

PART II
SIMULTANEOUS ANALYSIS IN REAL TIME

by

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The stream of input words arrives in the computer by data interrupts interspersed every 16 ms by a program interrupt. The words are stored sequentially in the main input list by using a pointer which is accessible to both hardware and software. This pointer is inspected during program interrupts and its value is stored in an index table. At any time the index contains a complete description of the data which is stored in the main input list. Both the main list and its index are filled cyclically the input data rate will fluctuate but index entries will be inserted regularly every 16 ms [see Fig. 5]

The programs which are analysing the sonar data obtain new information through the index table. It is necessary to keep two pointers to the index table, the first is used by the interrupt program to mark the position of the newest entry and the second by the processing programs to mark the entry which is next due for processing.

The interrupt program inspects these pointers and if temporary overloading is about to occur it will change the pointer which is used by the processing programs so that the stalest data is abandoned,

The details of the software will not be discussed here, in any case there is more than one satisfactory treatment, but the principles which have guided the software design will be enumerated.

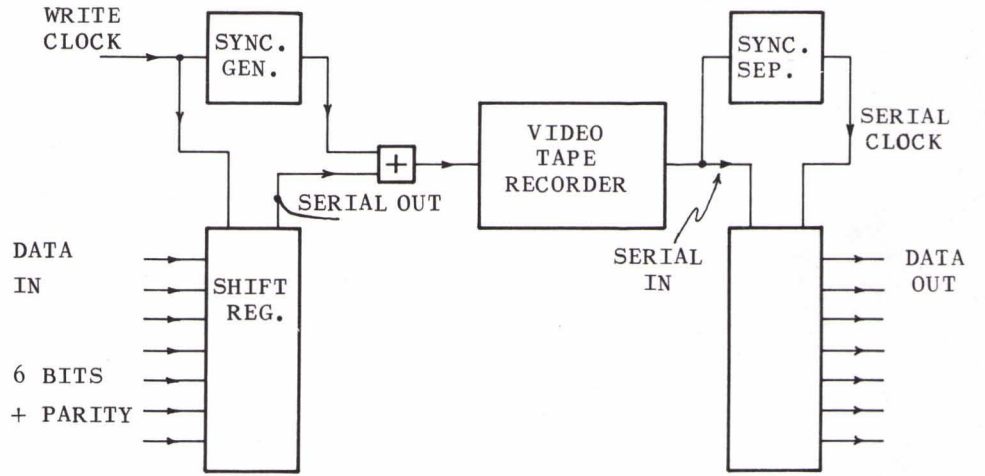
Firstly, the interrupt program must not be affected by the content of the input data words. If this is not so then there is a risk that faulty input could cause unexpected actions (e.g., endless loops) in the interrupt program.

Secondly, the converse should also be true, that is the data words should not be changed by the interrupt program, it is advisable to allow the input words to remain unchanged in a cyclic list for as long as possible as an aid to fault diagnosis.

Thirdly, the interrupt programs must not rely on the processing programs to work correctly. Even if the processing programs fail to take any more input data the interrupt programs should continue to run.

VIDEO TAPE SYSTEM

FIG. 3



COMPARISON OF RECORDING SYSTEMS

	DIGITAL	VIDEO	INSTRUMENTATION /DIGITAL	UNITS
TAPE SPEED	36	7	30	Inches/s
BIT DENSITY	0.12	0.56 (1.0 pos)	2.88	Megabits/s
RECORD TIME (2400 ft)	13	70	16	Minutes
TAPE WIDTH	0.5	1	1	Inches
TAPE COST	£50	£20	£50	Per Hour

FIG. 4

DATA STRUCTURE

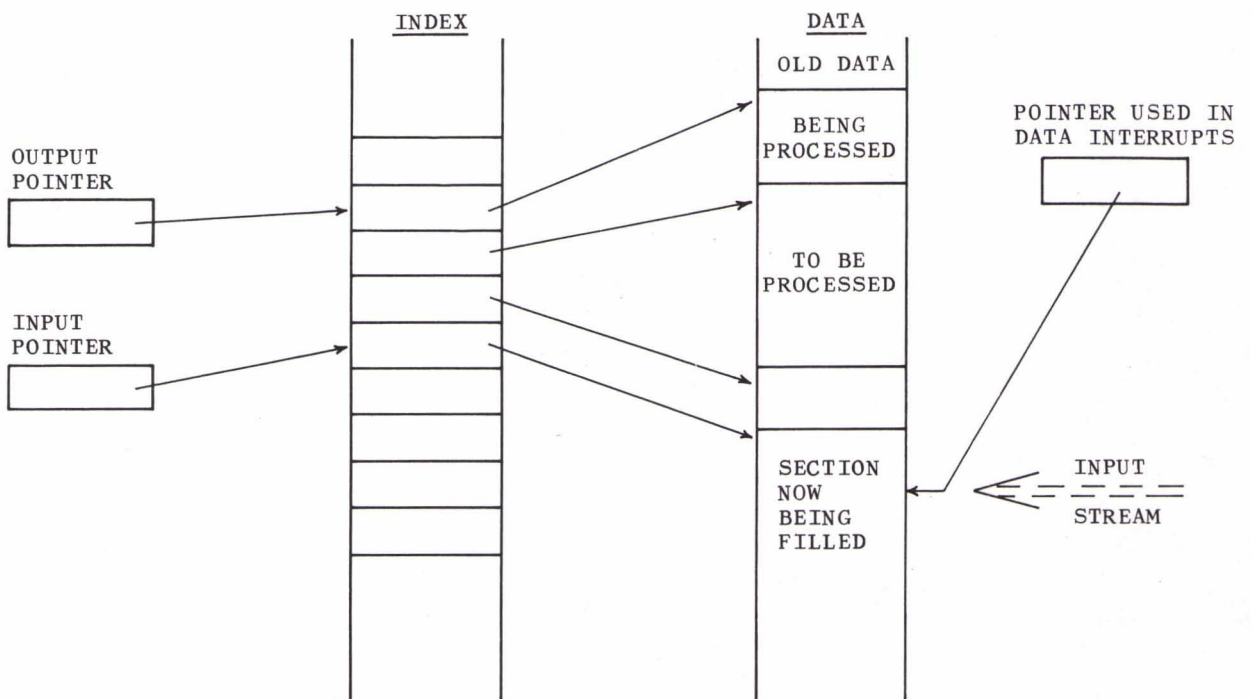


FIG. 5