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DRANETZ

Operating Manual

SERIES 626

UNIVERSAL DISTURBANCE ANALYZER

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NOTE

The PRINTOUT MODE key for the Series 626 Mainframe is located in a clear vinyl pocket on the inside back cover of this binder. Store this key in the pocket whenever transporting the Mainframe with this binder in its front cover, because the binder will not fit while the PRINTOUT MODE key is in the key switch.

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WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electrical Code (ANSI C1) and/or any other requirements which may be applicable to the user.

Installation, operation and maintenance should be performed only by qualified personnel.

TM-106650U

VOLUME 1

OPERATOR'S MANUAL

UNIVERSAL DISTURBANCE ANALYZER

SERIES 626

NOTE: Refer to Volume 2 (Service Manual) of TM-106650U for maintenance data.

1 May 1984
(Revised 15 August 1985)

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1000 New Durham Rd., PO Box 4019, Edison, NJ 08818-4019

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Subsidiary of Dranetz Technologies, Inc.
2385 SO. CLINTON AVE., **BLDG.1**
SOUTH PLAINFIELD, NJ 07080

TEL. (201) 287-2535
(201) 287-2536
TWX: (710) 997-9553
TELEX: 499-7808
CABLE: DRANETZ

REPAIR/SERVICE ORDER

NOTE: THIS COMPLETED FORM MUST ACCOMPANY RETURNED EQUIPMENT

CUSTOMER SHIPPING & BILLING INFORMATION

CUSTOMER P.O. # _____ P.O. DATE _____

SHIP TO: _____ INVOICE TO: _____

_____ _____

_____ _____

_____ _____

In Continental U.S., material will be returned by Dranetz to you by UPS, UPS Blue or other carrier chosen by Dranetz unless otherwise designated.

EQUIPMENT BEING RETURNED

Date of Original Purchase: _____ Original P.O. # _____

Model No. _____ S/N _____

Model No. _____ S/N _____

Ancillary equipment also being returned (If you neglect this, these items may not be returned to you).

☐ Power & Other Cables _____ ☐ Instr. Book _____

☐ Plug-ins (incl. S/N) _____ ☐ Connectors _____

☐ Other _____

RETURN AUTHORIZATION

Have you discussed the problem with Dranetz Sales or Service personnel?

Dranetz Return Authorization # _____

By: _____

If so, with whom _____ Date: _____

Whom should the Dranetz Service Corporation contact for technical questions?

_____ ( )

NAME (Print) DEPARTMENT TELEPHONE

DESCRIPTION OF PROBLEM

Reason for return: Defective ☐ Calibration ☐

Please be detailed, explicit and complete. Include test data, if this helps to describe the problem.
IMPORTANT: Repairs cannot be made unless this section is completely filled out.
(Attach added sheets if necessary)

_____

_____

_____

_____

CHECK WHERE APPLICABLE: IS MALFUNCTION RELATED TO: Warmup ☐ Temperature ☐

Intermittency ☐ Mechanical Handling ☐ Visual Defects ☐ Grounding ☐ Test Data Attached ☐

INITIATOR OF THIS ORDER

_____

NAME/TITLE SIGNATURE TELEPHONE

(SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (ENCLOSE THIS ENTIRE FORM WITH EQUIPMENT)

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INSTRUCTION FOR REPAIR ORDER — DRANETZ SERVICE CORPORATION

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IMPORTANT: FOLLOW INSTRUCTIONS & USE THIS FORM. IT IS DESIGNED TO HELP US HELP YOU.

1. **Before** returning equipment to our factory, call our Service Corporation Give the model No., serial number, and information on the problem. **Tel: (201) 287-2535 (201) 287-2536**

   A. Our specialists may be able to solve your problem rapidly without equipment return.

   B. If equipment return is needed, you will be supplied with appropriate instructions and authorization information to expedite service.

2. If return is to be made,

   A. Fill out the other side of this form **COMPLETELY.**

   B. Enclose original of form INSIDE the shipping carton, preferably attached by masking tape to the equipment.

   C. Ship prepaid (including insurance); we will return prepaid unless otherwise advised by you.

   D. **IMPORTANT** - PACK PROPERLY! SHIPPING DAMAGE WILL BE CHARGED TO YOU!

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Statement of Warranty - All products of Dranetz Technologies, Inc. are warranted to the original purchaser against defective material and workmanship for a period of one year from the date of delivery. Dranetz will repair or replace, at its option, all defective equipment returned, freight prepaid, during the warranty period, without charge for repair, provided there is no evidence that the equipment has been mishandled or abused.

FILL OUT OPPOSITE SIDE OF THIS FORM AND RETURN WITH EQUIPMENT.

INSTRUCTIONS FOR REPAIR ORDER — DRANETZ SERVICE CORPORATION

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DRANETZ TECHNOLOGIES, INC.

PRINTER PAPER REORDER FORM

All Dranetz Technologies instruments supplied with a thermal printer use specially treated thermal paper. This paper is supplied directly from the factory by Dranetz Technologies, Inc. (P/N 102714C). Use of non-approved suppliers may result in damage to the printheads and is therefore not recommended.

To insure rapid handling of your order, Dranetz Technologies, Inc. has established two plans (described below) for reordering printer paper. Please check the plan which you are using and provide the necessary information. Return this completed form to:

Order/Entry Department
Dranetz Technologies, Inc.
1000 New Durham Rd., PO Box 4019
Edison, New Jersey 08818-4019

Note: Prices below are subject to change, confirm prices at the time of order with the Dranetz Plant Sales Department or a designated representative.

1. STANDARD REORDER PLAN

Minimum quantity is 27 rolls (1 carton).
Price is $95.00 per carton, FOB Destination, Continental United States.

Send a purchase order specifying P/N 102714C, the shipping address, and the billing address (if different).

You will be billed according to standard Dranetz Technologies, Inc. procedures.

2. RAPID REORDER PLAN

Minimum quantity is 6 rolls.
Quantity:_____ rolls at $3.75 per roll = $_____
FOB Destination, Continental United States.

Enclose a check or money order (or bill COD) for the amount above, and write your shipping address below.

Ship paper to:

_____

_____

_____

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TABLE OF CONTENTS

MAIN FRAME (TM-10665ØU)		Page
1	Introduction	1
2	Purpose	1
3	Mainframe Description	1
4	Operating Controls	11
5	Mainframe Operating Procedures	14
6	General Description of Other Procedures	16
7	Installation of Paper Tape	2Ø
8	Cleaning Printhead	22
9	Baud Rate	22
1Ø	Power Supply AC Voltage Selection	22
11	Specification Summary	23
12	Features	23
13	Standard Accessories	24
14	626 Module Capacity	25
15	Factory Repair	25

LIST OF ILLUSTRATIONS

Figure		Page
1	Series 626 Universal Disturbance Analyzer	Ø
2	Series 626 Universal Disturbance Analyzer, Rear View	3
3	RS232C Interconnect Cable	7
4	Mainframe Controls	12

LIST OF TABLES

Table		Page
1	Options Connector J1 Pinout	4
2	RS232C Connector Pinout Description	5
3	626 Remote Commands	1Ø
4	Mainframe Controls	11
5	Specification Summary	23

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NOTE

The information in this manual has been reviewed and is believed to be entirely reliable. However, no responsibility is assumed for any inaccuracies. The material in this manual is for information purposes only, and is subject to change without notice.

USER INFORMATION

NOTE

The 626 System is U.L. listed provided that the mainframe and all plug-ins used are U.L. listed (as indicated by a U.L. listed marking).

626 plug-ins that do not bear the U.L. listed marking are not U.L. listed. Although these plug-ins have been designed for use with the 626 and will function properly, such use will void U.L. listing of the entire 626 system.

WARNING

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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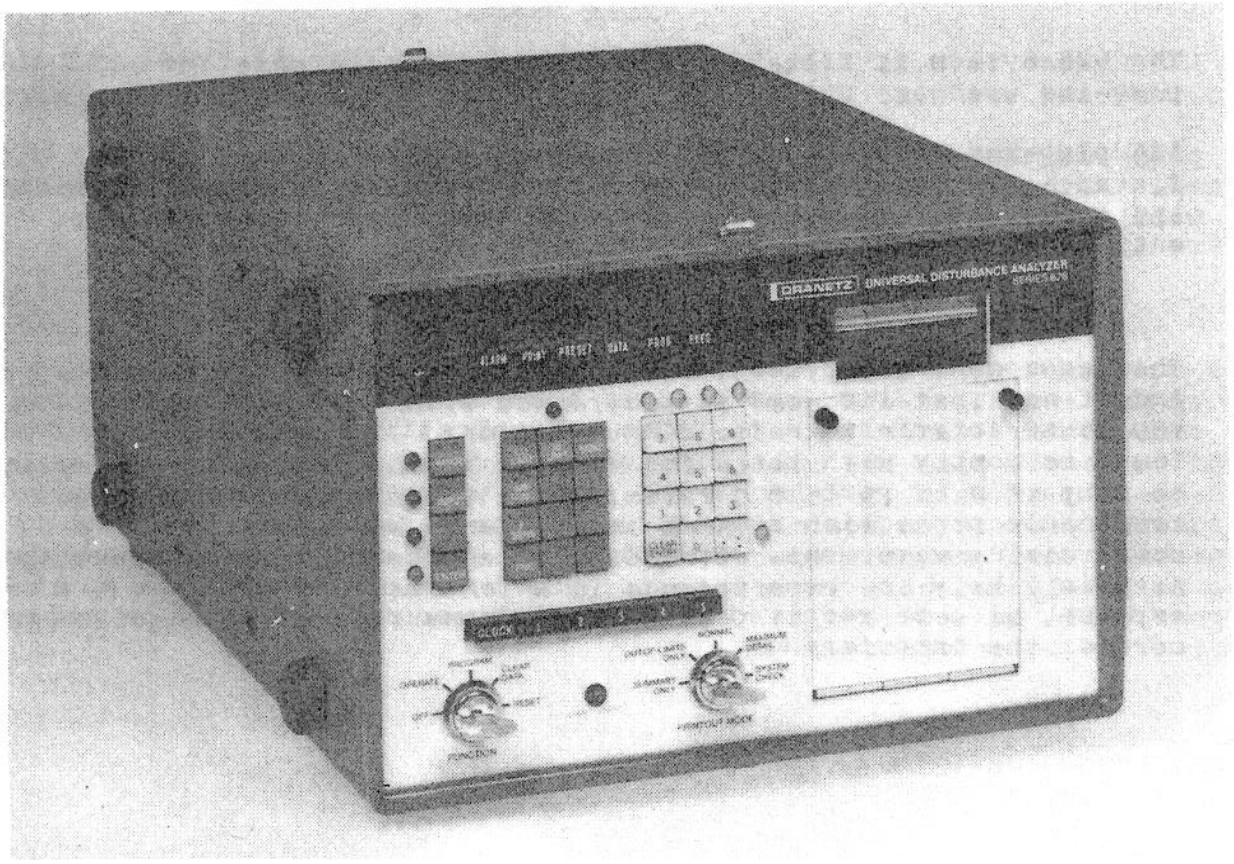


Figure 1. Series 626 Universal Disturbance Analyzer

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MAINFRAME

1 INTRODUCTION

This manual contains operating instructions for the Model 626 Universal Disturbance Analyzer (See figure 1.) The Model 626 consists of a mainframe into which may be installed up to five plug-in modules. A wide variety of module types are available for use. Each plug-in module designed for this microprocessor-based universal-type instrument is equipped with its own software.

The mainframe provides the common functions, including power and time base, for all plug-ins; its characteristics and operation are described in this manual. Other manuals describe the different plug-ins, their characteristics and operation.

2 PURPOSE

As a Universal Disturbance Analyzer, the Model 626 may be used for many applications. For example, it monitors, measures, records and prints disturbances. Depending on the particular plug-ins installed, the instrument is capable of monitoring disturbances on single phase or 3-phase AC power lines, AC neutral power lines (with respect to earth ground), and DC lines. The Model 626 may also be used as a sequence of events recorder, recording and printing out any changes of state detected at its inputs. Details of these and other specific functions of this universal instrument are presented in other manuals.

3 MAINFRAME DESCRIPTION

3.1 Front Panel

The front panel of the Model 626 contains all operating controls and indicators, regardless of the particular plug-ins installed in the unit. The two horizontal groups of pushbutton switches, as well as the FUNCTION and PRINTOUT MODE switches, perform basically mainframe functions, with some variations controlled by the particular plug-ins installed. The numeric keyboard is used for both mainframe and module functions while the two left-side groups of switches are module related. To simplify programming, indicators adjacent to the three centrally located switch groups are used to cue the operator. During the interactive programming sequence, the indicators light when switches should be depressed and go out one by one as the operator makes his selections. A thermal printer at the upper right corner of the instrument furnishes an onboard printout of data. The paper supply is accessible behind a hinged cover below the printer. The high speed printout, at 2-1/2 lines per second, may be switched off at will by the operator, although disturbance data continues to be measured and stored.

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Since the Model 626 is equipped with an RS232C interface, data may still be transferred to a remote printer or peripheral device. Baud rate may be set by the user to maintain compatibility with the remote equipment.

When the paper supply becomes low, a PAPER LOW message is printed and the thermal printer is automatically turned off to conserve paper. However, a daily summary of disturbance data accumulated during the previous 24-hour interval is printed automatically at midnight.

3.2 Real Time Clock

A crystal controlled (+25 PPM stability) real time clock in the mainframe is used as the source of time printouts. Time may be easily set by the operator, using the front panel facilities.

3.3 Audible Alarm

When the alarm circuits within the mainframe are enabled by the operator, a 1-second audible alarm sounds each time a disturbance or event change is detected (depending on modules installed). A pair of normally open dry contacts, accessible on a rear panel connector, may be used to activate a remote alarm.

3.4 Power Supply

A power supply module plugged into the rear of the instrument furnishes the power required for the mainframe and plug-in modules. (See figure 2.) The power supply may be operated from either 115 VAC or 230 VAC; a 115V/230V switch, located on its rear panel, selects the desired line voltage. (See paragraph 10 for instructions.) A 3-ampere fuse on this panel provides overload protection for either line voltage.

3.5 Battery Pack

An on-board battery pack in the mainframe, a standard feature, provides 10 to 40 minutes of uninterrupted operation if line power should fail. To increase back-up time, an external 12V battery source may be plugged into a connector on the power supply. However, the Model 626 will not operate from this source unless it is initialized by the AC line.

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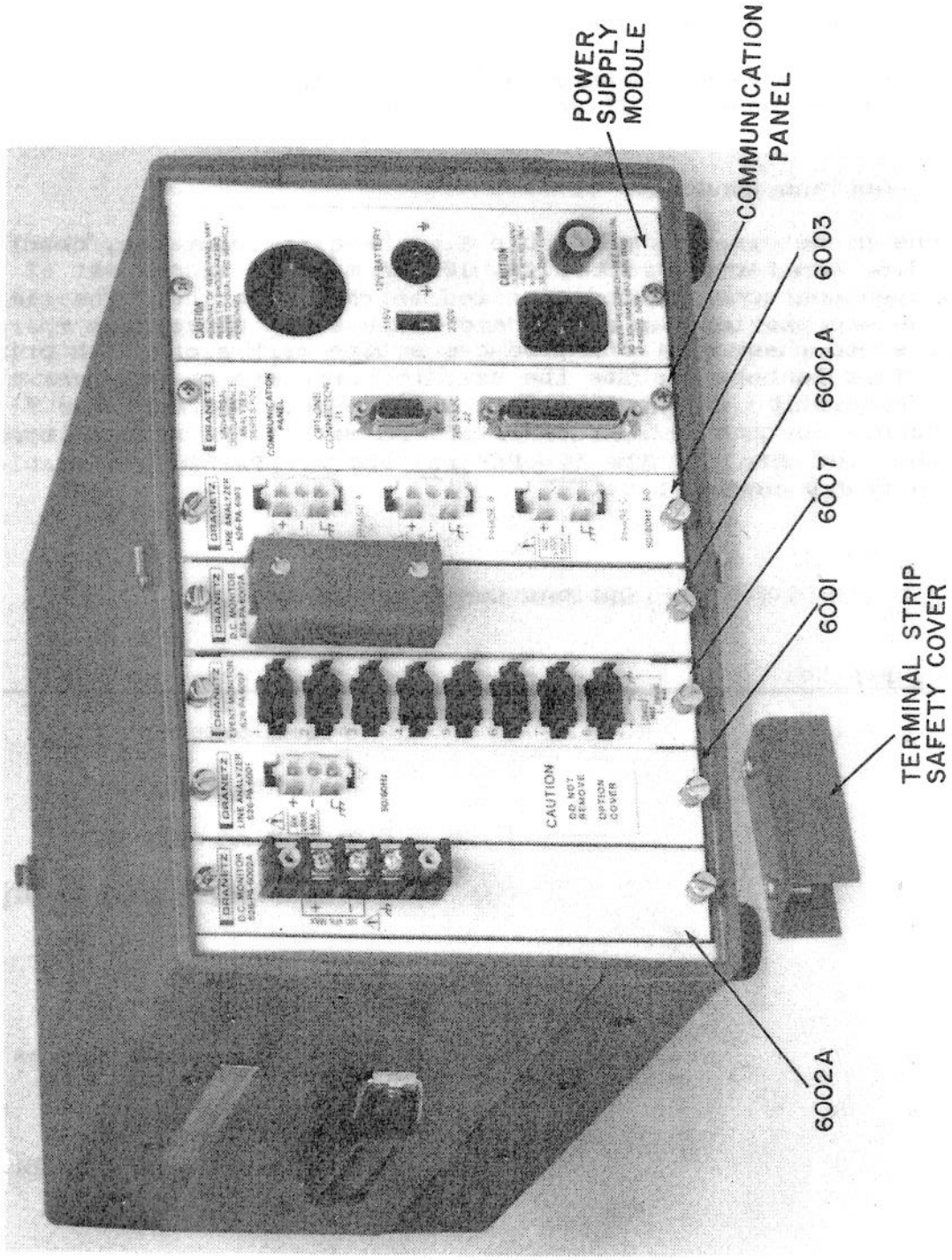


Figure 2. Series 626 Universal Disturbance Analyzer, Rear View

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3.6 Communications Panel

The Communications Panel, mounted adjacent to the power supply module, contains options connector J1 and an RS232C connector J2.

3.6.1 Options Connector J1

The options pinout is shown in Table 1. The alarm contacts, described in para. 3.3, are rated at 25 volts, 100 mA max. A second set of normally open contacts are undesignated at this printing. The time mark connections are provided as a standard feature. A DC voltage (para. 12b) applied to these contacts produces a time mark along with printout of time. This feature enables the user to correlate an external event in time. Resolution of the time mark is 10 mSec. The isolated field contact supply (Option 102), rated at 5V DC with a 5K source impedance, is available for use with the 626-PA-6007 and 626-PA-6011 to enable activation from a dry contact.

Table 1. Options Connector J1 Pinout

Pin No.	Function
1	Alarm contact 1
2	Relay contact 2*
3	Time mark (-)
4	Field Contact Supply (-)
5	
6	Alarm contact
7	Relay contact 2*
8	Time mark (+)
9	Field Contact Supply (+)

---

*Undesignated

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3.6.2 RS232 Port - Physical Description

Connector J2 provides an RS232C compatible communications port for remote printout and control of the 626. The port is configured as a DCE (Data Communications Equipment), with a drive capability of approximately 50 feet. The definition and operation of each pin of the 25-pin female "D" connector (J2) used by the 626 is described in Table 2. Note that the RS232C signal definitions are as viewed from a DTE, or the device connected to the 626.

Table 2. RS232C Port Pinout Description

PIN	NAME	FUNCTION	DIRECTION	DESCRIPTION OF OPERATION
1	GND	Protective Gnd.	n/a	Shield of interface cable should be connected to this pin which is tied to frame ground internally in the 626.
2	XMT	Transmit Data	To 626	Serial data output from the connected device is sent to the 626. RTS and DTR must be TRUE for data to be recognized.
3	RCV	Receive Data	From 626	Serial data outputted by the 626 to the connected device, provided DTR and RTS are TRUE.
4	RTS	Request to Send	To 626	This signal must be TRUE for the 626 to recognize the presence of connected device. A FALSE state of more than 240 msec will cause the RS232 PORT LOST message to be printed and appropriate action taken.
5	CTS	Clear to Send	From 626	This signal will be TRUE as long as the ACIA and driver circuitry of the RS232C port of the 626 are operational.
6	DSR	Data Set Ready	From 626	Same as CTS.
7	GND	Signal Ground	n/a	Internally connected in the 626 to pin 1.
8	DCD	Carrier Detect	n/u	Not used or provided by the 626. For devices requiring this signal to be TRUE, jumper pin 8 to pin 6 or 5.

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Table 2. RS232C Port Pinout Description (Cont'd)

PIN	NAME	FUNCTION	DIRECTION	DESCRIPTION OF OPERATION
15	XCLK	DCE Xmt Clock	From 626	Xmit clock of data outputted by the 626. Frequency = 16 x Baud rate.
17	RCLK	DCE Rcv Clock	From 626	Receive clock of data into the 626. Internally jumpered in the 626 to XCLK and DTE Xmit Clock. Hence, Xmit and Receive Baud rates must be the same.
20	DTR	Data Term. Ready	To 626	This signal must be TRUE for the 626 to acknowledge presence of connected device. FALSE state causes immediate disabling of port.

3.6.3 Dranetz RS232C Interconnect Cable

Connection of the Model 626 to a CRT terminal or teletypewriter may be made with a Dranetz RS232C cable (Dranetz Part #103506). (See figure 3.). The cable ties pins 4 and 20 internally to simplify connection to a terminal, and requires only a logic high signal to be fed to pin 20 (DTR).

3.6.4 Data Format

Data transmitted from and received by the 626 via the RS232C port should be 11 bit ASCII format serial data. The exact format is as follows:

1 Start Bit / 7 Bits of Data / 1 Parity Bit (Even) / 2 Stop Bits

Devices that require only 1 stop bit on received data should function properly even with the 2 stop bits (second one is ignored). For characters sent to the 626 by a human operator, 1 stop bit is sufficient since the time between characters will easily exceed 1 stop bit's duration. However, if the data is being sent by a high speed device (such as a computer), sufficient time between characters should be provided for, to prevent framing errors from occurring. Note: Such errors may result in misinterpretation of data.

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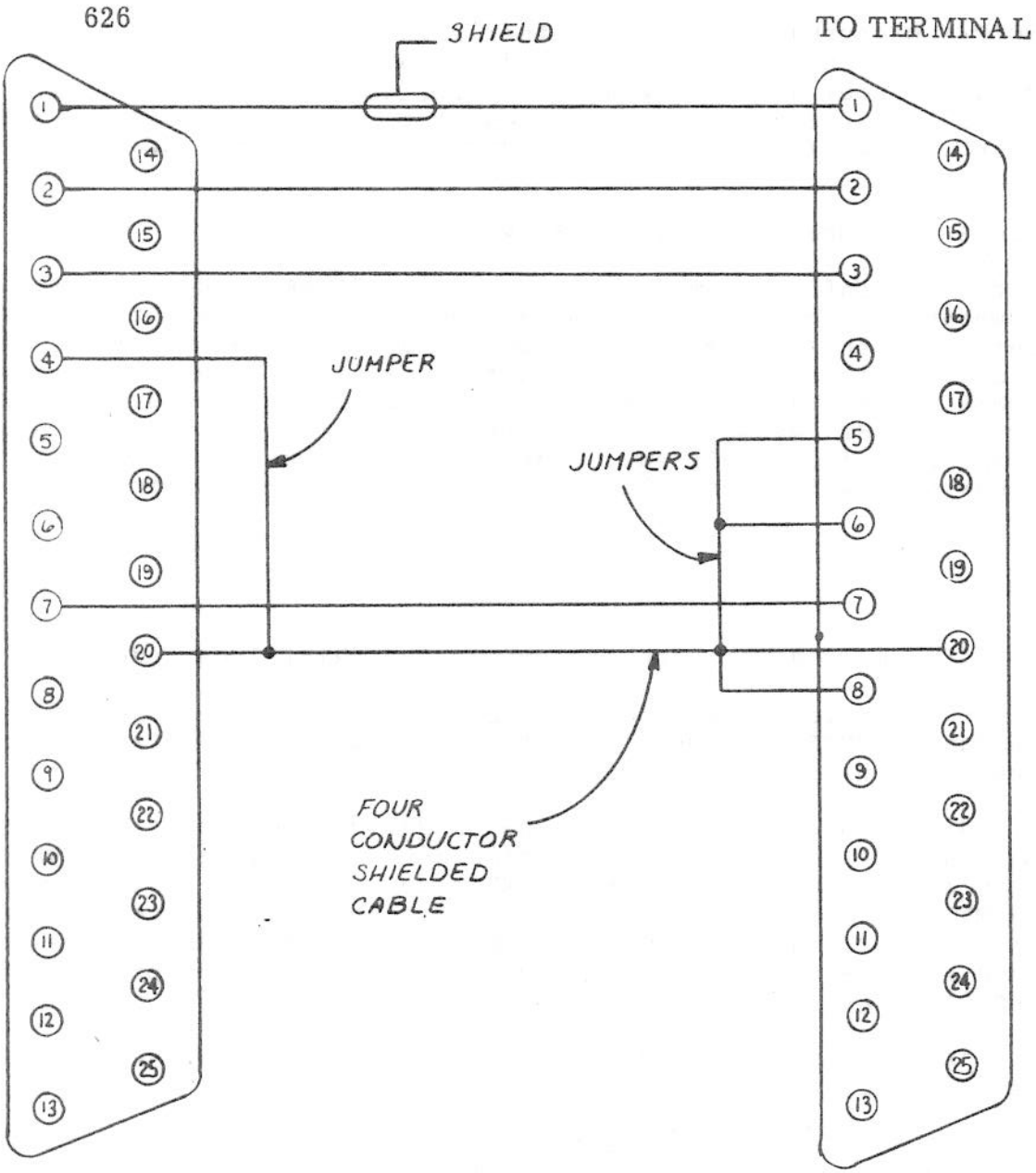


Figure 3. RS232C Interconnect Cable

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The baud rate is selectable from 110 to 9600 by switching S1 on the A2 board (See Maintenance Manual, Volume 2 of TM-106650U). Higher baud rates (up to 19,200) are possible, but not advisable. The baud rate is factory preset to 300. Xmit and Receive baud rates must be identical.

NOTE: Disturbance data and other printouts from the 626 contain EOT (ASCII 04) characters within and throughout the messages (unless the data is received via the 626-PA-6012, which strips out extraneous control characters). For devices that have an auto-disconnect feature on EOT, this feature should be disabled to prevent problems from occurring.

3.6.5 Operation of RS-232 Port and Printer

The 626 mainframe comes equipped with a "SMART" RS-232 port. Upon powering up the unit, the RS-232 control lines are interrogated to determine the existence of a functional remote device (i.e. teletype, video terminal, etc.). If this test fails for any reason, the normal POWER ON messages (see par 5.1) will be accompanied by an additional "RS-232 LOST" message and time printout. In this state, disabling the printer is not permitted. Thereafter, attempting to push the PRINT pushbutton will cause the following message to be printed:

```
10/14/83   13:15:47          ↑
     RS232 LOST              |   Read Up
     PRINTER ON              |
```

(Note: the unit "powers up" in the PRINTER ON mode).

If at any time thereafter, the RS-232 control lines are satisfied, a message: "RS232 RESTORED" and time/date will be printed, and normal operation will be restored.

If, during normal operation, the RS-232 control lines become invalid, the "RS-232 LOST" message and time/date will be printed. The unit is then forced into the "PRINTER ON" mode. The unit will, however, "REMEMBER" the last status of the printer, and upon restoration of proper RS-232 operation, print "RS-232 RESTORED" and time/date. It will then restore the previous status of the printer and print "PRINTER OFF" and time/date if applicable.

The "RS-232 LOST" message will be accompanied by a "PRINTER OFF" message only if the printer was off at the time.

The "RS-232 RESTORED " message will be accompanied by a "PRINTER OFF" message only if the printer was off at the time of the "RS-232 LOST" message.

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3.6.6 Remote Operation

On the 626's delivered prior to October 1, 1982, a remote device connected to the RS-232C port may request execution of three sequences. The remote commands, which may be entered from a terminal are P (to produce a PROGRAM SUMMARY), D (for a DATA SUMMARY), and C (for a SYSTEM CHECK).

The command character will be printed in column 1 on the 626 paper tape and/or any remote display device. Invalid characters are echoed with a "?".

626's delivered after October 1, 1982 can be fully operated in either LOCAL or REMOTE ONLY MODE.

3.6.6.1 Local Mode

When the 626 is turned on, it will start in LOCAL MODE. In this mode, the 626 responds ONLY to commands entered from its front panel and ignores inputs received through its RS-232C port, with one exception: the tilde (~) character. Each time this character is received, the 626 will toggle between LOCAL and REMOTE ONLY MODE.

3.6.6.2 Remote Only Mode

When placed in REMOTE ONLY MODE, the 626 will respond only to commands received through its RS-232C interface. The only exceptions are the "ON" and "RESET" positions of the FUNCTION switch. As shown in Table 3, an ASCII character has been set equivalent to each front panel push-button or switch position (except "OFF" and "RESET"). For operator convenience, a pull-out tabbed card with all remote commands is supplied in this manual.

3.6.6.3 Using the Thermal Printer as a Line Printer

The thermal printers on units delivered after October 1, 1982 can be made to function as line printers by executing the following ASCII commands:

~ (Tilde): Puts 626 in REMOTE ONLY mode

{ (Open Brace): Puts 626 in LINE PRINTER mode

} (Close Brace):Takes 626 out of LINE PRINTER mode

When used as a line printer, the 626 will print all data received via its RS232C port. The data is not echoed back to the source. Printing is in 20 columns, with a carriage return automatically generated after the 20th column.

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Table 3. 626 Remote Commands

(Valid ONLY in REMOTE ONLY Mode)

Front Panel Control Function Switch	Equivalent ASCII COMMAND
OFF	None-Local Only
OPERATE	O
PROGRAM	G
CLEAR DATA	K
RESET	None-Local Only
PRINTOUT MODE Switch	
SUMMARY ONLY	M
OUT-OF-LIMITS ONLY	U
NORMAL	N
MAXIMUM DETAIL	X
CALIBRATE (System Check)	C
Upper Pushbuttons	
ALARM	Q(To turn OFF or to A turn ON)
PRINTER	Z
PRESET	T
DATA	D
PROG	P
FEED	(Space)

Front Panel Control Programming Pushbuttons	Equivalent ASCII COMMAND
RANGE	R
INPUT	J
ENTER	E
LO LIMIT	L
HI LIMIT	H
SENS	S
IMP SENS	I
F SENS	F
FNC (Function)	<
Ø-9 (Yellow Pushbuttons)	Ø-9
• (Decimal Point)	•
: (Colon)	:
CLEAR ENTRY	Delete
LOWER PUSHBUTTONS	
Clock	/ (Slash)
1 (CH 1)	a
2 (CH 2)	b
3 (CH 3)	c
4 (CH 4)	d
5 (CH 5)	e

Special Command
REMOTE/LOCAL MODE Selection — ~ (Tilde Alternately selects REMOTE ONLY and LOCAL modes

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Table 3. 626 Remote Commands

(Valid ONLY in REMOTE ONLY Mode)

Front Panel Control Function Switch	Equivalent ASCII COMMAND	Front Panel Control Programming Pushbuttons	Equivalent ASCII COMMAND
OFF	None-Local Only	RANGE	R
OPERATE	O	INPUT	J
PROGRAM	G	ENTER	E
CLEAR DATA	K	LO LIMIT	L
RESET	None-Local Only	HI LIMIT	H
PRINTOUT MODE Switch		SENS	S
SUMMARY ONLY	M	IMP SENS	I
OUT-OF-LIMITS ONLY	U	F SENS	F
NORMAL	N	FNC (Function)	<
MAXIMUM DETAIL	X	Ø-9 (Yellow Pushbuttons)	Ø-9
CALIBRATE (System Check)	C	• (Decimal Point)	•
Upper Pushbuttons		: (Colon)	:
ALARM	Q(To turn OFF or to A turn ON)	CLEAR ENTRY	Delete
		LOWER PUSHBUTTONS	
PRINTER	Z	Clock	/ (Slash)
PRESET	T	1 (CH 1)	a
DATA	D	2 (CH 2)	b
PROG	P	3 (CH 3)	c
FEED	(Space)	4 (CH 4)	d
		5 (CH 5)	e

Special Command
REMOTE/LOCAL MODE Selection ~ (Tilde Alternately selects REMOTE ONLY and LOCAL modes

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4 OPERATING CONTROLS (See figure 4)

The functions of those operating controls primarily concerned with mainframe operation (i.e., used with all plug-in types) are described in Table 4. Where a control function varies when operating with a particular plug-in type, the variation is described in the manual covering that plug-in. Since some pushbuttons are included only for use with certain plug-in modules, they are described in other manuals, in conjunction with the associated modules.

Table 4. Mainframe Controls

Item	Function
ALARM pushbutton	When depressed to "in" position, enables alarm circuit.*
PRINT pushbutton	A momentary pushbutton which alternately enables or disables the thermal printer. With each depression of this pushbutton, the printer will echo either "PRINTER ON" and time/date, or "PRINTER OFF" and time/date. In the latter case, further printout is inhibited unless one of the following occurs: 1. Power is turned off or on. 2. End of day produces daily accumulated summary. 3. RS-232 is lost. 4. Power is lost.
PRESET	(Plug-in function)
DATA pushbutton	When depressed to "in" position, and with function switch in operate position, unit prints out date, time and contents of daily accumulator in each channel (instrument slot position) in sequence (1-5).
PROG pushbutton	When depressed to "in" position, and with FUNCTION switch in OPERATE position, unit prints time/date and a summary of the program (threshold settings) in each channel in sequence (1-5).

*With some types of disturbances or event changes, this causes 1-second audible tone to sound.

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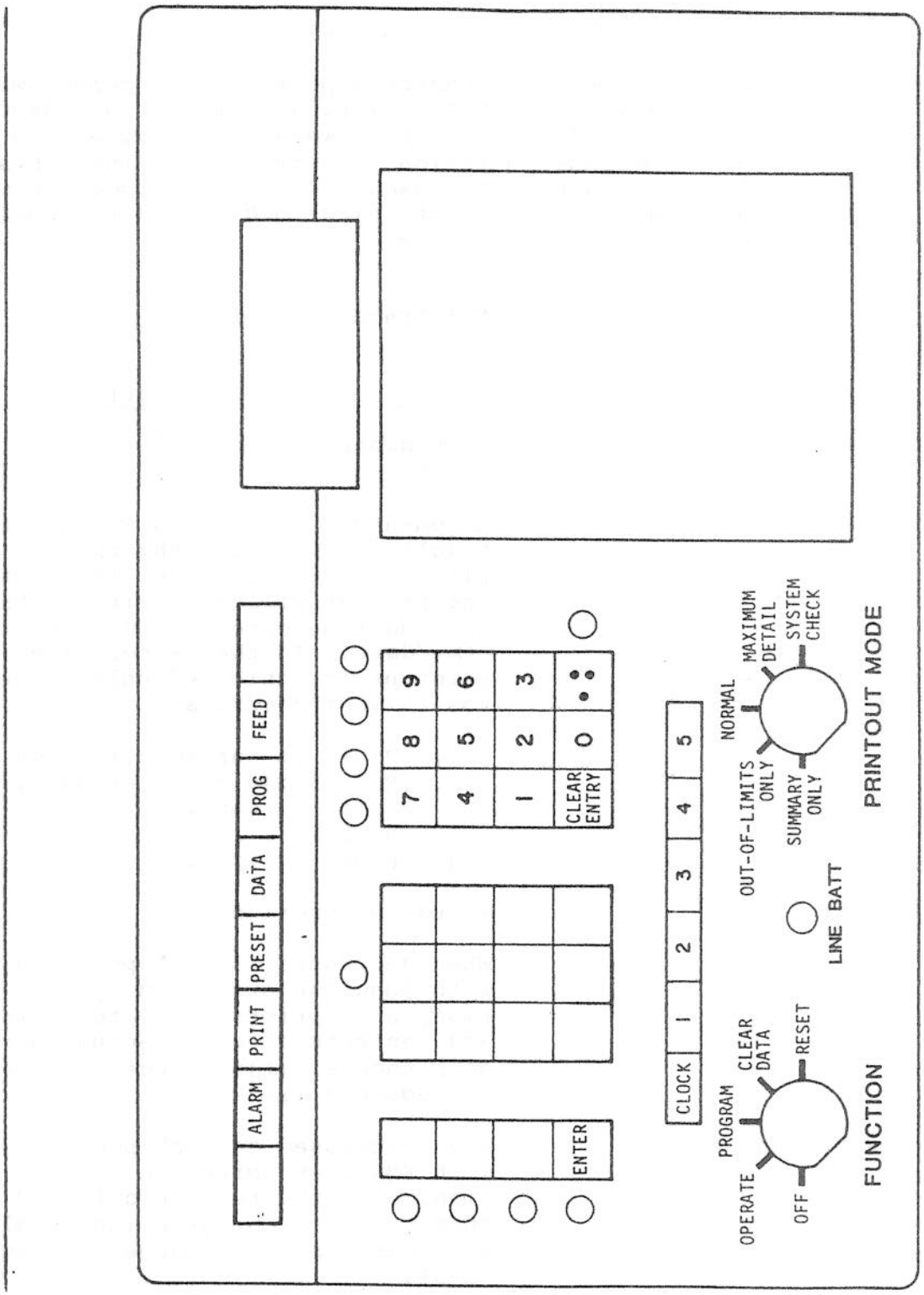


Figure 4. Mainframe Controls

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Table 4. Mainframe Controls (Cont'd.)

Item	Function
FEED pushbutton	When held in depressed position, causes paper to feed out of thermal printer.
ENTER pushbutton	When depressed, enters numeric keyboard constants into real time clock or plug-in program.
Numeric keyboard (Ø-9, ., and (CLEAR ENTRY)	Used to enter constants when setting time/date or programming.
CLOCK pushbutton	When depressed to "in" position and with FUNCTION switch in PROGRAM position, enables operator to set time and date.
1-5 pushbuttons	When depressed to "in" position, and with FUNCTION switch in PROGRAM position, selects plug-in channel for programming.
FUNCTION key switch	OFF: Turns off instrument. OPERATE: Normal operating position. Programming switches are disabled and key may be removed to prevent unauthorized use of instrument. However, top row of pushbuttons (ALARM, PRINT, etc.) may be activated. PROGRAM: enables user to program real time or thresholds of selected channel. CLEAR DATA: Clears all daily accumulators, removing all data obtained that day, but does not affect real time. RESET: Hard wire reset to central processing unit. Activates system initialization routine in the same manner as the POWER ON function. Does not reset time, date or program information.
LINE-BATT indicator	Green LINE indicator lights when AC power is present. Red BATT indicator lights when power is lost and unit is automatically switched to battery source.

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Table 4. Mainframe Controls (Cont'd.)

Item	Function
PRINTOUT MODE key switch	Printout data reduction occurs as switch is rotated ccw. Key (identical to FUNCTION switch key) may be removed in any position. SYSTEM CHECK: Puts all channels in system check mode, and printout (in sequence) is produced by self-contained calibrated signals. MAXIMUM DETAIL: Produces detailed printout (function of plug-in). NORMAL: Produces less detail (function of plug-in). OUT-OF-LIMITS ONLY: Prints disturbance data only when out of limits. SUMMARY ONLY: Printer is inhibited. All data is still loaded into daily accumulators. Provides Daily Summary at midnight.

5 MAINFRAME OPERATING PROCEDURES

5.1 Power On

With instrument plugged into AC power source, rotate FUNCTION key switch from OFF to OPERATE. The printer will provide a Power On message that shows date and time, mode of selected function and printout mode. Note: An external device is connected to the RS232 Port in this printout. If device is not connected, "RS232 LOST" message will also be printed.

Example

```
   MAXIMUM DETAIL
   OPERATE MODE
10/14/83   13:27:04
   LOCAL MODE
10/14/83   13:27:04
   POWER ON RESET
```

↑ (Read Up)

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When power is applied, the instrument performs diagnostics on its own (non-volatile) internal memory which is maintained during power off intervals by the internal battery pack. Thus, the Model 626 cannot lose its program or time during power off. Each time the instrument is turned on, all modules are reinitialized to their previous programming, even after extended intervals of time. If a normal POWER ON RESET message is generated, the memory is validated.

If the self-diagnostics on the internal memory determine that the memory is invalid (e.g., if the real time board in the mainframe was replaced), the unit prints

```
POWER ON RESET
                    ↑        (Read Up)
MEMORY INVALID      |
```

This indicates that the user must program time/date as well as the plug-in programs. Another self-diagnostics feature tests the CPU RAM. Failure would be indicated by a CPU RAM FAILED message on the printout.

5.2 Setting Date and Time

This mainframe function should be performed when real time must be reset (e.g., when time zones are switched, if back-up power fails, etc.). The procedures are detailed below.

5.2.1 Setting Date

a. Depress the CLOCK pushbutton and set the FUNCTION switch to PROGRAM. The instrument now prints the existing (old) date and time followed by an "ENTER DATE' message:

```
   (MM:DD:YY)
   ENTER DATE
10/14/83   13:37:48      ↑   (Read Up)
   PROGRAM MODE          |
```

b. Note that the two right-most cueing indicators above the numeric keyboard light, indicating that two pushbuttons on the keyboard must be depressed to enter the month (indicated on the printout as "MM"). Upon entering the month, the two indicators go out and the cueing indicator adjacent to the semicolon pushbutton lights. When the semicoolon pushbutton is depressed, the same two cueing indicators above the numeric keyboard light again. This indicates that the day should now be entered ("DD" on the printout). Once again these cueing indicators go out when the day is entered and the cueing indicator adjacent to the semicolon pushbutton lights. When the semicolon pushbutton is depressed again, the two cueing indicators above the numeric keyboard light. This indicates that the year should now be entered ("YY" on the printout).

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c. After the year is entered, the indicator next to the ENTER pushbutton lights. Depress the ENTER pushbutton to register the date on the instrument. The cueing indicator turns off and a printout takes the following form:

```
ENTER TIME (HH:MM)
10/14/83   13:39:42          ↑ (Read Up)
```

5.2.2. Setting Time

a. The two rightmost cueing indicators above the numeric keyboard light again, indicating that two pushbuttons on the keyboard must be depressed to enter hours (symbolized by "HH" on the printout). Upon entering hours, the two indicators go out and the cueing indicator adjacent to the semicolon pushbutton lights. When the semicolon pushbutton is depressed, the same two cueing indicators above the numeric keyboard light again, indicating that minutes should be entered.

b. When time (both minutes and hours) has been entered, the indicator next to the ENTER pushbutton lights. Assume that it is almost 12:30:00. At precisely 12:30:00, depress the ENTER pushbutton. This enters the time and turns off the cueing indicator. The printout takes the following form:

```
(MM:DD:YY)
ENTER DATE                   ↑ (Read Up)
10/14/83   12:30:00
```

After proper time and date have been entered, the operator may disregard the ENTER DATE message and proceed to program a plug-in channel or return to OPERATE MODE.

6 GENERAL DESCRIPTION OF OTHER OPERATING PROCEDURES AND PRINTOUTS

The following information is presented to give the user an overview of the instrument's operation and to avoid excessive repetition in later sections of this manual. Although some of the printouts necessarily include specific plug-in programs and data, only details common to overall operation (with any plug-in types) are highlighted.

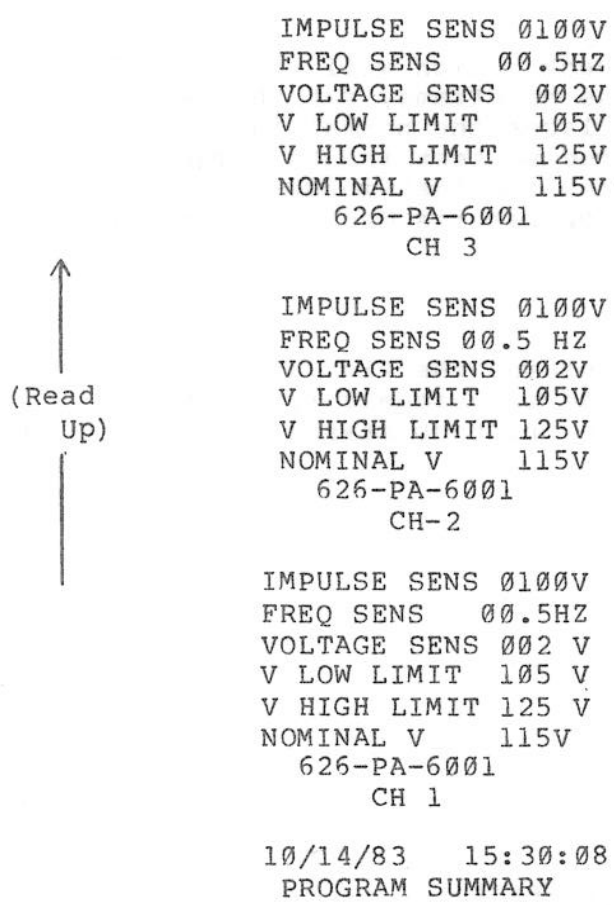
6.1 Program Summary

To operate a summary of the programs stored in the installed plug-ins, set FUNCTION switch to OPERATE and depress PROG pushbutton.

Example:

Three 626-PA-6001 plug-ins are installed in channels 1, 2, and 3. Channels 4 and 5 are empty. Note that the printout is identified as PROGRAM SUMMARY, time and date are furnished and each plug-in is identified by slot position and type.

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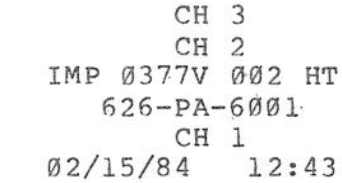
6.2 Data Summary

To obtain a summary of data, set FUNCTION switch to OPERATE and depress DATA pushbutton. The data summary provides the date, present time, present values and the total number and worst case of each type of disturbance for each channel of each plug-in.

Example:

With three 626-PA-6ØØ1 plug-ins installed in the mainframe, disturbance data recorded on channel 1 is printed out. (No data has been recorded on channels 2 and 3.)

NOTE: HT stands for "hits". The ØØ2 indicates two impulse "hits" or occurrences with the largest being 377V.



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6.3 System Check

To activate a system check, which will verify the performance of the plug-in installed in the mainframe, set the PRINTOUT MODE switch to SYSTEM CHECK. This replaces the normal inputs to all plug-ins with internally generated precise test inputs. The printout then indicates the results of processing the test inputs. The test printout must then be checked against the Operator's Manual to determine the accuracy of the plug-ins.

Example:

This printout contains the test data for plug-ins installed in channels 1, 2, and 3. Note that the printout starts and ends with asterisks.

```
**********************

   PRESENT F Ø60.Ø HZ
   PRESENT V 119.6 V
   IMP   + Ø160 V PK
       CH 3
   PRESENT F Ø60.Ø HZ
   PRESENT V 119.6 V
   IMP   + Ø160 V PK
       CH 2
   PRESENT F Ø60.Ø HZ
   PRESENT V 120.4 V
   IMP   + Ø160 V PK
       CH 1
   1Ø/14/83  15:16:43
******SYSTEMCHECK******
```

6.4 Internal Battery Pack

If an AC power failure should occur, the battery pack maintains full operation. The green LINE indicator on the front panel goes out and the red BATT indicator lights. The printer outputs a BATTERY ON message which also provides the time/date of this occurrence.

Example:

```
   1Ø/14/83   15:40:29
       BATTERY ON
```

If the output of the internal battery pack drops below operating level, a POWER LOSS message is printed, indicating that no further data may be processed. The unit is then automatically switched off. Time, date, data and program information will be valid for up to 2 weeks after power loss.

Example:

```
   1Ø/14/83   15:47:26
       POWER LOSS
```

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When line power is restored, a POWER RESTORED message is printed.

Example:

```
↑  10/14/83   15:43:39
       POWER RESTORED
```

NOTE

The internal battery pack will recharge to full capacity in approximately 10 hours with the mainframe connected to AC lines and unit operating.

When the instrument is turned off, a POWER OFF message is printed, along with date and time.

Example:

```
↑  10/14/83   15:45:16
       POWER OFF
```

6.5 Preset Factory Program

In the event the last program is lost, the program base for the plug-ins is automatically derived from factory-preset non-volatile memory (located in the plug-in). Standard programs are normally prepared for hard storage. As an option, user selected programs may be loaded into hard storage at the factory. The instrument reverts to the hard storage program when a MEMORY INVALID condition exists or when the operator depresses the PRESET pushbutton while in the program mode with the appropriate module selected.

6.6 Short Term Accumulator

The internal stack has the capability of handling at least 32 disturbances, more if multiple disturbances occur in a single time frame (10 mSec). Data is sent to the stack and is then printed out.

In the case where the data output cannot keep up with the data input, the stack will overflow. While the stack is full, the worst case data is sent to the Short Term Accumulator. After the Short Term Accumulator data is printed, it is cleared. The printout format is as follows:

```
                IMP      0166V     014 HT
                SAG      107.6V    002 HT
                V LO     105.4V    001 HT
Read
Up ↑
                    626-PA-6001
                        CH4
                  SUMMARY MODE
```

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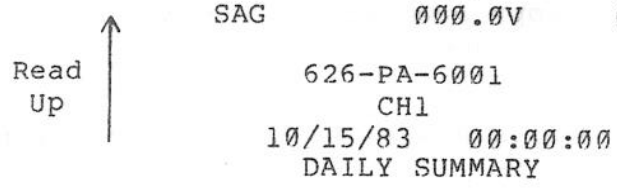
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6.7 Daily Summary

When the real time clock reaches 23:59:59.59, presumably at midnight, it will reset to 00:00:00.00 and print a daily summary which will consist of all the accumulated data of that day and then reset to begin accumulation for the present day.

The daily summary for Oct. 14th would read as follows:



7 INSTALLATION OF PAPER TAPE

The instrument is shipped with a roll of paper already installed. During operation, when the paper supply becomes low, the unit will automatically print

SUMMARY ONLY

PAPER LOW

and operation will be shifted to the SUMMARY ONLY mode (regardless of the PRINTOUT MODE setting), indicating that the paper roll should be replaced. After the paper is replaced, the unit reverts back to the setting of the PRINTOUT MODE switch.

NOTE

In the SUMMARY ONLY mode, normal printout of disturbance data is inhibited and only the daily accumulated summary is produced. Therefore, if it is anticipated that a large number of disturbances will occur during a period of unattended operation, do not wait for a PAPER LOW condition - install a full roll of paper.

Before replacing the thermally sensitive paper, clean the printhead as described in paragraph 8. After cleaning the printhead, replace the paper roll as follows:

a. Pull two black cover latches to lower cover.

b. Tear paper roll just above old roll. Do not remove remaining paper from printer.

c. Push two spring paper holders outward to release old paper roll and remove roll.

d. Remove holding tab from new paper roll to release end of roll. Use a scissors to cut edge of the paper straight.

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e. Holding the paper roll so that it unrolls, expand the two spring paper holders, install the roll, then release the holders to lock the roll in place.

NOTE

If there is no paper in printer, proceed directly to step i.

f. Ensuring that the new paper is aligned correctly to avoid jamming, insert the cut end between the rubber roller and the remaining old paper so that the old and new paper overlap.

g. Depress and hold FEED pushbutton until the new paper comes into view and the old paper is completely out of the printer.

h. Raise cover and guide paper through opening, then lock cover in place.

NOTE

Proceed with the following steps only if there is no paper in printer.

CAUTION

BE SURE THAT HANDS ARE CLEAN. ANY GREASE OR FOREIGN MATTER ON HANDS MAY CONTAMINATE ROLLER AND CAUSE PRINTER TO MALFUNCTION.

i. Using one hand, feed the cut end of the new paper between the rubber roller and the feed chute opening under the printer. Using the thumb on the other hand, gently rotate rubber roller in the forward direction until the paper comes into view.

j. Depress and hold FEED pushbutton to ascertain that paper moves smoothly. If not, repeat procedure to step i.

k. Raise cover, guide paper tape through opening, then lock cover in place.

NOTE

Due to the coiling action of the paper on its spool, it is likely that repetitive printouts of the PAPER LOW message will occur until the paper supply is clearly below the triggering point of the optical paper sensors. This occurrence is intentional and should not be a cause for concern.

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8 CLEANING PRINTHEAD

During the course of normal printer operation, minute particles of thermal sensitive material tend to be dislodged from the surface of the printer paper. These particles accumulate on the surface of the heating matrix in the printhead. This causes a reduction in heat-flow to the paper, causing the following symptoms:

Print density too light
No printout
Missing dots

To clean the printhead in the simplest and preferred method, particles may be removed by inserting a length of bond paper (approximately 10 inches in length cut to width of 2.25 inches) into the printer and operating the printer by pressing the FEED button until the length of paper passes through the printer. Insert this paper in the same manner as if replacing the paper roll.

NOTE

For your convenience Dranetz has made available a precut paper roll (Dranetz P/N 103418). This paper serves as an abrasive which buffs the surface of the printhead clean. It is recommended good practice to clean the printhead each time the thermal sensitive paper roll is replaced.

9 BAUD RATE

The baud rate is factory set at 300. Please refer to the service manual (Vol. 2 of TM-106650U) for setup of additional baud rates.

10 POWER SUPPLY AC VOLTAGE SELECTION

A 115/230V switch on the rear panel of the Power Supply Module enables 626 operation from either 115V or 230V (nominal) AC power sources. To program this switch for the desired power line voltage, proceed as follows:

a. Set the key switch to OFF, turn off power source and disconnect power cord from unit.

b. Disconnect all measurement inputs from unit.

c. Using a small screwdriver or other suitable tool, set the 115/230V switch to the desired position.

d. For 115V operation, install AC cord (DTI P/N 104943) between unit and 115V power source.

NOTE

This power cord is a standard accessory supplied when the 626 is factory set to 115V. When operating at 230V, AC cord P/N 110726 is mandatory.

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11 SPECIFICATION SUMMARY

Table 5 summarizes the specifications of the Model 626 mainframe.

Table 5. Specification Summary

Plug-in Module Capacity	1 through 5
Time Clock	Crystal controlled, +25 PPM Keyboard entry (approx.) ± 2 sec/day)
Alarm Circuits (Activated by any printable disturbance)	1. Audible alarm, 1 second self-cleaning, keyboard selectable 2. Alarm Contact closure
Temperature Range	
Operating	+10 to +40° C
Storage	-40 to +55° C
Power Requirements	90-130V rms or 180-250V rms at 47 to 450 Hz, 50W nom. +12 VDC @ 3 Amps nom.
UPS Capacity	10 to 40 minute operation on internal battery pack. 6-10 hr. recharge time.
Size	7-1/2" high x 11" wide x 15-1/2 deep
Data Output	Onboard thermal printer. RS232C Interface with control capability.

12 FEATURES

a. Factory preset program

b. Time Mark: Includes optical coupled time mark circuit which causes Model 626 to print a time mark when externally supplied DC voltage appears at the rear panel options connector. The time mark is useful in providing time correlation with an external event.

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Specifications

Input Voltage	5 to 12V DC
Input Current	4 mA @ 5V typical 22 mA @ 12V typical
Timing of applied voltage	Operates on leading edge
Pulse Width	100 uSec minimum
Pulse Rate	100 per sec.
Off Period	500 uSec minimum

13 STANDARD ACCESSORIES (SHIPPED WITH ALL UNITS)

Model No.	Part No.	Quantity	Description
626/626-0-101	TM-106650U Vol I	1	Operator's Manual
	107506	1	Mating Connector for 12V Battery
	104943	1	AC Line Cord
	Amp		
	205204-1 (1)		Connector Housing
	665570-3 (9)		Pin
	207908-1 (1)	1 Set	Hood & Cable Clamp
	110289-1 (1)		Instruction Decal
	102714	3	Thermal Paper
	103418	1 Set	Cleaning Paper

Option Connector P1

NOTE

Option 101 for the Series 626, the multiple printout modes option, is a standard accessory of every Series 626 Mainframe.

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14 626 MODULE CAPACITY

The 626 standard mainframe has an upper limit of the total load rating of the installed modules. The overall mainframe capacity is set at 20 units, and individual modules have load ratings as follows:

Plug-in	Load Ratings
626-PA-6001	2 Units
626-PA-6001 With Extra Option Board	3 Units
626-PA-6002	2 Units
626-PA-6003	4 Units
626-PA-6005	2 Units
626-PA-6006	2 Units
626-PA-6007	1 Unit
626-PA-6008	2 Units
626-PA-6009	4 Units
626-PA-6011	1 Unit
626-PA-6012	2 Units
626-PA-6012A	3 Units
626-PA-6013	2 Units
626-PA-6014	1 Unit
626-PA-6015	4 Units
626-PA-6018	4 Units
626-PA-6020	4 Units

NOTE

When selecting modules for installation into any Series 626 Mainframe, verify that the sum of the load ratings of the installed modules DOES NOT exceed 20 Units.

15 FACTORY REPAIR

When factory repair is desired, proceed as follows:

1. Contact the Dranetz Service Corporation (formerly Dranetz Technologies, Inc. Customer Service Department) in order to obtain an Authorization Number for factory repair.

   Telephone No: (201) 287-2535
   TWX: (710) 997-9553
   Telex: 499-7808
   Cable: DRANETZ

2. Fill out the REPAIR/SERVICE ORDER enclosed in this manual and ship it with the equipment to the Dranetz Service Department.

3. You have been supplied a Control Form with a Registration Number in this Operating Manual. The purpose of this form is to allow you to obtain a Maintenance Manual for your device at no charge. In the event that you have lost this document (which has been loosely inserted in this Operating Manual), please call the Dranetz Service Corporation and request a replacement form.

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Jumper A+ to C-

A - to B+

B - to C+

A ϕ B ϕ C ϕ

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