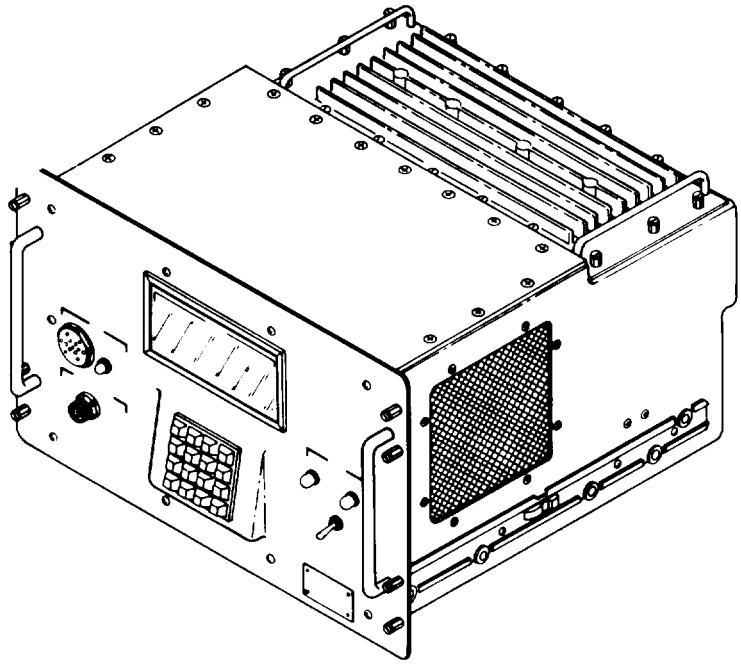
ARMY TM 11-7025-221-10
AIR FORCE T.O. 31S5-2G-251
MARINE CORPS TM-08467A-10/1

OPERATOR'S MANUAL



MULTIPLEXER, DIGITAL TD-1337(V)1/G
(NSN 7025-01-1 12-6311)

MULTIPLEXER, DIGITAL TD-1337(V)2/G
(NSN 7025-01-112-631O)

MULTIPLEXER, DIGITAL TD-1337(V)3/G
(NSN 7025-01-1 12-6312)

MULTIPLEXER, DIGITAL TD-1337(V)4/G
(NSN 7025-01-127-7020)

DEPARTMENTS OF THE ARMY, THE AIR FORCE,
AND THE MARINE CORPS

20 AUGUST 1982

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5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

ARMY TM 11-7025-221-10
AIR FORCE T.O. 31S5-2G-251
MARINE CORPS TM-08467A-10/1

TECHNICAL MANUAL

DEPARTMENTS OF THE ARMY,
THE AIR FORCE, AND THE MARINE CORPS
Washington, DC, 20 August 1982

Operator's Manual
MULTIPLEXER, DIGITAL TD-1337(V)1/G
(NSN 7025-01-112-6311)
MULTIPLEXER, DIGITAL TD-1337(V)2/G
(NSN 7025-01-112-6310)
MULTIPLEXER, DIGITAL TD-1337(V)3/G
(NSN 7025-01-112-6312)
MULTIPLEXER, DIGITAL TD-1337(V)4/G
(NSN 7025-01-127-7020)

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, TO. 00-5-1. Forward direct to prime ALC/MST.

Marine Corps Units should submit NAVMC10772.

In either case, a reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

You can maintain and operate Digital Multiplexer TD-1337(V)/G more efficiently if you become familiar with the contents of this manual.

The table of contents, preceding this page, lists all the sections, chapters, and appendixes in the manual. There is an alphabetical index at the back of the manual. This index lists all the types of information in the manual in alphabetical order. For example, look under “C” if you want to locate which pages in the manual contain “Configuration Routines.”

There is a quick-locate index on the front cover that shows the most used information in the manual. Each index entry shows the first page number of a section or chapter. In turn, there is an index of all the paragraphs in the section or chapter on the page listed. This type of indexing helps you to quickly locate operating routines, configuration routines, troubleshooting information, or other types of information described below.

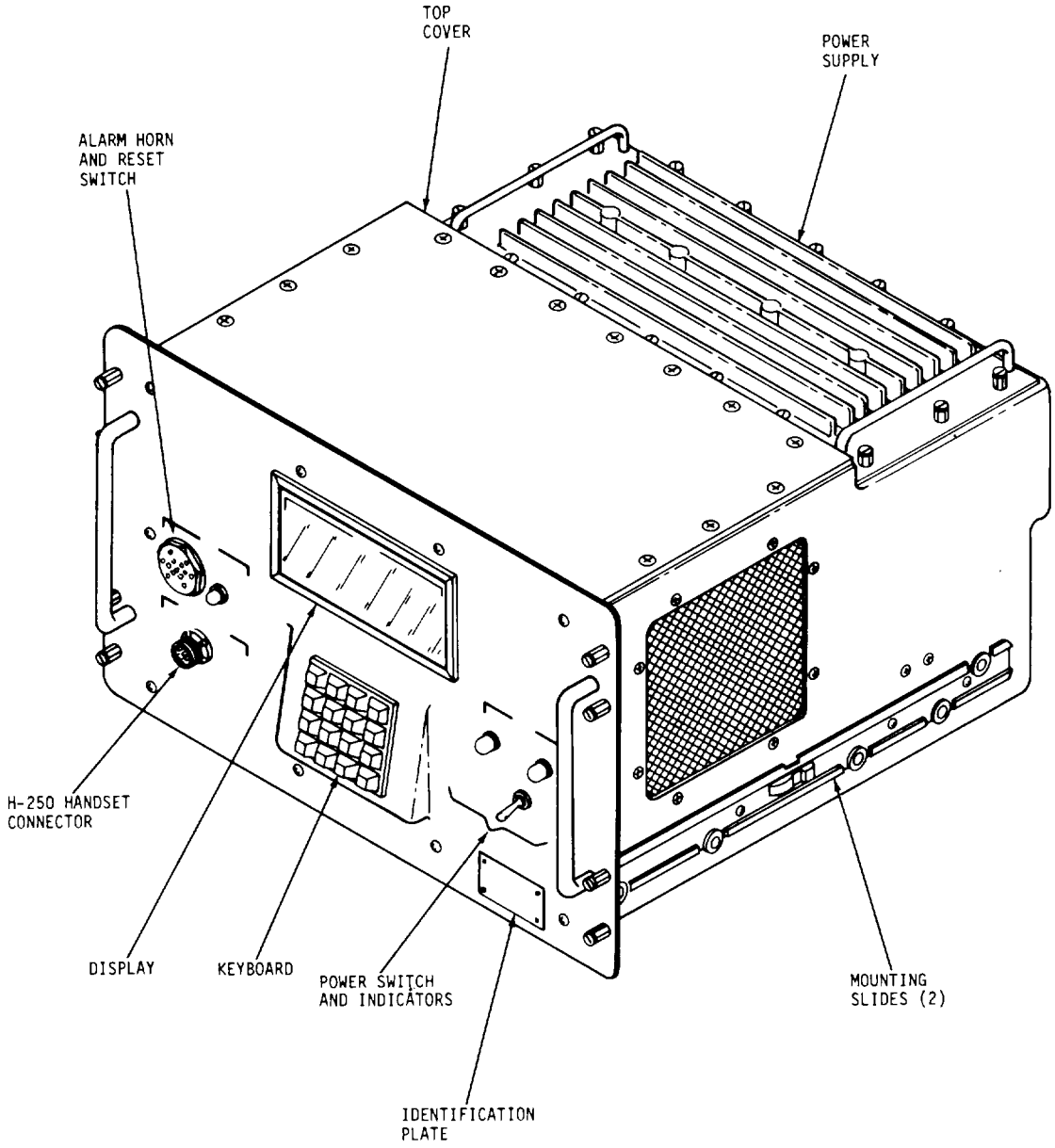
- *Equipment Description* (page 1-5). Descriptions of the TD-1337(V)/G physical and electrical characteristics are in this section.
- *Principles of Operation* (page 1-1 O). This section describes the operation and use of the TD-1337(V)/G as part of a satellite earth terminal. As explained in this section, there is a visual display and a 16-key keyboard used by an operator to perform the routines necessary to operate the TD-1337(V)/G. These routines are divided into operating and configuration routines as described below.

NOTE

A routine is defined as a series of sequential steps an operator performs to accomplish a required task. (Answering an orderwire call or displaying equipment status information on the display are typical tasks.)

- *Operating Routines.* These are the routines used by an operator to maintain and check the operation of the TD-1337(V)/G while it is operating in a system configuration. The step-by-step procedures for these routines start on page 2-29.
- *Configuration Routines.* These are the routines that an operator uses to place a TD-1337(V)/G in a desired operating configuration. The step-by-step procedures for these routines start on page 2-50.

- *Description and* Use of *Operator’s Controls and Indicators* (page 2-1), You need to be familiar with the information in this section to properly perform any of the operating or configuration routines.
- *Preventive Maintenance* (page 2-27). This section contains the information you need to know to keep the TD-1337(V)/G in an operating condition.
- *Maintenance* (page 3-1). There are no maintenance procedures that can be performed by an operator. This chapter contains one troubleshooting flow chart that you use when you have an indication that the TD-1337(V)/G may be faulty. No matter what the system fault may be, there is one entry point on the chart. You perform each sequential step as directed until an operator action is directed or the procedure terminates. There are no complex or special requirements to use this chart.



Multiplexer, Digital TD-1337(V)/G.

CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

Subject	Para	Page
Maintenance Forms, Records, and Reports	1-1	1-1
Hand Receipt (-HR) Manual	1-2	1-1
Reporting Equipment Improvement Recommendations (EIR's)	1-3	1-2
Nomenclature Cross-Reference List	1-4	1-2
List of Abbreviations	1-5	1-2
Glossary	1-6	1-2
	1-7	1-3

1-1. Scope.

a. Type of *Manual.* This manual contains operator procedures and maintenance instructions for the Digital Multiplexer TD-1337(V)/G family.

b. Model Numbers and *Equipment Name.* Digital Multiplexer TD-1337(V)/G (hereafter referred to as the TD-1337(V)/G) is the military nomenclature assigned to a family of digital multiplexer. There are four models in the TD-1337(V)/G family. Each model is assigned its own military nomenclature as listed below.

Digital Multiplexer TD-1337(V)1/G
Digital Multiplexer TD-1337(V)2/G
Digital Multiplexer TD-1337(V)3/G
Digital Multiplexer TD-1337(V)4/G

This manual covers all four models. Differences between models are denoted throughout this manual by notes, exceptions, separate procedures, or other appropriate means. When the term TD-1337(V)/G is used in this manual, it means all four models.

c. *Purpose of Equipment.* The TD-1337(V)/G is a synchronous time division digital multiplexer used in a satellite earth terminal. The TD-1337(V)/G provides a full duplex capability in interfacing the modem in the terminal radio equipment with ground equipments. Inputs from synchronous data users are multiplexed (combined) into a single output supergroup (SG) and supplied to the modem in the terminal radio equipment for transmission. Similarly, received SG(s) are demultiplexed (recombined) into their composite parts and supplied to the respective data users.

1-2. Maintenance Forms, Records, and Reports.

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (Army). Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Marine Corps personnel will use forms and procedures prescribed by TM 4700-15-1/D.

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATlNST 4355.73/AFR 400-54/MCO 4430.3E.

c. Discrepancy in Shipment Report (DISREP) (SF 361), Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38 /NAVSUPlNST 4610.33 B/AFR 75-18/MCO P4610.19C/DLAR 4500.15.

1-3. Hand Receipt (-HR) Manual.

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). The TM 11-7025-221-10-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i. e., COEI, Bll, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the following source in accordance with procedures in Chapter 3, AR 310-2 and DA Pam 310-10-2:

The US Army Adjutant General Publications Center
Baltimore, MD

1-4. Reporting Equipment Improvement Recommendations (EIR).

a. Army. If your TD-1337(V)/G needs improvement, let us know. Send us an EIR. You, the user, ore the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communciations-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you o reply.

b. Air Force. Air Force personnel are encouraged to submit ElR's in accordance with AFR 900-4.

c. Marine Corps, Marine Corps personnel are encouraged to submit ElR's through their local Beneficial Suggestion Program.

1-5. Nomenclature Cross-Reference List.

Shortened nomenclatures (common names) are used in this manual to make procedures easier for you to read. A cross-reference between the common name and the official nomenclature is listed below.

Nomenclature Cross-Reference

Common name	Official nomenclature
TD-1337(V)1/G or V1	Multiplexer, Digital TD-1337(V)1/G
TD-1337(V)2/G or V2	Multiplexer, Digital TD-1337(V)2G
TD-1337(V)3/G or V3	Multiplexer, Digital TD-1337(V)3/G
TD-1337(V)4/G or V4	Multiplexer, Digital TD-1337(V)4/G

1-6. List of Abbreviations.

Special or unusual abbreviations used in this manual and their meanings are listed below. Common abbreviations that you already know are not listed.

List of Abbreviations

Abbreviation	Meaning
AAL	Additional Authorization List
ANDVT	Advanced Narrowband Digital Voice Terminal
ATACS	Army Tactical Area Communications System
Bll	Basic Issue Items
b/s	Bits per second
CESE	Communications Equipment Support Element
CNCE	Communications Nodal Control Element
COEI	Components of End Item
CVSD	Continuous variable slope delta
DlØ	Diphase
DLED	Digital Loop Encryption Device

1-6. List of Abbreviations - Continued.

Abbreviation	Meaning
DVOW	Digital voice orderwire
EIR	Equipment Improvement Recommendations
kb/s	Kilobits per second
NRZ	Non-return to zero
NVM	Non-volatile memory
PCM	Pulse code modulation
PMCS	Preventive Maintenance Checks and Services
Rmux	Remote multiplexer
SG	Supergroup
TAMMS	The Army Maintenance Management System
TRI-TAC	Joint Tactical Communications
TSSP	Tactical Satellite Signal Processor (also means TD-1337(V)/G in this manual)
VCXO	Voltage-controlled crystal oscillator

1-7. Glossary.

Special or unusual terms used in this manual and their definitions are listed below.

Glossary

Term	Definition
Composite rate	Rate of SG. Rate is sum of overhead, orderwire, and traffic rates that make up SG.
Configuration data	Data that is entered in non-volatile memory (NVM) by operator to make TD-1337(V)/G operate in designated network.
Configuration routine	Routine performed by operator to enter configuration data in NVM or routine performed to place TD-1337(V)/G in another mode of operation.
Connectivity	Methods by which TD-1337(V)/G's can be functionally interconnected to provide various satellite communication networks.
Control Telemetry	Control telemetry is part of the overhead in the supergroup (SG). Control telemetry is used to transmit/receive configuration data, orderwire mode data, and slave timing data between TD-1337(V)/G's.
Dedicated user	Each TD-1337(V)/G model has one conditioned diphase input/output at a 16 or 32 kb/s rate. The user connected to this input/output is called the dedicated user.
Demultiplexer (demux)	Section(s) in TD-1337(V)/G that receives SG(s) from remote TD-1337(V)/G(s). Each demux generates strobe signals, at the proper times, to enable decombing (separating) the incoming SG into its composite parts.
DIØ	"DIØ" in a message display is abbreviation for "conditioned diphase". Conditioned diphase is one of signal formats that can be processed by TD-1337(V)/G.

1-7. Glossary - Continued.

Glossary - Continued

Term	Definition
Downloading	Transmission of configuration data from local TD-1337(V)/G to one or more remote TD-1337(V)/G's.
Duplex operation	Ability of TD-1337(V)/G to transmit (multiplexer section) and receive (demultiplexer section) data at the same time.
Group input/output	Name associated with the data from a user that are serviced by one port.
Local TD-1337(V)/G	TD-1337(V)/G you are operating.
Multiplexer (roux)	Section in TD-1337(V)/G that receives incoming orderwire and data signals and combines them into SG. SG is transmitted to one or more remote TD-1337(V)/G's.
Non-Volatile Memory (NVM)	Memory circuits that retain stored data when external power to TD-1337(V)/G is removed.
Operating Routines	Routines performed by operator during normal operation of TD-1337(V)/G. (All routines that are not designated as configuration routines.)
Orderwire	Voice circuits dedicated for use by operator/maintenance personnel for communication with other operator/maintenance personnel in network.
Port (1 to 8).	Entry/exit point for one group input/output assigned to an earth-side user.
Remote Mux (Rmux)	Multiplexer in a remote TD-1337(V)/G that is supplying a SG input to your TD-1337(V)/G.
Routine	A series of steps that are performed by an operator to accomplish a required task (operating and configuration routines).
Secure orderwire	Orderwire inputs and outputs that are processed through an encryption device.
Supergroup (SG)	Serial data stream that is transmitted from your multiplexer section to a demultiplexer section in one or more remote TD-1337(V)/G's in your network.

Section II. EQUIPMENT DESCRIPTION

Subject	Para	Page
Characteristics, Capabilities, and Features	1-8	1 - 5
Location and Description of Major Components	1-9	1 - 6
Differences Between Models	1-10	1 - 7
Equipment Data	1-11	1 - 8

1-8. Characteristics, Capabilities, and Features.

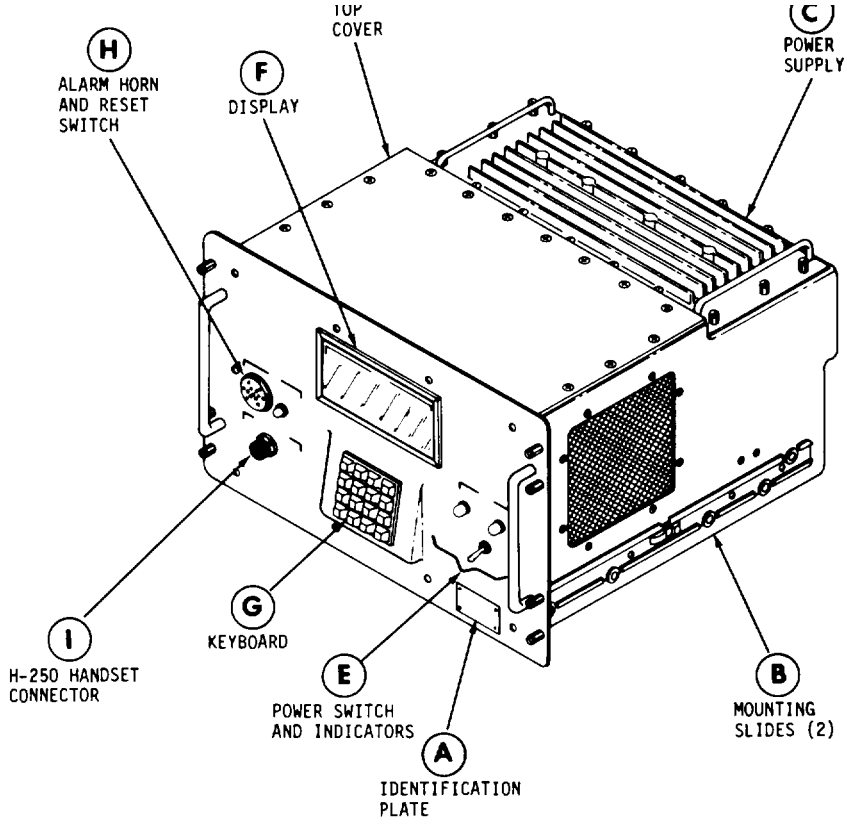
a. Characteristics.

- *Interface Ground Equipments to Radio Terminal Modem.* Inputs from synchronous data users are multiplexed (combined) into a single supergroup output and supplied to the modem in the terminal radio equipment for transmission. Received supergroup(s) are demultiplexed (recombined) into their composite parts and supplied to respective data users.
- *Synchronous Time Division Operation.* Timing between data users and TD-1337(V)/G is synchronized. Time division principles used in multiplexing and demultiplexing operations.
- *Fu// Dup/ex Operation.* Multiplexing and demultiplexing operations are performed simultaneously and independently.

b. Capabilities and Features.

- *ATACS and TR/-TAC Compatible.* Processes ATACS 6-bit PCM and TRI-TAC CVSD signal families.
- *Operator Programmable.* Operator enters configuration information by means of a front panel mounted keyboard. A 3-line, 96-character display presents configuration information or instructional messages to the operator.
- *Non-Volatile Memory.* Configuration data that has been entered is retained in non-volatile memory during electrical power interrupt and equipment turn-off periods.
- *Voice Orderwires.* A 16 kb/s digital voice orderwire is selectable to secure or non-secure mode of operation. Additionally, V3 and V4 models have a separate 2.4 kb/s digital voice orderwire capability.
- *Built-in Test Circuits.* Performance parameters are constantly monitored. Detected faults are displayed as discrete alarm indications or circuit card fail messages on the front panel display.
- *Rack Mounted.* Mounted in standard 19-inch equipment rack. Secured to rack by quick-disconnect slides and front panel fasteners.

1-9. Location and Description of Major Components.



External physical appearance of all TD-1337(V)/G models is identical. Functional differences in models are covered in paragraph 1-10.

(A) *Identification Plate.* Provides operator with model number of TD-1337(V)/G in use.

(B) *Mounting Slides.* An inner-channel mounting slide is attached to each side of the TD-1337(V)/G. They mate with outer-channel mounting slides installed in a rack to provide for rack installation.

(C) *Power Supply.* Provides operating power for TD-1337(V)/G. Operator is not authorized to remove power supply.

(D) *Top Cover.* Plug-in cards are mounted in card slots under the top cover. Operator is not authorized to remove top cover.

(E) *Power Switch and Indicators.* Used by operator for following functions.

- POWER ON/OFF circuit breaker switch controls application of ac power to power supply.
- POWER AC indicator lights when ac power is applied to power supply.
- POWER DC indicator is lit when power supply is operating normally.

1-9. Location and Description of Major Components - Continued.

(F) *Display.* 96-character display (3 lines with 32 characters/line). Displays alphanunerical messages for operator use. Also contains five alarm indicators to inform operator of malfunctions.

(G) *Keyboard,* 16-key keyboard. Provides means by which operator can communicate with TD-1337(V)/G.

(H) *ALARM Horn and RESET Switch.* Used by operator for following functions.

. ALARM horn sounds when orderwire call is received or when certain alarm conditions exist.

. ALARM RESET switch used to silence ALARM horn.

(I) *H-250 HANDSET Connector.* Connector for attaching a H-250 handset.

1-10. Differences Between Models.

External physical appearance of front panels on all models is identical. Internal hardware differences between models (not visible to operator) result in the following functional differences between models.

Functional Differences Between Models

Capability	V1	V2	V3	V4
GROUP INTERFACES				
Max No. of active ports (group inputs/outputs)	8	2	8	4
No. of unbalanced NRZ interfaces	4	2	0	0
No. of balanced NRZ interfaces	8	2	8	4
No. of conditioned diphase (group modem) interfaces	1	1	1	1
SG INTERFACES				
No. SG's transmitted	1	1	1	1
No. SG's received	4	1	4	1
ORDERWIRES				
16 kb/s non-secure digital voice (H-250 handset)	yes	yes	yes	yes
16 kb/s secure digital voice (Vinson)	yes	yes	yes	yes
2.4 kb/s digital voice (ANDVT)	no	no	yes	yes
MISCELLANEOUS				
16/32 kb/s dedicated user conditioned diphase interface (loop modem)	yes	yes	yes	yes
CESE telemetry reporting function	no	no	yes	yes
TD-754 demux function	yes	yes	no	no
TD-754 mux function	yes	no	no	no
TD-976 mode capability	yes	no	no	no

1-11. Equipment Data.

a. *Physical Data.*

Dimensions:
- Width (front panel) . . . . . 19.0 inches (48.26 cm)
- Height (front panel) . . . . . 12.22 inches (31.04 cm)
- Depth (including handles) . . . . . 18.625 inches (47.31 cm)

Weight . . . . . 62 pounds (28.1 kg) max

Cooling Air Requirements:
- Source . . . . . External
- Flow rate . . . . . 50 cfm (1.42 cu m/m)
- Back pressure . . . . . 0.5 inches (1.27 cm) max
- Temperature . . . . . 145°F (62.78°C) max

Power:
- Supply voltage . . . . . 115v (103.5 to 126.5v), 45 to 440 Hz
- Consumption . . . . . 140 watts max
- Overload protection . . . . . AC POWER ON/OFF circuit breaker switch on front panel

b. *Satellite Side (Supergroup) Interfaces.*

Format . . . . . Unbalanced NRZ
Rates . . . . . 16 kb/s to 4664 kb/s in 8 kb/s increments or 4915.2 kb/s

c. *Earth Side* Interfaces.

Unbalanced NRZ Group (V1 and V2 models only):
- Format . . . . . Unbalanced NRZ
- Rates . . . . . 288 and 576 kb/s (input)
  288, 576, and 1152 kb/s (output)

Balanced NRZ Group:
- Format . . . . . Balanced NRZ
- Rates . . . . . 8, 16, 32, 64, 72, 128, 144, 256, 288, 512, 576, 1024, and 1152 kb/s. 4915.2 kb/s for TD-976 mode.

Group Modem:

Group Data:
- Format . . . . . Conditioned diphase
- Rates . . . . . 72, 128, 144, 256, 288, 512, 576, 1024, and 1152 kb/s
- Cable length . . . . . 0 to 2 miles for data rates of 72 to 576 kb/s.
  0 to 1 mile for data rates of 1024 and 1152 kb/s.
  Internal cable equalization circuits compensate receive signal based on cable length in 1/4-mile increments.

Combined Digital Orderwire:
- Availability . . . . . Transmitted along with group data when group data rates are 256 kb/s and above.
- Format . . . . . NRZ

Rates:
- CESE data (V3 and V4 models only) . . . . . 2 kb/s
- Digital voice orderwire . . . . . 16 kb/s

1-11. Equipment Data - Continued.

Dedicated User (Loop Modem):
- Format ..... Conditioned diphase
- Rates ..... 16 or 32 kb/s

16 Kb/s Digital Voice Orderwires:
- Non-Secure Mode:
  - Interface device ..... H-250 Handset
  - Format ..... Analog
- Secure Mode:
  - Interface device ..... KY-57/58 Vinson
  - Format ..... Digital, ± 6v
  - Rate ..... 16 kb/s

2.4 Kb/s Digital Voice Orderwire (V3 and V4 models only):
- Interface device ..... Analog narrowband digital voice telephone
- Format ..... Digital, ±6v
- Rate ..... 2.4 kb/s

CESE Functions (V3 and V4 models only):
- Status Point Inputs:
  - No. ..... 56 max
  - Normal condition (any point) ..... +2.4 to +5.0v
  - Fault condition (any point) ..... 0.0 to +0.4v
- Data to DLED (Red):
  - Format ..... Digital, ±6v
  - Rate ..... 150 b/s
- Data from DLED (Black):
  - Format ..... Digital, ±6v
  - Rate ..... 2 kb/s
- CESE Telemetry Outputs:
  - No. ..... 4 max
  - Format ..... Balanced NRZ
  - Rate ..... 2 kb/s

Section III. PRINCIPLES OF OPERATION

Subject	*Para*	*Page*
Interfaces	1-12	1-11
TD-1337(V)1/G Interfaces	1-13	1-12
TD-1337(V)2/G Interfaces	1-14	1-14
TD-1337(V)3/G Interfaces	1-15	1-16
TD-1337(V)4/G Interfaces	1-16	1-18
Satellite Terminal Connectivities	1-17	1-20
Non-Nodal Point-To-Point Connectivity	1-18	1-20
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TD-754 Mux/TD-754 Demux Options	1-24	1-28
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Operating Routines	1-29	1-36

OVERVIEW

This section describes the principles of operation of the TD-1337(V)/G as related to the operator. To perform operating and troubleshooting procedures properly, you need to understand these principles. Five major areas are discussed.

- *Interfaces.* Paragraphs 1-12 through 1-16 discuss the number and types of interfaces for each TD-1337(V)/G model.
- *Terminal Connectivities.* The various forms of satellite terminal connectivities are discussed in paragraphs 1-17 through 1-22.
- *Timing Source Selection.* Paragraph 1-23 describes the three possible timing source selections.
- *TD-754 Mux/TD-754 Demux Options.* Paragraph 1-24 describes how certain TD-1337(V)/G models perform multiplexing and demultiplexing functions normally accomplished by a TD-754/G multiplexer.
- *Configuration/Operating Routines.* The operator performs various routines to configure and operate a TD-1337(V)/G. Paragraphs 1-25 through 1-29 describe these routines.

1-12. Interfaces.

a. General. Each TD-1337(V)/G model has different functional capabilities. Therefore, the number and types of interfaces vary with each model. For discussion purposes, these interfaces are referred to as either satellite side interfaces or earth side interfaces. The satellite side of the TD-1337(V)/G interfaces with the terminal radio equipment. The earth side of the TD-1337(V)/G interfaces with the various data users, The paragraphs listed below illustrate and discuss the specific interfaces applicable to each TD-1337(V)/G model.

Model	*Para*
V1	1-13
V2	1-14
V3	1-15
V4	1-16

b. Satellite Side Interfaces. Satellite side interfaces are to the MD-945 modem or other equivalent terminal radio equipment. Signals are the multiplexed supergroup (SG) output and SG'S received for demultiplexing.

c. Earth Side Interfaces. Earth side interfaces are subdivided into the following four categories:

. Group inputs/outputs

. Dedicated user

. Orderwires

. CESE telemetry (V3 and V4 models only)

These interfaces are to equipments in the satellite earth terminal and to equipments connected to the terminal.

(1) *Group Inputs/Outputs.* Group inputs/outputs consist of:

. TD-660/G unbalanced NRZ interfaces (V1 and V2 models only)

. Balanced NRZ group interfaces

. Group modem conditioned diphase interface

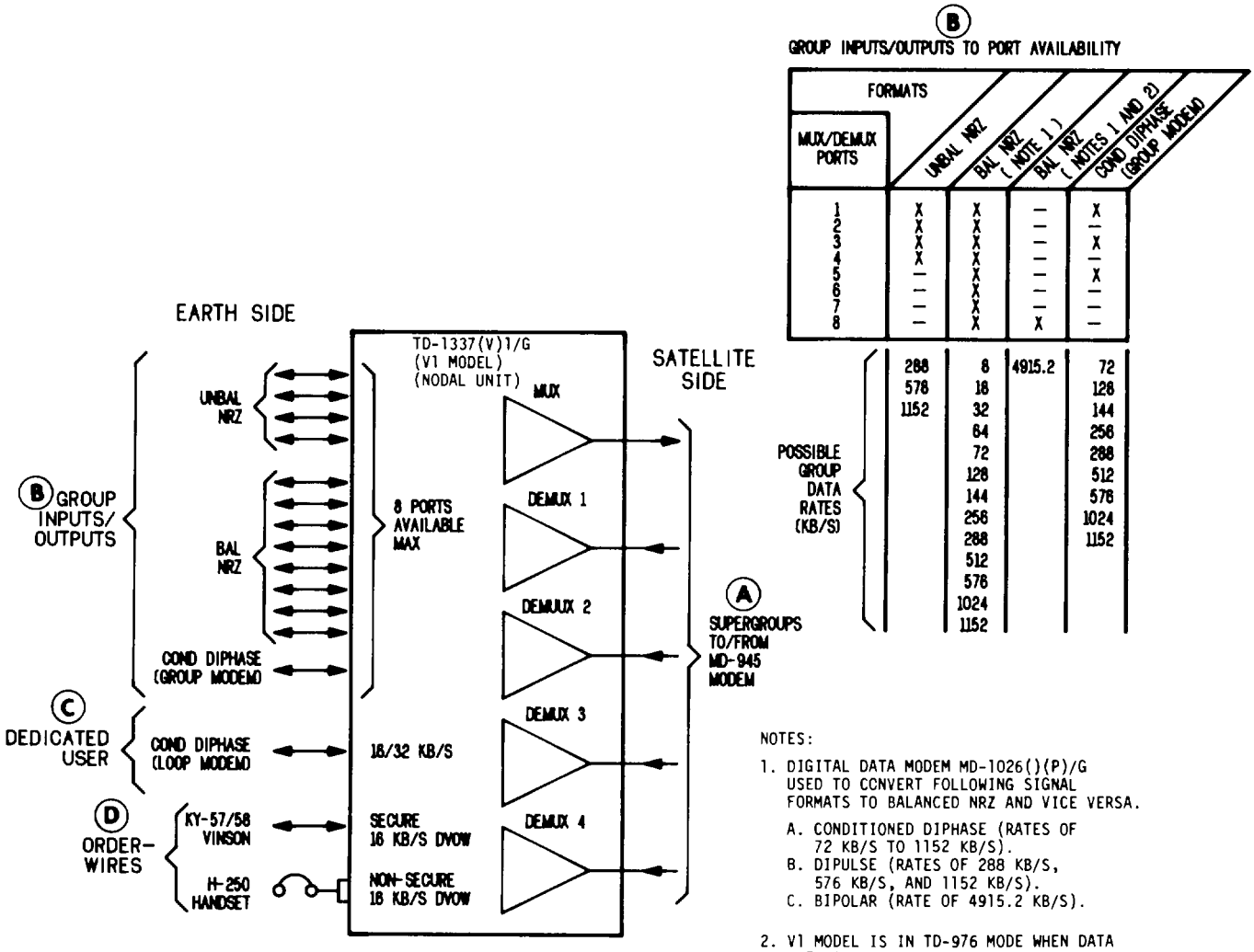
Each TD-1337(V)/G model has a certain maximum number of ports available to handle group inputs/outputs. In most cases, a given port can accommodate more than one type of interface. The TD-1337(V)/G operating configuration will determine which ports are active and select which interface is used at each active port. A port is defined as the entry and exit point on the TD-1337(V)/G for an active group input/output.

(2) *Dedicated User (Loop Modern).* All models have a second conditioned diphase interface for a dedicated user. The rate may be either 16 kb/s or 32 kb/s.

(3) *Orderwires.* All models have a 16 kb/s digital voice orderwire (DVOW) capability. This 16 kb/s DVOW may be operated in either a non-secure mode or a secure mode. In the non-secure mode, interface is with a H-250 handset connected to the front panel. In the secure mode, interface is with a KY-57/58 Vinson. The V3 and V4 models also have a 2.4 kb/s DVOW capability that interfaces with an advanced narrowband digital voice terminal (ANDVT).

(4) *CESE Telernetry.* On the V3 and V4 models only, interfaces are provided to facilitate CESE reporting functions.

1-13. TD-1337(V)1/G Interfaces.



(A) *Supergroups.* Multiplexer (roux) combines group inputs, dedicated user input (if used), and 16 kb/s DVOW input (if used) into a single output SG. Output SG rate is always the total of the following:

- Sum of active group input rates
- If used, 16 kb/s or 32 kb/s for dedicated user
- If used, 16 kb/s for 16 kb/s DVOW
- 8 kb/s for overhead

Four demultiplexers (demux) provide for simultaneous demultiplexing of four separate and independent received SG'S.

1-13. TD-1337(V)1/G Interfaces - Continued.

(B) *Group Inputs/Outputs.* Connection points exist for 13 group inputs/outputs. From these, a maximum of 8 may be selected for use (8 ports max available). The facing page chart defines which type(s) of group inputs/outputs (formats) can be accommodated by each port. Listed below the chart are the possible data rates for each format. As indicated by note 3, group data rates of 1024 and 1152 kb/s require the use of two ports.

Each received SG is demultiplexed (recombined) into its composite parts by a demux. Applicable group data is then switched to its designated port for output to the group. Thus, inputs and outputs for a given group use the same numbered port.

The conditioned diphase group modem input/output also provides for a combined digital orderwire to be received/transmitted along with the group data. This combined digital orderwire is available when group data rate is 256 kb/s and above and includes 16 kb/s of DVOW.

The VI model has a TD-976 mode. If this mode of operation is selected, a 4915.2 kb/s balanced NRZ input is accepted at input port 8 and becomes the output SG. In the return direction, a 4915.2 kb/s SG input is received and routed through demux 1 to port 8. No multiplexing or demultiplexing is performed nor are orderwires available in the TD-976 mode.

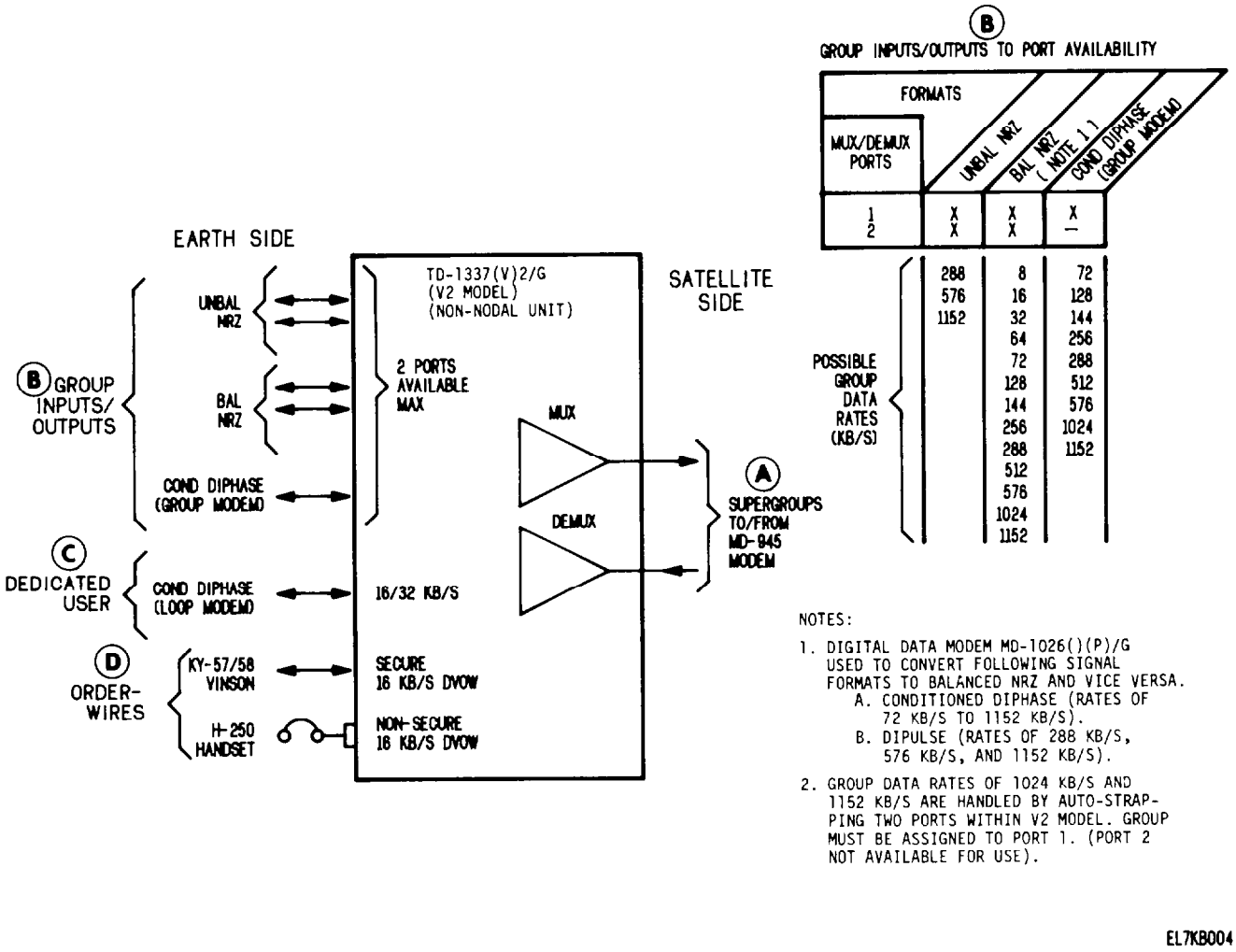
(C) *Dedicated User.* A 16 kb/s or 32 kb/s dedicated user option is available. If this option is used, data from the dedicated user is included in the multiplexed output SG. One of the four received SG'S will contain data for the dedicated user. That particular demux will be selected to complete routing of data to the dedicated user.

(D) *Orderwires.* A 16 kb/s DVOW capability is available and has two operating modes (non-secure and secure). Mode selection is controlled by the operator. Earth side interfaces are with a H-250 handset, a KY-57/58 Vinson, and a communications nodal control element (CNCE). The CNCE interface is through the combined digital orderwire that is part of the conditioned diphase group modem input/output. The Vinson and CNCE are secure orderwires.

The term "local" means your TD-1337(V)/G and the term "remote" means TD-1337(V)/G's that are on the other side of the satellite. Local and remote TD-1337(V)/G's must be in the same orderwire modes to conduct a conversation. Following is a list of points between which 16 kb/s DVOW conversations can be conducted.

Points	Non-Secure	Secure
Local H-250 handset to H-250 handsets at remote TD-1337(V)/G's	x	---
Local Vinson to local CNCE	x	x
Local Vinson to Vinsons at remote TD-1337(V)/G's	---	x
Local Vinson to CNCE at remote TD-1337(V)/G's	...	x
Local CNCE to Vinsons at remote TD-1337(V)/G's	---	x
Local CNCE to CNCE at remote TD-1337(V)/G's	---	x

1-14. TD-1337(V)2/G Interfaces.



(A) *Supergroups.* Multiplexer (roux) combines group inputs, dedicated user input (if used), and 16 kb/s DVOW input (if used) into a single output SG. Output SG rate is always the total of the following:

l Sum of active group input rates

. If used, 16 kb/s or 32 kb/s for dedicated user

. If used, 16 kb/s for 16 kb/s DVOW

. 8 kb/s for overhead

A demultiplexer (demux) provides for demultiplexing the received SG.

1-14. TD-1337(V)2/G Interfaces - Continued.

(B) *Group /nputs/Outputs.* Connection points exist for 5 group inputs/outputs. From these, a maximum of 2 may be selected for use (2 ports max available). The facing page chart defines which type(s) of group inputs/outputs (formats) can be accommodated by each port. Listed below the chart are the possible data rates for each format. As indicated by note 2, group data rates of 1024 and 1152 kb/s require the use of two ports.

The received SG is demultiplexed (recombined) into its composite parts by the demux. Applicable group data is then switched to its designated port for output to the group, Thus, inputs and outputs for a given group use the same numbered port.

The conditioned diphase group modem input/output also provides for a combined digital orderwire to be received/transmitted along with the group data. This combined digital orderwire is available when group data rate is 256 kb/s and above and includes 16 kb/s of DVOW.

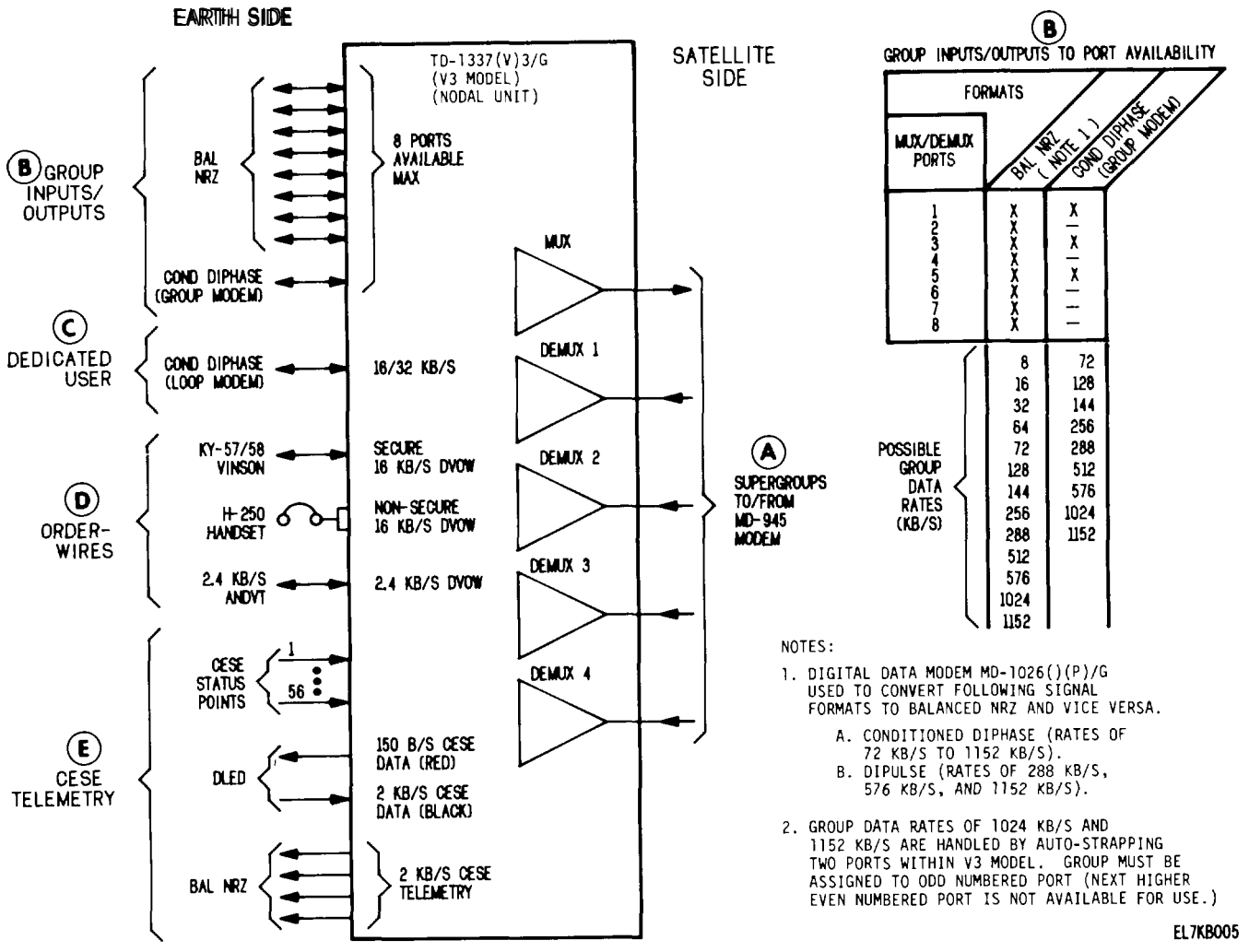
(C) *Dedicated User.* A 16 kb/s or 32 kb/s dedicated user option is available. If this option is used, data from the dedicated user is included in the multiplexed output SG. Data will be demultiplexed from the received SG and routed to the dedicated user.

(D) *Orderwires.* A 16 kb/s DVOW capability is available and has two operating modes (non-secure and secure), Mode selection is controlled by the operator. Earth side interfaces are with a H-250 handset, a KY-57/58 Vinson, and a communications nodal control element (CNCE). The CNCE interface is through the combined digital orderwire that is part of the conditioned diphase group modem input/output. The Vinson and CNCE are secure orderwires.

The term “local” means your TD-1337(V)/G and the term “remote” means TD-1337(V)/G’s that are on the other side of the satellite. Local and remote TD-1337(V)/G’s must be in the same orderwire modes to conduct a conversation. Following is a list of points between which 16 kb/s DVOW conversations can be conducted.

Points	Non-Secure	Secure
Local H-250 handset to H-250 handsets at remote TD-1337(V)/G’s	x	...
Local Vinson to local CNCE	x	x
Local Vinson to Vinsons at remote TD-1337(V)/G’s	...	x
Local Vinson to CNCE at remote TD-1337(V)/G’s	...	x
Local CNCE to Vinsons at remote TD-1337(V)/G’s	...	x
Local CNCE to CNCE at remote TD-1337(V)/G’s	...	x

1-15. TD-1337(V)3/G Interfaces.



(A) *Supergroups.* Multiplexer (mux) combines group inputs, dedicated user input (if used), 16 kb/s DVOW input (if used), 2.4 kb/s DVOW input, and CESE telemetry into a single output SG. Output SG rate is always the total of the following:

- Sum of active group input rates
- If used, 16 kb/s or 32 kb/s for dedicated user
- If used, 16 kb/s for 16 kb/s DVOW
- 8 kb/s for overhead (includes 2 kb/s of CESE data and 2.4 kb/s DVOW)

Four demultiplexers (demux) provide for simultaneous demultiplexing of four separate and independent received SG 's.

(B) *Group Inputs/Outputs,* Connection points exist for 9 group inputs/outputs. From these, a maximum of 8 may be selected for use (8 ports max available). The above chart defines which type(s) of group inputs/outputs (formats) can be accommodated by each port. Listed below the chart are the possible data rates for each format. As indicated by note 2, group data rates of 1024 and 1152 kb/s require the use of two ports.

Each received SG is demultiplexed (recombined) into its composite parts by a demux. Applicable group data is then switched to its designated port for output to the group. Thus, inputs and outputs for a given group use the same numbered port.

1-15. TD-1337(V)3/G Interfaces - Continued.

The conditioned diphase group modem input/output also provides for a combined digital orderwire to be received/transmitted along with the group data. This combined digital orderwire is available when group data rate is 256 kb/s and above and includes 16 kb/s of DVOW and 2 kb/s of CESE data.

(C) *Dedicated User.* A 16 kb/s or 32 kb/s dedicated user option is available. If this option is used, data from the dedicated user is included in the multiplexed output SG. One of the four received SG'S will contain data for the dedicated user. That particular demux will be selected to complete routing of data to the dedicated user.

(D) *Orderwires.* Two digital voice orderwires are available: a 16 kb/s DVOW and a 2.4 kb/s DVOW.

Earth side interface for the 2.4 kb/s DVOW is with an advanced narrowband digital voice terminal (ANDVT). This orderwire provides terminal to terminal communications. Data for this orderwire is included as part of the overhead in the SG.

The 16 kb/s DVOW has two operating modes (non-secure and secure). Mode selection is controlled by the operator. Earth side interfaces are with a H-250 handset, a KY-57/58 Vinson, and a CNCE. The CNCE interface is through the combined digital orderwire that is part of the conditioned diphase group modem input/output, The Vinson and CNCE are secure orderwires.

The term "local" means your TD-1337(V)/G and the term "remote" means TD-1337(V)/G's that are on the other side of the satellite. Local and remote TD-1337(V)/G's must be in the same orderwire modes to conduct a conversation. Following is a list of points between which 16 kb/s DVOW conversations can be conducted.

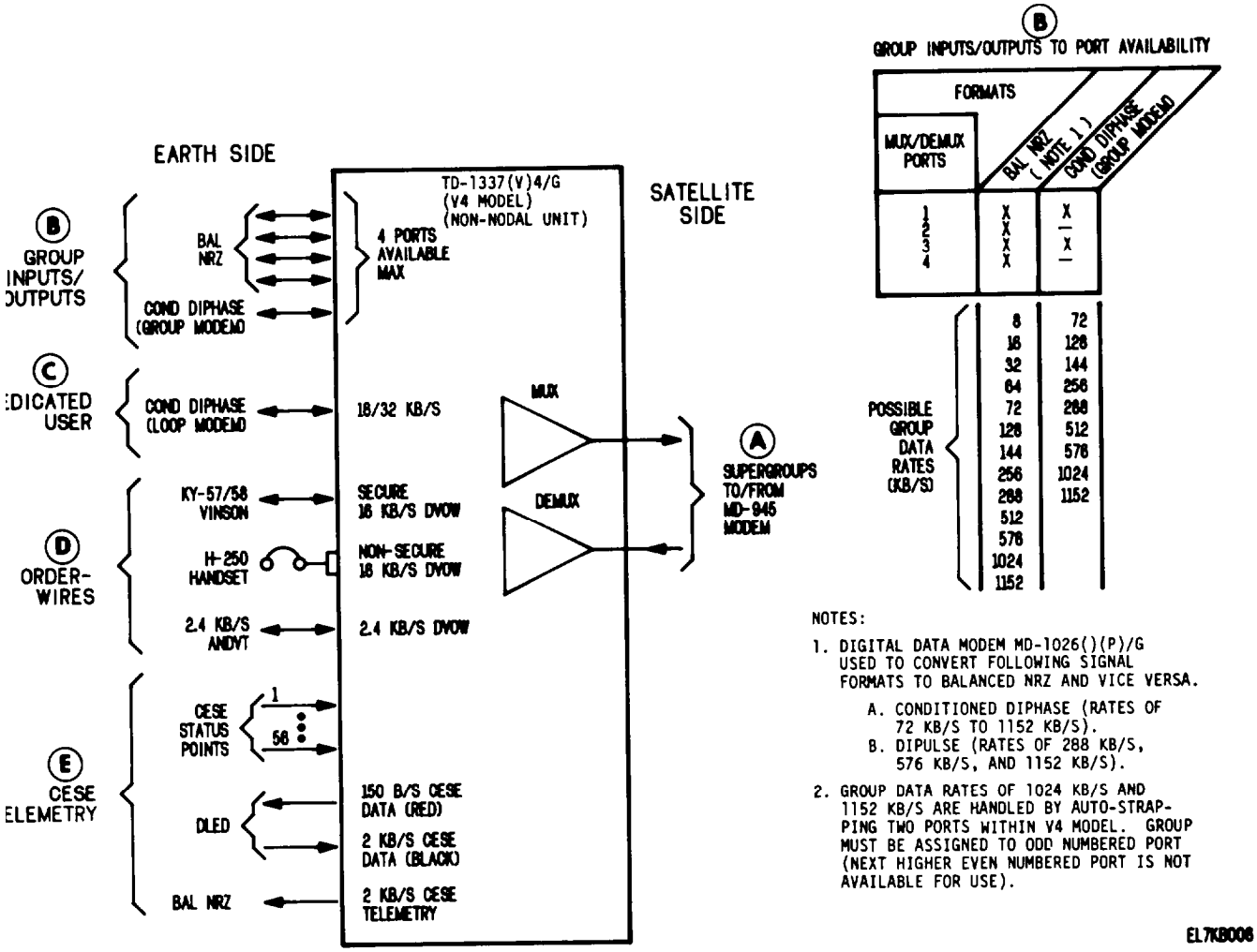
Points	Non-Secure	Secure
Local H-250 handset to H-250 handsets at remote TD-1337(V)/G's	x	---
Local Vinson to local CNCE	x	x
Local Vinson to Vinsons at remote TD-1337(V)/G's	...	x
Local Vinson to CNCE at remote TD-1337(V)/G's	---	x
Local CNCE to Vinsons at remote TD-1337(V)/G's	---	x
Local CNCE to CNCE at remote TD-1337(V)/G's	...	x

(E) *CESE* Telernetry, Communications equipment support element (CESE) telemetry is a collection of equipment status reports that are processed for transmission to the controlling CNCE.

Up to 56 CESE status points are monitored, formatted to a block message, and applied to a digital loop encryption device (DLED) as 150 b/s CESE data (red). The DLED encrypts the data and returns it as 2 kb/s CESE data (black), The encrypted CESE data is then included as part of the overhead in the SG.

CESE telemetry is demultiplexed out of the received SG'S and made available as 2 kb/s CESE telemetry in balanced NRZ format. A CESE telemetry interface is also available through the combined digital orderwire that is part of the conditioned diphase group modem input/output. The DLED output or the output of demux 1 can be selected by the operator for this interface.

1-16. TD-1337(V)4/G Interfaces.



(A) *Supergroups.* Multiplexer (roux) combines group inputs, dedicated user input (if used), 16 kb/s DVOW input if used), 2.4 kb/s DVOW input, and CESE telemetry into a single output SG. Output SG rate is always the total of the following:

- Sum of active group input rates
- If used, 16 kb/s or 32 kb/s for dedicated user
- If used, 16 kb/s for 16 kb/s DVOW
- 8 kb/s for overhead (includes 2 kb/s of CESE data and 2.4 kb/s DVOW)

A demultiplexer (demux) provides for demultiplexing the received SG.

(B) *Group Inputs/Outputs.* Connection points exist for 5 group inputs/outputs. From these, a maximum of 4 may be selected for use (4 ports max available). The above chart defines which type(S) of group inputs/outputs (formats) can be accommodated by each port. Listed below the chart are the possible data rates for each format. As indicated by note 2, group data rates of 1024 and 1152 kb/s require the use of two ports.

The received SG is demultiplexed (recombined) into its composite parts by the demux. Applicable group data is then switched to its designated port for output to the group. Thus, inputs and outputs for a given group use the same numbered port.

1-16. TD-1337(V)4/G Interfaces-Continued.

The conditioned diphase group modem inputioutput also provides for a combined digital orderwire to be received/transmitted along with the group data. This combined digital orderwire is available when group data rate is 256 kb/s and above and includes 16 kb/s of DVOW and 2 kb/s of CESE data.

(C) *Dedicated User.* A 16 kb/s or 32 kb/s dedicated user option is available. If this option is used, data from the dedicated user is included in the multiplexed output SG. Data will be demultiplexed from the received SG and routed to the dedicated user.

(D) *Orderwires.* Two digital voice orderwires are available: a 16 kb/s DVOW and a 2.4 kb/s DVOW.

Earth side interface for the 2.4 kb/s DVOW is with an advanced narrowband digital voice terminal (ANDVT). This orderwire provides terminal to terminal communications. Data for this orderwire is included as part of the overhead in the SG.

The 16 kb/s DVOW has two operating modes (non-secure and secure). Mode selection is controlled by the operator. Earth side interfaces are with a H-250 handset, a KY-57/58 Vinson, and a CNCE. The CNCE interface is through the combined digital orderwire that is part of the conditioned diphase group modem input/output. The Vinson and CNCE are secure orderwires.

The term “local” means your TD-1337(V)/G and the term “remote” means TD-1337(V)/G’s that are on the other side of the satellite. Local and remote TD-1337(V)/G’s must be in the same orderwire modes to conduct a conversation. Following is a list of points between which 16 kb/s DVOW conversations can be conducted.

Points	Non-Secure	Secure
Local H-250 handset to H-250 handsets at remote TD-1337(V)/G’s	x	---
Local Vinson to local CNCE	x	x
Local Vinson to Vinsons at remote TD-1337(V)/G’s	---	x
Local Vinson to CNCE at remote TD-1337(V)/G’s	---	x
Local CNCE to Vinsons at remote TD-1337(V)/G’s	---	x
Local CNCE to CNCE at remote TD-1337(V)/G’s	---	x

(E) *CESE Telernetry.* Communications equipment support element (CESE) telemetry is a collection of equipment status reports that are processed for transmission to the controlling CNCE.

Up to 56 CESE status points are monitored, formatted to a block message, and applied to a digital loop encryption device (DLED) as 150 b/s CESE data (red). The DLED encrypts the data and returns it as 2 kb/s CESE data (black). The encrypted CESE data is then included as part of the overhead in the SG.

CESE telemetry is demultiplexed out of the received SG’S and made available as 2 kb/s CESE telemetry in balanced NRZ format. A CESE telemetry interface is also available through the combined digital orderwire that is part of the conditioned diphase group modem input/output. The DLED output or the output of demux 1 can be selected by the operator for this interface.

1-17. Satellite Terminal Connectivities.

a. The TD-1337(V)/G allows satellite terminals to communicate with the following forms of connectivities:

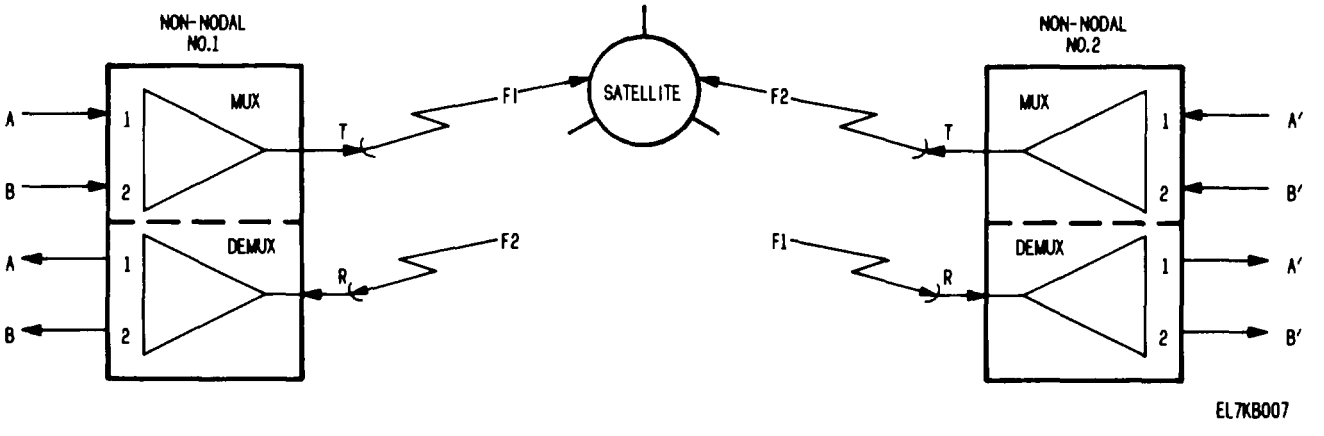
Form	*Para*
Non-nodal point-to-point connectivity	1-18
TD-976 mode connectivity	1-19
Nodal/non-nodal connectivity	1-20
Mesh connectivity	1-21
Hybrid connectivity	1-22

b. Paragraphs 1-18 through 1-22 each discuss a specific form of connectivity. These discussions represent typical applications. For simplicity, terminal equipment between the TD-1337(V)/G and the satellite is not shown. Terminal transmitting equipment is represented by a “T’ on the diagrams, Terminal receiving equipment is represented by a “R” on the diagrams.

c. The terms nodal and non-nodal are used in the following discussions. A V1 or V3 model is a nodal unit. A V2 or V4 model is a non-nodal unit. A nodal unit is capable of simultaneously demultiplexing four received SG’S. A non-nodal unit is capable of demultiplexing only one received SG.

d. For simplicity, only group inputs/outputs are shown on the following diagrams, To aid in understanding the diagrams, each group has been assigned an arbitrary letter designation or a letter designation with a prime symbol (’). Thus, group A communicates with group A’, B with B’, and so on. The ports assigned to each group are shown by numbers.

1-18. Non-Nodal Point-To-Point Connectivity.



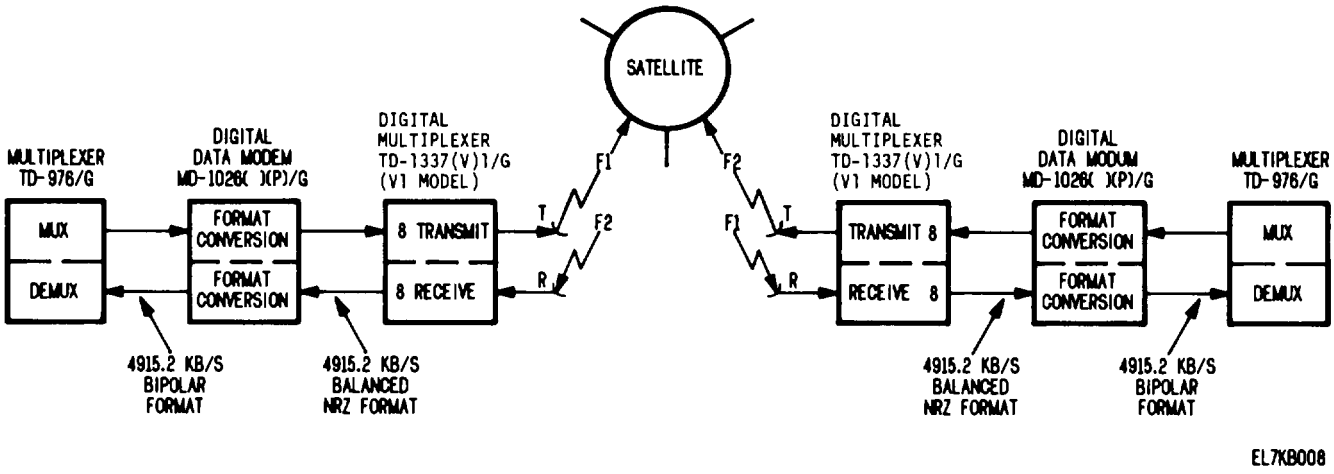
This form of connectivity allows one non-nodal unit to communicate with another non-nodal unit.

In the above example, inputs from groups (users) A and B enter ports 1 and 2 of non-nodal unit No. 1. The two group inputs are multiplexed into a SG. The SG is processed through the terminal transmitting equipment to produce an rf output. This rf output (designated F1) is transmitted via the satellite to non-nodal unit No. 2 where it is demultiplexed into its original composite parts and supplied to users A’ and B’.

Similarly, inputs from users A’ and B’ are multiplexed into a SG by non-nodal unit No. 2. This SG, designated F2, is demultiplexed by non-nodal unit No. 1 and supplied to users A and B.

Thus, user A communicates with user A’ and user B communicates with user B’.

1-19. TD-976 Mode Connectivity.

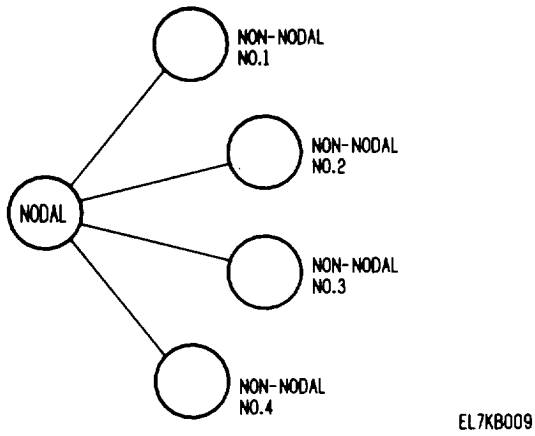


This form of connectivity allows for communication between two TD-976/G multiplexer. The TD-976 mode is applicable only to the VI model.

The TD-976/G can have up to eight group inputs. The output SG of a TD-976/G is always at a 4915.2 kb/s rate and in a bipolar format. The MD-1026( )(P)/G converts this bipolar SG to a balanced NRZ format which is applied to port 8 of the V1 model. In the TD-976 mode, the VI model serves as an interface between the MD-1026( )(P)/G and the terminal transmitting equipment, Ports 1 through 7 are not available for use and no orderwire options are available in this mode.

The SG received from the satellite is converted to a balanced NRZ format and made available at output port 8 of the VI model. In turn, the MD-1026( )(P)/G converts the SG to a bipolar format for application to the TD-976/G.

1-20. Nodal/Non-Nodal Connectivity.



This form of connectivity allows one nodal unit to communicate with up to four non-nodal units (simplified sketch shown above).

The facing page illustration is a more detailed example of the above simplified sketch. In this example, inputs from eight groups (users) identified as A through H are applied to input ports 1 through 8 of the nodal unit. These eight inputs are multiplexed into a SG. The SG is processed through the terminal transmitting equipment to produce a rf output designated F1. F1 is broadcast to the four non-nodal units via the satellite.

Each non-nodal unit demultiplexes received SG F1 to obtain desired group data. Data for each group is then routed to its assigned output port.

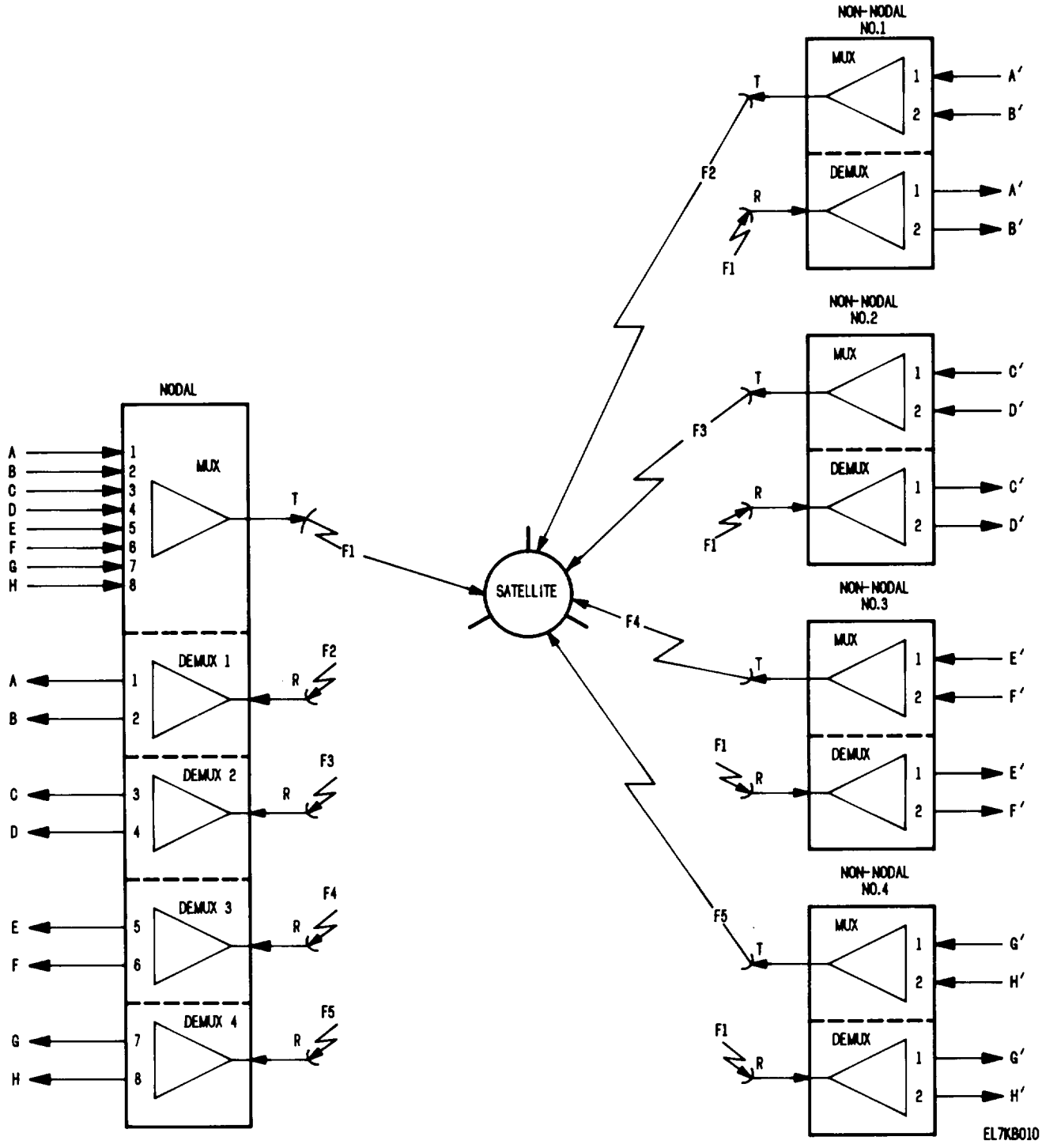
In the return direction, each non-nodal unit multiplexes its group inputs into an output SG. These four output SG'S (designated F2 through F5) are transmitted via the satellite to the nodal unit. At the nodal unit, each incoming SG is demultiplexed by a separate demux. Data for each group is then routed to its assigned output port.

For example, data from groups C and D enters ports 3 and 4 of the nodal unit mux and becomes part of SG F1. In turn, non-nodal unit No. 2 receives and demultiplexes the groups C and D data from SG F1. This group data is then routed to output ports 1 and 2 for users C' and D'. In the return direction data from groups C' and D' are multiplexed by non-nodal unit No. 2 to form SG F3. Demux 2 in the nodal unit demultiplexes received SG F3 and routes the demultiplexed data to output ports 3 and 4. Thus, user C communicates with user C' and user D with user D'.

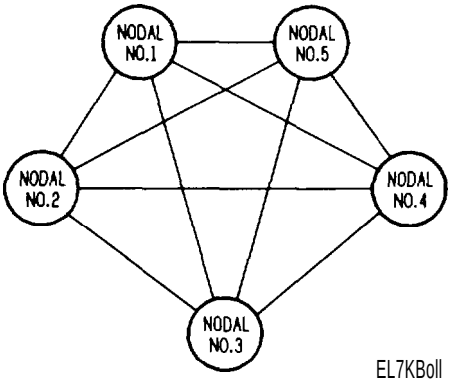
In summary, the following should be noted:

- The same numbered port is used to input and output data for a given group. For example, if data from a given group enters at mux input port 4, then return data for that group must exit at output port 4.
- Each demux has a port assignment capability controlled by operator entered configuration data. That is, data for a given group is demultiplexed out of a received SG and routed to its assigned output port.

1-20. Nodal/Non-Nodal Connectivity - Continued.



1-21. Mesh Connectivity.



This form of connectivity allows a nodal unit to communicate with up to four other nodal units (simplified sketch shown above).

The facing page illustration is a more detailed example of the above simplified sketch. In this example, each nodal unit is shown receiving eight group inputs. Therefore, the rate of each group input is 576 kb/s or less. Remember that group input rates of 1024 kb/s or 1152 kb/s require the use of two ports. The mux in each nodal unit multiplexes the group inputs together into an output SG. These output SG'S have been designated F1 through F5. Each output SG is broadcast to the other four nodal units via the satellite.

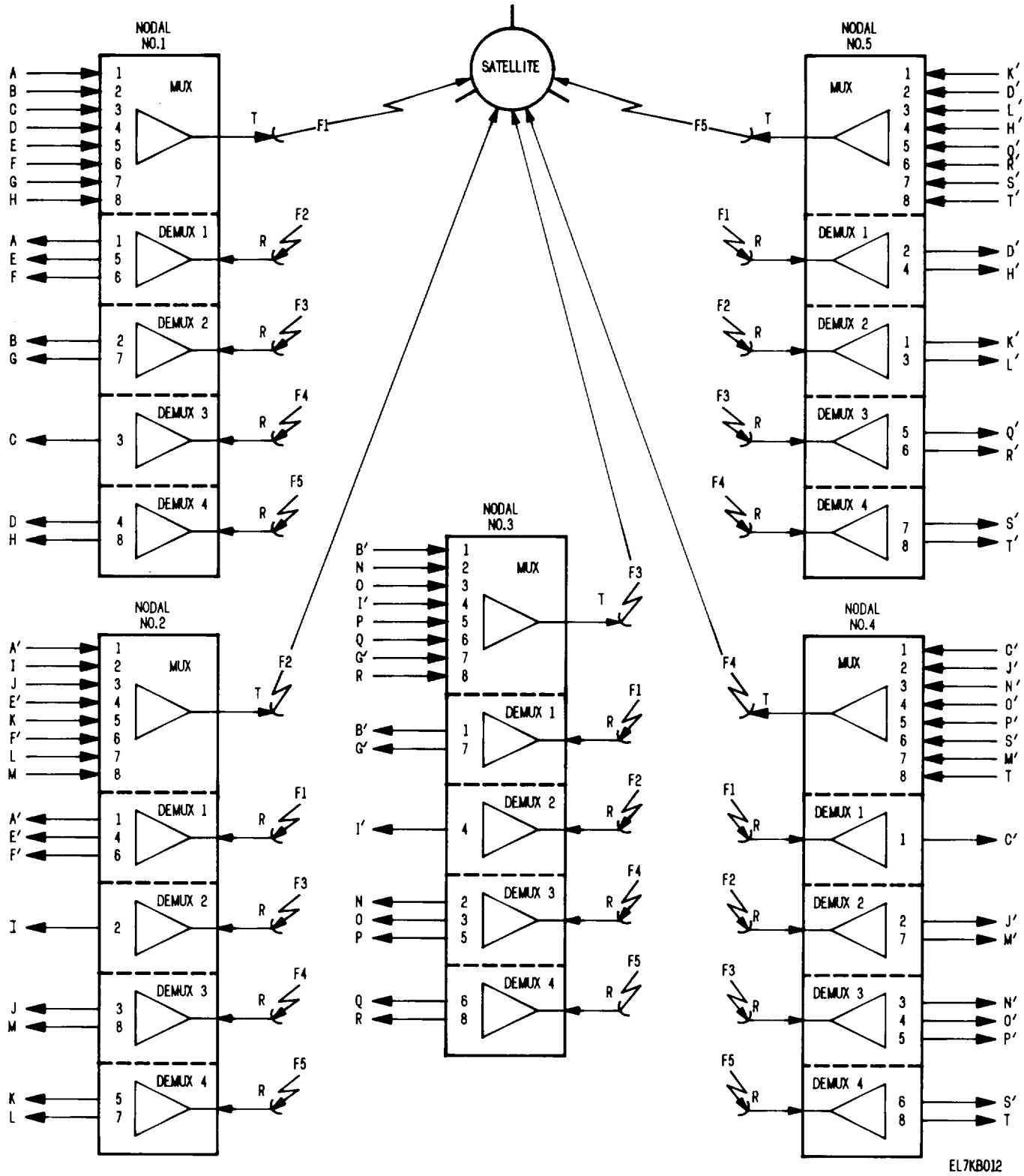
In the return direction, each nodal unit receives four SG'S. Each incoming SG is demultiplexed by a separate demux to obtain group data for those groups connected to that unit. Data for each group is routed to its assigned output port.

For example, data from group K enters at mux input port 5 of nodal unit No. 2 and is multiplexed into SG F2. Demux 2 of nodal unit No. 5 demultiplexes received SG F2 to obtain data for group K and routes it to output port 1. Similarly, data from group K' enters at mux input port 1 of nodal unit No. 5 and is multiplexed into SG F5. Demux 4 of nodal unit No. 2 demultiplexes SG F5 to obtain data for group K' and routes it to output port 5. Thus, user K communicates with user K'.

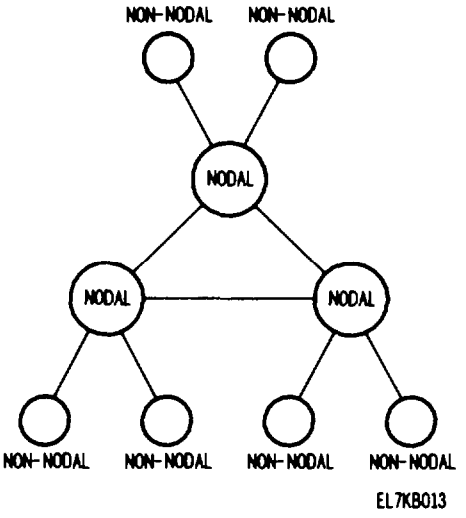
In summary, the following should be noted:

- The same numbered port is used to input and output data for a given group. For example, if data from a given group enters at mux input port 4, then return data for that group must exit at output port 4,
- Each demux has a port assignment capability controlled by operator entered configuration data. That is, data for a given group is demultiplexed out of a received SG and routed to its assigned output port.

1-21. Mesh Connectivity - Continued.



1-22. Hybrid Connectivity.



This form of connectivity is a combination of nodal/non-nodal and mesh connectivities (simplified sketch shown above). It allows a nodal unit to communicate with up to four other units that may be any combination of nodals and non-nodals.

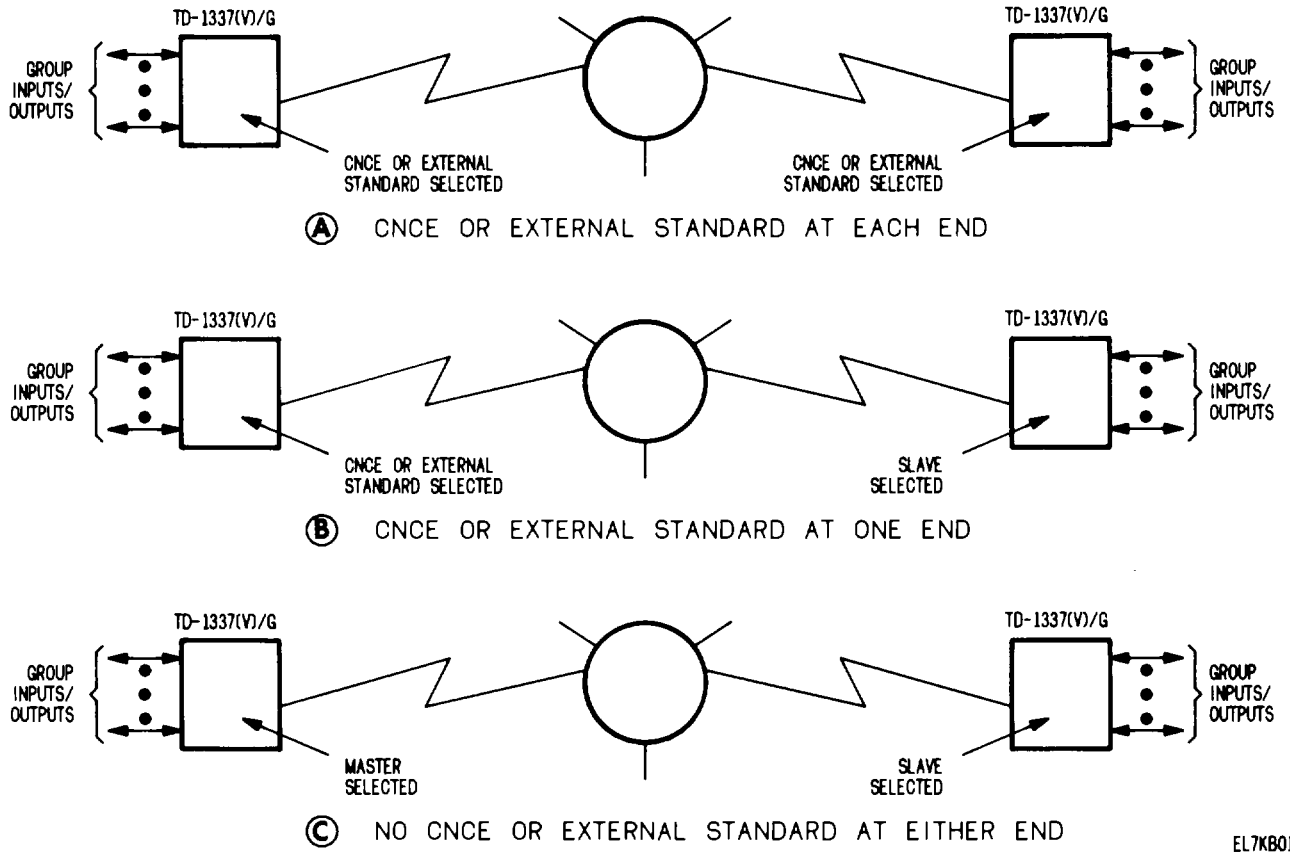
1-23. Timing Source Selection.

The TD-1337(V)/G is a synchronous multiplexer-demultiplexer. Therefore, all earth side interfacing equipments and the TD-1337(V)/G must be synchronized. Interfacing earth side equipments are synchronized to the TD-1337(V)/G by slaving their transmit timing to their receive timing or by being synchronized to the CNCE or external standard source. A timing source selection is made as part of the TD-1337(V)/G configuration routine. There are three possible timing source selections.

- *CNCE or External Standard.* This timing source selection synchronizes the TD-1337(V)/G to a selected group input. For this selection to be made, the group input must be in a balanced NRZ or conditioned diphase format and at a rate of 72 kb/s or greater. To ensure proper operation, the group input must have a timing stability of 1 part per million or better,
- *Master.* This timing source selection causes the TD-1337(V)/G to operate from an internal timing source. Normally, a nodal unit would be a master.
- *Slave.* This timing source selection causes the TD-1337(V)/G to be synchronized to a remote TD-1337(V)/G that is operating from a CNCE or external standard or as a master. Synchronization is accomplished by means of control data that is automatically transmitted/received in the SG.

The facing page illustration shows typical examples of various timing source selections.

1-23. Timing Source Selection - Continued.



(A) *CNCE or External Standard at Each End.* In this example, both TD-1337(V)/G's have selected CNCE or external standard as the timing source. In turn, each group input that meets the necessary criteria can be selected as a source. From these, the TD-1337(V)/G will select one of the group inputs as the timing source. In the event of failure of this source, the TD-1337(V)/G will automatically switch to one of the remaining sources. In the event all sources are lost, the TD-1337(V)/G will switch to a slave condition.

(B) In this example, a CNCE or external standard timing source exists at only one location. Therefore, the other TD-1337(V)/G has selected slave as its timing source. Slave timing is regulated by control data that is automatically transmitted/received in the SG.

(C) In this example, a CNCE or external standard timing source is not available. Therefore, one TD-1337(V)/G will be designated a master and the other will be a slave. The master operates from its own internal timing source.

1-24. TD-754 Mux/TD-754 Demux Options.

a. Certain TD-1337(V)/G models have the capability to perform multiplexing and demultiplexing functions normally accomplished by a TD-754/G. Use of these options eliminate the need for a TD-754/G to be located in the same terminal as the TD-1337(V)/G.

- The VI model has both TD-754 mux and TD-754 demux option capabilities.
- The V2 model has only a TD-754 demux option capability.

b. The TD-754 mux function is performed in the demultiplexer section of a V1 model. Two separate 576 kb/s groups are demultiplexed out of a received SG and then combined (TD-754 mux function) into a 1152 kb/s output. A maximum of two pairs of 576 kb/s groups can be demultiplexed and so combined. These outputs are in a balanced NRZ format and use output ports 5 and 7.

The TD-754 demux function is performed in the demultiplexer section of a V1 or V2 model. A 1152 kb/s group is demultiplexed out of a received SG and presented in parallel, in unbalanced NRZ format, at output ports 1 and 2 or 3 and 4.

d. The facing page illustration shows an example of use of the TD-754 mux and TD-754 demux options. In this example, two TD-660/G's at one end of the communications link are remoted from a VI model. At the other end of the link, two TD-660/G's are co-located with the other V1 or V2 model. Each pair of TD-660/G's are operated in a master/slave arrangement. Note that each master has its transmit timing slaved to its receive timing. This synchronizes the TD-660/G's with the V1 or V2 model. For simplicity, this figure only shows the input/output ports associated with the above described TD-660/G's. Other input/output ports could be processing data for other users.

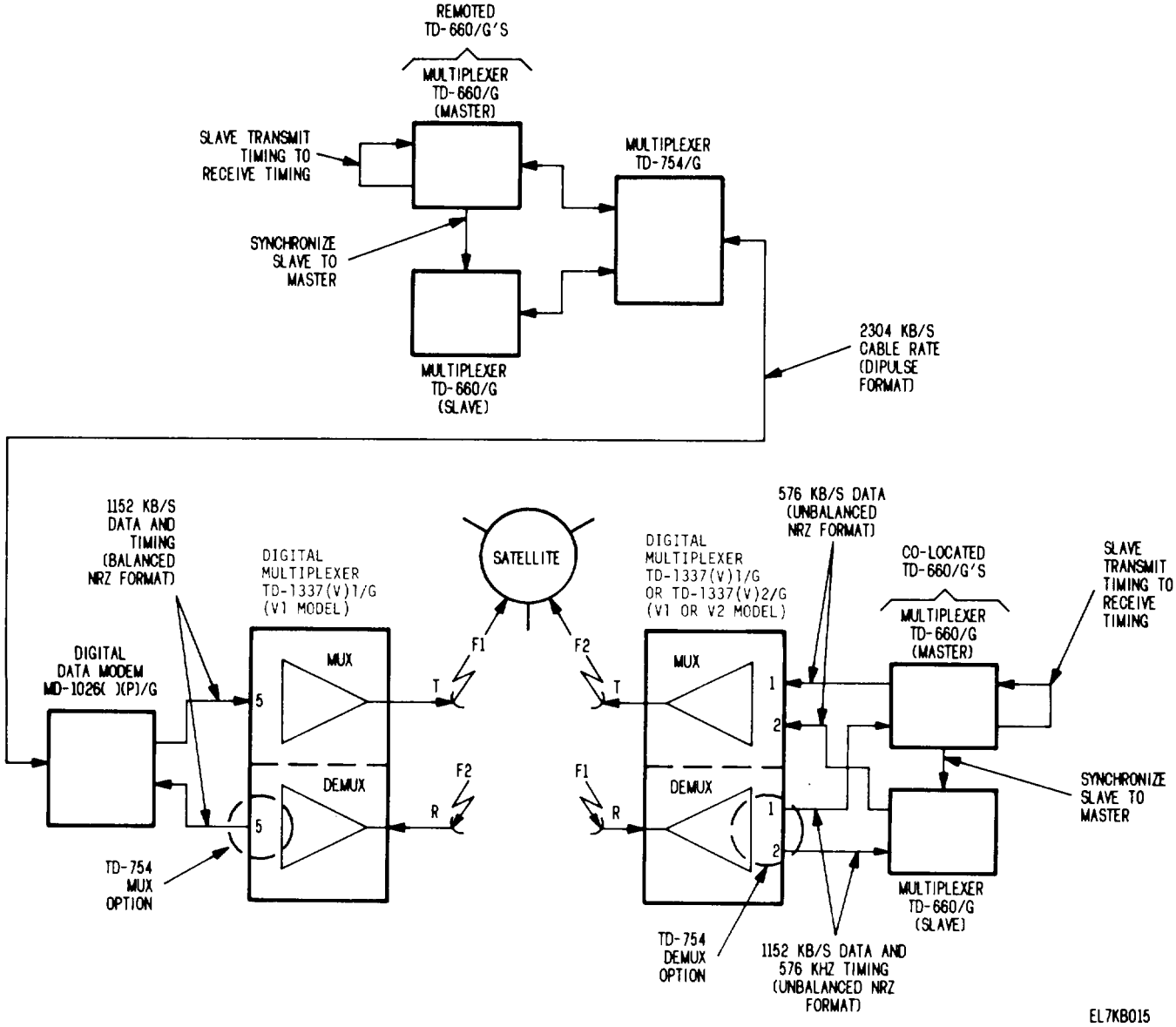
e. The remoted TD-660/G's each supply a 576 kb/s data stream to the TD-754/G which interleaves these two inputs into a single output (true data rate of 1152 kb/s). The TD-754/G has the capability of driving a cable system with restorers placed at appropriate intervals. Rate of transmission over the cable system is 2304 kb/s. Therefore, the TD-754/G transmits each data bit twice to achieve the cable rate. The MD-1026( )(P)/G receives the TD-754/G dipulse output and converts it into a balanced NRZ format at a true data rate of 1152 kb/s. Associated timing at 1152 kHz is also provided. This data and timing is applied to input port 5 for multiplexing into SG F1.

f. At the other V1 or V2 model, SG F1 is received and the 1152 kb/s group is demultiplexed out of the SG. This 1152 kb/s group is then presented at output ports 1 and 2 in parallel and in a unbalanced NRZ format (TD-754 demux function). Timing of 576 kHz is also supplied. Separation of the 1152 kb/s group data into two 576 kb/s groups is accomplished by the co-located TD-660/G's.

g. In the return direction, each co-located TD-660/G supplies a 576 kb/s data input. These data inputs, at input ports 1 and 2, are multiplexed into SG F2 as two separate 576 kb/s groups.

h. At the V1 model receiving SG F2, the two separate 576 kb/s groups are demultiplexed out of the received SG. These two 576 kb/s groups are then combined into a 1152 kb/s group (TD-754 mux function) that appears at output port 5. The MD-1026( )(P)/G converts the balanced NRZ output at port 5 into a dipulse format for routing over the cable system to the TD-754/G. In turn, the TD-754/G supplies 1152 kb/s data to the remoted TD-660/G's for separation into two 576 kb/s groups.

1-24. TD-754 Mux/TD-754 Demux Options – Continued.



1-25. Configuration/Operating Routines.

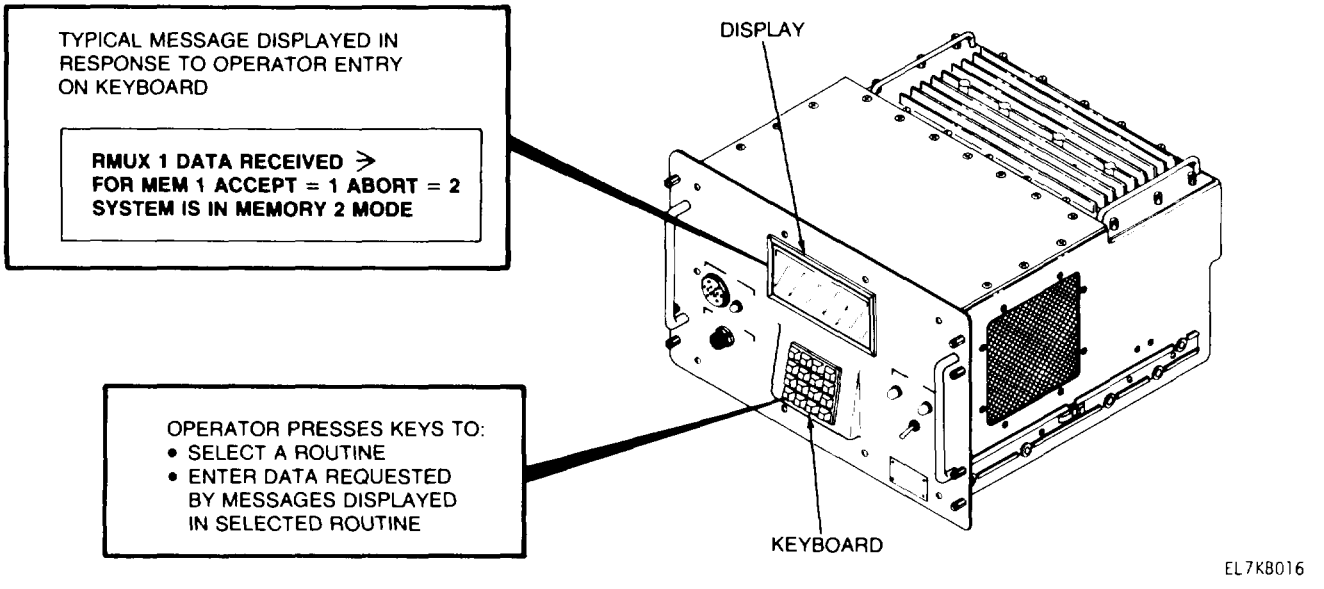
a. General. The operator performs various routines to configure and operate a TD-1337(V)/G. These routines are divided into configuration routines (b below) and operating routines (c below). A routine is defined as a series of sequential steps that an operator performs. The facing page illustration locates the keyboard and display which form the communications link between the operator and the TD-1337(V)/G. With these, the operator can select and perform routines. The operator requests or enters data by pressing keys on the keyboard. The 3-line display responds by presenting information and instructional messages as required by the routine.

b. Configuration Routines. Configuration data must be entered into a TD-1337(V)/G to place it in the desired operating configuration. Configuration routines are used to generate and enter this configuration data. Paragraph 1-27 describes the various configuration routines.

- Configuration data defines the operating parameters for a TD-1337(V)/G. For example, which ports are active and the rate and format of data at each active port.
- Configuration data is stored in non-volatile memory (NVM). NVM retains previously entered configuration data during electrical power interrupts or equipment turn-off periods. NVM has two identical memory areas which are identified as memory 1 and memory 2. Each memory area can receive and store configuration data for a TD-1337(V)/G operating configuration. Thus, a TD-1337(V)/G has the capability to operate in one mode (memory 1 or memory 2) and have an alternate operating configuration in the inactive memory area.
- For a TD-1337(V)/G to be completely configured, configuration data must be entered sufficient to:
  1. Configure orderwire.
  2. Configure local roux,
  3. Configure each local active demux.
- Configuration data for an operating configuration for your local TD-1337(V)/G may be generated by the following methods.
  1. Generated manually by local operator,
  2. Downloaded to you from remote TD-1337(V)/G's.
  3. Combination of the above.

c. *Operating Routines.* Operating routines are all routines not related to configuration. Operating routines allow you to make and receive orderwire calls, display or change system mode, recall diagnostic information for troubleshooting, and display various system status. With one exception (system mode change), operating routines can be performed without interrupting flow of user traffic. Paragraph 1-29 describes the various operating routines.

1-25. Configuration/Operating Routines - Continued.



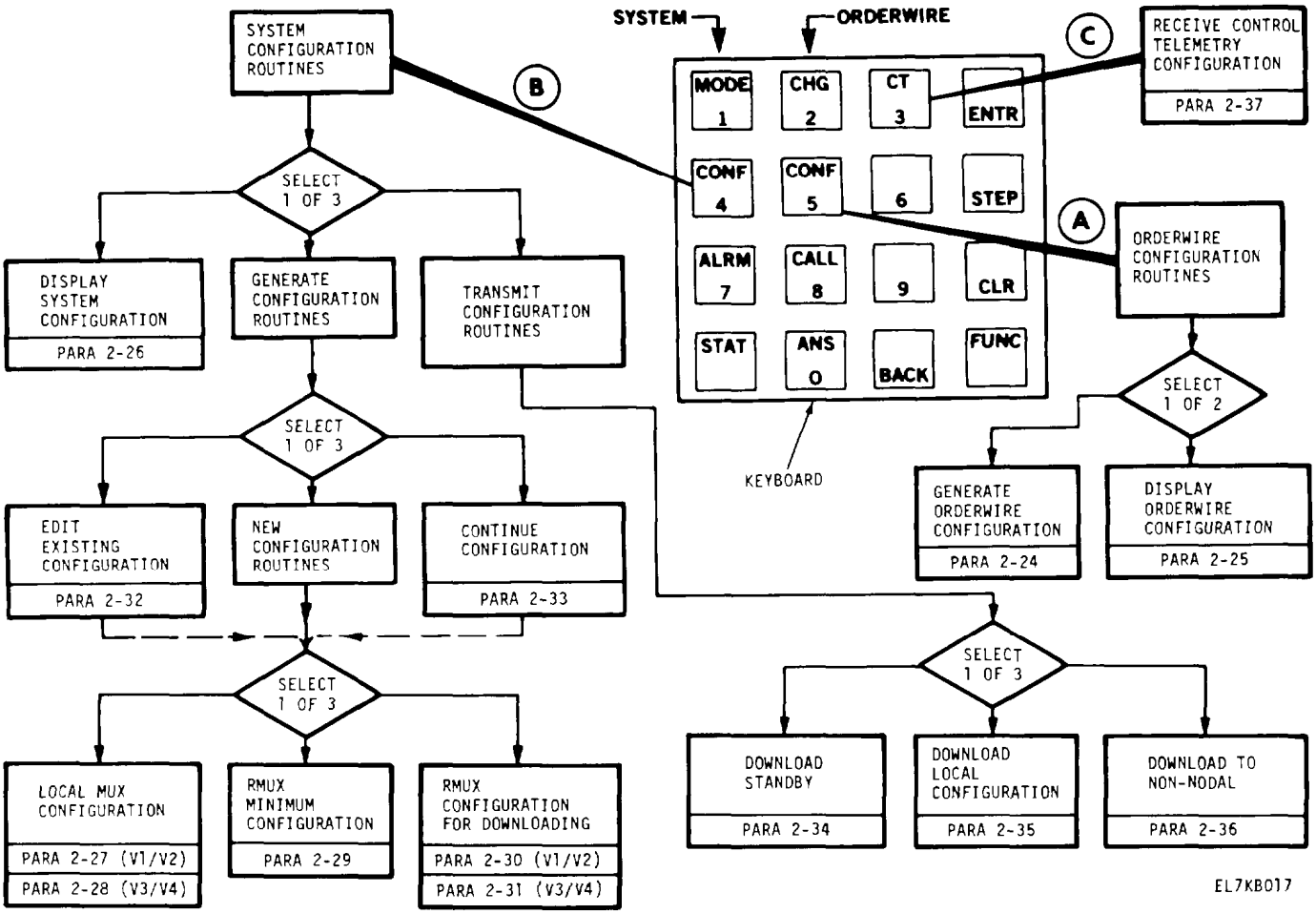
1-26. Modes of Operation.

The operator can select and place the TD-1337(V)/G in one of five modes of operation as follows:

- *Inactive Mode.* This is a powered-up idle mode. All output data and clock lines are inhibited. No user traffic or orderwire data is processed.
- TD-976 *Mode.* This mode is applicable only to a V1 model. In this mode, the TD-1337(V)/G serves as an interface between a MD-1026( )(P)/G digital data modem and the terminal transmitting/receiving equipment. A single 4915.2 kb/s data stream is processed. No multiplexing or demultiplexing operations are performed and no orderwire options are available. Selecting the TD-976 mode completely configures the TD-1337(V)/G to operate in this mode (no configuration data needed).
- *Preliminary Mode.* This mode establishes a communications link between terminals. Orderwire data must have been previously entered for this mode to be selected. When this mode is selected, the composite rate of your output SG and the composite rate of each incoming SG must be entered. Overhead and orderwire data can now be exchanged between terminals (no user traffic is processed). Since control telemetry is included as part of the overhead data, configuration data can be exchanged between terminals.
- *Memory 1 Mode.* In this mode, the TD-1337(V)/G operates in accordance with configuration data stored in memory 1.
- *Memory 2 Mode.* In this mode, the TD-1337(V)/G operates in accordance with configuration data stored in memory 2.

1-27. Configuration Routines.

A configuration routine is selected by pressing the FUNC key and then pressing one of the keys described below. A breakdown of the various configuration routines are shown in the below illustration. Paragraph references for step-by-step procedures to perform each of the 12 independent routines are also shown on the illustration.



(A) *ORDERWIRE CONF Key.* Orderwire configuration routines are used to generate an orderwire configuration or to display an orderwire configuration.

- *Generate Orderwire Configuration.* This routine enters orderwire configuration data into NVM. Orderwire configuration data consists of terminal No., call No., and mode for your local TD-1337(V)/G and each remote TD-1337(V)/G that will send a SG to you. The same data is also entered for any CNCE'S connected to TD-1337(V)/G's in your network, A complete orderwire configuration (local and all active remotes) must be entered before you can select memory 1 or memory 2 modes of operation. Preliminary mode of operation can be selected if either a complete or partial (local only) orderwire configuration is entered. If only a partial configuration is entered, you are limited to transmitting a download local configuration and receiving either a download local configuration or download to non-nodal configuration,
- *Display Orderwire Configuration.* This routine displays orderwire configuration data stored in NVM. No changes can be made to the data using this routine.

1-27. Configuration Routines - Continued.

(B) *SYSTEM CONF Key.* System configuration routines are used to display system configuration data, generate configuration data, and transmit configuration data.

- *Display System Configuration.* This routine selects and displays configuration data contained in memory 1 or memory 2. No changes can be made to the data using this routine.
- *Generate Configuration Routines.* There are five generate configuration routines. These routines are used to edit an existing configuration, to continue a configuration routine, and to generate new configurations.

NOTE

When the TD-1337(V)/G is operating in a memory 1 or memory 2 mode, a generate configuration cannot be performed on the memory being used for operation. That is, you can perform a generate configuration routine with memory 1 only if your TD-1337(V)/G is operating in any mode other than memory 1. The same situation applies to memory 2.

1. *Edit Existing Configuration.* This routine allows the operator to select and change configuration data stored in memory 1 or memory 2.
2. *Continue* Configuration. This routine allows the operator to resume a configuration routine (either new or edit) that was interrupted (by operator) before it was completed. For example, answering an orderwire call could cause such an interruption.
3. *Local Mux Configuration.* This routine allows you to enter configuration data to configure your local roux. Due to differences between models, two separate local mux configuration procedures are provided. One procedure for V1/V2 models and another procedure for V3/V4 models. If you are operating as a non-nodal, your local mux can be configured by receiving a download to non-nodal transmission from a remote TD-1337(V)/G. In this case, you would not perform a local mux configuration routine.
4. *Rrnux Minimum Configuration.* Each active demux in your local TD-1337(V)/G must be configured (one demux in a non-nodal unit or up to four demux's in a nodal unit). The Rmux minimum routine allows you to enter configuration data to configure one local demux. The routine would then be repeated for each additional active demux. Your demux's could be configured by one of the following alternate methods. In these cases, you would not perform Rmux minimum configuration routines,

   a. You can receive a download local configuration broadcast from a remote TD-1337(V)/G. This would configure your local demux associated with that remote TD-1337(V)/G.

   b. If you are operating as a non-nodal, your local demux can be configured by receiving a download to non-nodal transmission from a remote TD-1337(V)/G.

   c. You could be performing a Rmux configuration for downloading (5 below). In this case, when you enter data for the remote roux, you automatically configure your associated demux.

1-27. Configuration Routines - Continued.

NOTE

Refer to the illustration on page 1-32 when reading the following material.

5. *Rmux Configuration for Downloading.* This routine provides all configuration data necessary to configure the mux of one remote TD-1337(V)/G operating as a non-nodal. The routine also provides the configuration data to configure your local demux that services that remote TD-1337(V)/G. Due to differences between models, two separate Rmux configuration for down-loading procedures are provided. One procedure for V1/V2 models and another procedure for V3/V4 models.

- *Transmit Configuration* Routines. There are three transmit configuration routines. These routines are used to transmit configuration data from your TD-1337(V)/G to other TD-1337(V)/G's.

1. *Download Standby.* This routine downloads the contents of NVM in a TD-1337(V)/G to a standby TD-1337(V)/G in the same shelter. The standby TD-1337(V)/G must be in the inactive mode to receive the download. The TD-1337(V)/G transmitting the download can be in any operating mode.
2. *Download Local Configuration.* This routine selects and transmits the local mux configuration in memory 1 or memory 2 of your TD-1337(V)/G to remote TD-1337(V)/G's in network. Your TD-1337(V)/G must be operating in either preliminary, memory 1, or memory 2 mode to perform a download local configuration. At each remote TD-1337(V)/G, the downloaded data configures the demux that processes the SG from your TD-1337(V)/G.
3. *Download to Non-/Vodal.* This routine selects and transmits local mux configuration and Rmux download configuration data in memory 1 or memory 2 of your TD-1337(V)/G to a selected remote TD-1337(V)/G operating as a non-nodal. Your TD-1337(V)/G must be operating in either preliminary, memory 1, or memory 2 mode to perform a download to non-nodal routine. At selected remote TD-1337(V)/G, the downloaded data configures its mux and demux.

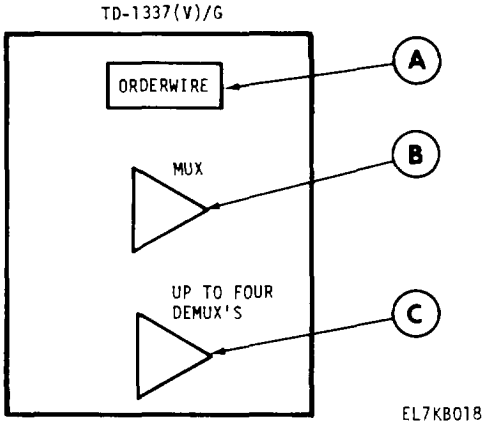
(C) *CT* Key. This key activates the receive control telemetry configuration routine. The routine accepts or aborts a download local configuration or a download to non-nodal configuration that has been transmitted to your memory 1 or memory 2 from a remote TD-1337(V)/G. You cannot accept download data to a given memory if you are operating in that memory mode.

1-28. Configuration Routine Usage.

Based on the configuration routine descriptions in the preceding paragraph, it is apparent that your TD-1337(V)/G can be configured by a number of different methods. As stated previously, a TD-1337(V)/G is completely configured when configuration data is entered to:

- Configure orderwire.
- Configure local roux.
- Configure each local active demux.

Following is a brief summary of the various ways that configuration routines can be used to configure a TD-1337(V)/G.



(A) *Orderwire.* You must configure your orderwire by using the generate orderwire configuration routine.

(B) *Mux.* Your mux can be configured by one of the following two methods.

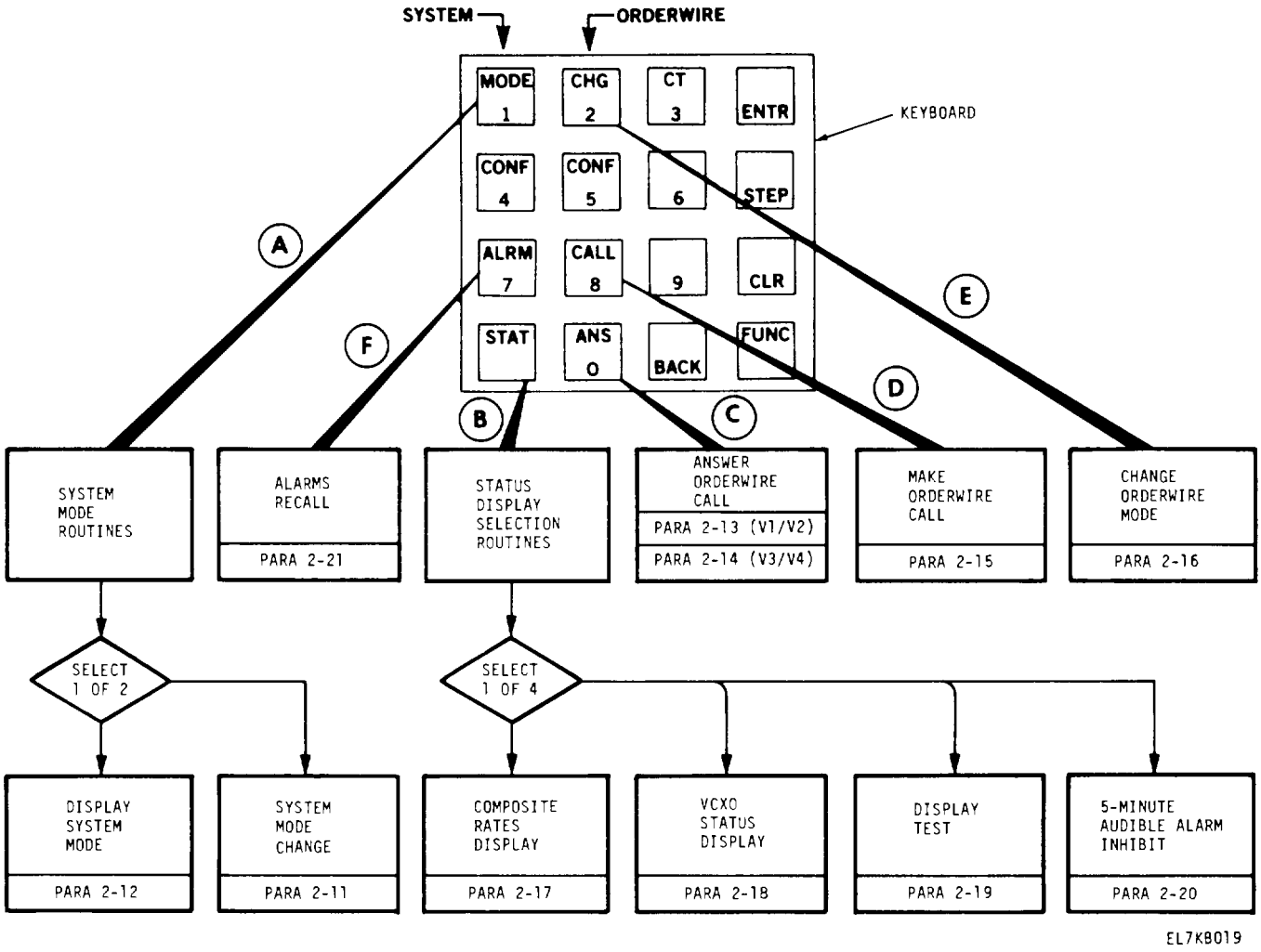
1. You configure it by using the local mux configuration routine.
2. If you are operating as a non-nodal (either non-nodal unit or nodal unit with only demux 1 active), your mux can be configured by receiving a download to non-nodal transmission from a remote TD-1337(V)/G.

(C) *Demux's.* Each active demux can be configured by one of the following four methods.

1. You configure it by using Rmux minimum configuration routine.
2. You receive a download local configuration broadcast from a remote TD-1337(V)/G. This configures your demux associated with that remote TD-1337(V)/G.
3. If you are operating as a non-nodal, your demux can be configured by receiving a download to non-nodal transmission.
4. You could be performing a Rmux configuration for downloading routine. In this case, when you enter data for the remote roux, you automatically configure your associated demux.

1-29. Operating Routines.

An operating routine is selected by pressing the FUNC key and then pressing one of the keys described below. A breakdown of the various operating routines are shown in the below illustration. Paragraph references for step-by-step procedures to perform each of the 10 independent routines are also shown on the illustration.



(A) *SYSTEM MODE Key.* System mode routines are used to display system mode in which TD-1337(V)/G is currently operating or to change the system mode, Paragraph 1-26 describes the five system modes.

- *Display System Mode.* This routine displays current operating mode of your TD-1337(V)/G.
- System *Mode Change.* This routine allows the operator to change the system mode. Preliminary mode cannot be selected unless orderwire configuration data has been entered. Memory 1 or memory *2* mode cannot be selected unless configuration data has been entered into appropriate area of memory.

1-29. Operating Routines-Continued.

(B) *SYSTEM STAT Key.* The status display selection routines consist of two display routines, one display test routine, and one alarm inhibit routine.

- Composite *Rates Display.* "This routine displays the composite rates assigned to the mux SG output and SG input to each demux. The composite rate assignments for preliminary, memory 1, and memory 2 modes are displayed.
- VCXO *Status Display.* This routine can only be used if your TD-1337(V)/G is operating from an external timing source. This routine displays operating status (in range or out of range) of VCXO (voltage controlled crystal oscillator).
- *Display Test.* This routine checks keyboard operation and produces a display pattern to test quality of 3-line display.
- *5-Minute Audible Alarm Inhibit.* This routine inhibits the MAJOR and MINOR ALARMS indicators and any sounding of ALARM horn related to these indicators for a five minute period. The routine can also be used to remove the inhibit before the five minute period expires. If you assume an operating mode (either by power turn-on or system mode change) and interfacing equipments have not been turned on or are operating in a manner incompatible with your mode, alarm indications will exist. In this situation, the routine is useful in inhibiting these alarm indications until interfacing equipments are in a compatible operating condition.

(C) *ORDERWIRE ANS Key.* This routine is performed to answer an orderwire call from another station in the network. Due to differences among models, two separate answer orderwire call procedures are provided. One procedure for V1/V2 models and another procedure for V3/V4 models.

(D) *ORDERWIRE CALL Key.* This routine is performed to make an orderwire call to another station in the network,

(E) *ORDERWIRE CHG Key.* This routine changes present orderwire mode of operation to opposite mode of operation (secure to non-secure or non-secure to secure).

(F) *SYSTEM ALARM Key.* The alarms recall routine allows for recall and display of diagnostic information associated with the MAJOR and MINOR ALARMS indicators.

CHAPTER 2
OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

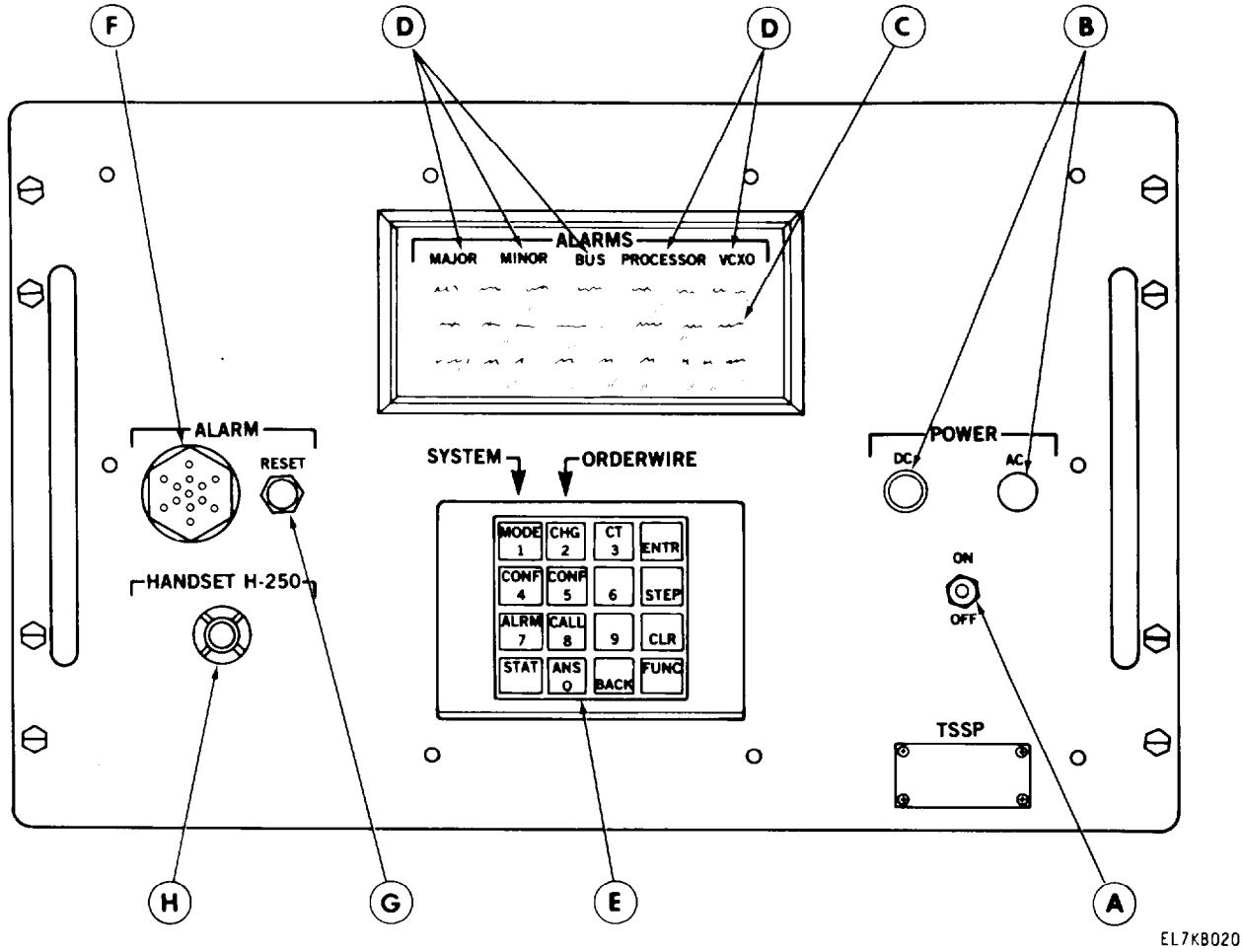
Subject	*Para*	*Page*
Front Panel Controls and Indicatrs	2-1	2-2
ALARMS Indicators	2-2	2-4
Keyboard	2-3	2-6
Operating Techniques Using Display and Keyboard	2-4	2-9
Types of Messages	2-5	2-11
List of Message Displays	2-6	2-12

OVERVIEW

This section describes the controls and indicators that you will use to configure and operate the TD-1337(V)/G. Study the illustrations and descriptions of the controls and indicators before you attempt to configure or operate the TD-1337(V)/G.

- Paragraph 2-1 contains descriptions of front panel mounted controls and indicators.
- Detailed descriptions of the ALARMS indicators and the keyboard are contained in paragraphs 2-2 and 2-3. The ALARMS indicators inform you of detected faults and are used in troubleshooting. The keyboard is the means by which you control and enter data into the TD-1337(V)/G. Some of the keys have dual functions. Study this area carefully.
- Paragraph 2-4 provides useful operating techniques that describe interface between the display and the keyboard.
- The various types of messages that can appear on the display are described in paragraph 2-5.
- Paragraph 2-6 contains a listing of message displays and provides a description of each display.

2-1. Front Panel Controls and Indicators.



(A) *POWER ON/OFF Circuit Breaker.* Provides on/off control and overcurrent protection for 115-volt ac power applied to TD-1337(V)/G power supply.

(B) *POWER AC* and *DC Indicators.*

- AC indicator lights when POWER ON/OFF circuit breaker is set to ON and 11 5-volt ac power is applied to TD-1337(V)/G,
- DC indicator lights when dc outputs of TD-1337(V)/G power supply are normal.

(C) *Display.* 96-character display (3 lines with 32 characters per line) provides alphanumeric messages for operator use. Message types are described in paragraph 2-5, Each of the messages that can be displayed are described in paragraph 2-6.

(D) *ALARMS Indicators.* There are five light emitting diode (LED) ALARMS indicators that light to indicate faulty conditions detected by TD-1337(V)/G. ALARMS indicators are described in paragraph 2-2.

(E) *Keyboard.* Keyboard has 16 keys that operator uses to select and perform configuration and operating routines, Paragraph 2-3 describes the keyboard.

2-1. Front Panel Controls and Indicators-Continued.

(F) *ALARM Horn.* Horn produces an orderwire tone (steady tone for 10 seconds) or an alarm tone (continuous beeping tone until turned off) under the following conditions:

- Orderwire tone is generated when one of following conditions occur:
  1. Incoming orderwire call is received. (Tone is silenced if answer orderwire call routine is performed before 10-second cycle is completed or ALARM RESET switch is pressed.)
  2. Incoming control telemetry transmission is received, (Tone is silenced if receive control telemetry routine is performed before 10-second cycle is completed or ALARM RESET switch is pressed,)
- Alarm tone is generated when one of following conditions occur:
  1. Faulty condition is detected by TD-1337(V)/G. (Tone is silenced if faulty condition goes away or ALARM RESET switch is pressed.)

NOTE

One of ALARMS indicators, except ALARMS MINOR, will light when alarm tone is generated.

2. If horn is silent, as result of pressing ALARM RESET switch, tone is generated when a previously detected fault goes away (fault is no longer detected).

NOTES

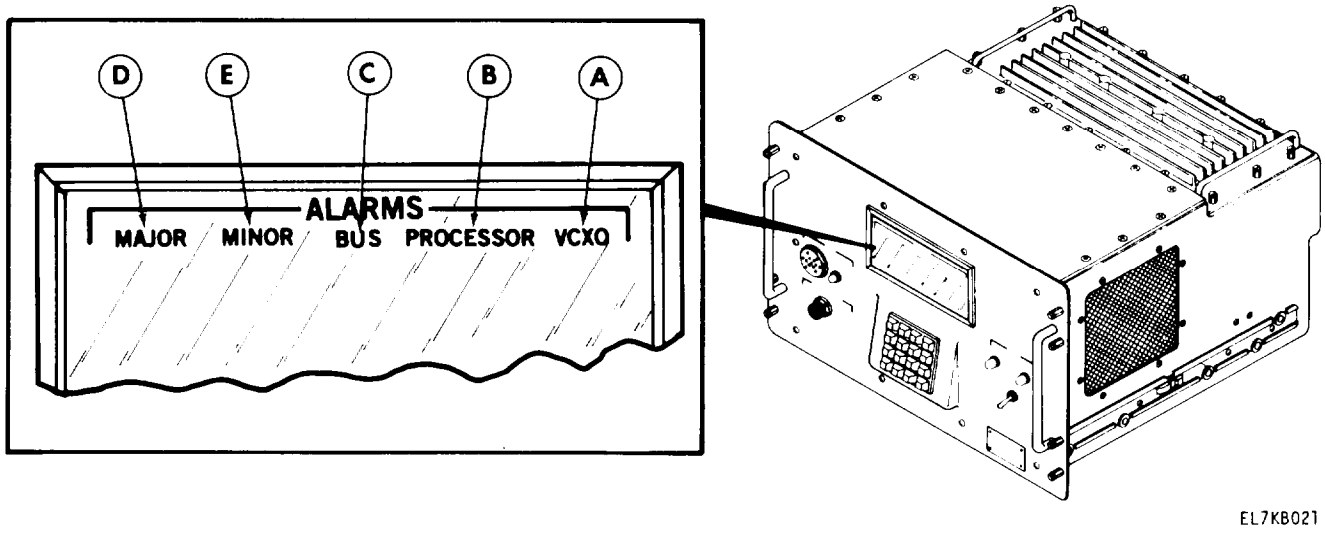
- An ALARMS indicator may, or may not, go off when horn is activated by this condition,
- Alarm tone can occur erratically as a result of multiple faults being detected, presence of intermittent faults, and operator pressing ALARM RESET switch each time tone occurs. Performing 5-minute audible alarm inhibit routine will silence tone for five minutes (or until inhibit is cancelled by operator,)

(G) *ALARM RESET Switch.* Pushbutton switch is pressed to manually silence active ALARM horn.

(H) *HANDSET H-250 Connector.* Front panel connector for attaching an H-250 handset to TD-1337(V)/G.

2-2. ALARMS Indicators.

The five ALARMS indicators are viewed through the display window and are located immediately above the 3-line display. The ALARMS indicators are normally off. One or more of the indicators light when a fault is detected by the TD-1337(V)/G.



NOTE

There is a hierarchy (rank or order of importance) associated with the ALARMS indicators. If multiple indicators light, this ranking allows for systematic troubleshooting. Thus, troubleshooting would start with lit indicator of highest ranking and ignore indicators of lower rank. Ranking of indicators is as presented below (VCXO is highest ranking through MINOR which is lowest ranking).

(A) *VCXO Indicator.* Lights when fault is detected in VCXO (voltage controlled oscillator) circuit. If fault goes away, VCXO indicator will go out.

(B) *PROCESSOR Indicator.* Lights when fault is detected in processor circuits. If fault goes away, PROCESSOR indicator will go out.

(C) *BUS Indicator.* Lights when a fault lasting for more than one second is detected with the common data bus lines in the TD-1337(V)/G. If fault goes away, BUS indicator will go out and MINOR indicator will light.

(D) *MAJOR Indicator.*

1. Lights when a fault (other than a fault associated with the BUS, PROCESSOR, or VCXO) is detected that has lasted for more than one second and continues to exist. Detected fault may be caused by a faulty circuit in TD-1337(V)/G or by a faulty input to TD-1337(V)/G.
2. If additional faults (of same type) are detected while first fault detected is still present, indicator remains lit.
3. Indicator goes out when fault(s) that caused it to light are no longer detected. (MINOR indicator now lights.)

2-2. ALARMS Indicators - Continued.

(E) *MINOR Indicator.*

1. Lights when a fault was detected and fault lasted one second or less.
2. Lights when a fault that caused MAJOR or BUS indicator to light is no longer detected.
3. indicator remains lit until it is automatically turned off when alarms recall routine is performed.

NOTE

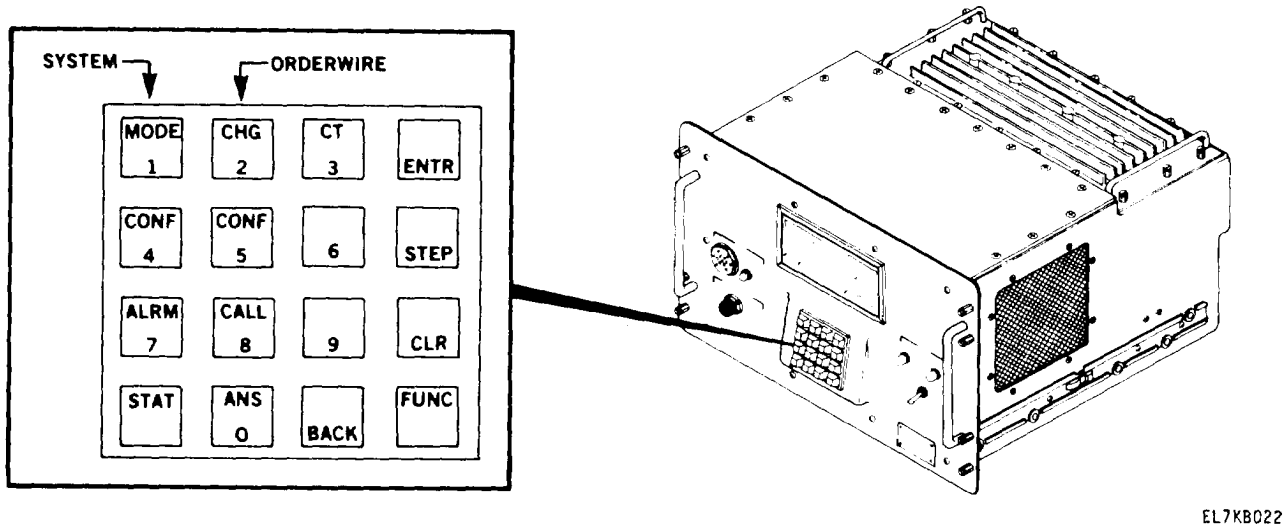
Detected faults that are intermittent (fault lasts longer than one second, goes away, returns, goes away, etc) or multiple detected faults can cause various combinations of MAJOR and MINOR displays. The following chart describes various combinations of these displays and typical fault conditions that could cause them.

Combinations of MAJOR and MINOR Indicator Displays

Indicator status	Fault description
MAJOR and MINOR indicators alternately light and go off.	Fault is detected that lights MAJOR. Fault goes away, causing MAJOR to go off and MINOR to light. Same fault reoccurs, causing MAJOR to light and MINOR to go off. As long as same intermittent fault is detected, MAJOR and MINOR continue to alternate on and off.
MAJOR and MINOR both lit.	Fault is detected that lights MAJOR. Later, a second fault of the type that would light MAJOR is detected. One of the two faults is no longer detected, This causes MINOR to light.
MAJOR lit and MINOR blinks. (Blink rate depends on fault characteristics.)	Same as described above except that fault which went away is again detected (MINOR goes off) and then goes away (MINOR lights again). As long as fault is intermittent, MINOR will turn on and off. Presence of other fault keeps MAJOR lit.
MINOR lit and MAJOR blinks. (Blink rate depends on fault characteristics.)	Fault is detected that lights MAJOR. Fault goes away, causing MAJOR to go off and MINOR to light. A different fault is detected that lights MAJOR (MINOR still lit). The different fault is an intermittent problem that goes away and returns. This causes the MAJOR to turn off and light each time the fault goes away and then is detected again. MINOR continues to be lit as a result of first fault that was detected and then went away.

2-3. Keyboard.

The keyboard contains 16 keys. The function of each key is described in the following chart, When using the keyboard, firmly press and ‘release a selected key one time to make an entry.



Function of Keyboard Keys

Key	Function
FUNC	Allows selection and use of one of the SYSTEM or ORDERWIRE keys or the CT key. This key is always active. If you are performing a routine, and a message is being displayed, pressing this key will terminate the routine.
SYSTEM MODE	Allows selection of following system mode routines, 1, System mode change routine. 2. Display system mode routine.
SYSTEM CONF	Allows selection of following system configuration routines. 1. Display system configuration routine. 2. Edit existing configuration routine. 3. Continue configuration routine. 4. Local mux configuration routine. 5. Rmux minimum configuration routine, 6. Rmux configuration for downloading routine. 7. Download standby routine. 8. Download local configuration routine. 9. Download to non-nodal routine.
SYSTEM ALRM	Allows selection of alarms recall routine,
SYSTEM STAT	Allows selection of following status display selection routines, 1. Composite rates display routine, 2. VCXO status display routine. 3. Display test routine. 4. 5-minute audible alarm inhibit routine.
ORDERWIRE CHG	Allows selection of change orderwire mode routine,

2-3. Keyboard - Continued.

Function of Keyboard Keys - Continued	
Key	Function
ORDERWIRE CONF	Allows selection of following orderwire configuration routines. 1. Generate orderwire configuration routine. 2. Display orderwire configuration routine.
ORDERWIRE CALL	Allows selection of make orderwire call routine.
ORDERWIRE ANS	Allows selection of answer orderwire call routine.
CT	Allows selection of receive control telemetry routine.
Numbered keys	Once a routine has been selected, numbered keys are used to supply data (numbers) required by steps in the routine. Eight of the keys described above have dual functions. They are initially used to select a routine. Once a routine has been selected, the number function associated with the key is active. **NOTE** Paragraph 2-4 provides examples of using the BACK, ENTR, STEP, and CLR keys.
BACK	Key is only activated when performing an edit, continue, or generate a new configuration routine in steps that require multiple entries. After you have entered data at an entry point within a step, and you want to change it, press BACK key. This action returns prompt to first entry in step and allows you to repeat or change entries in step.
ENTR	After one or more numbered keys are pressed to supply data for a step in the routine, this key is pressed to enter the data. For example, if you push a numbered key, you can write over it by pressing other numbered keys prior to pressing ENTR key. When ENTR key is pressed, data is entered and prompt will move to next entry step if entry is valid. If entry made was last or only entry for a step, pressing ENTR key causes message display to jump to next message display in procedure.
STEP	When key is pressed, prompt moves to next entry to be made or message display changes (steps) to next display in sequence, STEP key is inhibited in transmit and new configuration routines to prevent bypassing a step that has to be performed for a valid configuration, Pressing of STEP key is a required procedural step in some routines as directed in message display.
CLR	Key is inhibited when performing any display routine or an alarms recall routine. Key is used to perform the following functions. 1. If pressed at conclusion of a routine and before normal 30-second blanking occurs, it will clear (blank) the display. 2. if pressed during a step prior to ENTR key being pressed, it clears (erases) any numbers entered for that entry. 3. Pressing of CLR key is a required procedural step in some routines as directed in message display.

2-4. Operating Techniques Using Display and Keyboard.

The display and keyboard form the communications link between the operator and the TD-1337(V)/G. The operator requests or enters data by pressing keys on the keyboard. The display, in turn, responds by displaying messages that are associated with the operator actions. The types of messages that can be displayed are described in paragraph 2-5. In addition to the message displays, there are other operating features that the operator should be aware of in performing the operating and configuration routines. These features are described below.

a. Display Blanking. Display automatically blanks when operator does not press a key within 30 seconds of last key pressed.

b. Reactivate Display. Operator can press any key to reactivate display. Last message that was displayed prior to blanking reappears when operator presses a key.

c. Display Blanked, While display is blanked, operator cannot enter data or change a routine until display is reactivated.

d. ENTR Key. When entering data in a routine, the TD-1337(V)/G recognizes an operator entry when one or more numbered keys (O through 9) are pressed and the ENTR key is pressed. A message may request one operator entry or a message may request two or more entries (called multiple-entry messages). When the last entry required for a given message is made (ENTR key is pressed), the next message in the routine is automatically displayed.

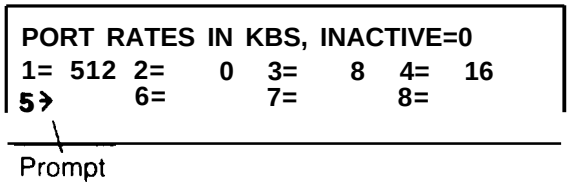
e. CLR Key. CLR key allows operator to change numbers entered by keyboard before the ENTR key is pressed, When the CLR key is pressed, all numbers displayed at prompt are erased and the proper entry can be made without further corrective action.

f. Invalid Data Entry. When operator enters invalid data, the “ILLEGAL ENTRY, REENTER” message is displayed. Operator presses CLR key and the message displayed at the time of the invalid entry reappears, At this time, operator can enter the proper data.

Example: Message display requests that operator select and enter a “1”, “2”, or a “3”. Operator enters a “4” and the ‘(ILLEGAL ENTRY, REENTER” message is displayed. Operator presses CLR key and message that requests operator to select and enter a “1”, “2”, or “3” reappears.

g. Prompt. Messages that require an operator entry have a prompt displayed as shown below. When the operator enters the required data (using numbered keys), the entered data appears to the right of the prompt, In multiple-entry messages, the prompt moves to the next valid entry point as each entry is completed (after ENTR key is pressed).

Example: Message indicates operator has made entries for ports 1 through 4 and data for port 5 is requested. When data is entered for port 5 (number keys and then ENTR key pressed), the prompt will move to port 6.



2-4. Operating Techniques Using Display and Keyboard - Continued.

h. STEP Key. STEP key is used in all display routines to advance (step) through the message displays. When using a routine to change data in an existing configuration, the STEP key is used to quickly advance through the message displays before and after the messages that are to be changed. After data is changed in any entry point in a multiple-entry message, the STEP key can be used to advance the message display.

Example: Assume you want to make a change to an existing configuration. You would select the routine and use the STEP key to advance through the routine until you reach the message where you want to make the change. Assume you want to change the rate of port 1 in the below message. You would enter the new rate (number keys and ENTR key pressed) and prompt would move to port 2. You can now press STEP key and display will advance to next message. Otherwise, ENTR key would have to be pressed for each entry point to reach next message.

```
PORT RATES IN KBS, INACTIVE=0
1→  512 2=    0 3=    8 4=   16
5=  128 6=  256 7=  256 8=   64
```

i. BACK Key. BACK key is only active when a configuration routine is performed and a multiple-entry message is displayed. The BACK key allows the operator to change any completed entry point in the message prior to completing the last entry point in the message.

Example: Assume you had entered message up to port 5 as shown in below message and then decided that entry at port 3 needed to be changed. Pressing BACK key would return prompt to port 1. Pressing ENTR key twice would move prompt to port 3. Then CLR key is pressed to erase old data (“8”). New data is entered at port 3 by pressing numbered keys and ENTR key and prompt moves to port 4. Pressing ENTR key again would move prompt to port 5 and normal message entry could continue.

```
PORT RATES IN KBS, INACTIVE=0
1=  512 2=    0  3=    8  4=   16
5→      6=       7=       8=
```

Prompt

2-4. Operating Techniques Using Display and Keyboard - Continued.

j. Automatic functions. Depending on previous data entries and model of TD-1337(V)/G being used, certain parts of a configuration routine are performed automatically. These functions are described below.

1. Messages that contain configuration data that are automatically configured, or messages that contain configuration requirements that are not applicable in a routine being performed are blanked.
2. Data entry points in some multiple-entry messages that are not used are blanked (not displayed).
3. Selected data entry points in some multiple-entry messages that are not used or have data automatically entered are bypassed by the prompt that designates the active entry point.

Example: Message **B** would be the next message displayed after entries had been completed for message **A** shown below.

(A)
```
PORT RATES IN KBS, INACTIVE=0
1> 512 2=   0 3=   8 4=  16
5=  128 6= 256 7= 256 8=  64
```

(B)
```
PORT INTERFACE
BALANCED=1 DIØ=2 UNBALANCED=3
PORT 1>   2=  3=  4=  5=
```

- Note that ports 6, 7, and 8 are not displayed. As discussed previously, these ports can accommodate only a balanced interface. Therefore, if these ports are active, they are automatically assigned balanced interfaces.
- V3 and V4 models do not accommodate an unbalanced interface. Therefore, “UNBALANCED=3” would be blanked on these models.
- As shown in message A, port 2 is inactive. When operator enters data and then presses ENTR key for port 1, prompt automatically jumps past port 2 and appears at port 3 in message B. A “0” is automatically displayed at port 2 (and any other port that was previously designated inactive).
- Maximum number of available ports varies between models. The number of ports displayed in the above message is automatically limited to the maximum available for a given model. For example, a V2 model has a maximum of two available ports. Therefore, only ports 1 and 2 would be displayed in message B.

k . Terminating a Routine. H is good practice to always press CLR key each time you complete or terminate a routine. This action clears any message being displayed at this time. If the message is not cleared, the display automatically blanks in 30 seconds. The next time you or another operator activates the display, the message reappears. Certain reactivated message displays could lead to confusion or concern.

Example: Assume another operator has performed a configuration routine for training purposes and did not press CLR key when completed. In the last step of the configuration routine, operator would abort the routine. Later you activated the display and a message such as “MEMORY LOAD ABORTED” is displayed. If you did not know that the message was in response to a training mission, you could not be sure that configuration data in TD-1337(V)/G has not been changed or aborted.

2-5. Types of Messages.

Messages displayed in a routine are divided into advisory and action messages. Advisory messages (a below) describe general operating information, equipment status, and general information that supports the action messages *(b* below). Action messages contain instructions that an operator must perform to accomplish an operating or configuration routine. All the messages that can be displayed are listed and explained in paragraph 2-6.

a. Advisory Messages. These messages are normally displayed on line 1 or line 2 of the displayed message. There are two types of advisory messages.

(1) *Information Messages.* The information message provides the operator with status or operating information. This type of message does not request specific operator actions. If you do not understand any displayed message, look it up in paragraph 2-6.

Typical message:

```
NO DATA IN SELECTED MEMORY
```

(2) *Command Message.* The command message informs you that you will need to perform a procedure, or step, that is not normally performed as part of a routine.

Typical message:

```
MEMORY IN USE, REENTER
```

b. Action Messages. These messages appear during an operating or configuration routine and require an operator action. All action messages have a prompt displayed. There are two types of action messages.

(1) Selection Message. The selection message directs you to make one or more selections. When the selection is made, number pressed appears to right of prompt.

Typical message:

```
LOCAL/REMOTE  MUX  SELECTION  >
LOCALMUX=0  RMUX  1=1  RMUX  2=2
 RMUX  3=3     RMUX  4=4
```

Prompt

(2) Entry *Message.* The entry message directs you to enter data at the locations (entry points) indicated by the prompt. In multiple-entry messages, as each entry point is completed prompt appears at the next entry point to be performed.

Typical message:

```
PORT RATES IN KBS, INACTIVE=0
1>        2=        3=        4=
5=        6=        7=        8=
```

Prompt

2-6. List of Message Displays.

Each of the messages that can be displayed on a TD-1337(V)/G are listed and described in the below chart. The messages are listed in alphabetical order.

NOTES

Symbol "#" precedes some of the message descriptions. This symbol indicates that operator actions (make selections or enter data) are determined by data supplied by the authority originating the configuration requirement.

In the following messages that involve port entries or port selections, the maximum number of ports that can be displayed are shown. Based on the model (V1, V2, V3, or V4) being used, and the routine being performed, less than the maximum number of ports may actually be displayed.

Message Displays

Message displayed	Description
ALARM INHIBIT ACTIVATED	Message displayed when 5-minute audible alarm inhibit is activated.
ALARM INHIBIT ACTIVATED ALARMS RECALL TERMINATED	Message displayed when alarms recall routine is selected and 5-minute audible alarm inhibit is activated. Operator must wait until 5-minute inhibit cycle is completed or perform 5-minute audible alarm inhibit routine and clear inhibit function to perform alarms recall routine.
ALARM INHIBIT CLEARED	Message displayed when operator clears (cancels) 5-minute audible alarm inhibit.
ALARMS RECALL COMPLETE	Last message displayed when all diagnostic information has been presented in alarms recall routine.
CALL # NOT IN CONFIG	Call number entered for routine being performed is not part of local TD-1337(V)/G orderwire configuration.
CESE MAJOR NEW STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
CESE MAJOR OLD STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.
CESE MINOR STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.
CESE TELEMETRY EQUIP ID >	# Enter CESE telemetry equipment identification number assigned to your TD-1337(V)/G. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.
CESE TLM PATCH OPTION > **PATCH LOCAL TO COND DIØ MODEM= 1** **PATCH DEMUX1 TO COND DIØ MODEM=2**	# Enter CESE telemetry patch option selected for your TD-1337(V)/G. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.
CNCE ENTRY REQUIRED, REENTER **CNCE OR EXT STD PORTS=1 OTHERS=0** **1> 2= 3= 4= 5= 6= 7= 8=**	# CNCE or external timing source was previously selected prior to performing this step. You did not select any CNCE or external sources in this step (entered all O's). If you are using CNCE or external source, configuration must have at least one "1" entry in step.
COMPOSITE RATE LESS THAN 16KBS **GENERATION FUNCTION TERMINATED**	You have entered a configuration that has a composite rate that is less than 16 kb/s. Routine is automatically aborted. Either incorrect rate(s) were entered when performing routine or incorrect configuration data was supplied.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
COND DIØ GROUP MODEM CABLE → # OF 1/4 MILE REELS=I THRU 8 NONE=O	# Enter assigned number of reels of cable (1 to 8 for data rates up to 576 kb/s or 1 to 4 for data rates of 1024 or 1152 kb/s) or enter "O" if no reels are designated.
CONFIGURATION SELECTION → DISPLAY=1 GENERATE=2 TRANSMIT=3	Enter number (1, 2, or 3) of configuration routine to be performed.
DEMUX LOOPBACK OPTION → NORMAL=0 LOOP MUX TO DEMUX=1	Enter "O" when performing Rmux configuration routines. Only enter "1" if loopback option is to be used. Loopback option is used in troubleshooting (Chapter 3).
DEMUX NOT ASSIGNED, REENTER DEMUX 1=1 2=2 3=3 4=4	You have selected a demux that you had set as inactive in a previous step. Press **CLR** key and reenter data. If message is repeated, check your configuration data.
DISPLAY FUNCTION COMPLETE	Last message displayed when all messages in a selected display routine have been displayed.
DOWN LOAD DATA RECEIVED → FOR MEM , ACCEPT=1 ABORT=2 SYSTEM IS IN MODE	Enter "1" if you accept, or enter "2" if you abort a download to non-nodal transmission for memory 1 or memory 2. This download transmission, if accepted, configures your local mux and one demux. Message also displays present operating mode of local TD-1337(V)/G. **NOTE** You cannot accept a download transmission for a given memory if you are operating in that memory mode. In this case, place local TD-1337(V)/G in another operating mode (system mode change routine) and repeat receive control telemetry routine.
DOWNLOAD TO NON-NODAL ENTER NON-NODAL CALL NUMBER →	# Enter call number of remote TD-1337(V)/G to receive download to non-nodal transmission.
END OF ORDERWIRE CONFIGURATION	Last message that is displayed when generate orderwire configuration routine is completed.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
ENTER CALL # > **16KBS ORDW IS IN MODE**	Enter call number of TD-1337(V)/G or CNCE being called. Message also displays mode (secure or non-secure) in which orderwire is active. **NOTE** Secure mode used for Vinson call or non-secure mode used for H-250 call.
ENTER CALL TYPE > **16KBS ORDW = 1 ANDVT=2**	Enter number (1 or 2) for call type selected for orderwire call. **NOTE** Message is not applicable to and is not displayed for V1 and V2 models.
EXTERNAL TIMING SOURCES **CNCE OR EXT STD PORTS= 1 OTHERS= 0** **1> 2= 3= 4= 5= 6= 7= 8=**	# At each port designated by prompt, enter "1" when port is assigned as an external timing source. "0" is assigned to a port that is not to be used as an external timing source.
FUNCTION NOT AVAILABLE	This message is displayed when you have selected a routine that cannot be performed. Examples: • Select an orderwire routine when TD-1337(V)/G is operating in inactive or TD-976 mode, • Select receive control telemetry routine when “T” not displayed. • Select answer orderwire call routine when “0” not displayed. • Select display VCXO status routine when TD-1337(V)/G is operating in a master or slave timing mode.
GENERATION MODE > **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION=3**	Enter number (1, 2, or 3) for configuration routine type to be performed.
HARDWARE LOAD ABORTED	Message is displayed when a hardware load operation has been aborted.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
ILLEGAL ENTRY, REENTER	You have entered data that TD-1337(V)/G cannot use. Press CLR key and reenter data for step being performed. If message reappears, confirm configuration data being entered is valid (legal). Example: Operator enters 577 for a port rate. This is not an acceptable entry. Operator presses CLR key and then enters 576 for requested port rate. Display advances to next action required.
LOCAL DATA MISSING	Message is displayed when a mode is selected or a routine is performed that requires local mux configuration data and the data has not been entered into the associated memory area.
LOCAL/REMOTE MUX SELECTION > LOCAL MUX=0 RMUX 1=1 RMUX 2=2 RMUX 3=3 RMUX 4=4	# Enter “0” if local mux is to be configured or enter number (1 to 4) of Rmux to be configured. **NOTE** “RMUX 2“ through “RMUX 4“ portion of message not displayed on V2 and V4 models.
MEMORY IN USE, REENTER MEMORY 1=1 MEMORY 2=2 SYSTEM IS IN MEMORY MODE	Message is displayed when TD-1337(V)/G is operating in a given memory mode (1 or 2) and you attempt to perform a generate configuration routine with that same memory area. A generate configuration routine cannot be performed with memory being used for operation.
MEMORY LOAD ABORTED	The last part of each generate configuration routine or the receive control telemetry routine involves loading of configuration data into memory. This message is displayed if memory loading is aborted.
MEMORY LOAD COMPLETE	Last message displayed in receive control telemetry configuration routine. Message indicates that downloaded data has been. entered in designated memory area.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
MEMORY LOAD COMPLETE MUX DATA COMPOSITE RATE= KBS	Last message displayed in a local mux configuration routine. Messages indicates that data for mux has been loaded into designated memory area. The SG composite rate is also displayed.
MEMORY LOAD COMPLETE RMUX DATA COMPOSITE RATE= KBS	Last message displayed in a Rmux minimum configuration routine or a Rmux configuration for downloading routine. Message indicates that data for a given Rmux has been loaded into designated memory area. The SG composite rate is also displayed.
MEMORY SELECTION → MEMORY 1=1 MEMORY 2=2 SYSTEM IS IN MODE	# Enter number (1 or 2) of memory to be used in routine. Message also displays mode in which TD-1337(V)/G is operating. **NOTE** If TD-1337(V)/G is operating in memory 1 or memory 2 mode, you cannot select that memory for this step.
MEMORY 1 COMPOSITE RATE IN KBS MUX > DEMUX1 = DEMUX2= DEMUX3= DEMUX4= STEP	Message is displayed when composite rates display routine is performed. The composite rates entered in memory 1 for local mux and each configured demux are displayed. **NOTE** "DEMUX2" through "DEMUX4" portion of message not displayed on V2 and V4 models.
MEMORY 2 COMPOSITE RATE IN KBS MUX → DEMUX1= DEMUX2= DEMUX3= DEMUX4= STEP	Message is displayed when composite rates display routine is performed. The composite rates entered in memory 2 for local mux and each configured demux are displayed. NOTE "DEMUX2" through "DEMUX4" portion of message not displayed on V2 and V4 models.
MODE CHANGE VERIFICATION → ACCEPT=1 ABORT=2 OLD MODE= NEW=	# Enter "1" to accept (make) system mode change. Both old mode (present mode) and new mode (mode which you are changing to) are displayed. Otherwise, enter "2" to abort system mode change.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
NO DATA IN SELECTED MEMORY	Message is displayed in display system configuration, download local configuration, download to non-nodal, or system mode change routines if appropriate configuration data is not in the selected memory.
NO DVOW ASSIGNMENT	Message is displayed when a system mode change to preliminary, memory 1, or memory 2 mode is attempted and orderwire configuration data has not been entered. System mode change routine is aborted.
NO PORTS AVAILABLE, REENTER > **IF CNCE OR EXTERNAL STANDARD=1** **IF NOT, SLAVE=2 MASTER=3**	# Message is displayed if CNCE or external standard was selected as the timing source and there are no ports with the proper rates and formats. Recheck configuration data that was supplied to you.
NVM CHECKSUM ERROR **MEMORY**	# Message can be displayed when a system mode change routine is performed. *MUX or RMUX (1-4) is displayed. **NOTE** • This display indicates that something has altered contents of NVM in memory 1 or memory 2. Display also identifies problem is local mux (MUX displayed) or one of Rmux's (RMUX 1 - 4 is displayed) configurations in NVM. • Inform proper authority that problem exists. If authorized, reenter configuration data and then perform system mode change routine. • If MUX is displayed, local mux and Rmux configurations must be entered in designated memory (1 or 2). If RMUX (1 - 4) is displayed, only that Rmux configuration need be entered in designated memory (1 or 2).
ORDW CONFIG SELECTION > **DISPLAY= 1 GENERATE=2**	Enter "1" if display orderwire configuration routine is being performed or enter "2" if generate orderwire configuration routine is being performed.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
ORDERWIRE MODE CHANGE **NEW MODE =**	Message is displayed when orderwire mode change routine is completed. Message displays active orderwire mode (secure or non-secure) after change is made.
PLEASE STAND BY	Message is displayed in a transmit configuration routine while configuration data is being transmitted to standby or remote TD-1337(V)/G.
PORT INTERFACE **BALANCED=1 DIØ=2 UNBALANCED=3** **PORT 1> 2= 3= 4= 5=**	# In generate configuration routines, enter number (1, 2, or 3) for port interface type at each port designated by prompt. NOTES • Prompt only designates active ports. Inactive ports have a "0" displayed. • Ports 6, 7, and 8 are not displayed. When one of these ports is active, it is automatically assigned as a balanced interface. • "UNBALANCED=3" is not displayed on V3 and V4 models.
PORT OUTPUTS, DEMUX/PORT **1 > / 2= / 3 = / 4= /** **5 = / 6= / 7= / 8= /**	# At each port designated by prompt, enter DEMUX number (1 to 4) and then enter PORT number (1 to 8). **NOTE** PORT OUTPUTS (1 to 8) displayed as part of message are your local mux ports. DEMUX data you enter is your demux receiving SG that contains data to be routed to local mux port being designated by prompt. PORT data you enter is remote mux port in SG that contains data to be routed to local mux port being designated by prompt.
PORT RATES IN KBS, INACTIVE=0 **1> 2= 3= 4=** **5= 6= 7= 8=**	# At each port designated by prompt, enter assigned port rate. Each designated port must have a port rate (in kb/s) or a "0" entered.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
POWER ON **SYSTEM IS IN MODE**	Message is displayed when POWER ON/OFF switch is set to ON. Message also displays the current system mode of operation. (When TD-1337(V)/G is turned on, it assumes same mode it was in when power was turned off.)
PRELIM COMPOSITE RATE IN KBS **MUX > DEMUX1 = DEMUX2=** **DEMUX3= DEMUX4= STEP**	# • Message is displayed when system mode change routine is performed and TD-1337(V)/G is to be placed in preliminary mode. At each entry point designated by prompt, enter assigned SG rate (in kb/s). • Message is displayed for information when composite rates display routine is performed. **NOTE** "DEMUX2" through "DEMUX4" portion of message not displayed on V2 and V4 models,
PRESENT ORDW MODE = **ORDW CALLS: NON-SECURE** **SECURE ANDVT**	Message is displayed in answer orderwire call routine. The message presents: • Present orderwire mode (secure or non-secure) of local TD-1337(V)/G. • Type of orderwire call being received and which demux is receiving call. **NOTES** • "ANDVT" portion of message not displayed in V1 and V2 models. • If incoming call is either secure or non-secure and local TD-1337(V)/G is operating in opposite orderwire mode, call cannot be completed until local orderwire mode is changed.
REMOTE DATA MISSING	Message is displayed when a mode is selected or a routine is performed that requires Rmux (1 to 4) configuration data and data has not been entered in associated memory area.
REMOTE NOT ON LINE	Message appears when a download to non-nodal transmit routine is performed and remote TD-1337(V)/G selected is determined to be off line. (Remote TD-1337(V)/G is either turned off or operating at an incompatible rate.)

2-6. List of Message Displays – Continued.

Message Displays - Continued

Message displayed	Description
RING BUSY	Message is displayed for approximately two seconds when make orderwire call routine is performed.
RING COMPLETED	Message is displayed to indicate that ring signal is transmitted to remote party being called. (Message appears after RING BUSY message is blanked.)
RMUX CONFIGURATION SELECT > MINIMUM CONFIGURATION=1 CONFIGURATION FOR DOWNLOADING =2	# Enter "1" when generate Rmux minimum configuration routine is being performed. Enter "2" when Rmux configuration for downloading to non-nodal routine is being performed,
RMUX PORT RATE INVALID FOR LOCAL PORT MEMORY LOAD ABORTED	This message indicates that port rate for local port identified in message is not the same rate entered for its associated remote port in demux. Either a wrong rate was entered when performing routine or incorrect configuration data was supplied. Routine being performed is automatically aborted.
RMUX DATA RECEIVED > FOR MEM , ACCEPT=1 ABORT=2 SYSTEM IS IN MODE	# Message indicates that a download local configuration transmission has been received from a remote TD-1337(V) G. Message also displays which demux (1 through 4) in memory 1 or memory 2 is to be configured and system mode in which local TD-1337(V)/G is operating, Enter "1" if configuration is to be accepted or enter "2" if configuration is to be aborted. **NOTE** You cannot accept a download transmission for a given memory if you are operating in that memory mode. In this case, place local TD-1337(V)/G in another operating mode (system mode change routine) and repeat receive control telemetry routine.
SELECT FUNCTION	Select operating or configuration routine to be performed by pressing one of SYSTEM or ORDERWIRE keys or CT key. (Only appears after FUNC key is pressed.)

2-6. List of Message Displays-Continued.

Message Displays - Continued

Message displayed	Description
SELECT FUNCTION **TRANSMIT ABORTED**	Message is displayed when a transmit configuration routine has been aborted by the operator.
SLAVE TIMING SOURCE > **DEMUX 1=1 2=2 3=3 4=4**	# Enter number (1 to 4) of demux receiving SG from remote TO- 1337(V)/G selected as timing source. **NOTE** This message is only displayed in V1 and V3 models.
STATUS DISPLAY SELECTION > **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4**	Enter number (1 to 4) to select one of status display selection routines. **NOTE** VCXO status display routine (VCXO= 2) can only be selected and displayed when TD-1337(V)/G is using CNCE or external standard as a timing source.
SYSTEM IS IN MODE **STEP IF SYSTEM MODE CHANGE IS** **DESIRED, OTHERWISE CLEAR**	Press CLR key to terminate display system mode routine or press STEP key to continue system mode change routine.
SYSTEM MODE CHANGE COMPLETE	Message is displayed when system mode change routine is completed. TD-1337(V)/G is now operating in new mode.
SYSTEM MODE SELECTION > **MEMORY 1=1 MEMORY 2=2 INACTIVE=3** **PRELIMINARY=4 TD-976=5**	# Enter number (1 to 5) to select mode of operation in which TD-1337(V)/G will be operated when system mode change routine is completed. NOTE "TD-976=5" is only displayed in V1 model.
TD-754 DEMUX OPTION **INACTIVE=0 ACTIVE= 1** **PORT 1> PORT 3=**	# At each port designated by prompt, enter "1" if port is to use TD-754 demux option. Otherwise, enter "0". NOTE This message is only displayed in V1 and V2 models.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
TD-754 MUX OPTION **INACTIVE=0 ACTIVE= 1** **PORT 5> PORT 7=**	# At each port designated by prompt, enter "1" if port is to use TD-754 mux option. Otherwise, enter "0". **NOTE** This message is only displayed in V1
TIMING SOURCE SELECTION > **IF CNCE OR EXTERNAL STANDARD=1** **IF NOT, SLAVE= 2 MASTER=3**	# Enter number (1, 2, or 3) of timing source selected for configuration.
TRANSMIT COMPLETE	Message is displayed when a transmit configuration routine is performed and remote TD-1337(V)/G has automatically acknowledged that transmission has been received. (This does not mean that remote operator has performed receive control telemetry routine to accept or abort transmission.)
TRANSMIT SELECTION → **DOWNLOAD STBY=1 LOCAL CONFIG=2** **DOWNLOAD TO NON-NODAL=3**	# Enter number (1, 2, or 3) to select transmit configuration routine to be performed.
TRANSMIT UNSUCCESSFUL	Message is displayed when download to standby routine is performed and standby TD-1337(V)/G does not acknowledge transmission.
TRANSMIT UNSUCCESSFUL **NO ACK FROM DEMUX**	Message is displayed when a transmit configuration routine is performed and remote TD-1337(V)/G does not acknowledge receiving the transmission. Message identifies which demux's do not receive an acknowledge from associated remote TD-1337(V)/G receiving transmission. Message can be caused by: • Remote TD-1337(V)/G is turned off. • Remote TD-1337(V)/G is operating in same memory (1 or 2) that is designated in transmitted configuration. • System-level transmission problem. **NOTE** V1 and V3 models can display up to 4 demux's, V2 and V4 models only display demux 1 when no acknowledge occurs.

2-6. List of Message Displays- Continued.

Message Displays - Continued

Message displayed	Description
TRANSMIT UNSUCCESSFUL **STANDBY OFF LINE**	Message is displayed when download standby routine cannot be completed. Check that standby TD-1337(V)/G is turned on and operating in inactive mode.
TRM#/CALL#/SECURE=1,NON-SEC=2 **LOCAL TD > / /** **LOCAL CNCE = / /1**	# ●Message is displayed when generate orderwire configuration routine is performed. At each entry point designated by prompt, enter: 1. Local TD-1337(V)/G terminal number, call number, and secure (“1”) or non-secure (“2”) mode. 2. Local CNCE terminal number and call number. CNCE automatically assigned a secure mode (“1” is displayed). ● Message is displayed for information when display orderwire configuration routine is performed.
TRM#/CALL#/SECURE=1,NON-SEC=2 **REMOTE > / /** **REM CNCE = / /1**	# ● Message is displayed when generate orderwire configuration routine is performed. Message is repeated for each remote TD-1337(V)/G in network. At each entry point designated by prompt, enter: 1. Remote TD-1337(V)/G terminal number, call number, and secure (“1”) or non-secure (“2”) mode. 2. Remote CNCE terminal number and call number. Remote CNCE automatically assigned a secure mode (“1” is displayed). ● Message is displayed for information when display orderwire configuration routine is performed. Message is repeated for each remote TD- 1337(V)/G in network. **NOTE** Above message only displayed once for V2 and V4 models since they can communicate with only one remote TD-1337(V)/G.
TSSP MAJOR NEW STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
TSSP MAJOR OLD STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description.
TSSP MINOR STEP	One of message headings that appear when alarms recall routine is performed. Heading can be followed by lines of diagnostic information. Refer to paragraph 2-21 for further description.
VCXO FREQUENCY DRIFT **IN RANGE VCXO OUTPUT=**	Message is displayed when VCXO status display routine is performed and VCXO frequency response is in range. (VCXO is considered in range when a value between +6 and -6 is displayed.)
VCXO FREQUENCY DRIFT **OUT OF RANGE VCXO OUTPUT=**	Message is displayed when VCXO status display routine is performed and VCXO frequency response is out of range. (VCXO is considered out of range when a value of + 7 or –7 is displayed.)
VERIFY MEMORY LOADING > **ACCEPT= 1 ABORT=2**	# Enter “1” to accept orderwire configuration data entered during generate orderwire configuration routine. Enter “2” to abort (not use) configuration data. (This step verifies that operator wants orderwire configuration data entered into memory or aborted.)
VERIFY MEMORY LOADING > **ACCEPT=1 ABORT=2** **SYSTEM IS IN MODE**	# Enter “1” to accept configuration data entered during local mux configuration, Rmux minimum configuration, or Rmux configuration for downloading routines. Enter “2” to abort (not use) configuration data. (This step verifies that operator wants configuration data entered into selected memory or wants configuration data aborted.)
16KBS ORDERWIRE OPTION > **INACTIVE=0 ACTIVE= 1**	# Enter “1” to use option or enter “O” if option is not used.

2-6. List of Message Displays - Continued.

Message Displays - Continued

Message displayed	Description
16/32 KBS USER DEMUX > **DEMUX 1=1 2=2 3=3 4=4**	# Enter number of demux (1 - 4) receiving supergroup containing data for dedicated user. **NOTE** Message is not displayed in V2 and V4 models. (Demux 1 automatically entered.)
16/32 KBS USER MISMATCH **MEMORY LOAD ABORTED**	Message is displayed when rate assignment (16 or 32) for dedicated user is not the same between local and associated remote TD-1337(V)/G. This message also indicates that memory loading is aborted.
16/32 KBS USER OPTION > **INACTIVE=0** **16KBS ACTIVE=1 32KBS ACTIVE=2**	# Enter “0” if option is not used. Enter “l” if 16KBS option is used or “2” if 32KBS option is used.
5 MIN AUDIBLE ALARM INHIBIT > **ACTIVATE= 1 CLEAR= 2**	# Enter “1” to activate inhibit function. Enter “2” to clear (turn-off) inhibit function before normal 5-minute inhibit cycle is completed.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

Subject	Para	Page
General	2-7	2-27
PMCS Procedure	2-8	2-27

2-7. General.

Preventive maintenance checks and services (PMCS) are scheduled maintenance items used to make sure that the TD-1337(V)/G is ready for operation at all times. Inspect the TD-1337(V)/G regularly and carefully so that you can find any defects and have them corrected.

a. *Before You Operate.* Always perform your (B) PMCS. Before you operate is defined as before you start a mission.

b. While You Operate. Always perform your (D) PMCS. The (D) PMCS can be performed without interrupting normal equipment operation.

c. *If Your Equipment Fails to Operate.* Troubleshoot in accordance with procedures in Chapter 3. Report any deficiencies using the proper forms. See TM 38-750.

2-8. PMCS Procedures.

Defects discovered during performance of PMCS will be referred to organizational maintenance for correction. All (B) and (D) PMCS is performed at the front of the TD-1337(V)/G and do not require it to be extended from the rack. The PMCS procedures are listed in the chart on the facing page.

- *Item No. Column.* This column lists the sequence number of all procedures in the chart regardless of interval. The item number in this column must be used as the entry in the “TM Number” column of DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.
- *Internal Column.* This column lists the interval that each PMCS procedure is performed. A dot under the “B” column indicates that the associated procedure will be performed before operation, A dot under the “D” column indicates that the procedure will be performed during operation. A dot under the “Y” column indicates that the procedure will be performed on a yearly schedule.
- */tern to be Inspected Column,* This column identifies the item(s) on which the associated PMCS procedures are performed.
- *Procedures Column.* This column contains the PMCS procedures that are to be performed.
- *Equipment is not Ready/Available If Column.* This column describes the criteria by which the TD-1337(V)/G will be considered not ready to perform its primary mission.

2-8. PMCS Procedures - Continued.

NOTES

- The TD-1337(V)/G may be operated on a continuous basis. Items 1 through 6 can be performed without interrupting normal equipment operation.
- Item 7 requires that TD-1337(V)/G be removed from normal operation. Have this check made when equipment can be shut down.
- Within the designated interval, these checks are to be performed in the order listed.

B-Before D-During Y-Yearly

PMCS Chart

Item No.	Interval B	Interval D	Interval Y	Item to be Inspected	Procedures Check for and have repaired as necessary	Equipment Is Not Ready/ Available If:
1	•	•		Front panel	Check that display window and lenses of POWER AC and DC indicators are not cracked.	
2	•	•		Front panel	Check that dust and moisture boot at ALARM RESET switch is not cracked.	
3	•	•		Front panel	Check that all front panel mounted items are tight.	
4	•	•		Front panel	If dusty or dirty, clean with dry, clean, lint free cloth (item 1, Appendix C).	
5		•		Front panel	Check that model number (V1, V2, V3, or V4) is on identification plate. If not legible, reapply proper model number to plate.	
6	•	•		TD-1337(V)/G	Perform display test (para 2-19).	Display cannot be read or display does not respond to keyboard entries.
7			•	TD-1337(V)/G	Frequency of VCXO must be checked and adjusted, if necessary, by direct support personnel. Advise direct support maintenance personnel that checks are required.	

Section III. OPERATING ROUTINES

Subject	*Para*	*Page*
General Operating Procedures	2-9	2-30
Power Turn-On and Turn-Off Procedures	2-10	2-31
System Mode Change Routine	2-11	2-32
Display System Mode Routine	2-12	2-34
Answer Orderwire Call Routine (V1/V2 Models)	2-13	2-35
Answer Orderwire Call Routine (V3/V4 Models)	2-14	2-36
Make Orderwire Call Routine	2-15	2-37
Change Orderwire Mode Routine	2-16	2-39
Composite Rates Display Routine	2-17	2-40
VCXO Status Display Routine	2-18	2-41
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5-Minute Audible Alarm Inhibit Routine	2-20	2-43
Alarms Recall Routine	2-21	2-46

OVERVIEW

This section contains the power turn-on and turn-off procedures and the above listed operating routines. These procedures and routines are used by the operator and are described below, The general operating procedures in paragraph 2-9 describe their use.

- *Power Turn-On and Turn-Off Procedures.* The procedures for turning power on and off are in paragraph 2-10. When the power is turned off all configuration data entered in the NVM is retained. When power is turned on, the TD-1337(V)/G is automatically configured and resumes operation in the mode in which it was operating when power was removed.

NOTE

Except for the system mode change routine, you can perform any of these routines without interrupting the flow of user traffic.

- *System Mode Change Routine,* The routine in paragraph 2-11 allows you to select and place the TD-1337(V)/G in any one of the five operating modes. If you want to confirm which mode of operation is presently being used, perform the display routine in paragraph 2-12.
- *Orderwire Routines.* When operating a V1 or V2 model, use the answer and make orderwire call routines in paragraphs 2-13 and 2-15. For a V3 or V4 model, use paragraphs 2-14 and 2-15. To change the orderwire mode (secure to non-secure, or non-secure to secure), use the routine in paragraph 2-16.
- *Status Display Routines.* You can view the composite rates entered in the NVM by performing the routine in paragraph 2-17. If you want to check the status of the VCXO, use the routine in paragraph 2-18. The routine in paragraph 2-19 is a visual test of the display itself.
- *5-Minute Audible A/arm Inhibit Routine.* Perform the routine in paragraph 2-20 to silence the ALARM horn for 5 minutes. Use the same routine to cancel the inhibit any time before the 5-minute cycle expires.
- *A/arms Recall Routine.* This routine in paragraph 2-21 displays the diagnostic information that identifies the possible cause(s) of one or more ALARMS indicators to light. The routine is also performed to turn off the ALARMS MINOR indicator if it is lit when power is turned on or a system mode change is performed.

2-9. General Operating Procedures.

Operation of the TD-1337(V)/G consists of performing the procedures described in *a* through e below. Operator functions are performed using the display and keyboard on the TD-1337(V)/G and the routines in this chapter.

a. Power Turn-On. When the POWER ON/OFF circuit breaker is set to ON, the TD-1337(V)/G is automatically operating in the same mode that it was in when it was turned off. When the TD-1337(V)/G is turned on, it is possible that the ALARM horn will sound and one or more of the ALARMS indicators will light. The turn-on procedures tell the operator how to evaluate these alarm conditions. If there are no configuration requirements, or mode change required, the TD-1337(V)/G is operationally ready to process user traffic if it is in a memory 1 or memory 2 mode of operation.

b. Orderwire Calls. A V1 or V2 model has the capability to answer or make orderwire calls using the Vinson or H-250 handsets. The Vinson, H-250, or ANDVT equipment can be used with a V3 or V4 model. The types of orderwire used are determined by the network configuration in which the TD-1337(V)/G is operating. If the TD-1337(V)/G is in the inactive or TD-976 mode of operation, the orderwires cannot be used.

c. Monitoring for Faulty Operation. The ALARM horn sounds and one or more of the ALARMS indicators light when a faulty condition is detected by the TD-1337(V)/G. Also, power faults are identified when the POWER AC and/or DC indicators are off. Any time a faulty condition occurs, refer to the troubleshooting procedures in chapter 3.

d. System Mode Change. You will only change the system mode of operation when authorized to do so. As described in the system mode change routine, certain alarm conditions can occur and should be evaluated as directed in the routine.

e. Configuration Routines. The configuration routines in section IV are used to enter configuration data in the NVM only when authorized. When performing a configuration routine, you will be provided with the required data. Authority that originates the operating configuration will provide the necessary configuration data. To assist you in determining if you have all the data necessary to perform a given routine, the data requirements for each routine are listed at the beginning of each routine. Use of the keyboard and a description of the messages that can be displayed in the routines are in section I of this chapter. Chapter 1 contains overall descriptions of the operating and configuration routines that you can use in the operation of the TD-1337(V)/G.

2-10. Power Turn-On and Turn-Off Procedures.

Perform the procedures in a below to turn on a TD-1337(V)/G. Use the procedures in *b* below to turn off a TD-1337(V)/G.

a. Turn-On Procedures. Perform the following steps to turn on your TD-1337(V)/G. When the TD-1337(V)/G is ready for operation (with all covers installed) there are no exposed shock hazards to the operator.

Power Turn-On Procedures

Step	Operator action
1	Set POWER ON/OFF circuit breaker to ON.
2	Check that POWER AC and DC indicators are lit.
3	Check that following message is displayed: **POWER ON** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed.
4	Check that all ALARMS indicators are off. If ALARMS MINOR indicator is lit, perform the alarms recall routine in paragraph 2-21 to turn it off. **NOTES** • ALARMS BUS, PROCESSOR, and VCXO indicators should be off while TD-1337(V)/G is in normal operation, • ALARMS MAJOR indicator should be off, but it will be lit if proper input signals are not applied to TD-1337(V)/G. For example, if one or more interfacing equipments are not turned on or are not operating in a compatible configuration, ALARMS MAJOR indicator will light and ALARM horn will sound, Therefore, this situation should be considered before proceeding to troubleshooting.

b. Turn-Off Procedures, Perform the following procedures to turn off the TD-1337(V)/G.

Power Turn-Off Procedures

Step	Operator action
1	Set POWER ON/OFF circuit breaker to OFF.
2	Check that POWER AC and DC indicators are off.

2-11. System Mode Change Routine.

Perform the following routine to change the system mode of operation. If you are placing the TD-1337(V)/G in the preliminary mode, you require the configuration data described in a below. The step-by-step procedures for changing the system mode of operation are in *b* below.

NOTES

- Do not perform this procedure without authorization. If a mode change makes TD-1337(V)/G operate in a configuration that is not compatible with other TD-1337(V)/G's in the network, user traffic flow is interrupted.
- Orderwire configuration data must be in NVM before TD-1337(V)/G can be placed in preliminary mode of operation.

Following configuration data must be in appropriate NVM memory area before TD-1337(V)/G can be placed in memory 1 or memory 2 mode of operation.

1. Orderwire configuration.
2. Local mux configuration data.
3. Configuration data for each active demux.

a. Data Required for Preliminary *Mode Change.* The data listed below is required to place the local TD-1337(V)/G in the preliminary mode. This data is provided by the authority that originated the configuration. In addition to the local TD-1337(V)/G, the composite rates of the SG'S from the remote TD-1337(V)/G's in the network are required. These are the composite rates assigned to the active demux's in the local TD-1337(V)/G. A nodal (V1 or V3) can use up to four demux's and a non-nodal (V2 or V4) uses only demux No. 1.

Display	Composite Rate (in kb/s)	Definitions
MUX	_____	Composite rate for local mux SG output.
DEMUX1	_____	Composite rate for remote TD-1337(V)/G SG input to demux No. 1. "0" entered for inactive demux.
DEMUX2	_____	Same as for demux No. 1.
DEMUX3	_____	Same as for demux No. 1.
DEMUX4	_____	Same as for demux No. 1.

b. Procedures for Change System Mode Routine. Perform the following procedures to change system mode of operation.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

2-11. System Mode Change Routine - Continued.

System Mode Change Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM MODE key.
2	SYSTEM IS IN * MODE STEP IF SYSTEM MODE CHANGE IS DESIRED, OTHERWISE CLEAR * MEMORY 1, MEMORY 2, INACTIVE, PRELIM, or TD-976 is displayed. Press STEP key.
3	**SYSTEM MODE SELECTION →** **MEMORY 1=1 MEMORY 2=2 INACTIVE=3** **PRELIMINARY=4 TD-976=5** **TD-976 =5** is not displayed in V2, V3, and V4 models. Press key representing selected mode (1 through 5) and then press ENTRY key. Go to step 4 if "4" key is pressed. Go to step 5 if "1, 2, 3, or 5" is pressed.
4	**PRELIM COMPOSITE RATE IN KBS** **MUX→ DEMUX1= DEMUX2=** **DEMUX3= DEMUX4=** **DEMUX2** thru **DEMUX4** portion of message not displayed on V2 and V4 models. If correct rates are entered at each entry point, press ENTR key to advance display to next step. Otherwise, at each entry point indicated by prompt, press CLR key, enter assigned rate, and then press ENTR key. If Demux is inactive, press CLR key, press "0" key, and then press ENTR key.
5	**MODE CHANGE VERIFICATION →** **ACCEPT=1 ABORT=2** **OLD MODE= * NEW= *** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press '1" key and then press ENTER key. Observe following message is displayed to indicate procedure is completed. SYSTEM MODE CHANGE COMPLETE

2-11. System Mode Change Routine - Continued.

System Mode Change Routine - Continued

Step	Operator action/message displayed
6	Check that ALARMS indicators are off. If they are off, go to step 8. If one or more indicators are lit, go to step 7.
7	Perform the operator action associated with first ALARMS indicator listed below that is lit. *ALARMS Indicator List* — *Operator Action* VCXO, PROCESSOR, or BUS — Perform troubleshooting procedures as directed in chapter 3. MAJOR — Indicator lights if interfacing equipments are not operating in a configuration that is compatible to local TD-1337(V)/G configuration. Confirm that equipments are operating in compatible configurations. If they are operating in compatible configurations, and MAJOR indicator is still lit, perform troubleshooting procedures as directed in chapter 3. MINOR (other ALARMS indicators are off) — Perform alarms recall routine to clear (turn off) MINOR indicator (para 2-21c).
8	Press CLR key to clear display.

2-12. Display System Mode Routine.

Perform the following procedures to display the system mode in which the local TD-1337(V)/G is operating. These procedures can be performed without affecting normal equipment operation.

Display System Mode Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM MODE key.
2	**SYSTEM IS IN * MODE** **STEP IF SYSTEM MODE CHANGE IS DESIRED, OTHERWISE CLEAR** * < **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Check system mode of operation.
3	Press CLR key to clear display.

2-13. Answer Orderwire Call Routine (V1/V2 Models).

Perform the following procedures to answer an orderwire call from another station in the network. These procedures can be performed without affecting normal equipment operation.

NOTES

- Audible ALARM horn sounds and “0" appears on upper right-hand corner of display to indicate that an orderwire call is being received.
- If audible ALARM horn sounds and a “T” appears on upper right-hand corner of display, this indicates that a control telemetry transmission has been received (refer to paragraph 2-37).
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Answer Orderwire Call Routine (V1/V2 Models)

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press ORDERWIRE ANS key.
2	**PRESENT ORDW MODE** = * ▲ **ORDW CALLS: NON-SECURE** **SECURE** ▲ * **SECURE** or **NON-SECURE** is displayed. ▲ Source of orderwire call. **0** = Local CNCE **1** = Remote TD-1337(V)/G #1 **2** = Remote TD-1337(V)/G #2 **3** = Remote TD-1337(V)/G #3 **4** = Remote TD-1337(V)/G #4 • Go to step 4 if **PRESENT ORDW MODE (SECURE** or **NON-SECURE)** is the same as incoming **ORDW CALLS** mode. • Go to step 3 if modes are different.
3	Press FUNC key and then press ORDERWIRE CHG key. Observe following message is displayed. Repeat step 1 and then go to step 4. **ORDERWIRE MODE CHANGE** **NEW MODE** = * * **SECURE** or **NON-SECURE** is displayed.

2-13. Answer Orderwire Call Routine (V1/V2 Models) - Continued.

Answer Orderwire Call Routine (V1/V2 Models) - Continued

Step	Operator action/message displayed
4	Press CLR key to clear display.
5	Answer orderwire call: • Use Vinson if call is secure mode. • Use H-250 if call is non-secure mode.

2-14. Answer Orderwire Call Routine (V3/V4 Models).

Perform the following procedures to answer an orderwire call from another station in the network. These procedures can be performed without affecting normal equipment operation.

NOTES

- Audible ALARM horn sounds and "0" appears on upper right-hand corner of display to indicate that an orderwire call is being received.
- If audible ALARM horn sounds and a “T” appears on upper right-hand corner of display, this indicates that a control telemetry transmission has been received (refer to paragraph 2-37).
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Answer Orderwire Call Routine (V3/V4 Models)

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press ORDERWIRE ANS key.
2	**PRESENT ORDW MODE** = * **ORDW CALLS: NON-SECURE** ▲ **SECURE** ▲ **ANDVT** ▲ * > SECURE or NON-SECURE is displayed. a Source of orderwire call. **0** = Local CNCE **1** = Remote TD-1337(V)/G #1 **2** = Remote TD-1337(V)/G #2 **3** = Remote TD-1337(V)/G #3 **4** = Remote TD-1337(V)/G #4 Go to step 4 if ORDW CALLS is ANDVT or PRESENT ORDW MODE (SECURE or NON-SECURE) is the same as incoming ORDW CALLS mode. Go to step 3 if modes are different.

2-14. Answer Orderwire Call Routine (V3/V4 Models) - Continued.

Answer Orderwire Call Routine (V3/V4 Models) - Continued

Step	Operator action/message displayed
3	Press FUNC key and then press ORDERWIRE CHG key. Observe following message is displayed. Repeat step 1 and then go to step 4. **ORDERWIRE MODE CHANGE** **NEW MODE =** * * **SECURE** or **NON-SECURE** is displayed.
4	Press CLR key to clear display.
5	Answer orderwire call: • Use Vinson if call is secure mode. • Use H-250 if call is non-secure mode. • Use ANDVT equipment if call is ANDVT.

2-15. Make Orderwire Call Routine.

Perform the following procedures to call another station in the network. These procedures can be performed without affecting normal equipment operation.

NOTES

- Orderwire configuration data (your local call number and call number of party being called) must have been entered in NVM (para 2-24) in order to make a call.
- TD-1337(V)/G must be operating in preliminary, memory 1, or memory 2 mode of operation to use orderwire routines.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Make Orderwire Call Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press ORDERWIRE CALL key.

2-15. Make Orderwire Call Routine - Continued.

Make Orderwire Call Routine - Continued

Step	Operator action/message displayed
2	**ENTER CALL #** **16KBS ORDW IS IN * MODE** * **SECURE** or **NON-SECURE** is displayed. Check that you are in the correct orderwire mode (SECURE if using Vinson or NON-SECURE if using H-250). In a V3 or V4 model, either mode can be used for ANDVT. • If mode is correct, enter call number (1 to 16) of station being called and then press ENTR key. Go to step 4 if you are using a V3 or V4 model. Go to step 5 if you are using a V1 or V2 model. • If mode is not correct, perform step 3 and then repeat steps 1 and 2.
3	Press FUNC key and then press ORDERWIRE CHG key. Observe following message is displayed: **ORDERWIRE MODE CHANGE** **NEW MODE = *** * **SECURE** or **NON-SECURE** is displayed.
4	**ENTER CALL TYPE →** **16KBS ORDW=1 ANDVT=2** Message not displayed on V1 and V2 models. • If you are using a Vinson or H-250 handset, press “1” key and then press ENTR key • If you are using ANDVT equipment, press “2” key and then press ENTR key.
5	Check that RING BUSY message is displayed for approximately 2 seconds and then RING COMPLETED message is displayed. Wait for audible response from called party. **NOTE** To repeat orderwire call, all steps have to be performed.
6	After call is completed, press CLR key to clear display.

2-16. Change Orderwire Mode Routine.

Perform the following procedures to change orderwire mode of operation from secure to non-secure or from non-secure to secure. These procedures can be performed without affecting normal equipment operation.

NOTES

- This routine may be used when making or answering an orderwire call. Since this routine is short, steps 1 and 2 below have been inserted in the orderwire routines in paragraphs 2-13, 2-14, and 2-15.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Change Orderwrire Mode Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press ORDERWIRE CHG key.
2	**ORDERWIRE MODE CHANGE** **NEW MODE** = * * **SECURE** or **NON-SECURE** is displayed Observe that message displays selected mode. **NOTES** • Use H-250 handset in non-secure mode. • Use Vinson in secure mode.
3	Press CLR key to clear display.

2-17. Composite Rates Display Routine.

Perform the following procedures to display the composite rate assignments. This routine includes the composite rate for the local mux supergroup output and the composite rate for the supergroup input to each active demux. The composite rate assignments for the preliminary, memory 1, and memory 2 modes are displayed in the routine. These procedures can be performed without affecting normal equipment operation.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Composite Rates Display Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM STAT key.
2	**STATUS DISPLAY SELECTION →** **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4** Press "1" key and then press ENTR key.
3	**PRELIM * COMPOSITE RATE IN KBS** **MUX= * DEMUX1 =* DEMUX2= *** **DEMUX3=* DEMUX4=* STEP** Press STEP key to advance to next display. * "0" or composite rate in KBS is displayed. DEMUX2 thru DEMUX4 portion of message not displayed on V2 and V4 models.
4	**MEMORY 1 COMPOSITE RATE IN KBS** **MUX= DEMUX1 = DEMUX2=** **DEMUX3= DEMUX4= STEP** Press STEP key to advance to next display. * "0" or composite rate in KBS is displayed. DEMUX2 thru DEMUX4 portion of message not displayed on V2 and V4 models.

2-17. Composite Rates Display Routine - Continued.

Composite Rates Display Routine - Continued

Step	Operator action/message displayed
5	**MEMORY 2 COMPOSITE RATE IN KBS** **MUX= * DEMUX1= * DEMUX2= *** **DEMUX3= * DEMUX4= * STEP** * "0" or composite rate in KBS is displayed. DEMUX2 thru DEMUX4 portion of message not displayed on V2 and V4 models. Press STEP key to advance to next display.
6	**DISPLAY FUNCTION COMPLETE** • Observe that above message is displayed. • Press CLR key to clear display.

2-18. VCXO Status Display Routine.

Perform the following procedures to display the VCXO (voltage-controlled oscillator) status. This procedure can only be performed when an external timing source is being used. These procedures can be performed without affecting normal equipment operation,

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

VCXO Status Display Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM STAT key.
2	**STATUS DISPLAY SELECTION →** **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4** Press "2" key and then press ENTR key.

2-18. VCXO Status Display Routine - Continued.

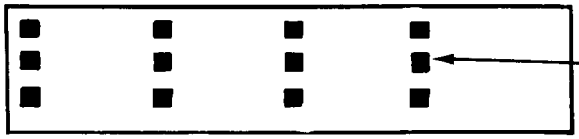
VCXO Status Display Routine - Continued

Step	Operator action/message displayed
3	**VCXO FREQUENCY DRIFT** **IN RANGE VCXO OUTPUT= *** * Value between +6 and –6 is displayed. OR **VCXO FREQUENCY DRIFT** **OUT OF RANGE VCXO OUTPUT= ▲** ▲ Value of +7 or –7 is displayed. If OUT OF RANGE message is displayed, request DS (or assigned level of maintenance) to perform VCXO frequency check.
4	Press CLR key to clear display.

2-19. Display Test Routine.

Perform the following procedures to test the display. This procedure can be performed without affecting the normal equipment operation.

Display Test Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed, Then press SYSTEM STAT key.
2	**STATUS DISPLAY SELECTION →** **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4** Press “3” key and then press ENTER key.
3	 Each column is: 1 character wide 3 characters high Check that there are no missing dots in each of four columns being displayed, Each character contains 35 dots (5 dots wide x 7 dots high).

2-19. Display Test Routine - Continued.

Display Test Routine - Continued

step	Operator action/message displayed
4	Press STEP key one time. Check that dot patterns move one character position to right. Repeat step 3 and then go to step 5.
5	Repeat steps 3 and 4 six times. This checks all 96 characters on the display.
6	Press CLR key and then, one at a time, press keys “1” thru “9” and “0”. Check that following message is displayed. **1234567890**
7	Check that message display blanks approximately 30 seconds after step 6 was performed.
8	Press BACK key and check that message displayed in step 6 reappears.
9	Press CLR key. Check that message display is cleared. Display test is completed.

2-20. 5-Minute Audible Alarm Inhibit Routine.

Perform the procedures in *a* below to activate the 5-minute audible alarm inhibit function. Perform the procedures in *b* below to clear (turn-off) the inhibit function before the 5-minute cycle expires. When the inhibit function is active, the following occurs:

- ALARMS BUS indicator is frozen in present state.
- PROCESSOR and VCXO indicators remain active during the inhibit cycle. If a fault is detected that is associated with the PROCESSOR or VCXO indicator, the appropriate indicator lights and the ALARM horn sounds.
- MAJOR and/or MINOR indicators, if lit, are turned off and remain off (inhibited) until inhibit cycle is completed.
- Except for faults associated with PROCESSOR or VCXO, or when an orderwire call is received, the ALARM horn is inhibited.
- Alarms recall routine cannot be performed while the inhibit cycle is active, Also, any existing minor alarms information is erased when routine is performed.

2-20. 5-Minute Audible Alarm Inhibit Routine-Continued.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

a. Procedures To Activate *5-Minute Audible A/arm Inhibit.* Perform the following procedures to activate the inhibit function.

Activate 5-Minute Audible Alarm Inhibit

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM STAT key.
2	**STATUS DISPLAY SELECTION →** **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4** Press "4" key and then press ENTR key.
3	**5 MIN AUDIBLE ALARM INHIBIT →** **ACTIVATE=1 CLEAR=2** Press "1" key and then press ENTR key. Check that following message is displayed. **ALARM INHIBIT ACTIVATED** **NOTE** ALARM INHIBIT ACTIVATED message will automatically blank after 30 seconds. Note that CLR key was not pressed at end of this routine so that if display is reactivated you will be reminded that alarm inhibit function was activated. However, after 5-minute inhibit cycle expires, ALARM INHIBIT ACTIVATED message will be displayed when display is reactivated.

2-20. 5-Minute Audible Alarm inhibit Routine-Continued.

b. Procedures To Clear 5-Minute Audible Alarm Inhibit. Perform the following procedures to clear the inhibit function.

Clear 5-Minute Audible Alarm Inhibit

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM STAT key.
2	**STATUS DISPLAY SELECTION →** **COMP RATE=1 VCXO=2 DSPL TEST=3** **ALARM INHIBIT=4** Press "4" key and then press ENTR key.
3	**5 MIN AUDIBLE ALARM INHIBIT →** **ACTIVATE=1 CLEAR=2** Press "2" key and then press ENTR key. Check that following message is displayed. **ALARM INHIBIT CLEARED**
4	Press CLR key to clear display.

2-21. Alarms Recall Routine.

This routine is performed to identify the faulty condition(s) that caused the ALARMS MAJOR or ALARMS MINOR indicator to light. This routine is also used to turn off the ALARMS MINOR indicator if it was lit at power turn on or when a system mode change was performed. When this routine is performed, diagnostic information is displayed under one or more of the headings described in *a* below. The diagnostic information that can appear in a message display is described in *b* below. The step-by-step procedures for the routine are in c below.

a. *Headings.* In each message display, a heading is displayed on line 1. There are six different headings that can appear in a routine. As described below, there are three TSSP headings that are displayed in all models. There are three CESE headings that are only displayed in V3 and V4 models.

(1) **TSSP MAJOR NEW** *Heading (A// mode/s).* The TSSP diagnostic information for the faults that are detected by the TD-1337(V)~G and cause the ALARMS MAJOR indicator to light are listed under this heading. The diagnostic information only appears under this heading the first time that the fault is displayed. If the routine is repeated, and the fault still exists, the information is now displayed under the TSSP MAJOR OLD heading.

NOTE

Examples of the TSSP MAJOR NEW and CESE MAJOR NEW headings are shown in *b* below.

(2) **TSSP MAJOR OLD** *Heading (All rnodels,).* Each time this routine is repeated, and a specific fault still exists, the information for the fault is displayed under this heading. If the fault goes away (no longer detected), the ALARMS MAJOR indicator goes off and the ALARMS MINOR indicator lights. The next time this routine is performed, the diagnostic information will be displayed under the TSSP MINOR heading.

(3) **TSSP MINOR** *Heading (All rnodels),* A fault that was detected and is no longer detected is only displayed under this heading during the performance of one routine. All lines of diagnostic information displayed under this heading are erased each time a routine is performed. Therefore, if a line of diagnostic information does appear under this heading in a repeated routine, this indicates that the same detected fault reoccurred and went away since it was last displayed in the preceding routine.

(4) **CESE MAJOR NEW** *Heading (V3 and V4 models).* A TD-1337(V)/G monitors up to 56 CESE status points. A fault or no-fault condition is reported by the equipment connected to each status point. When a faulty condition is indicated at a status point input, the ALARM MAJOR indicator lights and information for that status point is displayed under this heading.

(5) **CESE MAJOR OLD** *Heading (V3 and V4 rnodels).* CESE status point information is displayed under the same conditions as described for TSSP MAJOR OLD above.

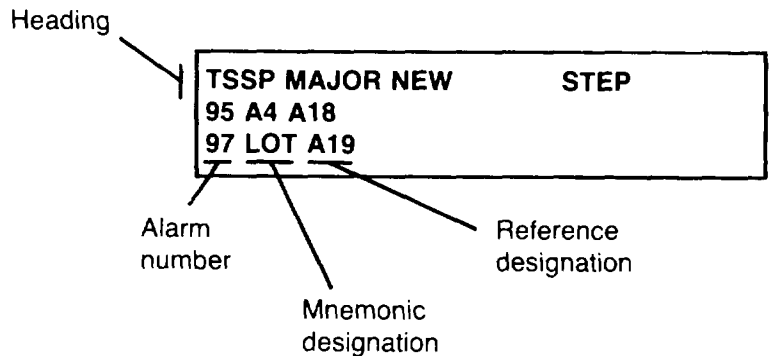
(6) **CESE MINOR** *Heading (V3 and V4 models).* CESE status point information is displayed under the same conditions as described for TSSP MINOR above.

2-21. Alarms Recall Routine - Continued.

b. Diagnostic Information. The TSSP diagnostic and CESE status point information that is displayed in the alarms recall routines are described below,

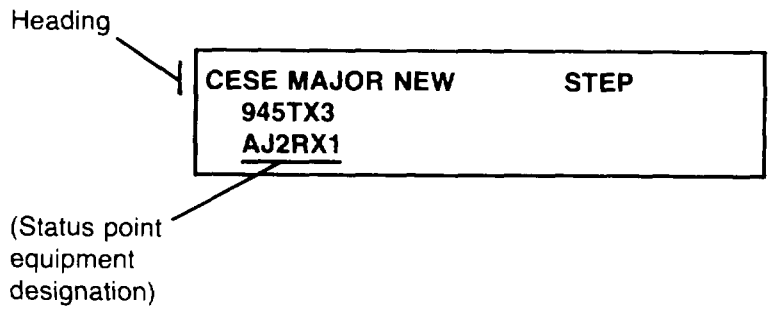
(1) *TSSP Diagnostic hformation.*

- As shown below, each line of diagnostic information under the heading contains an alarm number. There is an alarm number assigned to each type of fault that can be detected and displayed in a diagnostic information message. These alarm numbers are used as trouble-shooting aids by higher levels of maintenance, Normally, the alarm number is followed by a reference designation, a mnemonic designation, or a combination of the two,
- Each reference designation that is listed after the alarm number indicates a subassembly that could cause the detected fault.
- A mnemonic designation that is listed after the alarm number indicates a type of fault that is detected. There are three mnemonic designations: LOS for loss of signal, LOT for loss of timing, and OOS for out of sync.



(2) *CESE Status Point Information (V3 and V4 models).*

- Each line of information under the heading represents one status point. The equipment designation identifies the CESE equipment input that is reporting a faulty condition.



2-21. Alarms Recall Routine - Continued.

c. Procedures for Alarms Recall Routine, Perform the following procedures to display the diagnostic information that describes the fault(s) that caused the ALARMS MAJOR and/or ALARMS MINOR indicators to light. To assist in evaluating detected problems, it is recommended that diagnostic information that is displayed under each heading be recorded (written down) and retained. It is not necessary to record diagnostic information when routine is being used to turn off the ALARMS MINOR indicator if it was lit at power turn on or when a system mode change was performed. (All information displayed under TSSP MINOR or CESE MINOR headings is erased when routine is completed.)

NOTES

- The alarms recall routine cannot be performed while the 5-minute audible alarm inhibit is active.
- If an ALARMS indicator lights or ALARM horn sounds while routine is being performed, complete routine and refer to troubleshooting procedures in chapter 3 for operator action.
- If there are two lines of diagnostic information displayed under a heading, the heading is repeated when the STEP key is pressed. The following steps show the six headings that can be displayed in a routine. If a heading is repeated when STEP key is pressed, the routine may require more than 8 steps to complete.
- Start with step 1 and perform procedures as directed. Steps 3, 5, and 7 are not used (or headings displayed) for V1 and V2 models.

Alarms Recall Routine

Step	Operator action/message displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM ALRM key.
2	TSSP MAJOR NEW STEP Record any diagnostic information displayed. Then press STEP key.
3	CESE MAJOR NEW STEP Record any status point information displayed. Then press STEP key.

2-21. Alarms Recall Routine - Continued.

Alarms Recall Routine - Continued

Step	Operator action/message displayed
4	TSSP MAJOR OLD STEP Record any diagnostic information displayed. Then press STEP key.
5	**CESE MAJOR OLD STEP** Record any status point information displayed. Then press STEP key.
6	**TSSP MINOR STEP** Record any diagnostic information displayed. Then press STEP key.
7	**CESE MINOR STEP** Record any status point information displayed. Then press STEP key.
8	**ALARMS RECALL COMPLETE** • Check that above message is displayed. • Check that ALARMS MINOR indicator is off. Other ALARMS indicators will be lit if a previously detected fault still exists. If ALARMS MINOR indicator is lit, refer to troubleshooting procedures in chapter 3 for operator action.
9	Press CLR key to clear display.

Section IV. CONFIGURATION ROUTINES

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OVERVIEW

This section contains the above listed routines. These routines are used by an operator to generate, display, transmit, and receive configuration data as described below. The routines are used as described in paragraph 2-22. Paragraph 2-23 describes the data you require to perform a generate routine,

- *Generate Routines.* These routines are used by the operator to enter configuration data in the NVM, One or more of the routines in paragraphs 2-24, and 2-27 through 2-31, are required to configure the TD- 1337(V)/G for operation as described in paragraph 2-22.
- *Display Routines.* If you want to display the orderwire configuration data entered in the NVM, perform the routine in paragraph 2-25. To display the configuration data in memory 1 or memory 2 area in NVM, perform the routine in paragraph 2-26.
- *Transmit Routines.* The routine in paragraph 2-34 is used to download configuration data in your TD-1337(V)/G to a standby TD-1337(V)/G. Perform the procedures in paragraph 2-35 to send your local mux configuration to each remote TD-1337(V)/G in your network. Use paragraph 2-36 to transmit a Rmux configuration for downloading to a selected remote TD-1337(V)/G in your network.
- *Receive Routine.* When a remote TD-1337(V)/G has transmitted configuration data to your TD-1337(V)/G (remote operator would use routine in paragraph 2-35 or 2-36), use the routine in paragraph 2-37 to accept or abort the received configuration data.
- *Edit and Continue Routines.* These routines allow the operator to edit and continue configuration routines as described in paragraph 2-22.

2-22. Use of Configuration Routines.

Use of the configuration routines for configuring a TD-1337(V)/G are described below. None of the routines in this section are required to operate the TD-1337(V)/G in the inactive or TD-976 modes. The orderwire must be configured to place the TD-1337(V)/G in the preliminary mode of operation. To operate the TD-1337(V)/G in the memory 1 or memory 2 mode, the local mux and each active demux must have configuration data entered in the selected memory (1 or 2) and the orderwire must also be configured.

a. Configure Orderwire. Perform the generate orderwire configuration routine in paragraph 2-24 to configure the orderwire. This routine must be performed before the TD-1337(V)/G can be placed in the preliminary, memory 1, or memory 2 mode of operation.

b. Configure Local Mux. Configuration data is entered locally by using generate routine in (1) below or it can be transmitted to your TD-1337(V)/G from a remote TD-1337(V)/G and then entered as described in (2) below.

NOTE

When a local mux configuration is entered or edited in memory 1 or memory 2, all demux configuration data in the selected memory are erased. Therefore, each active demux has to be configured anytime the local mux configuration data changes.

(1) You can enter configuration data in memory 1 or memory 2 for the local mux by performing the generate local mux configuration routine in paragraph 2-27 (V1 or V2 models) or paragraph 2-28 (V3 or V4 models).

(2) If you are operating as a non-nodal, your local mux and demux can be configured by a remote TD-1337(V)/G who has transmitted to you by performing a download to non-nodal routine (para 2-35). You would perform the receive control telemetry routine in paragraph 2-37 to enter the received data in memory 1 or memory 2. In this case you would not perform a generate local mux configuration routine.

c. *Configure Active Demux's.* Configuration data for each active demux is entered locally by using the generate routines in (1) or (2) below or it can be transmitted to your TD-1337(V)/G from a remote TD-1337(V)/G and entered as described in (3) or (4) below.

(1) You can enter configuration data in memory 1 or memory 2 for a demux by performing the generate Rmux minimum configuration routine in paragraph 2-29. Repeat the routine for each demux to be configured.

(2) You automatically select and enter data for one demux by performing the generate Rmux configuration for downloading routine described in f(1) below.

(3) You can receive a download local configuration transmission from a remote TD-1337(V)/G. To enter this data in memory 1 or memory 2, perform the receive control telemetry configuration routine in paragraph 2-37. This would configure your local demux associated with that remote TD-1337(V)/G.

(4) If you are operating as a non-nodal, your demux is configured when you accept a download to non-nodal transmission as described in *b(2)* above.

d. Configure Standby TD-1337(V)/G. The standby TD-1337(V)/G is automatically configured when the download standby routine in paragraph 2-34 is per-formed. At this time, the NVM in the standby TD-1337(V)/G receives all the configuration data entered in the NVM of the local TD-1337(V)/G.

e. *Confjgure Dernux in Each Remote TD-1337(V)/G.* You can transmit the configuration data necessary to configure one demux in each remote TD-1337(V)/G in the network. Performing the transmit configuration – download local configuration routine in paragraph 2-35 transmits your local mux configuration to each remote TD-1337(V)/G. Each TD-1337(V)/G automatically uses the data to configure the demux that receives your supergroup when the remote operator performs the receive control telemetry routine in paragraph 2-37.

2-22. Use of Configuration Routines - Continued.

f. Configure One Remote TD-1337(V)/G Operating as a */Von-Nodal. You* can transmit the configuration data necessary to configure the mux and demux of a remote TD-1337(V)/G operating as a non-nodal by performing the following routines.

(1) Enter configuration data in memory 1 or memory 2 for remote TD-1337(V)/G by performing Rmux configuration for downloading routine in paragraph 2-30 (for V1 or V2 model) or paragraph 2-31 (for V3 or V4 model). When the routine is performed, you have entered a local mux configuration for a remote TD-1337(V)/G in memory. Also, when the routine is performed, your local demux associated with the remote TD-1337(V)/G selected is automatically configured in the selected memory location.

(2) The configuration data is transmitted to the non-nodal when the download to non-nodal routine in paragraph 2-36 is performed. When the transmit routine is performed, your local mux configuration in the selected memory is also transmitted. This data becomes the configuration data input for the demux in the non-nodal when the operator performs the receive control telemetry routine in paragraph 2-37.

g. Edit Existing Configuration Data in *NVM.* Any configuration data entered in NVM can be changed by performing the edit existing configuration routine in paragraph 2-32.

h. Continue an Interrupted Generate Configuration Routine. If you were performing a generate configuration routine and interrupted the routine before completing it (pressed FUNC key and selected another routine), you can recall the routine and continue entering configuration data by performing the continue configuration routine in paragraph 2-33.

i. Display Configuration Data. You can display and check the configuration data in NVM. Perform the display orderwire configuration data routine in paragraph 2-25 to display the orderwire configuration data entered in NVM. Paragraph 2-26 allows you to select and display the configuration data entered in memory 1 or memory 2 for the local mux or any active demux.

2-23. Data Requirements for Generate Routines.

The following data sheets summarize the data requirements that must be considered when planning or performing the below listed generate routines. The message headings in each routine (requiring data) are shown on the data sheets. In some operating configurations, all of the data requirements shown on the data sheets are not used. A detailed description of the data requirements (indicated by message headings) in each routine is provided at the beginning of the paragraphs listed below.

Routine	*Para No.*	*Comments*
Orderwire configuration	2-24	All models.
Local mux configuration	2-27	V1 or V2 model.
	2-28	V3 or V4 model.
Rmux minimum configuration	2-29	All models. (Sheet shows data requirements for four demux's (max))
Rmux configuration for downloading	2-30	V1 or V2 model.
	2-31	V3 or V4 model.

2-23. Data Requirements for Generate Routines - Continued.

ORDERWIRE CONFIGURATION ROUTINE

STATION	ITEM	LOCAL	REMOTES			
			1	2	3	4
TD-1337(V)/G	CALL NO.					
	TERM NO.					
	MODE	SECURE . NON-SECURE _	SECURE . NON-SECURE _	SECURE _ NON-SECURE _	SECURE _ NON-SECURE _	SECURE NON-SECURE ----
CNCE	CALL NO.					
	TERM NO.					

LOCAL MUX CONFIGURATION ROUTINE

MEMORY 1 _
MEMORY 2 —

LOCAL MUX PORT	PORT RATES IN KBS	PORT INTERFACE			PORT OUTPUTS		EXTERNAL TIMING SOURCES
		BAL	DIØ	▲ UNBAL	DEMUX	PORT	
1					/		
2			X		/		
3							
4			X		/		
5				X	/		
6		X	X	X	/		
7		X	X	X	/		
8		X	X	X	/		

16 KBS ORDERWIRE OPTION	YES _____ NO _____
16/32 KBS USER OPTION	16 KBS _____ 32 KBS _____ NO _____
16/32 KBS USER DEMUX	DEMUX NO. _____
TIMING SOURCE SELECTION	CNCE OR EXT STD _____ SLAVE _____ MASTER _____
SLAVE TIMING SOURCE	DEMUX NO. _____
COND DIØ GROUP MODEM CABLE	NO. 1/4 MILE REELS._
CESE TLM PATCH OPTION ■	PATCH LOCAL _____ PATCH DEMUX 1 _____
CESE TELEMETRY EQUIP ID ■	EQUIP ID NO. _____
TD-754 MUX OPTION ▲	PORT 5 _____ PORT 7 _____
TD-754 DEMUX OPTION ▲	PORT 1 _____ PORT 3 _____

RMUX MINIMUM CONFIGURATION ROUTINE

MEMORY 1
MEMORY 2_____

RMUX PORT	PORT RATES IN KBS			
	RMUX NO. 1	RMUX NO. 2	RMUX NO. 3	RMUX NO. 4
1				
2				
3				
4				
5				
6				
7				
8				

#				
#	YES_ NO —	YES _ NO —	YES _ NO _	YES _ NO —
#	16 KBS _ 32 KBS— NO —	16 KBS _ KBS — NO —	16 KBS _ 32 KBS _ NO _	16 KBS_ 32 KBS _ NO _

NOTES:

1. ▲ INDICATES NOT USED IN V3/V4 MODELS.
   ■ INDICATES NOT USED IN V1/V2 MODELS.
2. # INDICATES SAME HEADING DISPLAYED AS SHOWN TO LEFT IN LOCAL MUX CONFIGURATION ROUTINE.
3. PORT RATE IN KBS COLUMNS; AT EACH PORT ENTER RATE IN KBS OR "0" IF INACTIVE.

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2-23. Data Requirements for Generate Routines - Continued.

RMUX CONFIGURATION
FOR DOWNLOADING ROUTINE

RMUX NO. ____ MEMORY 1 ____
MEMORY 2 ____

RMUX PORT	PORT RATES IN KBS	PORT INTERFACE			PORT OUTPUTS		EXTERNAL TIMING SOURCES
		BAL	DIØ	▲ UNBAL	DEMUX	PORT	
1					/		
2			X		/		
3					/		
4			X		/		
5				X	/		
6		X	X	X	/		
7		X	X	X	/		
8		X	X	X	/		

16 KBS ORDERWIRE OPTION	YES ____ NO ____
16/32 KBS USER OPTION	16 KBS ____ 32 KBS ____ NO ____
16/32 KBS USER DEMUX	DEMUX NO. ____
TIMING SOURCE SELECTION	CNCE OR EXT STD ____ SLAVE ____ MASTER ____
SLAVE TIMING SOURCE	DEMUX NO. ____

COND DIØ GROUP MODEM CABLE I NO. 1/4 MILE REELS ____

CESE TLM PATCH OPTION ■	PATCH LOCAL ____ PATCH DEMUX 1 ____
CESE TELEMETRY EQUIP ID ■	I EQUIP ID NO. ____
TD-754 MUX OPTION ▲	PORT 5 ____ PORT 7 ____
TD-754 DEMUX OPTION ▲	PORT 1 ____ PORT 3 ____

NOTES:
1. ▲ INDICATES NOT USED IN V3/V4 MODELS.
   ■ INDICATES NOT USED IN V1/V2 MODELS.

2. PORT RATE IN KBS COLUMNS:
   AT EACH PORT ENTER RATE
   IN KBS OR "0" IF INACTIVE.

EL7KB024

2-24. Generate Orderwire Configuration Routine.

This paragraph contains the procedures for performing an orderwire configuration, This routine is applicable for all models of the TD-1337(V)/G. Before performing the routine, you require the configuration data described in *a* below. The step-by-step procedures for the routine are in *b* below.

a. Data Required. The terminal numbers and call numbers for the TD-1337(V)/G's and CNCE'S in the network are required when performing this routine. This data are provided by the authority that originated the configuration. The maximum number of stations in a network is shown in the below chart.

NOTES

. Each station in the network is assigned a terminal number (1 thru 999) and a call number (1 thru 16). The orderwire mode of each TD-1337(V)/G station is designated as secure (1) or non-secure (2). All CNCE'S are automatically assigned a secure orderwire mode.

. Remotes 2 through 4 are not assigned in V2 and V4 models.

Orderwire Configuration Data Requirements

Station	Item	Local	Remotes			
			1	2	3	4
TD-1337(V)/G	Call No.					
	Terminal No.					
CNCE	Mode					
	Call No.					
	Terminal No.					

b. Procedures. This routine configures the local TD-1337(V)/G to communicate with the other TD-1337(V)/G's and CNCE'S in the orderwire system. To perform the following routine, you need the terminal number and call number for each station in your network. The secure or non-secure assignment for each TD-1337(V)/G is also required as described in *a* above.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.
- If you are performing this routine to change your present call number, you must perform a system mode change (or power turn-on and turn-off) routine after completing this routine to activate your new call number.

2-24. Generate Orderwire Configuration Routine - Continued.

Orderwire Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed, Then press ORDERWIRE CONF key.
2	**ORDW CONFIG SELECTION >** **DISPLAY= 1 GENERATE=2** Press “2” key and then press ENTER key,
3	**TRM#/CALL#/SECURE=1,NON-SEC=2** **LOCAL TD > / /** **LOCAL CNCE = / /1** Perform steps *a* through c for local TD-1337(V)/G. Then perform steps a and *b* for local CNCE. *a.* Press CLR key, enter assigned terminal number, and then press ENTR key. *b.* Press CLR key, enter assigned call number, and then press ENTR key. c. Press “1” (secure) or “2” (non-secure) key and then press ENTR key. (When configuring a CNCE, secure is automatically assigned.)
4	**TRM#/CALL#/SECURE=1,NON-SEC=2** **REMOTE * / /** **REM* CNCE = / /1** * **1, 2, 3,** or **4** is displayed. Perform *a, b,* and *c* as directed in step 3 above for each remote message display.
5	**VERIFY MEMORY LOADING** **ACCEPT= 1 ABORT=2** Press “1” key and then press ENTR key.
6	**END OF ORDERWIRE CONFIGURATION** Check that above message is displayed. Then press CLR key to clear display.

2-25. Display Orderwire Configuration Routine.

Perform the following procedures to display orderwire configuration data in NVM. These procedures can be performed without affecting normal equipment operation.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Display Orderwire Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press ORDERWIRE CONF key.
2	**ORDW CONFIG SELECTION →** **DISPLAY=1 GENERATE=2** Press "1" key and then press ENTR key.
3	**TRM#/CALL#/SECURE=1,NON-SEC=2** **REMOTE 1 = */*/*** **REM 1 CNCE = */*/1** * Terminal no./call no./ and secure or non-secure assignments are displayed. Press STEP key to advance to next display.
4	**TRM#/CALL#/SECURE=1,NON-SEC=2** **LOCAL TD = */*/*** **LOCAL CNCE = */*/1** * Terminal no./call no./ and secure or non-secure assignments are displayed. Press STEP key to advance to next display. Repeat this step to display orderwire assignments for remote TD-1337(V)/G's and remote CNCE'S in network (max of 4) until following message is displayed. At this time the routine is completed. **DISPLAY FUNCTION COMPLETE**
5	Press CLR key to clear display.

2-26. Display System Configuration Routine.

Perform the following procedures to display local mux or an active Rmux configuration data contained in memory 1 or memory 2. These procedures can be performed without affecting normal equipment operation.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Display System Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION >** **DISPLAY= 1 GENERATE=2 TRANSMIT=3** Press "1" key and then press ENTR key.
3	**MEMORY SELECTION >** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * < **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press "l" or "2" key and then press ENTR key.
4	**LOCAL/REMOTE MUX SELECTION >** **LOCALMUX=0 RMUX 1=1 RMUX 2=2** **RMUX 3=3 RMUX 4=4** Press (0 - 4) key to select configuration to be displayed and then press ENTR key. **NOTE** If local mux or Rmux selected is not configured, the routine is terminated and the following message is displayed. If this message is displayed, go to step 6. **NO DATA IN SELECTED MEMORY**

2-26. Display System Configuration Routine - Continued.

Display System Configuration Routine - Continued

Step	Operator action/message display
5	Press STEP key to advance (step) through message displays in selected configuration. When total configuration has been presented, the following message is displayed. **DISPLAY FUNCTION COMPLETE**
6	Press CLR key to clear display.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models).

Perform this routine to enter local mux configuration data in memory 1 or memory 2. Before performing the routine, ensure that you have the configuration data required to complete the entries in the routine as described in *a* below. The step-by-step procedures for the routine are in *b* below.

a. Data *Required.* To assist you in listing and determining if you have all the data you will need, the following chart shows you what data are required and where the data are used in the routine.

NOTES

- *"Step No. " Column.* Step number for each procedure performed by an operator that requires configuration data is listed in this column. Steps performed by an operator that do not require a configuration data input are not listed.
- *"Message heading/data required" Column.* The message heading that is displayed for each step requiring configuration data is shown in this column. Below each message heading is one or more lines for listing the required data that is supplied by the authority that originated the configuration.
- *"Definitions" Columm.* This column defines the type of data that is supplied and entered on the lines in the "Message heading/data required" column. Some steps listed below are not used in all configurations. Notes are added in the column to describe the exceptions.

Local Mux Configuration Data Requirements (V1/V2 Models)

Step No.	Message heading/ data required	Definitions
4	MEMORY SELECTION Entry:____	Enter "1" for memory 1 or *"2"* for memory 2.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading/ data required	Definitions
6	**PORT RATES IN KBS** Port 1 _ Port 5 — Port 2 — Port 6 _ Port 3 — Port 7 — Port 4 — Port 8 —	At each port, enter port rate in kb/s or "0" if port is inactive. **NOTE** Ports 3 thru 8 not used in V2 model.
7	**PORT INTERFACE** Port 1 — Port 4 — Port 2 _ Port 5 _ Port 3 _	Enter one of following for each active port. "1" for balanced "2" for conditioned diphase "3" for unbalanced **NOTES** ● Ports 3 thru 8 not used in V2 model. ● Ports 6, 7, and 8 are automatically entered as balanced ("1") when active.
8	**TD-754 DEMUX OPTION** Port 1 _ Port 3 _	For each port, enter "0" if option is not used or "1" if option is used. **NOTE** Step 8 is only used for port 1 and/or port 3 when: *a.* For port 1 when ports 1 and 2 have port rates of 576 kb/s and an unbalanced interface. *b.* For port 3 when ports 3 and 4 have port rates of 576 kb/s and an unbalanced interface.
9	**TD-754 MUX OPTION** Port 5 _ Port 7 —	For each port, enter "0" if option is not used or "1" if option is used. **NOTES** ● Step 9 is only used for port 5 and/or port 7 when: *a.* Port 5 has a port rate of 1152 kb/s and a. balanced interface. *b.* Port 7 has a port rate of 1152 kb/s and a balanced interface. ● Step 9 is not used in V2 model.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading] data required	Definitions
10	**16KBS ORDERWIRE OPTION** Entry: _	Enter "0" if option is not used or "1" if option is used.
11	**16/32 KBS USER OPTION** Entry: __	Enter "0" if option is not used, "1" if option is used and rate is 16 kb/s, or "2" if option is used and rate is 32 kb/s.
12	**16/32 KBS USER DEMUX** Entry: _	Enter number of demux ("l", "2", "3", or "4") receiving SG containing data for dedicated user. **NOTES** . Step not used if "0" entered in step 11. . Step not used in V2 model. ("1" is automatically entered if "1" or "2" was entered in step 11.)
13	**PORT OUTPUTS, DEMUX/PORT** (a) (b) Port 1, Demux _ / Port _ Port 2, Demux _ / Port — Port 3, Demux _ / Port — Port 4, Demux _ / Port — Port 5, Demux _ / Port — Port 6, Demux _ / Port — Port 7, Demux _ / Port — Port 8, Demux _ / Port _	Following entries are made for each active port output. *a.* Demux number ("l", "2", "3", or "4") of demux supplying data to that port output. *b.* Port number ("1" thru "8") of group data that will be extracted from SG applied to selected demux *(a* above) and routed to your port output. (This is port number of Rmux port supplying selected group data in SG.) **NOTE** Ports 3 thru 8 not used in V2 model.
14	**TIMING SOURCE SELECTION** Entry:____	Enter "1" for CNCE or external standard, "2" for slave, or "3" for master.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading data required	Definitions
15	**EXTERNAL TIMING SOURCES** Port 1 — Port **2** — Port **3** — Port **4** — Port **5** — **Port 6** — Port **7** — **Port 8** —	At each port, enter “1” if port is designated as an external timing source. Enter “0” for each port not designated as a timing source. **NOTES** ● Ports 3 through 8 not used in V2 model. ● This step is used if CNCE or external standard was previously selected as the timing source (“1” entered in step 14).
16	**SLAVE TIMING SOURCE** Entry: _	Enter number of demux (“1”, “2”, “3”, or “4”) receiving SG containing timing from remote TD-1337(V)/G. **NOTES** ● This step is used if “2” was entered in step 14. ● This step is not used in V2 model.
17	**COND DIØ GROUP MODEM CABLE** Entry: —	Enter number of 1/4-mile cable reels (1 to 8 for data rates up to 576 kb/s or 1 to 4 for data rates of 1024 or 1152 kb/s) used with group modem input. Enter “0” when none are used. **NOTE** This step is used if “2” was entered in step 7 for port 1, 3, or 5.

2-27. Generate Local Mux Configuration Routine (VI/V2 Models) - Continued.

b. Procedures. Perform the following procedures to enter local mux configuration data in memory 1 or memory 2.

NOTES

- When a local mux configuration routine is performed, all demux configuration data in the NVM for the selected memory (1 or 2) is erased. Each active demux will have to be configured after this routine is completed.
- This ● symbol in a step indicates that operator will enter configuration data supplied by authority that originated the configuration.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph,
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Local Mux Configuration Routine (V1/V2 Models)

Step	Operator action/message display
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION >** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.
3	**GENERATION MODE >** **NEW CONFIGURATION= 1 CONTINUE=2** **EDIT EXISTING CONFIGURATION =3** Press "1" key and then press ENTR key.
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press ◆ key and then press ENTR key.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Routine (V1/V2 Models) - Continued

Step	Operator action/message display
5	LOCAL/REMOTE MUX SELECTION → LOCALMUX=0 RMUX 1=1 RMUX 2=2 RMUX 3=3 RMUX 4=4 Press "0" key and then press ENTR key.
6	PORT RATES IN KBS, INACTIVE=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, enter port rate in kb/s and then press ENTR key. If port is inactive, press “0” key and then press ENTR key.
7	PORT INTERFACE BALANCED=1 DIØ=2 UNBALANCED=3 PORT 1→ 2= 3= 4= 5= At each port selected by prompt, press ◆ key and then press ENTR key.
8	**NOTE** **Go** to step 9 if following message is not displayed. (Step 8 is performed when ports 1 and 2, ports 3 and 4, or all four ports are assigned port rates of 576 kb/s and interface is unbalanced.) TD-754 DEMUX OPTION INACTIVE=0 ACTIVE=1 PORT 1→ PORT 3= At each port selected by prompt, press ◆ key and then press ENTR key.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Routine (V1/V2 Models) - Continued

Step	Operator action/message display
	NOTE Go to step 10 if following message is not displayed. (Step 9 is performed when port 5, port 7, or both ports are assigned port rates of 1152 kb/s and interface is balanced. Step 9 not used in V2 model.)
9	**TD-754 MUX OPTION** **INACTIVE=0 ACTIVE=1** **PORT 5→ PORT 7=** At each port selected by prompt, press ▲ key and then press ENTR key.
10	**16KBS ORDERWIRE OPTION →** **INACTIVE=0 ACTIVE=1** Press ▲ key and then press ENTR key.
11	**16/32 KBS USER OPTION →** **INACTIVE=0** **16KBS ACTIVE=1 32KBS ACTIVE=2** Press ▲ key and then press ENTR key.
	NOTE Go to step 13 if following message is not displayed. (Message is not displayed if "0" entered in step 11 or you are using a V2 model.)
12	**16/32 KBS USER DEMUX →** **DEMUX 1=1 2=2 3=3 4=4** Press ◆key and then press ENTR key.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Routine (V1/V2 Models) - Continued

Step	Operator action/message display
13	**PORT OUTPUTS, DEMUX/PORT** **1> / 2 = 1 3 = / 4 = /** **5 = / 6 = / 7 = / 8 = /** At each port selected by prompt, perform substeps *a* and *b* below. **NOTE** Substep a below selects which demux (1 thru 4) is assigned to selected port output. Substep *b* then selects which group data (Rmux port) will be extracted from SG applied to selected demux and routed to your port output. *a.* Press ◆key and then press ENTR key. *b.* Press ◆key and then press ENTR key.
14	**TIMING SOURCE SELECTION >** **IF CNCE OR EXTERNAL STANDARD= 1** **IF NOT, SLAVE=2 MASTER=3** Press ◆key and then press ENTR key. **NOTES** • If “1” key was pressed, go to step 15. • If "2“ key was pressed, go to step 16 (V1 model) or step 17 (V2 model). • If “3” key was pressed, go to step 17.
15	**EXTERNAL TIMING SOURCES** **CNCE OR EXT STD PORTS=1 OTHERS=0** **1> 2= 3= 4= 5= 6= 7= 8=** **At** each port selected by prompt, press ◆ key and then press ENTR key, Go to step 17.

2-27. Generate Local Mux Configuration Routine (V1/V2 Models) - Continued.

Local Mux Configuration Routine (V1/V2 Models) - Continued

Step	Operator action/message display
16	**SLAVE TIMING SOURCE →** **DEMUX 1=1 2=2 3=3 4=4** Press ◆ key and then press ENTR key.
17	**NOTE** Go to step 18 if following message is not displayed. (Message is displayed if "2" was entered in step 7.) **COND DIØ GROUP MODEM CABLE →** **# OF 1/4 MILE REELS=1 THRU 8** **NONE=0** Press ● key and then press ENTR key.
18	**VERIFY MEMORY * LOADING →** **ACCEPT=1 ABORT=2** **SYSTEM IS IN ▲ MODE** Press "1" key and then press ENTR key. * Number selected in step 4 is displayed. ▲ **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed.
19	**MEMORY * LOAD COMPLETE** **MUX DATA** **COMPOSITE RATE= ▲ KBS** * Number selected in step 4 is displayed. ▲ Composite rate of output SG is displayed.
20	Routine is complete. Press CLR key to clear display.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models).

Perform this routine to enter local mux configuration data in memory 1 or memory 2. Before performing the routine, ensure that you have the configuration data required to complete the entries in the routine as described in *a* below. The step-by-step procedures for the routine are in *b* below.

a. Data *Required.* To assist you in listing and determining if you have all the data you will need, the following chart shows you what data are required and where the data are used in the routine.

NOTES

- *"Step No." Column.* Step number for each procedure performed by an operator that requires configuration data is listed in this column. Steps performed by an operator that do not require a configuration data input are not listed.
- *"Message heading/data required" Column.* The message heading that is displayed for each step requiring configuration data is shown in this column. Below each message heading is one or more lines for listing the required data that is supplied by the authority that originated the configuration.
- *"Definitions" Column.* This column defines the type of data that is supplied and entered on the lines in the "Message heading/data required" column. Some steps listed below are not used in all configurations. Notes are added in the column to describe the exceptions.

Local Mux Configuration Data Requirements (V3/V4 Models)

Step No.	Message heading/ data required	Definitions
4	**MEMORY SELECTION** Entry: _____	Enter "1" for memory 1 or "2" for memory 2.
6	**PORT RATES IN KBS** Port 1 _____ Port 5 _____ Port 2 _ Port 6 _____ Port 3 — Port 7 — Port 4 — Port 8 _	At each port, enter port rate in kb/s or "0" if port is inactive. **NOTE** Ports **5** thru 8 not used in V4 model.
7	**PORT INTERFACE** Port 1 _ Port 4 — Port 2 _ Port 5 _____ Port 3 —	Enter one of following for each active port. "1" for balanced "2" for conditioned diphase • Ports 5 thru 8 not used in V4 model. • Ports 6, 7, and 8 are automatically entered as balanced ("1") when active.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Data Requirements (V3/V4 Models) - Continued

Step No.	Message heading/ data required	Definitions
8	**16KBS ORDERWIRE OPTION** Entry: ____	Enter "0" if option is not used or "1" if option is used.
9	**16/32 KBS USER OPTION** Entry: _	Enter "0" if option is not used, "1" if option is used and rate is 16 kb/s, or "2" if option is used and rate is 32 kb/s.
10	**16/32 KBS USER DEMUX** Entry: __	Enter number of demux ("1", "2", "3", or "4") receiving SG containing data for dedicated user. **NOTES** ● Step not used if "0" entered in step 9. ● Step not used in V4 model. (<'1" is automatically entered if "1" or "2" was entered in step 9.)
11	**PORT OUTPUTS, DEMUX/PORT** (a) (b) Port 1, Demux _ / Port ____ Port 2, Demux _. / Port ____ Port 3, Demux _ / Port ____ Port 4, Demux _ / Port — Port 5, Demux _ / Port — Port 6, Demux _ / Port— Port 7, Demux _ / Port _ Port 8, Demux _ / Port _	Following entries are made for each active port output. **a.** Demux number ("1", "2", "3", or "4") of demux supplying data to that port output. ***b.*** Port number ("1" thru "8") of group data that will be extracted from SG applied to selected demux (a above) and routed to your port output. (This is port number of Rmux port supplying selected group data in SG.) **NOTE** Ports 5 thru 8 not used in V4 model.
12	**TIMING SOURCE SELECTION** Entry: __	Enter "1" for CNCE or external standard, "2" for slave, or "3" for master,

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Data Requirements (V3/V4 Models) - Continued

Step No.	Message heading/ data required	Definitions
13	**EXTERNAL TIMING SOURCES** Port 1 — Port 5 — Port 2 — Port 6 _ Po rt 3 — Port 7 — Port 4 — Port 8 _	At each port, enter "1" if port is designated as an external timing source. Enter "0" for each port not designated as a timing source. **NOTES** ● Ports 5 through 8 not used in V4 model. ● This step is used if CNCE or external standard was previously selected as the timing source ("1" entered in step 12).
14	**SLAVE TIMING SOURCE** Entry:_____	Enter number of demux ("1", "2", "3", or "4") receiving SG containing timing from remote TD-1337(V)/G. **NOTES** ● This step is used if "2" was entered in step 12. ● This step is not used in V4 model.
15	**COND Dlø GROUP MODEM CABLE** Entry:___	Enter number of l/4-mile cable reels (1 to 8 for data rates up to 576 kb/s or 1 to 4 for data rates of 1024 and 1152 kb/s) used with group modem input, Enter "0" when none are used. **NOTE** This step is used if "2" was entered in step 7 for port 1, 3, or 5.
16	**CESE TLM PATCH OPTION** Entry: —	Enter "1" to patch local mux or "2" to patch demux 1 to conditioned diphase modem (group modem). **NOTE** This step is not used if "2" or "3" was entered in step 12.
17	**CESE TELEMETRY EQUIP ID** Entry:_____	Enter CESE telemetry equipment identification number assigned to your TD-1337(V)/G.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

b. Procedures. Perform the following procedures to enter local mux configuration data in memory 1 or memory 2.

NOTES

- When a local mux configuration routine is performed, all demux configuration data in the NVM for the selected memory (1 or 2) is erased. Each active demux will have to be configured after this routine is completed.
- This ● symbol in a step indicates that operator will enter configuration data supplied by authority that originated the configuration.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Local Mux Configuration Routine (V3/V4 Models)

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY= 1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION =3** Press "1" key and then press ENTR key
4	**MEMORY SELECTION** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * < **MEMORY 1, MEMORY 2, INACTIVE,** or **PRELIM** is displayed. Press ● key and then press ENTR key.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Routine (V3/V4 Models) - Continued

Step	Operator action/message display
5	**LOCAL/REMOTE MUX SELECTION →** **LOCALMUX=0 RMUX 1=1 RMUX 2=2** **RMUX 3=3 RMUX 4=4** Press “0” key and then press ENTR key.
6	PORT RATES IN KBS, INACTIVE=0 **1 →** 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, enter port rate in kb/s and then press ENTR key. If port is inactive, press “0” key and then press ENTR key.
7	**PORT INTERFACE** **BALANCED=1 DIØ=2** **PORT 1 → 2= 3= 4= 5=** At each port selected by prompt, press ● key and then press ENTR key.
8	**16KBS ORDERWIRE OPTION →** **INACTIVE=0 ACTIVE=1** Press ● key and then press ENTR key.
9	**16/32 KBS USER OPTION →** **INACTIVE=0** **16KBS ACTIVE=1 32KBS ACTIVE=2** Press ● key and then press ENTR key.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Routine (V3/V4 Models) - Continued

Step	Operator action/message display
10	NOTE Go to step 11 if following message is not displayed. (Message is not displayed if "0" entered in step 9 or you are using a V4 model.) **16/32 KBS USER DEMUX →** **DEMUX 1=1 2=2 3=3 4=4** Press ● key and then press ENTR key.
11	**PORT OUTPUTS, DEMUX/PORT** **1→ / 2= / 3= / 4= /** **5= / 6= / 7= / 8= /** At each port selected by prompt, perform substeps *a* and *b* below. **NOTE** Substep *a* below selects which demux (1 thru 4) is assigned to selected port output. Substep *b* then selects which group data (Rmux port) will be extracted from SG applied to selected demux and routed to your port output.) *a.* Press ● key and then press ENTR key. *b.* Press ● key and then press ENTR key.
12	**TIMING SOURCE SELECTION →** **IF CNCE OR EXTERNAL STANDARD= 1** **IF NOT, SLAVE=2 MASTER =3** Press ● key and then press ENTR key. **NOTES** ● If "1" key was pressed, go to step 13. ● If "2" key was pressed, go to step 14 (V3 model) or step 15 (V4 model). ● If "3" key was pressed, go to step 15.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Routine (V3/V4 Models) - Continued

Step	Operator action/message display
13	EXTERNAL TIMING SOURCES CNCE OR EXT STD PORTS=1 OTHERS=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, press ● key and then press ENTR key. Go to step 15.
14	SLAVE TIMING SOURCE → DEMUX 1=1 2=2 3=3 4=4 Press ● key and then press ENTR key.
15	NOTE Go to step 16 if following message is not displayed. (Message is displayed if "2" was entered in step 7.) COND DIØ GROUP MODEM CABLE → # OF 1/4 MILE REELS=1 THRU 8 NONE=0 Press ● key and then press ENTR key.
16	NOTE Go to step 17 if following message is not displayed. (Message is displayed if "1" was entered in step 12.) CESE TLM PATCH OPTION → PATCH LOCAL TO COND DIØ MODEM=1 Press ● key and then press ENTR key.

2-28. Generate Local Mux Configuration Routine (V3/V4 Models) - Continued.

Local Mux Configuration Routine (V3/V4 Models) - Continued

Step	Operator action/message display
17	**CESE TELEMETRY EQUIP ID →** Press ● key and then press ENTR key.
18	**VERIFY MEMORY * LOADING →** **ACCEPT=1 ABORT=2** **SYSTEM IS IN A MODE** * Number selected in step 4 is displayed. Press "1" key and then press ENTR key.
19	**MEMORY * LOAD COMPLETE** **MUX DATA** **COMPOSITE RATE= ▲ KBS** * Number selected in step 4 is displayed. ▲ Composite rate of output SG is displayed.
20	Routine is complete. Press CLR key to clear display.

2-29. Generate Rmux Minimum Configuration Routine.

Perform this routine to enter the configuration data in memory 1 or memory 2 for one demux. Before performing this routine, ensure that you have the configuration data required to complete the entries in the routine as described in *a* below. The step-by-step procedures for the routine are in *b* below.

a. Data Required. To assist you in listing and determining if you have all the data you will need, the following chart shows you what data are required and where the data are used in the routine.

NOTES

- *"Step No." Column.* Step number for each procedure performed by an operator that requires configuration data is listed in this column. Steps performed by an operator that do not require a configuration data input are not listed.
- *"Message heading/data required" Column.* The message heading that is displayed for each step requiring configuration data is shown in this column. Below each message heading is one or more lines for listing the required data that is supplied by the authority that originated the configuration.
- *"Definitions" Column.* This column defines the type of data that is supplied and entered on the lines in the "Message heading/data required" column. Some steps listed below are not used in **all** configurations. Notes are added in the column to describe the exceptions.

Rmux Minimum Configuration Data Requirements

Step No.	Message heading/ data required	Definitions
4	**MEMORY SELECTION** Entry: _	Enter "1" for memory 1 or "2" for memory 2.
5	**LOCAL/REMOTE MUX SELECTION** Entry: _	Enter number of demux ("1", "2", "3", or "4") to be configured. NOTE Enter "1" if you are using a V2 or V4 model.
	NOTE Data entered for steps 8 through 10 pertain to mux in remote TD-1337(V)/G (Rmux).	
8	**PORT RATES IN KBS** Port 1 _ Port 5 _ Port 2 — Port 6 _ Port 3 — Port 7 — Port 4 — Port 8 _	At each port, enter port rate in kb/s or "0" if port is inactive.
9	**16KBS ORDERWIRE OPTION** Entry: ____	Enter "0" if option is not used or "1" if option is used.

2-29. Generate Rmux Minimum Configuration Routine - Continued.

Rmux Minimum Configuration Data Requirements - Continued

Step No.	Message heading/ data required	Definitions
10	**16/32 KBS USER OPTION** Entry: _	Enter "0" if option is not used, "1" if option is used and rate is 16 kb/s, or "2" if option is used and rate is 32 kb/s.

b. Procedures. Perform the following procedures to enter Rmux minimum configuration data in memory 1 or memory 2.

NOTES

- This ● symbol in a step indicates that operator will enter configuration data supplied by authority that originated the configuration.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Rmux Minimum Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION =3** Press "1" key and then press ENTR key.

2-29. Generate Rmux Minimum Configuration Routine - Continued.

Rmux Minimum Configuration Routine - Continued

Step	Operator action/message display
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press ● key and then press ENTR key.
5	**LOCAL/REMOTE MUX SELECTION →** **LOCAL MUX=0 RMUX 1=1 RMUX 2=2** **RMUX 3=3 RMUX 4=4** Press ● key and then press ENTR key.
6	**DEMUX *LOOPBACK OPTION →** **NORMAL=0** **LOOP MUX TO DEMUX=1** * Number selected in step 5 is displayed. Press "0" key and then press ENTR key.
7	**RMUX * CONFIGURATION SELECT →** **MINIMUM CONFIGURATION=1** **CONFIGURATION FOR DOWNLOADING=2** * Number selected in step 5 is displayed. Press "1" key and then press ENTR key
8	**PORT RATES IN KBS, INACTIVE=0** **1→ 2= 3= 4=** **5= 6= 7= 8=** At each port selected by prompt, enter port rate in kb/s and then press ENTR key. If port is inactive, press "0" key and then press ENTR key.

2-29. Generate Rmux Minimum Configuration Routine - Continued.

Rmux Minimum Configuration Routine - Continued

Step	Operator action/message display
9	**16KBS ORDERWIRE OPTION →** **INACTIVE=0 ACTIVE=1** Press ● key and then press ENTR key.
10	**16/32 KBS USER OPTION →** **INACTIVE=0** **16KBS ACTIVE=1 32KBS ACTIVE=2** Press ● key and then press ENTR key.
11	**VERIFY MEMORY * LOADING →** **ACCEPT=1 ABORT=2** **SYSTEM IS IN ▲ MODE** * Number selected in step 4 is displayed. ▲ **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press "1" key and then press ENTR key.
12	**MEMORY * LOAD COMPLETE** **RMUX * DATA** **COMPOSITE RATE= ▲ KBS** * Numbers selected in steps 4 and 5 are displayed. ▲ Composite rate of Rmux output SG is displayed.
13	Routine is complete, Press CLR key to clear display.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models).

Perform this routine to enter data in memory 1 or memory 2 to configure one remote TD-1337(V)/G operating as a non-nodal. Before performing this routine, ensure that you have the configuration data required to complete the entries in the routine as described in *a* below. The step-by-step procedures for the routine are in *b* below.

a. Data Required. To assist you in listing and determining if you have all the data you will need, the following chart shows you what data are required and where the data are used in the routine.

NOTES

- *"Step No." Colurnn.* Step number for each procedure performed by an operator that requires configuration data is listed in this column. Steps performed by an operator that do not require a configuration data input are not listed.
- *"Message heading/data required" Column.* The message heading that is displayed for each step requiring configuration data is shown in this column. Below each message heading is one or more lines for listing the required data that is supplied by the authority that originated the configuration.
- *"Definitions" Colunm.* This column defines the type of data that is supplied and entered on the lines in the "Message heading/data required" column. Some steps listed below are not used in all configurations. Notes are added in the column to describe the exceptions.

Rmux Configuration for Downloading Data Requirements (V1/V2 Models)

Step No.	Message heading/ data required	Definitions
4	**MEMORY SELECTION** Entry: _	Enter "1" for memory 1 or "2" for memory 2.
5	**LOCAL/REMOTE MUX SELECTION** Entry: ._	Enter number of remote mux ("1", "2", "3", or "4") to be configured.
	NOTE Data entered for steps 8 through 19 pertain to remote TD-1337(V)/G (remote roux) being configured.	
8	PORT RATES IN KBS Port 1 _ Port **5** _ Port **2** — **Port 6** _ Port **3** — Port **7** — Port **4** — **Port 8** _	At each port, enter port rate in kb/s or "0" if port is inactive.

2-30. Generate Rmux Configuration for Downloading Routine (VI/V2 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading/ data required	Definitions
9	**PORT INTERFACE** Port 1____ Port 4 _ Port 2 _ Port 5 _ Port 3___	Enter one of following for each active port. "1" for balanced "2" for conditioned diphase "3" for unbalanced **NOTE** Ports 6, 7, and 8 are automatically entered as balanced ("1") when active.
10	**TD-754 DEMUX OPTION** Port 1 _ Port **3** _	For each port, enter "0" if option is not used or "1" if option is used. NOTE Step 10 is only used for port 1 and/or port 3 when: *a.* For port 1 when ports 1 and 2 have port rates of 576 kb/s and an unbalanced interface. *b.* For port 3 when ports 3 and 4 have port rates of 576 kb/s and an unbalanced interface.
11	**TD-754 MUX OPTION** Port **5** _ Port **7** _	For each port, enter "O" if option is not used or "1" if option is used, **NOTE** Step 11 is only used for port 5 and/or port 7 when: a. Port 5 has a port rate of 1152 kb/s and a balanced interface. *b.* Port 7 has a port rate of 1152 kb/s and a balanced interface.
12	**16KBS ORDERWIRE OPTION** Entry: _	Enter "0" if option is not used or "1" if option is used.
13	**16/32 KBS USER OPTION** Entry: _	Enter "0" if option is not used, "1" if option is used and rate is 16 kb/s, or "2" if option is used and rate is 32 kb/s.

2-30. Generate Rmux Configuration for Downloading Routine (V1//V2 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading/ data required	Definitions
14	**6/32 KBS USER DEMUX** Entry: _	Enter number of demux ("1", “2”, “3”, or “4”) receiving SG containing data for dedicated user. **NOTE** Step not used if “0” entered in step 13.
15	**PORT OUTPUTS, DEMUX/PORT** (a) (b) Port 1, Demux ___ / Port ___ Port 2, Demux ___ / Port ___ Port 3, Demux ___ / Port ___ Port 4, Demux ___ / Port ___ Port 5, Demux ___ / Port ___ Port 6, Demux ___ / Port ___ Port 7, Demux ___ / Port ___ Port 8, Demux ___ / Port ___	Following entries are made for each active port output. *a.* Demux number (“1”, “2”, “3”, or “4”) of demux supplying data to that port output. *b.* Port number (“1” thru “8”) of group data that will be extracted from SG applied to selected demux (a above) and routed to your port output. (This is port number of Rmux port supplying selected group data in SG.)
16	**TIMING SOURCE SELECTION** Entry: _	Enter “1” for CNCE or external standard, “2” for slave, or “3” for master.
17	**EXTERNAL TIMING SOURCES** Port 1 — Port 5 — Port 2 — Port 6 _ Port 3 _ Port 7 _ Port 4 — Port 8 —	At each port, enter “1” if port is designated as an external timing source. Enter "0” for each port not designated as a timing source. **NOTE** This step is used if CNCE or external standard “ was previously selected as the timing source (“1” entered in step 16).
18	**SLAVE TIMING SOURCE** Entry:__	Enter number of demux (“1”, “2”, “3”, or “4”) receiving SG containing timing. **NOTE** This step is used if “2” was entered in step 16.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V1/V2 Models) - Continued

Step No.	Message heading/ data required	Definitions
19	**COND DIØ GROUP MODEM CABLE** Entry: _____	Enter number of 1/4-mile cable reels (1 to 8 for data rates up to 576 kb/s or 1 to 4 for data rates of 1024 or 1152 kb/s) used with group modem input. Enter "0" when none are used. **NOTE** This step is used if "2" was entered in step 9 for port 1, 3, or 5.

b. Procedures. Perform the following procedures to enter Rmux configuration for downloading data in memory 1 or memory 2.

NOTES

- This ● symbol in a step indicates that operator will enter configuration data supplied by authority that originated the configuration.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed, Messages that appear on the display are shown in bold type.

Rmux Configuration for Downloading Routine (V1/V2 Models)

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTiON →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued

Step	Operator action/message display
3	GENERATION MODE NEW CONFIGURATiON= 1 CONTINUE=2 EDIT EXISTING CONFIGURATION =3 Press “1“ key and then press ENTR key.
4	MEMORY SELECTION → MEMORY 1=1 MEMORY 2=2 SYSTEM IS IN * MODE * MEMORY 1, MEMORY 2, INACTIVE, PRELIM, or TD-976 is displayed. Press ● key and then press ENTR key.
5	LOCAL/REMOTE MUX SELECTION → LOCALMUX=0 RMUX 1=1 RMUX 2=2 RMUX 3=3 RMUX 4=4 Press ● key and then press ENTR key.
6	DEMUX * LOOPBACK OPTION → NORMAL=0 LOOP MUX TO DEMUX=1 * Number selected in step 5 is displayed. Press “0” key and then press ENTR key.
7	RMUX * CONFIGURATION SELECT → MINIMUM CONFIGURATION=1 CONFIGURATION FOR DOWNLOADING=2 * Number selected in step 5 is displayed. Press “2” key and then press ENTR key.

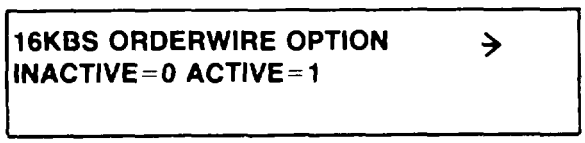
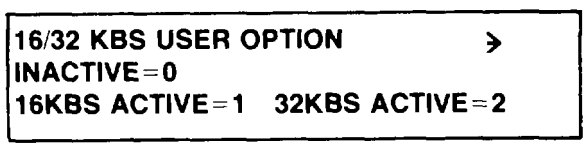
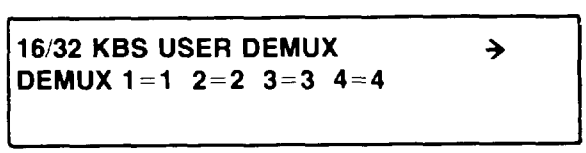
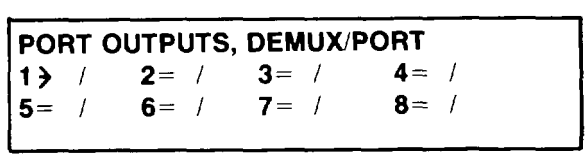
2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued

Step	Operator action/message display
8	PORT RATES IN KBS, INACTIVE=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, enter port rate in kb/s and then press ENTR key. If port is inactive, press "0" key and then press ENTR key.
9	PORT INTERFACE BALANCED=1 DIØ=2 UNBALANCED=3 PORT 1→ 2= 3= 4= 5= At each port selected by prompt, press ● key and then press ENTR key.
10	**NOTE** Go to step 11 if following message is not displayed. (Step 10 is performed when ports 1 and 2, ports 3 and 4, or all four ports are assigned port rates of 576 kb/s and interface is unbalanced.) TD-754 DEMUX OPTION INACTIVE=0 ACTIVE=1 PORT 1→ PORT 3= At each port selected by prompt, press ● key and then press ENTR key.
11	**NOTE** Go to step 12 if following message is not displayed. (Step 11 is performed when port 5, port 7, or both ports are assigned port rates of 1152 kb/s and interface is balanced.) TD-754 MUX OPTION INACTIVE=0 ACTIVE=1 PORT 5→ PORT 7= At each port selected by prompt, press ● key and then press ENTR key.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued

Step	Operator action/message display
12	 Press ● key and then press ENTR key.
13	 Press ● key and then press **ENTR** key.
14	**NOTE** Go to step 15 if following message is not displayed. (Message is not displayed if "0" entered in step 13.)  Press ● key and then press ENTR key.
15	 At each port selected by prompt, perform substeps *a* and *b* below. **NOTE** Substep *a* below selects which demux (1 thru 4) is assigned to selected port output. Substep *b* then selects which group data (Rmux port) will be extracted from SG applied to selected demux and routed to port output being configured. *a.* Press ● key and then press ENTR key. *b.* Press ● key and then press ENTR key.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued

Step	Operator action/message display
16	TIMING SOURCE SELECTION → IF CNCE OR EXTERNAL STANDARD=1 IF NOT, SLAVE=2 MASTER=3 Press ● key and then press ENTR key. **NOTES** ● If "1" key was pressed, go to step 17. ● If "2" key was pressed, go to step 18. ● If "3" key was pressed, go to step 19.
17	EXTERNAL TIMING SOURCES CNCE OR EXT STD PORTS=1 OTHERS=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, press ● key and then press ENTR key. Go to step 19.
18	SLAVE TIMING SOURCE → DEMUX 1=1 2=2 3=3 4=4 Press ● key and then press ENTR key.
19	**NOTE** Go to step 20 if following message is not displayed. (Message is displayed if "2" was entered in step 9,) COND DIØ GROUP MODEM CABLE → # OF 1/4 MILE REELS=1 THRU 8 NONE=0 Press ● key and then press ENTR key.

2-30. Generate Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued.

Rmux Configuration for Downloading Routine (V1/V2 Models) - Continued

Step	Operator action/message display
20	VERIFY MEMORY * LOADING → ACCEPT=1 ABORT=2 SYSTEM IS IN ◆ MODE * Number selected in step 4 is displayed. ◆ MEMORY 1, MEMORY 2, INACTIVE, PRELIM, or TD-976 is displayed. Press "1" key and then press ENTR key.
21	MEMORY * LOAD COMPLETE RMUX * DATA COMPOSITE RATE= ▲ KBS * Numbers selected in steps 4 and 5 are displayed. ▲ Composite rate of Rmux output SG is displayed.
22	Routine is complete. Press CLR key to clear display.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models).

Perform this routine to enter data in memory 1 or memory 2 to configure one remote TD-1337(V)/G operating as a non-nodal. Before performing this routine, ensure that you have the configuration data required to complete the entries in the routine as described in a below. The step-by-step procedures for the routine are in *b* below.

a. Data Required. To assist you in listing and determining if you have all the data you will need, the following chart shows you what data are required and where the data are used in the routine.

NOTES

- *"Step No." Column.* Step number for each procedure performed by an operator that requires configuration data is listed in this column. Steps performed by an operator that do not require a configuration data input are not listed.
- *"Message heading/data required" Colunm.* The message heading that is displayed for each step requiring configuration data is shown in this column. Below each message heading is one or more lines for listing the required data that is supplied by the authority that originated the configuration.
- *"Definitions" Column.* This column defines the type of data that is supplied and entered on the lines in the "Message heading/data required" column. Some steps listed below are not used in all configurations. Notes are added in the column to describe the exceptions.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V3/V4 Models)

Step No.	Message heading/ data required	Definitions
4	**MEMORY SELECTION** Entry:____	Enter “1” for memory 1 or “2” for memory 2.
5	**LOCAL/REMOTE MUX SELECTION** Entry: _	Enter number of remote mux (“1”, “2", "3”, or “4”) to be configured.
	NOTE Data entered for steps 8 through 19 pertain to remote TD-1337(V)/G (remote mux) being configured.	
8	**PORT RATES IN KBS** Port 1____ Port 5____ Port 2____ port 6____ Port 3____ Port 7____ Port 4____ port 8____	At each port, enter port rate in kb/s or “0” if port is inactive.
9	**PORT INTERFACE** Port 1____ Port 4____ Port 2 _ Port 5____ Port 3 _	Enter one of following for each action port. “1” for balanced “2” for conditioned diphase “3” for unbalanced **NOTE** Ports 6, 7, and 8 are automatically entered as balanced ("1”) when active.
10	**16KBS ORDERWIRE OPTION** Entry: ____	Enter “0” if option is not used or “1” if option is used.
11	**16/32 KBS USER OPTION** Entry:____	Enter “0” if option is not used, “1” if option is used and rate is 16 kb/s, or “2” if option is used and rate is 32 kb/s.
12	**16/32 KBS USER DEMUX** Entry: _	Enter number of demux (“1”, "2", "3", or “4”) receiving SG containing data for dedicated user. **NOTE** Step not used if “0” entered in step 11.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V3/V4 Models) - Continued

Step No.	Message heading/ data required	Definitions
13	**PORT OUTPUTS, DEMUX/PORT** (a) (b) Port 1, Demux _____ / Port_____ Port 2, Demux _____ / Port_____ Port 3, Demux _____ / Port_____ Port 4, Demux _____ / Port_____ Port 5, Demux _____ / Port_____ Port 6, Demux _____ / Port_____ Port 7, Demux _____ / Port_____ Port 8, Demux _____ / Port_____	Following entries are made for each active port output. *a.* Demux number ("1", "2", "3", or "4") of demux supplying data to that port output. *b.* Port number ("1" thru "8") of group data that will be extracted from SG applied to selected demux (a above) and routed to that port output. (This is port number of Rmux port supplying selected group data in SG.)
14	**TIMING SOURCE SELECTION** Entry:_____	Enter "1" for CNCE or external standard, "2" for slave, or "3" for master.
15	**EXTERNAL TIMING SOURCES** Port 1 — Port 5 — Port 2 — Port 6 — Port 3 — Port 7 — Port 4 — port 8 —	At each port, enter "1" if port is designated as an external timing source. Enter "0" for each port not designated as a timing source. **NOTE** This step is used if CNCE or external standard was previously selected as the timing source ("1" entered in step 14).
16	**SLAVE TIMING SOURCE** Entry: _	Enter number of demux ("1", "2", "3", or "4") receiving SG containing timing. **NOTE** This step is used if "2" was entered in step 14.
17	**COND DIØ GROUP MODEM CABLE** Entry: _	Enter number of l/4-mile cable reels (1 to 8 for data rates up to 576 kb/s or 1 to 4 for data rates of 1024 and 1152 kb/s) used with group modem input. Enter "0" when none are used. **NOTE** This step is used if "2" was entered in step 9 for port 1, 3, or 5.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Data Requirements (V3/V4 Models) - Continued

Step No.	Message heading/ data required	Definitions
18	**CESE TLM PATCH OPTION** Entry: _	Enter"1" to patch local mux or "2" to patch demux 1 to conditioned diphase modem (group modem). **NOTE** This step is not used if '12" or "3" was entered in step 14.
19	**CESE TELEMETRY EQUIP ID** **Entry: —**	Enter CESE telemetry equipment identification number assigned to TD-1337(V)/G.

b. Procedures. Perform the following procedures to enter Rmux configuration for downloading data in memory 1 or memory 2.

NOTES

- This ● symbol in a step indicates that operator will enter configuration data supplied by authority that originated the configuration.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Rmux Configuration for Downloading Routine (V3/V4 Models)

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY= 1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued

Step	Operator action/message display
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION =3** Press "1" key and then press ENTR key.
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * < **MEMORY 1, MEMORY 2, INACTIVE,** or **PRELIM** is displayed. Press ● key and then press ENTR key.
5	**LOCAL/REMOTE MUX SELECTION** **LOCALMUX=0 RMUX 1=1 RMUX 2=2** **RMUX 3=3 RMUX 4=4** Press ● key and then press ENTR key.
6	**DEMUX * LOOPBACK OPTION →** **NORMAL=0** **LOOP MUX TO DEMUX=1** * < Number selected in step 5 is displayed. Press "0" key and then press ENTR key.
7	**RMUX * CONFIGURATION SELECT →** **MINIMUM CONFIGURATION=1** **CONFIGURATION FOR DOWNLOADING=2** * < Number selected in step 5 is displayed. Press "2" key and then press ENTR key.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued

Step	Operator action/message display
8	PORT RATES IN KBS, INACTIVE=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, enter port rate in kb/s and then press ENTR key. If port is inactive, press "0" key and then press ENTR key.
9	PORT INTERFACE BALANCED=1 DIØ=2 PORT 1+ 2= 3= 4= 5= At each port selected by prompt, press ● key and then press ENTR key.
10	16KBS ORDERWIRE OPTION → INACTIVE=0 ACTIVE= 1 Press ● key and then press ENTR key.
11	16/32 KBS USER OPTION → INACTIVE=0 16KBS ACTIVE=1 32KBS ACTIVE=2 Press ● key and then press ENTR key.
12	**NOTE** Go to step 13 if following message is not displayed. (Message is not displayed if "0" entered in step 11.) 16/32 KBS USER DEMUX → DEMUX 1=1 2=2 3=3 4=4 Press ● key and then press ENTR key.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued

Step	Operator action/message display
13	PORT OUTPUTS, DEMUX/PORT 1→ / 2= / 3= / 4= / 5= / 6= / 7= / 8= / At each port selected by prompt, perform substeps *a* and *b* below. **NOTE** Substep a below selects which demux (1 thru 4) is assigned to selected port output. Substep *b* then selects which group data (Rmux port) will be extracted from SG applied to selected demux and routed to port output being configured. *a.* Press ● key and then press ENTR key. *b.* Press ● key and then press ENTR key.
14	TIMING SOURCE SELECTION → IF CNCE OR EXTERNAL STANDARD=1 IF NOT, SLAVE=2 MASTER=3 Press ● key and then press ENTR key. **NOTES** ● If “1” key was pressed, go to step 15. ● If “2” key was pressed, go to step 16. ● If “3” key was pressed, go to step 17.
15	EXTERNAL TIMING SOURCES CNCE OR EXT STD PORTS=1 OTHERS=0 1→ 2= 3= 4= 5= 6= 7= 8= At each port selected by prompt, press ● key and then press ENTR key. Go to step 17.
16	SLAVE TIMING SOURCE → DEMUX 1=1 2=2 3=3 4=4 Press ● key and then press ENTR key.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued

Step	Operator action/message display
	NOTE Go to step 18 if following message is not displayed. (Message is displayed if "2" was entered in step 9.)
17	**COND DIØ GROUP MODEM CABLE ›** **# OF 1/4 MILE REELS=1 THRU 8** **NONE=0** Press ● key and then press ENTR key.
	NOTE Go to step 19 if following message is not displayed. (Message is displayed if "1" was entered in step 14.)
18	**CESE TLM PATCH OPTION** **PATCH LOCAL TO COND DIØ MODEM= 1** **PATCH DEMUX 1 TO COND DIØ MODEM=2** Press ● key and then press ENTR key.
19	**CESE TELEMETRY EQUIP ID ›** Press ● key and then press ENTR key.
20	**VERIFY MEMORY * LOADING ›** **ACCEPT=1 ABORT=2** **SYSTEM IS IN ▲ MODE** * Number selected in step 4 is displayed. ▲ **MEMORY 1, MEMORY 2, INACTIVE,** or **PRELIM** is displayed. Press "1" key and then press ENTR key.

2-31. Generate Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued.

Rmux Configuration for Downloading Routine (V3/V4 Models) - Continued

Step	Operator action/message display
21	**MEMORY * LOAD COMPLETE** **MUX * DATA** **COMPOSITE RATE= A KBS** Numbers selected in steps 4
22	Routine is complete. Press CLR key to clear display.

2-32. Edit Existing Configuration Routine.

Use this procedure to edit (change) existing configuration data in memory 1 or memory 2. This edit routine allows you to advance through the configuration steps and change selected configuration data as required.

NOTES

- When a local mux configuration is edited, all demux configuration data in NVM for the selected memory (1 or 2) is erased. Each active demux will have to be reconfigured after local mux configuration change is completed.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Edit Existing Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press “2” key and then press ENTR key.

2-32. Edit Existing Configuration Routine - Continued.

Edit Existing Configuration Routine - Continued

Step	Operator action/message display
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION=3** Press "3" key and then press ENTR key.
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press "1" or "2" key (select memory area containing configuration data to be changed) and then press ENTR key.
5	**LOCAL/REMOTE MUX SELECTION →** **LOCALMUX=0 RMUX 1=1 RMUX 2=2** **RMUX 3=3 RMUX 4=4** Select and press one (0 - 4) key and then press ENTR key. **NOTES** ● If "0" key is pressed, you have selected a local mux configuration to be edited. Go to step *8a.* ● If one of (1 - 4) keys is pressed, you have selected a Rmux configuration to be edited. Go to step 6.
6	**DEMUX* LOOPBACK OPTION ▲ →** **NORMAL=0** **LOOP MUX TO DEMUX=1** * Number selected in step 5 is displayed. ▲ Present loopback option is displayed. *a.* If loopback option displayed is not to be changed, press STEP key. *b.* If loopback option is to be changed, press "0" or "1" key and then press ENTR key.

2-32. Edit Existing Configuration Routine - Continued.

Edit Existing Configuration Routine - Continued

Step	Operator action/message display
7	**RMUX * CONFIGURATION SELECT▲** **MINIMUM CONFIGURATION=1** **CONFIGURATION FOR DOWNLOADING=2** * Rmux selected for edit in step 5 is displayed. ▲ This display identifies which configuration routine will be edited (refer to *a* thru *d* below). a. If "1" is displayed and you are continuing to edit a Rmux minimum configuration routine, press STEP key. Go to step *8b.* *b.* If "1" is displayed and you are changing to a Rmux configuration for downloading, press "2" key and then press ENTR key. Go to step 8c. c. If "2" is displayed and you are continuing to edit a Rmux configuration for downloading, press STEP key, Go to step 8c. *d.* If "2" is displayed and you are changing to a Rmux minimum configuration, press "1" key and then press ENTR key. Go to step *8b.*
8	*a.* To edit a local mux configuration, start with step 6 in routine (para *2-27b* for V1/V2 models or para *2-28b* for V3/V4 models) and perform *d, e,* and *f* below. *b.* To edit a Rmux minimum configuration routine, start with step 8 in routine (para *2-29b)* and perform *d, e,* and f below. c. To edit a Rmux configuration for downloading routine, start with step 8 in routine (para *2-30b* for V1/V2 models or para 2-31b for V3/V4 models) and perform *d, e,* and *f* below. *d.* Check message display and press STEP key, as necessary, until message is displayed that contains data to be changed. e. Press CLR key and then change data as directed in routine for message being displayed. (If you are changing a multiple-entry message, press ENTR key until prompt designates entry to be changed.) Repeat *d* and this substep until all data changes are made. *f.* Press STEP key until following message is displayed. Then perform remaining steps in applicable routine until routine is completed. **VERIFY MEMORY * LOADING →** **ACCEPT=1 ABORT=2** **SYSTEM IS IN ▲ MODE** * Number selected in step 4 is displayed. ▲ **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed.

2-33. Continue Configuration Routine.

Use this procedure to continue a configuration routine that was interrupted before you completed it. This continue routine allows you to advance through the configuration steps without affecting information already entered in the configuration routine. Before using this routine, ensure that you have the information required to complete the configuration routine.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Continue Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION=3** Press “2” key and then press ENTR key.
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2, INACTIVE, PRELIM,** or **TD-976** is displayed. Press “1” or “2” key (select memory area containing configuration data to be continued) and then press ENTR key.

2-33. Continue Configuration Routine - Continued.

Continue Configuration Routine - Continued

Step	Operator action/message display
5	LOCAL/REMOTE MUX SELECTION ➔ LOCALMUX=0 RMUX 1=1 RMUX 2=2 RMUX 3=3 RMUX 4=4 Select and press one (0 - 4) key and then press ENTR key. **NOTE** Local mux or Rmux that was being configured when routine was interrupted is selected.
6	Check your message display and press STEP key until you reach step in routine where interruption occurred. At this point, continue procedures as directed in routine.

2-34. Download Standby Routine.

Perform the following procedures to download the configuration data in the local NVM to the NVM in the standby TD-1337(V)/G.

NOTES

- Standby TD-1337(V)/G must be operating in inactive mode.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Download Standby Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed, Then press SYSTEM CONF key.
2	CONFIGURATION SELECTION➔ DISPLAY=1 GENERATE=2 TRANSMIT=3 Press “3” key and then press ENTR key.

2-34. Download Standby Routine - Continued.

Download Standby Routine - Continued

Step	Operator action/message display
3	**TRANSMIT SELECTION →** **DOWNLOAD STBY=1 LOCAL CONFIG=2** **DOWNLOAD TO NON-NODAL=3** Press “1” key and then press ENTR key.
4	Check that **PLEASE STAND BY** message is displayed and then **TRANSMIT COMPLETE** message is displayed.
5	Routine is complete. Press CLR key to clear display.

2-35. Download Local Configuration Routine.

Perform the following procedures to transmit the local 0mux configuration data in memory 1 or memory 2 to all remote TD-1337(V)/G’s that receive your SG. This data is used by each remote TD-1337(V)/G to configure its demux that receives your SG.

NOTES

- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Download Local Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed, Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press “3” key and then press ENTR key.

2-35. Download Local Configuration Routine - Continued.

Download Local Configuration Routine - Continued

Step	Operator action/message display
3	**TRANSMIT SELECTION →** **DOWNLOAD STBY=1 LOCAL CONFIG=2** **DOWNLOAD TO NON-NODAL=3** Press “2” key and then press ENTR key.
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1, MEMORY 2,** or **PRELIM** is displayed. Press “1” or “2” key and then press ENTR key. (Select memory 1 or memory 2 as directed by authority originating transmission.)
5	Check that **PLEASE STAND BY message is displayed and then TRANSMIT COMPLETE** message is **displayed,**
6	Routine is complete. Press CLR key to clear display.

2-36. Download to Non-Nodal Routine.

Perform the following procedures to transmit a Rmux configuration for downloading to one remote TD-1337(V)/G that is operating as a non-nodal. You can select and transmit a configuration to any remote TD-1337(V)/G in your network that has an assigned call number,

NOTES

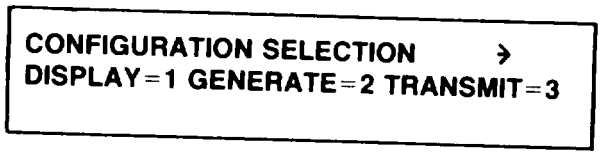
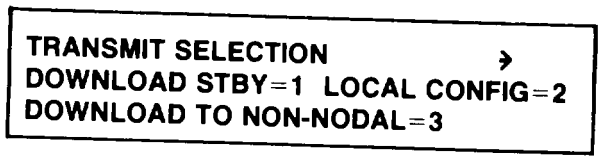
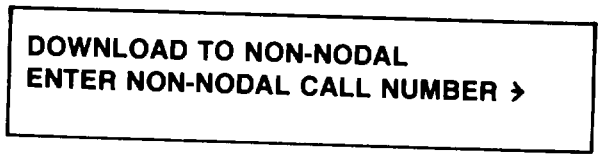
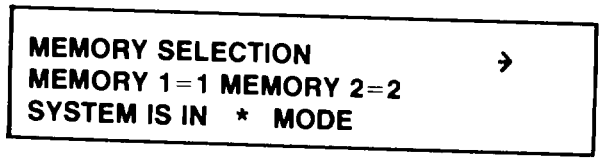
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Download to Non-Nodal Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION is** displayed, Then press. SYSTEM CONF key.

2-36. Download to Non-Nodal Routine - Continued.

Download to Non-Nodal Routine - Continued

Step	Operator action/message display
2	 Press “3” key and then press ENTR key.
3	 Press “3” key and then press ENTR key.
4	 Enter call number (1 thru 16) and then press ENTR key. (Enter tail number as directed by authority originating transmission.)
5	 * MEMORY 1, MEMORY 2, or **PRELIM** is displayed. Press “1” or “2” key and then press ENTR key. (Select memory 1 or memory 2 as directed by authority originating transmission.)
6	Check that **PLEASE STAND BY** message is displayed and then **TRANSMIT COMPLETE** message is displayed.
7	Routine is complete. Press CLR key to clear display.

2-37. Receive Control Telemetry Configuration Routine.

Perform the following procedures to accept or abort a download local configuration or a download to non-nodal transmission from a remote TD-1337(V)/G. This procedure is performed when ALARM horn sounds and a “T” appears on upper right-hand corner of display.

NOTES

- When a download local configuration is accepted, configuration data is entered in memory 1 or memory 2 for the demux that received the SG containing the transmission.
- When a download to non-nodal transmission is accepted, configuration data is entered in memory 1 or memory 2 for the local mux and one demux.
- When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.
- Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Receive Control Telemetry Configuration Routine

Step	Operator action/message display
1	Press FUNC key (one or two times) until **SELECT FUNCTION** is displayed. Then press CT key.
2	**RMUX * DATA RECEIVED →** **FOR MEM ▲ ACCEPT=1 ABORT=2** **SYSTEM IS IN ** MODE** Message A OR **DOWN LOAD DATA RECEIVED →** **FOR MEM ▲, ACCEPT=1 ABORT=2** **SYSTEM IS IN ** MODE** Message B * < **1, 2, 3,** or **4** is displayed. ▲ < **1** or **2** is displayed. ** < **MEMORY 1, MEMORY 2,** or **PRELIM** is displayed. **NOTES** ● Message A is displayed when a download local configuration transmission is received. ● Message B is displayed when a download to non-nodal transmission “is received. Press “1” (accept) or “2” (abort) key and then press ENTR key.

2-37. Receive Control Telemetry Configuration Routine – Continued.

Receive Control Telemetry Configuration Routine - Continued

Step	Operator action/message display
3	Observe that following message is displayed. Downloaded configuration data is entered in selected memory (1 or 2) at this time. **MEMORY LOAD COMPLETE**
4	Routine is complete. Press CLR key to clear display.

Section V. OPERATION UNDER UNUSUAL CONDITIONS

There are no procedures for operating under unusual conditions, The TD-1337(V)/G is rack-mounted in a shelter and air cooled as described in paragraph 1-11. There are no procedures for operating the TD-1337(V)/G external to a shelter in adverse weather conditions.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

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OVERVIEW

This chapter contains the troubleshooting procedures that can be performed by an operator. There are no repair procedures authorized for operator-level of maintenance. The troubleshooting procedures do not require the use of any tools or test equipment.

3-1. Introduction.

a. *Repair of TD-1337(V)/G.* When the TD-1337(V)/G needs repair, notify organizational maintenance of repair required.

b. Troubleshooting. The troubleshooting procedures in paragraph 3-2 are presented in the form of a troubleshooting flow chart. Operator uses this chart any time a fault is detected, or reported, to determine the required operator action.

3-2. Troubleshooting Procedures.

Use these procedures when a user reports a problem, one of ALARMS indicators is lit, or one of POWER indicators is off. Except for using the Ioopback option (described in paragraph 3-3), all the troubleshooting procedures can be performed without further affecting equipment operation. When the Ioopback option is used, it is necessary to interrupt user traffic flow.

a. *Use of Troubleshooting Chart. Go* to the START entry on chart. Then proceed through flow chart and perform steps as directed. Continue performing the steps as directed until either fault is corrected, it is determined that no fault exists, or operator is directed to contact supervisor or organizational maintenance for a specific fault condition. If the specific fault or problem condition is not determined when troubleshooting chart is used, notify organizational maintenance.

b. Use of Alarms Reca// Routine. Diagnostic information will be displayed when this routine is performed. It is important that all displayed diagnostic information be recorded (written down) as it is displayed, The recorded information can be an important part of troubleshooting equipment and system problems.

c. *Reporting Faults to Organizational Maintenance.* When notifying organizational maintenance of a problem, the following information should be reported.

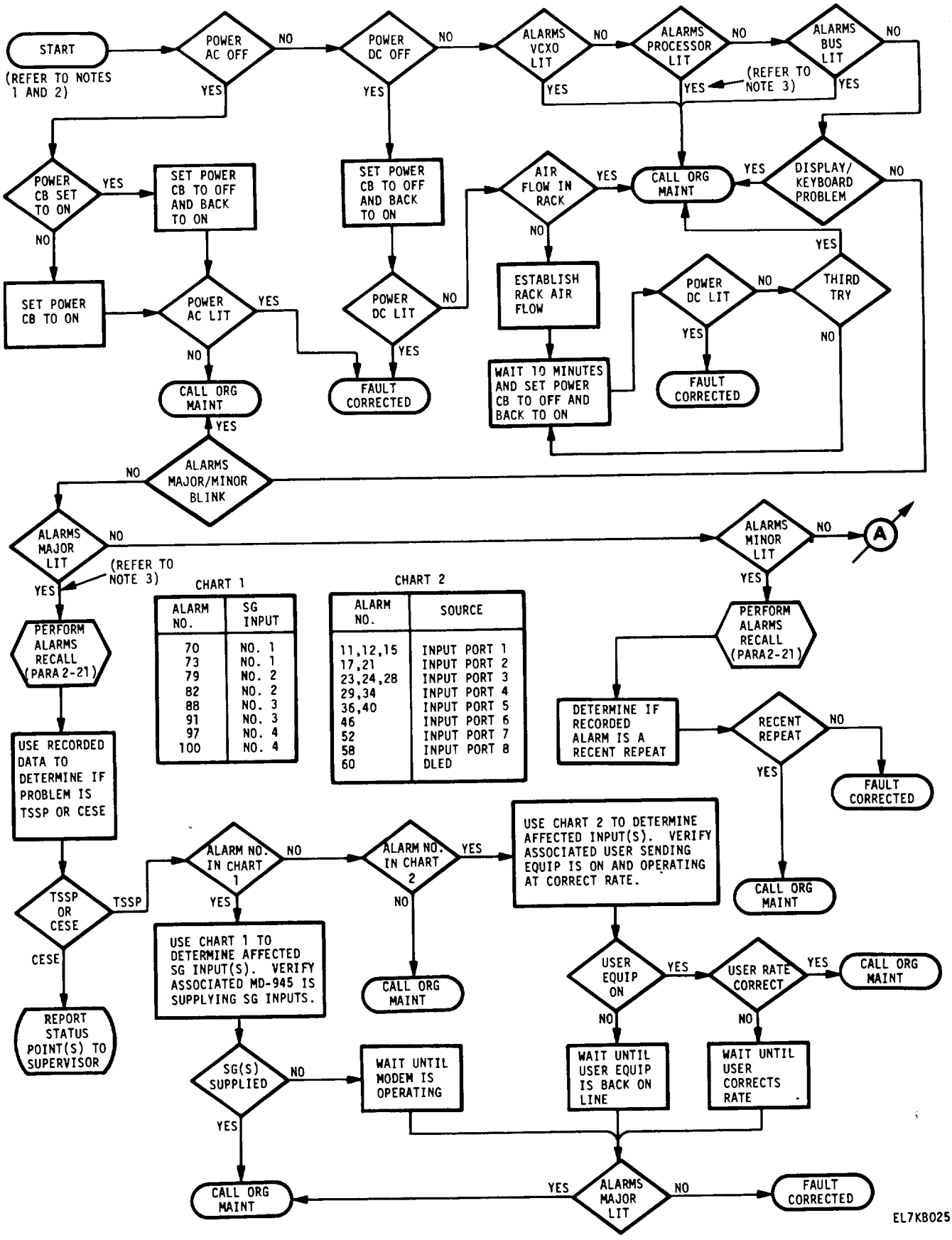
(1) Status of ALARMS (normally off) and POWER (normally lit) indicators.

(2) Diagnostic information recorded when alarms recall routine was performed.

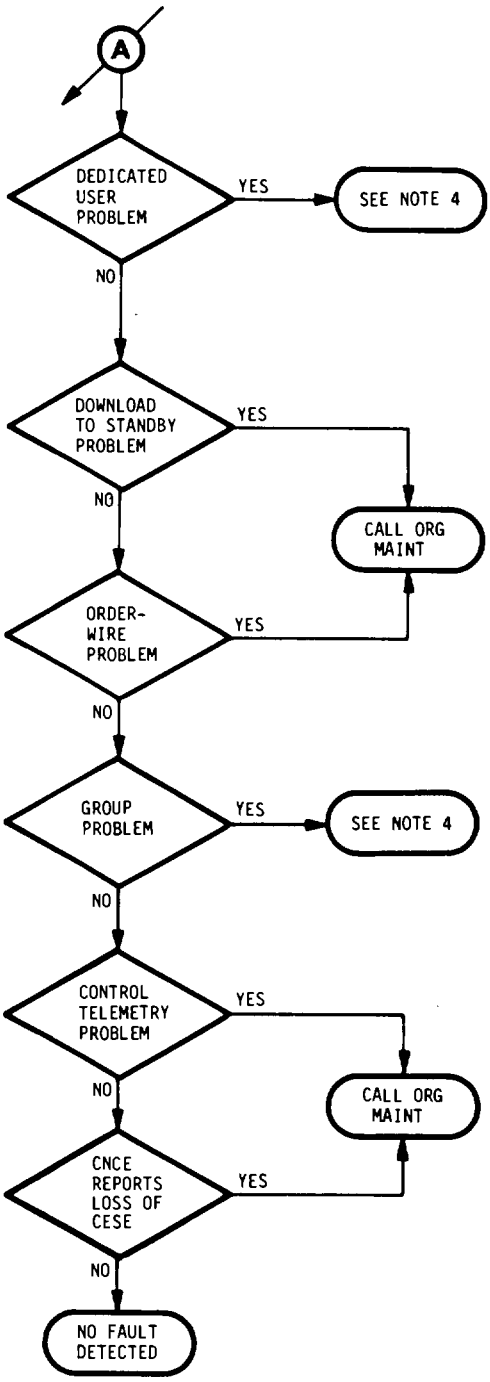
(3) Any user reports of faulty conditions that lead to this report.

(4) Any fault condition detected that is not a part of the above conditions.

3-2. Troubleshooting Procedures - Continued.



3-2. Troubleshooting Procedures - Continued.



NOTES:

1. NVM CHECKSUM ERROR MESSAGE CAN BE DISPLAYED WHEN A SYSTEM MODE CHANGE IS PERFORMED TO PLACE TD-1337(V)/G IN MEMORY 1 OR MEMORY 2 MODE OF OPERATION.
   - THIS MESSAGE INDICATES THAT SOMETHING HAS ALTERED CONTENTS OF NVM.
   - INFORM PROPER AUTHORITY THAT PROBLEM EXISTS. IF AUTHORIZED, RE-ENTER CONFIGURATION DATA AND THEN PERFORM SYSTEM MODE CHANGE ROUTINE.
   - IF MESSAGE IS DISPLAYED AFTER CONFIGURATION DATA IS RE-ENTERED, REPORT PROBLEM TO NEXT HIGHER LEVEL OF MAINTENANCE.
2. IF TD-1337(V)/G WAS NOT OPERATING IN INACTIVE MODE WHEN POWER WAS TURNED OFF, BUT GOES TO INACTIVE MODE WHEN POWER IS TURNED ON, REPORT PROBLEM TO NEXT HIGHER LEVEL OF MAINTENANCE.
3. SET POWER CB TO OFF AND BACK TO ON. IF ALARM INDICATION GOES AWAY, FAULT IS CORRECTED. IF ALARM INDICATION STILL EXISTS, PERFORM NEXT TROUBLESHOOTING ACTION.
4. LOOPBACK OPTION (DESCRIBED IN PARA 3-3) CAN BE USED AS A TROUBLESHOOTING AID FOR ISOLATING PROBLEMS AT THE SYSTEM LEVEL. WHEN DIRECTED BY HIGHER AUTHORITY, PERFORM LOOPBACK OPTION PROCEDURES IN PARA 3-4 TO PLACE TD-1337(V)/G IN LOOPBACK MODE. CALL ORGANIZATIONAL MAINTENANCE.

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3-3. Description of Loopback Option.

a. Genera/. The Ioopback option allows incoming group and dedicated user data from earth-side users to be looped back in the TD-1337(V)/G and returned to the users as incoming data. This option can be used as a troubleshooting aid for isolating user-reported problems at the system level. The following operating conditions are present in the TD-1337(V)/G when the Ioopback option is used.

(1) Inputs from earth-side users are still processed in theTD-1337(V)/G and applied as the supergroup (SG) output to the modem.

(2) In a TD-1337(V)/G that is operating as a nodal, any one or more of the active demux's can be placed in Ioopback. The demux's not placed in Ioopback continue to operate in their assigned configurations as described in (3) below.

(3) In a nodal configuration, the demux's not placed in Ioopback still process the SG inputs from the modems. Earth-side users associated with these active demux's receive their normal data inputs.

(4) The SG input to each demux placed in Ioopback is not processed. Each demux placed in Ioopback is automatically configured to receive and process the SG output of the local TD-1337(V)/G. The demux separates the SG back into the original data group inputs. The data groups are applied back to the users that are associated with the demux as input data. This configuration allows the user to transmit and receive back his own data for test and fault isolation purposes.

NOTE

In the following discussions, each memory area is referred to as the "primary memory" or "alternate memory". The primary memory is the memory area containing the configuration data being used for your present operating configuration. The alternate memory is the other memory area. It is the alternate memory that is used for Ioopback operation. For example, when the TD-1337(V)/G is operating in memory 1 mode, memory 1 is the primary memory and memory 2 is the alternate memory. Memory 2 would be configured for Ioopback option.

b. Activate Loopback Option. Paragraph 3-4 contains procedures to activate the Ioopback option. When these procedures are performed, configuration data necessary to perform Ioopback are entered in the alternate memory area. Then a system mode change to the alternate memory is performed and the Ioopback option is active, A general outline of this procedure is listed in (1) through (4) below.

(1) Local mux configuration data are entered in the alternate memory.

(2) Rmux minimum configuration data are entered in the alternate memory for each active demux not to be placed in Ioopback.

(3) Loopback option procedures are performed for each active demux to be placed in Ioopback in the alternate memory.

(4) Operator performs system mode change routine to change mode of operation to use alternate memory. At this time, the TD-1337(V)/G has the Ioopback option in operation.

Terminate Loopback *Option.* The procedures in paragraph 3-5 are used to return the TD-1337(V)/G back to normal operation. The operator performs a system mode change routine to place the TD-1337(V)/G back to the primary mode of operation. No further operator actions are required unless alternate configuration dots must be reentered in the alternate memory.

3-4. Activate Loopback Option Procedure

Perform the procedures in a and b below to activate loopback option using alternate memory. When performing the procedures, you will need the configuration data entered in the primary memory for the local roux. If you are operating as a nodal, you wiII also need the configuration data entered in the primary memory for each operating demux that will not be placed in loopback.

a. TD-1337(V)/G *Configuration for Loopback.* Perform the following steps to operate the TD-1337(V)/G in a loopback configuration. These procedures can be performed without affecting the flow of user traffic until step 5 is performed.

NOTE

When this procedure is performed, any configuration data previously entered in the alternate memory is erased. Therefore, if alternate memory contains valid configuration data, insure that a record of the configuration data is available so that data can be reentered in the alternate memory after loopback operation is completed.

Loopback Option Procedures

Step	Procedures
1	Enter local mux configuration data in alternate memory using same data as entered for local mux in primary memory. Use paragraph 2-27 (for V1 or V2 model) or paragraph 2-28 (for V3 or V4 model) and the special instruction listed below. *Special Instruction:* When performing step 13 in paragraph 2-27 or step 11 in paragraph 2-28, enter the same configuration data when performing substeps *a* and b with the one exception listed below. When performing substep b (port assignment) for a demux that is placed in loopback, assign the same port number as the port being designated by prompt. Example: If prompt is designating (pointing at) port “3”, enter a “3” for substep b. If prompt is designating port “5” enter a “5” for substep b. (Always enter the same demux assignment for substep *a* as entered in primary memory configuration.)
2	**NOTE** Use step 2 when TD-1337(V)/G is operating as a nodal and one or more active demux’s will not be placed in loopback. Otherwise, go to step 3. For each demux not placed in loopback, enter same Rmux configuration data in alternate memory that is entered in primary memory by performing Rmux minimum configuration routine in paragraph 2-29.
3	Perform demux loopback option procedures in b below for each demux to be placed in loopback. Then proceed to step 4.
4	Notify local users and remote TD-1337(V)/G’s in network that: • One or more demux’s in local TD-1337(V)/G are being placed in loopback. • Traffic flow is going to be momentarily interrupted while mode change routine is performed. • Local user’s associated with demux’s placed in loopback will have their own data group outputs looped back to their inputs. • Supergroup inputs to local TD-1337(V)/G that are applied to demux’s placed in loopback will not be processed.

3-4. Activate Loopback Option Procedure - Continued.

Loopback Option Procedures - Continued

Step	Procedures
5	Perform system mode change (para 2-11) and change memory modes of operation (if operating in memory 1, change to memory 2 or if operating in memory 2, change to memory 1). **NOTE** TD-1337(V)/G is now operating with selected demux('s) operating in loopback.

b. Demux Loopback Option. Perform the following procedures to place one demux in loopback. Repeat procedures, as required, to place additional demux's in loopback.

NOTES

. When a message is displayed that you do not understand, go to paragraph 2-6. All messages that can be displayed on TD-1337(V)/G are listed in alphabetical order. The operator action associated with each display is described in the paragraph.

. Start with step 1 and perform the action in the procedures as directed. Messages that appear on the display are shown in bold type.

Demux Loopback Procedures

Step	Operation Action/Message Displayed
1	Press FUNC key (one or two times) until SELECT FUNCTION is displayed. Then press SYSTEM CONF key.
2	**CONFIGURATION SELECTION →** **DISPLAY=1 GENERATE=2 TRANSMIT=3** Press "2" key and then press ENTR key.
3	**GENERATION MODE →** **NEW CONFIGURATION=1 CONTINUE=2** **EDIT EXISTING CONFIGURATION=3** Press "1" key and then press ENTR key.

3-4. Activate Loopback Option Procedure - Continued.

Demux Loopback Procedures - Continued

Step	Operation Action/Message Displayed
4	**MEMORY SELECTION →** **MEMORY 1=1 MEMORY 2=2** **SYSTEM IS IN * MODE** * **MEMORY 1** or **MEMORY 2** is displayed. Press “1” or “2” key for memory to be used (alternate memory). Then press ENTR key.
5	Press (1-4) Key for selected Rmux (represents demux to be placed in loopback. Tnen press ENTR key.
6	**DEMUX LOOPBACK OPTION →** **NORMAL=0** **LOOP MUX TO DEMUX=1** Press “1” key and then press ENTR key.
7	**VERIFY MEMORY * LOADING →** **ACCEPT=1 ABORT=2** **SYSTEM IS IN * MODE** * **MEMORY 1** or **MEMORY 2** is displayed. Press “1” key and then press ENTR key.
8	**MEMORY * LOAD COMPLETE** **RMUX ▲ DATA** **COMPOSITE RATE= ** KBS** * **MEMORY 1** or **MEMORY 2** is displayed. ▲ Number of Rmux (Demux) placed in loopback is displayed. ** Composite rate of local mux SG is displayed. Check that above message is displayed.

3-4. Activate Loopback Option Procedure - Continued.

Demux Loopback Procedures - Continued

Step	Operation Action/Message Displayed
9	Press CLR key to clear display.

3-5. Terminate Loopback Option Procedures.

Perform the following procedures to remove the loopback option and place the TD-1337(V)/G back in the primary mode of operation.

Terminate Loopback Option

Step	Procedures
1	Notify local users and remote TD-1337(V)/G's in network: ● Traffic flow is going to be interrupted while mode change routine is performed. ● ocal user's associated with demux('s) that were in loopback will now receive normal traffic flow from TD-1337(V)/G. (Supergroup inputs from modems will now be processed.)
2	Perform system mode change (para 2-11) and change from alternate memory to primary memory mode of operation. **NOTE** TD-1337(V)/G is now operating in system configuration that was being used before loopback option was performed.
3	If alternate memory contained valid configuration data before loopback option was used, perform the appropriate local mux and Rmux configuration routines to enter data back in alternate memory.

APPENDIX A
REFERENCES

DA PAM 310-1	Consolidated Index of Army Publications and Blank Forms.
FM 21-11	First Aid far Soldiers.
SB 700-20	Army Adolpted/Other Items Selected for Authorization/List of Reportable Items.
TM 11-5805-382-12	Operator's and Organizational Maintenance Manual: Multiplexer TD-660/G (NSN 5805-00-930-8079), TD-660A/G and TD-660B/Q (5820-00-928-3382).
TM 11-5805-383-12	operator's and Organizational Maintenance Manual: Multiplexer TD-754/G (NSN 5820-00-930-8078).
TM 11-7025-202-12	Operator's and Organizational Maintenance Manual for Multiplexer TD-976/G (NSN 7025-01-048-9678) and Pulse Form Resistorer TD-982/G (7025-01-061-1245).
TM 38-750	The Army Maintenance Management Systems (TAMMS).
TM 4700-15-1/D	The Marine Corps Maintenance Records and Procedures.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures far Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).
TO 00-20-2	Maintenance Data Collection System.

APPENDIX B

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

B-1. Scope.

This appendix lists components of end item and basic issue items for the TD-1337(V)/G to help you inventory items required for safe and efficient operation.

B-2. General.

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section //. Components of End Item. This section is not applicable. There are no accessories or attaching cables supplied with a TD-1337(V)/G.

b. Section ///. Basic Issue Items. These are the minimum essential items required to place the TD-1337(V)/G in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the TD-1337(V)/G during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

Section II. COMPONENTS OF END ITEM

(Not applicable)

Section III. BASIC ISSUE ITEMS

One copy of TM 11-7025-221-10 (Operator's Manual) is supplied with each shipped TD-1337(V)/G. There are no other Basic Issue Items.

APPENDIX C
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. Scope.

This appendix lists expendable supplies and materials you will need to operate and maintain the TD-1337(V)/G. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. Explanation of Columns.

a. Column (1) – Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O – Organizational Maintenance
F - Direct Support Maintenance
H - General Support Maintenance

c. *Column (3) - National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) – Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. *Column (5) – Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	7920-00-292-9204	Cloth, cleaning MIL-C-85043A	EA

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TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}. REASON: Experience has shown that with only a 1^{o} lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2^{o} without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

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