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WSA 600 REQUIREMENTS

The following is a list of functional requirements currently seen for the WSA 600, and is intended to serve as a "working paper".

1. The WSA 600 will be designed to interface with Bell System modems 303 and 301B.
2. The need for 7+1 transmission is apparent.
3. An 8-bit code will be considered as very desirable. In this event both 8+0 and 4 out of 8 should be considered, although 4 out of 8 may be implemented simply as 8 bits with even parity (and no parity bit).
4. The speed of the 303 and 301B data sets implies computer-like devices at both ends of the link. Thus, a method for transmitting binary information is considered highly desirable. This need is interpreted here as being a need for 6+1 code - transparent mode.
5. Code recognition - There is need for the adapter to compare and recognize control characters in the receive mode. Present thinking has been influenced by the possibility of using an already developed circuit board with 144 flip-flop devices. This board is a 16 X 9 solid state memory.

   Thus, consideration is being given to possibility of control character definition by software. That is, the GE645 software may define the control characters to be used by loading the 16X9 memory in the WSA 600.

There are three types of action which may be taken following receipt of a control character.

(a) Action taken by the WSA - - to change its operating characteristics.

(b) Reporting of termination status (and re-setting).

(c) Reporting of external signal status.

These three "types" of actions are not "independent." A character which causes some change in WSA characteristics may well report external signal status.

6. The WSA 600 will have no memory of previous characters except the DLE character. This is the only event which is to be "remembered". This memory will only exist for one additional character time.

7. Character parity will be a hardware function but under program control. That is, in receive mode no-parity check may be selected by software.

A summary of direct software controlled features:

(a) 6+1, 7+1, and 8-bit code transmission.

(b) Control characters - - 16 in number, 9-bits in length loaded into the WSA by software.

8. Block parity will be considered a software function. Thus, WSA 600 will neither generate nor check it. However, to facilitate this checking, the hardware will be required to be completely transparent to <u>two</u> characters following an ETX or ETB.

9. Use of SYN. In receive mode the hardware will strip SYN (or DLE SYN in transparent) so that this character will not be passed on to memory.

In transmit, the SYN (or DLE SYN) will be used as protection against the transfer timing error - - thus making the WSA a "soft-failing" device. When a transfer timing error impends, the hardware will insert SYN (or DLE SYN) as "fill" until another data service from the memory is available.

10. Error Recovery. Basically, error recovery is viewed as a software responsibility. The WSA, then, will be required to detect errors, where possible, and report.

    (a) The occurrence of a parity error will cause an immediate terminate status.

    (b) Failure to achieve sync also constitutes an error. WSA 600 will have to detect this and cause termination status.

11. There is a requirement for "literals" in transmit mode.

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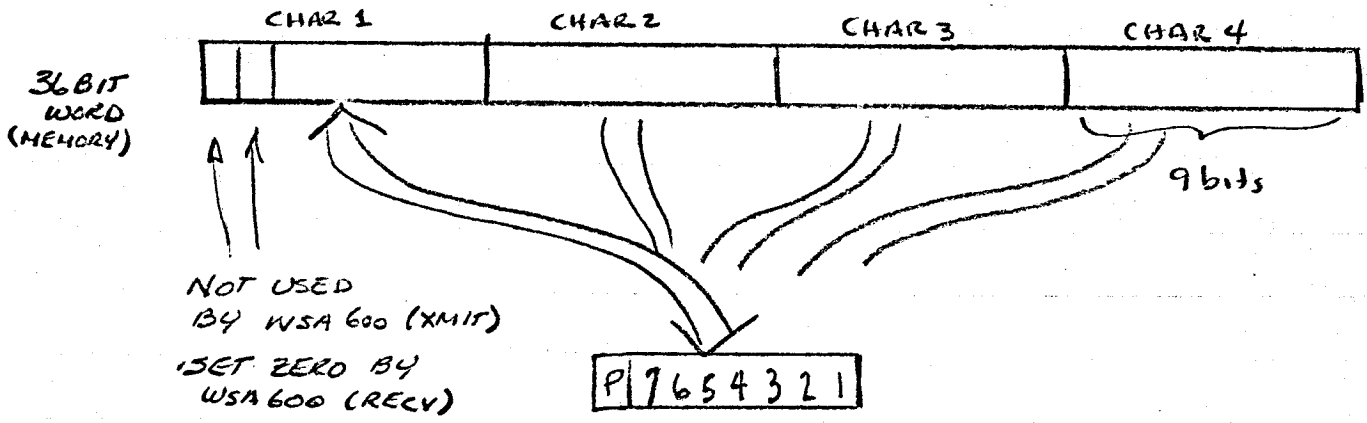
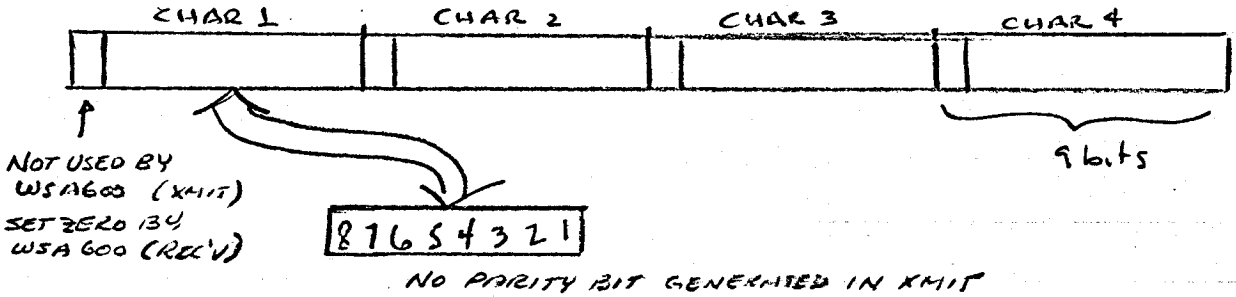
WSA 600 FORMATS

(1) 7+1 TRANSMISSION



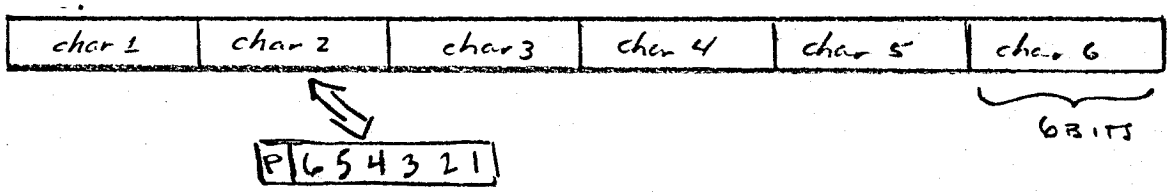
characters transmitted in order 1,2,3 4 ; bits transmitted 1,2...7,P

(2) 8 BIT TRANSMISSION

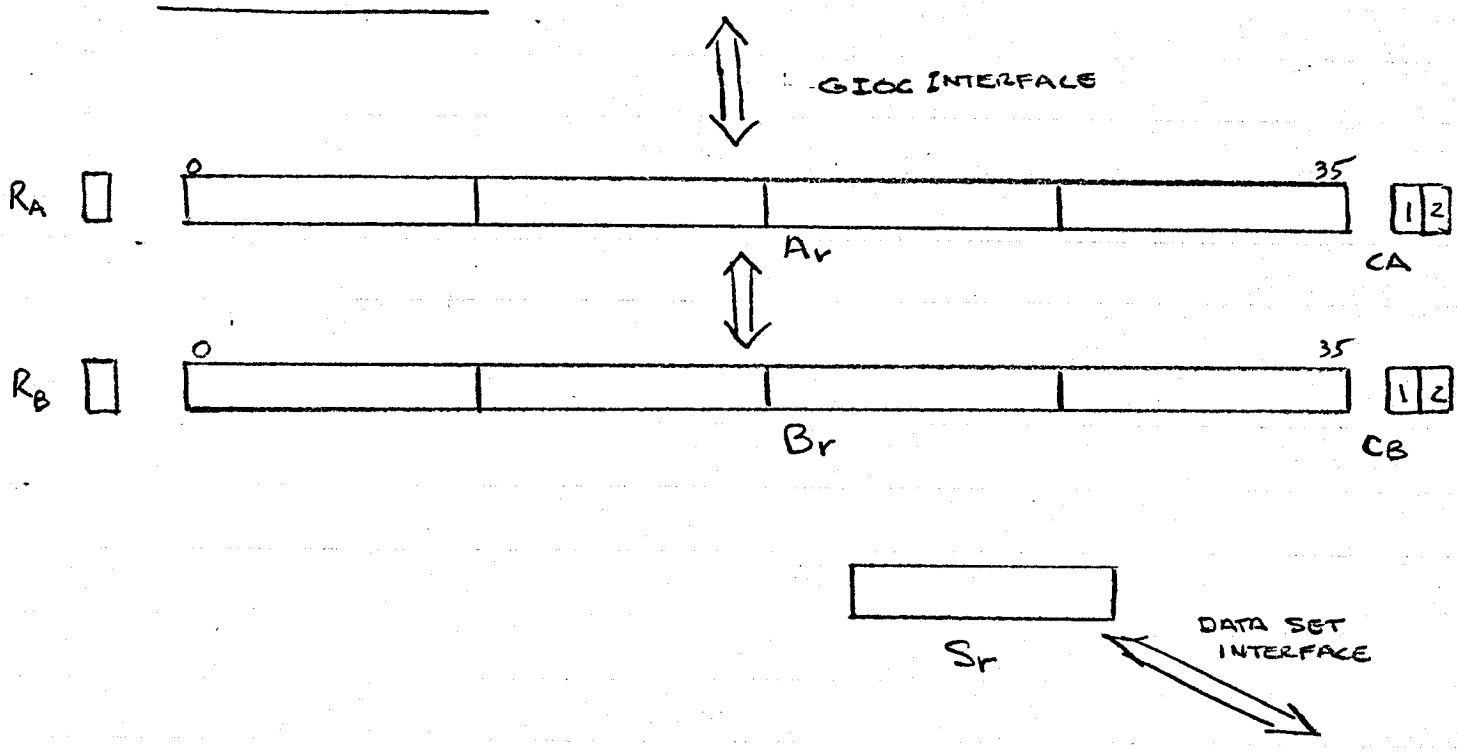


Same character and bit sequence

(3) 6+1 TRANSMISSION



WSA 600
ORGANIZATION



A_r, B_r ... Buffer storage -- 2 36-bit words -- within WSA

S_r ... A comparison register .. temporary (8-bit) storage accumulated from data set for comparison to control characters

R_A ... Indicates: (1) XMIT MODE: Initiate data service to refill A_r (2) RECV MODE: Initiate data service to transfer A_r to memory

R_B ... Indicates (1) XMIT MODE: request $A_r \rightarrow B_r$
(2) RECV MODE: request $B_r \rightarrow A_r$

CA_1, CB_1 ... (1) XMIT: TERMINATION UPON XFR of this word to data set
(2) RECV TERMINATION upon xfr of this word to memory

CA_2, CB_2 (1) XMIT: NOT USED (2) RECV: External signal status