

Foley

OFFICE OF NAVAL INTELLIGENCE



AGENTS' TRAINING SCHOOL

UNITED STATES NAVAL  
COUNTERINTELLIGENCE SUPPORT CENTER  
ARLINGTON, VIRGINIA

Mechanics of the Machine

1. KYMOGRAPH (Chart Roll Drive)

The kymograph is the chart drive assembly of the machine and consists of a synchronous electric motor. It operates on alternating current 110 volts, 60 cycles (almost universal in the U. S.), or 50 cycles. This unit moves the chart paper under the recording pens at the rate of six (6) or twelve (12) inches per minute. In those areas where 50 cycles vice 60 cycles are common, it must be noted that the machine will run only  $5/6$  as fast as on 60 cycles or 5" of chart paper per minute. Unless this condition is known by the operator the subject may appear to have an abnormally fast pulse rate which fact may lead to an erroneous conclusion on the part of the operator. In certain buildings the peak hours for use of electricity may also cause a slight drag in the speed of the machine. No lubrication is needed by this or any part of the machine. Adjustments to the sprocket roll should not be attempted as this section of the machine is factory set for life. Machines should be returned to the factory once every five years at a minimum for adjustment and overhaul and any necessary lubrication will be done at that time.

To remove the kymograph from the machine, tilt to the left and lift out, at the same time disengaging the plug from the socket. Paper is loaded by placing roll in cradle of roller bars and bringing flap up over writing table. Paper is held flat on writing table by spring tension. This tension may be increased but should not be unless absolutely necessary by running paper over top roller bar, then up over the writing table into the sprocket roll. Paper must be perfectly flat at the point at which it passes under the recording pens.

In the event the kymograph is not activated at the time the switch is turned on, check to see if the voltage and current is right, that the kymograph is plugged into the machine and the machine connection is plugged into outlet as well as the machine. While the kymograph will run only alternating current, an adapter for use with direct current can be secured for use aboard ship or at other installations where necessary, from the factory or can be easily be made at any electronics unit.

The kymograph can be operated manually at any time, whether the motor is running or not, but in its straight or normal direction only. No attempt should be made to reverse the roll of the sprocket at any time.

2. CHART PAPER

Chart paper is 100 feet to the roll. From the last 18 feet on warnings in indelible ink will appear at intervals of 3 feet recording the amount of paper left on the roll.

The chart paper is divided horizontally by three heavy equidistant parallel lines which are used for the purpose of centering the three patterns being obtained, i.e. pneumograph, galvanograph and cardio-sphygmograph, from top to bottom in the order named. The chart is divided vertically by parallel vertical

lines at one second intervals with a heavier vertical line marking the five second intervals. Lineal distance between vertical lines as 1/10 of an inch.

During the normal testing conditions the paper is driven at the rate of six (6) inches per minute. The 12" per minute speed is used only in those rare cases where pulse rate (not to be confused with amplitude) is so rapid that an unreadable or distorted pattern is obtained. Increasing the speed of the paper to 12" per minute serves to "space out" the pulse beat and gives a readable pattern.

To determine an individual's pulse rate, count the number of upward strokes in a five second section of the chart and multiply by 12; e.g. if a five second space contains 8 upward strokes or points the subject's pulse rate is 96.

### 3. THE PENS

The pens are hollow tubes, tooled to 5/1000 of an inch. Pens consists of three parts: 1. The point, which may be unscrewed from the tube, 2. The hollow tube and ink well and 3. The counter-weights. Points should be removed only for cleaning. Recording wire is ideal for cleaning and clearing obstructions when necessary. A fine plier should be used for removing the point and care must be exercised not to strip the threads. In the event bleeding occurs at the tip, it can be eliminated by tightening the tip. The pen proper consists of a hollow tube and an ink-well mounted on top at the end removed from the point end. The end of the tube is threaded and to it are attached weights which are used to adjust the touch of the pen to the recording chart.

The ink-wells of the pens are filled with eye-droppers. The ink is then started flowing through the tube of the pen by air suction exerted from the point end of the pen by a goose-neck. The pens should be so balanced during testing that they are held in contact with the paper by the capillary action of the ink (i.e. flow) not by the weight of pens. This perfect balance is achieved by use of the counter-weights.

Ordinary office ink, (not Parker's "51") or the red ink manufactured by Associated Research may be used in the pen. Blue-black ink produces a more vivid more easily read chart, as opposed to the advantage offered by the company's red ink which is manufactured primarily for use with the polygraph. The pens should be washed with warm water at the close of the day or any time when the machine is secured and is not going to be used for a period of hours, in order to insure that they do not clog. In the event that electric recording ink is available, pens may be left overnight or for long periods of time but even under these conditions should be cleaned every two or three days.

To clean pens, remove excess ink from well with eye-dropper, wash well with warm water, then fill well with warm water and force through tube by pressure of thumb on top of ink-well. Repeat several times till water coming from point is clear. This should be done after every period of use of the machine unless electric recording ink is used. Ink crystallizes when dried and will cause clogging. In the event of clogging, which cannot be cleared by warm water or recording with a solution of two (2) parts water and one (1) part clorox will usually clear the pen. The tips should be removed for cleaning. Clogging in the tube is usually easier to cure than clogging in the point. Extra points should be kept on hand for use in the event of clogging during testing. When not travelling, pens may be stored in jars of clean water overnight. PENS MAY also be dried and stored.

CAUTION: INK MANUFACTURED BY ASSOCIATED RESEARCH FOR USE WITH THE POLYGRAPH CANNOT BE REMOVED FROM CLOTHES WHICH MAY BE STAINED AND CARE IN ITS USE IS NEEDED. EXCESS INK IN GOOSE NICKS SHOULD BE SQUEEZED INTO A WASTE PAPER BASKET BEFORE STARTING ANOTHER PEN. INK SPILLED ON THE CONTROL PANEL SHOULD BE REMOVED AS SOON AS POSSIBLE SO THAT IT WILL NOT CRYSTALLIZE AND GET INTO PEN SHAFTS AND CAUSE WEAR. INK BLOTS ON CONTROL PANEL SHOULD BE REMOVED DAILY WITH WET CLOTH.

NOTE: Pen and well arrangement for portable machines is slightly different having a central reservoir serving both pens rather than separate ink-wells atop each pen. Care and starting of pens is the same.

a. INSERTING PENS:

The recording pens sit on forks atop of the drive shafts which are mounted on jewel bearing. Care in inserting the pens is essential and vertical pressure must be avoided since it may tend to damage or move slightly the jewels which will reflect on the accuracy of the tracings. It is these jewels in company with the tambours which necessitate the care in handling of the machine. The weight of the 302 model polygraph is sufficient (65 lbs) so that a drop of even a few inches will fracture the jewels and render the machine inoperational. 302 model machines should never be entrusted to porters or other persons unless they are fully warned of the necessity for careful handling. The collar of the pen is grooved and this groove must be fitted into the fork. PLACE ONE SIDE OF COLLAR IN FORK FIRST, USING GENTLE LATERAL PRESSURE, THEN LINE UP OTHER SIDE AND SLIP COLLAR INTO FORK. FORKS ARE TEMPERED AND MAY BE SPREAD BUT VERTICAL PRESSURE IS TO BE AVOIDED AS MUCH AS POSSIBLE.

Contact of the pens with the paper must be as frictionless as possible since pens are activated by minute impulses which are incapable of moving over-balanced pens or pens which are receiving too much friction from the recording surface. Conversely the less friction, the larger the amplitude of the pen stroke resulting in a more easily read chart. In this respect, it is well to note that while there are such things as easily interpreted charts, they are the exception rather than the rule, and correct interpretation of polygrams is essential to Naval Intelligence investigators.

Mechanics of the Machine

CARDIO-SPHYMOGRAPH SYSTEM

This is the section of the machine which records the variations in the blood pressure and in the pulse rate. Like the pneumograph this is an air pressure system. The cuff is inflated to the mid-point between the systolic and diastolic pressure of the subject. The deflection in the cuff is caused by the throb of the blood as it forces its way through the constricted vein. Therefore it follows that if the cuff is inflated to too high a level the flow of blood will be cut off and no tracing will be noted. Likewise if the cuff is not sufficiently inflated there will not be sufficient constriction to cause an impulse for recording.

The bellows in this system are necessarily much more sensitive and finer than is necessary in the pneumograph system. It was necessary to develop a bellows in this system which would be capable of recording the variations of a person whose recording would best be obtained at 60mm of pressure and rugged enough to withstand the pressure exerted by a person who would run at 140mm. CAUTION: WHILE THIS BELLOWS HAS BEEN TESTED TO WITHSTAND THE PRESSURE AT 140mm THIS SYSTEM SHOULD NEVER BE INFLATED OVER 120mm FOR FEAR OF DAMAGE TO THE BELLOWS.

The deflection in the cuff caused by the volume of blood flow in some instances will result in a deflection i.e. pen tracing of only 1/5000 of an inch. Extensive tests have demonstrated that no two persons are apt to have the same heart pattern and rate of pulse. The volume change, i.e. change in the blood pressure is transmitted as an impulse through the cuff feed tube, to the feed line through the resonance control, also called the distributor block, to the bellows.

Similar to the pneumograph system, the big danger to the sphygmograph section comes from leaks. Leaks may occur in the cuff, in the cuff tube, in the rubber feed tube to the distributor, in the connecting hoses between the distributor and the bellows or the distributor and the sphygmomanometer or the bellows themselves may develop a leak. IN CONNECTION WITH THE LAST NAMED ITEM THE FOLLOWING PRECAUTION SHOULD ALWAYS BE OBSERVED. SPHYGMOGRAPH CONTROL SHOULD NEVER BE TWISTED UNLESS THE CUFF IS INFLATED AND PRESSURE IS IN THE SYSTEM OTHERWISE THE SCRAPING OF THE BELLOWS ALONG THE STEEL WALLS OF THE CONTAINER MAY CAUSE LEAKS TO DEVELOP.

NOTE: In ordering replacements from the factory, it should always be specified whether a sphymer or pneumo tambour is needed because of the finer construction of the former.

The sensitivity of the sphygmograph when inflated to 90mm pressure is equivalent to 7/16" to 5/8" of pen movement on the chart with a change of 2mm in pressure. A change can be simulated by squeezing the hose sharply a couple of times. If as a result of the squeezing the 2mm change in pressure does occur, the sphygmograph is operating properly as far as sensitivity goes.

DETECTING LEAKS:

When inflated to 90mm the machine should hold its pressure for ten minutes. Maximum amount of deflection in the pen is 1/4" in ten minutes. The distance between the lateral lines on the chart is 1/4"; to check for a leak, wrap cuff around milk bottle, chair arm or leg and inflate to 90mm. Then watch sphygmo pen. If the deflection is more than 1/4" in less than ten minutes, a leak is present in the system. The check can also be made by watching the sphygmomanometer. Indicated pressure loss should not be more than 4-6mm in ten minutes.

## TO ISOLATE LEAK

Put cuff on chair leg and inflate to 90mm. Screw down resonance control tightly. If the leak is in the bellows or in the hose leading from the distributor to the bellows the pen will continue to drop. Pinch tube at the point where it enters the bellows, if the deflection continues, the leak is in the bellows itself, if the deflection stops the leak is in the hose between bellows and distributor block.

If after the resonance control is screwed down tightly the pen no longer drops, then the leak is not in the bellows or in the tube to the bellows but has been isolated in the after part of the system, that is, in the cuff, the cuff tube, in the vent valve, the feed line, at the point where connection to the machine is made. To check, open the resonance control, the leak is readmitted to the bellows the pen again starts to drop, now pinch off the cuff tube, if the dropping stops you have isolated the leak in the cuff or in the cuff tube. If with the tube pinched off, the drop in the pen continues the leak is in the feed system, the vent valve or in the joiner connection. Check each to determine at which point the leak is occurring. If the leak cannot be isolated in any of the foregoing then the leak will be in the sphygmomanometer itself. To check pinch off the hose leading from the distributor to the meter. If the sphygmometer stops losing pressure then the leak has been isolated in the meter itself or in the feed tube to the meter. CAUTION: AFTER INFLATING MACHINE, ALWAYS BE SURE TO SET THE CLAMP ON THE BULB PUMP TUBE TO PREVENT LEAKAGE THROUGH THE BULB.

## RESONANCE CONTROL

While the tambours in the sphygmo section are sensitive enough to pick up very weak pulses, they are too sensitive for the subject with a piledriver pulse. The resonance control is used to cut down the sensitivity of the machine to such a subject. It is located just to the right of the vent for the sphygmo system and consists of a screw with a blunt end. By slowly screwing this control down the feed tube will be squeezed, thus cutting down on the force of the impulse being received by the bellows. If the sensitivity of the machine is not cut down with a subject like this the rapidity of the pulse will cause a distorted pattern in which the diastolic notch will not be discernible, but will be jumbled in with the heart stroke pattern. This control may also be used to lessen the amplitude of the heart stroke, i.e. a subject's whose stroke is so large that it causes the pen to bounce repeatedly off the mechanical stops at the top and bottom of the sphygmo section of the chart. However, amplitude should be controlled by use of the counter-weights on the pen rather than by resonance when possible.

## REVIEW NOTES-MECHANICS

Machines are manufactured by ASSOCIATED RESEARCH INC., 3758 West Belmont Ave. Chicago 18, Illinois. For fast service on machine, correspondence should be addressed directly to the firm. Minimum billing for any supplies or repairs is two dollars. When ordering parts, serial number of the machine should be included. Machine or parts should be carefully packed for shipment to the factory. When returning machine to factory indicate the nature of the suspected trouble and authorize company to repair machine. If accompanied by a letter or if arranged by previous correspondence, one day service can be given in most cases. The firm will furnish estimate of cost upon request.

Kymograph chart can be operated manually at any time whether motor is running or not. Do not try to reverse sprockets as this will result in damage to the motor.

When ink is spilled on the control panel while machine is in use, it should be immediately blotted and if any ink enters the openings from which the pen pivots emerge, at the earliest opportunity the panel should be taken off and the ink removed from the pen shaft by gently wiping in an up and down manner with a blotter soaked in water. If the ink is allowed to dry, it will eventually crystallize and the powder will work into the jewel and pivot section, causing wear which will disrupt the accuracy of the pattern.

Control knobs for sphygmo and pneumo sections can be damaged by manipulating when not attached to subject. DON'T BE A KNOB TWISTER AND DON'T ALLOW OTHERS TO TAMPER WITH MACHINE

Sphygmo tambours can be damaged by over-inflating. 120mm to 130mm is extreme to which the machine should be inflated. Higher pressure than this is gambling.

#### MISCELLANEOUS

The success of the operator will depend on his ability to a large extent to obtain the following F-D-I-A-D-A.

1. FAVORABLE ATTENTION: Selling the subject and getting a favorable reaction to the idea of the submitting to examination.
2. DESIRE: On the part of the subject to prove his innocence or to beat the machine.
3. INTEREST: On the part of the operator is a necessity - he must make an authority of himself in the field of deception detection.
4. APPRECIATION OF VALUES: That is the subject's values - terms which the subject can understand must be used - concurrently those terms which are apt to rouse resentment in a subject must be avoided e.g. "steal" instead of "take."
5. DECISION: Operator must be capable of forming an opinion within a relatively short time after the conclusion of the examinations.
6. ACTION: Taken by the operator, as a result of this opinion i.e. interrogate to obtain admission of guilt or render an opinion of non-deception or that the chart is indeterminate.

Mechanics of the Machine

1. THE PNEUMOGRAPH

This section of the machine measures the expiration-inspiration rate of the subject. It is a pressure system which consists of a sealed tube which is attached around the subject; the tube has a rubber hose lead which passes through the machine to the tambour; the tambour is an accordion like bellows which is incased in an air-tight metal container. This system works on a vacuum or the movement of the air which is entrapped in the rubber tube and which is activated by the inhaling and exhaling of the subject. A vent valve is present just prior to the point where the tube enters the bellows. This vent must be opened prior to the initiation of the test and should be kept closed at all other times when a subject is attached except during the actual period of testing.

NOTE: WHILE THIS VALVE IS EFFECTIVE ENOUGH WHEN IN THE "CLOSED" POSITION TO PREVENT MOVEMENT OF THE SHAFT WHILE A SUBJECT IS ATTACHED, IT IS NOT AIR-TIGHT ENOUGH TO PREVENT MOVEMENT OF THE SHAFT BY ROUGH HANDLING OF THE TUBE ITSELF. SUCH CARELESS HANDLING MAY CAUSE DAMAGE TO THE SHAFT OR TO THE TAMBOUR BY THE VIOLENT MOVEMENTS WHICH WILL RESULT.

The tambour is attached by a linkage system to the pen shaft. The expansion and contractions of the tambour are transmitted via this linkage system to the shaft on which the recording pen sets.

In addition to tambour damage, the big danger to this section of the machine is leakage. Leaks may occur in the tube, in the feed line, feed line connection in the vent valve or in the bellow itself. Leaks may be caused by small pieces of dirt getting into the vent valve. To repair, close vent valve SLIGHTLY and squeeze tube violently several times. This will force any dirt which may be lodged in the valve out.

2. LEAK TEST

A leak may or may not be serious enough to impair the operation of the machine. A  $\frac{1}{4}$ " deflection in the pneumograph pen in 30 seconds is allowable; however, if the pens drop more than a  $\frac{1}{4}$ " in less than 30 seconds the leak is serious and must be repaired before testing. To test for leaks, attach tube to a subject and have it expanded about a quarter of an inch, ask subject to hold breath and note amount of deflection in three inches of chart paper, i.e. 30 seconds. When practicable and conditions allow the same test can be made by attaching pneumograph to back of upright chair. Note position of pen after tube is expanded and attached to chair and position thirty seconds later. No deflection at all is indicative of perfect air-tight connections and hoses.

3. ISOLATING LEAKS

Attach clamp to feed tube near point where it joins machine. Open vent valve expand tube about  $\frac{1}{4}$ " inch and allow pen to start deflection from leakage. Close clamp. If deflection stops you have isolated lead in the feed hose or in the tube itself. Check in same manner tire tube would be checked by immersing in water.



If pen continues to deflect, leak is somewhere between feed connection up to the bellows or in the bellows itself. To isolate, pinch the tube at the point where it enters the bellows, if deflection stops the leak is not in the bellows but in the feed hose between the connection and the bellows and the hose can be replaced. This should be done only by a skilled mechanic or by returning machine to factory for repair. If when the tube is pinched at the point where it enters the bellows the deflection continues, the leak is in the bellows. In case of leakage in the bellows, pre-calibrated pneumograph as well as sphygmograph tambour assemblies are available from the factory but except under extraordinary conditions, machines should be returned to the factory for tambour replacement.

CAUTION: Control knob for the pneumograph section should never be turned unless tube is expanded and valve is open because of the danger of damage to the bellows.

NOTE: In addition to vent valves, portable machines are also equipped with resonance control for the pneumograph section. For explanation of resonance control see note under that title.

1. ATTACHMENTS:

While no general rule can be laid down, it is considered advisable to attach the B/P cuff to the subject last. When operating a three pen machine, the hand electrode, for convenience should be first attached to the hand of the subject, followed by the pneumograph tube and finally the B/P cuff. Reason for foregoing is as stated for convenience because it is usually necessary to clean the excess lubricant from the hand after attaching the electrode.

a. PNEUMO-TUBE

After attaching the hand electrode, instruct subject to sit perfectly still, feet flat on the floor and to look straight ahead. Stand slightly to the rear of the chair in which the subject is seated and by looking down note where the breathing "break line" occurs. This will usually be betrayed by the movement of the shirt front. The majority of people (men) will be found to be "belly breathers" and the attachment is fitted around the stomach of the subject rather than the chest. Women may also be belly breathers. In some cases it will be necessary if the woman is obese to set the tube on top of the breasts, in other cases just under or around the breast. In view of the rather delicate nature of this attachment as regards to women, whenever practicable another woman, preferably a wave officer should be present or in a position to observe the procedure when the tube is attached to a woman. If another woman is not available, at least have another agent present or in a position to observe, to avoid the possibility of future embarrassment which might result from false charges against the operator. In those not uncommon cases where it is necessary to run a husband and wife team, usually for corroboration of the account given by one, or when both are equally suspected, if it is not prejudicial to the conduct of the case, the husband should be asked to stand by while the attachments are made to his wife.

It is preferable to have the feed tube for the pneumograph coming over the shoulder opposite to the one over which the feed tube for the B/P cuff comes. With the feed tube coming over the left shoulder of the subject, stand on the right side of the chair, hold the tube with the left hand firmly against the breathing line of the subject and with the subject sitting slightly forward, pull the tube chain around the subject's back with the right hand and connect it to the end of the tube. The chain attachment should not be made so tight that it causes the subject uncomfort but should be tight enough so that it will be moved by the exhalation and inhalation of the subject. At times with extremely obese individuals it will be difficult to derive a breathing pattern because of the many layers of fat between the lungs and the surface layer of skin. In such cases it may be helpful to insert a straight edge between the tube and the subject, vertically with the narrow ends of the straight edge against the subject and the contact part of the tube, in order to increase the amplitude of the stroke. Finally make sure that there are no kinks in the tube which will prohibit the passage of air. CAUTION: IF THE FEED TUBE IS PASSED UNDER SHOULDER, VICE OVER, IT IS POSSIBLE FOR THE SUBJECT BY EXERTING PRESSURE WITH HIS UNDERARM AGAINST THE TUBES TO CUT OFF THE AIR, RESULTING IN A DISTORTED OR NO PATTERN AT ALL

### 3. B/P CUFF:

The cuff is attached to either arm of the subject but preferably to the right, (located slightly further from the heart) and if possible not on the same side as the electrode. The flat part of the cuff bag is placed flat against the smooth inner arm and the band is wrapped neatly and smoothly with the end tucked in only, not knotted. It is very important to make sure that the bag is firmly against the inner arm, above the elbow and securely but not too tightly wrapped. As in the pneumo system it is necessary to insure that there are no kinks in the hose or any possibility of it being in such a position that it can be pinched off to lessen or to eliminate the pattern.

While a pattern can be obtained through fine material, a man should be asked to roll up his shirt sleeve. If it appears that the rolled sleeve is binding the subject's arm he should be asked to remove his shirt. The material in blue jumpers is usually too thick and the enlisted man being tested should be asked to remove his jumper. Again women present a special problem. Knit suits or suit coats are usually too thick and a satisfactory pattern cannot be obtained through them. The cloth of which blouses usually worn by women are made, is thin enough in most cases so that a pattern can be obtained. It may be necessary in some cases to ask a woman to remove a thick sweater or jacket. Again proper precautionary measure to prevent any embarrassment, present or future must be taken. In this respect it is noted that if one can be obtained from the local dispensary the short gown worn by a dental technician or corpsman while on duty are ideal to have on hand for such instances. Except under extraordinary conditions the building in which the test is being run will have a ladies rest room in which the necessary change can be accomplished. As a final word, it is noted that "circum-spection" is necessary to some degree during any test but a great deal is needed and necessary when testing a woman.

### c. CHAIR & LOCATION:

Under ideal conditions, a large arm chair in which the subject can comfortably be seated and low enough so that his feet will rest flat on the floor, is provided. Arms on the chair should be large so that subject can support his arms on them to prevent movements and long enough so that the greater part of his arm is resting on the chair rather than hanging over the edge.

This chair should be placed at right angle to and forward of the machine so that the operator can view the subject at all times during the examination while at the same time it is not possible for the subject to see the movement of the machine or pens from the corner of his eyes or the notations made by the operator.

### d. DESK:

Machine may be installed permanently in a desk or table manufactured for such purpose so that the control panel is flush or slightly below the surface of the desk. If it is necessary to set the machine on the top of the desk or table, care should be exercised to insure that the machine is in a level position. Tilts may be corrected by inserting thicknesses of blotter under the appropriate corners. Operator may either sit or stand at his discretion but he should insure that his position is not in range of subject's vision.

## DESCRIPTION

With all attachment made, subject should again be cautioned to sit perfectly still as the slightest movements will cause pen fluctuation, feet flat on floor, to try to avoid sniffing, coughing, throat clearing, etc. (NOTE: Gum should be removed prior to starting examination.) and the kymograph started. NOTE: WHILE NOT NECESSARY, IN ORDER TO SAVE TIME AND TO START THE TEST AS SOON AS POSSIBLE AFTER ATTACHING THE SUBJECT, PENS SHOULD BE PREPARED FOR USE PRIOR TO THE SUBJECT ENTERING THE ROOM OR PRIOR TO MAKING THE ATTACHMENTS TO SUBJECT. THIS CHORE CAN BE TAKEN CARE OF WHILE SUBJECT IS EXECUTING HIS WAIVER FORM IF THE PENS HAVE NOT BEEN PREPARED EARLIER, OR IN THOSE CASES WHERE IT IS NOT SURE THAT SUBJECT WILL SUBMIT TO EXAMINATION.

With the kymograph operating at the 6 inches per minute speed, and the pens tracing, the different units of the machine should be brought into play from top to bottom of the control panel, i.e. pneumograph, galvanograph and finally the sphygmograph. This is not only the logical way but delays until the last the inflation of the B/P cuff which is the only attachment which will cause any discomfort to the subject.

Open the pneumograph vent and when the pen is operating, center the pattern on the heavy horizontal line located in the upper third of the chart. Adjust counter weight to obtain optimum contact between paper and the pen point; heavy enough to hold pen on paper despite sudden jerky breaths and light enough so that the least possible friction exists between point and paper.

Inflating the sphygmograph: The machine is inflated to the mean blood pressure of the subject: i.e., the point (mean between the diastolic (low-expansion or dilation of the heart and the arteries as opposed) and the systolic (high-regular contraction of the heart and arteries that impels the blood outward). This point is reached when the diacrotic notch appears in the exact middle of the pattern. When ready to inflate this section, hold fingers of left hand cupped over sphygmograph so that they will stop a violent up swing of the pen when the tambour is filled with air: with the right hand gently squeeze the hand bulb until at least 30mm of pressure is recorded on the sphygmomanometer; violent or sharp squeezes at the outset may do damage to the tambour, with 30 mm pressure in the tambour, further pressure can be added by heavier squeezes until the desired pressure is reached. While ideally the diacrotic notch should be in the exact center of the pattern, this is hard to obtain exactly and the pattern is good as long as the notch appears in the lower 1/3 of the pattern.

A heart beat sends the pen in an upstroke, when the heart contracts the pen comes down, NOT IN A CLEAN SWEEP BUT IN A KIND OF BREAK THAT IS CALLED THE DIACROTIC NOTCH. A CHANGE IN THE POSITION OF THIS NOTCH INDICATES A CHANGE IN THE B/P. THIS NOTCH IS CAUSED BY A BACKSURGE OF THE BLOOD IN THE AORTA VALVE RIGHT OUTSIDE OF THE HEART, I.E. THE HEART IS CLOSED AND THIS BLOOD DOES NOT RE-ENTER BUT IT IS THE BACKSURGE WHICH IS CAUSED WHEN THE BLOOD IS FORCED FROM THE HEART.

When as a result of the air which is forced into the tambours by the hand bulb the pen moves up and contacts the cupped fingers of the left hand, adjust by the pen control; if the notch does not appear or is in the upper part of the pattern, add more air until the diacrotic notch appears in the lower 1/3 of the

pattern. At this point maximum amplitude in the stroke of the pen will have been obtained and at this point also maximum fluctuation in the sphygmomanometer (2-4mm) will be noted. WHEN DESIRED B/P is reached CLAMP SHOULD IMMEDIATELY BE CLOSED ON THE FEED LINE FROM THE PUMP. A simpler way to obtain the desired pressure point is to inflate the sphygmo so that the pen guided by the cupped fingers rises against the mechanical stop at the top of the sphygmo pattern - the pen will then not be subject to any violent movement and the operator can concentrate on the sphygmomanometer until he reaches the point where maximum fluctuation in the sphygmomanometer is noted, set clamp and then adjust pen downward with the hand control until the pattern is bisecting the lateral line. It will be noticed that the diacrotic notch is in the lower 1/3 of the pattern.

If the notch appears in the upper half of the pattern, the pressure is not high enough if it appears toward the bottom of the downward stroke or at the bottom, then the pressure is too high. As noted previously pulse rate can be determined in this pattern - an upward stroke represents a heart stroke and by counting the number of upward strokes in a five second space multiplying by 12 the individual's pulse rate can be determined.

Men generally tend to run between 70/80 to 100mm while with women usually a slightly higher pressure is needed. It is immaterial to which arm the cuff is attached. If the notch cannot be centered in the pattern, adjust by inflating or deflating the arm cuff for maximum pen movement. This attachment is the only one which is apt to cause the subject discomfort. Skill at rapidly attaining correct pressure point is necessary. It must be noted that some subject's heart action will not cause a true notch but a movement which is rather like a bounce or kick.

ALTERNATE WAY TO INFLATE CUFF: Screw resonance control tightly down. Inflate sphygmomanometer to the point where maximum fluctuation is obtained. Set clamp. Then with left hand again cupped over pen, slowly admit air into tambour by loosening resonance control till pen rises to hand or upper mechanical stop. Again if pen is not checked by hand and air is admitted too suddenly into tambour, damage to tambour or pen is apt to result from violent movement of pen.

Note: While there need be no hesitation about inflating the machine to a maximum of 130mm and many subjects will give the ideal pattern at a pressure point in excess of 100mm the machine should not be inflated over 130mm at any time.

MECHANICAL OPERATION AND CHART MARKING:

In operating the polygraph, it is necessary to run a good mechanical pattern. The panel board of the machine must be so familiar to the operator that he can make necessary adjustments without taking his eyes off of the subject. It has already been noted that some people are not fit subjects for the machine for physical reasons, e.g., cardiac condition, sinus, asthma affliction, etc. It must also be noted that some individuals will show no reaction to the machine, some will react in only one system, some to two and some (rare cases) will show reactions in all three media. In this connection it must also be noted that the same subject is capable of reacting to one pertinent question in one medium and to the next one in a different medium. It is therefore necessary that the operator be able to mechanically operate the machine automatically so that his full attention can be given to the subject and the chart during the actual conduct of the examination.

At the beginning of the examination, the pens should be bisecting the lateral guide lines. The pattern may begin to rise or fall during the test in any of the media; it is not necessary to adjust but when the pens begin to hit the mechanical stops at the top or bottom of the pattern adjustment should then be made either up or down to prevent damage to the pens. At the point of the adjustment an arrow should be marked on the chart pointing in the direction in which the adjustment was made, in order to facilitate reading of the chart when the test is finished. When adjustments are made in the galvo section, in addition to an arrow, a small x should be marked at the point where the adjustment has ended and the machine is again controlling the pen. In this connection it should again be noted reactions in the galvo section usually occur immediately and in noting the reaction, it should occur five seconds before the point on the chart where you have placed the stimulus mark.

Questions should be as short as possible so that the exact point at which the stimulus has occurred can be noted. Simultaneously with asking the question, a short vertical mark should be made at that point on the chart.

After all units of the machine are operating, the pressure at which the subject is being run should be noted on the bottom of the chart. If no adjustments are necessary, inform the subject that you are ready to begin the test and note this point with an X at the bottom of the chart. Allow at least fifteen seconds between each question - when a reaction to a pertinent question lasts for longer than 15 seconds wait until it is concluded before asking the next irrelevant question. Do not however ask irrelevant questions at intervals of 5 seconds and then wait for 15 or 20 seconds after asking a relevant question. This change in time will be noted by the subject and may cause undue alarm or false reactions on his/her part. Indicate the point at which you ask a question by the short vertical mark at the instant you ask the question. This mark should be made at the bottom of the chart and should be put at a point, one second behind the sphygmo pen at the moment you ask the question. Accuracy on this point is necessary in order that reactions can be properly evaluated. Indicate the subject's answer, affirmative by a plus sign +, negative by a minus sign - at the spot where subject answers. Note: Not all subjects answer immediately, some do up to five seconds before answering. Finally next to the plus or minus sign, indicate the number of the question which has been asked. (If ONI question sheet is used, 1-10 will be irrelevant questions, 26 through 45 relevant questions and 46, 47, and 48 will be control questions). When the final question in any test is given, wait for the usual 15 seconds to pass, then inform the subject that there are no more questions and tell him to sit still for a few seconds. Signify

the end of the test on the chart by a double XX. Allow chart to continue for 15 or 20 more seconds (to observe if there is any noticeable relief as a result of the announcement that the test is over, then close vent on pneumo, return galvo to "A" or "B" position, press down on sphygmo valve gently until pen drops to bottom of chart from the leak, then close vent completely. Subject should be warned against violent movements or attempting to stand up between tests but should be told that he can flex his fingers if he wishes. Charts should be limited to a maximum of ten irrelevant and 3 relevant and one control question (not over eight minutes at the longest for any test).

Immediately upon finishing a test, chart should be torn from machine and properly identified. This will prevent confusion of charts later during period of study. In upper left hand corner of chart, number each chart in order, e.g., 1, 2, 3, etc., name of subject, and other identification as appropriate, repeat the mm pressure at which subject was run in this space and circle, add date and name or initials of operator. At this point also (this usually occurs in first chart) if it is noted that the subject has been unduly nervous during the test the notation G.N.T. (general nervous tension) should be noted - this is usually signified by a very rapid pulse rate or jerky breathing pattern. If this condition continues without abatement in the second and third chart it may be an indication that the subject is attempting to hide something. If it disappears after the first chart, it is usually taken as a sign of nervousness occasioned by the first experience with the machine.

During the test, other marks should be added to the chart at the appropriate point as noted, e.g., if coughing or sniffing distorts the pneumograph pattern it should be noted at that point with small s or c so that it will not later be incorrectly interpreted as a reaction. Talking, sneezing, movements should all be noted by appropriate symbols as they will also cause distortion in the patterns.

Again it must be noted that prior to any examination the subject should be instructed to answer only yes or no to the questions and not to do any other talking. If he doesn't understand a question or feels that it cannot be answered either yes or, he should be advised to not answer and wait until between charts to discuss the question.

A mute should not be told to nod his head but simply to sit still. If a person has a noticeable stammer or stutter he also should be advised to make no answers. It is not necessary for the subject to answer for the reaction to be noted. Lying is not the act of saying yes or no but is the mental effort of the imagination, i.e., the substitution of fiction for fact in a given situation.

One final note, when it is necessary to reduce the amplitude of the heart stroke by use of the resonance control this should be indicated by the letters RES on the chart. Resonance should always be completely opened at end of each test inasmuch as in succeeding charts it may not be needed and may cause difficulty in obtaining a proper pattern if operator is not aware or forgets that this resonance control is set.

## TYPES OF EXAMINATIONS:

There are two types of examinations which can be conducted with the polygraph  
1. Peak of tension examinations and 2. General question or relevant - irrelevant type examinations.

**PEAK OF TENSION:** Symbol on the chart for this type of examination is PT followed by appropriate number; e.g., PT1, PT 2, etc. The peak of tension examination is generally a more accurate and easy test to interpret but it requires certain conditions. If there are certain pertinent factors or facets in connection with a crime, e.g., type of weapon, amount of money taken, type of jewelry, and these facets are known only to the guilty party and to the investigator, then you have the basic ingredients of a PT test.

**NOTES:** When there is more than one pertinent factor which maybe used, use them in separate PT type examinations never in the same test. The essence of the PT examination is that the guilty party must know the one spot at which he is going to have to lie. A PT differs from a GQ type examination because it is built as a unit and there is going to be one and only one lie contained in it. The pertinent question should be placed about fourth or fifth in the list of questions. In a PT examination the wording of the questions must always be the same with only the pertinent factor, color, weapon, amount, etc. changed. Prior to the examination the subject is always shown the list of questions, typed preferably. This is done so that the guilty party is not only made cognizant of the fact that he must lie, i.e., that some pertinent part of his crime is known, but also to insure that he knows exactly at what point he must lie.

In this type examination the operator must be absolutely sure that he has his facts correctly and that there has been no leakage of information concerning the pertinent facets. For example in an assault case if it has been leaked that the weapon used was a blackjack, it is only natural to assume that many people under questioning will react to the word blackjack. Agents with whom the operator works should also be advised of the necessity of not prematurely releasing information about any case, for the same reason. **EXAMPLE OF A TYPICAL PT EXAMINATION:** \$550 is discovered missing from the ship's store. This money is subsequently found in number two fire-room. Amount of money missing and hiding place is known only to investigators and reliable GPO who found the money. Conditions for two different PT tests are present here. Questions would be as follows and shown to each subject prior to testing: Two irrelevant questions to establish subject's norm, then the test questions at intervals of 10 or 15 seconds.

- a. Is your name Doe?
- b. Were you born in the U.S.?
26. Did you take \$150 from the ship's store?
27. Did you take \$250 from the ship's store?
28. Did you take \$350 from the ship's store?
29. Did you take \$450 from the ship's store?
30. Did you take \$550 from the ship's store?
31. Did you take \$650 from the ship's store?
32. Did you take \$750 from the ship's store?

Note that the wording of all questions is exactly the same with only the pertinent factor changing in each. None of these questions will mean more than



any other except to the guilty party who will know how much he has taken from the store: This series of questions can usually be run through twice on the same chart and then repeated again if necessary on a second chart after a short break. When a peak of tension is noted in the guilty party the operator may corroborate his findings by running a second peak of tension examination using the second facet of the offense which is known only to guilty party and himself, e.g., with a suspect determined by the first PT the second test could then be administered composed of the following questions:

26. Did you hide the money in the wheelhouse?
27. Did you hide the money in the galley?
28. Did you hide the money in the #1 fireroom?
29. Did you hide the money in the #2 fireroom?
30. Did you hide the money in #1 engine room?
31. Did you hide the money in #2 engine room?

Again the list of questions is shown to the subject prior to the examination. Note that only the location on the ship is changed in each of the foregoing questions.

Peak of tension tests ideally will show a chart in which the pattern gradually rises to the point at which the pertinent question is asked, then again levels off or falls off (with relief) as the danger point is passed. However, examples may occur where the patterns show no deviation at all except at the point of tension and then remain distorted till the end of the past or resume their even tenor. NCB: Always run this type test twice in succession. Make as few mechanical adjustments as possible during the running of the chart. Inform the subject that you are going to go through the series of questions twice, at the same time that you show him the list of questions. In PT Test the reactions are usually even more emphatic in the second run than in the first. In forming a PT question list you are building a unit, the questions must be repeated in the same order and the pertinent question will always occur at the same spot in the sequence, with at least 10 seconds between each question. In the PT examination, the advantage is that the operator knows exactly at what point to expect a response. Care must be taken to ask all questions in the same tone of voice and not to stress the pertinent question by a difference in voice inflexion.

N.B. Proper point at which to mark questions on the chart is about one second behind the B/P pen.

#### TYPE 2 PT:

A PT of tension examination may be run at times without the investigator being cognizant of the pertinent factor, e.g., Emory powder is discovered in the shaft bearing or sugar in the generators. Investigation establishes that the act had to be done sometime between Monday and Thursday. In order to place responsibility, it is necessary to know at what time the offense was committed. Here again PT conditions prevail but the examiner does not know at which point to expect the reactions. Since he does not know at which point the PT will be reached the examiner must start at a point prior to the time at which the offense could have been committed and carry it beyond the point of time in which it might have been committed. Questions could be formulated thusly under the foregoing conditions:

- 26. On Saturday did you put sugar in #1 generator?
- 27. On Sunday did you put sugar in #1 generator?
- 28. On Monday did you put sugar in #1 generator?
- 29. On Tuesday did you put sugar in #1 generator?
- 30. On Wednesday did you put sugar in #1 generator?
- 31. On Thursday did you put sugar in #1 generator?
- 32. On Friday did you put sugar in #1 generator?
- 33. On Saturday did you put sugar in #1 generator?

The operator knows that the reaction if any must occur between questions 28 and 31 but not at which question. Otherwise the procedure is the same as in the regular PT examination. With the day on which the deed was done is established, this test should be carried further. Assuming that a suspect indicates guilty knowledge in connection with the question relating to Tuesday. A further PT test can then be run by utilizing the following questions:

- 26. During the first watch on Tuesday, did you put sugar in the generator?
- 27. During the second watch on Tuesday, did you put sugar in the generator?
- 28. During the third watch on Tuesday, did you put sugar in the generator?
- 29. During the fourth watch on Tuesday, did you put sugar in the generator?

Caution: It must be noted that the reaction can occur in relation to the first question in this series which would result in a chart similar to a GQ chart in which a reaction is noted. Also it is not wise to carry the time of the questions back to the last watch on Monday and carry the questions through until the first watch on Wednesday because of the psychological effect on the subject when he realizes that you have determined the day on which the deed was done. This can be carried further and the actual hour or time of day in which the offense was committed can be determined. Successive tests of the nature mentioned supra has the effect of convincing the subject that his offense is being discovered, thus rendering him more adaptable to successful interrogation.

In successfully conducting an examination of the type noted supra, the operator not only is able to tie the offense down in time, he is able to determine what other personnel could be potential witnesses because of the time element, e.g., what personnel were in or in the vicinity of the engineroom at the time the sugar was put into the generator, who might have been aboard and seen the subject take sugar from the galley, who might have seen subject leave or enter the engineroom, etc. In this connection it is noted that in a trial by court-martial where a plea of guilty is not entered, corroborative evidence for even the most perfect statement or confession obtained is needed.

## GENERAL QUESTION TYPE EXAMINATION:

The theory of a general question examination plainly stated is that by establishing a norm i.e., subject's pattern when he is telling the truth, answering questions to which the truthful answers are known, any deviation or change from that "norm" at the point of pertinent questions will be noted.

Questions asked during this type of examination consist of two category, those which are relevant or pertinent to the offense under investigation and those which are not relevant and which are designed to eliminate any possibility of arousing an emotional response in subject and finally to which the absolutely truthful answers are known.

It has been noted previously that during the testing procedure the subject is restricted to answering questions either yes or no and prohibited from doing any other talking during the examination. In connection with this point it is good practice to select as a general rule irrelevant questions that are going to require affirmative answers. A slight psychological gain is obtained here by the operator because in lying usually the subject has to answer negatively; this tends to emphasize even more the difference between the relaxed carefree answer to a strictly irrelevant question and the negative (act of lying) answer to the relevant questions.

Whereas the pre-interrogation of a subject for a PT type of examination, is relatively brief the pre-interrogation is one if not the most important part of GQ type examination.

GQ type examinations as differentiated from PT type test in which only one lie is sought may contain several lies, i.e., lies on several points in connection with the offense or may contain only one lie: e.g., when a subject has knowledge of an offense but was not a participant in the actual deed.

GQ type examinations usually follow a specific pattern from general questions covering knowledge of and commission of the offense and advancing to specific points in connection with the crime or crimes e.g., tied down as to weapon, method, time, etc.

Again as a general rule the question in the first two examinations of this type will be identical in wording and practically in order. The reason for this is the original tension or nervousness felt by most subjects when they are taking an examination for the first time. Even the most innocent are apt to show reaction to the relevant questions owing to embarrassment, resentment at even being a suspect, fear that the machine may be wrong, etc. Remember that a reaction is not valid unless it is repeated on at least one additional chart. Between the first and second charts, the subject should be asked if he understood all questions or if he has questions about any of them; he should then be informed that he is going to be asked the same questions in approximately the same order. This has the effect of reassuring the innocent; they know that they have not lied and therefore have nothing to fear, the original fear or nervousness in connection with the machine has been abated to a great degree and secure in the knowledge of their innocence they tend to run a clear chart. On the other hand, the same advice to a guilty person not only informs him that he has lied but also puts him on guard to the fact that he has to lie again and at approximately the point he has to lie, thus introducing somewhat the element at least to a minor degree of a PT type test.

Except under exceptional circumstances (to be explained later) two relevant questions should not be asked in succession. Inasmuch as a subject will become accustomed to the rhythm of the questioning procedure as more tests are run this procedure will have to change, e.g. one instead of two, or three instead of two irrelevant questions between pertinent questions, this step being taken to rule out anticipatory reaction. (This of course does not refer to the first two charts - During Charts #1 and #2, questions should be in exactly same order, if possible).

The following is an example of a G<sub>2</sub> type examination: Offense: Emory powder in the main bearing of #2 shaft. Investigation discloses that the emory powder aboard ship is stored only in the machine shop and issued only by written authorization. Last issue on Tuesday and all accounted for. Emory powder put into bearing on Thursday. Personal data concerning present suspect obtained by investigation, personal observation, service jacket and PRE-INTERROGATION.

Joseph Walter JONES, EM2, 555 55 55, USN born 19 May 1920, Boston, Mass., married, two children, present home in Malden, Mass., has car, wearing glasses and dungarees, no food today except for coffee, sometimes called Jonesy, has been on ship 32 months, is in 3rd division, has not been sick in past year, has no ailments, saves stamps for a hobby, etc., denies knowledge or commission of offense, if asked to select most likely suspect would name striker in his watch section.

1. Is your name Jones?
2. Were you born in Mass.?
3. Do you know who put the emory powder in the bearing?
4. Are you sometimes called JONESY?
5. Are you wearing glasses today?
27. Did you put the emory powder in the bearing?
6. Is your first name Joseph
7. Can you drive a car?
28. Are you concealing knowledge of this matter (offenses, emory powder)?
8. Did you drink some coffee today?
9. Do you save stamps?
46. Have you answered all of my questions truthfully today?
10. Are you married?

Note that no questions allows of an opinionated answer as would be required by such questions as "do you think," to the best of your knowledge," "have you ever felt," etc. Questions must be factual, require a factual answer not an opinion. In effect strive to put the man on the point of a pin and push him one way or the other by your question, i.e., to truth or to falsehood.

After a short break and warning the subject again to answer only yes or no, inform him that the questions will be the same and run through the questions again in the same order. If after the second or if necessary the third chart, you are of the opinion that the subject is telling the truth in denying knowledge or guilt in connection with the crime, send him on his way. It is never necessary to tell a person the results of the test. To those who ask the stock answer is "you know the results, you know whether you lied or not don't you?" This is not an infallible rule, in cases it is necessary to reassure unjustly accused persons and tell them that in your opinion they did not lie and conversely in some cases where it is estimated that interrogation benefits will result it may be wise to indicate immediately that you think the individual is attempting deception.

If in your opinion the subject is guilty of deception but you feel that further testing is necessary to more firmly establish your opinion or to more favorably set up the individual for interrogation, a second series of tests may be run with either the same or similar irrelevant questions and with the following relevant questions:

26. Have you ever taken emory powder without permission?
27. Were in in #2 engineroom on Tuesday morning?
28. Did you put emory powder in the bearing on Tuesday morning?

It must be understood that the foregoing questions are offered only as a guide and wording of questions in any case will depend on the circumstances of the offense, number of pertinent facts known, etc. However, when many pertinent facts are known, e.g., time, method, weapon, tool, etc., don't shoot your wad all in one series of test but hold some back for use in subsequent testing or as a criteria by which to assess the truth and accuracy of any confessions obtained.

It is also noted that in some instances a suspect will indicate knowledge of the offense and the perpetrators but no personal involvement. In this latter case if further tests are run, questions will be aimed at determining how much knowledge subject has.

In this type of examination, after the last irrelevant question has been asked in the second examination (this procedure is never used on a first examination) in those cases where no nervousness or no reactions whatsoever has been noted, the question arises as to whether or not the subject is a non-reactor. A question must be devised which is calculated to cause a reaction in the particular subject so that it can be determined whether or not he is a reactor. Most common way to do this is to ask at this point, when the subject is momentarily expecting to hear you say "there are no further questions, just sit perfectly still for a few seconds." "do you mind 'or' may I at this point ask you a personal embarrassing question"? If no reaction is forthcoming from this question it may be necessary to actually ask a personal embarrassing question before concluding that subject is a non reactor. (THIS SHOULD NOT REPEAT NOT BE USED UNLESS NECESSARY - IT IS NOT TO BE ROUTINELY USED AT END OF EVERY EXAM).

As noted under chart marking, a machine is never immediately secured after the last question is asked, but the subject is told to sit still for a few seconds, after being informed that there are no more questions in order that the operator may have the opportunity to note if marked relief sets in with the announcements that there are no further questions.

By the same token, an individual may react most specifically to all pertinent questions yet for some reason does not fit the picture, e.g., lack of motive, lack of knowledge of crime, the operators intuition, etc., and it is necessary to determine if the person has a "guilt complex." These are persons who by the very fact that they are logical suspects become filled with a feeling of guilt, or have a persecution complex and feel that they are to blame or are going to be blamed no matter what, etc. To resolve this situation, in place of an EPQ, another crime question is asked. This question may be in connection with an actual or fictional offense of the same nature as that under investigation with which the suspect could have, under no circumstances, had any connection. As an example, sabotage on a destroyer in the Norfolk yard is under investigation, the suspected guilt

complex has been on board constantly for the past two weeks, he is asked if he is also responsible for the same type of sabotage to another destroyer the preceding week. Of course he is also informed that that destroyer or preferably knows from his own knowledge that this second destroyer has been in the Pacific or in the Med for the past six months. Under these circumstances if he still reacts in a guilty manner than a possible guilt complex has been established. The individual should not, repeat not, cease to be a suspect because of the foregoing, but further action or interrogation should be held in abeyance, until all other logical suspects have been tested and exonerated or the guilty person established. Needless to say voluntary confession from "guilt complex" cases, particularly when offered prior even to interrogation should be viewed with a jaundiced eye.

DEPARTMENT OF THE NAVY  
Office of the Chief of Naval Operations  
Washington 25, D. C.

ONI 05520.73  
Op-921DXL  
9 October 1961

FOR OFFICIAL USE ONLY

ONI INSTRUCTION 05520.73

From: Director of Naval Intelligence  
To: Distribution List

Subj: Polygraph Technique; ONI Policy and Rules for Employment of

Ref: (a) ONI Instruction 5520.72 of 2 Oct 1961, Subj: ONI Polygraph Operators; policy pertaining to  
(b) DNI ltr of 8 Sep 1960, Subj: Additional Polygraph Notes; forwarding of (All DIOs/IOs except DIO-15ND)

Encl: (1) Sample waiver form for polygraph testing

1. Purpose. To disseminate policy and rules of the Office of Naval Intelligence for application of subject technique to investigative matters.

2. Background. The polygraph technique has been employed in investigative matters by the Office of Naval Intelligence since 1948. The machine used in the application of this technique is commonly called a "lie detector" which is a misnomer. Correctly stated, THE POLYGRAPH IS A MACHINE WHICH IS CAPABLE OF PRODUCING A RECORD OF PHYSIOLOGICAL PHENOMENA WHICH MAY BE USED AS A REASONABLE RELIABLE INDICATOR FOR THE DETECTION OF DECEPTION. The machine will be ineffective with certain individuals for either physical or mental reasons. Included in this group will be mental deficient, alcohol or narcotic addicts while under the influence, many hardened criminals, etc.

The experience of the Office of Naval Intelligence has indicated that the correct application of the subject technique is as an investigative aid. It should be restricted, if used at all, to cautious use by skilled operators and considered as merely one of the many techniques of investigation rather than as a substitute therefor. The polygraph technique is an invaluable aid to investigations provided conditions for valid testing are present. The correct application of this technique is as an aid to further investigation and/or interrogation. The polygraph itself does not have the property of evoking confessions; this remains the task of the skilled interrogator.

As set forth in reference (a), polygraph operators within the Naval Intelligence Organization are trained at the Office of Naval Intelligence and authorized to use the technique by the Director of Naval Intelligence. There is no objection generally to the utilization of persons as operators who have been trained elsewhere; however, where done, it is the responsibility of the respective Officer in Charge.

FOR OFFICIAL USE ONLY

ONI 05520.73  
(10/9/62)

3. Policy and Rules. The following regulations comprise the general policy and rules of the Office of Naval Intelligence in respect to application of the polygraph techniques:

(1) The technique WILL NOT be used as the sole determinant for eligibility for security clearances. The conditions under which this technique may be used in this connection are described in reference (b). Even in those cases where no other avenues of inquiry are available, e.g., an escapee from an Iron Curtain country, the use of this technique alone to determine eligibility for security clearance is STRICTLY PROHIBITED.

(2) The technique is to be used in conjunction with and as an aid to investigation/interrogation, not in lieu thereof. It should not be restricted to use as a last resort, after all other techniques, particularly prolonged interrogation have failed; conversely, it should not be used prematurely; rather, its use should be applied as any investigative aid at the appropriate time relative to case development.

(3) Subjects cannot be compelled to submit to the examination and it is the operator's responsibility to ensure that the subject realizes he cannot be ordered or forced to submit to the examination. A waiver, setting forth the subject's agreement to submit to polygraph examination should be obtained in each instance. Enclosure (1) is the suggested waiver form.

(4) The responsibility for determining whether the technique is applicable to a particular case and/or whether the issue is susceptible of resolution by the polygraph technique, is that of the duly authorized polygraph operator. Local irreconcilable differences of opinion as to the applicability of the technique in a given situation should be referred to the Office of Naval Intelligence for decision.

(5) Polygraph operators shall submit OPINIONS ONLY. It should not be stated as a fact that "the individual told the truth" or "the individual lied." In the opinion of the operator, results may be POSITIVE, NEGATIVE or INDETERMINATE. If an individual is considered unsuitable for testing, either temporarily or permanently, for some physical or mental reason, this also should be stated as opinion only.

(6) Charts obtained by operators will be retained by them. Opinion of more experienced operators within the district may be sought but charts should not be given nor shown to operators who may be engaged by a subject to refute the opinion of the ONI operator. It is to be noted that ethical and experienced operators, as a general rule, will decline to venture an opinion or diagnose charts resulting from examinations conducted outside their presence.



ONI 05520.73  
(10/9/61)

(7) When the investigating agent is other than the polygraph operator, he will furnish to the operator all information he possesses concerning the case. The investigating agent will indicate to the operator what information is sought and the operator in turn will COMPOSE the questions. Questions must be posed with the utmost possible precision. They should be short, avoid the injection of extraneous matter, worded so as to eliminate false responses caused by word association and capable of being answered with "yes" or "no" responses.

(8) Different categories of issues or offenses should not be combined in one examination but each should be made the subject matter of separate examinations; for example, when an individual to be tested is suspected of both unauthorized disclosure of classified matter and sexual deviation, separate examination on each offense should be conducted rather than including questions about both offenses in the same examination. In considering the order in which the issues are to be handled, consideration must be given to which of the issues is liable to have the stronger emotional impact on the subject, rather than to which of the issues is the more important from an investigative or security viewpoint. Thus in the example included herein, even though the compromise is the more serious offense, the subject himself is apt to be more concerned about the sexual problem. Accordingly, this issue should be handled first, in effect to "sanitize" the subject so that concern about the sexual issue on the subject's part does not becloud or distort his reactions in response to questions concerning the compromise.

(9) The technique is not to be used as a "hunting license." Pertinent questions will be restricted to those which are germane to the issue or issues on which the subject has agreed to be tested. Control questions may be used only as required to determine if the subject is capable of reaction to the technique or to determine the presence of a "guilt complex."

(10) In order to be valid, a reaction must be repeated. A minimum of two charts should be run in each case.

(11) The operator shall include as part of his report (or shall prepare a memorandum for the investigating agent to include with his report) the date and place of the examinations, number of tests administered, a list of ALL QUESTIONS, relevant or irrelevant, employed, responses of the subject and a statement as to his (the operator's) opinion of the results of the examination.

(12) Requests for polygraph assistance may be received from other Federal, State, Municipal or even private agencies, e.g., telephone companies, Navy contractors, etc. In the interest of improved liaison and cooperation, such requests should be serviced on a selective basis

FOR OFFICIAL USE ONLY

CNI 05520.73  
(10/9/61)

as a reciprocal gesture, and provided that circumstances are in all respects favorable to employment of the technique and provided further that such tests are not precluded by local (municipal, state, etc.) ordinances. The request should be obtained/confirmed in writing in each instance and a waiver obtained from the subject(s) to be tested. The DIO/IO or his delegated representative should be aware of each such request before any commitment is made. Operators shall not solicit requests for polygraph service from other agencies nor arrangements to do polygraph work for other agencies, even on their own time, without the knowledge and expressed consent of the DIO/IO.

The foregoing are intended as general guidelines and rules for employment of the polygraph technique in connection with investigations conducted by CNI. They are not intended to be all inclusive in scope. Detailed instructions covering most situations which will be encountered are given during the course of instruction at the Office of Naval Intelligence.

4. Action. A copy of this Instruction should be made available to each polygraph operator.

/s/F. A. Klaveness  
F. A. KLAVENESS  
By direction

Distribution:

F28 (Intelligence Officers, Naval Districts):

DIO-1ND	(30)
DIO-3ND	(65)
DIO-4ND	(50)
DIO-5ND	(40)
DIO-6ND	(50)
DIO-8ND	(30)
DIO-9ND	(70)
DIO-10ND	(10)
DIO-11ND	(45)
DIO-12ND	(30)
DIO-13ND	(20)
DIO-14ND	(20)
DIO-15ND	(5)
DIO-17ND	(5)
IO-PENC	(60)
IO-COMNAVFORJAPAN	(20)
IO-CINCUSNAVEUR	(10)
IO-COMNAVMARIANAS	(8)
IO-COMNAVPHIL	(8)

FOR OFFICIAL USE ONLY

ENCLOSURE (1)

W A I V E R

I, \_\_\_\_\_, \_\_\_\_\_, have been informed of my rights and do freely and voluntarily agree to submit myself to examination by polygraph (lie detector). I have been told that I do not have to submit to such an examination unless I wish to do so. I further agree to cooperate voluntarily and fully with the operator of the machine during this examination.

Signature \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_  
(Witness)

ENCLOSURE (1)

ONI 5520.72  
(10/2/61)

"Special Agent DOE is qualified as a Polygraph operator and not as an expert. Although he has been given basic training which will lead to proficiency by the addition of experience, continued study and analysis of charts run by comparison with objective evidence where such is available, he is not considered sufficiently competent to provide training in polygraph operation."

This authorization may be withdrawn at the discretion of the Director of Naval Intelligence for good and sufficient reason therefor.

3. Policy. The Director of Naval Intelligence authorizes polygraph operators who are trained at the ONI school or who were trained at the Leonarde Keeler School under ONI orders prior to July 1951 to conduct polygraph examinations when the technique is applicable to investigations being conducted by the Office of Naval Intelligence. Operators who have received such authorization may be required to qualify at the Office of Naval Intelligence periodically in order to retain this authorization. The authorization may be withdrawn at anytime by the Director of Naval Intelligence. Other investigators currently employed by or on duty with the Office of Naval Intelligence who are trained in the use of the polygraph will not be authorized by the Director of Naval Intelligence as operators but may be authorized to conduct polygraph examinations by the Officer in Charge, District Intelligence Office/Intelligence Office. These operators may be issued letters of authorization by the Director of Naval Intelligence after attending a refresher course and/or demonstrating an acceptable degree of proficiency in operation and understanding of ONI rules for employment of this technique, at the Office of Naval Intelligence.

/s/F. A. Klaveness  
F. A. KLAVENESS  
By direction

Distribution:

F28 (Intelligence Officers, Naval Districts) (5)  
IC-PRNC (5)  
IC-COMNAVPHIL (5)  
IC-COMNAVFORJAPAN (5)  
IC-CINCUSNAVEUR (5)  
IC-COMNAVMIANAS (5)

## LEGAL ASPECTS OF THE MACHINE :

The following points are based on lectures of Dr. Robert Scott, Michigan State College, Crime School. Unless otherwise noted or stated, they are in accord with stated policy of ONI.

In regard to the legal aspects of the polygraph, there are three questions to be considered:

1. Can a suspect be compelled to take a polygraph examination? No.
2. Can a polygraph operator testify as an expert witness as to truth of the subject? No.
3. Can a confession obtained as the result of a polygraph examination be introduced in a court of law? If it meets all legal requirements of a confession it may be. (NOTE: The polygraph will not make anyone talk, confessions are still obtained as a result of interrogation, etc.)

In relation to the first of the foregoing questions, it must be noted that under our form of government, "NO MAN SHALL BE COMPELLED TO TESTIFY AGAINST HIMSELF": it is not only immoral and unjust, it is equivalent to compelling a man to testify against himself when he is forced (by threat, promise or otherwise to submit to polygraph examination. In addition, confessions obtained under such measures are usually held to be inadmissible and are apt to be unreliable or untrue.

How far does this privilege of not testifying against self extend? A man cannot be convicted by what the law calls his testimonial utterances unless supported by other evidence; however his physical features in a sense can be used to testify against the man, e.g., an eye-witness to the crime who remembers the appearance of the man, his fingerprints, etc. While submitting to polygraph examination, a man is in a conscious state, ergo, he is consciously testifying against himself; i.e., "although the pen is not in his hand, he is connected to the machine and it is his reactions that are causing the movements of the pens. For this reason the subject who is compelled to submit to polygraph examination cannot have the results introduced in court over his objections. By the same token, witnesses in court, cannot be compelled to submit to polygraph examination.

Evidence discovered through the use of the polygraph, i.e. corpus delicti can be introduced into evidence. E.g. a subject willingly submits to a polygraph examination as a result of which the loot he has hidden is discovered. In this case a waiver will be helpful in getting the results of the lie-detector test into court but will not close the door tightly to all objection - the defendant can always claim that he signed the waiver as a result of a gun being held against his back.

Can a polygraph operator take the stand and testify to whether in his opinion the subject was truthful or not? - with few exceptions he cannot. It is the function of the jury to weigh the evidence, to consider the facts to decide who is telling the truth and to make a finding of guilty or not guilty. (only these two findings are allowed in courts in this country) (e.g., under Scottish law three findings are allowable, guilty, not guilty or not proven. In this connection, military law is much closer to the Scottish (criminal) than to the English common law). If a polygraph operator was allowed to testify to the

truthfulness of the accused or the witnesses, he would be invading the province of the jury which is one of the reasons why courts are reluctant to admit as an expert a polygraph operator. EXCEPTION (rare). When the parties to a case agree to polygraph examination and the court consents the results of polygraph examinations may be used in civil or criminal cases. Usually when such agreement has been reached one of two stipulations are ordered by the court; 1. Examinations are permitted and the operator is allowed to testify as an expert but the results are not binding. 2. a consent to acquittal or a verdict of guilty as a result of the examination is obtained. N.B. IF FACED WITH THIS SITUATION, OPERATOR SHOULD BE SURE THAT THE CONSENT OF THE COURT AS WELL AS OF ALL INTERESTED PARTIES IS OBTAINED. As far as is known there is no objection to the use of the polygraph in a pre-sentencing investigation.

Can a confession obtained as the result of a polygraph examination be introduced as evidence? Affirmative, provided the confession otherwise is legally valid. A confession obtained from a subject who voluntarily submits to polygraph examination is valid provided it meets the other requirements for admissibility. A confession to be admissible must be voluntary and trustworthy, i.e., worthy of belief. In connection with this point notice the difference in the following statements made to a subject in order to obtain a statement; "it will be better for you if you come clean (implied threat or promise)" as opposed to "you will feel better if you come clean."

N.B. None of the foregoing is intended to imply that a polygraph operator will not be asked about the polygraph procedure in court. Many defense lawyers, without touching on the results of the examinations will nevertheless question operators very closely as to their knowledge of the machine, how the machine works, whether it is painful to the subject, etc., in an effort to prove duress or to invalidate a confession obtained subsequent to polygraph examination.

#### POLYGRAPH EXAMINATION AS A RESULT OF AN ACCUSATION:

In many cases an operator for Naval Intelligence will find himself in a situation where he must run a polygraph examination because of the exigency of the situation or because of the nature of the information received. It is a known fact that investigative agencies constantly receive anonymous information. Often this information is of such a nature that some check, e.g., a tip that John Doe has planted explosives aboard the ship. Because the assumption cannot be made by an intelligence operator that this information is unreliable, it may be necessary to test John Doe on the possibility that he has actually hidden explosives aboard the ship. On the other hand when accusations are received, particularly from a junior against a senior, it is necessary in all cases, all other conditions being equal to polygraph the accuser before the accused when polygraph examination is the course of action indicated by the information received.

#### DECEPTION CRITERIA:

As a general statement the remark that all polygraph charts will contain the answer but the polygraph operator will not always be able to find the answer is true. There is no such things as a complete list of the deception criteria that can be obtained on the polygraph. This again is owing to the fact that all individuals differ to some extent even in their B/P. It is also true that an in-

dividual may react in one medium to a specific question and in an entirely different manner to another pertinent question in another medium during the same examination. Therefore no definite rules can be laid down. However in checking charts during the actual running of the test or in the post period study, the following points should be looked for:

#### PNEUMOGRAPH:

Greatly accelerated or decreased rate of breathing at the point of pertinent question; suppression or partial suppression of breath, holding of breath at the peak of intake or outlet of breath, rise or fall of baseline, a very erratic pattern up to and including the pertinent question followed by a relatively smooth pattern. Indication of increasing tension in the breathing pattern throughout the examination.

#### GALVANOGRAPH

Generally speaking the amplitude as well as the duration of the response will be much greater at the point of relevant question. Again where a galvanometer has been operating in a normal manner up to the pertinent stimulus at which point it becomes static and remains so until the next irrelevant question is asked this must be considered a reaction.

#### S.PHYCOGRAPH:

This is the most reliable of the medium and is the one which is first checked and to which the operator pays prime attention during the actual operation of the test. A slow down in the pulse rate almost always accompanies deception. A suppression or increase in the amplitude of the heart stroke may indicate deception. A rise or fall in the B/P pattern on the chart may be indicative of deception. In some cases there will be a slight rise or fall in the pattern at the point of stimulus followed within 20 to 35 seconds by a noticeable increase in the pulse rate and a downward break in the pattern.

Familiarity with deception criteria cannot be taught but he obtained from experience. It is entirely possible that an operator will meet for the first time a reaction which has been previously noted by another operator owing to the infinite ways in which the physiological pattern of a subject may react to the situation of fear or detection and the necessity of lying.

#### INTERROGATION:

General Notes: Interrogation like salesmanship is a faculty that is possessed or developed - it cannot be taught. However some general principles in connection with interrogations may be set out; the difference between rape and a good time is very often salesmanship. Interrogation is the most difficult type of salesmanship inasmuch as the subject is being sold a course of action which is going to be detrimental to his own well being.

Always adopt the interrogation to the subject, use his language, understand his values, maintain his respect, keep control of the interrogation at all times except in those instances when the subject by his chattering is making damaging

admissions. The basic elements in any successful interrogation are: privacy, persistence, assumption that eventually the subject will talk, patience, and common sense.

Beware of the subjects who are too willing to talk. Many individuals need only a hint as to what is wanted and they are off on a long fanciful and entirely untrue account of the alleged facts.

Get the polygraph into play as soon as possible and use the results for clues to what line further interrogation/investigation should take.

Classify the subject as to first time offender or hardened offender. Be willing to sympathize with the first and help him to rationalize his offense; usually with the hardened offender spelling out a picture of incontrovertible evidence is the only effective step.

#### GENERAL OBSERVATION:

The polygraph is not the answer to investigative difficulties; as an investigative technique it is an invaluable aid provided required conditions are met - the correct application of the polygraph technique lies in using the polygraph as an aid to further investigation or interrogation. It should be utilized as soon as possible in any case in which it is needed. A polygraph unsupported is worthless. Success of the polygraph depends on efficient and complete investigations. It is an adjunct to, not a substitute for investigation.

The machine will be ineffective with psychological liars, mental patients, narcotic or alcohol addicts while under the influence and on many other individuals for either physical or mental reasons.

A reaction to a specific question is not valid unless repeated at least once on another chart.

Interrogation between charts should be limited to clearing up apparent discrepancies or the meaning of questions.

Operators must be alert to the possibility that reactions may be caused by an individual attempting to hide something other than complicity or culpability of the offense under investigation.

**CONTROL QUESTIONS:** Train investigators to determine or in pre-interrogation try to determine something about subject concerning which he will lie. Control questions are usually asked at the end of the second examination. Most common examples: Have you answered all of my questions truthfully? (asked after you have purposefully made a person lie), Did you lie to me intentionally during this test? Are you trying to beat the machine? Are you attempting to conceal something from me? etc. EPQ's are asked to create an emotional pattern in subject. This pattern should not be confused with the lie pattern. This question should create a reaction which will usually be similar in pattern and duration but which may be more emphatic than the lie reaction.

A person who blocks at the top of the intake in the pneumograph pattern may be giving a guilty reaction but it is more often a sign of emotional instability in the subject.



9

PRE-INTERROGATION

This step is as essential to successful polygraph testing as is the post interrogation which is aimed at extracting a confession when the opinion of the operator is that the subject is attempting deception.

A pre-interrogation is briefer than a regular interrogation and is aimed at obtaining information from the subject concerning his knowledge of the offense under investigation, personal data concerning the subject himself which may be used in the formulation of the questions to be asked during the test and in general establishing rapport between the subject and the operator. On the effectiveness of the pre-interrogation will very often depend on the success of the operator.

A pre-interrogation should never be allowed to develop into an interrogation and should never be allowed to extend to a period of time so that the subject becomes tired and irritated at the constant repetition of the same questions. Just as an accusatory type of interrogation in which the attitude of the interrogator conveys the impression that the subject is already tried and found guilty, may implant a feeling of guilt in an innocent subject, so a prolonged period of questioning prior to testing may tire a subject sufficiently or bore him to the extent that he ceases to be a good subject at that time for testing.

It is noted that at the outset of the pre-interrogation that the subject is warned, whether civilian or serviceman in accordance with the policy of ONI of his rights against self-incrimination - policy also dictates in those cases where it is not necessary to sell the subject on the idea of taking the examination, particularly in the case of servicemen that they understand that they are under no obligation to take the examination and cannot be ordered to submit to examination. At the same time, all operators should be aware of the possibility particularly with obviously nervous subjects that many guilty parties will confess when faced with the actual fact of the test or the machine. The machine has a tremendous psychological potentiality and in many cases the casual remark to a suspect "if you are innocent you have nothing to fear, but on the other hand if you are hiding something, you would probably be well advised not to take this examination" will result in a confession from a guilty party without the necessity of examination. However it must also be recognized that the majority of the guilty parties, even though they eventually confess as the result of polygraph tests, are inclined to gamble and hope that they will be able to beat the machine or that their expression of willingness to submit to examination will possibly throw the operator off. In the event a subject breaks down and confesses prior to examination he should always be tested after making his confession for several reasons: (1) In all strata of society there are individuals who are anxious to confess guilt of crimes which they have not committed, e.g. Black Dahlia case. (2) A person innocent of the crime being investigated might have much more important information to conceal, or at least some incident which seems to be much more important to himself, and even though innocent of the offense will confess to it, rather than take a polygraph and the risk that this other information will be uncovered, e.g., a subject, though innocent of a \$50 robbery might very well confess that he is the guilty party in order to escape polygraph examination which might uncover the fact that he has been involved in a more serious crime such as homicide, arson, etc.

Another point which is most important is the personal factor which is involved in and a part of every polygraph examination. As human beings we all create certain impressions on personnel whom we are meeting for the first time just as they create certain impressions on us. As interrogators we have all had the experience of questioning individuals toward whom we have immediately felt sympathetic, hostile, irritated, etc. Being human it is never possible to be entirely objective toward any subject whom we interrogate for the reason that we receive certain original impressions at the outset of the interview which will carry over and influence the tenor of the interview if we are not careful to screen it out. The same is true of the operator, he creates a certain impression on the suspect. We must in the pre-interrogation gain the favorable attention of the subject whom we are to polygraph. A subject who becomes incensed at an operator, or who receives the impression that the operator is a bungling incompetent may in the former case react to pertinent questions or unfavorably (indeterminate chart) during testing because of his anger toward the operator or in the latter case may not react at all owing to the fact that he considers himself superior to the polygraph operator and therefore convinces himself that he has nothing to fear, therefore does not fear and the fear of detection, the presence of which is necessary for successful testing is absent.

Additionally during pre-interrogation, an opportunity however brief is given to the operator to evaluate his subject and to gain information about the subject which will be of inestimable value in formulating the questions which are necessary for the successful testing of the particular subject.

It cannot be gain said that a good investigator is one who gets a certain feeling about or intuition about cases he works on particularly after some time has been spent on the investigation. If the operator himself has worked on the case, he must be cautious not to let his suspicions influence his testing - by the same token when he receives the facts of an investigation from another agent who has worked the case he must realize that he is getting the evaluation from another person of the reliability of the particular sources quoted and an account of the developments in the case to date, from a source which is bound to be somewhat shaded or influenced by his particular experience in the case - therefore it is of the utmost importance that in all pre-interrogations the subject or suspect be asked for and allowed to give his side of the story, to attempt to explain away the facts which have made him a suspect, etc. This method will always result in the operator having a clearer picture of the facts in the particular case under investigation and enable him to more intelligently formulate questions for the resolution of the case.

In summary it may be pointed out that the importance and the necessity of correct pre-interrogation is best illustrated by the fact that it is possible for two different operators to test the same subject with the same identical questions concerning the same identical offense and come up with different opinions concerning the truthfulness of the subject. This is the personal element of all polygraph examinations. Also, skill in pre-interrogation will create an impression on guilty subjects that will materially aid in the process of the interrogation following examination in which the person has indicated deception.

#### QUESTION FORMULATION:

Great care must be exercised in the formulation of questions. They should be as short as possible, couched in language readily understood by the subject and under no circumstances admitting of an answer other than "yes" or "no." Questions whether relevant or irrelevant should never be carelessly worded. A guilty party may be able to answer truthfully and escape detection if wording is not accurate enough, and an innocent person may be considered guilty because of improper wording of questions

No question pertinent to the offense should try to embrace too many facets of the offense, e.g., Did you at 2300 on Tuesday evening, 3 April 1955, jimmy the back door of the Officers Club open and steal 15 dollars from the cash register? This question is too long, covers too many facts, takes too long to ask and in those cases where a reaction is obtained (very probably that of confusion) it is practically impossible to determine what part of the question caused the reaction. The facts should be covered by separate short, to the point queries, e.g., Were you in the O Club on Tuesday night? (Date is not applicable unless the theft took place a considerable time prior to testing).

in

Did you get/the club by forcing the back door?

Did you take the \$15 from the cash register?

If considered necessary for the purpose of the examination the first question might be changed in subsequent tests to "were you in the O Club about 11 o'clock on Tuesday night."

It must be noted that for successful testing it is essential that the subject knows the conditions of the examination, why he is being tested and certain other facts about the offense under investigation so that he will not confuse it with some other offense of which he may have been guilty.

Choice of words is of the utmost importance because of the unfavorable connotation which certain words in themselves convey; thus "take" is always preferable to "Steal", in cases involving theft, "have you answered all questions truthfully" as opposed to "have you lied during this examination"? Words such as lie and steal in themselves may cause unfavorable reaction in a subject who is innocent.

Questions at the same time must be selective enough and broad enough to cover all possibilities, e.g. a man suspected of homicide is tested to determine the location of the victim's body - "Did you bury the body here, there, etc.." is obviously an improper question since there exists in the absence of information to the contrary the possibilities that the suspect (1) has not buried the victim, (2) has dismembered the body and scattered it, (3) has cremated the body, etc. Therefore the verb "bury" is not broad enough for this case and suggest the possibility that the suspect though guilty may escape detection by convincing himself that he is answering truthfully when he denies burial of the body since that is not the method which he used to dispose of the body. Now the importance of the foregoing may be pointed out by noting that even though previous examination has strongly indicated guilt on part of the subject in connection with the homicide, this opinion of the operator remains just an opinion if the subject resists interrogation successfully and it becomes necessary to locate the body in order to establish the "corpus delicti" or to establish the method used in disposal of the body therefore the question should be more properly worded "did you dispose of (vice bury) the body here, there, etc."

By the same token, it is necessary at times to make questions somewhat selective or limited, thus when the possibility exists that the suspect is not solely responsible or did not alone profit from a particular offense, for example a theft case the question "did you take the money" may be too broad for an individual who has only taken "some" of the money. The foregoing are necessarily very limited examples and are offered only so that operators will be aware of the fact that even

minor assumption on their parts or failure to recognize all the possibilities in particular cases, may lead to failure to locate the guilty person.

In question formulation, another point, with which all interrogators are familiar, is the necessity of "appreciation of values." In dealing with low level intelligence groups on the polygraph it is necessary to use the language that they will understand. Failure to comprehend will cause reaction on the machine in many cases because puzzlement is an "emotion." By the same token use of the unnecessarily vulgar language with an individual who is in higher intellectual group will cause a reaction of scorn, embarrassment, etc., which are also emotions. Under some circumstances these emotional reactions may be interpreted as deception criteria and lead to a false conclusion on the part of the operator.

It is not only necessary however to be careful in the formulation of pertinent questions, the same care must be exercised in the formulation of the irrelevant questions. We are all aware of some very common examples e.g., "are you divorced" should never be asked of a catholic inasmuch as his belief does not allow divorce, however the question "are you separated from your wife" might be quite appropriate. "Did you eat some ham today?" may be an offensive question to a member of the jewish religion whereas the irrelevant question "did you eat some meat today" might be quite harmless. Similarly care should be exercised in asking people of Mexican descent "were you born in the United States" in view of the possibility that they are "wetbacks" - foreign born have often changed their names or anglicized them and this fact is apt to cause conflict when they are asked "is your last name Brown"? when actually they have changed their last name from Brownlewski to Brown. The foregoing again serves to point out the necessity of the thorough pre-interrogation. Even through investigation and interrogation we can never learn all that we should know about individuals and the possibility exists that some chance word used in a question may cause an unfavorable reaction in an individual.

The necessity of avoiding words or association in our questions that will cause unfavorable reaction on the part of the subject is based on the fact that the human heart is capable of producing only limited amounts of adrenalin, the fluid which is injected into the blood stream to allow us to meet emergency situations. While the capacity for producing this adrenalin will vary from person to person, it is safe to say that no individual is capable of responding to emergency situations over a long period of time. Therefore it is necessary for the operator to formulate his questions so that no emotional reactions will be caused by irrelevant questions thus exhausting the adrenalin supply which should be used by the subject only to meet the challenge of the pertinent question. As an illustration of the following it might be pointed out that careless formulation of a question may lead to a dissipation of the adrenalin supply before the pertinent questions are asked and again a guilty or lying subject will not be uncovered.

One final word in connection with question formulation or more appropriately the pre-interrogation. Prior to any examination the operator should satisfy himself as to the health condition of the subject. Persons with a dangerous heart condition (cardiac) or a dangerous blood pressure condition should not be run as subjects in view of the danger that the nervousness usually attendant on a lie test may cause an attack. Individuals with sinus or asthma conditions may be

run but again false conclusions may be reached unless the operator is aware of the condition. Therefore as part of every pre-interrogation the subject should be queried as to his general physical condition. Hunger pangs may cause reaction, as will any fresh wound or bruise. An individual should be allowed to go to the head immediately prior to testing if such action is necessary. The subject should be asked if he had a good nights sleep, if he is hungry, has he been hospitalized within the past six months for surgery, was he doing any heavy drinking in the twenty-four hour period prior to the examination, has he taken medication within the forty-eight hour period prior to the examination. Many of the foregoing will not be a bar to the testing of the subject but the operator is well advised to be aware of them and to consider them when arriving at this opinion.

POST INTERROGATION TESTING:

It is good policy to test a subject after he has made a confession as to the truth and completeness of his statement or confession. Many guilty individuals will at times give a partial confession or admit to a crime but give a false explanation of it; e.g., a man deliberately puts emory powder in the bearing of a shaft and after polygraph examination admits to being responsible but claims he thought that he was putting graphite in the bearing. This accident may have occurred, on the other hand the individual may have deliberately put the emory powder in the bearing hoping to keep the ship in port. In testing the truthfulness or completeness of a statement, whether the same questions (pertinent) or others are used, it will be noted even when the subject has made a completely true confession that some sensitiveness will be present in relation to the pertinent questions in many cases. This is owing to the fact that it is hard for any individual to admit that he has lied. While relief has set in with the confession there is still some attendant fear or embarrassment. However this reaction should be minor compared to the guilt reactions shown during the previous polygraph tests and should tend to disappear altogether on the second or third chart run to test the truthfulness of the statement made.

The Polygraph is based on the principle that when an individual is faced with an emergency situation there is an interruption of the normal bodily responses and the new responses which are revealed have a pattern of physiological changes. In short the polygraph records the changes in the inspiration/expiration ratio, the pulse rate, the blood pressure, the skin resistance, which may occur as the result of an emotional state. It is important to bear in mind at all times that while primarily the polygraph operator is seeking indication of the "fear of detection", (an emotion) the machine is not selective and is not limited to recording just the physiological changes that accompany this fear of detection. Any emotion may cause the normal pattern of body responses to change, not just the fear of detection, and the changes caused by fear of detection will not be different from those changes which are recorded when other emotions are present.

Physiological measurements have a long history in the records of investigations from the ancient Chinese method of questioning subjects while they held a mouthful of dry rice powder (based on the principle that nervousness or fear causes a cessation of the flow of saliva) to the torture methods of the inquisition to the present day when the relation between the mind and body and the effect that emotional states will have on the physiological pattern of the body has been fully and unquestionably established.

Many authorities hold that it is not "fear of detection" alone that causes the interruption of the normal bodily functions, but a combination of "fear of detection" and the "increased mental effort" needed to lie which in turn has an effect on the bodily responses. As proof of the fact that increased effort is needed to lie, consider the "word association" test in which a subject is told to answer to a group of stimuli words with the first word that comes into his mind. A group of irrelevant words is fed to subject and his response is noted as well as the time it takes for him to respond, then a stimulus related to the crime is injected into the sequence, at which time, when dealing with a guilty subject it has been found that the time lag between stimulus and answer is much longer, indicating the amount of effort necessary on the part of the subject to avoid answering with the correct word and to substitute one which he thinks will be unrelated to the offense under consideration. It would appear that it is a safe assumption that deception criteria appear on the chart as a result of a combination of fear of detection as well as the increased mental effort (which is reflected in the physiological pattern) which accompanies lying.

Therefore, the polygraph operator is attempting by making sure that the subject is fully cognizant of the conditions of the test, by skillfully ruling out any other considerations, by accurate formulation of questions to arouse in the guilty subject the fear of detection in relation to the questions asked in connection with the offense and the effort needed to lie and on the other hand to prevent the innocent subject from being emotionally disturbed.

Man is a rational animal. Man alone of the animal world is capable of reasoning, that is, comparing two judgments and arriving at a conclusion. Man is capable of abstracting concepts, his mental process is immaterial as opposed to the physical world, yet his concepts depend on physical facts for man is incapable of a concept, the foundation of which is not some impression received through the physical senses. In other words, there is nothing in the mind of man which has not entered through one of the senses. Man is physical and material as opposed to his reasoning power which is spiritual and immaterial;

man however, is not transcendental, that is, that despite his spiritual faculty which is part of his essence he is restricted to the physical world and is incapable of passing over into the purely spiritual world. Since man himself is intrinsically, it follows that he is incapable of creating or inventing a machine which is capable of passing over into the purely immaterial or spiritual plane. Lying is a process of the rational part of man, that is the mental or spiritual. The relationship between the animal and the spiritual part of man is so intimate, the nexus is so close that they interchangeably effect each other. Thus the fear of detection or the effort required for man to lie which are purely immaterial things will have an effect on the physical part of man, whether it is dryness of the mouth, increased or decreased breathing rate, pulse rate, etc.

In short, the physiological changes or disturbances which accompany emotions are recorded by the polygraph. From the foregoing, it is evident that at this time and date there is no such thing as a "lie detector" and it is a misnomer when the polygraph is designated as such. DEFINITION: THE POLYGRAPH IS A MACHINE WHICH IS CAPABLE OF PRODUCING A RECORD OF PHYSIOLOGICAL PHENOMENA WHICH MAY BE USED AS THE BASIS FOR THE APPLICATION OF A REASONABLY RELIABLE TECHNIQUE FOR THE DETECTION OF DECEPTION

#### THE LIE:

What is a lie; what does man do when he lies? A lie is simply the act of the imaginative faculty of the rational power of man, that is, in order to lie, man must use his imagination. HE MUST SUBSTITUTE FICTION FOR THE FACT OF THE MATTER. In this connection it might be noted that all so called truth serums are based on the principle that if by narcotic injection the imaginative faculty of the human being can be rendered inoperable while memory remains intact the individual will be incapable of creating the fiction which is necessary for lying while the true memory of the incident will remain. Generally speaking, the polygraph operator is seeking the individual who is lying for fear of detection which may bring with it punishment. However, it cannot be stated that the only motive for lying is the "fear of detection." A person may lie about things concerning which if he told the truth there would be no punishment, he may lie to save face, he may lie to protect another, he may lie simply because it is more convenient than telling the truth in a particular situation. The nature and the cause of the lie will determine the amount and the kind of bodily reaction that can be expected. It is for this reason that it is impossible to simulate interrogation or test conditions. Thus while a person instructed to answer "no" to every question about a relatively unimportant matter, e.g. identity of card chosen, age or some such similar thing will show relatively little or no reaction, because there is no attendant penalty for being caught, the same person lying in connection with a crime will show a much greater and more pronounced reaction. The foregoing should be borne in mind at all times when attempting to run "control tests." Since a person cannot be expected to be unduly concerned, probably just mildly curious, over whether you are able to determine which card or number he selected it follows that the reaction, if any, will be so minor at the point at which he attempts deception, that it may escape detection by the operator. IT SHOULD BE BORNE IN MIND, THAT BECAUSE THE REASON FOR A LIE IS AN ALL DETERMINANT FACTOR IN WHETHER AN EMOTIONAL RESPONSE IS ATTAINED OR NOT, THE OPERATOR WHO EMPLOYS CONTROL TEST, WHETHER WITH CARDS OR OTHER MEDIA IS RUNNING A CALCULATED RISK WHICH MAY ENDANGER ANY FUTURE INTERROGATION OF THE SUBJECT IF HE IS UNABLE TO RIGHTLY ESTABLISH THE ANSWER UNDER CONTROL CONDITIONS-ONCE A POLYGRAPH OPERATOR HAS FAILED UNDER THESE CONDITIONS, HIS ARGUMENT TO THE SUBJECT THAT THE TEST INDICATED HE IS LYING IN RELATION TO THE CRIME IS APT TO FALL ON DEAF EARS. HE HAS GAMBLED AND LOST AND IN THE ATTEMPT HE HAS LOST ALL FACE WITH THE SUBJECT WHO IN TURN HAS LOST ALL FEAR OF THE MACHINE AS A RELIABLE DETECTOR.

Many subjects, whether innocent or guilty will show a great reluctance to submit to polygraph examination, just as many subject, who are guilty, will profess to be anxious and eager to take examinations in order "to clear themselves." As previously noted, no individual can be ordered to take a polygraph examination nor can he be forced to take one. Indeed, inasmuch as the complete cooperation of subjects is needed for polygraph testing, testing of an unwilling subject is practically impossible.

What steps can be taken by the operator in such circumstances? First of all it is of the utmost importance that the operator be interested in the machine and make himself a master of it, so that his own faith in the machine is apparent to the subject; he must convince the subject that he is a capable operator who knows what he is doing and be able to answer all questions that the subject might have in regard to the operation of the machine.

Second: When a suspect refuses to take examination under any conditions, the operator may point out to him that aliother suspects including the captain of the ship or whatever the case may be, have taken such examination and refusal to take a test on his part is going to lead to the presumption of guilt on the part of the authorities. The reasoning, if you are innocent you have nothing to fear can be very persuasive; the subject should be assured that his nervousness will not "make a liar out of him" inasmuch as if he is truly nervous, he will be apprehensive and nervous all during the examination, not just at the point of the pertinent questions.

Many subjects will profess that they "do not believe" in the machine. It sometimes pays to point out to such individuals that the Navy believes in such machines otherwise they would not allow their use. For those who claim that the machine is "against their religion" questioning as to what the religious scruple is will more often than not lead to such contradictory answers that the subject becomes confused and submits to examination rather than trying to hold an untenable position any longer.

In all cases patience on the part of the operator is necessary. No matter how convinced he may be of the subject's guilt, noticeable irritation or show of anger on his part will more often than not result in increased resistance to the idea of taking the examination. This same principle it may be noted also holds for interrogations. Once an interrogator indicates that the subject has "gotten under his skin" he has lost a great deal of ground which it may be impossible to recover.

Because the polygraph is a machine which like any other machine is not 100% accurate at any time, a polygraph operator should refrain from ever telling a subject "you lied". Results of the examinations simply allow the operator to form an opinion as to whether the subject is lying, i.e. attempting deception or not; therefore, when necessary in interrogation to indicate to a subject what the results of the tests have been it can only be phrased as "the charts indicate that you are attempting deception" or "in my opinion the charts indicate that you are not telling the truth" or some such similar phrase. Even in talking with associates the operator should refrain from a dogmatic statement as to the truthfulness of the subject. An operator who makes a dogmatic statement concerning the results of the examination to an authority who is going to take action as a result of the statement of the operator, or who tells the subject "you lied" is apt at a later date, whether in a courtroom under oath or in other situations to find that he is in an untenable position.



In many instances, particularly those in which a confession has not been obtained, it is necessary to prepare a written opinion to be attached to the investigation report as an enclosure. In these cases a short statement to the questions asked and the operator's opinion as sufficient and also more easily defined should the need to testify in connection with it or to defend it arise. Most people are not acquainted with the polygraph, therefore, the statement that normal polygraph testing procedure was used means nothing. A description of the attachments and their functions is also out of place inasmuch as you are reporting on the results of particular examinations not writing a treatise on the use of the polygraph. A form as follows is sufficient for the policy of ONI in this connection:

MEMORANDUM:

25 November 1960

Subj: HIGHMAN, John Bilges, OOO OO OO, SN, USN

1. Polygraph examinations were administered to subject this date in connection with the investigation of damage done to main bearing #2 shaft USS SEAGULL (AM-110). Three examinations were administered to subject in the course of which he was asked the following pertinent question interspersed with irrelevant questions:

- 26. Do you know who put the emory powder in the bearing? No
- 27. Did you put the emory powder in the bearing? No
- 28. Are you concealing something in connection with this matter? No
- 46. Have you answered all questions truthfully? Yes

2. Specific reaction was noted in connection with each of the foregoing questions and in the opinion of the polygraph operator, subject was attempting deception in answering as indicated. Interrogation of subject following the examination resulted in admissions by the subject which reflected that he had put the emory powder in the bearing--or--following the examination subject was questioned at length but refused to make any statement, whichever is applicable.

JOHN M. INKSTAINS  
SPECIAL AGENT, DIO-22

In some instances, particularly where a confession has not been obtained or where there is a strong possibility of subsequent legal proceedings as a result of successful interrogation, etc., it is advisable to word the first paragraph as follows; e.g. a 6(j) case.

1. "Subject was interviewed this date in DIO-22 concerning the allegations that he had engaged in homosexual activity. Subject vehemently (vigorously, strongly, etc.) denied that he had ever engaged in such activity and willingly (freely, eagerly, etc.) agreed to submit to polygraph examination in connection with this matter." It is noted that in this connection the only change in content is a statement to the effect that when offered the opportunity, subject freely agreed to submit to polygraph examination. It is understood that wherever feasible, polygraph examination, as interrogations are witnessed and recorded, if possible, in accordance with set policy of ONI. This, even through a waiver has been obtained, should be complied with in all cases when possible.

The foregoing has dealt with opinions of the operators vice results; what results may be obtained from polygraph examinations, namely three: an opinion of deception, an opinion of no deception or an opinion of indeterminate results (in this last case, if the reason is apparent it should be noted; e.g. subject's breathing pattern was considered to be similar to that of known psychotics and

he was considered an unfit subject - subject was under the influence of narcotics/liquor and not considered a fit subject for testing etc. If the charts are uneven at all points and there is no apparent cause for it, the simple opinion that the charts are considered indeterminate is all that is necessary.

A polygraph operator has the responsibility of being ethical and moral in all cases. It is understood that it is a natural desire to arrive at an opinion in all cases. However, this cannot always be done. Honesty in rendering an opinion rather than being swayed by the desires of the investigator or the command involved is of the utmost importance. In many cases circumstantial evidence will seem to indicate quite plainly that the subject is guilty beyond a shadow of a doubt. In many cases a command will want to hear an opinion of "guilty" in order to assure himself that a dangerous arsonist, saboteur, etc., has been apprehended and that his command is no longer in danger. In many cases the operator will be in a spot where by rendering a decision which he knows will be a popular one, he can win for himself acclaim and commendation. THE POLYGRAPH OPERATOR IS A MAN AND CANNOT AFFORD TO PLAY WITH GOD WITH HIS FELLOW MAN. Like the baseball umpire, no matter how unpopular the decision, he must "call them as he sees them" not as he wishes the results might be. It very often takes more courage to admit failure i.e., the results are indeterminate, than it does to render an opinion of guilt or innocence.

Finally, as will be noted again under "deception criteria" there is no such thing as a standard pattern by which the reactions of an individual can be compared to a standard and an opinion reached. Just as the personality of each individual is somewhat different so the reactions of each individual will differ even if only to a minor degree. Therefore, the phrase "relative deception criteria was noted" is incorrect. Relative to what? The statement that "man is/rational animal" is a universal concept, the statement that "John is a rational animal" is a singular concept and cannot be taken to mean that because John is a rational animal, he is exactly like every other man. John is an individual alone and set apart, his reactions cannot be relative to the reactions of another individual. However, inasmuch as through the media of control questions, it is possible in most instances to obtain a "true reaction" from John, the statement that "John's charts contain specific reaction in response to pertinent questions", "John's charts contain some reaction in relation to the pertinent questions" may be made. John, himself is used as the standard against which the comparison is made.

In summary, in accordance with generally accepted practices and the policy of ONI, the polygraph operator can offer only opinion not fact. Like a psychiatrist he can testify only to his belief as opposed to the fingerprint or ballistics expert who is engaged in an exact science and who can therefore testify to fact.

1. Chart paper moves at the rate of SIX inches per minute.
2. The electric polygraph on a 50 cycle circuit gives the impression of slower pulse rate.
3. The kymograph, at a minimum, should be lubricated: (a) every 6 months, (b) never, (c) once a year. (Underline correct answer)
4. The kymograph can be operated manually in either direction at any time. TRUE or FALSE. FALSE
5. The linear distance between vertical lines on chart paper is: (a) ~~one-third of an inch~~, (b) One-third of an inch, (c) one-tenth of an inch. (Underline correct answer)
6. The time distance between vertical lines is: (a) 5 seconds, (b) 3 seconds, (c) one second. (Underline correct answer)
7. Under ideal conditions, pens remain in contact with chart paper through the Capillary Action of the (flow of ink).
8. Pen balance is achieved by use of counter weights.
9. When inserting pens, lateral pressure rather than vertical pressure must be applied.
10. It makes no difference which pen is used for the pneumograph pattern and which pen is used for the sphgmograph pattern. TRUE or FALSE. True.
11. The GSR pattern is 5 seconds behind the other two patterns.
12. To prevent pen damage, the system must be OPEN or CLOSED (underline correct answer) while attaching the pneumograph.
13. In testing for leaks in the pneumograph system, repairs must be made if a 1/4" deflection occurs in 30 or fewer seconds.
14. In the sphgmograph section, the control knob may be twisted at any time provided the air system is closed. TRUE or FALSE. True.
15. Polygraph parts and supplies should be ordered via ONI. TRUE or FALSE. False
16. The pneumograph tube must be attached at the point where the breathing line appears.
17. In testing women, the pneumograph tube is always attached around the stomach rather than in the area of the breasts. TRUE or FALSE. False
18. It is immaterial whether the B/P cuff is attached to the left or the right arm. TRUE or FALSE. True
19. With all attachments made, the machine is always activated from Top to bottom.

20. At the conclusion of the examination, the sphygmograph system is always vented first to give immediate relief to the subject. TRUE or FALSE. False

21. With all units working, the Pulse rate is immediately entered on the chart. (reading on sphygmomanometer)

22. The spot at which the test is initiated, is indicated by an X; the conclusion of the test is indicated by XX.

23. At the conclusion of the examination, the machine is immediately vented. TRUE or FALSE. False.

24. In any given examination, the order in which the charts were run is unimportant from a viewpoint of interpretation. TRUE or FALSE. False

25. List the five (5) items which each chart should contain, as a minimum, for identification purposes:

- Pulse rate (reading from sphygmomanometer)
- Subject's name
- chart #
- Date
- Operator's initials

FORMULA FOR POLYGRAPH INK

GLYCERIN - - - - - 25 cc  
CHLOROFORM - - - - - 5 cc  
EROSIN Y- - - - - 10 gm  
DISTILLED WATER - - -500 cc

MAKES APPROXIMATELY ONE PINT

ONE TELETYPE MESSAGE (Outgoing)

OPNAV FORM 2105-2 (10-54)

DRAFTED BY (Last, first and name) R. J. J. - C-2X1	RELEASED BY ROBERT P. JACKSON, JR.	TELEPHONE EXTENSION 41063	DATE 18 May 64
---	---------------------------------------	------------------------------	-------------------

FROM DNI

TO DIO-1ND DIO-5ND DIO-9ND DIO-13ND  
 DIO-3ND DIO-6ND DIO-11ND IO-PRNC  
 DIO-4ND DIO-8ND DIO-12ND

SUBJECT THE POLYGRAPH

REFERENCE (A) DNI TWX 011805Z

181921Z

TEXT REFERENCE (A) ADVISED OF TWO ADDITIONAL REQUIREMENTS TO BE MET IN CONNECTION WITH THE CONDUCT OF POLYGRAPH EXAMINATIONS. IF APPLICABLE, REPORTS SHOULD STATE, IN ADDITION TO REQUIRED WARNING AND WRITTEN WAIVER, "ADVICE IN ACCORDANCE WITH PERTINENT SECDEF DIRECTIVE FURNISHED." IT IS EMPHASIZED THAT THESE REQUIREMENTS WILL BE TAKEN LITERALLY. ACCORDINGLY, IF A MIRROR IS PRESENT, EVEN THOUGH NOT MANNED, THE SUBJECT MUST BE ADVISED THAT IT IS A TWO-WAY MIRROR. ON THE OTHER HAND, THERE IS A NECESSITY TO ADVISE THE SUBJECT IN CONNECTION WITH THE SECOND CONDITION ONLY IF THE EXAMINATION WILL BE MONITORED OR RECORDED IN WHOLE OR IN PART BY ANY MEANS. IT SHOULD BE NOTED THAT THESE REQUIREMENTS AS INTERPRETED BY THIS OFFICE, PENDING CLARIFICATION BY JAG, APPLY ONLY TO THOSE SITUATIONS IN WHICH THE POLYGRAPH IS TO BE UTILIZED, NOT TO ALL INTERROGATIONS.

*[Handwritten initials]*

*[Handwritten initials]*

OP-921D

ORIGINATOR may use transmitted copy of message in the same manner as a green copy of correspondence. Complete the space in the right if message is to be filed in a case folder.	CASE HISTORY NO AND DESIGNATOR (IF APPLICABLE)
--	--

OMI TELETYPE MESSAGE (Outgoing)

OPTIONAL FORM 2100-2 (1/54)

DRAFTER (BY TOP NO AND NAME) M. HARRON - 921D1	RELEASED BY CDR. L. K. JORDAN	TELEPHONE EXTENSION 41063	DATE 1 May 1964
			D/T GROUP (ENTERED BY TELETYPEST)

011805-2

FROM DNI

TO DIO-1ND DIO-5ND DIO-9ND 1442 DIO-13ND 0292  
 DIO-3ND DIO-6ND DIO-11ND 4862 IO-TRNC 9213  
 DIO-4ND DIO-8ND DIO-12ND 5754

SUBJECT THE POLYGRAPH

REFERENCE (A) SECDEF MEMO TO THE SERVICES dtd 27 APR 64 (NOTAL)

TEXT CURRENT PROCEDURES REQUIRE WARNING UNDER THE 5TH AMENDMENT OR ARTICLE 31B AND A WRITTEN WAIVER PRIOR TO CONDUCTING A POLYGRAPH EXAMINATION. REFERENCE (A), EFFECTIVE IMMEDIATELY, REITERATES THESE TWO REQUIREMENTS AND IMPOSES TWO ADDITIONAL: (1) THE SUBJECT SHALL BE ADVISED WHETHER THE AREA IN WHICH THE POLYGRAPH EXAMINATION IS TO BE CONDUCTED CONTAINS A TWO-WAY MIRROR OR COMPARABLE DEVICE; (2) WHETHER THE EXAMINATION WILL BE MONITORED OR RECORDED, IN WHOLE OR IN PART, BY ANY MEANS. STRICT COMPLIANCE WITH THE FOREGOING IS DIRECTED. A NOTICE WILL BE FORTHCOMING.

ORIGINATOR may use transmitted copy of message in the same manner as a green copy of correspondence. Complete the space to the right if message is to be filed in a case folder.	CASE HISTORY NO AND DESIGNATOR (IF APPLICABLE)
--	--

## SCREENING PROCESS

The policy of ONI remains unchanged, that is, access to classified material shall not be granted on the basis of polygraph examinations only. It is emphasized again that the polygraph is an INVESTIGATIVE AIDE and is not, repeat not, to be used in LIEU OF INVESTIGATION.

Occasionally, the critical, highly sensitive nature of certain programs does require more intimate knowledge of the individual prior to clearance being granted than can be obtained from verification of biographical data furnished and the opinion of friends, references, co-workers, record checks, etc. In such cases, use of the polygraph as a SCREENING DEVICE MAY BE AUTHORIZED. THIS ACTION MAY TAKE TWO COURSES:

a. To eliminate immediately those individuals who should not be considered for the special clearance and on whom no investigative data is available. Put another way this simply means that an effort is made to conserve investigative effort. Further investigation will be conducted only on those applicants who "pass" the initial screening. They will not be cleared on the basis of the polygraph. Note the similarity of this process to that used when a large number of suspects are immediately available in a criminal type case. The polygraph is frequently used immediately in this type of case so that the innocent suspects may be eliminated and investigative effort concentrated on those who remain suspects.

b. To discover the possible presence of disqualifying information in applicants who have already been satisfactorily investigated. This disqualifying information is the type that might easily escape detection during the course of an ordinary background but which would bar the Subject from access to sensitive material if known; e.g., hidden organizational membership, for example in Alcoholics Anonymous, extra-marital affairs even though discreet, latent homosexual tendencies, psychiatric counselling, etc. Such information can be discovered through the screening process. It is noted that in these latter cases, THE POLYGRAPH IS USED TO SUPPLEMENT THE REGULAR INVESTIGATIVE TECHNIQUES.

Orders to conduct such screening examinations will usually emanate from Headquarters, ONI. Requests received locally for such "screening" should USUALLY be referred to ONI for decision. In any event, if and when undertaken, "screening" should be in accordance with the method set out in the following:

The matter is to be treated as an INTENSIVE PERSONNEL INTERVIEW not as an INTERROGATION. No matter what the status of the individual, service, civilian government employee, or contractor employee, the organization being serviced must furnish a recently executed DD Form 398 by the Subject. The CSC Form 57 or the contractor type SPH is not detailed enough for use in connection with "screening."

While most Subjects will know the purpose for their visit to your office this cannot be assumed and immediately the operator should determine this. He should also assure himself that the Subject knows that he cannot



be compelled to submit to "screening." It should be pointed out to Subject that the "screening" is a requirement for the particular clearance he is being considered for but no pressure or effort to "talk Subject into taking the examinations" if he demurs at the idea, should be attempted.

Once Subject has professed willingness to submit to "screening" the question of a warning arises. Again it is pointed out that an intensive personnel interview vice interrogation is being conducted. Nevertheless it must be pointed out to Subject and he must affirm that he understands that certain information might be revealed as a result of these examinations which would have to be reported to appropriate authorities. The following wording is suggested as a pattern to cover this situation: "Now, I don't know what, if anything, will be disclosed by these examinations, Sir, but I want to advise you that if any information is disclosed which should be reported to your superiors or even to the police, I will be duty bound to do so. For example, if you have committed a crime which you have successfully hidden so far and it becomes known to me through these examinations, I will of course, have to report that to the appropriate police officials."

Having completed these introductory formalities, each item of the Form 398 executed by Subject is then reviewed with him. In this connection attention is invited to item #6 which because of its location and small size is frequently overlooked. This is the item which has to do with nervous disorders, habit forming drugs, alcoholic beverages. Frequently the interviewee will advise that he is not exactly sure of the dates, the address number, location, etc. He should be assured that as long as the entries are correct to the best of his knowledge, and that he is not consciously attempting deception in connection with such entries, there will be no reflection of deception during the tests. Questions asked in connection with Form 398 should be couched so that omissions and/or inaccuracies will be discovered; e.g. Are these organizations listed the only ones to which you belong? You don't know the whereabouts of your previous wife? etc.

After all items on the PHS have been checked with Subject, questions designed to determine the presence of information which would be disqualifying and which would not be covered by SPH items must be asked. Of necessity, these questions tend to be personal in nature and DISCRETION as well as TACT must be used when formulating them. They must be broad enough in scope to cover all contingencies and yet avoid giving offense. These questions will inquire into Subject's financial conditions; is he under financial strain or is he able to meet his commitments? Do you take a drink? Ever drink excessively and if indicated "When were you drunk last?" Ask the Subject for a political evaluation of himself, liberal conservative, middle of the roader, do you or have you contributed to any political organizations, etc.? Has there been anything in the past, or is there now going on, anything that might be used to exert pressure against you? Such as extra marital affairs or instances, any instances of sexual perversion such as homosexuality, indecent exposure, etc. Any cheating, stealing, disgraceful conduct of any type that might be a threat?

If all answers are negative, Subject is then tested. A general questioning type of examination is given. The Operator must be alert to the possibility that in this type examination especially, a supposedly irrelevant question might in fact be a relevant one. Thus, if Subject has falsified descriptive, birth, employment data on his SPH such questions as:

Is your last name.....?

Were you born in.....?

Were you formerly employed by.....?

might create a reaction. This however will pose no problems and such questions are perfectly acceptable as irrelevant ones, provided the operator remains acute to the possibility that such might occur and is not bewildered when reactions in connection with a question(s) he supposes to be irrelevant, develops.

Even though clear charts are ultimately obtained on an individual, any admissions no matter how insignificant, made in the course of the pre-interview or between examinations, should be incorporated in the memo prepared by the operator.

IF in the course of the pre-interview, Subject makes an admission which the operator knows is serious enough to bar the Subject from access, time should not be wasted administering tests. The same of course is true of any admission made between tests, that is, no further tests should be run if the admission made is obviously sufficient to bar Subject

The operator must realize that as a background investigation is the hardest type to conduct because it cannot be foreseen in which stratum derogatory information is apt to develop, this is the hardest type of examination since the information to be sought is general and embracing rather than specific.

This type of examination reposes a tremendous burden of responsibility on the operator, in that on his opinion an individual is going to be given further consideration for a clearance or denied a clearance. Nevertheless the operator should restrict himself to the opinion that deception was or was not attempted and should avoid advising that the individual SHOULD or SHOULD NOT BE CLEARED.

The pertinent questions should be limited and should be along the following general lines:

26. Is your statement of personal history (or SPH) completely true (accurate)?
27. Have you wilfully omitted any information from your SPH?
28. Are you (or are you attempting to) conceal something from me?

29. Have you ever disclosed classified information to unauthorized personnel? (This to be asked of course only if the Subject has previously had access).

46. Have you answered all of my questions truthfully (today)?

At the end of the second chart, if no reactions whatsoever have been noted then and then only the Embarrassing Personal Question control should be used to assure that the Subject is capable of reaction. If results are satisfactory, process is then terminated.

If during the pre-test interview, Subject makes any pertinent admissions then of course a qualifying question(s) should be used in addition to 26, 27, and 28 above, e. g., Other than the incident in 1953, have you ever cheated on your wife? or; Other than admitted have you ever been arrested?

If at the conclusion of the first examination (whether two or three charts) there are indications of deceptions, Subject should be so advised and asked to explain. Is he conscious of trying to conceal something, is there a police record perhaps that he is hiding, are some of the entries on the SPH false or incomplete. This INTERVIEW should not be allowed to develop into an interrogation. If Subject professes that he is at a loss to explain the reactions or advises he is hiding nothing, then the interview should be terminated. A memorandum should be prepared, advising merely that in the opinion of the operator deception was present and when offered the opportunity, Subject denied any intent to deceive or could offer no explanation and interview was terminated.

Based on experience, it is known that the Subject will frequently admit when he has been advised that deception criteria is present, that his debts are heavier than admitted, there has been an arrest which he attempted to conceal, a homosexual incident, etc. Subject should be re-tested after this admission with such questions as:

Is your statement about your indebtedness now true?

or

Other than admitted have there been any arrests?

or

Other than admitted have there been any homo acts?

or

Are you still attempting to conceal something from me?

If deception is still present, Subject should be so advised and note made of any further admissions he might make BUT NO FURTHER INTERVIEW OR EXAMINATIONS SHOULD BE CONDUCTED. The fact that Subject had twice attempted to deceive is sufficient usually to bar him from the clearance which was considered. Unless the man is vital to the program and the Competent Authority specifically request that further examinations be conducted to determine the cause of the reactions, NO FURTHER EFFORT SHOULD BE EXPANDED ON THIS INDIVIDUAL.

# The Polygraph: Its Capabilities and Limitations in Security Clearances

*There has been much speculation recently as to the value of the Polygraph in effecting security clearances. The Polygraph is a delicate and complicated piece of machinery, which has specific capabilities in the hands of an experienced and intelligent operator, and also definite limitations.*

*The author of this article, a former student of the late Dr. Leonarde Keeler, internationally known criminologist considered by many qualified persons as the foremost exponent of his time in Polygraph technique, has been for many years in charge of special operations for the Security Branch of the Office of Naval Intelligence.*

THE Polygraph, commonly known as a lie detector, is a mechanical and electrical device used to detect and record certain physiological changes which are induced in an individual by his emotional response to certain questions, this response being involuntary for the most part. Relative changes in blood pressure, rapidity and amplitude of the pulse, variations in the respiratory pattern, and minute changes in the conductivity of the skin are detected by the instrument and recorded as a continuous graph or chart.

There are therefore three definite factors involved in the operation of the Polygraph. One, a blood pressure cuff sends pneumatic impulses through a tambour assembly which is essentially a delicate bellows, the movement of which activates a pen which charts the rate of pulse, amplitude of the heart beat, variations in blood pressure and in general gives a picture of the heart in action. Next, a rubber expansion tube, held in place around the chest and activated by the movement of the diaphragm, causes a recording to be made of the respiratory pattern. The rate of breathing, shallowness or depth of respiration, blockage, muscular tremors, and any other irregularity is recorded. Finally, a pair of electrodes, attached to the hand of the person being examined, are connected to an electrical circuit which also contains an amplifier unit. This assembly, usually known as the Galvanograph, is used to measure and record minute changes in the conductivity of the skin. The principle is much like that of a water wheel which, when two equal forces of water are directed against it, remains stationary. When the pressure of one

force becomes greater than that of the other, the wheel moves in the direction in which the greater force is being applied. In the Polygraph the machine is adjusted to match the conductivity of the skin, the machine being constant as the skin's conductivity undergoes a change. That change is translated into the movement of a pen.

The blood pressure, pulse, and respiratory patterns are considered to be the most reliable means of detection. The Galvanograph, which records changes in the conductivity of the skin, is reliable enough in laboratory experiments. For example, a subject is asked to look at six or seven playing cards and to select one of them. He is instructed to lie concerning the card he has selected. A phlegmatic individual being thus tested in familiar surroundings and lying according to specific instructions will in an extremely high percentage of cases reveal his choice to the examiner. The deviation from his lifelong training, plus the extra effort involved in lying, sets up a sufficient emotional response to enable this sensitive apparatus to pick up the resulting physiological changes. Unfortunately, the Galvanograph too often becomes erratic when used in actual cases. The precise factors involved are not too well known but the results indicate that this particular assembly is overstimulated and sets up secondary factors which result in a highly erratic graph not susceptible to diagnosis.

Attempts at detection of deception through psychological and physiological means may be traced back through many centuries. A typical attempt to ascertain the truth through physiological means

consisted of requiring a witness or suspect to testify with a quantity of rice in his mouth. If the rice remained dry the individual was thought to be lying, on the theory that the salivary glands of such a person would dry up while he was giving untruthful testimony. This rather crude attempt might nevertheless be considered basically sound in theory. From the psychological standpoint, suspects in a particular case were compelled to enter one by one, a darkened room where they were instructed to grasp the tail of a donkey who reputedly would bray when touched by the guilty person. Unknown to the suspects, the animal's tail was coated with a substance similar to lamp black. The hands of each individual would be examined when he returned from this room. The man with clean hands was indicated as guilty on the theory that the guilty person would refrain from touching the animal and thus hoped to escape detection. The first attempt to utilize an instrument similar to the modern Polygraph occurred about 1895. At that time Cesare Lombroso, the Italian criminologist,<sup>1</sup> conducted several experiments on suspected criminals seeking to determine their innocence or guilt on the basis of changes, or absence of changes, in blood pressure and pulse. In the United States, in 1921, John A. Larson, working under Chief August Vollmer of the Berkeley, Calif. Police Department, conducted several hundred similar tests. Beginning in 1925, Dr. Leonarde Keeler began experiments in California which he continued in the Scientific Crime Detection Laboratory at Northwestern University and in private practice until his death in 1949. With the aid of capable technicians and consultants, Keeler evolved the Polygraph as it is known today. His case histories exceeded 25,000 and he is generally conceded to have made the greatest single contribution to the science of the detection of deception.

Purely mechanical operation of the Polygraph to the point where the instrument is operating and producing a graph is a skill which can be acquired in a very short period of time. At this point the embryonic examiner is able to adjust the apparatus so that the blood pressure cuff, chest expansion tube and electrodes are transmitting the necessary impulses to the Polygraph and producing a graph. Here, comparatively speaking, the operator knows about as much as the medical student who has been shown a stethoscope, informed as to its name and purpose and told where to place it. The novice

<sup>1</sup> Lombroso is also known for his erroneous theory that a unique criminal physiognomy existed which could be classified like fingerprints.

Polygraph operator can now produce a chart, and the medical student is in a position to listen to a patient's heart beat. In both cases, only prolonged study and experience will enable each to make a correct diagnosis. In one case the problem is to diagnose the condition of the patient's heart on the basis of sounds heard through the stethoscope. In the other the Polygraph examiner must learn to interpret correctly the charts which the instrument brings to him. This is by far the most difficult part of the examination and in its very nature allows for an almost infinite variance in skill among operators. The proficiency of the examiner, as in the case of any machine or instrument which requires interpretation or diagnosis, has an all important bearing on the results obtained.

Two types of examination are commonly used. One is called the "Peak of Tension Test," the other the "Specific Response Test." Claims regarding accuracy in these tests vary greatly. Certain examiners have made claims of as high as 99 percent accuracy. Such claims are exaggerated, and if made in good faith are based on insufficient evidence and experience. On the other hand, they may be deliberate, with a knowledge or suspicion of the true facts. The best available statistics indicate that a highly skilled examiner, using the best instrument obtainable, will attain results in not more than 75 percent of cases. Such an operator will find that a small percentage of those examined, from 1 to 2 percent, are unresponsive. He will have a margin of error approximating 5 percent, and in approximately 20 percent of the examinations his records will be too indefinite or too ambiguous to permit him to make conscientiously a positive diagnosis.

The "Peak of Tension Test" is generally considered to be the more reliable of the two most commonly used tests. Its disadvantage is that circumstances of a case very often forbid its use. An example of a hypothetical case might perhaps illustrate this more vividly than an abstract description. A burglary is committed in a certain city. The mode of entry, the method of forcing a strongbox, the fact that jewelry only was selected, leads the investigator to select from the Police Department's MO (modus operandi) file, certain likely candidates, excluding those who are impossibles by reason of present incarceration, etc. A "Peak of Tension Test" may eliminate certain of these suspects, and may indicate the guilty person, provided, that a description of the articles taken has not been published or otherwise disclosed. A series of approximately 10 questions is prepared, each asking a suspect, "Did you steal a pearl necklace?" "Did you



The Polygraph records changes in the rate of pulse and heart beat, respiration, and in the conductivity of the skin. It is an aid which is sometimes of considerable value in investigations, but its value in effecting security clearance has been overstated. Scene from ONI Training Film.

steal a diamond stickpin?" etc. All of the articles named in these questions are fictitious except one, which is located somewhere between the first and the last of the 10 questions, and is usually the sixth, seventh, or eighth question. The questions are shown to the subject before the examination begins. Whether he is nervous or phlegmatic, it is obvious that his responses to these questions will be entirely insignificant or erratic if he is innocent. If guilty, or if he has knowledge of the stolen goods through a disclosure to him by the actual burglar, he immediately sees and concentrates upon the one pertinent question concerning which he must attempt to conceal his emotions and lie. This results usually in a rather graphic increase in blood pressure up to the asking of this one pertinent question, with a decrease in pressure after the hurdle has been passed. It is obvious, however, that in many or most cases, publication of details concerning an offense makes it possible for an individual being examined to react to a pertinent question because of knowledge acquired through innocent means.

The "Specific Response Test" consists in asking a series of relevant and irrelevant questions. The exact sequence of these questions differs among various examiners. These questions should be worded so as to permit an answer of either "yes" or "no." This is most important in order that the respiratory pattern be undisturbed other than by the individual's emotional reaction to the question. In this test the most reliable indication of deception is a simultaneous change in respiration and increase in blood pressure immediately after an answer is given to a pertinent question. The change mentioned must constitute a deviation from the subject's norm—which norm must have been established previously. Unfortunately, this simultaneous indication is not seen in every case. Specific responses in either the blood pressure or respiration are more common. Decrease in blood pressure, change in pulse rate or an increase or decrease in the amplitude of the heart beat may also indicate deception, but a diagnosis of a chart as indicating deception must take into consideration every possible pertinent

factor. The number of these factors is too great to be gone into in an article of this nature. Apparently contradictory indications of deception may appear, the clarification of which calls for the greatest care and skill in analyzing these contradictions and in reframing or utilizing questions which will produce the necessary elimination or clarification.

The greatest single factor which affects an untruthful response is the fear of detection and the extra effort used in the attempt to deceive. The conflict set up by a sense of wrongdoing or the emotion of remorse also contributes but in a minor way. There are many possible factors which may render a correct diagnosis of the Polygraph chart extremely difficult. These include emotional tension, such as nervousness in a guilty person, or tension aroused in an innocent person by the mere fact that a direct or indirect accusation has been made against him. Similarly, an innocent person may show indications of deception when he possesses a guilt complex surrounding an offense similar to, but different from, the incident concerning which he is being questioned. Usually a skilled examiner is able to detect and eliminate from consideration indications prompted by these factors. Physiological abnormalities such as respiratory disorders or very high or low blood pressure and mental abnormalities such as feeble-mindedness (idiot, imbecile, moron, IQ range 0 to 70) or the presence of a psychosis (manic depressive, schizophrenia, paranoia) together with psychoneurosis, tend to render a subject unfit for examination. In the case of mental abnormalities, irregularity of the respiratory pattern is usually present and constitutes a practical warning to the operator. Unresponsiveness of a guilty subject may be caused by lack of fear of detection, control of responses by a mental attitude, by a condition of subshock, by rationalization of the offense, or by prior extensive interrogation. This prior interrogation may itself produce a condition of subshock which might be described as the effects of adrenalin exhaustion. Rationalization of the offense occurs often in hardened criminals who are convinced that their conduct is completely justified.

Questions should be framed with the utmost possible precision. They should be short, avoid the injection of extraneous matter, worded so as to eliminate a false response caused by word association, and capable of being answered by "yes" or "no" responses. The more knowledge an examiner has of a subject and the incident involved, the greater his chance of a successful examination. If possible, the subject should be balanced on a figurative point from which he may jump either

into a black or white area—but only in either of these positions. In the "Specific Response Test" certain irrelevant questions are asked in order to establish a norm. Theoretically, it is possible that any apparently irrelevant question may be of the highest pertinency to the individual being examined. For example, an apparently irrelevant question such as "Are you married?" is utilized in order to help establish a norm. If the subject is married, a fact known to the examiner, but was caught by his wife a week before in flagrante delicto, a fact not known to the examiner, and faces divorce and the payment of large alimony, then this seemingly innocuous question may produce striking and startling results. While this is admittedly an extreme example, it may serve to illustrate the point that the more knowledge the examiner has of the individual he is to examine, the more precisely he may frame his questions in order to establish a true norm, and also avoid misleading indications caused by word association or by any of the other factors which tend to make a Polygraph diagnosis a delicate and often difficult operation.

*The proper function of the Polygraph is as an aid to interrogation. Interrogation is a specific investigative technique which in almost all cases follows and does not precede those other investigative techniques which may be employed in a particular case. Utilization of the Polygraph alone as a security clearance technique cannot be recommended except in the most unusual cases where,*



Preparing the Polygraph for use.

because of particular circumstances, no other avenue of investigation is open. It should be restricted, if used at all, to cautious use by skilled operators, and considered merely as one of the techniques of investigation to which it can be a valuable adjunct. Used as an initial and sole investigative technique, the best coverage within the possibilities of the machine would require a gradual sharpening of questions after a somewhat blunt initial application. This would necessitate several separate examinations of the subject each consisting of several runs in order that ambiguities might be resolved and contradictions be eliminated. As a process it would be time-consuming rather than timesaving, cumbersome, and extremely limited in clearance value.

One of the most valuable applications of the Polygraph as an initial technique in an investigation occurs where several suspects are involved and where circumstances indicate that one of these suspects is guilty but where evidence points fairly equally to all of them. Elimination by use of the instrument is a valuable timesaver, but here the knowledge that the guilty person is one of a small and definite group necessarily implies that a considerable amount of information concerning the circumstances of the offense or incident is available before the Polygraph examinations are made.

So far, it has been shown that there are certain limitations in the use of the Polygraph. Some of these are: the fact that 75 percent represents a reasonably high percentage of cases in which examination on the machine produces definite and positive results; the fact that thoroughly trained, experienced and skilled operators who are completely objective in viewpoint are required; and the fact that accepted and proper usage limits the Polygraph as but one of many scientific investigative techniques. The Polygraph is a valuable aid in its proper place but no more so than the technique of fingerprint examination and classification, ballistics, or the examination of questioned documents.

There is also another important factor that cannot be overlooked in a discussion of the machine—the eliminating of evasion, deception, or "beat the machine" technique sometimes employed by persons being examined. Falsification of Polygraph recordings in such a manner as to be imperceptible to the operator and not detectible by any distortion of the charts, has been achieved in laboratory experiments, and in turn met by effective countermeasures. There is, however, an inevitable time lag between the initiation of a specific evasion technique, its

recognition, and the employment of effective countermeasures. *It is therefore possible that presently unknown evasive techniques may be developed. If so, it would have to be assumed that subversive individuals attempting to infiltrate the government would be adequately briefed in their use.* It follows that any policy predicated security clearances on results from the machine alone, without utilization of the more orthodox investigative techniques, contains a margin of error too great for comfort, and could conceivably constitute an enormous aid to disqualified persons attempting to penetrate the security defenses of the government.

The Polygraph is a valuable tool when properly utilized and when entrusted to a skillful and conscientious examiner. A recognition of its limitations, in addition to those discussed above, must also include in its evaluation the opinion of the judiciary which is to the effect that it has not as yet attained a standard of reliability to the point where it may be admitted as legal evidence. Further, the Department of the Navy is contributing at the present time, together with other departments of the Defense Establishment, to a research project which is attempting to explore the field of deception criteria, recognizing that research into examination methods has not kept pace with development of the mechanical aspects of the machine itself. Many, if not most, experienced operators, will decline to diagnose charts resulting from an examination conducted by another without their presence. This attitude points not only to a lack of standardization as to what constitutes deception criteria, but also strongly indicates that many experienced operators, who usually are also experienced interrogators, consciously or otherwise place considerable reliance upon their sizing up of an individual, and often secure a confession following a Polygraph examination and then read into the chart deception indications which agree with the confession they have received.

With the present great expansion of the Defense Establishment, a method which gives promise of quick security clearances is certain to be examined with interest. The Polygraph is a valuable adjunct to the many investigative techniques which are utilized to scrutinize and establish the loyalty of individuals who are to occupy sensitive positions. However, an improper use of this instrument will produce security clearances which are worse than nothing in that they give a dangerous illusion of security which might in particular instances result in the most far-reaching and dangerous results.



When the subject is questioned at points of questioning, the question is usually referred to as a "response".

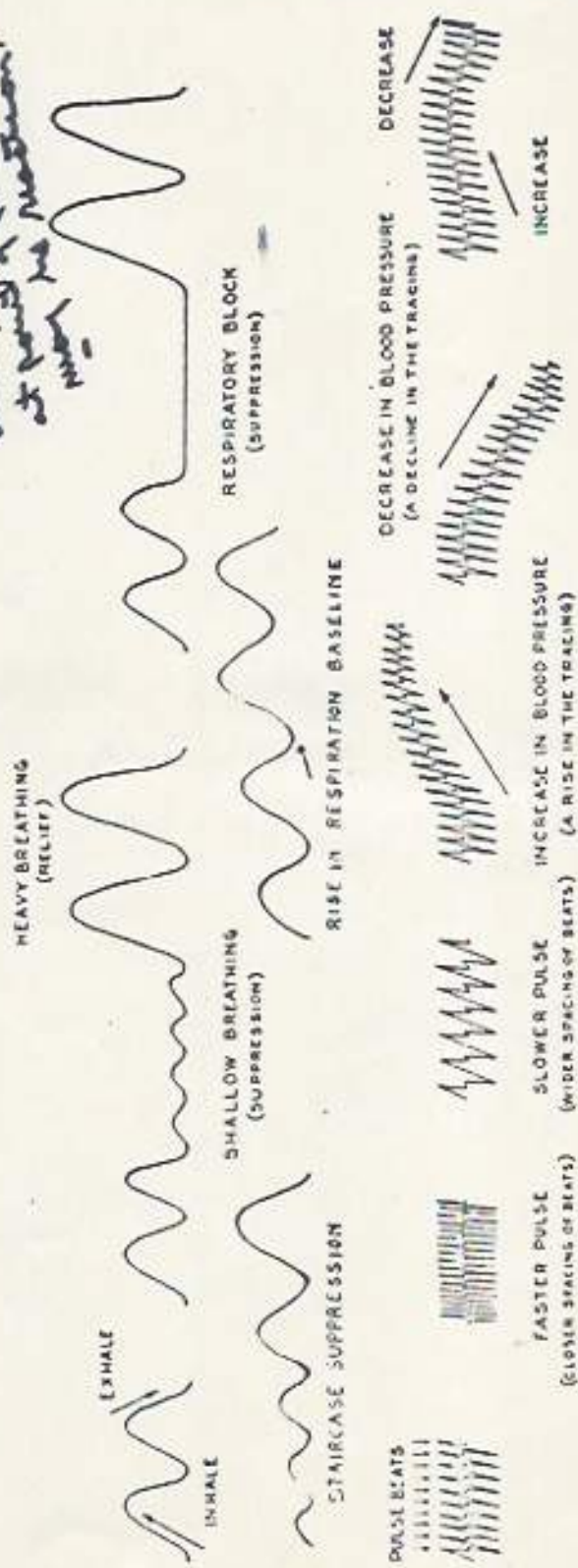


FIG 5. SKETCHES OF LIE-DETECTOR TRACINGS OF BLOOD PRESSURE, PULSE, AND RESPIRATION  
 The above sketches identify the types of blood pressure, pulse, and respiration responses which appear in later illustrations of actual case records.  
 Any change in the recording (i.e., a deviation from the "norm") as the subject answers a test question is usually referred to as a "response".

NOTES

- NOTE 1: A SETTING OF ZERO SUBJECT RESISTANCE MAY BRING PEN TOWARD CENTER OF CHART. THIS CONDITION MUST STILL BE CORRECTED.
- NOTE 2: TO CHECK SENSITIVITY, MAKE SURE HAND ELECTRODE IS NOT PLUGGED IN (THIS AUTOMATICALLY LEAVES THE INTERNAL CALIBRATION RESISTOR IN THE CIRCUIT). CENTER PEN BY ADJUSTING SUBJECT RESISTANCE CONTROL (APPROXIMATELY 50 ON THE DIAL). WITH THE REACTIVITY CONTROL SET AT 5, A ONE DIVISION CHANGE OF THE SUBJECT RESISTANCE CONTROL SHOULD GIVE FULL PEN DEFLECTION. WITH THE REACTIVITY CONTROL SET AT ZERO, IT SHOULD REQUIRE APPROXIMATELY TWO DIAL DIVISIONS CHANGE OF THE SUBJECT RESISTANCE CONTROL FOR THE FULL DEFLECTION.  
NOT APPLICABLE TO 6303C CONVERTED POLYGRAPHS.
- NOTE 3: UNIT SHOULD BE RETURNED TO FACTORY FOR REPAIRS.

NOTE

MODEL 6303 KEELER POLYGRAPHS BEARING SERIAL NUMBERS 6303150 OR HIGHER HAVE A BUILT-IN 50K SUBJECT RESISTANCE CALIBRATOR. WHEN THE HAND ELECTRODE PLUG IS REMOVED FROM THE JACK, THE 50K CALIBRATOR SUBSTITUTES FOR THE SUBJECT'S RESISTANCE AND PERMITS BALANCE OF THE SUBJECT RESISTANCE CONTROL AT ABOUT 50 ON THE DIAL. TO MAKE USE OF THIS FEATURE ON EARLIER MACHINES, A CALIBRATOR MAY BE PREPARED BY CONNECTING A 50K RESISTOR BETWEEN THE TIP AND RING OF A THREE CIRCUIT PHONE PLUG. INSERT THIS PLUG IN THE JACK WHEN THE HAND ELECTRODE PLUG IS REMOVED. THIS WILL COMPLY WITH TEST CONDITION A OF THE TROUBLE SHOOTING CHART.

NOT APPLICABLE TO 6303C CONVERTED POLYGRAPHS.