ADDENDUM 1: REMOTE OPERATION OF THE UNIDEX 21 VIA A HOST CONTROLLER

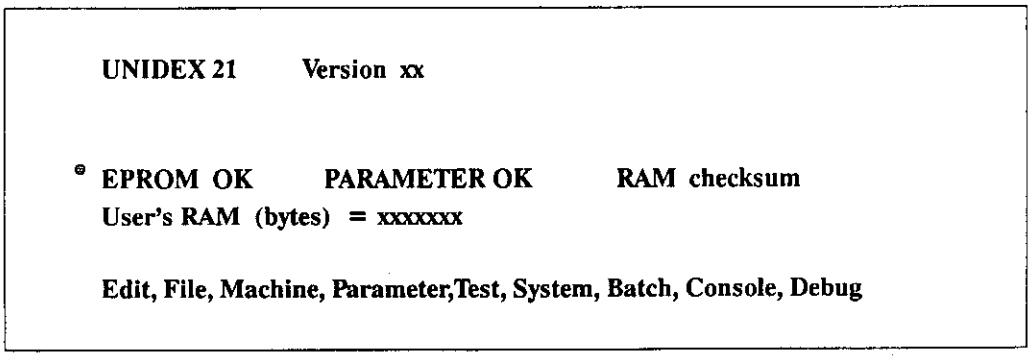
All Models of the Unidex 21 Controller may be remotely operated by a Host Controller. The communication interface between the Host Controller and the Unidex 21 is the Unidex 21's RS-232 Port A, hence, any Controller capable of RS- 232 interface may be used.

SECTION 1A-1: INITIALIZATION

Prior to the initial operation of a Unidex 21 through a Host Controller, the Unidex 21 must be configured for Remote Control. This may be accomplished in three ways:

1A-1-1: PARAMETER SETTING

Following Power-Up, the initial selection screen is displayed:



Press the "P" key to enter the Parameter mode.

The following screen will be displayed:

```
 0 : System password                    1 : Skip auto-boot function ?
 2 : IDX buffer 1 block only ?          3 : IDX seg. calculate base (1/2/3)
 4 : COMM input feedback ?              5 : System default at metric ?
 6 : RS232 protocol port-A              7 : Additional RAM in 1024 bytes
 8 : RS232 protocol port-B              9 : Debug display is at front panel ?
10 : RS232/IEEE488 time out (sec)      11 : Parts program stack size in bytes
12 : Edit block buffer (1 to 40)       13 : Edit default Char-insert ?
14 : Edit default Line-insert ?        15 : Edit TAB space
16 : End of all file code CHR$(n)      17 : End of file code CHR$(n)
18 : Beeper duration (1 to 280) ms     19 : Double side floppy disk ?
20 : Beeper frequency  (2 to 20K)      21 : Display blank-out (minutes)
22 : MFO inc./step (-100 to 100)       23 : Tracking display program step ?
24 : Y pixel size reduce to (%)        25 : Print screen to port-A ?
26 : Joystick axis pair                27 : Digitize with joystick ?

200 : NEXT PAGE                        201 : Axes auto-tune

300 : Load/save parameter              301 : Front panel function keys
401 : 1st axis    402 : 2nd axis       403 : 3rd axis    404 : 4th axis
405 : 5th axis    406 : 6th axis       407 : 7th axis    408 : 8th axis

ctrl-Quit, number <cr> to each parameter =
```

Enter "200" to go to the Next Page.

The display will be:

```
28 : Input 1 is 0-CW/CCW, 1-CLK/DIR, 2-QUAD x 1, 3-QUAD x 2
29 : Input 2 is 0-CW/CCW, 1-CLK/DIR, 2-QUAD x 1, 3 -QUAD x 2
30 : Axis ramp time (1-32767) ms        31 : Power on remote control 0/1/2/3/4
32 : M strobe delay (0-65535) ms        33 : M ack delay to 65535 ms, 0 no
34 : S strobe delay (0-65535) ms        35 : S ack delay to 65535 ms, 0 no
36 : T strobe delay to (0-65535)        37 : T ack delay to 65535 ms, 0 no
38 : Quick stop Hi-Lo trigger ?         39 : Quick stop at trigger point ?
40 : IDX does checksum ?                41 : GANTRY (msmsmsms) m,s = 1,8
42 : Input 1 handwheel scale 0-254      43 : Input 2 handwheel scale 0-254
44 : Roll over max # 99999999           45 : H-V pairs (hvhvhvhv)h,v=1,8
46 : 1 perpendicular error arc sec      47 : 2 perpendicular error arc sec
48 : 3 perpendicular error arc sec      49 : 4 perpendicular error arc sec
50 : Reset MALC memory 0/1/2            51 : Default at Front Panel Interface?
52 : SYNC code 0?                       53 : IEEE488 Setup
54 : Keep position during reset?        55 : MFO adjust Handwheel scale?
56 : Axis trap negate Output (0-8)      57 :
58 :                                    59 :

200 : PREVIOUS PAGE
> Ctrl-Quit, number <cr> to each parameter =
```

Enter "31" to change the Unidex 21's Remote Control status.

Enter a "0" for no Remote Control.

Enter a "1" for the Unidex 21 to be under RS-232 Remote Control following a Power Up or Reset. The Unidex 21 display is not active and will not be updated during Remote operation.

Enter a "2" for the Unidex 21 to be underRS-232 Remote Control following a Power Up or Reset. The Unidex 21 display will be active and will be updated during Remote operation.

Enter a "3" for Unidex 21 to be under IEEE-488 Remote Control following a Power Up or Reset. The Unidex 21 display is not active and will not be updated during Remote operation.

Enter a "4" for Unidex 21 to be under IEEE-488 Remote Control following a Power Up or Reset. The Unidex 21 display is active and will be updated during Remote operation.

A Parameter setting of "1", "2", "3" or "4" will cause the Unidex 21 to automatically go into Remote Control at the next Power Up or Reset.

1A-1-2: INITIALIZATION THROUGH HOST CONTROLLER

Remote Operation may also be initiated through the Host Controller as follows:

Press the "Control", "\", and "0" keys for no Remote Control.

Press the "Control", "\", and "1" keys to put the Unidex 21 under Remote Control. The Unidex 21 display is not active and will not be updated during Remote operation.

Press the "Control", "\", and "2" keys to put the Unidex 21 under Remote Control. The Unidex 21 display will be active and will be updated during Remote operation.

1A-1-3: INITIALIZATION THROUGH UNIDEX 21

The Unidex 21's may be initialized through it's keyboard (sealed membrane Front Panel, TeleVideo 905 Terminal or IBM AT) as follows:

Press the "Control", "\", and "0" keys for no Remote Control.

Press the "Control", "\" and "1" keys to put the Unidex 21 under RS-232 Remote Control. The Unidex 21 display is not active and will not be updated during Remote operation.

Press the "Control", "\", and "2" keys to put the Unidex 21 under RS-232 Remote Control. The Unidex 21 display will be active and will be updated during Remote operation.

Press the "Control", "\" and "3" keys to put the Unidex 21 under IEEE-488 Remote Control. The Unidex 21 display is not active and will not be updated during Remote operation.

Press the "Control", "\", and "2" keys to put the Unidex 21 under IEEE-488 Remote Control. The Unidex 21 display will be active and will be updated during Remote operation.

SECTION 1A-2: OPERATION

Following initialization, the Unidex 21 is controlled by the Host Controller.

Communication from the Host Controller to the Unidex 21 is accomplished in the same manner as communication from the TeleVideo 905 Terminal. (See Chapter 2 of the *Unidex 21 User's Manual.*)

NOTE: Regardless of the keyboard configuration of the Host Controller, communication to the Unidex 21 must follow TeleVideo 905 Terminal input conventions

As data is keyed into the Unidex 21 from the Host Controller, the requested function is performed. When the Unidex 21 is ready for anotherr command, the Unidex 21 feeds back the same key sequence to the Host Controller's display. If an error is detected by the Unidex 21, the error Code identification number will be sent to the Host Controllers display instead of the input key sequence.

The next Section provides a complete list of possible error codes and their corresponding messages.

SECTION 1A-3: ERROR CODES AND MESSAGES

During RS-232 data transmission and/or performance of a function, if an error is detected, the Unidex 21 will feed back an error code in the following format:

Master Error Code (087H) followed by the Secondary Error Code (1 or 2 bytes)

During IEEE-488 data transmission and/or performance of a function, if an error is detected following a Serial Poll, the Unidex 21 will feed back an error code in the following format:

Master Error Code (C0H) followed by the Secondary Error Code (1 or 2 bytes)

The following is a list of the Secondary Error Codes and Messages as well as the function from which they may occur.

1A-3-1: EDIT MODE

The following Secondary Error Codes/Messages may appear while in the Edit Mode:

10H - Input key undefined
11H - Not enough User's RAM space
12H - File format error
13H - File not found
14H - File read only
15H - Block functions got range error
16H - Input key not ctrl-Q or ctrl-W
17H - Input key not Y or N

1A-3-2: FILE MODE

The following Secondary Error Codes/Messages may appear while in the File Mode:

20H - Input key undefined
21H - Undefined I/O port
22H - File format error
23H - File not found
24H - File read only
25H - File currently active
26H - No disk
27H - Not enough User's RAM space
28H - File verify error
29H - RS232/IEEE-488 time out, or transfer interface fail

2AH - Target file exists already
2BH - Not enough disk space
2CH - Disk write protected
2DH - Disk access fail
2EH - Disk up load fail

1A-3-3: MACHINE MODE

The following Secondary Error Codes/Messages may appear while in the Machine Mode:

30H - Input key undefined
31H - File not found
32H - Illegal filename.type
33H - Sub-program not found
34H - Can't open read file
35H - Can't open write file
36H - Write file not closed

40H - Undefined symbol
41H - Format error
42H - Undefined Type 2 command
43H - Undefined G code
44H - Undefined M code
45H - Illegal BCD format
46H - Illegal system variable
47H - Undefined variable
48H - Illegal I/O format
49H - Illegal mathematics format
4AH - Undefined array
4BH - Miss CLS command
4CH - Undefined subroutine
4DH - Undefined entry
4EH - Undefined condition
4FH - Stack overflow
50H - Miss return address
51H - Undefined safe zone
52H - Illegal function in MDI
53H - Not enough memory space
54H - Circle miss center point
55H - No feed rate

56H - Move into safe zone
57H - Undefined data in read file
58H - In ICRC look ahead
59H - <no>
5AH - MALC format error
5BH - CPAG format error, or need (MALC, < 1, option
5CH - Undefined H code
5DH - Undefined axis plane
5EH - Axis can't be both master & slave, or more than 1 master
5FH - PLC Option not foun, or ladder program not exist
60H - Need (MALC to allocate memory
61H - No recorded position to play back, need (RECO
62H - PSO Option not found

1A-3-4: PARAMETER MODE

The following Secondary Error Codes/Messages may appear while in the Parameter Mode:

70H - Input key undefined
71H - Input data error
72H - Not enough memory for p-meter save
73H - File exist already for p-meter save
74H - File not found for p-meter load

1A-3-5: TEST MODE

The following Secondary Error Codes/Messages may appear while in the Test Mode:

80H - Input key undefined
81H - RAM fail at (0) case
82H - RAM fail at (F) case
83H - RAM fail at (5) case
84H - RAM fail at (A) case
85H - RAM checksum error
86H - EPROM checksum error
87H - PARAMETER checksum error

1A-3-6: SYSTEM MODE

The following Secondary Error Codes/Messages may appear while in the System Mode:

90H - Input key undefined
91H - TIME input error
92H - DATE input error

1A-3-7: MAIN ERRORS

The following Secondary Error Codes/Messages may appear during Remote operation:

A0H - Input key undefined
A1H - No password privlege
A2H - Batch file not found or format error
A3H - RAM error during power on test
A4H - Indexing board error during power on test
A5H - Real time clock fail, set at default data

1A-3-8: SPECIAL REMOTE SYSTEM-FAIL ERROR

During RS-232 data transmission and/or performance of a function, a Special Remote System error having two bytes of Secondary Error may be detected, it will be displayed in the following format:

Master Error Code (087H) followed by 0E0H and the Secondary Error Code

During IEEE-488 data transmission and/or performance of a function, a Special Remote System error having two bytes of Secondary Error may be detected, it will be displayed in the following format:

Master Error Code (C0H) followed by 0E0H and the Secondary Error Code

The following Secondary Error Codes/Messages may appear during data transmission and/or performance of a function:

80H - Indexer 68000 CPU Bus Error
81H - Indexer 68000 Address Error
82H - Indexer 68000 Illegal Instruction
83H - Indexer 68000 Zero Divide
84H - Indexer 68000 Line 1010 Emulation
85H - Indexer 68000 Line 1111 Emulation

86H - Indexer 68000 Uninitialized Interrupt Vector
87H - Indexer 68000 Spurious Interrupt
88H - Indexer Dual-Port Ram Group B Checksum
89H - Indexer Dual-Port Ram Group B Data Out of Boundary
8AH - Feedrate is 0 or Negative Value
8BH - Invalid Sin/Cos Combination
8CH - Invalid Contouring Plane

A0H - Axis in Limit (Software or Hardware)
A1H - Axis Trap (Velocity or Position or Integral)
A2H - M Function Output Fail to Detect the Acknowledge Signal
A3H - S Function Output Fail to Detect the Acknowledge Signal
A4H - T Function Output Fail to Detect the Acknowledge Signal
A5H - DSP Feedback Illegal Code

B0H - MFO = 0 or Feedhold is On
B1H - AC Fail
B2H - Joy-Stick/ Trackball/Handwheel Motion Hit Software or Hardware Limit

SECTION 1A-4: SAMPLE PROGRAM

The following program is representative of a Basic Program that may be sent to the Unidex 21 from a Host Controller.

```
10    CLS
20    CLOSE
30    PRINT "SAMPLE PROGRAM FOR UNIDEX21 HOST REMOTE  CONTROL OPERATION"
40    PRINT "SET RS232 AS 9600,N,8,1, CONNECT TO UNIDEX21 PORT-A"
50    ON ERROR GOTO 1000
60    OPEN "COM1:9600,N,8,1" FOR RANDOM AS 1
70    RT$ = CHR$ (28)                              'Remote enable code is ctrl\2
80    GOSUB 500                                    'Sent to Unidex21
90    RT$ = "2"                                    'Remote case  2
100   GOSUB 500
110   RT$ = INKEY$                                 'Read data from keyboard
120   If RT$ = " " THEN 110                        'No data
130   GOTO 100                                     'Sent out

500   PRINT #1, RT$;                               'Sent to Unidex21
510   RTB$ = INPUT$(1, #1)                         'Feedback from Unidex21
515   IF RT$ < >CHR$(10) THEN 540                  'If LF skip everything
520   IF RT$ < > RTB$ THEN 550                     'The same?
530   PRINT RT$;                                   'Yes
540   RETURN                                       'No error, back to caller
550   IF RTB$ < >CHR$(135) THEN 900                'Remote error code
560   RTB$ = INPUT$(1,#1)                          'Yes, what is the error code?
570   IF RTB$ = CHR$(224) THEN 600                 '2 bytes error code?
580   PRINT "REMOTE ERROR CODE ="; ASC(RTB$)
590   RETURN                                       'Let caller decide what to do

600   RTB1$ = INPUT$(1, #1)                        '2nd error byte
610   PRINT "REMOTE ERROR CODE ="; ASC(RTB$); " + "; ASC(RTB1$)
620   RETURN                                       'Let caller decide what to do

900   PRINT  "HOST REMOTE CONTROL FAIL"
910   GOTO 1010

1000  PRINT " ERROR CODE = "; ERR; "try again"
1010  STOP
1020  END
```