



THE PROBLEM AND HYPOTHESIS

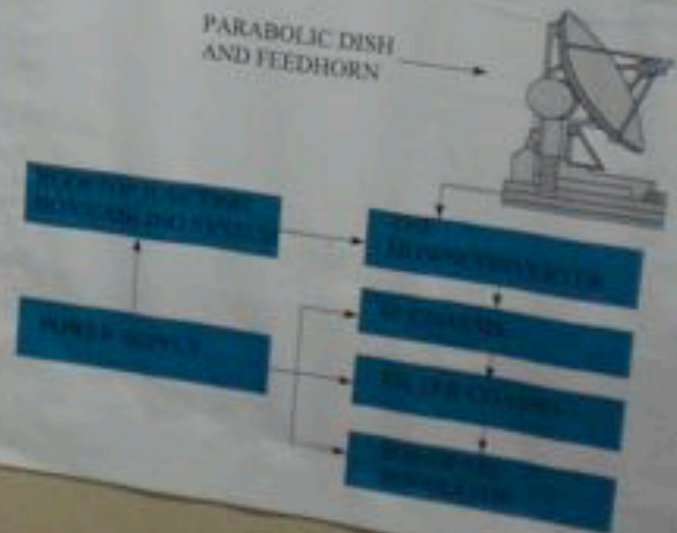
WHEN A RADIO TELESCOPE IS PLACED WITHIN A CITY THERE IS A HUGE AMOUNT OF RFI (RADIO FREQUENCY INTERFERENCE) TO BE DEALT WITH

I HYPOTHESIZED THAT RFI CAN BE IDENTIFIED AND ELIMINATED BY THE DESIGN AND FABRICATION OF A NEW RECEIVING SYSTEM FOR OUR RADIO TELESCOPE

THIS SYSTEM WAS BUILT IN SEVEN DIFFERENT SECTIONS. THESE SECTIONS WERE: THE DOWNCONVERTER, IF CHASSIS, FILTER CHASSIS, BANDPASS SEPARATOR, POWER SUPPLY, CABLING SYSTEM AND THE PLACING TOGETHER OF THE ENTIRE SYSTEM

IDENTIFYING RADIO FREQUENCY THROUGH SPI

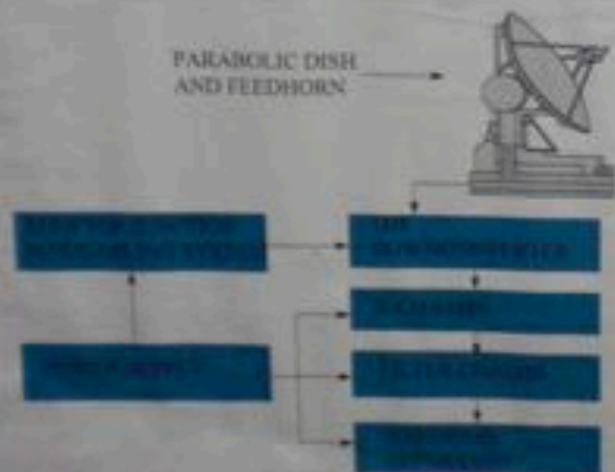
THE RADIO TELESCOPE GENERAL SYSTEM DESIGN BLOCK DIAGRAM



POWER SUPPLY

IDENTIFYING AND REDUCING RADIO FREQUENCY INTERFERENCE THROUGH SPECTRUM ANALYSIS

THE RADIO TELESCOPE GENERAL SYSTEM DESIGN BLOCK DIAGRAM



THE SYSTEM

Problem	Solution
Power supply noise due to the antenna system	Using a low noise amplifier
RF noise from the antenna	Using a bandpass filter
Interference from other systems	Using a bandpass filter

The system design process involves identifying radio waves in the air by giving them some all signal strength and the frequency and amplitude of the signals to find different examples of the signals.

POWER SUPPLY

The power supply provides 50V DC. The voltage and the current needed for the rest of the system.

BANDPASS SEPARATOR

Problem	Solution
Power supply noise due to the antenna system	Using a low noise amplifier
RF noise from the antenna	Using a bandpass filter
Interference from other systems	Using a bandpass filter



INTERFERENCE TRUM ANALYSIS

MF1 signal

THE DOWNCONVERTER

Problem

12.77 MHz IF was distorted

Wave was taking through overtones

No signal from the second IF amplifier
and 12.77 MHz OSC.

Solution

The V converter distorted and
was replaced with an 8000
series converter

A permanently sealed vacuum
tube used to replace the old one

12.77 was fine and functional

THE SYSTEM

Problem

Power voltage was low for
the receiver

It was consuming 12 V
amps

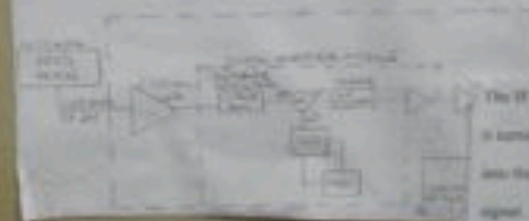
Video signal was normal

Solution

Using another power supply

Regenerative detector was
set up

Working buffer amplifier was
added to IF Channel - video
amplifier stage



The IF Channel takes the 75 MHz signal and lowers through
it turning the signal from the mixer to amplitude detector
and frequency to amplitude with the output of a video
signal

IF CHASSIS

Problem

Using vacuum tube detector
and mixer

Using video detector and
12.77 MHz OSC

Solution

Using video detector and
12.77 MHz OSC

Working video detector and
12.77 MHz OSC



BANDPASS SEPARATOR

Problem

Using vacuum tube detector
and mixer

Using video detector and
12.77 MHz OSC

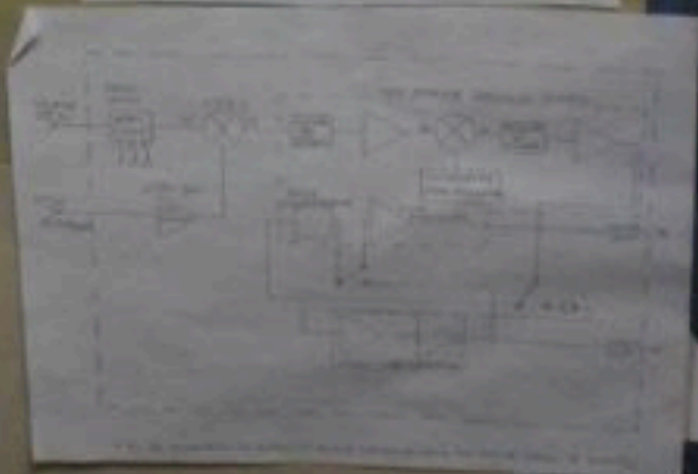
Working video detector and
12.77 MHz OSC

Solution

The complete redesign of the
video channel

Regenerative detector was
set up

Working video detector and
12.77 MHz OSC

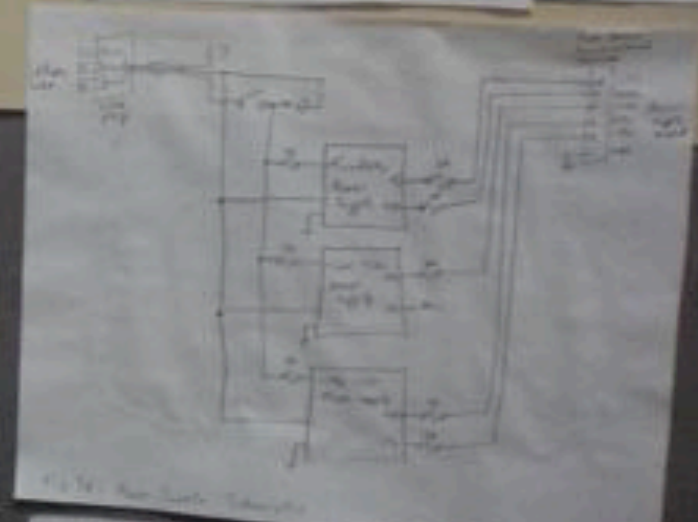


FABRICATION OF A NEW RECEIVING SYSTEM
FOR OUR RADIO TELESCOPE

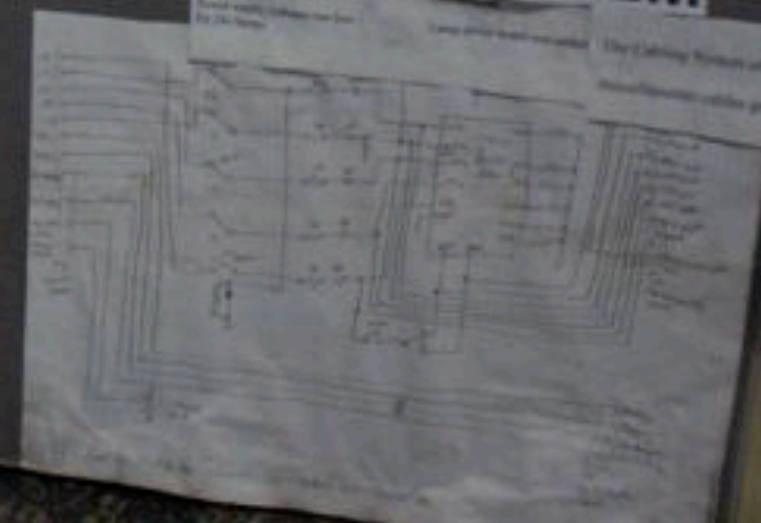
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CABLING SYSTEM AND THE PLACING
TOGETHER OF THE ENTIRE SYSTEM.

POWER SUPPLY

The power supply converts 220 V AC line
voltages needed by duration of the system.



CABLING SYSTEM



Frequency and amplitude of the strongest channels of the spectrum

RECEIVED SIGNAL

BANDPASS SEPARATOR

POWER SUPPLY

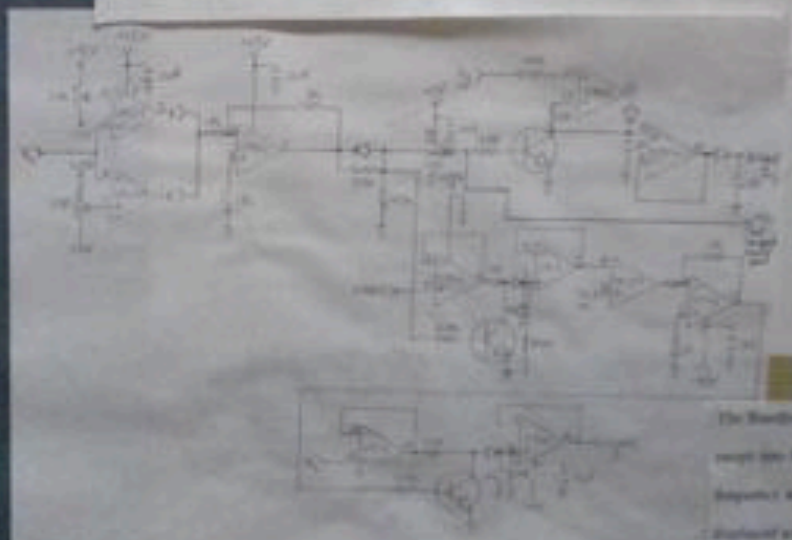
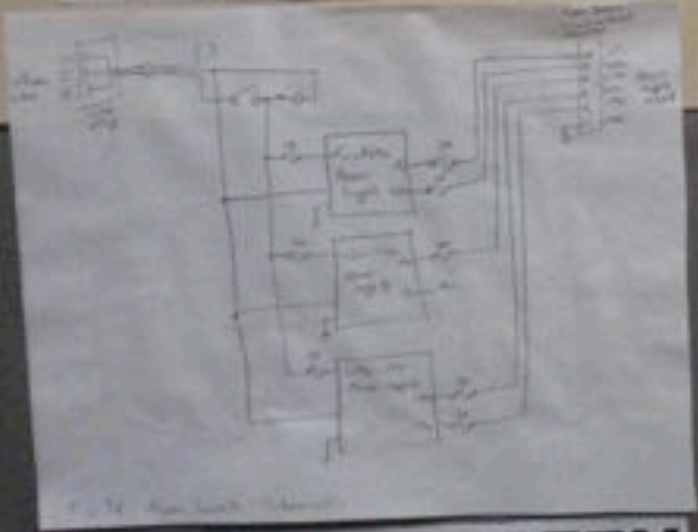
The power supply converts 120 VAC line voltage into the voltages needed by the rest of the system.

Problem

- original design would not work
- Integration was needed
- Integration required debugging was too long

Solution

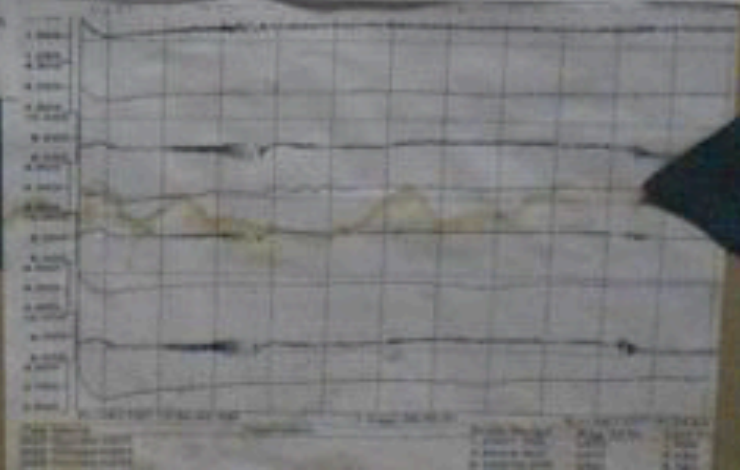
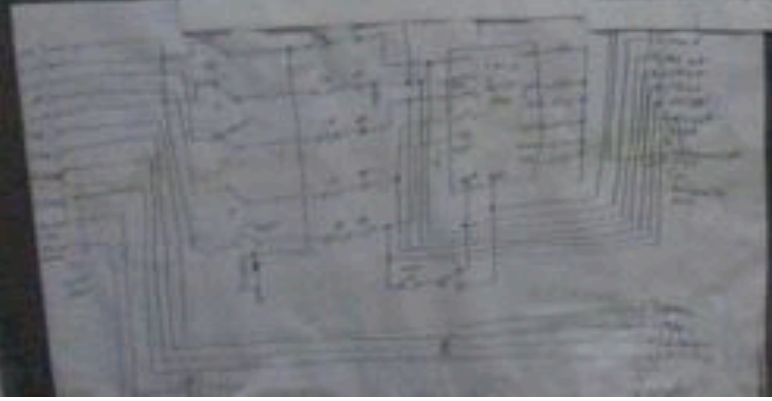
- The complete workings of the main board
- Integration steps were added to around the board
- Designs needed were added



The Bandpass Separator splits signals frequency into four channels where to each channel frequency and the amplitude of the strongest signal found as a function of voltage

CABLING SYSTEM

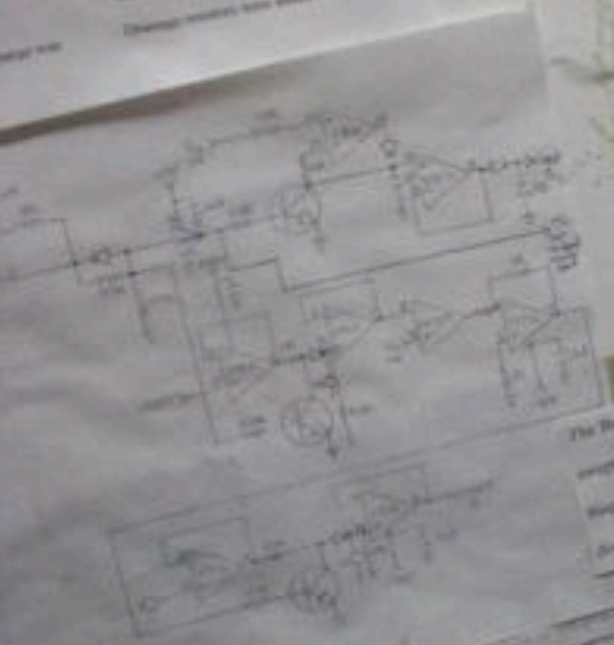
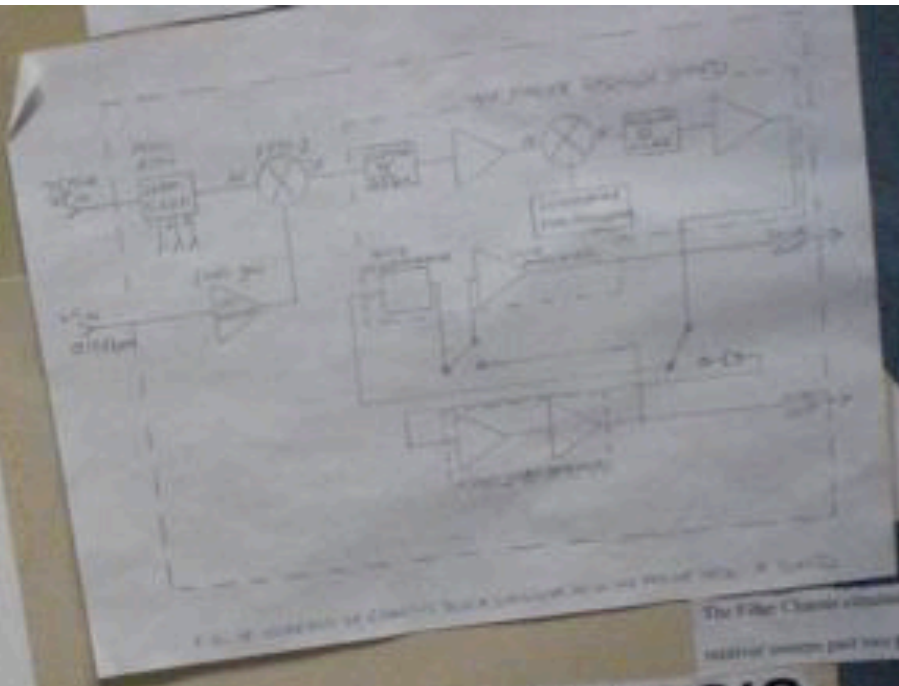
Low price board required. The Cabling System utilizes every wire on all microcomputers cables going up to the board.



NDPASS ARATOR

Solution

- The constant voltage of the time base
- Integration caps were added to extend the base
- Charge reservoirs were added



The Bandpass Separator splits up the frequencies being sent into four channels where in each channel the frequency and the amplitude of the composite signal is displayed as a function of voltage.

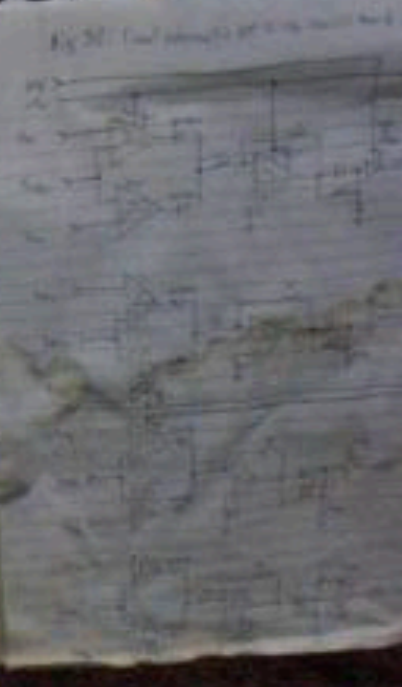
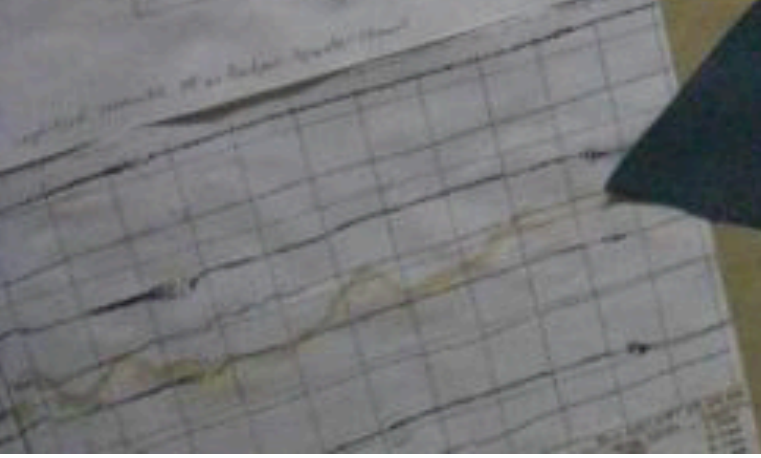
FILTER CHASSIS

Problem

- Bad component selection
- Incorrect voltage connections
- Bad component selection
- Bad component selection

Solution

- Good component selection
- Correct voltage connections
- Good component selection
- Good component selection



The Filter Chassis simulates the video output of a matrix system and two pre-see voltage