IMAGENEX TECHNOLOGY CORP.   **16SEP15**

MODEL 852 DIGITAL SONAR HEAD
MODEL 852 DIGITAL ECHO SOUNDER

DATA STORAGE FILE FORMAT (.852)

When recording the sonar and/or echo sounder data to a **.852** file, the following bytes are appended and saved to the file every 'shot':

Byte #	Description
0 to 99	**File Header** (100 Bytes)
100 to 111	**Sonar / Echo Sounder Return Data Header** (12 Bytes)
112 to **xxxx**	**Sonar / Echo Sounder Return Echo Data** (0, 252 or 500 Bytes) **xxxx** = 112+above number Byte **xxxx** always = **0xFC** (Termination Byte from sonar or echo sounder)
xxxx+1 to **yyyy**	**Zero Fill** **yyyy** = 127, 383 or 639

FILE HEADER

Bytes 0 through 99 contain the following **File Header** information:

0   **ASCII '8'**
1   **ASCII '5'**
2   **ASCII '2'**

3   **nToReadIndex** - Index for Number of Data Bytes
           0 = 0 Data Bytes (IPX data)
           2 = 252 Data Bytes (IMX data)
           3 = 500 Data Bytes (IGX data)

4-5   **Total Bytes** - number of bytes that are written to the disk for this shot

Byte 4								Byte 5							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
128 (for IPX), 384 (for IMX) or 640 (for IGX)															

6-7   **nToRead** - Number of Bytes from the sonar or echo sounder

Byte 6								Byte 7							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
13 (for IPX), 265 (for IMX) or 513 (for IGX)															

8-19   **Date** - null terminated date string (12 bytes)
              "**DD-MMM-YYYY**"

20-28   **Time** - null terminated time string (9 bytes)
              "**HH:MM:SS**"

29-32   **Hundredth of Seconds** - null terminated string (4 bytes)
              "**.hh**"

33-36   **Reserved** – always 0

37   **Dir, Xdcr, Mode, Step**

For Sonar Head (Head ID = 0x10):

Byte 37							
7	6	5	4	3	2	1	0
Dir	**Xdcr**	**Mode**			**Step Size**		
0=ccw	0=Dn	0 = Sector (IGX)			0 = 2.25 Deg (Slow)		
1=cw	1=Up	1 = Polar (IMX)			1 = 4.5 Deg (Fast)		

For Echo Sounder (Head ID = 0x11):

Byte 37							
7	6	5	4	3	2	1	0
N/A	**N/A**	**Mode**			**N/A**		
0	0	0 = IGX			0		
		1 = IMX					

38   **Start Gain**
              0 to 40 in 1 dB increments

39   **(Sector Size)/3**

              For Sonar Head (Head ID = 0x10):
              0 to 102 = 0 to 306 Degrees in 3 degree increments

              For Echo Sounder (Head ID = 0x11):
              Reserved – always 0

40   **(Train Angle)/3**

For Sonar Head (Head ID = 0x10):
10 to 130 = -180 to +180 Degrees in 3 degree increments
70 = 0 degrees

For Echo Sounder (Head ID = 0x11):
Reserved – always 0

41   **Reserved** – always 0

42   **Reserved** – always 20

43   **Reserved** – always 9

44   **Pulse Length**
1 to 250 in microseconds

45   **Profile**
0 = Off
1 = Points Only
2 = Low Mix
3 = Medium Mix
4 = High Mix

46-47   **Sound Velocity**

Byte 46								Byte 47							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
V	Sound Velocity (in meters/second) * 10														

If '**V**' = 0, Sound Velocity = 1500.0 m/s
If '**V**' = 1, Sound Velocity = [((Byte 46 & 0x7F)<<8) | (Byte 47)]/10.0

48-79   **User Text** - null terminated text string (32 bytes)

DATA STORAGE FILE FORMAT (.852) (con't)

80-81   **ROV Depth**

Byte 80								Byte 81							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
D	ROV Depth * 10														

If '**D**' = 0, ROV Depth not available
If '**D**' = 1, ROV Depth = [((Byte 80 & 0x7F)<<8) | (Byte 81)]/10

82   **ROV Depth Units**
'M' = Meters
'F' = Feet

83-84   **ROV Heading**

Byte 83								Byte 84							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
H	ROV Heading * 10														

If '**H**' = 0, ROV Heading not available
If '**H**' = 1, ROV Heading = [((Byte 83 & 0x7F)<<8) | (Byte 84)]/10

85-86   **ROV Turns Counter**

Byte 85								Byte 86							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
T	ROV Turns Counter + 100														

If '**T**' = 0, ROV Turns Counter not available
If '**T**' = 1, ROV Turns Counter = [((Byte 85 & 0x7F)<<8) | (Byte 86)] - 100

87   **Operating Frequency**
For Sonar Head (Head ID = 0x10):
0 = 675kHz
1 = 850kHz
For Echo Sounder (Head ID = 0x11):
0 = 675kHz

88   **Head ID**
0x10 = Sonar Head
0x11 = Echo Sounder

89-99   **Reserved** - always 0

DATA STORAGE FILE FORMAT (.852) (con't)

SONAR / ECHO SOUNDER RETURN DATA HEADER
SONAR / ECHO SOUNDER RETURN ECHO DATA
ZERO FILL

The following bytes contain the **Sonar / Echo Sounder Return Data** that is acquired directly from the sonar head or echo sounder serial COM port (refer to the Model 852 Serial Interface Specification):

      If Header is ASCII '**IPX**':

          Bytes 100 through 112 (13 bytes)
          Bytes 113 through 127 (15 bytes – **Zero Fill**)

      If Header is ASCII '**IMX**':

        8-Bit
          Bytes 100 through 364 (265 bytes)
          Bytes 365 through 383 (19 bytes - **Zero Fill**)

      If Header is ASCII '**IGX**':

        8-Bit
          Bytes 100 through 612 (513 bytes)
          Bytes 613 through 639 (27 bytes - **Zero Fill**)