18. GDP-32^{II} USERS NOTES

This section of the manual is provided for users to add their own field operating notes as well as to compile notes sent out by Zonge Engineering concerning operation of the GDP-32^{II} and other ZERO equipment.

18.1   USE OF THE ATTENUATOR

The attenuator function in the GDP-32^{II} is useful for limiting the input signal for low frequency surveys using fractional N-spacings or other configurations where the input voltage may exceed 3.5 volts.

The attenuator should not normally be used for high frequency measurements, such as TEM, CSAMT, or AMT, where phase accuracy is necessary and the input load resistance varies. The reason for this restriction is that the attenuator circuit works as a low-pass filter when engaged, due to its high impedance and associated parasitic capacitance. Some typical phase shifts with the attenuator IN and a 10 KΩ input load are:

16	Hz	1	mr
64		4	
256		12	
1024		52	
4096		210	
8192		375	

With its low-pass filter characteristics, the attenuator can be used with resistivity and IP surveys to filter out strong radio signals from sources such as broadcast stations and air navigation stations, without affecting the IP response.

If the input load resistance is constant, the phase shift values can be calibrated out for high frequency CSAMT and AMT measurements, but not for TEM. The added filtering will affect the early times up to about 1 ms.

18.2   RECALIBRATE WHEN REPLACING ANALOG CARDS

With the ease in changing the configuration of the GDP-32^{II} analog cards, clients have been moving cards between channel positions in the internal card rack when they suspect some kind of electrical problem. With the new software, the calibrates in the calibrate cache do not have to be in the same order as the analog cards. However, if the GDP does not find a corresponding serial number for each card that is active, an error message will come up on the screen, and the operator can decide whether to go on or not.

When analog cards are replaced, the operator must calibrate all channels before gathering data with the new configuration, so that a valid calibrate is available in the calibrate cache.

18.3   CONNECTING PERIPHERALS TO THE GDP-32^{II}

When connecting peripherals (computers, XMT-16 or XMT-32 controllers, printers, etc.) it is always best to connect the cable first to the peripheral and then to the GDP-32^{II}.   This will minimize any static shock effects that might occur.

18.4   ALWAYS MEASURE CONTACT RESISTANCE - CRES

Always remember to use the contact resistance check by pressing the **CRES** function key. By measuring the contact resistance, you can tell if you have a break in the pot line for E-field measurements, or if your magnetic antennas are turned on for H-field measurements. An ANT/1 or TEM/3 antenna will have approximately 200 ohms resistance when turned on, and over 1,000 ohms resistance when turned off. Regular use of this function can save hours of lost field time.

However, if you are using a signal control box or some other signal conditioning peripheral attached between the GDP and the electrodes, you must bypass that peripheral in order to get a valid measure of electrode contact resistance.

18.5   XMT-32 TRANSMITTER CONTROLLER SPECS

GENERAL DESCRIPTION

Microprocessor controlled with memory for storing time schedule look-up tables for automatic transmitter control.

Synchronous time-base with internal calibrator.

Time or Frequency domain capability, 50% or 100% Duty cycle.

Frequency range in Binary Steps: 1024 Seconds to 8192 Hz

Size: 28x21x18 cm (11x8x7 in)

Weight: 6.4 kg (14 lb)

Enclosure: Heavy duty, environmentally sealed aluminum case.

Power: 12 V rechargeable battery, more than 10 hours continuous operation

Temperature range: -40° to +60°C (-40° to +140°F)

Humidity range: 0 to 95% non-condensing

Time base: Oven-controlled crystal oscillator;
   aging rate $<5x10^{-10}$ per 24 hours
   (optional crystal: $1x10^{-11}$ per 24 hours.)

CONTROLS & DISPLAYS

Phase/Battery meter

Time/Frequency switch

Battery/Phase meter switch

High/Low range calibrate output switch

.025/.25/2.5V PP

Reset switch

LCD Frequency display

Circuit Breaker.

OUTPUTS & INPUTS

12V Battery charge input

Control input/output

Calibrate output

RS232 input for time sequence table

FUNCTIONS

Can be synchronized with GDP-32^{II} Receiver for synchronous measurements. Capable of controlling GGT-series and ZT- and NT-series transmitters in both time and frequency domain. Continuous phase coherency between 1024 second period and 8192 Hz. 20 milliamp control signal for transmitter control. Reset pulse output for GDP-series receiver.

18.6   TRANSMITTER CONTROL INTERFACE

The GGT series transmitters use a twenty milliamp control signal with a rise and fall time of less than one microsecond. There are two control signals used; Transmitter on/off and Polarity.

1. **TRANSMITTER ON/OFF.** This signal is used in the time domain mode to turn off the transmitter when needed depending on the duty cycle required.

2. **POLARITY.** This signal controls the output polarity of the transmitter. When the signal is supplied the transmitter reverses the output polarity from the rest state.

The timing diagram below shows the relationship between the two signals for a fifty percent duty cycle.
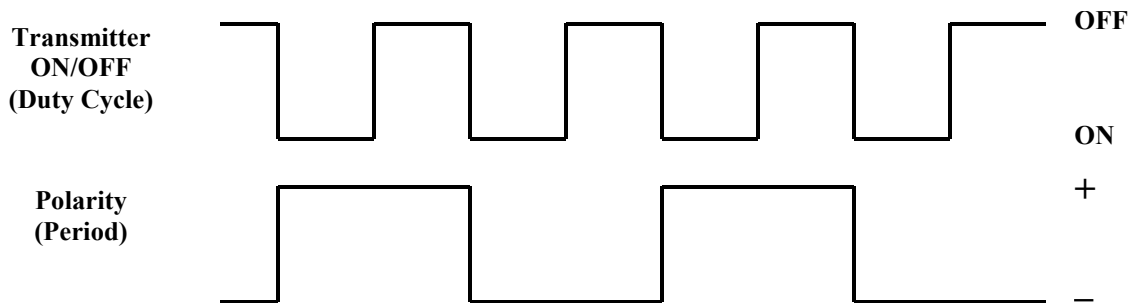
Presently we use a National Semiconductor chip to provide the drive for the transmitter from both the transmitter controller and the receiver. This MM88C3ON chip is used with either a 180 ohm or 560 ohm resistor in the output, depending on whether it is interfaced to 5 volt or 12 volt logic. This limits the current to a maximum of twenty milliamps in the drive circuits. The speed of the chip is more than sufficient to provide the proper drive.

Transmitter Control MS Connector

Polarity: A

Ground: B, E   (Need to be shorted together)

Transmitter ON/OFF: C   (With no connection, default is ON)

Duty cycle: D

18.7 RESISTANCE OF STANDARD GAUGE WIRE

Wire Size		Ohms per	Ohms per
mm^2	AWG	1000 ft	1000 m
-	10	1.04	3.4
-	12	1.65	5.4
-	14	2.62	8.6
-	16	4.17	13.7

METRIC WIRE

6.0	-	0.5	1.5
4.0	-	1.4	4.5
2.5	-	2.3	7.5
1.0	-	5.5	18.0

18.8   SETUP INSTRUCTIONS FOR LOADBANK LB2500

6.25 Amperes maximum through any 25 Ω resistor.

225 Watts maximum though the 500 Ω resistor.
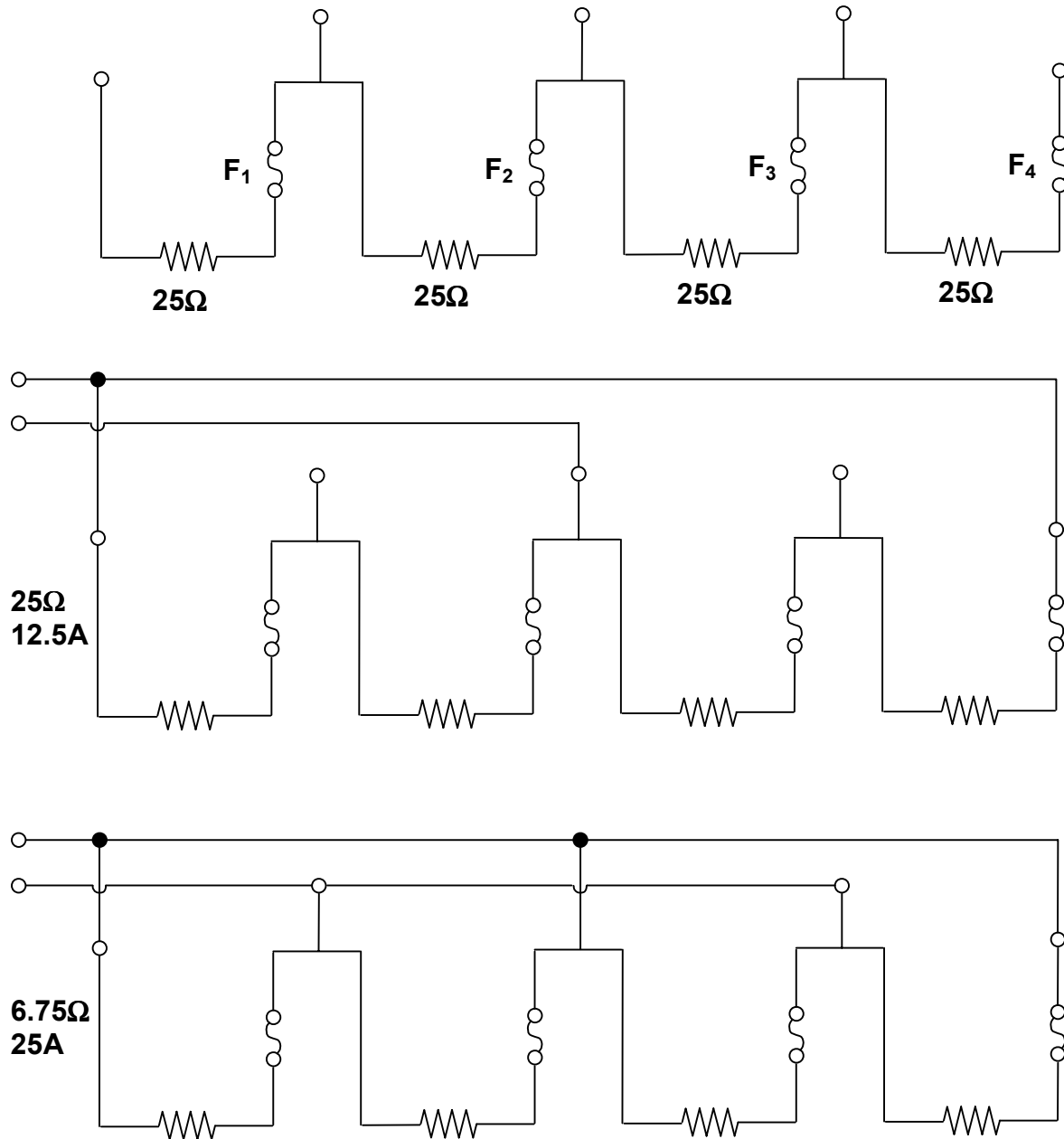
18.9 ANTENNA DESIGNATIONS

Antenna numbers are comprised of two parts - the antenna serial number, and the antenna or calibration type:

> NNNC
>
> NNN   antenna serial number
>
> C   channel number, antenna type or calibration type

Values for C:

0   Reserved for ANT/1 CSAMT antennas

1, 2   Reserved for dual axis AA antennas: 1 is channel 1, 2 is channel 2.

3   Reserved for AMT/CSAMT antennas, ANT/3

4   Reserved for MT antennas, ANT/4, EMI-BF4

5   Reserved for light-weight CSAMT antennas, ANT/5, UOII, UOIV

6   Reserved for Low Noise AMT antenna, ANT/6

9   Reserved for TEM antennas, TEM/3

7, 8   Not used at this time.

18.10   SERIAL PORT DATA TRANSFER, HYPERTERMINAL

Start HyperTerminal

       Click on the "Start" button.

       Move the mouse to "Programs", then "Accessories", then click on "HyperTerminal".

       Note: If HyperTerminal is not included, install it using your Windows installation CD.

              Click on the "Start" button.

              Move the mouse up to "Settings", then click on "Control Panel".

              Double click on "Add/Remove Programs".

              Click on the "Windows Setup" tab.

              Double click on "Communications".

              Click the "HyperTerminal" checkbox.

              Click "OK".

              Click "OK" again and follow the directions it will give you.

HyperTerminal Setup

From the folder that opened using the above instructions, double click on "Hypertrm.exe".

Enter a name such as "Gdp32", and click "OK".

Now you will have to try to figure out which Serial Port you are going to use on your computer. Most likely, it is COM1, so try that. For the "Connect using:" box, set it to: "Direct to Com 1". Click "OK".

Now set the following:

       Bits per second: 9600 (other speeds can be used if set on both GDP and Computer)

       Data Bits: 8

       Parity: None

       Stop bits: 1

       Flow control: Xon/Xoff (default is "Hardware", but the GDP does not support it.)

       Click "OK"

The default settings for everything else should be OK.

Testing the GDP to Computer Setup

Connect the serial cable to the GDP and try sending a few blocks of data. See Section 7.6 for GDP Serial Port Data Transfer Setup. You should see data displayed on the computer screen. If not, make sure the baud rate on the GDP is set to 9600. Make sure you are using the right serial port on your computer. Or try changing it to "Direct to Com 2". Try clicking the "Disconnect" followed by the "Connect" buttons and try sending data again. These are the telephone buttons on the toolbar, or they can be accessed through "Call".

Writing Data to a Computer File

Click on "Transfer->Capture Text".

Enter a path and filename for the file. The default path is good, it's the HyperTerminal folder. Use a filename such as "somename.raw".

Dump the data blocks from the GDP and watch the data scroll across the computer screen.

After the transfer is complete, close the file using: Click on "Transfer->Capture Text->Stop".

That's it! Now you can click the 'X' in the upper right corner to close HyperTerminal. Be sure to save the changes so the next time you can just double click on the folder icon you just named, and HyperTerminal will open with these same settings.

18.11   LOCAL AREA NETWORK (LAN) CONNECTION

The GDP32^{II} can be connected to a Local Area Network so that its hard drives can be accessed from any other computer, which is also connected to the LAN. The network is 10BaseT compatible and can be configured to your network settings in Windows95. Since networks can be configured many different ways, you should consult your network administrator for the settings your LAN requires. Also, see the GDP-32^{II} Manual, Section 7.

18.12   BLACK SCREEN WHEN RESETTING THE GDP-32^{II}

Under certain conditions, the screen on the GDP-32^{II} may turn black when the CONTROL/ALT/DELETE keys or the RESET key is used. If this happens, push the POWER ON/OFF key once to get the reset tone. The screen should return to its normal color. If it does not become bright after several tries, turn the receiver off and back on again.

18.13   OBSERVE PROPER TURN-OFF PROCEDURE

To extend the life of the Liquid Crystal Display (LCD), please always use the proper turnoff procedure for the receiver. See Section 3 Page 5 of the GDP-32^{II} Manual.