

Published: 12/28/66

Identification

Overview of the GIOC Interface
H. S. Magnuski

Purpose

This paper is an introduction to section BF.20 of the MSPM. The papers in BF.20 describe the Multics system programs needed to run the General Input Output Controller (GIOC). This document is an overview of the GIOC - software interface, and it attempts to aim the reader at other documents in BF.20 which may be of particular interest.

Introduction

A person interested in knowing more about the GIOC interface probably has one of two motives - either he is in charge of running some device and consequently has to use the facilities of the GIOC, or else he is involved in some part of the system which interacts with the GIOC, such as accounting or resource allocation, and therefore needs a thorough understanding of how the GIOC software operates and affects him. Those people in the first category will probably be interested in the majority of the documents in this section of the manual. Those in the second category will probably only be interested in BF.20.02, which describes the internal operations of the GIOC Interface Module (GIM).

The GIM

The GIM is the most important module in the software interface to the GIOC. Its relation to the GIOC and other modules is illustrated schematically in figure 1. It has direct control over all of the facilities of the GIOC and consequently is one of the hard-core-supervisor modules. The main functions of the GIM include the formatting of the Data Channel Word (DCW) lists, the activation of these lists through the use of the Connect Channel Words (CCW's), and the reception of interrupts and status words.

The GIM, then, is faced on one side with the hardware present in the GIOC, and on the other side with software which wants to use the hardware or control the amount and type of I/O activity.

The CDT's

To aid the GIM in formatting the DCW lists mentioned above, there is a system-wide data segment which contains a group of structures known as the Class Driving Tables (CDT's). The Class Driving Tables contain information about forming the DCW and CCW lists for a particular device and also the restrictions imposed on the DCW - CCW lists for that device.

Although one CDT could probably serve a large number of similar devices, such as the common peripherals, the CDT's will be tailored to individual devices and documented with the corresponding DCM.

The IOTC

To help create the CDT segment, a program known as the I/O Table Compiler has been written. The IOTC is only used when a new CDT has to be created, and this usually occurs only when a new device is placed in the system. After a CDT is created, it is thoroughly checked by the persons charged with maintaining system security, and is then made available to the GIM for use in making DCW lists for the new device. The DCM gets to use the CDT by making appropriate calls to the GIM.

Calls to the GIM

The calls to the GIM are divided into two major categories which are

1. Calls to create the DCW, CCW lists
2. Calls to use the DCW, CCW lists

Calls in category 1 will assign a data channel to a process, define the CDT to be used for that channel, create space for a list, and release space for a list. Calls in category 2 can change the contents of a list, activate a list, and process status words caused by active lists. All these calls are specified in BF.20.Q1.

The IOCT

The GIM call which makes changes to a list does so through a piece of data known as the "change" structure. This "change" structure specifies (via the CDT) a type of pseudo-DCW which eventually gets transformed into a real DCW.

The DCM will have to constantly use "change" structures designed for each device, and since these structures are relatively tedious to generate through simple EPL programs, a module has been written which can be used by the DCM to translate I/O Commands into these structures. This I/O Command Translator is described in BF.20.07.

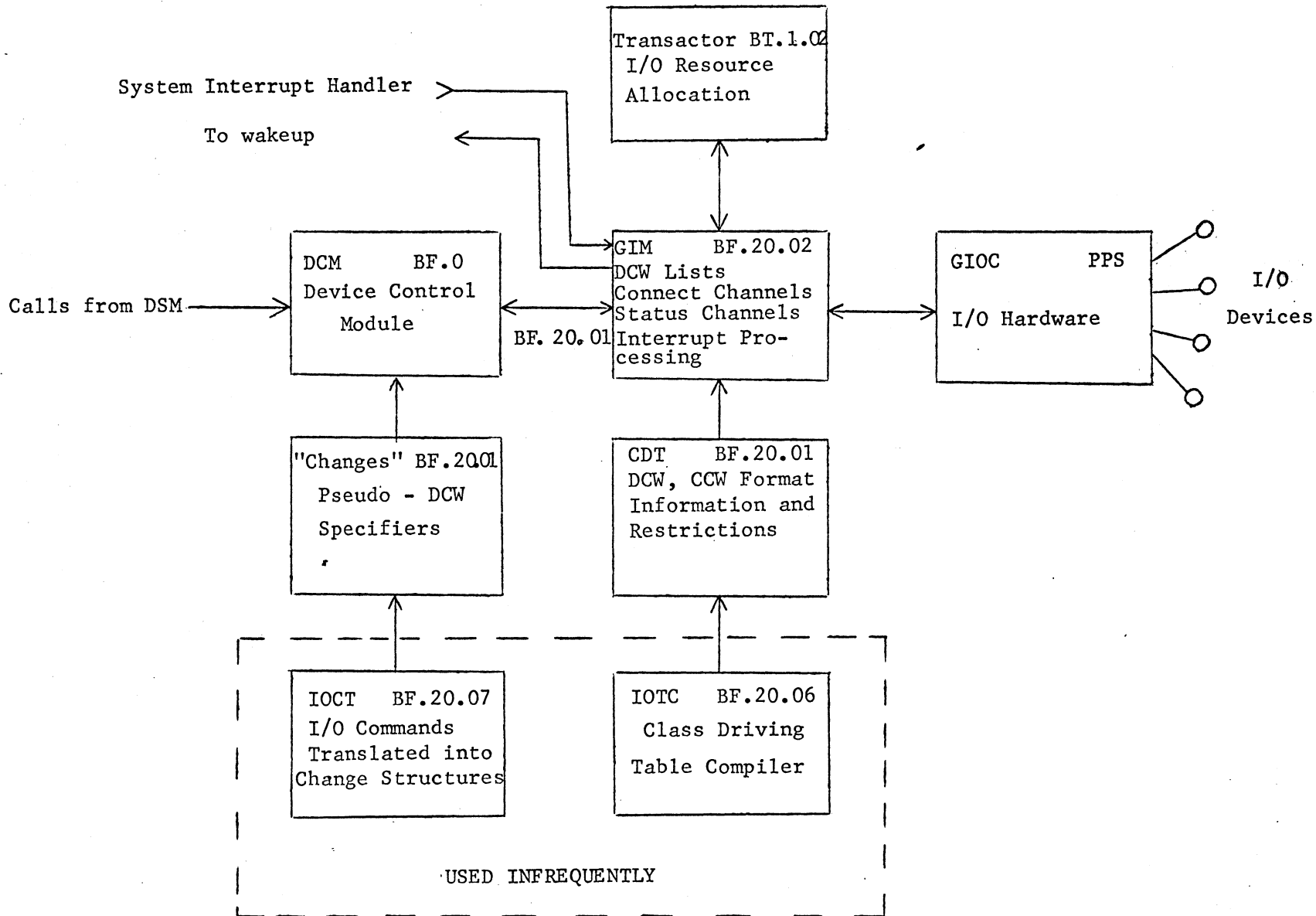


FIG. 1 GIOC - SOFTWARE INTERFACE DIAGRAM