LIST OF ABBREVIAIONS

CG - Comment group

CL - Comment line

CPI - Characters per incc

C20 - Allison Series II engine

C28 - Allison Series III engine

C30 - Allison Series IV engine

DOS - MS-DOS Registered trademark of MicroSoft, Inc.
MicroSoft disk operating system

dyno - Dynamometer

FOD - Foreign object damage

GP - Gas producer

IBM - Registered trade mark of IBM Corp.

in.Hg - Inches of mercury

in.H2O - Inches of water

LP - Low pressure

N1 - Gas producer rotor

N2 - Power turbine rotor

psig - Pressure per square inch gauge

PT - Power turbine

RPM - Revolutions per minute

SERIES II - Allison C20 Series engine

SERIES III - Allison C28 Series engine

SERIES IV - Allison C30 Series engine

SFC - Specific Fuel Consumption

TOT - Turbine outlet temperature

INTRODUCTION

This manual provides instructions for operation of the Air Logistics test stand, developed by Aviall and Precision Software Inc. It also supplies information for the testing of Allison turboshaft engines Series II, III and IV, and operation of the IBM compatible computer system. A brief description of the test stand layout and functions is also provided.

The procedures and limits in the manual are in compliance with Allison engine test requirements, Publications 10W3, 14W3 & 16W3.

Numerical units of measurement are given in terms standard to the United States system of weights and measures.(English System)

ENGINE INSTALLATION

PREPARING ENGINE FOR INSTALLATION

1. Install starter-generator mount and tighten nuts. Install starter-generator, with required packing. Secure with band clamp.

   NOTE: Check N1 and N2 rotation.

   NOTE: C30 and C30S engines require installation of a fight-approved cover on the forward accessory drive. Also, a hard plug (#4) with packing, on the side drain port.

2. Remove aft turbine burner drain valve. Install the compressor discharge temperature/pressure probe and ensure packing is in place.

3. Comply with inlet inspection for FOD. Install the compressor inlet bellmouth assembly with the vibration pick-up assembly at the 12-O'clock position. If required, install #3 hard cap on the anti-ice tube.

4. Attach the turbine vibration pick-up assembly at the 12 O'clock position on the GP-to-PT support split-line.

5. Install N1 and N2 tachometers, and ignition exciter box(es).

6. Where applicable, install # 3, #4 or #5 hard caps onto the fuel pump. Install fuel supply hose assembly. If required, install the dummy check valve assembly.

   NOTE: C30 and C30S engines must have the LP fuel filter assembly transmitter port capped. (#4 hard cap)

7. Install bleed valve positioning indicator on C30 and C28 series engines only.

8. On C20 series engines, install gearbox overboard vent tube assembly.

9. Insure all caps and plugs are removed from all drains and drain valves

INSTALLATION OF ENGINE INTO TEST STAND

1. Lubricate and install engine-to-dyno coupling into the dyno input shaft. Position engine to align PTO splines to coupling splines. Align engine mounting pads to test stand mounts. Secure bottom mount, then side mounts.

   NOTE: Check N2 rotation.

2. Remove engine lifting bracket and install and secure gearbox vibration pick-up assembly to engine top mount.

3. Install exhaust duct. On C28 and C30 engines, secure with four bolts and nuts. On C20 engines install two exhaust ducts and secure with band clamps. Open test cell exhaust stack and fresh air inlet doors.

4. Install the following lubrication hoses, ensure proper packings are in place on unions: oil in, oil out, oil pressure, gearbox vent and torquemeter pressure.

   CAUTION: After all lubrication tubes are secure, open main oil supply valve. Bleed air from the oil-in tube assembly as re-required. Service oil tank.

5. Connect compressor discharge pressure tube to the compressor discharge temperature/pressure probe.

6. Install the compressor seal vent tube assembly to the vent tube. Make the initial orifice selection to mid-range. Connect compressor inlet pressure tube.

7. Install fuel control to fuel nozzle tube and valve assembly to the fuel nozzle and fuel control.

8. Rig fuel control to obtain cut-off, idle and maximum positions. Rig governor to obtain minimum and maximum positions. Check rigging to ensure smooth travel of arms and proper positioning.

9. Install all test cell electrical/temperature connectors to the engine: main engine harness, # 1 bearing scavenge, # 6 & 7 bearing oil, # 8 bearing oil, oil in, oil out, compressor inlet, anti-ice, N1 and N2 tachometers, GP TOT, and compressor discharge.

10. Connect the turbine, gearbox and compressor vibration pick-up leads.

11. Connect main fuel supply line and bleed air from fuel system. Comply with 100 hour oil flow check (90 cc min.) Recheck oil level.

CONTROL ROOM SETUP

Once engine installation is completed, comply with testcell prestart checklist. Description of checklist:

_____ COMPLY WITH INLET INSPECTION - NO F.O.D.

_____ CHECK N1 AND N2 ARE FREE

_____ CHECK ENGINE INSTALLATION

_____ EXHAUST STACK OPEN

_____ INLET AIR DOORS OPEN

_____ OIL TANK SERVICED AND OIL VALVE OPEN

_____ FUEL TANK FULL OR 1/4 MINIMUM

_____ WATER TANK SERVICED

_____ DYNO WATER PRESSURE, 80 PSIG

_____ COOLING TOWER PUMP AND FAN FUNCTIONING

_____ CHECK INTERNAL AND EXTERNAL PLUMBING FOR LEAKS

_____ CHECK OIL COOLER FOR LEAKS

_____ FUEL BOOST PUMP OFF

_____ IGNITION OFF

_____ COMPLY WITH CHIP DETECTOR TEST

_____ TOT LIMITER SET (1518F-C30 1490F-C28 1550F-C20)

_____ N2 RPM TACH-SELECTOR SET (A-C30 B-C18 THRU C28)

_____ ALL GAUGES READ ZERO OR AMBIENT

_____ ALL CONTROLS MOVE FREELY

_____ GOVERNOR LEVER TO MINIMUM

_____ FUEL CONTROL LEVER TO CUT-OFF

_____ OIL COOLER CONTROL TO FULL FORWARD POSITION

_____ WATER OUT AND IN CONTROLS TO FULL AFT POSITION

_____ DYNO WATER IN AT FULL FORWARD POSITION

COMPUTER SET UP

Once prestart checklist is completed, begin computer setup. Ensure computer and monitor are on line. The main menu display allows five options, or functions pertaining to engine tests; F1, F2, F3, F4. and F5.

Before the engine can be tested, and if there is no previous file by engine serial number, a new disk must be formatted. Install a new blank disk in drive A (top disk drive) and press F4.

F4 - Format a new engine disk. As with most other function keys, instructions for continuing are usually displayed at the bottom of the screen. When formatting is completed, note if the bytes available equal total bytes. If not, discard disk and format another.

When formatting is satisfactory, and the question to format another appears, press N (no) and <ENTER>. The main menu screen appears and you are ready to proceed with the computer set up and engine test.

F1 - Monitor and test engine. After selecting this function, the program instructs you to install the disk in drive A. The previously formatted disk, or a previously filed engine disk should be in drive A. Press any key to begin. The next screen to appear will be the Identification Page.

This page requests information about the test to be performed: engine model, serial number, work order number, etc. Enter the required information and press F10 to continue to the next screen. This will be the Channels screen, which is not needed at this time. Press F10 again, and the Engineering screen is now in place; the engine testing will be started and run with it. The engine type and serial number must be correct because once entered, cannot be changed.

NOTE: Exhaust pressure must be 0 on the screen.

The sub-menu of the Engineering Data screen consists of:

F1 - Raw; this is only used for calibration.
F2 - Engineering; the screen the engine will be run on. This constantly gives current data on engine parameters.
F3 - Calculations; this screen allows monitoring engine performance It displays calculated specification horsepower, actual horsepower and specific fuel consumption during engine test.
F4 - Remarks; this function allows entering comments for each individual test sequence. Comments must be made before saving test data.

NOTE: Comments are entered as Comment Groups (CG) For example CG48 is the comment group for the governor droop test. Also available are Comment lines. (CL) See Appendix II for additional examples.

F6 - Capture; pressing this key freezes data on the engineering screen. When this mode is in effect, five additional sub-menu options are then available:

F1 will retrieve the Comment page allowing review or modifying comments for the present test sequence.
F3 saves the data captured to disk. NOTE: Always make sure comments for the test sequence are completed before saving the data.
F5 allows viewing the calculated horsepower and specific fuel consumption at point of capture.
F7 presents the Identification page.
F10 releases the captured data without saving and returns to the Engineering screen.

F7 - I.D. Page; allows review of the Identification page.

F9 - Channels; allows viewing the numerical values programmed for the various engine parameters. They are numbered 0 through 29. These values are normally determined during the calibration process and entered in the computer's hard disk. Any changes made during an engine test are restored to the original values after completion of the current engine test. Function keys in the Channels sub-menu are:

F1 moves backward through the channels.
F2 moves forward.
F3 allows selecting the channel needed by entering the number code, or channel number.
F10 returns to the Engineering screen.

F10 - End Test; after pressing this function key, the question to continue testing will appear. Pressing Y (yes) will return the Engineering screen. N (no) will quit the testing program and return to the main menu.

CONSOLE CONTROLS

Directly in front of the operator are six hydraulic transmitter controls. From left to right, numbered one through six, their functions are:

1. Engine oil cooler control; this control should be in the full forward position at engine start up. This allows quick engine oil warm up. Adjusting the control towards the aft position results in engine oil cooling until the desired oil temperature is obtained.

2. & 3. Dyno water out controls; these should be in the full aft position before engine start. And, they are usually only used when desired restriction on the dyno cannot be obtained using the dyno water in control. (4) They are also used during cold weather.

4. Dyno water in control; this control must be in the full forward position before start. Full forward position is the minimum load point. Moving the lever aft allows more water into the dyno, thus applying a load to the engine. It is also used in conjunction with the PT governor control (6) to maintain correct dyno and PT rotor RPM.

5. Fuel control lever; has three working positions: cut off, idle and maximum fuel flow. Before start it must be in cut off, or aft position. During engine start it is modulated to the idle position, then full forward to begin engine acceleration.

6. PT governor control; must be in the full aft, or minimum position prior to start. Once the engine is started and the fuel control is at maximum fuel flow, this lever is moved forward to accelerate the engine and maintain 100 % N2 RPM. It is also used in conjunction with the dyno water in control.

CONTROL PANELS

Control panel # 1, in front of the operator, is directly behind the hydraulic transmitter controls. Panel # 2 is to the right of #1. And panel # 3 is at the right side of the operator.

1 consists of 15 digital, 2 multiple function selectors, 1 strain digital and 5 analog gauges. Parameters monitored are: oil pressures and temperature, fuel temperature, compressor discharge pressure and temperature, barometric pressure, dyno torque, GP TOT, N1 & N2 percent and RPM.

NOTE: See Appendix I for setting N2 RPM digital gauge.

2 has 2 analog and 4 digital gauges, 4 vibration amplifiers, start-stop timer system alarm , start & ignition, system kill switch (emergency stop) and magnetic plug switches. The analog gauges monitor DC volts and amperes for the 24 volt rectifier. Digital gauges monitor water in and out temperature, water in pressure, fuel flow and dyno RPM. NOTE: When the alarm limits are met, the computer decellerates the engine to idle. The alarms are: water inlet pressure, oil pressure and temperature, N1 and N2 over-speed and GP temperature.

3 panel has 5 on and 5 off switches. The on/off switches are for: cooling tower fan, cooling tower pump, dyno pump, fuel boost pump and DC voltage rectifier.

The viewing window houses 4 analog gauges and 2 manometers.The manometer at the left is used to monitor gearbox pressure measured in in. H20. The manometer on the right monitors compressor seal vent pressure in in. Hg. The 4 analog gauges indicate: compressor discharge pressure, main oil pressure, scavenge oil pressure and engine torque pressure. These gauges are direct reading psig gauges and are used as a primary back up system.

The computer system monitor is at the right of the viewing window. During engine run, the computer screen displays all parameters indicated at the viewing window, and the # 1 and # 2 control panels.

ENGINE TEST RUN

Prior to starting the engine, conduct a final inspection of the engine installation and ensure the prestart checklist has been properly filled in. The computer and monitor must be on line and the proper engine disk in the A drive on the computer. At this point the operator should be in the Monitor and Test Engine program with the Engineering screen on display.

Engine start. Turn on rectifier, fuel boost pump and dyno water pump. CAUTION: Ensure fuel control is at cut off, governor at minimum and dyno at minimum.

NOTE: All procedures and engine test settings are to be in accordance with current relevant Allison overhaul manual.

Reset water inlet pressure (WIP) by pressing WIP switch down and reset switch up, simultaneously. Press starter button to engage starter. At 15 % N1, turn ignition switch on and advance the fuel control to obtain engine light off. Modulate fuel control and monitor GP TOT, N1 speed and main oil pressure. Time start and note maximum GP TOT peak. When engine stablizes at idle, turn ignition and rectifier off.

Monitor all parameters. If satisfactory, press F4 to get the comment page, enter the proper comment group number (CG##) and enter the required data for the particular comment group. Press F10 to continue, if parameters are still satisfactory, press F6 to capture the data. Review parameters and press F3 to save the data to disk. The engineering screen will return .

The above procedure will be repeated for all remaining settings. Complete testing of the engine in accordance with current relevant Allison overhaul manual.

Engine shut down. After capturing and saving ground idle data, engine shut down procedure is as follows:

1. Allow 2 minute cool down.
2. Send assistant out to check for smoke.
3. Turn fuel boost pump off.
4. Return fuel control lever to the cut off position.
5. Monitor any unusual noise on engine coast down.
6. Monitor GP TOT to ensure temperature is decreasing.
7. Apply slight load with dyno control to slow N2.
8. Disconnect main fuel supply.
9. Shut off oil supply, drain gearbox, inspect and clean magnetic plugs.

PERFORMANCE EVALUATION

This is a two step procedure using function keys F2, Review Engine Data Disk and F3, Produce Large Scale Run Sheet.

To begin, end the test by pressing F10. The question appears whether to continue engine run. Press N. The screen will return to the main menu.

F2: Selecting this function will bring up the test run directory review. This shows the numerical sequence, work order number, date and time of saved performance points.

To plot horsepower and specific fuel consumption, the numerical sequence of the power points must be known. In a Functional Plus Five Power Points test, these numbers are usually 7 through 12. To select the points, press the corresponding arrow keys to move the cursor up or down. Starting at the lower number, highlight the points desired by pressing F1 (add), to remove the highlighted number press F2 (remove). When selections are made, press F6 for a data plot, then press U (use the saved files). The screen showing whether the engine passed or failed horsepower and specific fuel consumption will appear.

Viewing graphs:

To view the horsepower graph, press F1. To return, press the Escape key.

To view specific fuel consumption, press F2 and Escape to return.

NOTE: The graph curves may be adjusted if desired by the following procedure:

When the graph screen is up, press F1 for adjusting the left side of the graph, then use the appropriate arrow keys to plot the point wanted. Use F10 and the arrow keys for the right side. To view your curve press <ENTER>. The question appears regarding input order (1 through 5) select a number and press <ENTER>. The modified curve will appear. If you are not satisfied with this curve, repeat the procedure. If satisfied, press Escape and the new data plot will be displayed. A hard copy of the plot can be made by pressing F5.

NOTE: When an altered curve is drawn, and a hard copy is plotted, keep in mind the redrawn graph will not be duplicated on subsequent graphs. If at a later date a graph is plotted, the finished product will be produced from saved data and not the revised data.

When F5 for a hard copy is pressed, instructions for setting up the plotter will appear on the screen. Press any key to continue and instructions will again appear. At the plotter, the pen for the upper left corner will be poised to strike a mark. It must be aligned to the corner of the graph. To align, press the appropriate arrow key on the plotter. When the pen is positioned, press P (to print) on the computer keyboard and the plotter pen will strike a mark. If the mark is in the right place, press Y (yes) and the plotter will move to the bottom left corner. Repeat the procedure for this corner at the bottom right corner.

NOTE: If, after pressing P, the mark is not aligned with the corner of the graph paper, press N (no) and retry.

When plotting is finished, press F10 to cancel and the screen with the previously highlighted points will appear. options on this screen are:

F1 - Add, to highlight a point.

F2 - Remove a highlighted point.

F3 - To go to the next page.

F4 - Go to the previous page.

F5 - Print, highlighted points can be printed.

NOTE: The printed engine test run sheets will be abbreviated. For large scale run sheets you will have to return to the main menu.

F6 - To go to the previous page.

F8 - Engine Review. This function brings you to the data saved at the particular highlight point the cursor is on at the engineering screen capture. A sub menu on this screen offers options:

F1 - To review the comment page.

F5 - To view the calculation screen.

NOTE: Immediately after pressing the F5 key, pressing the Alt and the R keys simultaneously will bring up a review of the calculation correction factors on screen

F7 - Reveals the identification page.

F3 - Save. If any changes are required, they can be saved to the disk with this function key.

F10- To return to the previous screen.

PRINTING A LARGE SCALE RUNSHEET

Function key F3 on the main menu is used to produce a large scale run sheet. Press this key, confirm the disk is in drive A, press any key and the question on whether this engine is for Air Logistics performance requirements appears. If the test was to determine if the engine met Air Logistics performance requirements, then press the Y key. If not press the N key. when the test run directory appears. Use the up or down arrow keys to move the cursor to the performance points desired. To select, or highlight a point, press Y. Press N to remove a highlighted point.

NOTE: The selections must be made in the proper numerical sequence.

After selections are made, press D (done) and your selections will appear in the proper numerical sequence. At this point you may make the following choices:

R - Respecify. Allows returning to the directory to ammend selections.

Q - Quit. Returns to the main menu.

C - Continue. This then brings up several question pages that must be answered by numerical choices or entering serial numbers. The pages are:

1 for New Iberia

1 for Air Logistics

Select from 1 through 8 to pick the number corresponding the type of engine run performed.

1 or 2 for the type fuel used, usually Jet A.

The number for the type oil used, usually Mobil Jet 2.

If oil consumption was evident or the oil consumption test was performed, indicate the amount used and press <ENTER>.

Type in the fuel control serial number and <ENTER>

Type in the governor serial number and <ENTER>.

The next question will ask whether you are satisfied with the input so far. Press Y if you are, press N if you want to correct any input. If you pressed Y the screen will ask if you wish to advance the printer to the top of the form. Stop here and go to the next step, Getting Ready to Print.

GETTING READY TO PRINT

Be sure printer is on line, the On-Line indicator is illuminated. the type style is Sans Serif and the type pitch is at 15 CPI.

Load paper to proper start position by pressing the On-Line switch to turn the On-Line light off. Press the Load-Eject switch and when the Paper-Out light is on, press Load-Eject again. The paper should then move to the proper position. Finally, press the On-Line switch to turn the On-Line light on. The printer is now ready.

As previously stated, the question at the bottom of the screen asks if you wish to advance the paper to the top of the form. Since the printer is now ready, press N and the printer will begin making the large scale run sheet.

The next screen shows two options: A for abort, and T for Test. Pressing A will abort the printing process. Pressing T will display a helicopter taking off and flying across the screen!

In addition to the engine performance graph and the large scale run sheet, a torque graph can also be plotted. With the engine disk in drive A, and using the reverse side of the engine performance graph, insert the graph sheet into the plotter.

TORQUE GRAPH

Before going to the torque graph procedure, it must be known what the power point numbers are. Also how many power points were taken during the engine test. From the main menu, use function key F2 to obtain this information if it is not readily available.

From the main menu, press function key F5.

Answer the question of how many points to compute by pressing the number key desired and <ENTER>

Question: Starting with which point? Press the number key applicable and <ENTER>

A screen appears with a menu selection of: View, Print, Save or Quit. Select View and <ENTER>

A screen with the corrected GP speed will appear. Press <ENTER>

A torque graph will appear. Press <ENTER>.

Another menu selection will appear at the top of the screen. Select Save from the menu.

After the screen shows what is being saved, press <ENTER>.

For the next menu selection. Select Quit.

On next menu selection options, Image-Select is high lighted, press <ENTER>, and <ENTER> again at the following screen.

At the next menu selection options, select Go. At this time the computer will emit beeping noises. Make sure paper is installed in the plotter and <ENTER>. The plotter will begin making the torque graph.

After the graph is completed, the menu selection will appear. Select Exit. The question comes up; End of print graph session? Select Yes.

ENGINE REMOVAL

After cool down procedure and all graphs and run sheets are completed, the engine can now be removed from the test cell. The removal procedure is the reverse of installation.

TROUBLE SHOOTING

Trouble	Probable cause	Remedy
Program fails to run	Hard disk crash	Reformat hard drive
Program will not hand shake	Umac failure	Restart Umac
Improper readings due to input/output error	Umac failure	Restart Umac

HARD DISK ... PROGRAMS

Procedures for installing DOS 6.22 and Aviall5. In case of a hard disk crash or other problem which requires formatting the hard drive, the following steps must be performed:

A - Formatting the hard drive.

1 Load the TEST CELL disk # 1 in the A drive. Reboot the computer by pressing the Ctrl-Alt-Delet keys at the same time, or pressing and releasing the reset switch on the front of the computer.

2 Answer the date/time prompts. When the A> prompt appears on the screen, type FDISK and press the enter key. Follow the directions on the screen concerning creating partitions. If a partition already exists, follow the directions for deleting the partition and creating a new primary partition.

3 Once a primary partition has been created, and at the A> prompt, type FORMAT C:/S/V and press enter. The DOS program will inform you when format is complete and display instructions on the screen, one of which will ask for a volume label. Name the label TESTCELL.

B - Installing DOS and the engine programs.

1 With the 3 1/2 floppy disk marked DOS setup #1 in the B floppy drive, ask for the B drive by typing B: and pressing the ENTER key; type SETUP and press ENTER. MS-DOS version 6.22 will be installed. When requested insert disks # 2 and # 3 as required.

2 Once installation is complete, you will be advised to remove any disks the floppy drives and the computer will be restarted by the Setup program.

3 The computer will now be on line with a disk operating system. At the prompt (C:\>) place the 3 1/2 floppy disk labeled Test Cell Programs in drive B, type B: and press the ENTER key. At the B:\> prompt, type INSTALL and press ENTER. The test cell installation software has an online help program that can be accessed by using the F1 key. The Help program can be started in lieu of the Install program by typing HELP and pressing ENTER. Help explains installation in greater detail and has an option to launch the installation program from the help screen.

4 When the Install program has finished writing test cell software to the computer hard disk, you will be asked to remove floppies from the disk drives. Install will restart the computer so the changes become effective. After restart the test cell menu will then be available to launch the engine test, review, floppy format and graph programs.

ISA w/com port

Berry 1 of 2

UMAC RESTART

The Umac may be restarted in two modes using the XTALK program. The warm restart can be used anytime the computer fails to execute the handshake procedure. The cold restart is done after replacement of the Umac battery or board replacement.

To install the FAST3.MAC program into UMAC RAM, first insure the Umac main board battery is at the proper voltage of 5.0 volts DC. Then refer to figure 1 to determine the proper dip switch settings which are:

S2 These switches control the communications parameters that link XTALK to the UMAC. (data format)

S3 Determines mode of operation. For Cold Restart after random access memory (RAM) loss or corruption. The #2 & #3 switches are changed from the normal positions (ON) to the OFF position to install the RAM program (FAST3.MAC). Then they are changed to the ON position for normal operation.

S6 Controls the baud rate for communication between the computer and the UMAC. The XTALK's UMAC file is set at 9600 baud. Switch # 7 is 9600 baud and is set to ON.

UMAC PROGRAM INSTALLATION

1 - From the Avia115 directory, type XTALK and press ENTER.

2 - When the XTALK program screen asks for choosing the UMAC file (1-1), type 1 and press ENTER.

3 - Get the Command bar at the bottom of the screen by holding down the CTRL key and pressing the B key.

4 - When the bar asks for a Command, type GO LOCAL and press ENTER

5 - Locate and press the reset button on the UMAC mother board twice. Then the screen should show the following message:

UMACBasic Rev. 1.4
Left xxxxx bytes remaining.

6 - Press and hold down the CNTRL key and press B for the Command line. Type SEND FAST3.MAC and press ENTER. The screen will scroll the program being entered into the UMAC.

7 - When the screen stops scrolling. Use the CTRL B keys to get the command bar and type QUIT and press ENTER.

Berry 1 of 2

UMAC RESTART

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S6 Controls the baud rate for communication between the computer and the UMAC. The XTALK's UMAC file is set at 9600 baud. Switch # 7 is 9600 baud and is set to ON.

UMAC PROGRAM INSTALLATION

1 - From the Avia115 directory, type XTALK and press ENTER.

2 - When the XTALK program screen asks for choosing the UMAC file (1-1), type 1 and press ENTER.

3 - Get the Command bar at the bottom of the screen by holding down the CTRL key and pressing the B key.

4 - When the bar asks for a Command, type GO LOCAL and press ENTER

5 - Locate and press the reset button on the UMAC mother board twice. Then the screen should show the following message:

UMACBasic Rev. 1.4
Left xxxxx bytes remaining.

6 - Press and hold down the CNTRL key and press B for the Command line. Type SEND FAST3.MAC and press ENTER. The screen will scroll the program being entered into the UMAC.

7 - When the screen stops scrolling. Use the CTRL B keys to get the command bar and type QUIT and press ENTER.

UMAC RESTART

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To install the FAST3.MAC program into UMAC RAM, first insure the Umac main board battery is at the proper voltage of 5.0 volts DC. Then refer to figure 1 to determine the proper dip switch settings which are:

S2 These switches control the communications parameters that link XTALK to the UMAC. (data format)

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Type CD\Avia115

UMAC PROGRAM INSTALLATION

1 - From the Avia115 directory, type XTALK and press ENTER.

2 - When the XTALK program screen asks for choosing the UMAC file (1-1), type 1 and press ENTER.

3 - Get the Command bar at the bottom of the screen by holding down the CTRL key and pressing the B key.

4 - When the bar asks for a Command, type GO LOD 6 and press ENTER

5 - Locate and press the reset button on the UMAC mother board twice. Then the screen should show the following message:

UMACBasic Rev. 1.4
Left xxxxx bytes remaining.

CAP LOCKS

6 - Press and hold down the CNTRL key and press B for the command line. Type SEND FAST3.MAC and press ENTER. The screen will scroll the program being entered into the UMAC.

7 - When the screen stops scrolling. Use the CTRL B keys to get the command bar and type QUIT and press ENTER.

Type Menu.

TEST CELL MONTHLY INSPECTION

MECH.	DATE	
		1. DRAIN AND SERVICE OIL TANK AND REPLACE FILTER.
		2. REPLACE FUEL FILTER.
		3. INSPECT AND GREASE WATER BRAKE SHAFTING.
		4. INSPECT COOLING TOWER AREA, FAN, BELT AND OIL LEVEL.
		5. INSPECT INTERIOR AND EXTERIOR OF TEST CELL FOR CORROSION
		6. INSPECT WATER BRAKE WEIGHTS FOR DAMAGE.
		7. INSPECT ALL BELLMOUTHS AND EXHAUST DUCTS FOR CRACKS.
		8. INSPECT STARTER GENERATOR AND CHANGE PACKING.
		9. REPLACE ALL PACKINGS ON ALL TEST CELL FITTINGS.
		10. INSPECT ALL FIRE EXTINGUISHERS FOR PROPER CHARGE.
		11. CLEAN AND INSPECT ALL A\C UNITS AND CLEAN FILTERS.
		12. INSPECT CONSOLE FOR BURNED BULBS AND INSPECT GUAGES.
		13.CLEAN,INSPECT,GREASE,AND REPLACE PINS IN PLOTTER IF REQ.
		14.CLEAN,INSP.GREASE,AND REPLACE RIBBON IN PRINTER IF REQ.
		15.TEST WATER IN WATER TANK USING DOW TEST STRIPS .
		16. UPDATE COMPUTER ENG. FILES AND GIVE COPY TO RON KIDDER.
		17. COMPLY WITH MONTHLY CALIBRATION CHECK.

MECHANIC _____ ID # _____ DATE _____

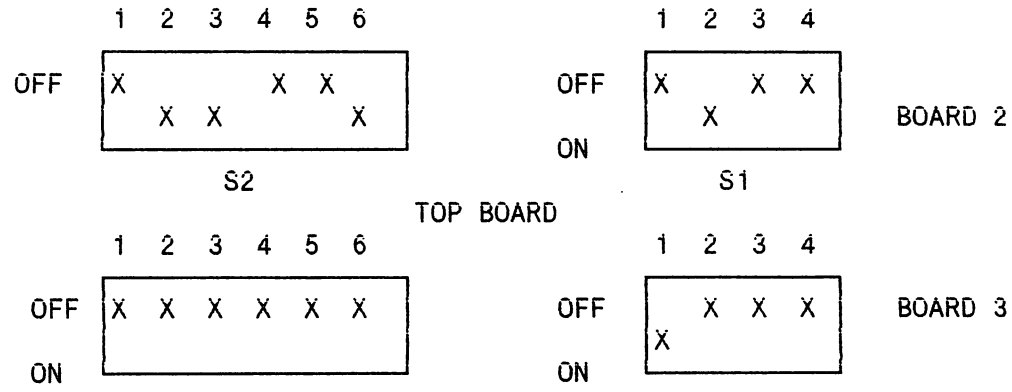
AIR LOGISTICS FAA APPROVED REPAIR STATION ALGR151C

FIGURE 1

DIP SWITCH POSITIONS FOR NORMAL OPERATION BOARD 1 (BOTTOM)

	S2	S3	S6
1	OFF	OFF	OFF
2	ON	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	OFF
5	ON	OFF	OFF
6	ON	OFF	OFF
7	ON	OFF	ON
8		OFF	OFF

MIDDLE BOARD



DIP SWITCH SETTINGS FOR BOARDS 2 & 3

NOTE: Dip switch position is on when the switch tab is in the downward position on the ON side of the switch panel, and OFF when the tab is down on the OFF side.

APPENDIX I

N2 RPM GAUGE SET-UP

The N2 RPM gauge must be set to the type of engine being tested. Setting the gauge is required in order to correctly calibrate N2 % to N2 RPM gauges. Listed below are the settings and numbers for the switches used in setting to engine type:

ENGINE	SETTING #	A/B SWITCH	DTW #	CTW #
C18	8.333	B	2	0
C20	7.924	B	2	0
C28	7.957	B	2	0
C30	7.297	A	1	0

EXAMPLE:
Setting gauges to run a C28 engine:

Set CTW switch to 3, the setting number for the previously run engine will appear.

The DTW switch can now be used to adjust the setting number for the engine type to be run. (in this case a C28) The DTW number position and the use of the reset button on the left determine the following:

DTW # 0 sets the decimal point.
DTW # 1 sets thousands.
DTW # 2 sets hundreds
DTW # 3 sets tens
DTW # 4 sets whole numbers.

With the DTW switch set to 4, press and release the reset button until the whole number 7 appears. Repeat this procedure with DTW numbers 3 to zero to get the number 7.957. (C28 setting number)

Return DTW & CTW switches to 0, the display should read P6.

Press the reset button and 0 should appear.

Set the DTW switch to 2 and B indicator should light up and gauge should read 0.000.

The N2 RPM and N2 percent gauges are now calibrated for testing a C28 engine. This procedure is the same for the other engine types, using the settings and number values required for particular engine type to be tested.

APPENDIX II

The following 7 pages list the Comment Lines and Comment Groups available to structure each engine setting when recording block data.

Pages II / 1 through II / 6 illustrate the various Comment Groups for engine settings.

Page II / 7 lists the different Comment Lines that are used or can be added to any Comment Group.

COMMENT GROUPS

GROUP FILE NUMBER 11

FULL PERFORMANCE TEST RUN BY DMWR SPECS
GROUND IDLE SETTING
START TEMPERATURE WAS ____ DEGREES F
START TIME WAS __ SECONDS
SEAL VENT ORIFICE SIZE SET AT ____
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
FUEL CONTROL SERIAL NUMBER IS _____
GOVERNOR SERIAL NUMBER IS _____
ENGINE LEAK CHECKED OK; OIL SAMPLE TAKEN

GROUP FILE NUMBER 12

SEAL RUN IN TO MAX POWER SETTING
BLEED VALVE CLOSED AT __K __% N1SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
VIBRATION SCAN CHECKED, OK
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 13

ANTI-ICE CHECK
BLEED VALVE CLOSED
ANTI-ICE TURNED ON
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ANTI-ICE TEMPERATURE ACCELERATED AT A NORMAL RATE
ANTI-ICE CHECKED; OK

GROUP FILE NUMBER 14

TAKE-OFF RATED POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
MILITARY MAX POWER SETTING

GROUP FILE NUMBER 15

GROUND IDLE SETTING
DECELERATION TIME WAS ___ SECONDS
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
DECELERATION CHECKED; OK

GROUP FILE NUMBER 16

FLIGHT AUTO-ROTATION SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 17

TAKE-OFF RATED POWER SETTING
ACCELERATION TIME WAS ___ SECONDS PEAK TOT WAS ____ DEGREES F;MAX N1 SPEED WAS _____ RPM; MAX TORQUE WAS ___ FT. LBS. MINIMUM N2 SPEED WAS _____ RPM
ACCELERATION CHECKED; OK. BLEED VALVE CLOSED AT __K __% N1 SPEED; ANTI-ICE TURNED OFF; SEAL VENT ORIFICE SIZE SET AT __; ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 18

GROUND IDLE SETTING
DECELERATION TIME WAS ___ SECONDS
BLEED VALVE OPEN
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR ONE MINUTE
DECELERATION CHECK; OK

GROUP FILE NUMBER 19

FLIGHT AUTO-ROTATION SETTING
BLEED VALVE OPEN
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE SET UP FOR ACCELERATION CHECK.

GROUP FILE NUMBER 20

TAKE-OFF RATED POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ACCELERATION TIME WAS ___ SECONDS PEAK TOT WAS ____ DEGREES F MAX N1 SPEED WAS _____ RPM; MAX TORQUE WAS ___ FT. LBS. MINIMUM N2 SPEED WAS _____ RPM
ACCELERATION CHECKED; OK

GROUP FILE NUMBER 21

OIL LEVEL SET AT _____
OIL INLET TEMP WAS ___ DEGREES F
FIRST POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
44.8% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 22

SECOND POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR ONE MINUTE
61.5% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 23

THIRD POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
75% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 24

FOURTH POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
90% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 25

FIFTH POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
100% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 26

SIXTH POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
108.9% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 27

SEVENTH POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
MILITARY MAX POWER SETTING

GROUP FILE NUMBER 28

OIL LEVEL CHECKED AT ____ __
OIL INLET TEMPERATURE WAS ___ DEGREES F
OIL CONSUMPTION IS ___ GALLONS PER HOUR
OIL CONSUMPTION IS WITHIN DATA LIMITS
BLEED VALVE CLOSED; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
44.8% NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 29

GROUND IDLE SETTING
ENGINE COOLED DOWN FOR THREE MINUTES
ENGINE SHUT DOWN; TEST RUN COMPLETE
SEAL VENT ORIFICE SIZE RECOMMENDED ____
MAG PLUGS AND FILTERS CLEANED; BLEED
VALVE OPEN; ANTI-ICE TURNED OFF; FUEL
SYSTEM PRESERVED WITH _____ OIL
COMPRESSOR PRESERVED AS PER DMWR MANUAL
ENGINE LEAK CHECKED OK OIL SAMPLE TAKEN

GROUP FILE NUMBER 30

FUNCTIONAL TEST RUN
GROUND IDLE SETTING
START TEMPERATURE WAS ____ DEGREES F
START TIME WAS __ SECONDS
SEAL VENT ORIFICE SIZE SET AT ____
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
FUEL CONTROL SERIAL NUMBER IS _____
GOVERNOR SERIAL NUMBER IS _____
ENGINE LEAK CHECKED, OK

GROUP FILE NUMBER 31
SEAL RUN IN TO MAX POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 32
ANTI-ICE CHECK
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 33
ANTI-ICE TURNED ON
BLEED VALVE REMAINED CLOSED
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ANTI-ICE TEMPERATURE ACCELERATED AT A NORMAL RATE
ANTI-ICE CHECKED, OK

GROUP FILE NUMBER 34
GOVERNOR DROOP CHECK
FLIGHT AUTO-ROTATION SETTING
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ENGINE IS IN _____ RANGE OF FLIGHT AUTO-ROTATION LIMITS; AUTO-ROTATION OK
GOVERNOR DROOP CHECK, OK

GROUP FILE NUMBER 35
GROUND IDLE SETTING
ACCELERATION TIME WAS ___ SECONDS PEAK TOT WAS ____ DEGREE F DECELERATION TIME WAS ___ SECONDS; ACCEL/DECEL CHECKED OK
FUNCTIONAL TEST RUN COMPLETE. START OF POWER PERFORMANCE POINTS. BLEED VALVE CLOSED AND ANTI-ICE TURNED OFF FOR POWER POINTS. SEAL VENT ORIFICE SIZE SET ____
ENGINE LEAK CHECKED OK WITH BLACK LIGHT

GROUP FILE NUMBER 36
FIRST POWER SETTING
BLEED VALVE _____
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
CRUISE (B) POWER SETTING

GROUP FILE NUMBER 37
SECOND POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 38
THIRD POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
POWER CHECK FOR TEST CELL RECORDS ONLY
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 39
SECOND MAX POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING
START OF SECOND FUNCTIONAL TEST RUN

GROUP FILE NUMBER 40
ANTI-ICE CHECK
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 41
ANTI-ICE TURNED ON
BLEED VALVE REMAINED CLOSED
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ANTI-ICE TEMPERATURE ACCELERATED AT A NORMAL RATE
ANTI-ICE CHECKED, OK

GROUP FILE NUMBER 42
SECOND GOVERNOR DROOP CHECK
BLEED VALVE OPEN
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ENGINE IS IN _____ RANGE OF FLIGHT AUTO-ROTATION LIMITS; AUTO-ROTATION OK
GOVERNOR DROOP CHECKED, OK

GROUP FILE NUMBER 43
GROUND IDLE SETTING
ENGINE COOLED DOWN FOR TWO MINUTES
ENGINE SHUT DOWN TEST RUN COMPLETE
SEAL VENT ORIFICE SIZE SET AT ____
MAG PLUGS & FILTERS CLEAN. BLEED VALVE OPEN; ANTI-ICE TURNED OFF; FUEL SYSTEM AND COMPRESSOR PRESERVED AS PER O/H MANUAL; ENGINE LEAK CHECKED, OK

GROUP FILE NUMBER 44 *
FUNCTIONAL PLUS FIVE POWER POINTS TEST
GROUND IDLE SETTING
START TEMPERATURE WAS ____ DEGREES F
START TIME WAS ____ SECONDS
SEAL VENT ORIFICE SIZE SET AT ____
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
FUEL CON S/N_____; GOV S/N _____
CAC_____ ; CAG_____ ; CAT_____

GROUP FILE NUMBER 45 *
SEAL RUN IN TO MAX POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 46 *
ANTI-ICE CHECK
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 47 *
ANTI-ICE TURNED ON
BLEED VALVE REMAINED CLOSED
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ANTI-ICE TEMPERATURE ACCELERATED AT A NORMAL RATE; ANTI-ICE CHECK OK

GROUP FILE NUMBER 48 *
GOVERNOR DROOP CHECK
FLIGHT AUTO-ROTATION SETTING
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE IS IN _____ RANGE OF FLIGHT AUTO-ROTATION LIMITS; AUTO-ROTATION OK
GOVERNOR DROOP CHECK OK
ENGINE LEAK CHECKED OK WITH BLACK LIGHT

GROUP FILE NUMBER 49 *
GROUND IDLE SETTING
ACCELERATION TIME WAS ____ SECONDS PEAK TOT WAS ____ DEGREE F DECELERATION TIME WAS ____ SECONDS; ACCEL/DECEL CHECKS OK
FUNCTIONAL TEST RUN COMPLETE; START OF POWER PERFORMANCE POINTS. POWER TAKEN WITH BLEED VALVE CLOSED; ANTI-ICE OFF
SEAL VENT SET AT ____;
ENGINE LEAK CHECKED OK

GROUP FILE NUMBER 50 *
FIRST POWER POINT
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
CRUISE (B) POWER SETTING

GROUP FILE NUMBER 51 *
SECOND POWER POINT
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF;
SEAL VENT ORIFICE SIZE SET
AT ____; ENGINE STABILIZED FOR TWO MIN.
CRUISE (A) POWER SETTING

GROUP FILE NUMBER 52 *
THIRD POWER POINT
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 53 *
FOURTH POWER POINT
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
MAX CONTINUOUS POWER SETTING

GROUP FILE NUMBER 54 *
FIFTH POWER POINT
BLEED VALVE CLOSED __K __% N1 SPEED
ANTI-ICE TURNED OFF
PARTICLE SEPARATOR TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING
ENGINE MEETS ALLISON POWER REQUIREMENTS

GROUP FILE NUMBER 55 *
GROUND IDLE SETTING
ENGINE COOLED DOWN FOR THREE MINUTES
ENGINE SHUT DOWN TEST RUN COMPLETE
MAG PLUGS AND FILTERS CLEANED
BLEED VALVE OPEN; ANTI-ICE OFF
SEAL VENT SIZE SET AT ____;
ENGINE TEST IAW PUB ____ N1 & N2 FREE
NO FOD, SMOKE OR METAL, N1 COAST-DOWN
TIME __ SECONDS.

GROUP FILE NUMBER 56
FULL PERFORMANCE TEST RUN
GROUND IDLE SETTING
START TEMPERATURE WAS ____ DEGREES F
START TIME WAS ____ SECONDS
SEAL VENT ORIFICE SIZE SET AT ____
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
FUEL CONTROL SERIAL NUMBER IS _____
GOVERNOR SERIAL NUMBER IS _____
ENGINE LEAK CHECKED OK WITH U.V. LIGHT

GROUP FILE NUMBER 57
SEAL RUN IN TO MAX POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 58
ANTI-ICE CHECK
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 59
ANTI-ICE TURNED ON
BLEED VALVE REMAINED CLOSED
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
ANTI-ICE TEMPERATURE ACCELERATED AT A
NORMAL RATE; ANTI-ICE CHECK OK

GROUP FILE NUMBER 60
GOVERNOR DROOP CHECK
FLIGHT AUTO-ROTATION SETTING
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
FLIGHT AUTO-ROTATION CHECKED OK
GOVERNOR DROOP CHECKED OK

GROUP FILE NUMBER 61
GROUND IDLE SETTING
ACCELERATION TIME WAS ___ SECONDS PEAK
TOT IS ____ DEGREE F; DECELERATION TIME
WAS ___ SECONDS; ACCEL/DECEL CHECKED OK
FUNCTIONAL TEST RUN COMPLETE; START OIL
CONSUMPTION CHECK AND POWER PERFORMANCE
POINTS; POWER TAKEN ABOVE BLEED VALVE
RANGE WHEN POSSIBLE; BLEED VALVE OPEN
ANTI-ICE TURNED OFF. LEAK CHECKED OK

GROUP FILE NUMBER 62 *
START OF OIL CONSUMPTION CHECK
OIL LEVEL SET AT _____ __
OIL INLET TEMPERATURE WAS ___ DEGREES F
BLEED VALVE OPEN
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES

GROUP FILE NUMBER 63
FIRST POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
CRUISE (B) POWER SETTING

GROUP FILE NUMBER 64
SECOND POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
CRUISE (A) POWER SETTING

GROUP FILE NUMBER 65
THIRD POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
NORMAL CRUISE POWER SETTING

GROUP FILE NUMBER 66
FOURTH POWER SETTING
BLEED VALVE CLOSED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
MAX CONTINUOUS POWER SETTING

GROUP FILE NUMBER 67

FIFTH POWER SETTING
BLEED VALVE CLOSED AT __K __% N1 SPEED
ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
TAKE-OFF RATED POWER SETTING

GROUP FILE NUMBER 68 *

OIL LEVEL CHECKED AT _____ __
OIL INLET TEMPERATURE WAS ___ DEGREES F
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
SEAL VENT ORIFICE SIZE SET AT ____
ENGINE STABILIZED FOR TWO MINUTES
OIL CONSUMPTION IS ___ GALLONS PER HOUR
OIL CONSUMPTION IS WITHIN LIMITS
ENGINE RETURNED TO GROUND IDLE SETTING

GROUP FILE NUMBER 69

GROUND IDLE SETTING
ENGINE COOLED DOWN FOR THREE MINUTES
ENGINE SHUT DOWN; TEST RUN COMPLETE
SEAL VENT SIZE RECOMMENDED IS ____
BLEED VALVE OPEN; ANTI-ICE TURNED OFF
MAG PLUGS AND FILTERS CLEANED; ENGINE
FUEL SYSTEM PRESERVED WITH _____ __
COMPRESSOR PRESERVED AS PER O/H MANUAL
ENGINE LEAK CHECKED OK

GROUP FILE NUMBER 70 **

AIR LOGISTICS C30SE SPECIAL POWER POINT
____ OUTSIDE AIR TEMPERATURE
____ N1 PERCENT RPM
1280 TURBINE OUTLET TEMPERATURE
____ PSI ENGINE TOURQUE
____ ACTUAL HORSEPOWER
____ SPECIFICATION HORSEPOWER
____ HORSEPOWER MARGIN

GROUP FILE NUMBER 71 ***

AIR LOGISTICS C28B SPECIAL POWER POINT
47.2 PSI ENGINE TORQUE
DO NOT EXCEED 1371 F TOT (744 C)
____ C OAT
____ C TOT
____ C MARGIN
____ ACTUAL HORSEPOWER
____ SPECIFICATION HORSEPOWER
____ HORSEPOWER MARGIN

GROUP FILE NUMBER 72

AIR LOGISTICS PERFORMANCE REQUIREMENTS
FUNCTIONAL TEST GROUND IDLE SETTING
START TEMPERATURE WAS ____ DEGREES F
START TIME WAS __ SECONDS
SEAL VENT ORIFICE SIZE SET AT ____
ANTI-ICE TURNED OFF; BLEED VALVE OPEN
FUEL CON S/N _____ GOV S/N _____
CAC_____ ; CAG_____ ; CAT_____
ENGINE LEAK CHECKED OK

GROUP FILE NUMBER 73 *

MAGNETIC PLUG INSPECTION DURING 250
ENGINE TEST CELL ACCEPTANCE TEST
CLEANED AND INSPECTED PLUGS AND FILTER
CHIPS OR FLAKES _____ EXCEED 1/32 IN.
DIAMETER OR MORE THAN FOUR SLIVERS
PENALTY RUN STARTED AT _____

GROUP FILE NUMBER 74 *

ENGINE _____ PENALTY RUN IAW DIL 229
PENALTY RUN COMPLETED AT _____
DIL 229 COMPLIED WITH

* Most commonly used Comment Groups
** Air Logistics power point for the Sikorsky S-76 engine.
*** Air Logistics power point for the Bell 206L-I engine.

COMMENT LINES

LINE FILE NUMBER 11 GROUND IDLE SETTING

LINE FILE NUMBER 12 FIRST POWER SETTING

LINE FILE NUMBER 13 SECOND POWER SETTING

LINE FILE NUMBER 14 THIRD POWER SETTING

LINE FILE NUMBER 15 FOURTH POWER SETTING

LINE FILE NUMBER 16 FIFTH POWER SETTING

LINE FILE NUMBER 17 SIXTH POWER SETTING

LINE FILE NUMBER 18 SEAL VENT ORIFICE SIZE SET AT ____

LINE FILE NUMBER 19 ANTI-ICE TURNED OFF

LINE FILE NUMBER 20 ANTI-ICE TURNED ON

LINE FILE NUMBER 21 BLEED VALVE CLOSED

LINE FILE NUMBER 22 BLEED VALVE OPEN; ANTI-ICE TURNED OFF

LINE FILE NUMBER 23 ENGINE STABILIZED FOR TWO MINUTES

LINE FILE NUMBER 24 ENGINE LEAK CHECKED OK

LINE FILE NUMBER 25 GOVERNOR DROOP CHECK

LINE FILE NUMBER 26 ANTI-ICE & PARTICLE SEPARATOR TURNED OFF

LINE FILE NUMBER 27 ANTI-ICE & PARTICLE SEPARATOR TURNED ON

LINE FILE NUMBER 28 BLEED VALVE SLIGHTLY OPEN

LINE FILE NUMBER 29 ENGINE HAS OIL LEAK, SHUT DOWN TO REPAIR

LINE FILE NUMBER 30 2-1/2 MINUTE POWER SETTING

LINE FILE NUMBER 31 BLEED VALVE CLOSED AT IDLE

LINE FILE NUMBER 32 TURBINE RAN ON AVIALL SLAVE ENGINE

LINE FILE NUMBER 33 OIL CONSUMPTION EXCEEDS ALLISON LIMITS

LINE FILE NUMBER 34 METAL IN OIL C/W PENALTY RUN IAW DIL-229

LINE FILE NUMBER 35 ENGINE DOES NOT MEET ALLISON POWER REQ.

LINE FILE NUMBER 36 ENGINE FAILED DUE TO TURBINE N1 DRAG

LINE FILE NUMBER 37 ENG. FAILED DUE TO HIGH _____ VIBRATION

LINE FILE NUMBER 38 ENGINE FAILED DUE TO SMOKE ON SHUT DOWN

LINE FILE NUMBER 39 FAILED DUE TO HIGH ___ SCAV. OIL TEMP

LINE FILE NUMBER 40 PARTICLE SEPARATOR TURNED OFF

Easy Working Writer for the IBM-PC & Compatibles

TABLE OF CONTENTS

INTRODUCTION

Easy Working Writer is an easy-to-use program containing both a word processor and a spelling checker. A word processor is like a typewriter with expanded capabilities. Use it to write a document, such as a letter, a paper, or a report, just as though you were using a typewriter. But, unlike a typewriter, you can edit and format your document easily and without retyping. With a word processor, once you type the first draft, you only need to type in corrections and additions to your text--you never need to retype the entire document. Formatting, too, is a simple matter--with a single command, you can change from single spacing to double spacing, center a title, boldface a heading, or place a foreign word in italics.

The built-in Spelling Checker helps you find and replace misspelled words before you print your document.

The simplest way to use EW Writer is:

1. Write the letter or document just as you would on a typewriter, with one difference: don't press Enter at the end of each line. The Writer will automatically "wrap-around" to the next line. Only use the Enter key at the end of a paragraph.

2. Edit the document as necessary, changing words, correcting misspellings, adding phrases, sentences, or even whole pages as necessary.

3. Use the built-in Spelling Checker on your document.

4. Save the document on your disk.

5. Print the document.

6. Edit the document again, if it's necessary.

You can, of course, save, edit and print the document as many times as you need. Also, you can "re-use" text--the draft of a letter to one person can be edited into a letter for another.

EW Writer uses default or pre-set settings for all of its features, such as margins and tabs so you can ignore any feature until you're ready for it. Simply start typing. Then, if you want to use a feature, such as a different typeface or a formatting command, look it up in this chapter and put it to work.

We refer to the "current word" or "current paragraph" in this manual. This is simply the word or paragraph on which the cursor is currently positioned in your document.

What You Need To Know

EW Writer is designed for the first-time computer user. You don't need to know how to use other programs, although it will certainly help. We do assume you know how to turn on your computer and bring up the MS-DOS or PC-DOS operating system. Consult the guide that came with your computer if you're unfamiliar with this.

Toggles and Defaults

Two terms you need to know are default and toggle. A default is the information the program uses unless you give it something else. For example, when you run EW Writer on a floppy disk, it assumes the A: drive is where all of its files are kept. If you are keeping word processing files on separate disks, you'll have to tell the program to use the disk in the B: drive. In this case, the default disk drive is A:.

A toggle is an option with fixed choices, as in Yes or No. When you "toggle" an option, you flip between the choices one after the other.

GETTING STARTED

Before you begin using EW Writer, make a back-up copy of the program and install the program on your hard disk if you have one. Back-ups save time and energy if something should ever happen to your original program disk.

Backing Up The Program

Start your computer with DOS. Depending on how your computer is set up, you may have to enter the time and date. The DOS prompt should be on your screen. If you have a hard disk, the DOS prompt should appear as C>. If you have a floppy disk, the DOS prompt should appear as A>. The letter preceding the ">" identifies the address of the disk drive where the computer was booted from (in most cases, the same disk drive where DOS is located).

Type DISKCOPY A: B: and press Enter.

The DISKCOPY program (an internal DOS program) will be loaded, and when instructed, put the "source disk" in drive A:, and the "target disk" in drive B:. Source disk refers to the disk to be copied, or the source material (such as the original EW Writer program disk.) Target disk refers to the disk that will be copied to. Make sure the target disk is new, or contains no valuable information as DISKCOPY will erase any information that is currently on the target disk. It is safest to copy onto a new, clean disk.

Drive A: refers to the first disk drive in your computer. If you don't have a hard disk, the drive which contains DOS when you boot your computer is drive A:. If you do have a hard disk and only one floppy

disk drive, then the floppy drive is considered to be drive A:. If you have two floppy drives and a hard disk, it gets more confusing.

Typically, drive A: is on the left while drive B: is on the right; or drive A: is on the top, and drive B: is on the bottom. If you are in doubt as to which drive is which, consult your computer's manual.

If your computer has only one floppy disk drive, you can still copy floppy disks. The computer assumes you have two drives, and prompts you to switch the source and target disks back and forth during the copying procedure. Just follow the prompts. When the computer says, "Now insert target disk in drive A: and press Enter," take out the source disk from drive A:, and replace it with the target disk. Then press Enter.

The target disk doesn't have to be formatted before using DISKCOPY. When DISKCOPY is used, it creates a mirror image of the source disk on the target. Therefore, when DISKCOPY copies the disk, it also copies the format.

When the message "Diskcopy complete. Copy another? Y/N" appears, type N (No). When the DOS prompt appears, you're ready to proceed. Place the original program disk in a safe place, and label the new back up copy of the program.

Copying the Program Onto a Hard Disk

Start the computer with DOS. Then place the EW Writer program disk in drive A:. When the C> prompt is on the screen, do the following:

> Type A: and press Enter. This changes the disk drive from C: to A:. Then type INSTALL and press Enter. This automatically copies the program from the A: drive to the hard disk into a subdirectory called "Easy."

Loading the Program

Once you've made a back up of the program disk, and have copied the program into your hard disk (if you have one), you are ready to load the program. To do this:

Turn on your computer. (If you have a floppy drive system, make sure DOS is in drive A: when you do this.)

HARD DISK USERS

Make sure you're logged to the C: drive (i.e. C> is on your screen). Assuming you followed the previous instructions for installing EW Writer on your hard disk:

> Type CD \EASY and press Enter. Then type EW and press Enter to load.

FLOPPY DISK DRIVE USERS

Remove the DOS disk from drive A: after booting the computer. Place the EW Writer back up program disk in drive A:. Then:

Type EW and press Enter.

-Setting Up the Program for Your Hardware
The first time you use EW Writer, the program must be configured to your particular computer and printer. To do this:

Press ESC to get the Writer Main Menu. Then press the Right Arrow key until the cursor highlights the option "Setup." Then press Enter. (Alternatively, you can simply press S to select Setup.) This produces the Setup Menu which has the following options:

Disk Drives
Printer
Video
User Manual
Save Setup

The first 3 options may or may not require adjustments. The fourth option lets you View the user manual. The fifth option is used to save the setup changes you make. Once you make these changes, EW Writer will be able to use your Setup configuration every time you start using the program.

-Disk Drives
This option allows you to configure programs to a non-standard computer system. If you have a hard disk and you've followed the INSTALL procedure, you won't have to modify the "Disk Drive" option. If you have a floppy disk drive system, this is optional because EW Writer assumes you have the program (EW Writer disk) in drive A:, and a data disk in drive B:. A data disk is a formatted disk where you can store files you create. If you're using a floppy drive system, insert a data disk in drive B to save something you've written. The program disk will not allow data files to be stored on it, so you'll need a blank data disk for storage.

To change the designated disk drive locations:

Select "Disk Drives" from the Setup Menu by pressing the letter D, or the Down Arrow until "Disk Drives" is highlighted. Then press Enter to produce the Select Drives Menu. The following list explains the items on this menu:

Data Files - This tells the program where to find or store any files you create with the program.

Program Files - This tells the program on which drive its own program files are located. These two options are designated by a disk drive letter; A: for the A

drive, B: for the B drive, and C: for the C drive (usually the drive address for a hard disk drive).

Path - The "Path" is more confusing. It is most relevant for users with hard disk drives. If you don't have a hard disk drive, leave this line blank and skip this section by pressing Enter, or F2. If you do have a hard drive, and you don't know what the path is, read your DOS manual.

-Video

If you have a color monitor, you can choose the colors on the screen and specify whether you have an EGA or CGA card. To do this:

Select "Video" from the Setup Menu and press Enter. (Or type V.) This produces the Video Menu. Use the Space Bar to display the different options. When the name of the adaptor you're using displays, press F2 to accept it. This produces another screen displaying options you can use. Press the Space Bar until the color combination you like appears. Then press F2 again, and the colors you selected will become the default colors. You can change them back, or change them again if you want.

-Printer

You need to indicate the type of printer you are using. Select "Printer" from the Setup Menu which produces a list of printers. Use the PgUp and PgDn keys to move the cursor through the list. When the name of your printer appears, highlight it and then press Enter to select it. You will then go to the Printer Setup screen where you select the port for your printer. After you select the port, you will return to the Setup Menu.

-View

If you wish to View the user manual while you are using the program, select the View Manual option on the Setup menu. The manual will then scroll screen by screen. When you want to exit from the View Manual option, press ESC. You will return to the Setup Menu.

-Save Setup

The last step in configuring EW Writer is to save the Setup information you've just specified. Once you do this, you won't have to do it again (or change the Setup information) unless you change hardware, or want to change the specified disk drives, paths, etc. If you don't save the Setup information, all the specifications you've just made will be lost when you turn off the computer.

When you select "Save Setup," the program checks that all the Disk Drive information you specified is correct. If any of this information is wrong, (i.e. you have specified the wrong path for the program's location), an error message will display. If this occurs, re-select "Disk Drives", check the path names to make sure there are no typos, and that you've specified the correct location for the program files. Once the Setup information has been saved, you are ready to use the program.

Menus

EW Writer uses "pop-up" menus called so because they work like restaurant menus: they offer you a set of choices or options while extending from the Main Menu.

When you first run EW Writer, you will drop directly into the Writer screen. Press Escape to return to the Main Menu. To see the pop-up menu choices, press the Shift key or your CAPS LOCK key. As you use the arrow keys to move through the menu, press Shift to cause the different pop-up menus to appear.

Try it now. There are cursor arrow keys on the key pad part of your keyboard. Depending on your computer, you may have a separate set of arrow keys. The File option will be highlighted. Press the key labeled 6 ->. The highlighted bar will move from "File" to "Edit" to "Print," and so on. If you press Shift when "Setup" is highlighted, the Setup Menu will pop up. (If the highlighted bar doesn't move when you press the 6->, press your Num Lock key once and try again.) You can use the 4 <- and 6 -> keys (the left arrow and right arrow keys) to move to the left and right on the menus. If the option you move to has a pop-up menu, press Shift to cause the menu to pop up. Options such as "Quit," which don't have a pop-up menu, will just highlight the option.

On a monochrome monitor, highlighting changes the option from green (or amber or white) letters on a black background to black letters on a bright background. On a color monitor, highlighting changes the colors of the letters and background.

When you move past the last option, "Quit," the menu will wrap-around to the first option. This happens in the other direction, too: when you move to the left of the first option, "File," the "Quit" option will change color or highlight.

Selecting an Option

EW Writer gives you two ways to select options. Use whichever one is most convenient for you. The two ways are:

> Graphically. Press the arrow keys until the option you want is highlighted. Then press Enter or the down arrow. (The Enter key may be labeled "Return" or "Enter" or have an arrow on it: "<--¦". We call it the Enter key throughout this manual. The down arrow key is the key pad 2.)
>
> By Letter. Type the first letter of the option's name. You don't have to press the Enter key--the program will automatically select the option. If you are in the Main Menu and want to select an option on a pop-up menu, first select the option that contains the pop-up menu. For example, to select "Setup Printer," you must first select "Setup" from the Main Menu.

When you select an option, EW Writer guides you through it. If the program needs more information, such as the name of a file or a start and end page, it displays a screen asking for the information that is needed. This screen is called a "dialog box" because it is where EW Writer has a dialog with you, the user.

Getting Help

EW Writer has a built-in help system. Whenever you want help with an operation, just press F1 and the Help screen pops up. (F1 is the function key labeled "F1." Most PCs have 10 function keys on the left side of the keyboard. Some may have the function keys along the top of the keyboard or they may have more than 10 function keys. Regardless, the keys will all be labeled F1, F2, F3, F4, and so on.)

There are two parts to the help system. The first screen summarizes the keys you can use in EW Writer. Press F1 again when this screen is showing, and see more information about the operation you were performing when you first asked for Help. Use the PgUp and PgDn keys to move through this text.

The second part of the help system is a Help Index. For help on a different topic, choose F2 from the summary screen. You will see a list of the help that is available within the application. Move your cursor to the topic you want to read about and press Enter. You will see detailed text about the topic you chose. Use the PgUp and PgDn keys to move through this text.

Press Escape when you're done. The Help menu will disappear and you will return to whatever you were doing. These are the keys you can use when looking at Help:

Key	Function
F1	Show more help. Press F1 again and additional screens appear. Use the PgUp and PgDn keys to move through text.
F2	See a list of Help available. Choose any of these options to see more.
Escape	Leave the Help system. You may have to press Escape more than once, but it will always back you out of the Help system.

Entering Text

When a dialog box asks for information, simply type it in. They're set up so you can only enter text in certain places so you don't type something in the wrong place by mistake. When you're at the end of a screen, press F2. EW Writer will respond to the information on the screen.

If you notice a mistake, use the arrow keys to move to the information. When the cursor is on the information, type the correction over the existing information. If there are extra letters left over, press the Delete key to erase them.

These are the keys you can use when you're entering information in a dialog box:

Key	Function
Up Arrow	Jump one field up.
Tab	Jump to the next field.
Down Arrow	Jump one field down.
Shift/Tab	Jump to the previous field.
Home	Jump to the first field in the box.

Note the Tab key, which is usually on the left side of the keyboard, may be labeled "Tab" or have a "--->¦" symbol on it. Also, the Home key is on the numeric key pad, although your computer may have an extra set of cursor (or arrow) keys as well.

At times, there are only a few possible choices you can enter. For example, in Setup Video, there are various colors of text and borders to choose from. In cases like this, EW Writer will display the first choice with a message, "Space select."

Press the SpaceBar to see each choice in turn. When you reach the end of the list, it starts over. When the choice you want is shown, press Enter. If the list is a long one, press F3 for a pop-up menu of the available choices. Move your cursor to the choice you want. Press Enter.

Entering Filenames

Whenever you're asked to enter a filename, whether it be to load or save, write to file or read from file, the Filename Screen will appear. Enter the filename if you know the exact name. The path will default to what you setup in Setup Disk Drives. Enter the path if you want to override the default.

If you're saving the file for the first time, choose a name to help you remember what the file is about. Type the name, press Enter, and it will be saved. If the filename already exists on the disk, the program will ask if you want to overwrite it. Answer yes and the program will replace the old file with the new information you just entered. To keep an old file while saving a new one, enter a new filename for the current file.

If you forget the exact name of a file, press F3 to access a directory without leaving the screen. Or type "wildcard" characters in the filename box to narrow down the directory you get (i.e. 'word' would show all files which begin with 'word').

After typing a name or path to narrow down the directory search, press F3. A directory will appear containing only those files relevant to the application you're in and the wild card characters entered. Move the cursor to the filename you want and press Enter.

Quit

The option "Quit" on the Main Menu takes you out of the program back to DOS.

Easy Working Writer Menu Options

When you first load the program from DOS, you go directly into a document where you can start typing immediately. The top four lines of your monitor display the current layout information. Each of the terms on these lines are explained below:

> Memory shows how much computer memory is available. Typeface shows the current typeface. Layout shows the type of text layout chosen such as ALIGN or CENTER. The left bracket < shows the left margin. The vertical lines ¦ show the position of the tab settings. The right bracket > shows the right margin of your document.

The remaining lines on the screen are for your documents. If a document is less than or equal to 80 characters wide, each line will appear. If a document is wider than 80 columns, the word processor will show as much of it (starting at the left margin) as possible. Any text beyond the right side of the screen will be cut off. To see the rest of the line, move the cursor beyond the right side of the screen. As you do, the screen will be scrolled to the left one character at a time.

-Editing
To edit text you've already entered, use the F3 through F6 keys. You can also choose the editing commands from the Main Menu. "Mark" your block of text by moving the cursor to the beginning of the block you want to mark. Press F3 and then move the cursor to the end of the block. The block you are marking will be highlighted.

To cut or delete a marked block, press F5. To memorize the block to be pasted or written to a file without erasing the block marked, press F4. To perform any other type of block editing, use the function keys as described below or choose them from the menu that appears when you press Enter after marking a block. For any other Writer feature, return to the Main Menu by pressing the Escape key.

When you select Quit, you will return to DOS. To return to the Writer screen from the Writer Main Menu, press Escape. A brief summary of the Writer Main Menu options follows:

FILE	Loads and saves documents.
EDIT	Cuts and pastes blocks of text.
PRINT	Prints document, displays printed document on screen, prints to file.
TYPEFACE	Selects different typefaces (bold, italic,underline).
OPTIONS	Searches and replaces text, spell checks your document.

LAYOUT	Changes the format of page (including centering, spacing, etc.)
SETUP	Configures EW Writer to your particular hardware.
QUIT	Leaves the Writer Main Menu and returns to DOS.

Cursor Movement and Other Special Keys

You can use a number of keys to control the cursor and perform other operations. Remember that the Ctrl and Alt keys work like the Shift key:

To press Ctrl-F, hold down the Ctrl key and press the letter F.
To press Alt-F, hold down the Alt key and press the letter F.

CURSOR MOVEMENT KEYS

KEY	FUNCTION
Down Arrow	Move down one line in your document.
Up Arrow	Move up one line in your document.
Left Arrow	Move one character to the left.
Right Arrow	Move one character to the right.
Enter	Move to the beginning of the next line.
Ctrl-Left Arrow	Move to the beginning of line.
Ctrl-Right Arrow	Move to the end of line.
Ctrl-F	Move forward one word.
Ctrl-R	Move backward one word.
Home	Go to the top of screen.
End	Go to the bottom of screen.
PgDn	Move to the next screenful of text.
PgUp	Move to the previous screenful of text.
Ctrl-PgDn	Move to the next page in the document.
Ctrl-PgUp	Move to the previous page in the document.
Ctrl-Home	Go to the top of document.
Ctrl-End	Go to the bottom of document.
Ctrl G	Move cursor to current bookmark
Ctrl L	Insert page break before current cursor position.
Ctrl S	Bookmark repositioned to current cursor position.

The Function keys duplicate some of the more commonly used commands found on the Main Menu. Use the Function Keys or the Main Menu options interchangeably-the Function Keys are there to make it easier for you.

FUNCTION KEYS

KEY	FUNCTION
F3	Mark block.
F4	Memorize marked block.
F5	Cut to memory.
F6	Paste from memory.
F7	Find text.
F8	Load a document.
F9	Save a document.
F10	Print the current document.

EDITING KEYS

KEY	FUNCTION
Ins	Toggle between insert and overwrite modes. (Insert pushes existing characters to the right as you type. Overwrite types over existing characters.)
BackSpace	Delete the last character typed.
Del	Delete the current character.
Alt-W	Delete the word at the current cursor position.
Alt-P	Delete the paragraph that currently contains the cursor.
Alt-L	Delete the current line.
Alt-H	Toggle the display to show hard returns.
Alt-F	Search forward for next occurrence of search string.
Alt-R	Search backward for last occurrence of search string.

NOTE: When using Alt-F and Alt-R, a search string must be specified under "Options" in the Writer Main Menu.

QUICK FUNCTIONS

KEY	FUNCTION
Alt B	Put the current word in Bold.
Alt U	Underline word at cursor.
Alt N	Put the current word in Normal typeface.
Alt C	Center paragraph.
Alt S	Spell check.

The FILE Menu

FILE lets you load and save document files. It can clear the document you're currently working with and pull up another, show a directory listing, and create an ASCII file. (The description of the Write ASCII option explains ASCII files in detail.)

Select the option you want from the FILE menu. When you are done using FILE, use the left or right arrow keys to move to the option you want to use next.

-Load Text
This option loads a previously created document. If you're working on a document when you select Load Text, the Writer will ask whether to save the document before loading the new document. Select Yes to save the current document. Select No to erase it.

An Input Box asks for the filename to load. Enter the name and extension if necessary, and press Enter. Remember, you can get a directory of the files available by pressing F3. The file will be loaded and you will immediately drop into the EWW screen.

-Save Text
This option lets you save the current document into a file. When you select Save Text, an Input Box asks for the name to save the file under. Type the filename and the extension if there is one and press Enter. The file will be saved and you will return to the Writer screen.

-New Text
New Text erases the current document so you can work on a new one. When you select New Text, the Writer asks whether to save your current document before erasing it. Select Yes to save the current document before erasing it. Select No to erase the current document.

-Write ASCII
This option lets you save the current document as an ASCII file. An ASCII file is more universally readable than an EW Writer file so they can be imported into other programs.

Most word processors, including this one, put commands into files that control such things as margins, boldfacing and underlining, etc. Each word processor uses a different set of commands which means you can't use a file from one word processor directly in another. So you have to convert files to ASCII, which can be read by almost all word processors, then read the ASCII file into the new word processor.

When would you want to convert a document to ASCII? Save a document as an ASCII file when you want to use it in another program. For example, you might do this to prepare a file so your friend could use it on another word processor.

When you select Write ASCII, an Input Box asks for the name you want to save the file under. The current name of the file, if it has one, is shown by default.

- -To save the ASCII file under the current filename, press F2.
- -To save the ASCII file under a new name and extension, enter it, and press F2.

CAUTION: If you save the ASCII file under the current name of the file, you will overwrite the current formatting.

-Directory
The Directory option shows a list of files on a disk. When selected, a box showing the name, size, date and time last edited of all files or subdirectories will appear.

When you are finished looking at the directory listing, press Esc. You'll return to the Main Menu. You can also load a file through the Directory by highlighting the file you want to load and pressing Enter.

-Remove File
This erases a file you've previously saved from the disk. Type in the filename and press Enter (You can also press F3 to see the directory). When asked if you're sure you want to remove this file, select Yes or No and press F2 to accept.

-Format Disk
This initializes disks for use by the program. When prompted, insert a new or reusable disk into your floppy drive and press Enter. Make sure you want to reuse the disk, as the Format command will erase anything currently on the disk.

The EDIT Menu

The EDIT function lets you select a block or paste already saved text into the current document. Cut and paste on a computer works in the same way as cutting and pasting typewritten pages: you cut a portion of text out of one page and paste it on another page. Of course, using EW Writer is a lot less messy.

After you cut or memorize a block of text, it is stored in the computer's memory. Paste it into your document whenever you want. The block will still be in memory after you save the current document, so you can cut a block from one document and paste it into another, using it as much as you want until you exit from the Writer, or until you cut or memorize a new block.

-Select Block
Select Block lets you mark a block of text to be cut or memorized. When you choose Select Block from the Edit Menu an Input Box will appear. Move the cursor to the beginning of the text you want to work with and press F3.

When the next dialog box appears, move the cursor to the end of the text you want to cut. At this point, you have several choices:

KEY	OPERATION
F3	Re-mark. Press F3 to erase the beginning of the block and start again. The Input Box will ask you to move to the beginning of the text you want to cut and press F3 again.
F4	Memorize. Use F4 to leave the block where it is and make a copy of the block.
F5	Cut. Use F5 to remove the block from the text and use it.
Esc	Exit. Cancel the operation and return to the Writer Main Menu.
Enter	Display the Writer edit menu. This menu lets you perform edit functions on just the marked block of text rather than the whole document.

Choose one operation and press the appropriate key. After you press F4, the Writer will make a copy of the block and the highlighting will disappear.

After you press F5, the Writer will cut the block from the text and reformat the document to close up the space where the block of text was.

At this point, use the Paste from Memory option or the F6 key to paste the block into another location in your document.

-Paste from Memory
This option lets you insert a block of text into your document. Make sure to cut or memorize the block, using "Select Block," before you try to paste it.

Move the cursor to where you want to place the block. Choose Paste from Memory from the Edit Menu. The block will be pasted into the document, starting from the cursor. The text will automatically be reformatted to include the block. If you try to paste a block before you have cut or memorized one, EWW will beep and return you to the Main Menu.

-Read From File

This option lets you paste text from a file into your document. Since the cut or memorized block disappears when you leave the Writer, you can only use it for cutting and pasting during one working session. There may be pieces of text you reuse day after day, such as the salutation and heading of a letter. Save these into a file and then use "Read from File" to paste them into your document.

This option can merge two files together, if you have two pieces of one document you work with separately. Simply load the first file and read the second file into the first.

Move the cursor to where you want to place the block. Choose Read from File from the Edit Menu. The Writer asks for the name of the file to read. Type in the name of the file and press Enter.

The file will be transferred to your document, starting from the cursor. The text will automatically be reformatted to include the block.

-Write to File

Mark the block you want to write to a file. Press Enter to get to the Writer Main Menu. Select Write to File within Edit. When prompted for the filename under which you want to save this block, enter the name and press Enter.

The PRINT Menu

This option lets you print the current document. You can specify how many copies will be printed, and whether to print all or a portion of the document. You can also see how a document will look when it's printed, or "print" it to a file. Select the option you want from the menu. (See explanations that follow.)

-Printer

Printer sends a document to your printer. It will be formatted according to the Page Layout and Typeface commands. Or print the current document by pressing F10. Remember to first select your printer in the Setup option on the Main Menu.

-View

View will "print" your document on the screen. All formatting will be shown, wherever possible. Typefaces won't appear because of the limitations of the PC screen, but you can see page breaks, the effects of various indentations, and so forth. View will show one screenful at a time. Press the SpaceBar to see the next screenful. When the document is finished being previewed, press Esc to return to the Writer Screen.

-File
File will "print" your document to a file. The file will be properly formatted and will contain the necessary printer commands for different typefaces, page breaks, etc. Printing to a file is useful if you want to print the file at a future date.

Select File from the Printer screen. The Writer will ask for the name of the file. Type in the filename and press Enter. If the file already exists you will be asked if you want to overwrite it. Enter Yes or No and press F2.

-Setup
"Setup" allows you to modify the current printer settings. Change the fields that you want to change, and when finished, press F2. You can change the following:

Field	Function
No. of Copies	How many copies to print. The default is one. The max is 99.
Start Page	The page at which to begin printing. The default is the first page.
End Page	The page at which to stop printing. The default is the last page.
Pause on Page Feed	If using single sheets of paper, you'll want the printer to pause after each page is ejected so that you can insert a new page. If you're using tractor feed paper (connected sheets with pinholes at the side), enter No.
Use Printer Controls	If you don't want the typefaces to appear, enter No. If you DO want them to appear, enter Yes. This option is useful if you're printing on a different printer than the one for which you set EW Writer.
Quality Print	If your printer has two print qualities and you've told EWW how to select them (in the Main Menu Printer Setup), you can choose to print Draft Quality (faster but lesser print quality) or Letter Quality (slower, but better quality print). The default is Draft Quality. Enter Yes for Letter Quality print or No for Draft Quality print.
Pitch	Enter 10 for Pica or 12 for Elite. The default is Pica.

The TYPEFACE Menu

Typeface lets you customize a document to include different typestyles, such as bold, underlining, italics, and so on. Your printer must be able to print these options for them to appear on the page. Use the Setup Menu to tell your printer to use these typestyles.

Note that these typefaces appear highlighted on your screen. Don't worry if a sentence doesn't appear boldfaced or underlined. It will be done when you print the document. There are two ways to use this option:

Select a typeface and begin typing. EWW will use the new typeface until you select a new one. This is most useful when you are first creating the text.

Mark a block, using F3, and then select a typeface. The Writer will change the typeface of the marked block. This is more useful if you want to change the typeface of existing text.

Select the typeface you want to use. Your typeface choices are listed below. You can only have one typeface at a time--you can't have underlined AND boldfaced text, for example, only underlined OR boldfaced. However, you can have more than one typeface within the document. Use the two options explained previously. If you select a typeface that cannot be printed, the text will appear as normal text.

TYPEFACE	APPEARANCE
Normal	The normal text.
Underline	The normal text underlined.
Bold	Bold-faced text is printed twice so it is darker than the normal text.
Italics	Italics show up as true italics, if your printer can print them.

The OPTIONS Menu

"Options" provides several additional features: find text, search and replace, and Spell-Checking your document. Select the option you want. Each is explained below.

-Find Text
Find Text searches for a "string" of text which is simply a group of characters, (letters, numbers, spaces and/or punctuation). EWW can search for strings up to 20 characters long. Choose whether or not the search will be case-sensitive. A case-sensitive search matches the difference between upper and lower case letters in the search string. A case-insensitive search (not case-sensitive) ignores the difference between upper and lower case letters in the search string. This operates from the location of your cursor forward.

Say you want to find the next time the word "will" appears in a letter. A case-sensitive search will not find the word if it appears in the text as "Will" or "WILL." A case-insensitive search will find the word "will" whether or not it appears as "will," "Will," "wiLL," or "WILL."

Select Find Text from the Options Menu and enter the string, up to 20 characters, you want to find. If the search will be case-sensitive, make sure to type the string using the right case.

Specify whether the search will be case-sensitive or not, and press F2. The cursor will stop at the next occurrence of the word. To continue finding text, use the ALT-F and ALT-R keys to search forward and backward.

-Replace Text

Replace Text searches for a string of text and replaces it with another string (up to 20 characters long). The two strings don't have to be the same length so you can replace the string: "a nice day" with "a fantastic day" or vice versa.

Choose whether the search is case-sensitive. You can tell the Writer whether to ask or "verify" before replacing a word or to find and replace every occurrence of the word automatically. Find and replace with verify is useful to change some occurrences of a word, whereas find and replace without verify is useful to change every occurrence of a word. This operates from the location of your cursor forward.

Suppose you're writing a short story and decide to change a character's name from Will to George. If you use an automatic case-sensitive find and replace, the Word Processor will change the word "Will" as well as the character's name:

"Will you visit us in the country?" Will asked.

becomes:

"George you visit us in the country?" George asked.

A find and replace with verify is more appropriate in this case. If the character's name was Hannah and you wanted to change it to Rachel, you could use an automatic find and replace, since "Hannah" doesn't have another meaning.

Select Replace Text from the Options Menu, and an Input Box will appear. Enter the string, up to 20 characters, you want to find. If the search will be case-sensitive, make sure to type it using the right case.

Enter the replacement string. Specify whether the search will be case-sensitive or not. Specify whether the Writer should verify the replacement. Press F2.

The Writer will look for the first occurrence of the search pattern. If you told the Writer NOT to verify the replacement, it will automatically replace the word and look for the next occurrence of the search pattern and stops when it reaches the end of the text.

If you told the Writer to verify the replacement, it stops when it finds the string and displays an Input Box. Press F2 to replace the text. It replaces the string and looks for the next occurrence of the search pattern. It will stop at the end of the text.

Press F3 to leave the original string alone. The Writer will NOT replace the word. It looks for the next occurrence of the search pattern and ask again. It stops at the end of the text. Press Esc to cancel the Replace operation.

-Spell Check

Spell Check checks the spelling of the words in your document against the dictionary contained in the program. You can also create your own dictionary to include words that aren't in the standard one.

Move the cursor to the position where you want to begin the spell check. To check your entire document, move the cursor to the very beginning. Select Spell Check from the Options menu. The Spelling Checker will start to work.

If no misspelled words are found, the Spelling Checker displays a box with the message: "No Misspelled Words". You'll be returned to the Word Processor Menu. If a misspelled word is found, the word will be highlighted and an Input Box will appear with the word in question. You have the following choices:

a. Change the misspelled word by typing in the corrections. These kind of changes are most useful when you notice a typo, such as typing "teh" for "the." Press F2 to continue the Spell Check and to recheck the spelling of the word. To change a misspelled word and correct all occurrences of that word, press F3.

b. Leave the word as it is and press F6 to continue. Sometimes the word is correct, but isn't in the spelling checker's dictionary (i.e. technical or specialized terms like rhizome or bipolar or proper names). You can also press F7 to skip all occurrences of that word in your document.

Press F4 to add the "questionable" word to your dictionary if you think you'll be using it a lot. Press ESC to quit the spell checking. When you press ESC, the spell checking will stop, and you'll return to the Writer Main Menu.

NOTE: To delete words from your user dictionary, load the file "USR.dct" into your word processor, make the changes, and save it as an ASCII file under the same name using the "Write ASCII" command.

The LAYOUT Menu

"Layout" lets you customize your document. Specify such things as single- or double-spacing, margins, and so on. Most of these options take effect immediately. When selected, the LAYOUT menu appears. Select the option you want from the menu.

-Page Layout

"Page Layout" allows you to define the margins, tab settings, and header and footer of your document. Enter the changes and press F2.

These changes reformat your document. Feel free to change the layout at any time. You can change:

FIELD	FUNCTION
Left Margin	Set the left margin of the document. The default is 11 spaces from the left edge of the paper.
Right Margin	Set the right margin. The default is 70, which leaves 10 spaces from the last letter to the right edge of the paper.
Top Margin	Specify the number of blank lines from the top of the page to the start of text. The default is 6 lines.
Bottom Margin	Specify the number of lines from the top of the page to the bottom of the text. The default is 61, which leaves 5 lines from the last printed line to the bottom edge of the paper.
Paper Length	Specify how many lines there are on the page. The Writer prints 6 lines per inch, so a standard 8 1/2 by 11 inch page has 66 lines on it (6 lines x 11 inches). The default is 66 lines. Don't change this unless you are using paper that is not 11 inches long.
Tab Settings	Set the tab stops. When you type any number in the tab setting field, the default settings will be deleted. Separate tab settings with a comma: 5, 10, 15, 20 etc.
Number of Title Pages	Specify how many title pages there are in the document. The header and footer don't appear on title pages.
Header	A header is text that appears at the top of every page. It is vertically centered in the top margin.
Center	Specify whether or not to center the header.
Typeface	Specify the typeface of the Header.
Text	Type the text of the header as you want it to appear (enter up to 2 lines.) If you want the page number to appear in the header, put a pound sign (#) in your header at the location you want the page number to appear.
Footer	A Footer is text that appears at the bottom of every page. It will be vertically centered in the bottom margin.
Center	Specify whether to center the Footer.
Typeface	Specify the typeface of the Footer.
Text	Type the text of the Footer as you want it to appear. You can enter up to 2 lines of text. If you want the page number to appear in the footer, put a pound sign (#) in your footer at the location you want the page number to appear.

-Center Text
This option centers each line of text currently marked according to current left and right margins. If no block is marked, the paragraph where the cursor is located will be centered.

-Align Text
This causes all text in the currently marked block to be aligned on the left margin only. If no block is marked, the current paragraph will be left aligned. It counteracts any centering or justification that has been set on the block or paragraph.

-Forced Page
This tells the Writer to break the current page at the current location of the cursor. The Writer insets a double line to show the page break. To delete a forced page break, place the cursor on the first character of the new page and press the backspace key.

-Single Space
Sets all of the text within the currently marked block to single spacing. If no block is marked, the current paragraph will be single spaced.

-Double Space
Sets all of the text within the currently marked block to double spacing. If no block is marked, the current paragraph will be double spaced.

The SETUP Menu

Please see Part 1, GETTING STARTED, for an explanation of the SETUP Menu.

The QUIT Command

This option returns you to DOS. If you've changed the document since the last time you saved it, you'll be asked if you want to save the document before exiting. Enter No to exit WITHOUT saving any recent editing changes; or type Yes to remain in the document.

1. PRINTING ATTRIBUTES:

There are several special considerations when printing with attributes.

First, the actual availability of attributes is totally dependent upon your printer.

Second, several of the attributes that FormTool supports for various printers must be used with care. These include attributes that change the size of the text (such as: compressed, expanded or elite), or proportionally spaced attributes. Those requiring the most care are expanded and proportional. In the case of expanded, the text can expand over other areas of the form, so be sure you leave extra space to the right of that area if used. Proportional fonts will pull and compact text to the left. Since the IBM PC font was designed for fixed spacing this is not compensated for. Also, gaps can appear when using proportional fonts mixed with other fonts. You will have to experiment to obtain the best results on your printer.

Also the three user attributes, expanded, elite & compressed (#6, #7 & #8) generally are sizes other than the base CPI of the form. For this reason, when using other than the default CPI, you will want to be sure that they can be used correctly. This is only a problem with printers that have exactly defined fonts, such as laser printers. Additionally, these three attributes are normally not available when printing in Landscape (except on some HP LaserJet font cartridges).

FormTool provides features for shifting vertically the fonts selected by the subscript or superscript (attributes #4 & #5) even though your printer would not normally do this, though this is limited to some printers (includes HP LaserJet). Use PRNTUTIL to remove or change this feature.

A note on Justification. Justification in FormTool is not an attribute that is applied. It is a screen function only. If you center text on the screen, it is done without regard to the actual attribute (if any).

2. PRINTING OPTIONS:

On most printers FormTool's Draft quality will print more quickly; but in most case will not use the full character set or Letter Quality (if available). Use this mode to try out different designs; but use Final mode for the final print you wish to make, since this will print all available attributes, double lines, etc. However, a select few will only have Draft or Final (i.e., Cordata Laser or most daisy wheel printers).

Portrait or Landscape option is straightforward, and provides the obvious result of printing vertical or sideways. Note that not all of the printers indicated in our list will support Landscape. Those that do not, will not allow the selection of this option. In the case of the 11x8.5 size form, if Landscape is not available, you will have to insert the correct paper so FormTool can print Portrait mode.

The form or page length option allows you control over the form feeding that occurs at the end of printing a form. By default it is set to 11 inches corresponding to 66 rows at 6 LPI or 88 at 8 LPI, which is what a standard 8.5 x 11 inch paper provides, and remains set to this unless it is overridden. This is very useful when printing continuous Rolodex cards, mailing labels, or envelopes, for example. If the value is set to 0 (zero), this indicates that no form feed will be sent to the printer, allowing you to control the spacing between printing using blank rows in the form. For correct feeding using a zero for form length (to disable form feed) you will need to use blank rows at the bottom of the form. When using blank rows for this purpose, be sure the bottom blank row has an attribute applied somewhere on that row to prevent FormTool from ignoring these rows to speed printing.

You may also change or set printing margins for your form. The normal 8.5 x 11 size defaults to zero top margin and a left margin of 2. Change these to suit your requirements, but keep in mind the limitations of your printer. These will not be retained and must be set for each printing; to have margins become permanent within the form, extra space must be added to the form itself. If your printer only supports 80 columns, and you want to print a form with 76 columns, don't set the left margin to more than 4 or the printer may wrap lines or clip automatically.

The pause on page break feature is useful for a variety of printer types. With many printers you would use this to insert single cut sheets into the printer to print each form. This would also be used with semiautomatic page feeders (fully automatic page feeders, from NEC and others, can be used without this feature). Also, you could use this feature with laser printers that accept single sheet insertion for alternative sized or weight paper. Be sure not to use this unless you want it, since it will force the program to wait for a key stroke between each printing.

Overrides for character and line (row) spacing should be used with care. These override the setting actually set for your form. If the form was 8.5 x 11, set to 10 CPI & 6 LPI, you could shrink it both vertically and horizontally by changing these values. But, this is highly dependant upon your printer's ability to print in that spacing. If the spacing chosen is not supported, the form may be printed incorrectly. Equally important, not all spacings are supported by every printer in both Draft and Final mode. CPI may be changed to any value, up to 255; but most printers only support 10, 12, 15, & 17 (or something very close), so set it to these values if this is all that is supported. Note that decimal values are not accepted. However, because of the way FormTool's driver is designed, on many printers the LPI can be set to a wide range, up to 255. This can cause the form to shrink vertically to produce a more compacted form; the most useful range tends to be from 3 to about 20. Also on some printers, FormTool will switch to an all graphics mode for unsupported CPIs or LPIs unless changed with PRNTUTIL. Also, and value of CPI from 15 through 18 will revert to the exact value indicated on the Change Drive screen in PRNTUTIL. You should experiment a little to find out some of the capabilities of your printer.

When actually printing the form, you are able to use the cursor keys to view any part of the form. This will help in checking up while printing if something does not appear correct.

Just remember, when all else fails, use the defaults. To test some of the new features of FormTool, try printing the collected forms, contained on the Accessories Disk; but it is recommended that you at least print the form SAMPLE99, which will help indicate if the printer selection is correct.

3. PRINTER SPECIFIC INFORMATION:

FormTool supports well over a hundred models of printers from several manufacturers. Each printer is unique and has special characteristics that are important when using it with FormTool. Some of these special characteristics are as follows:

GENERAL:

(1) Some printers use a basic character redefinition mode for printing (and all Daisy Wheel printers). This provides only one quality and printing can only be done in Portrait mode. This is totally due to the limitations of these printers. Also, these printers will not print true lines; but will substitute other characters for those (except the Diablo 630 API/ECS, but it must use the graphics character wheel).

(2) Some printers may not work with the specific selection if setup to emulate or be compatible with another printer. Always check your printer setup if this problem occurs. If setup in this way, choose a selection correct for that setup (i.e., the Toshiba P351 in IBM mode should use the 100% IBM selection).

(3) Color printers may be used with FormTool, however you would have to change the escape codes for a specific selection to be able to use color in the form. This would be done using PRNTUTIL.

(4) Other printers such as: Band printers, line printers, etc. may also be used with FormTool. However, the Typewriter selection should be tried if none of the other selections work correctly.

LASER PRINTERS:

(5) On some laser printers (like the HP), it is not possible to print forms that are 10 CPI 80 columns wide. This was done to provide both text and graphics alignment such that they print correctly in each column. You may change the "Offsets" using PRNTUTIL if this is not satisfactory.

(6) The Hewlett Packard standard LaserJet printer has limited internal memory; only 59K total. It is possible to create a form more complex than can be printed with the available memory of this printer. This will be indicated by the bottom part of the form not being printed. This is a problem only when printing in Final mode. If you draw a border around an 8.5 x 11 size form, and select Final, the printer may not be able to print the entire page. Also, this is dependent upon the number, locations, and type of attributes used in the form. If you encounter this problem, restructure your form for fewer graphic lines and symbols, remove the border, try to combine or eliminate some attribute areas, or use the Draft mode if available. Pay close attention to the print status line display during printing to identify in what pass and on what row your printer fills it's memory. For LaserJet Plus owners, this should not be a problem.

(7) The HP LaserJet Plus may now use soft fonts. These can be downloaded in any order. However, you may have to change the escape codes of that driver if the are loaded in an order different than that indicated in the Attribute List.

(8) If you use any of the HP Font Cartridges with the HP LaserJet Plus printer, you may have to adjust the "Offset" values. This is due to differences between the two models. These are changed using the PRNTUTIL program, selecting the "Change Driver" function. These should be changed to reflect the values for the "HP LaserJet Softfonts" printer selection. By making this change, text will more correctly align with graphics in the printed form.

(9) In some of the HP font selections you will notice a plus "+" sign before specific attributes in the list displayed. This indicates that if this font cartridge or selection is being used on an HP LaserJet Plus, that these attributes will be available. Also, an "L:" is used to indicate that a font is available in landscape.

(10) The Ricoh 4080R Laser also has limited memory. However, unlike the HP, the Ricoh when out of memory will lose bits and pieces of the form instead of simply not printing lines beyond a specific point.

(11) The DEC LN03 and the CANON LBP8 Laser printers are not able to obtain the Final quality printing while in the Landscape mode.

(12) We recommend that the DEC LN03 be used with addition memory cartridges to allow it to fully use FormTool's features.

(13) The CORDATA Laser printer has two different selections for Portrait and Landscape printing. This is due to radical differences in the way the printer functions in these two orientations. The Landscape selection, however, will only print with a single font due to the limitation of the printer.

(14) Several other low memory laser printers have the same problem as the HP standard LaserJet (including: the Canon LBP 8 A1, DEC LN03 std.). Use Draft when available to reduce the requirements placed upon the printers memory. The Xerox 4045 when out of memory will lock up both the printer and the computer; to continue simply power off and back on the printer. See note 5 for more information.

(15) Quadram QuadLaser requires special FormTool Line Draw download font. These are located on the Accessories Disk. FormTool will automatically download these files. These 2 font files (PC106.FNT & PC106B.FNT) are originally provided on the Accessories Disk. They may placed on a hard disk with the FormTool files, or on a data disk for floppy disk users. These will be downloaded the first time printing is selected (this can be disabled for users who want to download there on fonts as well with PRNTUTIL). See the file QUADLOAD.DOC for details.

(16) The Xerox 4045 with the PC cartridge may also use the Diablo 630 ECS selection if correctly setup.

(17) Some unsupported laser printers do in fact work with FormTool. These include: GTC Blazer Laser, 100% IBM Compatible (requires escape code changes); TI Laser Printer, use Epson FX for TI 855 (Possibly Diablo 630 ECS or HP No Font with escape code changes); NCR Laser printer use Canon Laser. Please note that these are the result of user feedback only.

DOT MATRIX PRINTERS:

(18) Some model of the IBM Proprinter or Quietwriter should use the 100% IBM Graphics selection is stead of the their selection. If you have a problem try this selection.

(19) The C. ITOH 1550 printer is not able to obtain the Final quality printing while in the Landscape mode.

(20) Many printers are compatible with the Epson LQ1500 printer. These include: NEC P560 and the Star NB24-15. This would apply to most 24 pin Epson compatible printers.

(21) Many printers that claim to be 100% IBM Graphics Printer compatible are in fact Epson FX/RX/MX compatibles, and should use that selection to print. These include printer made by: Brother, Citizen, Panasonic, Star and Tandy.

(22) The Diconix 150 Ink Jet printer must be configured to emulate the Epson Printer. See the Diconix manual for information on performing this setup.

PLOTTERS:

(23) If you encounter difficulties plotting a form, the first item to check is the Serial Port Baud Rate and other setups. Use PRNTUTIL to change or examine these.

(24) When printing on plotters be sure not to extend the form beyond the plotting area available. If this occurs, you will note that the top and left edges are not fully formed. Using PRNTUTIL you can change the scaling of the plotter selection. Also, if the plotter pen runs off the page you will need to adjust the page length from within PRNTUTIL.

4. ADDITIONAL PRINTING NOTES:

The following are a few additional cautions and consideration when using FormTool and your printer.

(1) There is an internal width setting used by FormTool during printing to determine if clipping will result based upon the size of the form to be printed. Several of the dot matrix printer selection are intended to be generic, and have this value set to 132. If you have an 80 column printer you may want to change this value to have FormTool prompt you when your form extends beyond the width of your printer. Or, if you have a wide carriage printer and the value is set to 80, you will need to change this to allow wider forms. To change these values, if may be done with the PRNTUTIL program provided on the FormTool Accessory Disk.

(2) FormTool was designed around the IBM character set, that has fixed font spacing, and as such, does not compensate for proportionally spaced character fonts. You will have to be careful of spacing and placement of attributes if you are using proportional spacing with your printer. The best advice in these cases is to first print the form, examine it for spacing problems, then correct these and print again. Draft may not always produce an accurate result, so use Final to gauge correct spacing if this is the case with your printer.

(3) Printer ports: From within FormTool, you can access the normal selection of printing ports used with the PC. These are the two serial ports, COM1: & COM2:; the three parallel ports, LPT1:, LPT2: & LPT3:. It is possible to use more serial or parallel ports than these; but they are not directly supported. One additional port, PRN:, is specifically available by DOS for redirection; as when MODE is used to redirect a parallel port to a serial port. If you are using redirection, you should select PRN: as the port from within FormTool. Also, if you have ports beyond the supported range, use redirection, and PRN:. The disadvantage of PRN: is speed; it is SLOW! You may also print to a file.

(4) Serial printers: FormTool automatically presets the Baud rate and other serial port characteristics based upon values contained in the driver. These values are: 9600 Baud, 8 Data Bits, 1 Stop Bit, and No Parity. These values will be used when you select COM1: or COM2: from the port selections. If you have used the DOS command MODE to change these values, those changes will be ignored by FormTool. The only way to use MODE to effectively change these, is to use MODE to set the values, then use MODE to redirect LPT1: to COM1: and select the PRN: port in FormTool. If you want to change these values within FormTool, you will have to use the PRNTUTIL.

(5) Print spoolers: FormTool is compatible with print spoolers; however, if any problems arise in printing with a spooler, select the PRN: port from within FormTool. This is more accommodating with redirection and should provide any additional compatibility that might be needed.

(6) Occasionally, you might encounter (while printing with FormTool), "Timeout" or "Off Line" errors. A few things can cause these, and generally are quickly corrected if need be. An error can occur if you are using a printer with an external buffer, and the buffer fills and does not accept new data before the computer times out. Normally, just press a key to continue. You might also want to read PRNTUTIL.DOC to find out how to change the value used. The same thing can happen with a printers internal buffer, especially while printing in Final mode on some printers, since much of what is being printed is in graphics, requiring vast amounts of data being sent to the printer. (This is also the reason in some cases for the slowness on some printers).

(7) You may notice (depending on your printer) that the printer may pause at times while printing, or that the printer is printing somewhat slowly. This is generally due to the amount of data FormTool must send to the printer to print a form. Several factors can decrease speed while printing. These include: the number of individual attribute areas on a row (which means the number of time escape codes have to be sent to cancel one attribute and start another); the use of lines or symbol characters on printers that don't internally support these (requiring them to be printed in graphics); printing in Final (which produces better quality, but is slower) instead of Draft ; printing sideways (which requires everything to be printed in graphics); and high density printer, such as 24 pin matrix printers that requires 3 to 4 times the data. Be patient, there is a reason behind it all.

(8) Printing with foreign characters: If you used an international character set in editing the form, keep the set active while printing. Also, you should set the printer switches for the correct int'l. set, to avoid FormTool printing these characters as graphics if not fully supported. This allow these characters to be of the same quality as regular, standard ASCII text.

5. SUMMARY.

Please refer to the FormTool manual, as well as the on-line help, for additional details about FormTool and its capabilities. Also, be sure to carefully examine, and print the sample forms provided on the accessories disk. These will provide firsthand examples of many of the unique features of FormTool, and will guide you in discovering what is possible. Note: Some printers are not able to print all the sample forms.

F-Keys (Drawing)
F1:All F-Keys Menu
F2:All Editor Commands
F3:Double/Single Lines
F4:Grid/Line Generator
F5:Draw Vertical Line
F6:Erase Vertical Line
F7:Draw Horiz. Line
F8:Erase Horiz. Line
F9:Erase All Text
F10:Manual Line Drawing

Alt Keys (Text)
F1:[A] Attributes/Fonts
F2:[C] Alignment Counter
F3:[E] Erase Form/Block
F4:[H] Help / Help Menu
F5:[J] Justify or Center
F6:[L] Large Letters
F7:[V] Vertical Typing
F8:[W] Word Wrap Mode
F9:[X] Fill Block/Symbols
F10:[Z] Reformat Text

Ctrl F-Keys (File/Print)
F1:Save Current Form
F2:Quit Form/Organizer
F3:Get Another Form
F4:Start a New Form
F5:Switch Current Form
F6:Toggle Between Forms
F7:Print Current Form
F8:List Active Forms
F9:Rename Current Form
F10:Load ASCII File

Shift F-Keys (Blocking)
F1:Mark Row Block
F2:Mark Character Block
F3:Open Block (Insert)
F4:Close Block (Delete)
F5:Copy Block (Insert)
F6:Copy Block (Replace)
F7:Move Block (Insert)
F8:Move Block (Replace)
F9:Drag Block (Replace)
F10:Unblock (Unmark)

Ctrl Keys (Other)
F1:[Backsp] Delete Row
F2:[Enter] Insert Row
F3:[D] Quick DOS Shell
F4:[Q] Exit to Organizer
F5:[W] Word Erase/Replace

Advanced Alt Keys (Merge)
F1:[F] Easy Fill-Out Form
F2:[M] Master Form Merge

Alt F-Keys (Screen/Form)
F1:Change Options
F2:Change Paper Size
F3:Change Char./Inch
F4:Change Lines/Inch
F5:Change Tab Settings
F6:Special Forms Tabs
F7:Foreign Char. Sets
F8:Key-Pad Char. Sets
F9:Size current Window
F10:Toggle Stack Forms

Current Form: A:PT6BLEED [H] Help / Help Menu Replace Row: 1 Col: 1

Help Window ——— Page: 1

KEYS USED FOR COMMANDS ARE DISPLAYED AS:

WHEN A KEY NAME HAS [ ], THIS IS THE ACTUAL KEY THAT MUST BE PRESSED TO USE A SPECIFIC FUNCTION.

WHERE A YES OR NO SELECTION IS NEEDED, <Y/N> IS USED; PRESS [Y] FOR YES, OR [N] FOR NO.

MANY COMMANDS MUST HAVE 2 KEYS PRESSED, AS IN [ALT][H]. HOLD DOWN THE 1ST KEY, THEN PRESS THE 2ND.

AT MANY PROMPTS, MANY OPTIONS ARE AVAILABLE. THESE WILL BE INDICATED BY A NUMBER FOR EACH. PRESS THE NUMBER KEY (OR F-KEY) TO USE THAT FUNCTION.

AT MENUS, FUNCTION KEYS MAY BE USED TO SELECT A COMMAND AND ARE INDICATED BY THE "F" BEFORE THE COMMAND.

End of Help. [Esc]:Exit

Current Form: A:PT6BLEED [H] Help / Help Menu Replace Row: 1 Col: 1
Help Window Page: 1

FORMTOOL 2.01

TO BEGIN EDITING A FORM, 1ST SELECT A FORM FILE. DO THIS BY: 1 PRESS [ENTER] AT THE 1ST PROMPT, AND SELECT FROM A LIST OF FORMS; 2 USE THE ORGANIZER (PRESSING [F1] AT THE SAME PROMPT); OR 3 BY TYPING THE NAME OF THE FORM, THEN PRESSING [ENTER].

IF YOU DO NOT KNOW THE FORM NAMES, JUST PRESS [ENTER] AND A LIST OF ALL FORMS IS DISPLAYED. IF YOU WANT TO START OR CREATE A NEW FORM, TYPE IN ANY FORM NAME (BUT ONLY 8 LETTERS).

NOTE: SELECT PRINTER PRIOR TO USING ATTRIBUTES TO OBTAIN CORRECT LIST OF ALL ATTRIBUTES AVAILABLE FOR THAT PRINTER. ALSO AT ANY TIME, AT ANY COMMAND, PROMPT, MENU OR ERROR, HELP IS AVAILABLE BY PRESSING [ALT][H]

End of Help. [Esc]:Exit

Current Form: A:PT6BLEED [H] Help / Help Menu Replace Row: 1 Col: 1
Help Window Page: 1

THE FORMTOOL 2.0 DISPLAY.

THE DISPLAY IS DESIGNED TO PRESENT INFORMATION IN AN ORGANIZED WAY. THERE ARE 3 AREAS OF THE DISPLAY THAT SHOULD BE VIEWED FOR THE CURRENT ACTIVITY.

THE TOP ROW OF THE DISPLAY IS THE STATUS LINE. IT HAS INFORMATION ABOUT THE CURRENT FORM AND ACTIVE COMMAND. CURRENT FORM IS THE NAME OF THE FORM DISPLAYED FOR EDITING. THE CENTER AREA IS USED TO DISPLAY THE ACTIVE COMMAND. THE NEXT AREA IS THE INSERT/REPLACE INDICATOR. THE LAST AREA IS THE CURSOR POSITION INDICATOR IN ROWS AND COLUMNS.

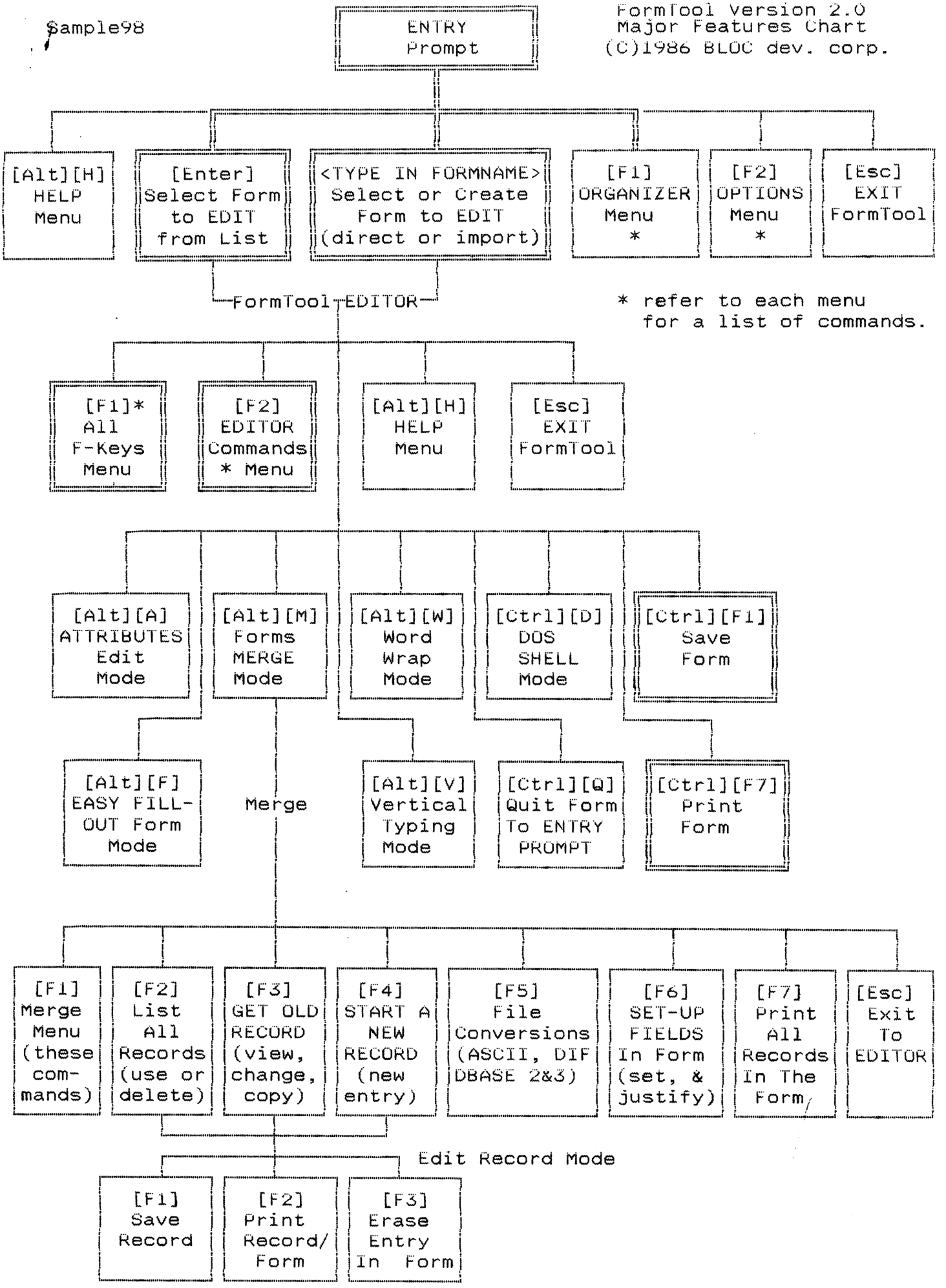
THE CENTRAL AREA OF THE SCREEN IS THE EDIT AREA, AND IS USED TO ACTUALLY CREATE THE FORMS. THE FORMS ARE ENCLOSED IN WINDOWS, AND HAVE RULERS ON THE TOP AND LEFT SIDES.

THE BOTTOM ROW OF THE DISPLAY IS THE PROMPT LINE. THIS DISPLAYS MESSAGES, ACCEPTS ENTERED INFORMATION, AND PROMPTS FOR MANY COMMANDS.

End of Help. [Esc]:Exit

Sample98

FormTool Version 2.0 Major Features Chart



Sample 97

FORMS DESIGN WISH LIST

We at BLOC Development Corporation would like to hear from you regarding any ideas you might have regarding FormTool, or forms design in general.

Please take a moment to complete the following items to give us your ideas and suggestions. Include your name, company name, and phone number. Then send this form to us at:

BLOC Development Corporation
Customer Support Department
1301 Dade Boulevard
Miami Beach, Florida, 33139

What did you really like about FormTool?

What did you not like?

How could we have done it better?

What does FormTool not do, that you would like to have included?

How do you use FormTool in your job or company?

PLEASE include samples of your forms!

What other software have you used to design forms?
What was good or bad about them?

Your Name:
Company:
Address:

City: State: Zip:
Phone:

Try Easy Fill-out with this form. Thank you for your comments.

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.              <DIR>        8-24-88    8:58a
..             <DIR>        8-24-88    8:58a
COMMENTS       <DIR>        6-14-89    1:50p
EDISK          <DIR>        2-08-89    9:36a
                 4008       1-16-90    8:38a
123       BAT      65       4-17-90    9:26a
D1                491       9-09-86    8:56p
D2               2623       4-28-87   10:49a
D3                  3       9-09-86    8:53p
D4                 41       9-09-86    9:04p
LOGO      000    9100       1-14-90   10:37p
LOGO      ALO    9100       1-14-90   10:37p
LOGO      AVL    1690       1-14-90   10:33p
AVIALLC   BAS  128653       6-07-89   11:22p
MAKECFIL  BAS    2973       8-24-86   10:28p
MAKESCRN  BAS   20584      10-20-86    3:15p
MKSCREN3  BAS   22960      10-21-86    3:15p
READCFIL  BAS    1334       8-20-86    1:10p
AUTOEXEC  BAT      11       4-28-87   11:57a
COMP      BAT      74      10-10-86   10:17a
COMPC     BAT     105       6-14-89    2:21p
DOC       BAT      54       4-28-87   10:36a
DOSSETUP  BAT      89       4-28-87    9:37a
Strike a key when ready . . .

Strike a key when ready . . .
START     BAT     112      12-10-86    7:04p
XTALK     BAT      48       2-23-90    4:10p
PTC18     COF    2615       2-01-89    8:16a
PTC20     COF    2647      10-20-86    6:57p
PTC28     COF    2631      10-20-86    6:57p
PTC30     COF    2631      10-20-86    6:57p
BASICA    COM   65278       8-25-84   10:00a
COMMAND   COM   23210       3-07-85    1:43p
GRAPHICS  COM    3111       3-07-85    1:43p
QUICKEYS  COM     272       7-18-86    1:00p
SUPERSPL  COM   11111       9-26-85    9:25a
225-C10   DAT     168      10-28-88    3:58p
BODY1     DAT     508       8-08-88    6:02a
C18       DAT     232       9-16-88   12:04a
C20       DAT     230       9-16-88   12:04a
C20B      DAT     352       9-16-88   12:04a
C20F      DAT     352       9-16-88   12:05a
C20J      DAT     352       9-16-88   12:05a
C20R1     DAT     236       9-16-88   12:05a
C20R2     DAT     236       9-16-88   12:05a
C28B      DAT     327       9-16-88   12:06a
C28C      DAT     328       9-16-88   12:04a
C30       DAT     379       9-16-88   12:06a
Strike a key when ready . . .
```

```
Strike a key when ready . . .
C30L       DAT        304    9-16-88   12:06a
C30P       DAT        304    9-16-88   12:06a
C30R       DAT        304    9-16-88   12:05a
C30S       DAT        324    9-16-88   12:06a
C30SE      DAT        256    1-22-90    1:00p
CFILE      DAT       2623    1-12-89    1:36p
ROTOR      DAT        943    8-08-88    6:02a
STABI      DAT        959    8-08-88    6:02a
AVIALL     EXE      73934    4-16-87    2:00p
AVIALLC    EXE      73975    1-22-90    4:57p
BASCOM     EXE      51328    4-04-86   12:00p
BASRUN20   EXE      64150    4-04-86   12:00p
DIRREAD    EXE      55479    1-22-90    4:58p
FOREDSK    EXE       5399    8-21-88   10:41p
LINK       EXE      38144    6-25-85    4:42p
MENU       EXE       4999    9-19-88    8:01p
PLOTSCR    EXE      63031    2-12-90   11:54a
RUNSHEET   EXE      54055    3-01-89    2:01p
UMACOM4B   EXE      17952    4-16-87    2:36p
ALARM      FIL       1209    1-22-91   11:24a
BULKDAT    FIL      20561    1-22-91    1:40p
CELLS      FIL        131    1-22-90   12:24p
AVIALL     SCN       4010    5-14-90    1:43p
Strike a key when ready . . .

Strike a key when ready . . .
FUELS      FIL        181    9-06-88    3:15p
HEADINGS   FIL        640    1-16-90    8:54a
LINENAME   FIL       1354    2-01-89    8:13a
MILS       FIL        141    9-06-88    3:15p
PRINTER    FIL          7   10-28-88    7:15a
SETUP      FIL        828   10-27-88   10:07a
T1         FIL         40    1-22-91   11:48a
TESTID     FIL        491   12-27-89    1:30p
TYPES      FIL        191    9-06-88    3:12p
UMACOMM    FIL          9    4-16-87    2:41p
DYNO       HLD        682   10-21-86   10:54a
BASCOM20   LIB     167424    4-04-86   12:00p
BASRUN20   LIB       6656    4-04-86   12:00p
HPGUESS    LOC         31    1-22-91    2:46p
FAST2      MAC       6095    9-17-86   11:01a
FAST3      MAC       6173   11-03-86    2:23p
DOSSUB     OBJ        267   10-15-84   12:00p
SETRAP     OBJ       2584    8-22-88   10:09p
DOC        P1        1383    4-28-87    2:09p
DOC        P2        1402    4-28-87    2:42p
COMMENTS   BAK       1332    6-12-89   11:17a
INPUTSUB   PAC      17150    9-22-86    5:27p
BASCOM20   PIF        369    6-25-85    4:42p
Strike a key when ready . . .
```

```
Strike a key when ready . . .
COMPC     SAV         83    9-11-86    1:58p
AVIALL    SCA       4008    1-16-90    8:27a
AVIALL    SCB       4008    1-16-90    8:32a
AVIALL    SCC       4008    1-16-90    8:33a
AVIALL    SCD       4008    1-16-90    8:33a
AVIALL    SCE       4008    1-16-90    8:34a
AVIALL    SCF       4008    1-16-90    8:34a
AVIALL    SCG       4008    1-16-90    8:35a
AVIALL    SCH       4008    1-16-90    8:35a
AVIALL    SCI       4008    1-16-90    8:36a
AVIALL    SCJ       4008    1-16-90    8:36a
AVIALL    SCK       4008    1-16-90    8:39a
AVIALL    SCL       4008    1-16-90    8:37a
AVIALL    SCM       4008    1-16-90    8:38a
AVIALL    BAK       4008    1-16-90    8:38a
AVIALL    SCQ       4008    1-16-90    8:39a
C18CHAN   SET       1552    4-05-89    9:37p
C30CHAN   SET       1555    4-06-90    9:53a
C20CHAN   SET       1554    4-06-90    9:54a
C28CHAN   SET       1555    4-06-90    9:54a
GAIN_OFF  BAK        412    5-30-90    7:19p
GAIN      MR         418    4-06-90    9:56a
CONFIG    SYS         41    4-28-87   10:18a
Strike a key when ready . . .

AVIALL    SCI       4008    1-16-90    8:36a
AVIALL    SCJ       4008    1-16-90    8:36a
AVIALL    SCK       4008    1-16-90    8:39a
AVIALL    SCL       4008    1-16-90    8:37a
AVIALL    SCM       4008    1-16-90    8:38a
AVIALL    BAK       4008    1-16-90    8:38a
AVIALL    SCQ       4008    1-16-90    8:39a
C18CHAN   SET       1552    4-05-89    9:37p
C30CHAN   SET       1555    4-06-90    9:53a
C20CHAN   SET       1554    4-06-90    9:54a
C28CHAN   SET       1555    4-06-90    9:54a
GAIN_OFF  BAK        412    5-30-90    7:19p
GAIN      MR         418    4-06-90    9:56a
CONFIG    SYS         41    4-28-87   10:18a
Strike a key when ready . . .
RUNSHEET  TMP      53127   10-26-88    7:51p
C30CHAN   BAK       1553    4-06-90    9:51a
C28CHAN   BAK       1553    4-06-90    9:52a
C20CHAN   BAK       1552    4-06-90    9:53a
GAIN_OFF  SET        422    5-30-90    7:24p
COMMENTS  PAC       1332   12-17-90    3:09p
DIRRUN    FIL       1122    1-22-91   11:48a
      122 File(s)  13430784 bytes free

C:\AVIALL5>
```

Air Logistics test cell installation software.

The installation program makes the required directories, writes the compressed files to disk and decompresses. The options available are: continuing with the program by pressing the ENTER key, ESCape to quit the Install program, F10 to run the NoUmac disk preparation procedure, or selecting the F1 key to read this text.

If this is a first time installation or installation after a reformat or replacement of the hard drive then press ENTER and type in the test cell serial number. Follow the directions for the remaining procedures.

Reinstalling certain segments of the engine test programs is also possible by running the Install program. For example from time to time certain files in the engine test program are updated due to calibration shifts in any one of the test cell transducers. These updates are usually performed during the 90 day calibration inspection. To reinstall the updated engine test programs, run the Install program again. When Install detects the existing directory a message will appear as such and ask whether to over write. Press the Y key. The same over writing options are available for updates to the power and SFC programs and the menu and associated programs directory.

The Power and SFC graph programs have not been updated since they were written for Aviall of Dallas.

Menu and related files were written exclusively for Air Logistics and contain the test cell menu as well as the programs and directories needed for engine testing with the UMAC data acquisition processor inoperative.

At one point during the installation procedure Install will notifiy you of changes about to be made to your start up files CONFIG.SYS and AUTOEXEC.BAT. In addition a file needed to start the test cell menu, MENU.BAT will be written to disk. If these files are already in the root directory, you have the options to rename, over write, or keep the existing file without renaming or over writing.

If the UMAC processor is inoperative or down for repairs, working disks can be prepared to run and monitor the engine without real time UMAC to computer data transfer. The F10 key is pressed to set up the disks, then select which engine model you wish to make a test disk for. Try to have a fresh formatted 5 1/4 inch floppy disk ready. However there is an option available to formatthe test floppy.

Within this section of the Install program the options list the C20 through C30SE engine data. Working disks can be prepared by running the Install program whenever conditions require these disks.

After installation is complete, the Install program will reboot the computer and the test cell menu will be run. On this menu in addition to the engine programs the Noumac program can be called up by pressing the % key. Prepared disks are required and, as stated above, must be prepared by the Install program.

At the date of this writing, the present test cell computer configuration is as follows:

PC Plus 80286-12 MHz, 1 Mb RAM, 130 MB hard disk drive, 5 1/4 inch floppy drive A:, 3 1/2 inch floppy drive B: and MS-DOS version 6.22.

HPD 01-29-1997

Customer Information

Name: Air Logistics Test Cell
Company Name: Air Logistics, Inc.
Address1: 4605 Industrial Drive
City/ST/Zip: New Iberia, LA 70560
Phone: 318-365-6771

Summary Information

Computer: Award/Award, 80286/80287
Memory: 640K, 384K Ext, 320K XMS
Video: VGA, Phoenix
Network: No Network
OS Version: MS-DOS Version 6.22
Mouse: Not Detected
Other Adapters:
Disk Drives: A: B: C:
LPT Ports: 1
COM Ports: 2
Windows Information: 3.00A, Not Active

Computer

Computer Name: Award
BIOS Manufacturer: Award
BIOS Version: eWK286 Modular BIOS Version 3.03HL Copyright Awar
eWK286 Modular BIOS Version 3.03HL Copyright Awar
BIOS Category: IBM PC/AT
BIOS ID Bytes: FC 01 00
BIOS Date: 10/20/87
Processor: 80286
Math Coprocessor: 80287
Keyboard: Enhanced
Bus Type: ISA/AT/Classic Bus
DMA Controller: Yes
Cascaded IRQ2: Yes
BIOS Data Segment: None

Memory

Legend: Available " " RAM "##" ROM "RR" Possibly Available ".."

EMS	Page Frame "PP"	Used UMBs "UU"	Free UMBs "FF"
1024K	FC00	RRRRRRRRRRRRRRRR	FFFF
	F800	RRRRRRRRRRRRRRRR	FBFF
	F400	RRRRRRRRRRRRRRRR	F7FF
960K	F000	RRRRRRRRRRRRRRRR	F3FF
	EC00	....	EFFF
	E800	....	EBFF
	E400	....	E7FF
896K	E000	....	E3FF
	DC00	....	DFFF
	D800	....	DBFF
	D400	....	D7FF
832K	D000	....	D3FF
	CC00	....	CFFF
	C800	....	CBFF
	C400	RRRRRRRR....	C7FF
768K	C000	RRRRRRRRRRRRRRRR	C3FF
	BC00	################	BFFF
	B800	################	BBFF
	B400	....	B7FF
704K	B000	....	B3FF
	AC00	....	AFFF
	A800	....	ABFF
	A400	....	A7FF
640K	A000	....	A3FF

Conventional Memory
Total: 640K
Available: 615K
629904 bytes

Extended Memory
Total: 384K

XMS Information
XMS Version: 3.00
Driver Version: 3.10
A20 Address Line: Enabled
High Memory Area: In use
Available: 320K
Largest Free Block: 320K

Video

Video Adapter Type: VGA
Manufacturer: Phoenix
Model:
Display Type: VGA Color
Video Mode: 3
Number of Columns: 80
Number of Rows: 25
Video BIOS Version:
Video BIOS Date: 07/25/91
VESA Support Installed: No
Secondary Adapter: None

OS Version

Operating System: MS-DOS 6.22
Internal Revision: 00
OEM Serial Number: FFH
User Serial Number: 000000H
OEM Version String: MS-DOS Version 6.22
DOS Located in: HMA
Boot Drive: C:
Path to Program: C:\DOS\MSD.EXE

Environment Strings

```
PROMPT=$P$G
COMSPEC=C:\COMMAND.COM
PATH=C:\;C:\DOS
```

Other Adapters

Game Adapter: Not Detected

Disk Drives

Drive	Type	Free Space	Total Size
A:	Floppy Drive, 5.25" 1.2M 80 Cylinders		
B:	Floppy Drive, 3.5" 1.44M 80 Cylinders		
C:	Fixed Disk, CMOS Type 9 1000 Cylinders, 15 Heads 512 Bytes/Sector, 17 Sectors/Track CMOS Fixed Disk Parameters 900 Cylinders, 15 Heads 17 Sectors/Track	60M	124M

LASTDRIVE=E:

LPT Ports

Port	Port Address	On Line	Paper Out	I/O Error	Time Out	Busy	ACK
LPT1:	0378H	Yes	No	No	No	No	No
LPT2:	-	-	-	-	-	-	-
LPT3:	-	-	-	-	-	-	-

COM Ports

	COM1:	COM2:	COM3:	COM4:
Port Address	03F8H	02F8H	N/A	N/A
Baud Rate	2400	2400		
Parity	None	None		
Data Bits	8	8		
Stop Bits	1	1		
Carrier Detect (CD)	Yes	No		
Ring Indicator (RI)	No	No		
Data Set Ready (DSR)	Yes	No		
Clear To Send (CTS)	No	No		
UART Chip Used	8250	8250		

IRQ Status

IRQ	Address	Description	Detected	Handled By
0	0391:003C	Timer Click	Yes	Default Handlers
1	0391:0045	Keyboard	Yes	Default Handlers
2	F000:EF6F	Second 8259A	Yes	BIOS
3	F000:EF6F	COM2: COM4:	COM2:	BIOS
4	F000:EF6F	COM1: COM3:	COM1:	BIOS
5	F000:EF6F	LPT2:	No	BIOS
6	0391:00B7	Floppy Disk	Yes	Default Handlers
7	0070:06F4	LPT1:	Yes	System Area
8	0391:0052	Real-Time Clock	Yes	Default Handlers
9	F000:ECF3	Redirected IRQ2	Yes	BIOS
10	F000:EF6F	(Reserved)		BIOS
11	F000:EF6F	(Reserved)		BIOS
12	F000:EF6F	(Reserved)		BIOS
13	F000:F070	Math Coprocessor	Yes	BIOS
14	0391:0117	Fixed Disk	Yes	Default Handlers
15	F000:EF6F	(Reserved)		BIOS

---------- C:\AUTOEXEC.BAT ----------

```
@ECHO OFF
LOADHIGH C:\DOS\PRINT /D:LPT1
TUNEUP.EXE
PATH C:\;C:\DOS
MENU
```

---------- C:\CONFIG.SYS ----------

```
DOS=HIGH
BUFFERS=25
FILES=49
DEVICE=C:\DOS\HIMEM.SYS
```

COMMERCIAL ENGINE BULLETIN

Detroit Diesel Allison
Indianapolis, Indiana 46206

December 12, 1975

ENGINE, NEW PART NUMBER BENDIX GOVERNOR ASSEMBLY FOR MULTI-ENGINE APPLICATIONS--INSTALL AND REIDENTIFY

PLANNING INFORMATION:

EFFECTIVITY: 250-C20B Engine Assemblies incorporating the new P/N 6891971 (Bendix P/N 2524667-2) Power Turbine Governors for Bolkow BO105C and D and Agusta A109A helicopters.

REASON: To provide 250-C20B engine reidentification instructions following installation of the new P/N 6891971 (Bendix P/N 2524667-2) Governor. The new governor is required on 250-C20B engines used in BO105C and D helicopters to increase load sharing stability between engines. The new governor is the same as the current 250-C20B P/N 6876568 (Bendix P/N 2524553-1) Governor except that the flyweights are mounted on ball bearings instead of pins. Ball bearing mounting significantly reduces the hysteresis in the governor flyweight system which results from varying degrees of wear on the flyweight mounting pins and in the flyweight pin holes. Also, a different governor spring is incorporated to provide a 3.8% governor slope setting (low gain) instead of the standard 3.0% governor slope setting. (Reference: CEB-1077).

DESCRIPTION: Model 250-C20B engines assemblies which incorporate new P/N 6891971 (Bendix P/N 2524667-2) Governors must be reidentified as P/N 6893660. Also, all other engine identification plate data must be transferred exactly to the new identification plate.

INTERCHANGEABILITY: P/N 6891971 (Bendix P/N 2524667-2) Governor Assemblies are authorized only for 250-C20B engine assemblies which power BO105C, BO105D and A109A helicopters.

The new P/N 6893660 Engine Assembly differs from the currently-released P/N 6887190 C20B Engine Assembly only in that it incorporates the new P/N 6891971 Governor in lieu of P/N 6876568 Governor.

Revision No. 1
June 24, 1976

COMMERCIAL ENGINE BULLETIN

ENGINE, NEW PART NUMBER BENDIX GOVERNOR ASSEMBLY FOR MULTI-ENGINE APPLICATIONS—INSTALL AND REIDENTIFY

COMPLIANCE: *It is recommended that the engine assembly be reidentified as P/N 6893660 following installation of P/N 6891971 (Bendix P/N 2524667-2) Governor Assembly.*

APPROVAL: FAA-DER approved.

MAN POWER: No appreciable time will be required to reidentify the engine assembly following governor installation.

MATERIAL AVAILABILITY:

Part No.	Nomenclature	Qty.
6891971* (Bendix 2524667-2)	Governor Assy, Power Turbine	1
6889365	Plate, Identification, Blank, Engine	1
MS35206-241	Screw	2
MS122054	Washer	2

*P/N 6876568 (Bendix P/N 2524553-1) Governors are reworked to P/N 6891971 (Bendix P/N 2524667-2) per 250-C20B CEB-1077.

TOOLING: None

WEIGHT AND BALANCE: Not affected.

REFERENCES: 250-C20B CEB-1077
CW-1526A

Revision No. 1
June 24, 1976
Published December 12, 197

COMMERCIAL ENGINE BULLETIN

ENGINE, NEW PART NUMBER BENDIX GOVER NOR ASSEMBLY FOR MULTI-ENGINE APPLICATIONS—INSTALL AND REIDENTIFY

ACCOMPLISHMENT INSTRUCTIONS:

I. Following installation of P/N 6891971 Governor Assembly on 250-C20B engine assembly, reidentify the engine assembly as follows:

A. Obtain a new P/N 6889365 Engine Identification Plate (Blank).

B. Identify Bendix-controlled engine assembly as P/N 6893660, the engine model as 250-C20B, T. C. No. as E4CE, and P. C. No. as 310. Transfer the exact engine serial number from the old plate. Information may be metal stamped vibro-peened or scribed.

C. Install new identification plate, using two MS122054 Washers and MS35206-241 Screws.

II. Record compliance with 250-C20B CEB-1081 in the Engine Assembly (white pages), Modification Record Part III of the Engine Log Book.

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Published December 12, 1975

COMMERCIAL ENGINE BULLETIN

ENGINE, NEW PART NUMBER BENDIX GOVERNOR ASSEMBLY FOR MULTI-ENGINE APPLICATIONS—INSTALL AND REIDENTIFY

MATERIAL INFORMATION:

New P/N	Qty.	Nomenclature	Old P/N	Qty.	Disposition
6893660	1	Engine Assy, Aircraft Turboshaft—Bendix	6887190	1	A
6891971 (Bendix 2524667-2)	1	Governor Assy, Power Turbine	6876568 (Bendix 2524553-1)	1	B
6889365	1	Plate, Identification, Engine, Blank	6889365	1	C
MS35206-241	2	Screw	MS35206-241	2	C
MS122054	2	Washer	MS122054	2	C

STOCK DISPOSITION NOTES:

A. Reidentify.

B. Rework per 250-C20B CEB-1077.

C. Scrap removed part only.

L. O. Davidson, Service Manager
Gas Turbine Engines

MJK/aw

Revision No. 1
June 24, 1976
Published December 12, 1975