4. QUICK START

4.1   INTRODUCTION

This section covers the basic startup procedure. Use this summary to test the basic functions of the receiver without having to be intimately familiar with its operation.   More complete operating instructions are available for each topic in later sections of this manual.

Simple menus make operating the GDP-32^{II} straightforward. The easiest way to become familiar with the receiver operation is to try the various software options.

To position the cursor on the LCD display use the Cursor Control Keys:
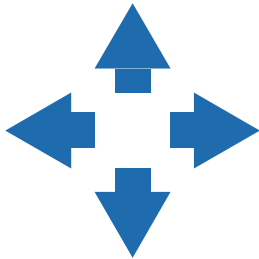
or the **NEXT FIELD** Pg Dn and **PREV FIELD** Pg Up. To cycle through available options, labels and numbers use the Rotary Entry Keys: **SELECT UP** Home and **SELECT DN** End.

4.2 RECEIVER START-UP

1. Power Up the receiver by cycling the **Power ON/OFF** button on the Control I/O panel. This applies power to the oven-stabilized Crystal Oscillator and illuminates the Crystal Oscillator Power Light on the Front Panel.

2. Press the **POWER ON/OFF** button located on the Front Panel. The unit beeps and the LCD displays the initializing parameters for the digital section.
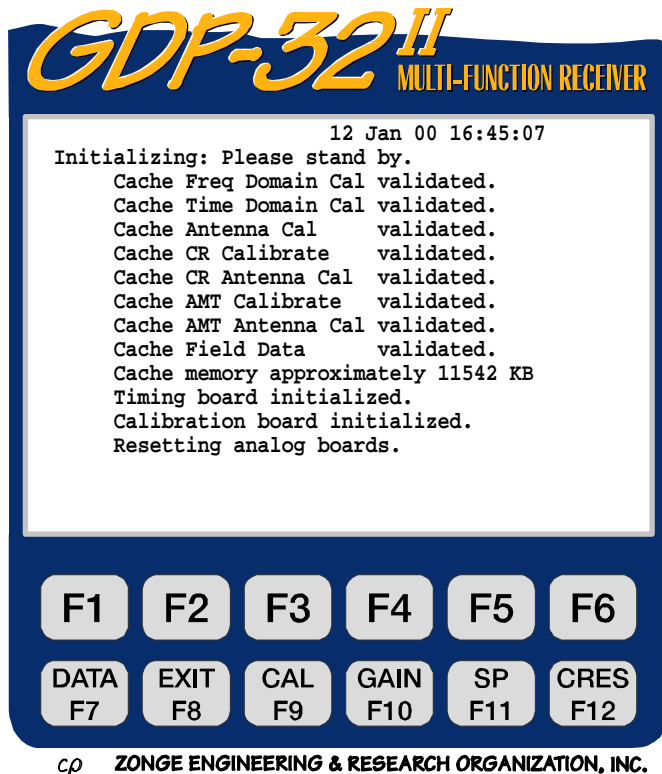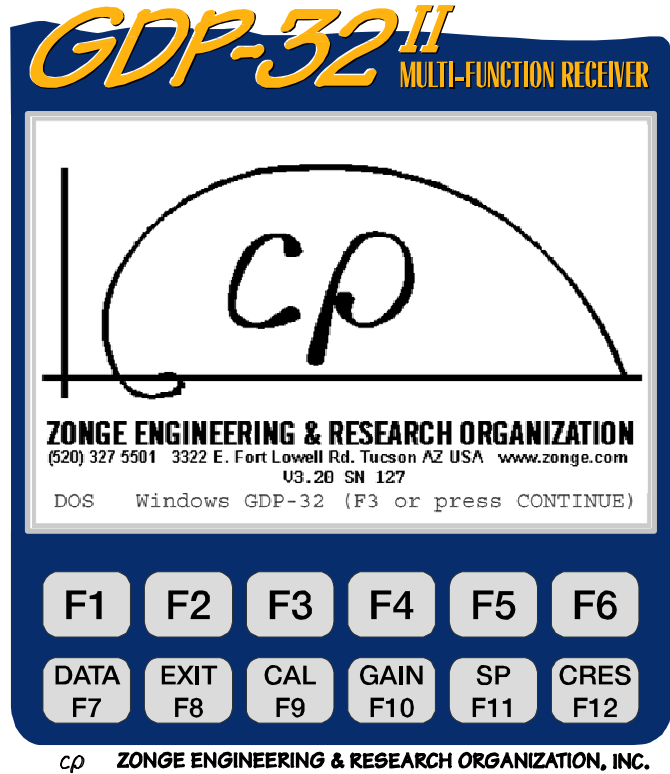
3. After adjusting ▼ on the screen (if necessary), press **CONTINUE Enter** or **F3** and wait for the unit to verify the caches and analog channels.

4. Check the date and time. If the settings are incorrect, press **!1** to enter the "Set Date and Time" program. Press **NEXT FIELD Pg Dn** to change the field values. Enter the correct values and press **CONTINUE Enter**.

```
ZONGE ENGINEERING 11.8 12 Jan 00 17:16:16
GDP32II320

     1) Set Date and Time
     2) Utilities
     3) RPIP
     4) TDIP
     5) CR AND HACSAMT
     6) CSAMT
     7) TEM
     8) AMT/MT
     9) NANOTEM
     a) ZETA
Select program (Press 1 - 9, ESCAPE):


                                      Ch Info
```
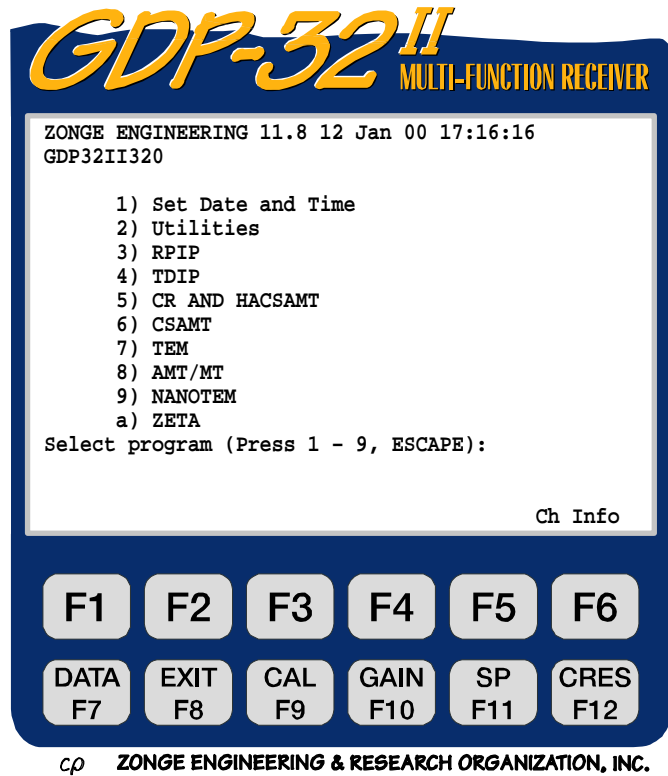
F1	F2	F3	F4	F5	F6
DATA F7	EXIT F8	CAL F9	GAIN F10	SP F11	CRES F12

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5. Select the Field Survey Program (e.g. Press **(9** for the for the NanoTEM program). This brings up the **Initial Program Screen** for that program. For a complete description of program screens and parameters see **Section 5 – Accessing Programs**.

4.3 ENTER SURVEY PARAMETERS

Each Field Survey Program has four primary screens where survey parameters are entered.

1. Initial Program Screen

Enter the Array type, Mode, etc. (depending upon survey type), and press [CONTINUE Enter].

2. Operation Information Screen

This screen displays semi-permanent data. Enter the value for OPERATOR, TX ID (Transmitter ID), A-SP (A-Spacing or Dipole Spacing), JOB, LINE, SPREAD (as needed) and press [CONTINUE Enter].

3. Channel Parameters Screen

Enter channel parameters. Some examples are:

TDIP		RPIP		CR		AMT,CSAMT						TEM	
Ch	N	Ch	N	Ch	N	Ch	Sta/Ant	Ch	Sta/Ant	Ch	Sta/Ant	Ch	ANT
1 ON	1	1 ON	1	1 Ref	0	1 Ex	1	1 Ex	1	1 Ex	1	1 Hx	43
2 ON	2	2 ON	2	2 Ex	1	2 Hy	211	2 Ex	2	2 Hy	211	2 Hy	53
3 ON	3	3 ON	3	3 Ex	2	3 Ey	2	3 Ex	3	3 Ey	1	3 Hz	63
4 ON	4	4 ON	4	4 Ex	3	4 Hx	212	4 Ex	4	4 Hx	212	4 OFF	
5 ON	5	5 ON	5	5 Ex	4	5 Hz	30	5 Ex	5	5 Ex	2	5 OFF	
6 ON	6	6 ON	6	6 Ex	5	6 OFF		6 Ex	6	6 Hy	321	6 OFF	
7 OFF		7 OFF		7 Ex	6	7 OFF		7 Ex	7	7 Ey	2	7 OFF	
8 OFF		8 OFF		8 OFF		8 OFF		8 Hy	211	8 Hx	322	8 OFF	
		N=1,6 IP				1-STATION TENSOR		7-STATION SCALAR		2-STATION VECTOR		1-STATION 3-AXIS	

NOTE: Refer to the appropriate Survey Program chapters for more information on setting up channels.

- Any designator other than **OFF** will turn on channels for all programs.

- For CR, **Ref** is the current reference channel and can be set to any single channel. Any designator other than **Ref** can be used for the rest of the channels.

- For CSAMT and HACSAMT, the program uses the first orthogonal H-field component found for the respective E-field. Hence, **Ex** must always precede **Hy**; **Ey** precedes **Hx**, etc., as above.

- For CSAMT the numbers beside the H-field designators in the **Sta/Ant** column are coil serial numbers for coil calibrations. The last digit signifies the antenna type:

- A single channel ANT/1 CSAMT antenna ends in **0**.

- A dual channel ANT/2 ends in **1** for channel 1 or **2** for channel 2.

- CSAMT / AMT antennas, ANT/3 ends in **3**.

- A TEM/ 3 TEM antenna ends in **9**.

- An MT/AMT antenna using Sarloos coils or equivalent ends in **4** for DC to 1 kHz range or **3** for .1 to 10,000 Hz range.

- Numbers beside the E-field designators in the **Sta/Ant** column are used as station numbers.

Press **CONTINUE / Enter** to go to the next screen.

4. **Data Acquisition Screen**

Select frequency, number of cycles to average, notch filter in or out, etc. From here you can perform Calibrations, System Checks or set Gains prior to acquiring data.

4.4   CALIBRATION

Calibrations are performed from the ***Data Acquisition Screen*** of the Survey Program to be calibrated.

CAUTION: Performing a calibration overwrites any previous calibration data for that program.

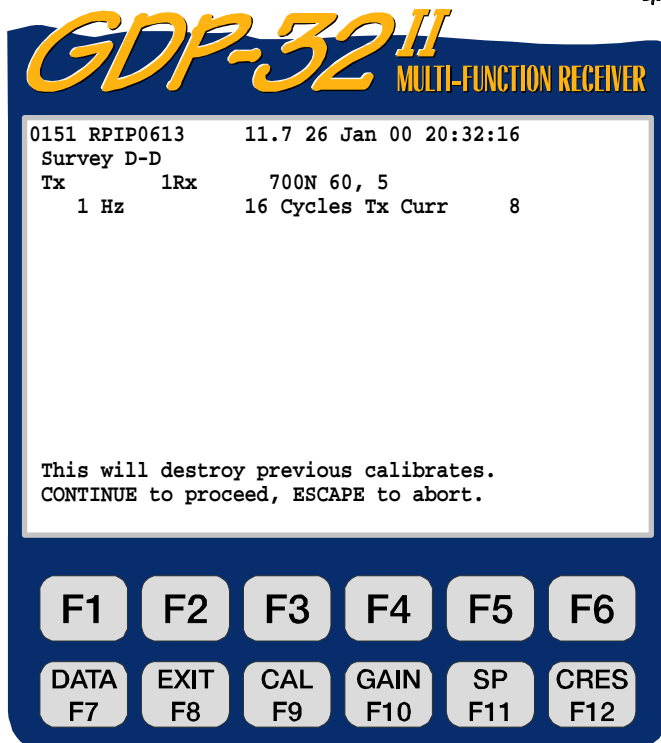**INTERNAL   CALIBRATION SUMMARY**

NOTE: The following summary is based on the TDIP, RPIP or CSAMT Survey Programs.

1. Set the frequency to the lowest frequency to be used in your survey. (e.g. 0.125 Hz)

2. Set cycles to 16.

3. Set the notch filter to be used for this Survey Program.

4. Press the ⟨CAL / F9⟩ function key. You can now select between the Calibrate (Cal) and System Check (Sys) Mode.
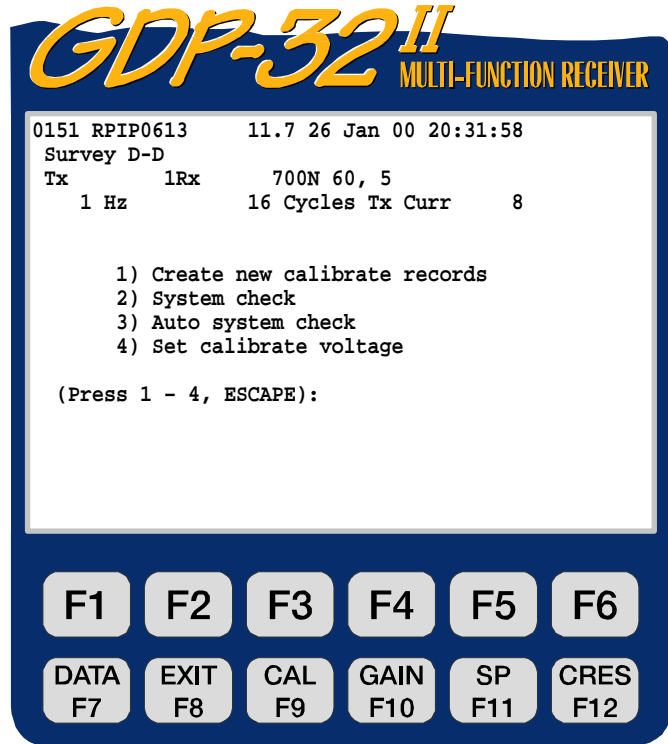
```
0151 RPIP0613      11.7 26 Jan 00 20:31:58
 Survey D-D
 Tx        1Rx       700N 60, 5
    1 Hz              16 Cycles Tx Curr     8


     1) Create new calibrate records
     2) System check
     3) Auto system check
     4) Set calibrate voltage

 (Press 1 - 4, ESCAPE):
```

GDP-32 II MULTI-FUNCTION RECEIVER

F1	F2	F3	F4	F5	F6
DATA F7	EXIT F8	CAL F9	GAIN F10	SP F11	CRES F12
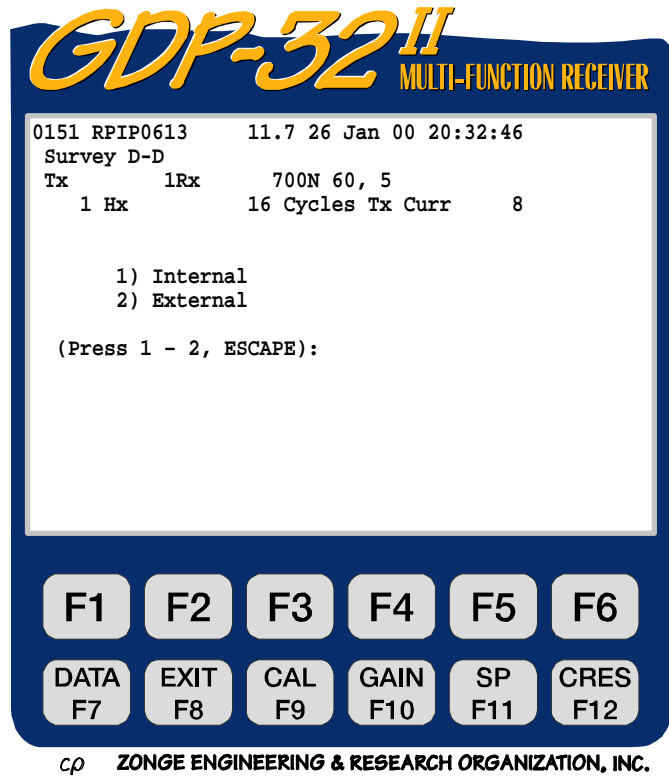
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5. Press ⟨! / 1⟩ to "Create new calibrate records".

GDP-32 II MULTI-FUNCTION RECEIVER

```
0151 RPIP0613      11.7 26 Jan 00 20:32:16
 Survey D-D
 Tx        1Rx       700N 60, 5
    1 Hz              16 Cycles Tx Curr     8











 This will destroy previous calibrates.
 CONTINUE to proceed, ESCAPE to abort.
```

F1	F2	F3	F4	F5	F6
DATA F7	EXIT F8	CAL F9	GAIN F10	SP F11	CRES F12

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6. Press ⟨CONTINUE / Enter⟩ to proceed.

```
0151 RPIP0613      11.7 26 Jan 00 20:32:46
 Survey D-D
Tx        1Rx       700N 60, 5
   1 Hx            16 Cycles Tx Curr     8


     1) Internal
     2) External

 (Press 1 - 2, ESCAPE):
```
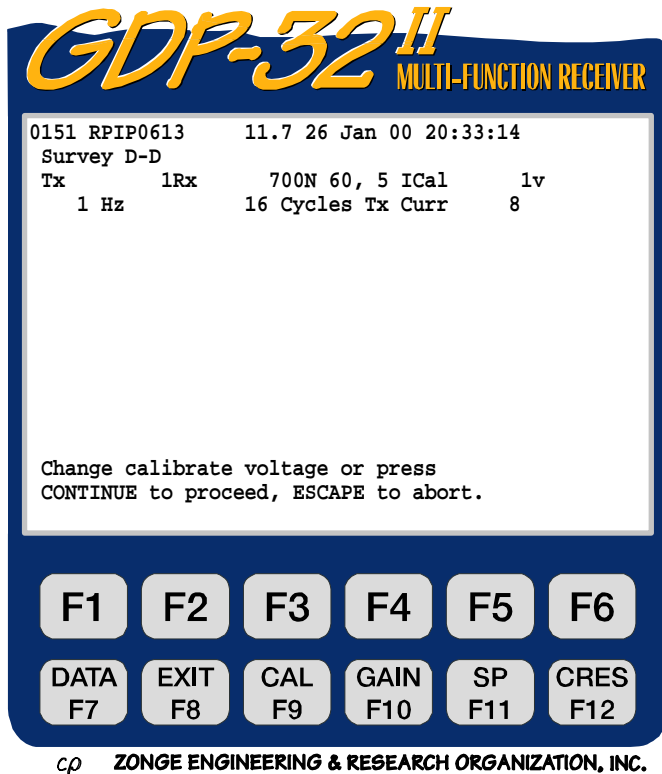
7. Press **! 1** for "Internal" voltage source.


```
0151 RPIP0613      11.7 26 Jan 00 20:33:14
 Survey D-D
Tx        1Rx       700N 60, 5 ICal      1v
   1 Hz            16 Cycles Tx Curr     8




 Change calibrate voltage or press
 CONTINUE to proceed, ESCAPE to abort.
```
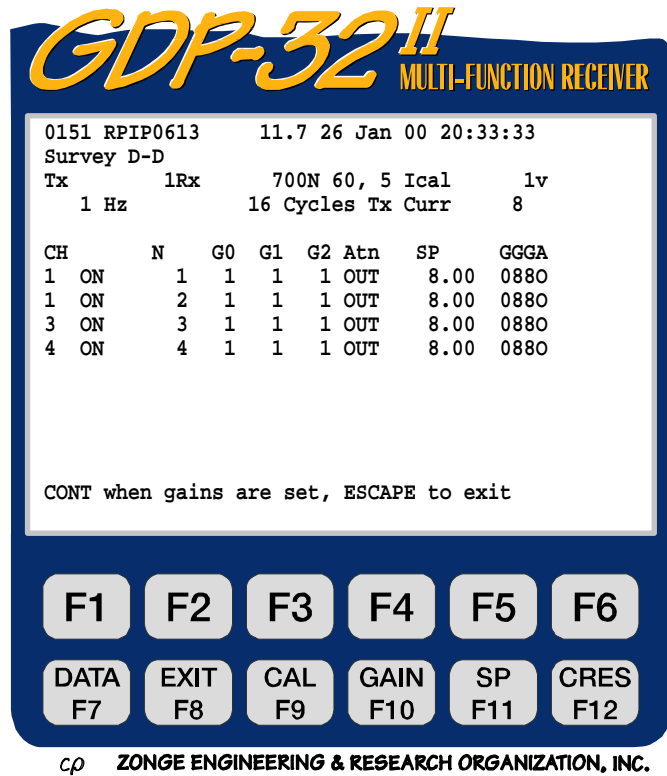
8. Press **CONTINUE / Enter** to select the default calibrate voltage (Cal=1.000V).

9. Press **CONTINUE / Enter**. The program now sets all gains to 1, and pauses to enable the operator to change gains and attenuator settings.

10. Press **CONTINUE / Enter** to automatically gather calibration data from the starting frequency to the highest frequency available in the selected program.

```
0151 RPIP0613      11.7 26 Jan 00 20:33:33
Survey D-D
Tx         1Rx        700N 60, 5 Ical      1v
   1 Hz              16 Cycles Tx Curr      8

CH         N    G0  G1  G2 Atn    SP     GGGA
1   ON         1   1   1   1 OUT    8.00   0880
1   ON         2   1   1   1 OUT    8.00   0880
3   ON         3   1   1   1 OUT    8.00   0880
4   ON         4   1   1   1 OUT    8.00   0880




CONT when gains are set, ESCAPE to exit
```

F1 F2 F3 F4 F5 F6

DATA / F7   EXIT / F8   CAL / F9   GAIN / F10   SP / F11   CRES / F12

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11. To limit the calibration to a particular frequency range, press **STOP AVG / Escape** at the appropriate frequency. If you halt the calibration routine, you must answer the question: "**Exit auto-cal mode? (1 - yes, 2 - no)**". Press **@ 2** to change the frequency, number of cycles, or calibration voltage, and then proceed with the calibration. The calibration data is stored in the corresponding calibration cache, and in the main field data cache.

12. To terminate the calibration before it completes its cycle for all frequencies, press **STOP AVG / Escape** and then **! 1** to exit the autocal mode ["**Exit autocal mode? (1 - yes, 2 - no)**"].

13. When the calibration is complete, a system check is recommended.

EXTERNAL CALIBRATION SUMMARY

1. Connect the peripheral equipment to be included in the calibration. (See Figure 6.1 for an example of how to connect an Isoamp to the calibration circuit for referenced CR measurements.)

2. Set the frequency to the lowest frequency to be used in your survey. (e.g. 0.125 Hz)

3. Set cycles to 16.

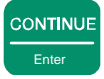4. Set the notch filter to be used for this Survey Program.

5. Press the [CAL F9] function key.

6. Press [! 1] to "**Create new calibrate records**".

7. Press [CONTINUE Enter] to proceed.

8. Press [@ 2] for "**External**" voltage source.

9. Press [CONTINUE Enter] to select the default calibrate voltage (Cal=1.000V).

10. Press [CONTINUE Enter]. The program now sets all gains to 1, and pauses to enable the operator to change gains and attenuator settings.

11. Press [CONTINUE Enter] to automatically gather calibration data from the starting frequency to the highest frequency available in the selected program.

12. To limit the calibration to a particular frequency range, press [STOP AVG Escape] at the appropriate frequency. If you halt the calibration routine, you must answer the question: "**Exit auto-cal mode? (1 - yes, 2 - no)**". Press [@ 2] to change the frequency, number of cycles, or calibration voltage, and then proceed with the calibration. The calibration data is stored in the corresponding calibration cache, and in the main field data cache.

13. To terminate the calibration before it completes its cycle for all frequencies, press [STOP AVG Escape] and then [! 1] to exit the autocal mode ["**Exit autocal mode? (1 - yes, 2 - no)"**].

14. When the calibration is complete, a system check is recommended.

4.5   SYSTEM CHECK

System checks are performed from the *Data Acquisition Screen* of the Survey Program to be checked.
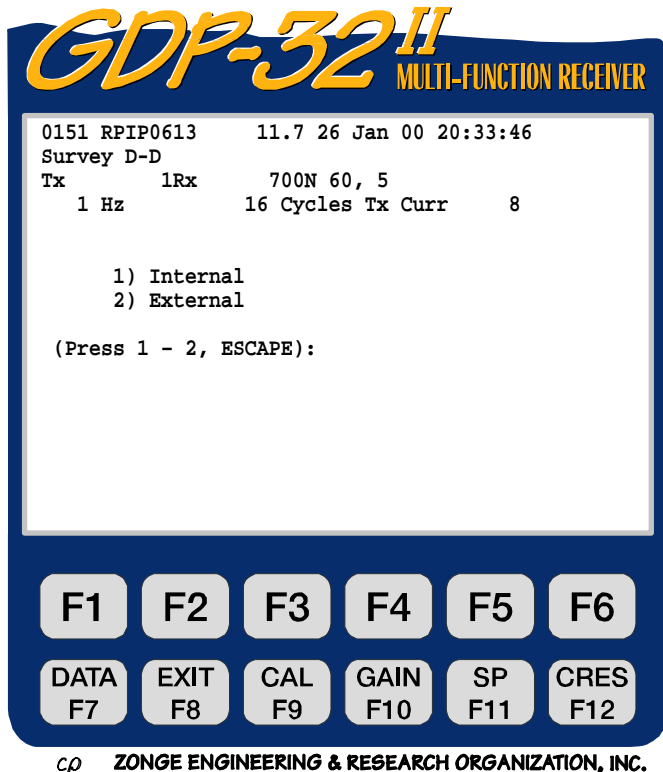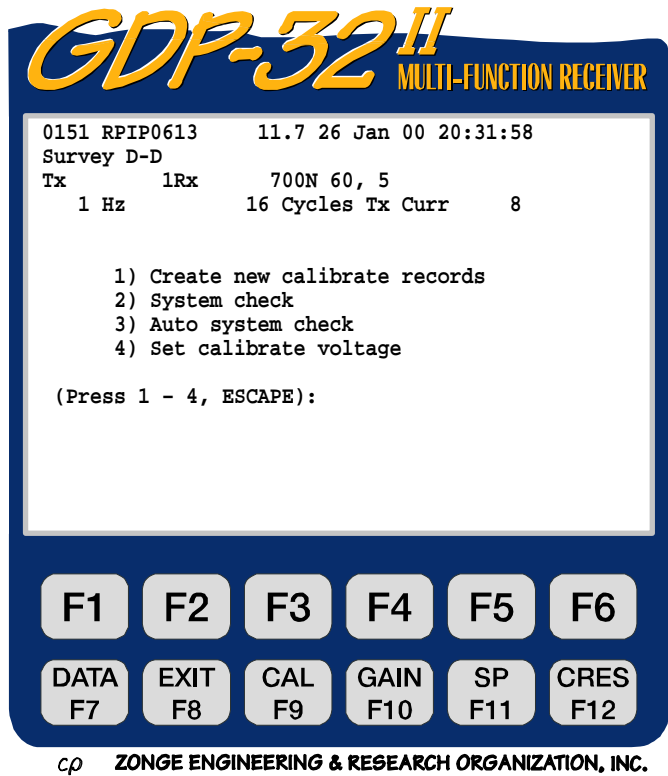
SYSTEM CHECK SUMMARY

1. Set the frequency value to check (e.g. 0.125 Hz)

2. Press the [CAL F9] function key. You can now select between the Calibrate and System Check Mode.
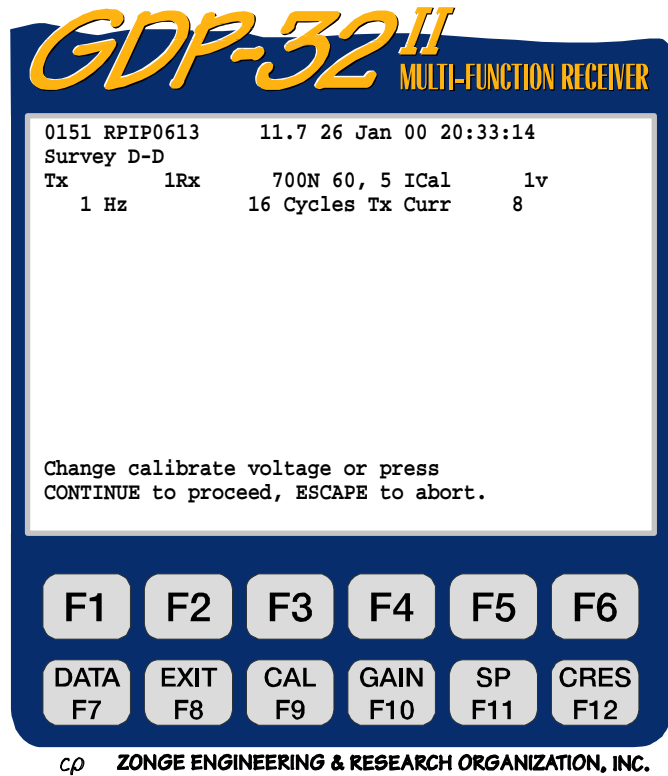
3. Press [@ 2], System Check or [# 3], Auto System Check.

```
0151 RPIP0613      11.7 26 Jan 00 20:31:58
Survey D-D
Tx        1Rx       700N 60, 5
   1 Hz             16 Cycles Tx Curr      8


     1) Create new calibrate records
     2) System check
     3) Auto system check
     4) Set calibrate voltage

 (Press 1 - 4, ESCAPE):
```

```
F1   F2   F3   F4   F5   F6
DATA EXIT CAL  GAIN SP   CRES
F7   F8   F9   F10  F11  F12
```

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4. NOTE: In the "Auto System Check" mode, the program automatically goes from the frequency selected in Step 1 above, to the highest frequency available for the selected Survey Program until [STOP AVG Escape] is pressed.

```
0151 RPIP0613      11.7 26 Jan 00 20:33:46
Survey D-D
Tx        1Rx       700N 60, 5
   1 Hz             16 Cycles Tx Curr      8


     1) Internal
     2) External

 (Press 1 - 2, ESCAPE):
```

5. Press [! 1] for "Internal" voltage source.

```
F1   F2   F3   F4   F5   F6
DATA EXIT CAL  GAIN SP   CRES
F7   F8   F9   F10  F11  F12
```

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```
0151 RPIP0613      11.7 26 Jan 00 20:33:14
Survey D-D
Tx        1Rx       700N 60, 5 ICal      1v
   1 Hz            16 Cycles Tx Curr     8




Change calibrate voltage or press
CONTINUE to proceed, ESCAPE to abort.
```

6. Press **CONTINUE Enter** to set the default calibrate voltage (Cal=1.000V).

7. Press **CONTINUE Enter** to begin data acquisition. If this is the first time data have been acquired at this frequency, the automatic gain adjust program takes over. Watch the screen to see how it adjusts the gains. The program will go directly from automatic gain setting to data acquisition.

8. The GDP-32II receiver will now:

   ▪ Stack and average the calibrate signal

   ▪ Calculate a standard error of the mean (SEM) on the real- time parameter displayed

   ▪ Calculate the resistivity and IP parameters, display them, and ask if you want to save or discard your data.

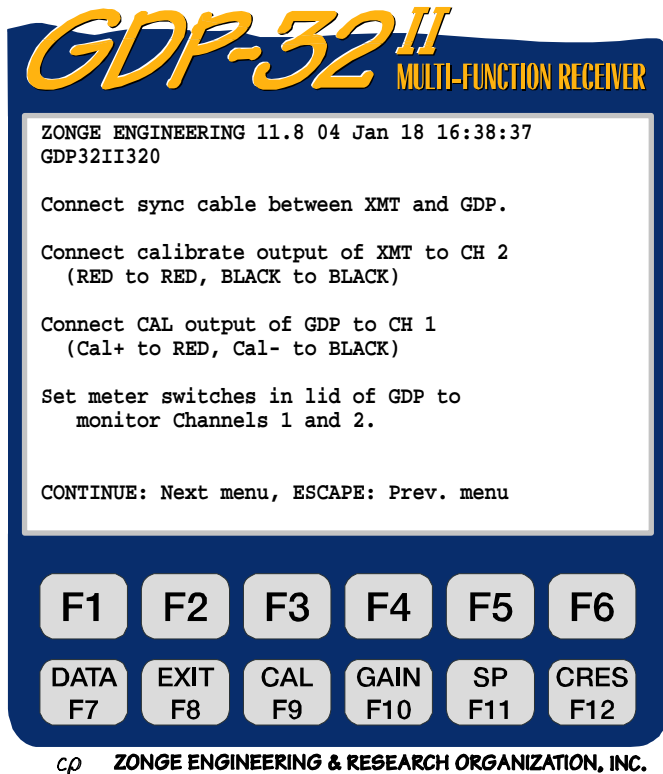9. Press **CONTINUE Enter** to store the data in the *Field Data* cache, or press **RESET** to discard the data.

10. Press **@ 2** or **CONTINUE Enter** to stay in the System Check mode, or press **! 1** to exit.
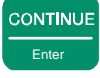
4.6   SYNCHRONIZATION

The Utility program guides the user through a set of instructions to automatically set up the GDP-32^{II} for a synchronization check.
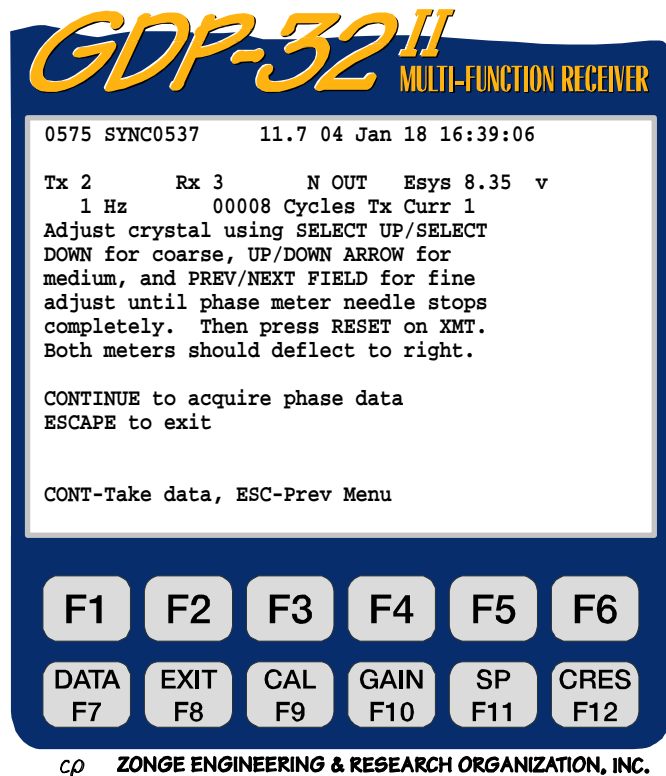
NOTE: You must have a good calibrate in FDCALS, since the RPIP program is used in this synchronization routine.

1. Press [@ 2] to enter the "**Utilities**" program from the Main Program Menu.

2. Press [$ 4] to select the "**Synchronize to XMT**" program.

3. Follow the instructions displayed:

```
ZONGE ENGINEERING 11.8 04 Jan 18 16:38:23
GDP32II320




Turn on XMT and GDP.  Then wait 1 hour.

Set XMT to 1 Hz
   and 100% DUTY CYCLE.
```

F1 F2 F3 F4 F5 F6
DATA F7 EXIT F8 CAL F9 GAIN F10 SP F11 CRES F12

ZONGE ENGINEERING & RESEARCH ORGANIZATION, INC.
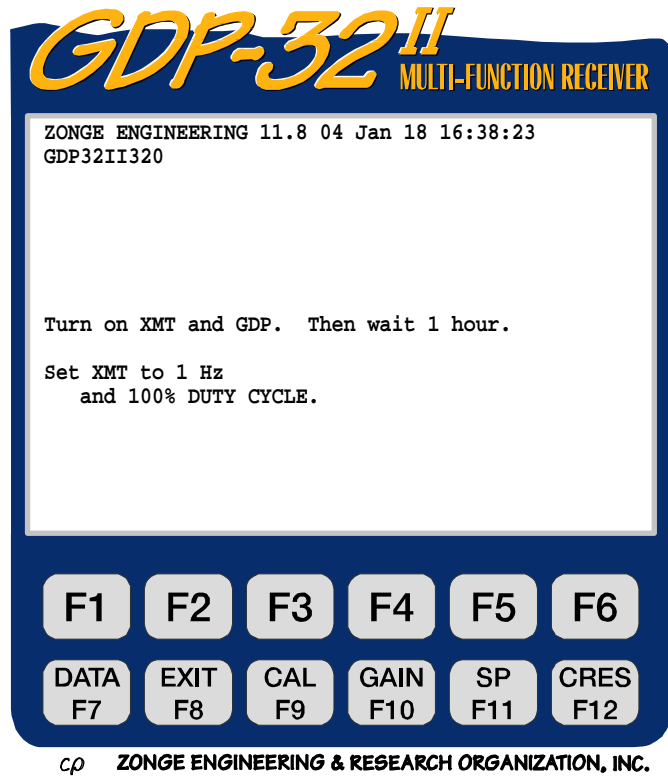
4. When the crystals in the GDP and XMT have been on for an hour or more, press [CONTINUE Enter] to proceed to the next set of instructions.

5. Follow the instructions on the screen. Press [CONTINUE Enter] when everything is connected properly.

```
ZONGE ENGINEERING 11.8 04 Jan 18 16:38:37
GDP32II320

Connect sync cable between XMT and GDP.

Connect calibrate output of XMT to CH 2
  (RED to RED, BLACK to BLACK)

Connect CAL output of GDP to CH 1
  (Cal+ to RED, Cal- to BLACK)

Set meter switches in lid of GDP to
   monitor Channels 1 and 2.


CONTINUE: Next menu, ESCAPE: Prev. menu
```

F1 F2 F3 F4 F5 F6
DATA F7 EXIT F8 CAL F9 GAIN F10 SP F11 CRES F12

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6. If a fast beep sounds while pressing any of the crystal adjust keys, no more adjustment is avaliable on that particular key. Move to the hext higher (coarser) adjustment key.

7. If unable to make the phase meter needle stop moving completely, see **Section 6.2** for the manual adjustment procedure.

```
0575 SYNC0537     11.7 04 Jan 18 16:39:06

Tx 2       Rx 3        N OUT    Esys 8.35  v
  1 Hz         00008 Cycles Tx Curr 1
Adjust crystal using SELECT UP/SELECT
DOWN for coarse, UP/DOWN ARROW for
medium, and PREV/NEXT FIELD for fine
adjust until phase meter needle stops
completely.  Then press RESET on XMT.
Both meters should deflect to right.


CONTINUE to acquire phase data
ESCAPE to exit


CONT-Take data, ESC-Prev Menu
```

| F1 | F2 | F3 | F4 | F5 | F6 |

| DATA F7 | EXIT F8 | CAL F9 | GAIN F10 | SP F11 | CRES F12 |

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8. Once the crystals have been adjusted to give the same frequency (the phase meter needle has stopped), press **RESET** on the XMT. The analog meters for channels 1 and 2 should deflect to the right. Release the **RESET** button and press [CONTINUE Enter] on the GDP-32^{II} to make a phase measurement. If everything has been done properly, the phase should be close to 0.0.

9. Ensure that synchronization has been obtained by disconnecting the synchronization cable and repeating the phase measurement.

Note: The XMT Sync screen instructions assume that there are standard analog cards in channels 1 and 2. A NanoTEM card in either channel can cause the receiver to lock up if the synchronization routine is tried.

4.7   ACQUIRE FIELD DATA

(For survey specific settings refer to the individual Survey Program sections).

1. Enter the appropriate Survey Program from the Program Menu, and enter the information required in each of the following screens.

2. Connect the field wires from the receiver electrodes to the input connectors for each channel.

3. With the transmitter turned **OFF**, Press F6 to check the contact resistance. You may find that it is not necessary to turn off the transmitter if the receiver signals are relatively weak.

4. Turn the transmitter **ON**.

5. Input information for Rx and Tx location, and transmitter current in the ***Data Acquisition Screen***. Select the frequency, number of cycles, and notch filter setting. See ***Sections 6 – Receiver Setup*** for advice on setting notch filters and gains.

6. Press CONTINUE Enter to begin data acquisition. Monitor the acquisition progress by observing the SEM values and the number of cycles.

7. Press STOP AVG Escape to halt data collection before the predetermined number of cycle stacks has been obtained. Press CONTINUE Enter to save the data in the ***Field Data*** cache, or RESET to discard the data.

4.8   CHECK DATA IN THE DATA CACHE

1. Press the DATA F7 function key. This causes the program to enter the cache at the last data block.

2. Use the Cursor Control Keys to move around in the cache to review data.

3. Press the EXIT F8 function key to return to Data Acquisition mode.

4.9   DATA TRANSFER TO A COMPUTER

1. Connect the cable from the Serial Port on the GDP to the RS-232 input on your computer.
2. Open a data file in your computer by using ***HyperTerminal*** or other similar data transfer or terminal program. Configure the program to capture data as text.
3. On the GDP-32^{II} press [**DATA F7**] to enter ***Data Mode***.
4. At this point it may be necessary to configure the serial port.

CONFIGURE THE SERIAL PORT (if necessary)

1. While in ***Data Mode***, press [**STOP AVG Escape**] twice to get to the cache/port configuration menu.
2. Press [**# 3**] to configure the serial port (if necessary). Default values are: 9600 baud, no parity, 8 data bits, 1 stop bit.
3. Press [**CONTINUE Enter**].
4. Press [**! 1**], "**Access Cache**".
5. Access the desired cache (e.g. Press [**! 1**] to access the ***Data*** cache. Press [**@ 2**] to access the ***Frequency Domain*** calibration cache).

DUMP FIELD DATA

1. While in ***Data Mode***, press [**STOP AVG Escape**].
2. Press [**@ 2**] to output all field data or [**# 3**] to transfer selected blocks.
3. Close the data file on the remote computer and exit the transfer program. Check the data files on the remote computer to verify the transfer.

TRANSFER CALIBRATION DATA

1. While in ***Data Mode***, press [**STOP AVG Escape**] twice to get to the cache/port configuration menu.
2. Press [**! 1**], "**Access Cache**".
3. Press [**@ 2**] to access the ***Frequency Domain*** calibration cache.
4. Press [**@ 2**] to output the calibration data.
5. Close the data file on the remote computer and exit the transfer program. Check the data files on the remote computer to verify the transfer.