Perception Stenderd No. 2
Hearing Standard
Bo. 1 (2)

2The non-pilot classifications are not relevant to the present report. The 3 classes of airship pilot refer to lighter-than-air aireraft. For the latter, no recommendations have been made, the subject having been deferred for further study. See page 1, tmmoducmion, for clarification。
23.08 Pixderge Fred Pation

Wo. 2
isformita ntivencuast mt ith
Colour Percoption Standard
Hearing Stendard
$13.09^{2} 3$ ex ex one 2na close Alrohip pilot
Physical Stenderd
No. 2
V1sual Standaid
No. 1
Cotonutp ertaption Standerd

Ho: 2
No. 4
$13.10^{2}$ lat Glabs Alrahip palat.
Paysical Standard
No. 2
Yestiol istandar!
No. 2
Corour Fercoption Standard Ho. Z
Fearing Standand
No. 4 (1)
$13.21^{2}$ A1rok2p Pi4ght Fngernos sud Airahip Holnsment


## SECTION II

## PHYSTCAJ ponvTpawrume MOn L.TCENSES



11. The candidste mast have the cominlatio see of his form 71 mhe, bust bo fres from any active or latent (ooncealed), acuite or chronfic (of
long duration), podiaai or surgiaal disability or infeotion, whioh

poan fere whth thed mafo hamdling of an adreraft at any alltitude evan in
tho cutse offprollonged on dirnioult miggit.
15. The mediond examination shall also be based on the following reçuirenents of montal and physical iftneass
15.2 The cotudicete will be questioned concerning inis family and porbonal. hiatory.
15.2 nutuilition of the norvous syotem. The exeninetion of the nervous system of the dardidete shall include a full inquizy into fominy and personal hietory. The inforaation obtained shall bo given in a
ytatement wsde land aigaed by the candidate. Ne must bs free from
 not preaent any uental, or trophic (mutritional) impaiment, path:ological tremor (trembling due to disease), or presumptive evidence of latent epilepsy. Motility (movement), sensibility (physical
sensation), tendinous (pertaining to tendons or sinews), cutaneous (pertaining to the skin) and pupillary (pertaining to the pupil of the oye) rofloxes (involuntery movemente in respones to etimietion), coordination of movemonts and corebellar functions ${ }^{3}$ must be normal. An oxception may be nade for local peripheral trouble due to accidental seation of a nerve branch, 4

Injuries of the head winl be doelt with es follows:
(1) Gases of simple concussion (brain injury due to a blow or violent shaking), or simple fracture of the akull without associated intraoranial damags (injury to the contents of the shon1) Win1 entell temporary unfitness for a period of at least two months froa the dato of the conoussion or fracture, After the oandidate hes resumed his duties, his lieense will bs rendered valid only for suecessive periods of two months, unt11 the after-effects no longer appear liable to produce a suddon incapecity in flight.
(2) In the caso of severo intracranial injuries, the presance of local lasion (weund or injury) of tho brain mis1 entall permanent rejection. Any trepanning 5 with lose of the bowy gubstence involving the two tables of the omenfal vault (the rounded portion of the ekull) mill entail refection. The eame nill apply in case of lasion of the dura mator (the tough outer membrane covering the brain), even after a bone graft. 7

3
${ }^{3}$ The main fumotion of the cerabellum is to produce gracoful coordination of voluntary movement. Disturbenoe of physioal oquilibrium mey bo due to cerebellar disease or injury.

When a nerve is cut the muscles supplied by it abre paralysed and the skin ares suppiled by it becomes insensitive. Whan the injury ooours outside of the brain or spinal cord (and is aslled peripherel) narve rege aration eventually restores normal function if the out ends of the nerve are brought into proximity. The same prinoiples apply when a paripheral narve has been crushed or bruised aeverely onough to interfere with normal function.

5the renoval of a diso of bone from the skull by means of a oirou* lar sam is called trepanning or trephination.

6 The aknll hones are eomposed of two hati 7 cyore (tables) of bone (outer and inner) soparated by a soft (oancollowe) Iayer.

7 A bone graft is a plece of bone transplanted to cover a bony dofeot; in this case substituting for loss of bone in the cranial veult,

Any byphilis, past or present, affecting the sentral nervous sybtom (brain and apinal cord) or its blood vessels or its membraneg 8 will entail the permament rejection of the oandidato. Any presumod norvous Byphilis will entail refection, unless the non-extstence of such an impairmont is proved by an examingtion of the blood and an oxan ination of the cerobro-spinal fluic, 9 nade with the consent of the cundidate.
15.3 General surgical examination. The candidate must neither suffer from any wound, on injury, nor have undergone any operation, nor possess any abnormulity, congonite? (oacting at blíth) or aoquired, which might interfere with the safe handling of an airplane at eny altitude even in the case of prolonged or diffieult flight. He must be complately freo from hernis (rupture).

When palpation (the act of feeling with the hand) of the abdowen revesis any arolling or distinot pain, the abtopingl examination 10 must be comploted by a radioscopic and railogzaghic axnminetion. 10

Any anatomioal. Leaion in tha walls of any pert whatover of the digestive tract, and atrleture (narroning) of $15,6 a 11 \mathrm{bre}$, any calculus (conoration, such as gell stonsh) or forsigin body, and pordtonesl (pertaining to the poritonour) 21 20e1ep, ogstabzishod zy olinical or Leboratoxy axapinations will entail rojeotion, Exooption may be made for spesmodic striotimes (tomporary narrowing of the digeativs traot due to zusculan action) not accompantod by other troubles and for ptoses (a felling or sinking dom of any organ below its normal position) conpensated by a good abdominal muscuieture.

Ary candidate who has undergons a surglcal oparailon on the bilsery passages (the syatem of tuboa running from tho 11 ver and gall bladder to the digestive tube just beyond the etomagh) or the kigestive


- Bre brain and spinsi cord are enossed in threa membrenes, the monInges, called the pia (soft) mater, the arychnold and the dura (herd, tough) mater.

9The cerebro-apinal. fluid is the olear fluid in which the brain and epinal cord are suspended. Tests of this-fiuld-are-used to deteot the presence of syphilis of the central nervous syatem.

10 A radioscopic oiosminstion, elso. fromm as fluoorobdopylymplies the use of x-rays which are so modifled by arfuoroscoptcrsorioon as to be visible to the oxaviner whea the pablent 16 berng estanined. A redio-
 photographic, requiring subspquent developmenteqund evilfination of the was plates.

The peritoneun is the membrane which covers the orgaris of the abdominal cavity and the imor surfaces of the abdominal walls.
eion (outting out) or is diversion of eny of thede orgens shall be dectared unfit-unless a poriod of two yearis has alapsed since the ourglcal operation and the offeots of ths operation are not doomed 1lable to oause sudden incapacity in the sir, or an attestation mado by a surgeon beving knowledge of the nature of the disease which necessitated the sporation, certiples that no inmediate or future after-effects are to be feared.

Disesoes of the 1.1ver (including those of the bilisary passages) and of the pencreas 6111 , in cases There it is deemed necessary, be
 radlography as wall as by an examination of the blood and of the urine, and will gntail rejection only if they afford indication of the existence of a calculue, tumour or lesion involving a persiatent inpaffori of furotion of these orgens.

15E 4 General medicel examtantion. The candidate mast not suffer from any diseee or disability which renders hia liable suddenly to become incorgetent in the management of afroraft. iis muscular povier mngt tos andequate for the honding of the types of alrplanes he will have to p1lot or tis epperatus he ig to use, The heart must be normal,
 haart baet due to broathing) Incroiss of pulao rate from excite= ment or oxeraise and a genoral siow pulse not associated with auri-culo-ventricular diesooiation ${ }^{12}$ wil1 be allowed. He must not heve any 11 gns of aneurien taneur am; a sac formed by the dilatation or swelling of the walle of an artery and f111ed with blood) of the large arterial trunka.

The cantidetb tust not suffex from any soute disabllity of the lungs, horl posbofes ahyodcetrioial lezion (a wound or injury containing soas
 being diagnosed by tho uso of clinical methods and, in the cases of oxeminaijons for orlginal aocoptances, by zadioscopy frum tracise bronohial (pertaining to the windpipe or 1ta larger branches) disoase of the plande and from pilaonary emphysonal 13 oven if silght. lion-r ever, with regard to the maintenance of aifiolenoy of the pilot, pulmonary omphysema will enta.il rajection only when marked. In addition, each examination shall includa a radiographic record in doubtful olin-

12 Normally the contraotion of the heart muscle begins at the upper chambers (atria with auricles) and proceede to the lower chambers (ventrioles). The progress of the contraction from upper to lower chambers in the normal heart is precisely timed. When these tmo contractions do not bear the proper relationship to each other the condition is known as aurioulo-ventricular dissocietion.

13
Pulmonary eirphysema is a condition in which the alveoli of the lungs become distended or ruptured.

Ical casss. Fihon the examination of the splean and of the gaaglionic tract 14 revoals hypertrophy (enlargement) of these organs, the condidate shall be declered unfit unleas a hematological (pertaining to the blood) examination has ehom that it is not e case of an original impairwent of the hematopoiatic (blood forming) organs. Hemoglobimury (presence, in the urine, of hemoglobin, a substance normally found in red blood corpusoles), hemophily (hemophilia, characterised by profuse uncontrollable bleeding) and purpuras (affections caused by bleeding into the skin, membrenes or internal organs) shall also enteil rejection, unless a henatologia oal examination shoms that it is a case of only transitory impaire ment. The cendicete must not present say signs of orgenic dieesse 15 of the kidneys; thase lattor must bs insonsitive to palpation and be of normal size. The urine must not contain any pathological element. Affeotions of the urinary passages 16 and of the genital organs, even blemnorchoea (muoous disoharge from the organs of generation), may entail tempoxary unfitness, an exception baing allowed as regards the maintomance of effioiency in the case of tubereulosis orchi-epididymitis ${ }^{\text {l7 }}$ in its mild and localized formo

Candidates of the female sex wust present a normal utexus (womb; the hollow muscular organ in which the impregnated oveum is developed into the ohild) and appendages (the internal orgens of generation associated with the uterus) Cases in whioh surgleal oporation has taken place will be considered Individually. Any presumad pregnancy will eatail rejection until, at least, after the pregnanoy has been terminated. Following confinement or misoarriage, 28 tho holdor of E liounse will to knomed to teaums hor alr duties only after having undergone e naw medical examination. The candidate must not prasent any olinioul signs oŕ syphilis.

HThe ganglionic tracts are the pathways along which $I y m p h$, a body $^{\text {a }}$ fluid, is drained. Lymph nodes are grouped along theso pathways, notably in the neok, armiptt, and groin.
${ }^{15} \mathrm{An}$ organic disesse is one in which there is evident structurel change in some of the tissues or orgeas of the body.

16The uxthary passages are those structures inicil convey the urine from the kidneys to the outside. They include the uraters, bladder, and urethrs.

17 Iuboroulous orchi-epididymitis is an inflanmation of the testis and of the epididymis, the convoluted tube leading from it. It is caused by tuberoulosis of these parts.

18 continemenic usually refors to the birth of the child at the normal. time. Miscarrisge refers to birth bofore the period of pregnanoy is finished. Both modiosi and legal definitions of misaarriage vary conaiderably.

Dysentery (a diseass oharaoterized by the pasaing of frequent bloody stools) shall be considerad as an acute disease; provided that a prea sumption of dysenterto (pertaining to dysentery) infeotions shall entail rejection, unless the medics examiner oonsiders that the oilnical phenomena have disappeered.
15.5 Bye examination, The oxndidete must present no active nor chronie pathological condition of either eye or adnexse 19 which might interFore with its proper functiono mhe detatis of the visual stamdards for candidates for Ilcenses shall. be as set out in Section III, and those of the colour perception atsndexda as set out at Section IV.
15.6 Ear examination. The candidats must haves
(2) No aetive pethological process, scute or ahronic, of the intermal ear20 or middle ear cleft. 21
(2) No unherled (unclosed) parforation or perforations of the tympanic membrane (ear drum).
(3) No obstruction of the Eustachian tubes. 22
(4) No disturbances of the vestibular apparatus 23

The dotalls of the hearing standards shall bo' as set out at Section V.
${ }^{19}$ Adnexae are parts accessory to a main organ or structure. In this ease reference is made to the eyelids, lacrimal apparatus (tears), etc.
${ }^{2}$ CThe internal ear is looated doep in the head. It contains the organ of sound perception and the vestibular (equilibratory) apparatua.
$2 I_{\text {phe middle ear oleft is the tympanio cevity, on air-fliled spece }}$ located medial to the ear drum and containing the ossicles, or conducting bozes. It connects posteriorly with the mestoid air cells and anterlorly with the throat (naso-pharynx) by the Eustachian tube which normailly remains open and is air filled.

22 The Eustachian tubes are passageways leading from the tympenic cavities on both sides to the upper throat (naso-pharynx), opening above and behind the soft palate on both sides. They are normally air-filled (see footnote 21).
${ }^{23}$ The vestibular apparatus is the baiance mechanisu of the body (see footnote 20).
21. Noee, throet, and mouth examization. The candidate hust posseas iree Thesl and tubal air entry on both sides and must have noither serionu malromstion (structural dofoct) or serlous, acute or chronic, ailledtion of the buccai (mouth) cavity or upper respiratory tanct 24

## Physical Standard. No, ?

The medicel examination shall be besed on the following requtrements of mentsi and physical fitness:
16.1. The cendidata must heve a good family and personal hietor, with particular reference to מervous stability. Information as to this hiatowy must be given in a statement made and algned by the candidate.
26.2 Examination of the nervous gystom. The candidate magt bo free from any disability, congenital or acquired, of the nervous syatem caueIng euch degree of functional incapacity ae might interfsre, in the case of piloting, with the safe handing of the aircreft at any altitude even in the case of prolonged or difficult flight or, in the case of air.work other than ploting, Wth the efficiant performance of the duties for wich the 11 cense io boing souglt. (See text of paragraph 15.2 and footnotes 3-9 for technical texminology.)

In juriae of the head will be dealt with as followe:
(1) Cases of aimple concueaion or atmple fracture of the strull, without asecciated intracranial lawage, will onteil temporary unftenesi for a period or, at least, two months from the date of concussion or fracture. After the candidete has resumed his dut1es, his 21cense mey be rendered valid only for \& reducod period, or poriods, until the efter-effecte no lonfer appear lisile to produce a sudden incepacity dixing plight.
(2) Severe intracrantal infuries, the presence of Local 2esion of the brain, trepanning with $108 s$ of bony substance involving the two tables of the cranial vault or e lesion of the dure mater will involve permanent rejection.

Any preauned nervous ayphilie will require to be inve日tigated by an examination of the blood and an examination of the cerebro-spinal fluid, made rith the consent of the cendidete.
${ }^{2} 4$ rhe upper respiratory tract can be generally defined as the pathway taken by inspired air from the outaide to the laxynx (voice box). This includes the nasal cavities and the throat (phacynx) from its communication with the pasal cevities above to its opening into the larynx below the root of the tongue.
26.3 General surgical exataination. The cendidate must neither suffer from any wound, or injury, nol hevs unciergone any operation, nor possess avy abwormellty, congenttal on acquizti, which might Anturnere, in the case of pllotingy with the sefe handling of the eircratit at any altitude evan is the case of pra-onged or difficult flight, or in the case of a.ir work cther than plioting, with the efficient performance of the dution for which a Ziconse is leing sought. (Soe toxt of pearagraph 15.3 and footnotes 10-21 for technical terminology,)

When palpation of the abdomen revesis any swelling or distinct pain, the abdominal examination must be completed by a radioscopio and radiographic exantaation. Any anatonical Iosion in the thells of any part of the digastive tract, any atricture of ita calibre, any calculus or foreign body, any peritoneal lesion, estabilshed by cilndoel or laboretory examhations, will entail rejection. Excoption may be made for spasmodic atrictures not accompaniod by other troubles and for ptoses compensated by a good abdomfnal musculatrue. Any candidate sho has undergone a surgical operation on the blliary passages
 pertial exolaion or a diversion of any of these organs, shell be declared unfit unlass a period of two years has alapsed since the aurgm fal operation and the effects of the operation ars not decmed liable to ceuse sudien incapadity in the air, or sh attestation made jy a surgeon, having knowledge of the nature of the dissase which nsoessitated the operation, certffles that no imedtate or future afteraffects are to be feared.

Diseases of the liver (Including those of the blliary passages) and of the pancreas $w 131$ in cases where $1 t$ is deemed necesaary, be veris fied by laboratory and other exanimation, particularly by radiogreply os well as dy an examination of the blocd snd of the uriter and wil9 entail rejection only if they afford indication of the existemce of a calculus, tumour or lesion involving a persistent impafment of function of these organs.
26.4 Goneral medical examination. The candidate uust not suffer from ony disease or disability which renders him liable suddenly to becme inm competent in the performance of his dusips. He must have no orgatie cardibc lesion. He must be in a state to withstand the effocts of $k$ titude. He must be free from kidney disease and must not presont eny clinical sign of syphilis. (Sea text of paragraph 15.4 and footnotes 12-18 for technical terminology.)

Candidates of the female sex must present a normal uterus and appendages. Casos in which surgical operation has taken place will be considered individually. Any presumed pregnancy will entaili rejection until, at least, after the prognsmcy has bean texninated. rollowias confinement or miscarriage a candidate of the female sex will be allowed to wesume her duties only after having undergone a new medical examination.

# 16.5 Eye examination. The andidate must present no active nor chronic pathological condition of either eye or adnexae which might intarm fere with its proper function. The dotails of the visual stendards for candidates for licenses shall be as set out in Section III and those of the colour percaption standards as set out at Section IV. (See text of paragraph 15.5 and footnote 19 for technical terminology。) <br> 16.6 Ear exanination. The candiciate must have: (See text of paragraph 15.6 and footnotes 20-23 for technical terminology.) 

(ג) No active pathological process, acute or chronic, of the internal ear or middle ear cleft.
(2) No unhealed (unclosed) perforation or perforations of the tympanic mambrane.
(3) No obstruction of the Eustachian tubes.
(4) No diaturbances of the vastibular apparatus.

The detalls of the hearing atandards shall be as set out at Section $V$.
16.7 Nose, throat, and mouth examination. The candidate must possess frsa nasal and tubel air entry on both sides and must have neither serious malformation nor serkous, acute or chronic, affeption of the bucesl cavity or upper reapiratory tract. (See text of paragraph 15.7 and footnote 24 for technical terianology.)

## Physfos Standaxd No ?

17. The medical examination shall be based on the following requiroments of mental and physioal fitness:
18. 1 The candidate must have a good family and personal history with par ticular reference to nervous stability. Information as to this hlatorymust be given in a statement made and signed by the candidate.
17.2 Examination of the nervous syatom, The candidate must be free from any wound, or injury, nor have undergone any operation, nor possass any abnorwality, congenital or ecquired, which might interfere with the safe handling of the alroratt under oxdinery conditions. (See text of paragraph 15.2 and Sootnotes 3-9 for technical terminology.)
17.3 General surgical examination. Then palpation of the abdomen reveala any swelling or distinct pain, the abdominal examination must be come ploted by the radioscopic and radlographic exanination. (See text of paragraph 15.3 and footnotes 10-11 for technical terminology.)

Any candidate who has undergone a surgical operation on the biliaty passages, or the digeative tract, except for apperdicitis, involving a total or partial excision DF E diverision of any of these organs, shall be declared unitt unless a period of two years hae elapsed since the surgical operation and the effects of tho operation are not domed

1iable to cause sudden incapacity is the afr, or an attestation made by a surgeon, having knowledge of the nature of the disease which nocessitabed the operation, certilies that no lwwediate or future after-effeots are to be feared.

The existence of a calçulus, tumour, or lesion involving a persisto ent impalment of function of the liver or the pancreas will entail rejection.
17. 4 General medical examinetion. The candidate must not suffer from any disease or disability which renders him liable suddanly to become in competemt in the porformance of His duties. He must have no organio cardiac lesion. His lungs mat bo in a state to "ithstand the effects of altituds, He must be free from kidney disease and must not present any clinioel gigns of syphilis. (See text of paragraph 15.4 and footnotes 12-18 for technical terminology.)

Candidates of the female sex must present a zormal uterus and appendages. Cases in which aurgicel operation has taken place will be considered individually. Ary. presumed pregnancy will enteil rejection unt11, at least, sfter the pregmancy has been torminatod.

17:5 Eye examination. The candidate must prasent no active ncr chronic pathological condition of either eye or adnexse which might interfere with it's proper function. The details of the visual standards for candidates for 21 cences shall be as set out at Section III and those of the colour perception stendards as set out at Section IV. (See text of paragraph 15.5 and footnote 19 for technical terminology.)
27.6 Ear examination. The candiciete must haves (See text of paragraph 25.6 and footnotes 20-23 for technical terminology.)
(1) No active pathological process, acute or chronic, of the internal ear or middle ear cleft.
(2) No unhealed (uncloged) perforation or parforations of the tympanic membrene larger than pin point in sizo.
(3) No obstruction of the Eustachian tubea.
(4) No disturbances of the vestibular spparstus.

The deteils of the hearing standerds sint be as set out at Section V。
27.7 Nose, throat, and mouth examingtion. The candldate must possess free nasel and tubal air ontry on both sides and must have neither serious malformation zor sorious, autie or chronic, affection of the buccal cavity or upper respiratory tract. (See text of paragraph 15.7 and footnote 24 for teohnical teriainology.)

## VISDAL FEQUTREMEVTS FOR LTCENSES

18. The measurement of the visual scuity (keenness of vision) will be made by means of a series of optotypes (test letters) of Laodholt, or aimiler optotypes, 111 umlnated at not lean than 22 lux (meter-candle) and not sore than 20 ltuz and placed at a distance of 6 metres ( 20 feet ) from the candidate, 25

## Yigugl itsndard $\mathrm{NO}_{2} 1$

19. The candidete must have:
19.1 A visual acuity of at least $6 / 9(20 / 30)^{26}$ in each eye soparately, without correotion (no glassea); provided that if the vision in efther of both eyws ill poorer than $6 / 9(20 / 30)$ sut int poorer thats $6 / 19(29) / 60)$ ond car ber brought uk to $6 / 6(20 / 20)$ or better in aech eye ty giasses, the candidate may be admattod upoz coadition thet correcting glasses bo worn while exercising the privilages of his liconse

19,2 In the ange of epplication for an original lioonee, not wore then -2.25 dioptres of hyermetropis 27
${ }^{25}$ The lux, or meter-oandle is a mesaure of the brightness of the $13-$ lumination. The prescribod brightiness is sufficient for effortlosa reading and does not produce glare in a range known to produoe maxdmal viaval acuity.

26 Outside the parentheses the measure is in meters; inside the parenthases it is in feet. One meter 1 s about 39.4 in., a little over 3 ft. Thus, 6 meters equal about 19 ft .8 in , or 20 ft 。 In this generally socepted fractional method of noting visual acuity the mumerator (1st number) of the fraction represents the distance the subject stands from the test chart, and doss not ohange. The denominator (2nd number) reprasenta the distance from which a "nommal" eye could read the gmallest line of type successfully read by the subject whose acore is recordod. For example, a $6 / 9(20 / 30)$ eye, as above, can read test type which could bs read from a distance of 30 ft . by a normal eye. The $20 / 30$ eye thus possesses mesker acuity than a nornel eye.. A $6 / 6(20 / 20)$ eye 1 s "normal." In young poople an eye is frequently bettor than normal, as $6 / 5(20 / 16)$. The poorer the visual acuity, the larger the denominator of the fraction.
$27_{\text {Tho }}$ loris dioptrs (or dioptor) is a unit uned to denote tho strongth (refractive power) of a lens. A lens whioh bringa parallel rays of light to a focus 1 meter from the leas has a strength of one diopter. The atrangth of a lens in diopters is the reoiprocal of the focal distance of the lens measured in moter's ( 39.4 in .) Eypermotropie, or fer sightedness, is a condition in which the transparent 11 ght bending madia in the eye (cornea, lens, eto.) do not bend the light raye enough to produce a focus on the proper membrane (retins) of the eye. The foosl point in this condition lise bohind the eye
19.3 Not more than 1 dioptes of byperphoria ta ofther eye, 28
19.4 Not more than 20 asouters of -rophorlin 28
19.5 Not more than 5 dioptare of exophorie 28
 ately without the ree of correcting lanses. Where the sandidate is over 40 years of age, correcting glazaes mey be usnd to provide the same character of near vision, if he alivedy holds r. Ilcense. 29

27 (continued) and a convex lans, which causos light raye to converge, is necessary to produce a focus on the retina. The degree of hypermetropia present is expressed in terme of the etrencth of the lens nocessery to correct the oye to normel. The plus sign indicates a convex lens (minus would mean a concave lens). Hypernetropia rarely exceods 6 to 7 diopters.

28
When the eyes look ab an objeot they are so placed that theix visual axes intersect at the object under regard. If the line of viaion of one eye is occluded a slight chenge in the position of the occluded eye occurs, and is readjusted when the occlueion is removed. Rarely the occluded oje will remain in the aeme position, this being known as orthophoria, said by some authoritiss to be rare. When the occluded eye is seen to readjugt itself after remorel of the occlusion the condition 1 e called heterophoria, of whioh there aro several varietiess in hyperphoria (as above) the irisual axis of one eye risan abova that of the other; in esophoria (es above), the visusl axes converge, a convergent squint; and in exophoris, the visual axes diverge, divergent squint. The various phor1 as are measurad by the strength of the prism (which hends 1 ight rays) required to realign the tro visusl axes mhen the eyas are out of 1ine. The "prisim diopter" is uaed to deaignate the strangth of a pxisil. A 1 diopter priem bends a ray of $11 \mathrm{ght} I \mathrm{~cm}$. out of line 1 meter away. A 2 diopter prism bends the 11 ght 2 cm ., etc. It will be seon from the specification thet only e small degree of verticel misolimment ( 1 diopter) is permitted. Greater degrees of convergence ( 10 diopters) and divergence ( 5 diopters) are permitted. In tho various phorias no misalignment is implied when both eyes can see an object. Phorias are a tendency to misalignment whioh is reves?ed by obscuring the vision of one eye.
${ }^{29}$ Accommodation is the teohnical texm denoting the focusing power of the eye. The normal eye at rest is focused for objects 20 ft, or more distant. For an object any neerer than 20 ft , the normal eye must "accommodate" to bring the light reye from the object to a foous at the proper point in the eye. The range of accomodation is greatest in young people and decreases with age. The nearest point at which clear focus can bo made by a normal eye is about 3 inches distant, the farthest point being infinitely distent. The focusing power of any eye is measured by the strength of tho lens required to produce the same effect, and is expressed in (lens) diopters (footnote 27). At the age of 12 about 13 diopters of accommodation are possible, the range deorvesing to 6 diopters at 40 and 1 diopter at
19.7 Normal visual fields, 30

## VA aval Standard Nos 3

20. The candidate must heves
20.1 A vieual acuity of at least, $6 / 12(20 / 40)$ in each oye separately, without correction, provided that if the vision in either or both eyec i.a proper that $6 / 12(20 / 40)$ but not poorer than $6 / 60(20 / 200)$ and can be brought up to $6 / 6(20 / 20)$ or batter in eech eye by glasses, the cend1date may be aduitted upon condition that correoting glasses be worn whize exeroiaing the privileges of his liconse. (See text of paragraph 19.1 and footnote 26 for tecinical terwinology.)
20.2 Satiefeotory ocular muscle belance. (See text of paragraph 19.3 to 19.5 and footnote 28 for technicel torminology.)
20.3 Hormal fislds of vision, due allowance being wade, where errors of rew fraction exist, concerning those aress not covered by the correoting lenses. 30

## Yigus 1 Standerd $\mathrm{NO}_{\mathrm{o}} 3$

21. The candidate must haven
21.1 A viaual acuity of at least $6 / 12(20 / 40)$ in each eye separately, without correction, provided that if the vision in either or both eyes is poorer than $6 / 12(20 / 40)$ but not poorer than $6 / 24(20 / 80)$ and can be brought up to $6 / 6(20 / 20)$ or better in each oye by glasses, the candidate may be admitted upon condition that correcting glasses be worn while exercising the privileges of his ilcense, (See text of paragraph 19.1 and footnote 26 for teohnical terminology.)
21.2 Normel fields of vision, due allowance being made, whers errors of rofraction exist, concerning those arees not covered by the correcting lepeer, 30
${ }^{29}$ (continued) 60. The above apecification requires the examinee to road a line of type 30 centimeters ( 12 inches) distant. The size of the type is so reduced that it corresponds to the type size thet a normel eye could read at 20 feot. Correoting glasses ars fitted so as to bring the foous of the resting eye to a convenient point. Thus, when correcting glasses are worn the oye is able to exert whatover range of accommodation it possesses with an artificial "head start, In this way correcting glassas may bring the "same character of near vision to persons with a ifinited range of accommodation.

30 This implies normal extent of vision above, below, and to both sides of the line of vision. It also implies that no abnormal blind spots o. arreas of din vision can be detected anymere in the P4elds.
22. The candidate must have no. .al colour porception as tested by means

- of Iahihare plates or 1sochromatio plátes. 31 . .

The caniddate must be able to distinguish easily signal red; signal green, and white.

SEGTION V

2i. The measuremert of the sudttory eculty (keenness) in the first three standards datajlad belou will be made by meana of a standard pure tone audioneter (an eleotrical instrument for recording the "minimum audible ${ }^{n}$ for pure sounds of various pitches) in a quiet room, that is, a room in which the intonaity of the backgromad nolee is lese than 50 desibels as measured by a sound level moter. 32

## Heating Stindars rizo. 3

25. The condidate muet not have a loss in elther ear of wore than 20 decibels at any one of the İve frequenotes ' $256,512,1024,2048$, and 4096 cycles por second. 33

31
Ishihara plates or isoohromatio plates are sets of cards on which spots of ilfferent colors are arranged in certain patterns (figures, letters, winding lines) against a background of differently colored spots. Persons with defective color vision experience difficulty in reading the designs. In certain of the Ishibara plates people with normal color vision read ons number and color blind individuals another.

32
The decibel is used to measure the intensity values of audible sound. Sounds in a quiet streat approxinate 30 dacibele; a conversational voice at 12 feet, 50 decibels; and a loud peal of thunder, 70 decibels.
${ }^{33}$ Hearing loss in deaibels inay be roughly estimated by reading the ifgure as a percentages a loss of 20 decibels may be considered a 20 per cent loss. The pitch of a sound depends on the nurbes of vibrations per second in the sir, its frequency. Audible frequencles vary from 32 per second, the very lowest, to about 20,000 per second, the very highest. Ordinary conversetion occupies frequencies of from 300 per socond to 3000 per second. The above frequencies comprise a somewhat greater range than that of spoken conversation in paragraph 25. Note the differences in paragraphe 26 and 27.

## Hearine Stendard. No, 2

26. The candidate muat not have e loss in atther ear of more than 20 decibels at any one of the four frequencies 256, 512, 1024, and 2048 cyclos per second. 33

## Haaring Stsuderd lio. 3

27. The candidete mist rot have a loss in oxther ear of more than 10 decibels at aky one of the thres frequencles 512, 1024, and 2048. 33

## Hearing Standard Mont

28. The candidate must be able to hear a oonversational voice, using both ears and standing with his back towards the examiner, at a distance of 2.50 metres (about $8 \mathrm{ft}_{\mathrm{f}}$ ) from the examiner.

## Footnotes

(1) A Private or Comercial Pilot who bolds, or wishes to hold, an Instrument Rating will require to reach the Hearing Stendard appropriate for a Plight Radio Operator.
(2) Where the holder of a liconse falls to mest Hearing Standard No, 2 but is able to meet Hearing Standard No, 2 and the competent aeronautical authorities are of the opinion that his aeronautical experience, ablifty and fudgment compensete for his hearing deficiency having regard to the nature of the equipment ho requires to oparate the license may be ranewed being limited, 15. necessery, as to the type of operation, the type of radio equipment or the porsod before medicel re-evominetion.

## Note

In several countries, oring to the lack of suitable equipment and facilities at the prasent time, the authorities may be unable to arrange compliance with Hearing Standards Nos. 1, 2, and 3 as dow tailed above. In sush countries the avthorities should, as an interim measure, set altemative etandards and meens of testing whioh they are setisfied are the equivelents of these detailed.


## CAA Modicel Recuirements

Part B conteins the current medical requiremente of the Civil Aeronautics Administration (CAA) of the Department of Comerce, U.S.A. The following source materials have been used:
> (A-1) HANDBOOK FOR MEDICAL EXANINERS, SECOKD EDITION, REVISED OCTOBER 15, 1944.
> (A-2) SUPDTEMONT TO SWCOND EDTMION OF HA*DOBOOK FOR MEDICAL EXAMINIERS, APRIL 1946 .
> (B-1) PARI IV TO HANDBOOK FOR MEDICAL EXAMINERS AIRLINE TRANSPORT PIION, SECOND EDITION, FOVIMBER $1,1942$.
> (B-2) SUPPLEMENT TO EANDBOOK FOR MEDICAL EXAMINERS ATRLINS RRANSPORT PILOT, APRIL 1946.

The above materiale have been rendered in single form as follows: PARI III, FHYSICAL REQUIRKMEMS of A-2 supersedes certain portions of PARI III, PHYYICAL RBRUTREMENES of A-1. The supergeding paragraphs of A-2 have been inserted in A-1 accordingly. PART IV, PHYSICAL REQUJREMBIMS of B-2 similarly supersedes corresponding paragraphs of PART IV, FHYSICAL RPRUIRAMENES of B-1 and has received aimilar treatment.

The PARI III, FHYSICAL REQUIREMENIS of A-1 and A-2 applies to 2nd and 3nd class pilots. PART IV, PHYSICAI RBQUTREMEMTS of B-1 and B-i applies to let class pilots (Airline Tranaport P1lots).

The CAA meterials listed above heve been amended by a directive dated Monday, November 11, 1946, from the office of T. P. Wright, Administrator of Civil Aeroneutics. This itam directs the omission of Fye Refraction Tests as a part of the physical examinations of Comercial Pilots. Requirements pertaining to Eye Refraction Testa have been deleted from the above materials in accordance with this directive.

The original CAA materials, prepared as indicated above, have been rendered in RKD, and the insertions have been printed in PURPLE.

It is to be noted that the CAA pateriale are presented only on the left hand pages. On the right hand pages, opposing the CAA materials, are presented the sections from the PICAO report. It should again be notod that the direct comparability between the CAA and PICAO materials presented. in juxtaposition is far from perfect beceuse of the diveraity of the two sets of materials. The PICAO materials bave been organized as far as possible as they pertain to (1) vision, (2) ear, nose, throat, and equilibrium; (3) general physical condition, and (4) nervous system. These are the categories in terms of which the CAA materials axe organized. However, it should.
be made clear thet direct comparability of reference betweon OAA and PICAO materials within these general categoriss is not necessarily implied.

Furthexmore, it should aleo be empheaized that the cless designations of physical, visual, color percoption, end hearing otandards, as presented. in the PICAO materials, do not always correapond to the "pilot class" certificate as presented. in the CAA materisis. For example, the CAA third. class certificate may bo held by private pilote. According to the PICAO requirementa, as presented on page 8, the private pilot must attain Physical Standard No. 3, Fisuel Stendard. No. 2, Color Porception Stancand No. 2, and Hearing Standaxd Mo. 4. Similarly, the CAA requirements for a commercial pilot require a second class medical certiflcate. According to the PICAO requiremente, a commercial pilot muet atoin Viewal Standerd. No. 1. However, deapite this fact the presentation of PTCAO Standard.s No. I hes bsen placed in juxtaposition with the CAA requitrements for the transport pilot. This has been done bscause the PICAO materials require the airline traneport pllot to attein the Standards No. I in ell cases. Both the PICAO Standards No. 1 , and the CAA flret class requirements represent the most strict apecifications in the PICAO and CAA raterials, respectively.

It ahould also be observed that in Part B, footnote references in the PICAO material refer back to the explanatory footnotes in Part A where the PICAO requirements are presented fully and in context.

$\qquad$









 120


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## SBCOOND \& THIRD CIASSTS

20 preserve uniformity of expreseion in this part of the Fandbook, the following are listed as disqualifying limits and conditions.

When in doubt issue a lower class certificate or refer the decision to the Medical Director,
(A) EYE

## 2. HTSTMORY34

History of algnificant ocular diseases or injury is evaluated individusliy in connection with other ifndings. See 'special issue' certificatos.

## 2. VISION

SECOND CLASS - Leas than 20/2035 each oye separately without correcting lenser of any kind (including contact lenses) is diacualifying. If the vision of either eye is less than 20/20 but not less than 20/50 it must correct to at leabt $20 / 20$ in each eye separately, in which case the lens requirement must be entered on the report of examinstion and on the medical certificate.

THIRD CLASS - Less than 20/50 each eye Beparately without correction of any kind (including contact lenses) is disqualifying. If the vision is less than 20/50 in e1ther eye it must corract to at least 20/30 in each eye separately, in which cass the lens requiremonts must be entered on the report of examination and on the medical certificate, 36

## 3. DEPTM PERCEETYON37

${ }^{34}$ Certain characteristics encountered in oye examinations are suggestive of the presence of or history of disease elsowhere in the body. (History is the past medical record of the examinee.)
${ }^{35}$ In this fractional mothod of noting visual acuity the numerator (first number) represents the distance (in feet) that the examinee stands from the test chart, and does not change. The denaminator (second number) represents the diatence from phich a "nornal" oye could reed the amallest lino of type read by the oxaninee. Thus, $20 / 20$ is normal vision. An oye yiolding a score of $20 / 50 \mathrm{can}$ read, from 20 foet, a line of type which could be read from a distance of 50 ft . by a normal (20/20) eye.
$36_{\text {whon glesses are worn this is known as corrected Fiaion. The above }}$ specification requires correction to normal vision.

37The Howard-Dolman apparatus is specified. The oxaminee is required to adjust a movable rod to a position opposite a fixed rod 20 foet distant so that the two are equelly dietant from him. Preecribed mules guard against judgment by other means than depth perception. The average score is derived from not less than 5 nor more than 10 determinations.

## PICAO REQULRKMESTS

## ITSTAL RIOQUTRFMEVAS FOR LTCIMSES

18. The meeouremant of the winual aculty (koonneas of Viaion) will be maile by means of a aerios of optotypeo (test letters) of Landholt, ©r simiiar optotypes, flluminated est not less then 122123 (meter-candle) and not more than 20.2 ux , and pisced at a diatance of 6 metros ( 20 foet) from the candidate. 25

## Visua). Standerd Io. ?

20. The candidnte must have:
20.1 A risual acuity of at lesst $6 / 12(20 / 40)$ in oech oye separatoly, without correction, provided thet, if the vision in oithor or both oyes is poorer than $6 / 12(20 / 40)$ but not poorer than $6 / 60\{20 / 200)$ and cen be brought up tio $6 / 6 .(20 / 20)$ or bettar in eewh oye by glaceee, the caraidate mey be edmitted upon condition that correcting glasses bo wown while oxerciaing the privileges of his license. (See text of paragraph 19.1 and Pootnote 26 for tecimical terminology, pege 19.)

## Fianal Standard IIO. 3

an... The candidato muet have:
2xi A viauni acuity of at least $6 / 12(20 / 40)$ in oach oyo soparately, without dorrection, provided that if the viaion in olther or both eyos is pootor than $6 / 12(20 / 40)$ out not pooros than $6 / 24(20 / 80)$ and can 05 brought up to $6 / 6(20 / 20)$ or botter In each eye by glasies, but the candidate msy be adnitted upon condition that correcting glasses be worm wifle exerciging the privilegon of his jlcenge. (Soe text of paragraph 19.1 and Pootnote 26 for technical torininology, pege 1.9.)

SRCOND \& TRIRD CIASSAS - Avorage oxcror Over 30 mm. (about 1-3/16 1nches) is disqualifying. If correcting lenges ero required to seoure adequate viaion, thia requiremont must alao be met with those losses, and the lons requiremont entered upon the report of the exemainetion and upon the medical certiffostis.
4. CUULAR MUSCLE BAIANCE 38
a. Diplopia:39

SToCID CIASS ; If present in any part of the field bounded. by an angle of 35 degrees from directly ahead, disqualifies.

THTRD CJASS .. If present in any part of the fleld bounded by an engle of 35 degrees from directily ahoad, disqualifles, unless overcome by the applicant"s correcting lonses, in fitch case the lens reguirement muet be ontersd. upon the report of exsmination snd the medical certificate. If lenses are required to meet the visual and depth porception requirements the red glass test for diplopia must be accomplished. With those lenses.
b. Hoterophorie: 40

SMCOND CLASS - Iyperphoris (2atent tendency for one eyo to point higher than the other), right or left, exceeding one diopter, diequalifies.

THERD CLASS - No requirements. Recorded only.

38 The ocular muscles attached to the eye control eye movemont and eye position. Jormeliy the line of vision, or Fisual aris, of ono oye intersects that of the other aye at the objact under regard.

39piplopia is double vieion. The two visual axes are miseligned and do not intergect at the object under regard. The image of the outaide world in one eye is differently placed from that in the other syo. The two do not fuse into one, and double vision occurb. A piece of red Blass in placed before one eye and the examinoe loolcs at a distant white light. If two images appear, one white and the other red, diplopia is present.
${ }^{40}$ Hoterophoria is a latont tondency to miealigmont of the visual axes (footnote 38). The Fisual axes are properiy aligned (or nearly so) when both eyes see the object under regard. When the vision of one oye is obscured the latent tendency to misaligment becomes a real miealigment and the obscurse sye wanders out of line. The bame result can be obtained by the prescribed appaxatus, the Maddox Rod, which producas dissimilar ininges of the test object (point of light) when pleced before one sye. The extent of latent tondency to miseligrmant is monsured by the strength of tho prism required to coxract it. The atrength of prismes, which bond light, is moasured in (prisa) diopters. A 1 diopter prism bends light 1 centimeter out of line 1 meter from the eye, a 2 diopter prism, 2 centimeters, etc.

## PICAO RTQUIRTMIMIS

## V1sne 2 Suandarg No. ?

20.2 Satisfactory ocular muscie balance. (See text of paragraph 19.3 to 19.5 and footnote 28 for technical terminology, page 20.)
20. 3 Horasi. Flelतa of velon, due ellovence being whte, vhere sxrors of retraction axiet, conceming thae arese not covered by the correcting lenges. (Soe text of pexregraph 19.7 and footnote 30 for technical. terminology, pege 21.)

## Wioual Standard ITC. 3

23. 2 Normal flelde of Fision, dus ailoweace being wede, where orcors of refraction exiat, concerning those areass not covered by the compecting lense日, (See text of paregraph 19.7 and footnote 30 for tachnical terminology, page 21.)

SECOND CLASS - Divergence (priam base in, abduction) less than 3 prism di= optars diaqualifies.

Corvergence (prism base out, adduction) 3ess than 6 prism dioptera, disqualifiese

THIND GLASS - No requirements. Recorded only. 5. ACCOMODAMTOn42

SECOMD GLASS - Pallure to read $V=1.00$ at 28 inches without corroction on the Civil Aeronautics Administration Toat Caxd, disqualifies. Tost performed binoculaty.

THIFD Class - No requiremente. Recorded only.
6. exumelar coroon vieran 43

SECOND CLASS - Inability to differemtiate readily the dominant huea of rod, green, yellow, blue, and brom, disqualifles for pilots, Airport Traffic Controllers.

THIRD CLASS - No requirements. Recorded onily.
7. VISTAT PTEYDS44.

4lphis is a measure of the examineo's ability to diverge (abduct) and converge (adduct) the viaual azes to maintain a single image whon a priean, plased. in front of one oye, bends the two inages (progreasively) further away froes esch other. The prises is rotated until the dsetant light becomes double. The strength of the prien that would be required to corroct such a degres of rienaligroant of the eyes is the reasuroment of the exasines 'a power of duction.

4 rimis requirement desis with the focuaing power of the eye. The normal eyo at rest is focused for objects 20 feet or more distant. then an object is nearer than 20 feet the nowmal eyo mut focum the 11 ght so that a clear image of it lalls on the light wensitive membrane in the sye. The range of acconnodation is greatost in young people and decreases vith age. In the above test both eyea are used (binocular performance) without glesges.
${ }^{43}$ The terin "CIGFRAL" puplies objects seon when loolding directly at thom as diatinguished from objects of: to one side, above, or below, which are designated PKRTPHERAL. Different colored Jaras are used to perform such a test. Fiolugren Test, Set No. 70, is apecified.
44. In noxmal. eyes the field of vision extends $90^{\circ}$ or more from the line of vision to the side on a horizontal plane and to a like extent for aome diatence below. Above, bolow, and medially the pield of vision is linited

## PICAO RERUIREAETMS

## Colour Percoution Stenderd IIo. 2

23. The candidate muat be able to distinguish easily algonal yed, aignal. Brosn, and white.
B. Finger and Fixation Te日t, (checi defocts with partmeter and camplmeter, include record with report).

SECOND \& THIRD CLASSRS - Significant ifold dofocts disqualify.
8. ITSPESCMTON 45

STCOVD Ef ITMRD CLASSISS - Strabiemus, nyatagama, and any pathological condition ilkely to grow worse, or which may interfere with function, diequalify

## 9. INSPDCDION (Continued) 45

SBCOMD \& THMFD CLASSES - Abnomnal associatod movementa; abnomal pupillary reactions of pethological aignificance, or likely to interfere whith function, disqualify.
10. OPEFMALMOSCOPIC RXAMITAAIO 46

SBCOND \& TRIRD CIASSES - Fundus and modia - Any pathological or morphological condition of significance, likely to intexfore with function, or likely to progress to that degree will diequally.
(B) EAR, NOSB, THROA'G, AND EQUILTBRIUM
21. HISTORY47

44 (Continued) by eyebrow, choek, and nose, respectively. In the finger tost the oxaminer sits facing the examinoe and judges the distance offside, above, below, otc. at which a finger can no longer be seen. This test serves to reveel decreases in the size of the fielde or abnormal blind spote. The perimeter is an instrument deaigned for localization and mapping of the dofect. The campimeter is an instrument similarly used when defects near the line of vision require very exact localization.

45 Strabigms is a lack of parallelism of the diraction in which the two eyes are looking when at rost; squint, cross-eyednoss, etc. Ilystagmus is an involuntaxy raythmical oscillation of the eyeballs. Abnormal associated movemonts, which rosemble a "tic" or St. Vitus' dance, are generally regarded as indications of nervous instability. The pupillary reactions are those involving changes in the size of the pupil.
$46_{\text {The ophthalmoscope is in instrument designed for exemination of the }}$ interior of the oyeball. A bright beem of light is directed into it and the reflected light is observed by the examiner. The fundus is the part of the interior of the oye which can be obeerred with an ophthalmoscope. The modia are the transparent structures through which light normally passes to stimulate the light sensitive membrane. Changes due to disesse (pathology) or structural (morphological) abnormalities can be observed by this tochnique.
$47_{\text {A radical mastoidectong is an operation on the mastold process, } 10-10}$ cated behind the ear, in which the oar drum and certain of the amall conducting bones of the ear have beon removed. Otitis media is inflommation of the middle ear.

## PICAO REQUIRIMISNIS

## Physicel Standerd No. 2

26.5 位e thamination. The candidate mast preaent no active nor chronic pathological coniltion of eithor eye or ednaxse which might interfere with its proper function. The detaile of the visual standerde for candidetet for 21 censes ahall be ae sat out in Section III and those of the colour perception stendards ae sot out at Section IV. (Soe text of paragraph 15.5 and footnote 19 for technical terminology, page 14.)

## Physical Standard No. 3

17.5 Mye examination. The candidate must preaent no active nor chronic pathologicel condition of either oye or adnexae which might interfore with 1 te proper function. the detalss of the Fiaval etenderde for condidates Por licensos shell be as set out et Section III and those of the colour perception standards as set out at Section IV.
(See text of paragraph 15.5 and footnote 19 for technical terininology, page 24.)

SBCOND \& 2HITRD CLASiSP8 - Radical mestoidectory or recurrent chronic otitis media are disquelifying. Other sienificant higtory will bo avaluated in comnaction wich essociated. finalnge
22. DRTM MGYBRAME (BAR DRMM)

SDCOOND CTASS - Perforations of axy dagree, unle日a weived, disqualify.
 cal conditions are to be referred. to the Medical. Director.
13. OTMTYS OR NASTOTDTETSS 48
smcorm of Tultio elmasme - mithor acute or chronic is disqualifying until cured. Other significant conditions are to be referred to the Medicel Diractor.
14. Hetafictig

SECOND CIASS - Nust hear the whispored voice in each ear separately without the use of hearlng alds at 8 leat or present an eudiogram showing no loss in either oes greater than 40 decibels at Irequencies from 512 to 2856, inclusive.

SHITID CIASS - Iees than 3 feot (wispered. voice) in both ears, teated seperateily diequalifios. (Minimum of 3 Peet required in one ear only.)

WAIVERS - May be grented by tho Modical. Direetor to appilcante who fail to meot these requirements provided thein long experience in aviation and actuki flight toEts indicatos that leanirg is odecuate undor flying conaltions and provided that a hearing aid is worm on the ground. With which the atated hearing requirements can be mat. Nerlex cases for waivers to the Nedicel Director, Civil feronautics Adininistration, Fashington, D. C.

## 15. MOSI \& SMUUSES 50

$480 t 1 t 1 s$ is Inflammation of the eex. Nastolditis is inflamation of the mastold process, the bony prominonce bohind the oar, conteining air celle wich onuminicate with the middle oer.

49 Audible Irequencies range from 32 per second (lowest audible pitch) to about 20,000 per second (highest audible pitch). Ordinary conversation occupies frequencies of Prom 300 to 3000 per second. The decibel is a unit used to measure the intensity values of audible sound. In general, decibel loss may be regarded as percentage loss.

50 The nasal septumis loceted in the midino and divides the nesal cavity in two, each portion commuicating with the outside by a nostril. Perforations of this septum sometimes occur. Nasal polypi are growths into the nasal carity, atteched by a stalk of tiseue.

## PICAO RBQUIREMGWIS

## Paygical Standard Mo ?

### 16.6 Bar exemination. The cendidate muet have: (Soe text of paragraph

 15.6 and footnotes 20-23 for technical terminology, pege 14.)(1) No activa pathoingical procees, acute or chronio, of tha internal. oar or middle ear cieft.
(2) Wo unheeled imelooed) perpozetion or perforetione of the tynpanic membrano.
(3) No obetruction of the Bustachse tubes.
(4) Wo disturbances of the vagtibular epperetus.

The dotails of the hearing stenderde shail ho as bot out at Section 7 .

## Phystica? Standard 30. 3

17.6 Bar oxarination. Mio candidate must, hanv: (Beo text of paragraph 15.6 and footnotes 21-23 for tochnicel terminology, page 14.)
(1) IHo active patholagical process, anto or chropic, of the interral ear ox middle ear cjert.
(2) Mo unheslod (unclosed) perioration or porforstions of the tynpenic membrano larger than pin point in size.
(3) No obstmaction of the Fhatachian tribas.
(4) No disturbances of the rostibular apparetus.

HRARTNG RENTIREMETHP FOR ITCETESES
24. The meesurement of the anditory soulty (keennese) in tho flrat thres atandards will be mide by means of a standerd pure tone audiometer (an electrical instrument for recording the "winimum audible" for pure sounde of various pitches) in a quiet rocm, thet is, a room in which the intensity of the beciceround noise is less than 50 decibole as moasured by a bound level mater 32

Heneing Standard No. 2
26. The candidato must not have a loas in either ear of more than 20 dacibels at any one of the four frequevoles 256, 512, 1024 , and 2048 cyc an per gecond 33 (See tsxt of paragraph 25 and footnote 33 for technical terrainology, page 22.)

## Hearing Standard 70.3

?.. The candidate must not hays a loes in either ear of moce than 40 dacibels at eny one of the thres Irequenclas $512,1,024$, and 20t8 33

HaRming Standard No 4
28. The candidato must be able to hane a converentional voice, using botb oars and standing with bis back, tovends the exaroiner, at a distance of 2.50 netrea (about 8 ft .) efam the examiner.
A. Detormity, malfoxzertion or obstmuction of the nose guffictent to interTere with nasal cesplxation
bo Septal perporations watsi. proven non-syph111.t1c.
c. Poat nasal edenoids or naesl polypi sufficient to interfere with nasal respiration, ox when abrociated with progreaelve midale ear diseese.
16. MOUYE \& MHROAT 51

## SIOCOWD \& THIRD CLASSES

The following will be regarded as disqualifying:
s. Barelip unrepeired, or cleft palate.
b. Other mesformetion or any condition of the tongue producing interfersnce wi.th speech.
C. Pexforgtion or extensive logs of substance of the hand or sor't palate; extensive adhesions of the soft palate to the phergax; or paralyale of the soft palsto.

## 17. ECTSTORX OF SWIMF, TRATN, SBA, OR A1R SICKYESS

Consider in connection with other inndings.
18. SIMIF-BATANCX52

SECORD \& TETRD CLASSES Neliure on three tifals disqualifies. Consider also any history of intemal eax disease of Meniere's Syndrome. Refer to the Nodical Directsor

## 19. THMPERRATURE

If abnormal, defer examination.
${ }^{51}$ Harelip is a cleft in the upper 11p, ueually running from the mouth to the nostril. It is scmetines accompanied by cleft palate, which causes communication between the nesal cavity and the mouth. Clear apsech is difficult in oither condition. The hard pelete hes a bciy siructure and forms the front part of the roof of the mouth. The moft pelate, lacking bone, forms the poaterior part of the roof of the mouth.

52 Joint-muscle घenve is in part responeible for the maintenance of equilibrium. The prescribsd test requires the examinee to stand on one foot with eyes closed for 15 seconds. Falling or awaying indicates poor selfbalance. Heniere's Syndrome is due to divease of the equilibratory (vestibutar) apparatus in the inner oar and is cherecterized by paleness, dizziness, disordered oye movement and auditory symptoms.

## PICAO RMQULRIMETIS

## Footnotes

(1) A Private or Commerclat Pllot who holds, or wiphee to hold, an Instruwent Rating will require to reach the Hearing Standard appropriate for a Fligint Radio Operator.
(2) Whare the holder of a Ilcense falle to neet Hearing Stondara No. i, but is able to meet Hearing Stondard. Ho. 2 and the competent aeronautical authoritioe am, of the opinition that his aoronautical oxporience, ability and fudbent compenseto for his heering deficiency having regard to the nature of the equipment he xequiras to operate the 1 icense may be renewed baing linited, if necessery, as to the type of operation, the type of radio equipnoat or the period befono medical re-czomination.

## Note

## aget ban witce)

In several countales, oring to the leck of suitable enulpment and facilitios at the present time, the authorities may be unable to axrange compliance with Foaring Stendarkis Mos. 1, 2, and 3 as dotailed above. In such countries the authoritiea should, as an intierim mecsure, sob sltomativo standaris and means of tasting which thay are satisplied ars the oquitmionts of thano detailod.

## Physical Standard No. ?

36.7 IVose, throat, and mouth axamination. The oandideto must possess freo nasal and tubal alr ontry on both eldes and muet have neither serious matformation nor sexicus, scuto or chronic, affaction of the buocel cavity or upper rospiratory tract. (See text of paragraph 15.7 and footaote 24 for tochnical terninoloesy, page 15.)

$$
\text { Physical Standard No. } 3
$$

17.7 Fose, throat, and nouth examinstion. The candidate must possoas irgo nasal sad tubal air ontry on both sides and must have noithor seriove matfomation now sembire, eante on ohreanin, affection of tha huccal carlty or uppes reaplratory tzact. (Ses toxt of paragraph 15.7 and footnoto 24 for technical torminology, poge 15.)

## (C) GENEAMZ PAYEIGCAL CONDITION

20. MBDTCAL ETSY'ORT

SBCOND \& THIRD CIASSES - Individually oveluated. Orerwoight will be con oidered oniy as ralatod to conetitutional pathology or as it interferes with the aape operation of alroxatc.

## 23. BONES \& JOTNTS

 (restriction of movement), deformity; diseaee of the vertebrae.

Petvis - Nerrormetions and dorormitios eurficieat to interfore with the esfe operation of alrcraft.

Bxtramitios (exms and lege) - Any abnomalities in the form, number, proportions, or movements which interfere with nomes funotion.
a. Any inilation of motion of the shouleer, elbor, wrist, hip, knee, or ankle jointe, or any deforaities of the hande or feet which interfere with the eafe operabion of aircra?t.
b. Any atrophy (wasting) of tho mascles or any pert of the body which is progressiva, or is sufficient to interfere with function.
c. Tremorg (trembling or quivering) of eufficient degree to interfere with function.
d. Any unlimitod. Practures with ahortaning or defomity; dislocations wnreduced or pexily unceduced, anlylosis of a joint, partial or complete, reiaxed ennulax (ciroular) ilements permiting froquent or involuntaxy displacement.
o. Armputation of eny portion of a 2.5 mb , except fingers and toes, or resection (partial removal) of s joint. A sufilcient number of fingens muet be present on esch hent to insure the ability to manipulete all controle of alroraft properly. See 'speciel iseue' cortifloaties.
f. Disease of the bones or joints; chronic eders (swelling of tissues); chronic or obstinate neurelgias (nerve pain), particularly acietics. Recent history of rhoumstic or arthritic infent:on.
24. - 25. CARD OVASUUTAR SYSTIGM

SDCOND OLASS
c. Orthostatic tolerance test: 53

[^0]
## PICAO REQUIREMETIS

## Paybicai Stendare Ho. ?

35.4 SeDerai medicai ezemingtion. The cendidate muat not duffer from any disearee or dlaablility valch renders him 3iable guldoniy to become ln-
 sardio leaion. Ke muat. be 10 a atate to withatand the effecta of a?
 isinical is: of syphilis. (See text of paragraph 15.4 and footnotes 12-18 for technical terainology, pages $12-13$.)

15, 3 Generel arryical examination. The csudidnte mant not ther euf for from aly weand, or infury, nor bave undergone any operation, nor proseege any abnormaility, ongenstai or acguired, wich migit interpers, in the ase of pliotiog, whth the nafe handilng of the mircraft of any a] titude even in: the csse of prolonged or alfricult filght, or in the cese of air waxk other than pilozing, with the afficlent perform. anne of the dutieo for thich a Iicense if being sought. (Soe text of paragraph 15.3 and footnotem 10-11 for tochnical tezminology, pages 11-12.)

The reaponse to the teat, waless due to recent ilingss, ia disqualifying if
(e) Pulse rate increases to more than 120 beates per minute (ORTHOSTATJC TACEYCARDIA).
(b) Blood prossuxe falle to velues less thea 90 man. H.g. systollo, of 54 mm . H. 8. diastolic (ORTHOSNATIC HYPOTENSION).
(o) Examinoe dieplay faititness or ByDCope (ORIHCsidatic Sxacope)。

## SBCOMD \& THIRD CIASSES

 of 100 mm ., disqualifies for second claes. Systolic in excess of 160 mm ., or diastolic in excess of 100 mFI , disquelifies for third class. 54
b. Valvular dieease of the heart. 55 See appendix for report form,
c. Hypertrophy (overgrowth) dilation of the heart.
d. Poricarditis; andocarditis; myocerditia; or coronery disoase with or Without angine pectoris. 56
Q. Hoartblock, armoculon flutter auricular Pibrilidition, parcxy
tachycerdia or thyroid toxicosis. 57
f. Asteriosclerosis (bendening of the arteries) or hyportension. .
g. Anoumem, any locetion (bulging of anterial walla)
h. Intermittent claudication; Burgoris disease, Roynaud ${ }^{\circ}$ e diseese; or
$54_{\text {The }}$ blood pressure rises and falle with the heartbeat. The thrust of the heart muscle increases the pressure (systolic prosaure) which falls between heartbeate (diestolic pressure).

5\% men the valves of the heart are diseased this pornits flow of blood in the wrong direction causing circulatory inefficiency.

56 pericerditis means inflemmetion of the membrenes covering the hoart; endocarditis refers to a like condition of the lining membranes; and myocarditis to inflamation of the hoart muacle itself. Angina Pectoris is a constricting pain in the chest and arm due to fmpaired coronary circulation of the heart.

57 In heartblock the beat of the lower chembers of the heart does not follow that of the upper chambers in proper sequence. Auricular flutter and fibrillation both imply departuro from the normal regular beat of the uppor chambers of the heart. Peroryemal techycendie fmplies rapti pulee the onset of which is suddon. Thyroid toxicosis is overactivity of the thyroid gland producing toxic symptoms.

## PICAO REQUIRPMENS

## Physical Standard Mip. 3

17.4 Qeneral todisal exmatration. The candidste must not guffor irom amy disease or diesilifty wich renfors hine liablo suddenly tn beccme incompotent, in the portoxmance of his dution. He must hove no argantc carliac lesion. Hls lupge must be in a state to wthatand the effenta of altitude. He wivet he frse from klisey disesse and must not prosent any clinical aters of Byph121s. (Seo text of paragraph 15.4 and footnotes 12-18 for technical terminology, pages 12-13.)
thromboph2elitis, if there is evidence of eircuiatory obetruction. 58
26. RIESPTRATOAFY SYETRMM

SBOORD \& TETMD CLASSHS 59
The following oflli be regardod as disqualirying:

triorex; hydrothorax; tiorecotouys pheiunothorex, spontantous or artificiel.
b. Chronic bronchitis; unresolved prowainia; puimonary omphyseos; bronchioctasia; maxked silicosie.

58 Interaittent claudication is characterized by pain in the legs brought about by exercise and relieved by rest. The underlying pathology is impaired circulation of the extremities.

59ruberculosis is described as pulmonary when the lungs aro attacked by this disease. Fibrosis indicates the presence of fibrous (scar) tissue. Cavitation implies the presence of abnormal cavities in the lung substance. Whon air or flutd collecte betwoon tho chest wall and the lung this is knom as pneumothorax or hydrothorax, respectively. Thoracotary is surgival ineision of the wall of the chest. When air is purposely introduced between the chost wall and the lung this is known as artificial pneumothorax. If such a condition occurs without such technique it ie lmown as spontensove prevmothoras.

Bronchitis is inflamation of the bronchial air tubes in the lung. Onrosolved penumonia is that in which the tissues have not been restored to the normel stete. pulmonary omphyseme is a condtion in thich atr is prezont in the connective tiesues of the lung where no air nornally exists. Bronchioctasis means enlargoment of the bronchial air tubes.

In silicosis the inhalation of the dust of stone, sand or flint has caused a diseased condition "nvolving fibrous hardening and piementation.

A membrane (pleura) covers the lungs and lines the inner surisaces of the chest walls and other tissues with which the lung cames into contact. Inflemnation of this mombrene is callod plourisy. Fluid may be given off (erfusion) and pus may be formed to collect in the pleural carity (ompyema). Fibrinous plourisy (dry plourisy) is characterized by the presence of the blood clotting substance (fibrin) and tends to soal the lung to the surrounding structures whero it would normally be freoly movable.

Cysts are sac-like structures uevally containing fluid and are abnormal for the lung. The mediastinum is the flosky partition soparating the two lungs. It contains the heart and the large vessels connecting with the heart.

Allergic reactions occur due to abnormal sensitivity to certain proteins. The best known allergy is hay fover, in which case the irritating protelne are found in the polion of tertous plants, otc.
$\qquad$
$\qquad$
$\qquad$
$\qquad$

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\text { 20 } 2
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c. Acute fibrinous pleurity; pleuxicy with offusion or empyemea. (26, p. 19)
a. Cysits; abscess or tumore of the lung, pleure or medtestinum.
Q. Agthoma.
f. Allexgic reactions of a dogree bufficient to intariere with safe piloting of alrcrapt. Minor allergy will not diequalify for the third cless if a detatlod repori siccompanies the sicantration copori. Seo supplsment for report form.

## 27. - 28. AKDOMSN - GASMRO-THTLSTINAJ SYSTMEM

The following will be rogardod es disquallfying:
a. Wounds, infuries, ofcatrices (scars), or rupturod abdominal muecles aufflcient to interiere with function.
b. Hemile, any varioty, (may be approved for third ciass if properiy fittod. truss is worn while operating aircrept) 60
c. Undescended tooticle, when the testicle is in the Inguinal canal, or outside of the cansi but $2 y 108$ againat the pubic bone. (If the toaticie if in the abdominal cavity or if it has bean removed, it may be diaregarded.) 61
d. Iarge tumora of the abdotadnal wall.
e. Chronic peritonitie; peritonoal adhesions which cause symptoms. 62
f. Gasturic or duodonsl ulcere. 63

See supplement for detealied report forza.
B. Chrontc al seases of stannch or intestin nes.
$60_{\mathrm{A}}$ hernia is the protrusion of some part of an internal organ through an abnormal opening in the wall of its containing cavity. The commonest type of hernia in man is the inguinal (groin) in wich the protruding orgen may onter the scrotum and rest near to the testicle.
${ }^{61}$ During developmont before birth the testicle develops in the abdaminal cavity. It gradually desconds into its final position in the scrotum, but may bo errested in ite descent. Ite pethrey ortends through the inguinal canal which opens, benoath the skin and fatty tisaue, in front of the hip bone near the midline of the body.
$62_{\mathrm{Tm}}$
The peritoneum is the membrane which covers the organs of the abdominal cavity and the inner surfaces of the abdominal walls. Under nomal. conditions the peritoneum is smooth and moist, permitting gliding movement between contiguous structures covered by $1 t$. Inflemmation of the peritonoum (peritonitis) mey cause contiguous surfaces to fuse, this condition being known as adhesion.
${ }^{6}$ The duodenum is the first portion of the small intestine into which the stomach empties. Gastric pertains to the stomach.

## PICAO REQUIRTMETMS

## Phyatcal Standerd. Ho. 2 (Mrearpt from section 16.3)

When paipation of the abdomen reveals any Bwolling or diatinct pair, the abdominal exanination muat bo completad by a radioscopic and radiographic exumination. Any anatomical leaton in the wella of any part of the digaotive treat, any stiflctiure of Its callbre, any calculus or foretgo body, any peritonoat isalon, eetabliabed by clinical, or laboratory exeleinetione, will entail rejection. Rxception may be tade for spasmodic atricturas not, accorupenied oy other troublea and $\rho 0 x$ ptoses scapeneated by e goiod abocminat. masculature. Aly candidste tho has undergone a surgical. operation on the biliaxy pasesges or the digestive tract, oxcopt for eppendicitis, involiving a total or partial exeliston or a diveration of any of thane organs, ehall he declared unfit यूtese a period of two yours has elspact singe thes surgical operution and the offacte of tho pperation are not deemed Ifenle to canse sudden incapacity in the air, or en attostation made by a aurgoon, having knowledge of the nuture of the disesce which nerensitated the operation, certifios that no fursadiato or futux after-effocts are to be frarad.

Disessea of the IIver (incluling those of the biliary pabsages) and of the penareas will in cases whero it is deeged necescaury, be veri. fied hy labcratory and othex examination, percicularly by radiography es woil ae by an examination of the blood asd of the urine, and vill entall xefoction onity if they afford indication of the exiatence of a calcialus, tumour or lesion invoiving a porsiatent impaiment of fuaction of those organs.

## Phyaical Standard Ho. 2 (Excerpt from Bection 16.4)

Cundidster of the fermile sex muet pmoment a norme? vterue and eppondoges. Cases in which surgical operation hes taken place will be conEidered Individualiy . Any preaumed proguancy will eatail rejection unt11, at least, after the pregnancy has been texwineted. Folloulng confinoment or mucurrfage e candidste of the fonmle sez vill bo alloved to resume ber dution only after having undergone a new modical excuistation.
i. Inlargoment of aplean or ityor.

1. ohmonic or persistont jamine 64
A. Fibtulae from viscoral or. bony lesione or following operations or due to congonftal defecta. 65
2. Acuta or chronic diseases of 11 ver, gall bleddex, or pancrsas.
3. Painful or blooding hemorrioids . 66
4. GENITO-URTMARY SYSTHR

## SDCOND \& THITM CLASSTES

The followng w111 be regarded as disquallfyirg:
8.) Teparitio (inrtarmation of the kidneys), scute or chronto.
b. Hydronephzosis, pyonephrosis, pyelitis, tumors of the kidney, renal calouli, flosting kidnoy, nophrectony 67
c. Cyatitia (inflamation of the bladder), acute or chronic.
d. Vesicai calculi (stones in the bladder), twmors of bladder.
E. Muborouloosis of any part of gentto-urinaxy tract 68

64 Jaundice, cherecterized by yellowness of the eyes, skin, and urine, is due to the presence of bile in the blood. The term may be loosely used to designato any jellowing of the oyes, skin, etc.
$65_{\text {Pistulae are abnormal passageways from an organ to the surfisce or }}$ to another organ. The viscera are the internal organs. Congenital defecta tur thoso prosent at birth.
$66_{\text {Hemorrioids are a twisting or tortuous condition of veing in the }}$ anal arsa, causing painful swolling and sometimes blooding.

67 Eydronephrosis is a dilatation of the largex urine containing passegoways of the kidney due to obstruction of the flow of urine. Inlargement of the semo areas with pus is called pyonephrosis. In pyelitis there is kidney inflametion, involving especially the aroa which conducta urine from the organ. Renal calculi are stones in the kioney. A floating kidney is one which is unduly movable. Nophrectaray is removal of the lridney.

68 The genito-urinary tract includes the sexual organs, both external and internal, and the urinary systam of organs, including the kidnoys, ureters, bledder, and prethre.

## PICAO RROUIRTMIKMS

## Phygical Strandard Mo. 3

# 17.3 General surgical exanination. Wan palpation of the ebdcaion reveale any greliing or distinct pein, tha abdawinal extamination must be camplotad by the radioscopic and radiographic exmennation. (See toxt of paragraph 15.3 and footnotes 10-11 for techinical teminology, pp. 11-12. 

Ary candidate who has undergono a suagical operation an the billery pasasges, or the digertive tract, except $\mathcal{I} 0$ appendicitis, involving as total or partial excision or a divecsion of ang of these organy, ehali be deolared unit unleas a period of two years lvas alapeod nince the aurzical operation and the affecta of the operation are not deanad Inable to cause suâden incapacity' in the alr, or an atteatation hade by a surgeon, having lnoulodge of the nature of the ilseese which necessitated the peration, certifies that no inmediete or future aftererfecte are to bo fearod

The existence of a calculus, tumous, or loason involving a persiatent impairment of function of the 11 ver or the pancreas will entatil rojecそion.

## (Excerpt from section 17.4)

Candidaten of tho fomale sex munt prosent a nozmal uteruo and appendages. Cesos in which surnsicel oporation hms telken place will bo considered individuelly. Apy presumed pregpancy will ontail rejoction until, at least, aftor the pregnancy has been terminstoai.
$\qquad$
$x^{\prime}$. Voneroel disonses (EAe superseding gection on VENISREAL DISEASE on 2. 54.) Syphilis is any stage: Gonococcue infections, inciuding arthastios chanerold, bibo; gramuzome invulinule.
B. Diabotos mellitus. (A motabolic disorder charactorized by inadequate oxidation of carbohydrates thereby producing elevated blood sugar, excess urinary sugar, excoss urine, increased thirgt and loss of woight.)
h. Diabetes insipidus (A disease characterized by excese urine formation ithout an increase in augar due to an abnormality of the posterior lobe of the pituitaxy gland or hypothalamus.) - Refor to the Medicat Diroctor with foll information.
(D) JIERVOUS SYSEIM

30-33- YERPOUS STBTEM
SEIOURD \& THITRD CIASSES
The following wilt bo mogarded se disqualifying:
a. Nultiplo etignata (marks or Eigns) or degeneration.
B. Chronte micoholism.
c. Drug hebit.
d. Denontia praecos 69
e. Nancio-dopressive insanity. 70
a. conotml pabole 71
8. Tabes doraalis. 72
I. Syphilis in zay form faeo supereoding soction on VETRERAL DISEASE on P. 54.)

69 Domentia praecox is a torm for a large group of psychoses ofton recognized during adolescence but not infrequent in later maturity, charactorized usually by disorientation, loes of contact with reality or uplitting of the personality.

70 sanic-dopressive insanity is also known as cyclic inganity. It is characterized by alternating stages of melancholia (depression) and excitemont with great aotivity, rapid pessing of ideas, otc. (menia).
${ }^{71}$ General paresis is a chronic eyphilitic disease of the central nervous system characterized by progressive dementia and a diffuse genoralized paralysis.
$72_{\text {Pabes }}$ corgalis is a chronic syphilitic disease of the central nervous system characterized by muscular incoordination, sensory loss and pain.

## PICAO REQUIRIMENTS

Phyeical Standerd Hio. 2
16.2 The candidate unet, have a good family and perronal bistory with pertis cular reference to nersone atabllity. Information as to this hiatory muxt be given in as atatersant made gnd signed by the candidate.
36.2 Examination of the nervous oysters. The candidate must be free from any dieability, congenital or eoquired, of the newous syotern causing such degree of functional ivcapecity as might, intorfore, in the caso of plioting, with the eape bahdling of the alrcreft ot evv altitude oven in the cese of pralongod or difflcult flight or, in the case of air worif other then pliotigg, with ihe offlolont performance of the dutias for which the 11 sense ia being sobigt. (See text of paragraph 15.2 and footnotes 3-9 for technical terminology, pages 9-11.)

Infuries of the head will be dealt with as follows:
(1) Cacee of' simple congreston or siraple fexactive of the skul. without agsociated Intracrarial demage, will entatl temporary unfitnoss for a porion of, at leset, two manthe from the date of concuagion or fracture. After the candidate has rosumed. his duties, his liconse may be nomlered valld only for a reduced period, or poriode, untill the after-effects no longer appear $11 a b 10$ to produce a euddon incapacity during flight.
(2) Severe intracrental injurios, the prosence of locel lesion of the brain, trepanning with loas of bory substance Involring the two tables of the crailel vault or a lasion ef the dura meter will involve permanen's rejoction.

Any preaumed nervous byphilia will require to be investigated by an oxamination of the blond and an axaminathon of the corebre-spinal fluid, made with the consont of the condldete.

1. Mal.tiplo solorosis, 73
2. Paraptogia Eparalysis of both logs and part of trunk)
k. Syringanyalie. 74
3. Wiscular ateoput bis and dyetroplisies. 75
II. Nultiple neurtti6 (simultaneous inflemation of many narves).
n. Mortiti deftcienct and notionto ateves. 76
c. Const viutions peychopethic states (constitutiona) psychopathic atates are montal disorders without clearly defined tangible cauee or structural change).
4. Peychonouroses qaigeterte, neruxagthenie, and peychestheria). 77
5. Epllepey or marked eptleptold (resembling epilopey) background
I. Mniocrinopethies (Disesces treceeble to tho glanda of internal eacretion.)
S. Poripherel nerrs injuries of a typo thest would interfere with function in handiling airaraft.
t. Sovere head injurios uith or without parsiatent symptoms. (If there is a history of slruli frecture of unconecloumess for any poriod of tine, refor to the Hodical Diractor. See supplement for detalled report Poxa-)

73vultiple sclerosis is the occurrence of patches of hardening in the brain and epinal cord causing varlous nervous symptoms deponding on its location.
.${ }^{14}$ Syringomyelie is due to cavity formetion in the apinal cord. There 1s loss of scite sensations and weakness of some muscles with incoordination of others.

75 Both muscular atrophy and muscular dystrophy imply shrinkage and therefore weekoning of the muscles.

76 Nental deficiency is customarily indicatod by comparing the intellectual powers of the examinee with that of normal children. The "mental. age" of the individual is the chronological age of the normal child erith compareble intellection. The "Binot age" derines idiots as less than 2 yoars; 1abecilos, 2 to 7 yoars; and morons, 8 to 12 years.
$77_{\text {paychonouroses are minor }}$ aiseases of the mind wich are not actuslly insanities. Hyateria may vary from the state of excitement usually associated. with the word to more radical states involving disorders of motor activities (convulsions) and loss of normal sensation. Neurasthenia is a condition of norvous oxhaustion which ray take many forme. Peychasthenia is rolatively nild, boing cheracterized by lack of self-control, morbid feare, etc.

## PICAO RKQUIRSMOKSS

## Phyaical Btandard IVo. 3

17.1 The cendidato must hame a good emaly ane porgonal history with particular roforenco to nervous stabllety, ompormation as to this history must bo given in a stoternent made and aigned by the candideto.
17.2 Pramination of the nervoue ayatem. The candlintp wast be freo from ary wound, or infury, nior have undergono any oporation, nor possoss thy abnortrality, confonital or ecquiteo, whiteh might intorfore $w 1$ th the safe banding of the alraraft unlor ordinary conditions. (Seo text of paragraph 15.2 and footnotes 3-9 for tochnical terminology, pages 10-11.)


## Sincomm ctacg

 hoaling has ocourred, whotiler apcritansously or as a reault of treatmont, and for throo monthe theroaftor. Perbous vith a history of the diesase, but not evidenco of it orgept pooitive cutaneous (Froi) of complement flx ation tosts, mey quality. $78^{\circ}$
 completo houling has occumed and for one year thereapter. Porsuns with scare of the didecse may qualify.
 1.in, diaqualify only for the day of treatmont. Teste of cure are not requirod. (2) If treeted with aulfonemides, elequalify during ontire period of Bulfonamide treathont enc. until teata of cure, (throe negtitive urine cultures at weekly dintarcals) are completo.
 (1) If trented with penicililn, diaqualify for duration of aymptoms only Teats of cure are not roquirod. (2) If trostad. with Bulfonmides, disquaify until symptomes diseppoar and, in addition, during sulfonamide therapy; and until teats of cure, as above, are ccupleted.

Gonorrheal erthmits which has produced perwanont anigloais (restriction of movament) or deformity which might interfere with operation of aircraft kill disqualify

CHANCROLD (infectious venoreal Bore), WITI OR WIPHOUT BUBO (avollen 3 ymph gland) - diaquelify only during presence of active lasions and/or during eutînamide therany.

SYPHILTS - All active cases of eyphilia axe disqualifying.
Hothing in our prosent lanomledge of syphilitic infoction or'1ts treatment leads one to belisvo that early syphilis, latent syphilis, or benisn late syphilis (as doffnet ebove) affects the nomal physiology of an infected peraon, whether or not under flying condftions. In general terms, therefore, persona with oarly syphilis, latont ayphilis (whether congenital or ecquired) or bonign 2ato oyphilis, should be elfgiblo for pllot'b cortification following adequato traatment, having dus rogard to possible disquel-

[^1]
## PICAO REQUIRENMMES

## PICAO roquirements rogariting venoroal disoase fnclude the following statements:

Preorpt from PTCAO aection 16.2; Fhysical Standard Io. 2, prosented proviously (see p. 15).
"Any presumed nervous ayphilis will require to be investigated by an exemination of the blood and an examination of the cerebroepinal flutid, made with the consent of the onndidate."

Fheorgt from PICAO section 17.4; Physical Standard Ilo. 3, prosontod proviously (soo p. 18).

Nug mast bo free from k-1dney disoase and must not present any clinical signs of ayphilis." (See tegt of paragraph 15.4 and footnotes 12-18 for technical tominology, pagos 12-13.)
ifying effects of treostment filacusced bolow). On tha cther hand, those phases of late byphtiltic infoction which may involve the jor onatomic atruc.
 vaseals), or the norvous syetern) mey sortiously appect the petiont's playsical mochenssm, whether or not under r3ying conditlons. Tharefors, persones with $2.8 t s$ ocular, viscerve, carcloresculax, or nourossyphile should bo disquatifiod for cortiflostion; ant. Ia this cseo this disqualification should be permariend.

A positive Wersenninn (oomploment-ifxetion) teat of any degree in the spinal flutd, discovered et ady ting and wegaxdlees of the presence or absonce of bymptons or piysicel signo of navzosyphtlis, ahould disqually for pilot'e certiplcation,

## 3\%. RIVthrKS

Suntirize tho Ievomble or uteavorablo fectore of the applicent's intell1fance, volition, and tompsament.

## SUPPTEAGTIARE REPORTS

## DTaDoters

Diabetes of any degree is disqualifying for all classen. The presence of a glycosuria (presence of augar in normal urine) may necassitate a glucose tolorance toet with perlodik blood blagar deverminations to differentiate a.imentary (digeative) glycosuria from true diabotes. If recont laboratory roporta aro availablo, fowward with noport; if not, they of necessity will be requestad by tho Nedical Diroctor in arproprists cases. A stataromt that the applicant is not uning insulin in sny corg, end tho oxiginaz eignod. laboratoxy reporte will be most helpful.

## 7ephiractomy

The adequacy of the romaining kidnoy tisgue can De best doterainod. by functional testing. In cases in wifich kidnay function is a factor, the Medical. Diractor vill requast a P.S.P. and a Mossnthal. Test. Any zecent functional roport should be forwerded with your report of exeminntion. The original signod laboratory roportes should bo bubmittod if possiblo.

## Syphilis

Applicants who heve contracted gyplilits may be qualifiod by tho Nadical Director upon presentetion of the original reports of negetive serological. rsactions taken eix monthe aftor comploilon of adoquato twastmont, if 811 other requiroments are mot. (Seo supersoding paragraph on VEISRREAL DISEASE above.)

# Ileuro-Paychistric (both nourological and mentel) conditions 

Tri mouro peychiatilic conititions a supplemontal roport giving a briaf historg, vith dstos, inaluding any remedial measures employed together with the neme end addreas of any physicien or inatitution giving treatment, vil2 bo of ereut aseiotenae

## PEYSTCAT RROUIRSMGMSS

## YIRST GLASS PILOTS

An applicent peosenting ary of the folloing 1.1ated conditions will be conesiderod as having fellod to reet the pingacel atandarde of tho Ifrst class (A1rilno Transport P2.しot). In any case in which a doubt exists, or whorb inetructad. tho modical. oxaminor will not, issus a modical cortiflcato but vit1 formard hie forort to tho Chiot Aviation Modical Diviaion, for decision

The physical roquirements in this eection apply to FIRSI CLASS PILORS. The genaral outline of these requirements follows those prescribsd for SBCOWD AID THLRL CLASS PILONS, which outline precedes this one. In cases where technical texmes have provioualy beon dopinod, reference is mede to footnotes occurring in the preceding pages. Technical terms not alxeady explainod. are clarified by footnotes, etc. in the pages following.

## (A) EXTB

## 2. HTSTCORY

Fistory of algnifloant ocular disoase or ingux is ovaluatad individuaily in connaction with other findinge. (Footnoto 34, p. 28.)
2. ThITOK

Loes than $20 / 20$ each oye soparately without conmocting lenses of any kind (including contact Iensos). If the vision of efther eye 18 less then $20 / 20$ but ript less than $20 / 50$ it mast corroct to at laest $20 / 20$ is each eyb saparatoly, in wich cess the lens requinonent mint be extered on the report of examination and on the medical certiricata. (Footnotes 35, 36, p.28.)
3. DEPTTH PERCEPTLOK (Footnote 37, D.28.)

Average error over 30 mm . If corxecting lenges axe required to secure adoqueto vision, this requirement zwet elso be met with those i.enses, and. the lona roquirsment ontered upon the roport of the exars sation and upon the medical cortificato.

## PICAO REQULREMEMTS

## 

## 0.•etoriocoll

## Phyalogl Standen Mo ?

15.5 Eye examination. The candidate must present no active nor ohronic pathological condition of elther eye or sdnexer 29 which might interfere with its proper function. The details of tho visual standards for cendidates for IIcenses sha 11 be as set out in Sectian III, and those of the colour percaption stendards as set out at Seotion IV.

## V1gual Btenderd Nos-2 5 (1) atoatout)

19. The candidate must heves
19.1 A viaual agusty of at least $6 / 9(20 / 30)^{26} 1 n$, each eye peparatoly, nithout oosrection (no glasses) ; pzovided that if the vieion in either or both eyes is poorer then $6 / 9(20 / 30)$ but not poorer then $6 / 18(20 / 60)$, and can be brought up to $6 / 6(20 / 20)$ or better in each eye by glasses, the candidate may be sdmitted upon conctition that corm recting glasses be vorn tilile exercistig the privileges of hia liconse.
19.2 In the case of application for an orlginal 11 cense, not more than +2.25 dioptres of hypermetropia. 27
19.3 Trot more than $\mathcal{I}$ dioptre of hyperphoria in eithor aye, 28
19.4 Fot more than 10 dioptres of esophoris, 28
29.5 Not more than 5 es optres of eyphovia 28
19.6 An accomodation of at least $V=1.00$ at 30 cm with esoh eye aeperately without the use of correcting lenses. Where the cendidats is over 40 yesrs of age, corzeoting glasses may bo used to provide the same charecter of neer vision, if he allescly hotds a llophse, 29
19.7 Mormel visusl fields, 30

## atrand ofl

4. oCUEAR MUSCLE BMAAICS (Footmoto 38, p. 30.)

- Dipionta: (Mootnote 39, n, 30.)

If present in any part of the tield bounded by an anglo of 36 degrees froin directly ahoad.
h. Matermphorle: (Footnote 40, 2. 30.)

耳yperphoria (1atent tendency for one eye to point higher than the other), right or left, axcooding on' diopter

Interal phoria - Esophioila (Iatent tendency for the eyos to converge) exteoding 10 degreen.
Kephomi= (1atent tendency for the oyen to diverge) axcoeding 5 dogreen.
c. Duction: (Footnoto 41, 2. 32.)

Convorgence (pisca beeo out, sdduction) lesu than 6 prian dioptere.

- acuar nucctis mataices tamorr conmutton ar mear yjston 80

IRST CIASS - Pborias at 13 inchos
Beophoria....................... 10 prises diopters, maximum
Erophoria ........................ 18 prish diopters, maximum
Ryperphoria. ................... i. 5 priam diopterg, meximum
Prism divergence at 13 inches 15 prias dioptors, intinum
Prlan convsrgence at 13 inchos Nust excood exophoria
5. ACCOMMODATION (Footnote 42, p. 32.)

Inability to reen $\psi=1,00$ on the ereofel Givil Aoronautics Administration Teat Card at 18 inches without correotion; asch eye soparately.
5. CEMPRAL COIOR VISTOX (Footnote 43, p. 32.)

Thabillty to differentiate mositly the dominant hmes of red, greon, yellow, blue, and brow. If dafoctive, report in detail giving also the odition number of the tests used.

7 TISUKT TMMS (Tootnote 44, pp. 32, 34.)
a. Winger and Fixstion Test; ichack defacts with perimeter and compimeter) Significent fiold defects.

80These tosts aro made with the tost object 13 inches distant fromi the examinee as compared to the 20 ft . distence of paragraph 4, OCULAR YUSCLE BATATCE.

## PICAO REQUIREMENTS

## Colour Perception Standard Mo. I

22 . The candidate must have nomal colour perception as tested by moens of Iabihara platea or isochromatic plates 31

## 3. INSPRCDION (Tootnote 45, p. 34.)

 or which may interfose with function:
9. Inspaction (eonespuad) (Footnoto 45, p. 34.)

Abnormal associatod movenienta. Abnormal pupiliary reuctions of pathological. of gniflcance, or likely to interpere with function.

Fhondus sut modta - Aty pethologtcal or morphologital condition of algnificunce, Iikoly to intorfore with fumction, or likely to progress to that deg2\%e.
10.5. HIOHP VISTO 81

THIT CH - Tho exo tat distancs at which the charector is corrootiy Judgad 4 out of 4 or 8 out of 20 reedrnge, in recorted as the acora. A 30020 of 7 le conaldorod as evilionce of satigractory night vision, 8 acore of 9 of superior nicht $\nabla$ ision. This ecore will bo racorded under Paragraph 34 "Remarks."
(B) ENR, MOSE, MRROAT, AMD EQUIJTBRELM
12. HISTORY (Tootnote 4.7, p, 34.)

Rudical meatoltactory; chronic otitis media. Othac eignificant hiatory will be evaluetod. in connaction with aseociated ifminge.
12. DRUM MGMERAME (ear drum)

Perforations of any dagnee.
13. OPIPIS OH haspotb iTIS (Footnoto 48, p. 36.)

Efther ecute or chronic. Other aigaipicant condztyote are to be reparred to the Chiof, Aviation Manica? Division.
14. HEARIIC (Footnote 49, p. 36.)

Lesa than 8 foet (vhiepered voice) gach oas separataly. In case the hearing for the whispored roice is less than 20 foet an audiogram showing not loss then 50 por cent of nommel throughoud worti apeoch and radio range, oech ear separately $\begin{aligned} & \text { ill } \\ & \text { be required to qualify, }\end{aligned}$

8light vision is tested in a totally dark room with the oxeminoe ifliy adapted (oyes accustomed to the dark). A radium plaque Night Vision Tester is specified. This epperetus hes a very dim self-luminous test object, the position of which is altered while obscured. The examinee is requirod to tell its position when it is exposed.

## PICAO REQUIREMSNTS

## 1ल elontoot

## Physical Standard No 1

15.6 Ear examination. The cendidate muat haver
(1) No active pathologicsi process 2 aoute or chronic, of the inter-
nal osr20 or middia ear cleft.
(2) No unhealed (unclosed) parforatlon or porforestons of the tympanic membrane (ear drum).
(3) No obstruation of the Eustachian tubes. 22
(4) No disturbences of the vestibular apparatus, 23

The dotails of the hearing stendards shatl ba as set out at Section $V$ o
15.7 Nose, throat, and mouth examination. The cendidste niust possesa froe nasal and tubal air entry on both sides and must have neither serious metromation (structural defeot) or sertous, acuth or chronle, affoction of the buccal (mouth) Cavity or upper respiratory tract. 24

## Mearine Stendara No. 1

25. The candidate must not have a loes in exther ear of pore than 20 decibels at any one of the Ifve frequenoies $256,512,1024,2048$, and 4096 cycles per aecond. 3
26. MOSE \& sTMues (Vootnoto 50, o. 36.)
 fore with mosel porpiration.
b. Soptat youferastione untli provan non-sypailitio.
 2oagitation, or wheth aseocieten with progreesive middle oeir disease.
27. Motmy a TEMRNT (Footnoto 51, p. 38.)
a. Berblip uswepaised, oz eleft nolate.
b. Cthar millemation of ay conatition of the tongue producing intorference with speoch.
a. Perforation an extenctivo 1000 of substance of the hard or voft pealate;
 gaft mainte:
a. Acnte or chionio diveaso of the largnax (voice box).

- Pameiygie oe the weont mavie.

Considur in consection with othar Innetinge.
18 SETYMBATAMCTME (Pootnote 52, p, 38.)
Folluxg on theoe trifala. Conetior elso any history of internal ear 8icoaso or Meniarete Syndrano. Bofor to the Chief, Apiation Msilicel Divialom.

19. GYanp GRRTURIS

If ainornal, defor oxamination.
(c) GEMERNL PHzstCAL CONDIPTOH
20. MEDICAZ HISTCRY

Indiviaually oveluated in 821. cacae and in comnootion with other Pindinge.

Individually ovaluatec.
23. BONNS \& JOPMIS (Paragraph 23, p. 40.)

## PICAO REQUIREMENTS

## Physica: Standerd No: 1

14. The condidate musi fiave the coinplete ate of his four' 11 mbe , must be free from any active or latent (concealed), acute or chronic (of long duration), medical or surgioal dissbility or infection, which would entail any degres of fanctional incapacity which might inter-. lere with tho safo handling of an airaraft st eny altitude even in the case of prolonged or difficult ilijght.

Soinel column - Marked curratures, enkylosis, defornfty; disease of the vertobze. (Paragragh 23, p. 40.)

Polvis - Marforwations and catomitios suipliolont to interpore with the bais operation of aircraft.

Sctrematios - Any ilnnormalitles in the form, number, peoportions or movamencis which intarfere with nomal function.
a. Any linitation of motion of the shouider, elbow, whiat, hip, knee, or enkle jointe, of any daformities of the hands or feot which interfare mith the sape operation of alrexapt.
b. Any atrophy of the muscles or any part of the body wich is grogressivo, or ia sufficient to intorfore with function.
c. Iremore of suflicient docree to interfere with function:
d. Any ununited fractures with shortening or derozmity; disiccatione vnreduced or pertiy varoduced, anigylosis of a joint, partial or complete, rolarod arnular 25 gamantis porat thing frequent or involuntery displacemont.
6. Amputation of any partion of a 15 mb , excopt fingery and toes, or resection of a joint. A sufficiont number of fingere wust be present on each hand to insure the ability to manipulate all contrula of aircraft properly
i. Dispase of the bonos or joints; chronic edema; chronic or obstinete nouralsias, particularly oclatica.
24. BUIED

Considerved only es it affeots the safe operation of eircrait. If there is any diaproportido betreon hoight and weight detormine whether it is due to pathological condition.

## 25. - 26. CATDIOVASCUTAR SYSTEM

a. Blood proesure. Sygtolite over 135 mm, of diagtolic, 95 aza.
(Footnote 54, p. 42.)
b. Valvular diseabe of the heurt. (Footnote 55, p. 42.)
c. Ily pertroply (overgrowth) or dilation of the heart.
d. Poricarditis; endocarditis; myocurditis; or coronary dieoose with or without angina pectoris. (Footnote 56, p. 42.)
Q. Heartbloct, aurioutar fluttor, auricitar fibriliation, parozysmal tachycardis 02 thyrotoxicobis. (Footnote 57, p. 42.)
f. Artoriosclerosie (hardening of the arteries) or hypertension.

## PICAO REQUIREMENTS

## mhyicat standuct सigel

15.4 Ganerel medical examination. The candidate muet not, suffer from any disesse or disability which renders him ilable suddenly to beoome incompetent in the mensgement of airoratt. His musoular power must be adequata for the handiing of the types of airplanes he will. have to pilot or the apparatus he is to use. The heart wust be normal, with normaj function, and only regpiratory arriythaje. (irregular heart beat due to breathing) Increase of pulse rate from excitement or exercise and a general slow pules not assooiatod with suricuio-ventricular dissociation 22 will be allowed. He muet not have any signs of aneurism (aneurism; a sac fomed by the dilatation or swelifng of the walls of an artery and f3lled with blood) of the large arterial trunks.

The candidate must not suffer from any aaute disability of the lunga, nor possess any cicatsicial lesion (a wound or injury containing scar tiasue) of the Iungs, and must be fies From tuberoulosis capable of beling diegnosed by the ure of elinical wethods and, in the casea of examinations for original acceptances, by radiosoopy, from tracheobronchial (pertaining to the windpipe or its lexger branchea)disease of the gtands and from putmonaty aripyseme $\frac{13}{}$, even if stight. However, with regard to the melatenance of effleleney of the pilot, pulmonary emphysema w 12.1 entail rejection only when marised. In addition, each examination shall include a redlographic rscord in doubtrul clinical cases, When the examination of the spleon and of the ganglionic tract 14 reveals hypertrophy (enlargenent) of these organs, the cantla date shall be declared unft urless a hemstologiosl (pertaining to the blood) braminetion has shom that it is not a case of an original impairwent of the hewatopoietic (blood forming) organs. Henoglobinury (preaence, in the urine, of bemoglobin, a substance normaliy found in red blood corpuscles), hemophily (hemophilia, characterized by profuse uncontrollable bleeding) and purpurss (affections caised by bleeding into the skin, membranes or internal organs) ahail also entail rejec tion, unless a hematological examination ahows that it is a case of orly transitory impalraent. The orindiate must not present any aigns of orgaric disease 15 of the ifidncys; these letter must be ingensitive to palpation and be of nommal size. The urlue muat not contain any pathological eloment. Affections of the urinary pasaagas 16 and of the genital organs, even Clonnofrhoea (wuoous discharge from the organs of gezeration), may entall ienporary unfitnoss, an excoption being allowed es regarcs the malntenance of effictenoy in the case of tubarculous orchi=epididymitis 17 In its mild and localizent form
8. Ansur ath, Any Location (bulging of artesial vella).
 thrombophlebitis, if there is evidencs of ciaculatory obstruction-
(Footnote 58, 2. 44.)

1. Schnoldar indor rating persistentiy leas than 8.82 In such ceses sperawl teats vill berecuired by tha Chiof, Aviation Modioal Diviaion
2. RRETPTRATORE SYSTM (Footnote 59, P. 4.).)
a. Active puimonary ćnberculonis; extomive itbrosis; cevitation; panysothorak; hydrothorex; thoracotory.
 iectasis; marived alizoosie.
Q. Acute PIbrinous plouriby; pleuriey with effueion of sangrums.
a Cyats; abscess of tumove or the Iuns, pleura or sediastinm.
-. Asthiga.
3. MTlorgic reactions of a degriea supficient to interfore with safe plloting or azecraftt.
4.     - 29. ABDOMEN GASEROTVXISSPIMAT SYSPIOS
1. Founte, injuhtos, HIceticas (scars), of zupturod abdominm muecles sufficient to intorfore with function.
b. Hernia, any marlety (may bo approved for private claas if properly iftted truas is worn while operating alrcratt). (Footnote 60, p. 46.)
c. Undescended testlcle, when the toaticle is in the inguinil canal, or outside of the canal but lying agninat tha pubic bone. (If the texticles is in the. obdominai cavity of if it has beon removed, it myy be diaragarded.) (Pootnoto 61, 2. 4.6.)
2. Large tumass of the sbdominel wail
e. Chronic paritctitis; poritonoel sdhesions which caune bymptoms. (Footnote 62, p. 46.)
P. Gaetric or duodenal weere (Pootnote 63, p. 46.)

82he schneider Index is a mosaure of the officiency of the blood circulation of the examines. The score dopands on pulee rete and Ulood pressure determinations taken with the examinee reclining and then standing. For second class pilots roquirements of this naturo are deacribed under orthostatic tolerance tast (paragraphs $24-25$, SBCOND CIASS, $c, ~ p p .40,42$ footnote 53).

## PICAO REQUIREMENTS

## Phuston Standard Mo, $\frac{2}{2}$

15.3 Generel surglosi examination. The cendidate must neither suffer from any wound, or injuxy; nor have winiergone any operetion, nor posseas any eknomality, congenital (exteting at birth). or acgutrod, which might interfore with the bafo handling of an airplane at any altiturie even in the case of prolonged or difficult fllght. He must be complotely frea from hornia (rupture).

When palpetion (the act of feeling with the hand) of the abdomon reveals any swelling or distinct pain, the abdosinal examination must be completed by a rediosoopio and radiographic exacinetion, 10

Ary anatomicer lasion io the wa7la of any phith whteves of the aigestive tract, and stricture (aarrowing) of ita calibros any calculus (conoretion suoh as gell atone) cr foreign body, and peritonenl (porteining to the peritonoum) li legion wetabilshed by clintcel or laboratory examinations will entall refaction. Kxoeption may be mado for spamodic stricturas (temporary narrowing of.the digestive traot due to muscular action) not e.campanied by other troublea and for ptoses (a falling or sinking dom of any organ below its normal poaition) compensated by a good abdoninsi umsculature.

Any candldate who has undorgoms a surgioal operation on the billary passagas (the system of tubes running from tho liver and gall bladder to the digestive tube just begond the stomach) or the digeetive tract, excopt for eppendlcitis, involying a thotal on partiel oxe1aion (outting out) or a diveraion of any of theso orgers shalit be doclarad unfit unloas a paciod of two years has elapeod sinco the surgiocal operation and the effects of the operetion are not deomed 1ieble to cevee gwden inconpelty in the air, or en ettestetion made by a surgeon having knowledge of the nature of the diease thich necessitated the operation, cercifies that no immadiate or future aftersifects are to be foared.

94-eeces of the 14 ver (inelwaing those of tho bililary passages) and
 iled by laboratory and othar examination, particularly by radiography as well as by an examination of the blood sind of the urine, and will entail rejection only if thoy afford indicafion of, the existencs of
 function of these orgens.

> 4T 8saxacol)

ne
B. Chanic diseceas of atomich or inteatines
h. Inlargoment of ephesin ox livar.

1. Cbroatc of purelatsni fandice- (Footnote 6is, p. 48.)
2. Pintula fron pisceirat of bouy leestme or follouing operations or due to congenital defecter (Footnote 65, p. 48.)
k. Acute or chronic diseases of Lifer, gall bladder, or pancreas.
3. Peluitul or bleedíg herortriolde (Pootnote 66, p. 48.)

A. Nephritis (inflemsation of the kidneys), ecute or chronic.
D. Eydronophroes. pyonophicosis, pyolstle, cuacres of the leidney, ronal calouli, floating kidnay. (Footnote 67, p. 48.)
c. Cybtitis (intlanation of the bleadere), actite or chucric.
c. Vesicel caldute (stones in the blader); tumorr of blacter:
B. Tuberculosio of any pert of genito-urinnry trect. (Footnote 68, p. 48.)
£. Veneroal diseares: Syphilis in any etage; gonococcus 2 ufections, including arthritis; chenoroid; bubo; eranulom inguinalo. (See euperseding section 30. VMMIRRAS DTSEASE on pp. 54,56 with Poothotes 78 and 79.)

## (u) SIGkMOUS SYSTIM

31.     - 34. NERYOIUS SYSTM24
a. Multiplo atimmots (marise or signs) of degeneration.
b. Chronic alcaholiena.
c. Drug babit.
d. Demontia pre.900x. (Footnote 69, p. 50.)
o. Mienic-depraseive Incarity. (Footnote 70, p. 50.)
1. Ceneral paresis. (Footnote 71, p. 50.)
g. Tabes dorsalia. (Footnote 72, p. 50.)
h. Symhilis $2 n$ axy form. (See superseding bection 30. VGYEREAL DISIEASE on $\mathrm{yg} .54,56$ with footnotes 78 and 79.)

## PICAO REQUIREMENTS

## Phystan Standard No 1

Candidates of the female ser must present a nowmal uterus (womb; the hollow muscular organ in whioh the impregnated ovum is developed into the child) and appendages (the internal organs of generation associated with the uterus). Cases in which surgical operation has taken place will be consldered individually. Any preaunod pregnancy $\$ 111$ entail rejection unt11, at least, efter the pregnancy has been terminated. Following con? inement or miscarriage, 18 the holder of a license w111 be allowed to resume her afr dutles only efter having undergone a metr medical oxamination. The candldate aust not prosent any clinical aigns of syphilie.

Dysentery (a disease charscterised by the passing of frequent bloody stools) shell be considered as an ecute disease; providod that a presumpition of dysenteric (pertaining to dysentery) infections shall entail rejection, unless the medical examiner considers that the olinical phenomena have disappesred.

## Physical Standard No. 1

15.2 Examination of the nervous syetem, The examination of the aervous syatem of the candidate shall include a full inquiry into family and personal history. The information obtained shall be given in a statement made and signed by the cendidate. He must be free from any history of morbid mental or nervous trouble. The cathdidate must not present eny mentel, or trophic (nutritional) fxpairmont, pathological tremor (trembling due to disease), or presumptivo evidence of latent ep1lopsy. Motility (movement), senaibility (physical sonsation), tendinous (pertaining to tendons or sinews), cuteneous (pertaining to the skin) and pupil1ary (pertaining to the pupil of the oys) retlexes (involuntaxy movements in responee to stimulation), coordination of movements and cerebeliar functions 3 must be normal, An exception may be mede for local pertpheral trouble due to accidental section of a norve branoh. 4

1. Nultiple scierosia. (Rootnote 73, 2. 52.)
f. Perapiogia (Pera)grete of both lege and pert of trunk.)

सi. Syzerpanyetis. (7006note 7h, p. 52a)

1. Moscular atrophtos and dyetroph1em- (Footnote 75, 9.52.)

II: Nultigis mowitis. (sfmultomoous inflomation of many norves.)
n. Menvel dapleiency and mononic etates (Pootnote 76, , 5. 52.)
Q. Constitutionsl peycisogathic bidtos. (Totocalized. aisordere of the reind.)
 p (20J52.)

Q- Epilepgy or meriked eptiopto1d (resembling opilopsy) background
I. 药docrinopstiley, (Diesases tracesble to melfunction of the glends of internal aecretion.)
B. Poriphoral nexve injuries of a type that would interfere with puaction in fandiing afrcrapt.
i. Sororo ludd tiajution vith or without porsietont gyaptomes. (If tinore is a hietory of uncongotounnese for any pariol of time repez to the Chier', Aviation Modical Divieion.)
u. Hourociroulatory aschoma 83
32. FKMERHAL DISFASH

## 

 healing has cocurrod, whothar ponteneously of we a, 58Buit of trentmont,
 but not, evidence of it except positive cutansous (iroi) ar complement fization testio, may quaitfy: (Footnote $78, \mathbf{p} .54$. )
 complete healing hes occurred and for one rear thersefter. Parsons with acere of the disenae may qualify.
 11n, disqualify only for the dey of treatment. Teste of cure are not roquired. (2) If thrented witin mulfonmidea, disqualify during oxbire poriod

[^2]
## PICAO REQUIREMENTS

## Physical Standard No 1

15.1 The candidate win to muostsoned concoming hls fanily and porsonal history.

Infuries of the head will be dealt with as follows
(1) Cases of simpla concuesion (brain injury due to a blow or violent shaking), or simple frecture of the skvil without associated intracianiol danage (injury to the contents of the skiwil) pill enteil temporary unftrnees for a period of at least two months from the date of the concussion or fracture. After the cendidate has resuwod his duties, his lidease will berondered valld only for suocesalve periods of two monthe, until the after-effeets no longer appear liable to produce e surdion incapacity in mitght.
(2) In the case of sevese intracrenial infurios, the preaence of looal leaion (wound or injury) of tho brain will entail pernanont rejection. Aay tropanaing 5 inith 2oss of the boay sube stance involving the tiro tablen 6 of the crantal vamit (the roundsd portion of the akull) w121 entall rejection. The seme will apriy in sase of legion of the dura mater (tho tough outer membrane covering the brain), even efter a bone graft. 7
of aulfonsmide treatmont and watil teate of cure three negative urine chiltwes at woekly intervals) are corpletsd.

(Footnote 79, 8. 54.) (3) If trentsd atith penicililn, diequailiy for duration of symptorg only. Testes of oure exe not required. (2) IP treated With sulfommisdoe, discumlily unt: 1 symptome dieappoer and, in addition, dmeing sulfonamide therang; and. vatil tonts of curs, an sbove, ars come ploted.

Conorrical arthritis whith hes produced permenent ankylosis (restriction of zovemant ) or deformity which might Interfere with operaticn of aircraft w113. diequalify.

 Butfonamide therepy

Sxpmons - AL eotive ceses of egphilie are dibqualifying. (liote diecugelion.)
Wothing in our prosont lnorrledgo of oyphilis infection or 1 ta treatmont loade ona to bolisvo that eariy syphilie, latent eyplulis, or benign late syphilis (as darinod above) affoots the normal physiologs' of an infocted person, whethor or not widor flying conditions. In general terms, therefore, ponsons with early byphilis, latent gyphilis (yhether congenital or eoquired) or benign lete gyphilis, should be eligible ior pilot's cortilicstion folitoring adequate twestmont, having eue regard to possible dinqualifying offects of treatmont (aiscrusead below). On the othor hand, those pheses of late syphilitio infection which mey involve mafor anstomic atractures (tho oye, the viscora, the cerdlovascular apparetue (hioart end blood. vossels), ox the nexvous Bystum) twy sextously effoot the pertiont's physioul mochenim, whether or not umier flying conditions. Therofore, persone with late ocular, viscoral, cardiovasoular, or nourotyphilio ahould bo disqualifled for cor'tiflcation; and in 'thle cese the diequeliflcetion should bs por. menent.

A positive Yessermann (complemont-Pixation) toet of any dogroo in tho apinaz fluid, discovered at any time and regartless of the presence or absence of eymptome or phyeical elgus of nsurosyphilis, should disqualify for pl2ot's cortiplication.

## 35. REMaRJKS

Suminarizo the fevorable or unfavoreble feotors of the epplicent's intelligence, rolition, and tercperament.

## PICAO REQUIREMENTS

## Physicel Stenkeri Mo. 1 . Excerpt fon bection 15.2)

Any syphilis, past or present, affecting the central pervous system (brain and spinal cord) or 1 ta blood vessols or its merabranes 8 w 111 entail the permanent rejection of the candidate. Any presumed nerve ous syphilis will entail rejection, unless the non-existence of such an impatrment is proved by an examination of the blood and an examine ation of the cerebroospinal fluid, 9 made with the consent of the oandidate.

Mashae





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[^0]:    53pulse rate and blood preasure are determinod with the examinee lying down and then, again, after stending for 3 minutes. Orthostatic tolerance refers to the individual 's reaponse to erect postwre. Orthostatic tachycardia means a rapid pulse rate upon standing. Orthostalle hypotension means low blood pressure upon standing. Orthostatic syncope means faintness or actual fainting on atanding.

[^1]:    $78_{\mathrm{A}}$ tumor of $2 y$ mphetic tissue of venorsal origin is known as a 2 yruphogranuloma vanerevm.

    79 The enididymis ie a convoluted tube close to the testicle. The prostete is an organ of the genito-urinary system in the male, located close to the bladdor. Inflammation of these organs is indicated by the suffic "itis." Arthritis refors to inflammation of the joints.

[^2]:    83Nourooirculatory asthonia is also lmown as irritable hoart or soldier's heart. Involving nervous and circulatory irregularitios, it causes increased susceptibility to fatigue.

