

George Staples Ltd.

Microsell/QX10 Link

Operating & System Manual

INTRODUCTION

At a preselected time (when you are snugly tucked up in bed), the Epson QX10 micro-computer at Head Office will control a sequence of telephone calls to each branch of George Staples Ltd. as determined by the Calling Schedule.

When each call is answered by the branch's Microsell 8000 Till Controller an exchange of data takes place: the previous day's sales etc. at the branch are recorded in the QX10 and price changes etc. from Head Office are recorded in the Till Controller.

A strict protocol is observed to ensure to high confidence that the exchanged data is accurately and completely recorded without duplication, reasonable attempts being made to overcome any communication problems encountered. Events considered significant are logged on the Epson's printer and on individual Till Rolls.

So that the main "Molecular" computer is not required to operate overnight, all data is buffered on the QX10's Floppy Diskettes. A "Molecular" program run each evening stores the relevant price changes etc. on diskette. Another "Molecular" program run each morning retrieves and processes the overnight data from the Tills.

During the remainder of the working day the QX10 may be used as an additional VDU terminal on the "Molecular" system (or as a stand-alone micro-computer). The facility is included to print shelf edge labels (one set for each branch) automatically from the updates passed through the QX10.

No specialist computer knowledge is required to operate the system. Non-routine changes (VAT rates, Calling Schedule, etc.) may be set up with a rudimentary knowledge of "BASIC".

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Startup.

The Staples System is started by switching on the QX10 (with printer & modem) with the "Software Diskette" in the left hand drive (Drive A) and the "Spool Diskette" in the right hand drive (Drive B). If the QX10 is already switched on, press the unmarked RESET button about two inches directly below the letter "B" of Drive B.

The "Basic Diskette" is not normally required on-line; it should be kept in a secure place safe from dust, sunlight and other hazards.

The system assumes the printer is on-line and loaded with paper at all times. Make sure that the paper flow is not obstructed by cables etc.

After a few seconds the system identifies itself at the top of the display screen and shows the date and time from the QX10's internal clock and the time at which the alarm is due (i.e. when the QX10 is due to call the branches).

The QX10 keyboard and screen may now be used as an additional terminal to the Molecular system. As the QX10 screen has 25 lines, the top line is used by the system as a Status Line and is not strictly part of the Molecular terminal display area although some Molecular programs may acquire 25 lines by shunting the Status Line off the top of the screen.

Keyboard Layout.

All the customary Molecular terminal keys have equivalents on the QX10 as follows:

QX10 Key:	Molecular Key:
[Bent LEFT ARROW]	[ENTER+] or [YES]
[DOWN ARROW]	[ENTER+] or [YES]
[UP ARROW]	[ENTER-] or [NO]
[ESC]	[ESCAPE]
[BS]	[Back Space]
[LEFT ARROW]	[Back Space]
[LF]	[New Line] (within Name & Address fields)
[TAB]	[COMMAND MODE]
[DEL]	[ERROR Acknowledge] (Programmers' Key)
[RIGHT ARROW]	[Forward Step] (Programmers' Key)
[HOME]	[LITERAL MODE] (Programmers' Key)

The extra “programmable” keys on the top row of the keyboard have been labelled with your most frequently called program names, to save a little typing effort. In addition:

[**SCRN DUMP**] Prints a hard copy of the current screen contents.

[**PAUSE**] or

[**OPTION**] Interrupts the Staples System to enable the operator to request a special function. The cursor moves into the status line (at top of screen), alongside the prompt “**Option:**”. A single option character, as described below, may now be entered (press [**ESC**] if no action is required).

A Alarm. Triggers the Automatic Call Controller immediately regardless of and without affecting the preset alarm time.

F Prints the current Calling Schedule and the contents of each Till Update File **TILLx.DAT** in reverse chronological sequence.

L List Spooled Data. Produces a formatted report on the Epson’s printer of all data received overnight from the Microsell Tills which has not yet been passed to the Molecular.

M Obtain Microsell Software Update. Instructs the modem to call the number against Branch “00” in **TILLSYS.DAT**. By prior arrangement with Microsell this number will be answered automatically and software updates sent to the QX10. If the call is successful the updates are saved in the Till Update File **TILLx.DAT** on drive A, where “**x**” is the next unused letter in the Update File series.

R Recover Spooled Data. Enables the Till data already processed by the Molecular but still recorded on the Spool Diskette to be passed again to the Molecular. (Normal system operation ensures that data is not inadvertently processed more than once by the Molecular; this option may be needed when the Molecular system has been recovered from security.)

S Shelf-Edge Label Print. Prints a label for each product change or addition in the most recent Till Update file (**TILLx.DAT**). One complete set is produced for each branch. Line up the stationery so that the print head is three lines above the first print line.

X Exit. Terminates the Staples System and reverts the QX10 to its CP/M Command Level (the prompt “**A>**” appears on the screen). The QX10 is now a stand-alone micro-computer with the Molecular and telephone channels closed. Consequently this action should only normally be taken when the screen is at the Molecular “**PROGRAM?**” prompt.

Y Shutdown Serial Printer and Exit.

Note: The QX10 may be used as a Molecular terminal whilst option **A F L M** or **S** is in progress.

[**SF1**] Trace. If pressed (so that it lights up), the screen will display data being transferred through the modem and to/from the Molecular in “electronic” mode.

[**SF2**] If pressed (so that it lights up), the Automatic Call Controller will instruct the Tills not to log on the Till Roll the file updates contained in the files **TILLx.DAT**.

[**SF3**] If pressed (so that it lights up), the Automatic Call Controller will instruct the Tills to print the Profit Analysis on the Till Roll.

Electronic Mode.

Three programs have been defined on the Molecular system which, when called at the QX10 by operator response to the “PROGRAM?” prompt, switch the QX10 into “Electronic” mode: the QX10 will disable its keyboard (all keystrokes are “beeped”) and load and execute its own corresponding program. The QX10 and Molecular exchange data automatically. When data transfer is complete the QX10 reverts to normal “Terminal” mode and redisplay the Molecular “PROGRAM?” prompt.

The three programs are separately described below. Note: should you inadvertently call any of these programs from a Molecular terminal other than the QX10 you should press [ESCAPE] immediately!

AM – The Morning Program.

This Molecular program obtains from the QX10 and processes all data received (if any) from the Branch Tills since its last run. No operator attention is required.

Usually AM will be run first thing in the morning to process the data collected overnight by the QX10’s Automatic Call Controller, but it may be run whenever there is data to be processed.

PM – The Evening Program.

This Molecular program scans the Molecular Product File for all new products, price changes etc. loaded onto the Molecular system since its last run.

The details are passed to the QX10 which, after first “cleaning up” Drive A by deleting all TILLx.DAT files which have been sent to all branches and renaming those files remaining to commence at TILLA.DAT, stores the details on Drive A in the Till Update File TILLx.DAT, where “x” is the next unused letter in the Update File series.

TILL – The Direct Connection.

This Molecular program instructs the QX10 to call a specific branch. Any update records which the Molecular program then passes to the QX10 will be passed directly to the Till. The QX10 will make only one dial attempt; if this is not successful the QX10 reverts to Terminal mode and the operator may try again.

Note that the Till must be in its end-of-day function displaying “Waiting for Call”, otherwise it will not answer the phone. The session will begin in the usual way with the Till sending whatever transactions are outstanding; the QX10 adds this data to the spool diskette (provided the call is successful) so that it will be passed to the Molecular by program AM in the normal way.

System Utilities.

The QX10 Software Diskette in Drive A contains a number of stand-alone QX10 programs as described below. To run any of these programs you must first exit to the QX10 native system (CP/M) command level: check you are at the Molecular "PROGRAM?" prompt, press [OPTION] followed by the character "x". This takes you to the native system prompt "A>". To call the program, type its name followed (where relevant) by any options (each option preceded by at least one space) then press the bent left arrow key (known as the [RETURN] key in the CP/M system). Please refer to the QX10 Operation Manual for further information on the CP/M system.

- ALARM** Type **ALARM hhmmss** and press [RETURN] to reset the QX10's internal alarm, where **hh**, **mm** and **ss** are the hour (00 to 23), minute and second at which the Automatic Call Controller is to be triggered. You may omit "ss" (and even "mm") if the value zero may be assumed. Once set, the alarm occurs daily when the QX10 clock coincides with the alarm time (provided the QX10 is on). The current alarm time is displayed on the screen when starting the system.
- TIME** Type **TIME hhmmss** and press [RETURN] to reset the QX10's internal clock, where **hh**, **mm** and **ss** are the present hour (0 to 23), minute and second. You may omit "ss" (and even "mm") if the value zero may be assumed.
- DISKCOPY** Use the "F" option of this program to make at least one copy of the Software Diskette as security in the event of the diskette being damaged. See QX10 Operation Manual page 1 for a full explanation of **DISKCOPY**.
- FORMAT** All diskettes not previously used on a QX10 system must be overwritten with the correct format prior to use on the QX10. Use this utility prior to labelling your Spool Diskette with the "DLU" utility (see below). See QX10 Operation Manual page 5.61 for a full explanation of **FORMAT**.
- GO** Restarts the Staples System (quicker than pressing the **RESET** button).
- PFKSET** Assigns character strings to the ten "Programmable Function" keys at the top of the QX10 keyboard. Please refer to the QX10 Operation Manual page 5.65 for a description of **PFKSET**. Use the **PFKSET /L** format to change the key assignments.
- STAT** Indicates how much unused space is available on a floppy diskette. See QX10 Operation Manual page 5.34 for a description of **STAT**. Please note that this utility will not give the unused space on the Spool Diskette because the software does not write this diskette under CP/M conventions.
- DLU** Labels a formatted diskette as the Spool Diskette. Place the diskette in Drive B, type **DLU N** and press [RETURN]. This writes a "label" sector onto Drive B indicating that the diskette is a new (empty) Spool Diskette.
- It is also possible, when a Molecular recovery has taken place, to recover Till data still recorded on an existing Spool Diskette but previously passed to the Molecular. Under normal circumstances the Spool Diskette holds the data collected from one overnight session until it is overwritten the next night. Information held in the label ensures program AM processes the data once and only once, but by typing **DLU R** and pressing [RETURN] the label (if such is found in Drive B) is rewritten so that AM may reprocess all the available Till data. Alternatively type **DLU R=tt.ss** and press [RETURN] so that AM will start reprocessing at Track **tt** Sector **ss** (decimal). It is your responsibility to ensure that **tt.ss** is a valid start of call as printed on the relevant System Log (you cannot reprocess from within a call).

The Basic Diskette.

The Basic Diskette holds the QX10's Basic Language interpreter program MFBASIC and a number of simple MFBASIC programs each of which generates (on the Software Diskette) a data file for subsequent use by the Staples System. See the QX10 Basic Manual for a full description of the MFBASIC language.

The MFBASIC program "SCHEDULE" generates the Calling Schedule file "SCHEDULE.DAT":

```
10 DEFSTR A-E : DEFINT F-Z : SAVE "SCHEDULE"
20 SUN=1 : MON=2 : TUE=4 : WED=8 : THU=16 : FRI=32 : SAT=64
30 HOL=FRI+SAT : TRY=3
40 DATA b1,b2,....bn
50 OPEN"O",#2,"A:SCHEDULE.DAT" : ON ERROR GOTO 70
60 READ M : PRINT#2,RIGHT$(STR$(M),2);CHR$(127-HOL);CHR$(TRY); : GOTO 60
70 IF ERR <> 4 THEN ON ERROR GOTO 0
80 PRINT#2,CHR$(0); : CLOSE : SYSTEM
```

The **DATA** statement in line 40 is the list of branch numbers to be called in the sequence of calling. Care must be exercised to ensure no branch appears twice. The variable "HOL" set in line 30 here prevents calls on Fridays and Saturdays, whilst "TRY" here sets a limit of 3 dial attempts per branch per session.

The program generates a four byte record per branch: Branch Number, Calling Day Mask and Calling Attempt Counter. A null byte indicates the end of the schedule.

The MFBASIC program "TILLSYS" generates the Till System Control File "TILLSYS.DAT". This file contains dynamic information about the Till Update files **TILLx.DAT** as well as the static information defined in the **TILLSYS** program. It is recommended that **TILLSYS.DAT** be modified only when there are no **TILLx.DAT** files outstanding to any branch (otherwise you must take care to preserve the dynamic information).

The layout of the single **TILLSYS.DAT** record is:

BYTES	NAME	DESCRIPTION
1	TILLX	Number of active files TILLx.DAT now on the Software Diskette (binary)
1	SHELF	Number of print runs per Shelf-Edge Label Print session (binary)
2	IPASS	Seconds delay between ACC passes (binary, low byte comes first!)
2	ICALL	Seconds delay between ACC calls (binary, low byte comes first!)

Then for each Branch:

2	BR	Branch Number (ASCII Zero-filled)
1	TILLN	Number of active files TILLx.DAT already sent (binary)
var	DIAL	Telephone Number (ASCII terminated by NUL byte)
var	DESCR	Branch Name/Location (ASCII terminated by NUL byte)

```
1 CHR$(0) A NUL byte follows the last Branch
1 N Number of entries in the Microsell Id Table
```

Then N one-byte entries giving:

```
1 ID Microsell Transaction Element Id (BCD 2 digits)
```

Then N one-byte entries giving:

```
1 LN Microsell Transaction Element Length
(binary Byte Count excluding Id and Element Separator)
B7 set if QX10 is to insert Branch No into Element
```

Further MFBASIC programs may be prepared to generate on Drive A the “global” Special Update File **TILLFM.DAT** or the Single Branch Special Update File **TILLnn.DAT** (where “nn” is the Branch Number).

These files contain variable length records (as defined by the Microsell specification) each preceded by two control bytes. The first control byte must contain in binary the record length (excluding control bytes). A binary zero length indicates “end of file” and must be present after the last record. The second control byte (usually set to binary 00000001) contains flags indicating how the record is to be transmitted:

B7: ETX (not ETB) (masked out by the ACC: ETB will be sent)
B6: EOT (no data sent if ETB) (masked out by the ACC: EOT will not be sent)
B5: SOH (not STX)
B0: Transparent Mode (record may contain ASCII control codes)

To run an MFBASIC program proceed as follows:

1. Remove the Spool Diskette and insert the Basic Diskette into Drive B.
2. Exit the Staples System by typing **[OPTION] X**.
3. When the “**A>**” prompt appears type the two characters “**B:**” and press the **[RETURN]** key (bent left arrow).
4. When the “**B>**” prompt appears type **MFBASIC** and press **[RETURN]**.
5. When the MFBASIC prompt “**OK**” appears, type **LOAD"pgmname"** and press **[RETURN]**, where **pgmname** is the relevant program name (eg. **SCHEDULE** or **TILLSYS**).
6. **LIST** the program by typing **LIST** and press **[RETURN]**.
7. Edit the program as necessary, then **LIST** the program again to check the changes were done correctly.
8. Type **RUN** and press **[RETURN]**. The new version of the “**.DAT**” file replaces that previously on the Software Diskette in Drive A, and the modified “**.BAS**” program file replaces that previously on the Basic Diskette. The cursor comes to rest alongside the “**B>**” prompt.
9. Remove the Basic Diskette and reinsert the Spool Diskette in Drive B. Press the **QX10 RESET** button to restart the Staples System.

The Automatic Call Controller.

The ACC lies dormant until triggered by the Alarm or by the “**A**” Option. When it is assured exclusive access to the modem, printer and disc drives the ACC loads the Calling Schedule “**SCHEDULE.DAT**” into memory.

The ACC selects branches to call in turn from the schedule. At the end of the first pass if there were any failures another pass will be made, redialling the failed calls, and so on until all branches have been successfully called or the attempt counters exhausted. The ACC pauses 10 seconds between calls until there is only one Branch remaining, whereupon the pause is extended to 120 seconds.

When the ACC launches a call onto the public telephone network it spawns two sub-tasks: the Communicator and the Collector. The Communicator dials the call and controls data transfer with the Till using ASCII code at 1200 Baud Async (V23 Half Duplex). The Collector “spools” the data from the Till onto Drive B and reports to the System Log. The ACC assembles the Till Updates from the software diskette for despatch to the Till:

1. If key [**SF2**] is lit: an “**OF**” record to turn the Till Log off.
2. The contents of **TILLx.DAT** if any, where “**x**” is the oldest Update File on Drive A not yet sent to this branch.
3. (2) above is repeated for the next oldest Update File on Drive A until all Update Files have been sent.
4. An “**ON**” record to turn the Till Log on.
5. If key [**SF3**] is lit: an “**AN**” record to run the Profit Analysis report.
6. The contents of **TILLFM.DAT** if any.
7. The contents of **TILLnn.DAT** if any, where “**nn**” is the Branch Number designated in the Calling Schedule.
8. If the Collector has spooled all the data from the Till: a “**⌘6**” record to signify “Call Successful” to the Till.

The Collector will terminate the call without spooling if it detects a Block Sequence Error or a Transaction Element Syntax Error in the Till data.

Following a successful data exchange, the Collector will listen for further data (e.g. Software down-loads) from the Till. If received, this data is dumped onto the Software Diskette as file **BRANCHnn.DAT** where “**nn**” is the Branch Number designated in the Calling Schedule. If a failure occurs during this phase this does not invalidate the earlier data exchange and no further attempt will be made to call the branch during this session.

The total data collected in a single ACC session cannot exceed the capacity of the spool diskette. The System Log gives, for each successful call, the position at which the collected data begins, in the form “**R=track.sector**”. There are 40 tracks each of 64 sectors on the diskette (numbered **00.00** to **39.63**).

Provided program “**AM**” has processed all previous data, the Collector has the full capacity of the spool diskette available to it, otherwise new data will be added to the current spool extent. If it has not been possible to run program “**AM**” and there is a risk of spool overflow at the next session, a new (empty) spool diskette may be substituted in drive B.

The Molecular “Electronic Interface”

Ordinarily the QX10 is just another I/O station on the Molecular system (for correct cursor control it is configured as device type “v16”). The Electronic Interface enables a Molecular I/O Station program to communicate with its counterpart on the QX10. Data is exchanged alternately in variable length records (as specified separately for each application). By convention, the Molecular sends the first record.

Activation.

The Molecular program activates the interface by calling the “Initialize Electronic Interface” subroutine:

```
JSBR IZ 1670    FETCH & LINK Overlay
P1=002002
P2=Address of Module Number
```

Upon return to the step following **P2** the Electronic Interface is active. The absolute address of the Electronic OUTPUT routine is installed at step 0000- and the absolute address of the Electronic INPUT routine is installed at step 0001- within the calling task partition.

Under the present implementation **P2** identifies a specially provided two-sector overlay loaded at step 2000- within the Task Partition. Whilst the Electronic Interface is active the program must not modify steps 2000- to 2377- inclusive, and must not use the Operating System **GET** subroutine. The data transferred may comprise printable characters only (the system frames the records using **[STX]** and **[ETX]** codes). Data sent to the QX10 by the Operating System **PUT** subroutine is displayed on the screen at the current cursor position.

The Electronic Interface remains active until ASCII code **[ESC]** is received from the QX10 or (abnormally) until the Molecular Task is restarted at the default address (after halting!).

Output.

```
JSBR I 0000
P1=Byte Address of String
```

The string is transmitted to the QX10. A NUL byte indicates end-of-string.

Input.

```
JSBR I 0001
```

The subroutine returns to the step following **JSBR** if ASCII control code **[ESC]** **[FS]** **[GS]** **[RS]** or **[US]** was received before a complete record. In this event the bottom byte of the A register contains the received control code (the top byte will be **NUL**). If the control code was **[ESC]** the Electronic Interface *is now closed*.

The subroutine skips the step following **JSBR** if a complete record was received. In this event the data is available in the Task Input Buffer at 3600- (terminated by a **NUL** byte) and the number of data characters received is placed both at 00/0045 and in the **A** register.

Electronic Interface for Program AM.

1. The Molecular outputs the run parameters. Currently no parameters are defined, so this may be a null string.
2. EITHER the QX10 sends the next Microsell data element from the spool diskette (see Microsell specification for details),
OR the QX10 sends ASCII code [US] (037 octal) if a Microsell transaction separator occurs next,
OR the QX10 sends ASCII code [ESC] (033 octal) if there is no further data on the spool diskette (program terminates).
3. The Molecular outputs a null string, indicating it is ready for the next input at step 2 above.

If the QX10 has to be reset for any reason (e.g. Molecular halt), the next run of program AM will recommence unspooling at the beginning of the call which was being processed at the time the reset occurred.

Electronic Interface for Program PM.

1. The Molecular outputs the run parameters. Currently no parameters are defined, so this may be a null string.
2. EITHER the QX10 sends ASCII code [GS] (035 octal), indicating it is ready for the next Molecular output.
OR the QX10 sends ASCII code [ESC] (033 octal), indicating it cannot accept further Molecular output (e.g. software diskette is full) (QX10 discards all Molecular output and program terminates).
3. EITHER the Molecular outputs the next Till Update record (program goes to step 2 above),
OR the Molecular outputs a null string, indicating there are no further Till Update records (QX10 replies with ASCII code [ESC] and program terminates).

Electronic Interface for Program TILL.

1. The Molecular outputs the run parameters. Currently these are Branch Number (2 characters) followed by Telephone Number to be dialled (the telephone number is not necessary if the Till is to be locally connected with the Modem Bypass cable).
2. The program now functions as per program PM (step 2) above.

The QX10 Communicator has extensive memory buffers in which Molecular output is held prior to transmission. In some circumstances program TILL may have terminated even before dialling has been completed. The operator must check with the system log that the call was indeed successfully completed.

Power Failure.

The QX10 clock and the preset alarm time are not affected by loss of power. If the power is off at the alarm time the Automatic Call Controller will not be triggered should power be restored later.

The QX10 will automatically “reboot” itself when power is restored. The [**SFn**] keys will go to the **OFF** state. If the diskettes have not been changed the Staples System restarts in Molecular Terminal mode.

If program AM, PM or TILL was active you should press the [**ESCAPE**] key so that the Molecular program will recognise that the QX10 program has been cancelled. No data transferred by TILL or by PM will be retained by the QX10, therefore these programs must be rerun. Program AM will restart unspooling from the beginning of the telephone call it was processing (this could result in duplicate processing by the Molecular).

If the Automatic Call Controller was active, completed calls are retained on the Spool diskette and the current call is disconnected, ensuring that the Till will retain the data until next called.

Installation.

The Molecular cable is connected to the built-in Serial Port marked **RS232C**.

The Modem cable is connected to the auxiliary Serial Port installed in any Option Slot 1-4.

The Modem Bypass cable may be used to connect a local Till directly to the QX10 auxiliary Serial Port.

The eight DIP switches near the Monitor cable socket should all be in the UP position except:

- SW2** DOWN if Molecular Task is configured **v24** (not **v16**).
- SW3** DOWN if Molecular link is 4800 Baud (not 9600 Baud).
- SW7** DOWN if Microline (not Epson) connected to **PRINTER** port.

The Modem may remain on power at all times. Under the current implementation the software never instructs the Modem to answer the phone.

And finally:

Before leaving the office in the evening please ensure:

1. The QX10 is on power, at the Molecular “**PROGRAM?**” prompt with the alarm time and clock correctly set and loaded with the software diskette in Drive A, spool diskette in Drive B.
2. The printer is on power, selected, loaded with sufficient paper and the paper flow is not obstructed.
3. The modem is on power, can obtain dial tone and is connected to the QX10.

Addendum (21 May 1986)

1. The option to use a Serial printer through the auxiliary port "COM4:" is provided. Print data format is 9600 baud 8 data bits no parity 1 stop bit with hardware handshake using pins 11 or 20 (DTR). When the system is started, the program senses the parallel printer port: printout goes to COM4 if and only if the parallel cable is unplugged (either end) at start-up.
2. The system outputs Epson printer control codes only (i.e. QX10 SW7 setting is ignored). Shelf Edge labels (Option "s") cannot be printed through the parallel port. (If you ever need to reconnect the Microline you should use the old software diskette and take care to "PIF" over all files "* .DAT").
3. Option "Y". This new option shuts down the system and returns you to CP/M just like option "X", but sends an additional command to the printer's Serial Interface ordering the printer to switch in its parallel port and to disregard its serial port. The parallel cable must not be plugged in until *after* you have done option "Y"! The printer switches back to its serial port when powered off/on but you must always unplug the parallel cable *before* you switch the printer on! So if you do go messing with the cable please take care to put it back to normal when you've finished. It may be easier, when in MFBASIC, to output listings etc. through COM4, e.g.

```
LIST "COM4:(E8N19)"
```

4. The SCHEDULE.DAT file format has the added option (by adding 128 to the "calling day mask" byte) to instruct the Automatic Call Controller to retry a failed call next (until the attempt counter is exhausted) rather than cycle through the remaining schedule first. This enables you to control the sequence in which data will be despoiled by program "AM".
5. The ACC will summarise, at the foot of the log for each session, any branches scheduled for that session with which it failed to communicate successfully. Option "A" has been extensively revamped to reduce the need to enter MFBASIC to make temporary modifications to the schedule when communications problems occur.
6. The keyboard [INS] light is ON when the system is in "Electronic" mode, i.e. when program AM, PM or TILL is running. This indicates that the keyboard is not available as a Molecular terminal (keystrokes will be beeped).