

OFFICE MAINTENANCE
DESCRIPTION
NO. 3 ELECTRONIC SWITCHING SYSTEM

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MAINTENANCE PROGRAMS	3	1.01 This section describes the office maintenance system in a No. 3 Electronic Switching System (ESS) office. It is intended to familiarize the reader with the maintenance documentation, trouble detection means, system reaction, recovery, and facilities available to the craft for maintenance or repair actions.	
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NOTICE

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1.03 In a No. 3 ESS office, maintenance procedures are initiated:

- In response to system-detected troubles
- In response to trouble reports (customer-detected troubles)
- To perform manual test routines
- To perform scheduled (periodic) testing.

1.04 The teletypewriters (TTYs) referred to in this section are the maintenance TTY in the local office and the remote TTY at the switching control center (SCC). The remote TTY provides the same TTY functions at the remote locations as provided by the local TTY.

2. NO. 3 ESS MAINTENANCE DOCUMENTATION

2.01 Numerous documents, providing specific maintenance information on all system units, are available in a No. 3 ESS office. A description of some of these documents follows.

INPUT MESSAGE MANUAL

2.02 The input message manual (IM) lists TTY message codes that can be typed on the maintenance TTY to request a system action or function. A description of the format and the use of each message, as well as cautions and expected results, is given for each message. The messages are arranged in alphanumeric order, and a topical index aids in finding the specific message to be used. The IM is used by maintenance personnel to input data to the system and request special reports on some conditions.

OUTPUT MESSAGE MANUAL

2.03 The output message manual (OM) is a listing in alphanumeric order of output codes automatically produced by the system or as a consequence of some action initiated manually via TTY input. The OM contains a description of each message, its purpose, its significance, and recommended actions to be taken if any. The OM is used by maintenance personnel to translate the output messages on the maintenance TTY which may consist of alarm status conditions, trouble indications, result of trouble diagnostics, and replies to interrogation requests.

TROUBLE LOCATING MANUAL

2.04 The trouble locating manual (TLM) supplements the OM by aiding in the location of troubles within system units. The TLM is basically used with a diagnostic program to identify faulty circuit packs associated with particular failures. The maintenance TTY prints out a number which, when referenced in the TLM, indicates in order of probability a list of possible faulty circuit packs.

TASK ORIENTED PRACTICES

2.05 Task oriented practices (TOP) are self-contained packages of maintenance task which support the following activities for the No. 3 ESS office: routine maintenance, acceptance testing, company order work, and trouble clearing. The data in TOP is organized to direct the user to a successful completion of a task or job from beginning to end. Each task is identified through task analysis and defined from the perspective of the task rather than hardware boundaries.

SOFTWARE SUBSYSTEM DESCRIPTIONS

2.06 Software subsystem descriptions (SSDs) provide an overall explanation of functional program areas and serve as an aid in accessing the program listing. SSDs also provide for a coverage of the software area to go along with the hardware. Similar to TOP, SSDs are not confined to specific program boundaries or internal interfaces. The SSDs explain how a specific function is performed, referencing all necessary parts of No. 3 ESS software (subroutines, programs, tables, etc) for the function. In referencing all applicable software components of a function, the links to more detailed program listings can be established. Some SSDs describe or contain information concerning instruction set use, microcode program listing format, and other support information.

DESCRIPTION AND THEORY OF OPERATION

2.07 Bell System Practices (BSPs) are technical manuals for the Bell System Operating Companies. Descriptive and theory of operation BSPs provide descriptions, installation data, operating instructions, theory, and maintenance information pertinent to the equipment covered.

SUPPLEMENTARY PROGRAM DOCUMENTS

A. Program Map (Memory Map-PK)

2.08 The program map is a list of all programs in the system together with their starting and ending memory address.

B. Program Listing

2.09 A program listing (PR) provides the coding for operation, maintenance, administrative software, or component modules. The listing has a prologue (text) which indicates the functions or portions of functions that are performed by the program. Also, each program entry and exit point will be identified. Each line of the code may have a brief explanatory comment text statement.

2.10 The program listing in conjunction with the software BSPs provide a complete program documentation package.

3. MAINTENANCE PLAN

INTRODUCTION (PHILOSOPHY)

3.01 Maintenance routines for the No. 3 ESS office are designed to ensure continuity of service (Fig. 1). Redundant call processing equipment is provided. System control is the combination of the control units, frame input/output controllers, network controllers, scanner controllers, peripheral pulse distributors (which together provide complete control of the periphery and whose status is switchable as a single unit) and the system status panel. Except for the system status panel, the system control is duplicated for reliability. A system control (SYC) switch is scheduled once a day. The purpose of SYC switch is to make the standby system active to carry the call processing load. Prior to the switch, the standby systems capabilities are checked for serviceability. When no problems are encountered, the scheduled switch proceeds. The office can be controlled by either SYC 0 or SYC 1 but cannot be reconfigured to allow one 3A Central Control (3A CC) to access peripheral controllers associated with the other 3A CC.

3.02 When a fault is detected in the active duplicated portion of the peripheral system, a second try will be initiated to verify that the fault recognition was not due to a transient error.

If the order fails on the second try, a SYC switch is made whereby the standby SYC will assume active system control. The order is tried a third time on the now active SYC, and if successful, a removal from service message will be printed by the maintenance TTY. This TTY message will indicate which peripheral controller of the now standby SYC has been removed from service.

3.03 When the third try is unsuccessful, the problem is assumed to exist in the nonduplicated portion of the peripheral units. These areas of the system (Fig. 2) include:

- (1) Network fabric
- (2) Peripheral decoder points
- (3) Scanner matrix rows or columns.

This equipment is marked as being service-affected, and this is indicated to the call processing functions. Also, the appropriate TTY message is printed.

3.04 Diagnostics will not be performed automatically upon fault recognition. Diagnostics can be accessed from the tape cartridge either by a manual TTY request or by automatic request by the system on a scheduled basis. This reduces the possibility of excessive wear on the tape as well as the tape cartridge should a system encounter excessive trouble indications. (All diagnostic programs are stored on tape cartridges.)

3.05 In the event of problems, maintenance indicators will notify office personnel or the remote SCC that corrective action is required. The system will continue to function with its remaining capabilities until the trouble has been cleared.

◆MAINTENANCE PROGRAMS

3.06 Software and hardware are arranged to detect service-affecting troubles by making the appropriate per-call checks or by performing maintenance checks on the hardware. The maintenance programs handle the functions related to the detection, diagnosis, and reaction to abnormal office operation (Fig. 1).

A. Trouble Detection

3.07 Trouble detection is the primary means of inhibiting performance deterioration. Detection

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schemes are used throughout the system to facilitate identification of problem areas. These procedures utilize hardware and software operations to further ensure the integrity of the system.

Check Circuits

3.08 Self-check circuits are provided in the 3A CC, MAS, and peripheral controllers. These check circuits act as continuous monitors by which the system is notified of erroneous responses.

Call Processing Tests

3.09 During call processing, many checks are made to ensure the validity of the system actions. For example, a check is made for high voltage to prevent damage to sensitive circuits associated with the customer line. Checks are also made to ensure that a customer line is ready for another origination after a previous disconnect (restore-verify check); this verifies that the line attending element was restored to the line to allow an origination.

Routine Testing

3.10 Routine testing is performed as periodic diagnostics. Periodic diagnostics are tests of hardware performed automatically on a scheduled basis (every 24 hours). These diagnostics are read in (paged) from the tape cartridge and will be performed by the standby 3A CC. The diagnostics may also be manually requested via the local or remote maintenance TTY.

B. Recovery

Duplicated Units (Periphery)

3.11 Recovery programs are automatically initiated when a problem associated with the active SYC is detected. Recovery initiates a retry of the action which was being taken when the problem occurred (eg, scanner order). If the problem persists, recovery initiates an SYC switch which causes the other SYC to assume active control. A second retry of the action previously taken is initiated on the newly active SYC. If action taken as directed by the data accomplishes the expected results, recovery returns control to normal processing activity.

3.12 This sequence causes the faulty peripheral controller to be removed from service. A removal from service message and an SYC switch message indicating the SYC currently active are printed out on the TTY. The appropriate lamp lights on the SSP indicating the peripheral controller is removed from service and a major audible alarm sounds.

3.13 If the second retry does not eliminate the problem condition, the problem is located in the nonduplicated portion of the periphery accessed by the peripheral controllers. The nonduplicated portions are:

- Scanner matrix (row and column)
- Peripheral decoder (point)
- Network fabric.

A TTY message is printed out indicating the problem area as well as the active SYC. A minor audible alarm sounds. Call processing is notified of the problem area and assumes control.

Duplicated Units (Control Complex)

3.14 The No. 3 ESS processor is basically a self-checking machine. Detection of faults occurs when a failure of specific checks (error check circuits, programs, or program timer) indicates that the integrity of the program system and/or data base is questionable. The detection of faults associated with the error check circuits causes one of the following:

- (1) Error interrupt-main memory will function.
- (2) Unit initialization-main memory may not function.
- (3) Switch and unit initialization-microcode may not function.

A problem with the active program timer (times out) causes a switch and initialization of the standby 3A CC. A switch will not occur if the LOCK or FORCE keys on the system status panel (SSP) are operated. A problem in the program will normally cause a 3A CC switch, depending on the type of program involved.

3.15 There are three classes of fault:

- (1) The first and most serious involves a fault which affects the operation of the active SYC or which might prevent the microcode of the processor from operating. It may also occur if the active program timer times out. Either of these results in a switch of the processors and initialization of the now active machine.
- (2) The second class is keyed by a fault (primarily main store errors) which prevents the main store from functioning. This results in an initialization of the active processor with no switch of processors involved.
- (3) The third class involves peripheral errors.

Unduplicated Circuits (Periphery)

3.16 The unduplicated portion of the system includes the following circuits:

- (1) Trunks
- (2) Service
- (3) Lines
- (4) Network links
 - (a) A-links
 - (b) Test vertical
 - (c) Junctors B-links
 - (d) Wire B-links

The following circuits are associated with the unduplicated portion of the system:

- (a) Scan/distributor points
- (b) Switches
- (c) Crosspoints.

3.17 Special software routines are used to analyze failure rates in the replicate areas. If a circuit fails three consecutive times, it is removed from service. Only a set percentage of the circuits are removed from service. When this percentage

is reached, the circuit is not removed from service, but a trouble report is indicated on the TTY.

3.18 The error analysis software of the No. 3 ESS is invoked by failures in call processing involving the replicated portion of the system. This software receives an error report and analyzes problems in categories by comparison. The error rate of a particular circuit is compared with the error rate of its particular group. If the comparative rate is excessive, that particular trunk, line, service circuits, junctor, A-link, or B-link is removed from service and an appropriate TTY message is printed out, indicating a problem which must be diagnosed later.

3.19 Quick-check is used to analyze problems which affect trunks, service circuits, A-link, B-link, and junctors. If three successive errors occur in a particular circuit, the circuit is automatically removed from service (if allowed), as opposed to the member group failure rate of the error analysis programs.

Initialization

3.20 Initialization can be caused by several hardware and software detected problems. Initialization can also be executed manually from the SSP. The stimulus is failure of a check that indicates a possible fault in the integrity of the programming system and/or its data base. An initialization consists of the following:

- (1) Restoring the 3A CC to a known good state
- (2) Restoring the periphery to a known good state
- (3) Aborting certain activities
- (4) Zeroing or otherwise initializing temporary data
- (5) Reloading the programs from tape.

Not all of the above are performed on every initialization. The amount of initialization can vary depending on the extent to which corrective action is required.

3.21 The five levels of initialization are as follows:

- (1) First level-partial clear

- (2) Second level-partial clear
- (3) Third level-partial clear
- (4) Fourth level-transient clear
- (5) Fifth level-stable clear.

Each level takes more drastic action. The system automatically cycles sequentially through the first four levels as required and, if necessary, initiates a bootstrap. The fourth and fifth levels can also be manually initiated from the SSP.

Bootstrap

3.22 Bootstrap provides a reload of memory only from the cartridge tape systems. Both tape systems, if not faulty, are always used. It is a sophisticated, selective reload of only the memory which has been destroyed. Bootstrap is a microprogram-initiated loader with three major segments. The first brings in enough of the loader to continue with a more reliable error checking loader. A second segment in turn, loads in a more sophisticated system loader and its associated programs. A third more sophisticated loader handles selective reloading of the 3A CC system by interaction with the 3A CC initialization programs. A bootstrap does not affect translation data. A memory reload must be executed from the SSP to accomplish a complete reloading of main store (MAS). This also initiates a stable clear.

3.23 The periphery will cause an initialization when a dual fault condition exists, eg, a scanner controller failure on both SYCs. Peripheral unit fault recovery will provide a suitable solution for single fault detection without invoking the initialization sequence.

C. Alarm and Status Reporting

3.24 The alarm and status reporting programs provide a means of notifying the craft person of faults or situations which require action. These programs instantly identify, on the SSP, any system abnormality. They also maintain the current status (standby SYC) of the system as determined by various maintenance and common system programs. The SSP, under the control of these programs, provides the craft person with the means for remote access to the system and for initializing the system.

3.25 System maintenance is supported by an office alarm structure which serves as the stimulus for software controlled diagnostics. Both visual and trouble audible alarm indications are provided. When a particular alarm is sounded, a corresponding message is printed on the TTY indicating the category and source of the alarm. The alarm classifications are given in (1) through (8).

- (1) **CRITICAL**—Indicates that the system, or a major portion or capability of the system, is inoperable. An audible indication of the CRITICAL alarm is a continuous tone sounded twice, 1/2 second apart. There is a 1-1/2 second interval before the pattern is repeated.
- (2) **MAJOR**—Indicates a partial loss of the system capability of a failure such that another similar failure could result in a critical condition. An audible indication of the MAJOR alarm is a continuous tone that sounds at 1-1/2 second intervals.
- (3) **MINOR**—Indicates a minor loss of the system capability or some other condition requiring the attention of the maintenance personnel. An audible indication of a MINOR alarm is a continuous tone that is silenced after 5 seconds.
- (4) **MAJOR POWER**—Indicates a major power failure in the power equipment.
- (5) **MINOR POWER**—Indicates a minor power failure in the power equipment.
- (6) **ALARM CIRCUIT**—Indicates a trouble in the office alarm circuit or in its battery supply.
- (7) **FUSE**—Indicates a blown fuse.
- (8) **SERVICE LOSS**—Indicates that recovery has taken place with the possible loss of calls approximately within the last 3 minutes.

3.26 There can be two alarm indications; ie, an alarm in classifications (4) through (8) will cause either a critical, major, or minor indication as defined in classifications (1) through (3).

3.27 Only the highest level alarm class is indicated on the SSP at any one point in time. It

has priority over a lesser alarm class indication (critical over major or minor), and the lesser alarms would not be indicated until the higher alarm source was eliminated.

3.28 Visual alarm indicators associated with audible alarms remain operated until the alarm is retired. Audible alarms are on a timed interval in the alarm transfer mode (ALARM TRFR key on SSP operated) and can be disconnected manually.

3.29 The software routines related to the alarms initiate the following:

- The message to be printed
- The proper alarm indications, both audible and visible, to be activated
- The proper timing for alarms.

D. Diagnostics

Computer Aided

3.30 Diagnostics are stored on the tape cartridge (nonresident) only and are loaded into the system by requests typed in via the maintenance TTY. Also, they are loaded when nightly routines are performed. The input message manual (IM) (paragraph 2.02) provides a listing of available diagnostic input messages.

3.31 The failure results of the diagnostics are printed out by the maintenance TTY in the form of numbers. These numbers are located in the appropriate TLM and list specific circuit packs which may be responsible for the trouble.

3.32 There are three categories of diagnostics, each having a monitor program which serves as an interface between the test table data and routines which process the table entries. These are as follows:

- (1) Processor diagnostics
- (2) Peripheral unit diagnostics
- (3) Trunk and service circuit diagnostics.

Processor Diagnostics

3.33 The processor diagnostics are programs (common systems) which employ start-small philosophy. A small portion of the machine is diagnosed and, if its operation is correct, is used for further diagnosis. Essentially, each test is dependent upon the previous tests. There are two divisions of the tests: the main store diagnostics and the diagnostics handling the other hardware of the 3A CC. The active processor may diagnose the standby in three ways:

- (1) Via the maintenance channel at the microlevel
- (2) By instructing the standby processor to run short sequences of code with the results checked by the active processor
- (3) By instructing the standby processor to run code and check its results.

Peripheral Unit Diagnostics

3.34 The peripheral unit diagnostic programs (applications) diagnose the peripheral controllers, when requested. The craft person specifies either the network, peripheral pulse distributor, frame input/output controller, or the scanner to be diagnosed. A diagnostic (DGN:) input message designates the controller to be diagnosed. A peripheral controller can be diagnosed using a restore (RST:) message in lieu of the DGN. The diagnostic checks the input/output port of the processor and the frame input/output controller verifying that each is operational as it works its way to the designated controller. The output returned message states the results of the diagnostic performed.

Trunk and Service Circuit Diagnostics

3.35 The trunk and service circuit diagnostics are programs (applications) invoked for the detection of trunks, junctor, and service circuit failures. Test circuits are categorized as service circuits for diagnostic purposes. The following test circuits are provided to make periodic tests (under software control) on critical hardware circuits:

- Continuity and polarity
- Transmission test environment

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- Milliwatt (mW) and transmission environment
- Dial pulse receiver
- TOUCH-TONE® receiver
- Tone presence detector
- Loop environment
- False cross and ground and power detector
- Line insulation
- Station ringer
- Trunk and line test panel
- Transmission test termination.

Network Fabric Diagnostics

3.36 The network fabric exercise program verifies tip-ring wiring for continuity and crosspoints for operation. It also checks for tip and ring reversals. The only crosspoints accessed in the first stage are associated with loop-start lines. All crosspoints in the second stage are accessed. Third stage crosspoints checks depend on the network frame available.

Remreed Fault Diagnostic

3.37 The remreed fault diagnostic software isolates transient fabric faults and pulse path matrix problems in the remreed network. The software aids the craft in location of a single concealed fault that affects a large portion of the network. The software involved is divided into;

- Grid Error Count Routines which determines and tabulates the number of network orders that failed when accessing a particular grid, and
- Remreed Pattern Analysis which attempts to isolate a fault by sending out network controller orders and analyzing the group check data results.

Manual Trouble Testing

3.38 The trunk and line test panel (TLTP) provides manual capability to test trunk, junctor,

line, and service circuits. Two access trunks provide access through the network to the circuits that require testing. The access trunks are arranged for key-controlled access to voltmeter and transmission test circuitry and also voice communication facilities.

E. Manual Trouble Clearing

Programmed Maintenance Aids

3.39 The programmed maintenance aids assist the craft person to either define a problem or verify a predetermined fault within the system. These aids include:

- Station ringer test line
- Loop around test line
- Milliwatt test line
- Short circuit, open circuit, and charge test line
- Local test desk
- Synchronous test line
- AC/DC open circuit test line
- Trunk and line test panel.

Maintenance and Administration Facilities

3.40 The master control center (MCC) is used by maintenance personnel dispatched to site when trouble occurs. The MCC may be complemented by connection to an SCC which, when provided, permits complete remote status reporting and control capabilities at a remote location.

3.41 The MCC serves as a system maintenance tool in an operating office and consists of the following components:

- (a) The system status panel
- (b) The teletypewriter
- (c) The trunk and line test panel.

System Status Panel

3.42 The SSP provides indications of normal as well as emergency and alarm conditions (Fig. 3). The SSP provides designated keys to implement system emergency manual control as well as keys for test control, alarm control, and panel power. Visual indications are provided also, to relate instantaneous system status. The types of indications include system control status, other equipment status, equipment troubles, and power failures.

Teletypewriter

3.43 The TTY is used as a means of communication with the system (Fig. 4). The TTY can be used for requesting tests, diagnostics, removal of equipment from service, restoring equipment to service, and also for changing class of service and directory number assignments. The TTY will print out test results, trouble records, and diagnostic results.

Trunk and Line Test Panel

3.44 The TLTP is used for making normal transmission and operational tests on trunks, service circuits, and junctors by the craft person (Fig. 5). The TLTP has the capability of busying out trunks and service circuits, making gain and stability tests on outgoing trunks, and providing access to any line terminated in the No. 3 ESS. In addition, the TLTP also has the capability to perform most tests presently performed by the 3A local test cabinet. The TLTP cannot be operated from the SCC.

Switching Control Center

3.45 The SCC is an extension of the technical assistance center concept and permits centralized control as well as monitoring of switching offices. The SCC normal mode of operation involves the automatic polling (interrogation) of remote offices on a continuous basis. This mode is used to collect and display status information from remote offices. The information received indicates office alarms, generalized trouble location information, and building and system status. All TTY maintenance messages are sent from the remote offices to the SCC and stored.

3.46 Remote maintenance can be accomplished at the SCC. When remote control of an office is provided, the SCC can arrange to remove that office from the polling category. A universal console is connected to the system in conjunction with a TTY to provide remote control capabilities. This provides the equivalent control which is available in the office and keys operated in the SCC will initiate functions in the local office.♦

4. SPECIAL MAINTENANCE CONSIDERATIONS

Precautions

4.01 Precautions should be taken when in the immediate area of the system regardless of the state of the system. The maintenance personnel should practice the following:

1. Always work on the standby SYC
2. Avoid removal of power from an active controller
3. Be constantly aware of the state of the following keys:
 - (1) FORCE key on SSP
 - (2) LOCK key on SSP
 - (3) MANUAL key on 3A CC control panel.

These keys, if incorrectly positioned, can greatly reduce recovery capabilities. The system will not accept an equipment removal message manually inputted at the TTY if the removal impairs call processing.

Power Control

4.02 Power control arrangements provide the means for manually removing power from equipment in a manner such that the effect on call processing is minimized and repair or replacement of the equipment is facilitated. In addition, power control is concerned with the detection and signaling of failures in the power equipment itself and distribution buses. Power control consists of more than just keys and lamps associated with turning power on and off. It also involves the software for removing equipment from service, for recovering from power failures, and for generating the visible and audible alarms and TTY messages when needed.

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4.03 Power is removed from trunks, service circuits, junctors, and line circuits by manually removing the fuse pair (talk and signal) associated with the particular circuit of interest. Except for MF receivers and TOUCH-TONE receivers (each of which has a POWER OFF key), fuse removal is the only way to remove power from these circuits. Trunks, junctors, and line circuits are powered with a maximum of four circuits per fuse pair; the four circuits are all associated with the same peripheral decoder. Service circuits are powered with one circuit per fuse pair. Before removing a fuse, all associated circuits must be removed from service via a TTY input message. Power removal in other areas (such as peripheral decoder boards, ferrod boards, and 15A network grids) is also accomplished by manual fuse removal.

Note: Before any power removal, the proper TOP document should be acquired and consulted for correct procedure. This applies to all maintenance activities.

5. LOCATING EXTERNALLY REPORTED TROUBLES

5.01 If a customer complaint indicates a trouble such that a verification of the originating (terminal equipment number) or terminating (directory number) translation is to be made, the verification messages of the input message manual are used.

5.02 Many trouble reports are associated with lines and trunks. The TLTP can be used to test line troubles such as shorts, opens, leakage, foreign potential, and other tests.

5.03 Trunk troubles are grouped into four categories:

- (a) Facility troubles—Cables, carrier, etc
- (b) Operational troubles—Relay operation
- (c) Transmission troubles
- (d) Translation troubles—The information stored in memory and used by the system to determine the type of supervision, signaling, etc.

The first three categories of trouble can be checked from the TLTP. Translation verifications are made via the TTY and the appropriate input message.

6. REFERENCES

6.01 This section contains a list of pertinent sections and other documents which are germane to this section.

SECTION	TITLE
233-001-000	Numerical Index Div. 233
233-000-003	General Description No. 3 Electronic Switching System
233-001-011	Equipment Test List
233-100-010	Emergency Action Procedure
233-110-000	Control Complex Description No. 3 Electronic Switching System
233-121-100	Scanner Description No. 3 Electronic Switching System
233-135-100	Test Equipment Description for No. 3 Electronic Switching System
233-135-105	Trunk and Line Test Panel and Associated Equipment Description and Theory of Operation No. 3 Electronic Switching System
233-141-100	Centralized Office Maintenance Description and Theory of Operation No. 3 Electronic Switching System
233-150-100	Software General Description for No. 3 Electronic Switching System
233-150-140	Peripheral Unit Fault Recovery Software Subsystem Description No. 3 Electronic Switching System
233-153-105	Programmed Maintenance Aids Software Subsystem Description No. 3 Electronic Switching System
233-153-115	Trunk, Test, and Service Circuit Diagnostic Software Subsystem No. 3 Electronic Switching System
233-153-125	Alarm and Status Reporting Software Subsystem Description No. 3 Electronic Switching System

SECTION	TITLE	
233-153-130	Initialization and Fault Recovery Software Subsystem Description No. 3 Electronic Switching System	interpret and act upon information read from the main store memory.
254-300-150	3A Processor Main and Supplemental Stores Description and Theory of Operation Common Systems	Control Complex —Equipment located in the No. 3 ESS office required to provide control and maintenance of the office.
254-300-170	Tape Data Controller Description and Theory Common Systems	Control Unit (CU) —The combination of 3A CC, main store, power, store buses, and the system status panel.
254-300-180	System Status Panel, System Status Panel Controller, and System Status Panel Unit Description and Theory of Operation Common Systems 3A Processor	Duplication —Providing two of the same units in vital areas to maintain call handling capabilities when a problem occurs in one of the units.
254-300-190	Teletypewriter and Teletypewriter Controller Description and Theory of Operation Common Systems	Fault —A condition which causes a device, a component, or an element to fail to perform in a required manner.
254-340-088	Processor Diagnostics Software Subsystem Description 3A Processor Extended Operating System	Junctor —A circuit associated with the switching network which provides a path for a call through the network.
	Input Manual—IM3H300	Line —Any connection to a network terminal which is not classified as a trunk or service circuit.
	Output Manual—OM3H300	Off-Line —A condition in which equipment is operating but not called on to perform its primary function.
	Trouble Locating Manual—TLM3H100 Through 115	On-Line —A condition in which equipment is performing its primary function.
	Trouble Locating Manual—TLM1C900 Through 931	Replicated —Equipment that is redundant but usage of which is not considered duplicated.
	Programmers Manual—X47292.	Service Circuit —An auxiliary circuit connected through the switching network to lines or trunks as required. It performs a specialized function such as dial-pulse detection.
7. GLOSSARY		
7.01	A glossary of terms is provided to aid in the understanding of definitive words used in this section.	System Control (SYC) —Consists of the combination of the 3A CC, MAS, power store buses, and periphery controllers.
	3A CC —The combination of logic, microstore, input/output channel which is primarily utilized to	Trunk —A channel connecting switching centers or exchanges. An interface circuit for transmission and supervisory purposes.

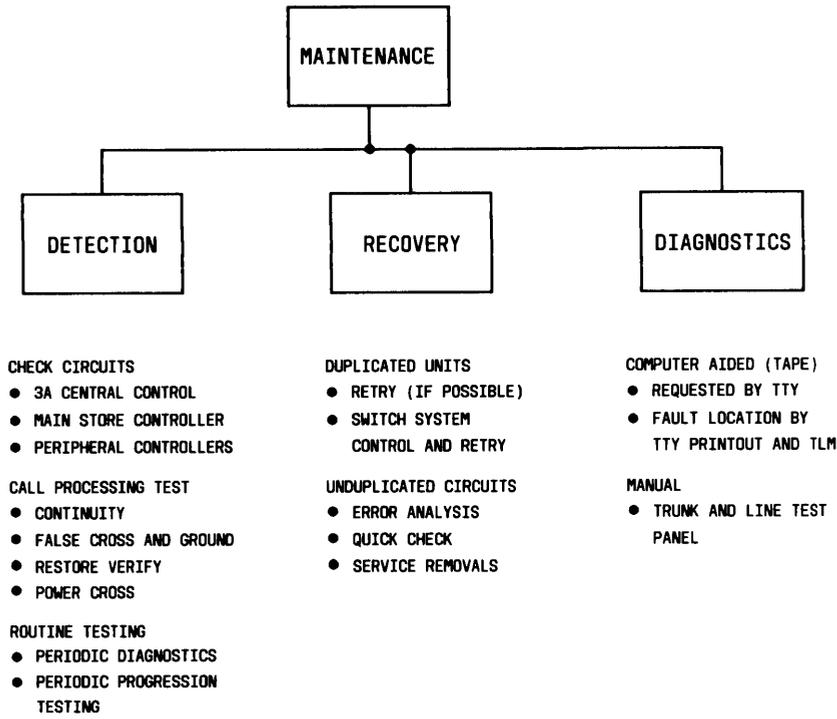


Fig. 1—No. 3 ESS Maintenance Plan

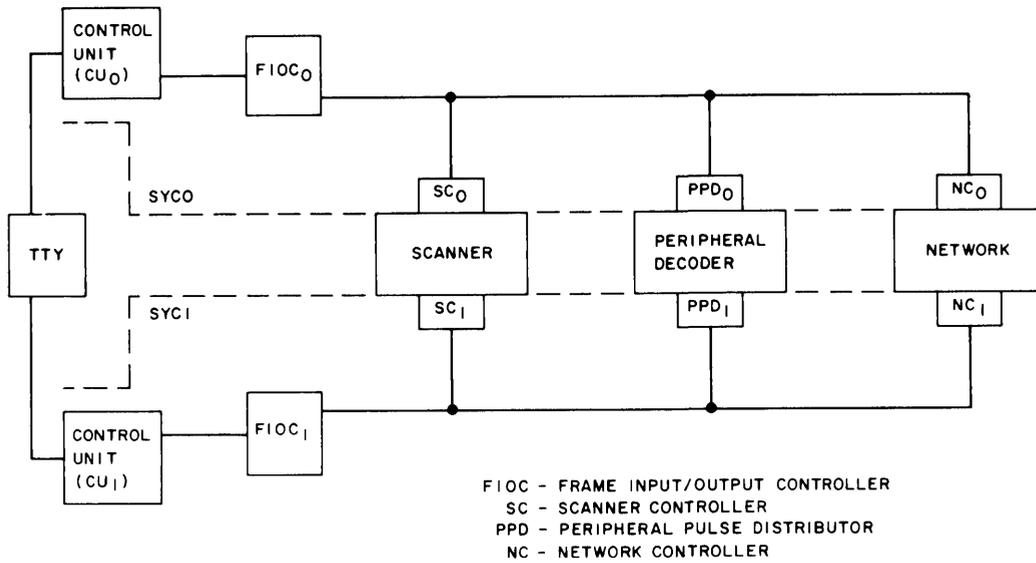
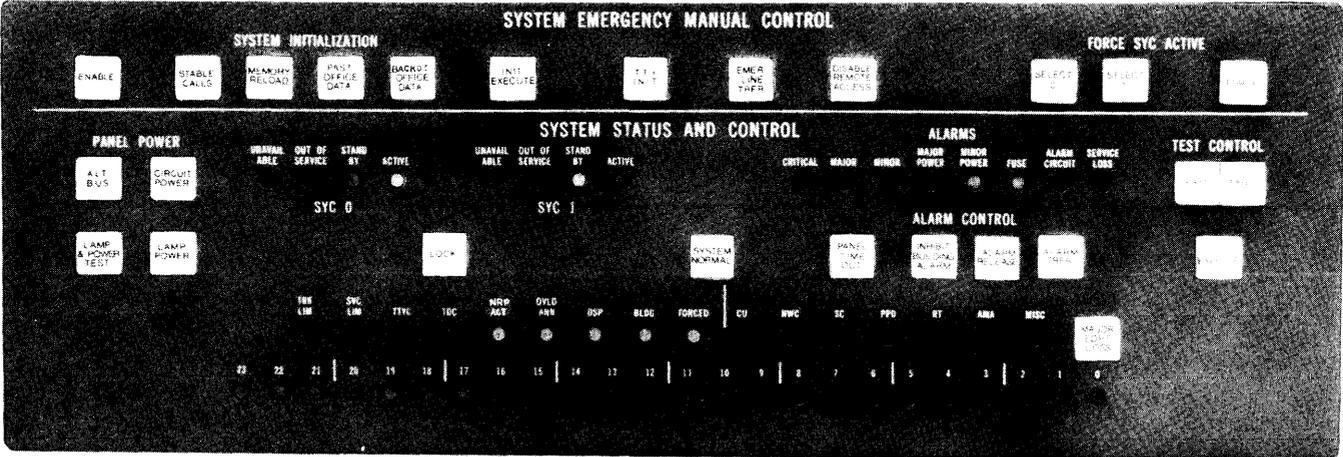
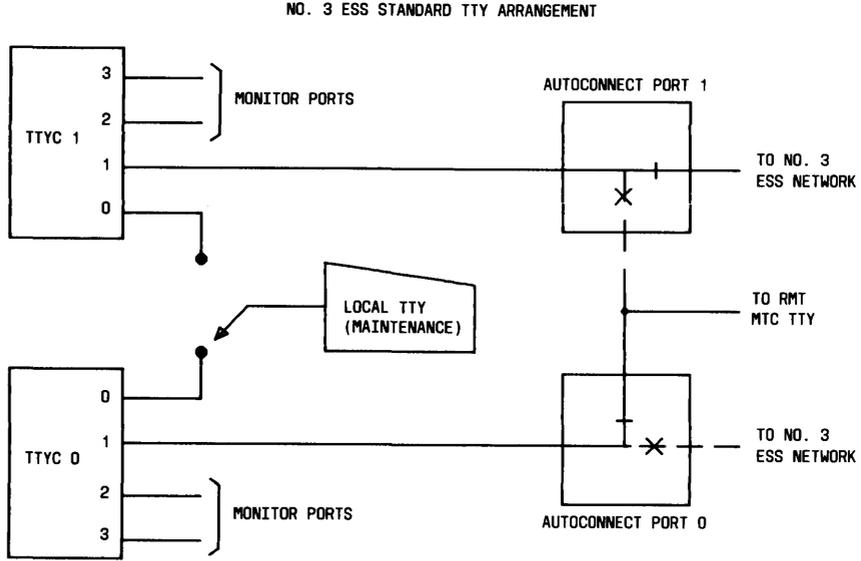


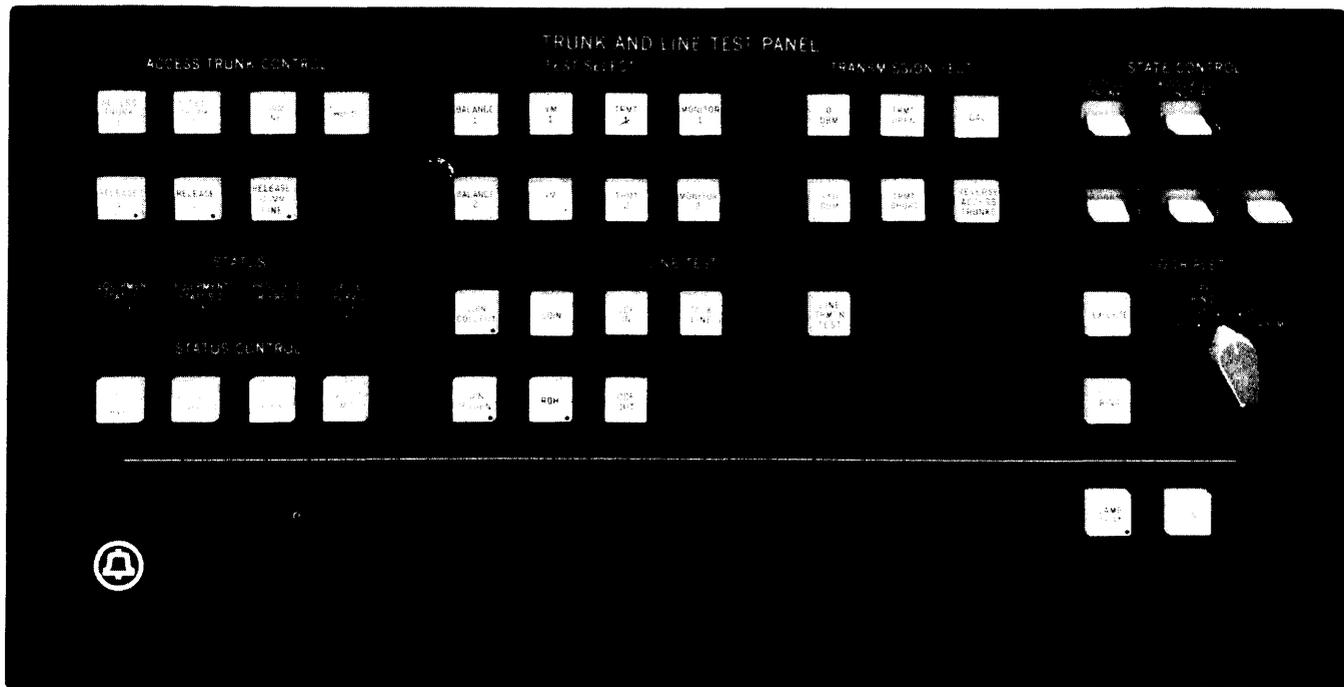
Fig. 2—Duplicated and Nonduplicated Active/Standby Equipment With TTY



◆Fig. 3—No. 3 ESS System Status Panel◆



◆Fig. 4—No. 3 ESS Standard TTY Arrangement◆



▶Fig. 5—Trunk and Line Test Panel—Front View◀