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Identification

Use of the I/O System by the Answering Service.
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Purpose

This section summarizes the way in which the Answering Service uses the I/O System (IOS). The IOS calls mentioned herein are standard IOS outer calls and are described in detail in other sections of Section BF.

General

The Answering Service uses the standard IOS user interface. Its needs are fulfilled by the use of the attach, order, upstate, getstatus and detach calls. attach and detach are described in detail in Section BF.1.01. order is the general purpose IOS call used for issuing special requests to the IOS; its generic description is provided in Section BF.1.07. The particular requests appropriate for the Answering Service are described herein. upstate permits the IOS to update status on outstanding transactions; it is described in BF.1.21.

Attachment

The basic function of the Answering Service is to monitor the GIOC channels from which a user may log in to Multics (see Section BQ.2). Inasmuch as login procedures for devices other than typewriters are not yet established, the scope of the discussion in this document is limited to the case of typewriters calling in on typewriter channels. To arrange to monitor a typewriter channel, the Answering Service calls:

```
call attach(ioname,"twchan",description,mode,status)
```

ioname is any ioname the caller chooses to associate with the channel. The type argument must be "twchan". The description must be a symbolic channel name, (actually a "level 1" I/O Registry File name (see Section BF.2.23)). The mode argument need not be used and may be a null character string, since the default modes are the only appropriate ones (see Section BF.1.02). status is the standard IOS status bit string (see Section BF.1.21). The resulting attachment invokes an iopath consisting of a standard typewriter DSM and a standard typewriter DCM. As a result of attachment with type = "twchan", the DSM tolerates the device-absent-from-channel condition. The DCM has the ability to:

1. Log the behavior of the channel and data set.
2. Interpret data set status leads.
3. Control data set control leads.

4. Signal events when certain status conditions exist.
5. Verify presence of proper typewriter type for the channel.
6. Link certain I/O Registry Files for IOS purposes.
7. Perform normal input/output when a suitable typewriter is connected to the channel.

Following a successful attachment the Answering Service can issue the order calls described below. After a successful dial-in, normal input/output can be performed. When the Answering Service is finished, a detach call should be issued.

Operation

The order call has the following generic form:

```
call order(ioname,request,argptr1,argptr2,status)
```

ioname must be the ioname previously attached. request is a character string of 1 to 32 characters. argptr1 and argptr2 are pointer variables pointing to structures containing the arguments that go with the particular request. status is the standard IOS status bit string.

When request = "listen", argptr2 is ignored and argptr1 points to:

```
dcl 1 args,
 2 process_id bit (36),        /*process to be signalled*/
 2 dialin_event bit (36),      /*successful-dial-in event*/
 2 error_event bit (36);       /*error event*/
```

The DCM turns on the Data Terminal Ready control lead to enable the data set to answer calls. If the data set is a 103E, the "make busy" control lead is turned off. The DCM signals the dial-in event when a successful data set handshake has occurred and the presence of a typewriter of the proper type has been verified. The DCM signals the error event when something happens which precludes a successful dial-in event. Following either signal, the Answering Service can obtain a new status for the original order call by calling upstate and getstatus (see Section BF.1.21). The "listen" request is rejected by the DCM if a typewriter is already connected to the channel.

When request = "line_status", argptr1 and agrptr2 are ignored. The IOS returns full line and data set status in the call-oriented report field of status (see BF.1.21).

When request = "make-busy", argptr1 and argpt-2 are ignored. The DCM turns on the "make busy" control lead on 103E data set. If a data set type other than 103E is connecte(to the channel, status indicates an error. An error is also indicated if a typewriter is connected to the channel.

When request = "hangup", argptr1 and argptr2 are ignored. The DCM turns off the Data Terminal Ready lead to the data set, thereby initiating a disconnect sequence, and returns. In the case of a 103E data set, the "make busy" control lead is also turned on. If the disconnect sequence does not complete successfully, an error is indicated eventually in status. The Data Terminal Ready lead remains off and the data set will not answer any calls; in the case of a 103E, the data set will appear busy. A "listen" request can be used to turn the Data Terminal Ready lead back on and enable answering.

When request = "get_rf", argptr1 is ignored and agrptr2 is a pointer to the following returned structure.

```
dcl 1 rf,                          /*type and description for*/
 2 type char (32),                 /*  subsequent user-group*/
 2 description char (32);          /*  attach call*/
```

The DSM returns type and description arguments suitable for use in the attach call to be issued in the new user group to attach the dialed-in device. In the present typewriter case, rf.type = "typewriter".

The order calls discussed above are appropriate for channels connected to the telephone switching system. Any additional requests required by private line connections will be described in a subsequent edition of this section.