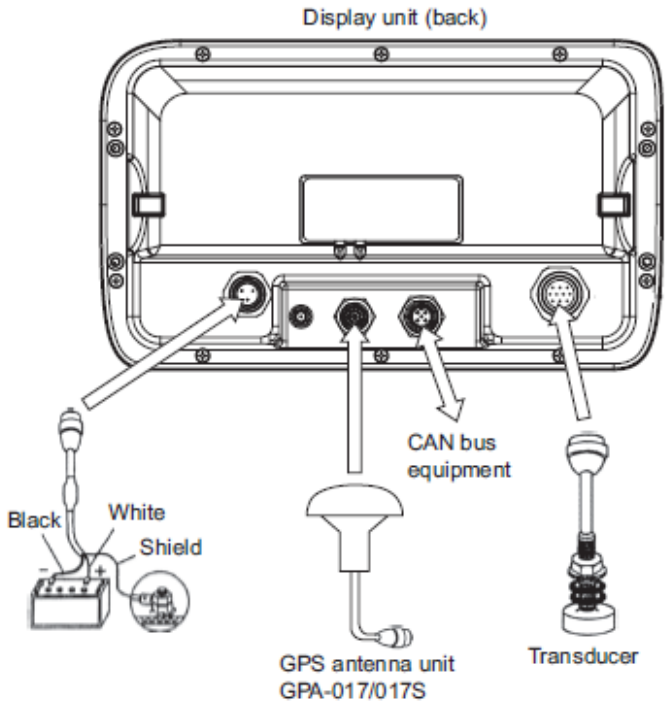

Figure 3. Connection socket of GP 1670F.

※ This figure is quoted from "FURUNO GPS PLOTTER/SOUNDER GP1670F, GP1870F OPERTOR'S MANUAL" of product GP-1670F of Furuno Electric Co., Ltd.

HOW TO CONNECT ECHO SOUNDER TO DATA COLLECTION SYSTEM

There are multiple signal lines on the cable connecting the main unit and the transducer. Among them, it is necessary to find the signal line used for transmission/reception. The number of pins and assignments varies from manufacturer to manufacturer. In many cases, it is described in the manual of each device. After checking the signal line, cut the cable halfway and connect it to terminal 8 (Transducer side) shown in Figure 4. Other signal lines are connected to the same pin number as Transducer side and GP1670F side. If necessary, replace the connector both of Transducer side and GP1670F XDR PORT.

Equipment modification was performed by importing the echo sounder transmitting and receiving signal from transducer cable to the newly designed Echo Sounder Data Collection System (AQFI-1301). The Echo Sounder Data Collection System (AQFI-1301) is composed of Pre-Amplifier and Band Pass Filter, Interface unit, Analog to Digital Converter, and PC computer system. The GPS position data is transferred from GP 1670F to PC Computer passing through NMEA to USB port. The GPS position data are recorded to the PC using Windows Hyper-terminal program. The data collection system is designed to record the echo sounder signal of 50 kHz. only.

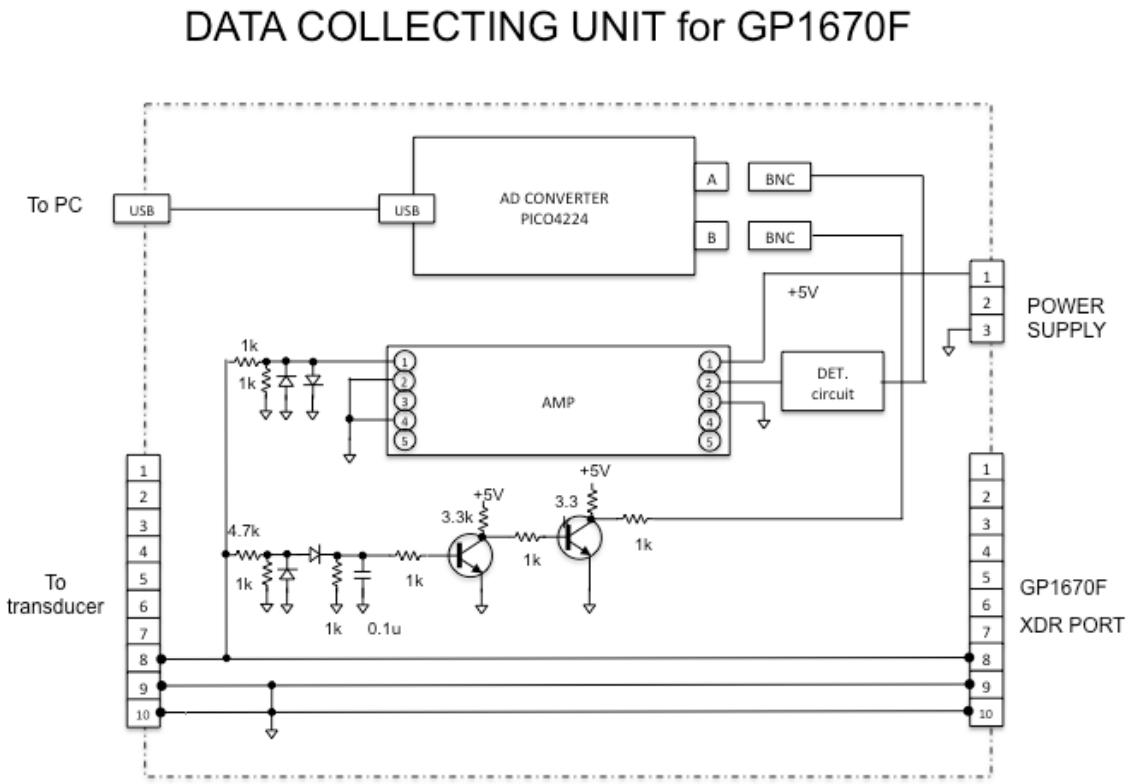

Figure 4. Circuit diagram of Survey Echo Sounder Data Collection System (AQFI-1301).

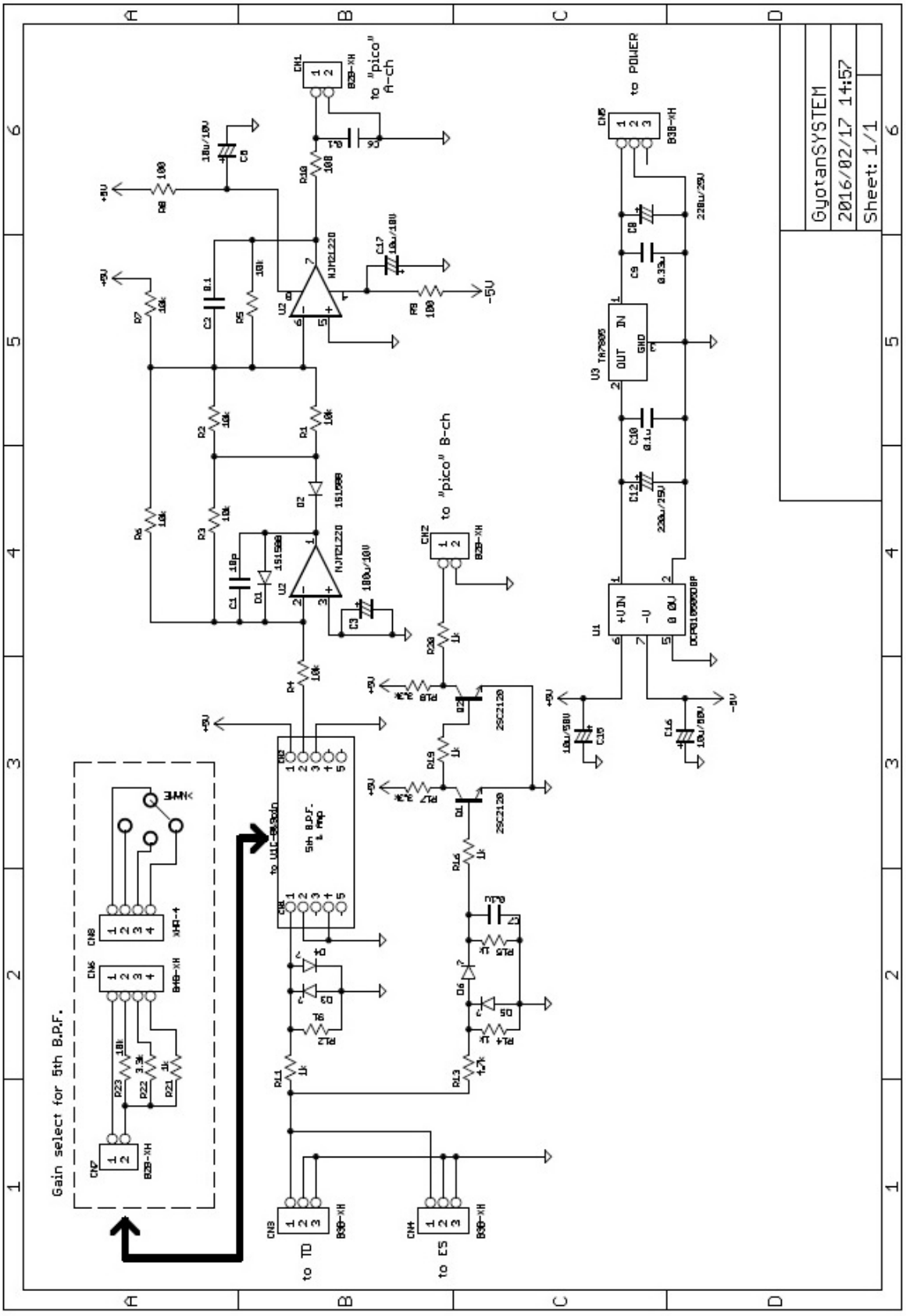

Figure 5. Frequency filter circuit at 50 kHz**.**

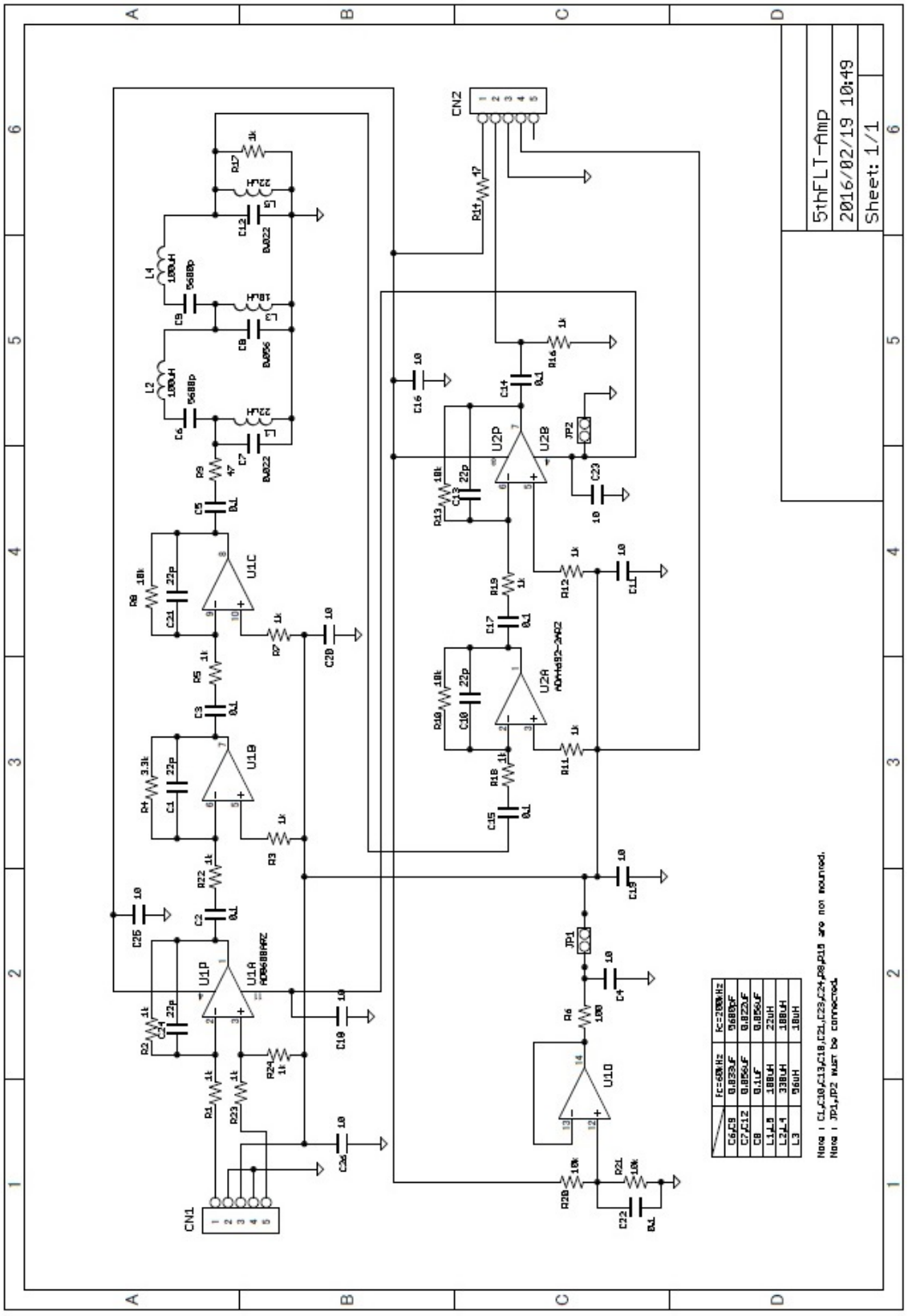

Figure 6. Pre-Amplifier circuit at 50 kHz**.**

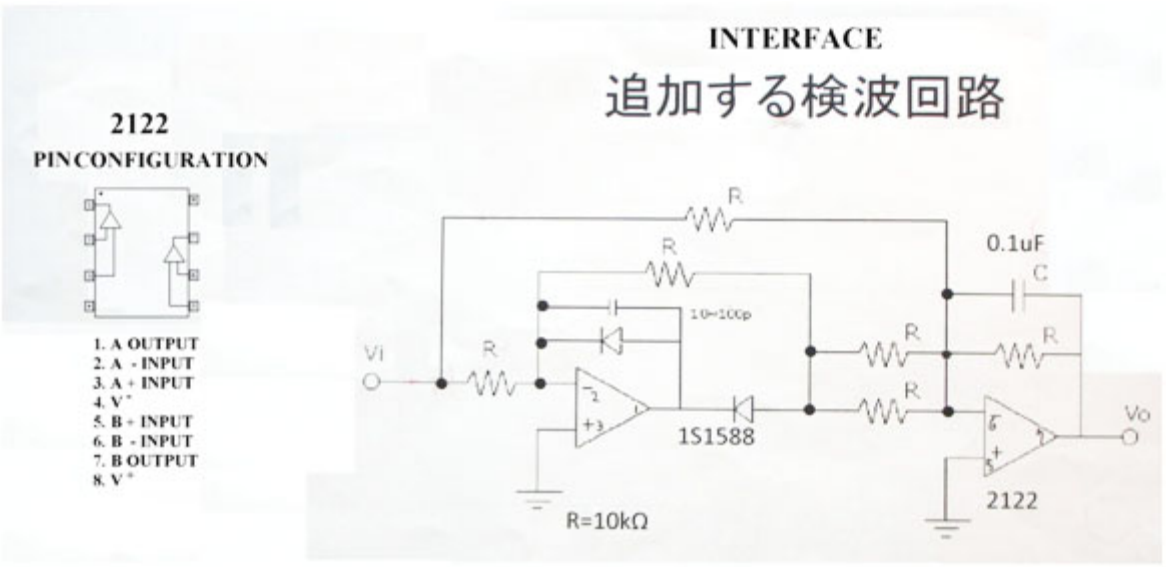

Figure 7. Interface circuit using IC 2122**.**

The return echo signal picks-up from the transducer cable is fed into Pre-Amplifier circuit for signal filtering and amplifying. Analog echo signal from Pre-Amplifier are put into Analog – Digital Converter, Pico 4224, for transforming into echo signal digital data. Personal Computer receives and records digital echo signal by AQUA SOUND software program of "FishFinder, Version 3.2" for Microsoft Windows 7. Digital data from echo sounder are sent to PC through USB port.

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Figure 8. Analog to Digital Converter, PicoScope 4224.

How to connect GPS receiver to PC

Ship position information (GPS) from echo sounder (GP1670F) is present on the CAN bus equipment port. CAN bus is a communication protocol that shares multiple data and signals through a single backbone cable. By simply connecting any CAN bus devices into the backbone cable, the network onboard can be expanded. All CAN bus devices can be incorporated into the NMEA2000 network.

The GPS receiver should have USB or RS232C data output port. If it is a USB output, connect it directly to the PC. If it is RS232C, connect it to the PC using the conversion cable (Figure 10).

The GPS information from echo sounder is transferred to the PC by applying the program "HyperTerminal" through NMEA Data Converter (IF-NMEA2K2), USB-to-Serial (RS232) Converter, and PC USB port.

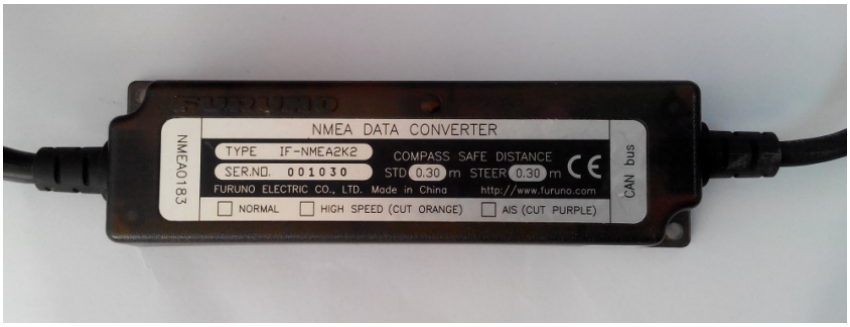

Figure 9. NMEA Data Converter (IF-NMEA2K2).

Figure 10. USB-to-Serial (RS232) Converter.