TRANSMITTAL SLIP

DATE: 10 May 1960

TO: [redacted] STAT

ROOM NO.: 2815

BUILDING: Alcott Hall

REMARKS:

SS

When I learned the lab was investigating use of beyer memory storage for receiving [redacted] message with subsequent off-line readout, I sent [redacted] a copy of the TI DS-1 proposal of two years ago. Here are John's comments.

STAT

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[redacted]

EP BB Info

DWR

FROM: ~~R&D Lab~~ R&D

ROOM NO.:

BUILDING:

EXTENSION:

(47)

STANDARD FORM NO. 64 CONFIDENTIAL

Office Memorandum • UNITED STATES GOVERNMENT

TO : [redacted]

FROM : [redacted]

DATE: 10 May 1960 50X1

SUBJECT: Visual Readout Device (Ref. TI Proposal)

1. The coincident current memory [redacted] development 50X1
has been confined to approaches which would not preclude use of
[redacted] as a receiving and readout device, should it later be 50X1
desirable to develop a companion unit containing the necessary binary-to-unit decimal conversion matrix and lamps or other (mechanical) indicators, as well as circuitry, such as an 850-cycle filter, for interconnecting the receiver and keyer unit.

2. The [redacted] as it now stands contains all the 50X1
functional circuitry represented by flip-flops 1-7, start-stop gate, schmitt trigger, and clock, in Figure 2 of the TI proposal. Outputs for the information transfer gate and flip-flops 8-12, contained in the companion device, are available with a choice of amplitudes and impedance levels. With consideration of details such as our almost exclusive use of pulse binary devices, such as cores, in preference to DC binary devices, such as flip-flops, the off-line keyer could be made to replace directly the boxes named.

3. The only advantage of using the [redacted] and a 50X1
companion unit for visual readout, instead of an equipment such as proposed by TI, seems to be leisured copy by the operator. The
[redacted] setup would yield one character each time the advance 50X1
button is pressed, the character being lighted for as long as the button is held. Releasing and pressing again would yield the following character. Since the memory is non-destructive, repeated copy would be possible until the message was deliberately erased. Transportation with power off does not destroy the message.

4. All keyer circuitry now in its final form is "stressed" for 1600 wpm transmission in the event this will become a requirement. Although 1600 wpm reception would be restricted to (a) sped-up baudot characters over routes in which multipath is not a problem, or (b) special models resulting from a separate development program to adapt the keyer circuit for reception of synchronous non-baudot characters, it could be thought of as an attribute that the off-line keyer can be made to accommodate 1600 wpm messages, when used as a readout device.

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5. Here are some specific differences between the method of operation of the [redacted] in the receive mode and the method proposed by TI. 50X1

a. The clock used in the [redacted] is a silicon unijunction relaxation oscillator with an expected over-all stability of 2%. The circuit is arranged so that in all operating modes, but specifically in receive, an 11 Msec delay (at 60 wpm) exists between excitation and first firing. In this respect it is identical to the clock shown in the TI proposal. However, an option has been provided whereby the clock will not fire unless the input actually remains in the SPACE state for a total of about 11 Msec. This adds greatly to noise discrimination, but assumes rectangularity such as would be provided by the 850 cy filter described. After initial firing, only the input state at the time of strobing is of interest, since the clock continues to fire for seven pulses in all before being returned to the initial state. The above option is not a requirement. 50X1

b. The function switch on the [redacted] unit contains a RECEIVE and a COPY position in addition to TYPE, SEND, and BACKSPACE. The incoming message is stored in the RECEIVE position. In case noise or operating procedures may have caused bogus triggering and partial depletion of memory capacity, a RESET button, if pressed just prior to start of actual message, returns the keyer circuitry instantly to the first memory address, permitting full use of the three 40-group bays. To copy the message, the function switch is turned to COPY. The same button, which under one plan rotates with the knob of the function switch, is now used to ADVANCE the memory one address at a time. A message is received in three 40-group sections. Duration of message is indicated by a flashing light. The operator must move the bay selector switch to a new bay between sections, and press the RESET button once. The sections may be copied in the order received. 50X1

c. During COPY, the output from the [redacted] unit to the companion unit consists of pulses on five wires to the five flip-flops of the parallel storage register. The function of the information transfer gate of the TI proposal is performed at the time the message is received. The five flip-flops can receive their information (pulse/absence of pulse) simultaneously or 22 Msec apart, as desired. Both types of output have already been provided. 50X1

6. The operating breadboard now contains all functional circuitry plus one 40-group bay. A test of receiving operation is not scheduled since no requirement exists and it is desirable not to delay demonstration of a complete prototype with TYPE and SEND capability. Subsequent completion of all other operation modes will not be difficult, since by and large the [redacted] circuitry operates in an identical manner for all. 50X1

[redacted] 50X1