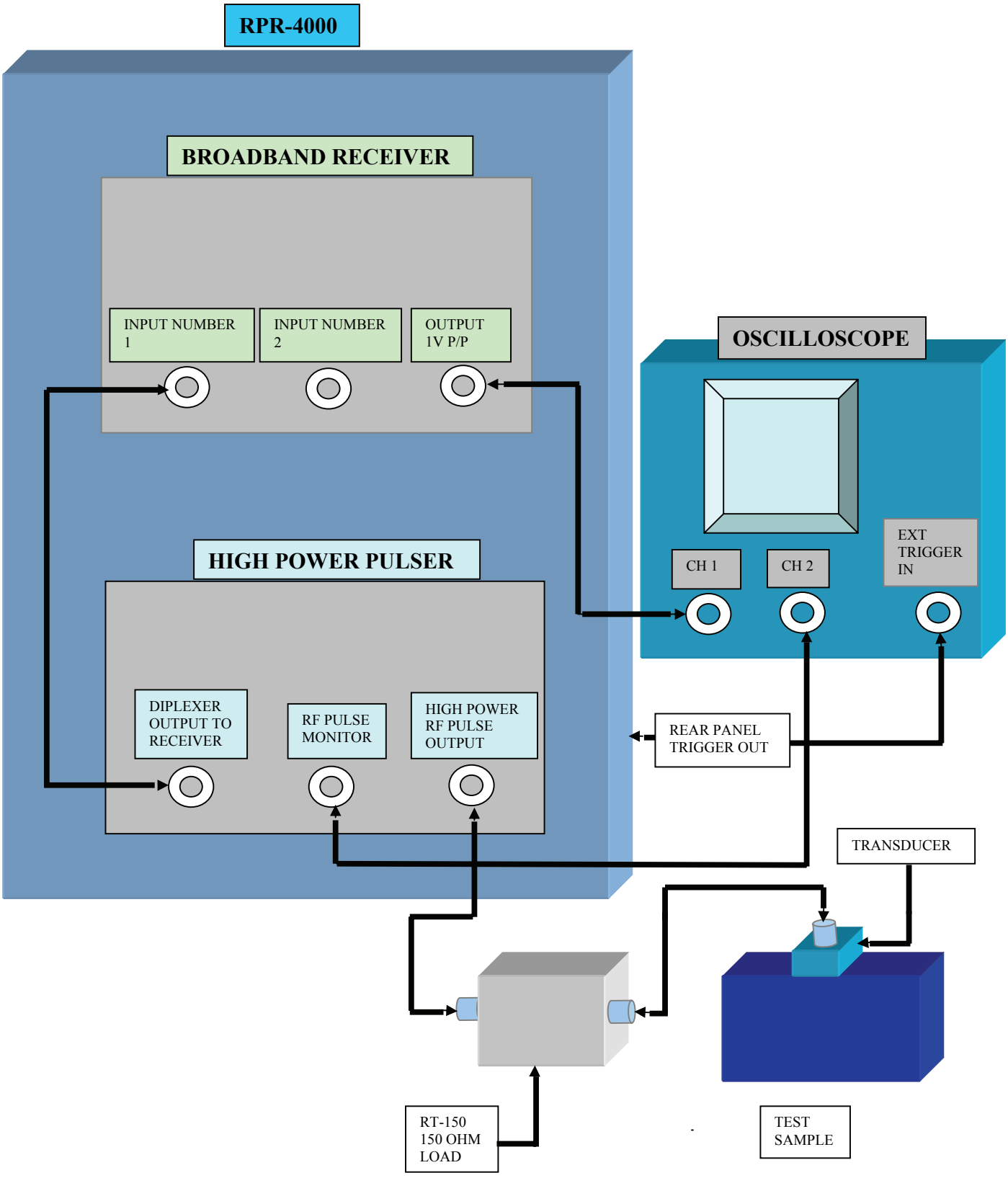
RPR-4000 Transmission/Receive Setup

Operating the RPR-4000 Pulser/Receiver in the two standard modes of operation (Pulse-Echo and Through Transmission) is very straight forward. (It should be noted that the instrument can operate from any line voltage from 90 to 240VAC).
A block diagram for the Pulse-Echo operation is shown in figure 1.
For Pulse-Echo operation proceed as follows:

1. Connect a short coaxial cable from "Diplexer Output to Receiver" to Receiver "Input Number 1".
2. If using a piezo-electric transducer, connect coax cables from "High Power RF Pulse Output" to an RT-150 (150 ohm high power load) and then to an appropriate transducer.
   If an electromagnetic transducer is used, the 150 ohm load is not required.
3. Connect a coaxial cable from "Trigger Out" on the rear panel of the RPR-4000 to the external trigger input on the scope.
4. Connect a coaxial cable from receiver "Output" to a 50 ohm vertical input on the scope. Set scope vertical sensitivity to 0.5 v/cm.
5. Connect a coaxial cable from "RF Pulse Monitor" to a 50 ohm vertical input on the scope. Set scope vertical sensitivity to 2v/cm. (Because the monitor output is down 40 dB [100:1] this vertical sensitivity then corresponds to 100 v/cm).
   Note* : The 150 ohm load when used with piezoelectrics serves two functions: A.) Cleans up the base line during the RF pulse.
   B.) Allows the control algorithm for output level to function with higher resolution.
6. Using the keypad on the front panel set the various operating parameters as follows:
   Frequency: To match the transducer
   Pulse Width: Typically 5 cycles
   Repetition Rate: 100pps
   Control: 10
   Receiver Input: Number 1
   Receiver Gain: 40dB
   Receiver High Pass Filter at 100 KHz
   Receiver Low Pass Filter at 20 MHz

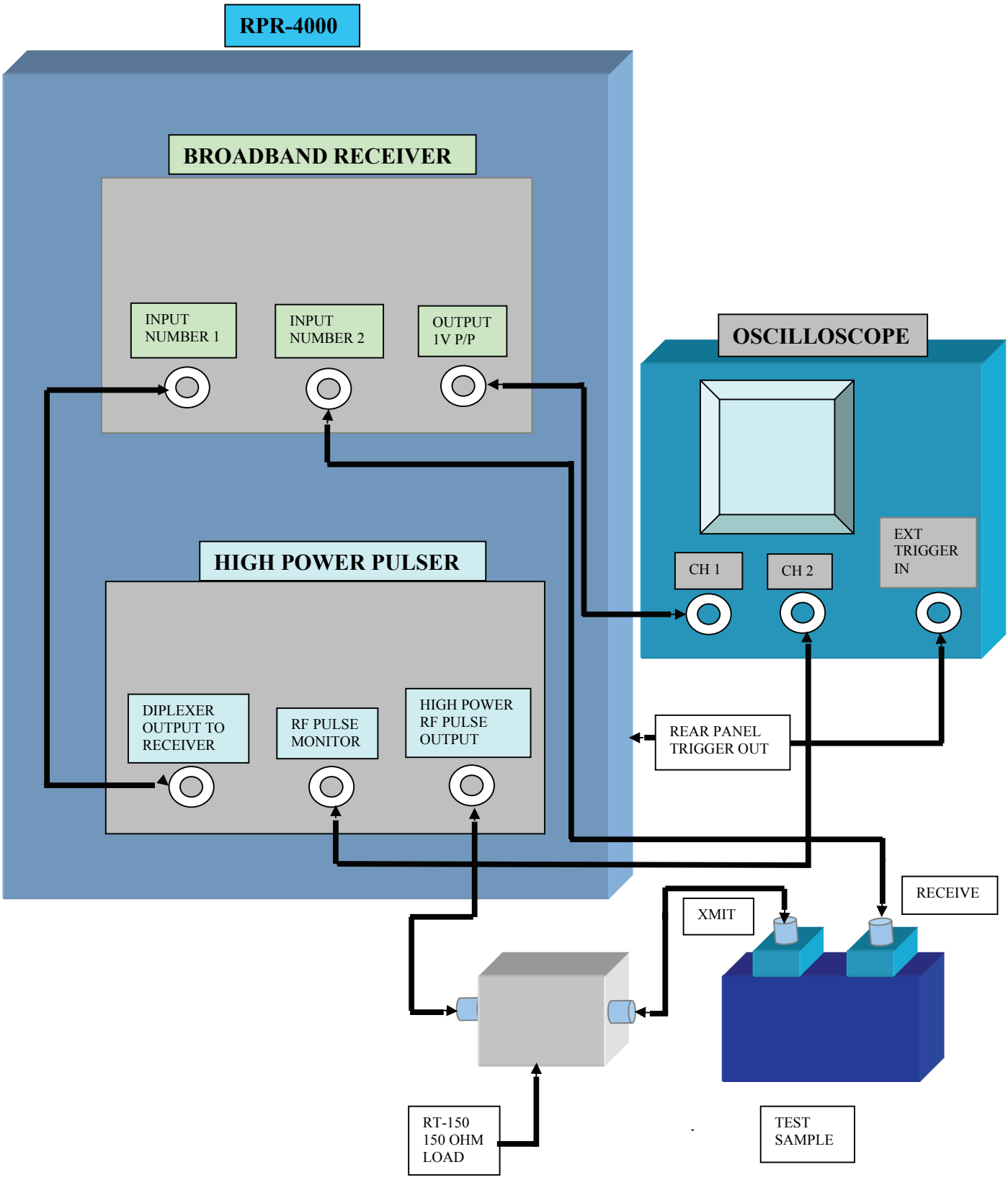
It should now be possible to obtain return signals from the test sample (after turning on the high voltage). Fine adjustments of all control parameters can then be carried out. Please note that some piezo-electric transducers will not tolerate the very large pulse outputs available from the RPR-4000. The maximum output available is approximately 2000 volts pk-to-pk. On the other hand EMATS, which are usually very low impedance, can typically tolerate the full output from the pulser.

FIGURE 1


RPR-4000
BROADBAND RECEIVER
INPUT NUMBER 1
INPUT NUMBER 2
OUTPUT 1V P/P
OSCILLOSCOPE
CH 1
CH 2
EXT TRIGGER IN
HIGH POWER PULSER
DIPLEXER OUTPUT TO RECEIVER
RF PULSE MONITOR
HIGH POWER RF PULSE OUTPUT
REAR PANEL TRIGGER OUT
TRANSDUCER
RT-150 150 OHM LOAD
TEST SAMPLE

For operation in thru-transmission simply connect the output from a second pick-up transducer to receiver “Input Number 2” and select that input with the keypad. The keypad will also allow the instrument to toggle back and forth between the two received inputs. All operation parameters can be independently set for the two received inputs even when the instrument toggles between the two inputs based on the repetition rate selected.
A block diagram for the thru-transmission operation is shown in figure 2.

FIGURE 2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RECEIVE
XMIT
RT-150 150 OHM LOAD
TEST SAMPLE