



**Proposal  
for  
modification  
of  
the satellite boxes**

# Synopsis

- ✓ The op-amp in the first stage of the sat. box occasionally doesn't properly operate (depending on the cable load). This leads to some high-freq. oscillation.
- ✓ Let's add **a 100 nF cap.** in parallel to the op-amp feedback resistor and do this modification for all the satellite boxes.

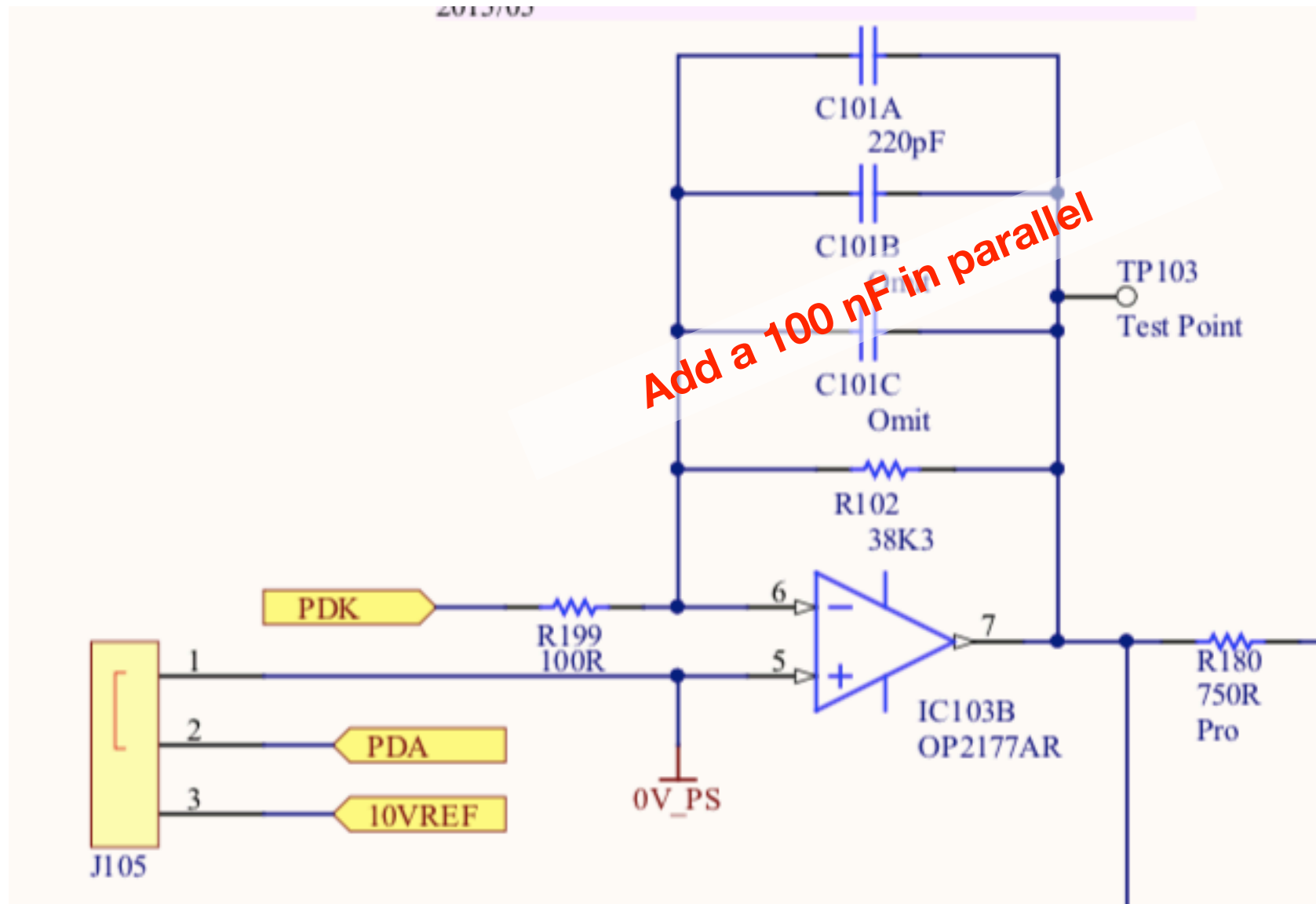
# Range of impact

✓ ***VIS, CRY, AOS.***

✓ And any subsystems which use the satellite box for photo-signal amplification.

## Implication

✓ The signal bandwidth will be limited to ***41 Hz.***



# Why 100 nF?

- ✓ The bandwidth was originally designed to be **19 kHz** which seems too high for most of our applications.
- ✓ Akutsu et al. some years ago found that an additional capacitor stabilized the op-amp while this mod. reduced the signal bandwidth at the same time.
- ✓ To date, several of us tested/implemented a few capacitor values, 10 nF, 100 nF and 470 nF (although in different setups). All worked out fine so far.
- ✓ CRY group prefers **100 nF (41 Hz)**. VIS and AOS implemented **470 nF (9 Hz)** to a few places.
- ✓ AEL group prefers ***one capacitor value for minimizing their working effort.***
- ✓ ***The 41 Hz bandwidth should cover the signal bandwidth required for CRY, VIS and AOS*** while still preventing the op-amp from oscillation.

# Some references:

- klog 4260: 10 nF added for ETM photo sensors by Ushiba et al.
- klog 4274: 470 nF added for WAB photo sensors by Miyo et al.
- klog 4332: 100 nF added for ETM photo sensors by Miyamoto.
- klog 5096: 470 nF added for BS shadow sensors by by Tanioka et al.
- JGW-D1503499-v2: 4 ch satellite amplifier board.