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POSSIBLE PRODUCTION OF PHOTONS DURING A REMOTE VIEWING TASK: PRELIMINARY RESULTS

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We conducted a conceptual replication of work published by the People's Republic of China (PRC) in which it was claimed that anomalous signals from photomultiplier tubes are observed during sessions in which "exceptional vision" was successfully employed to identify concealed Chinese language characters. Specifically, we experimentally examined the possibility that light is emitted in the vicinity of correctly identified remote viewing (RV) target material. A state-of-the-art, ambient temperature, photon counting system was used to monitor the target material (35mm slides of National Geographic photographs). We collected a total of 22 sessions from four of the best viewers in a concurrent RV program. The statistical measure derived from the photon counting apparatus that best represented the data collection used by the PRC work showed a significant correlation with the RV results ($p \leq 0.035$). That is, when the remote viewing was good, there was an increase in the signal detected by the photon counting system. When the viewing was less accurate, a smaller signal was detected by the counting system. One viewer demonstrated independently significant correlations ($p \leq .007$ and $p \leq .022$) between his/her viewing and photon counting signals. Out of the 22 sessions, we recorded two which contained a photon counting anomaly that resembled those reported by the Chinese. In each case, the anomaly was detected with a signal-to-noise ratio of about 20-40:1. This ratio is far below the 100-1000:1 reported by the Chinese, however other characteristics that we observed were in agreement with their work. Our results indicate that we observed a weak effect that supports the PRC claims.

INTRODUCTION

In 1982, new reports of PK experiments by physicists in the Peoples Republic of China (PRC) emerged (Chinese Acad. of Sci., 1982; Yonjie and Hongyhang, 1982). The two papers cited contain brief descriptions of experiments in which individuals with so-called "exceptional vision" affected physical systems (film, photomultiplier tubes, and plants) when correctly identifying Chinese language characters hidden with the test apparatus.

As the Chinese themselves point out, the photomultiplier (PM) tube has the best sensitivity, stability and response to transients of the three systems examined. For these reasons, we concluded that a replication of the PRC experiments using SRI International RV participants and a PM tube afforded the most promising test of their claims.

Specifically, the Chinese reported that PM tube count rates of 10^2 – 10^3 greater than background rates have been produced during "exceptional vision." Their signal discriminators were set to produce a background of about 15 counts/sec. Although the Chinese claim to have eliminated sources of experimental artifact such as light leaks, electomagnetic interference etc., at least one report states that

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

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individuals "must touch the surface of the light-proof material" or the effect is not produced. This procedure seemed such an obvious potential source of artifact that we excluded touching entirely in our investigations. The PRC experiments also reported that the anomalous signals produced during exceptional vision were principally large amplitude pulses which appeared rapidly ($\sim$1 sec rise time).

EXPERIMENTAL METHOD

HARDWARE

To test these reports, we devised a photomultiplier tube light detector system and a remote viewing procedure which paralleled the Chinese efforts. We selected 35mm slides of *National Geographic* sites as our target material rather than symbolic characters.

A light-tight slide holder which could be opened and closed easily was fabricated and fitted to the end flange of the PM tube housing. The slide was positioned within approximately 1 cm of the active surface of the tube.

The PM tube was selected to have an active area equal to or greater than the film area of the slide. In addition, we required the tube to be sufficiently broadband and sensitive so as to equal or surpass the device used by the Chinese. We also required the dark count (background) rate to be as low as possible at or near room temperature. (Very low background count rates can be achieved by cooling PM tubes to $-20\ ^{0}C$ but the additional complexity, expense and deviation from the PRC experiments prevented us from using cooling in this series of investigations.)

The output of the PM tube was processed and displayed by state-of-the-art instrumentation used in nuclear radiation spectroscopy. We selected the multi-channel scaling (MCS) mode of signal processing as the most appropriate for our experiment. In this type of data acquisition, the amplified pulses from the PM tube were counted for a specific length of time (.9 secs) and the resulting total was stored and displayed. A histogram was then built up showing the count rate of the tube over the duration of a single session ($\sim$15 mins.).

Since the voltage output of a photomultiplier tube is directly proportional to the intensity of the incident light source we decided to set two "windows" on the PM tube signal. One window displayed the entire voltage range output which is dominated by numerous small amplitude background pulses. We designated this window Region I. The window for Region II was adjusted to show only large voltage pulses. In this fashion, we were able to monitor the system for either of two possible outcomes:

- A significant increase in the number of small amplitude pulses.
- An increase in the frequency of relatively rare large amplitude events.

The Chinese claim that an individual with "exceptional vision" produces an anomalous signal from the PM tube consisting of mainly large amplitude pulses.

Since the PM tube was in total darkness and no light emitting materials were included in the sample chamber, all background counts were due to thermionic emission at the photocathode or dynodes (Knoll, 1979). A photon which strikes the photocathode will produce a signal which is indistinguishable from that resulting from thermionic emission. Therefore, one could not say conclusively in our experiment whether a statistically significant increase in count rate (above background) is due to enhanced thermionic emission or photon production. For simplicity in this report, we have refered to the putative effect as "photon production", and have calculated our results assuming that photons are striking the photocathode in the PM tube.

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

A multichannel analyzer (MCA) with three inputs received, sorted and stored the signals coming from the two windows. A third input was connected to a signal generator which could be triggered by a microswitch in the adjoining RV room. That switch was used to mark the beginning and end of data taking in the RV session. Details of the session are contained in the methodology section. A schematic of the equipment used is shown in Figure 1.

Following an experimental session, the data collected by the MCA was transferred to cassette tape. The cassette was subsequently read into a computer for analysis (see Photomultiplier Tube Analysis below). The count rates during control periods in our two regions of interest were approximately 300 sec^{-1} and 10 sec^{-1} respectively. Since a single photon can produce a count, we were sensitive to an increase of approximately $\sqrt{N}$ photons, where N is the count rate. This figure would correspond to about 50–60 excess counts in Region I and as few as 3–4 excess counts in Region II.

We exercised considerable care in reducing the sources of experimental artifact. The PM tube housing and slide holder were light–tight and constructed of metal which was grounded and shielded against RF, magnetic and electrostatic fields. In at least one Chinese report, the light proofing of the PM tube was accomplished by using only layers of black cloth. Our entire PM tube housing was further enclosed in a standard photographers film changing bag so that the slide selection and insertion could be accomplished in the dark.

We found it necessary to isolate and filter the 110V AC power to the experimental set up. Line transients produced by nearby heavy machinery caused spurious peaks to appear in the PM tube output until suitable filters and surge suppressors were installed.

The slides which served as the targets during the session were prepared from a pool of 112 National Geographic photographs. Each slide was placed in a separate opaque envelope marked with an identification number. Prior to each session, four slides were selected from the target pool by a random number generator. All four slide envelopes were placed in the changing bag with the PM tube housing and shuffled. One envelope was selected, the slide removed and placed into the special holder which covers the PM tube. This procedure ensured that the slide selected was unknown to the viewer and experimenter.

The photomultiplier tube and its preamplifier were both positioned in the same room used for the RV session. Connecting cables for signals, high voltage, etc., were run through a utility access space into an adjoining room. Located in this adjacent area was the instrumentation for amplifying and counting the PM tube signals. The viewer and experimenter always accompanied each other when it was necessary to enter the instrumentation room during the course of a session. At all other times that room was locked.

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

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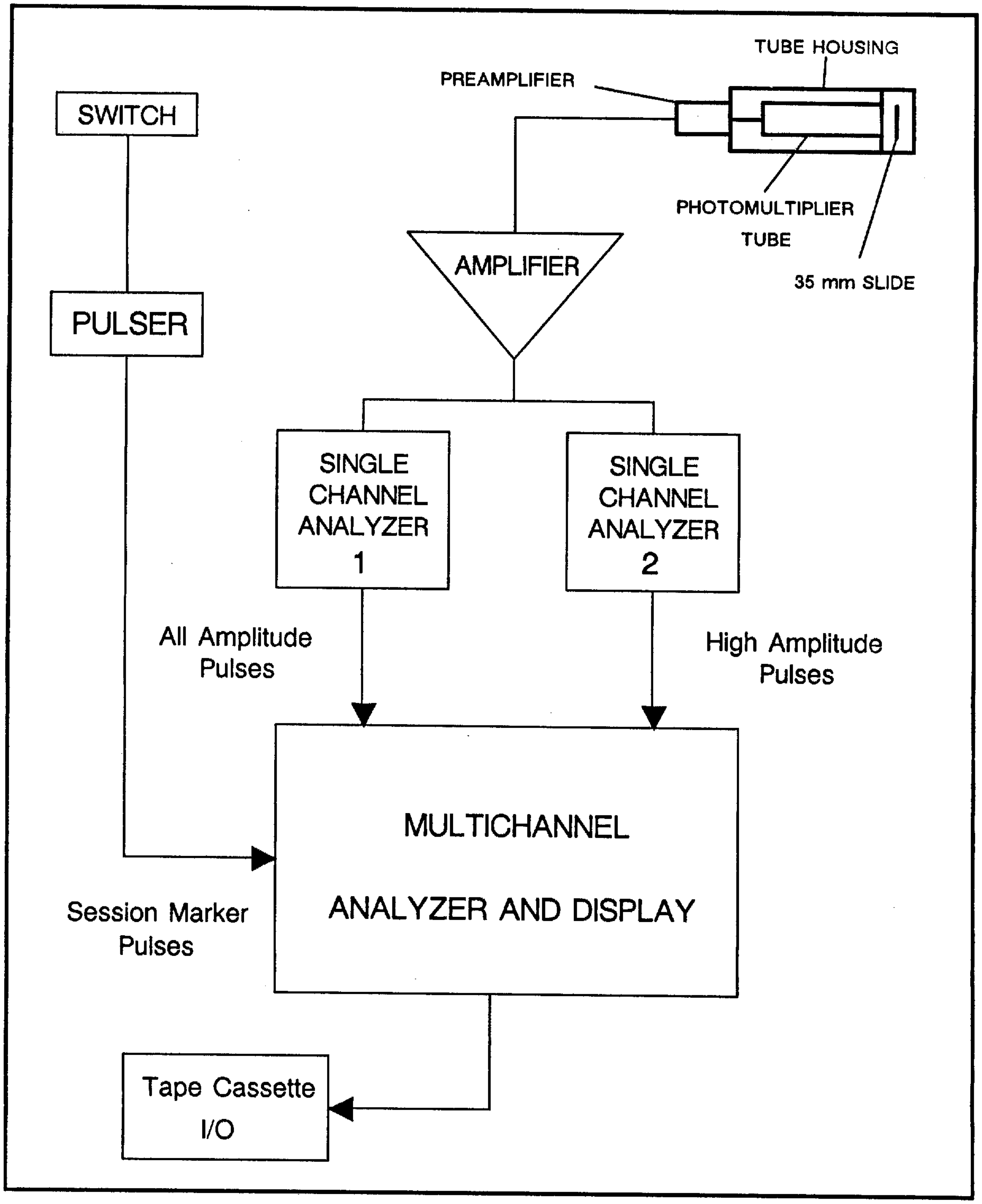

Figure 1 SCHEMATIC DIAGRAM FOR THE PHOTON PRODUCTION EXPERIMENT

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

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METHODOLOGY

Prior to the arrival of a viewer, the experimenter selected the four slides, checked the equipment for proper functioning, shuffled the envelopes and loaded the target slide. To achieve a relatively constant background pulse rate, we always cooled the exterior of the PM housing and changing bag with a plastic bag of ice.

This moderate form of cooling was necessary since the RV session room would get quite warm during afternoon sessions. A rise in temperature to about 26 ^{0}C was sufficient to increase the background count rate a factor of two or three over that observed in the morning session. Cooling with ice allowed us to maintain the temperature of the PM tube near 20 ^{0}C for all sessions.

After the arrival of the viewer, three minutes of data were collected with no one in the RV room. (The first minute was always discarded in subsequent analysis because of transients occurring when voltage was again applied to the PM tube after installing a slide.) The viewer and experimenter then entered the RV room and carried out an RV session. Each time the viewer was ready to give a response in the RV session, the experimenter marked that time with a press of a microswitch. Closing the switch briefly sent a series of TTL logic pulses which were registered in the MCA memory. After the response the experimenter again closed the switch for 1–2 secs. These two bursts of pulses clearly defined the period of psychic effort for future analysis of the PM tube output. Following the session, the viewer and experimenter once again returned to the instrumentation room where the accumulated data was read out into a cassette tape. Once this process was begun, the pair returned to the RV room where the target slide was removed from its holder and displayed to the viewer.

Following the departure of the viewer, the experimenter rechecked the apparatus and left it ready for the next session. Following the manufacturer's recommendations all the principal hardware (PM tube, amplifier, MCA, etc.) remained on continuously. The data tape remained in place until filled ($\sim$15 sessions) then was removed for further analysis.

PHOTOMULTIPLIER TUBE DATA

Figure 2. shows typical data recorded from the photomultiplier (PM) tube during a 15 minute RV session. Three spectra are displayed concurrently. The top spectrum displays all pulses from the PM tube, regardless of their amplitude, that were detected during each 0.9 second counting period. The middle spectrum displays only those pulses, detected in the same 0.9 second interval, whose amplitude exceeded a preset threshold which was adjusted to eliminate all but the largest of pulses. The remaining histogram represents RV session dependent timing markers. Each spectrum has a common x–axis of 1024 channels (0.9 seconds/channel). For the the all amplitude pulse case, the average counting rate was about 180 counts per channel (0.9 second). The deviation about the mean ($\pm$15 counts) is ordinarily due to random variations in thermionic emission within the PM tube and is a well understood phenomenon. Average rates in the high–amplitude spectrum were about 5/channel.

The analysis of these data proceeded as follows. For each spectrum, a control (baseline) period was designated to be the two minutes of data collected one minute prior to the first RV time marker. This period occured when the PM tube was unattended. The data in this region were fit with a straight line by the least squares technique. For each possible number of counts greater than or less than that represented by the fitted straight line, a histogram of the number of channels was constructed. For example, assume the straight line fit has zero slope (i.e. the same value regardless of the channel number). Further assume this value is 100 counts. First, we count the number of channels in the region of interest that contain 100 counts. Next, we count the number of channels that contain 101 counts. We continue this process until all observed channels have been evaluated. The resulting histogram approximates a normal distribution. In the analysis of the base line region, a normal distribution, with mean μ_0 and standard distribution σ_0, is fit to the base line histogram.

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

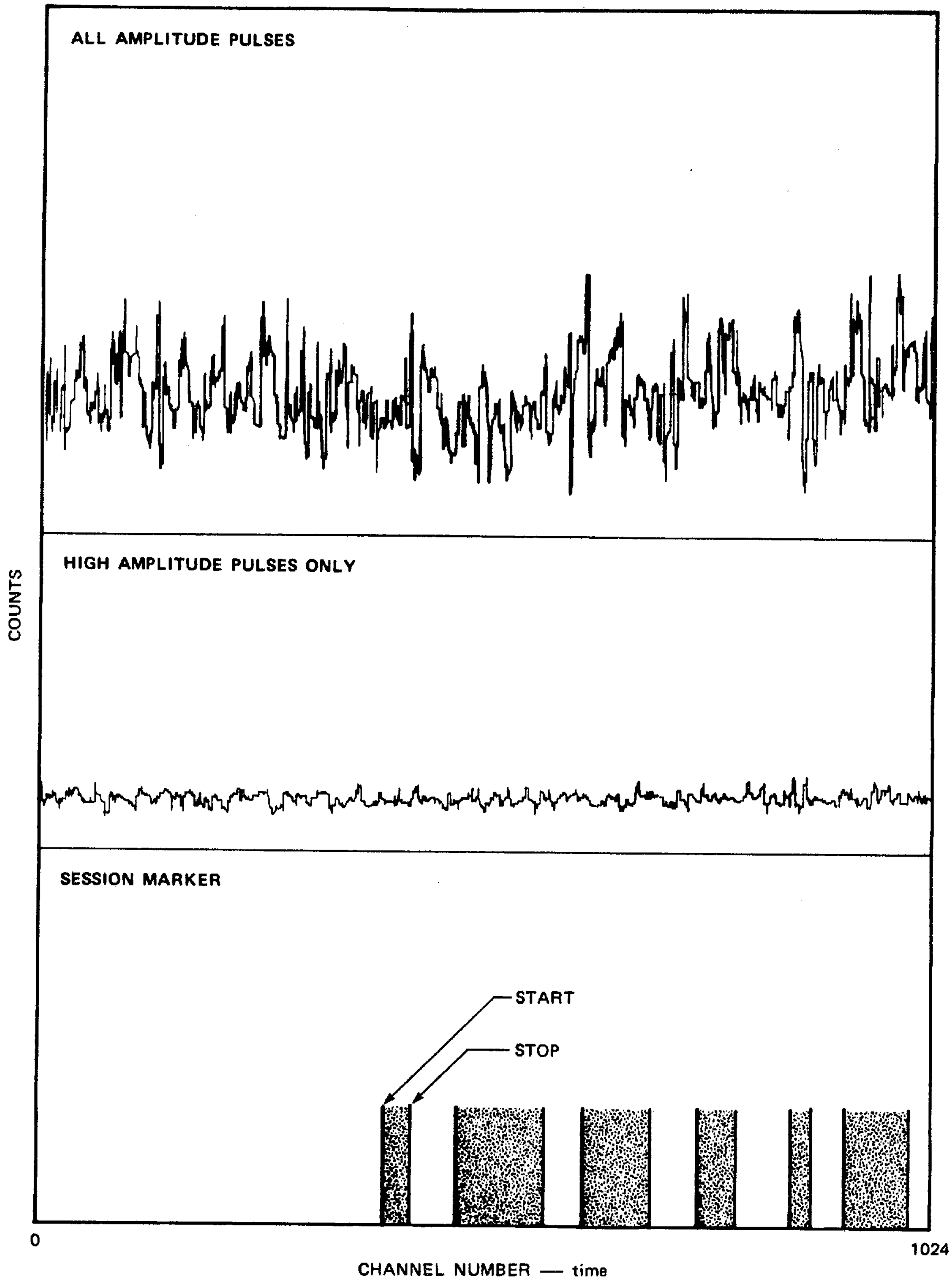

FIGURE 2 TYPICAL PM TUBE OUTPUT DURING AN RV SESSION

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

The RV timing markers displayed in the bottom histogram of Figure 2 represent the begining and end of "target access" periods. From our analysis of the quality of the remote viewing, we have evidence that there was contact with the target material during these periods.

The analysis for each RV marker pair is the same. If there was no psychoenergetic effect, we assume that a normal distribution, calculated as above, will be the same in the base line period as in the RV period. While there are a number of statistical measures for comparing two distributions, we chose to count the number of channels (time periods of 0.9 seconds) in the RV period that contained a significantly greater number of PM pulses. We chose this particular technique to be consistant with the PRC claims that the interaction causes an increase in the count rate. We also counted the number of channels that contained a significant decrease of PM pulses. The number of pulses required for significance in a channel in either direction is given by:

$$\text{counts required} = y \pm 1.65 \times \sigma_0$$

$$y = a + b \times t$$

Where t is the channel number in the region and a and b are the intercept and slope of the best fit line for the region respectively. σ_0 is the empirical standard deviation found in the control region.

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

RESULTS AND DISCUSSION

REMOTE VIEWING RESULTS

Four viewers contributed 6 sessions each in the photon production experiment. The viewers were selected on the basis of good performance in concurrent RV training programs. Each RV session was judged using a figure-of-merit analysis (FM). The FM is defined as the product of two measures: accuracy and reliability. The accuracy of an RV response is the fraction of the target material which is described correctly. Reliability is the fraction of the response which is correct (May, Humphrey, Mathews and Puthoff, 1985). Tables 1-4 show the RV results for each session.

Table 1
REMOTE VIEWING RESULTS FOR VIEWER 177

Session	Figure-of-Merit
2001.hs	0.457*
2002.hs	0.250
2003.hs	0.356
2004.hs	0.300
2005.hs	0.125
2006.hs	0.167
Average 0.276	

* Significant $p \leq 0.05$

Table 2
REMOTE VIEWING RESULTS FOR VIEWER 309

Session	Figure-of-Merit
2001.wm	0.125
2002.wm	0.167
2003.wm	0.257
2004.wm	0.300
2005.wm	0.036
2006.wm	0.048
Average 0.155	

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

Table 3
REMOTE VIEWING RESULTS FOR VIEWER 558

Session	Figure-of-Merit
2001.br	0.286
2002.br	0.100
2003.br	0.214
2004.br	0.225
2005.br	0.680*
2006.br	0.161
Average 0.274	

* Significant $p \leq 0.05$

Table 4
REMOTE VIEWING RESULTS FOR VIEWER 807

Session	Figure-of-Merit
2001.cr	0.286
2002.cr	0.300
2003.cr	0.356
2004.cr	0.444*
2005.cr	0.056
2006.cr	0.257
Average 0.278	

* Significant $p \leq 0.05$

From the analysis performed in our RV program, we found that a figure of merit greater than 0.4 is statistically significant at the 0.05 level. In combining the z-scores based upon the average figure of merit for each viewer, we find an overall $z = 1.44$ corresponding to a p-value ≤ 0.075. From Tables 1-4 we see that viewers 177, 558 and 807 each produced significant individual responses although no one showed overall significant performance. Since we had initially decided to base our conclusions on the correlation between the data from the photomultiplier tube and the RV figures of merit, it was not necessary to require consistently high figures of merit. The only criteria is that there must be some evidence of "contact" with the target material. Since the overall z-score was nearly significant, and since most all of the sessions produced figures of merit greater than the expected mean (0.13), we concluded that we observed good contact with the target material.

Table 5

PHOTOMULTIPLIER TUBE NORMALIZED RAW DATA

Viewer	Session *	FM	A^+	A^-	H^+	H^-	N
177	2001.hs	.457	7.14	5.95	11.11	2.78	252
	2002.hs	.250	4.67	0.67	9.33	4.33	300
	2003.hs	.356	6.02	1.88	7.89	1.50	266
	2004.hs	.300	4.03	1.15	13.26	4.32	347
	2005.hs	.125	0.00	0.00	0.65	0.00	306
309	2001.wm	.125	3.71	2.47	6.01	2.82	556
	2002.wm	.167	2.52	3.35	9.64	5.24	477
	2003.wm	.257	5.52	6.75	9.00	4.50	489
	2004.wm	.300	2.30	1.67	8.35	1.46	479
	2005.wm	.036	6.10	4.67	2.33	1.26	557
	2006.wm	.048	7.68	5.91	7.87	2.76	508
558	2001.br	.288	7.02	5.58	13.02	4.96	484
	2002.br	.100	8.91	7.09	10.73	5.87	494
	2003.br	.214	6.22	6.00	7.56	3.33	450
	2004.br	.225	13.11	12.70	11.68	2.66	488
	2005.br	.681	2.24	1.55	6.88	1.72	581
	2006.br	.160	6.78	4.03	5.27	0.00	472
807	2001.cr	.286	7.00	5.32	10.36	3.92	357
	2002.cr	.300	1.36	0.68	13.22	4.41	295
	2004.cr	.444	0.00	0.00	10.79	0.00	241
	2005.cr	.056	0.00	0.00	0.00	0.00	199
	2006.cr	.257	0.50	5.00	1.00	5.50	200

2006 hs X

* The automated fitting routine failed for sessions 2006.hs and 2003.cr. Those sessions were not included in the correlation calculations.

PM TUBE/RV CORRELATION RESULTS

For a single RV session the number of channels with significantly increased or decreased count rates are summed over all RV target access periods. These summations were made for the all amplitude spectrum (A) and for the high amplitude spectrum (H). The final output from the photomultiplier tube data analysis consists of the four summations described above normalized by the total number of RV channels (i.e. The length of time during the whole session that the viewer was in "contact" with the target material.).

Table 5 shows the results of the RV figure of merit and photomultiplier tube analysis for the all–amplitude and high–amplitude cases for each viewer. The PM results are shown in units of percent number of significant channels. The symbols A and H represent the all–amplitude and high–amplitude data respectively, and the symbols + and – represent the increase or decrease from the expected number of pulses, respectively.

In order to analyze the combined RV and PM results, we chose to calculate the linear correlation coefficient between the figure of merit and the normalized PM tube data. This method was chosen since the Chinese claim that "exceptional vision" results in an increased count rate of mainly large amplitude pulses. Therefore we could expect a positive correlation between the FM and H+ and a negative correlation between FM and H–. (As the quality of the RV contact increases, there should be fewer number of channels containing small count rates.) Although the PRC data does not specifically mention results for the all amplitude PM data, we would expect that the far greater count rate of small amplitude pulses in A+ and A– would tend to mask any increase in only high amplitude pulses. Since the direction of the correlation could be specified, we calculated single tailed p–values for the the correlation coefficients. Table 6 shows these results.

Table 6
CORRELATION RESULTS

Analysis	Mean	Correlation Coef. (r)	p-value (1-tailed)
FM	0.247	–	–
A^+	4.674	−0.158	0.242
A^-	3.746	−0.174	0.220
H^+	7.998	0.393	0.035†
H^-	1.981	−0.017	0.469

† Significant

We observe in Table 6 that there is a weak, statistically significant correlation of RV with increased number of PM pulses of high amplitude. Furthermore, the direction of the correlation is as expected although the difference in the correlations is not significant. This is in direct agreement with the PRC claims, with the exception that the magnitude of our observations is considerably less than theirs.

There are a number of possible explainations for this weak correlation:

1. We have simply observed a statistical fluctuation in a noisy environment.

2. Since our target materials were photographic slides of natural (and existing) locations, our assumption that the slides were the target materals (rather than the actual sites) was false.

3. The PRC subjects with exceptional vision might be much more skilled than our viewers.

4. Closer proximity between viewer and PM tube might be required to enhance the effect.

5. The thermionic emission of the PM tube has been enhanced rather than photons being produced.

By calculating the auto-correlation functions for lags of 0–20, we found that each of the all-amplitude spectra was significant for most all of the lags. Secondly, there were significant correlations between all- and high-amplitude spectra; an expected result since the high-amplitude information is completely contained in the all-amplitude spectra. Only a few of the high-amplitude spectra, however, showed significant auto-correlations. Thus we are able to say that we observed some small amplitude periodic signals in the output of the PM tube.*

The most likely source of periodic signals in the PM tube pulses is from the AC power line. During construction of the apparatus, we noticed occasional periods of highly regular signals in the analyzer. We found that our laboratory was across a hall from a machine shop. All of the observable artifacts vanished when we utilized appropriate power conditioning hardware. Nonetheless, the significant auto-correlations demonstrate that we were unsuccessful at eliminating all the regular structure from the signal. Therefore explanation 1. above must remain as a likely possibility.

As of this report, there is not enough data for us to determine the origin of the RV information (i.e., from the slide in present time; precognitively from the slide at a future feedback time; or the site itself in present and/or feedback time.). Thus item 2. above can not be eliminated as a critical distinction between our work and that of the Chinese.

Since we chose the resources available to us for the experiment, we chose viewers who had demonstrated ability at remote viewing natural scenes. We do not have individuals with a history of viewing abstract or alphabetic sympols. Therefore, we attempted a conceptual replication of the PRC experiments rather than an exact one.

Finally, we note that one of the best viewers (177) demonstrated significant positive correlations between figures of merit and both all-amplitude measures ($p \leq 0.007$ and $p \leq 0.022$ for A+ and A- respectively). Since this result is not confirmed by the summed result (Only the positive high-amplitude pulses showed significance.), it is difficult to interpret. If the PRC claim proves ultimately to be correct, it is tempting to say that viewer 177 "interacted" with the target system by increasing the variance of the signal during the RV periods.

The above analysis, while statistically suggestive of the PRC result, does not demonstrate that we observed an overall effect of the same magnitude. The Chinese report signal-to-noise ratios of at least 25:1, and usually 100:1 to 1000:1.

We did, however, observe two "anomalies" during the course of the experiment which are suggestive of the PRC claims. Those anomalies are shown in Figures 3 and 4. In order to designate any spectral feature as an anomaly, several strict criteria had to be met:

* We thank D. I. Radin for calculating the auto- and cross-correlations.

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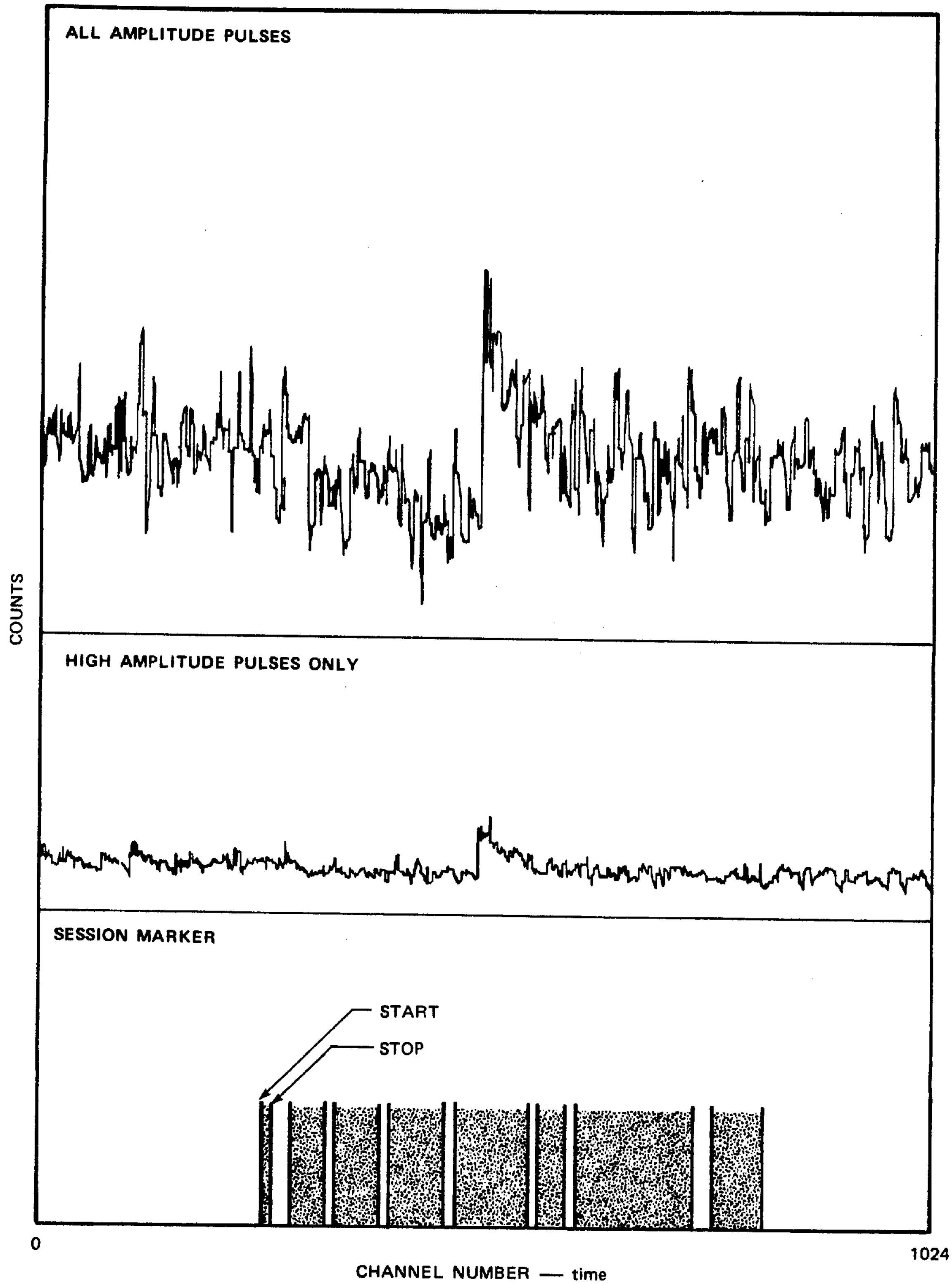

FIGURE 3 ANOMALY PRODUCED BY VIEWER 558

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1

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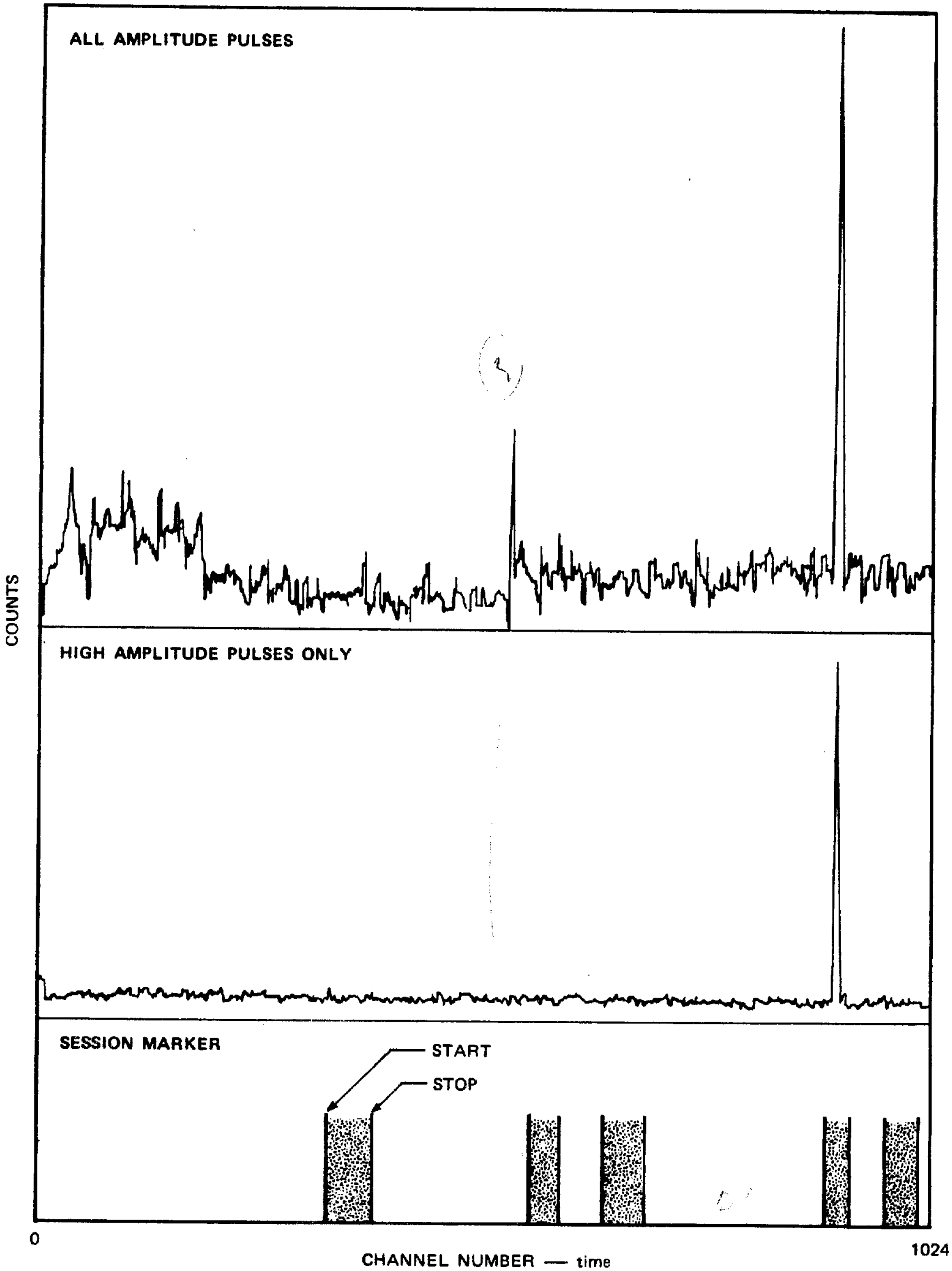

FIGURE 4 ANOMALY PRODUCED BY VIEWER 807

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1. The anomaly must appear simultaneously in both the all-amplitue (A) and high-amplitude (H) spectra. Since we observed occasional small amplitude noise bursts in our pilot trials, we decided to ignore high count rate signals appearing only in the A spectrum. Likewise, the H spectrum must overlap with the A spectrum by virtue of the discriminator settings. Therefore any unusual feature appearing only in the H spectrum must be due to an equipment malfunction, not a psychoenergetic event.
2. Any anomaly appearing in both A and H spectra must appear at exactly the same channel number. For the reasons discussed above, any signals which are not correlated in time would be considered due to only noise or equipment problems.
3. To be considered, an anomaly must have been observed during an RV contact period. While some evidence exists for so called "linger" or "relaxation" effects in PK experiments we were specifically testing for increased pulse rates during remote viewing. Any unusual signals observed at other times were ignored.
4. Finally, anomalies were considered to be only those signals which showed a rapid transition in count rate. Either the increase or decrease in rate must occur within a few channels (i.e., a few seconds). Slowly varying count rates are known to be due to temperature drift and were discarded.

CONCLUSIONS

We have conducted a conceptual replication of work published by physicists in the People's Republic of China. The overall results (summed across all viewers) indicate a weak statistical effect that supports the Chinese claims that correct RV acquisition of information perturbs physical systems.

In addition to the statistical result, we observed two anomalies which resemble the shape and magnitude of the signals reported in the PRC papers. However, the evidence that these transients were psychoenergetically induced is inconclusive (i.e., The anomalies occured in RV sessions of modest quality.). Furthermore, we observed very similar kinds of signals during the initial equipment set-up which were clearly due to environmental noise and AC line transients. We are unable to completely dismiss the anomalies, however, for two reasons:

- The anomalies occured in RV contact periods. ? ?
- The characteristics of the anomalies agreed with the type of signals reported by the Chinese.

Since we observed both statistical correlations and two suggestive anomalies, the Chinese claims were partially verified. ! !

To carry out a more definitive investigation, another set of experiments should be conducted with the following improvements:

- Add more-experienced viewers to the initial group.
- Examine the possibility of using English language alphabet letters as target material. ?
- Cool and temperature stabilize the PM tube to further reduce background noise levels.

- Carry out the experiment in a more nearly electrically isolated environment to eliminate AC power line transients.

o Vary distance to PM

o

REFERENCES

Chinese Academy of Sciences, High Energy Institute, Special Physics Research Team, Exceptional Human Body Radiation. *PSI Research*, 1982, June, 16.

Knoll, G. F., *Radiation Detection and Measurement*. New York: John Wiley & Sons, 1979.

May, E. C., Humphrey, B. S., Mathews, C., and Puthoff, H. E. Figure-of-Merit Analysis for Free Response Data, Submitted for presentation at the 28th Conference of the Parapsychological Association, 1985.

Yonjie, Zhao and Hongyhang, Xu EHBF Radiation: Special Features of the Time Response. Institute of High Energy Physics, Beijing, Peoples Republic of China, *PSI Research*, 1982, December, 20.

Approved For Release 2000/08/08 : CIA-RDP96-00788R001800010002-1