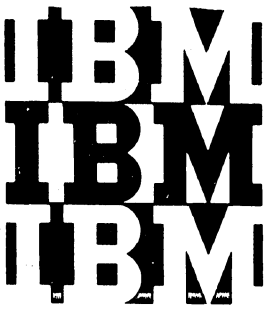

File Number S360-37(DOS)
Order No. GY24-5154-2

Program Logic

DOS OLTEP Logic

Program Number 360N-DN-481

This reference publication describes the internal logic of the IBM Disk Operating System On-Line Test Executive Program (OLTEP). It is for persons involved in program maintenance and programmers who are altering the program design.

For titles and abstracts of associated publications, see the IBM System/360 and IBM System/370 Bibliography, GA22-6822.

DOS Release 26

Third Edition (September 1971)

This edition applies to Release 26 of the IBM Disk Operating System and to all subsequent releases until otherwise indicated in new editions or Technical Newsletters. Changes are continually made to the specifications herein; before using the publication in connection with the operation of IBM Systems, consult the latest System/360 and System/370 Newsletter, GN20-0360, for the editions that are applicable and current.

This edition, GY24-5154-2, is a major revision of, and obsoletes, GY24-5154-1. It includes support for (1) Line Connection Routine, (2) DASD Security Byte, (3) SOSP, (4) Dynamic CE Communication, (5) Symbolic Addressing, and (6) CE Pack Identification as VOL1CEPACK.

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for reader's comments is provided at the back of this publication. If the form has been removed, comments may be addressed to the IBM Corporation, Programming Publications, Department G60, P. O. Box 6, Endicott, New York 13760. Comments become the property of IBM.

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This Program Logic Manual (PLM) is a detailed guide to the IBM System/360 Disk Operating System, On-Line Test Executive Program (OLTEP). It supplements the program listing by providing high level text, label list, tables, and flowcharts.

This manual is organized in nine sections consisting of:

- Introduction: Describes OLTEP functions, structure and relationship to the system.
- Text of Phases: A composition of each phase making up the executive program. The primary phases are in succession of use. The support modules are in numeric sequence.
- Charts of the Phases: Summarized blocks of coding within the program units depicted. The charts of the primary phases are in succession of use. The support module charts are in numeric sequence.
- APPENDIXES A THROUGH E: Contains the label, microfiche and message cross-references, and a module directory.
- Glossary of OLTEP Terms.

This sectional organization allows quick access of pertinent information required by the OLTEP program support personnel.

PREREQUISITE PUBLICATIONS

Effective use of this manual requires a thorough understanding of IBM System/360 programming concepts. The publications providing this information follow.

Note: Although titles of some DOS publications have been simplified, the change does not affect the contents of the publication.

- IBM System/360 Principles of Operation, GA22-6821.
- Concepts and Facilities for DOS and TOS, GC24-5030.
- DOS Data Mangement Concepts, GC24-3427
- DOS System Control and Service, GC24-5036.
- Introduction to DOS Logic, GY24-5017
- DOS IPL and Job Control, GY24-5086
- DOS Librarian, GY24-5079.
- DOS Linkage Editor, GY24-5080.
- DOS Logical Transient, GY24-5152.
- DOS Supervisor and Related Transients, GY24-5151.
- DOS System Service Programs, GY24-5133

RELATED PUBLICATION

- DOS OLTEP, GC24-5086.

Titles and abstracts of other related publications are listed in the IBM System/360 and System/370 Bibliography, GA22-6822.

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OLTEP FUNCTION

The IBM System/360 Disk Operating System provides a set of programs to test I/O units. These test programs and the On-Line Test Executive Program make up the On-Line Test System. The On-Line Test Executive Program (OLTEP) is an interface between the system and the test programs and communicates with the operator during the running of tests (Figure 1).

Some uses of DOS OLTEP are:

- Diagnosing I/O errors.
- Verifying I/O device repairs and engineering changes.
- Checking I/O devices.

Some features of DOS OLTEP are:

- Multiple device testing.
- Data security.
- Data protection.
- No re-IPL time required.
- Prompting.
- Recognize ASCII labels; restore ASCII labels.
- Accessing of error recording information.
- Line connection routine for remote terminal testing.
- SOSP support.
- RETAIN/370.

OLTEP operates much like other problem programs in the Disk Operating System. It is cataloged into the core image library and called by standard job control statements. When OLTEP is called, it notifies the operator that it is active and communicates with him during testing. OLTEP can run in a batch-only system or as a background program in a multiprogram environment. It operates on 24K or larger

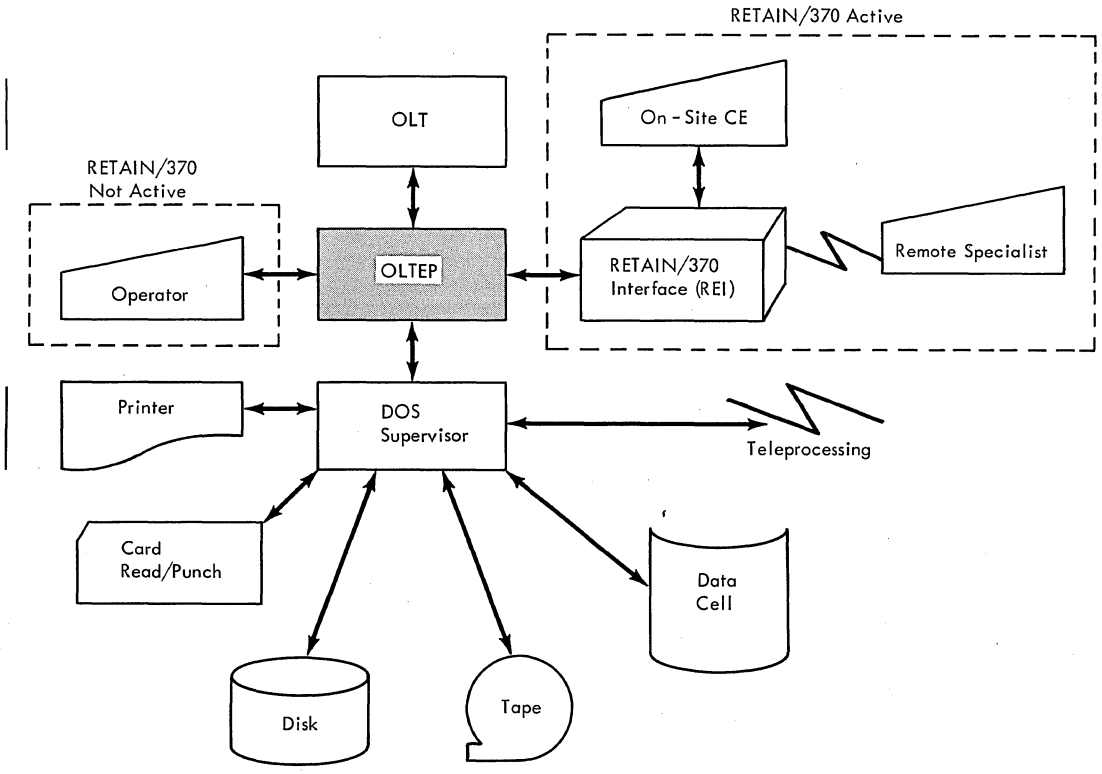


Figure 1. OLTEP System Relationship

systems under DOS (except those with a 6K supervisor, which does not support OLTEP).

You can test an I/O unit with minimum interference to other programs running on the system. Testing an I/O device ordinarily does not interfere with system input and output. Any unit being tested, except for direct access devices, must not be assigned to the foreground partitions. Direct access devices, however, may be shared.

An OLTEP user language defines and controls the test. With this language the user selects the devices to test, the test sections to run, and the options to exercise. He enters this information via the console device or in the form of control records in the job input stream. This information is referred to as the test-run definition, and is common to OLTEP components for all operating systems.

You can test multiple devices of the same type with no operator interventions other than those required for data protection and data security. OLTEP loads and executes the test sections one at a time until all the tests for one device are completed. The test sections then repeat for the next device if one is requested and is available. Testing continues in this manner until all units in the test-run definition are tested.

During testing under control of OLTEP, the system error recovery procedures are bypassed on the device being tested. OLTEP has built-in data integrity safeguards so that no data is destroyed and no protected data is accessed during testing.

OLTEP STRUCTURE

OLTEP requires a minimum of 14K in the background partition and 18K with RETAIN/370 active. Because all the OLTEP and On-Line Test (OLT) functions exceed this allotted space, transient modules are loaded and executed as needed.

The background partition is divided into four areas:

- OLTEP Resident: The OLTEP resident area (nucleus) consists of tables, pointers, and coding that must reside in main storage during OLTEP execution

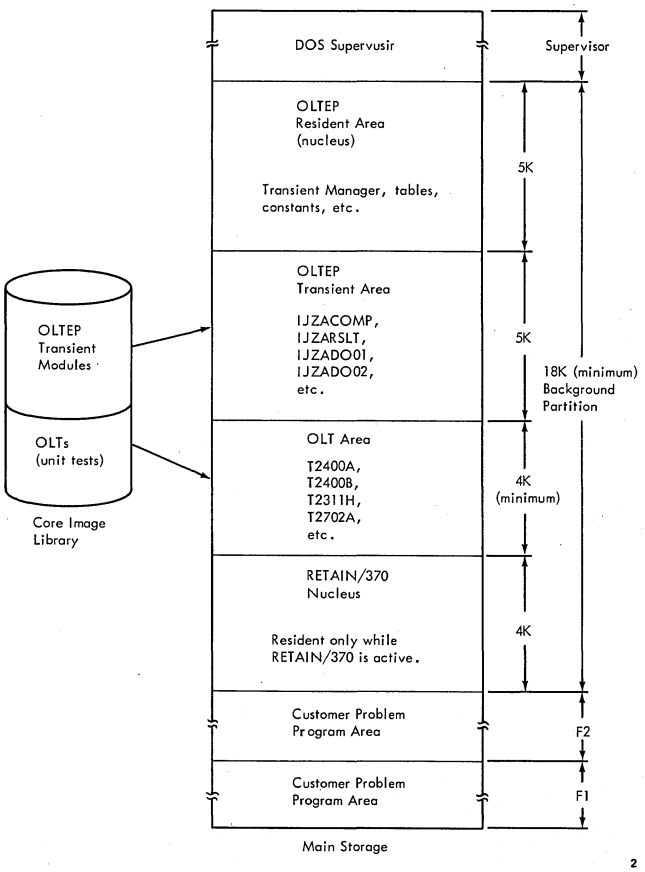


Figure 2. Storage Allocation

- OLTEP Transient: The transient area is reserved for modules that have limited use and need not be resident. One or more transient modules can be in main storage at a given time. These modules, when needed, overlay previously loaded modules that are no longer being used.

- OLT Area: One area of at least 4K is reserved for the OLT.

- RETAIN/370 Interface (REI): The RETAIN/370 interface, when active, occupies the last 4K of the background partition.

ON-LINE TESTS (OLTS)

OLTs are called into main storage for execution by the scheduler portion of the OLTEP nucleus. Tests normally do not exceed 4K. However, those that do are loaded if the allotted background partition is large enough. If an OLT requires greater than 4K and there is not sufficient space for the OLT, OLTEP generates a message and proceeds to run the next OLT (if any).

OLTEP allows the OLT to be divided into a root segment and associated test modules. Although the root segment must remain in main storage for the duration of a particular test, the supporting test modules can be loaded from the core image library as they are needed.

Information about individual tests appears in the writeup that accompanies them.

> Note: Device tests for tape that are run under OLTEP are for the physical device itself rather than for any control unit to which a device may be attached.

OPERATOR COMMUNICATION

OLTEP gives the operator maximum control in running the tests. If a console device is assigned to the system and you do not choose to enter the test-run definition by card, you can establish a communications interval. Once the communications interval is initiated, OLTEP issues a message requesting you to enter the test-run definition. At this time, you can enter or change the testing procedure or end the test by entering CANCEL. The four methods of initiating a communications interval are:

1. The initial communications interval automatically occurs when OLTEP is first called in, unless the test-run definition is entered by card. At this time, the initial test-run definition is entered.

2. You can invoke an interrupt communications interval by pressing the interrupt key on the console.

3. The first-error communications interval occurs when an error is encountered during a test. The operator can suppress it by entering NFE (No First Error) as an option in the test-run definition.

4. The test completion communications interval automatically occurs when the specified testing procedure ends.

DATA PROTECTION

OLTEP assumes much of the responsibility for the protection of customer data. The data protection modules within OLTEP protect customer files and storage during the on-line tests. Objectives of the data protection modules in the order of their priority are to:

1. Protect customer data.

2. Allow effective testing within constraints of data protection.

3. Minimize manual interventions.

All requests for device testing are channeled through the data protection modules. The following sections show the data protection measures invoked for specific device types.

All Devices

A device ready check is performed on all devices to satisfy the ready requirement for the tests and to allow execution of the data protection checks. If the device is not ready, a message containing sense information and the channel status word (CSW) is issued. The operator is then given options to control further testing of the device.

> Note: For a detailed description of the messages and replies, see the DOS OLTEP publication listed in the Preface.

Tape Devices

Before a tape device is tested, OLTEP makes three checks:

1. Standard Label. OLTEP checks for a standard label to ensure a test volume is mounted. If a standard label is not recognized, OLTEP checks for a standard label in ASCII mode. If a standard label is not recognized at this time, a message is issued stating that a nonstandard labeled tape is mounted. The operator is then given the option to bypass the test, retry the test after mounting a different tape, or to proceed testing with the tape that is mounted.

   Note: If no bit pattern is read (tape is new or clean), OLTEP will read to the end of the reel, rewind, and retry. To avoid this, some bit pattern must be written on new or clean tapes.

2. Security. OLTEP checks the security byte in the header. If on, a message is issued stating the volume cannot be used as a scratch. The operator can bypass the test or retry the test after mounting a different tape.

3. Expiration Date. The expiration date is checked to determine if it has expired. If it hasn't, a message is issued stating the volume cannot be used as a scratch. Options are then available to bypass the test, retry the test after mounting another tape, or to proceed testing with that tape.

When testing of a tape device is completed or discontinued, and a standard label has been successfully read before testing, OLTEP rewinds the tape and writes a standard label. The following records are written:

VOL1	Volume S/N	70 bytes of zeros
HDR1	48 bytes of zeros	01	27 bytes of zeros

OLTEP does not attempt to write a label if a standard label was not read at the beginning of the test.

Unit Record Devices

The device ready check is the only data protection task performed on unit record devices.

Direct Access Storage Devices

The device ready check is the initial data protection task performed on all direct access devices. If the device is ready OLTEP determines the type of DASD being tested, and performs the data protection tasks for that device type.

IBM 2311 OR IBM 2314

A read command is issued by OLTEP to read the volume label. If the volume label is a standard label, a check is made to determine if the volume is security protected. If the volume is security protected, the volume cannot be used as a scratch volume and you are given the option to bypass or retry. If the volume is not security protected, a check is made to determine if the volume serial number is CEPACK. If it is not a CE pack, you are given the option either to bypass the test retry after mounting a different pack, or proceed testing in the file protect mode (FPM) with the pack that is mounted. If the volume serial number is CEPACK and is not security protected, testing is allowed to proceed in non-file protect mode unless the volume is shared with another partition. In this case testing proceeds in FPM.

Note: System protection of system secure data sets is bypassed and system secure data sets may be destroyed if the volume is not security protected.

IBM 2321

If the device to test is an IBM 2321, a message is issued asking if a CE volume is mounted in bin 0 of the device. A NO reply bypasses testing of the device. If the reply is YES, OLTEP ensures that the CE volume is mounted, then turns control over to the test section. If OLTEP finds that the volume mounted in bin 0 is not a CE volume, it gives the operator the option to bypass the test, or retry the test after mounting a CE data cell.

Space Allocation

Before write testing is performed on a direct access device, OLTEP issues a message asking if volume data can be destroyed. If the reply is YES and the

device is not shared, testing proceeds in non-FPM. Otherwise, testing proceeds in FPM.

Note: If testing is in non-FPM, the test section may reformat the volume. Reformatted volumes are not recognized as usable by the operating system.

File Protect Mode (FPM)

File protect mode allows testing of a direct access device without obtaining or destroying volume data. While in FPM, OLTEP scans the channel program for any Write or Read Data commands that violate data security or protection. OLTEP can perform only a limited test when operating in this mode.

Non-File Protect Mode (non-FPM)

When operating in non-FPM, OLTEP allows the test to perform Write and Read Data operations on the device. Cylinders in the CE volume are allotted for this function. The same cylinders are used on both CE volumes and scratch volumes.

ACCESSING OF ENVIRONMENTAL RECORDING DATA

OLTEP can retrieve records from an environmental recording data set (Error Recording Environmental Procedures (EREP) history tape) for use by the OLT. Record types that can be accessed by the OLT are:

OBR Outboard recorder.
CHI Channel inboard.
CPU CPU machine check.

Upon receiving a request from the OLT for this information, OLTEP checks to determine if the EREP history tape is mounted. If not, OLTEP requests the operator to mount the tape on a free device and enter the device address. You must assign this device to the background partition, but you must not include it in the test run definition.

The history tape is searched sequentially beginning from where the last record was retrieved. However, if the RESET=YES parameter in the LOGSCN macro is specified in the LOGSCN macro expansion, the search always starts at the beginning of the data set.

TIMING TEST PROGRAMS

Timing test programs require the interval timer to make calculations If the interval timer is not available on the system or is not operative, OLTEP issues a diagnostic message, and schedules another test. If a timing test is run in a multiprogramming environment, the performance of any foreground program can be affected.

These restrictions apply to timing test programs:

- Timing tests cannot be performed on units attached to the multiplex channel (channel 0).
- Timing tests cannot be performed when time dependent devices (teleprocessing and/or magnetic character reader - MICR - devices) are operating within the system.

Diagnostic messages are printed if the timing test is attempted under these conditions, and the operator can then enter another test procedure

Note: Timing test programs apply to System/360 Models 40 and larger. If an attempt is made to run a timing test on a Model 30, the test program issues a diagnostic message, and control returns to OLTEP.

SVC 46 DOS-OLTEP SUPERVISOR CALL

The SVC 46 was designed for DOS OLTEP When it is issued the supervisor checks that the request originates from the background partition. It then checks for OLTEP running in the background, by testing the OLTEP bit in the background communication region extension. This bit is set by a B-transient, $$BOLTEP, called by the OLTEP initializer (IJZADOLT).

By issuing the SVC 46, OLTEP is put into the supervisor state and is then able to issue privileged instructions or store data into the supervisor area. At the initial issuance of the SVC, register 1 contains an entry point in OLTEP, and register 7 contains an entry point into the supervisor, which is used to exit from the supervisor state. At the second issuance of the SVC, register 1 contains zeros. This forces task selection.

RETURN CODE USAGE

Because OLTEP is a multiphase program, it must communicate between modules. Also, the results of operations requested by the OLTs must be passed back from OLTEP. To accomplish this, the expected results have been equated to hex codes. These hex codes are returned via general purpose register 15 for examination by the requesting phase.

REGISTER CONVENTIONS

Registers 0, 1, and 14, 15 can be used by the unit test but the contents will be destroyed by various macros.

Registers 4, 5, 6, 7, 8, 9, 10, 11 can be freely used.

Register 12 must be reserved for an additional base register.

Note: The CC set by an instruction is not preserved through a macro call.

General register conventions of the operating systems are observed. They are:

GR	Usage
15,0	Supervisor parameter registers
1	Parameter list register
13	Pointer to save area
14	Return register
15	Entry point register

In addition, the following OLTS convention must be observed:

GR	Usage
2	Pointer to section control table (set by INTLZE macro).
3	First base register of CSECT, established as base register by the INTLZE macro instruction.
13	Must point to save area when issuing a MACRO call.
15	Return code register.

RETAIN/370

With the RETAIN/370 feature of OLTEP a remote specialist can control and obtain the results of the on-line tests. When the RETAIN/370 interface is active, OLTEP provides a communications path between the on-site customer engineer and the remote specialist via the remote analysis center.

Requirements and detailed operating procedures for RETAIN/370 are found in DOS OLTEP, GC24-5086.

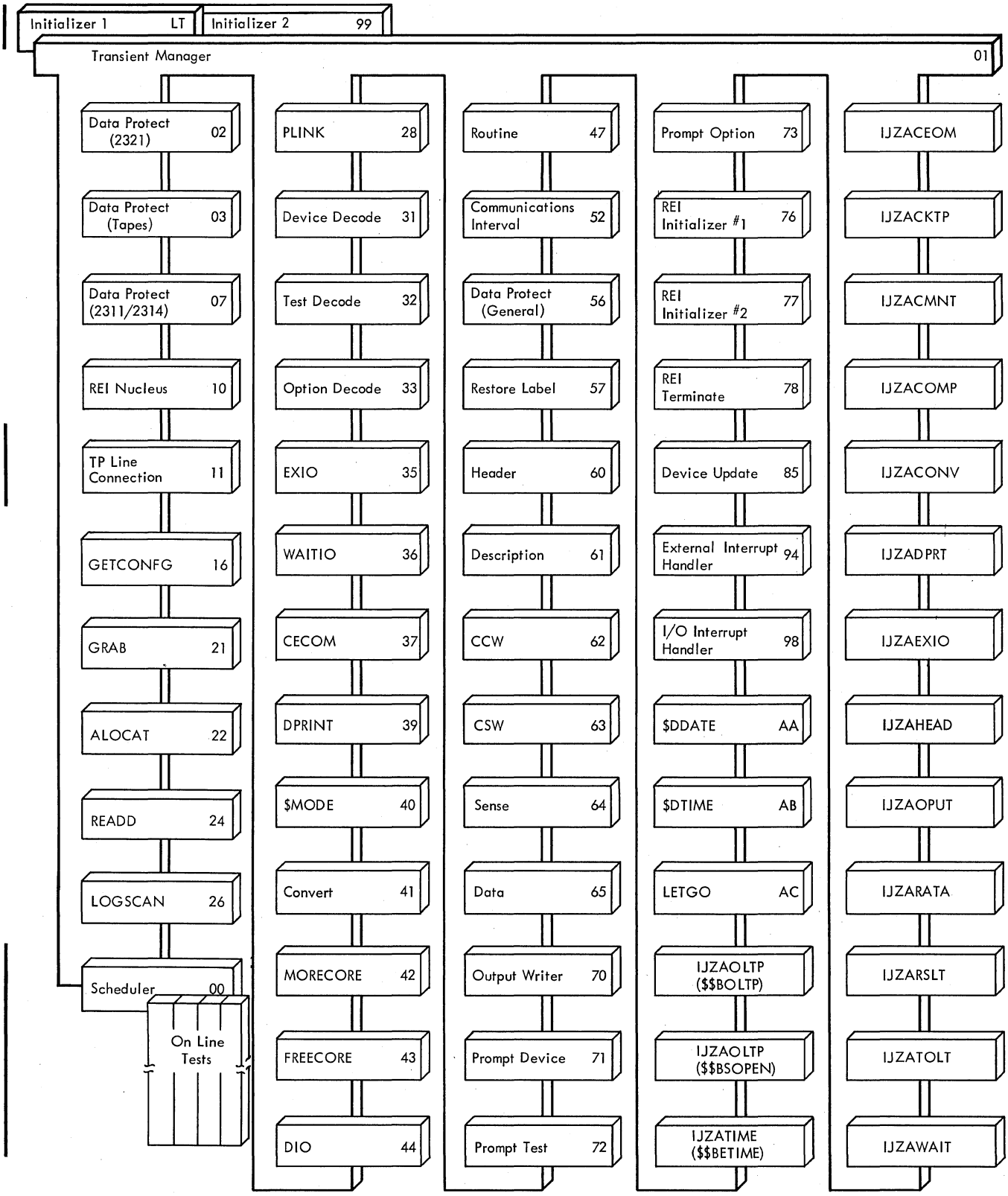
The primary modules that perform the basic functions of OLTEP include:

1. Initializer (IJZADOLT).
   - Sets up common area.
   - Initializes switches.
   - Issues OLTS RUNNING message.
2. Transient Manager (IJAZADO01).
   - Loads requested modules and passes their entry point to the requester, or enters them as requested
   - Remains resident, maintains a table of transient modules available in the transient area.
3. Communications Interval (IJZADO52).
   - Issues the ENTER DEV/TEST/OPT message.
   - Analyzes the operator's preliminary response.
4. Data Protection.
   - Performs the necessary data protection tasks, on the test device, to ensure the customer's data is not destroyed.
5. Scheduler (IJZADO00).
   - Loads the requested OLT
   - Returns control to the communications interval module after all the specified devices have been tested.
6. DECODE Modules.
   - Decodes the reply to the ENTER DEV/TEST/OPT message.

The phases that make up OLTEP are of a transient nature. That is, they are called in as needed. A phase may be requested at different times by different phases. Thus to ensure efficiency of core and to prevent reloading a loaded phase, all phases are loaded and monitored via the transient manager. The transient manager is a resident phase once it is loaded by the initialization of OLTEP.

All the desired on-line tests are scheduled and loaded via the scheduler Figure 3 shows the relationship of the OLTEP modules.

The detailed module descriptions that follow are in the order they are initially entered.



NOTE: The (--) in IJZADO-- can be replaced by the two numeric characters in the right corner of the block to obtain the corresponding phase name.

3

Figure 3. OLTEP Hierarchical Chart

IJZADOLT: Initializer 1 Chart AA

OBJECTIVE: Identifies to the DOS Operating System that OLTEP is active. It then issues message E102I (OLTS RUNNING) to both the SYSLOG and SYSLST DEVICE. A calculation of the size of the BG partition is then made. If the BG partition is less than 14K, message E232I is issued along with a System EOJ. Otherwise, control is passed to the Initializer 2 module (IJZADO99).

ENTRY POINT: Label AEZADOLT.

EXIT:

1. To module IJZADO99 when BG partition size is 14K or greater.
2. To System EOJ when BG partition size is less than 14K.

EXTERNAL ROUTINES:

1. System EXCP to issue the message.
2. System EOJ to terminate OLTEP.
3. System LOAD to load module IJZADO99.
4. System COMRG to identify address of BG partition.

INPUT: None.

OUTPUT: The registers passed to the Initializer 1 module identify the size, beginning address, and highest location of the BG partition. The messages are: BG E102I and BG E232I.

METHOD: The initializer module (IJZADOLT):

- Saves the caller's register.
- Establishes base registers for OLTEP.
- Obtains the background partition's communication region address, and saves it in the DOS-OLTEP common area.
- Sets the OLTEP bit in DOS communication region.
- Issues the OLTS RUNNING message via an EXCP.
- Obtains the background partition size from the DOS communication region, deducts the OLTEP size (14K), and places the remainder in the Section Control Table (SCT), which resides in the OLTEP common area. This is used for the OLT and its MORECORE requirements.

IJZADO99: Initializer 2 Chart AB

OBJECTIVE: Performs basic initialize functions necessary to DOS-OLTEP execution after OLTEP is loaded and control is passed to OLTEP. Switches are set, the message OLTS RUNNING is issued, and preliminary checks are made of the DOS features present relevant to OLTEP execution.

ENTRY POINT: Label EPZADO99.

EXIT: To communication interval module. IJZADO52.

EXTERNAL ROUTINES:

1. System EXCP to read card entry information if available and to issue message E240I.
2. System GETIME macro to get time of day information.
3. GETCONFIG (IJZADO16) to the CPUCDS.
4. System STXIT to get the address of the STXIT module.

INPUT: The reply to message BG 04E105D if made by card entry.

OUTPUT: The reply to message BG 04E105D. The following message is issued: E240I.

METHOD: The initializer module (IJZADO99):

- Determines if the STXIT facility option is available and, if so, provides for abnormal termination and operator communication handling in accordance with this facility.
- Sets a flag in the SCT to show quiesce mode as active.
- Obtains CPU descriptor information via the GETCONFG macro, and places that information in the OLTEP common area.
- Determines if the timer is available for OLTEP use, and sets a switch in the OLTEP common area if it is.
- Determines if a 1052 is available.
- Determines if card input is desired for DEV/TEST/OPT entry and, if so, provides for a read of one card.
- Issues an SVC 46 to store the address of the external interrupt handler in the supervisor.

IJZADO01: Transient Manager Chart AC

OBJECTIVE: Handle all transient module linkages.

ENTRY POINT: EPZADO01.

EXITS:

1. Exit to the called module via register 15, if the load was successful on a call.
2. Return to the caller via register 14, if the load was successful on a load.
3. Exit to communication interval (IJZADO52), if an external interrupt is encountered.
4. Return to caller with a return code of X'04' if module load fails.

EXTERNAL ROUTINES: LOAD (System).

INPUT: Pointer to parameter list (Register 1).

OUTPUT: Return code of X'04' if module load fails.

METHOD: When a module is requested, the transient manager first checks the Module Control Table (MCT) to determine if it is already in main storage. If it is, the LOAD is bypassed, and control is given to it. If the requested module is not in main storage, it is loaded and the MCT is updated.

If an external interrupt is encountered, the previous request is ignored, and the communication interval module (IJZADO52) is loaded.

IJZADO52: Communication Interval Chart AE

OBJECTIVE: Communicate between operator, remote specialist, and OLTEP for the purpose of defining, changing, and terminating the testing sequence and obtaining a dump of the OLT's partition.

ENTRY POINT: At label EPZADO52 from the scheduler (IJZADO00) or the initializer 2 (IJZADO99).

EXITS:

1. A system EOJ is issued on a CANCEL request.
2. IJZADO31: If the DEV entry is used
3. IJZADO32: If no DEV entry and a TEST entry is used.
4. IJZADO33: If neither the DEV nor TEST entry is used.
5. IJZADO76, REI Initialize #1: If REI is entered.
6. IJZADO78, REI Terminate: If STOPREI is entered.

INPUT: The reply from the message

01E105D ENTER DEV/TEST/OPT

or control statement if card input is used

OUTPUT: Pointers to slashes, prompt messages, messages E106I, E108I E105D E112I, E161I, E166I, E199D, E226I, E242I

EXTERNAL ROUTINES:

1. CECOM (IJZADO37) to issue messages.
2. Prompt Dev (IJZADO71) to print examples of the device field.
3. Prompt Test (IJZADO72) to print examples of the test field.
4. Prompt OPT (IJZADO73) to print table of options
5. PDUMP macro to dump OLTs partition.
6. Option decode (IJZADO33) is called to format and issue message E107I.

METHOD: A check is made to determine if input is on cards. If so, the control statement is decoded. If input is via the console, a check is made to determine if the console is available. If not, an exit is taken to IJZADO57 after issuing message E226I to SYSLST. If the communication interval was not initiated by the remote specialist, the 01E105D message (ENTER DEV/TEST/OPT) is issued via the CECOM module (IJZADO37). The operator or the remote specialist may now enter the device(s) to test, the tests to run, and the testing options, or they may communicate with each other. If communication is neither onsite nor remote an exit will be taken to the appropriate decode module to set up or change the test

conditions. Otherwise, the 01E105D message will be reissued. Acceptable operator entries and resultant actions taken are as follows:

Operator Entry	Action Taken
CANCEL	A system EOJ is issued.
DUMP	OLTEP and the OLT area are dumped on the SYSLST device.
PROMPT XXX	Exits to the prompt module requested and prints examples of the device, test, or option entries.
DEV/TEST/OPT	Check to determine if three slashes were entered. If not, an error message prints and the E105D message is reissued.
REI	Exit to the REI Initialize #1 module (IJZADO76).
STOPREI	Exit to the REI Terminate module (IJZADO78).
TALK	Signifies dynamic CE communications is requested.

If this is the initial entry, a test is made to determine if the device and test are specified. If not, an error message prints, and the 01E105D message is reissued. If both device and test were specified, the device decode module is called, and the fields are checked for validity. The device decode module exits to the test decode module to determine the tests to be run. The test decode module exits to the option decode module to determine the options to select. If there are any invalid entries in any field, this module is reentered at label IJZADO52, and the 01E105D message is issued again. If all the entries were valid, the option decode module exits to the scheduler (IJZADO00).

If this is not the first entry, any or all fields can be omitted. Entries made in the previous run are used in place of omitted entries. If a field is not present, its corresponding decode module is not entered, except for the option decode module, which is entered if neither the DEV nor TEST entry is used.

IJZADO57: Restore Label Routine Chart AG

OBJECTIVE: This module is called to restore the labels of any standard labeled tapes that were used in testing if either all tests have been run on all devices, or testing has been terminated early for some reason. Note that when SOSP is the active OLT, the tape labels are not restored. The procedure to restore tape labels is to search the device table entries with the standard label bit on, and write standard labels on the proper tapes using the volume serial numbers saved in the device table This module also disables all enabled TP lines.

ENTRY POINT: EPZADO57.

EXIT: Return to caller via GPR14, or to OLT if it has a cleanup routine

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).
2. CONVERT (IJZADO41)
3. Macros: EXCP, WAIT, CCB RETURN

INPUT: The device entry table in the common area is used as the information source. $EOJFLAG indicates EOJ should be issued. $EXOUTFG indicates a check for OLTs cleanup.

OUTPUT: Messages: E137I, E139D, E174I, E199I, E414I.

METHOD: This module searches the device table for entries with the standard label bit on, and restores a standard label with the same volume serial number that it had when the test started. If the device is not a standard label, the next device (if there is one) undergoes the same test The previous status is then cleared and a sense is performed. The module then checks if the device is file protected or if intervention is required. If either condition exists, an error message is issued. If the tape is not file protected or intervention is not required, the tape is rewound. A test is then made to determine if SOSP is active. If it is, the label is not restored and the pointers are updated to the next device. Otherwise, the label is restored and pointers are updated If the restoring of the tape label is unsuccessful, the module issues message E174I which indicates that the label was not restored. A test is then made for a sense. If sense was not detected, it performs a sense. In either case, message E137I is printed if a console is available If a console is not available, the next device is tested. If message E137I was

printed, then message E139D is issued requesting to bypass or retry restoring the label. If bypass is specified, the pointers are updated to the next device. If the retry option is entered, a sense is performed and the label is attempted to be restored.

Message E199D is issued if a valid option is not selected. This indicates that an incorrect reply was made and that a valid reply is needed. Each time the device pointers are updated, a test is made to determine if the last device has been encountered. After the last device has been tested, a check is made to see if line connection has been invoked. If it has, message E414I is issued and all enabled lines are disabled. In either case, control is returned to the caller.

IJZADO31: Device Decode Chart AH

OBJECTIVE: Decode the data entered in the device field of the reply to the BG E105D message.

ENTRY: EPZADO31.

EXITS:

1. Test decode (IJZADO32).
2. Communications interval (IJZADO52), if there is an error.

EXTERNAL ROUTINES:

1. Output writer (IJZADO70), to issue messages.
2. CONVERT (IJZADO41), to convert the entry from EBCDIC to hex.
3. GETCONFG (IJZADO16), to access the configuration data set (CDS).
4. CECOM (IJZADO37).
5. Restore tape labels (IJZADO57).

INPUT: Reply to message

01E105D ENTER DEV/TEST/OPT/

OUTPUT: Device addresses and/or symbolic names are put into the device entry table along with CDS information. Messages: E108I, E110I, E111I, E127I E161I, E165I E234I.

METHOD: A check for the origin of the entry is made to determine if the entry is from the onsite operator or the remote specialist. (Note that the only valid response from the remote specialist is '.NDR/'. Any other entry causes message E165I to be issued.) If there is either a valid entry from the remote specialist or from the onsite operator, module IJZADO57 is called to restore any tape labels. The device field is now ready to be decoded and a check for '.NDR' is made If present, control is given to IJZADO32 (Test Decode) Otherwise, a check for channel entry, symbolic name, or unit address is made If none are present, messages E108I and E161I are issued and IJZADO52 (Communication Interval module) is called If the device is valid, it is moved into the device entry table. A check for more devices is then made and the routine is run once more If there are too many devices, message E110I is issued and module IJZADO32 is called If there are no valid devices, message E111I is issued and module IJZADO52 is called. The presence of one of the following in the device field is verified:

1. DDDDDDDD. Indicates a symbolic name of from 1-8 characters, the first of which must be A-Z, #, $, or @
2. .CHxxxx. Channel testing is desired xxxx is a unit address of from 3-4 digits beginning with a numeral 0-9
3. .NDR. No device required for testing
4. A three- or four-digit numeric followed by one of the following:
   a. Slash. End of device field and beginning of test field
   b. Dash. Another four-digit numeric follows defining a range of devices up to sixteen.
   c. Comma. Another four-digit numeric device address follows. Up to 16 four-digit numeric device entries are accepted, each separated by a comma.

If an incorrect entry is made, a message is issued describing the error, and the communications interval module (IJZADO52) is entered. Only one entry from the remote operator is allowed: .NDR.

IJZADO32: Test Decode Chart AK

OBJECTIVE: Decode the data entered in the test field.

ENTRY POINT: Label EPZADO32.

EXITS:

1. Option Decode (IJZADO33).
2. Communications Interval (IJZADO52) on an error condition.

EXTERNAL ROUTINE: The output writer module (IJZADO70).

INPUT: Reply to message

01E105D ENTER DEV/TEST/OPT/

Tables and workareas:

1. B32TMSK - 8 bytes used to set masks.
2. T32BLE - 27 bytes used for converting alphabetic characters to numeric values.

OUTPUT:

- Routine bits set in SCT.
- Section IDs in the test table.
- Highest routine name in common.
- Messages: E112I, E155I, E161I.

METHOD: A test is made on the first entry flag, then the information entered between the first two slashes is checked for:

1. Slash. Indicates use of the same tests as indicated in the previous test run definition (invalid on first request).
2. Alphabetic character. A test is made to determine if the first character is alphabetic. If so, the test field is checked for:

   a. SOSP entry (SOSPA, SOSPB, TSOSPA, TSOSPB). Indicates the running of a special purpose OLT.

   b. Valid alphabetic prefix (N, P, R, or T).

      Note: If entry is not a SOSP entry but contains a valid prefix, the next four characters are checked. A four-digit numeric following in this position denotes test type.

3. Four digit numeric. Indicating the test type and followed by:

   a. Slash. Indicates run of all available test within section range A-Z.

   b. Alphabetic character. Indicates a test section to be run followed by:

      (1) Slash. End of test field.

      (2) Dash. Another alphabetic character follows to establish a range of test sections to run. The second alphabetic character can be followed by:

         (a) Slash. End of test field.

         (b) Comma. Another alphabetic character designating another test section is to run.

      (3) Comma. Indicates additional test field entries follow. These can be:

         (a) Alphabetic character. Another test section to run (up to 26 single character entries separated by commas are accepted)

         (b) Numeric character. Routine in the section immediately preceding the comma is to be run. This can be followed by:

            - (Dash). Another numeric character follows designating a range of routines to be run (must not exceed 255).

            , (Comma). Another numeric character follows designating another routine within the section to be run.

Notes: Where routines are requested, only one test section is allowed in the test field entry. Finally, the program checks to ensure that the field is terminated by a slash. A mask of X'FF' is set after the last entry to mark the end of the test table. The device initial entry switch is reset in this module. A valid section entry can be up to three alphabetics (ZZZ).

IJZADO33: Option Decode Chart AN

OBJECTIVE: Decode the data in the option field.

ENTRY POINT: Label EPZADO33.

EXITS:

1. Normal. IJZADO00, or old on line test. The program checks to determine if this is a communication interval during the execution of an old OLT and that neither a device change nor test change is desired. If these conditions are met, control is given to the old OLT. Otherwise, exit is to the scheduler.

2. Error. When an error occurs, the appropriate message is issued. Control is given to IJZADO52.

EXTERNAL ROUTINE: CECOM (IJZADO37).

INPUT: Reply to message

01E105D ENTER DEV/TEST/OPT/

OUTPUT:

1. Option bits in SCT.

2. Messages: E107I, E115I, E161I, E176I.

METHOD: This module checks the information entered in the option field for:

1. Slash. Indicates no options are being entered. In the initial test run, the default options are supplied. Thereafter, unspecified options are selected according to the previous status.

2. Alphabetic characters Represent the options:

TL (value)	NTL	Test loop
EL (value)	NEL	Error loop
EP	NEP	Error print
CP	NCP	Control print
PP (x)	NPP	(where x=level 0,1,2 or 3) Parallel print
FE	NFE	First error communication
MI	NMI	Manual intervention
PR	NPR	Print
RE	NRE	Remote
EXT= Followed by up to 56 characters which are placed in an area adjacent to the PASSON area of the OLTEP nucleus. EXT= must be entered last in option field.		
Commas		Separating the options.

The option bits in the Section Control Table (SCT) are set and reset in accordance with entries in the option field.

Notes: The test and option initial entry switches are reset in this module. If a slash occurs in the option field, the default values are used on the initial entry. MI and RE are mutually exclusive options and, if selected together, a message is printed and control is passed to the Communications Interval module (IJZADO52).

IJZADO00: Scheduler Chart AP

OBJECTIVE: Schedule testing of those devices entered in the device field of the DEV/TEST/OPT entry.

ENTRY POINT: Label EPZADO00 normally, or label S00DTERM when entered from the DTERM macro.

EXITS:

1. To the OLT entry point.

2. To the communications interval module (IJZADO52) after all devices are tested.

3. To the REI Initialize No.2 module (IJZAD077).

EXTERNAL ROUTINES:

1. Data protection (IJZAD056).
2. Convert (IJZAD041).
3. CECOM (IJZAD037).
4. Device update (IJZAD085).
5. LOAD (System).

INPUT: Tables and workareas.

1. Device Table.
2. Section List Table.
3. Switches in Common Area.
4. Section Control Table.
5. Section Preface in OLT.

OUTPUT: Messages: E117I, E127I, E158I, E198I, E201I, E225I, E227I, E231I, E238I, E239I.

METHOD: After performing standard linkage, the scheduler initializes device and test table pointers, resets bits possibly set for previous sections, and loads the section indicated by the section pointer. Next the current device is checked for a Configuration Data Set (CDS). When symbolic naming is indicated in the device field, messages E158I, E127I, and E231I will specify both the unit address and symbolic name. If the device has a CDS, the scheduler calls the data protection module (IJZAD056). Note that if SOSP is the active unit test and CDS information is not available, the device update module (IJZAD085) is called to obtain the device descriptors. If the device does not have a CDS and the test just loaded is a new section, an error message is printed, and the test pointer is updated. If the test just loaded is an old section, the scheduler branches to a subroutine, which places the device description for this device in the SCT.

The local-print-only bit is set so that data-protection messages do not go to the remote location. The data-protection module (IJZAD056) is then called to perform the necessary checks on the device. On return from the data protection module, the scheduler checks the status of the device, and resets the local-print-only bit. If it did not pass the data protection checks, the device pointer is updated. If it did pass, the primary device flag for this device entry is set in the device table, a LUB pointer to the PUB is set up, and the first eight bytes of device descriptors are moved into the SCT. If the current test section is new, two checks are made before checking the error count. First, the predicted OLT size (in the section preface) is checked against core available. If the OLT is too large, an error message is printed, the test is bypassed, and the section pointer is updated. Next, device descriptors are checked against the OLT requirements (in the Section Preface). If the two do not match, an error message is printed, the test is bypassed, and the test section pointer is updated. The OLT error count is moved to the SCT and then overlaid by the FE loop on error count if one was specified.

The following initialization takes place before branching to the OLT:

1. The device and section pointers are stored in the common area
2. The OLT entry point is placed in register 15.
3. The parameter list pointer is placed into register 1.
4. The pointer to the scheduler return coding in the common area is placed into register 14.

When the scheduler is entered at label S00DTERM, it resets the grabbed bit for every entry in the device table, clears MORECORE and FREECORE pointers, loads the current device and section pointers from the common area, and checks for three possible error conditions:

1. A two/way CECOM was issued with no console available. In this case an error message is printed, no terminate message is printed and the section pointer is updated.
2. The current test was bypassed for some other reason, and an explanatory message has preceded the call of the scheduler return. An additional message is printed by the scheduler return (S00DTERM) and the section pointer is updated.
3. Not all selected routines were run In this case, an error message is printed. If REI is being initialized, no other tests are allowed to start.

Following the last two checks, the terminate message is printed, unless No Control Print (NCP) was specified. If an error occurred during execution of the current section, an asterisk is added to the terminate message to indicate that testing has been completed with errors. An asterisk (*) is also placed before the T if the section is terminated by the operator/CE at an interrupt or first error communication interval.

If a device or test change was made, a branch is taken to the beginning of the scheduler where the pointers are initialized. If no changes were made, the test pointer is updated. Upon termination of a test section, the scheduler purges all outstanding I/O on test devices.

Each time the test pointer is updated, a check is made to determine if the last section in the table has been reached. If so, the section pointer is reset to the beginning of the table and the device pointer is updated. After all devices are tested, control goes to the communication interval module (IJZAD052), unless Test Loop (TL) was specified in the option field. In this case, the device and test pointers are reset, and the entire cycle is repeated the number of times indicated.

IJZAD056: Data Protection (General) Chart AS

OBJECTIVE: Determine device type, check ready status, and call appropriate specific module for further data protection.

ENTRY POINT: EPZAD056.

EXITS: To the:

1. Data protection module for tape (IJZAD003).
2. Data protection module for 2311 and 2314 (IJZAD007).
3. Data protection module for 2321 (IJZAD002).
4. Caller if unit record or TP device.

EXTERNAL ROUTINES:

1. Convert module (IJZAD041) to convert binary data to EBCDIC before printing.
2. CECOM (IJZAD037) for two-way communications.
3. $$BSOPEN.
4. Macros: EXCP, WAIT, CCB

INPUT: Pointer device to be data protected.

OUTPUT: Messages: E024I, E130I, E137I E139D, E199D.

METHOD: If the device to be tested is shared (assigned to both background and foreground), a bit in the device table is set to indicate that testing can only proceed in file protect mode. If the device belongs exclusively to the background, full testing can be performed provided that it fulfills all other data protection requirements.

The next check is for ready status This is the only data protection task required for unit record or TP devices because input/output for these devices is external and pertains only to a particular test section with no exposure to destruction of permanent data. If the device being tested is a tape, IJZAD003 is entered. If 2321, IJZAD002 is entered If 2311, or 2314, IJZAD007 is entered

The data protection modules communicate with the Scheduler and the GRAB module by setting two bits in the device table.

1. Data protection bit:
   - OFF indicates testing of this device must be bypassed
   - ON indicates the device meets data protection requirements
2. File protect bit:
   - OFF. Full testing can be done on this device if data protection bit is ON.
   - ON. Test can only be run in file protect mode.

These bits are reset by the restore labels routine.

IJZADO02: Data Protection, IBM 2321 Chart AU

OBJECTIVE: Protection of customer data while allowing effective testing of the IBM 2321.

ENTRY POINT: EPZADO02.

EXIT: Return to caller via R14.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37 for two-way communications, and messages.
2. CONVERT (IJZADO41) to convert hex data to EBCDIC before printing.
3. $$BSYSWR.
4. Macros: EXCP, WAIT, CCB.

INPUT: Pointer to device entry.

OUTPUT: Messages: E126I, E130I, E131I, E132I, E137I, E139D, E140D, E199D.

METHOD: A message is issued asking the operator if a CE volume is mounted in bin 0. If his reply is NO, control is given back to caller, and testing of the device is bypassed.

If the reply is YES a sense command is issued first to bin 0, subcell 18, then to bin 0, subcell 19. The CE bit should turn ON when subcell 18 is sensed to indicate that a CE cell is mounted. The bit should reset when the sense to subcell 19 is made. If both sense commands are successful, caller is reentered, and testing is allowed in non-file protect mode (non-FPM).

Any failure in the sense commands prints a message indicating the failure, followed by the sense and CSW information. A message is then issued giving the operator the option either to bypass the test or to mount another cell and retry the sense commands.

IJZADO03: Data Protection, Tapes, Chart AV

OBJECTIVE: Protect customer data while allowing effective testing of tape devices.

ENTRY POINT: EPZADO03

EXIT: Return to caller via R14.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37) for two-way communications, and messages.
2. Convert (IJZADO41) to convert binary data to EBCDIC before printing.
3. Macros: EXCP, WAIT, CCB

INPUT: Pointer to device entry.

OUTPUT: Messages: E118I E119I, E122I E123I, E137I, E139D, E199D

METHOD: Full testing is allowed on tape devices if a standard labeled tape is mounted, the security bit is OFF, and the expiration date has expired. The standard label can be either EBCDIC or ASCII

If the tape label is unreadable, the following messages print.

- E118I UNREADABLE TAPE LABEL
- E137I SNS - XXXXX CSW - ZZZZZZ
- 04E139D REPLY B TO BYPASS R TO RETRY P TO PROCEED. (May destroy data.)

A bypass reply causes a return to the calling module. A retry reply causes the data protection checks to repeat. A proceed reply allows the tape to be used for testing.

If the security bit in the label is ON the following messages are issued:

- E122I VOL ON XXXX CANNOT BE USED AS A SCRATCH - SECURITY PROTECTED.
- 04E139D REPLY B TO BYPASS, R TO RETRY.

The bypass reply causes a return to the calling module. The retry reply causes the data protection checks to repeat

If the expiration date has not expired, the following messages are issued:

- E123I VOL XXXX CANNOT BE USED AS A SCRATCH - UNEXPIRED DATE.
- 04E139D REPLY B TO BYPASS, R TO RETRY P TO PROCEED. (May destroy data.)

If all the data protection measures are met or the proceed reply was given in response to the 04E139D message, the label is saved and control is returned to the caller. If a standard label was on the tape, a standard label with the previous volume serial is written by IJZADO57 at test completion.

IJZADO07: Data Protection, IBM 2311 and 2314 Chart AX

OBJECTIVE: Protect customer data while allowing effective testing of the IBM 2311 and IBM 2314.

ENTRY POINT: EPZADO07.

EXIT: Return to caller via R14.

EXTERNAL ROUTINES:

1. Output writer (IJZADO70) to issue messages.
2. CECOM (IJZADO37) for two-way communications, and messages.
3. Convert (IJZADO41) to convert binary data to EBCDIC for printing.
4. $$BSYSWR.
5. Macros: EXCP, WAIT, CCB.

INPUT: Pointer to device entry.

OUTPUT: Messages: E122I, E124I, E125I, E137I, E139D, E199D.

METHOD: When a unit to be tested is a 2311/2314, this module is invoked and an attempt is made to read the volume label. (If unsuccessful, there will be up to ten retries.) A check is made for a standard label (Volume 1). If a volume has a standard label and the volume security indicator is not X'F0' or X'00', the volume is considered secure; OLT accessing will not be allowed; and message E122I is issued. If the pack has a volume serial number of CEPACK and is not security protected, testing is allowed to proceed in non-file protect mode. If a pack has a standard label, but does not have a volume serial number of CEPACK and is not security protected, message E124I is issued and the file protect mode bit in the device table is set indicating that testing can proceed in file protect mode. If a volume does not have a standard label, message E125I is issued Whenever messages E122I, E125I, and/or E124I are issued, message E139D follows giving the operator the following three options:

1. BYPASS. Bypasses the testing of this device and returns to caller
2. RETRY. Reissues the read command after another pack has been mounted.
3. PROCEED. Returns to caller. Testing is restricted to File Protect Mode (FPM).

If the label was unreadable a message prints giving the sense and CSW information. This is followed by the bypass, retry, proceed message

The OLTEP primary modules, the OLT, or other support modules can call the support modules. These support modules are loaded into the transient area by the transient manager, and entry is made into the module or the entry point is passed to the caller as requested. They perform functions such as printing messages, converting data from hexadecimal to EBCDIC, etc. A detailed description of each of these modules appears in the following sections.

IJZADO10: REI Nucleus Chart BA

OBJECTIVE: Control REI input/output.

ENTRY POINT: EPZADO10.

EXIT: Return to caller.

INPUT: Messages from the remote location.

OUTPUT: Message to the remote location.

METHOD: This module is comprised of four parts:

1. This part is used only to relocate A and V type adcons. Because OLTEP can load the module at any address, the value for the constants cannot be defined until the module is loaded. An address is returned to the caller that serves as a base register when other modules require functions of the REI nucleus.

2. This part of the REI nucleus is the Interrupt Handler. Its address is put into the CCB, and DOS passes control to it when an interrupt is encountered. It determines from the CSW and sense information which CCW string is to be executed next. This information is then passed to the supervisor, or the CCB is posted.

3. (Input) This part of the REI nucleus retrieves messages from the remote location that are in the input buffer. The message is translated to uppercase EBCDIC and given to the caller.

4. (Output) This part controls messages to the remote location. Because the input messages are buffered and are not handled immediately, the remote location must be informed if all the messages were not accepted. Control returns to the caller.

IJZADO11: TP Line Connection Chart AX

OBJECTIVE: Performs line connection function for a teleprocessing test.

ENTRY POINT: EPZADO11.

EXIT: Return to caller.

EXTERNAL ROUTINES: CECOM (IJZADO37).

INPUT: CDS Address.

OUTPUT:

1. Return codes:

   00 = Line connection successful.
   14 = Line connection not performed.

2. Messages: E400I through E410I, and E412I through E414I.

METHOD: A bit in the CDS indicates that line connection is required. Line connection is then attempted, and if successful, a return code of '00' is sent to EXIO and no messages are issued. If there is insufficient or inaccurate information in the CDS, line connection cannot be performed. In this case, appropriate diagnostic messages and an error return code (X'14') is returned to the EXIO module. To generate the correct CCW chain, the sequence code in the CDS entry is examined. If an operator call is required, a message is issued to the operator. This message contains the telephone number (if it is specified in the CDS). An EXCP is issued to execute the CCW chain. System ERP's are bypassed and appropriate error recovery procedures take place in the module. Error conditions or time out are indicated by a diagnostic message. In the case of time out, the I/O request is purged and an error message code (X'14') is returned to the EXIO module. This indicates that line connection was not performed. If line connection is successful, the bit in the CDS requesting line connection is reset and a return code of X'00' is passed back to EXIO.

IJZAD016: GETCONFG Chart BE

OBJECTIVE: Locate and load the desired Configuration Data Set (CDS) into the location specified.

ENTRY POINT: EPZAD016.

EXIT: Return to Caller

EXTERNAL ROUTINES:

1. LOAD (System).
2. CONVERT (IJZAD041).

INPUT:

1. Buffer address, buffer size and address of CDS.
2. Local file (Phases IJZAC000-IJZAC999).
3. CE/customer (remote) file (Phases IJZAD000-IJZAD999).

OUTPUT: Return codes:

X'00' = Successful completion.
X'04' = Function not available.
X'08' = Buffer full or entry size greater than buffer size.
X'0C' = No entry found.

METHOD: The GETCONFG module obtains the desired CDS information specified by the caller. The first action taken by this module is to check the macro level. If correct, processing continues. Otherwise, a code of X'04' is returned to the caller. The module then determines if any CDS's exist in this system. If they do, processing continues. Otherwise, a code of X'0C' is returned to the caller. Now the module determines either if the caller has specified, through the parameter list, a desired CDS or if a default to the primary device is desired. This is done by testing the CDS ADDR parameter. If it is a zero, the default to the primary device is desired. If not zero, the caller has specified a desired CDS.

In the case in which the caller has specified a CDS in the CDS ADDR, a test is made to determine which type of CDS is desired. There are two general CDS's -- a local CDS family and a remote or Customer/CE defined CDS family. If a local CDS is specified (Byte 9, Bit 6 is off), the local CDS phases (IJZAC000-IJZAC999) are searched. If a remote or Customer/CE CDS is specified (Byte 9, Bits 4 and 6 are on), the remote file CDS phases (IJZAD000-IJZAD999) are searched.

In the case in which the caller has not specified a CDS, the default is to obtain CDS information for the primary device The primary device can be either a local CDS type or a remote or Customer/CE CDS type.

The GETCONFG module uses the same routine to search either of the two CDS files. This routine consists of loading the first phase of the CDS file into a buffer within this module. Then, the following sequence of testing is done:

1. The keyword 'NEXT' is issued which signifies that the end of the phase has been reached and the next phase is to be loaded.
2. The keyword 'LAST' is issued which signifies that the end of the CDS file has been reached without finding the CDS information. This condition results in a code of X'0C' being returned.
3. A check for the desired CDS information is made. If the desired CDS is found, a return code of X'00' is given if the caller's buffer is large enough to hold the CDS information. If it is not, a return code of X'08' is given.

IJZAD021: GRAB Chart BF

OBJECTIVE: Perform a search of the device table for the device to be used as a secondary device by the on-line test section.

ENTRY POINT: Label EPZAD021.

EXITS: Returns to the calling module

INPUT: Parameter list: $GRBTRMG, $GRBLEVL, $GRBIDNT, $GRABCDS, $GRABFLG, $GRABCLS, $GRABTYP, and $GRABCNT.

OUTPUT: Return codes:

X'00' = Successful grab.
X'04' = Facility not available.
X'08' = Device not found.
X'0C' = Only one device in entry list
X'10' = Device descriptors not available.
X'14' = CDS indicater predefined information available, but was not passed

METHOD: The grab module searches the device table for a secondary device starting at the entry following the last assigned secondary device, or the entry following the primary device (if no secondary device has been assigned). It scans to the end of the table, restarts at the beginning until a match or the starting point is found.

If there are no entries in the device table or if the GRAB macro is not compatible with the module, a code of X'04' is loaded into GPR15, the caller's registers are restored, and control returns to the caller. If there is only one entry in the device table, a code of X'0C' is loaded into GPR15, and control returns to the caller.

The program checks each device table entry to determine if the GRAB bit is on. Then it checks to determine if it is primary. Any of these conditions causes the next entry to be examined until the whole table is searched, or a valid device is found. Next, the device is checked against the requirements specified by the caller. If it doesn't match, then the search continues. When a device is found that meets all the specifications (and if the device may be grabbed) it sets the data protection bit and the grab bit in the device table, the SDBUPTR is updated and device descriptors (if available) are moved into the caller's buffer along with the device address. A return code of X'00' is set in GPR15, and control returns to the caller.

If data protection does not allow the device to be grabbed, then the next entry in the table is checked, etc until the whole table is searched.

If the whole table is searched without finding an appropriate device, a return code of X'08' is loaded in GPR15 and control passes to the caller using standard linkage.

IJZADO22: ALOCAT Chart BH

OBJECTIVE: Check to determine if write testing is allowed on a direct access device.

ENTRY POINT: EPZADO22.

EXIT: Return to caller.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).
2. CONVERT (IJZADO41).

INPUT: Parameter list: $ALTORMG, $ALTLEVL, $ALTINDT, $ALTCDSA, $ALTAMNT, $ALTFLGT, and $ALTFLAG.

OUTPUT:

1. Return Codes:
   X'00' = Successful Allocation.
   X'04' = Function not available
   X'10' = Space not allocated.
2. Messages: 04E120D and 04E199D.

METHOD: The local-print-only bit is set so that the remote location does not get any of the messages. The program then checks to determine if the macro level is version 2 or later. If not, a return code of X'04' is put in register 15, and control returns to the caller.

The program checks the CDS address to determine whether to use the device address in the SCT or the CDS. If scratch was specified, then the ALOCAT bit in the device table is reset, and a return is made to the caller with a X'00' in GPR15 If device is not scratched, or grabbed and not primary, an X'04' is returned.

If the FPM bit is OFF and if data protection has already been performed, the ALOCAT bit is turned on, and X'00' is returned to the caller in GPR15. Otherwise, the operator is asked if the data on the volume may be destroyed. If it may, the FPM bit is turned off, the ALOCAT bit is turned on, the local-print-only bit is reset, and control returns to the caller with an X'00' in GPR15. If data may not be destroyed or if the device is shared, a X'10' is returned to the caller in GPR15.

IJZADO24: READD Chart BJ

OBJECTIVE: Provide for the reading of a record from an external data set.

ENTRY POINT: EPZADO24

EXIT: Return to the OLT.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).

2. CONVERT (IJZADO41).

3. Macros: EXCP, WAIT, CCB.

INPUT: Address of data to be read.

OUTPUT:

1. Data that is read successfully.

2. Messages 04E230D, E236I, E237I and 04E199D.

METHOD: The local-print-only bit is set so that the remote location does not get any of the messages. The macro level is then checked to determine if it is version 2 or a later version. If it is not, a return code of X'04' is put in GPR 15, and control returns to the caller. The program then checks to determine whether card or tape is being used for input data. If the input is on card, OLTEP checks for the standard label (first two cards). If the data set resides on tape, it checks for a standard label. If no standard label is recognized, X'04' is put into register 15, and control returns to the unit test.

If this is a new file, message 04E230D is issued requesting a tape to be mounted on a free device. A 'NO' reply causes a return code of X'04' to be returned. If a tape is mounted, the device is checked to insure it is not a test device, and that it has a logical unit assignment. If the device is a test device, message E236I is issued. If the device does not have a logical unit assignment, message E237I is issued.

Next, the program checks the RESET and BACKSPACE parameters. If neither is active, the program builds and issues the READ macro. If there are no errors, the data record reads from tape or card and goes into the input buffer area provided by the unit test.

If an error is encountered while reading, control returns to the unit text with X'08' in register 15.

If the RESET parameter is active and if tape is the data input device, the tape is positioned to the beginning of the data set and control returns to the unit test. If the device is not tape, control returns to the unit test with X'04' in register 15.

If the BACKSPACE is active, the program checks to determine if the device is tape or card. If card, control returns to the unit test with X'04' in register 15. If tape is the data input device, the following checks are made:

- Absence of a backspace integer results in the default of one record to be backspaced.
- When the integer is from 1 to 255, the tape backspaces the number of records indicated by the integer.

At end of file, the program checks to determine if the data set is on tape. If it is, it positions the tape to the beginning of the data set, the local-print-only bit is reset, and control returns to the unit test with X'0C' in register 15. If the data set was not on tape, the local-print-only bit is reset, and control returns to the unit test with X'10' in register 15.

IJZADO26: LOGSCAN Chart BL

OBJECTIVE: Search the error recording data set history tape for the next sequential recording of the specified record, class, or device type.

ENTRY POINT: EPZADO26

EXIT: Return to caller.

EXTERNAL ROUTINES:

1. Output Writer (IJZADO70)

2. CONVERT (IJZADO41)

3. CECOM (IJZADO37).

4. Macros: EXCP, WAIT, CCB

INPUT: The parameter list passed by the LOGSCAN macro through register 1 is:

1. $LOGLEVL. Macro level.

2. $LOGSINA. The starting address into which the records specified are to read, or the register containing the address of the area into which the records are to read.

3. $LOGREC. Size of $LOGSINA.

4. $LOGSCLS. Device class (optional)

5. $LOGSTYP. Device type (optional)

6. $LOGDUAD. Device address

OUTPUT:

1. Return codes:

   X'00' = Successful read.
   X'04' = Logscan facility not available.
   X'08' = Read error.
   X'0C' = End of data set.
   X'10' = No record found.

2. Messages: 04E199D, 04E228D, E235I, E236I, E237I.

METHOD: This module searches error recording data set history tape for the next sequential recording for the specified record, class, or device type. If found, this recording is placed in the buffers supplied by the caller. Otherwise, it searches the sequential recordings until a match is found or EOF is encountered.

A table is constructed to convert the device class combined with the unit type into one byte of hex information called the device type. The local-print-only bit is set on during execution of this module.

IJZADO28: PLINK Chart BM

OBJECTIVE: Load and/or delete modules at the request of the OLT section.

ENTRY POINT: EPZADO28.

EXIT: Return to caller (OLT).

EXTERNAL ROUTINE: LOAD (system)

INPUT: Parameter lists that contain pointers to the names of the modules to load and/or delete.

OUTPUT:

1. List of entry points for modules loaded.

2. Return codes:

   X'00' = Successful.
   X'04' = Facility not available.
   X'08' = Error encountered.
   X'0C' = No module found
   X'10' = No space in main storage.

METHOD: The caller's macro expansion is checked for the correct level (2). If the level is wrong, a return code of X'04' is set into register 15, and control returns to the user. If the level is correct, the caller's request is examined. A request for a delete causes a return code of X'00' to be set and control to pass back to the calling OLT.

If a load is requested, the program tests to determine if the number of modules to be loaded is zero. If so, the return code is set to X'08', and control returns to the calling OLT section. A request to load a module that is too large for the available storage causes a return code of X'10' to be set before returning.

If the requested module is loaded, its entry point is placed into the caller's entry point list, and the return code set to X'00'. Control then returns to the calling OLT section. The OLT section is responsible for making sure it doesn't overlay the path back to itself

IJZADO35: EXIO Chart BN

OBJECTIVES: Converts the test section's request for an I/O operation into DOS format. When in file protect mode, the CCW chain is scanned for reads and writes.

ENTRY POINT: Label EPZADO35.

EXIT: Return to caller via GPR14.

EXTERNAL ROUTINE: TP Line Connection (IJZADO22).

INPUT: Parameter list: $XIOTRMG, $XIOLEVL, $XIOIDNT, $XIOTCBA, $XIOCDSA, $XIOCCWA, $XIOCCWC, and $XIOFLAG.

OUTPUT: Return codes:

   X'00' = EXCP issued.
   X'04' = Facility not available.
   X'08' = Device not available or TECB address missing, or device not primary, or not primary grabbed, or data protected, or device inoperative, or second CCB not available.
   X'0C' = DP error in CCW list parameter
   X'10' = Processed all requests except SENSE=NO.
   X'14' = Line connection requested but not successful.

METHOD: The program checks the macro level to determine if it is 2 or 3. If not, the caller receives control with a return code of X'04'.

If CDSADR is specified, the device address is picked up from the caller's CDS. If not, it is picked up from the SCT.

The device table is then searched by unit address or symbolic name until the right device entry is found or the end of the table is reached. If the device is not found a code of X'08' is returned to the caller.

If the correct device is located in the device table and, if it is already active or not grabbed or primary, a code of X'08' is returned to the caller. A LUB pointer to the PUB will already be set up by the Device Decode. This establishes a programmer-logical-unit name to be specified in the CCB (Command Control Block). If the device is flagged as active and a WAITIO has not been issued, a code of X'08' is returned to the caller. If the device is active and a WAITIO has been issued, a purge is required. SVC 25 is issued and the purge bit is reset. Then a check is made to determine if CCB1 or CCB2 is available. If not, a code of X'08' is returned to the caller. If so, a pointer is set to the available CCB.

The first six bytes of the CCB are cleared. Further checks are made to determine if line connection is required. If so, the line connection module is called. If line connection is unsuccessful, a code of X'14' is passed back to the caller.

Next, the program checks the file-protect-mode bit in the device table. If it is on, the CCW chain is scanned for data protection violations. If any are found, a code of X'0C' is returned to the caller.

Next the CCB is built. The CCW address and LUB assignment are moved in and a return code of X'04' is set to indicate the existence of an OLTEP appendage. If ATTNIN=YES is specified, a bit is set in the device table. The active bit in the device table and a bit indicating the CCB in use are set. Another bit in common is set indicating that the CCB is in use. The CCW chain is then executed via the EXCP macro. Before returning to the caller a test is made to determine if SENSE=NO was specified. If it was, the return code is set to X'10'. Otherwise it is set to X'00'.

INPUT (PARAMETER LIST): TECB address, CCW address and count, CDS address (optional), Flag Byte (contains indicators to show if ATTNIN=YES, BUSY=YES, and/or SENSE=NO are specified).

IJZADO36: WAITIO Chart BP

OBJECTIVES: Provide the facility for a test section to wait for any interrupt, device end, or completion of an I/O operation initiated through EXIO or to poll to determine if an interrupt has occurrd as a result of an active EXIO.

It also provides the facilities to purge an outstanding I/O request or to give up control for a specified minimum period of time.

ENTRY POINT: Label EPZADO36.

EXIT: Return to caller.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).
2. CONVERT (IJZADO41).

INPUT: Parameter list: $WIOTRMG, $WIOLEVL, $WIOIPNT, $WIOTECB, $WIOCDS, $WIOFLAG, $WIOTIME.

OUTPUT:
Return codes:

X'00' = Event complete (WAIT=YES, POLL=YES)
DE occurred (WAIT=DE), Purge done (PURGE=YES).
X'04' = Function not available.
X'08' = WAIT timed out.
X'10' = Polled event occurred (POLL=YES)
Interrupt occurred (WAIT=ANY).
X'0C' = Program error (device not in table, not active, or TECB address is not equal to EXIO TECB address).

METHOD: The functions which the caller may request (via the parameter list) includes:

1. WAIT=YES -- a request of this function causes a check for event complete. If it has not yet occurred, a timing loop is set up for the number of seconds specified by the caller or a default of 30 seconds. Within the loop an interrogation is made to determine if the event is complete. Return codes are set as defined in OUTPUT above.
2. POLL=YES -- this causes a test to be performed to determine if an interrupt has occurred. Immediate return to the OLT is effected with a return code issued as specified in OUTPUT above.

3. WAIT=DE -- this function is the same as WAIT=YES except that control is returned to the caller on the occurrence of DE.

4. WAIT=ANY -- this function is the same as WAIT=YES except that control is returned to the caller on the occurrence of any interrupt on the specified device.

5. PURGE=YES -- I/O or device specified in the CDS is purged.

6. TIME=Integer(alone) -- control is returned to the OLT when the specified time has elapsed.

IJZADO37: CECOM Chart BQ

OBJECTIVE: Provide communications between the (OLT) unit test section or OLTEP and the operator.

ENTRY POINT: Label EPZADO37.

EXIT: Return to caller.

EXTERNAL ROUTINES: EXCP, WAIT, CCB.

INPUT: Address of parameter list in GPR1.

OUTPUT: All CECOM messages.

1. Return codes:
   X'00' = Successful.
   X'04' = Facility not available.
   X'08' = Error condition.
   X'0C' = Still awaiting reply.
   X'10' = Outstanding message (only one outstanding message allowed at a time).

2. Messages: E100I, 04E101D, 04E154D, E175I.

METHOD: For two-way communications, an outgoing message is moved from the caller's area to the operator communications buffer, and its byte count is placed in the output CCW. The message is then issued to the SYSLOG device via EXCP. An incoming message is read into the operator communications buffer and translated to uppercase. The message and its byte count are placed in the areas specified by the caller.

For one-way communications, an EXCP is issued.

All outgoing and incoming messages are also issued to the SYSLST device.

With RETAIN/370 active, all messages to the SYSLOG device also print on the remote specialist's console with the exception of OLTEP data protection messages. A reply code of '03' is available for communication between the onsite CE and the remote specialist. You can enter this reply at any communications interval without affecting the testing procedure.

Note: A pointer to a parameter list is supplied, in GPR1, by the caller. The parameter list contains four byte addresses of:

1. The out message and its byte count.

2. The in message and its byte count.

3. Flags.

IJZADO39: DPRINT Chart BS

OBJECTIVES: This module provides the means for handling print requests from test sections. It will:

1. Examine the parameter list for a line to print.

2. Determine if a line should be printed

3. Determine if the line should go to both the console device and output device.

4. Determine the types of messages to be issued and call the appropriate message formatting modules. They are: (A) Header, (B) Description or message (comments), (C) CCW/CC, (D) CSW (expected, received), (E) Sense (expected, received), and (F) Data (expected, received, written).

5. Do the above until all lines are printed.

6. Issue the first error and/or catastrophic error messages (if required) and exit to the communication interval.

7. Return to caller if communication is not required.

ENTRY POINT: Label EPZADO39.

EXIT: Return to caller or communications interval (IJZADO52).

EXTERNAL ROUTINES:

1. Communications Interval (IJZADO52).
2. Header Message (IJZADO60).
3. Description Message (IJZADO61).
4. CCW message (IJZADO62).
5. CSW message (IJZADO63).
6. Sense message (IJZADO64).
7. Data message (IJZADO65).
8. Output writer (IJZADO70).

INPUT: Pointer to a parameter list consisting of 4-byte pointers to the following information:

1. Control field -- Four bytes of flags indicating forms control, message levels, type of error, and type of data.
2. Message list -- Pointers to the messages and comments to be printed.
3. Test event control block (TECB).

OUTPUT:

1. Parameter list passed to formatting modules.
2. Message address length, and forms control to the Output Writer.
3. Return codes:

   X'00' = Successful

   X'04' = Facility not available.

   X'0C' = Missing parameters.

4. Messages E129I and E157I.

METHOD: All output is sent to the SYSLST device. If the operator selects the parallel printer option, output is also routed to the SYSLOG device. If the operator selects message level control, only those lines corresponding to the requested level are routed to the SYSLOG device. The four requested levels to determine the type of printed output are:

Level	Information Printed
0	Header
1	Header and descriptions message.
2	Header and results
3	All

If the SYSLST device is selected and the output is limited to as few as 61 characters, forms control may not yield the desired results. Also, printing will not occur if the NPR (no print), EL (error loop), or TL (test loop) options are selected simultaneously.

With RETAIN/370 active all messages to the system output device (SYSLST) also print on the remote specialist's device.

IJZADO40: $Mode Chart BT

OBJECTIVE: Determines if it is possible to place the foreground partitions in a quiescent state; and if it is, waits until the foregrounds are quiesced.

ENTRY POINT: Label EPZADO40.

EXIT:

1. Scheduler (IJZADO00) if quiesce is not available.
2. To caller, if quiesce is available.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).
2. Check teleprocessing (IJZACKTP).

INPUT: Parameter list, address of PSW table.

OUTPUT: Messages: 04E199D, 04E221D, E222I, E229I, E233I.

METHOD: Upon entry into this module, standard linkage conventions are followed and the local-print-only bit is set. If PSWTABLE was specified as a parameter, a message (E229I) is issued to inform the operator that the section was bypassed, and an exit is made to the scheduler. If running on a non-MPS system, the quiesce mode bit is turned on, message E233I is

issued, and a return to the caller is executed.

On MPS systems the program calls module IJZACKTP to determine if teleprocessing (TP) is active. If it is, the foreground connot be quiesced, and the section is bypassed after informing the operator via message E229I.

When TP is not active, the operator is asked if the foreground can be quiesced. If it can be, message E222I is issued requesting the operator to issue the commands necessary to stop the foreground. The program information blocks are then checked until it is ascertained that both foreground partitions are quiesced. Then message E233I is issued, and the caller is returned to. If the reply to the 04E221D message is NO, the test is bypassed and message E229I is issued. The local-print-only bit is reset before returning to the caller.

IJZADO41: Convert Chart BU

OBJECTIVE: Convert all hex digits to their equivalent EBCDIC characters or the EBCDIC characters to their equivalent hex digits 0-F.

ENTRY POINT: Label EPZADO41.

EXIT: Return to caller.

INPUT:

- Address: Of character to be converted.
- Address: To put the converted characters.
- Count: Number of bytes to convert.
- Type: Hex or EBCDIC (H/E).

OUTPUT: Return codes:

X'00' = Successful completion.
X'04' = Macro level not complete.
X'08' = Invalid hex to EBCDIC conversion. (The address of the failing character is in GPR1.)

METHOD: To determine which conversion is to be made, the module tests bit 0 of the fourth word of the parameter list passed by register 1. If the bit is on, conversion is from hex to EBCDIC (H/E); otherwise, from EBCDIC to hex (E/H).

In the Hex to EBCDIC conversion, four bits are converted at a time. Every hex character has an EBCDIC conversion. (2 bytes of EBCDIC per 1 hex)

If the conversion is from E/H, the program checks to determine if the byte count is odd. If so, a switch is turned on. Each EBCDIC character is converted into a hex character of four bits. Thus, it takes two EBCDIC characters to form a byte of hex characters.

Therefore, if the switch is on (indicates an odd number of EBCDIC characters) after the last conversion, this module also converts a F0 into a hex 0 to complete the last byte.

After each conversion is completed, successful or not, the registers are restored, and an appropriate return code is sent back to the caller.

IJZADO42: MORECORE Chart BV

OBJECTIVE: Provide available core space to the calling routine.

ENTRY POINT: The label EPZADO42.

EXITS: Return to the on-line test.

INPUT: MAXSIZE, maximum number of the bytes required. MINSIZE (optional), minimum number bytes required.

OUTPUT: Return codes:

X'00' = Successful core allocation.
X'04' = MORECORE facility not available.
X'08' = Core requested not available.

METHOD: If the call macro is not compatible with the MORECORE module, a code of X'04' is returned to the caller. If it is compatible, the program determines the amount of core available by subtracting the size of the OLT (ROOT and PLINK modules) from the size of the OLT partition. It compares this amount to the maximum and minimum requests. If the amount is less

than the minimum, or less than the maximum with no minimum request being specified, control returns to the OLT with a X'08' code (indicating core requested is not available). If the amount of core satisfies the maximum or minimum request and no previous MORECOREs have been given to this section, an amount equal to either the maximum or minimum is given.

If previous MORECOREs have been given, the program determines the amount available by subtracting the highest byte given in a MORECORE entry (HIGHLOC) from the highest byte of the partition (ENDPART). If this amount equals or exceeds the maximum request, the maximum is given. If not, MORECORE tries to satisfy the maximum request with a FREECORE entry. If FREECORE has not been used or if neither the maximum or minimum request can be filled with a FREECORE entry, the program compares the (ENDPART-HIGHLOC) amount to the minimum request. Failure of all these attempts results in a return to the test section with a X'08' return code.

When a request is satisfied an X'00' return code is passed to the caller along with the location and size of the storage allocated, in registers 1 and 0, respectively.

Note 1: A doubleword at the beginning of each allocated area is reserved for management. The first word indicates the size of the area, and the second is a pointer to the next MORECORE entry. The address of the obtained core (passed to the unit test) is the address following the doubleword, and the size passed is the size less the doubleword.

MORECORE also requires three pointers in the (nucleus) OLTEP common area.

1. $FRSTLOC. Address of the first MORECORE entry
2. $PREVLOC. Address of last MORECORE entry
3. $HIGHLOC. Highest byte given in a MORECORE entry

The following FREECORE pointers are also referred to:

1. $FSTFREE. Pointer to first FREECORE entry
2. $LSTFREE. Pointer to last FREECORE entry

Note 2: The section control table is accessed to get the OLT partition size (size of the partition starting from the beginning of the OLT).

The section preface is referred to for RTSIZE (size of the OLT, ROOT and PLINK modules).

The highest byte of the partition is obtained from the communication region of the DOS supervisor.

IJZADO43: FREECORE Chart CA

OBJECTIVES: Free up an area of core previously obtained by a MORECORE request.

ENTRY POINT: Label EPZADO43 from the transient manager.

EXIT: To the on-line test via the transient manager.

INPUT: The address of the area to be freed is specified as a parameter in the FREECORE macro called by the unit test.

OUTPUT: Three possible return codes are passed to the caller in register 15:

1. X'00' = Indicates that the area has been successfully freed.
2. X'04' = Indicates that the FREECORE facility is not available. Given when macro level is incorrect.
3. X'08' = Indicates that the address specified does not correspond to any returned on a MORECORE request

METHOD: When FREECORE receives control, the address specified in the macro is decreased by 8 so that it points to the beginning of the management area. This address is compared to the MORECORE entry addresses until a match is found. Adjustment of pointers remove the MORECORE entry at this address from the MORECORE list. Before including this area in the FREECORE list, the program checks to determine if it is contiguous to an already existing FREECORE entry. If this is the case, the two adjacent areas are incorporated as one entry. Otherwise, the new entry is placed at the end of the FREECORE list.

Notes: A doubleword at the beginning of each FREECORE entry is used for management. The first word indicates the size of the area while the second points to the next FREECORE entry.

FREECORE also requires two pointers in the nucleus, one pointing to the first FREECORE entry ($FSTFREE) and the other ($LSTFREE) pointing to the last. The pointers must be set to 0 at the beginning of each section.

IJZADO44: DIO Chart CB

OBJECTIVES: Issues the required privileged instructions for a calling routine by utilizing a SVC 46.

ENTRY POINT: Label EPZADO44.

EXIT: Return to caller.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37).
2. Check teleprocessing (IJZACKTP).
3. Macros: TIO, TCH, SIO, HIO.

INPUT: CDS address, operation requested, TECB address.

OUTPUT:

1. Return codes:
   X'00' = CC status, sense posted.
   X'04' = Function not available.
   X'08' = Time-out occurred to terminate the operation.
2. Messages: 04E199D, 04E221D, E222I, E233I.

METHOD: For the DIO request to be performed, the specified device must be grabbed or primary. For an HIO request (except for TP terminal devices) the system must be quiesced. If the system is not already in quiesce mode, the operator is asked if the foregrounds can be stopped. If not, a return code of X'04' is set and control is returned to the caller. If operator permission for quiesce mode is granted, the operator is then requested to issue system commands to quiesce foregrounds (F1 and F2). The module then loops until the quiesce is complete.

When the system is quiesced (for HIO request) or a TIO or TCH is requested, SVC 46 is issued to enter supervisor state. The privileged operation is then executed and the resulting condition code posted.

If a condition code (CC1) occurs on a TIO or HIO, the CSW is posted. If unit check occurs in the status, a sense is issued and the sense data is posted in the sense field of the TECB. If no sense field is available, the sense is issued with the suppress data transfer bit on.

After condition code posting and status examination (when necessary), control is returned to the OLT with a return code of X'00'.

IJZADO47: Routine Chart CD

OBJECTIVE: Determine whether a given routine should be run by checking the appropriate bits in the section control table.

ENTRY POINT: Label EPZADO47.

EXIT: To the calling routine. To the Routine following the calling routine, if the calling routine cannot be run.

EXTERNAL ROUTINE: CECOM (IJZADO37).

INPUT:

- Address of next routine.
- Address of RTNTERM (if TERM=YES)
- Reference number used in header of error printed.

OUTPUT: Message: E210I.

METHOD: After the program verifies the correct macro level, a check is made for the MASK=MI parameter. This indicates a need for manual intervention. If this parameter is included, ROUTINE interrogates the MI bit in the section control table to determine if the CE selected this option. If MASK=MI is specified and the CE has not selected this option, the following message is printed:

E210I ROUTINE BYPASSED - MANUAL INTERVENTION REQUIRED

and a branch is taken to the next routine. If the MI bit is on or if MASK=MI is not indicated, the routine mask in the section control table is checked to determine if the bit corresponding to the calling routine is on. If not, the routine cannot be run and a branch is taken to the next routine. If the routine bit is on, the active routine number in the section preface is updated, the error bit in the section control table is reset, the reference number (if any) is moved into the section preface, and the routine is allowed to run.

The TERM=YES parameter designates the last routine of the module. In cases where this routine is not allowed to run, ROUTINE branches to RTNTERM, the address of termination code in the last routine.

IJZADO60: Header Message Chart CE

OBJECTIVE: Construct a basic header line and call the output writer module to issue it.

ENTRY POINT: EPZADO60.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list consisting of four byte pointers to the following information:

- The control field. This is a fullword of flags and control bits that indicate forms control, message levels, type of error, and type of data required for a data message.
- A message list. Pointers to the messages and comments to be printed.
- The Test Event Control Block (TECB).

OUTPUT: The message, its length, and a forms control character are passed to the output writer module via a pointer in GPR1.

METHOD: This module constructs a basic header line and calls the output writer module to issue it. The content of the message is:

1. An asterisk if error printout.
2. Section ID.
3. Routine number.
4. Device address. If the device address is not supplied in the DPRINT request it is retrieved from the TECB (provided the TECB address is supplied). If neither address is given, the device address cannot be printed.
5. A reference number, if supplied.
6. The Engineering Change Announcement (ECA) number.

IJZADO61: Description Message Chart CF

OBJECTIVE: Controls the printing of descriptions and messages. The lines to be printed are moved to the print buffer and the output writer module is called to issue the message.

ENTRY POINT: Label EPZADO61.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list consisting of four byte pointers to the following information:

1. The control field. This is a fullword of flags and control bits which indicate forms control, message levels, type of error and type of data required for a data message.
2. A message list. Pointers to the messages and comments to be printed.
3. The Test Event Control Block (TECB)

OUTPUT: The message, its length, and a forms control character are passed to the Output Writer module (IJZADO70) via a pointer in GPR1.

METHOD: The message, its length and a forms control character are passed to the output writer module via a pointer in GPR1.

IJZADO62: CCW Message Chart CG

OBJECTIVE: Construct CCW messages containing CCW, CAW, and CC.

ENTRY POINT: Label EPZADO62.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list consisting of four byte pointers to the following information:

1. The control field. This is a fullword of flags and control bits that indicate forms control, message levels, type of error and type of data required for a data message.
2. A message list. Pointers to the messages (comments) to be printed.
3. The Test Event Control Block (TECB).

OUTPUT: The message, its length, and a forms control character are passed to the Output Writer (IJZADO70) via a pointer in GPR1.

METHOD: The CCW and CC addresses are supplied in the DPRINT request. The device address is used to retrieve the CAW from the TECB. If the device address is not given, the primary device address is used. If the TECB address is not given, a return code of X'0C' is set, and the rest of the DPRINT request is processed. A CCW in error is prefixed by an asterisk (*) on request.

IJZADO63: CSW Message Chart CH

OBJECTIVE: Construct the expected and received CSW messages.

ENTRY POINT: Label EPZADO63.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list consisting of four-byte pointers to the following information:

1. The control field - This is a full word of flags and control bits which indicate forms control, message levels, type of error and type of data required for a data message.
2. A message list - (pointers to the messages (comments) to be printed).
3. The Test Event Control Block (TECB).

OUTPUT: The message, its length, and a forms control character are passed to the Output Writer (IJZADO70) via a pointer in GPR1.

METHOD: This module constructs expected and received CSW messages, each containing information related to one or two CSWs. Each block of information contains key, command address, CSW, and residual count.

The expected CSW is composed of only those elements supplied in the DPRINT request. The received CSW contains all four items. If the CSW address is not given, the TECB is searched, using the device address for the needed information. If the device address is not given, the primary device address is used for the search. A message line for a CSW in error is prefixed by an asterisk (*) upon request.

IJZADO64: Sense Message Chart CK

OBJECTIVE: Construct expected and received sense messages.

ENTRY POINT: Label EPZADO64.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list, (consisting of four-byte pointers to the following information):

1. The control field. This is a fullword of flags and control bits that indicate forms control, message levels, type of error, and type of data required for a data message.
2. A message list. Pointers to the messages and comments to be printed.
3. The Test Event Control Block (TECB).

OUTPUT: The message, its length, and a forms control character are passed to the output writer (IJZADO70) via a pointer in GPR1.

METHOD: This module constructs expected and received sense messages and calls the output writer module to issue them. If the received sense address is not given, the TECB is searched using the device address, sense field length, and sense field count. If the device address is not given, the primary device address is used for the search. A message line for a sense in error is prefixed with an asterisk (*) upon request.

IJZADO65: Data Message Chart CL

OBJECTIVES: Construct expected, received, and written data messages.

ENTRY POINT: Label EPZADO65.

EXIT: Return to caller.

EXTERNAL ROUTINE: Output Writer (IJZADO70).

INPUT: Upon entry, GPR1 contains a pointer to a parameter list consisting of four-byte pointers to the following information:

1. The control field. This is a fullword of flags and control bits that indicates forms control, message levels, type of error, and type of data required for a data message.
2. A message list. Pointers to the message and comments to be printed.
3. The Test Event Control Block (TECB).

OUTPUT: The message, its length and a forms control character are passed to the Output Writer module (IJZADO70) via a pointer in GPR1.

METHOD: This module constructs expected, received, and written data messages and calls the output writer module to issue them. The length of data is variable, therefore the number of lines printed for each type of data is variable. The first message line of received data in error is prefixed by an asterisk (*).

IJZADO70: Output Writer Chart CM

OBJECTIVE: Provide the print functions for error messages and some OLTEP messages.

ENTRY POINT: Label EPZADO70.

EXIT: Return to caller.

EXTERNAL ROUTINES: CECOM (IJZADO37).

INPUT: A pointer to a parameter list is supplied, in GPR1, by the caller. The parameter list contains a:

1. Four-byte pointer to the message.
2. One-byte forms control character.
3. One-byte message length (in bytes).

OUTPUT: The message is printed on SYSLST and, if required, on SYSLOG devices.

METHOD: This module provides the print function for error messages (DPRINT) and OLTEP messages. The messages are issued as follows:

1. Error messages are issued to SYSLST. These are also issued to SYSLOG if:
   a. A console keyboard is assigned to SYSLOG.

b. The alternate printer option is selected.

c. The message level agrees with the alternate printer level option specified by the operator.

2. OLTEP messages are issued to SYSLOG and SYSLST.

IJZADO71: Prompt Device Chart CN

OBJECTIVE: Provide illustrated examples of the possible device field entries.

ENTRY POINT: Label EPZADO71.

EXIT: Communication Interval (IJZADO52).

EXTERNAL ROUTINE: CECOM (IJZADO37).

INPUT: Reply to message:

01E105D ENTER DEV/TEST/OPT

OUTPUT: Illustrative examples of devices, message E147I.

METHOD: PROMPT DEV is an aid to the operator in making his response to the message 01E105D ENTER DEV/TEST/OPT/. This module prints a list of all the possible ways that the entries for the device field can be entered.

IJZADO72: PROMPT TEST Chart CP

OBJECTIVE: Provide illustrated examples of the possible test field entries.

ENTRY POINT: Label EPZADO72.

EXIT: Communication Interval (IJZADO52).

EXTERNAL ROUTINES: CECOM (IJZADO37).

INPUT: Reply to message:

01E105D ENTER DEV/TEST/OPT

OUTPUT: Illustrative examples of tests, message E148I.

METHOD: PROMPT TEST is an aid to the operator in making his response to the message 01E105D ENTER DEV/TEST/OPT. This module prints a list of all the possible ways that the entries for the test field can be entered.

IJZADO73: Prompt Option Chart CQ

OBJECTIVE: Provide illustrated examples of the possible option field entry.

ENTRY POINT: Label EPZADO73.

EXIT: Communication Interval (IJZADO52).

EXTERNAL ROUTINE: CECOM (IJZADO37).

INPUT: Reply to message:

01E105D ENTER DEV/TEST/OPT

OUTPUT: Illustrative examples of options, message E149I.

METHOD: PROMPT OPT is an aid to the operator in making his response to the message 01E105D ENTER DEV/TEST/OPT. This module prints a list of all the possible ways that the entries for the option field can be entered.

IJZADO76: REI Initialize #1 Chart CR

OBJECTIVE: Determines if RETAIN/370 can operate on the system.

ENTRY POINT: EPZADO76.

EXITS:

1. Communications Interval (IJZADO52) if unsuccessful.

2. REI Initialize #2 (IJZADO77) if successful.

EXTERNAL ROUTINES:

1. CECOM (IJZADO37) to issue messages.

2. Scheduler (IJZADO00) to cleanup for OLT removal.

METHOD: The module determines if REI is already in main storage. If it is, a message is issued and the Communications Interval module is entered. If it isn't already in, the following checks are made to determine if it can be loaded:

- Is the REI device (IBM 2955) assigned to SYS005?
- Is a console device available?
- Are console interrupts (FOPT OC= YES) allowed?
- Is the background partition at least 18K?

If the answer to any of these is no, message E164I is issued and exit is taken to the Communications Interval module. If all the conditions are met, the current OLT's cleanup routine is performed and the REI Initialize #2 module is entered.

IJZAD077: REI Initialize #2 Chart CS

OBJECTIVE: Establish communication with the remote analysis center.

ENTRY POINT: EPZAD077.

EXIT: Communications Interval (IJZAD052).

EXTERNAL ROUTINES:

1. CECOM (IJZAD037) to issue messages.
2. REI nucleus (IJZAD010).

METHOD: The partition size is reduced by 4K to make room for the REI modules. The REI nucleus is then loaded and relocated. The REI device (IBM 2955) is opened, and communications with the remote analysis center is attempted. If communications are established, and the proper response is received, the line is put in receive mode, message E163I is issued, and the Communications Interval module is entered. If communications cannot be established, or the proper response is not received, the borrowed 4K is returned and the Communications Interval module is entered.

IJZAD078: REI Terminate Chart CT

OBJECTIVE: Deactivate RETAIN/370.

ENTRY POINT: EPZAD078.

EXIT: Return to caller.

EXTERNAL ROUTINE: CECOM (IJZAD037) to issue message.

OUTPUT: Messages E137I, E176I, and E169I.

METHOD: This module is entered if either the on-site CE or the remote specialist enters STOPREI at a communications interval. The following actions are taken:

1. All active CCBs are canceled.
2. The REI device is closed.
3. Message E169I (RETAIN/370 TERMINATED) is issued.
4. All REI switches are reset.
5. The borrowed 4K is returned.

IJZAD085: Device Update Chart CU

OBJECTIVE: Supplement the configuration data set when an old on-line test is called, and no CDS exists for the test device.

ENTRY POINT: EPZAD085.

EXIT: Return to Scheduler (IJZAD000).

EXTERNAL ROUTINES:

1. CECOM (IJZAD037).
2. CONVERT (IJZAD041).

INPUT: Pointers to primary device and adapter code for teleprocessing.

OUTPUT:

- Unit address in SCT.
- Device features in device table.
- Symbolic unit address in CCB.
- Messages: E030I, 04E199D, 04E227D.

METHOD: When this module is entered, the device feature information is placed in the SCT, CCB and the current device table entry. If the device is for teleprocessing, the TPSCT and TPCCB are loaded with data describing the line zero device. For any TP device, the adapter subroutine uses a two-way CECOM call to ask the operator to furnish a two-character adapter code.

IJZADO94: External Interrupt Handler Chart CW

OBJECTIVES: Receive control from DOS when a 1419 external interrupt occurs. Post the interrupt in the test section TECB if it has an I/O operation active on the device.

ENTRY POINT: Label EPZADO94.

EXIT: Return to DOS Supervisor.

INPUT: Not applicable.

OUTPUT: Not applicable.

METHOD: Upon entry to the module, standard linkage is performed to save the caller's registers. Next, the old external PSW is examined to pick up the line code, which is used to search the device table for the device that causes the interrupt. If no entry is found in the device table or if an entry is found and the device is not active, a return is made to the DOS supervisor via GPR7. Otherwise, the old external PSW is stored in the TECB associated with the I/O request, and control returns to the supervisor via GPR7.

IJZADO98: CCB Appendage Chart CX

OBJECTIVE: Handle interrupts for devices on which an EXIO has been performed. Relevant information is posted in the TECB associated with the I/O request.

ENTRY POINT: Label EPZADO98.

EXIT:
SIOCC Return: to caller via GPR11.
Interrupt Return: to caller via GPR7.

EXTERNAL ROUTINE: None.

INPUT: SIO CC (GPR7)
CCB address in GPR1.

OUTPUT: Posting in TECB (sense data).

METHOD: This module receives control from the supervisor upon occurrence of an SIO condition code or an I/O interrupt from a device to which an EXIO has been issued.

When control is passed from the supervisor, a bit is set in the CCB (byte 8 bit 5) indicating an I/O passback. If the bit is not on, it is an I/O interrupt passback. In all cases, first a search is made of the device table to find the device associated with the event. The table is searched by Logical Unit Assignment and the device must be active and be using the CCB address passed to this module in GPR1. If any of these requirements are not met, the search continues until the end of the table is reached. If no device is found, a return is made to the supervisor via GPR7. If there is an I/O interrupt passback, a return to supervisor is made via GPR7; if there is an SIO passback, a return is made via GPR11 after reseting the indicator in the CCB.

When the proper device has been found, a test is made to determine if it is an SIO passback. If it is, the following are posted:

1. CC0 -- This condition code is posted in the TECB (for level 3 EXIO and up) unless all fields are full. If all fields are full, the counter is updated. Control is then returned to the supervisor via GPR11 after resetting the SIO passback indicator.

2. CC2 -- This condition code is not posted. Control is returned to the supervisor as described for CC0.

3. CC3 -- Condition code 3 is posted as described for CC0. Event complete is also posted and control is returned to the supervisor as described for I/O passback.

4. CC1 -- Condition code 1 is posted along with the status stored. An indicator is set to show the occurrence of a CC1 and the event occurred bit ($INTOCC) in the device table is set. Status stored is examined as described below for I/O interrupt. However, upon return to the supervisor, a check is made to determine the method of return to be used.

If it is not an SIO passback, interrupt handling (described below) takes place. Note that status examination for CC1 is done in the same manner as in interrupt handling.

If there is room in the TECB, the CSW associated with the interrupt is posted along with the device address and an event code of FF which indicates that the CSW was posted. However, if the TECB is full and the event code is not FF, the event counter is dumped. Also, if the last event from the device was a condition code 1, the flag indicating $CCIOCC is reset and control is returned to the supervisor via GPR7. (The status will be the same as from the condition code).

After posting, the event occurred bit ($INTOCC) is set in the device table and the status is examined. If unit check is in the status, an SIO to sense is issued. The sense data is read directly into the TECB unless all fields are used. Then, the count is incremented and the sense is issued with the suppress data transfer flag on. If sense fails on the first try (CC≠0) and if SIO condition code was 1, sense is retried. If SIO condition code was 2 or 3, sense count is not incremented. If on retry a CC0 occurs, all intervening status stored is OR'ed together, CUE and busy are turned off, and the CSW is posted in an event field (if available). In any case where SIO CC0 occurred, a TIO is issued to clear the device.

In all cases where unit check occurs, the UC is turned off, DE is turned on with any other error status, event complete is posted, and control is returned to the supervisor via GPR7 (unless SIO passback).

If UC is not in status, a check is made to determine if DE has already occurred. If it has and ATTNIN was specified, event complete is posted. The supervisor is returned to via GPR7 when DE has occurred and DE has occurred and DE in bits ($DEOCC, $DEVEND) are set in the device table. Event complete is posted if ATTNIN was specified. The supervisor is then returned to via GPR7.

On all returns to the supervisor after examining status, a check is made for: (a) Program check, (b) Protection check, (c) Channel data check, (d) Channel control check, (e) Interface control check, or (f) Chaining check.

If any of the above are in the status, the bits are turned off, DE is turned on, and event complete is posted before returning to the supervisor.

IJZADOAA: $DDate Chart DA

OBJECTIVE: Provide the calendar date to the requestor.

ENTRY POINT: Label EPZADOAA.

EXIT: Return to caller.

INPUT: Not applicable.

OUTPUT:

1. dd/m - (GPR0).
2. m/yy - (GPR1).
3. Return codes:
   X'00' = Date returned in GPRs.
   X'04' = Facility not available.

METHOD: This module provides the calendar date in registers 0 and 1, in the format DD/MM/YY. The date is retrieved from the communication region, reformatted (if necessary) and returned to the caller.

IJZADOAB: $DTIME Chart DB

OBJECTIVE: Provide the time of day to the requestor.

ENTRY POINT: Label EPZADOAB.

EXIT: Return to caller.

EXTERNAL ROUTINES: GETIME (SVC34).

INPUT: Not applicable.

OUTPUT: Return codes in GPR15:
   X'00' = Operation successfully completed.
   X'04' = Facility not available.
   Time of day in packed decimal (GPR1).

METHOD: This module provides the time of day. The time is retrieved, using the system GETIME macro with the STANDARD parameter, and returned to the caller in GPR1 in packed decimal format.

Time is given in hours, minutes, and seconds military time in GPR1 packed decimal. The format is 0HHMMSSF. For example 3:45 PM would be represented by 0154500F in GPR1.

IJZADOAC: LETGO Chart DC

OBJECTIVE: Control the flag bit in the device table that indicates if that device may be grabbed.

ENTRY POINT: EPZADOAC.

EXIT: To the calling module.

INPUT: Pointer to the device address.

OUTPUT: Not applicable

METHOD: The device table is searched for the requested device. When it is found, the LETGO, GRAB, PRIMARY, and ALOCAT bits are turned off. Then, a return code of X'00' is put in GPR15, and control returns to the caller.

If no entry is found in the device table for the device, then a return code of X'04' is put in GPR15, and control returns to the caller.

IJZAOLTP: $$BOLTEP Chart DD

OBJECTIVE: Indicate that OLTEP is active.

ENTRY POINT: IJZAOLTP.

EXITS: Return to caller.

EXTERNAL ROUTINE: SVC11.

INPUT: Not applicable.

OUTPUT: Not applicable.

METHOD: This module is a $$B transient called by IJZAOLTP to set a bit in the supervisor indicating that OLTEP is active. This bit is examined by the supervisor when an SVC46 is issued, to ensure that it is OLTEP that issued the SVC46.

IJZATOLT ($$BTOLTP): Terminate OLTEP Chart DE

OBJECTIVE: Perform cleanup functions for OLTEP if an abnormal termination occurs.

ENTRY POINT: EPBTOLTP.

EXIT: To the supervisor ($$BEOJ3).

EXTERNAL ROUTINES:

1. REI Terminate (IJZAD078) to deactivate the RETAIN/370 Interface.
2. Restore Labels (IJZAD057) to restore tape labels and disable TP lines.
3. The OLT cleanup routine if available.
4. The Scheduler (IJZAD000).

METHOD: Upon entry, the abnormal termination flag is set, EXIO cleanup is performed via the Scheduler and the OLT cleanup routine is performed if one is available. If RETAIN/370 is active, the REI Terminate module is entered to terminate the RETAIN/370 Interrace. Tape labels are restored and TP lines disabled if necessary by the Restore Labels module. The OLTEP Active flag is then reset and exit is taken to the DOS supervisor.

If this module is entered because of an error in cleanup, the OLTEP Active flag is reset, and exit is taken to the supervisor. All other cleanup procedures are bypassed.

PRE-RELEASE 25 SUPPORT MODULES

The OLTEP/OLT support modules that follow were used by OLTEP prior to release 25. They are retained as part of OLTEP to support previously written OLTs.

IJZACEOM: CE Communication Chart EA

OBJECTIVE: Provide two-way communications between OLTEP and the operator.

ENTRY POINT: IJZACEOM.

EXIT: Return to calling module.

EXTERNAL ROUTINE: LOAD (SVC4).

INPUT: Not applicable.

OUTPUT: Not applicable.

METHOD: When the macro is issued, a pointer indicates the message to be issued, the length of the message, and an area where the reply can be placed.

When the CECOM macro is issued, a message asking the operator some specific question is printed on the console. The operator then replies, thus establishing the two-way communication.

The CECOM macro is used in the following way:

```
CECOM   FSTERR,FERRC,INBUFR,FERIN
```

FSTERR. Specifies the message to be put out on the console.

FERRC. Specifies the length of the message to be put out on the console.

INBUFR. Specifies the area where the operator's response will be located.

FERIN. Specifies the length of the operator's reply.

If no IBM 1052 is available, the following message is issued:

E0261 TEST XXXXX CANCELED - 1052 UNAVAILABLE FOR INPUT

Control returns to the scheduler routine in the control module to load the next section (if any), to loop the test (if specified), or to terminate OLTEP.

IJZACKTP: Check Teleprocessing Chart EB

OBJECTIVE: Perform checks to determine if time-dependent devices are active.

ENTRY POINT: IJZACKTP.

EXIT: Return to EXIO (IJZAEXIO) after performing the timing test checks.

EXTERNAL ROUTINES:

1. Output writer (IJZAOPUT) to print messages.
2. CECOM (IJZACEOM) for two-way communication.
3. Time test (IJZATIME) to perform the timing test ($$BZTIME).
4. LOAD.

INPUT: Not applicable.

OUTPUT: Messages: E136I, E199D, E317I, 04E135D, 04E133I.

METHOD: The program checks to determine if the device to perform the test is on channel 0. If it is, a message is issued indicating the test cannot be run on the multiplex channel, and return is to OLTEP control for the next DEV/TEST/OPT/ entry, if a 1052 is available. If it is not available, OLTEP is terminated.

If the device is not on channel 0, the program checks to determine if a teleprocessing (TP) device is present in the system and, if so, whether it is active or not. If it is active, a message is issued indicating the test cannot be run and return is to OLTEP Control. If there is a TP device and it is not active, a message is issued asking if TP will be active. A YES response causes a return to OLTEP control. A NO reply allows the test to run.

The timing module, IJZATIME ($$BZTIME) is called into the B-transient area. Upon return from the timing module, the program checks determine if the timer is working. If it is not working, a message is issued and return is to OLTEP control. If the timer is working, the timing results are stored, and return is to the IJZAEXIO module for return to the unit test.

This module uses a special set of switches, labeled FLGS. If it contains X'01', it indicates the device is a teleprocessing device. A X'02' indicates the timer is not working.

IJZACMNT: Print Comment Chart EC

OBJECTIVE: Build the comments message.

ENTRY POINT: IJZACMNT.

EXIT: Return to caller via GPR14.

EXTERNAL ROUTINES: None.

INPUT: Data from the print module IJZADPRT.

OUTPUT: Data formatted for the message.

METHOD: Move the message to be printed from the caller's area to the OLTEP buffer

IJZACOMP: Compare Chart ED

OBJECTIVE: Check received data against expected data.

ENTRY POINT: IJZACOMP.

EXIT: Return to OLT.

INPUT: Address of check field and error return code.

OUTPUT: Not applicable.

METHOD: This module sets up a pointer to the checkfield that is used for the compare function. The checkfield (Figure 16) contains the information to compare. The first test in the compare module determines whether or not the TECB is relevant. If it is, some portion of the TECB information must be checked. The entire TECB is checked to determine if the following are relevant:

- CC.
- CSW Address.
- Device Status.
- Channel Status.
- Residual Count.
- Sense Data.

All this information is initially entered in the TECB from the last seven bytes of the CSW and the last eight bytes of the Channel Command Block (CCB).

Once the program determines which portions of information are relevant, it compares them with the expected information found in the checkfield (Figure 16). In each case, if the received data does not compare favorably with the expected data, an error switch is set.

After these comparisons are completed or if the TECB is not relevant, the program checks the data to determine whether or not it is relevant. The relevant data is then compared to the expected data, and a switch is set if the comparison in unfavorable.

Finally, a test is made to determine if any error switches have been set. If any have been set, the error exit to the unit test is used. Otherwise, the return is normal.

IJZACONV: Convert Chart EE

OBJECTIVE: Convert data from hexadecimal to EBCDIC and vice versa.

ENTRY POINT: IJZACONV.

EXIT: Return to calling module.

INPUT: Pointer to parameter list.

OUTPUT: Converted data.

METHOD: The convert macro works in the following way:

CONVERT HE,SCT+14,ENDMSG+9,2

HE. Specifies convert from hex to EBCDIC.

SCT+14. Specifies the address of the data to be converted.

ENDMSG+9. Specifies the address when the converted data is to be stored.

2. Specifies the number of bytes to convert.

A pointer is initiated to point to the following table:

Byte	
0	Address of data to be converted
4	Address of data after conversion
8	Address of next word
12	Unused *Byte Count 0 = convert from hexadecimal to EBCDIC 1 = convert from EBCDIC to hexadecimal

If the characters to convert are EBCDIC, they are compared to a translate table of hexadecimal characters to make the conversion (vice versa if the conversion is from hexadecimal to EBCDIC).

If no match is found in an EBCDIC to hexadecimal conversion, an error code is inserted in general register 15, and the program returns to the entry point. No error indicator is used for hexadecimal to EBCDIC conversion because every hexadecimal character has an EBCDIC equivalent.

If the conversion is completed, the characters are placed in an output area, and control returns to the calling routine.

IJZADPRT: Print Chart EF

OBJECTIVE: Build the print line(s) issued by the Output Writer.

ENTRY POINT: IJZADPRT.

EXITS:

1. Return to OLT normally.
2. To OLTEP control if an external interrupt is encountered.

EXTERNAL ROUTINES:

1. IJZAHEAD to build the heading. Chart DK.
2. IJZARSLT to build the results. Chart DP.
3. IJZACMNT to build the comments. Chart DC.
4. Output Writer (IJZAD070) to print.
5. Convert (IJZACONV).

INPUT: Pointer to parameter list.

OUTPUT: Messages: E129I, E157I,

METHOD: The information that is to be printed is acquired from the previously built checkfield (Figure 16) and from a parameter list pointed to by general register 1 (Figure 17). The control bits in the table are checked to determine which subroutine (print heading, print results, or print comments) should be entered.

Information to print is assembled into lines of print on the basis of the control flags in the print parameter table and the flag bytes in the checkfield. The information acquired from the parameter table indicates the type of information to print. The information acquired from the checkfield indicates the portions of the checkfield to print.

The three modules utilized by the print module are:

- Print Heading (IJZAHEAD)
- Print Results (IJZARSLT)
- Print Comments (IJZACMNT)

Each of these modules builds line(s) of print with the appropriate prefixes, and passes control back to the print module to be put out.

After the specified data is put out, control returns to the unit test, unless the interrupt switch is set or if the operator wishes to be notified on the first error. If either of these two cases occur, control returns to OLTEP control.

IJZAEXI0: OLTAM EXI0 Chart EJ

OBJECTIVE: Initiate an I/O operation.

ENTRY POINT: IJZAEXIO

EXITS:

1. Return to OLT normally.
2. To communications internal (IJZAD052) if an external interrupt is encountered and it is not a GAP test.

EXTERNAL ROUTINES:

1. CECOM (IJZAD037).
2. Check teleprocessing (IJZACKTP).
3. $$BZTIME (IJZATIME).
4. EXCP.

INPUT: Pointer to parameter list.

OUTPUT: Message E313I.

METHOD: The I/O operation is initiated with an EXCP after the program completes a series of instructions:

1. Clears the Test Event Control Block (Figure 15).
2. Sets up the CCB, or the TPCCB if the teleprocessing switch is on.
3. Executes the CCW, or TPCCW.
4. Loads the IJAZCKTP module if there is a timing request.
5. Loads the IJZATIME ($$BZTIME) module if there is a gap test request.

After OLTAM has completed these steps, the EXCP is executed and control returns to the unit test.

IJZAHEAD: Print Heading Chart EK

OBJECTIVE: Build the heading containing the IC, CCW, and I/O addresses.

ENTRY POINT: IJZAHEAD.

EXIT: Return to caller via GPR14.

EXTERNAL ROUTINE: CONVERT (IJZACONV).

INPUT: Data from the print module IJZADPRT.

OUTPUT: Data formatted for the message.

METHOD: Set up the heading print from information passed from the unit tests TECB for I/O error messages.

IJZAOPEN: Pseudo Open, $$BSOPEN Chart EL

OBJECTIVE:

ENTRY POINT: IJZAOPEN.

EXIT: Return to device update information routine via SVC11.

EXTERNAL ROUTINE: SVC11, SVC22.

INPUT: Device type and symbolic unit address, from the CECOM routine.

OUTPUT: Not applicable

METHOD: Upon entry, this module seizes the system via an SVC 22 with a mask of X'FF'.

The addresses of the tables needed to accomplish the pseudo open are obtained. These addresses are located at the:

- First Available Pointer (FAVP). A one byte pointer to the next available JIB.
- Address of the Job Information Block (JIB) table.
- First in Class (FICL). A four-byte pointer:

  First byte. Points to first Logical Unit Block (LUB) table entry.

  Second byte. Points to first programmer class unit in the LUB table BG area.

  Third byte. Points to the first programmer class unit in the LUB F2 area.

  Fourth byte. Points to the first programmer class unit in the LUB F1 area.

After the JIB associated with the logical unit to test is located, the upper and lower cylinders of the extent (also, cell numbers in the case of the 2321) are queued in the JIB chain.

When an extent must be put into a new JIB, this routine gets the JIB from the available JIB chain, puts in the extents, and inserts the new JIB in the chain. The extent is now considered file protected and available for testing by the unit test. To release the system, the SVC 22 with a mask of X'FF' is reissued.

Once the limits are obtained and stored, control returns to the device update routine by issuing an SVC 11.

IJZAOPUT: Output Chart EM

OBJECTIVE: Provide one-way communication from the program to the operator.

ENTRY POINT: IJZAOPUT.

EXIT: Return to caller.

EXTERNAL ROUTINE: CECOM (IJZADO37).

INPUT: Pointer to parameter list.

OUTPUT: Pointer to output data.

METHOD: When the output writer module is entered, a pointer is initiated to point to the following table:

Address of data to be printed	Forms control character	Byte count of message

CECOM is then called to issue the message. When CECOM is finished, control returns to the caller.

IJZARATA: Random Data Generator Chart EN

OBJECTIVE: Generate the indicated number of random numbers, and store them in the requesting OLT.

ENTRY POINT: IJZARATA.

EXIT: Return to calling OLT.

INPUT: Pointer to parameter list.

OUTPUT: Random data in caller's buffer.

METHOD: This module uses the first two bytes in the SCT as the starting random number. Eight bytes are moved to a work area where random bits are generated and stored in the requesting OLT.

As each doubleword of random data is generated, the pointer is incremented by eight so that newly generated data does not overlay previous data. This process continues until the last eight bytes are reached. When less than eight bytes remain generation terminates and control returns to the OLT.

IJZARSLT: Print Result Chart EP

OBJECTIVE: Build the results message.

ENTRY POINT: IJZARSLT.

EXIT: Return to caller via GPR14.

EXTERNAL ROUTINES:

1. Convert (IJZACONV).
2. Output (IJZAOPUT).
3. Output Writer (IJZADO70).

INPUT: Data from the print module IJZADPRT.

OUTPUT: Data formatted for the message.

METHOD: Set up and print the received and expected data, condition code, CSW, and sense information that is passed by the unit tests.

IJZATIME: Timing Tests Chart EQ

OBJECTIVE: Performs timing calculations.

ENTRY POINT: IJZATIME

EXITS:

1. Check teleprocessing (IJZACKTP) if a timing test was requested.
2. EXIO (IJZAEXIO) if a GAP test was requested.

EXTERNAL ROUTINES: EXCP, SVC11, SVC22.

INPUT: Pointer to CCB to be executed.

OUTPUT: Not applicable

METHOD: This module is entered from the IJZACKTP module when the timer test is requested, or from the IJZAEXIO module when the gap test is requested.

TIME TEST: An EXCP is issued, a check is made to determine if the channel has started, and when it has, the system is seized by issuing an SVC 22. The timer (clock) setting is stored before and after a countdown and the difference is kept in a register. The channel is unlocked by changing a TIC to a NOP and the timer is again checked without channel interference. The system control is released by reissuing the SVC 22, and the two time results are passed back to the unit test.

GAP TEST: An EXCP is issued, and the system is seized by issuing an SVC 22 when the channel has started. The channel is unlocked (TIC to NOP), a one-second delay is used to stabilize the system, the go-down loop is performed, the channel unlocked again, and countdown is done until the sense CCW has been executed. When SENSE has been executed, the system is released by reissuing the SVC 22, and the results of the final countdown are passed back to the unit test.

IJZAWAIT: OLTAM WAITIO Chart ER

OBJECTIVE: Perform a wait operation.

ENTRY POINT: IJZAWAIT.

EXITS:

1. Return to OLT normally.
2. Communications interval (IJZADO52) if an external interrupt is encountered.

INPUT: Pointer to TECB.

OUTPUT: Unit test TECB posted.

METHOD: The wait is performed by using the same CCB used by the EXIO, and issuing a SVC 7.

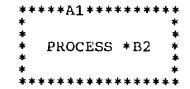
Once this has been done, the following are posted in the TECB (Figure 15):

- CCW address.
- CSW status.
- CCW residual count.
- Sense information (if the CSW contained a unit check).

The TECB must be aligned on a fullword boundary and must be exactly five words in length.

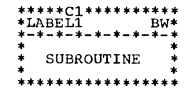
After these operations have been completed, control returns to the unit test.

EXPLANATION OF FLOWCHART SYMBOLS

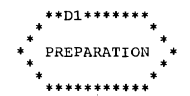


A GROUP OF PROGRAM INSTRUCTIONS THAT PERFORM A PROCESSING FUNCTION OF THE PROGRAM. THE LABEL, IF ANY, IS SHOWN ABOVE THE BLOCK.

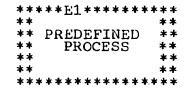
*B2
IF ANY ADDITIONAL EXPLANATION IS REQUIRED, ITS LOCATION ON THE CHART IS IDENTIFIED BY AN ASTERISK AND BLOCK ID.



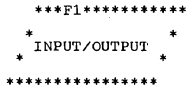
DESCRIPTION OR TITLE OF A ROUTINE THAT IS DETAILED ON ANOTHER FLOWCHART. THE STARTING LABEL OF THE ROUTINE AND THE FLOWCHART ID APPEAR ABOVE THE STRIPE.



AN INSTRUCTION, OR GROUP OF INSTRUCTIONS, THAT CHANGES PORTIONS OF A ROUTINE OR INITIALIZES A ROUTINE FOR GIVEN CONDITIONS.

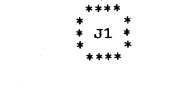


A GROUP OF OPERATIONS NOT DETAILED IN THE FLOWCHARTS IN THIS MANUAL, SUCH AS USER'S ROUTINES.



ANY FUNCTION OF AN INPUT/OUTPUT DEVICE OR PROGRAM, USUALLY BRANCHING TO AN I/O ROUTINE TO PERFORM THE FUNCTION STATED IN THE BLOCK.

POINTS WHERE THE PROGRAM BRANCHES TO ALTERNATE PROCESSING, BASED UPON VARIABLE CONDITIONS SUCH AS PROGRAM SWITCH SETTINGS AND TEST RESULTS.



ON-PAGE CONNECTOR. AN ENTRY FROM, OR AN EXIT TO, ANOTHER FUNCTION ON THE SAME FLOWCHART. THE NUMBER IN THE CONNECTOR IDENTIFIES THE CORRESPONDING ENTRY OR EXIT ON THE CHART.

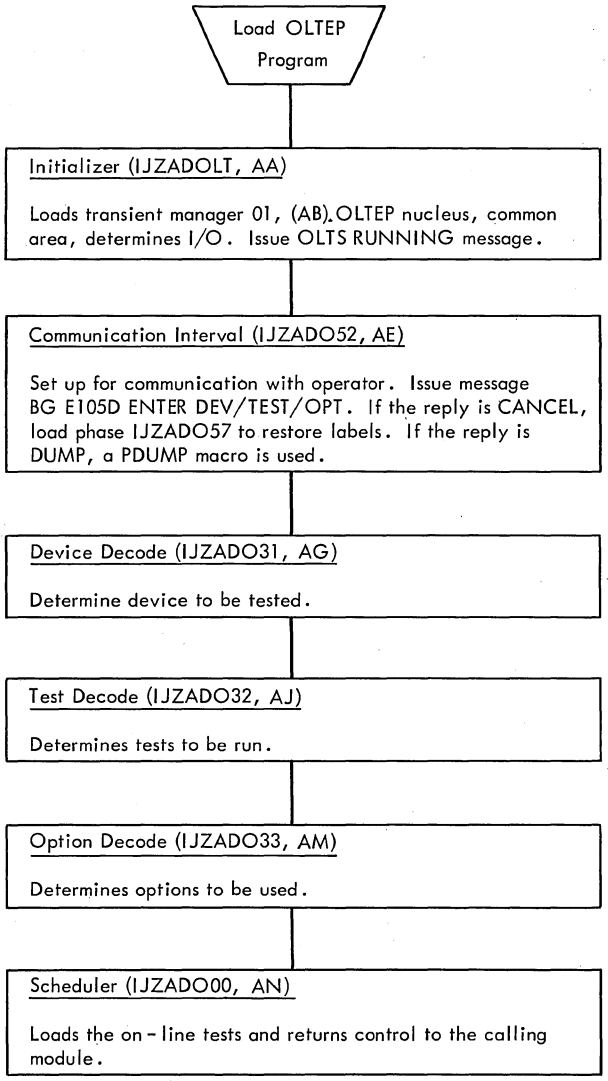
THE BEGINNING, END, OR POINT OF INTERRUPTION IN A PROGRAM.

OFF-PAGE CONNECTOR. AN ENTRY FROM, OR AN EXIT TO, A GIVEN POINT ON ANOTHER FLOWCHART. THE CHARACTERS IN THE CONNECTOR IDENTIFY THE CHART AND BLOCK. FOR MULTIPLE ENTRIES AND EXITS, AN ASTERISK APPEARS IN THE CONNECTOR AND THE CHARACTERS ARE LISTED NEARBY.

FLOWCHART ABBREVIATIONS

ADDR	ADDRESS
AVAIL	AVAILABLE
BG	BACKGROUND
CAT	CATASTROPHIC
CC	CONDITION CODE
CDS	CONFIGURATION DATA SET
CHAN	CHANNEL
CHAR	CHARACTER
COMM	COMMUNICATION
COND	CONDITION
DE	DEVICE END
DESC	DESCRIPTOR
DEV	DEVICE
DISP	DISPLACEMENT
DP	DATA PROTECTION
EQ	EQUAL
ERR	ERROR
EXT	EXTERNAL
FLD	FIELD
FPM	FILE PROTECT MODE
GT	GREATER THAN
ID	IDENTIFICATION
INFO	INFORMATION
INIT	INITIALIZE
INT	INTERRUPT
LT	LESS THAN
LTH	LENGTH
MAX	MAXIMUM
MCT	MODULE CONTROL TABLE
MOD	MODULE
MSG	MESSAGE
OP	OPERATION
OPT	OPTION
PERM	PERMANENT
PRI	PRIMARY
PTR	POINTER
RCVD	RECEIVED
REG	REGISTER
REI	RETAIN/370 INTERFACE
REQ	REQUESTED
RTN	ROUTINE
SCT	SECTION CONTROL TABLE
SEC	SECONDARY
SW	SWITCH
SYM	SYMBOLIC
SYS	SYSTEM
TECB	TEST EVENT CONTROL BLOCK
TERM	TERMINATE
TP	TELEPROCESSING
TRANS	TRANSIENT
VOL	VOLUME
WRT	WRITE
XPTD	EXPECTED

Chart 00. General



EXTERNAL ROUTINES USED:

By the Initializer:

Output Writer (70), and GETCONF (16). The Transient Manager (01) will reside in the OLTEP nucleus section and determines if a transient is resident in core or needs to be loaded. COMREG, STXIT.

By the Communication Interval:

The PROMPT phases (71, 72, 73) assist the operator in replying to the DEV/TEST/OPT message, and CECOM (37), and DECODE Routines (31, 32, 33).

By Device Decode:

Get CONFG (16), output writer (70), convert (41), and CECOM (37).

By Test Decode and Option Decode

Output Writer (70), and CECOM (37). Option decode also uses convert (41).

By the Scheduler:

Data Protect (56), Convert (41), CECOM (37).

Chart 01. Main Flow

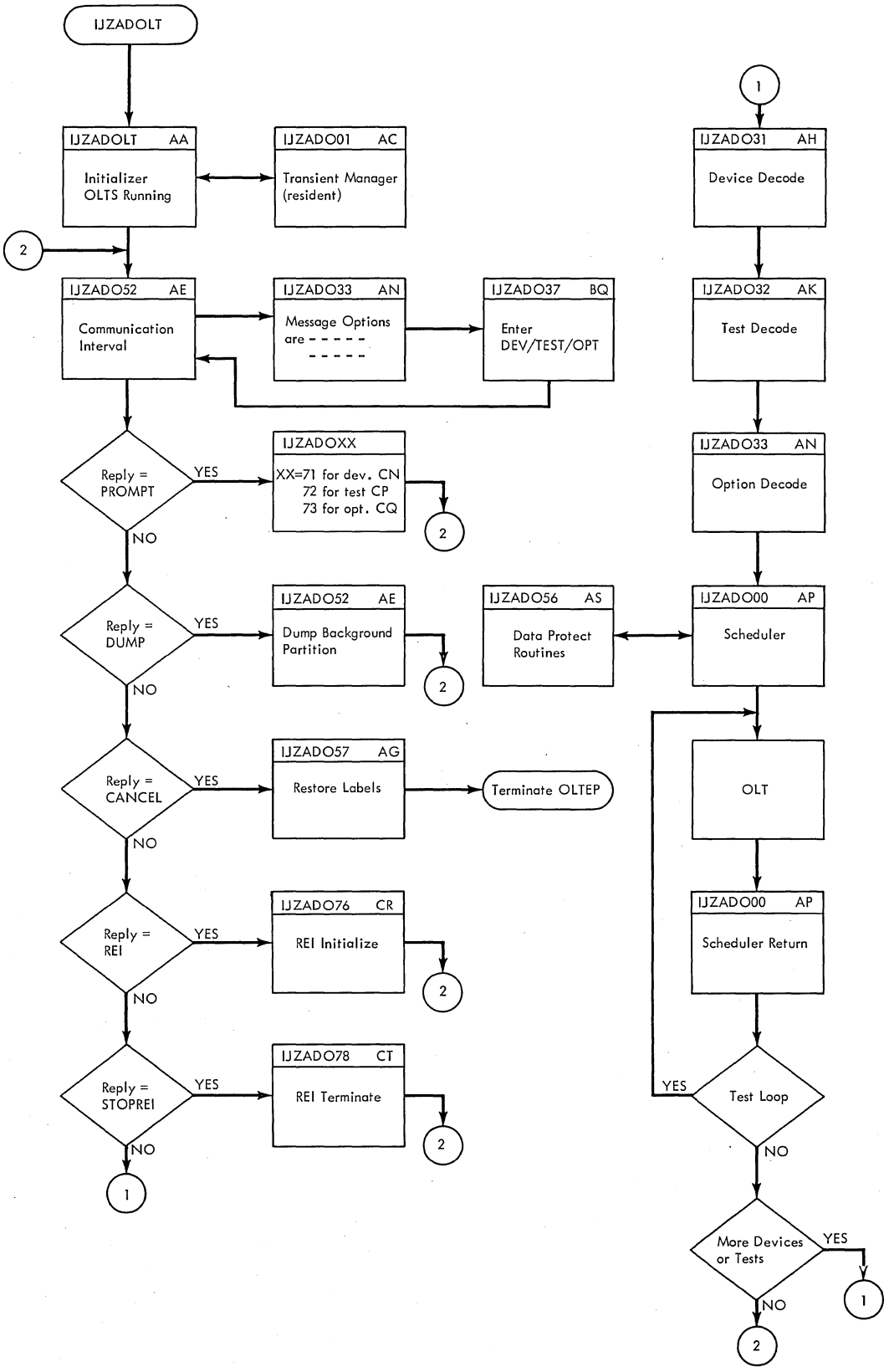
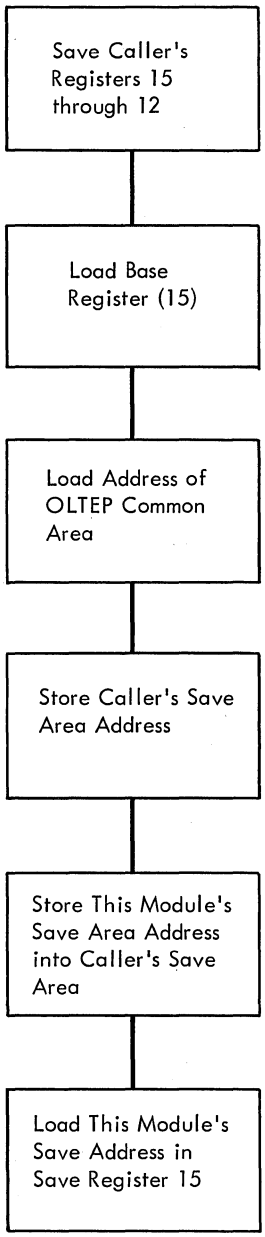


Chart 02. Standard Linkage



All OLTEP phases use this standard linkage.

NOTE: The assembly listing of each transient module 01 through LT shows a dummy section before the prolog. This is an overlay of the OLTEP resident common area that is used to locate tables, constants, and other data needed by the transient module.

Chart AA. IJZADOLT: Initializer 1

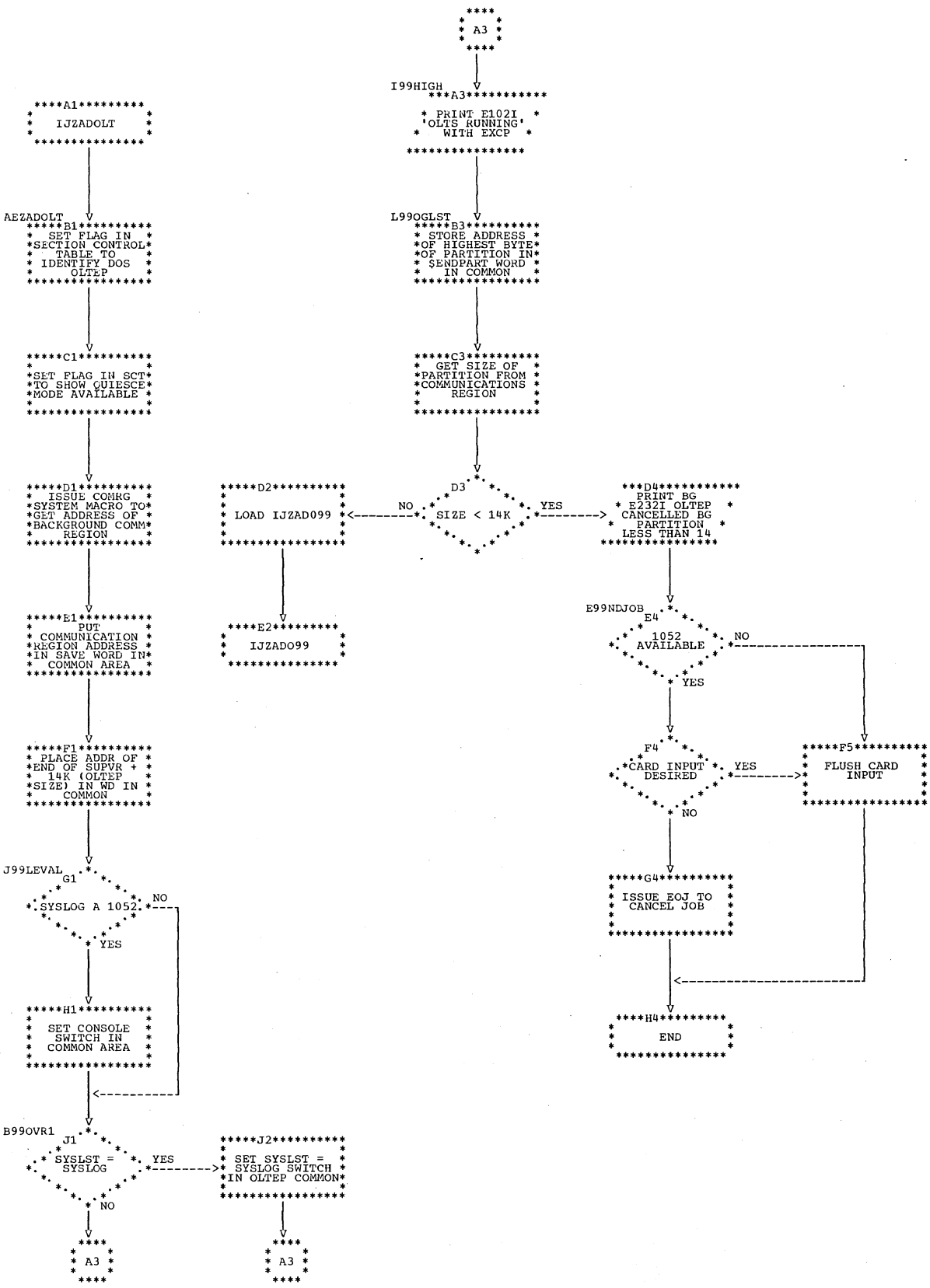


Chart AB. IJZADO99: Initializer 2

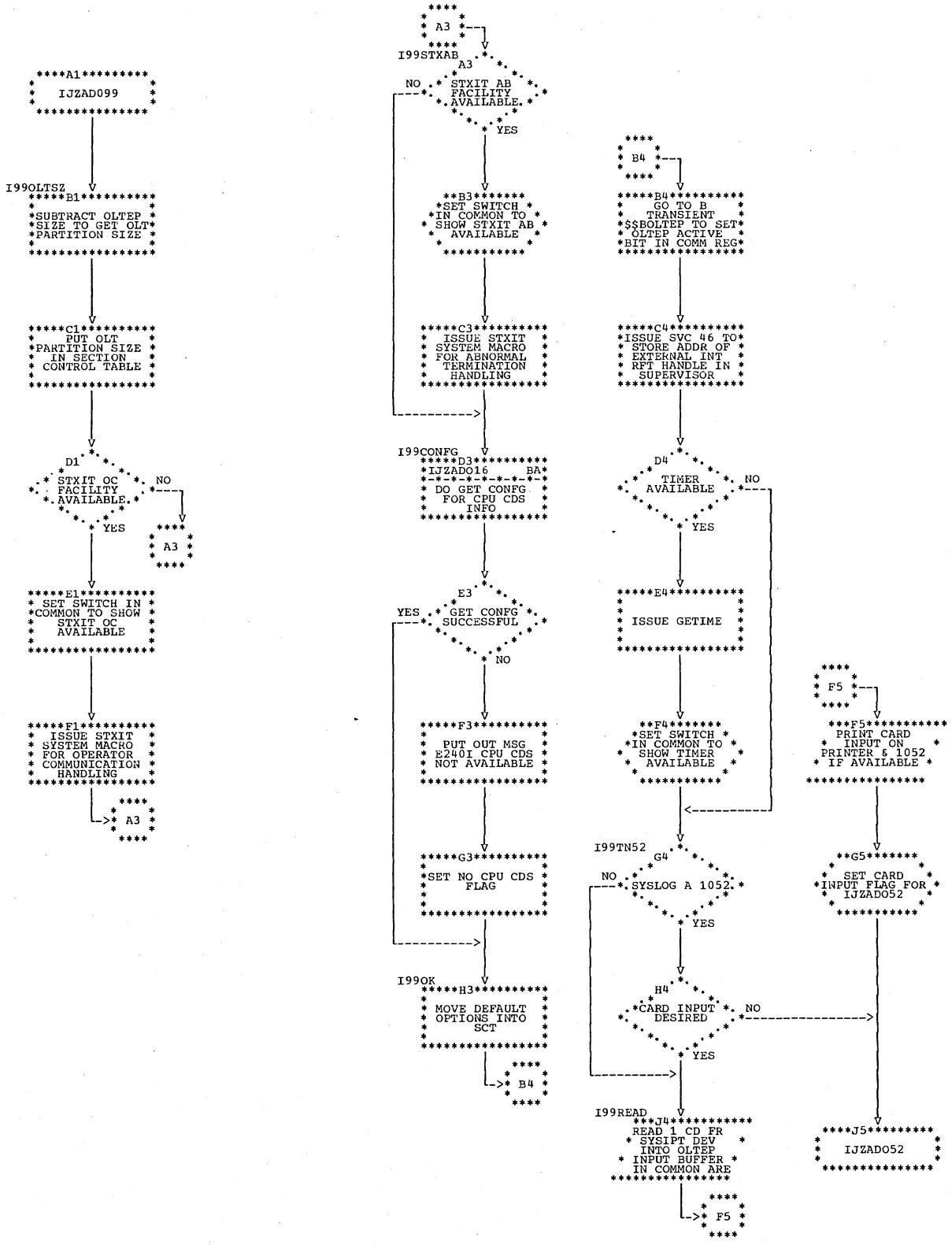


Chart AC. IJZADO01: Transient Manager (Section 1 of 2)

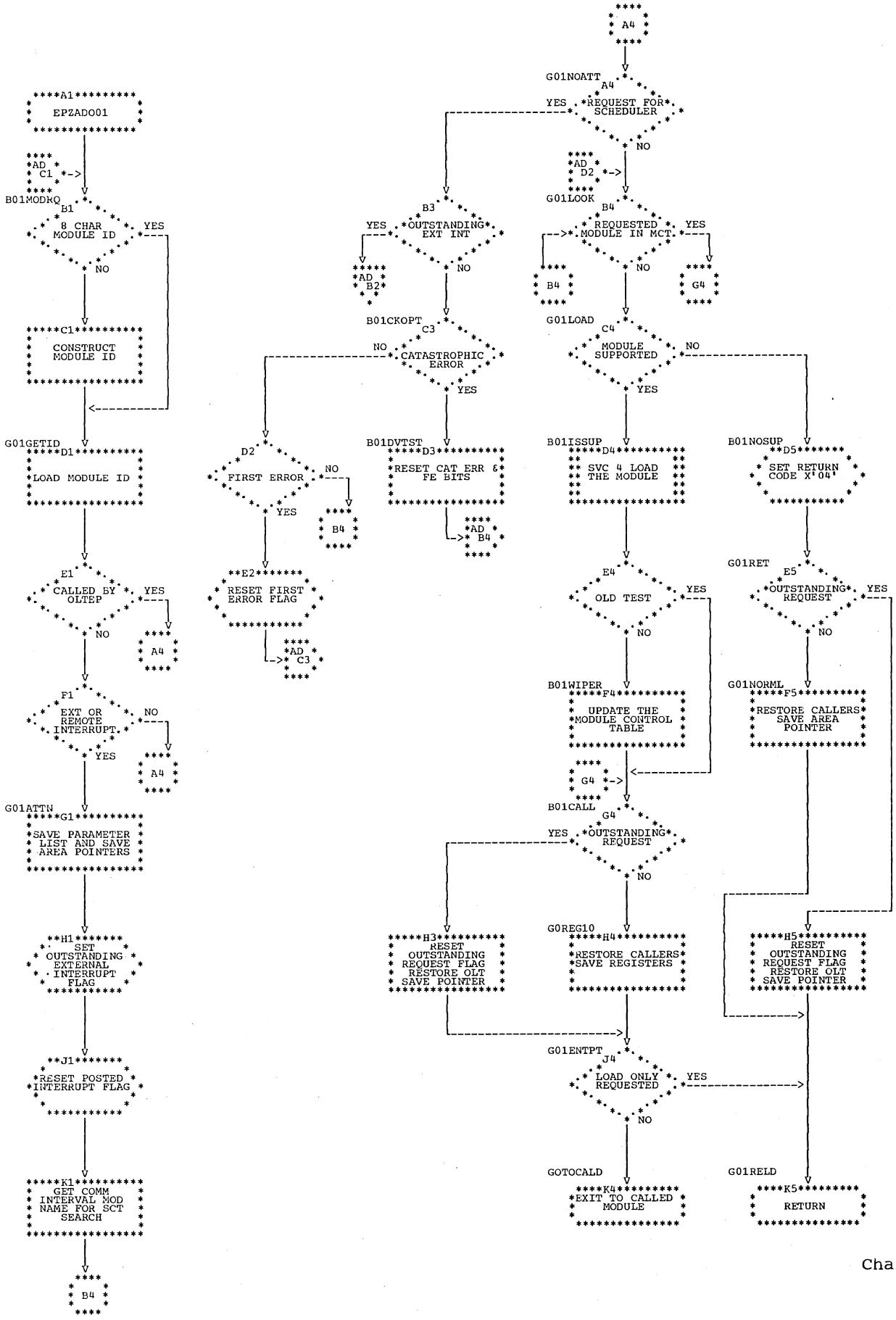


Chart AD. IJZADO01: Transient manager (Section 2 of 2)

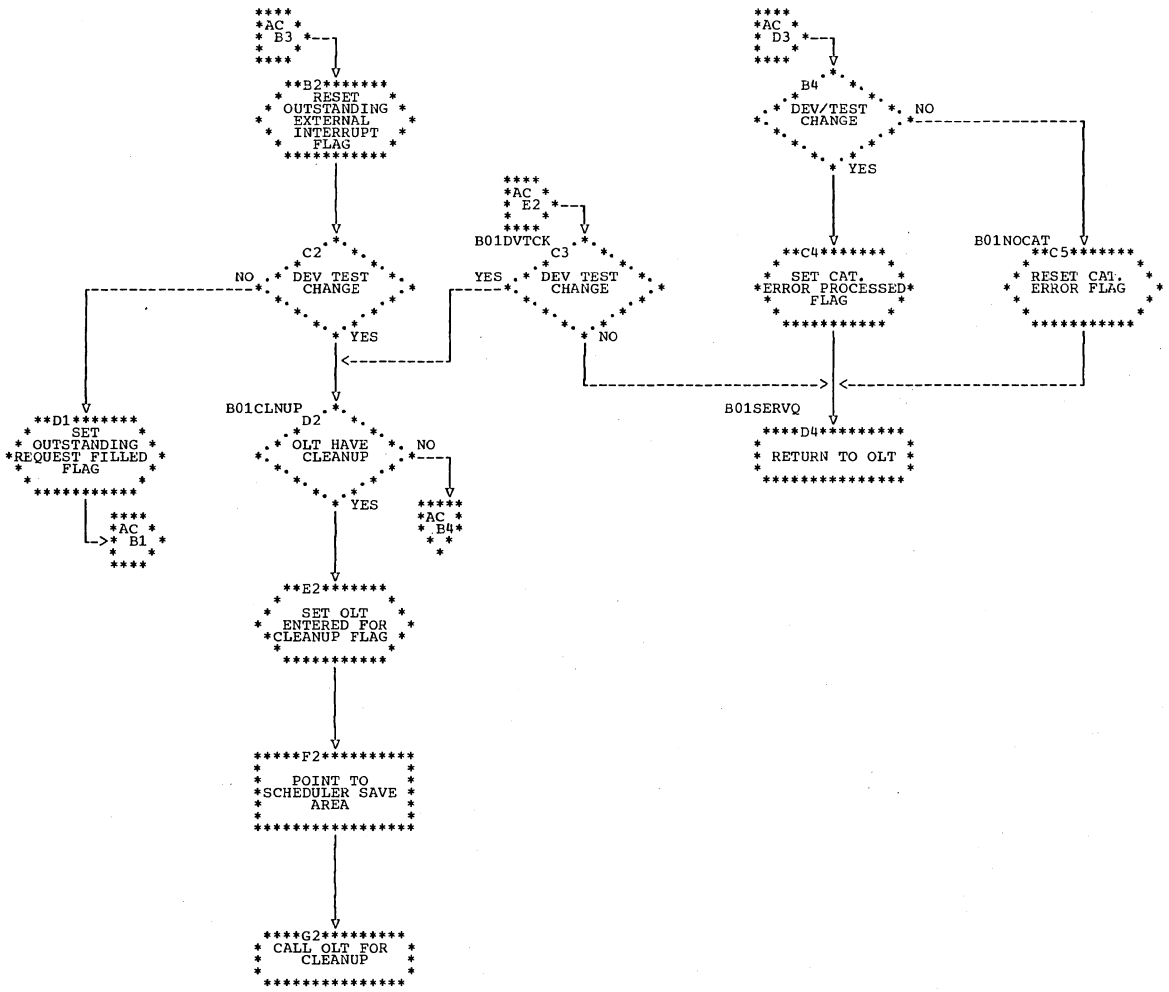


Chart AE. IJZADO52: Communications Interval (Section 1 of 3)

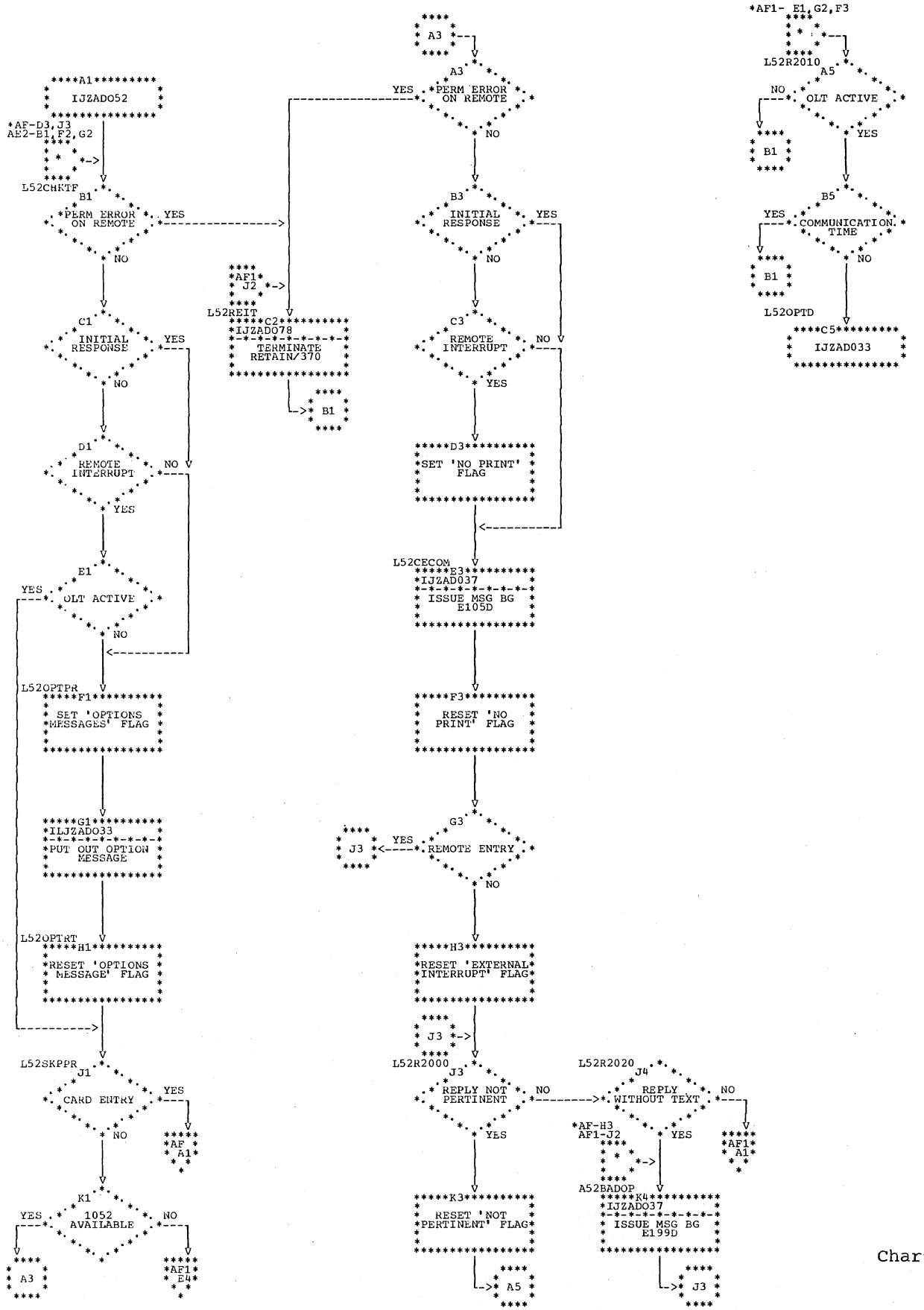


Chart AF. IJZAD052: Communications Interval (Section 2 of 3)

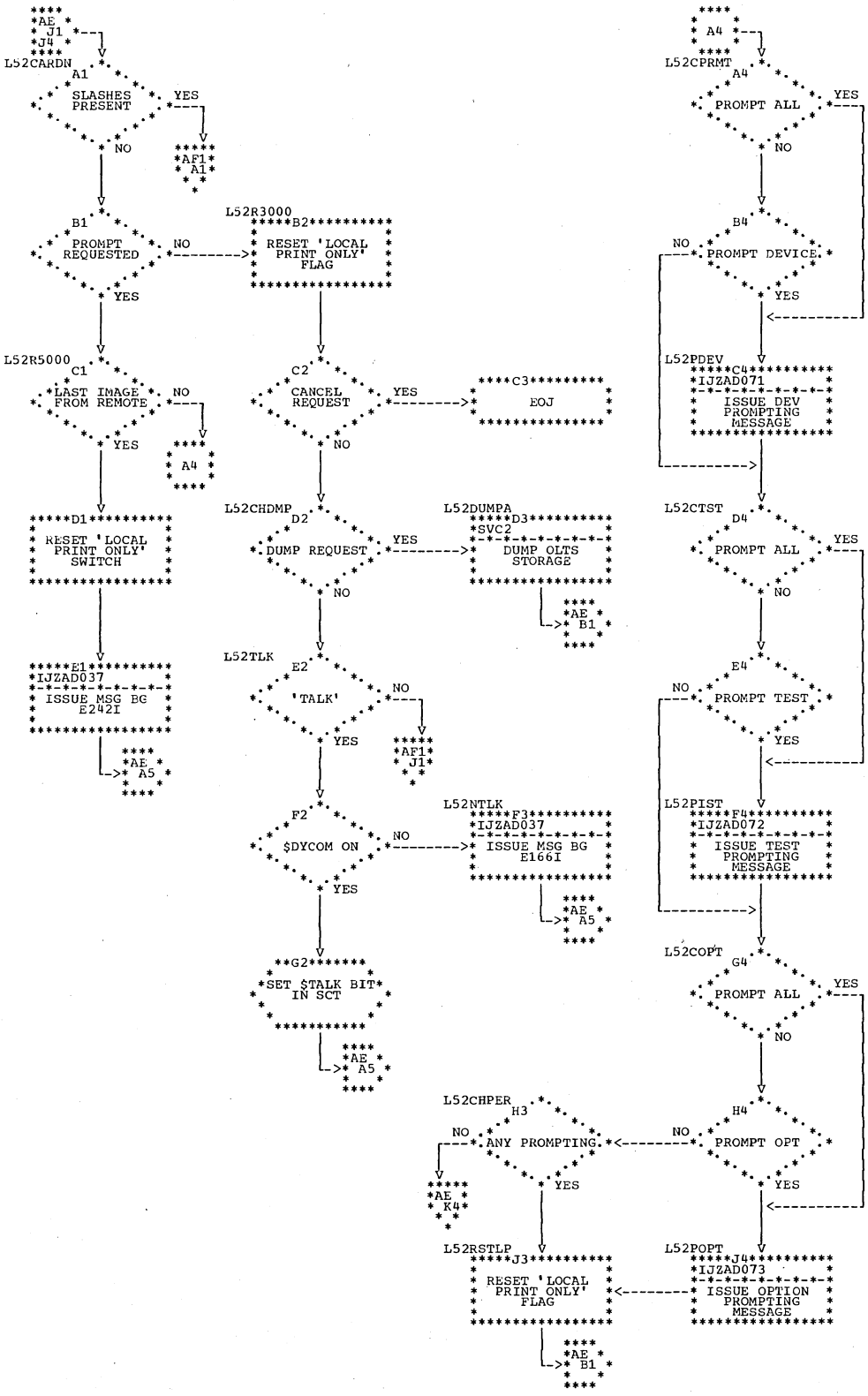


Chart AF1. IJZADO52: Communications Interval (Section 3 of 3)

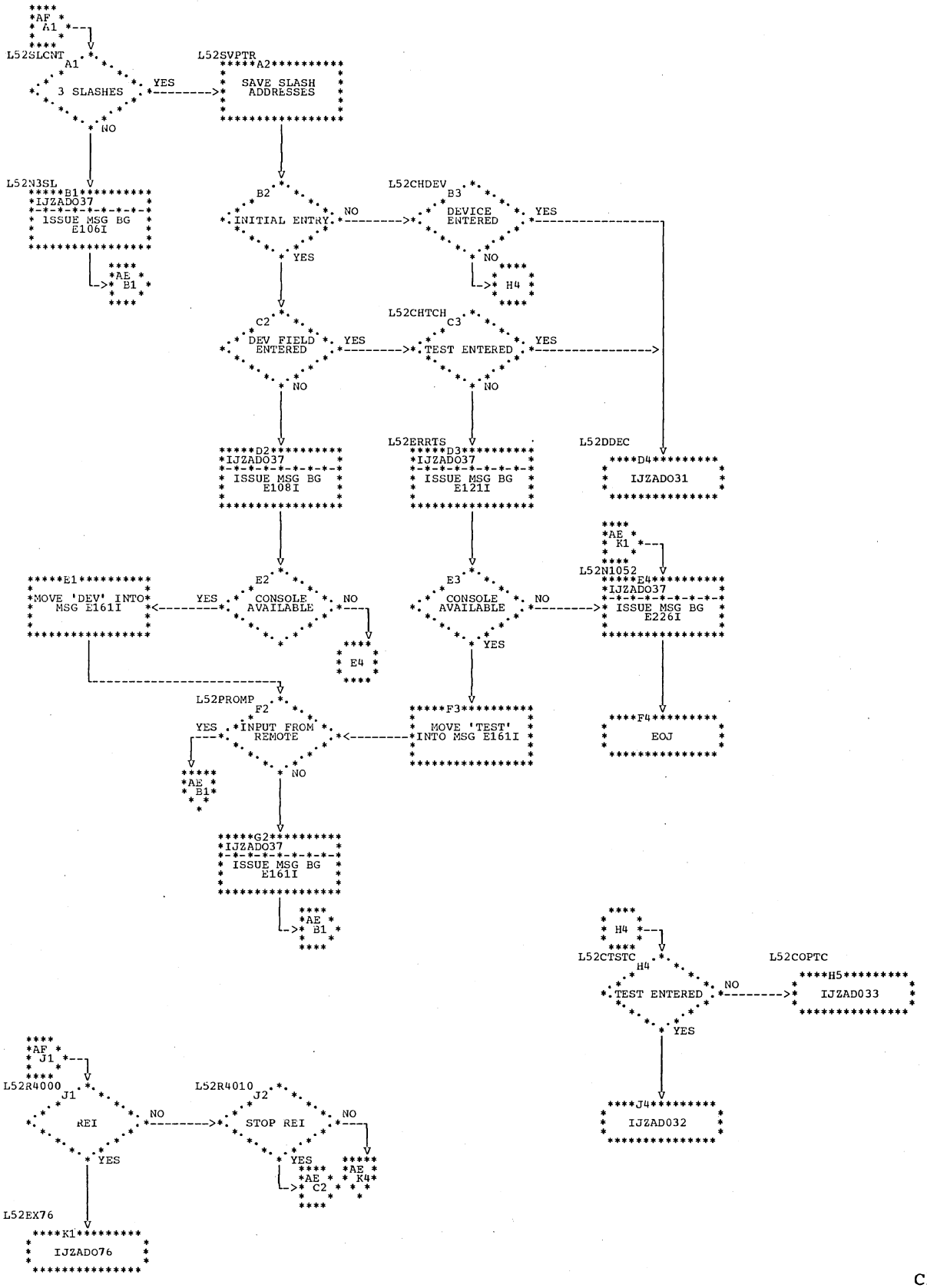


Chart AG. IJZADO57: Restore Tape Labels

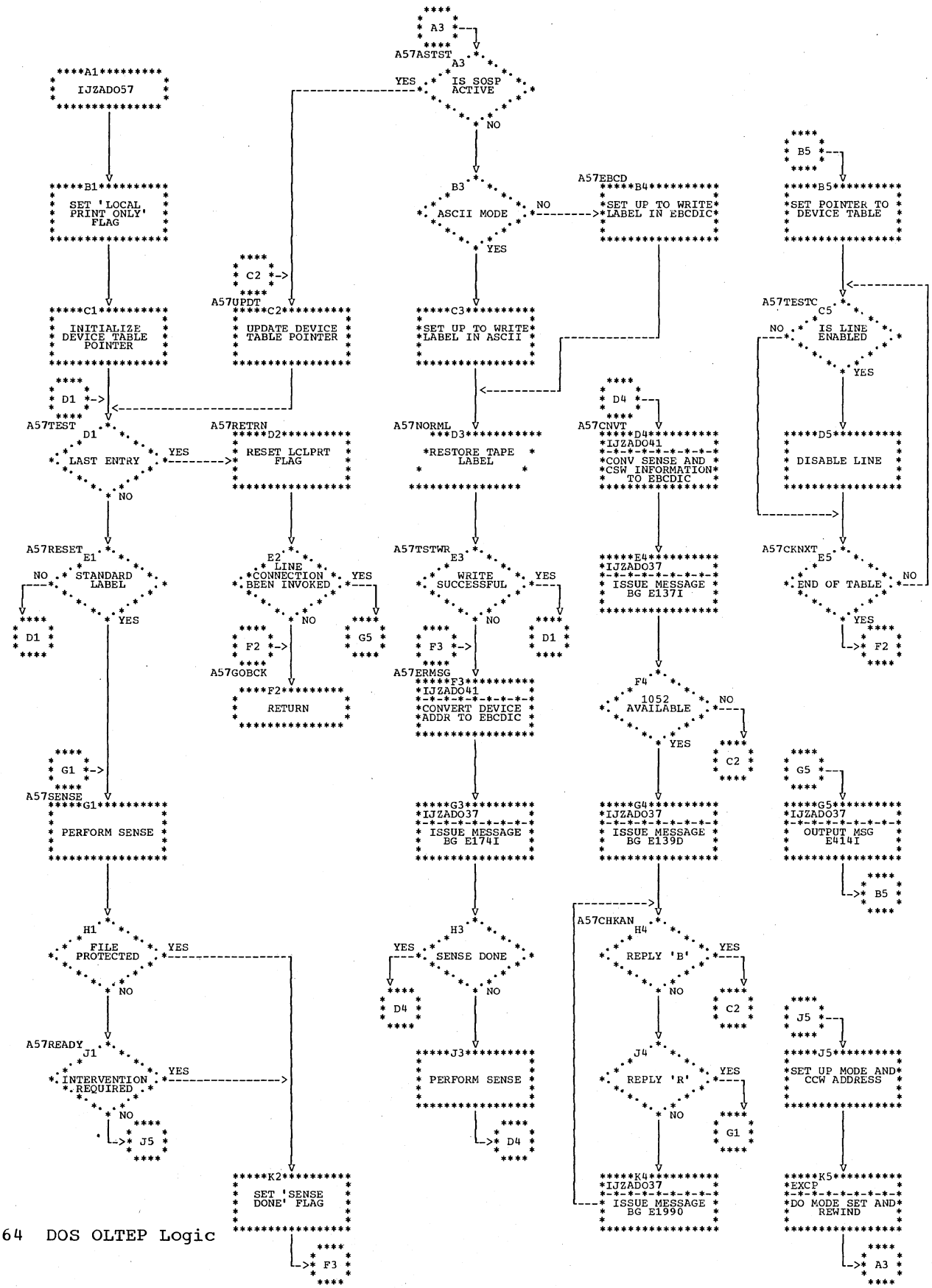


Chart AH. IJZADO31: Device Decode (Section 1 of 3)

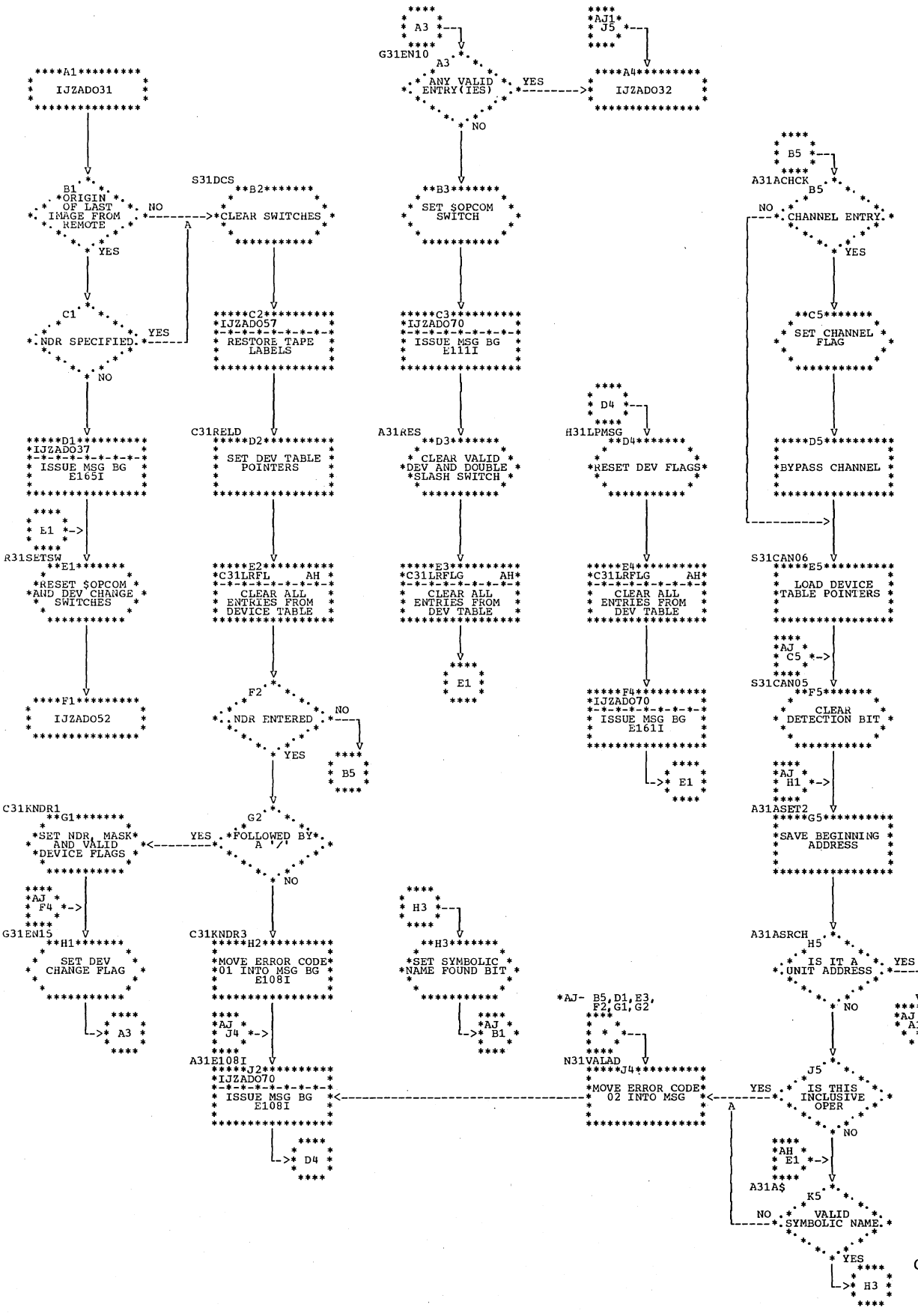


Chart AJ. IJZADO31: Device Decode (Section 2 of 3)

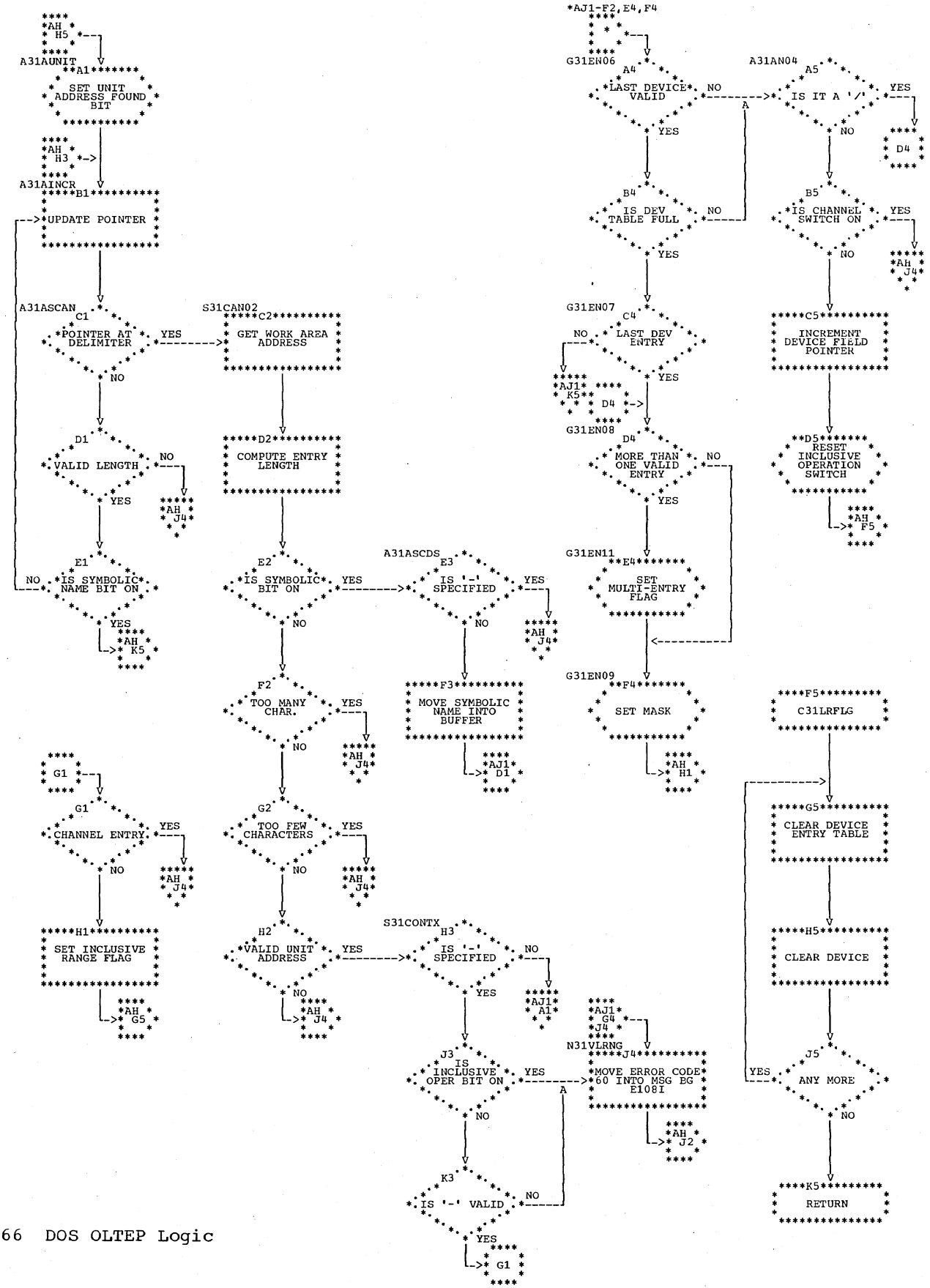


Chart AJ1. IJZADO31: Device Decode (Section 3 of 3)

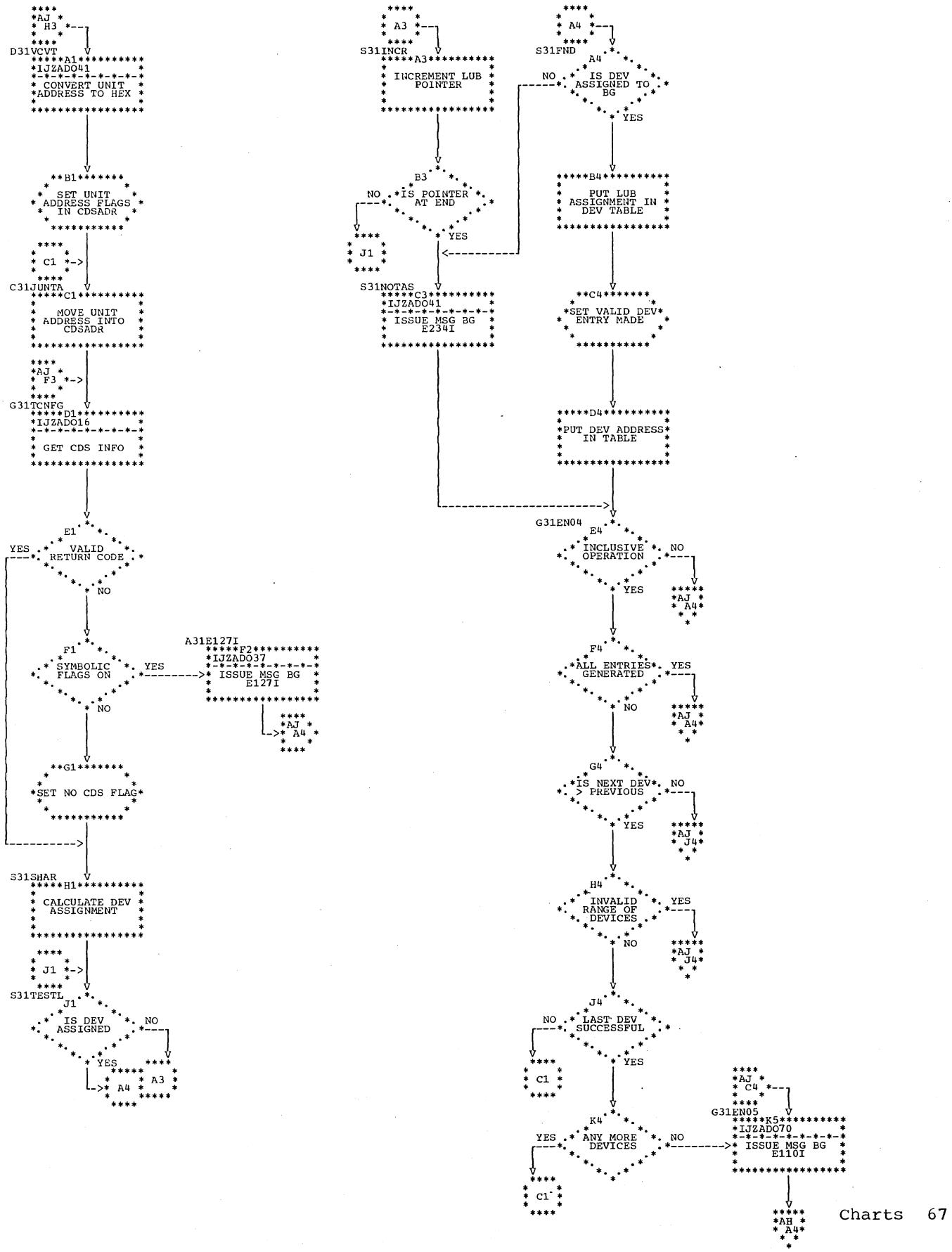


Chart AK. IJZADO32: Test Decode (Section 1 of 3)

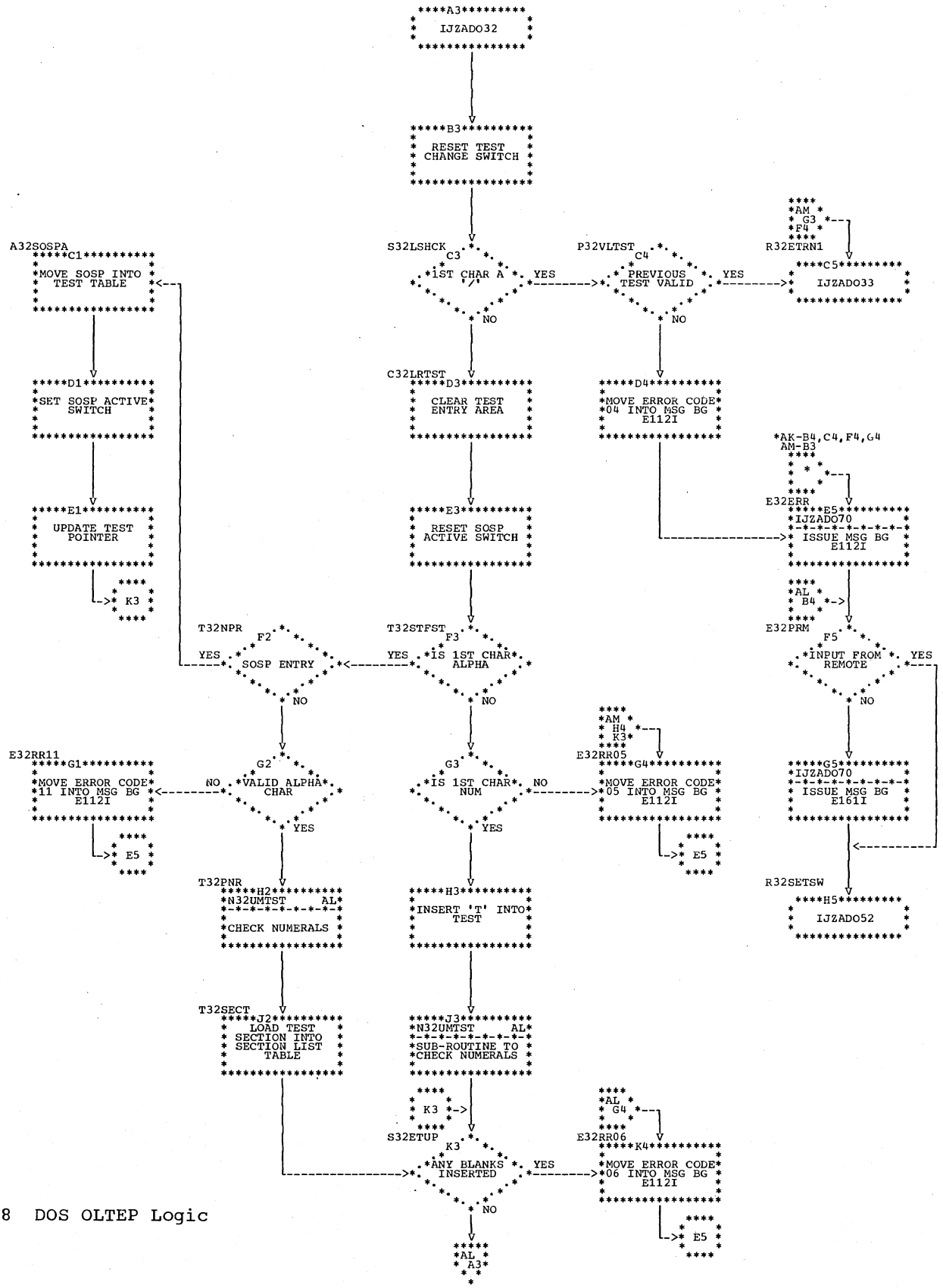


Chart AL. IJZADO32: Test Decode (Section 2 of 3)

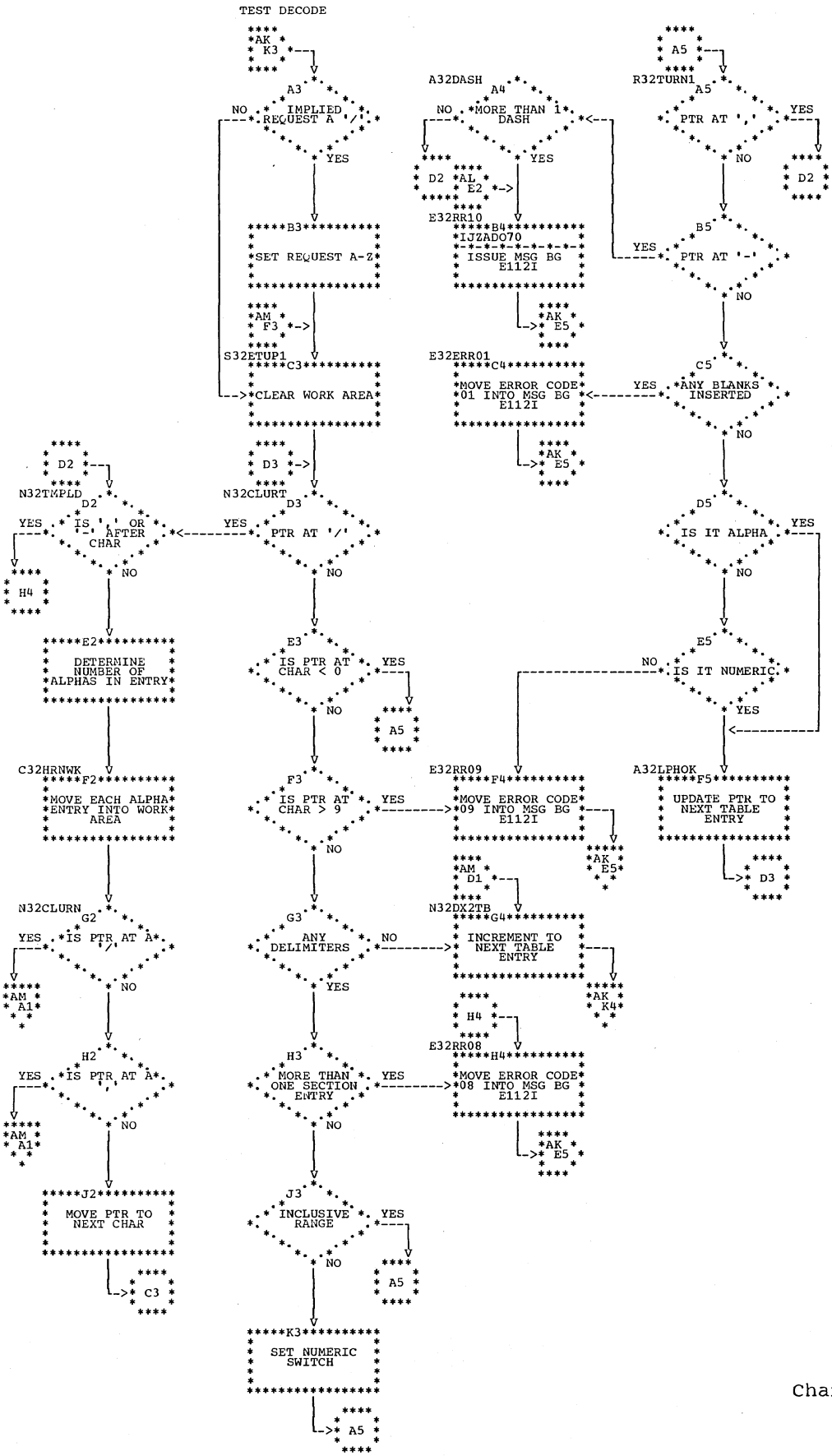


Chart AM. IJZADO32: Test Decode (Section 3 of 3)

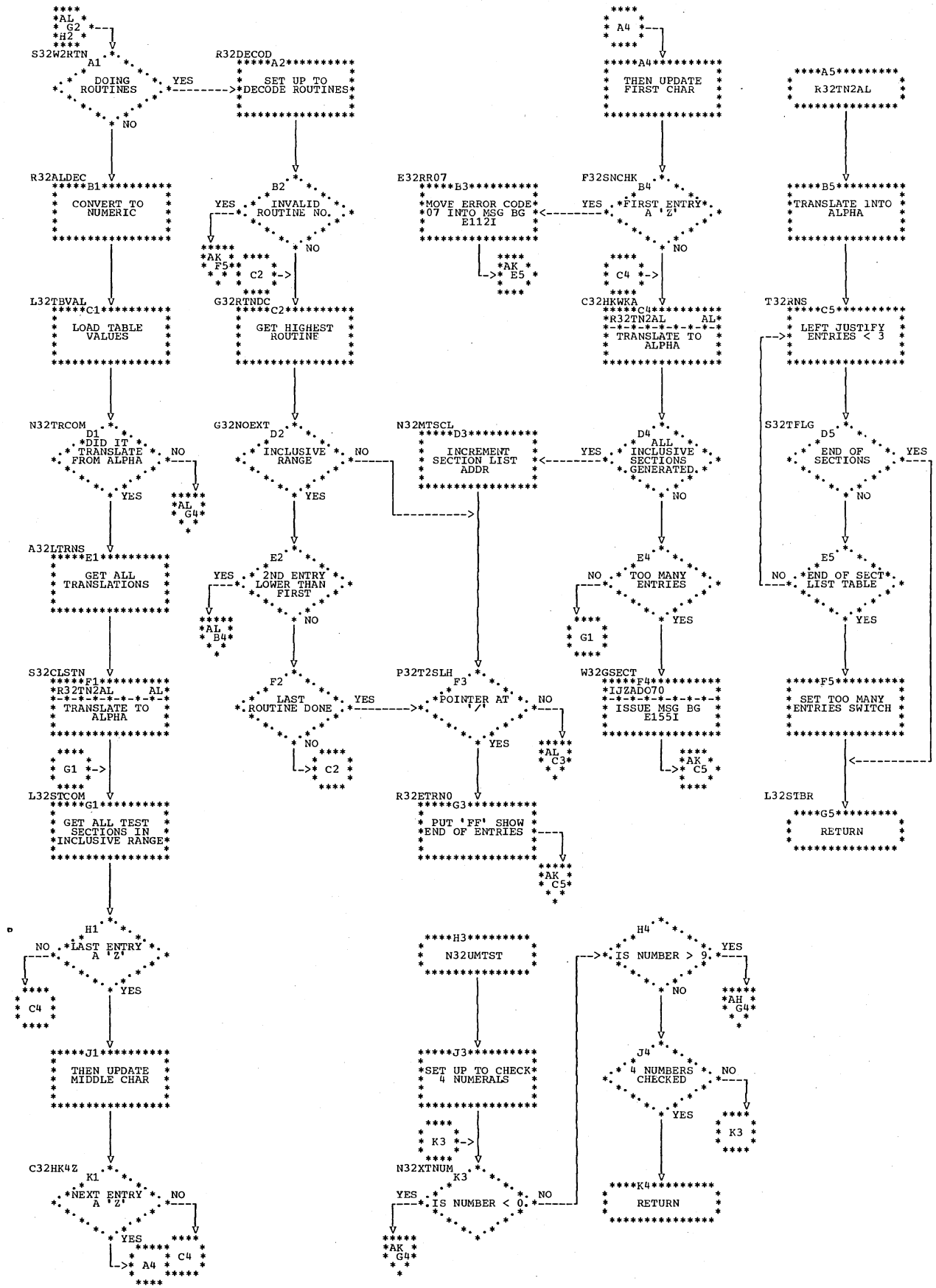


Chart AN. IJZADO33: Option Decode

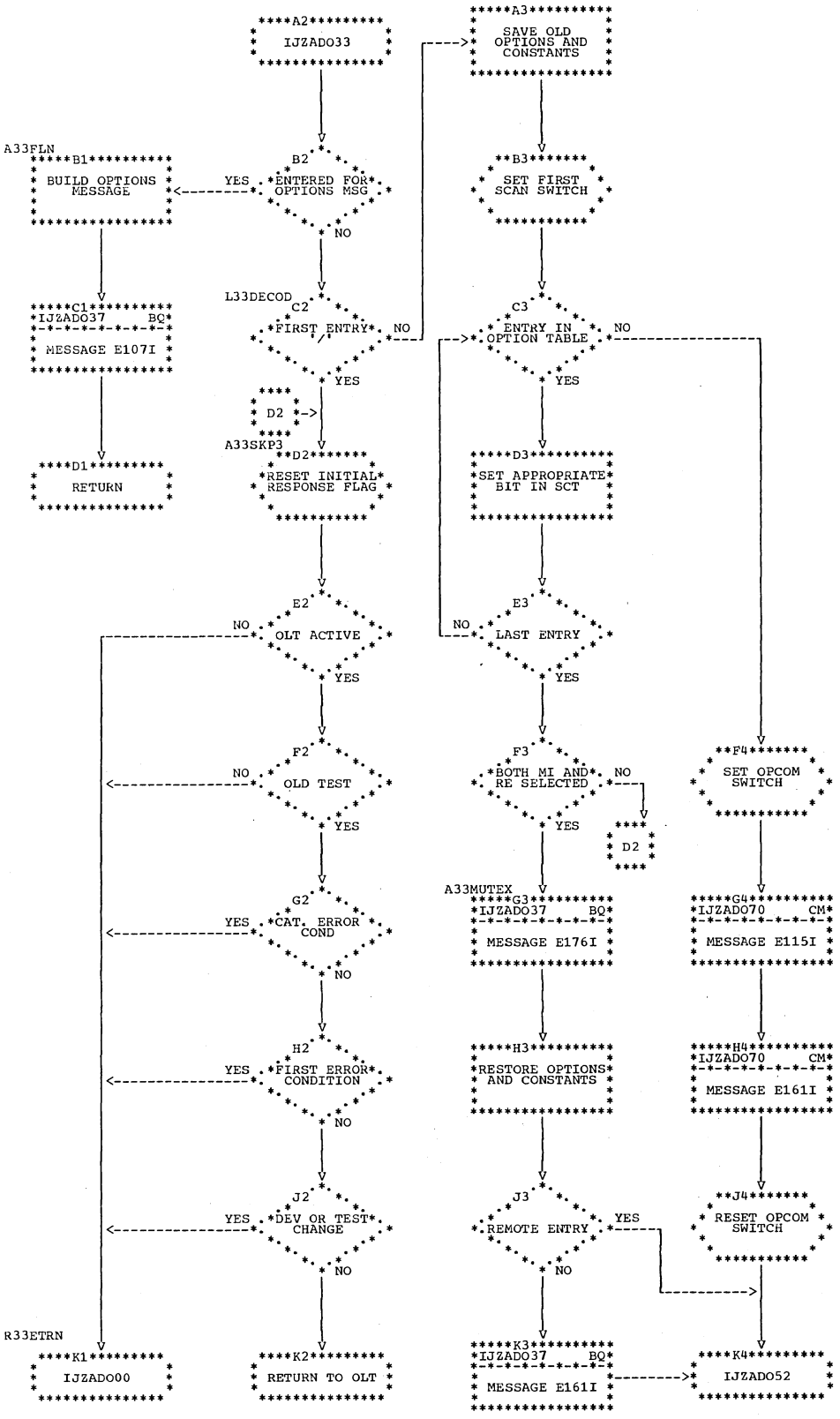


Chart AP. IJZADO00: Scheduler (Section 1 of 4)

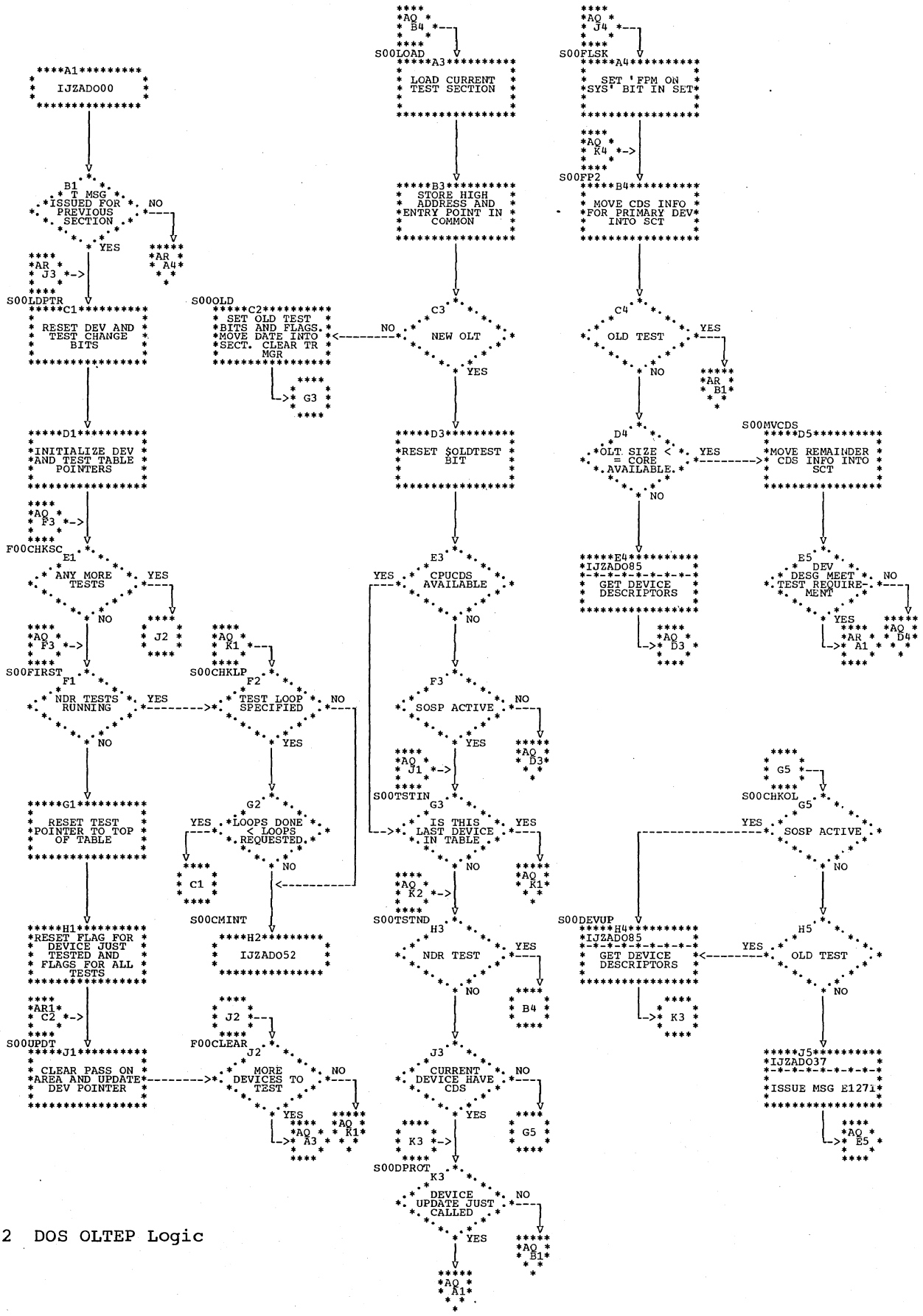


Chart AQ. IJZADO00: Scheduler (Section 2 of 4)

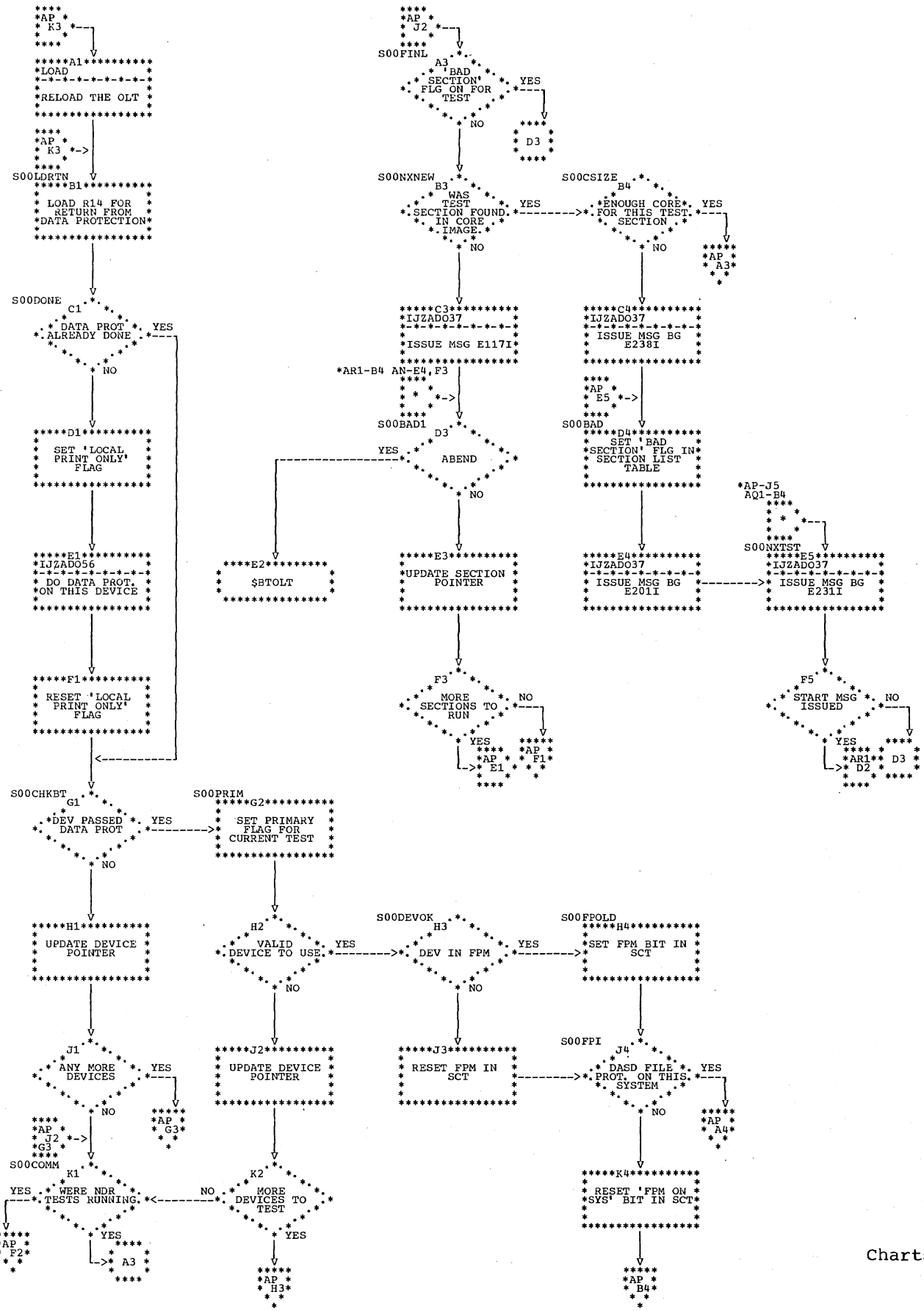


Chart AR. IJZADO00: Scheduler (Section 3 of 4)

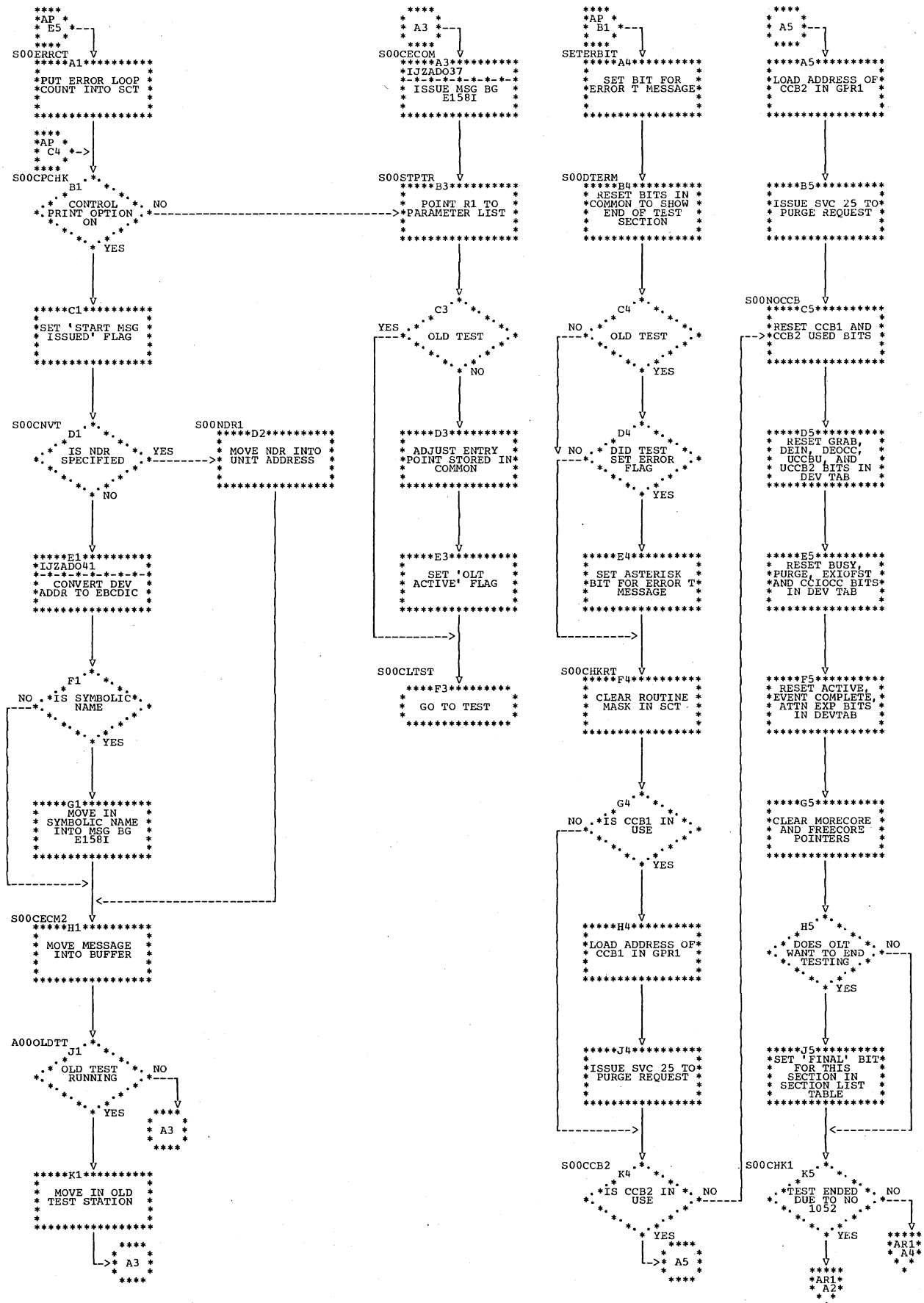


Chart AR1. IJZADO00: Scheduler (Section 4 of 4)

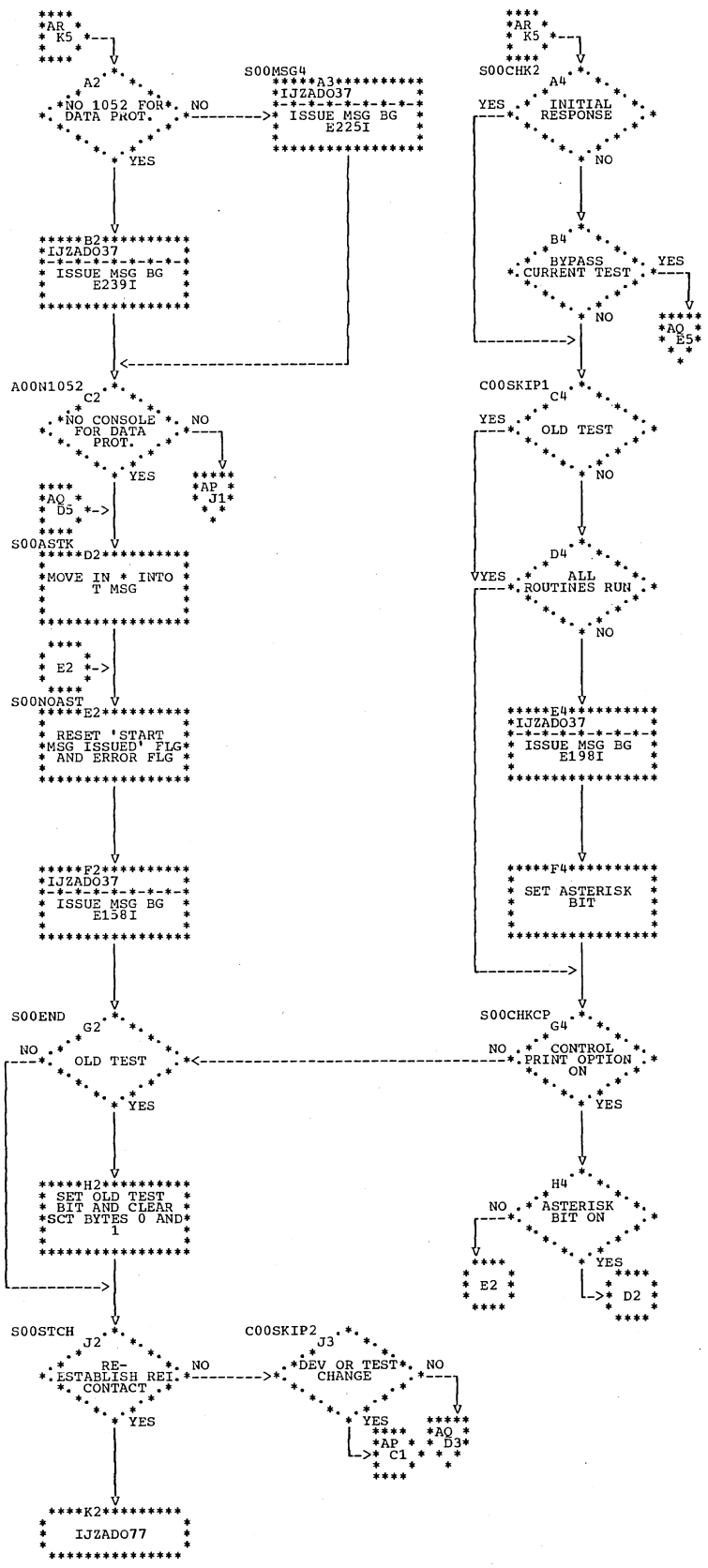


Chart AS. IJZADO56: Data Protect (General) (Section 1 of 2)

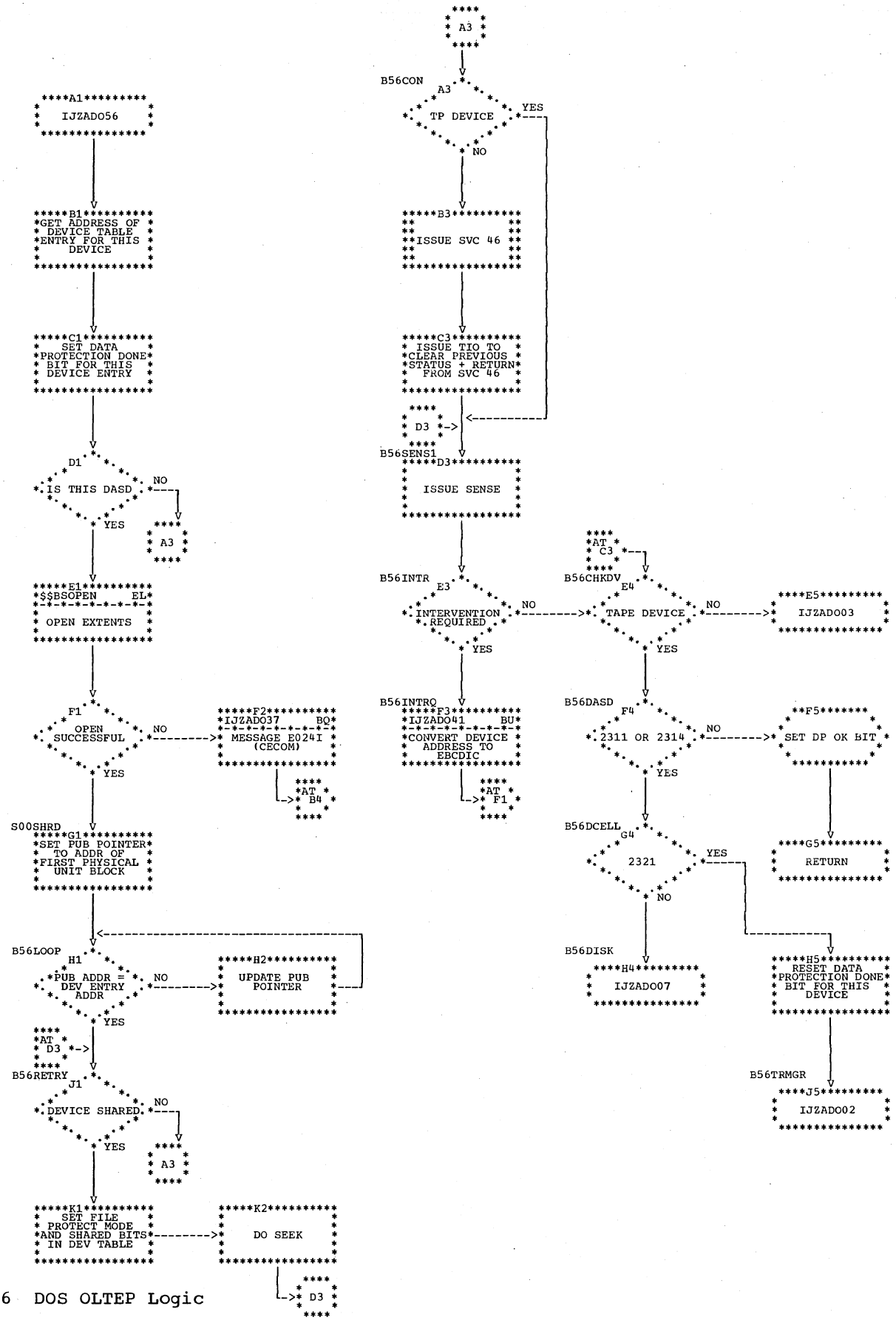
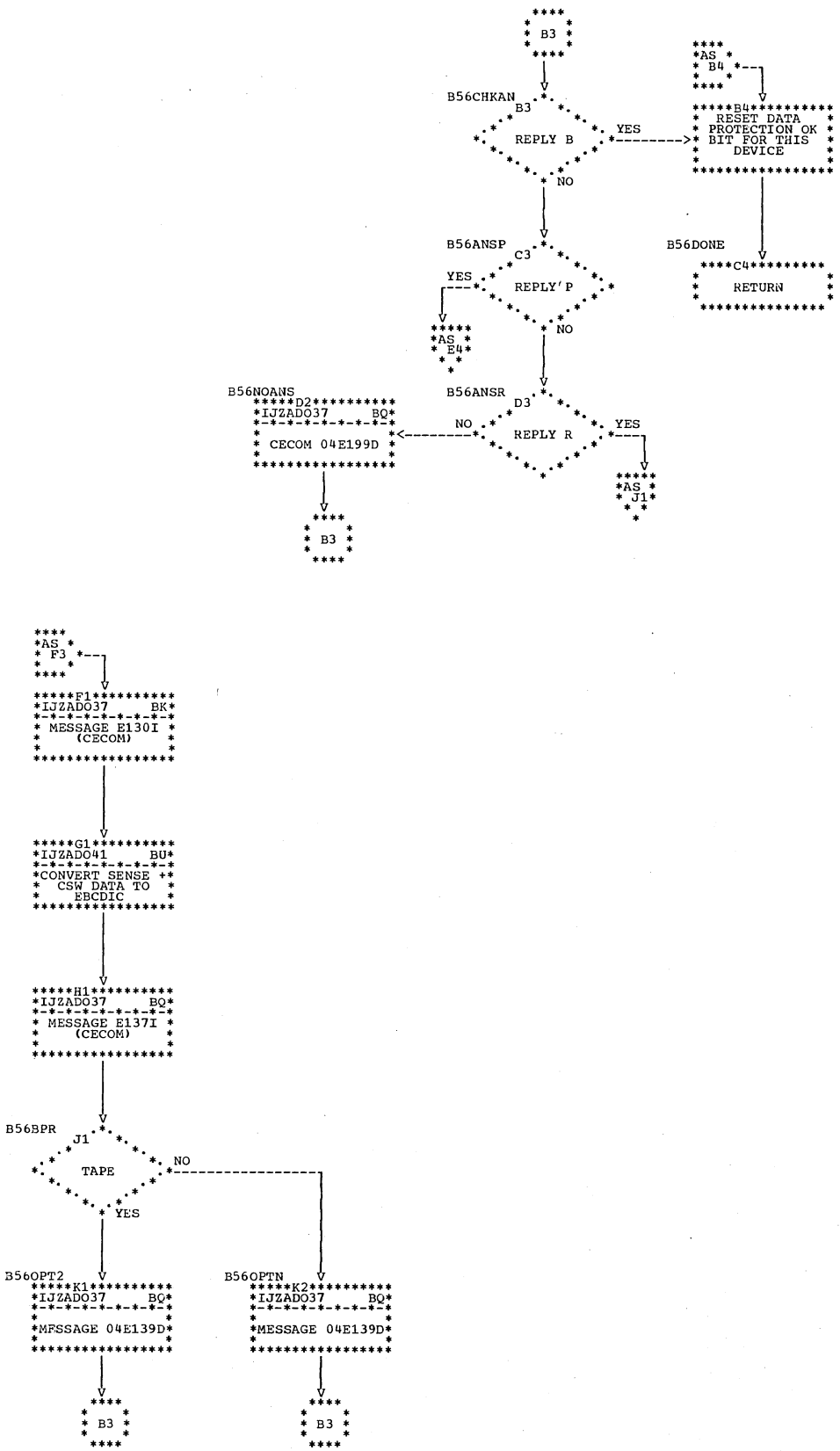


Chart AT. IJZADO56: Data Protect (General) (Section 2 of 2)



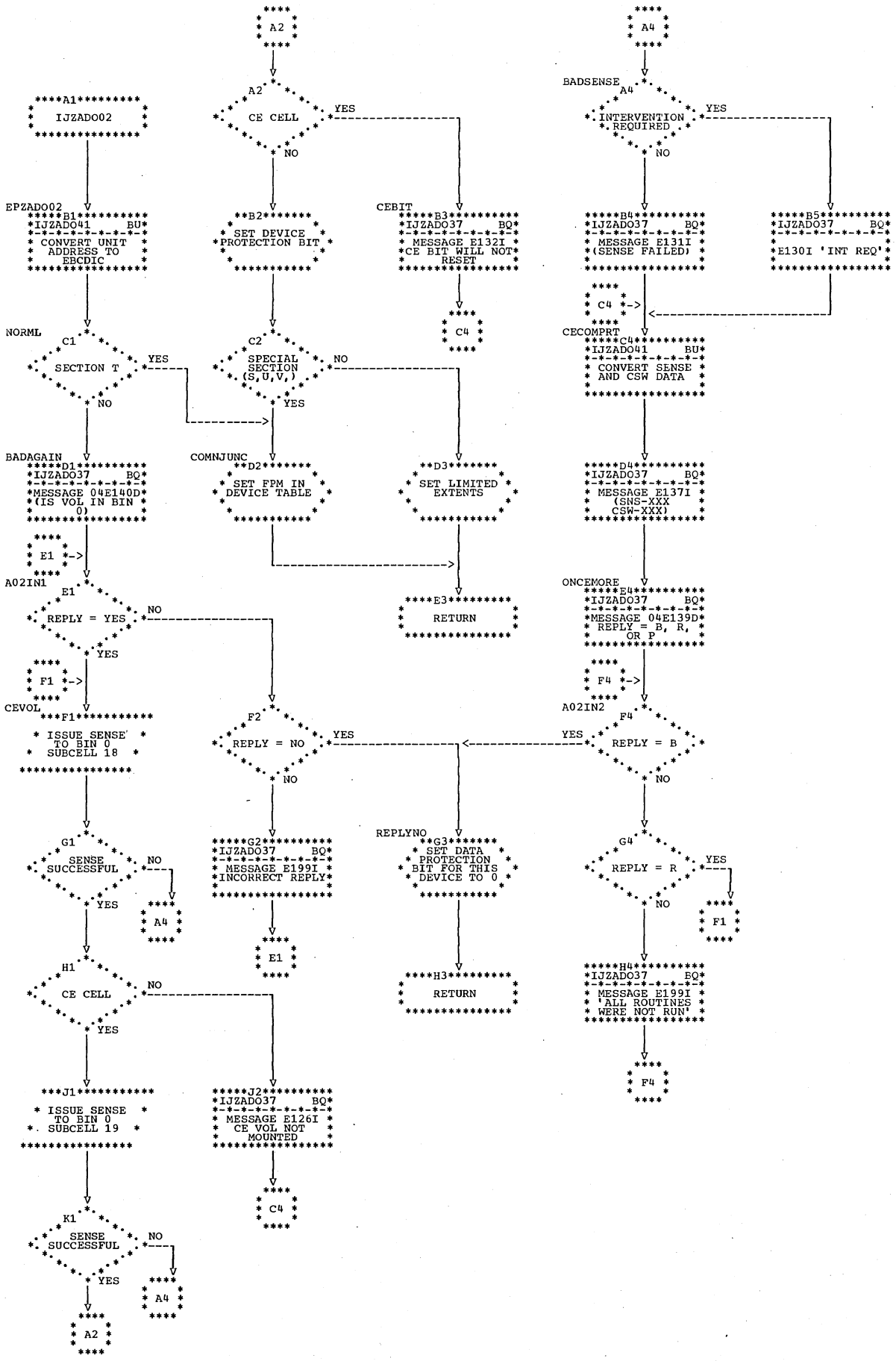

A2
A1
IJZADO02
CE CELL
YES
NO
EPZADO02
B1
IJZADO41 BU
CONVERT UNIT ADDRESS TO EBCDIC
B2
SET DEVICE PROTECTION BIT
CEBIT
B3
IJZADO37 BQ
MESSAGE E132I
CE BIT WILL NOT RESET
C4
NORML
C1
SECTION T
C2
SPECIAL SECTION (S,U,V,)
BADAGAIN
D1
IJZADO37 BQ
MESSAGE 04E140D (IS VOL IN BIN 0)
COMNJUNC
D2
SET FPM IN DEVICE TABLE
D3
SET LIMITED EXTENTS
E1
A02IN1
REPLY = YES
E3
RETURN
F1
CEVOL
ISSUE SENSE TO BIN 0 SUBCELL 18
F2
REPLY = NO
G1
SENSE SUCCESSFUL
G2
IJZADO37 BQ
MESSAGE E199I
INCORRECT REPLY
REPLYNO
G3
SET DATA PROTECTION BIT FOR THIS DEVICE TO 0
H1
CE CELL
H3
RETURN
J1
ISSUE SENSE TO BIN 0 SUBCELL 19
J2
IJZADO37 BQ
MESSAGE E126I
CE VOL NOT MOUNTED
K1
SENSE SUCCESSFUL
A4
BADSENSE
INTERVENTION REQUIRED
B4
IJZADO37 BQ
MESSAGE E131I (SENSE FAILED)
B5
IJZADO37 BQ
E130I 'INT REQ'
CECOMPRT
C4
IJZADO41 BU
CONVERT SENSE AND CSW DATA
D4
IJZADO37 BQ
MESSAGE E137I (SNS-XXX CSW-XXX)
ONCEMORE
E4
IJZADO37 BQ
MESSAGE 04E139D REPLY = B, R, OR P
F4
A02IN2
REPLY = B
G4
REPLY = R
H4
IJZADO37 BQ
MESSAGE E199I 'ALL ROUTINES WERE NOT RUN'

Chart AV. IJZAD003: Data Protect (Tape) (Section 1 of 2)

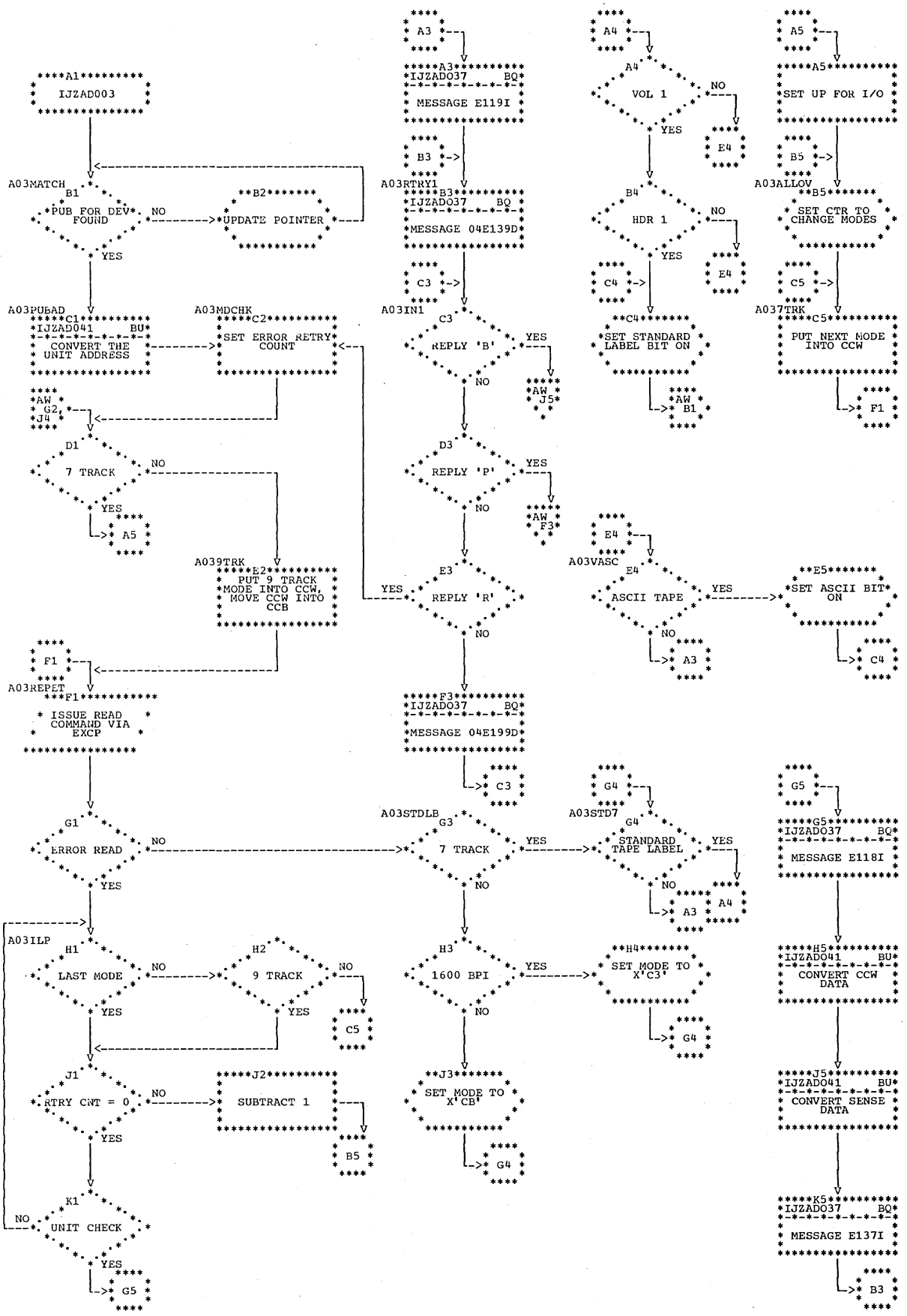


Chart AW. IJZADO03: Data Protect (Tape) (Section 2 of 2)

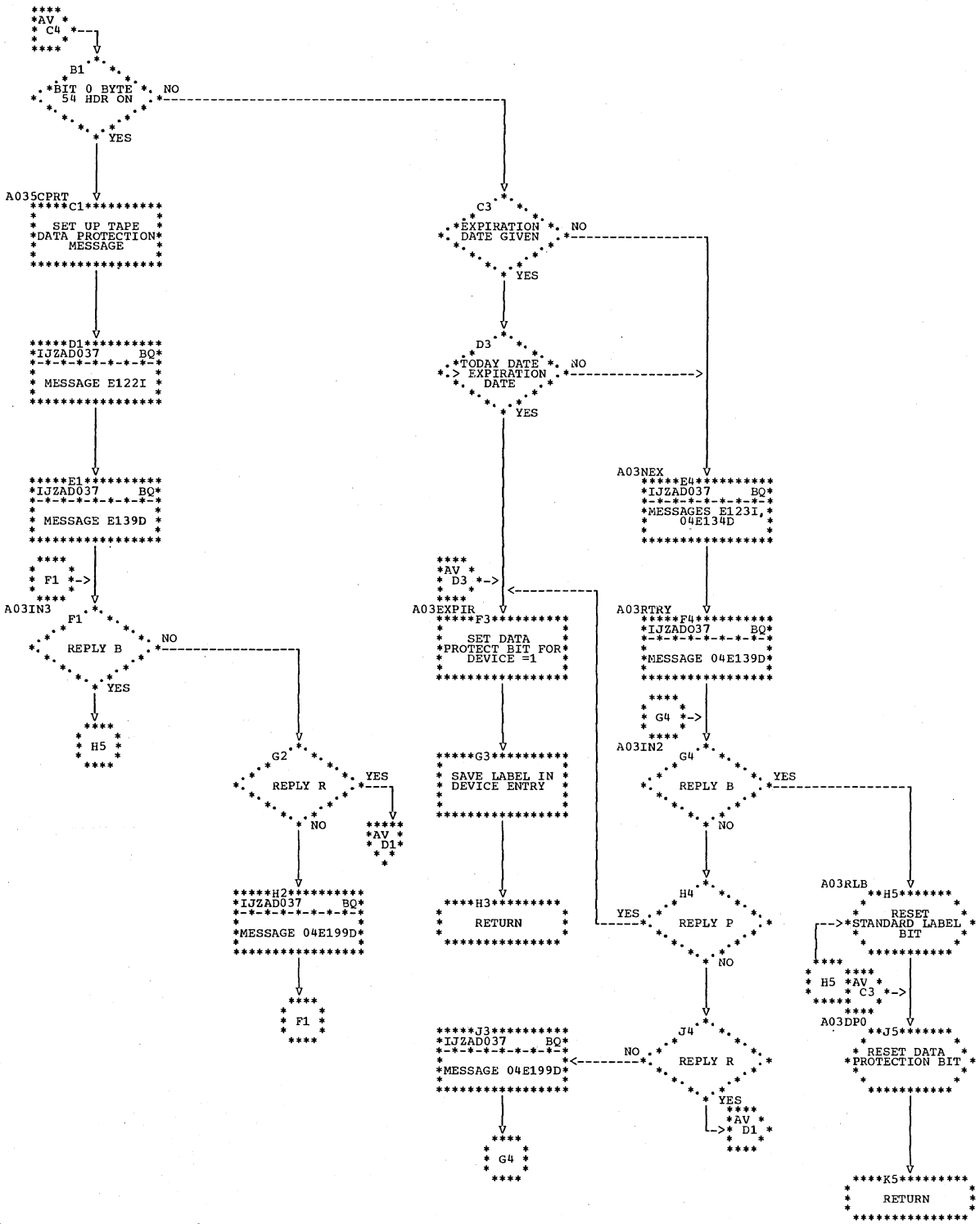


Chart AX. IJZADO07: Data Protect (2311/2314)

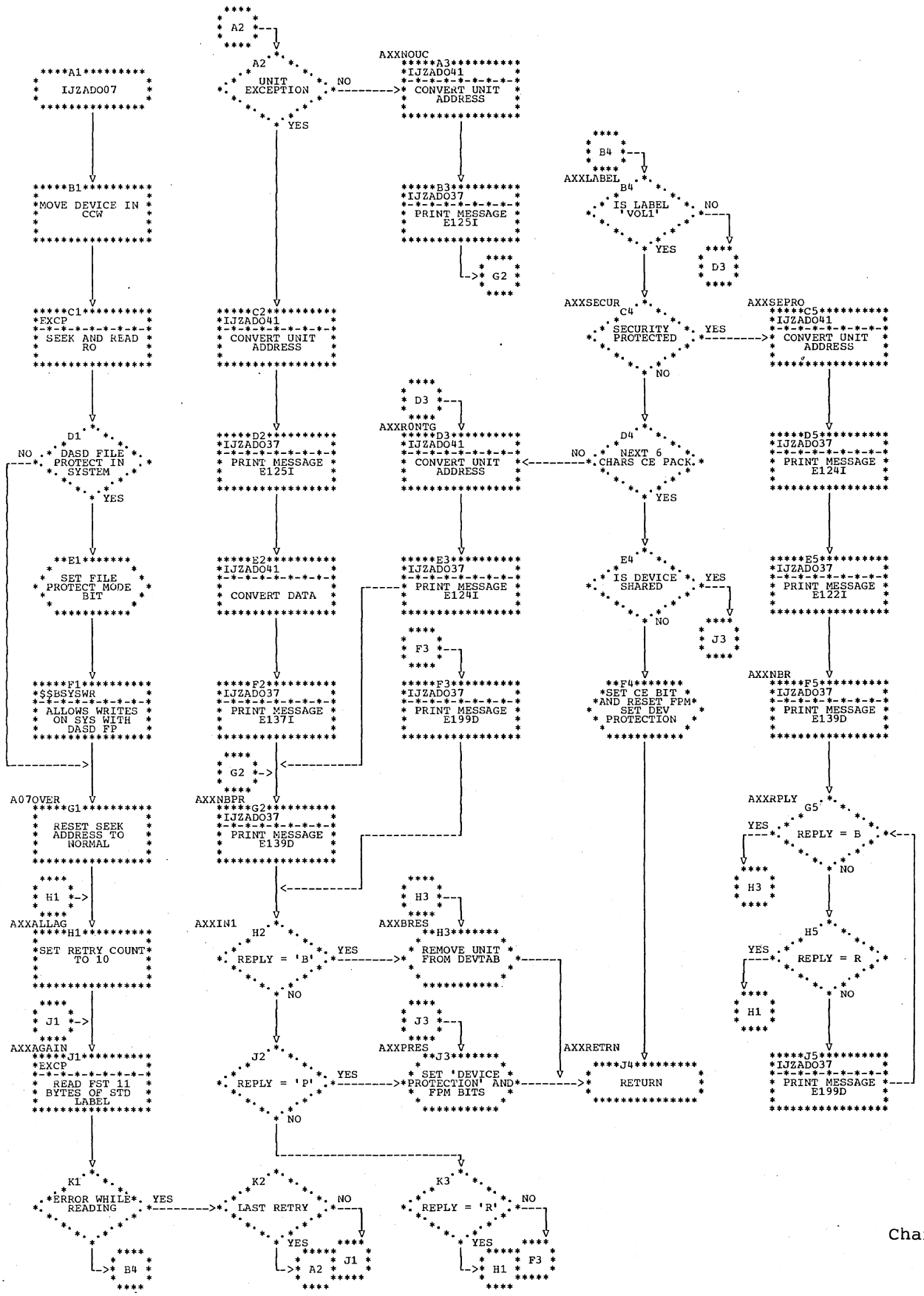


Chart AY. IJZADO11: TP Line Connection (Section 1 of 3)

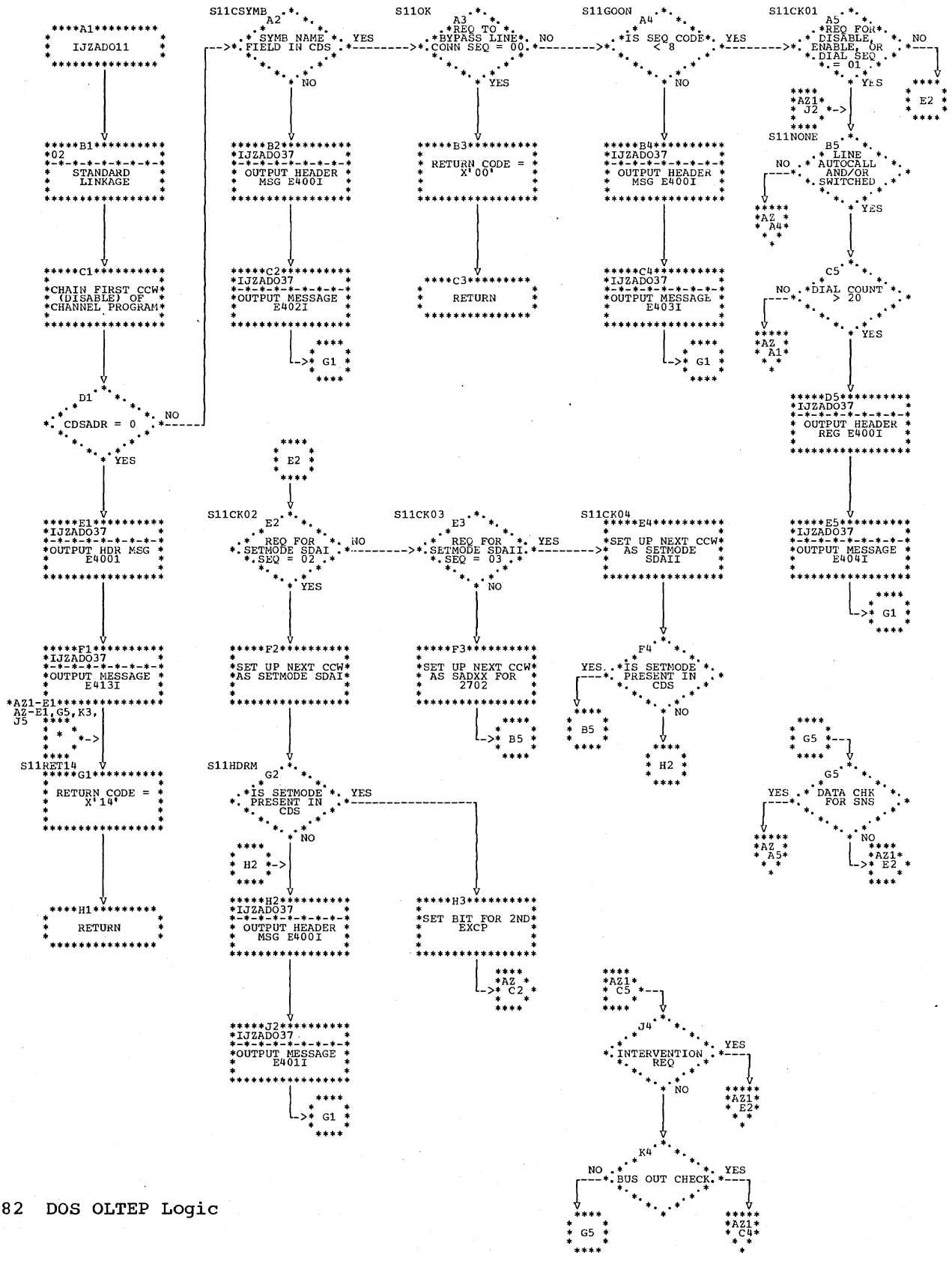


Chart AZ. IJZADO11: TP Line Connection (Section 2 of 3)

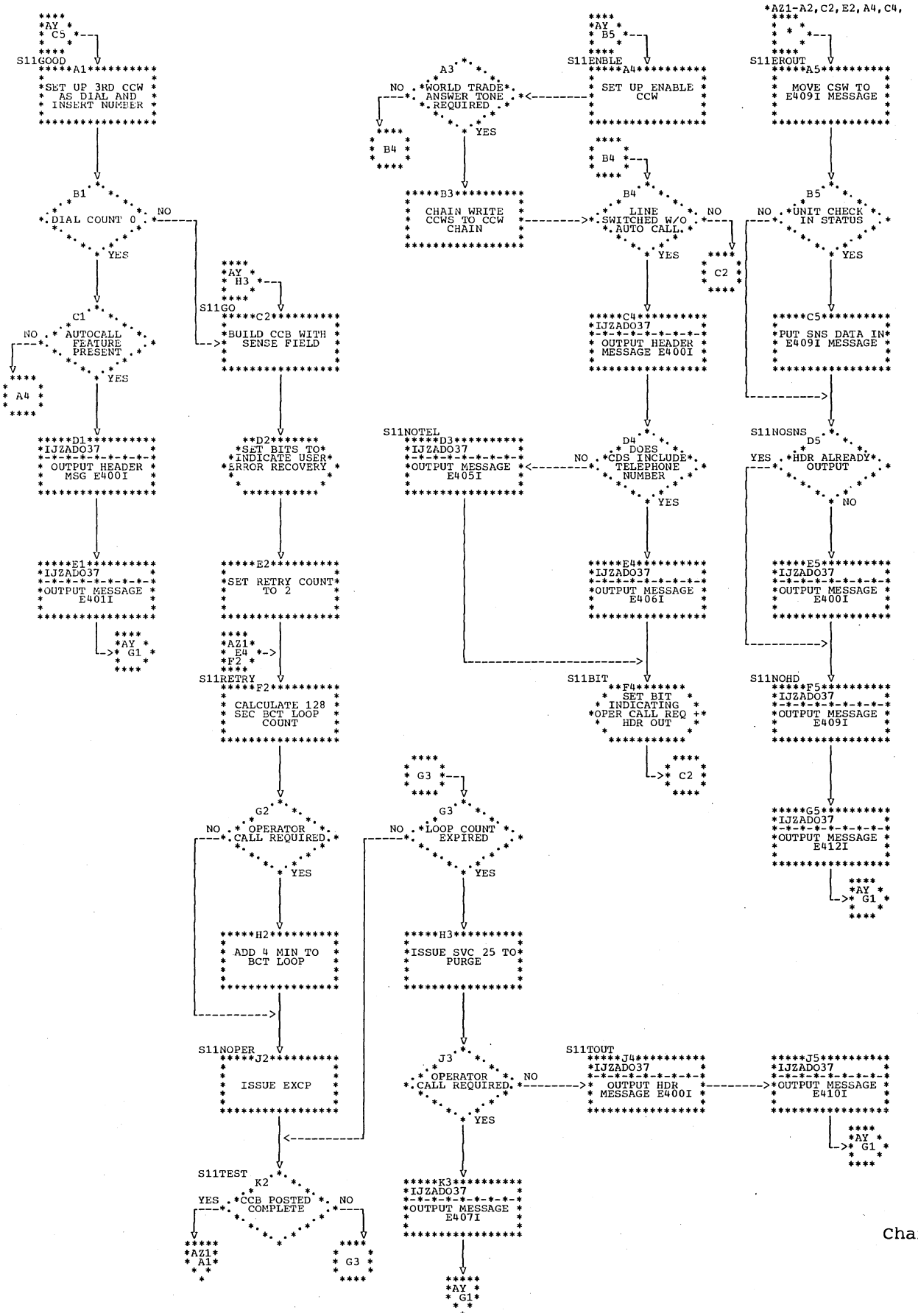


Chart AZ1. IJZADO11: TP Line Connection (Section 3 of 3)

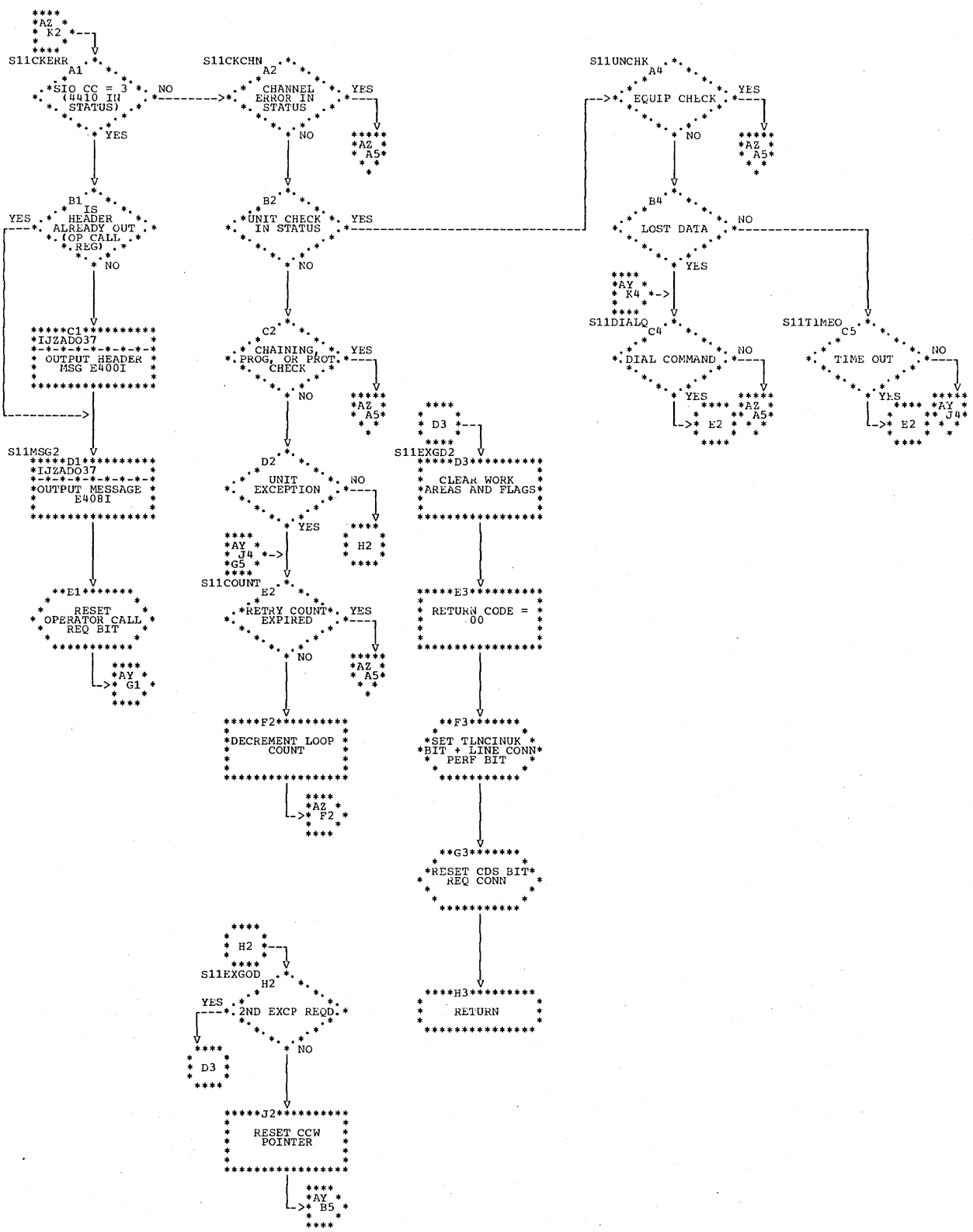


Chart BA. IJZADO10: REI Nucleus (Section 1 of 4)

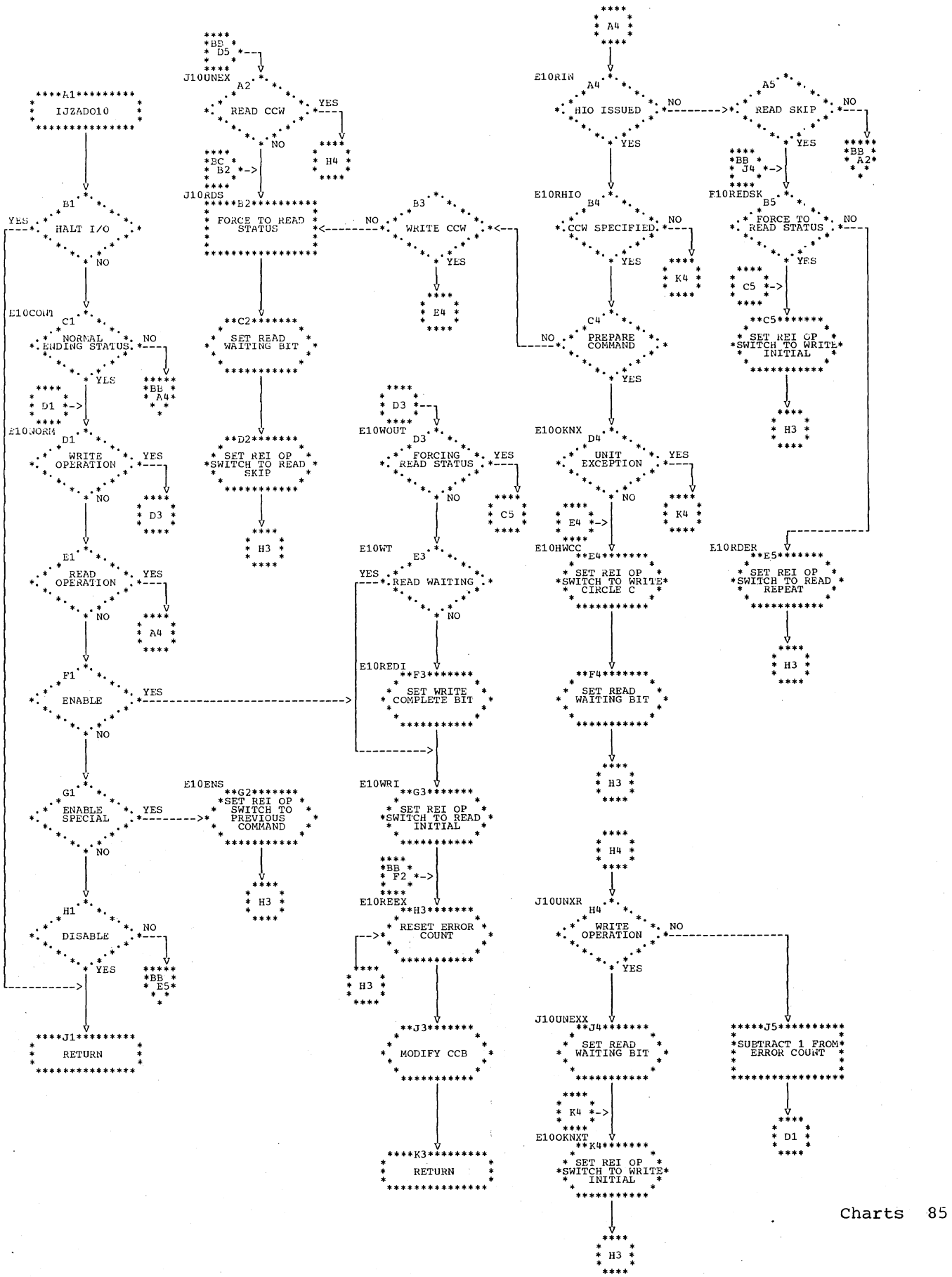


Chart BB. IJZAD010: REI Nucleus (Section 2 of 4)

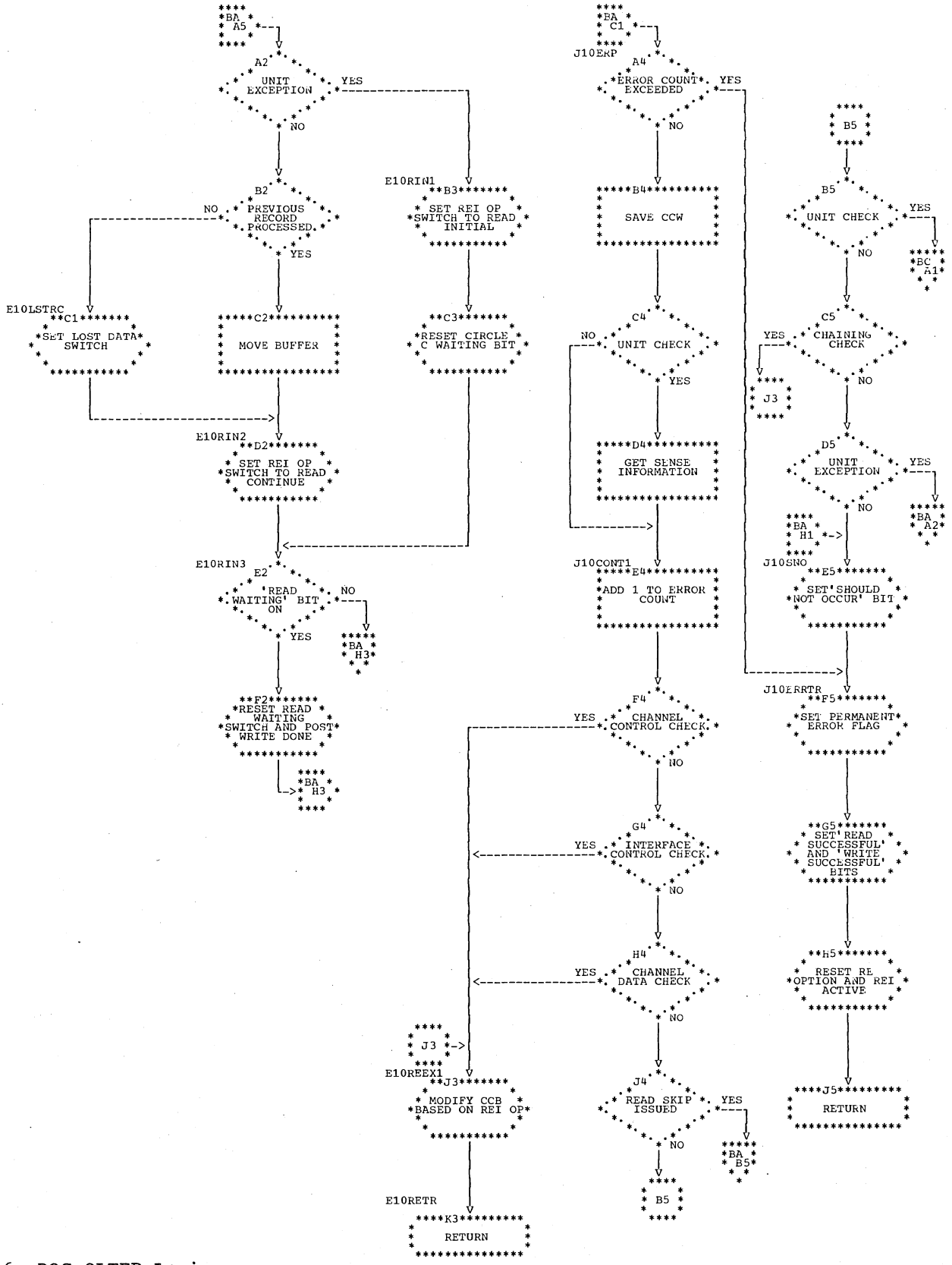


Chart BC. IJZADO10: REI Nucleus (Section 3 of 4)

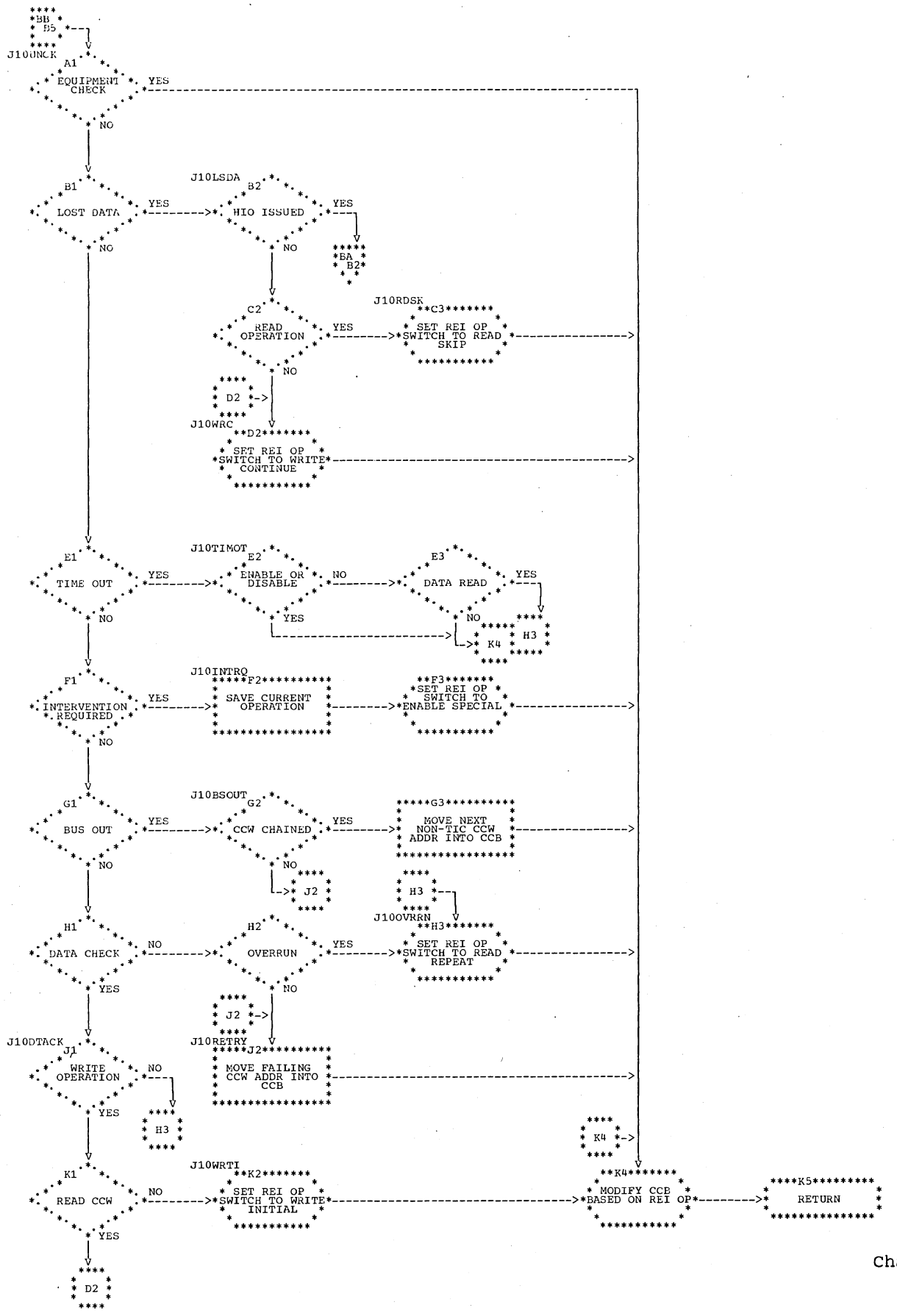


Chart BD. IJZADO10: REI Nucleus (Section 4 of 4)

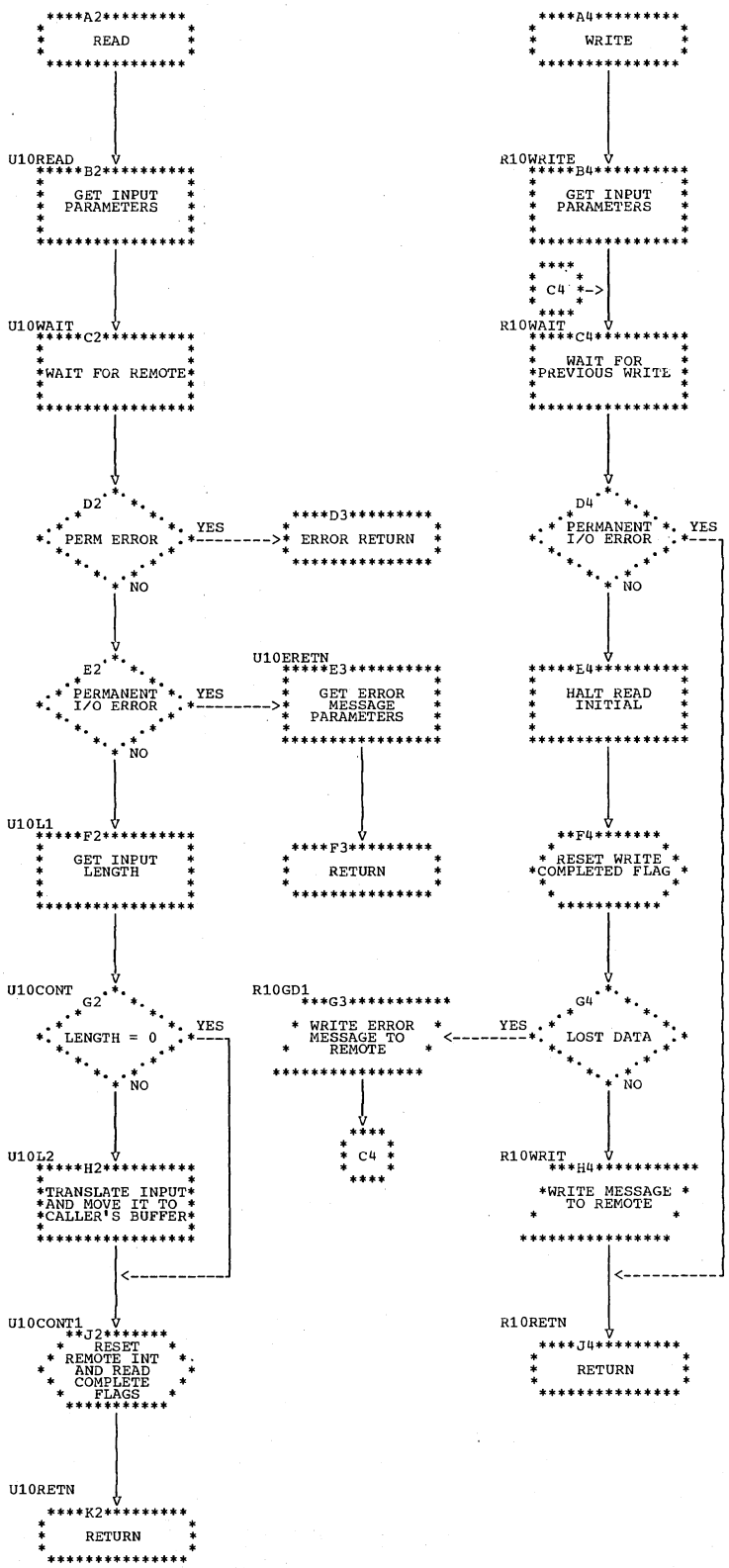


Chart BE. IJZADO16: GETCONFG (Section 1 of 2)

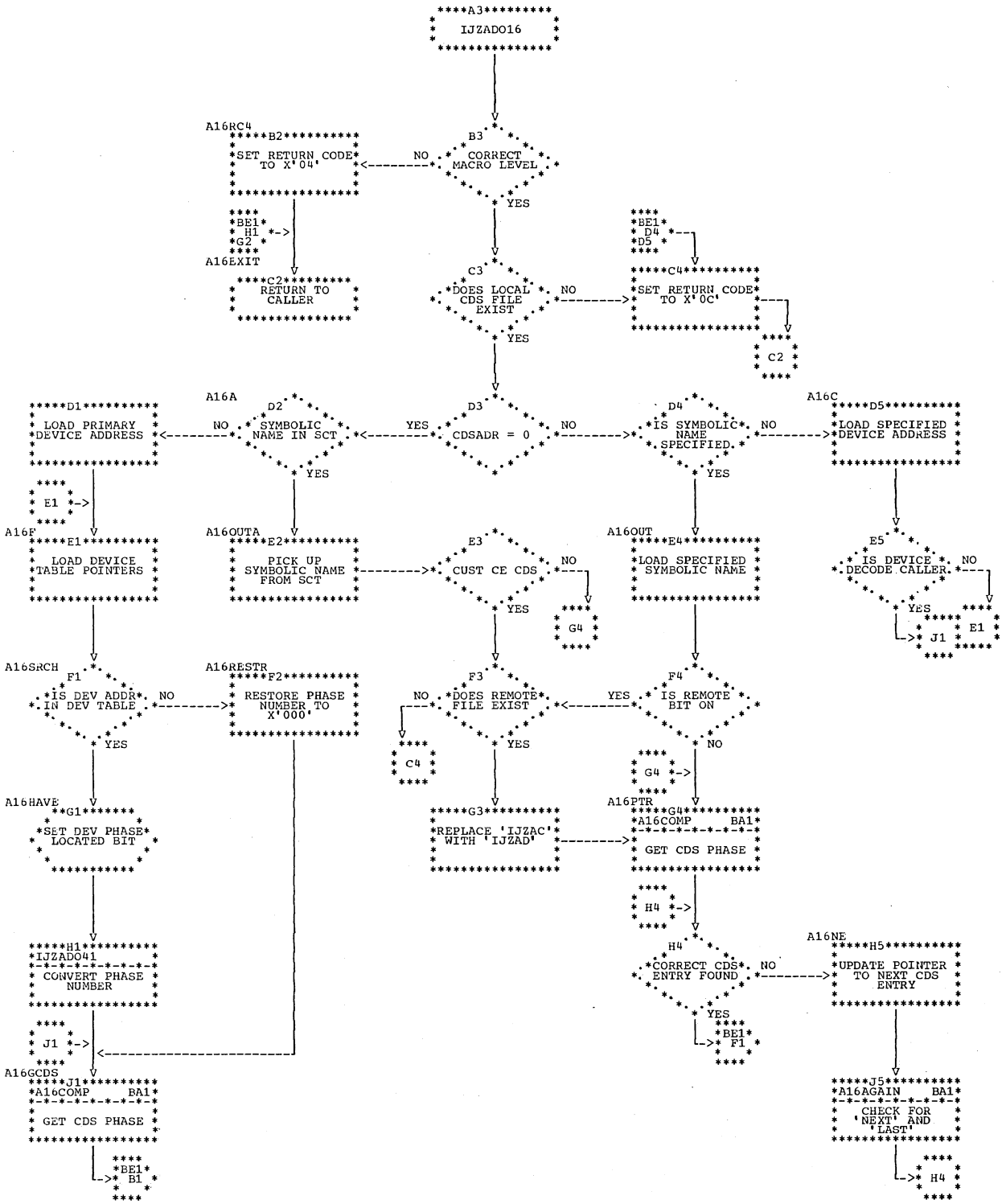


Chart BE1. IJZADO16: GETCONFG (Section 2 of 2)

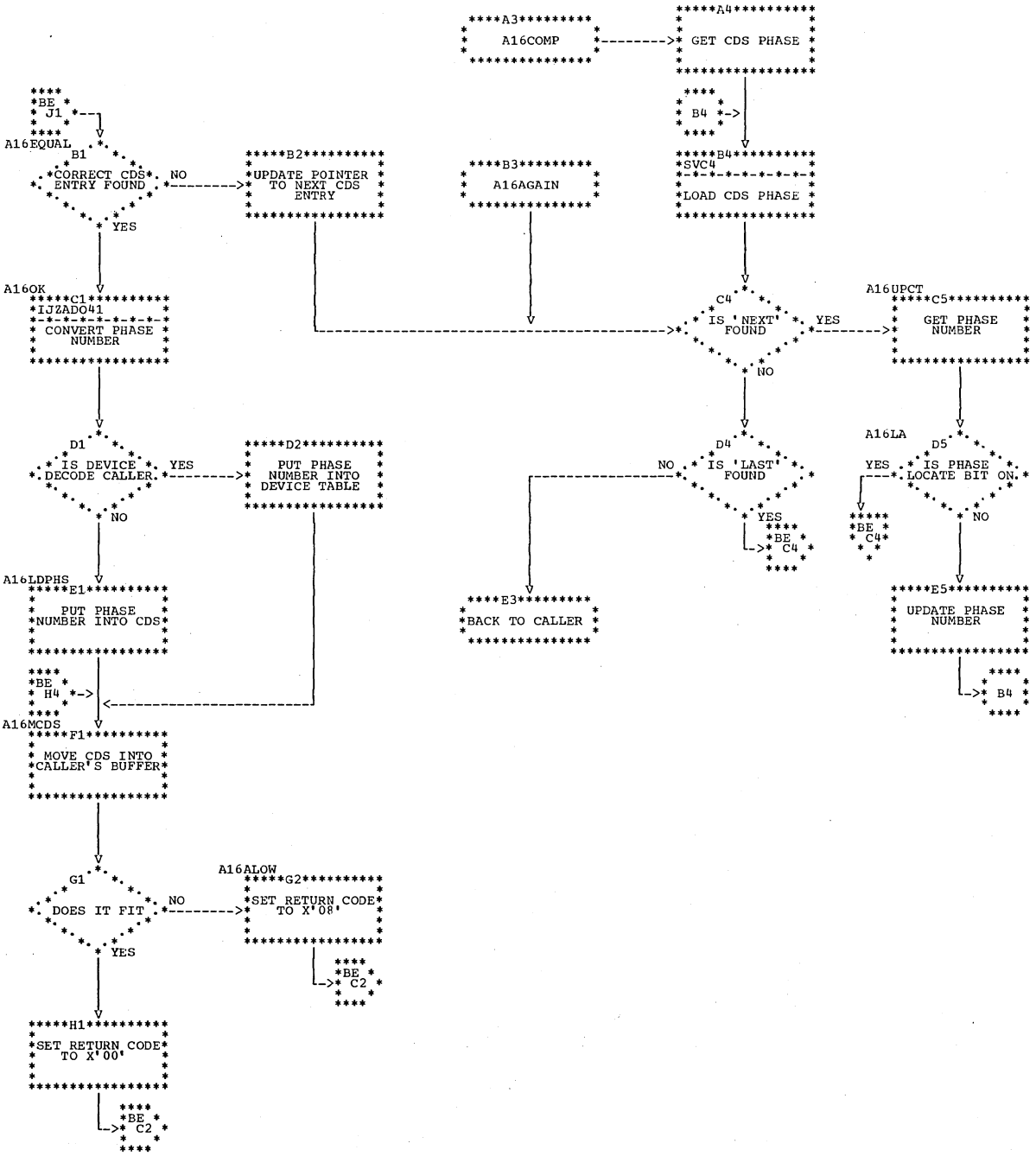


Chart BF. IJZADO21: GRAB (Section 1 of 2)

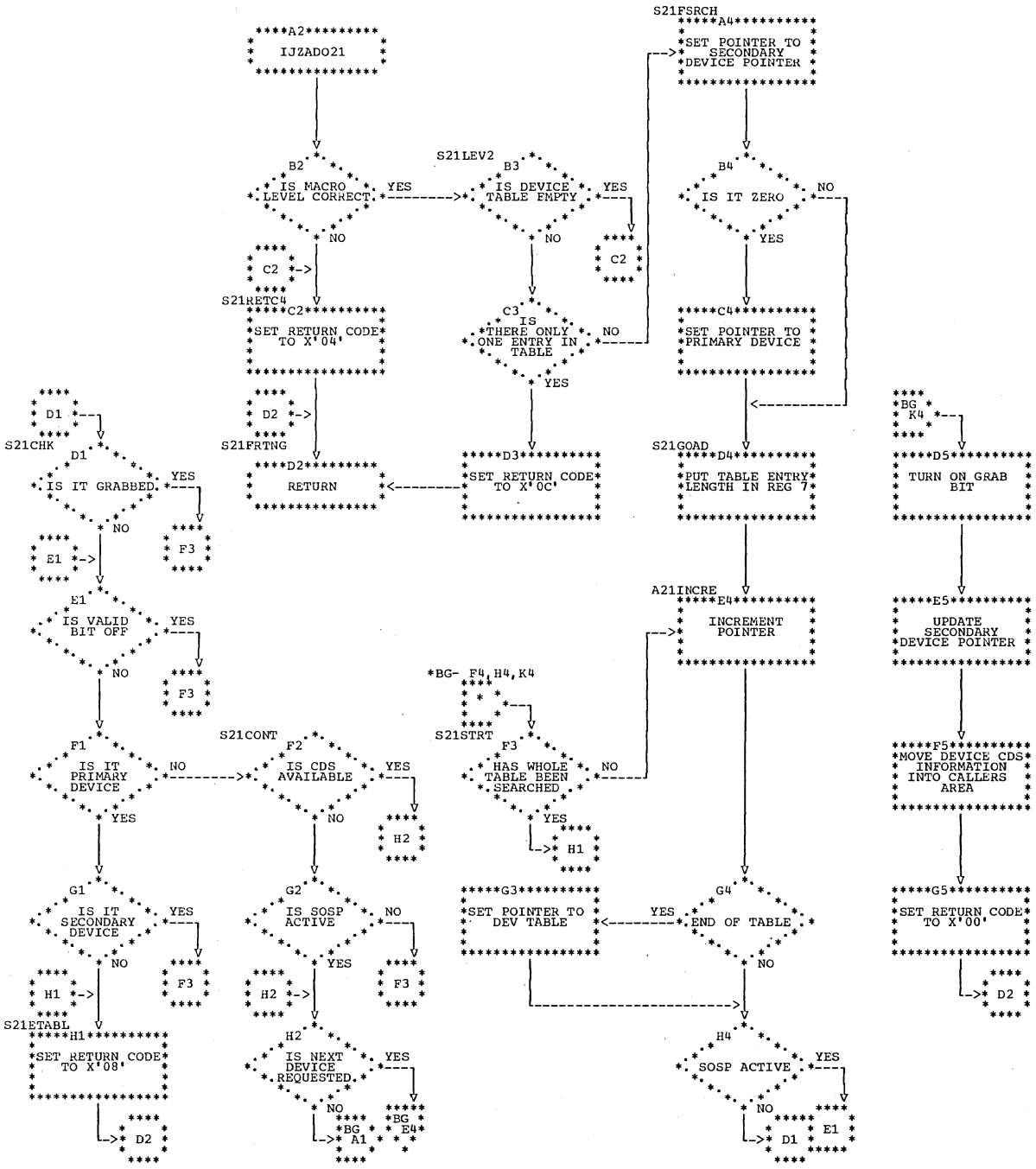


Chart BG. IJZADO21: GRAB (Section 2 of 2)

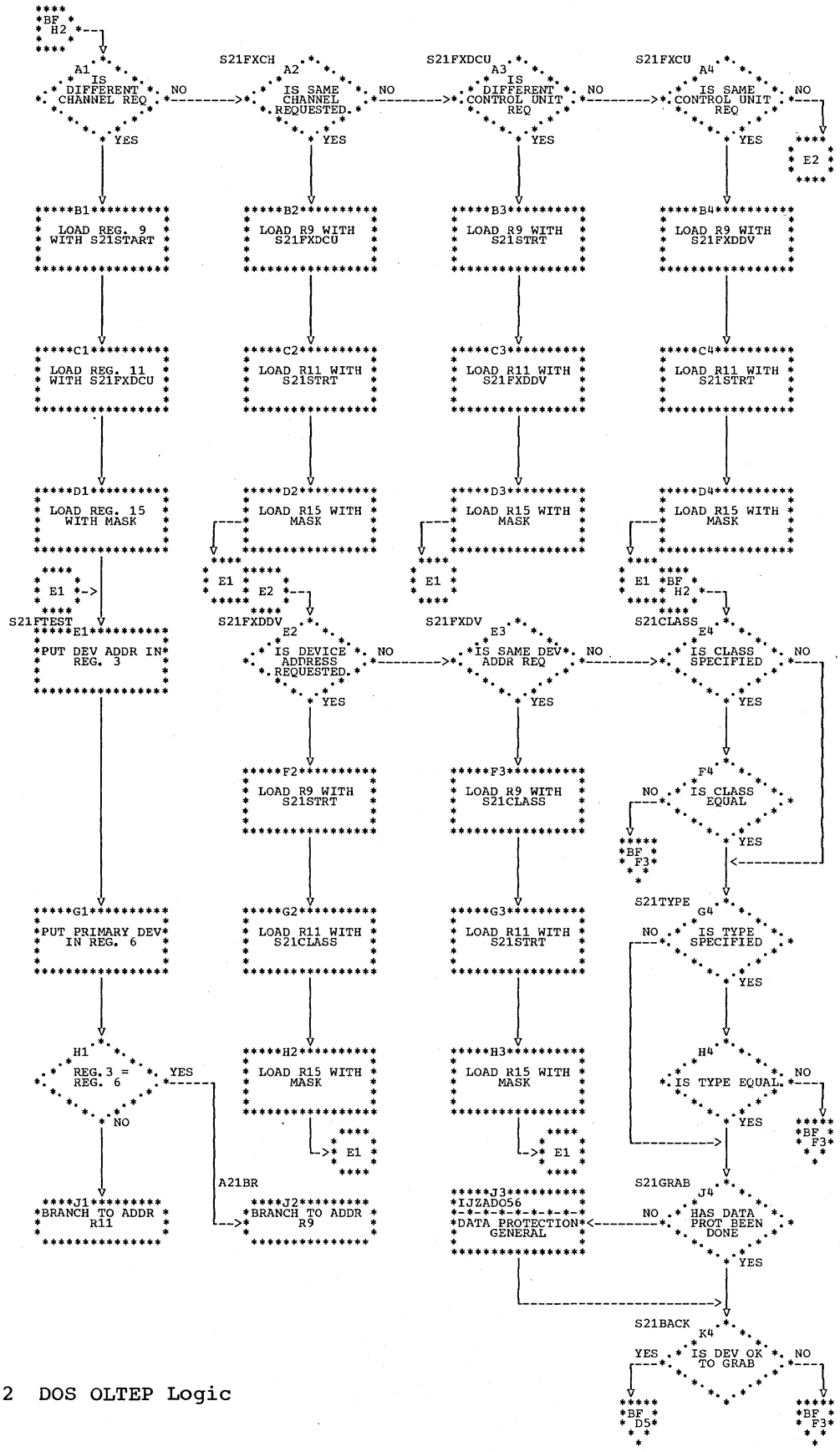
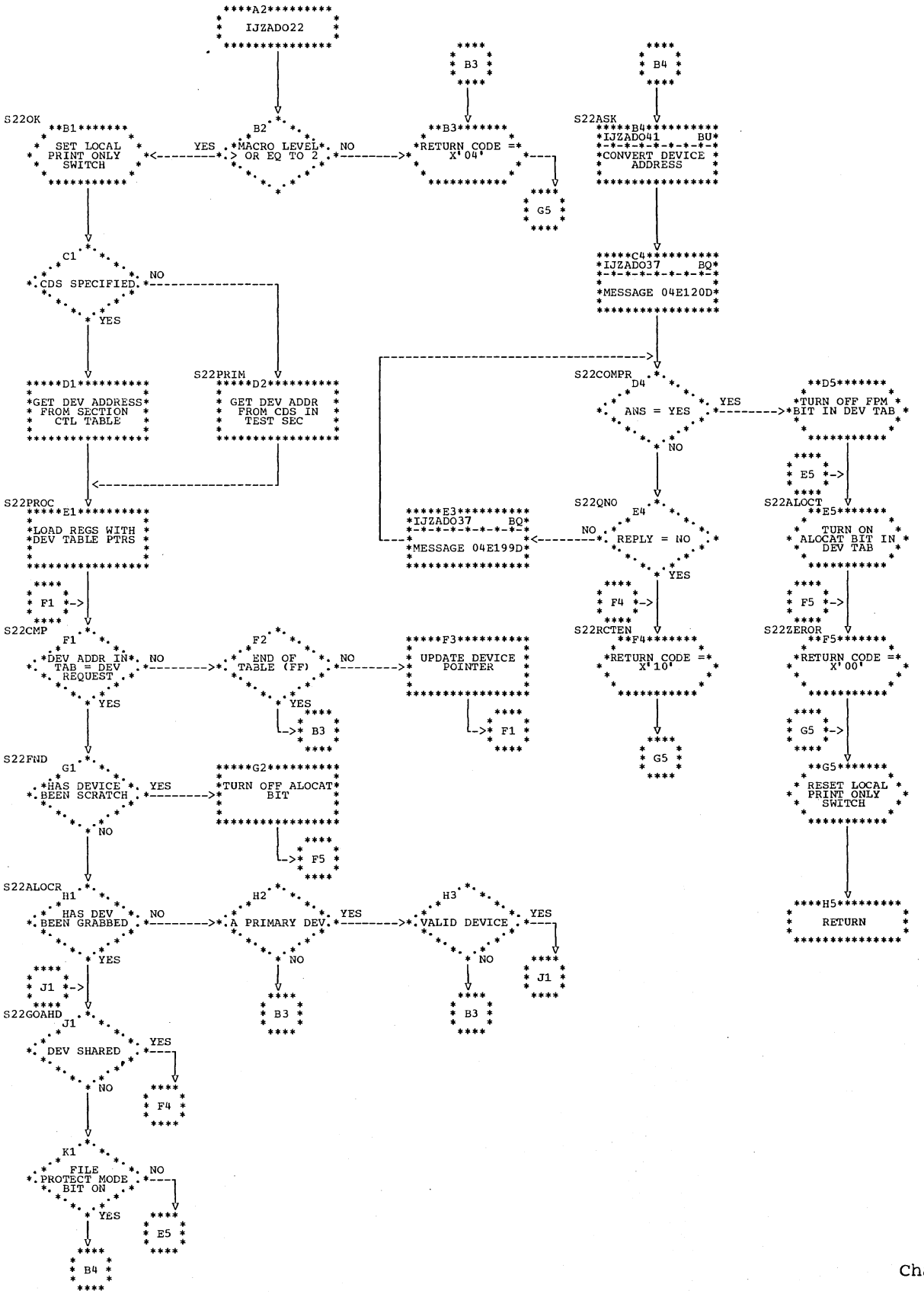


Chart BH. IJZADO22: ALOCAT



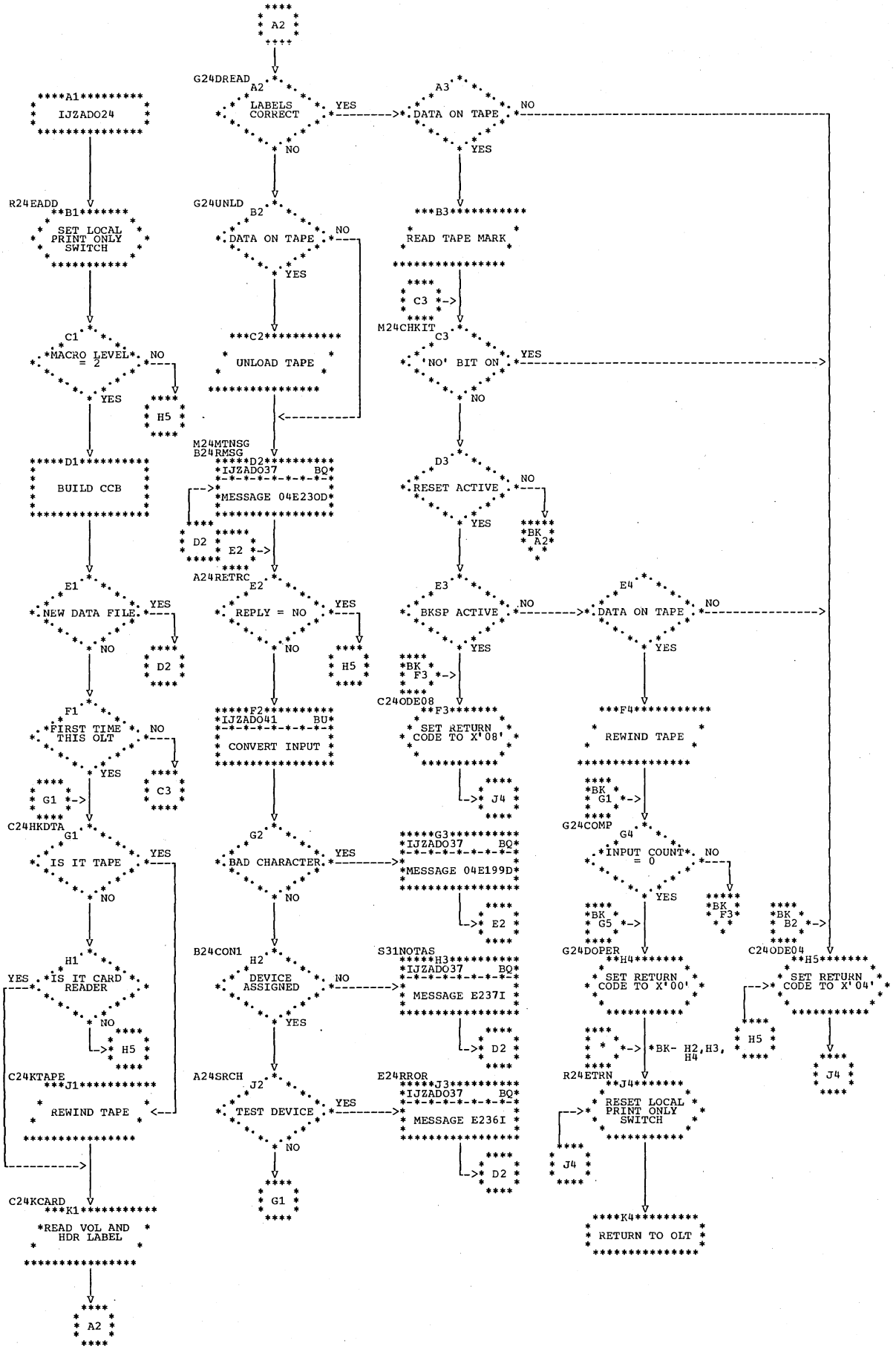

A1
IJZADO24
R24EADD
B1
SET LOCAL PRINT ONLY SWITCH
C1
MACRO LEVEL = 2
NO
YES
H5
D1
BUILD CCB
E1
NEW DATA FILE
YES
NO
D2
F1
FIRST TIME THIS OLT
YES
NO
C3
G1
C24HKDTA
G1
IS IT TAPE
YES
NO
H1
IS IT CARD READER
YES
NO
H5
C24KTAPE
J1
REWIND TAPE
C24KCARD
K1
READ VOL AND HDR LABEL
A2
A2
G24DREAD
A2
LABELS CORRECT
YES
NO
G24UNLD
B2
DATA ON TAPE
NO
YES
C2
UNLOAD TAPE
M24MTNSG
B24RMSG
D2
IJZADO37 BQ
MESSAGE 04E230D
D2
E2
A24RETRC
E2
REPLY = NO
YES
NO
H5
F2
IJZADO41 BU
CONVERT INPUT
G2
BAD CHARACTER
YES
NO
B24CON1
H2
DEVICE ASSIGNED
NO
YES
A24SRCH
J2
TEST DEVICE
YES
NO
G1
A3
DATA ON TAPE
NO
YES
B3
READ TAPE MARK
C3
M24CHKIT
C3
'NO' BIT ON
YES
NO
D3
RESET ACTIVE
NO
YES
BK A2
E3
BKSP ACTIVE
NO
YES
BK F3
C24ODE08
F3
SET RETURN CODE TO X'08'
J4
G3
IJZADO37 BQ
MESSAGE 04E199D
E2
S31NOTAS
H3
IJZADO37 BQ
MESSAGE E237I
D2
E24RROR
J3
IJZADO37 BQ
MESSAGE E236I
D2
E4
DATA ON TAPE
NO
YES
F4
REWIND TAPE
G24COMP
G4
INPUT COUNT = 0
NO
YES
BK F3
G24DOPER
H4
SET RETURN CODE TO X'00'
BK- H2,H3, H4
R24ETRN
J4
RESET LOCAL PRINT ONLY SWITCH
J4
K4
RETURN TO OLT
C24ODE04
H5
SET RETURN CODE TO X'04'
H5
J4

Chart BK. IJZADO24: READD (Section 2 of 2)

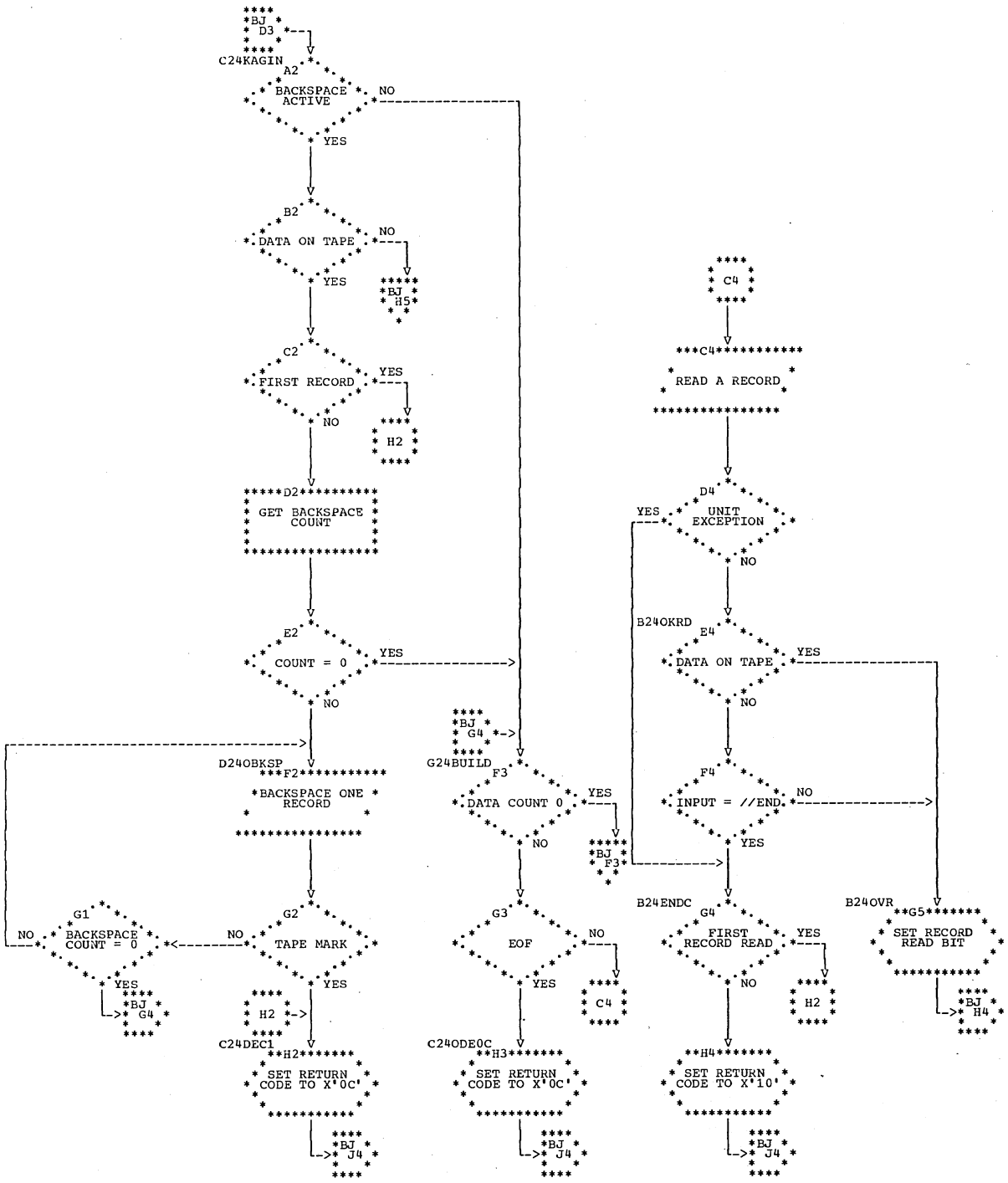


Chart BL. IJZADO26: LOGSCAN

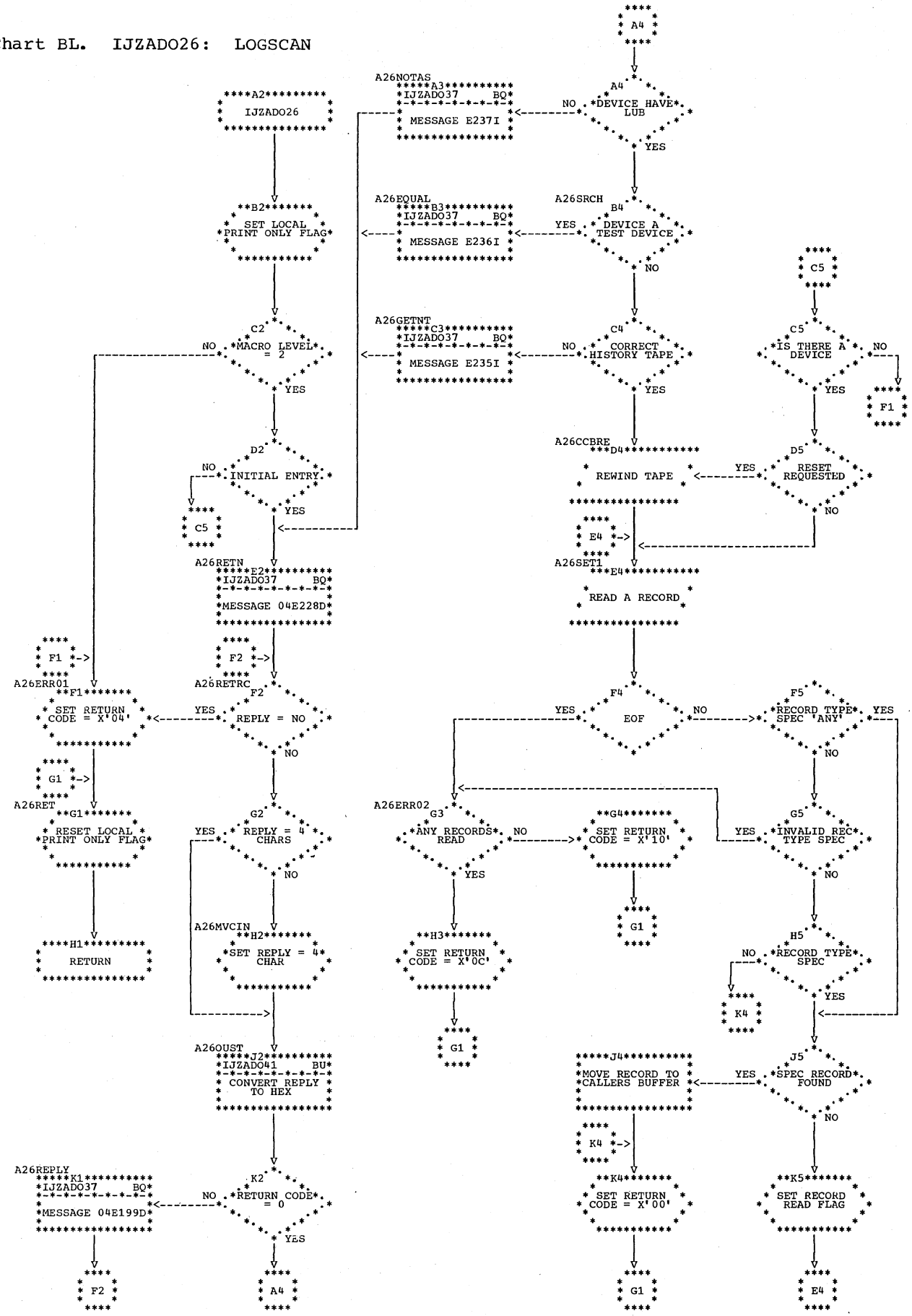


Chart BM. IJZADO28: PLINK

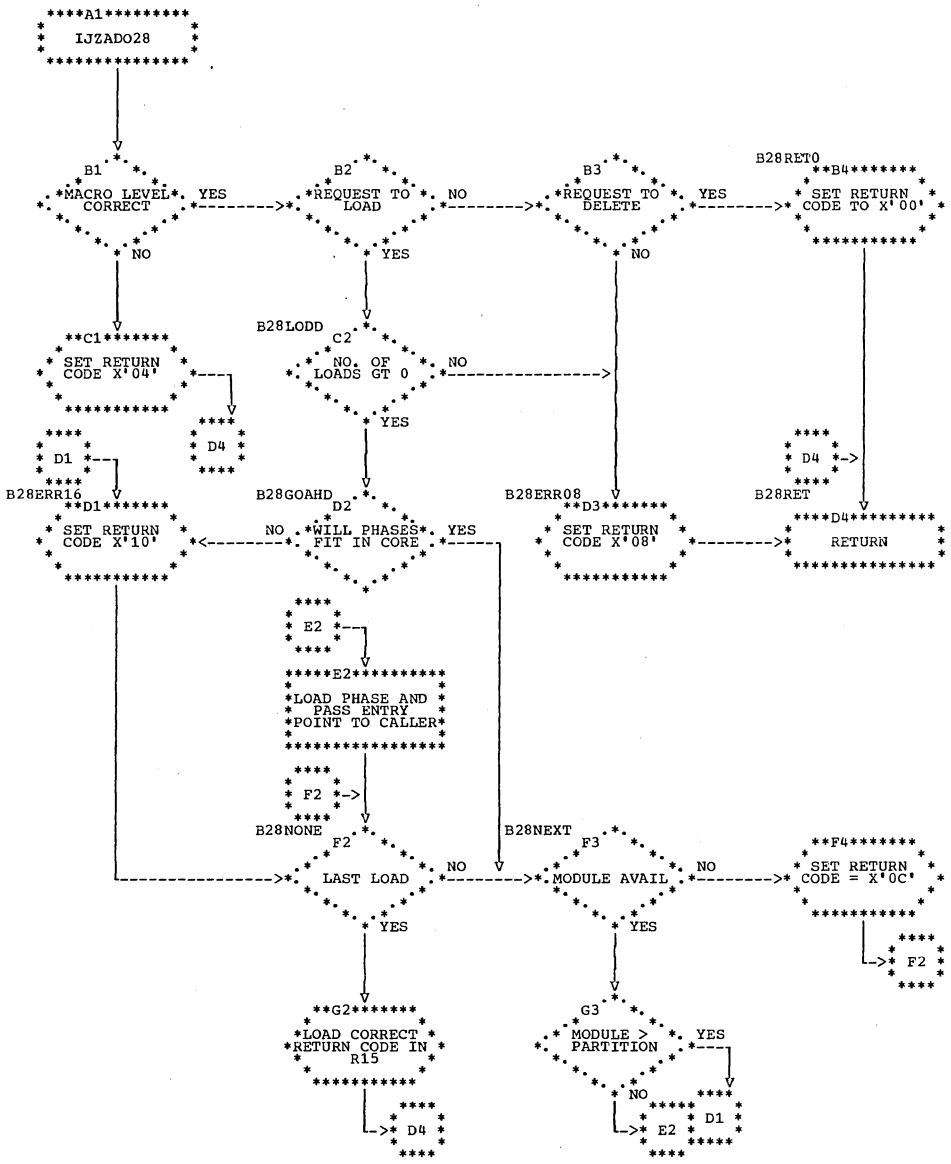


Chart BN. IJZADO35: EXIO (Section 1 of 3)

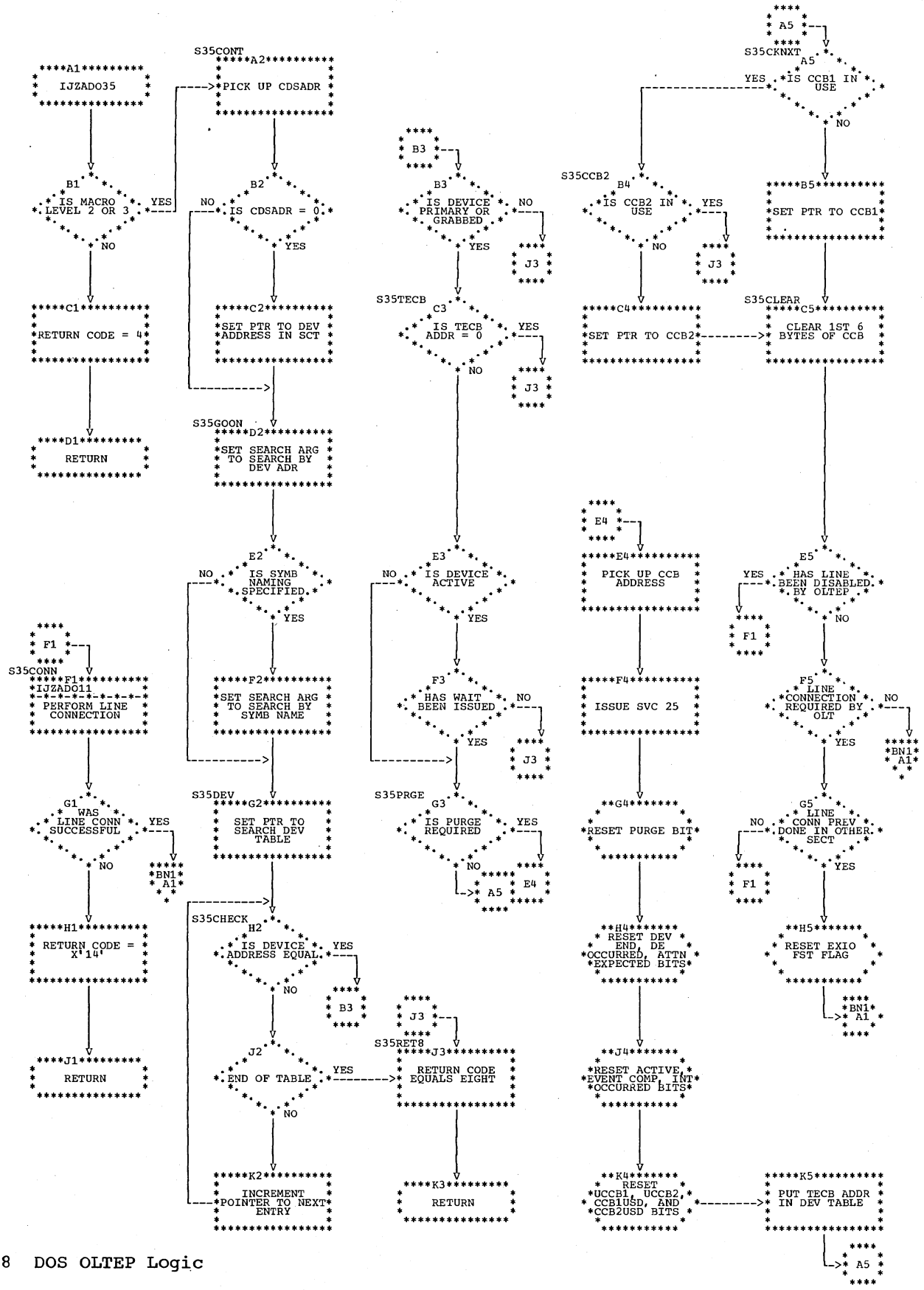


Chart BN1. IJZADO35: EXIO (Section 2 of 3)

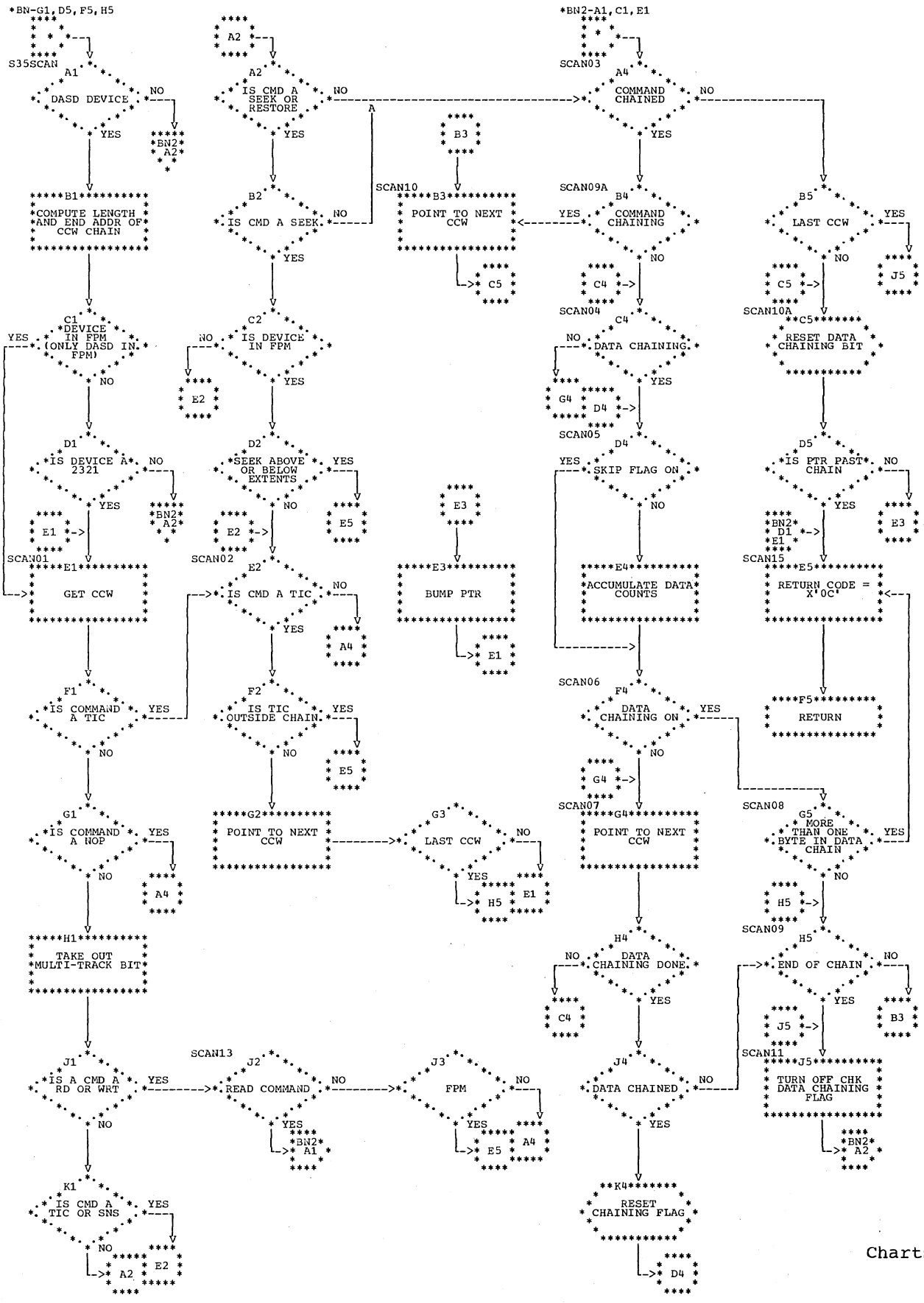


Chart BN2. IJZADO35: EXIO (Section 3 of 3)

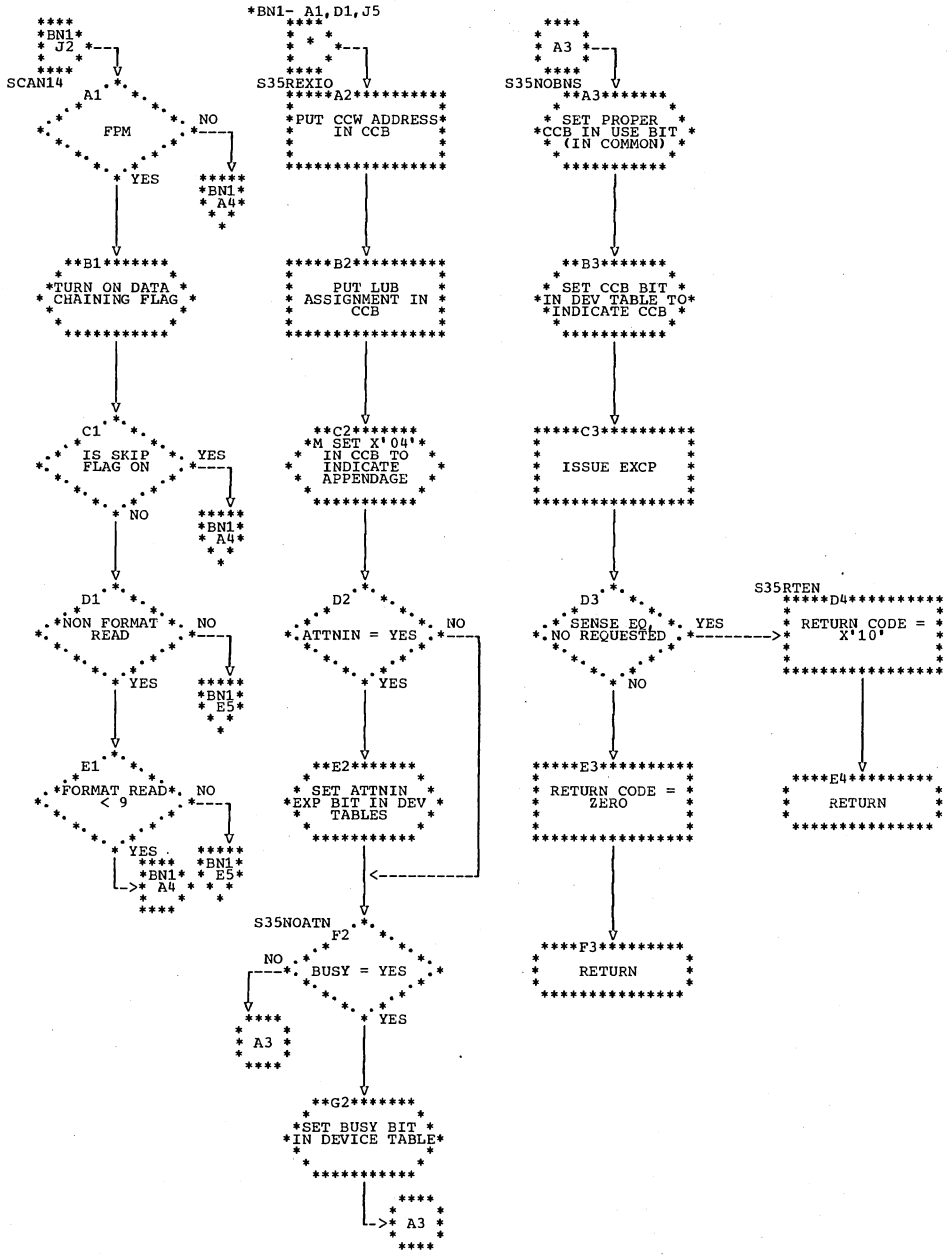


Chart BP. IJZADO36: WAITIO (Section 1 of 3)

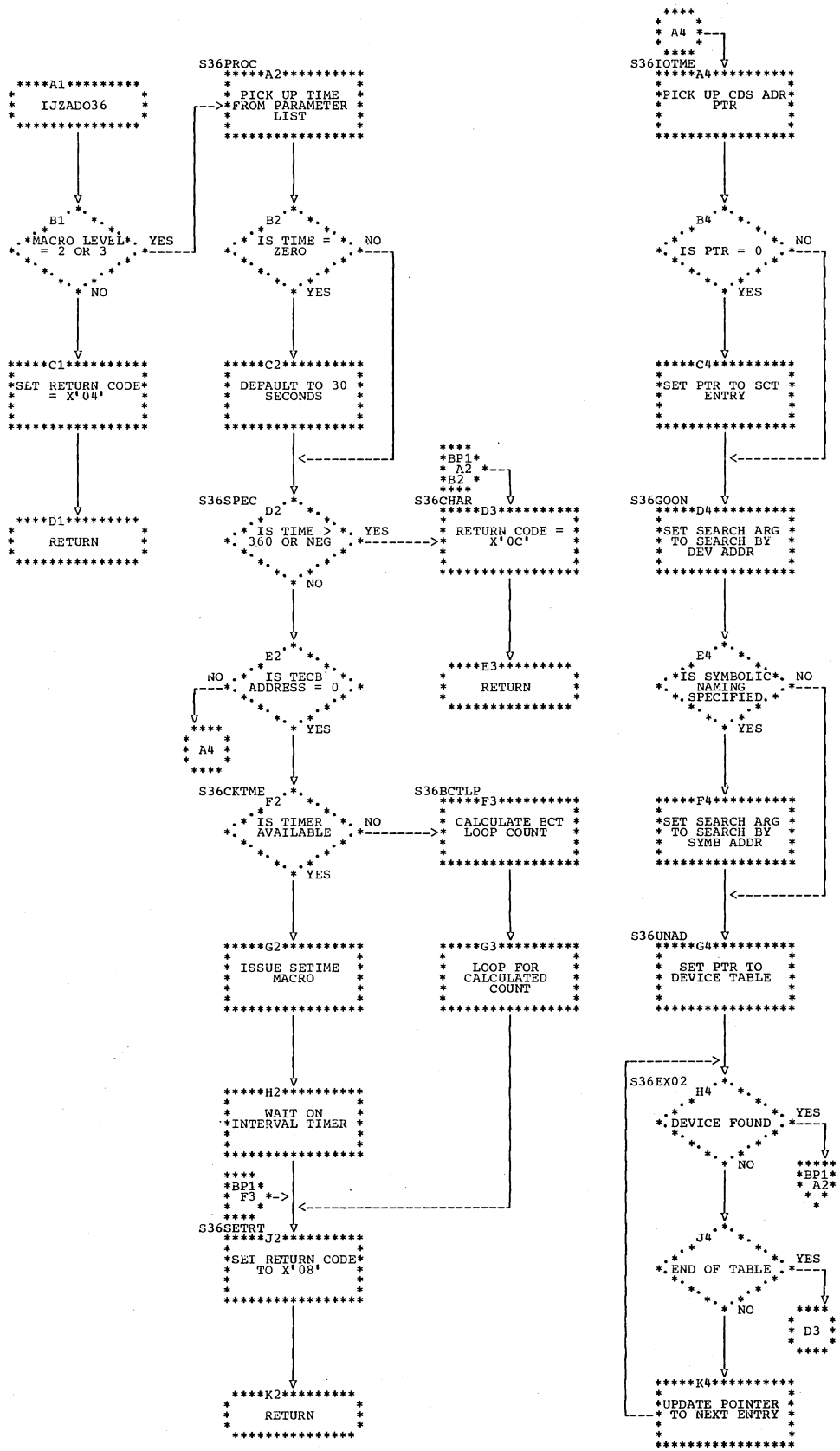


Chart BP1. IJZADO36: WAITIO (Section 2 of 3)

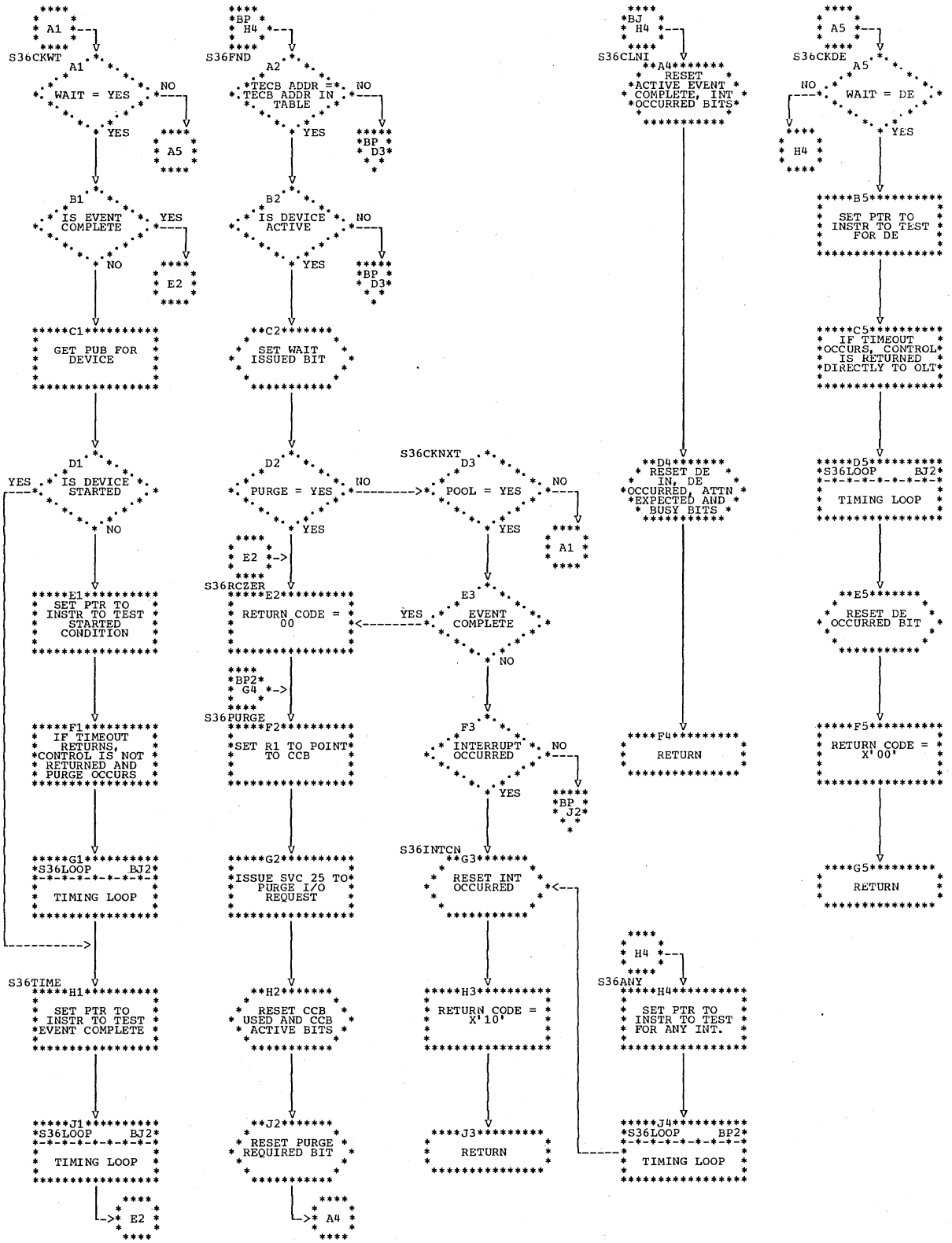


Chart BP2. IJZADO36: WAITIO (Section 3 of 3)

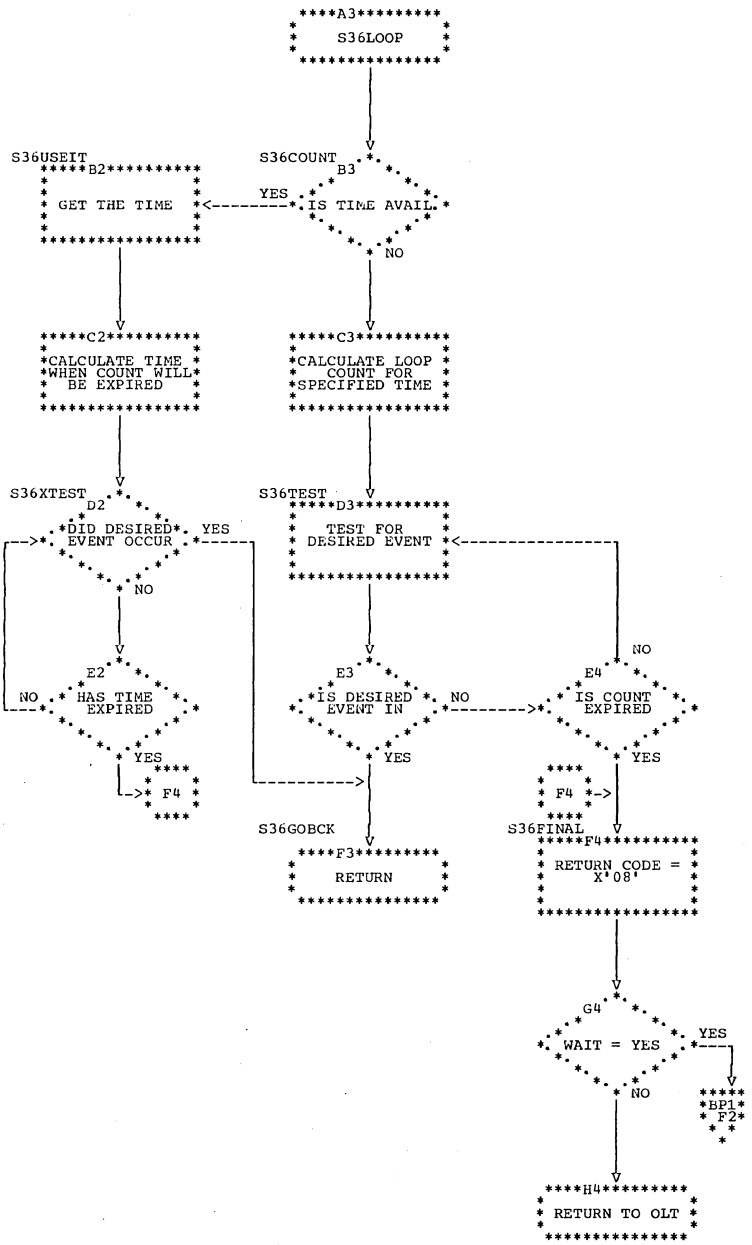


Chart BQ. IJZADO37: CECOM (Section 1 of 2)

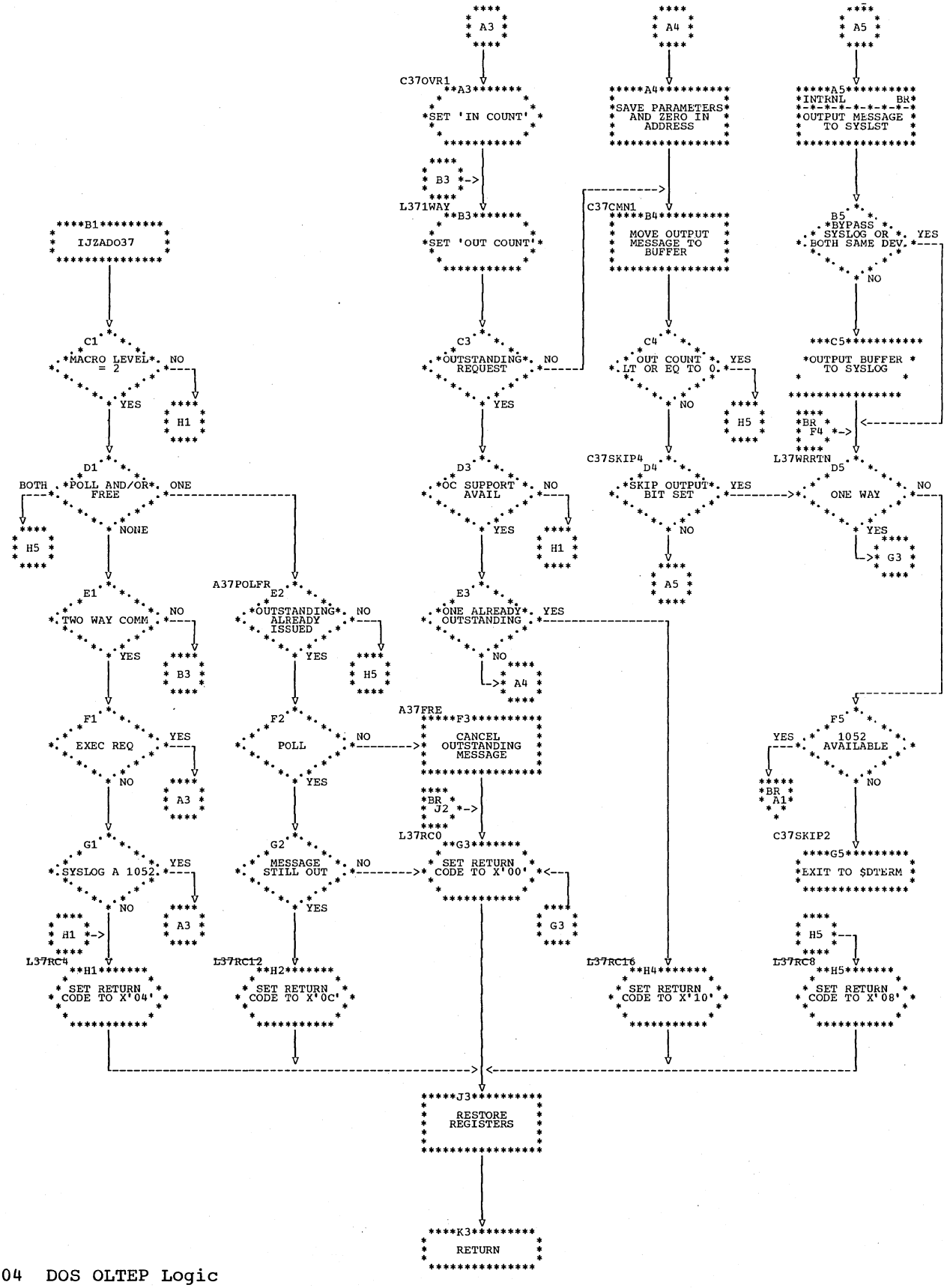


Chart BR. IJZADO37: CECOM (Section 2 of 2)

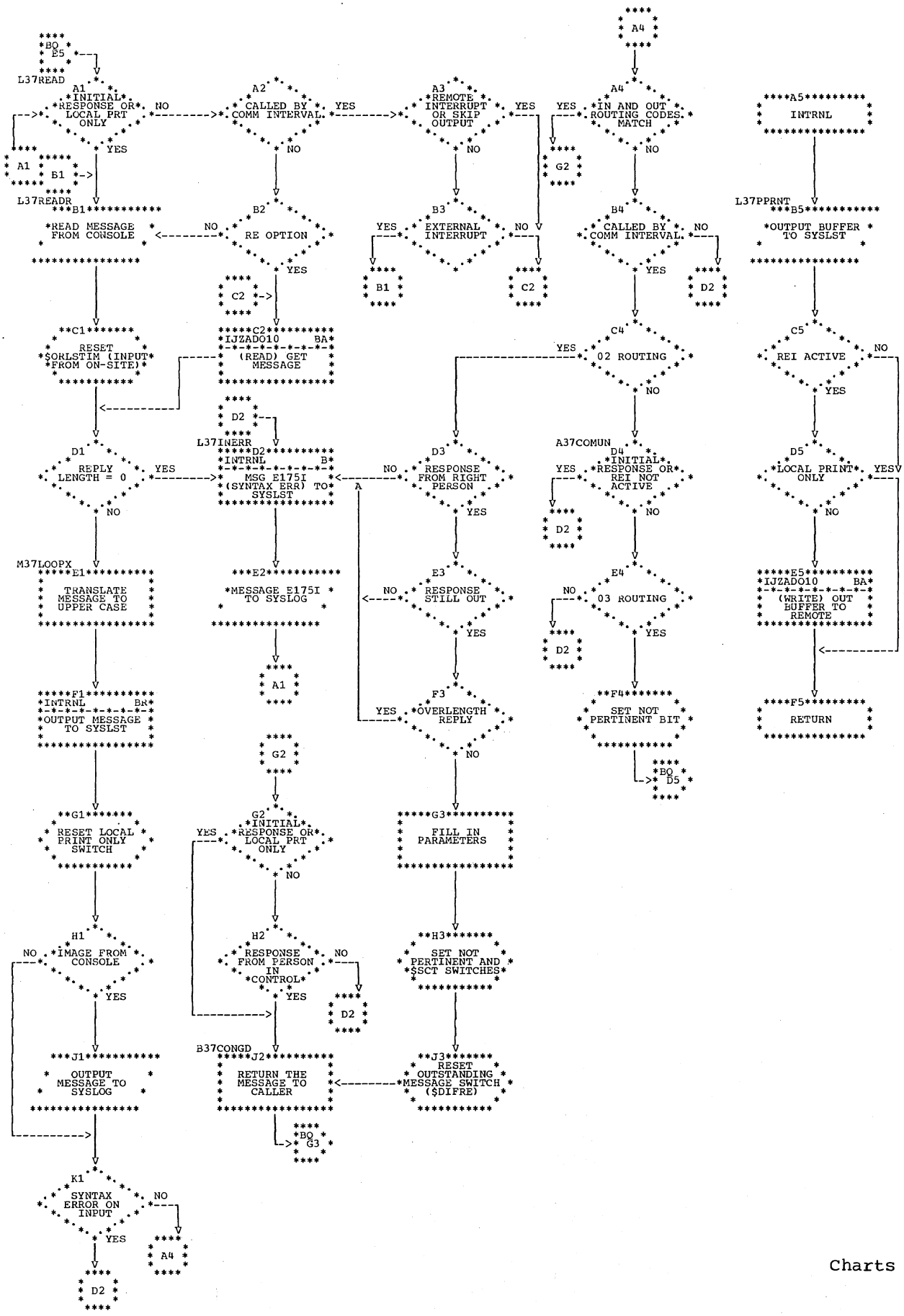


Chart BS. IJZADO39: DPRINT (Section 1 of 2)

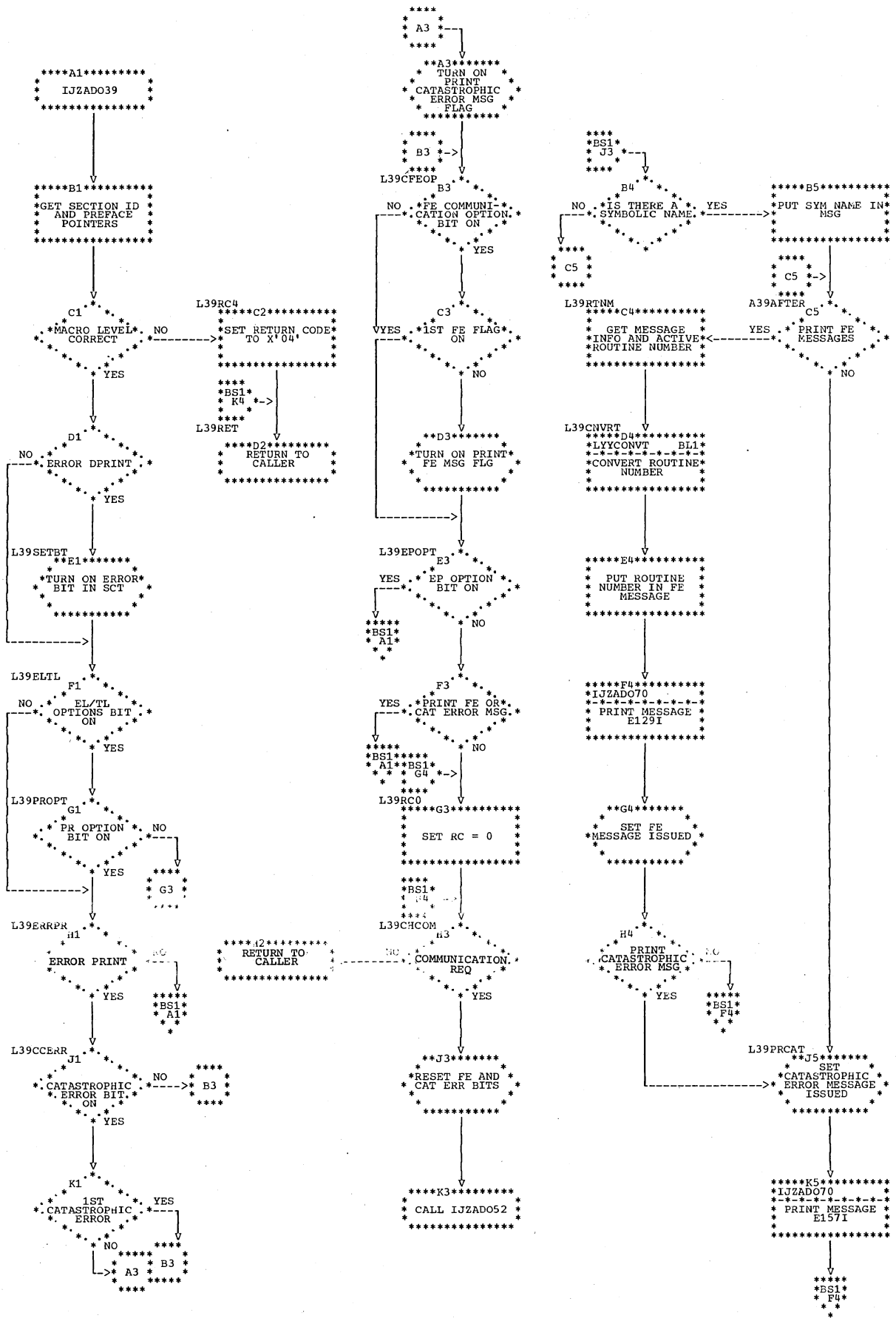


Chart BS1. IJZADO39: DPRINT (Section 2 of 2)

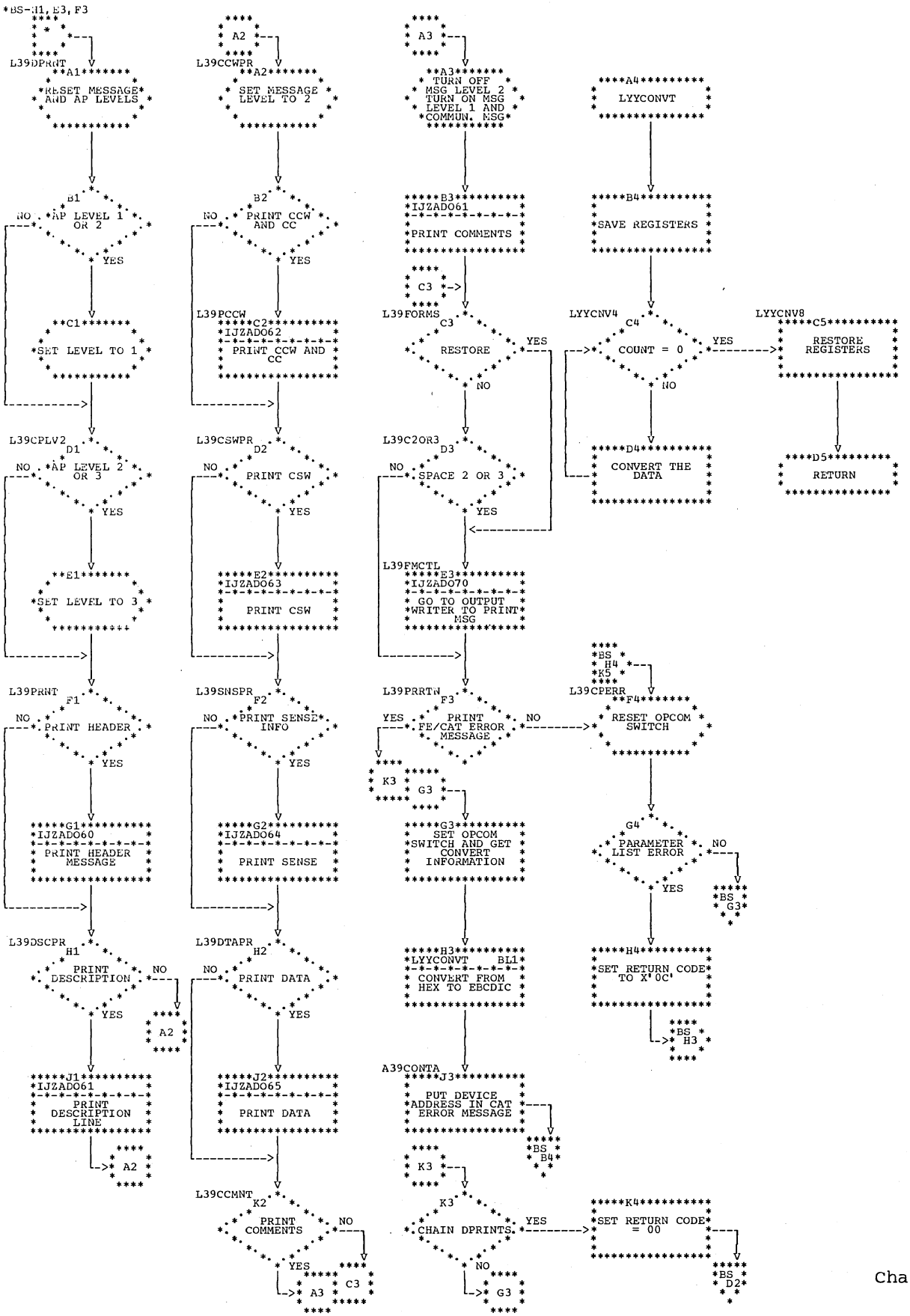


Chart BT. IJZADO40: $MODE

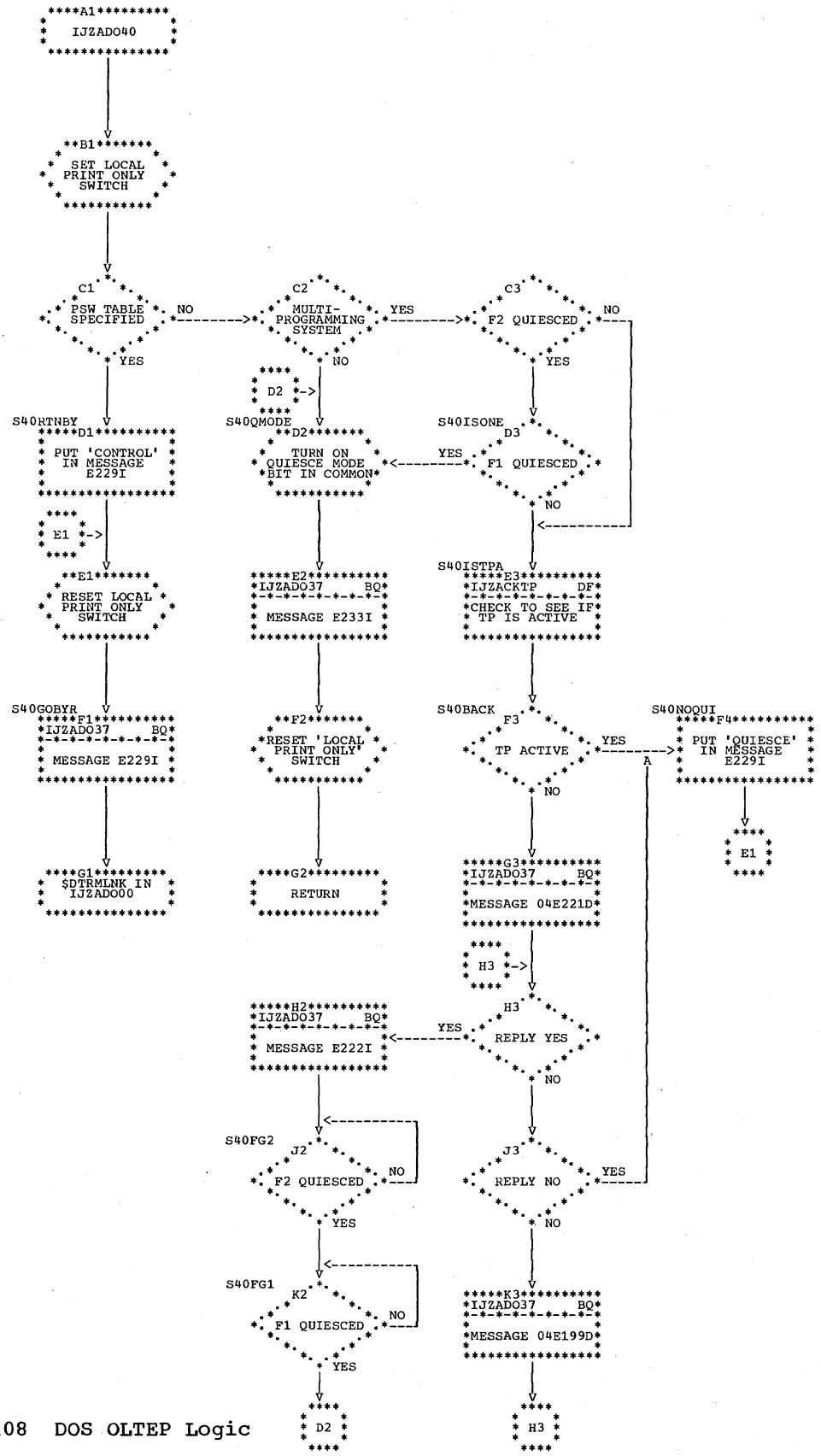


Chart BU. IJZADO41: CONVERT

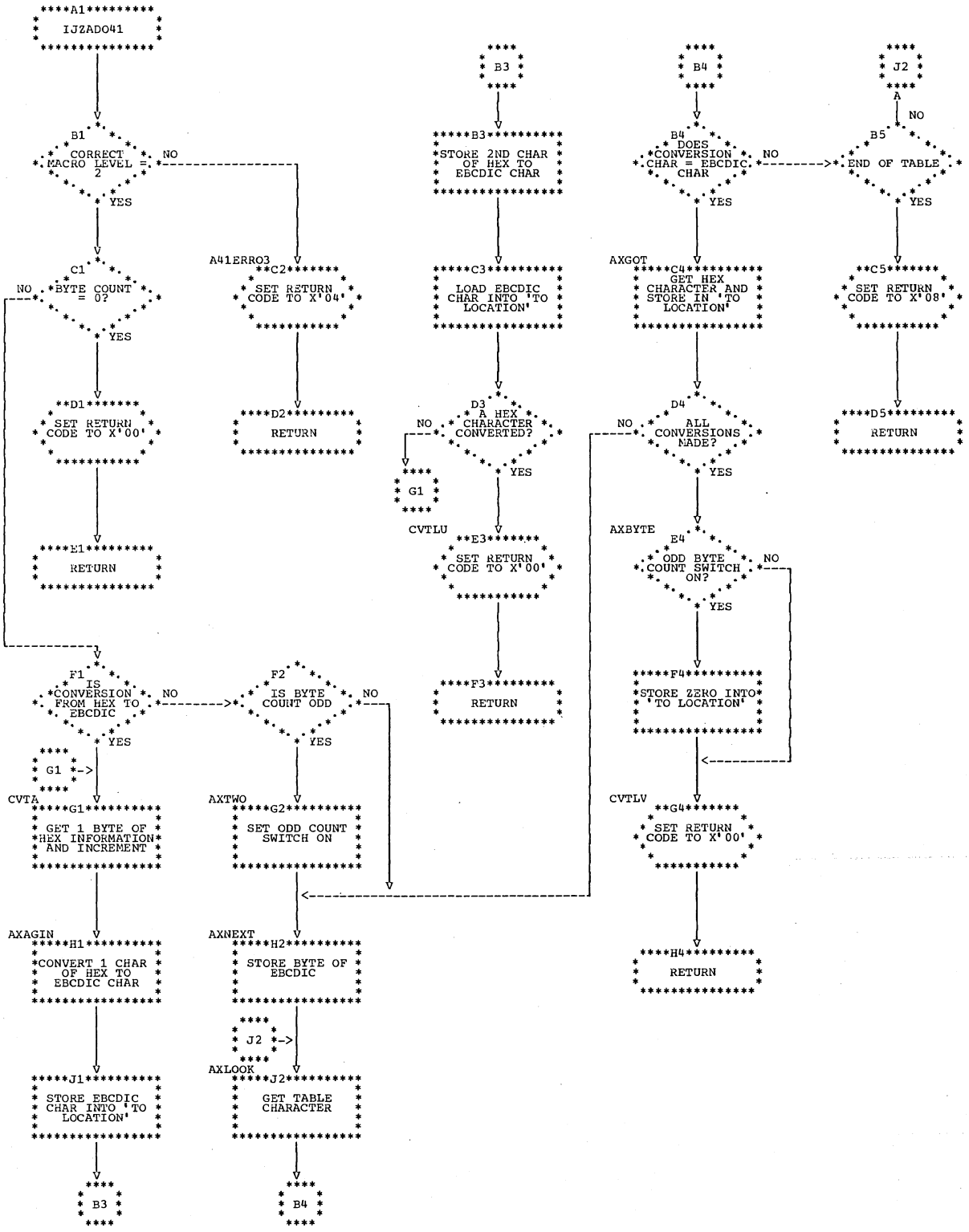


Chart BV. IJZADO42: MORECORE (Section 1 of 3)

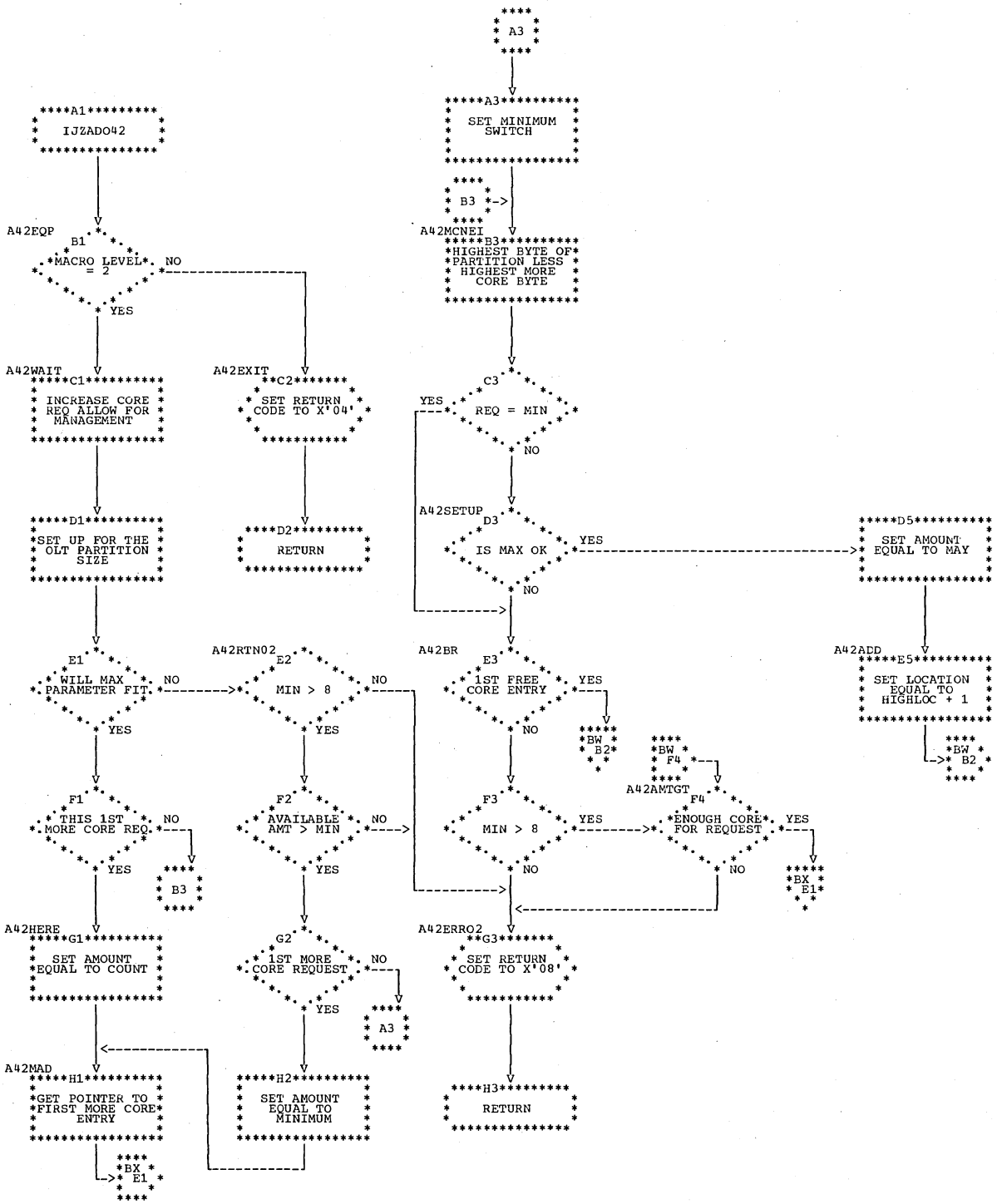


Chart BW. IJZADO42: MORECORE (Section 2 of 3)

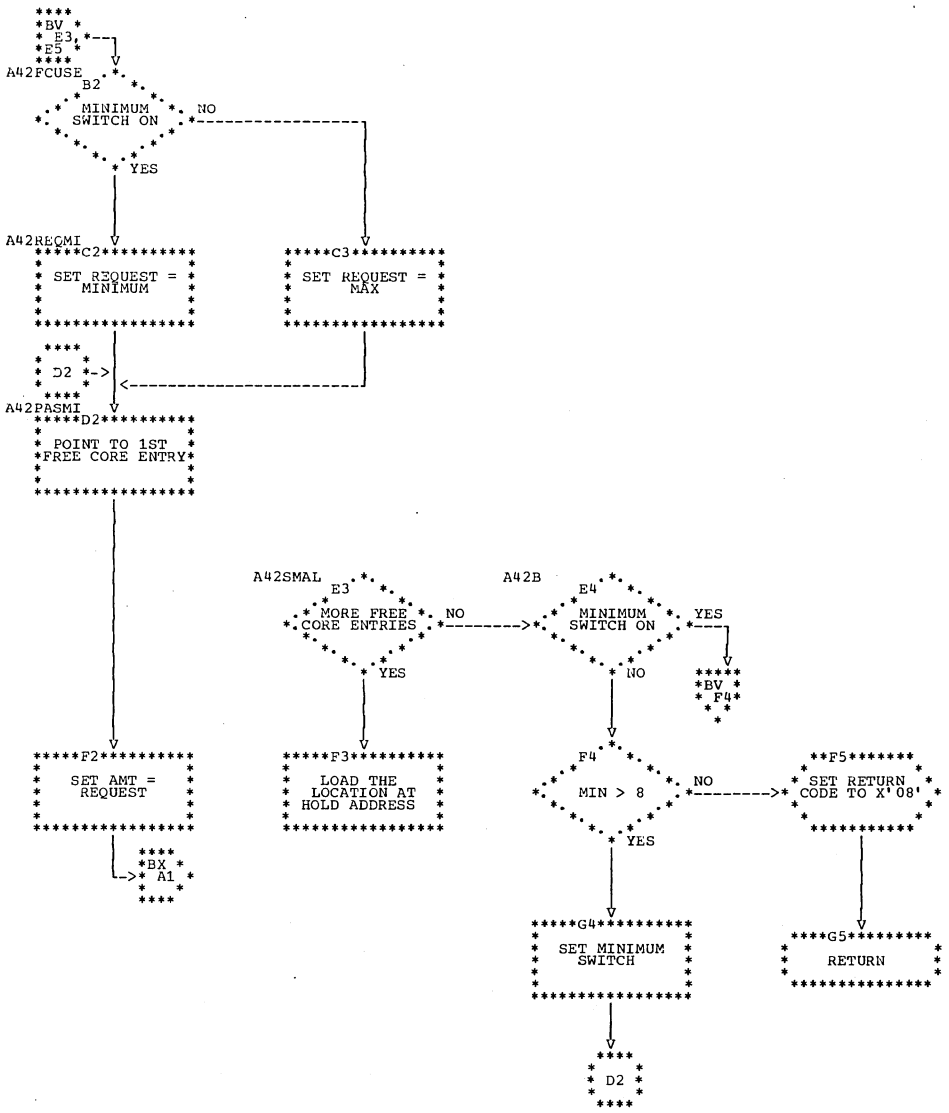


Chart BX. IJZADO42: MORECORE (Section 3 of 3)

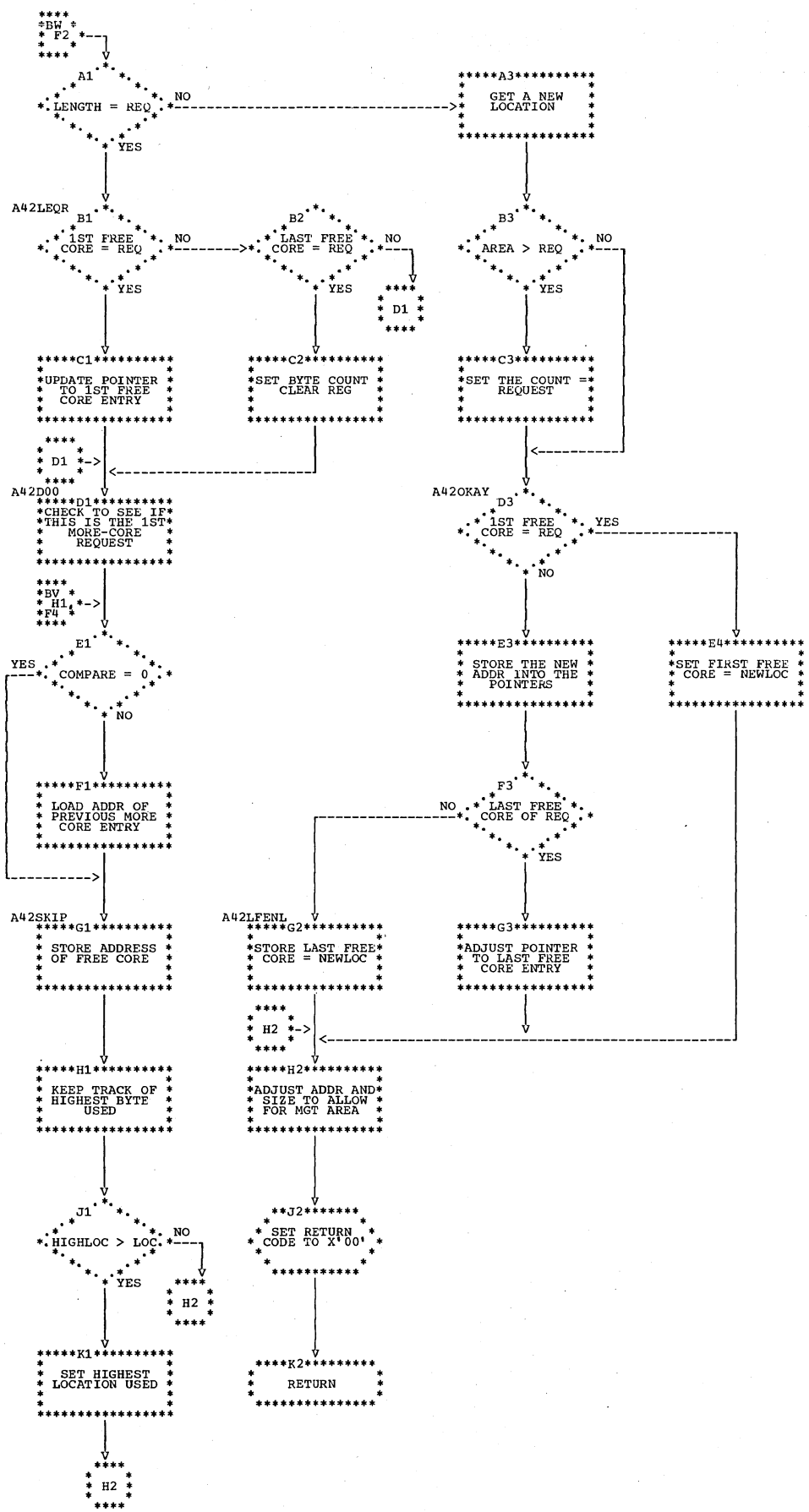


Chart CA. IJZADO43: FREECORE

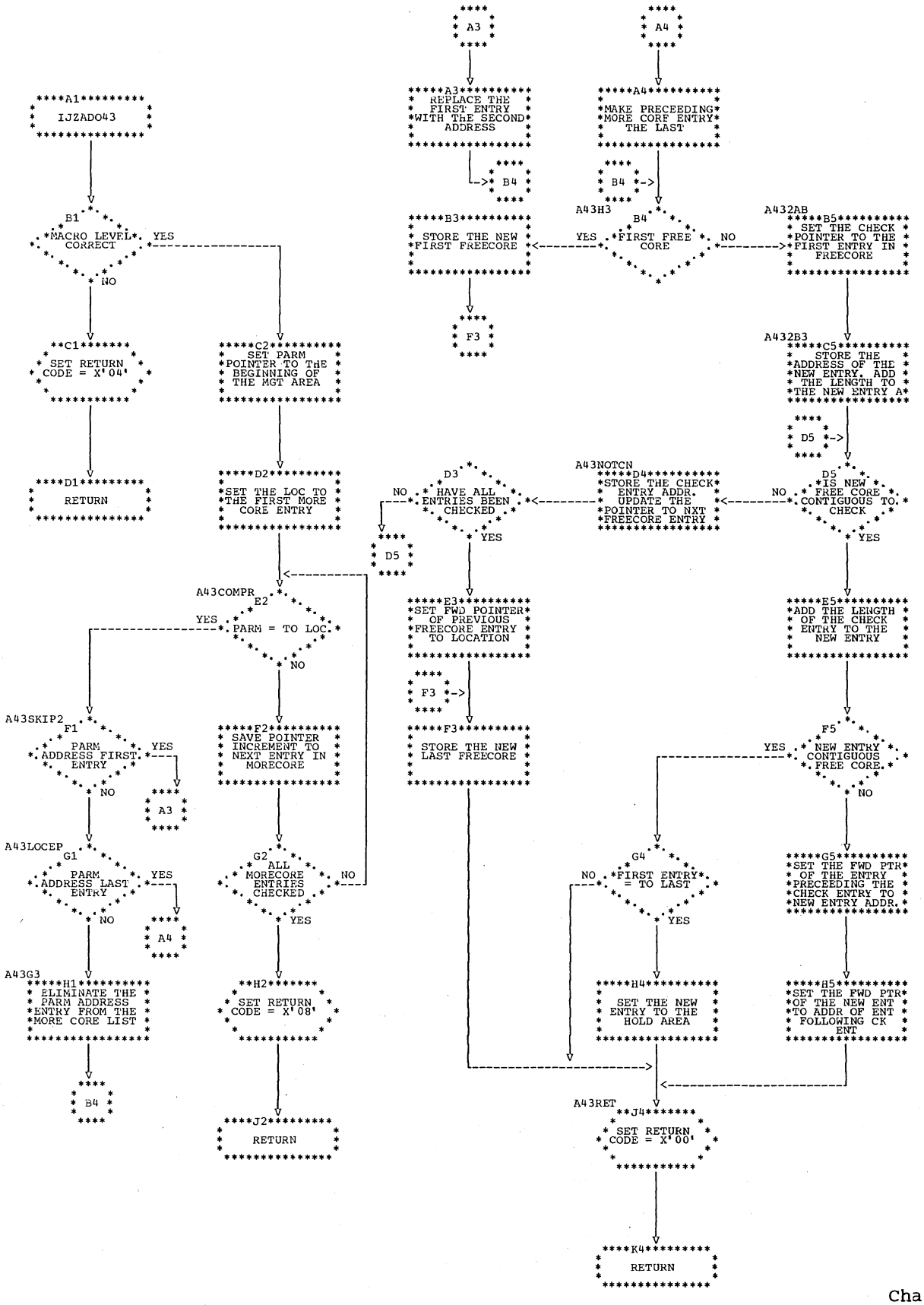


Chart CB. IJZADO44: DIO (Section 1 of 2)

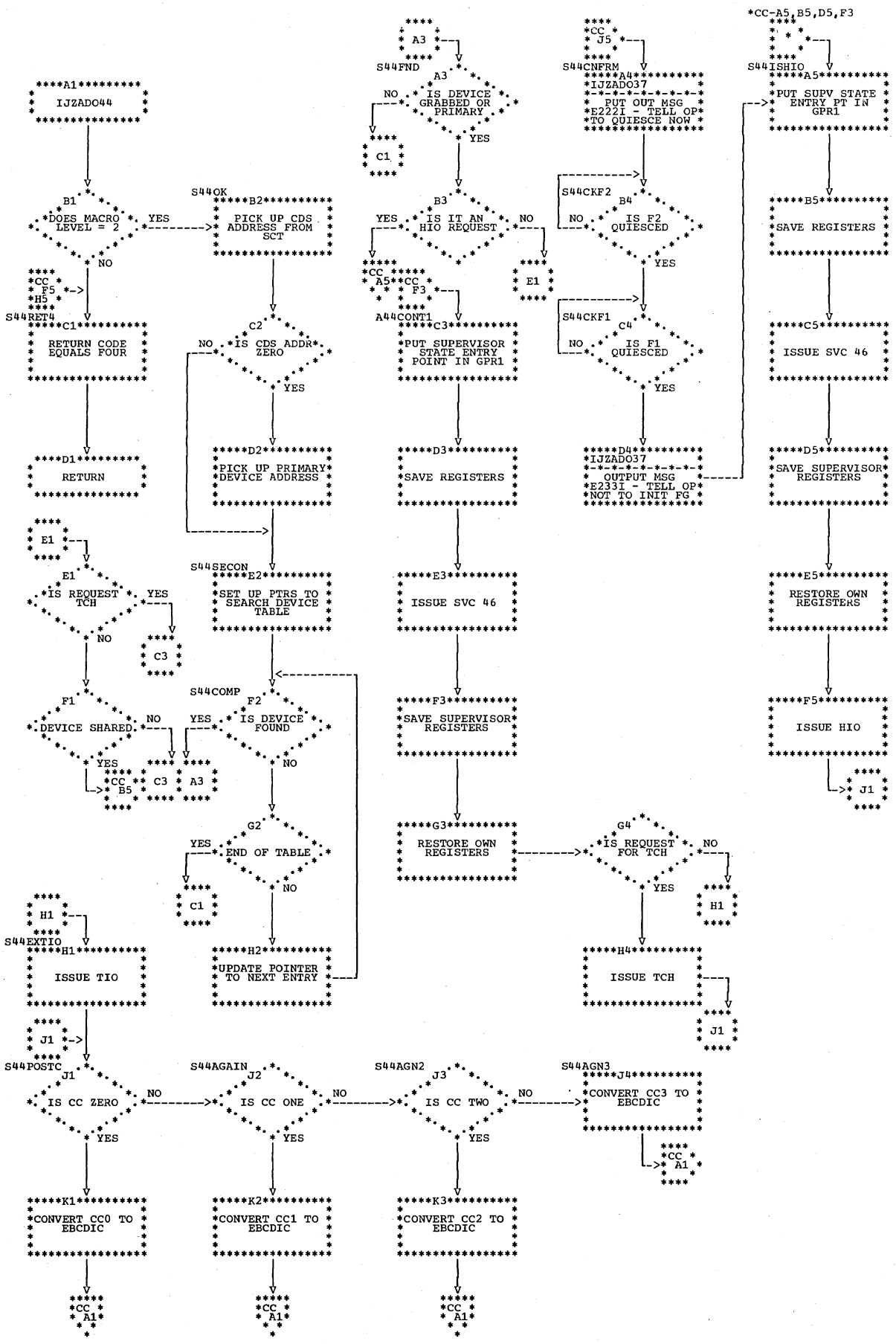


Chart CC. IJZADO44: DIO (Section 2 of 2)

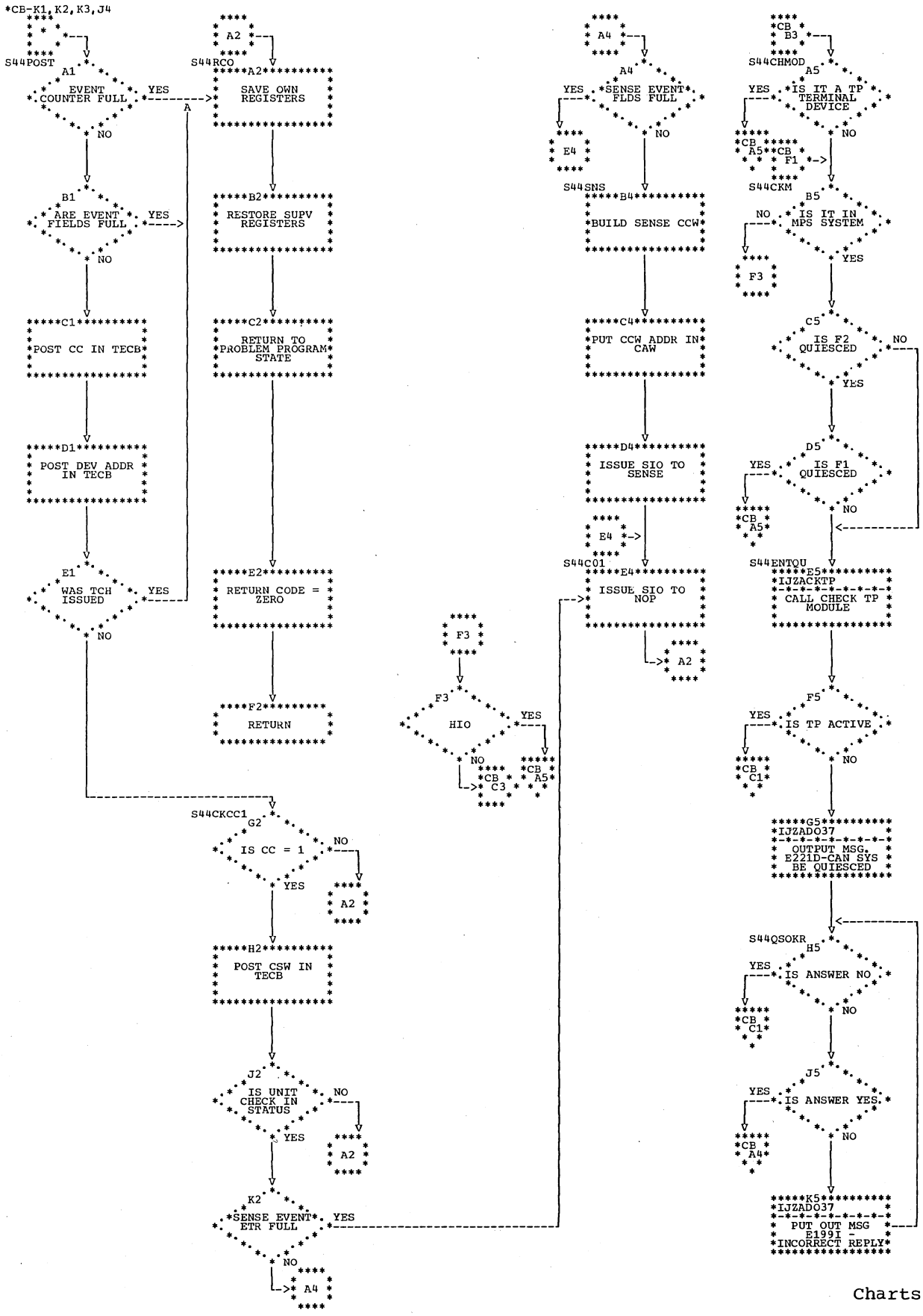


Chart CD. IJZADO47: Routine

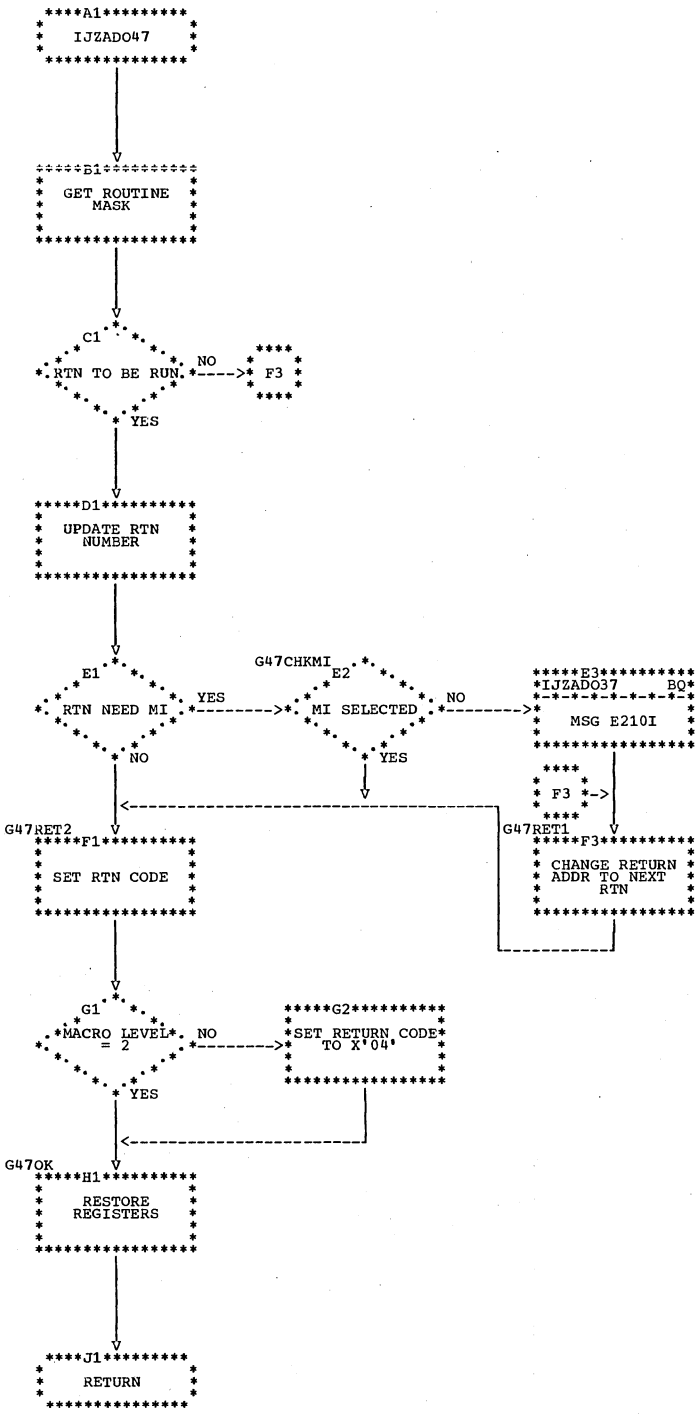


Chart CE. IJZADO60: Header Message

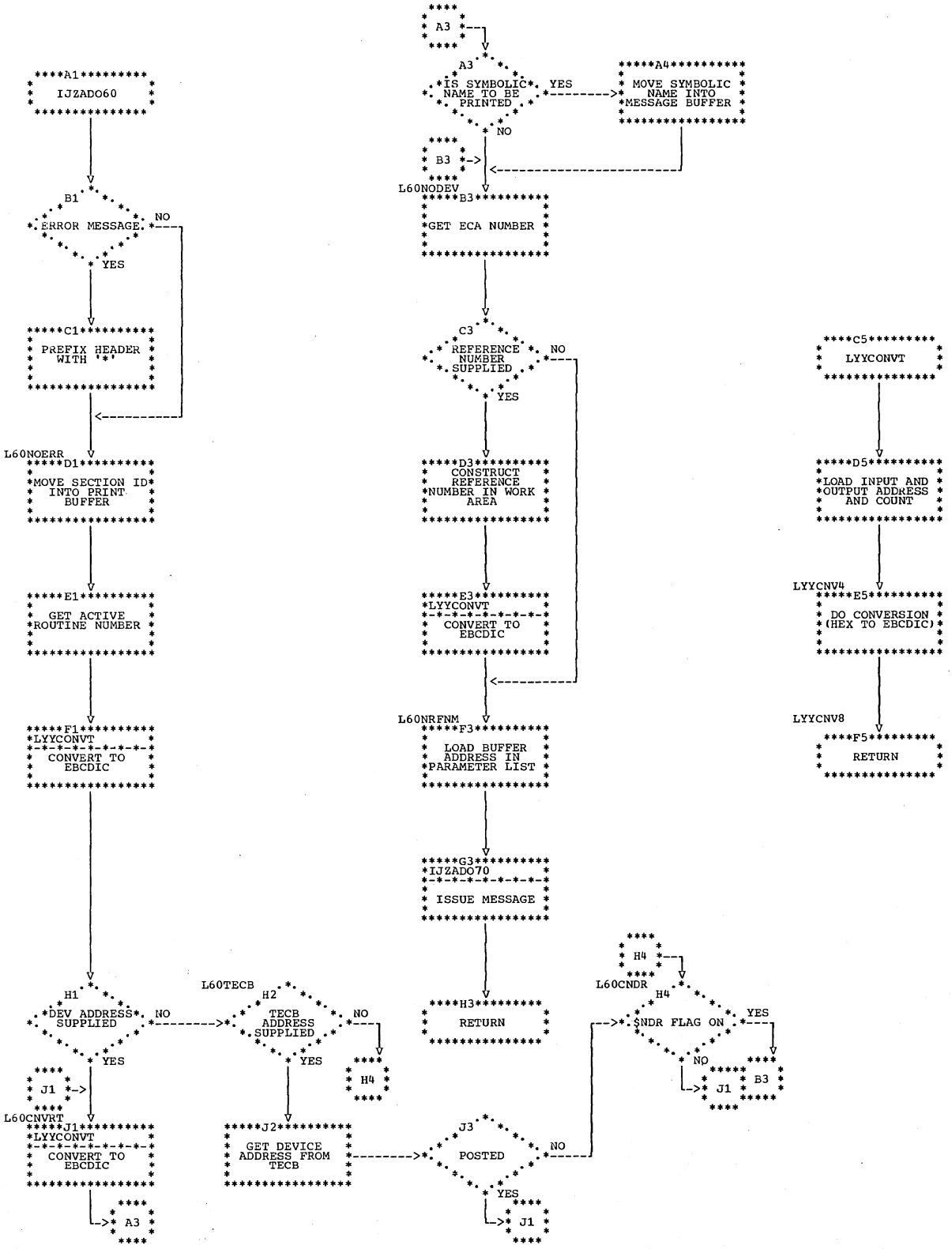


Chart CF. IJZADO61: Description Message

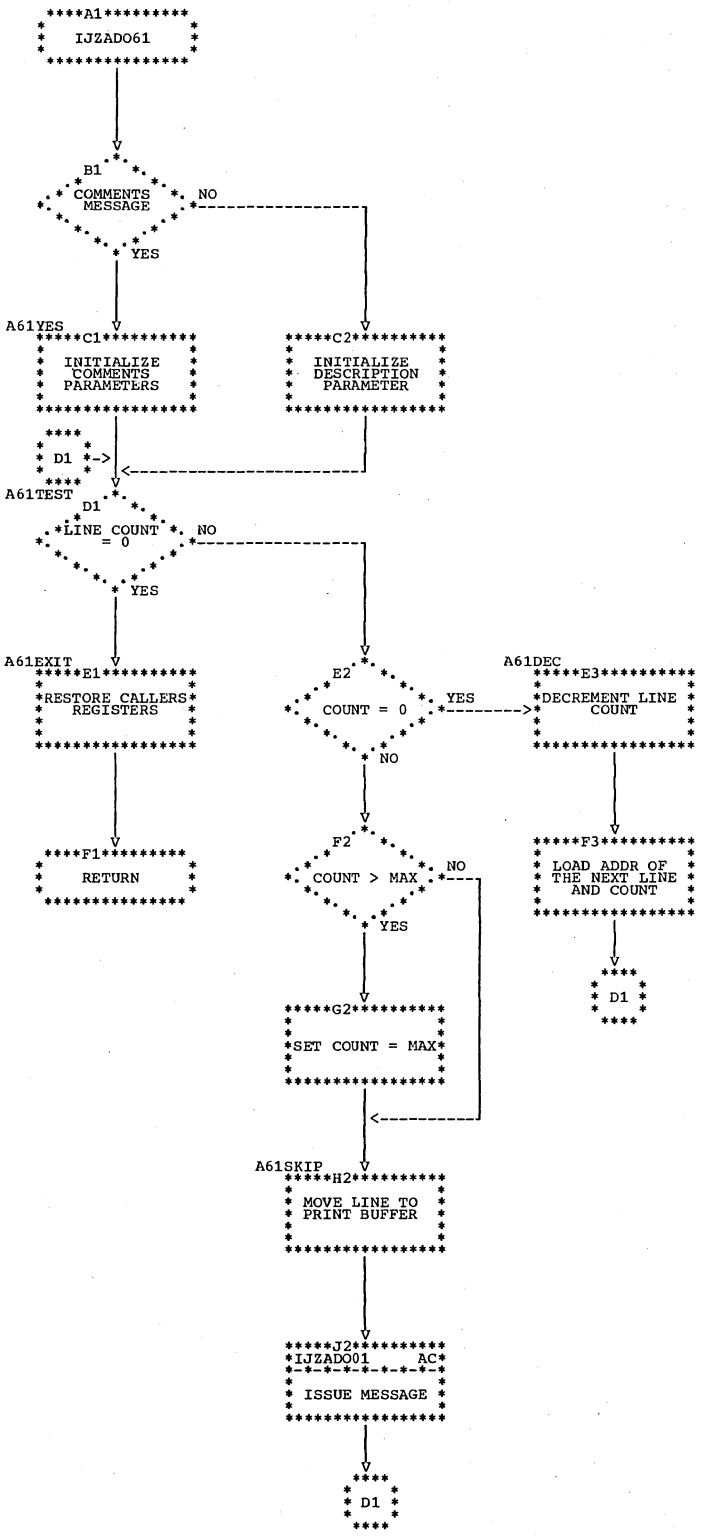


Chart CG. IJZADO62: CCW Message (Setup)

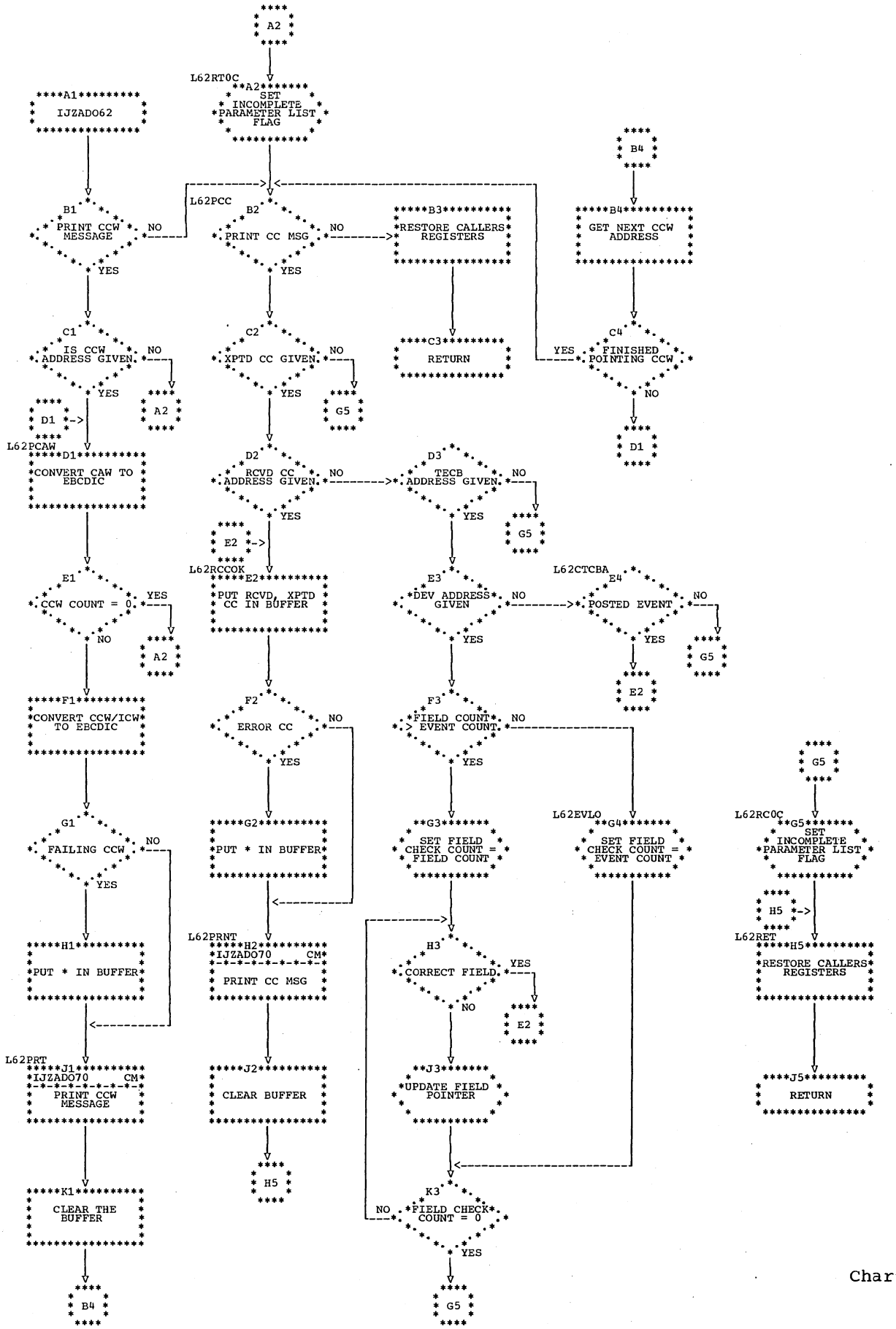


Chart CH. IJZADO63: CSW Message (Setup) (Section 1 of 2)

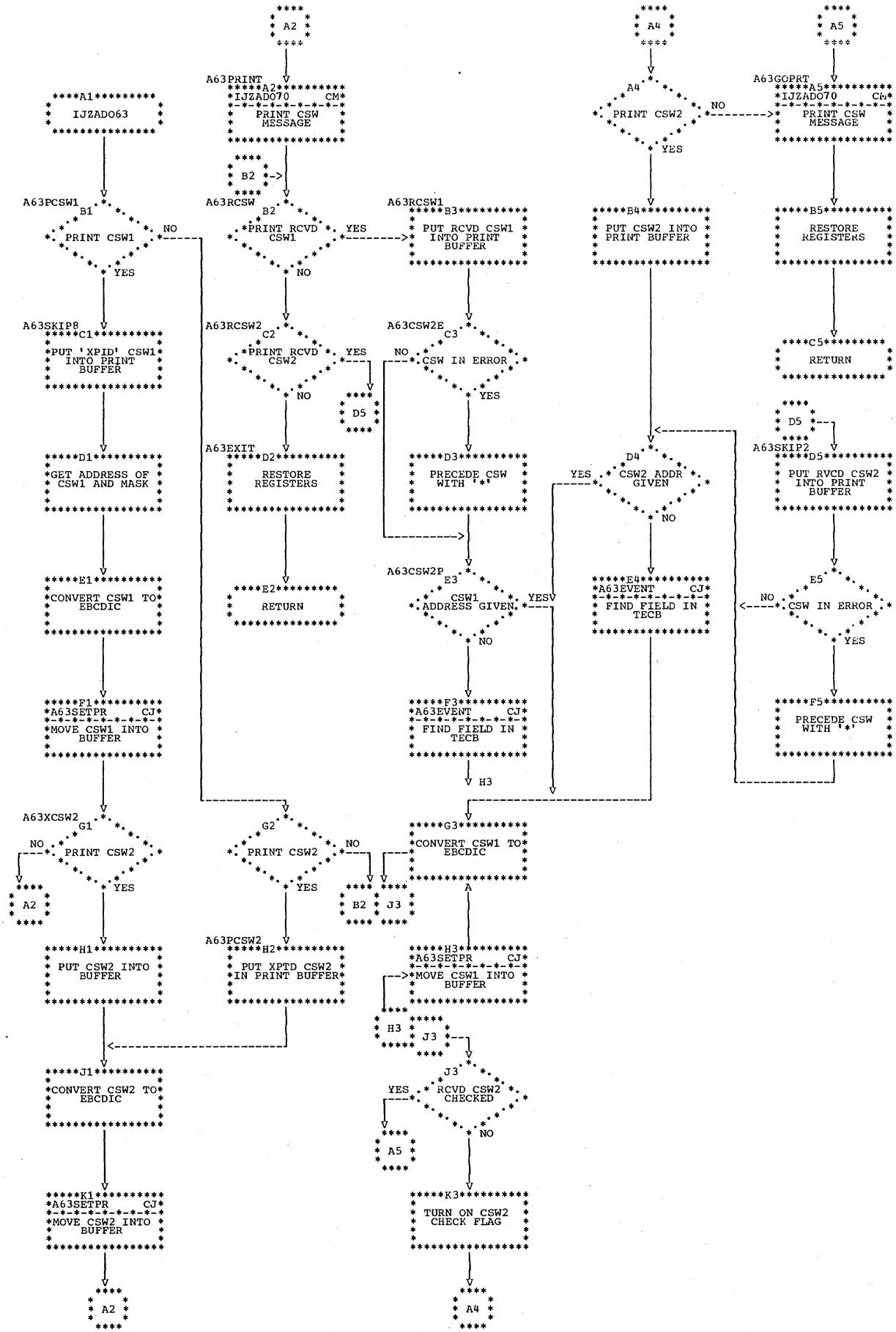


Chart CJ. IJZADO63: CSW Message (Setup) (Section 2 of 2)

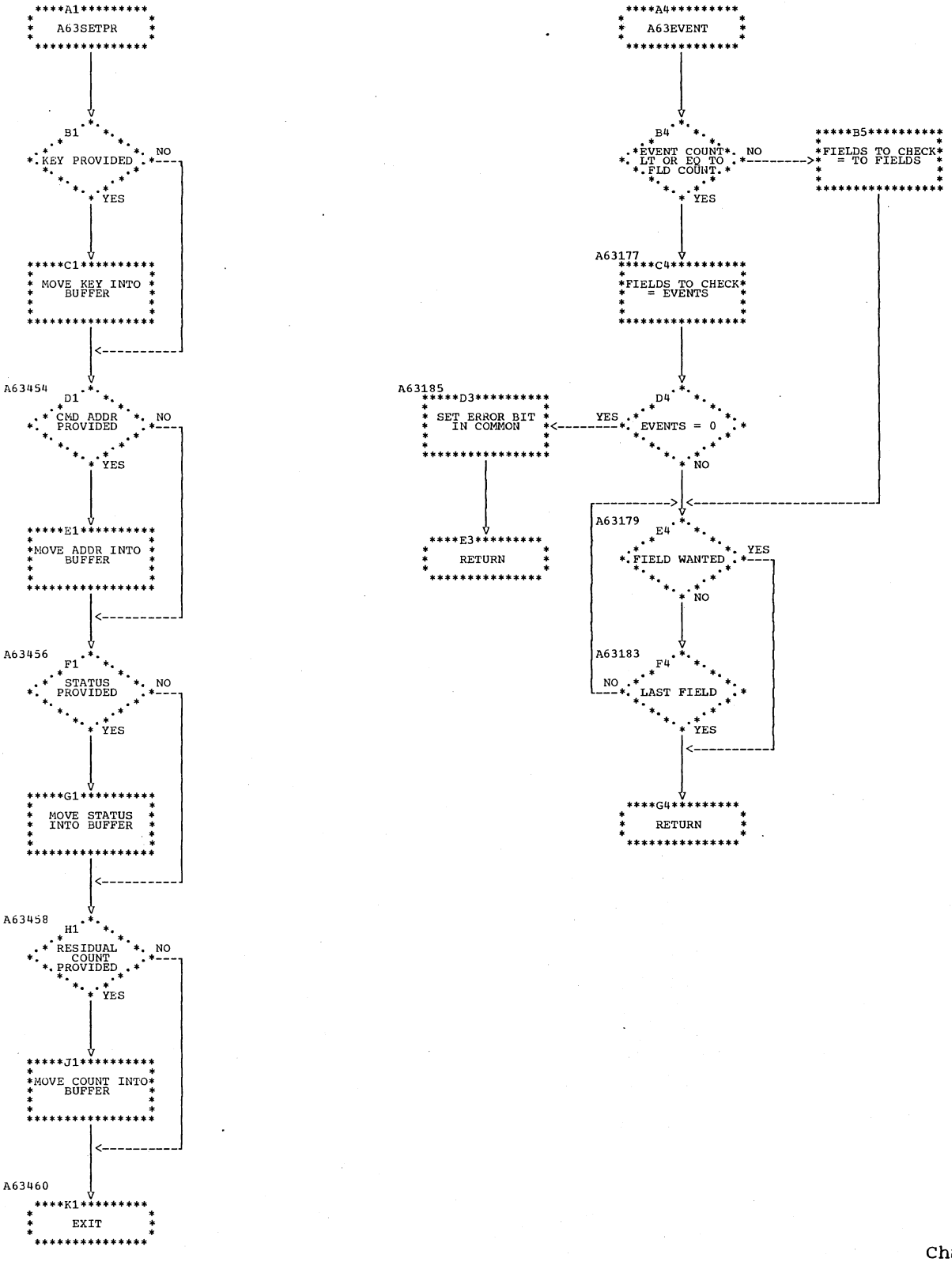


Chart CK. IJZADO64: Sense Data Message (Setup)

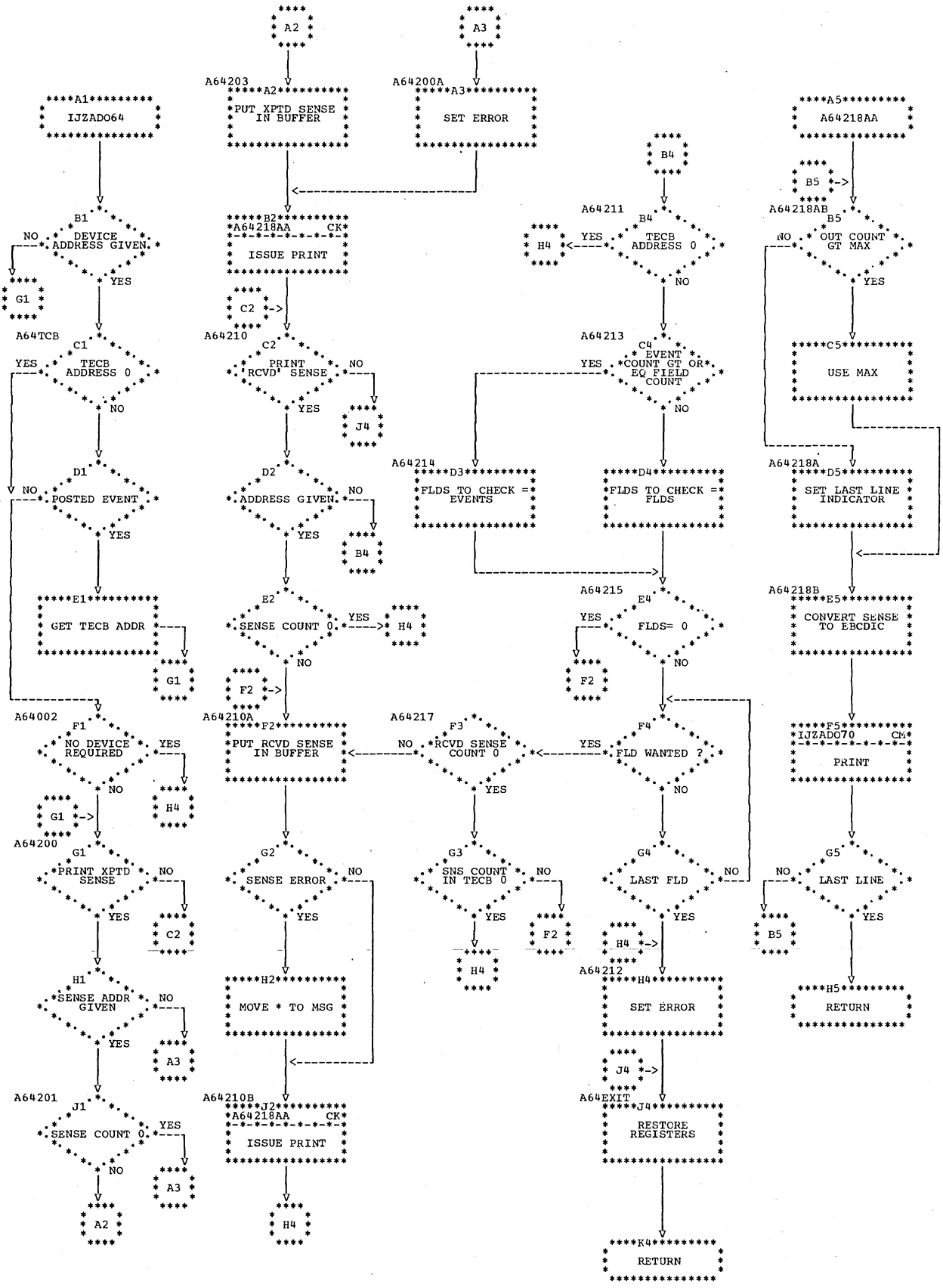


Chart CL. IJZADO65: Data Message (Setup)

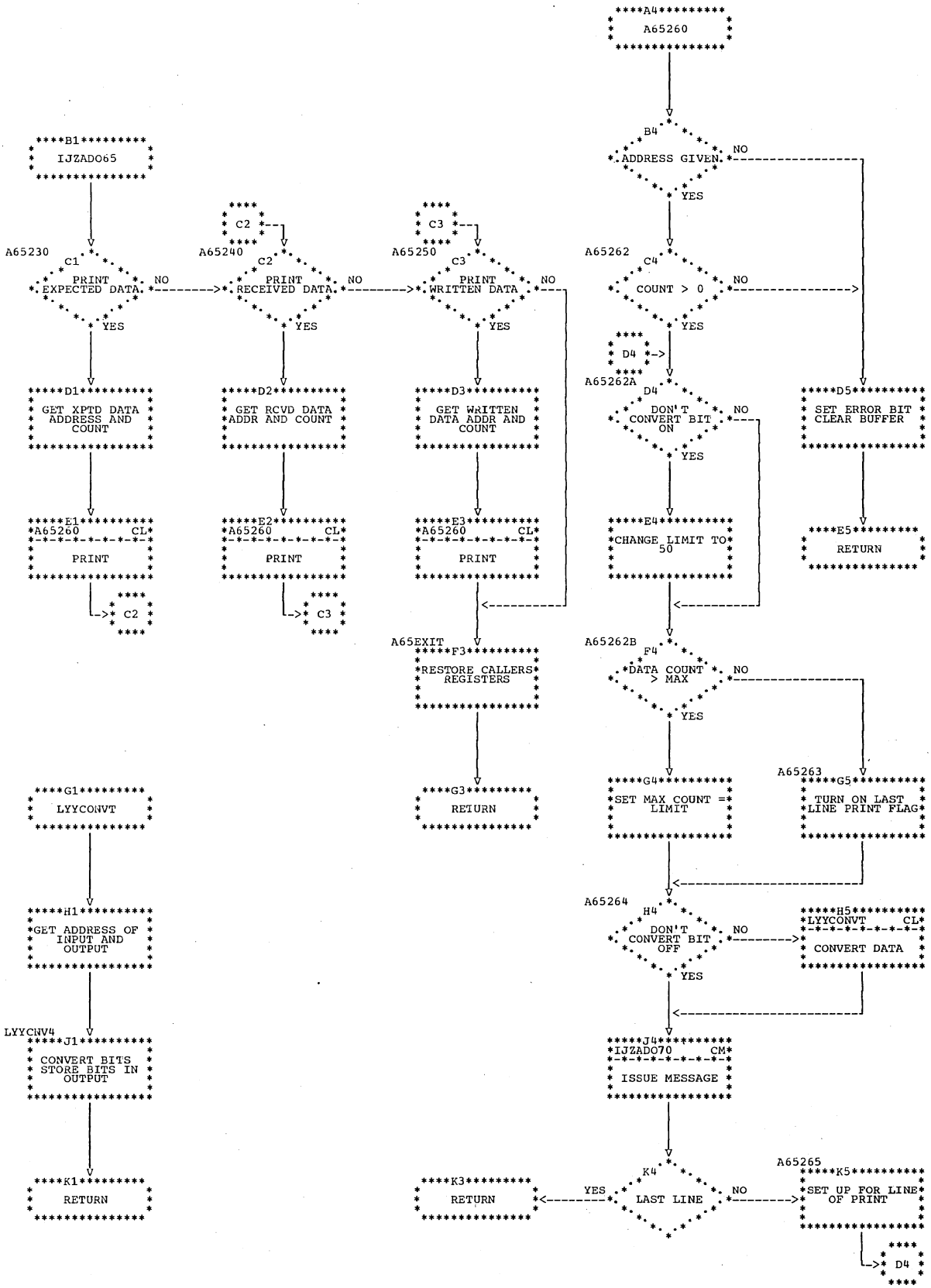


Chart CM. IJZADO70: Output Writer

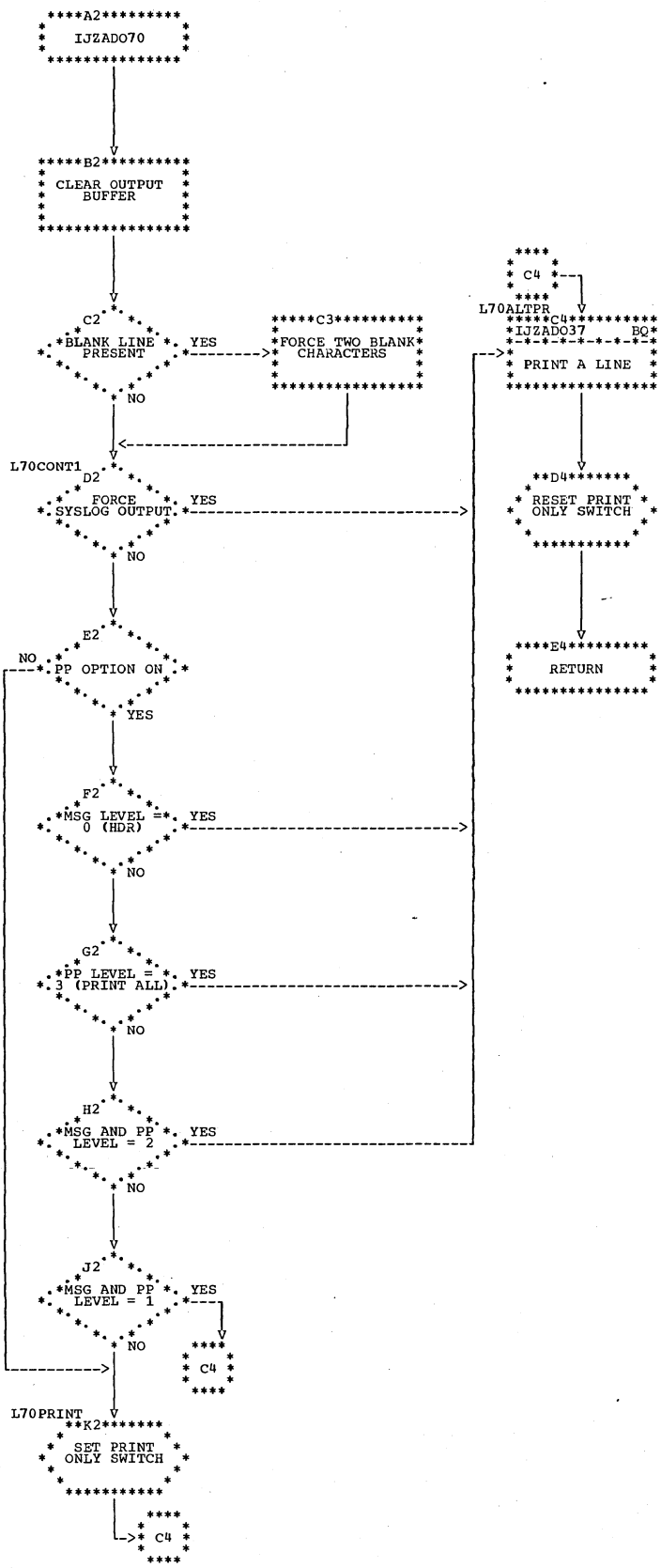


Chart CN. IJZADO71: Prompt Device

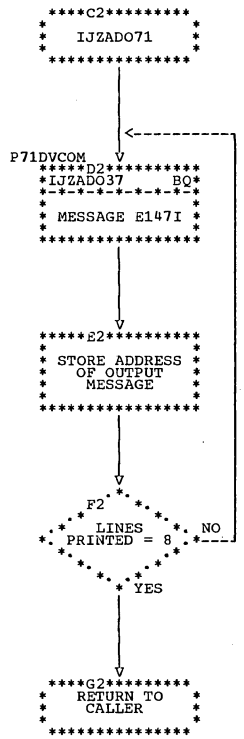


Chart CP. IJZADO72: Prompt Test

Chart CQ. IJZADO73: Prompt Option

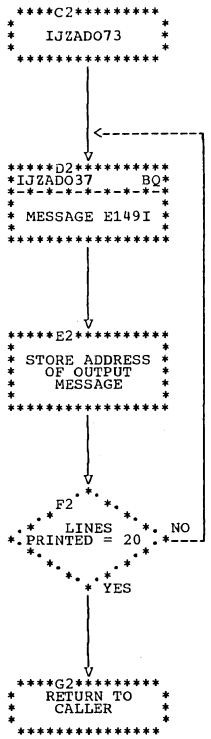


Chart CR. IJZADO76: REI Initializer #1

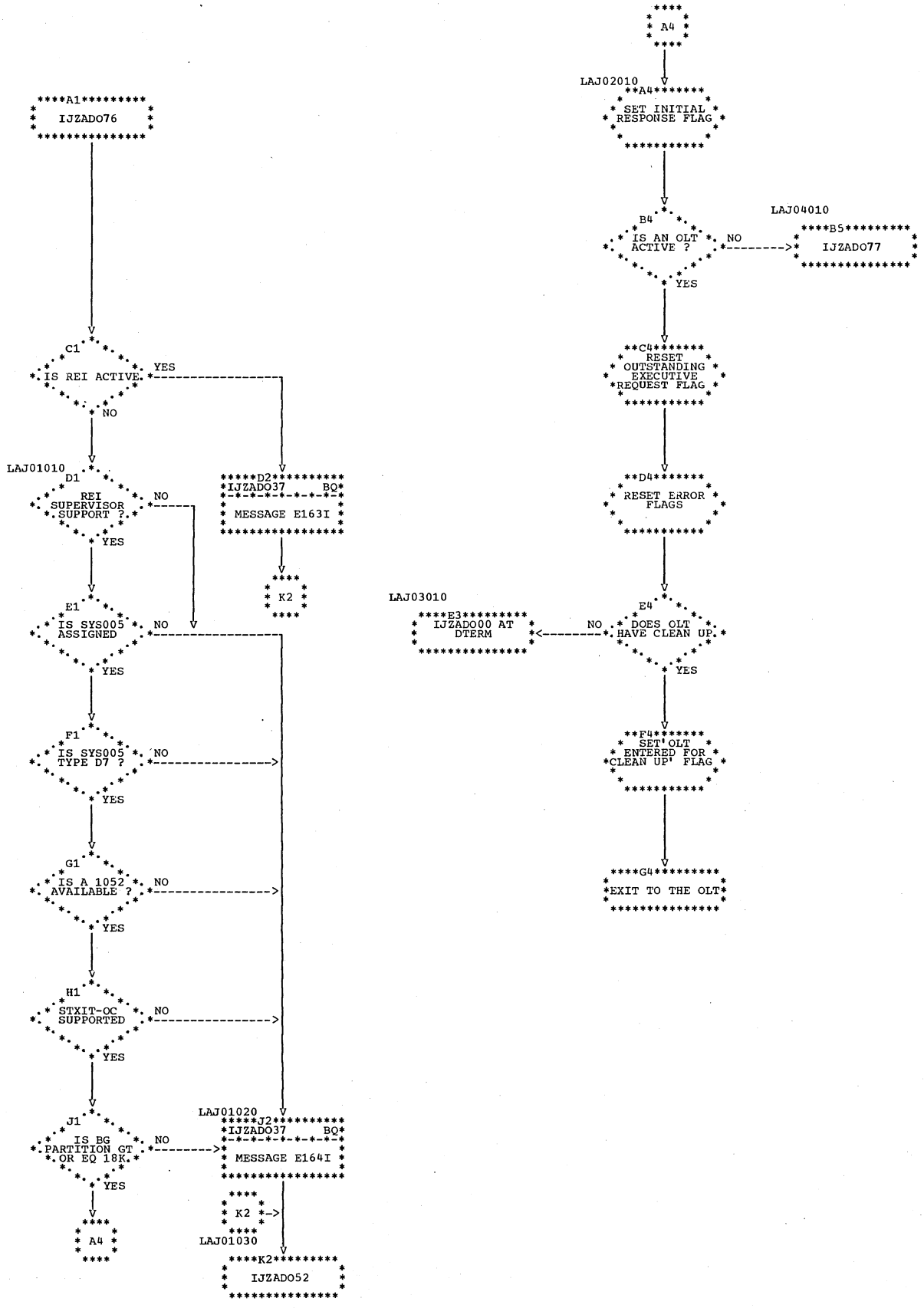


Chart CS. IJZADO77: REI Initializer #2

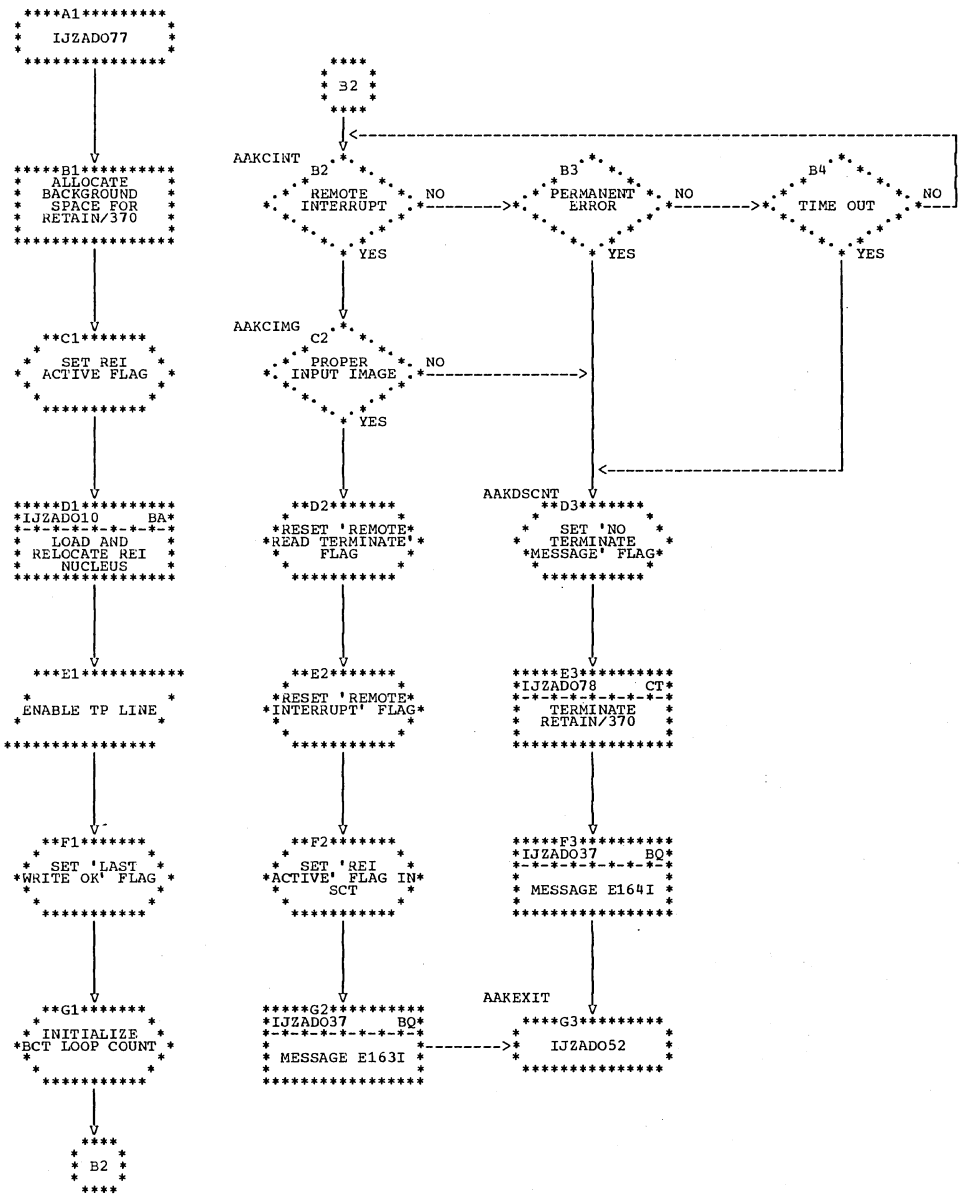


Chart CT. IJZADO78: RETAIN/370 Terminate

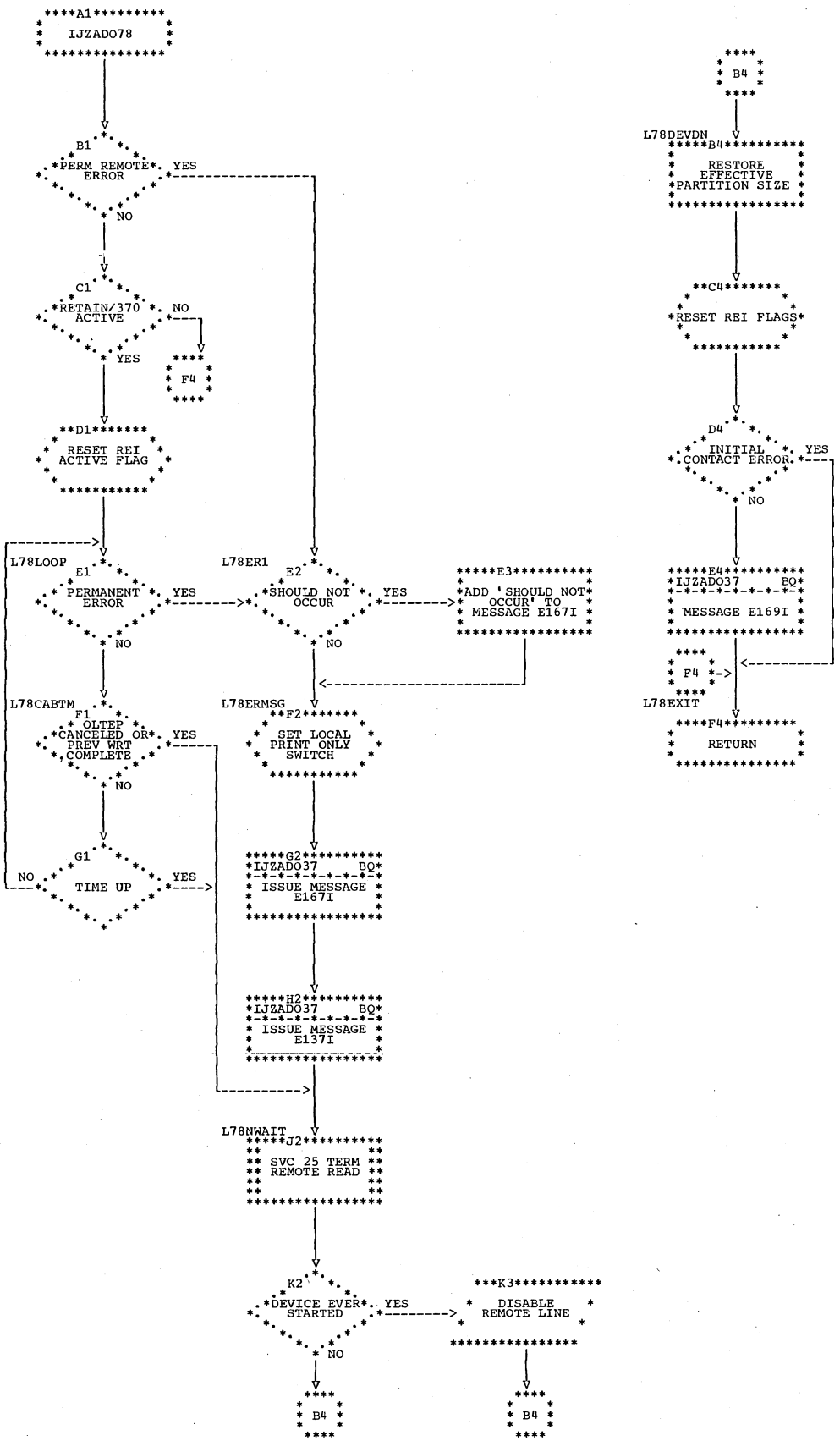


Chart CU. IJZADO85: Device Update (Section 1 of 2)

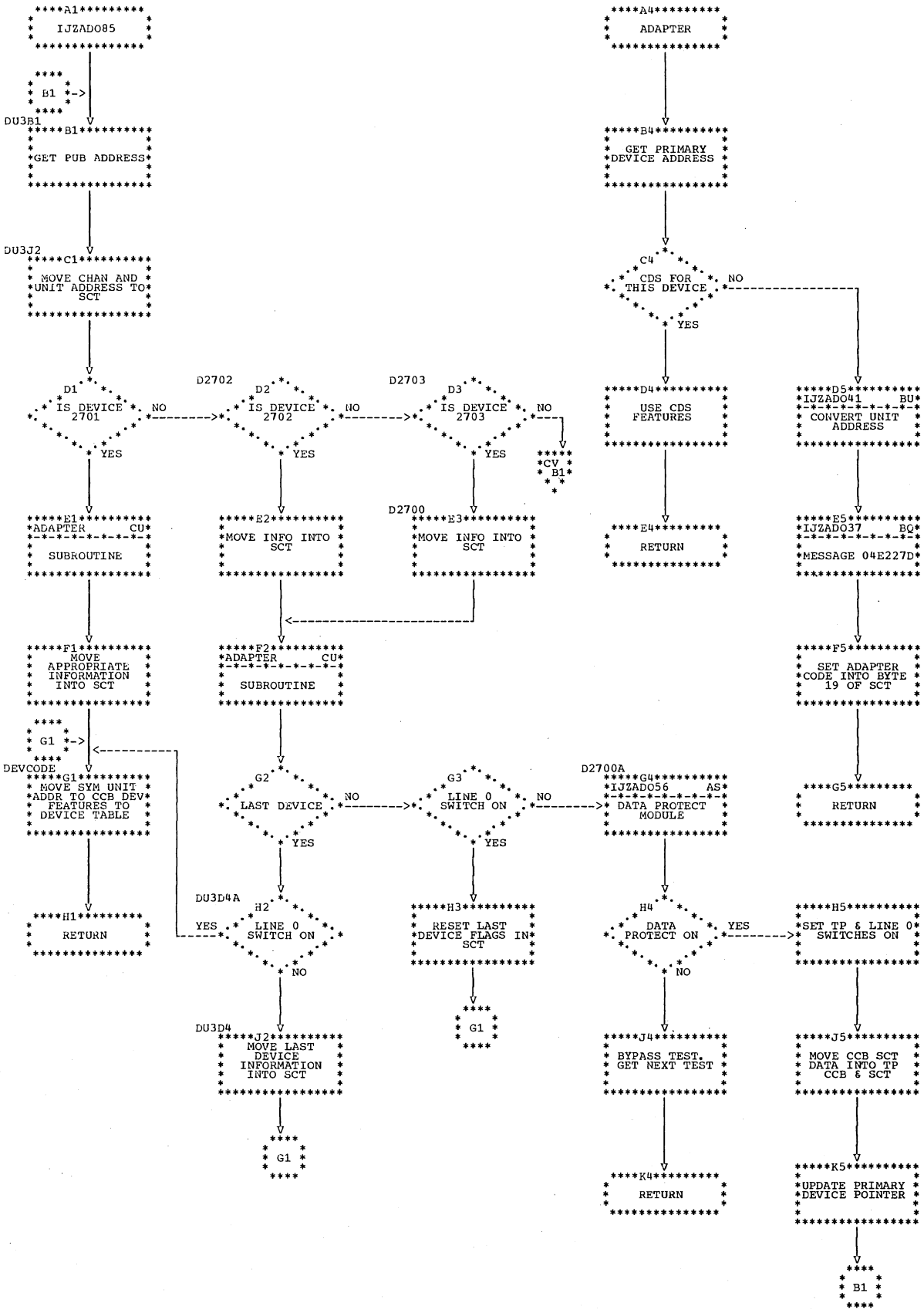


Chart CV. IJZADO85: Device Update (Section 2 of 2)

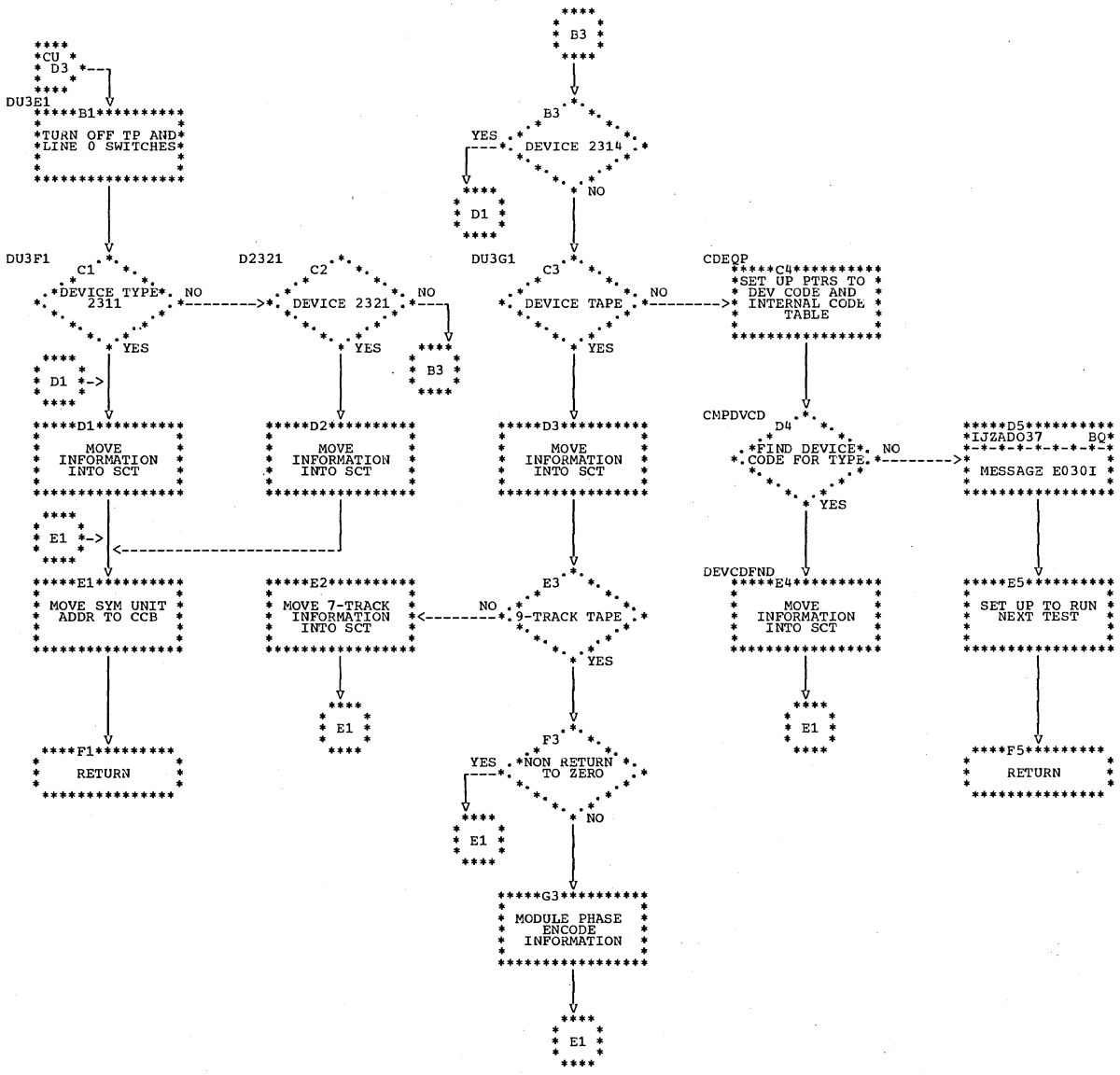


Chart CW. IJZADO94: External Interrupt Handler

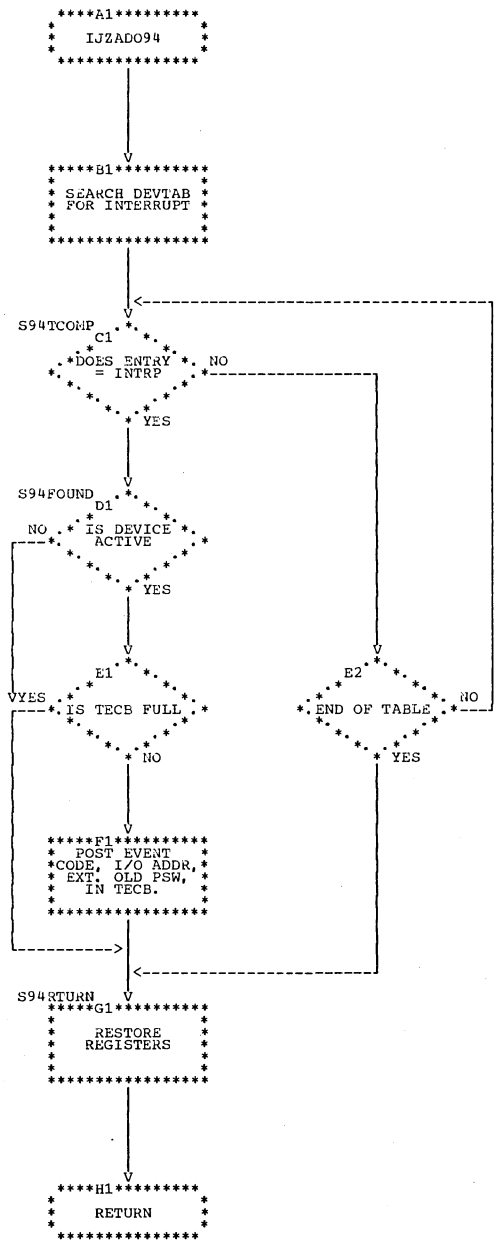


Chart CX. IJZADO98: I/O Interrupt Handler (Section 1 of 3)

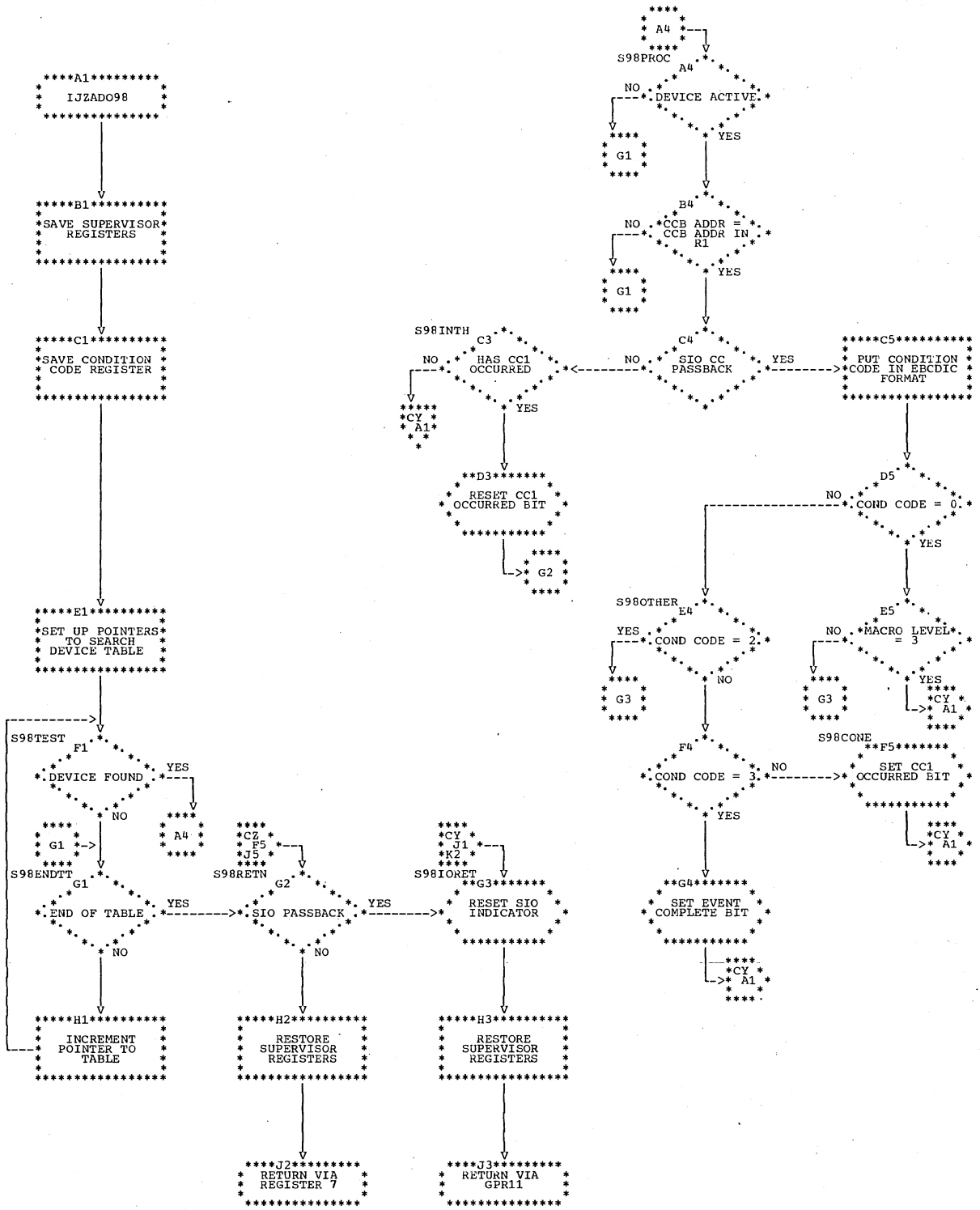


Chart CY. IJZAD098: I/O Interrupt Handler (Section 2 of 3)

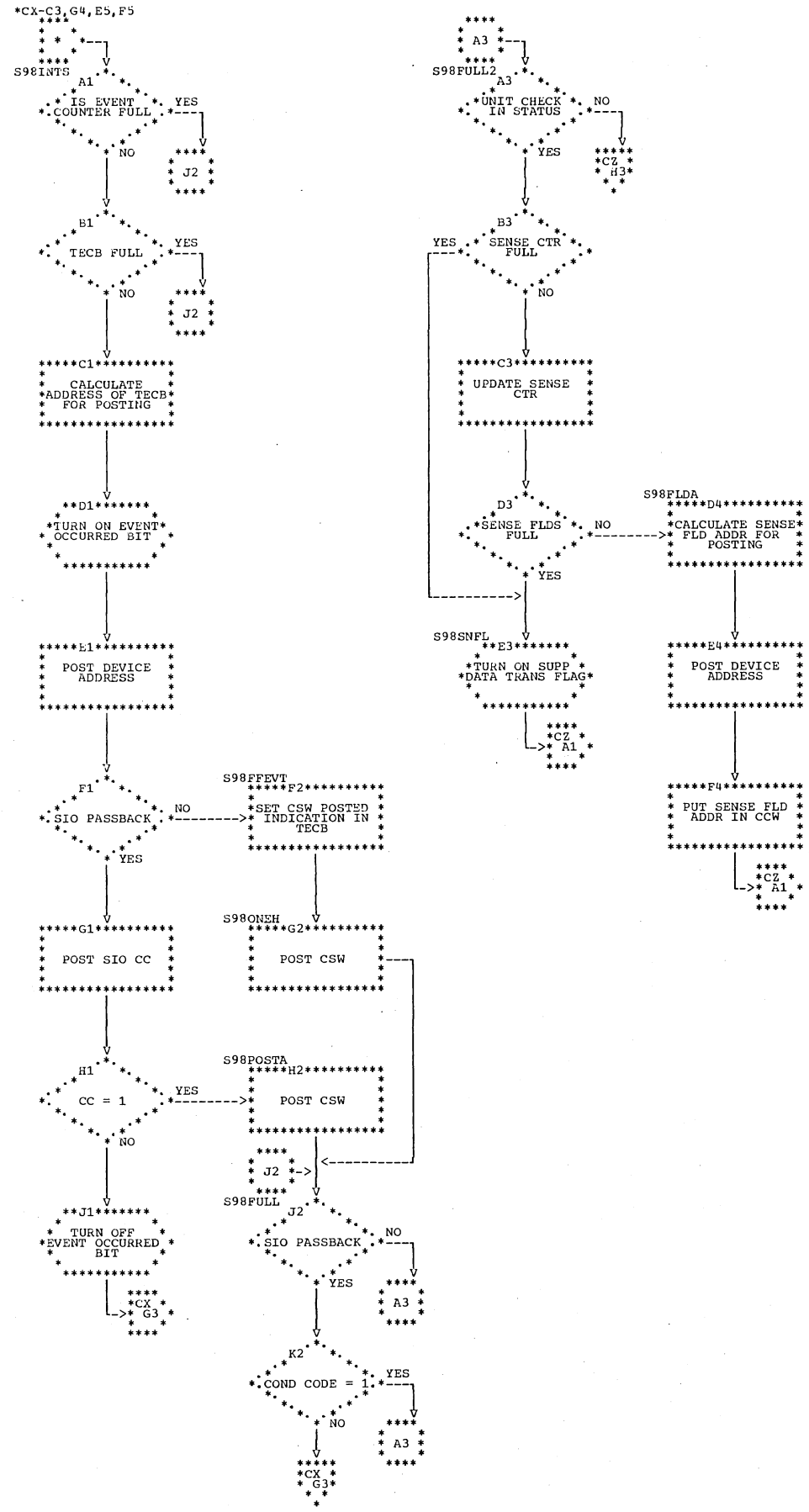


Chart CZ. IJZADO98: I/O Interrupt Handler (Section 3 of 3)

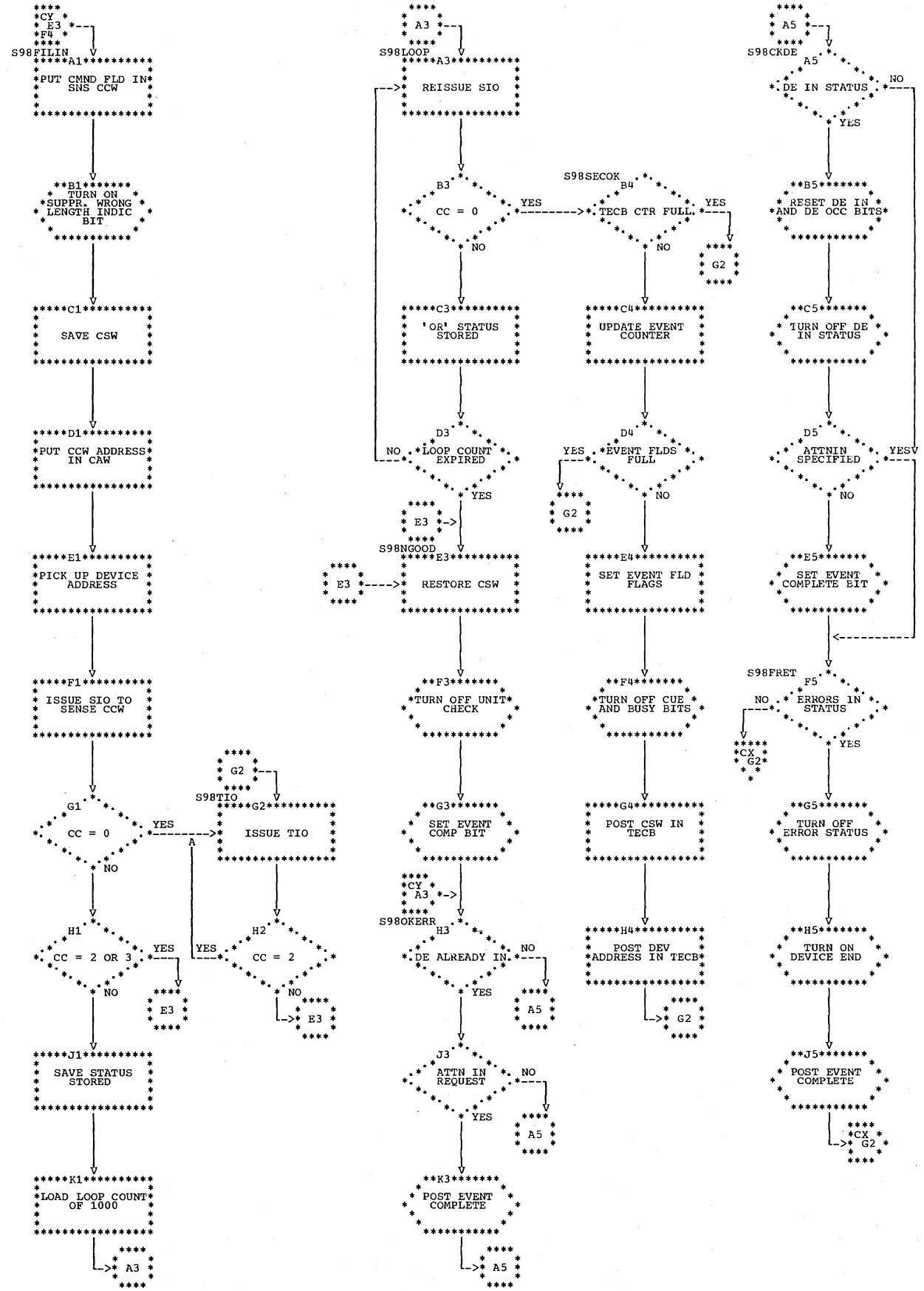


Chart DA. IJZADOAA: $DDATE

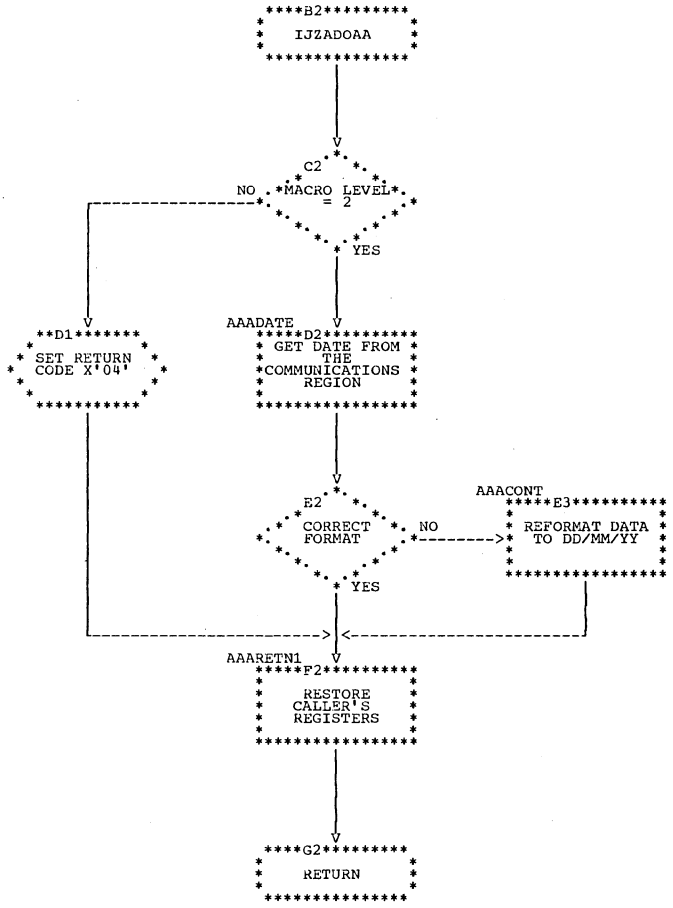


Chart DB. IJZADOAB: $DTIME

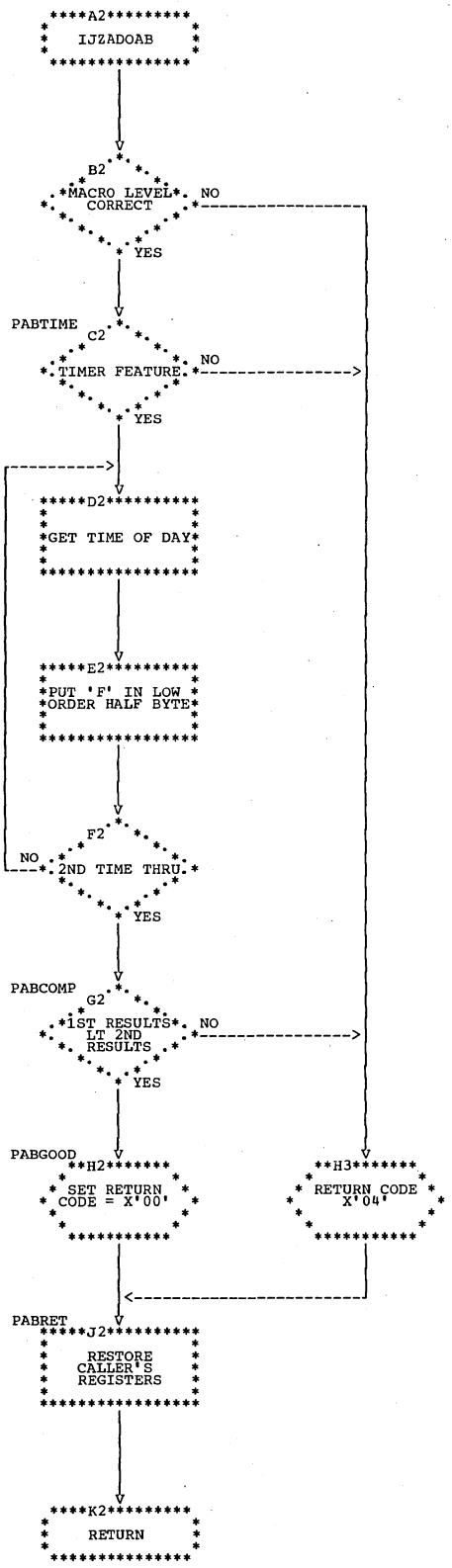


Chart DC. IJZADOAC: LETGO

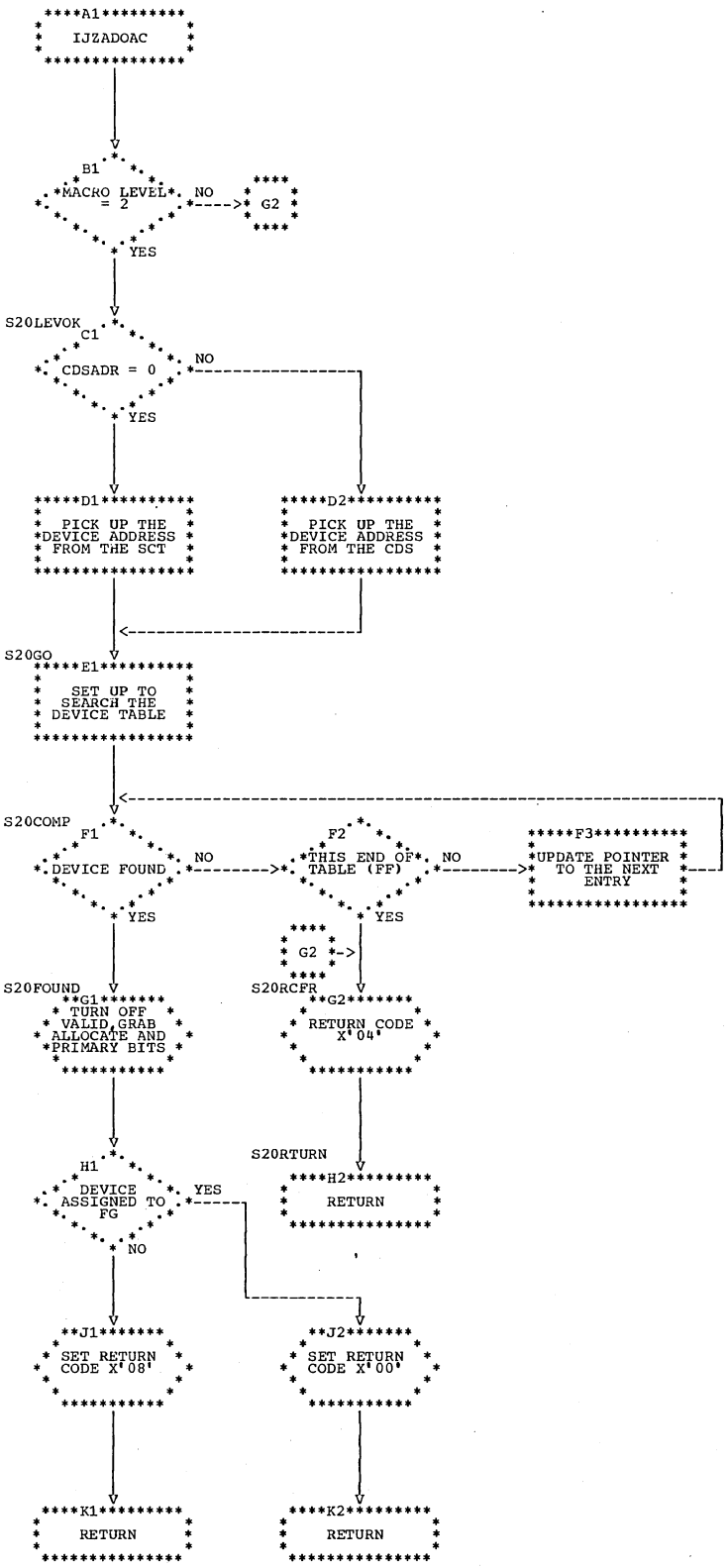


Chart DD. IJZAOLTP: $$BOLTEP

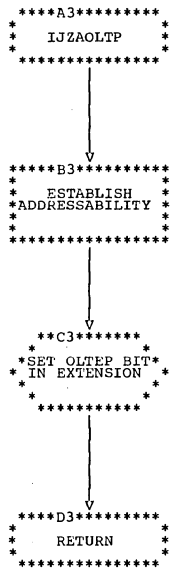


Chart DE. IJZATOLT: $$BTOLTP, Terminate OLTEP

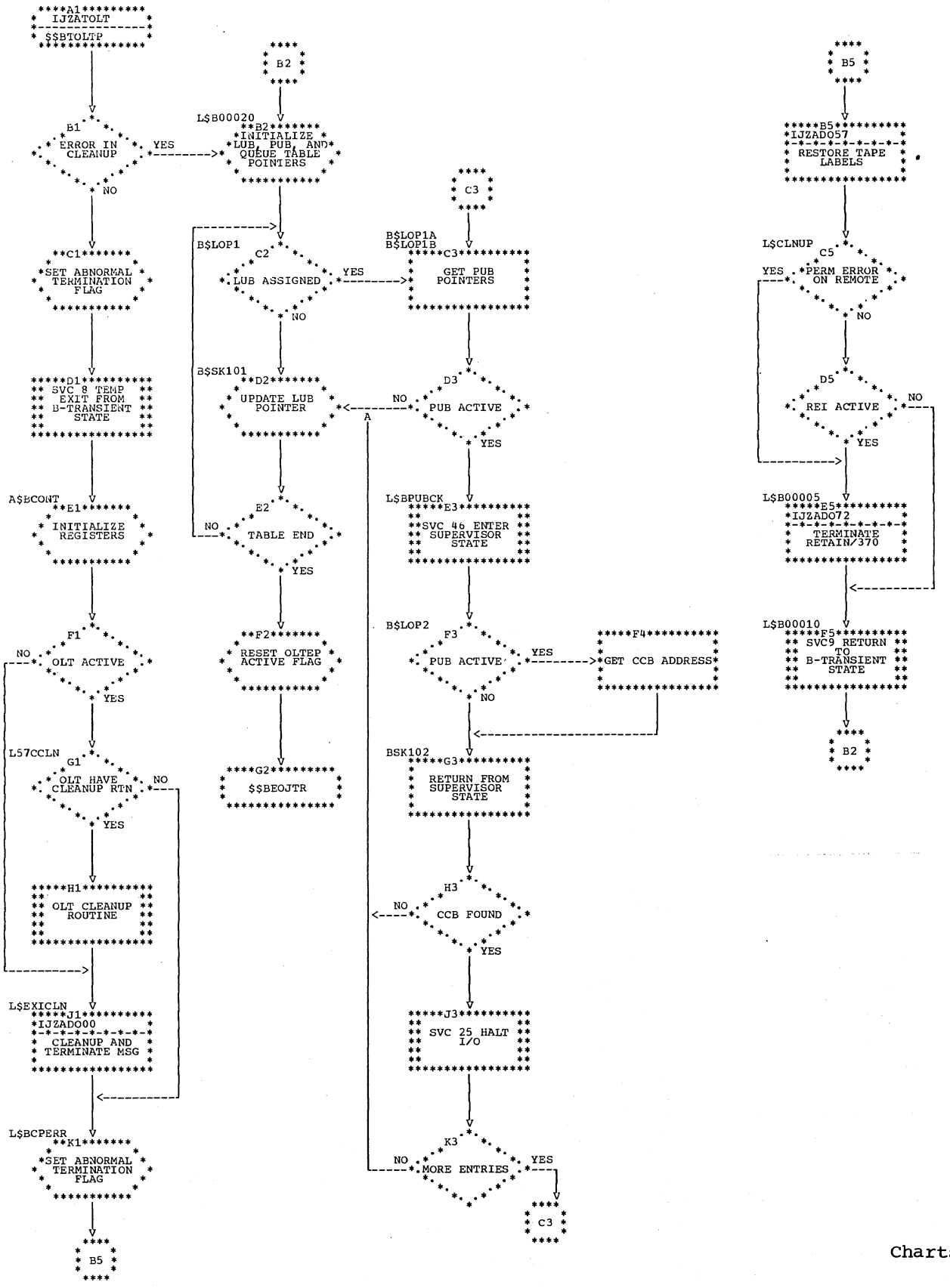


Chart EA. IJZACEOM: CE Communication

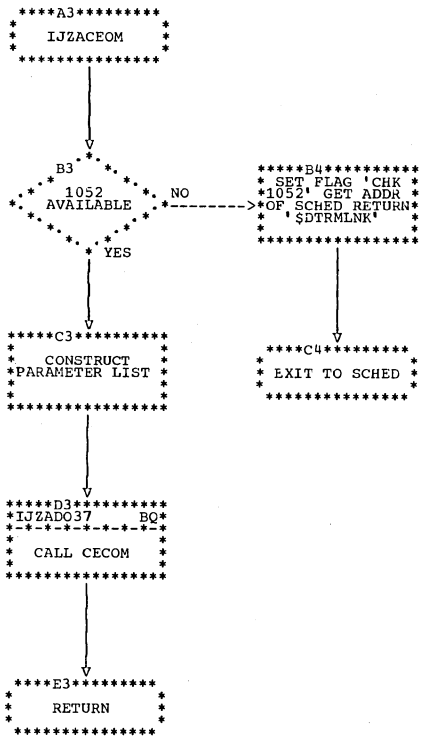


Chart EB. IJZACKTP: Check Teleprocessing

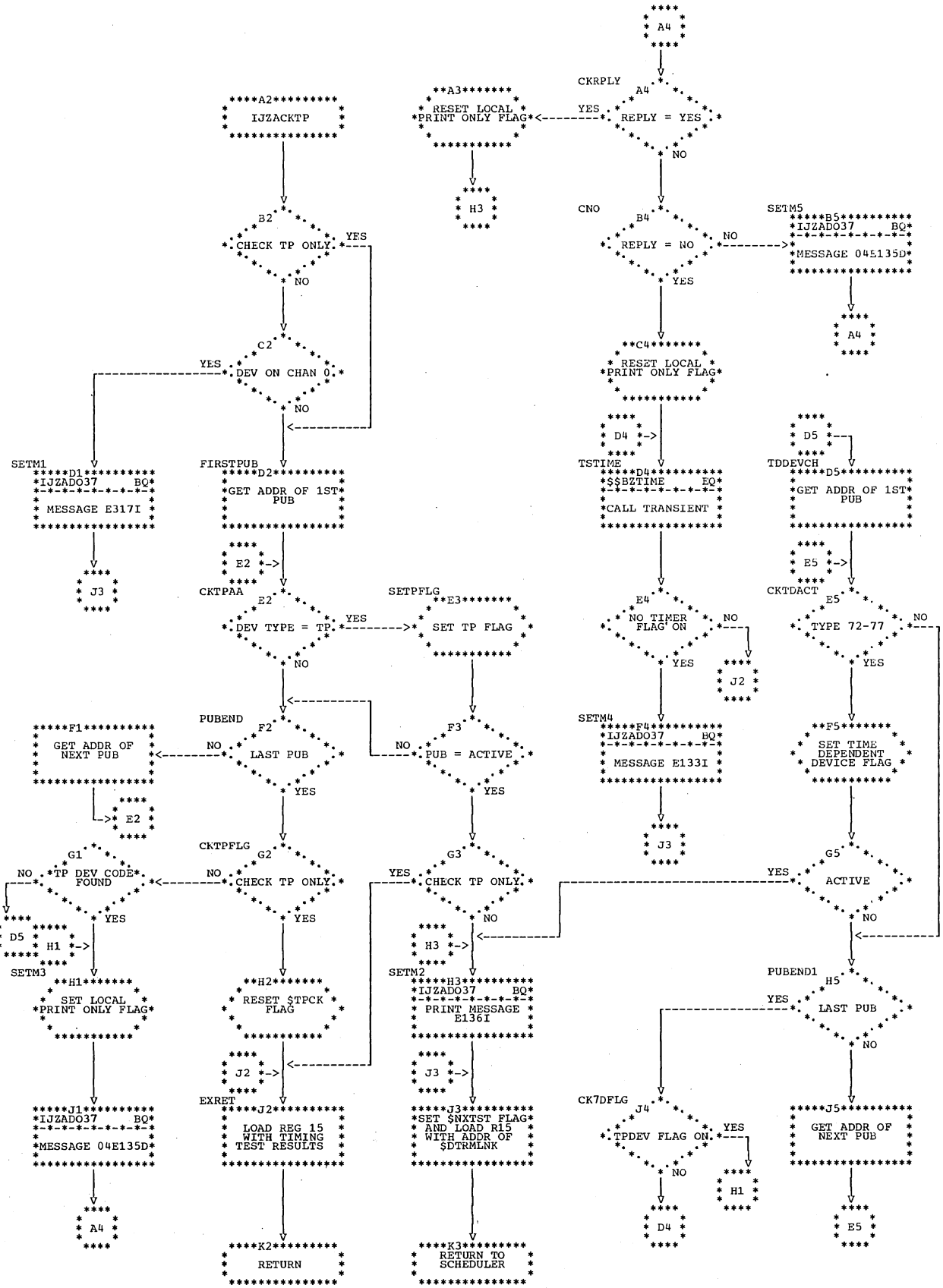


Chart EC. IJZACMNT: Print Comment

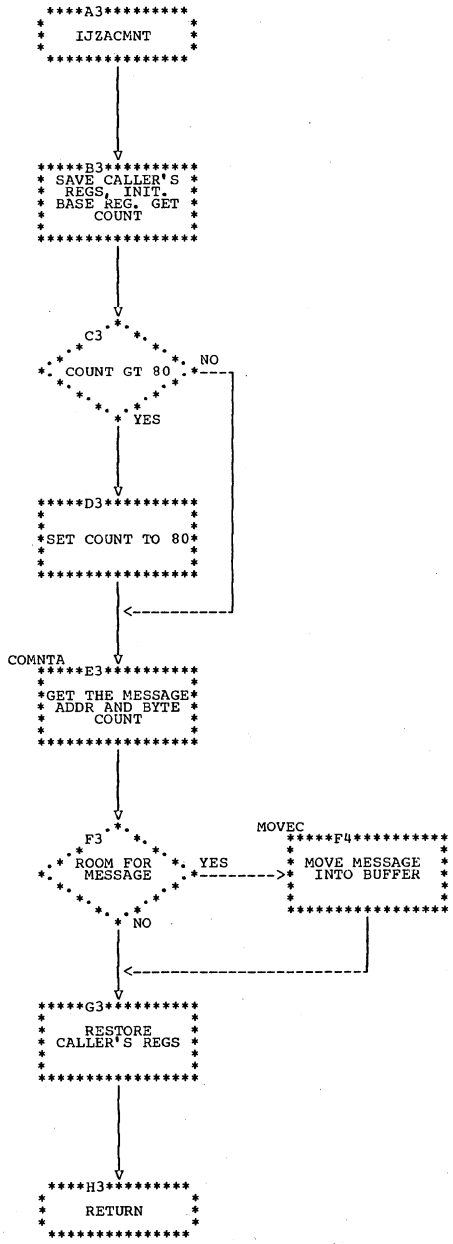


Chart ED. IJZACOMP: Compare

*A3
AT PRESENT, THIS TEST
DOES NOT APPLY TO
DOS/TOS. IT IS LEFT IN
THE LISTING FOR
COMPATABILITY PURPOSES
WITH AN OS OLTEP PROGRAM.

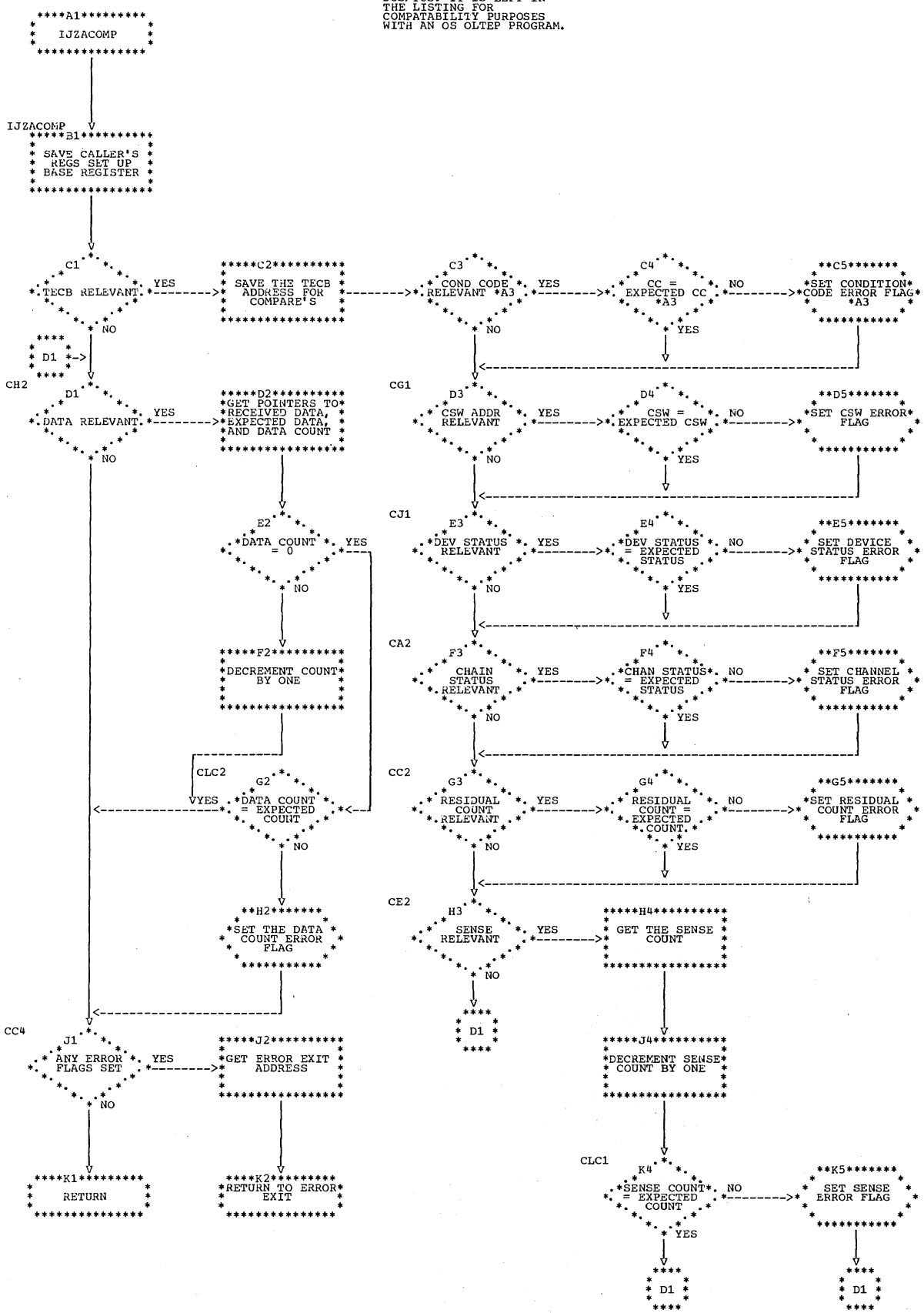


Chart EE. IJZACONV: Convert

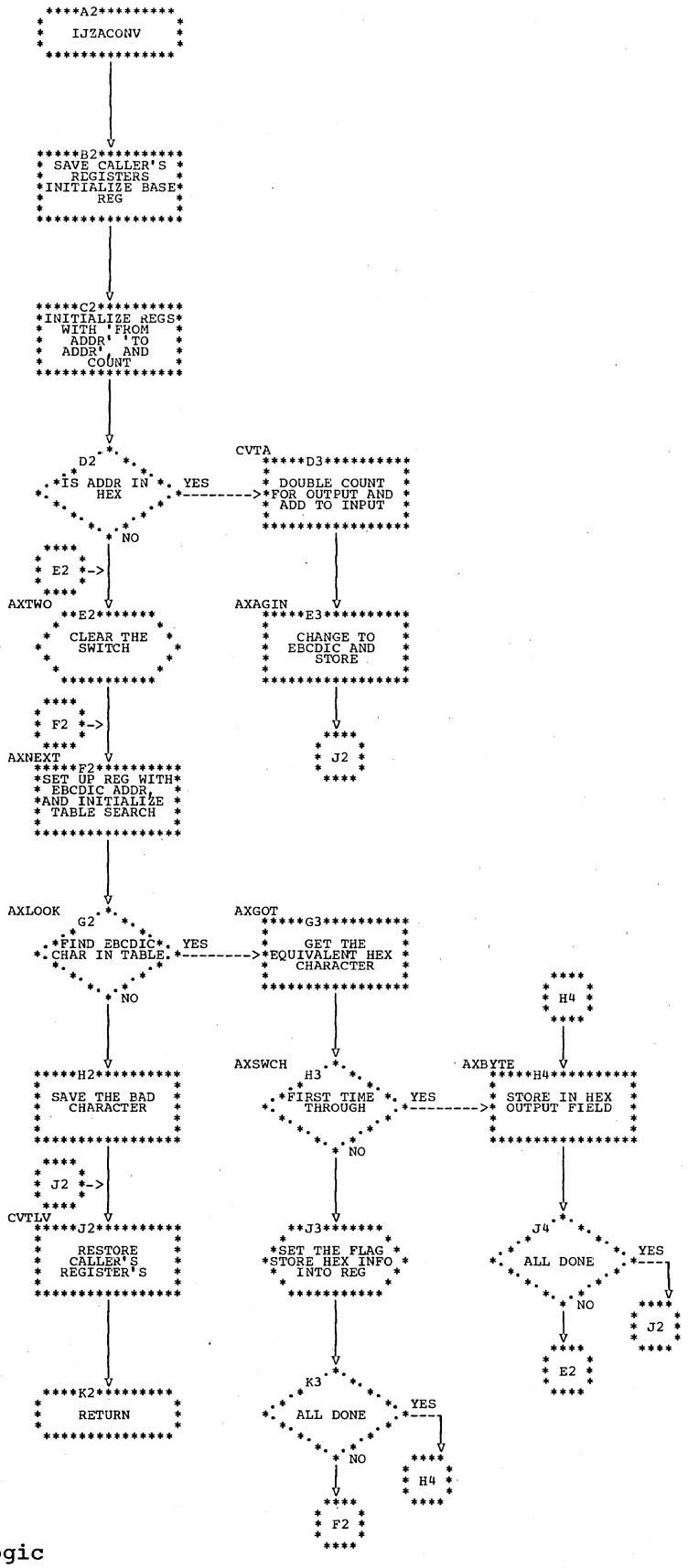


Chart EF. IJZADPRT: Data Print (Section 1 of 3)

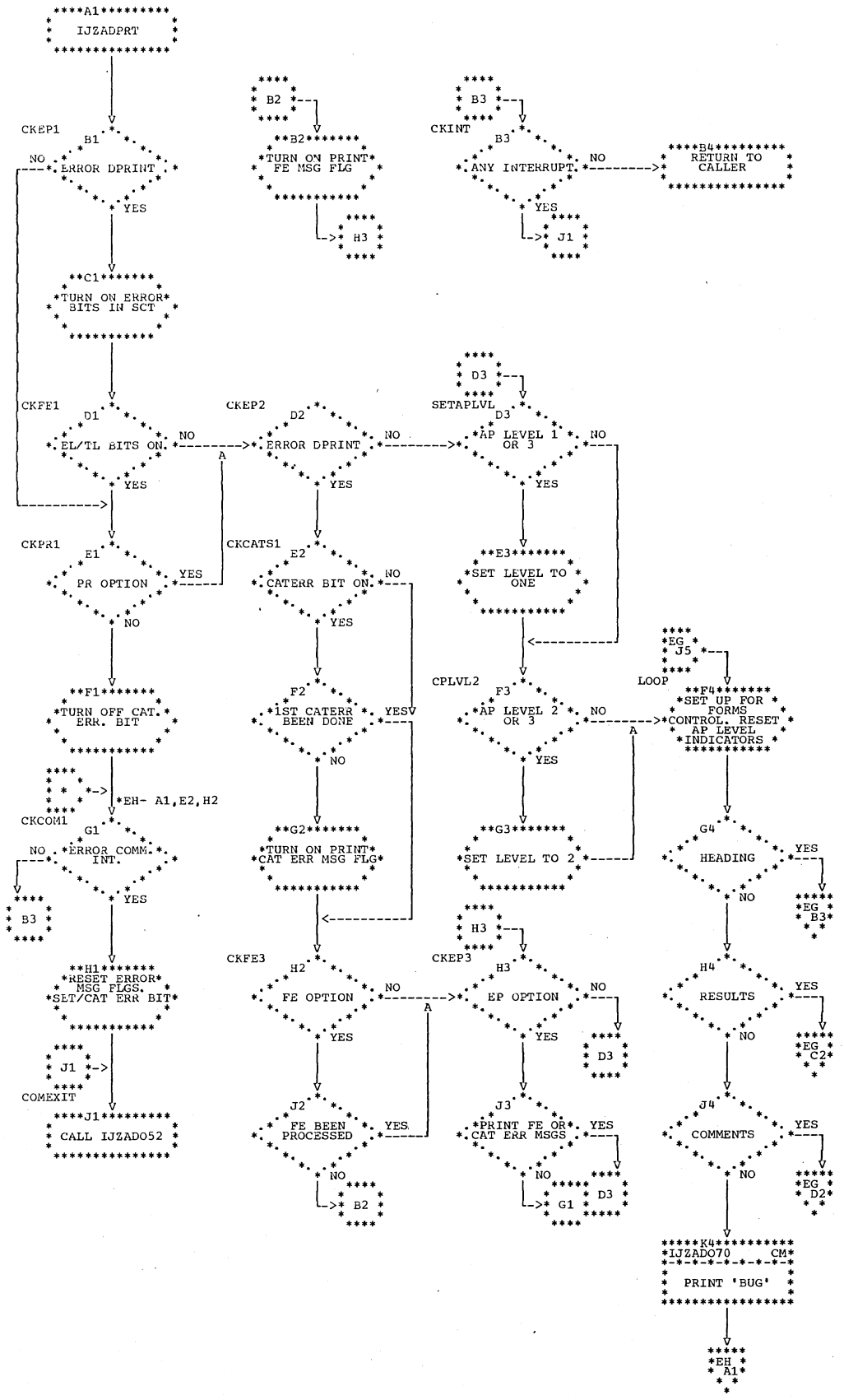


Chart EG. IJZADPRT: Data Print (Section 2 of 3)

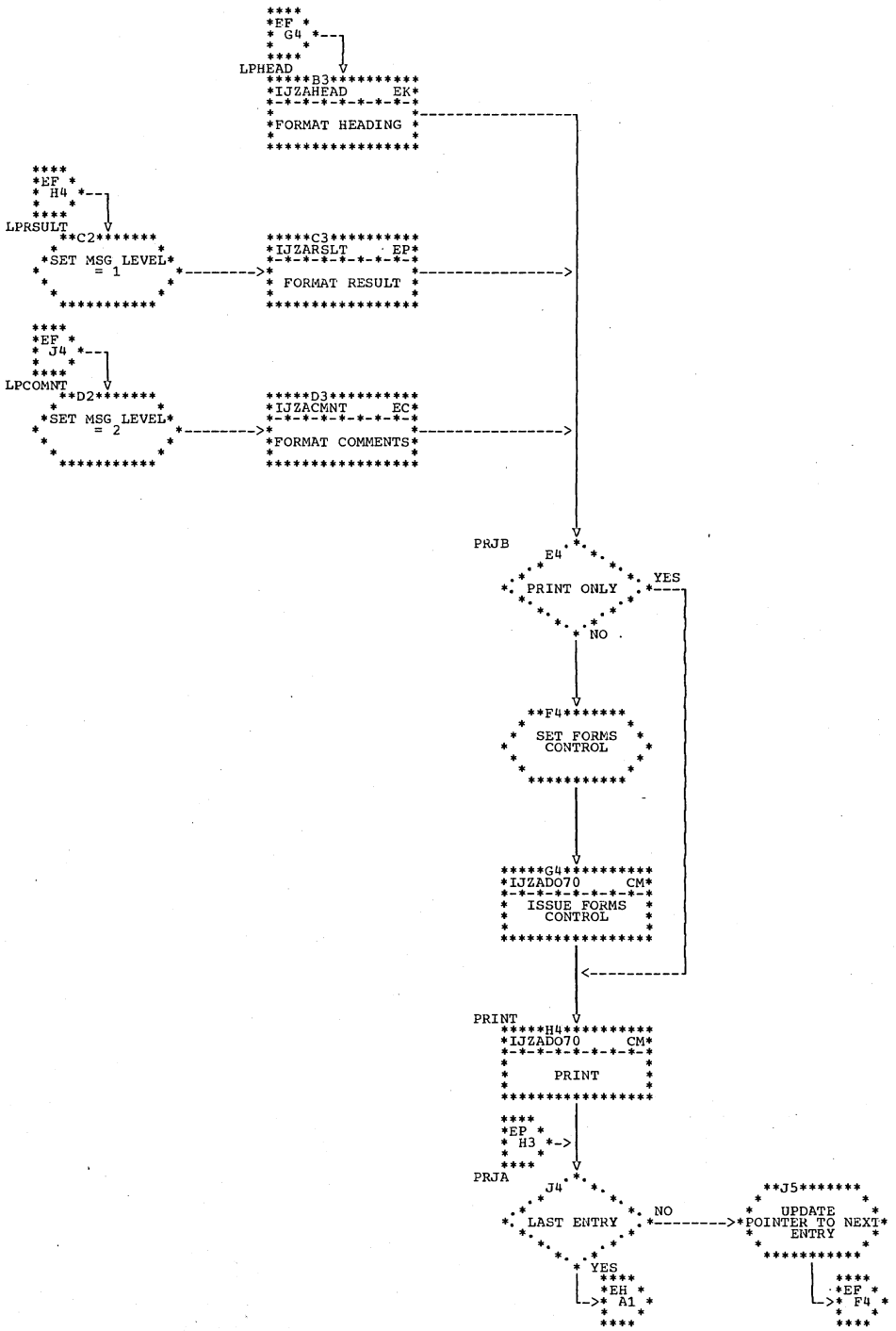


Chart EH. IJZADPRT: Data Print (Section 3 of 3)

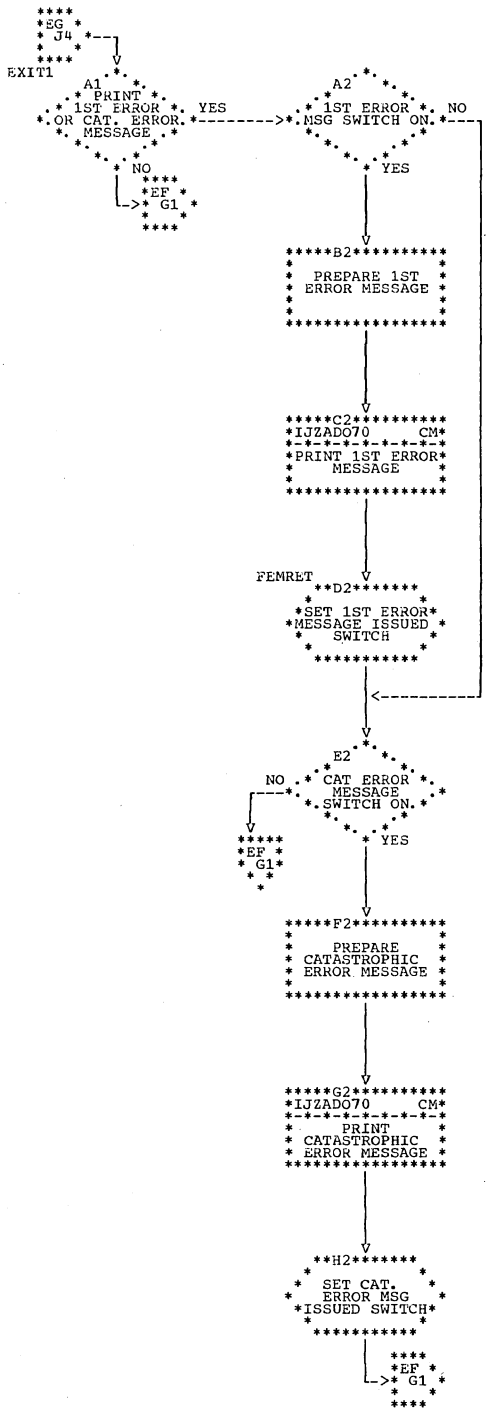


Chart EJ. IJZAEXIO: OLTAM EXIO

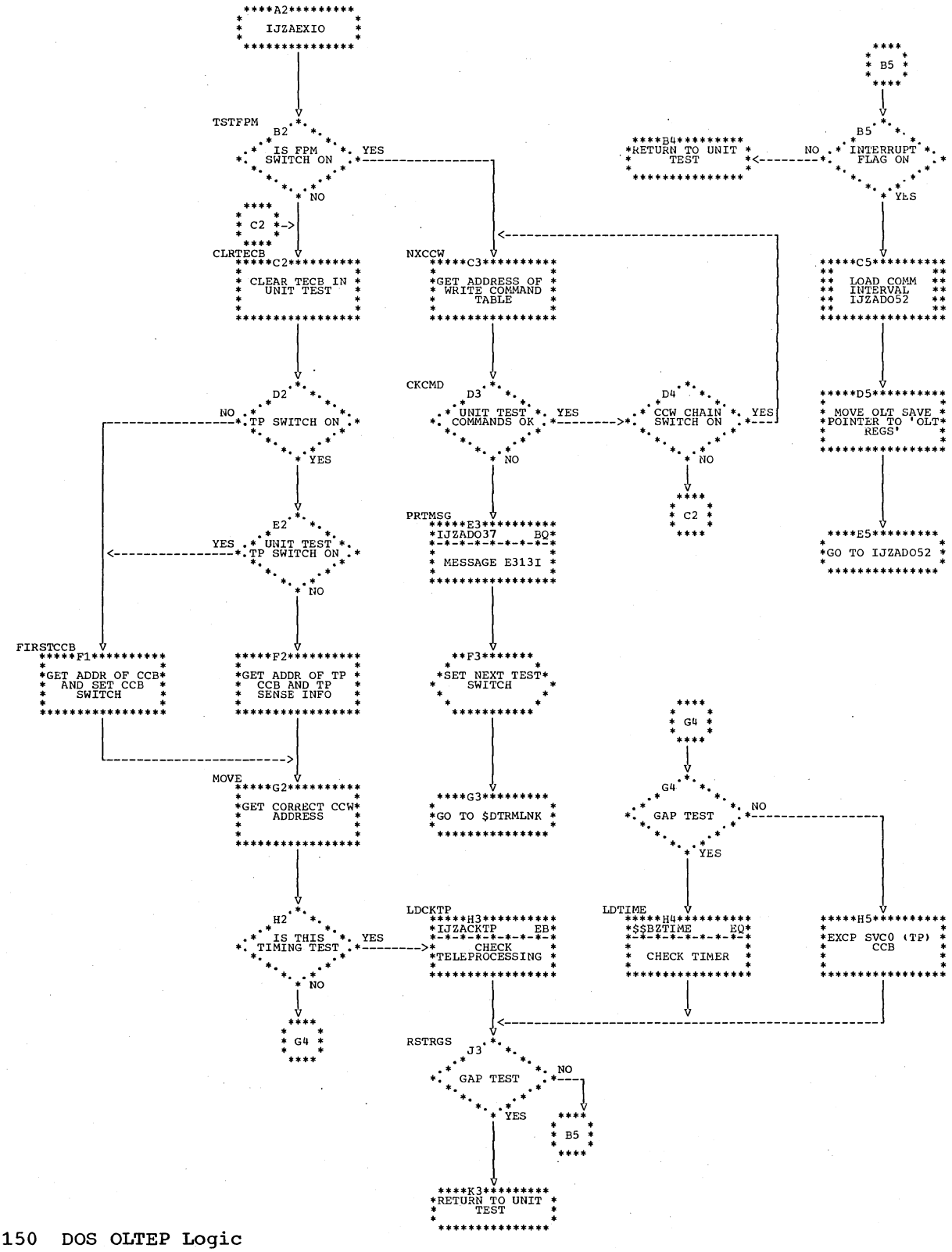


Chart EK. IJZAHEAD: Print Heading

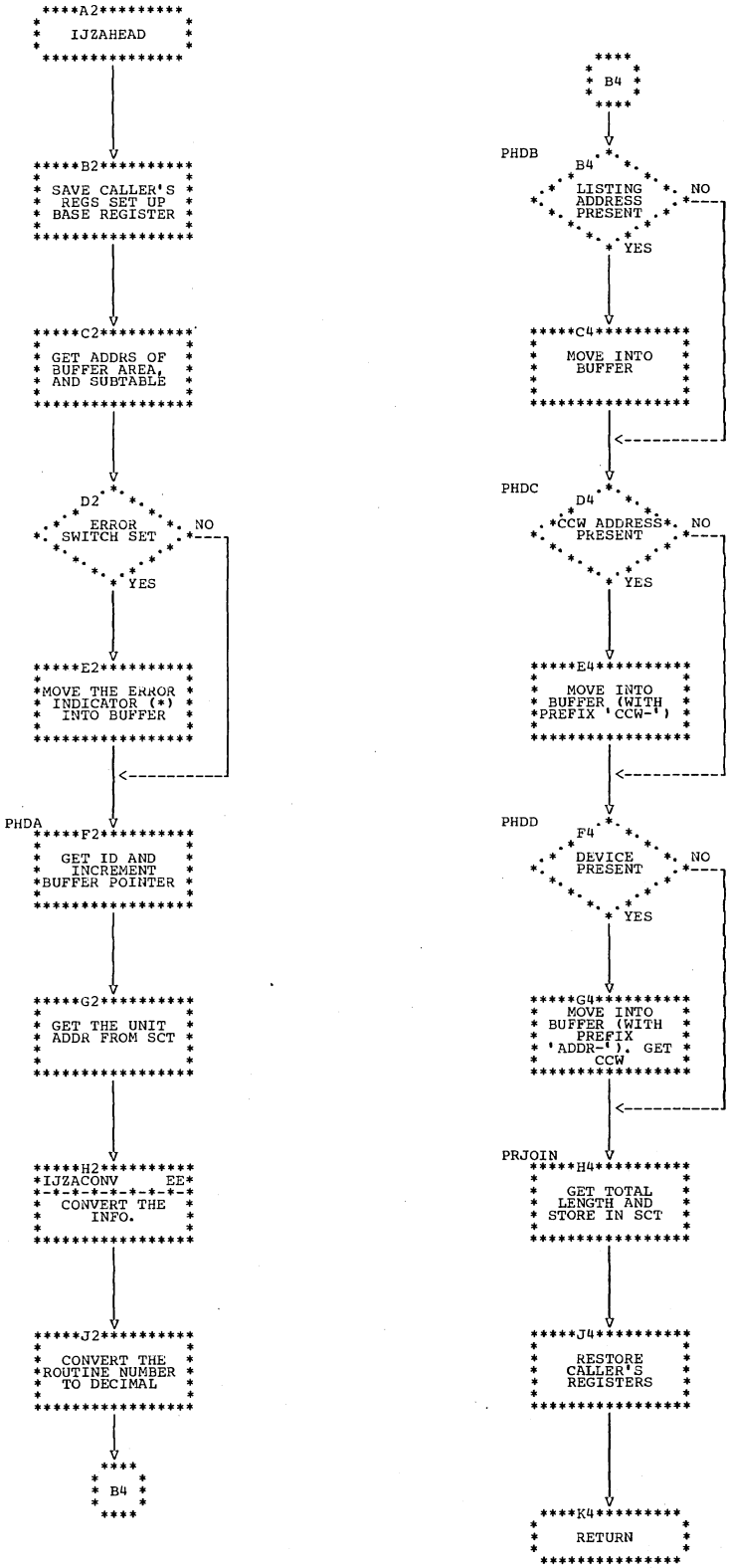


Chart EL. IJZAOPEN: $$BSOPEN, Pseudo Open

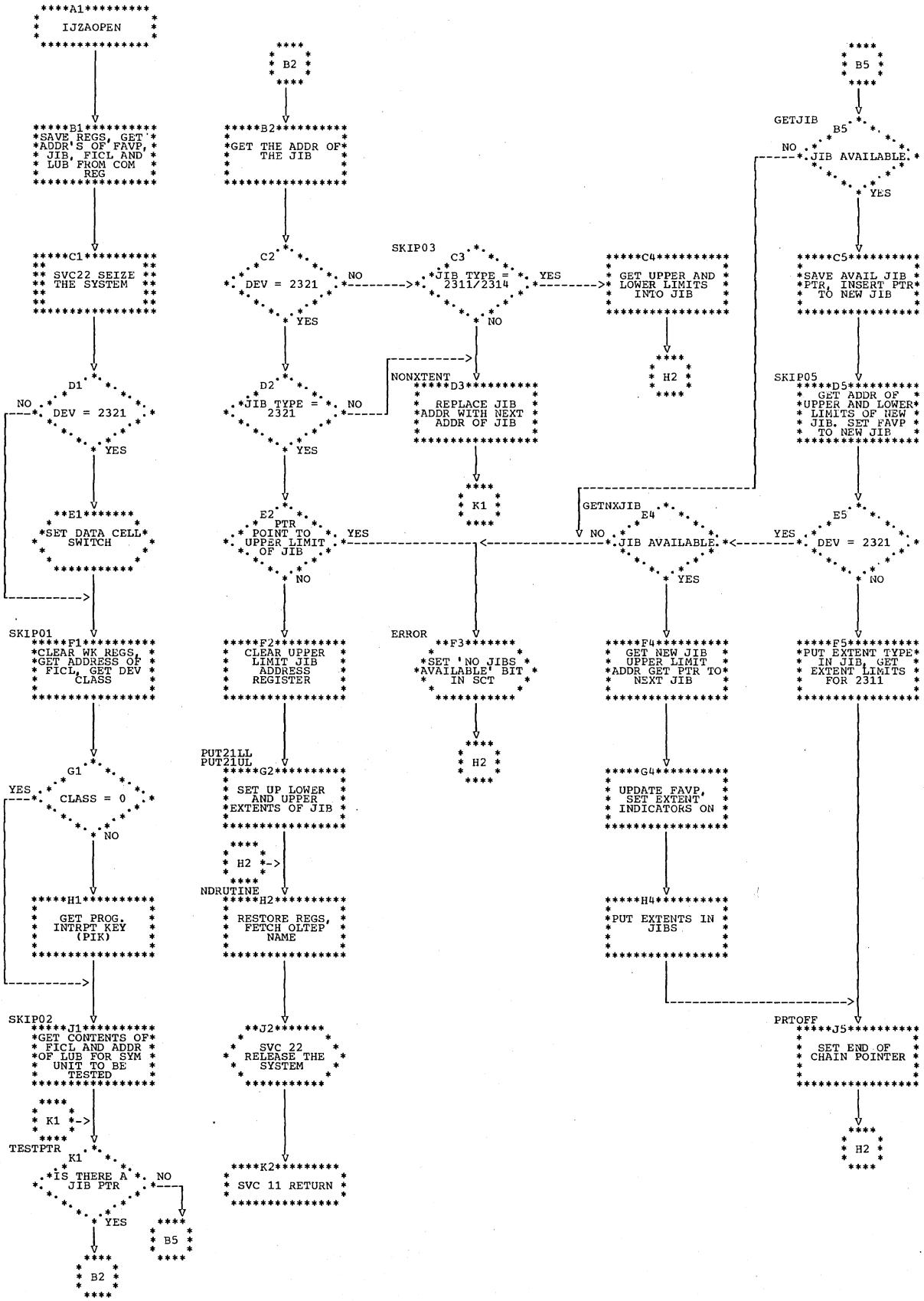


Chart EM. IJZAOPUT: Output

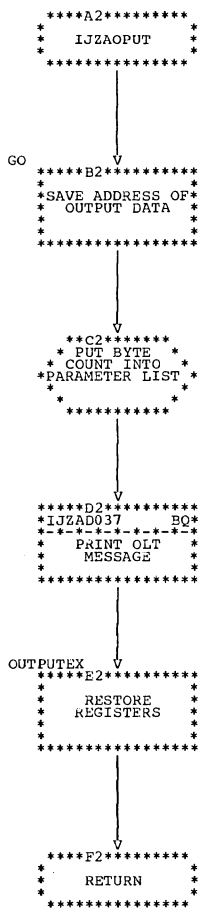


Chart EN. IJZARATA: Random Data Generator

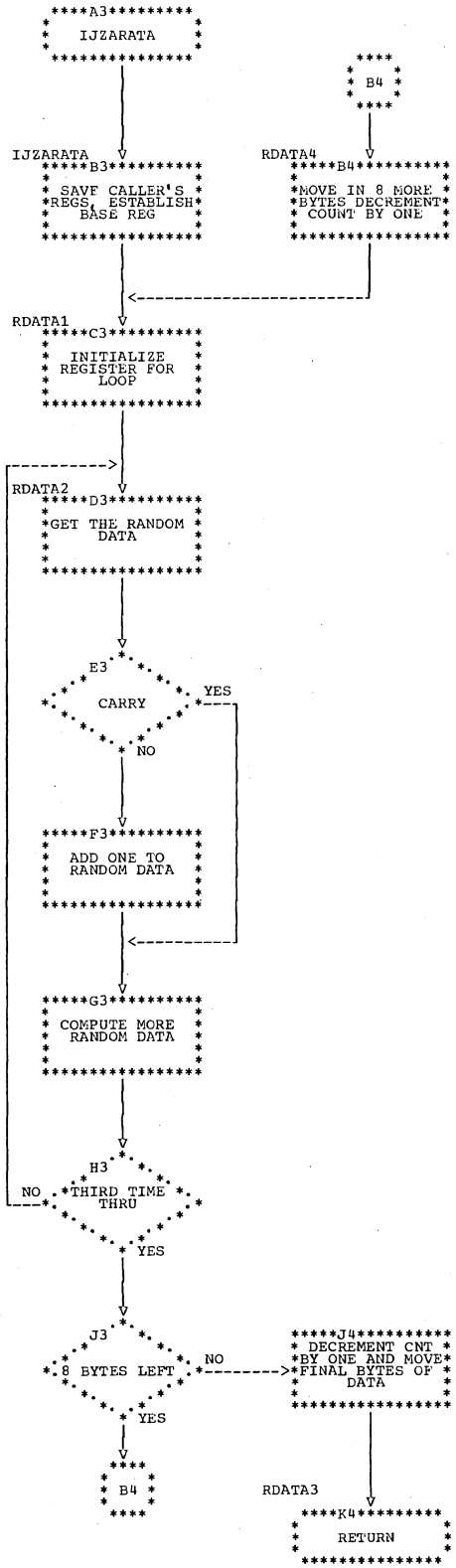


Chart EP. IJZARSLT: Print Result

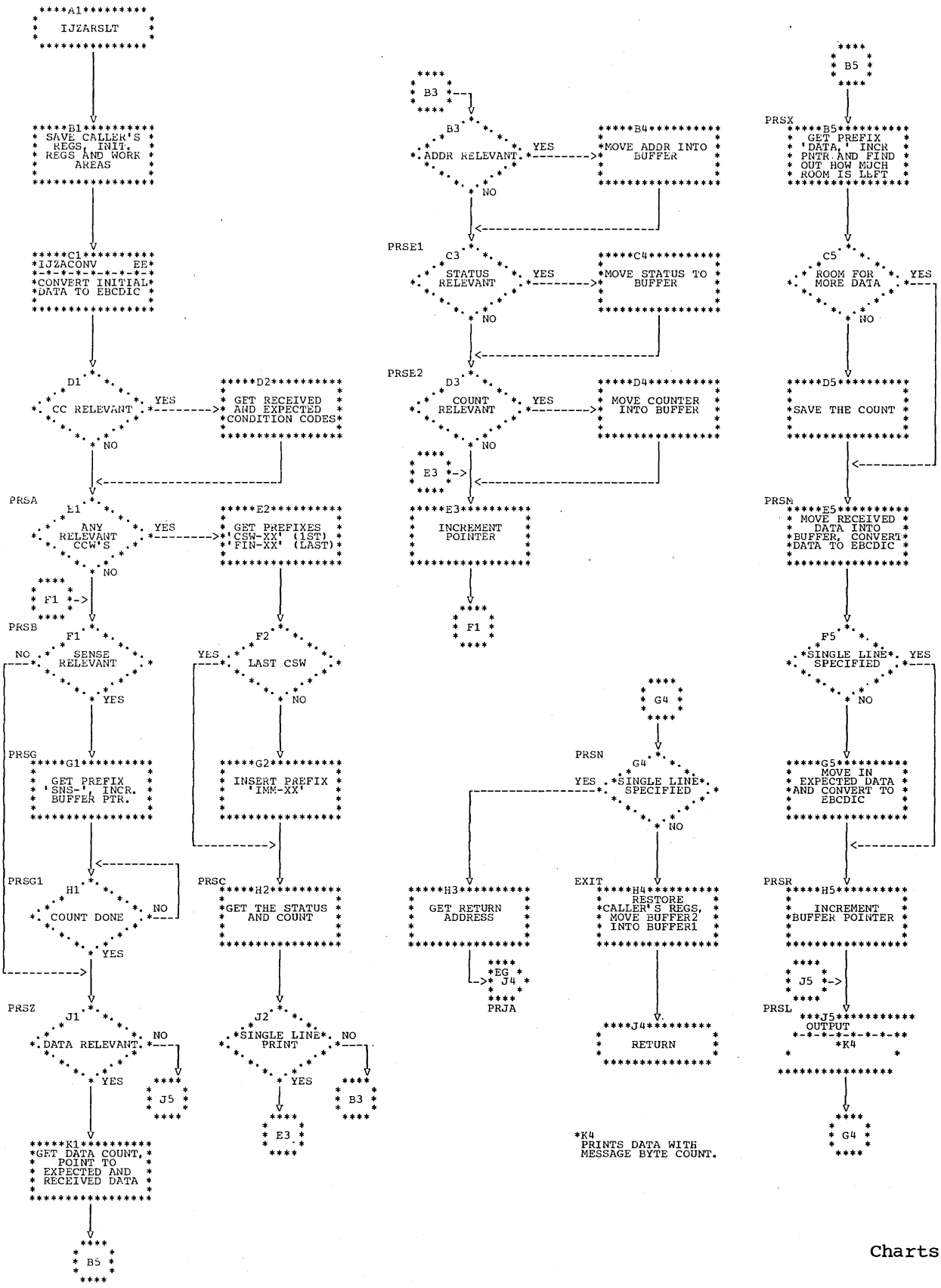


Chart EQ. IJZATIME: $$BZTIME, Timing Test

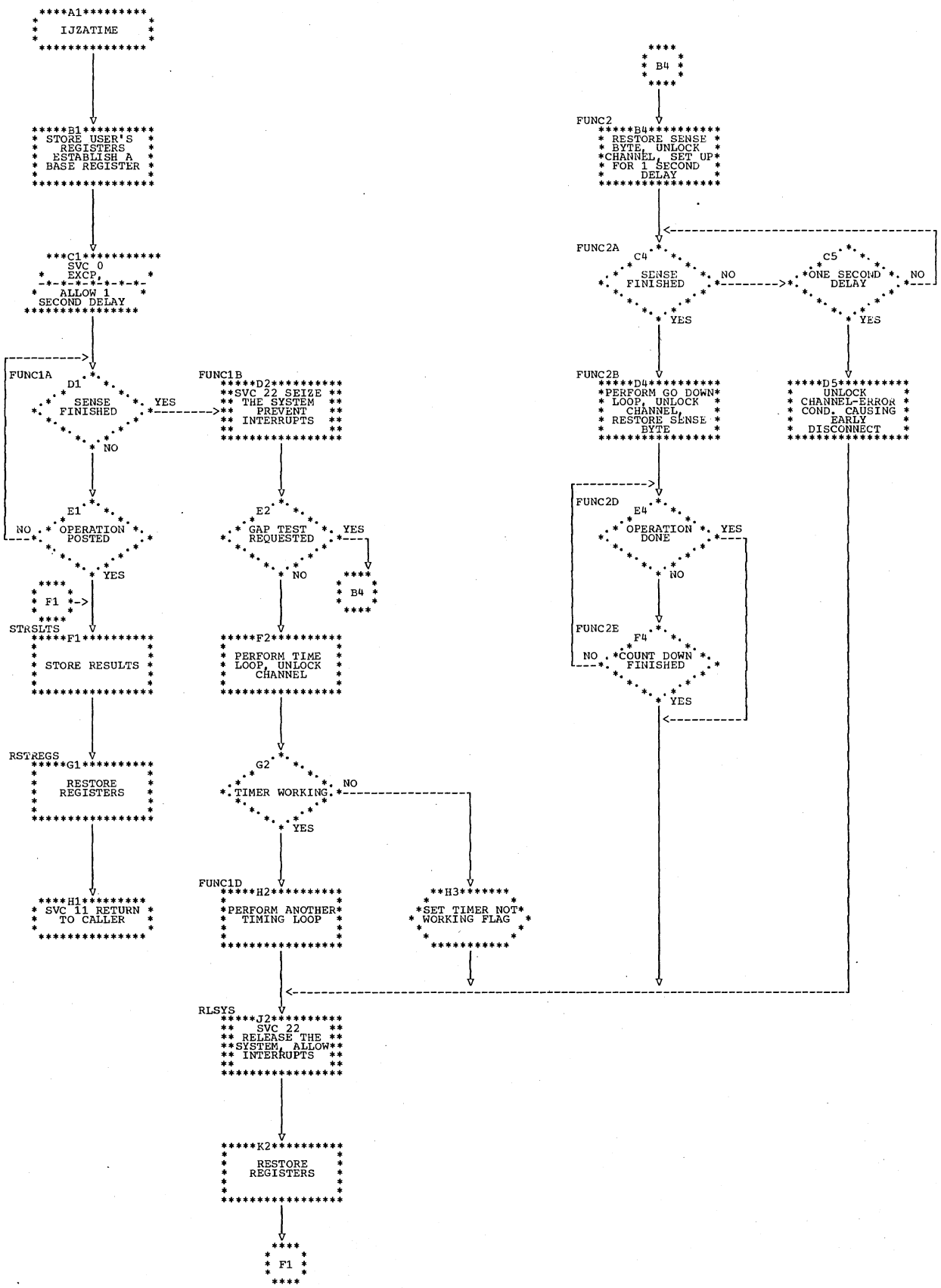
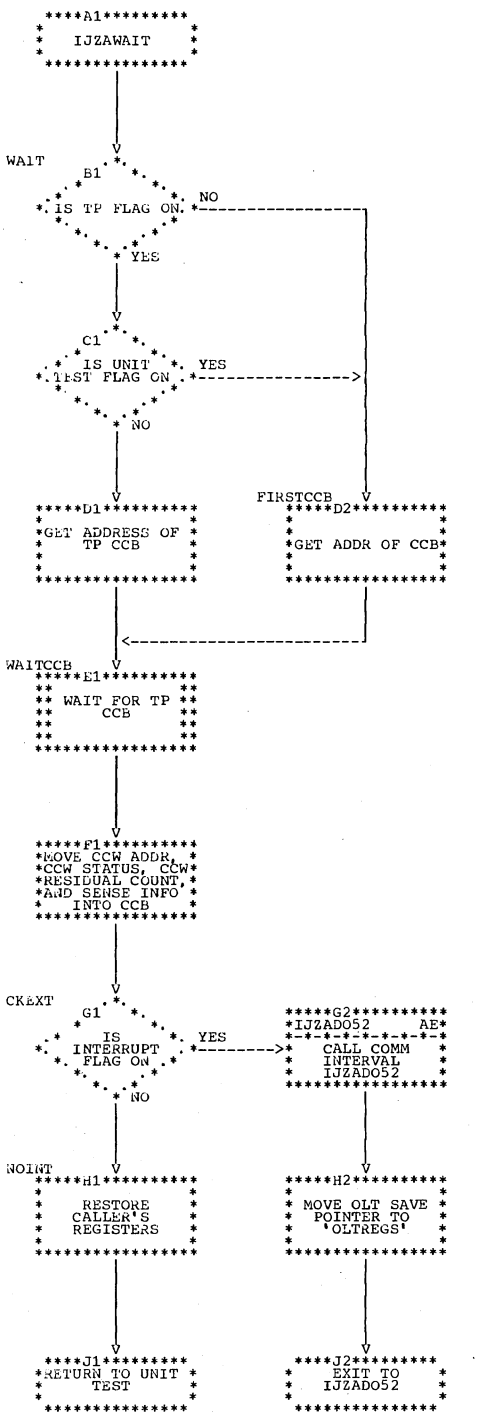


Chart ER. IJZAWAIT: OLTAM Wait



APPENDIX A: LABEL CROSS REFERENCE

Label	Phase	Chart
A$BCONT	IJZATOLT	DE
AAACONT	IJZADOAA	DA
AAADATE	IJZADOAA	DA
AAARETN1	IJZADOAA	DA
AAKCIMG	IJZADO77	CS
AAKCINT	IJZADO77	CS
AAKDSCNT	IJZADO77	CS
AAKEXIT	IJZADO77	CS
ADAPTER	IJZADO85	CU
AEZADOLT	IJZADOLT	AA
AXAGIN	IJZADO41	BU
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AXBYTE	IJZADO41	BU
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AXGOT	IJZACONV	EE
AXLOOK	IJZADO41	BU
AXLOOK	IJZACONV	EE
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AXSWCH	IJZACONV	EE
AXTWO	IJZADO41	BU
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BADSENSE	IJZADO02	AU
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CA2	IJZACOMP	ED
CC2	IJZACOMP	ED
CC4	IJZACOMP	ED
CDEQP	IJZADO85	CV
CEBIT	IJZADO02	AU
CECOMPRT	IJZADO02	AU
CEVOL	IJZADO02	AU
CE2	IJZACOMP	ED
CG1	IJZACOMP	ED
CH2	IJZACOMP	ED
CJ1	IJZACOMP	ED
CKCATS1	IJZADPRT	EF
CKCMD	IJZAEXIO	EJ
CKCOM	IJZADPRT	EH
CKEL1	IJZADPRT	EF
CKEP1	IJZADPRT	EF
CKEP2	IJZADPRT	EF
CKEP3	IJZADPRT	EF
CKEXT	IJZAWAIT	ER
CKFENSG	IJZADPRT	EF
CKFE1	IJZADPRT	EF
CKFE2	IJZADPRT	EF
CKFE3	IJZADPRT	EF
CKINT	IJZADPRT	EH
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CKPR1	IJZADPRT	EF
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CKTDACT	IJZACKTP	EB
CKTPAA	IJZACKTP	EB
CKTPFLG	IJZACKTP	EB
CK7DFLG	IJZACKTP	EB
CLC1	IJZACOMP	ED
CLC2	IJZACOMP	ED
CLRTECB	IJZAEXIO	EJ
CMPDVCD	IJZADO85	CV
COMNJUNC	IJZADO02	AU
COMNTA	IJZACMNT	EC
CVTA	IJZADO41	BU
CVTA	IJZACONV	EE
CVTLU	IJZADO41	BU
CVTLV	IJZADO41	BU
CVTLV	IJZACONV	EE
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C31RELD	IJZADO31	AH
C32HKWKA	IJZADO32	AM
C32HK4Z	IJZADO32	AM
C32HRNWK	IJZADO32	AL
C32LRTST	IJZADO32	AK
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DEVCODE	IJZADO85	CU
DU3B1	IJZADO85	CU
DU3D4	IJZADO85	CU
DU3D4A	IJZADO85	CU
DU3E1	IJZADO85	CV
DU3F1	IJZADO85	CV
DU3G1	IJZADO85	CV
DU3J2	IJZADO85	CU

D2321	IJZADO85	CV
D24OBKSP	IJZADO24	BK
D2700	IJZADO85	CU
D2700A	IJZADO85	CU
D2702	IJZADO85	CU
D2703	IJZADO85	CU
D31VCVT	IJZADO31	AJ1
EPZADO02	IJZADO02	AU
ERROR	IJZAOPEN	EL
EXIT	IJZARSLT	EP
EXIT1	IJZADPRT	EH
EXRET	IJZACKTP	EB
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FEMRET	IJZADPRT	EH
FIRSTCCB	IJZAEXIO	EJ
FIRSTCCB	IJZAWAIT	ER
FIRSTPUB	IJZACKTP	EB
FUNC1A	IJZATIME	EQ
FUNC1B	IJZATIME	EQ
FUNC1D	IJZATIME	EQ
FUNC2	IJZATIME	EQ
FUNC2A	IJZATIME	EQ
FUNC2B	IJZATIME	EQ
FUNC2D	IJZATIME	EQ
FUNC2E	IJZATIME	EQ
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F00CLEAR	IJZADO32	AP
F32SNCHK	IJZADO32	AK
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GETNXJIB	IJZAOPEN	EL
GO	IJZAOPUT	EM
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H31LPMSG	IJZADO31	AJ
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LDTIME	IJZAEXIO	EJ
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LPHEAD	IJZADPRT	EG
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LYYCNV4	IJZADO65	CL
LYYCONVT	IJZADO65	CL
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L60NOERR	IJZADO60	CE
L60NRFNM	IJZADO60	CE
L62CTCBA	IJZADO62	CG
L62EVLO	IJZADO62	CG
L62PCAW	IJZADO62	CG
L62PCC	IJZADO62	CG
L62PRNT	IJZADO62	CG
L62PRT	IJZADO62	CG
L62RCCOK	IJZADO62	CG
L62RCOC	IJZADO62	CG
L62RET	IJZADO62	CG

L62RTOC	IJZADO62	CG
L70ALTPR	IJZADO70	CM
L70CONT1	IJZADO70	CM
L70PRINT	IJZADO70	CM
L78CABTM	IJZADO78	CT
L78DEVDN	IJZADO78	CT
L78ERMSG	IJZADO78	CT
L78ER1	IJZADO78	CT
L78EXIT	IJZADO78	CT
L78LOOP	IJZADO78	CT
L78NWAIT	IJZADO78	CT
MOVE	IJZAEXIO	EJ
MOVEC	IJZACMNT	EC
M24CHKIT	IJZADO24	BJ
M24MTNSG	IJZADO24	BJ
M37LOOPX	IJZADO37	BR
NDRUTINE	IJZAOPEN	EL
NOINT	IJZAWAIT	ER
NONXTENT	IJZAOPEN	EL
NORML	IJZADO02	AU
NXCCW	IJZAEXIO	EJ
N31VALAD	IJZADO31	AH
N31VLRNG	IJZADO31	AJ
N32CLURN	IJZADO32	AL
N32CLURT	IJZADO32	AL
N32DX2TB	IJZADO32	AL
N32TMPLD	IJZADO32	AL
N32TRCOM	IJZADO32	AL
N32UMTST	IJZADO32	AM
N32XTNUM	IJZADO32	AM
ONCEMORE	IJZADO02	AU
OUTPUTEX	IJZAOPUT	EM
PABCOMP	IJZADOAB	DB
PABGOOD	IJZADOAB	DB
PABRET	IJZADOAB	DB
PABTIME	IJZADOAB	DB
PHDA	IJZAHEAD	EK
PHDC	IJZAHEAD	EK
PHDD	IJZAHEAD	EK
PHD13	IJZAHEAD	EK
PRINT	IJZADPRT	EG
PRJA	IJZADPRT	EG
PRJB	IJZADPRT	EG
PRJOIN	IJZAHEAD	EK
PRSA	IJZARSLT	EP
PRSB	IJZARSLT	EP
PRSC	IJZARSLT	EP
PRSE1	IJZARSLT	EP
PRSE2	IJZARSLT	EP
PRSG	IJZARSLT	EP
PRSG1	IJZARSLT	EP
PRSL	IJZARSLT	EP
PRSM	IJZARSLT	EP
PRSN	IJZARSLT	EP
PRSR	IJZARSLT	EP
PRSX	IJZARSLT	EP
PRSZ	IJZARSLT	EP
PRTMSG	IJZAEXIO	EJ
PRTOFF	IJZAOPEN	EL
PUBEND	IJZACKTP	EB
PUBEND1	IJZACKTP	EB
PUT21LL	IJZAOPEN	EL
PUT21UL	IJZAOPEN	EL
P31TNTAB	IJZADO31	AM
P32T256H	IJZADO32	AK
P32VLTST	IJZADO32	AK
P71DVCOM	IJZADO71	CN
RDATA1	IJZARATA	EN
RDATA2	IJZARATA	EN
RDATA3	IJZARATA	EN
RDATA4	IJZARATA	EN
REPLYNO	IJZADO02	AU
RLSYS	IJZATIME	EQ
RSTREGS	IJZATIME	EQ
RSTRGS	IJZAEXIO	EJ
R10GD1	IJZADO10	BD
R10RETN	IJZADO10	BD
R10WAIT	IJZADO10	BD
R10WRIT	IJZADO10	BD
R10WRITE	IJZADO10	BD
R24EADD	IJZADO24	BJ
R24ETRN	IJZADO24	BJ
R24KCARD	IJZADO24	BJ
R31SETSW	IJZADO31	AH
R32ALDEC	IJZADO32	AM
R32DECOD	IJZADO32	AM
R32ETRN0	IJZADO32	AM
R32ETRN1	IJZADO32	AK
R32SETSW	IJZADO32	AK
R32TURN1	IJZADO32	AL
R33ETRN	IJZADO33	AN
SETAPLVL	IJZADPRT	EG
SETCATS	IJZADPRT	EF
SETFE2	IJZADPRT	EF
SETM1	IJZACKTP	EB
SETM2	IJZACKTP	EB
SETM3	IJZACKTP	EB
SETM4	IJZACKTP	EB
SETM5	IJZACKTP	EB
SETPFLG	IJZACKTP	EB
SKIP01	IJZAOPEN	EL
SKIP02	IJZAOPEN	EL
SKIP03	IJZAOPEN	EL
SKIP05	IJZAOPEN	EL
STRSLTS	IJZATIME	EQ
S00ASTK	IJZADO00	AR1
S00BAD	IJZADO00	AQ
S00BAD1	IJZADO00	AQ
S00CCB2	IJZADO00	AR
S00CECM2	IJZADO00	AR
S00CECOM	IJZADO00	AR
S00CHKBT	IJZADO00	AQ
S00CHKCP	IJZADO00	AR1
S00CHKLP	IJZADO00	AP
S00CHKOL	IJZADO00	AP
S00CHKRT	IJZADO00	AR
S00CHK1	IJZADO00	AR
S00CHK2	IJZADO00	AR1
S00CLTST	IJZADO00	AR

S00CMINT	IJZADO00	AP
S00CNVT	IJZADO00	AR
S00COMM	IJZADO00	AQ
S00CPCHK	IJZADO00	AR
S00CSIZE	IJZADO00	AQ
S00DEVOK	IJZADO00	AQ
S00DEVUP	IJZADO00	AP
S00DONE	IJZADO00	AQ
S00DPROT	IJZADO00	AP
S00DTERM	IJZADO00	AR
S00END	IJZADO00	AR1
S00ERRCT	IJZADO00	AR
S00FINL	IJZADO00	AQ
S00FIRST	IJZADO00	AP
S00FLSK	IJZADO00	AP
S00FPOLD	IJZADO00	AQ
S00FP1	IJZADO00	AQ
S00FP2	IJZADO00	AP
S00LDPTR	IJZADO00	AP
S00LDRTN	IJZADO00	AQ
S00LOAD	IJZADO00	AP
S00MSG4	IJZADO00	AR1
S00MVCDS	IJZADO00	AP
S00NOAST	IJZADO00	AR1
S00NOCCB	IJZADO00	AR
S00NXNEW	IJZADO00	AQ
S00NXTST	IJZADO00	AQ
S00OLD	IJZADO00	AP
S00PRIM	IJZADO00	AQ
S00STCH	IJZADO00	AR1
S00STPTR	IJZADO00	AR
S00TSTIN	IJZADO00	AP
S00TSTND	IJZADO00	AP
S00UPDT	IJZADO00	AP
S11BIT	IJZADO11	AZ
S11CKCHN	IJZADO11	AZ1
S11CKERR	IJZADO11	AZ1
S11CKO1	IJZADO11	AY
S11CKO2	IJZADO11	AY
S11CKO3	IJZADO11	AY
S11CKO4	IJZADO11	AY
S11COUNT	IJZADO11	AZ1
S11CSYMB	IJZADO11	AY
S11DIAL	IJZADO11	AZ
S11DIALQ	IJZADO11	AZ1
S11ENBLE	IJZADO11	AZ
S11EROUT	IJZADO11	AZ
S11EXGOD	IJZADO11	AZ1
S11EXGO2	IJZADO11	AZ1
S11GO	IJZADO11	AZ
S11GOOD	IJZADO11	AZ
S11GOON	IJZADO11	AY
S11HDRM	IJZADO11	AY
S11MSG2	IJZADO11	AZ1
S11NOHD	IJZADO11	AZ
S11NONE	IJZADO11	AY
S11NOPER	IJZADO11	AZ
S11NOSNS	IJZADO11	AZ
S11NOTEL	IJZADO11	AZ
S11OK	IJZADO11	AY
S11RETRY	IJZADO11	AZ
S11RET14	IJZADO11	AY
S11TEST	IJZADO11	AZ
S11TIMEO	IJZADO11	AZ1
S20COMP	IJZADOAC	DC
S20FOUND	IJZADOAC	DC
S20GO	IJZADOAC	DC
S20LEVOK	IJZADOAC	DC
S20RCFR	IJZADOAC	DC
S20RTURN	IJZADOAC	DC
S21BACK	IJZADO21	BG
S21CHK	IJZADO21	BF
S21CLASS	IJZADO21	BG
S21CMP	IJZADO21	BF
S21CONT	IJZADO21	BF
S21END	IJZADO21	BF
S21ETABL	IJZADO21	BF
S21FRTNG	IJZADO21	BF
S21FSRCH	IJZADO21	BF
S21FTEST	IJZADO21	CM
S21FXCH	IJZADO21	BG
S21FXCU	IJZADO21	BG
S21FXDCU	IJZADO21	BG
S21FXDDV	IJZADO21	BG
S21FXDV	IJZADO21	BG
S21GOAD	IJZADO21	CL
S21GRAB	IJZADO21	BG
S21LEV2	IJZADO21	BF
S21RETCH	IJZADO21	BF
S21TYPE	IJZADO21	BG
S22ALOCR	IJZADO22	BH
S22ALOCT	IJZADO22	BH
S22ASK	IJZADO22	BH
S22CMP	IJZADO22	BH
S22COMPR	IJZADO22	BH
S22FND	IJZADO22	BH
S22GOAHD	IJZADO22	BH
S22OK	IJZADO22	BH
S22PRIM	IJZADO22	BH
S22PROC	IJZADO22	BH
S22QNO	IJZADO22	BH
S22RCTEN	IJZADO22	BH
S22ZOROR	IJZADO22	BH
S31CAN	IJZADO31	AH
S31CAN02	IJZADO31	AJ
S31CAN05	IJZADO31	AH
S31CAN06	IJZADO31	AH
S31CONTX	IJZADO31	AJ
S31DCS	IJZADO31	AH
S31FND	IJZADO31	AJ
S31INCR	IJZADO31	AJ1
S31NOTAS	IJZADO31	AJ1
S31NOTAS	IJZADO24	BJ
S31SHAR	IJZADO31	AJ1
S31TESTL	IJZADO31	AJ1
S32CLSTN	IJZADO32	AM
S32ETUP	IJZADO32	AK
S32ETUP1	IJZADO32	AL

S32TFLG	IJZADO32	AM
S32W2RTN	IJZADO32	AM
S35CCB2	IJZADO35	BN
S35CHECK	IJZADO35	BN
S35CKNXT	IJZADO35	BN
S35CLEAR	IJZADO35	BN
S35CONN	IJZADO35	BN
S35CONT	IJZADO35	BN
S35DEV	IJZADO35	BN
S35FND	IJZADO35	BN
S35GOON	IJZADO35	BN
S35NOATN	IJZADO35	BN2
S35NOBUS	IJZADO35	BN2
S35PRGE	IJZADO35	BN
S35RET8	IJZADO35	BN
S35REXIO	IJZADO35	BN2
S35RTEN	IJZADO35	BN2
S35SCAN	IJZADO35	BN1
S36BCTLP	IJZADO36	BP
S36CHAR	IJZADO36	BP
S36CKDE	IJZADO36	BP1
S36CKNXT	IJZADO36	BP1
S36CKTME	IJZADO36	BP
S36CKWT	IJZADO36	BP1
S36CLNI	IJZADO36	BP1
S36COUNT	IJZADO36	BP2
S36END	IJZADO36	BP1
S36EX02	IJZADO36	BP
S36FINAL	IJZADO36	BP2
S36GOBCK	IJZADO36	BP2
S36GOON	IJZADO36	BP
S36INTCN	IJZADO36	BP1
S36IOTME	IJZADO36	BP1
S36PROC	IJZADO36	BP
S36PURGE	IJZADO36	BP1
S36RCZER	IJZADO36	BP1
S36SETRT	IJZADO36	BP
S36SPEC	IJZADO36	BP
S36TEST	IJZADO36	BP2
S36TIME	IJZADO36	BP1
S36UNAD	IJZADO36	BP
S36USEIT	IJZADO36	BP2
S36XTEST	IJZADO36	BP2
S38COMPL	IJZADO36	BP
S38DFLT	IJZADO36	BP
S38EARCH	IJZADO36	BP
S38FOUND	IJZADO36	BP
S38LEVOK	IJZADO36	BP
S38LOOP	IJZADO36	BP
S38QPOLL	IJZADO36	BP
S38RC12	IJZADO36	BP
S38RTURN	IJZADO36	BP
S38STIME	IJZADO36	BP
S38WAIT	IJZADO36	BP
S40BACK	IJZADO40	BT
S40FG1	IJZADO40	BT
S40FG2	IJZADO40	BT
S40GOBYR	IJZADO40	BT
S40ISONE	IJZADO40	BT
S40ISTPA	IJZADO40	BT
S40NOQUI	IJZADO40	BT
S40QMODE	IJZADO40	BT
S40RTNBY	IJZADO40	BT
S44AGAIN	IJZADO44	CB
S44AGN2	IJZADO44	CB
S44AGN3	IJZADO44	CB
S44CKCC1	IJZADO44	CC
S44CKF1	IJZADO44	CB
S44CKF2	IJZADO44	CB
S44CKM	IJZADO44	CC
S44CKMOD	IJZADO44	CC
S44CNFRM	IJZADO44	CB
S44COMP	IJZADO44	CB
S44ENTQU	IJZADO44	CC
S44EXTIO	IJZADO44	CB
S44FND	IJZADO44	CB
S44ISHIO	IJZADO44	CB
S44OK	IJZADO44	CB
S44POST	IJZADO44	CC
S44POSTC	IJZADO44	CB
S44RCO	IJZADO44	CC
S44RC01	IJZADO44	CC
S44RET4	IJZADO44	CB
S44SDT	IJZADO44	CC
S44SECON	IJZADO44	CB
S44SNS	IJZADO44	CC
S44QSOKR	IJZADO44	CC
S98CKDE	IJZADO98	CZ
S98CONE	IJZADO98	CX
S98ENDTT	IJZADO98	CX
S98FFEVT	IJZADO98	CY
S98FILIN	IJZADO98	CZ
S98FLDA	IJZADO98	CY
S98FRET	IJZADO98	CZ
S98FULL	IJZADO98	CY
S98FULL2	IJZADO98	CY
S98INTH	IJZADO98	CX
S98INTS	IJZADO98	CY
S98IORET	IJZADO98	CX
S98LOOP	IJZADO98	CZ
S98NGOOD	IJZADO98	CZ
S98OKERR	IJZADO98	CZ
S98ONEH	IJZADO98	CY
S98OTHER	IJZADO98	CX
S98PROC	IJZADO98	CX
S98RETN	IJZADO98	CX
S98SECOK	IJZADO98	CZ
S98SNFL	IJZADO98	CY
S98TEST	IJZADO98	CX
S98TIO	IJZADO98	CZ
TDDEVCH	IJZACKTP	EB
TESTPTR	IJZAOPEN	EL
TSTFPM	IJZAEXIO	EJ
TSTIME	IJZACKTP	EB
T32LSHCK	IJZADO32	AK
T32NPR	IJZADO32	AK
T32PNR	IJZADO32	AK
T32RNS	IJZADO32	AM
T32SECT	IJZADO32	AK

T32STEST	IJZADO32	AK
U10CONT	IJZADO10	BD
U10CONT1	IJZADO10	BD
U10ERETN	IJZADO10	BD
U10L1	IJZADO10	BD
U10L2	IJZADO10	BD
U10READ	IJZADO10	BD
U10RETN	IJZADO10	BD
U10WAIT	IJZADO10	BD
WAIT	IJZAWAIT	ER
WAITCCB	IJZAWAIT	ER

For complete message and response, refer to the DOS OLTEP publication listed in the Preface.

Message Number	Message	Issuing Routine	Chart ID
E024I	NO JIB AVAILABLE	IJZAD056	AS
E030I	DEVICE UNSUPPORTED	IJZAD085	CV
E100I	'OLT CECOM'	OLT	BS
04E101D	(request from the OLT)	OLT	
E102I	OLTS RUNNING	IJZADOLT	AA
01E105D	ENTER DEV/TEST/OPT	IJZAD052	AE
E106I	INPUT DATA DOES NOT CONTAIN THREE SLASHES	IJZAD052	AF
E107I	OPTIONS ARE XXX, XXX	IJZAD033	AN
E108I	INVALID ENTRY IN DEV FIELD-XX	IJZAD052	AF
E108I	INVALID ENTRY IN DEV FIELD-XX	IJZAD031	AH
E110I	TESTABLE DEVICES MAY NOT EXCEED 16	IJZAD031	AJ
E111I	NO DEVICES AVAILABLE FOR TEST	IJZAD031	AH
E112I	INVALID ENTRY IN TEST FIELD-XX	IJZAD052	AF
E112I	INVALID ENTRY IN TEST FIELD-XX	IJZAD032	AK
E115I	INVALID ENTRY IN OPT FIELD-XXX	IJZAD033	AN
E117I	SECTION XXXXXXXX NOT FOUND	IJZAD000	AP
E118I	UNREADABLE TAPE LABEL	IJZAD003	AV
E119I	NON-STANDARD TAPE LABEL	IJZAD003	AV
04E120D	CAN VOL DATA BE DESTROYED	IJZAD022	BH
E122I	VOL CANNOT BE USED AS SCRATCH-SECURITY PROTECTED	IJZAD003	AW
E122I	VOL CANNOT BE USED AS SCRATCH-SECURITY PROTECTED	IJZAD007	AX
E123I	VOL CANNOT BE USED AS SCRATCH-UNEXPIRED DATE	IJZAD003	AW
E124I	CE VOL IS NOT ON UNIT XXXX	IJZAD007	AX
E125I	UNREADABLE LABEL ON -- XXXX	IJZAD007	AX
E126I	SENSE TO BIN 0 OF XXXX DOES NOT INDICATE CE VOL MOUNTED	IJZAD002	AU

E127I	NO CDS FOR XXXXXXXX	IJZADO00	AP
E127I	NO CDS FOR XXXXXXXX	IJZADO31	AJ1
E129I	FIRST ERROR COMMUNICATION	IJZADO39	BS
E129I	FIRST ERROR COMMUNICATION	IJZADRPT	EH
E130I	INTERVENTION REQUIRED XXXX	IJZADO56	AT
E130I	INTERVENTION REQUIRED XXXX	IJZADO02	AU
E131I	SENSE TO XXXX FAILED	IJZADO02	AU
E132I	CE BIT WILL NOT RESET	IJZADO02	AU
E133I	TIMER NOT STEPPING. TIMING TEST BYPASSED	IJZACKTP	EB
04E135D	ARE TIME DEPENDENT DEVICES ACTIVE?	IJZACKTP	EB
E136I	TIMING TEST BYPASSED	IJZACKTP	EB
E137I	SNS-XX...X CSW-ZZ...Z	IJZADO56	AT
E137I	SNS-XX...X CSW-ZZ...Z	IJZADO02	AU
E137I	SNS-XX...X CSW-ZZ...Z	IJZADO07	AX
E137I	SNS-XX...X CSW-ZZ...Z	IJZADO57	AG
E137I	SNS-XX...X CSW-ZZ...Z	IJZADO78	CT
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO56	AT
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO02	AU
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO03	AV
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO03	AW
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO07	AX
04E139D	REPLY B TO BYPASS, R TO RETRY, P TO PROCEED	IJZADO57	AG
04E140D	IS CE VOL IN BIN 0 OF XXXX. REPLY, YES OR NO	IJZADO02	AU
E147I	ILLUSTRATIVE EXAMPLES-DEV	IJZADO71	CN
E148I	ILLUSTRATIVE EXAMPLES-TEST	IJZADO72	CP
E149I	TABLE OF OPTIONS	IJZADO73	CQ
02E154D	(request from the OLT)	OLT	
E155I	TEST SECTIONS MAY NOT EXCEED 26	IJZADO32	AK
E157I	CATASTROPHIC ERROR ON DEVICE XXXX DDDDDDDD	IJZADPRT	EH
E157I	CATASTROPHIC ERROR ON DEVICE XXXX DDDDDDDD	IJZADO39	BS
E158I	S(T) XXXXXX ($) UNIT YYYY DDDDDDDD	IJZADO00	AR
E158I	S(T) XXXXXX UNIT YYYY	IJZADO00	AQ
E161I	FOR HELP, ENTER PROMPT XXX	IJZADO31	AH
E161I	FOR HELP, ENTER PROMPT XXX	IJZADO32	AK

E161I	FOR HELP, ENTER PROMPT XXX	IJZADO33	AN
E161I	FOR HELP, ENTER PROMPT XXX	IJZADO52	AF
E163I	* RETAIN/370 READY	IJZADO76	CR
E163I	* RETAIN/370 READY	IJZADO77	CS
E164I	UNABLE TO ESTABLISH CONTACT WITH RETAIN/370 CENTER	IJZADO76	CR
E164I	UNABLE TO ESTABLISH CONTACT WITH RETAIN/370 CENTER	IJZADO77	CS
E165I	ENTRY IN DEVICE FIELD NOT ALLOWABLE	IJZADO31	AH
E166I	OLT DOES NOT SUPPORT TALK	IJZADO52	AF
E167I	PERMANENT ERROR ON REI DEVICE	IJZADO10	BA
E167I	PERMANENT ERROR ON REI DEVICE	IJZADO78	CT
E169I	* RETAIN/370 TERMINATED	IJZADO78	CT
E174I	UNABLE TO RESTORE LABEL ON DEVICE XXXX	IJZADO57	AG
E175I	SYNTAX ERROR	IJZADO37	BR
E176I	MUTUALLY EXCLUSIVE OPTIONS HAVE BEEN SELECTED	IJZADO33	AN
E198I	NOT ALL ROUTINES SELECTED WERE RUN	IJZADO00	AR
04E199D	INCORRECT REPLY	IJZADO02	AU
04E199D	INCORRECT REPLY	IJZADO03	AW
04E199D	INCORRECT REPLY	IJZADO03	AV
04E199D	INCORRECT REPLY	IJZADO56	AT
04E199D	INCORRECT REPLY	IJZADO07	AX
04E199D	INCORRECT REPLY	IJZADO22	BH
04E199D	INCORRECT REPLY	IJZADO52	AF
04E199D	INCORRECT REPLY	IJZADO24	BJ
04E199D	INCORRECT REPLY	IJZADO26	BL
04E199D	INCORRECT REPLY	IJZADO44	CB
04E199D	INCORRECT REPLY	IJZADO57	AG
04E199D	INCORRECT REPLY	IJZADO40	BT
E201I	DEV DESCRIPTORS DO NOT MEET REQUIREMENTS	IJZADO00	AQ
E210I	ROUTINE XXX BYPASSED	IJZADO47	CD
04E221D	CAN FOREGROUND BE QUIESCED?	IJZADO40	BT
04E221D	CAN FOREGROUND BE QUIESCED?	IJZADO44	CC
E222I	STOP FOREGROUND JOBS	IJZADO40	BT
E222I	STOP FOREGROUND JOBS	IJZADO44	CB
E225I	XX..X BYPASSED-CONSOLE KEYBOARD NOT AVAILABLE	IJZADO00	AR

E226I	OLTEP TERMINATED	IJZADO52	AE
04E227D	ENTER 1 BYTE TERM CONTROL TYPE CODE	IJZADO85	CU
04E228D	IS HISTORY TAPE MOUNTED?	IJZADO26	BL
E229I	SECTION XX..X RTN YY..Y BYPASSED	IJZADO40	BT
04E230D	MOUNT VOL XX..X	IJZADO24	BJ
E231I	XX..X CANNOT RUN ON YYYY	IJZADO00	AQ
E231I	XX..X CANNOT RUN ON YYYY	IJZADO40	BT
E232I	OLTEP CANCELLED	IJZADOLT	AA
E233I	DO NOT INITIATE ANY FOREGROUND JOBS	IJZADO40	BT
E234I	DEVICE XXXX NOT TESTED. NO LOGICAL UNIT ASSIGNMENT	IJZADO31	AJ1
E235I	INVALID TAPE MOUNTED ON DEV XXXX	IJZADO26	BL
E235I	INVALID TAPE MOUNTED ON DEV XXXX	IJZADO00	AP
E236I	XXXX IS A TEST DEVICE	IJZADO24	BJ
E236I	XXXX IS A TEST DEVICE	IJZADO26	BL
E237I	DEVICE HAS NO LOGICAL UNIT ASSIGNMENT	IJZADO24	BJ
E237I	DEVICE HAS NO LOGICAL UNIT ASSIGNMENT	IJZADO26	BL
E238I	XXXX BYPASSED-CORE NOT AVAILABLE	IJZADO00	AQ
E239I	XXXX BYPASSED-KEYBOARD NOT AVAILABLE	IJZADO00	AR
E240I	CPU CDS NOT AVAILABLE	IJZADOLT	AB
E241I	LOST DATA - RE-ENTER MESSAGE	IJZADO10	BA
E242I	PROMPT NOT ALLOWED FROM REMOTE	IJZADO52	AE
E250I	WHEN CARD INPUT IS USED, SELECTIONS ARE PRINTED ON SYSLST AND SYSLOG	IJZADOLT	AA
E313I	UNIT TEST CANCELED	IJZAEXIO	EJ
E317I	CHAN 0 REQUEST INVALID	IJZACKTP	EB
E400I	TP LINE CONNECTION, LINE=XXXX TERMINAL=XXXXXXXX	IJZADO11	AY, AZ, AZ1
E401I	REQUIRED DATA NOT FOUND IN CDS FOR XXXXXXXX	IJZADO11	AY, AZ
E402I	SYMBOLIC NAME FIELD NOT PRESENT IN CDS	IJZADO11	AY
E403I	INVALID LINE CONN COMMAND SEQUENCE IN CDS	IJZADO11	AY
E404I	DIAL DIGIT COUNT EXCEEDS 20	IJZADO11	AY
E405I	OPERATOR CALL REQUIRED, TELEPHONE NUMBER NOT PROVIDED IN CDS	IJZADO11	AZ
E406I	OPERATOR CALL TERMINAL ON NUMBER XYZ	IJZADO11	AZ
E407I	OPERATOR CALL NOT COMPLETED WITHIN TIME LIMITS	IJZADO11	AZ
E408I	SIO RETURNED A CC=3, NOT OPERATIONAL	IJZADO11	AZ1

E409I	SIO FINAL STATUS ERROR CSW=XXXXXXXXXXXXXXXX SNS=YYYY	IJZADO11	AZ
E410I	FINAL STATUS NOT RECEIVED FROM I/O OPERATION	IJZADO11	AZ
E412I	CCW CHAIN TERMINATED ON XXXXXXXXXXXXXXXX	IJZADO11	AZ
E413I	REQUIRED CDS POINTER NOT PRESENT	IJZADO11	AY
E414I	OLTEP WILL DISABLE ALL ENABLED TP LINES	IJZADO57	AG

APPENDIX C: (DELETED)

Appendix C is deleted in this edition.

SECTION PREFACE

Label	No. of Bytes	Definitions
SVAREA	18 Full-words	Save Area

Additional save areas (optional) would follow SVAREA in displacements of 18 full-words.

Label	No. of Bytes	Definitions
RTN#	1	Active Routine Number
#MODEL	1	Model Needed
#FEAT	1	Feature Needed
#CLASS	1	Class Needed
#TYPE	1	Type Needed
#CMODEL	1	Model - Must Not Have
#CFEAT	1	Feature - Must Not Have
#CCLASS	1	Class - Must Not Have
#CTYPE	1	Type - Must Not Have
RM	2	Mask for Routines 1-16
	1	Reserved
PLINK	4	PLINK Management
	1	Reserved
REFNUM	1	Reference Number
#COUNT	2	Loop on Error Default
RTSIZE	4	Root and PLINK Module Size
MOSIZE	4	MORECORE Requirement Size
DCHB	4	Length/Displacement to DCHB(TOTE)
ECA	3	FE Change Announcement Letter
RME	0(EQU*)	Extended Routine Mask

SECTION DESCRIPTORS

The first 16 bytes of information preceding every program are Section Descriptors. The labels for this information vary depending upon whether or not the short or long form of initialize is used. The following expansion is used in the long form.

Label	No. of Bytes	Definition
SECTID	8	Section ID
LEVEL	2	Level
RTNDISP	2	Displacement to RTN#
INST	4	Pointer to first Executable instruction.

The following expansion is used in the short form.

Label	No. of Bytes	Definition
SECTIDSH	8	Section ID
LEVELSH	2	Level
PLKDISP	2	Displacement to PLINK Management
INSTSH	4	Pointer to first Executable Instruction

Core Image Phase Name	Relocatable Module Name	Card ID
$$BOLTEP	IJZAOLTP*	DN1.054.00
$$BSOPEN	IJZAOPEN*	DN1.055.00
$$BTOLTP	IJZATOLT*	DN1.059.50
$$BZTIME	IJZATIME*	DN1.059.00
IJZACEOM	IJZACEOM*	DN1.001.00
IJZACKTP	IJZACKTP*	DN1.002.00
IJZACMNT	IJZACMNT*	DN1.003.00
IJZACOMP	IJZACOMP*	DN1.004.00
IJZACONV	IJZACONV*	DN1.005.00
IJZADOAA	IJZADOAA*	DN1.007.00
IJZADOAB	IJZADOAB*	DN1.008.00
IJZADOAC	IJZADOAC*	DN1.009.00
IJZADOLT	IJZADOLT*	DN1.010.00
IJZADPRT	IJZADPRT*	DN1.051.00
IJZAEXIO	IJZAEXIO*	DN1.052.00
IJZAHEAD	IJZAHEAD*	DN1.053.00
IJZAOPUT	IJZAOPUT*	DN1.056.00
IJZARATA	IJZARATA*	DN1.057.00
IJZARSLT	IJZARSLT*	DN1.058.00
IJZAWAIT	IJZAWAIT*	DN1.060.00
IJZADO00	IJZADO00*	DN1.011.00
IJZADO01	IJZADO01*	DN1.012.00
IJZADO02	IJZADO02*	DN1.013.00
IJZADO03	IJZADO03*	DN1.014.00
IJZADO07	IJZADO07*	DN1.015.00
IJZADO10	IJZADO10*	DN1.015.50
IJZADO11	IJZADO11*	DN1.015.51
IJZADO16	IJZADO16*	DN1.016.00
IJZADO21	IJZADO21*	DN1.017.00
IJZADO22	IJZADO22*	DN1.018.00
IJZADO24	IJZADO24*	DN1.019.00
IJZADO26	IJZADO26*	DN1.020.00
IJZADO28	IJZADO28*	DN1.021.00
IJZADO31	IJZADO31*	DN1.022.00
IJZADO32	IJZADO32*	DN1.023.00
IJZADO33	IJZADO33*	DN1.024.00
IJZADO35	IJZADO35*	DN1.025.00
IJZADO36	IJZADO36*	DN1.026.00
IJZADO37	IJZADO37*	DN1.027.00
IJZADO39	IJZADO39*	DN1.028.00
IJZADO40	IJZADO40*	DN1.029.00
IJZADO41	IJZADO41*	DN1.030.00
IJZADO42	IJZADO42*	DN1.031.00
IJZADO43	IJZADO43*	DN1.032.00
IJZADO44	IJZADO44*	DN1.033.00
IJZADO47	IJZADO47*	DN1.034.00
IJZADO52	IJZADO52*	DN1.035.00
IJZADO56	IJZADO56*	DN1.036.00
IJZADO57	IJZADO57*	DN1.037.00
IJZADO60	IJZADO60*	DN1.038.00
IJZADO61	IJZADO61*	DN1.039.00
IJZADO62	IJZADO62*	DN1.040.00
IJZADO63	IJZADO63*	DN1.041.00
IJZADO64	IJZADO64*	DN1.042.00
IJZADO65	IJZADO65*	DN1.043.00
IJZADO70	IJZADO70*	DN1.044.00
IJZADO71	IJZADO71*	DN1.045.00
IJZADO72	IJZADO72*	DN1.046.00
IJZADO73	IJZADO73*	DN1.047.00
IJZADO76	IJZADO76*	DN1.047.50
IJZADO77	IJZADO77*	DN1.047.60
IJZADO78	IJZADO78*	DN1.047.70
IJZADO85	IJZADO85*	DN1.048.00
IJZADO94	IJZADO94*	DN1.049.00
IJZADO98	IJZADO98*	DN1.050.00
IJZADO99	IJZADO99*	DN1.050.01

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*Microfiche Label

For a more complete list of data processing terms, refer to the IBM Data Processing Techniques, A Data Processing Glossary, GC20-1699.

ASCII (American National Standard Code for Information Interchange): A 128-character, 7-bit code. The high-order bit in the System/360 8-bit environment is zero.

CE cell: A data cell used to test an IBM 2321. A CE cell is recognized by a sense to bin 0, subcell 19. If the CE sense bit is on, the CE cell is mounted.

CE pack: A disk pack used to test an IBM 2311 or 2314. It has a volume label of VOL1CEPACK.

CE volume: If the device is an IBM 2311 or 2314, see CE pack. If the device is an IBM 2321, see CE cell.

communications interval: A period of communication between the console operator and OLTEP. The operator is requested by OLTEP to enter the test-run definition at this time.

data protection: A safeguard invoked to prevent the loss or destruction of customer data.

data security: A safeguard invoked to prevent the accessing of customer data.

default value: A predetermined value used in place of an omitted entry.

expiration date: A date within a tape label for Data protection. The tape may not be used as a scratch tape until this date has expired.

File Protect Mode (FPM): A mode of operation that insures maximum protection and security of customer data. While in file protect mode, the system performs no write operations, and reads no customer data.

On-Line Test (OLT): A test program of the on-line test system. The tests reside in the core image library, and are brought into core storage by OLTEP when requested by the operator.

On-Line Test Executive Program (OLTEP): The control program of the on-line test system. OLTEP is the interface between the on-line test and the operating system.

on-line test system: A control program, OLTEP, and a series of tests (OLTs) designed to test I/O devices without interrupting normal system processing.

privileged instruction: An instruction that can be executed only while the CPU is in the supervisor state. Protection, I/O, direct control, and any instructions that manipulate the program status words are privileged.

prompting: A request for help made by the operator when entering the test-run definition. OLTEP prints examples of the field requested by the operator.

Quiesce Mode: A mode of operation that requires the foreground partitions to be stopped by the operator. The operator does this on the console by issuing the PAUSE EOJ and STOP commands when requested by OLTEP.

supervisor state: The state of CPU operation that allows execution of privileged instructions. When bit 15 of the PSW is zero, the CPU is in the supervisor state.

test-run definition: Information requested by OLTEP at the various communications intervals. This information consists of the device to be tested, the test or test routines to be executed, and the options to be exercised.

Indexes to systems reference library manuals are consolidated in the publication DOS Master Index, GC24-5063. For additional information about any subject listed below, refer to other publications for the same subject in the Master Index.

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